PLAINTIFF'S
EXHIBIT

PLAINTIFF'S
EXHIBIT
CAM-207

CERTIFICATE OF TRAINING

MSHA Form 5000-23, Nov 78

for retention by trainee)

Certificate of Training

U.S. Department of Labor
Mine Safety and Health Administration

This certificate is required under Public Law 91-173 as amended by Public Law 95-164. Failure to comply may result in penalties and other sanctions as provided by sections 108 and 110. Public Law 91-173 as amended by Public Law 95-164.

♦ Issue Certificate Immediately Upon Completion of Training	Serial Number (for operator's use)

1. Print Full Name of Person Trained (first, middle, last)

2. Check Type of Approved Training Received:

☐ New Miner ☐ Annual Refresher ☐ Newly Employed, Experienced ☐ New Task (specify)
☐ Hazard Training
☐ Other (specify)

3. Check Type of Operation and Related Industry:

A. ☐ Surface ☐ Construction ☐ Underground ☐ Shaft & Slope
B. ☐ Coal ☐ Metal ☐ Nonmetal

4. Date Training Requirements Completed

☐ Check if not completed

♦ If completed, go to item 6, below. and go to item 5. below.

5A. Date Training Requirements Partially Completed

5.B. Check Subjects Completed (use only for partially completed training):

☐ Introduction to Work Environment
☐ Hazard Recognition
☐ H&S Aspects of Tasks Assigned
☐ Statutory Rights of Miners
☐ Self-Rescue & Respiratory Devices
☐ Transport & Communication Systems
☐ Roof/Ground Control & Ventilation
☐ Health
☐ Electrical Hazards
☐ First Aid
☐ Mine Gases
☐ Explosives
☐ Prevention of Accidents
☐ Other (specify)
☐
☐

6. False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety & Health Act (P.L. 91-173 as amended by P.L. 95-164).	I certify that the above training has been completed (signature of person responsible for training)

7. Mine Name, ID, & Location of Training (if institution, give name & address)

8. Date — I verify that I have completed the above training (signature of person trained)

MSHA Form 5000-23, Nov 78 — Part I (for retention by trainee)

U.S. Department of Labor
Mine Safety and Health Administration
Metal and Nonmetal Mine Health and Safety
4015 Wilson Blvd
Arlington, VA 22203

Official Business
Penalty for private use $300
LAB 441

THIRD-CLASS BULK RATE
POSTAGE & FEES PAID
U.S. Department of Labor
PERMIT NO. G-59

2800959 CNTY% MIDDLESEX
SOUTH PLAINFIELD MILL
CYPRUS MINES CORPORATION
65L METUCHEN ROAD
S. PLAINFIELD NJ 07080

Instructions for Part 56 Standards Booklets

Update May 1985 edition of Surface Standards booklets with Subpart B enclosures as Follows:

1. Remove Subpart B—Ground Control (Pages B-1 through B-5) **from May 1985 edition.**

2. Insert enclosed Subpart B—Ground Control (Pages B-1 through B-4) **into May 1985 edition.**

3. Replace front cover and title page (May 1985) **with revised front cover and title page (October 1987).**

Note: Enclosed October 1987 edition contains all safety and health standards revisions promulgated through August 1987.

FHMAN 00004

329	040	010	329LND0301	LAND, S. PLAINSFIELD NJ MILL, OF SAL 1/1/87	12-31-86	3C-00	637,425.00	0.00
329	040	260	329032230Z	SHED RAIL CAR	03-01-79	12-00	34,442.00	24,223.00
329	040	260	329032293Z	BUILDING-MILL	09-01-79	12-00	115,700.00	64,178.77
329	040	260	329032250B	WAREHOUSE	09-01-79	12-00	68,370.00	35,963.77
329	040	260	329032250A	ADDITION-WAREHOUSE	09-01-79	12-00	20,179.00	15,907.49
329	040	260	329032270B	OFFICE & LAB	09-01-79	12-00	191,330.00	88,374.21
329	040	260	329032270A	ADDITION-SHOP & LAB	09-01-79	12-00	37,573.00	20,430.64
329	040	250	329032290Z	UNLOADING HOPPER CAR SYSTEM	09-01-79	00-00	94,979.00	94,979.00
329	040	250	329032300Z	DRYER SYSTEM	09-01-79	15-00	284,927.00	239,392.46
329	040	250	329032310Z	MILL FEED CONVEYOR SYSTEM	09-01-79	15-00	189,331.00	159,731.94
329	040	250	329032320Z	MILL GRINDING & PACKING SYSTEM	09-01-79	15-00	299,344.00	167,426.20
329	040	250	329032330Z	ROLLER MILL & PACKING SYSTEM	09-01-79	15-00	552,201.00	447,995.00
329	040	250	329032540Z	BULK STORAGE LOADING & TRANSFER SYSTEM	09-01-79	15-00	37,573.00	37,573.00
329	040	250	329032350Z	COMPRESSOR AIR, 15 HP INGERSOLL	09-01-79	05-00	0.00	0.00
329	040	250	329032360Z	COMPRESSOR AIR, 25HP INGERSOLL	09-01-79	05-00	0.00	0.00
329	040	250	329032370Z	TRUCK TOWMOTOR CAT LIFT AUTO TRANS	09-01-79	05-00	4,100.00	4,100.00
329	040	250	329032380Z	TRUCK TOWMOTOR CAT LIFT AUTO TRANS	09-01-79	05-00	0.00	0.00
329	040	250	329032390Z	W.LOADER MERWDE BOBCAT BOX CAR	09-01-79	05-00	0.00	0.00
329	040	250	329C324C0Z	TRACTOR CORD [illegible] AND LOADER	09-01-79	05-00	0.00	0.00
329	040	250	329032410Z	SHED 4 15' DIA X 32' WALK STORAGE	09-01-79	05-00	10,988.00	10,988.00
329	040	250	329032420Z	MAINTENANCE MISC EQUIP & TOOLS	09-01-79	05-00	0.00	0.00
329	040	250	329032430Z	MISC FIXED ASSET ACQUISITION COST AFE 3G9	10-01-79	05-00	0.00	0.00
329	040	260	329032870Z	STORAGE PAD PAVING CROSS AFE 3G9	10-01-79	12-00	17,370.00	14,362.96
329	040	250	329032C80Z	SNAP PACKING IPM 4875 SC STRETCH AFE 3G9E	10-01-79	15-00	4,101.00	3,411.35
329	040	250	329032890Z	TRUCK CAT LIFT 75C-D 67A00900 AFE 3G9F	11-01-79	15-00	21,121.00	18,332.19

Loc.040
So. Plainfield

FIXED FASB
ASSET LISTING
FOR PERIOD ENDING 12/31/87
CYPRUS INDUSTRIAL MINERALS' PROPERTIES

COMP CODE	FINCOMP
329	329

FINCOMP	PHYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	222	329B329103	TWX MACHINE, ASR 33 AFE 3889	12-01-79	10-00	0.00	0.00
329	040	222	329B329104	ADDTL COST-TWX MACHINE, AFE 3889	12-01-79	10-00	0.00	0.00
329	040	250	329C347002	PLANT IMPROVEMENTS, AFE 3161	06-01-80	10-00	0.00	0.00
329	040	222	329C355402	AUDIO VISUAL, AFE 635	11-01-80	10-00	33.00	366.75
329	040	250	329D402402	MILL ROLLER REPAIR, AFE 3860	08-01-80	10-00	0.00	0.00
329	040	250	329B402302	WELDER MILLER AMP 200 SN JA562159 AFE 723	01-01-01	10-00	0.00	0.00
329	040	250	329D469202	SHOP TOOLS, AFE 3890	04-01-01	10-00	0.00	0.00
329	040	260	329D409302	RAIL DOCK PLATE, AFE 730	09-01-81	10-00	613.40	613.40
329	040	250	329D414402	DRYER PROD ELEVATOR, AFE 3886	03-01-00	10-00	565.00	437.60
329	040	260	329D414502	GUARDS & RAILINGS-PLANT, AFE 3888	04-01-01	10-00	17,152.00	11,259.62
329	040	250	329D414602	ACCESS DOORS-PLANT, AFE 3889	12-01-00	10-00	1,937.00	1,204.92
329	040	250	329C414702	COMPRESSOR, AIR MODEL TA220AAF SN 145845 AFE 600	06-01-01	10-00	21,800.00	14,214.70
329	040	250	329D414802	VANE OIL DISPENSING MODEL HDLS2-101160 AFE 700	06-01-01	10-00	3,098.00	2,023.32
329	040	260	329D419702	ADDTL COST-CHIP TOOLS C/R 04092 3800	04-01-01	10-00	0.00	0.00
329	040	250	329D420002	CYCLONE ROLLER MILL REPLACEMENT, AFE 635	10-01-00	05-00	11,250.00	11,250.00
329	040	250	329D420202	ADDTL COST-RACK OIL STORAGE C/R 04148	06-01-01	10-00	0.00	0.00
329	040	260	329C420302	CONVEYTAINER AIR SIGMA 12000 BTU CARRIER AFE 813	07-01-81	10-00	474.00	307.01
329	040	260	329D421302	ADDTL COST-SHOP TOOLS C/R 04092 AFE 3800	04-01-01	10-00	0.00	0.00
329	040	250	329D421702	WELDER, SYNCO, AFE 881 & ADDL COST 04252	09-01-01	10-00	23,000.00	23,000.00
329	040	250	329D433502	AREA LIGHTING-FOR TWSTR EXTEN ADDL COST CA4395 AF	11-01-01	10-00	2,394.00	1,483.34
329	040	250	329D434402	LOADER 928 CAT S/N 62X10730 AFE 892	11-01-00	05-00	49,000.00	49,000.00
329	040	260	329C434702	DOCK SEALS AFE 937	01-01-01	10-00	2,219.00	1,246.34
329	040	250	329D478102	LOADER SKID-STEER SN 11556	12-01-82	10-00	14,162.00	7,191.47
329	040	250	329D481802	AIR VENTING IMPROVEMENTS	06-01-82	10-00	31,099.00	17,131.34
329	040	222	329D504702	MICROWAVE OVEN, LITTON AFE 1074	12-01-82	10-00	413.24	192.54
329	040	260	329D506612	DUSTY SC FT 1853 ELECTRIC JET AFE 1075	12-01-82	10-00	1,103.92	507.00
329	040	250	329D506902	SAW JET BAND MMES 712 AFE 1085	12-01-82	10-00	1,650.00	814.46
329	040	260	329D530002	WELDER MILLER CP-300 MIG W/WIRE FEED SN JCM46162	12-01-82	10-00	1,901.00	934.22
329	040	222	329D502702	TWX VTR 2000 32K	02-01-83	10-00	1,500.00	724.11
329	040	222	329D502702	ADDL COST, TWX VTR	03-01-83	10-00	463.93	223.40
329	040	222	329D502703	SALES TAX, TWX VTR	02-01-83	10-00	85.64	41.30
329	040	222	329D502706	SALES TAX-TWX VTR	03-01-83	10-00	18.07	8.73
329	040	222	329D503101	TYPEWRITER, MEMORY SELECTRIC EXEC	04-01-83	10-00	1,378.00	665.19

REO FARM
ASSET LISTING
FOR PERIOD ENDING 12/31/87
CYPRUS INDUSTRIAL MINERALS' PROPERTIES

CORP CODE 329 FINCOMP 329

FINCOMP	PHYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	222	329a503102	SALES TAX-TYPEWRITER	04-01-83	10-00	82.20	24.04
329	040	221	329359290A	MISC FURN & FIXTURES	09-01-79	10-00	2,000.00	1,037.80
329	040	221	329359291D	CABINET FOR VTR CSOE TV UNITS	08-01-84	10-00	340.00	113.74
329	040	221	329359291C	ADDTL COST	09-01-84	10-00	42.65	15.04
329	040	211	3294300301	PICKUP 1982 FORD F-250 VIN 1FTHF25Z3CPA19491 PIHA	05-01-84	03-00	4,025.12	3,422.12
329	040	211	3294300302	FREIGHT-PICKUP 1982 F250	03-01-84	03-00	350.00	293.00
329	040	250	329340220A1	CLASSIFIER JET STREAM - AFE 83-17 ADDL DETAILS REQ	03-01-84	15-00	52,573.57	12,702.06
329	040	250	329340220B2	CLASSIFIER JET STREAM AFE 83-17 ADDL COST	03-01-84	15-00	244.52	49.66
329	040	250	3298403201	CONTROLLER ROLLER MILL REJECT	10-01-83	10-00	442.15	97.06
329	040	250	329840320A2	ADDTL COST-CONTROLLER ROLLER MILL	11-01-85	10-00	1,351.71	283.64
329	040	250	3298403401	SEMI-BULK PACKAGING SYSTEM, AFE 82-03	12-01-85	07-00	28,021.23	11,398.42
329	040	260	329930111A	RAIL RAMP 26M (CHANGE EQUIP-DUPLC)	10-01-83	10-00	2,350.00	1,047.58
329	040	260	3299301201	FREIGHT ON UNIDENTIFIED ARTICLE	10-01-83	10-00	101.83	84.06
329	040	260	3299301301	RAMP & PAD-CRUDE UNLOADING	12-01-83	10-00	3,403.00	1,361.15
329	040	260	3299301302	FABRICATED DECK PLATE FOR CRUDE UNLOADING RA	12-01-83	10-00	500.00	192.24
329	040	260	3299301303	COLOR TV PJC4230A	07-01-84	10-00	301.94	107.75
329	040	260	3299301304	RECORDER VIDEO VJ250	07-01-84	10-00	453.46	159.64
329	040	260	3299302001	PROJECTOR MOVIE, USED	11-01-83	05-00	425.00	349.41
329	040	260	3299302501	PLATFORM CRUDE UNLOADING	12-01-83	10-00	3,400.00	1,360.22
329	040	260	3299302801	AIR CONDITIONING UNIT (CARRIER) S/N 5307144	06-01-84	10-00	410.00	136.00
329	040	260	3299303002	SALES TAX-AIR CONDITIONING	06-01-84	10-00	24.64	5.65
329	040	260	3299307601	DUCK 2/0 X 7/C STEEL	01-01-85	10-00	535.99	153.32
329	040	260	3299307602	SALES TAX-STEEL DUCK	01-01-85	10-00	32.16	7.19
329	040	260	3299312401	TRAILER RESTRAINT	02-01-85	10-00	2,509.00	714.04
329	040	260	3299312402	ADDTL COST-TRAILER RESTRAINT	03-01-85	10-00	247.35	68.04
329	040	260	3299312403	SALES TAX-TRAILER RESTRAINT	03-01-85	10-00	15.00	3.28
329	040	260	3299312404	ADDL COST-LABOR	02-01-85	09-00	244.00	64.40
329	040	260	3299314701	MAGNET, FORGET-BULK RAIL SYSTEM	07-01-85	10-00	3,094.00	733.48
329	040	260	3299314702	ADDTL COST-BULK RAIL SYSTEM	08-01-85	10-00	31.51	7.21
329	040	260	3299314801	CURTAIN-NOISE CONTROL	03-31-85	10-00	2,399.00	648.52
329	040	260	3299314802	SALES TAX-NOISE CONTROL CURTAINS	05-01-85	10-00	13.01	3.05
329	040	260	3299314803	ADDTL COST-CURTAINS	05-02-85	09-00	127.41	33.34
329	040	260	3299320601	UPGRADE-ELECTRICAL POWER SERVICE, AFE 86-39	12-31-86	20-00	89,931.68	4,788.80

M&D FA:M
ASSET LISTING
FOR PERIOD ENDING 12/31/87
CYPRUS INDUSTRIAL MINERALS' PROPERTIES

CORP CODE	FINCOMP
329	329

FINCOMP	PHYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	300	3299323901	CRUDE UNLOADING FACILITY, AFE 86-15	12-31-86	12-00	14,275.26	1,288.74
329	040	260	3299392901	NO DESCRIPTION	09-01-83	10-00	759.00	313.30
329	040	260	3299392903	RAILCARACCES 3T4-409 16GACARBON STEEL-6 SLIPCOUPLI	01-01-85	10-00	858.41	245.98
329	040	260	3299392904	ADDTL ACCESSR-RAIL CARACCES	01-01-85	10-00	2,717.09	784.24
329	040	260	3299392905	STEEL TUBING-RAIL CARACCES	01-01-85	10-00	585.66	172.92
329	040	260	3299392906	ADDTL COST-RAIL CARACCES	01-01-85	10-00	739.23	215.60
329	040	260	3299392907	ADDTL COST-RAIL CARACCES	02-01-85	10-00	22.52	4.97
329	040	260	3299600001	REPAIRS TO LOADING DOCK REMOVED CONCRETE PIER	11-01-83	10-00	0.00	0.00
329	040	260	3299700601	BUILDING-CRUDE STORAGE	11-01-85	10-00	79,909.84	16,763.40
329	040	260	3299700602	ADDTL COST-CRUDE STORAGE BUILDING	11-01-85	10-00	1,280.00	269.10
329	040	260	3299700603	SALES TAX-STORAGE BUILDING	11-01-85	10-00	76.80	16.42
329	040	260	3299700604	ADDTL COST-STORAGE BUILDING, AFE 83-20	01-31-86	10-00	400.00	80.00
329	040	260	3299700605	ADD'L COST, ORE STORAGE BUILDING, AFE 87-33	04-30-87	09-00	9,200.00	766.67
** PHYLOC			040					
							3,023,628.72	1,703,513.40

SCHEDULE: D
COMPANY CODE: 329

CIN TALC - DIVISION OF CYPRUS MINES
FINANCIAL BOOK DEPRECIATION SCHEDULE
JAN 1987

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MAIN ACCT	PPI SUB	EQUIP NO.	CNTRL NO.	ACQ DTE MO	ACQ DTE YR	COST	SALVAGE VALUE	LIFE	NET BOOK VALUE	DEPRECIATION CURRENT MONTH	DEPRECIATION YEAR-TO-DATE	DEPRECIATION TO-DATE
3521	301	43003	2902	03	84	350.00	52	05	94	8	8	256
3521	301	43003	2901	05	84	4,025.12	603	09	985	95	95	3,040
TOTAL EQUIPMENT				43003		4,375.12	655		1,079	103	103	3,296
TOTAL PRIMARY SUBACCOUNT				301		4,375.12	655		1,079	103	103	3,296
TOTAL MAIN ACCOUNT				3521		4,375.12	655		1,079	103	103	3,296
3522	301	35999	2909	08	84	340.00		10	296	3	3	84
3522	301	35999	2908	04	79	2,000.00		10	576	17	17	1,424
3522	301	35999	2910	09	84	43.65		10	44			
TOTAL EQUIPMENT				35999		2,383.65			876	20	20	1,508
TOTAL PRIMARY SUBACCOUNT				301		2,383.65			876	20	20	1,508
3522	302	03554	2902	11	80	598.00		10	206	4	4	392
3522	302	05047	2902	12	82	413.20		10	272	3	3	141
3522	302	35031	2901	04	85	1,370.00		10	1,139	11	11	231
3522	302	35031	2902	04	85	82.20		10	61	1	1	21
TOTAL EQUIPMENT				35031		1,452.20			1,200	12	12	252
TOTAL PRIMARY SUBACCOUNT				302		2,463.40			1,678	19	19	725
TOTAL MAIN ACCOUNT				3522		4,787.13			2,554	39	39	2,233
3525	300	03229	2902	09	79	99,976.00		00	4,963	989	989	90,013
3525	300	03230	2902	09	79	204,927.00		10	62,874	2,374	2,374	216,053
3525	300	03231	2902	09	79	189,991.00		10	45,903	1,503	1,503	144,040
3525	300	03232	2902	09	79	199,344.00		10	49,166	1,661	1,661	151,151
3525	300	03233	2902	09	79	532,281.00		10	125,421	4,436	4,436	403,000
3525	300	03234	2902	09	79	37,573.00		00	1,975	391	391	35,600
3525	300	03237	2902	09	79	4,160.00		05				4,160

I FHMAN 00009

SCHEDULE: B
COMPANY CODE: 329

CIM TALC - DIVISION OF CYPRUS MINES 3
FINANCIAL BOOK DEPRECIATION SCHEDULE
JAN 1987

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MAIN ACCT	PRI SUB	EQUIP NO.	CNTRL NO.	ACQ DTE MO	ACQ DTE YR	COST	SALVAGE VALUE	LIFE	NET BOOK VALUE	DEPRECIATION CURRENT MONTH	DEPRECIATION YEAR-TO-DATE	DEPRECIATION TO-DATE
3525	300	03243	2902	09	79	10,980.00		08	587	114	114	10,393
3525	300	03288	2902	11	79	4,101.00		10	1,000	34	34	3,101
3525	300	03289	2902	11	79	21,121.00		10	3,125	176	176	17,996
3525	300	04144	2902	03	80	565.00		10	100	5	5	365
3525	300	04147	2902	06	81	21,800.00		10	9,680	182	182	12,200
3525	300	04148	2902	06	81	3,098.00		10	1,361	26	26	1,737
3525	300	04200	2902	10	80	11,250.00		05				11,250
3525	300	04252	2902	09	81	28,081.00		10	12,390	234	234	15,691
3525	300	04734	2902	11	81	49,000.00		05				49,000
3525	300	04781	2902	12	82	14,162.00		10	8,272	118	118	5,890
3525	300	04818	2902	06	82	31,099.00		10	16,853	259	259	14,246
3525	300	04020	2901	03	84	51,573.57		15	42,103	287	287	9,471
3525	300	84020	2902	08	84	244.62		15	216	1	1	29
TOTAL EQUIPMENT				04020		51,818.19			42,319	280	280	9,500
3525	300	04032	2901	10	85	442.13		10	382	4	4	60
3525	300	04032	2902	11	85	1,351.71		10	1,196	11	11	154
TOTAL EQUIPMENT				84032		1,793.84			1,506	15	15	214
3525	300	04034	2901	12	85	28,021.25		05	21,950	467	467	6,071
TOTAL PRIMARY SUBACCOUNT				300		1,620,122.28			417,617	13,352	13,352	1,202,506
TOTAL MAIN ACCOUNT				3525		1,620,122.28			417,617	13,352	13,352	1,202,506
3526	300	03223	2902	09	79	34,442.00		12	12,606	239	239	21,796
3526	300	03224	2902	09	79	113,762.00		15	56,250	632	632	57,512
3526	300	03295	2902	09	79	152,378.00		15	75,321	647	647	77,057
3526	300	03225	2904	09	79	28,179.00		15	13,912	157	157	14,267

I FHMAN 00010

SCHEDULE: B
COMPANY CODE: 329

CIM TALC - DIVISION OF CYPRUS MINES 3
FINANCIAL BOOK DEPRECIATION SCHEDULE
JAN 1987

MAIN ACCT	PRI SUB	EQUIP NO.	CNTRL NO.	ACQ DTE MO	ACQ DTE YR	COST	SALVAGE VALUE	LIFE	NET BOOK VALUE	DEPRECIATION CURRENT MONTH	DEPRECIATION YEAR-TO-DATE	DEPRECIATION TO-DATE
TOTAL EQUIPMENT				03	225	180,557.00			89,233	1,004	1,004	91,324
3526	300	03227	2903	09	79	151,335.00		15	74,816	841	841	76,519
3526	300	03227	2904	09	79	37,573.00		12	13,827	261	261	23,746
TOTAL EQUIPMENT				03	227	188,908.00			88,643	1,102	1,102	100,265
3526	300	03287	2902	10	79	17,378.00		10	4,192	145	145	13,186
3526	300	04093	2902	03	81	915.00		10	388	8	8	527
3526	300	04145	2902	04	81	17,152.00		10	7,674	143	143	9,478
3526	300	04146	2902	12	80	1,635.00		10	543	14	14	1,092
3526	300	04203	2902	07	81	474.00		10	209	4	4	269
3526	300	04333	2902	11	81	2,594.00		10	1,405	22	22	1,189
3526	300	04547	2902	01	82	2,219.00		10	1,225	18	18	994
3526	300	05048	2902	12	82	1,103.92		10	681	9	9	423
3526	300	05049	2902	12	82	1,650.00		10	994	14	14	656
3526	300	05050	2902	12	82	1,961.00		10	1,209	16	16	752
3526	300	93011	2901	10	83	2,550.00		10	1,752	21	21	798
3526	300	93012	2901	10	83	181.88		10	106	2	2	76
3526	300	93013	2903	07	84	301.94		10	215	3	3	87
3526	300	93013	2904	07	84	453.46		10	337	4	4	116
3526	300	93013	2901	12	83	3,400.00		10	2,364	28	28	1,036
3526	300	93013	2902	12	83	350.00		10	239	3	3	111
TOTAL EQUIPMENT				93	013	4,505.40			3,155	38	38	1,350
3526	300	93020	2901	11	83	425.00		05	166	7	7	259
3526	300	93023	2901	12	83	3,400.00		10	2,392	28	28	1,008
3526	300	93038	2901	06	84	410.00		10	320	3	3	90
3526	300	93038	2902	06	84	24.60		10	25			

I FHMAN 00011

SCHEDULE: 8
COMPANY CODE: 329

CIN TALC - DIVISION OF CYPRUS MINES 3
FINANCIAL BOOK DEPRECIATION SCHEDULE
JAN 1987

PAGE 7A
02/02/87

MAIN ACCT	SUB	EQUIP NO.	CNTRL NO.	ACQ DTE MO	YR	COST	SALVAGE VALUE	LIFE	NET BOOK VALUE	DEPRECIATION CURRENT MONTH	YEAR-TO-DATE	TO-DATE
TOTAL EQUIPMENT				93030		434.60			345	3	3	90
3526	300	93076	2901	01	85	585.95		10	440	4	4	96
3526	300	93076	2902	01	85	32.16		10	32			
TOTAL EQUIPMENT				93076		568.11			472	4	4	96
3526	300	93124	2904	02	85	240.09		09	218	2	2	30
3526	300	93124	2901	02	85	2,569.00		10	2,107	21	21	462
3526	300	93124	2903	03	85	15.00		10	15			
3526	300	93124	2902	03	85	247.35		10	203	2	2	44
TOTAL EQUIPMENT				93124		3,079.44			2,543	25	25	536
3526	300	93147	2901	07	85	3,094.00		10	2,652	26	26	442
3526	300	93147	2902	08	85	34.51		10	35			
TOTAL EQUIPMENT				93147		3,128.51			2,687	26	26	442
3526	300	93148	2901	08	85	2,399.08		10	1,979	20	20	420
3526	300	93148	2902	08	85	18.01		10	18			
3526	300	93148	2903	09	85	127.41		10	108	1	1	19
TOTAL EQUIPMENT				93148		2,544.50			2,105	21	21	439
3526	300	93206	2901	12	86	86,931.60		20	86,570	362	362	362
3526	300	93909	2903	01	85	850.41		10	696	7	7	162
3526	300	93909	2905	01	85	730.23		10	595	6	6	144
3526	300	93909	2906	01	85	585.65		10	466	5	5	120
3526	300	93909	2904	01	85	2,717.09		10	2,196	23	23	531
3526	300	93909	2907	02	85	22.52		10	23			
3526	300	93909	2901	09	85	750.00		10	625	6	6	234
TOTAL EQUIPMENT				93909		5,601.91			4,691	47	47	1,191

I FHMAN 00012

SCHEDULE: B
COMPANY CODE: 329

CIM TALC - DIVISION OF CYPRUS MINES 3
FINANCIAL BOOK DEPRECIATION SCHEDULE
JAN 1987

MAIN ACCT	PRI SUB	EQUIP CAT.	CNTRL NO.	ACQ DTE MO	ACQ DTE YR	COST	SALVAGE VALUE	LIFE	NET BOOK VALUE	DEPRECIATION CURRENT MONTH	DEPRECIATION YEAR-TO-DATE	DEPRECIATION TO-DATE
3526	300	97006	2904	01	86	400.00		10	367	3	3	33
3526	300	97006	2903	11	05	76.00		10	63	1	1	14
3526	300	97006	2902	11	05	1,298.68		10	1,126	11	11	184
3526	300	97006	2901	11	05	78,909.04		10	70,586	666	666	9,324
TOTAL EQUIPMENT				97006		81,666.64			72,142	681	681	9,525
TOTAL PRIMARY SUBACCOUNT				300		759,640.59			444,258	4,635	4,635	315,591
TOTAL MAIN ACCOUNT				3526		759,640.59			444,258	4,635	4,635	315,591
TOTAL LOCATION				29		2,387,153.12		665	865,500	18,129	18,129	1,523,626

I FHMAN 00043

February 19, 1987

G. R. M. Dugan, Three Forks
R. Estrada, Los Angeles
J. R. Ferrell, Waterville
G. C. Jeske, Ennis
T. D. Landels, Grand Island
K. B. Lehman, S. Planifield
M. R. McCune, Alpine
M. B. Toelle, Ennis

Asset List

Attached are the latest runs of the asset list. These are going to be sent to you monthly.

As time allows, peruse them to see if assets either are missing from the lists or from the property.

I would like to see us utilize excess or spare equipment where feasible, and transfer it to locations where it will be used, or dispose of it.

Thank you for your support

Michael J. Lorang
S250

MJL/blm

Enclosures

August 7, 1986

A.B. Cooper
G.R.M. Dugan
R. Estrada
W.E. Flynn
G.C. Jeske
H.M. Harlan
T.D. Landels
K.B. Lehman
G.R. McCloskey
M.R. McCune
H. Turnbaugh

Certificate of Vehicle Insurance

The Certificates of Vehicle Insurance must be replaced with the commencement of a new policy year as of July 1986. I have enclosed several forms which should be completed and one should be kept with each registered vehicle.

I would like to take this opportunity to update the asset listing for all registered vehicles. Thus, I have enclosed the asset listing for your operation. Please check the listing specifically for the registered vehicles to confirm the data shown. Where no identification number is provided, please do so or correct if listed incorrectly. I have highlighted those vehicles I felt were definitely registered, however, others left unmarked may also be registered for public road use.

If other assets are no longer present at your location or have been transferred, feel free to indicate this and send to me. It is the intention of CIM's Accounting Department to conduct a thorough inventory of fixed assets for the mines and the mills within the next six months. Any preliminary help will be appreciated.

Please provide me with any changes to the fixed asset listing at your convenience.

Mark A Wilson

M.A. Wilson
235A

MAW/sjw

Attachment

M.J. Lorang
R.G. Morris
R.B. Rickard

K. Lehman

December 7, 1987

CIM Superintendents/Managers

Asset Lists

It has come to our attention that the M&O asset listings sent to you in October for the period ending September 30, 1987 contain assets which have been sold, scrapped, traded-in on replacement items, or transferred to other locations.

Every effort will be made to correct these asset lists by year end and write off assets which we no longer have. In order to accomplish this and determine the amount of the writeoffs, you are hereby requested to carefully and thoroughly review the asset list(s) for your location(s), mark the disposition of each asset you no longer have directly on the list, and forward to me. These lists must be received no later than December 14.

If you need another copy of your asset list(s) or have any questions, please contact Joanne Felger.

R. J. Buettner

RJB:jsf

D. K. Hullock
M. J. Lorang
R. G. Morris
T. C. Rhodes

ASSET LISTING
FOR PERIOD ENDING 09/30/87

CORP CODE: 329 FINCOMP: 329

FINCOMP	PAYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	250	3290402502	A WELDER MILLER AMP 200 SN JA362155 AFE 723	01-01-81	10-00	0.00	0.00
329	040	260	3290409202	F SHOP TOOLS, AFE 3880	04-01-81	10-00	0.00	0.00
329	040	250	3290409302	RAIL DOCK PLATE, AFE 730	03-01-81	10-00	915.00	549.65
329	040	250	3290414402	DRYER PROD ELEVATOR, AFE 388C	03-01-80	10-00	565.00	422.90
329	040	260	3290414502	GUARDS & RAILINGS-PLANT, AFE 388G	04-01-81	10-00	17,452.00	10,796.57
329	040	250	3290414602	ACCESS DOORS-PLANT, AFE 388H	12-01-80	10-00	1,938.00	1,168.05
329	040	250	3290414702	COMPRESSOR JOY MODEL TAZZOIAAF SN 145545 AFE 663	06-01-81	10-00	21,890.00	13,725.79
329	040	250	3290414802	UNIT OIL DISPENSING MODEL HDC12-1C1160 AFE 786	06-01-81	10-00	3,098.00	1,947.91
329	040	260	3290419802	F ADDTL COST-SHOP TOOLS C/R 04092 3880	04-01-81	10-00	0.00	0.00
329	040	250	3290420002	CYCLONE ROLLER MILL REPLACEMENT, AFE 635	10-01-86	05-00	11,250.00	11,250.00
329	040	250	3290420202	F ADDTL COST-RACK OIL STORAGE C/R 04146	06-01-81	10-00	0.00	0.00
329	040	260	3290420302	CONDITIONER AIR BIOLAB 12000 BTU CARRIER AFE 613	07-01-81	10-00	474.00	298.04
329	040	260	3290425102	F ADDTL COST-SHOP TOOLS C/R 04092 AFE 3880	04-01-81	10-00	0.00	0.00
329	040	250	3290425202	VACUUM SYSTEM, AFE 691 & ADDL COST 04252	09-01-81	10-00	28,081.00	17,414.76
329	040	260	3290433802	AREA WAITING-FOR TRUCK DRIVER ADDL COST CR4363 AF	11-01-81	10-00	2,594.00	1,470.98
329	040	250	3290433402	LOADER 920 CAT SN 62K10730 AFE 892	11-01-81	05-00	* 49,000.00	49,000.00
329	040	260	3290454702	DOCK SEALS AFE 937	01-01-82	10-00	2,219.00	1,185.54
329	040	250	3290478102	LOADER SKID-STEER SN 11562	12-01-82	10-00	† 14,162.00	6,837.63
329	040	250	3290481802	BIN VENTING IMPROVEMENT	06-01-82	10-00	31,099.00	16,993.55
329	040	220	3290504702	MICROWAVE OVEN, LITTON AFE 1079	12-01-82	10-00	713.26	181.42
329	040	260	3290504802	HOIST 50 FT IR58 ELECTRIC JET AFE 1079	12-01-82	10-00	1,103.92	309.18
329	040	260	3290504902	SAW JET BAND MVBS 712 AFE 1085	12-01-82	10-00	1,650.00	772.91
329	040	260	3290505002	WELDER MILLER CP-300 MIG W/WIRE FEED SN JC646062	12-01-82	10-00	1,961.00	903.03
329	040	222	3293502705	TWX VTR 2000 32K	02-01-85	10-00	2,599.00	658.84
329	040	222	3293502706	ADDL COST, TWX VTR	03-01-85	10-00	810.99	205.80
329	040	222	3293502707	SALES TAX, TWX VTR	02-01-85	10-00	155.69	37.26
329	040	222	3293502708	SALES TAX, TWX VTR	03-01-85	10-00	38.67	7.39
329	040	222	3293503101	TYPEWRITER, MEMORY SILVERREED EX66	04-01-85	10-00	1,270.00	330.54
329	040	222	3293503102	SALES TAX-TYPEWRITER	04-01-85	10-00	82.20	22.04
329	040	221	3293592908	MISC FURN & FIXTURES	09-01-79	10-00	2,000.00	1,583.56
329	040	221	3293592909	CABINET FOR VTR C50E TV UNITS	08-01-84	10-00	340.00	106.19
329	040	221	3293592916	ADDTL COST	09-01-84	10-00	43.65	8.83
329	040	211	3294300301	PICKUP 1982 FORD F-250 VIN 1FTHF2523CPA19481 PIMA	05-01-84	03-00	4,035.12	3,422.12
329	040	211	3294300302	FREIGHT-PICKUP 1982 F250	03-01-84	03-00	350.00	298.00

I FHMAN 00047

ASSET LISTING
FOR PERIOD ENDING 09/30/87

CORP CODE: 329 — FINCOMP: 329

FINCOMP	PHYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	250	3298402001	CLASSIFIER JET STREAM - APE 83-17 ADDL DETAILS REQ	03-01-84	15-00	51,573.57	11,831.90
329	040	250	3298402002	CLASSIFIER JET STREAM APE 83-17 ADDL COST	08-01-84	15-00	244.62	45.45
329	040	250	3298403201	CONTROLLER ROLLER MILL REJECT	10-01-85	10-00	442.13	85.92
329	040	250	3298403202	ADDTL COST-CONTROLLER ROLLER MILL	11-01-85	10-00	1,351.71	249.60
329	040	250	3298405401	SEMI-BULK PACKAGING SYSTEM, APE 85-03	12-01-85	05-00	26,021.25	9,973.68
329	040	260	3299301111	RAIL RAMP 20M (CHANGE EQUIP-DUPLC)	10-01-83	10-00	2,550.00	982.26
329	040	260	3299301201	FREIGHT ON UNIDENTIFIED ARTICLE	10-01-83	10-00	181.56	70.76
329	040	260	3299301301	RAMP & PAD-CRUDE UNLOADING	12-01-83	10-00	3,400.00	1,275.03
329	040	260	3299301302	FABRICATED DOCK PLATE FOR CRUDE UNLOADING RA	12-01-83	10-00	350.00	133.46
329	040	260	3299301303	COLOR TV PJC4230C	07-01-84	10-00	301.94	100.29
329	040	260	3299301304	RECORDER VIDEO VJ255	07-01-84	10-00	453.46	144.16
329	040	260	3299302001	PROJECTOR MOVIE, USED	11-01-83	05-00	425.00	326.74
329	040	260	3299302201	PLATFORM CRUDE UNLOADING	12-01-83	10-00	3,400.00	1,253.22
329	040	260	3299303601	AIR CONDITIONING UNIT (CARRIER) S/N S38G144	06-01-84	10-00	410.00	125.64
329	040	260	3299303802	SALES TAX-AIR CONDITIONING	06-01-84	10-00	24.60	5.12
329	040	260	3299307601	DOOR 2/8 X 7/0 STEEL	01-01-85	10-00	535.95	139.66
329	040	260	3299307602	SALES TAX-STEEL DOOR	01-01-85	10-00	32.16	6.68
329	040	260	3299312401	TRAILER RESTRAINT	02-01-85	10-00	2,569.00	647.53
329	040	260	3299312402	ADDTL COST-TRAILER RESTRAINT	03-01-85	10-00	247.55	61.79
329	040	260	3299312403	SALES TAX-TRAILER RESTRAINT	03-01-85	10-00	15.00	3.00
329	040	260	3299312404	ADDL COST-LA60R	02-01-85	09-00	248.09	56.85
329	040	260	3299314701	MAGNET, FBAST-BULK RAIL SYSTEM	07-01-85	10-00	3,094.00	654.79
329	040	260	3299314702	ADDTL COST-BULK RAIL SYSTEM	08-01-85	10-00	34.51	6.31
329	040	260	3299314801	CURTAIN-NOISE CONTROL	03-01-85	10-00	2,399.08	587.46
329	040	260	3299314802	SALES TAX-NOISE CONTROL CURTAINS	03-01-85	10-00	12.01	3.44
329	040	260	3299314803	ADDTL COST-CURTAINS	09-01-85	09-00	127.41	31.50
329	040	260	3299320601	UPGRADE-ELECTRICAL POWER SERVICE, APE 86-39	12-31-86	20-00	86,931.68	3,622.15
329	040	260	3299392902	NO DESCRIPTION	09-01-83	10-00	759.00	293.64
329	040	260	3299392903	RAILCARACCES ST6-409 16GACARBON STEEL-6 SLIPCOUPLT	01-01-85	10-00	858.91	224.11
329	040	260	3299392904	ADDTL ACCESSP-RAIL CARACCES	01-01-85	10-00	2,717.09	715.21
329	040	260	3299392905	STEEL TUBING-RAIL CARACCES	01-01-85	10-00	585.66	158.15
329	040	260	3299392906	ADDTL COST-RAIL CARACCES	01-01-85	10-00	739.29	196.90
329	040	260	3299392907	ADDTL COST-RAIL CARACCES	02-01-85	10-00	22.52	4.35
329	040	260	3299600001	REPAIRS TO LOADING DOCK REMOVED CONCRETE PIER	11-01-93	10-00	0.00	0.00

ASSET LISTING
FOR PERIOD ENDING 09/30/87

CORP FINCOMP CODE
329 329

FINCOMP	PHYLOC	ACCT	ITEM NUMBER	ASSET DESC LONG	BOOK ACQ DATE	BOOK LIFE	BOOK COST	BOOK ACCM DEPR
329	040	260	3299700601	BUILDING-CRUDE STORAGE	11-01-85	10-00	+ 79,909.84	14,769.72
329	040	260	3299700602	ADDTL COST-CRUDE STORAGE BUILDING	11-01-85	10-00	† 1,260.00	236.84
329	040	260	3299700603	SALES TAX-STORAGE BUILDING	11-01-85	10-00	75.80	14.49
329	040	260	3299700604	ADDTL COST-STORAGE BUILDING, AFE 86-25	01-31-86	10-00	400.00	76.00
329	040	260	3299700605	ADD'L COSTS ORE STORAGE BUILDING, AFE 87-33	04-30-87	09-00	9,200.00	511.11
** PHYLOC			040				2,401,928.46	1,658,948.90
329	041	260	3290001501	ADR RECONCL TAX ASST-VAN HORN GRP 10000-74 @ CONVR	07-01-74	10-00	0.00	0.00
329	041	260	3290001601	ADR RECONCIL TAX ASST-VAN HORN GRP 10000-75 @CONVR	07-01-75	12-00	0.00	0.00
329	041	260	3290001701	ADR RECONCL TAX ASST-VAN HORN GRP 10000-77 @ CONVR	07-01-77	12-00	0.00	0.00
329	041	260	3290001801	ADR RECONCIL TAX ASST-VAN HORN GP 10000-78 @ CONVR	07-01-78	12-00	0.00	0.00
329	041	260	3290001901	ADR RECONCIL TAX ASST-VAN HORN GRP 10000-79 @ CONVE	07-01-79	08-00	0.00	0.00
329	041	260	3290007403	OFFICE VAN HORN	02-01-65	10-00	935.00	935.00
329	041	260	3290007503	BUILDING MAINTENANCE SHOP VAN HORN	07-01-67	10-00	8,034.00	8,034.00
329	041	265	3290419403	FACILITY BATHROOM AFE 903	07-01-81	15-00	11,592.00	4,121.17
** PHYLOC			041				20,561.00	13,090.17
329	042	240	3290121802	BIN HEAD FRAME & ORE	06-01-64	10-00	5,000.00	5,000.00
329	042	230	3290356607	TRAILER DUMP PEERLESS 60 YARD BOTTOM	04-01-80	10-00	54,309.00	36,745.88
329	042	240	3290357402	MINE COMMUNICATION SYSTEM	04-01-80	10-00	17,967.00	13,214.65
329	042	240	3290358402	UNITS MINE COMMUNICATION MOTOROLA SN 235AQM6411 SN	06-01-79	10-00	5,180.00	2,629.27
329	042	235	3290358602	TRACTOR ORE HAULING SN:270916R PETERBILT	06-01-79	10-00	44,028.00	35,364.44
329	042	230	3290360802	TIRE 29.5X25 MICHELIN XRB	06-01-79	05-00	2,919.00	2,919.00
329	042	260	3290361502	CRANE WORK #98 AT HAZEN PIT & PLANT	12-01-78	10-00	1,353.00	1,215.55
329	042	230	3290362504	SCRAPER CAT 1964	02-01-65	05-00	42,395.00	42,395.00
329	042	230	3290362505	SCRAPER CAT REPAIR	06-01-80	10-00	41,246.00	30,046.70
329	042	230	3290362506	ROPS FOR CAT 619C AFE 842	09-01-81	05-00	3,143.00	3,143.00
329	042	230	3290362702	TRACTOR DOZER-MICHIGAN M250 #22230	02-01-65	05-00	28,250.00	28,250.00

cc: Supt
✓ – Asset Redeployment.

March 18, 1987

R. J. Buettner, MC S246
M. J. Lorang, MC S250
R. G. Morris, Cartersville

ASSET REDEPLOYMENT PROCEDURES

A summary of general procedures for adding assets to the surplus asset list and requesting assets from the surplus asset list is attached. Adherance to these procedures should streamline the asset redeployment process, ultimately saving us money.

I would like to get your ideas on how we can further improve the system. Please take some time to review the procedures and contact me to ask questions or give comments.

Dan

D. J. Cornette
MC S221

xc: M. F. Cox, MC S230
J. S. Felger, MC S249

SURPLUS ASSET IDENTIFICATION

Identification of surplus assets is primarily the responsibility of the operating location managers. To facilitate the gathering and distribution of information, the Asset Redeployment Committee has developed a standard Asset Identification Form (attached). Instructions for completing the form follow.

A. Asset Identification Form

1. Header Information

1.01 Division:	Division Name
1.02 Location:	Location Number and Description (i.e. 25-Three Forks, MT)
1.03 Item Number:	To be assigned by H. G. Bruxvoort (Englewood)
1.04 Surplus Status:	Check one category only, either "surplus, probably, or possibly" surplus.

2. Part I

2.01 Description:	See "Major Equipment List" (attached for standard descriptive categories of equipment. Select the closest appropriate category name, or write your own.
2.02 Purchase date:	Date of original acquisition.
2.03 Company Number:	Equipment or property no. assigned.
2.04 Manufacturer:	Original equipment manufacturer.
2.05 Model Number:	Style or Model (as named by manufacturer).
2.06 Serial Number:	Unique number assigned by manufacturer.
2.07 Operating Hours:	Current hours/miles/tons, or best estimate.

2.08 General Condition: Select from the following:

Excellent - first class operating condition; minor wear and tear; no parts missing; no repair needed; parts available from O.E.M.

Good - operational; may require up to 10% of original price to restore to excellent condition; minor parts missing or broken; appearance may show use, but no structural damage from rust; parts available from O.E.M. or other reasonably priced source.

Poor - may or may not be operational; major repairs costing over 25% of original price would be required to restore to original operating condition; parts missing or broken; severe damge or wear to exterior; parts unobtainable or extremely expensive.

2.09 Comments: Any pertinent information - special equipment or accessories, missing parts, design modifications, etc.

2.10 Availability Date: Best estimte as to when equipment would be available for sale, transfer, or other disposition (see item 1.04, above).

3. Value amd Suggested Price: Part II - To be completed by Asset Redeployment Coordinator. Attach note if information relative to the value or selling price is known.

4. Distribution of Asset Identification Form

4.01 Original to CIM Asset Redeployment Coordinator

4.02 Copy to be retained at operation location.

4.03 Asset Redeployment Coordinator will cc:

President - CIM
Senior V. P. Operations
V. P. Eastern Operations
V. P. Western Operations
H. G. Bruxvoort

Surplus Equipment Requistion

Surplus equipment lists will be distributed with periodic Asset Redeployment Status Reports. When an operation needs a certain piece of equipment, the Surplus Asset List should be scanned to determine if the equipment is available within Cyprus. If the equipment is found to be available, the following steps should be taken to ensure quick response to an asset request:

1) Equipment requests should be preceeded by an approved purchase request or AFE.
2) Requisitions should be channeled through the appropriate Sales and Marketing or Operations Vice President.
3) Requisitions should then be forwarded to H. Bruxvoort who will contact appropriate parties to expedite the equipment transfer. The Asset Redeployment Coordinator should also be given a copy of the requisition.

If the equipment is available from another CIM location, the equipment transfer can be performed without the assistance of the Asset Redeployment Coordinator. When such a transfer is completed, however, notify the Asset Redeployment Coordinator so the Surplus Equipment List can be revised.

A copy of an Asset Requisition form is attached to this document.

ASSET REQUISITION FORM

A.R. No. _____

Requested By _____ Date _____

Division _____

Location _____ Tel. _____

Item Requested _____

Manufacturer(s) _____

Model(s) _____

Acceptable Condition _____

Acceptable Price _____

Date Needed _____

Comments:

RESPONSE

Item Unavailable _____ Item Available _____

Company _____ Location: _____

Contact for Info: _____

Comments:

Scales
Scoops
Scrapers
Screens
Shop Equipment
Shovel - Loading
Shovel - Stripping
Shuttle Car
Steam Cleaners
Structures (Metal Buildings)
Sub Station
Surveying Equipment
Tanks
Tractor - Battery
Tractor - Highway (Mack, GMC, Ford)
Trailer - (Lowboys, Storage, Other)
Transformers
Truck - Dump
Truck - Lube
Truck - Mechanics
Truck - Other
Truck - Pick-Up
Truck - Rock
Truck - Tire
Truck - Water
Washer
Welders
Wheel Excavator

Forklifts (Hi-Lifts)
Generator
Graders
Hoists
Inventory
Jeeps
Lab Equipment
Land
Light Plants
Loader - Rubber Tire
Loader - Track
Loading Machine
Locomotives
Mine Cars
Miner - Auger
Miner - Borer
Miner - Continuous
Miner - Longwall
Misc. - Surface Equipment
Misc. - Underground Equipment
Motors - Electrical
Pans
Portal Buses
Plant - Preparation
Plant - Other
Plant - Tipple
Power Centers
Preparation Equipment - Other
Property - Houses
Property - Mobile Home
Property - Office Trailers
Pumps
Rail Cars
Rectifiers
Rock Dusters
Service Cars

CCC(a)/Equip-List

MAJOR EQUIPMENT LIST

Aircraft
Automobiles (Broncos, Blazers, Cars)
Backhoe
Barges
Battery Charger
Beds - Truck Coal
Beds - Truck Rock
Belt Feeders
Belt Starters
Blades
Boats
Buckets (Dragline, Loader, Shovel)
Buildings
Centrifuges
Chocks - Longwall
Compressors
Conveyers - Other Than Long Wall
Conveyors - Long Wall Face
Cranes - Track
Cranes - Truck
Crushers
Cutting Machines
Ditchers
Dozers - Track
Dozers - Rubber Tire
Dragline
Drills, Coal Surface
Drills, Coal Underground/Face Drill
Drills, Overburden
Drills, Prospect
Drills, Roof (Bolters)
Earth Borer
Electrical - Misc.
Fans
Farm Machinery
Feeder Breaker

I FHMAN 00028

ASSET IDENTIFICATION FORM

Division _____

Location _____ Item No. _____

Surplus _____

Probable Surplus _____

Possible Surplus _____

Part I

Description _____

Purchase Date _____

Company Number _____

Manufacturer _____

Model Number _____

Serial Number _____

Operating Hours to Date _____

General Condition _____

Comments:

Date available _____

Part II

Appraised Value $_____

Book Value $_____

Suggested Sale Price $_____

Appraisal Approved By _____

Date _____

Comments:

TECHNICAL CENTER

MONTHLY STATUS REPORT DISTRIBUTION

R. D. BAKER	CIM - WINDSOR, VT.
F. F. BEYL	230 S
R. J. BUETTNER	229 S
J. P. DANIEL	CIM - CARTERSVILLE, GA
G. J. GILL	258 S
G. D. LESSNER	235 S
M. J. LORANG	CIM - THREE FORKS
L. D. MURINO	234 S
C. W. NICHOLS	CIM - ALPINE
M. A. NORDHAUSER	FRANKLIN LAKES, N.J.
R. M. PADDEN	276 S
R. A. PENNE	CIM - GHENT, BELGIUM
W. E. PRATT	251 S
E. H. READE	CIM - CARTERSVILLE
R. E. ROEDER	288 N
W. R. SEVY	277 S
E. P. TIRITAS	236 S
L. VERKEST	CIM - GHENT, BELGIUM
G. R. WILLIAMS	287 N
R. J. ZAZENSKI	257 S
TECHNICAL STAFF	
TECHNICAL FILES	

October 3, 1989

E.P. Tiritas
Mail Code 236S

Technical Group - Monthly Summary September, 1989

Plastics & Rubber

Bill Steen presented a paper entitled "Pigmentation of Talc Filled Polypropylene" to the Society of Plastics Engineers Regional Technical Conference in Toronto on September 26, 1989. The paper, which promotes the benefits of Stellar talc for white compounds, was well received with questions from the audience.

Bill Steen also visited with F. Ruiz of Heritage Plastics and obtained basic data on talc in low density polyethylene film. It appears that for Vertal 200, about 2.3% talc is optimum for UV degradation. We are going to engage in some joint work with Heritage on talc for antiblock, UV degradability and barrier properties. W. Steen visited the Cartersville and Alpine plants and other customers in the area, including Tallapoosa Rubber, Hanna Chemical, Kennedy Company and Velcon Filters.

D. Noel compounded Beaverwhite 325 and Mistron Vapor R antiblock concentrates for Presto Products. The application is a polybutadiene rubber bag. Samples were shipped to the customer who will evaluate these products on his bag line. Oscar also prepared some Barytes treated with Titanates for American Electric Company.

Ramey Bragassa analyzed a yellow discoloration in a fabric supplied by JPS Elastomerics and found it to be an aromatic amide antioxidant. K. Harris used the SEM to show that some white specks in a bromobutyl rubber were Magnesium Dxide and not Cyprubond.

Preliminary evaluations of Chinese talc samples from Haichen and Guangshi has been completed. Both products have excellent compounded color characteristics.

E.F. McCarthy is working with Exxon to produce a Stellar 500 product to their specifications at the Houston plant. In initial work we had problems with the color meter and variability in the wax wet brightness test. We expect to resolve these within the next 4-6 weeks.

Coatings

Bill Meadows visited with Vogel Paint, Valspar and 3M Corporation along with Don Sullivan. Of interest is the fact that Valspar is now formulating all Nytal products out of their paint.

A second sample of the Mistron RCS treated with silane and Hypemer dispersant was sent to RAM products for evaluation in gel coats. C. Pugh completed evaluations of 7 Hegman Yellowstone and 6 Hegman Beaverhead products for flatting and opacity. Neither are better than Monomix but the 7 Hegman Yellowstone is a superior Thixotrope.

A new sample of Vertal 6 from Johnson was characterized for a data sheet as was a sample of the Gent product CF5A made at Grand Island.

Cosmetics

Tom Zinge completed characterizations of lecithin coated products made at Alpine in August. All is now clear for customer sampling. He also assisted on characterizing a pH problem on Altalc with Maybelline. We found that the acidic filter paper was depressing the customers values, but the pH on our product was still below the 9.0±0.5 value we report on our data sheets.

Barytes

We continue to provide assays, mineralogy and quartz analyses on production of Barytes at Cartersville. Barium assays are now running consistently above 95% $BaSO_4$.

We have also run Einlehner abrasion values of all our Barytes products and a couple of our competitors. As expected the values decrease with product fineness, but our products do not compare favorably with competitive materials of similar particle size.

We have also analyzed three Barytes #22 samples from National Friction of Logansport, IN. Product characteristics appear to be within spec - but there is variability in the pH values.

Paper

The paper group continued their field and lab support for Mistron Cascade and Vertal Slurry. Bill Cavanagh visited Flambeau Paper and Weyerhaeuser, Columbus for Mistron Cascade and the Johnson plant and some northeast customers in connection with Vertal Slurry. We expect to have a trial at James River Oldtown this month on Vertal Slurry. Evaluations of Vermont talc, Chinese talc and Mt. Seabrook talc as the mineral base for Mistron Cascade are in progress.

Deposits from Northwoods, Alabama River Paper and James River-West Linn, were analyzed. Dispersions from E.B. Eddy and S.D. Warren were characterized as was a competitive sample of Luzenac 811.

Product Certification and Mineralogy

M. Clark completed 730 XRD analyses on 295 product certification samples. Forty samples of feed, product and tailings from Johnson were analyzed for quartz and 43 development drilling samples from the Yellowstone were characterized for mineralogy. Ten other miscellaneous materials were analyzed for mineralogy including Chinese talcs, a clay/cellulose mixture from Suffern Chemical and some samples of Australian ore.

P. Colville provided assistance to T. Landels in analyzing the contaminants in Vertal 8 at Congoleum. As expected it was primarily coarse sand. Pat also analyzed a talc prospect from Michigan and did some mineralogy and microscope work on a homogenized talc sample from Alpine. She also visited Western Source.

The JOEL 1200 SEM automation package was finally installed and made operational. Ken Harris hopes to be able to provide basic product certification backup in the fourth quarter of this year.

Miscellaneous

Expenditures through 8/31 were $992,000 versus a budget of $1,023,000. A safety meeting was held on 9/20/89. The new fire alarm system was installed and is operational. The surplus chemicals were repackaged during the week of 9/11/89 and are now in storage awaiting transportation to incineration.

P. Colville, W. Cavanagh, W. Steen and T. Zinge attended two day company supervisory training courses. N. Stolina, R. Bragassa and C. Pugh attended offsite courses on infrared analysis and color measurement.

Edward F. McCarthy

EFM/kmp

Plastics and Rubber Monthly Report-September 1989

W. P. Steen

1.0 Technical Service

a) Prepare surface treated Barimite XF and Mistron Vapor (89-404)

Samples of Kenrich titanate treated Barimite XF and Mistron Vapor were prepared and sent to American Electric for evaluation in a high voltage electric product application. The customer has not completed his testing in this elasomeric type of application but has requested an additional sample modified with a silane.

b) Evaluate potential Chinese crude sources in polypropylene (89-420 and 89-441)

Samples of Chinese ore from Haichen and Guangshi providences was evaluated in polypropylene homopolymer. The color and brightness numbers were very good, exceeding the values of surface modified Mt. Seabrook ore. Not only was color exceptional but the tint as measured by the "a" and "b" values were very low, indicating a very white product. Mechanical properties will be evaluated in October.

c) Prepare concentrate of Mistron Vapor and Beaverwhite 325 in customer resin. (89-426)

Samples of Mistron Vapor and Beaverwhite 325 were compounded into polybutadiene resin from Presto Products, a subsidiary of Reynolds Aluminum, for use in a plastic bag application. The polybutadiene resin was very sensitive to run temperatures and shear. No feedback has been received from the customer.

d) Check processability of talc in ultra high density polyethylene UHDPE (89-429)

Samples of customer UHDPE were received and compounded with Stellar 600, 605X and 611X and Cyprubond. The high molecular weight of the compound leads to a very low flow which is carefully controlled by extrusion temperature. Samples will be tested in October.

e) Prepare samples for blow molding to evaluate barrier properties versus mica (89-451)

Samples of various talcs were compounded into a polypropylene film resin for evaluation of the contribution of talc to the oxygen and moisture barrier properties. These samples will be sent to Heritage Plastics for blow molding into 4-5 mil films for further testing.

2.0 Miscellaneous

a) The nylon samples that had been compounded in September were injection molded this month. Temperature profiles during the extruder run were apparently too high as splay problems were noted. Tests run on some of the filled samples showed an increase in modulus from 430,000 psi to over 1,000,000 psi. A significant drop off in impact strength suggests that some polymer decomposition occurred during extrusion. Further test will be run to better determine the parameters required to

run nylon in our lab equipment.

b) Bill Steen spent a week calling on customers and company plants in the southeast during the month. The most valuable contact was at Heritage Bag Co. in Atlanta that represents a large potential customer in the antiblock area as well as a valuable source of lab support. Heritage has found that Vertal 200 is slightly better than Pfizer MP25-38 and calcium carbonate in causing the photodegradation of polyethylene films at loading levels of 2.5-5.0%. As a result of these tests, a joint venture evaluation of various Cyprus talcs will be initiated in October. Heritage also has an extensive film testing laboratory for evaluating antiblock and other film type tests. Samples of previously prepared films were evaluated per ASTM method for antiblock and the results show that Stellar 500 and Vertal 300 are superior to Pfizer MP 25-38. Samples have also been submitted for blow molding that will evaluate the oxygen and moisture barrier properties of talc filled polypropylene films versus a mica control.

c) Bill Steen presented a paper at a Toronto, SPE meeting that focused on the variables that influence color in talc filled polypropylene systems. A call was made at DuPont of Canada while in the area that focused on talc filled polymer alloys.

d) Bill Steen visited the Grand Island facility during the month to become familiar with that processing plant.

October 4, 1989

October 4, 1989

W.P. Steen

Monthly Report, September, 1989

1.0 Technical Service

1.1 American Electrical (89-404) - Surface treated Barimite XF and Mistron Vapor with titanates and silane per customers request.

1.2 Allied Signal (89-429) - Extruded and molded four talcs in high molecular weight polyethylene to determine processability on our equipment. Maximum temperature extablished by thermal stability of silanes on Pfizer's Microtuff. Elimination of surface treatments would allow customer to process at higher temperature and possibly improve production rate.

1.3 Presto Products (89-426) - Compounded polybutadiene with Beaverwhite 325 and Mistron Vapor for customer. Material used in blown film extrusion for bags to contain pelletized rubber stock. Presto would like additional antiblock properties. It was suggested that they consider increasing talc loading instead of adding more antiblock agent.

1.4 DuPont Canada - Treated Mistron Vapor R with vinyl-trimethoxysilane and shipped in August. The material is to be used in cable coating and requires 24 weeks for evaluation. Unsuccessful in obtaining status update from J. Colter.

1.5 Wittona Technical Institute - Contacted Mr. Sanghui. Samples received. Investigation of fatigue resistance of talc filled materials for application in Southeast Asia. Will continue to follow his progress.

1.6 PVC Applications -

Sewer and Pressure Pipe - ETI will compare flow of talc filled materials to their current Ultra-rib formulation this week. This represents a significant cost reduction even with 5p CPE impact modifier.

Electrical Conduit - Beaverwhite 200, Stellar 200, and Vertal 1500 surface treated with octamolybdate and compounded into Carlon's ultra-high molecular weight polyethylene. UL-94 flame test run on injection molded parts suggest that additional flame supperssion additives will be required.

PVC Siding - Measured translucency on two samples from Mastic per their request. Sent samples of PVC tapes extruded at ETI to J. Griggs which demonstrate the superior rheology of talc filled materials. They would be interested if they can improve extrudate and achieve higher output.

1.7 Chemtrusion - Vertal 7 was blended with Stellar 400 in a 40:60 ratio in an attempt to match Pfizer's MP44-26.

1.8 Chinese Talc Evaluation (89-420 & 441) - Evaluated two samples from Haichen and one from Quangshi. Compared to high brightness Seabrook with and without PEG surface treatment.

1.9 Seabrook Cosmetic Talc (89-389) - Evaluated color of three specimens of high brightness cosmetic talc selected by R.J. Buettner and compared with 8230 and S400 in highly stabilized polypropylene. R.J. Buettner specimens were significantly better in GEB, L and b values.

1.10 Heritage (89-451) - Four talcs and mica compounded and shipped to Heritage for film extrusion and vapor permeability analysis.

2.0 Non-Project Programs

2.1 Talc as a Homogenizer - Talc significantly alters the microstructure of polyethylene terephthalate and high-density polyethylene blends. This translates into a signficant increase in flexural and tensile modulus without adversely effecting other mechanical properties.

2.2 PEG vs Color Uniformity - The ability of PEG surface treatment to reduce variations in color due to changes in dry brightness of talc feed was evaluated. The results will be reported next month.

2.3 Surface Treatment of Chinese Talc - The effect of PEG on Talc de Lusenac's 8230 was evaluated and will be reported next month.

Oscar F. Noe

OFN/kmp

PROJECT STATUS SHEET - PLASTICS GROUP

(W.P. STEEN, O.F. NOEL, C.L. SUCH)

SEPTEMBER, 1989

I FHMAN 00038

Request #	Date Request Received	Requested By	Company
89-336	8-3-89	W. Steen	CIM
89-343	8-7-89	B. Linscott	JPS Elastomerics
89-350	8-10-89	E. McCarthy	Heritage Bag Company
89-359	8-21-89	E. McCarthy	West Company
89-389	8-26-89	E. Tiritas	CIM
89-392	8-31-89	W. Steen	Ameripol

I FHMAN 000339

Description of Work	Comments
Evaluate Cantal 45-91 sample	Sample tested positive for amphiboles, pictures provided.
Evaluate discolor in underwear	Stain appears to be aromatic amide antioxidant that is added to rubber compount. A report issued.
Evaluate photo-degradability of talc filled polyole-fins	Preliminary tests with poly-propylene filled samples shows rapid deterioration of talc filled samples versus unfilled control. Customer samples and lab prepared samples placed in UV test machine for accelerated aging. Samples also exposed to sun-light on roof.
Evaluate cause of gel particles in bromo-butyl rubber	Sample of Cyprubond screened and agglomerates evaluated for homopolymerized silane. EDAX shows enrichment of Si peaks. Further testing will be done. Customer sample requested. See 89-403.
Characterize new Australian ore sample in plastic	Samples compounded. Report issued that shows sample equivalent to present material.
Verify quartz content on BW 200 sample	Sample of Beaverwhite 200 evaluated vs. customer spec. Material submitted for evalua-tion for rubber dusting evaluation.

Request #	Date Request Received	Requested By	Company
89-402	9-1-89	W. Steen	Mach 1
89-403	9-5-89	W. Steen	West Co.
89-404	9-6-89	O. Noel	American Electric
89-420	9-14-89	F. Beyl	Development
89-426	9-12-89	D. Bonko	Presto Products
89-427	9-13-89	W. Packer	DuPont
89-428	8-20-89	W. Sevy	JPS
89-429	9-11-89	R. Padden	Allied
89-441	9-22-89	F. Beyl	Development
89-451	9-30-89	W. Steen	Heritage Plastics

I FHMAN 00040

Description of Work	Comments
Analyze additional samples for talc	SEM work done on additional samples with unknown agglomerates. Nothing conclusive found. Report issued.
Analyze rubber samples for agglomerates.	SEM work shows lack of talc or silane agglomerates. Report issued.
Prepare surface treated Barimite XF and Mistron Vapor	Samples prepared and sent to customer for evaluation. Cover letter sent.
Evaluate Haichen talc in plastics	Compounded color excellent
Prepare concentrate of Mistron Vapor and BW 325 in customer resin	Samples prepared and sent to customer. Cover letter sent. No feed back yet
Evaluate nucleating talc for nylon	Additional information required. Will compound and test in October.
Check dusting props of talc in customer rubber	No work yet
Check processability and talc in UHDPE	Samples compounded, to be tested in early October
Evaluate Guangshi talc in plastics	Compounded color looks very good
Prepare samples for customer blow mold	Samples prepared and sent to customer versus mica control.

October 6, 1989

E.F. McCarthy

W.D. Meadows-Monthly Report-September 1989

A. Technical Services

1. Technical Service call in Orange City, Iowa on Diamond-Vogel Paint Corp, September 19. Presented Vertal 700, Mistron Mist and Mistron 400 as offsets to Nytal 300H. Determined use of talc in specific products.

2. Technical Service call in Minneapolis, Mn. on Valspar Corp. Made full presentation of Cyprus talcs to new consumer products group. Determined use of talc in various locations and Cyprus products approved.

3. Technical Service call in St, Paul, Mn. on 3M Co. Discussed Gent product, Mistron CF5A now being purchased and our plans for U.S. production. Discussed SA data on Mistron RCS with sealant group.

B. Technical Service Lab

1. Designed two projects for Mistron Monomix with stages of Titanium Dioxide reduction in both economy and premium grade paints. Technical bulletin has been prepared on the economy grade paints using Mistron Monomix where the product permits significant reduction of titanium. Results were not satisfactory in the higher grade paints where Mistron Monomix did not permit titanium reduction with equal opacity.

C. Literature Production

1. Produced new technical bulletin for plastics. Out for approval.

2. Produced new paint technical bulletin. Out for approval.

3. Revised and reissued for approval cycle data sheets for Aspect 606, Mistron Cyprubond, Castle 65 and Brillante.

4. Plans for October: I will prepare report on status of literature production for sales meeting, October 17. All literature is being designed and produced on Ventura desk-top publishing software. I am up to speed (somewhat) on the system. In general I will divide my time equally between literature production and paint projects in the next period.

D. General

1. I made presentations to the sales service groups on September 12.

William Meadows
Technical Manager, Paint

October 6, 1989

E.F. McCarthy

Monthly Report - September, 1989

Cosmetics

The major impetus of work over the last reporting period has been on verifying the levels of lecithin that were placed on the cosmetic samples during the pilot plant testing of the Topnote 200 and Supra A samples at Alpine. Phosphorus was used as the tracer and from the analytical work it appears that we did an adequate job of coating. In all cases we coated over the amounts that were prescribed. Because the turbilizer was not cleaned between campaigns it appears that we coated to slightly higher levels than originally planned. I feel however, that in actual production our control will probably be no better than in these initial tests; therefore these samples should represent these products fairly well. We have yet to receive any information on the bacteria growth on these materials. I have contacted Alpine and requested that this work be completed as soon as possible. It is felt that we may have to use special handling of this product in order to avoid contamination as the lecithin would be an excellent nutrient for bacteria growth. This first campaign should give us some insight into whether this will be necessary or not as we made three passes through the turbilizer and this increased our chances of contamination.

Paint

Paint work has concentrated on additional work in generating the new Technical Bulletin for economy paints. We have also been busy in generating data on new products. Ed McCarthy has provided us with approximately seven or eight samples for characterization work. We are continuing to investigate surface modification of our talc for use in gel coats. We received a new silane sample from Union Carbide and this product was used in conjunction with a hypermer to aid in dispersion. We formulated two new samples which were sent to RAM paint for evaluation. We still haven't been able to glean any information out of RAM concerning our previous work. We have sent out a sample of Stellar 500 which was treated similarly to one of our earlier successful products. Bill Meadows has also requested several product evaluations for new and competitive products.

Analytical Work

The main thrust of the analytical work has been in the area of Barite analysis. I have been working very closely with Mike Clark on Ba analysis for both plant control and in evaluating competitor products. We have modified our existing gravimetric method and we have improved greatly on the precision and accuracy of the procedure. We also worked on trying to develop a method for analyzing phosphate on the lecithin coated materials. We are also looking to Prosil to help us develope a method for determining the levels of coating on the talcs used for gel coat applications. Prosil has offered us a method but at this writing I have not had time to evaluate the procedure. The method is very similar to the current A-1100 method in that the procedure relies on the development of surface color and then standards are used for comparison.

Other Activities

During this reporting period two days were spent at the management seminar. I also took a weeks' vacation.

Thomas P. Zinge

TPZ/kmp

PROJECT STATUS SHEET

(T.P. ZINGE)

SEPTEMBER, 1989

I FHMAN 00045

Request #	Date Request Received	Requested By	Company
89-374	8-27-89	E. McCarthy	CIM
89-375	8-28-89	D. Young	CIM-Industrial
89-399	9-1-89	E. McCarthy	CIM
89-400	9-1-89	E. McCarthy	CIM
89-401	9-1-89	C. Maybern	CIM-Barytes
89-407	9-7-89	J. Anderson	CIM
89-421	9-14-89	W. Meadows	CIM
89-431	9-19-89	G. Gill	CIM
89-438	9-21-89	G.Lautenschlager	CIM

FHMAN 00046

Description of Work	Comments
Characterize samples of TN505X & Mistron Special	Work finished. Report issued 9-21-89.
Characterize MP46-16 Pfizer Product	Work completed. Report issued.
Full characterization of Vertal 6 for Data Sheet	All data given to Bill Meadows
Characterize two samples - Yellowstone and Beaverwhite	Report issued
Ba, L.O.I. and Sp Gr along with typical chemical	Report issued to Chris Maybern, 9-20-89
pH problem with Supra A - verify customer's method vs Alpine's	Report issued. pH within specifications
Surface modify RCS for gel coat application	Samples prepared and shipped
Analyze Momomix for 8-analytes for Prod. Spec	Work sent to Skyline for analysis
Screen analysis requested on production samples	Report issued same day as request.

October 3, 1989

E.F. McCarthy

Monthly Report - Paper Group
September, 1989

1. Mistron Cascade

The Weyerhaeuser Columbus mill was visited at the request of the customer to assess their pitch control program. Although our recommendation to add 20 pounds per ton of Mistron Cascade was not acted on, we did obtain a sample of their TMP pulp and will do additional work with Mistron Cascade to demonstrate its effectiveness.

Two Chinese talcs, Guangshi and Haichen, and Vertal Slurry are being thoroughly evaluated as the mineral component of Mistron Cascade. Malaga talc will also be evaluated.

2. Mistron Vertal Slurry

A progress meeting was conducted at the Johnson mill. Difficulties with the screens and the homogenizer were assessed. Three customers were identified and James River Oldtown was targeted for the first trial tentatively scheduled for October 16. One truckload of slurry has been manufactured.

3. Technical Service

Seventeen technical service requests were completed and six are active. These are summarized in the Project Status Report.

4. FTIR

The Nicolet Model 205 FTIR was recommended for purchase. This will upgrade our analytical capabilities to the level enjoyed by many of our customers and competitors.

Safety

No accidents were reported this month.

Other

I attended the Supervisory II Training Course. Ray Bragassa and Nellie Stolina attended an FTIR workshop.

October Plans

Mistron Cascade

- Complete the evaluation of alternative minerals.
- Provide technical support for the effort at Weyerhaeuser Columbus.

Mistron Vertal Slurry

- Provide technical support to the planned trial at James River Oldtown.

Other

- I will attend the TAPPI Pulping Conference and Paper Group Sales Meeting.

W.A. Cavanagh

WAC/kmp

PROJECT STATUS SHEET - PAPER GROUP

(W.A. CAVANAGH, N. STOLINA, R.D. BRAGASSA)

SEPTEMBER, 1989

FHMAN 00049

Request #	Date Request Received	Requested By	Company
89-285	7-5-89	E. McCarthy	CIM
89-287	7-10-89	R. Roeder	CIM
89-302	7-10-89	E. McCarthy	CIM
89-303	7-17-89	J. Locke	James River
89-309	7-25-89	F. Schmucker	S.D.Warren

FHMAN 00050

Description of Work	Comments
Evaluate Current CMV for pellet integrity	The CMV (FEM) pellet at the dryer was superior to the Nicron 100. The CMV (FEM) at the dryer exit was slightly inferior to the Nicron 100. The CMV silo material was substantially inferior.
Evaluate Seabrook talc slurry	Slurry (39.3% solids) was settled badly GEB 85.9% Sedigraph 8.3 Micron Surface area 3.96 M^2/g Abrasion 51.5 g/m^2
Quantify difference in pellet integrity between Nicron 100 and CMV.	The pellet integrity test showed: Bepex Pellets 91.3% Nicron 100 79.6 Luzenac 54.3 Pfizer 12-52 51.3 CMV 0016 44.3 CMV 0006 6.9 Redispersion of the Bepex Pellets was good.
Analyze deposits and paper defects	The Uhle box deposit was 8.1% talc and contained pimarily fatty acid pitch and defoamer. The foil deposit was 7.4% talc and primarily defoamer.
Analyze deposits to determine effect of talc	The two deposits from the No. 14 paper machine contained similar levels of talc and PVAC latex.

Request #	Date Request Received	Requested By	Company
89-311	7-26-89	F. Schmucker	S.D. Warren Westbrook
89-312	7-26-89	D. Bagneski	Nekoosa Port Edwards
89-313	7-11-89	R. Valliant	Kimberly Midtec
89-314	7-27-89	W. Pratt	CIM
89-317	7-25-89	W. Pratt	CIM
89-319	8-7-89	F. Schmucker	James River Oldtown
89-320	7-28-89	T. Hicks	CIM-Johnson

I FHMAN 00051

Description of Work	Comments
Analyze talc slurry and 3 samples of CMV 0016	Dispersions at both mills were poor 6.6 Micron mean and 7.6 Micron mean with maximum particle size of 96 Microns. Pellet integrity of Lot 06219P was good - 68.2%. Lots T01269P and T01279P were poor.
Analyze Montana Nicron 100	Lot SIDG 0627 was quite low in brightness - GEB 77.3. Pellet size was 1/4 inch and pellet integrity was 67.6%.
Simulate 200 mesh "Hard Particle" count test. Determine number of quartz particles.	Retain on 200 mesh was primarily undispersed talc; only 1-2 particles of quartz.
Evaluate three filler clays in Mistron Cascade	The Georgia Kaolin SAF was recommended as a replacement. The two Wilkenson clays were not recommended because of higher viscosity and inferior pitch reduction.
Evaluate two clays for high brightness Mistron Cascade	Columbia filler clay (GEB 85) was recommended for use in a high brightness Mistron Cascade.
Analyze deposits from the last three bleach stages	The talc content increased from 1.21% in the third stage to 1.93% in the fourth stage and 17.9% in the fifth stage. This may have been caused by the addition method and poor dispersion.
Evaluate three start-up samples	The three slurries were low in solids (20.5% to 33.7%) and had poor stability.

Request #	Date Request Received	Requested By	Company
89-321	7-28-89	D. Bagneski	Consolidated Rapids
89-322	7-28-89	R. Roeder	CIM
89-328	8-2-89	J. Locke	Garden State Pomona
89-329	8-2-89	J. Locke	Smurfit-Newberg
89-330	8-2-89	J. Locke	Stone-Snowflake
89-331	8-3-89	J. Sincere	Weyerhaeuser Columbus
89-333	8-3-89	M. Dugan	CIM-Three Forks
89-334	8-8-89	E. McCarthy	CIM

FHMAN 00052

Description of Work	Comments
Evaluate CMV 0008 quality	The CMV exceeded the quality specifications.
Develope Mistron Vertal Slurry Data Sheet and Material Safety Data Sheet.	The Data Sheet and the MSD Sheet were reviewed and approved at the September 6 meeting.
Determine ash content and mineralogy of newsprint	The ash was 1.96% and the talc content was 8.15 pounds/ ton. Talc retention was 50.9%.
Characterize pellet quality of CMV 0016	The lot from July 12 was 33% pellets and the Lot from July 17 was 50% pellets. Pellet integrity was fair.
Determine ash and mineralogy of float cell samples	The first set of PDM accepts showed a reduction in ash and an increase in brightness. The second set showed the accepts to be higher in ash and similar in brightness.
Four samples of talc dispersions were analyzed	The solids content on all four samples was low (1.2% to 1.9%) and the dispersions had mean particle sizes of 5.9 microns and 6.4 microns.
Six samples of in process CMV were evaluated for pellet integrity.	The CMV made with ACM and FEM feed showed the best integrity.
Evaluate Vertal Slurry in Mistron Cascade.	In Process

Request #	Date Request Received	Requested By	Company
89-338	8-4-89	D. Bagneski	Flambeau Park Falls
89-342 89-342A	9-15-89	T. Hicks	CIM-Johnson
89-351	8-15-89	G. Williams	Three BC mills
89-352	8-15-89	G. Williams	Northwoods
89-353	8-8-89	E. Tiritas	CIM
89-360	8-21-89	F. Sincere	Alabama River

FHMAN 000553

Description of Work	Comments
Evaluate Mistron Cascade from the second railcar at Flambeau	Test results showed that the Mistron Cascade was acceptable and should perform similarly to previous shipments.
Evaluate six samples of Mistron Vertal Slurry	Results showed: Solids content: 49.7 to 56.0% Mean Particle Size: 10.3 to 11.3 Microns 325 Mesh Retain: 6.1 to 8.1% Stability: the 49.7-52.2% solids range was recommended.
Evaluate three talc dispersions	The three dispersions had low solids (2.8% to 7.0%) and poor dispersion (mean particle size 6.3 microns to 7.1 microns).
Analyze two pulp mill residuals	The 65B residual was 1.8% ash and primarily talc, calcite and quartz. The rejects residual was 11.0% ash and was primarily quartz.
Determine Einlehner abrasion of two Seabrook talcs and compare to CMV	The Seabrook Talc showed less abrasion than the CMV; SV-276 14.4 g/M^2 SV-277 18.7 CMV 22.6
Two deposits from the felt dryer were analyzed	The dryer can deposit contained 19.2% talc and the organic portion was defoamer and pitch. The dryer felt deposit was primarily organic and this was identified as defoamer & pitch.

Request #	Date Request Received	Requested By	Company
89-361	8-22-89	J. Smith	James Maclaren, Thurso
89-364	8-22-89	E. McCarthy	J.P. Stevens
89-366	8-24-89	E. McCarthy	CIM
89-394	8-31-89	G. Williams	Congoleum
89-396	9-5-89	D. Bagneski	Consolidated
89-397	9-5-89	D. Bagneski	Williamette
89-398	8-28-89	D. Bagneski	Flambeau
89-405	9-6-89	W. Pratt	CIM

FHMAN 00054

Description of Work	Comments
Analyze Luzenac Select-O-Sorb	The mean particle size of 8.2 microns and the surface area of 4.98 M^2/g and the GEB of 76.8 were competitive with Mistron Vertal Slurry.
Identify organic portion of fabric stain	Infrared analysis showed the best matches were Natsyn 2205 rubber and TE-70 paste.
Compare the stability of Mistron Cascade made with different molecular weight polymers.	In Process
Analyze six slurries	Granulometer and solids data were generated.
Evaluate CMV (0008) for Hard Particle count using the Consolidated method	The Hard Particle Count was high (81) but the Hard Particles were identified as talc not quartz.
Analyze Luzenac 811	Results showed: GEB: 76.5% Mean Particle Size: 4.8 Microns Surface Are: 5.3 M^2/Gram Pellets: 25.5%
Provide technical support to the mill and analyze grit from supply pump.	A second application point for Mistron Cascade was established and economic justification for Mistron Cascade was developed. The grit contained 24.4% kaolin. Coarse screens prior to the feed pumps were recommended.
Evaluate the effect of chlorine dioxide with talc.	In Process

Request #	Date Request Received	Requested By	Company
89-406	9-7-89	J. Smith	E.B. Eddy
89-411	9-11-89	F. Schmucker	S.D.Warren
89-413	9-8-89	J. Locke	Stone Snowflake
89-425	9-18-89	J. Locke	Golden State
89-430	9-18-89	D. Bagneski	Consolidated
89-432	9-19-89	T. Hicks	CIM-Johnson
89-435	9-20-89	J. Locke	James River West Linn

FHWAN 00056

Description of Work	Comments
Analyze four Mistron Vapor Dispersions	The four dispersions were excellent; mean particle sizes were 4.4 to 4.7 microns. Dispersion solids were 15.5 to 17.1%.
Analyze two Mistron Vapor dispersions and determine the pellet integrity of CMV 0016.	The two dispersions were good with mean particle sizes of 5.3 to 5.4 microns. Solids were 9.8 to 10.2%. Lot T08129P was was 46.7% pellets.
Seven samples from the float cell trials were analyzed	Results showed: Ash content: 4.8% to 12.6% Talc Content: 2.4% to 6.6%
Analyze newsprint sample from Port Alberni	Results showed: GEB 55.7% Ash 2.01% Mineralogy: Talc with small amounts of calcite and TiO_2
Survey Mistron Vapor for hard particle count and abrasion	Four Lots of CMV showed low hard particle counts (5) and low Einlehner abrasion.
Evaluate Vertal Slurry sample, representative of the first truckload	The sample was 54.5% solids, 11.9 microns mean particle size and had 3.6% 325 mesh retain. The material was recommended for use at James River Oldtown.
Analyze stock line deposit for mineralogy	The primary component of the deposit was calcium sulfate (49%). This was from the sulfuric acid treatment of calcium carbonate containing Broke.

October 3, 1989

E.F. McCarthy

September Analytical

Projects in addition to those reported by M. Clark and K. Harris.

Montana Projects:

Analyses of 1989 Yellowstone Mine drill hole samples is underway with approximately 10 holes completed and another 8 awaiting analysis. This year we are doing specific quantitative quartz scans on the samples. Levels of quartz have been encountered that are 1-2%, much higher than the 0.5 and lower we have come to expect from Yellowstone ore.

The project to review the occurance and range of quartz in Three Forks products is continuing. All lots are being analyzed and a report will be written at the end of October. So far we are finding the variations are just as extreme as those found in Grand Island products.

Congoleum:

Samples of Chester Vermont product shipped to Congoleum were received for analysis of a gritty contaminant. The material isolated on a 200 mesh screen was quartz sand and could not have come from the Cyprus product. The contaminant was introduced during shipping and ruined a whole silo of talc.

Clay Minerals Society Meeting

This was somewhat disappointing in that most of these scientists seem to be involved only in playing with computers to generate increasing details on the crystal structures and interlayering of illite, montmorillonite, chlorite, mica and kaolin. The analytical, quality control and technical service people are taking little interest in the quartz problem and intend to "wait and see" as long as possible. A high proportion think their products will be labeled.

A paper of particular interest to us was presented by researchers from the State University of New York at Buffalo (abstract attached). They have developed a method to measure the surface energy of powders and have tested talc and pyrophyllite as well as clays. The entire paper and procedure will be published by the end of the year. In the meantime, I have arranged to supply the author with some characterized talc samples. It will be interesting to know if we can find differences between source areas and what effects our surface treatments may have.

Visit to San Adreas Mill - Western Source

Following the clay meeting I visited Pete Cawlfield at the Western Source Mill - a largely outdoor operation. The laboratory capabilities there are restricted to screen analyses and Fisher Subsieve tests. Incomplete equipment is present for Alpine Airjet sizing and Scott density. There is no brightness measuring equipment since their products do not have color spec. This would be needed if a talc city product is to be made there.

P. Colville.

THE SURFACE ENERGIES OF TALC AND PYROPHYLLITE AS DETERMINED BY THE WICKING METHOD

Giese[1], R. F., Costanzo[1], P. M., van Oss[2], C. J., and Norris[1], J.

[1] Department of Geology; [2] Departments of Microbiology and Chemical Engineering, State University of New York at Buffalo, Buffalo NY

The surface energies of solids and liquids are composed of contributions from apolar Lifshitz-van der Waals (termed LW) and polar Lewis acid/base (termed AB) forces. The values of the LW and AB components of the total surface energy are usually derived from contact angle measurements with liquids (both polar and apolar) of known properties using the expanded Young equation:

$$(1+\cos\theta)\gamma_L = 2\left(\sqrt{\gamma_S^{LW}\gamma_L^{LW}} + \sqrt{\gamma_S^+\gamma_L^-} + \sqrt{\gamma_S^-\gamma_L^+}\right)$$

where L and S refer to liquid and solid, the γ's are the surface tensions, and the + and - super scripts refer to the electron acceptor and donor parameters of the surface tension.

This method works well for solids which have smooth surfaces such as self-supporting films of hectorite, but it is not appropriate for materials which do not form films. For these materials, an alternate method is to derive the contact angles by measuring the capillary flow rate of standard liquids through a thin, uniform layer of powdered sample. This technique is known as wicking and the contact angles are derived using the Washburn equation:

$$h^2 = tR\gamma_L\cos\theta/4\eta$$

where h is the distance the liquid has moved in time t, γ_L is the surface energy of the liquid, R is the average pore radius of the powder, and η is the viscosity of the liquid.

As an example, the components of the total surface energy have been determined for talc and pyrophyllite. These values are-

Component	talc	pyrophyllite
γ_S^{LW}	31.5 mJ/m^2	34.4 mJ/m^2
γ_S^-	2.7 *	3.2 *
γ_S^+	2.4 *	1.7 *

The major difference between talc and pyrophyllite is the slightly larger γ^{LW} of the latter and probably reflects the trioctahedral versus dioctahedral nature of the two minerals.

LEHMAN 00058

October 2, 1989

P.A. Colville

Monthly Report, Electron Microscopy K.L. Harris, Sept. 1989

During the month both electron microscopes have remained functional. I have continued work on the automated scheme for amphibole identification using the JEOL Jemscan 1200EX analytical electron microscope. While at the same time performing the more routine analysis and microscopy with the AMRay scanning electron microscope.

During the month over 60 micrographs and 25 EDX analysis were done either in support of other technical groups in the laboratory or customer requests. Eleven projects were completed for this report period. These include:

Internal work for plastics group - Micrographs of fractured extrusion pellets of PET/HDPE blend with and without talc coupling agents. Micrographs of fractured surfaces of injection molded parts were also taken. The micrographs, as well as the mechanical properties, show an increase in the compatability between the two components with the addition of talc.

89-269, Technical Request - R. Sebenik, micrographs of Thompson Creek produced Molybdenum Disulfide.

89-368, Technical Request - Compare morphology of homogenized Italian talc to the Brillante product. Both talcs showed to be very platy with the homogenized sample showing more particles in the mid-size range, thus giving a smaller mean psd.

89-395, Request from Russ Licciardello for micrographs of Cyprufil 200 showing a non-asbestiform product.

89-394, Customer Request, Mach-1 Compounding, Q.C. tapes of incoming raw material showed some optical disruption or light defraction areas which Mach-1 had circled. These areas, when examined with the S.E.M. did not show the same inclusions of unmixed CPE as observed in previous extrusion test tapes.

89-359, Customer Request - The West Company, "white" specks in their bromobutyl rubber formulation. West is using Mistron Vapor but would like to switch to Cyprubond for better physicals. "White" specks showed in the compound when the switch to Cyprubond. The white inclusions did not show to be talc or silane. They contained either unblended polymer or metalic magnesium in the specimens examined with the S.E.M.

89-416, Customer Request - Micrographs of sample of Manville Company's roofing grade talc product milled by Cyprus to varify Manville's claim that sample contains fibrous amphibole. No amphibole material was found.

Prints of cosmetic products were prepared for cosmetic show in October.

Presently there is one additional request for microscopy in the laboratory.

R.L. Harris

CYPRUS TECHNICAL CENTER
MONTHLY REPORT -- SEPTEMBER, 1989
MICHAEL L. CLARK

PRODUCT CERTIFICATION

730 XRD analyses were performed for Product Certification on 295 samples received from CIMC, USA, mills. Polarized light microscopy with dispersion staining and phase contrast techniques were used to corroborate some XRD results. Polarized light microscopy is being employed routinely to analyze for chrysotile in CIMC talc and chlorite products. Chrysotile has not been detected in CIMC products. Product Certification analyses performed for individual mills were as follows: 67 XRD scans were performed on 21 samples received from Chester, 326 scans on 119 samples from Grand Island, 51 scans on 17 samples from Johnson, 286 scans on 138 samples from Three Forks. No samples were received from Alpine Western Source, or Windsor. Analyses for quartz has been scaled down for Grand Island from every lot to representative lots and has been stepped up for Three Forks from weekly and monthly composites to every lot.

OPERATIONS SUPPORT

Johnson, VT -- 40 samples of feed, product and tailings were analyzed for quartz content as part of a continuing project to monitor quartz concentrations at various stages of the Johnson flotation circuit (Project No. 89-061).

Yellowstone Mine, MT -- 43 samples from selected and composite intervals of 1989 drill holes 3, 12, 14, 15, 18, 19, and 25 were analyzed for mineralogy, LOI and GEB (Project No.s 89-388 and 89-408). These results will be used for mine planning and development.

LABORATORY REPORTS

No.	*REPORTED TO*	*PROJECT AND DATE REPORTED*
89-370	G. Lautenschlager	Comparison of 2 lots of C-2 talc with an unknown competitor for Fulflex Co. 9/18/89
89-392	Mr. Cliff Rees	Ameripol-Synpol Co.--Determination of quartz concentration in BW-200 and summary of analytical technique for quartz. Report requested by W. Steen. 9/5/89
89-416	Gordon Gill	Analyses for amphibole in CIMC roofing-grade talc from Vermont in order to verify or refute Manville's claim of amphibole in the product. Amphiboles were NOT detected after rigorous testing. 9/13/89

INTRALABORATORY REPORTS

No.	*REPORTED TO*	*PROJECT AND DATE REPORTED*
89-363	Ed McCarthy	Mineralogy and LOI for 5 samples of Australian ore. 9/11/89
89-410	Ed McCarthy	Mineralogy and PSD of an unknown material from Suffern Chemical Co. 9/12/89
89-413	Bill Cavanagh	Mineralogy of 7 samples of a Snowflake-brand material. 9/29/89
89-435	Bill Cavanagh	Mineralogy of material from James River Co. 9/26/89
89-436	Ed McCarthy	Mineralogy of Bone White material. 9/21/89
89-441	Ed McCarthy	Mineralogy and Product Certification analyses of GuangShi talc. 9/26/89
89-443	Ray Bragassa	Mineralogy of Vertal Slurry, Haichen talc, BW-325, and Superclay material. 9/28/89

EQUIPMENT MAINTENANCE

Data General service engineer, George Delzell, performed preventative maintenance on the computers of both XRD systems on 9/27/89. Both systems checked out.

Michael Clark

copies to: E.F. McCarthy, P.A. Colville, files

PROJECT STATUS SHEET - ANALYTICAL

(P.A. COLVILLE)

SEPTEMBER, 1989

I FHMAN 00063

Request #	Date Request Received	Requested By	Company
89-269	6-26-89	R. Sebenick	Cyprus T.C.
89-359	8-7-89	E. McCarthy	West
89-368	8-25-89	E. Tiritas	Alpine
89-370	8-25-89	G.Lautenschlager	Johnson
89-372	8-24-89	E. Reade	Exp
89-392	8-31-89	W. Steen	Ameripol
89-394	9-1-89	W. Steen	Mach 1
89-395	9-1-89	R. Licciardello	Plastic
89-408	9-7-89	R.Piniazkiewicz	Yellowstone Mine
89-410	9-8-89	Suffern	Industrial
89-413	9-8-89	W. Cavanagh	Paper
89-416	9-13-89	W. Sevy	Manville
89-417	9-13-89	E. McCarthy	Sales CIM
89-419	9-13-89	R. Licciardello	RBC Ind

FHMAN 00064

Description of Work	Comments
Micrograph MoX_2	Complete 9-89
Specks in rubber composition	Complete 9-89. Mg Compound not talc.
Homogenizer float samples 22 m, 11 m & 2.2 m characterize	Complete 9-89
Mineralogy unspecified Competitors product - Compare to C-2 grade	C-2 product coarser
Calahan-Michigan talc product	Complete 9-89
Analyze BW-200 sample	Complete 9-89
Analyze rubber samples	Complete 9-89
Require micrograph of Cyprufil product	Complete 9-89
Mineralogy of 1989 Drill Hole samples	Continuing to end of year.
Mineralogy unknown	Complete 9-12-89
Mineralogy Snowflake mill samples	Complete 9-29-89
Product certification Roofing grade	No amphiboles found
Comparison CIM versus competitors Barites	In progress
Identify talc filler in epoxy hardener	$CaCO_3$/Cantalc mixture

Request #	Date Request Received	Requested By	Company
89-434	9-14-89	R. Licciardello and Landels	Congoleum
89-436	9-21-89	E. McCarthy	
89-437	9-21-89	R. Zazenski	Alpine
89-441	9-22-89	F. Beyl	Development
89-443	9-22-89	W. Pratt	Paper
89-450	9-30-89	M. Keener	Cosmetics

FHMAN 00065

Description of Work	Comments
"Sand" contaminent in shipment - silo sample car, lines, felts	Complete 9-18 Sand - Quartz
Mineralogy Bone White	Complete 9-21-89 Hydroxyapatite
Shipment samples Italian talc	Expected 10-5-89
Mineralogy Guangshi talc	Complete 9-26-89
Mineralogy 3 talcs for use in Cascade Product	Complete 9-28-89
Evaluate 2 different Vermont talcs morphology	Expected 10-13-89

MILLING LOCATION 29 - SOUTH PLAINFIELD MILL

CURRENT MONTH ACTUAL	CURRENT MONTH PLAN	CURRENT MONTH VARIANCE		YEAR TO DATE ACTUAL	YEAR TO DATE PLAN	YEAR TO DATE VARIANCE
101	112	11	TONS MILLED	513	211	302CR
103	117	14	CRUDE TONS USED	515	220	295CR
			CRUDE RECOVERY = 98 %			
4,522	2,268	2,254CR	MILLING LABOR	15,271	10,095	5,176CR
4,522	2,268	2,254CR	TOTAL LABOR	15,271	10,095	5,176CR
2,740	972	1,768CR	SUPPLIES	6,328	5,304	1,024CR
423	1,421	998	CHEMICALS	297	2,378	2,081
973	778	195CR	MAINT. & REPAIR	2,073	3,678	1,605
2,165	373	1,792CR	FUEL AND WATER	2,239	1,871	368CR
3,385	1,261	2,124CR	POWER	7,111	4,603	2,508CR
292		292CR	CUSTOMER CREDITS	292		292CR
132	23	109CR	OTHER	228	116	112CR
12,009	12,140	131	CRUDE USED	96,381	99,967	3,586
26,641	19,241	7,400CR	TOTAL CONTROLLABLE	130,220	128,012	2,208CR
1,084CR	985	2,069	BAG USAGE	1,732	4,209	2,477
7,118	13,867	6,749	FREIGHT TO MILLS	7,118	13,867	6,749
1,053	2,166	1,113	FREIGHT TO BRANCHES	1,053	2,369	1,316
184CR		184	PURCH. PRICE VAR.-BAGS	414CR		414
126CR		126	PURCH. PRICE VAR.-CHEM	126CR		126
204CR		204	PURCH. PRICE VAR.-OTHER	364CR		364
6,573	17,018	10,445	TOTAL OTHER VARIABLE	8,999	20,445	11,446
33,214	36,259	3,045	TOTAL CONTR. & VAR. COST	139,219	148,457	9,238
6,355	10,079	3,724	SALARIES	13,451	20,158	6,707
	3,050	3,050	TAXES		6,100	6,100
345		345CR	FREIGHT & SALES TAXES	376		376CR
335	500	165	COMMUNICATION	675	1,000	325
950	20	930CR	PROFESSIONAL SERVICES	950	40	910CR
905	215	690CR	TRAVEL	905	430	475CR
360	85	275CR	RENT	474	170	304CR
1,473	750	723CR	OTHER	2,385	1,500	885CR
16,190	16,200	10	DEPRECIATION	32,380	32,400	20
26,913	30,899	3,986	TOTAL FIXED COSTS	51,596	61,798	10,202
60,127	67,158	7,031	TOTAL MILLING COST	190,815	210,255	19,440

I FHMAN 00067

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

SEP 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
10%.0	ON-PEAK	9o4000	977.60
12.0	INTERMEDIATE	1.0500	12.72
510.0	OFF-PEAK	1.0600	540.60
		SUB-TOTAL	1,530.92 S
ON-PEAK	9800	.090090	882.88
INTERMEDIATE	200	.076850	15.77
OFF-PEAK	42200	.058480	2,467.86
ENERGY ADJUSTMENT			1,511.76 CR
		SUB-TOTAL	3,385.67 S
SERVICE CHARGE			400.00
	52200 S	TOTAL	3,785.67 *

85-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

MAY 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT	
108.0	ON-PEAK	8.1700	882.36	
.1	INTERMEDIATE	.0003	0.00	
506.0	OFF-PEAK	1.0600	536.36	
		SUB-TOTAL	1,418.72	S
ON-PEAK	8000	.090090	720.72	
INTERMEDIATE		.078830	0.00	
OFF-PEAK	47000	.058480	2,748.56	
ENERGY ADJUSTMENT			1,592.86	CR
		SUB-TOTAL	3,295.14	S
SERVICE CHARGE			400.00	
	55000 S	TOTAL	3,695.14	*

5.40
8.17
1.23

June / Sept
Oct / May

95-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

JAN 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
96.0	ON-PEAK	7.5500	724.80
12.0	INTERMEDIATE	.9000	10.80
410.0	OFF-PEAK	.9000	369.00
		SUB-TOTAL	1,104.60 S
ON-PEAK	6800	.082930	563.92
INTERMEDIATE	200	.070490	14.10
OFF-PEAK	33400	.048000	1,603.20
ENERGY ADJUSTMENT			273.630
		SUB-TOTAL	3,012.19 S
SERVICE CHARGE			400.00
	40400 S	TOTAL	3,412.19 *

93-4071 68M 12/85

LEHMAN 00070

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

JUN 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
100.0	ON-PEAK	9.4000	940.00
8.0	INTERMEDIATE	1.0600	8.48
518.0	OFF-PEAK	1.0600	549.08
		SUB-TOTAL	1,497.56 S
ON-PEAK	9000	.090090	810.81
INTERMEDIATE	400	.078830	31.53
OFF-PEAK	47800	.058480	2,795.34
ENERGY ADJUSTMENT			1,656.57◊
		SUB-TOTAL	3,478.67 S
SERVICE CHARGE			400.00
	57200 S	TOTAL	3,878.67 *

95-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

COPY COPY

JUN 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
100.0	ON-PEAK	9.4000	940.00
8.0	INTERMEDIATE	1.0600	8.48
518.0	OFF-PEAK	1.0600	549.08
		SUB-TOTAL	1,497.56 S
ON-PEAK	9000	.090090	810.81
INTERMEDIATE	400	.078830	31.53
OFF-PEAK	47800	.058480	2,795.34
ENERGY ADJUSTMENT			1,656.570
		SUB-TOTAL	3,478.67 S
SERVICE CHARGE			400.00
	57200 S	TOTAL	3,878.67 *

95-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

JUL 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT	
100.0	ON-PEAK	9.4000	940.00	
8.0	INTERMEDIATE	1.0600	8.48	
466.0	OFF-PEAK	1.0600	493.96	
		SUB-TOTAL	1,442.44	S
ON-PEAK	6200	.090090	558.56	
INTERMEDIATE	200	.078830	15.77	
OFF-PEAK	38200	.058480	2,233.94	
ENERGY ADJUSTMENT			1,291.66	CR
		SUB-TOTAL	2,959.05	S
SERVICE CHARGE			400.00	
	44600 S	TOTAL	3,359.05	*

95-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

APR 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
112.0	ON-PEAK	8.1700	915.04
12.0	INTERMEDIATE	1.0600	12.72
502.0	OFF-PEAK	1.0600	532.12
		SUB-TOTAL	1,459.88 S
	ON-PEAK 10000	.090090	900.90
	INTERMEDIATE 200	.078830	15.77
	OFF-PEAK 56200	.058480	3,286.58
ENERGY ADJUSTMENT			1,923.01 CR
		SUB-TOTAL	3,740.12 S
SERVICE CHARGE			400.00
	66400 S	TOTAL	4,140.12 *

93-4071 78M 11/86

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

MAR 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
108.0	ON-PEAK	8.1700	882.36
6.0	INTERMEDIATE	1.0600	6.36
518.0	OFF-PEAK	1.0600	549.08
		SUB-TOTAL	1,437.80 S
ON-PEAK	9600	.090090	864.86
INTERMEDIATE	400	.078830	31.53
OFF-PEAK	55800	.058480	3,263.18
ENERGY ADJUSTMENT			1,905.630
		SUB-TOTAL	3,691.74 S
SERVICE CHARGE			400.00
	65800 S	TOTAL	4,091.74 *

95-4071 68M 12/85

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

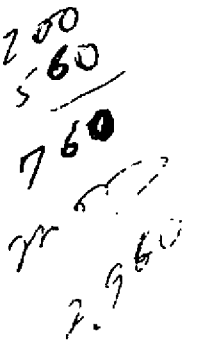
52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

DEC 1986 | RATE LPL | PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT	
114.0	ON-PEAK	7.5500	860.70	
8.0	INTERMEDIATE	.9000	7.20	
486.0	OFF-PEAK	.9000	437.40	
		SUB-TOTAL	1,305.30	S
ON-PEAK	10400	.082930	862.47	
INTERMEDIATE	200	.070490	14.10	
OFF-PEAK	48600	.048000	2,332.80	
ENERGY ADJUSTMENT			400.960	
		SUB-TOTAL	4,113.71	S
SERVICE CHARGE			400.00	
	59200	S TOTAL	4,513.71	#

85-4071 88M 12/85



Company

STATEMENT OF ELECTRIC CHARGES

[redacted]

52 518 950 8 9 IND

CYPRUS IND MINERALS
ATT ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

AUG 1986 RATE L PL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT	
57.0	ON-PEAK	8.7500	498.75	
6.3	INTERMEDIATE	.9000	5.67	
325.0	OFF-PEAK	.9000	292.50	
			==========	
		SUB-TOTAL	796.92	S
ON-PEAK	6080	.082930	504.21	
INTERMEDIATE	160	.070490	11.28	
OFF-PEAK	34080	.048000	1,635.84	
ENERGY ADJUSTMENT			273.09	CR
			==========	
		SUB-TOTAL	2,675.16	S
SERVICE CHARGE			400.00	
			==========	
	40320 S	TOTAL	3,075.16	*

95-4011 86M 12/85

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 8 9 IND

CYPRUS IND MINERALS
ATT ACCTS PAY
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JUN 1986 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
88.8	ON-PEAK	8.7500	770.00
6.4	INTERMEDIATE	.9000	5.76
465.6	OFF-PEAK	.9000	419.04
		SUB-TOTAL	1,194.80 S
	ON-PEAK 9600	.08 930	796.13
	INTERMEDIATE 160	.070490	11.28
	OFF-PEAK 55680	.048000	2,672.64
ENERGY ADJUSTMENT			443.230
		SUB-TOTAL	4,231.62 S
SERVICE CHARGE			400.00
	65440 S	TOTAL	4,631.62 *

PSE&G Public Service Electric and Gas Company

EMENT OF ELECTRIC CHARGES

METUCHEN RD
INFIELD NJ 07080

52 950 8 9 IND

CYPR IND MINERALS
ATT ACCTS PAY
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APR 1986 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
177.6-	ON-PEAK	7.5500	1,340.88
41.6-	INTERMEDIATE	.9000	37.44
512.0-	OFF-PEAK	.9000	460.80
		SUB-TOTAL	1,839.12
ON-PEAK	11680	.082930	968.62
INTERMEDIATE	320	.070490	22.56
OFF-PEAK	56800	.048000	2,726.40
ENERGY ADJUSTMENT			465.980
		SUB-TOTAL	5,090.72
SERVICE CHARGE			400.00
	68800 S	TOTAL	5,490.72

95-4071 88M 12/85

LEHMAN 00080

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 8 9 IND

CYPRUS IND MINERALS
ATT ACCTS PAY
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S PLAINFIELD NJ 07080

COPY COPY

MAR 1986 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
302.4	ON-PEAK	7.5500	2,283.12
8.0	INTERMEDIATE	.9000	7.20
467.2	OFF-PEAK	.9000	420.48
		SUB-TOTAL	2,710.80 S
ON-PEAK	49760	.082930	4,126.60
INTERMEDIATE	320	.070490	22.56
OFF-PEAK	47200	.048000	2,265.60
ENERGY ADJUSTMENT			658.88 CR
		SUB-TOTAL	8,466.68 S
SERVICE CHARGE			400.00
	97280 S	TOTAL	8,866.68 *

95-4071 SEM 12/85

LEHMAN 00081

PSE&G
The Energy People

STATEMENT

651 METUCNEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

JAN 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	124.0 ON-PEAK		8.170000			1,013.08
	36.0 INTERMED		1.060000			38.16
	500.0 OFF-PEAK		1.060000			530.00
					SUB-TOTAL	1,581.24
	ON-PEAK	5000	.090090			450.45
	INTERMED	200	.078830			15.77
	OFF-PEAK	42600	.058480			2,491.25
	ENERGY ADJUSTMENT					-1,384.34
					SUB-TOTAL	3,154.37
	SERVICE CHARGE					400.00
	TOT KWN	47800			TOTAL	$3,554.37
	KW CONSTANT	200.000				

95-3301

PSE&G - The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

DEC 87 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	80.0	ON-PEAK	8.170000			653.60
	6.0	INTERMED	1.060000			6.36
	456.0	OFF-PEAK	1.060000			483.36
					SUB-TOTAL	1,143.32
		ON-PEAK 5600	.090090			504.50
		INTERMED 400	.078830			31.53
		OFF-PEAK 36000	.058480			2,105.28
		ENERGY ADJUSTMENT				-1,216.36
					SUB-TOTAL	2,568.27
		SERVICE CHARGE				400.00
		TOT KWH 42000			TOTAL	$2,968.27
		KW CONSTANT 200.000				

95-3391

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 52518950 – 89
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

ELECTRIC RATE	BILLING MONTH		ON PEAK MEASURED KW	ON PEAK BILLED KW	INTERMED. BILLED KW	OFF PEAK BILLED KW	ON PEAK KWH
LPL	86, JAN	1	.0	155.2	16.0	369.6	9,280
	86, FEB	1	.0	174.4	20.8	520.0	14,080
	86, MAR	1	.0	302.4	8.0	467.2	49,760
	86, APR	1	.0	177.6	41.6	512.0	11,680
	86, MAY	1	.0	340.8	126.4	481.6	49,600
	86, JUN	1	.0	88.0	6.4	465.6	9,600
	86, JUL	1	.0	94.4	9.6	536.0	9,920
	86, SEP	1	.0	57.0	6.3	325.0	6,080
	86, OCT	1	.0	98.0	.1	492.0	7,600

MORE =>

INTERMED. KWH	OFF PEAK KWH	TOTAL KWH	MONTHLY BILL ELECTRIC $	SPECIAL BILL CONDITION
320	43,680	53,280.00	$4,446.78	
640	69,920	84,640.00	$6,199.09	
320	47,200	97,280.00	$8,866.68	
320	56,800	68,800.00	$5,490.72	
1,280	49,280	100,160.00	$9,410.86	
160	55,680	65,440.00	$4,631.62	
480	53,760	64,160.00	$4,719.47	
160	34,080	40,320.00	$3,075.16	
0	38,400	46,000.00	$3,428.07	

<= MORE

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 52518950
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

ELECTRIC RATE	BILLING MONTH		ON PEAK MEASURED KW	ON PEAK BILLED KW	INTERMED. BILLED KW	OFF PEAK BILLED KW	ON PEAK KWH
LPL	86, NOV	1	.0	96.0	.1	494.0	12,200
	86, DEC	1	.0	114.0	8.0	486.0	10,400
	87, JAN	1	.0	96.0	12.0	410.0	6,800
	87, FEB	1	.0	604.0	.0	.0	49,600
	87, MAR	1	.0	108.0	6.0	518.0	9,600
	87, APR	1	.0	112.0	12.0	502.0	10,000
	87, MAY	1	.0	108.0	.1	506.0	8,000
	87, JUN	1	.0	100.0	8.0	518.0	9,000

END OF REPORT

MORE =>

INTERMED. KWH	OFF PEAK KWH	TOTAL KWH	MONTHLY BILL ELECTRIC $	SPECIAL BILL CONDITION
0	40,800	53,000.00	$4,180.65	
200	48,600	59,200.00	$4,513.71	
200	33,400	40,400.00	$3,412.19	
0	0	49,600.00	$3,958.50	
400	55,800	65,800.00	$4,091.74	
200	56,200	66,400.00	$4,140.12	
0	47,000	55,000.00	$3,695.14	
400	47,800	57,200.00	$3,878.67	

END OF REPORT

<= MORE

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 52518950
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

GAS RATE	BILLING MONTH		THERMS	MONTHLY BILL GAS $	SPECIAL BILL CONDITION
LVG	86, JAN	1	3,861.0	$2,344.88	
	86, FEB	1	5,280.0	$3,167.40	
	86, MAR	1	5,441.0	$3,260.83	
	86, APR	1	3,300.0	$2,019.65	
	86, MAY	1	5,263.0	$3,157.94	
	86, JUN	1	3,369.0	$2,059.86	
	86, JUL	1	2,652.0	$1,644.17	
	86, AUG	1	1,386.2	$910.35	
	86, OCT	1	2,068.6	$1,409.11	

MORE

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 52518950
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

GAS RATE	BILLING MONTH		THERMS	MONTHLY BILL GAS $	SPECIAL BILL CONDITION
LVG	86, NOV	1	2,275.6	$1,318.67	
	86, DEC	1	3,872.9	$2,056.01	
	87, JAN	1	3,177.3	$1,701.59	
	87, FEB	1	3,785.2	$2,012.00	
	87, MAR	1	3,719.9	$1,978.68	
	87, APR	1	2,769.3	$1,493.20	
	87, MAY	1	2,342.9	$1,212.18	
	87, JUN	1	1,920.7	$1,016.48	

END OF REPORT

PSE&G Public Service Electric and Gas Company

STATEMENT OF ELECTRIC CHARGES

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
651 METUCHEN RD
S PLAINFIELD NJ 07080

AUG 1987 RATE LPL PLAINFIELD DISTRICT

KILOWATTS	KILOWATT HOURS	BLOCK	AMOUNT
126.0	ON-PEAK	9.4000	1,184.40
14.0	INTERMEDIATE	1.0600	14.84
518.0	OFF-PEAK	1.0600	549.08
		SUB-TOTAL	1,748.32 S
ON-PEAK	12200	.090090	1,099.10
INTERMEDIATE	200	.078830	15.77
OFF-PEAK	57600	.058480	3,368.45
ENERGY ADJUSTMENT			2,027.27 CR
		SUB-TOTAL	4,204.37 S
SERVICE CHARGE			400.00
	70000 S	TOTAL	4,604.37 *

85-4071 78M 11/86

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

1,600 / 2,128 W.B.

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

OCT 87 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
-434	112.0	ON-PEAK	8.170000	@ 3,546	3,545	915.04
434	50.0	INTERMED	1.060000		4B4	53.00
434	434.0	OFF-PEAK	1.060000			460.04
					SUB-TOTAL 460	1,428.08
	ON-PEAK	10800	.090090	3,600	3,420 4,465	972.97
	INTERMED	800	.078830			63.06
	OFF-PEAK	38000	.058480			2,222.24
	ENERGY ADJUSTMENT					-1,436.47
					SUB-TOTAL	3,249.88
	SERVICE CHARGE					400.00

9,000

TOT KWH	49600	TOTAL	$3,649.88
KW CONSTANT	200.000		

95-9391

LEHMAN 00088

ENERGY USAGE REPORT 1986

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Total (dryed)	622	901	772	929	1,043	531	637	205	103	528	386	520	7,177
Roller Mill	550	897	740	837	1,001	485	551	164	103	413	321	497	6559
Vertical Mill	72	4	32	92	42	46	86	41	0	115	65	23	618
DEGREE DAYS													
Heating	985	942	642	341	89	7	0	11	22	240	594	826	4,699
Cooling	0	0	2	2	149	243	380	303	136	30	0	0	1,245
ELECTRIC													
KW-Demand	369.6	520	467.2	512.0	481.6	465.6	536.0			492.0	494.0	486.0	402.
KWH	66,080	124,640	69,600	94.240	92,320	57,600	58,080	40,640	9,800	63,000	52,000	49,600	777.600
KWH/Ton	106.24	138.34	90.15	101.44	88.51	108.47	91.18	198.24	95.15	119.32	134.7	95.39	108.35
Cost ESTIMATED	4,745	8,049	6,529	6,759	7,866	3,872	3,910	3,075	456	3,955	3,714	4,084	57,014
Cost/Ton	7.63	8.97	8.46	7.28	7.54	7.29	6.14	3.89	4.43	7.49	9.62	6.89	7.94
MID MONTH BILLING	4,447	6,199	8,867	5,491	9,411	4,632	4,719	3,075	0	3,428	4,181	4,514	58.964
NATURAL GAS													
MCF	499.	714.4	416.8	516.9	402.4	267.3	225.8	78.7	61.2	235.3	298.2	354.9	4,070.9
MCF/Ton	.802	.793	.539	.556	.385	.503	.354	.383	.594	.445	.772	.683	.567
Cost ESTIMATED	3,091	4,426	2,582	3,226	2,512	1,668	1,409	492	410	1,577	1,998	1,922	25,313
Cost/Ton	4.97	4.91	3.34	3.47	2.41	3.14	2.21	2.40	3.98	3.0	5.18	3.7	3.53
MID MONTH BILLING	2,345	3,167	3,261	2,020	3,158	2,060	1,644	910	0	1,409	1,319	2,057	23,350
No 2 DIESEL FUEL (LOADERS ONLY)													
Gallons	82	42	92	82	134	117	74	74	73	110	69	87	1,036
Gallons/Ton	.132	.047	.119	.088	.128	.22	.116	.36	.708	.208	.179	.167	.144
Cost	85	40	88	78	127	111	52	52	51	77	48	61	870
Cost/Ton	.137	.045	.113	.083	.121	.209	.081	.253	.495	.145	.124	.117	.121
PROPANE (FORK LIFTS ONLY)													
Gallons	198	126	137	161	177	196	149	126	93	150	78	86	1,677
Gallons/Ton	.319	.140	.177	.173	.169	.369	.233	.614	.902	.284	.202	.165	.254
Cost	208.	132.	123.	166.	158	165	157	132	98	157	81	86	1,663
Cost/Ton	.335	.147	.159	.178	.151	.310	.246	.643	.951	.297	.210	.165	.252
GASOLINE (NOT USED IN PRODUCTION)													
Gallons	139	106	71	79	134	83	73	86	270	270	95	120	1,526
Cost	158	93	75	69	106	76	70	85	265	265	97	110	1,469

I FHMAN 000889

SCHEDULE: A

COMPANY CODE: 329

CIM TALC - DIVISION OF CYPRUS MINES 3
PROPERTY RECORD LISTING

DEC 1986

PAGE 89
01/29/87

S.P

TYPE	SECT	VOUCHER REF NO.	MONTH	YEAR	MAIN ACCT	CC IDENT	PRI SUB	EQUIP NO.	CONTROL NUMBER	MT SD	TB CD	ACQ MO	DATE YR	IC CD	AMOUNT
ARTICLE					DESCRIPTION										
62	03	037	05 FREIGHT	4	3521	30120029	301	43003	2902	02	06	03	84	90	350.00
									TOTAL COST CTR IDENT					30120029	350.00
62 PICK UP	03	029	05 1982 FORD F-250 VIN 1FTHF2523CPA19481 PIMA P	4	3521	32920029	301	43003	2901	02	06	05	84	90	4,025.12
									TOTAL COST CTR IDENT					32920029	4,025.12
									TOTAL PRIMARY SUBACCOUNT					301	4,375.12
									TOTAL MAIN ACCOUNT					3521	4,375.12
62 CABINET	03	027	09 FOR VTR CSOE TV UNITS	4	3522	32920029	301	35999	2909	01	06	08	84	01	340.00
63	07	026	03	3	3522	32920029	301	35999	2900	01	01	09	79	01	2,000.00
63	07	009	10 ADDL COST	4	3522	32920029	301	35999	2910	01	06	09	84	01	43.65
									TOTAL COST CTR IDENT					32920029	2,383.65
									TOTAL PRIMARY SUBACCOUNT					301	2,383.65
63 AUDIO VIDEO	07	003	07 AFE 685	3	3522	32920029	302	33554	2902	02	01	11	80	01	530.00
63 OVEN	07	009	03 LITTON MICROWAVE AFE 1874	3	3522	32920029	302	05047	2902	02	06	12	82	01	413.20
62 TYPEWRITER	03	029	04 SILVERREED PERSONY EX60	5	3522	32920029	302	35031	2901	02	06	04	85	01	1,370.00
62	03	029	04 SALES TAX	5	3522	32920029	302	35031	2902	07	06	04	85	90	82.20

I FHMAN 00090

TYPE	SECT	VOUCHER REF NO.	MONTH	YEAR	MAIN ACCT	CC IDENT	PRI SUB	EQUIP NO.	CONTROL NUMBER	MI CD	TB CD	ACQ DATE MO	ACQ DATE YR	IC CD	AMOUNT
ARTICLE						DESCRIPTION									
									TOTAL COST CTR IDENT						32920029 2,403.48
									TOTAL PRIMARY SUBACCOUNT						302 2,403.48
									TOTAL MAIN ACCOUNT						3522 4,787.13
63	07	004	09	3	3525	32920029	300	03229	2902	02	01	09	79	01	94,976.00
SYSTEM			UNLOADING HOPPER CAR												
63	07	004	09	3	3525	32920029	300	03230	2902	02	01	09	79	01	284,927.00
DRYER SYSTEM															
63	07	004	09	3	3525	32920029	300	03231	2902	02	01	09	79	01	189,951.00
SYSTEM			MILL FEED CONVEYOR												
63	07	004	09	3	3525	32920029	300	03232	2902	02	01	09	79	01	199,344.00
SYSTEM			MILL GRINDING & PACKING												
63	07	004	09	3	3525	32920029	300	03233	2902	02	01	09	79	01	512,281.00
SYSTEM			ROLLER MILL & PACKING												
63	07	004	09	3	3525	32920029	300	03234	2902	02	01	09	79	01	37,573.00
SYSTEM			BULK STORAGE LOADING & TRANSFER												
63	07	004	09	3	3525	32920029	300	03237	2902	02	01	09	79	01	4,100.00
TRUCK			TOWNMOTOR CAT LIFT AUTO TRANS												
63	07	004	09	3	3525	32920029	300	03243	2902	02	01	09	79	01	10,980.00
SILO			2 15' DIA X 32' BULK STORAGE												
63	07	004	09	3	3525	32920029	300	03288	2902	02	01	11	79	01	4,101.00
WRAP MACHINE			IPM 4875 SR STRETCH AFE 388E												
63	07	004	09	3	3525	32920029	300	03289	2902	02	01	11	79	01	21,121.00
TRUCK			CAT LIFT 750-6 87K00980 AFE 388F												
63	07	004	09	3	3525	32920029	300	04144	2902	02	01	03	80	01	565.00
DRYER			PROD ELEVATOR AFE 388C												
63	07	004	09	3	3525	32920029	300	04147	2902	02	06	06	81	01	21,880.00
COMPRESSOR			JOY MODEL YA220IAAF SN 145545 AFE 663												
63	07	004	09	3	3525	32920029	300	04148	2902	02	06	06	81	01	3,098.00
UNIT			OIL DISPENSING MODEL HDC12-101160 AFE 706												
63	07	004	09	3	3525	32920029	300	04200	2902	02	01	10	80	01	11,250.00
CYCLONE			ROLLER MILL REPLACEMENT AFE 635												

I FHMAN 00091

TYPE	SEQ	VOUCHER REF NO.	MONTH	YEAR	MAIN ACCT	CC IDENT	PRI SUB	EQUIP NO.	CONTROL NUMBER	NT CD	TR CD	ACQ MO	DATE YR	IC CD	AMOUNT
ARTICLE						DESCRIPTION									
63 SYSTEM	07	004	09	3	3525	32920029	300	04252	2902	02	06	09	81	01	28,881.00
						VACUUM APE 631 & ADDL COST 04252									
63 LOADER	07	004	09	3	3525	32920029	300	04394	2902	02	06	11	81	01	49,000.00
						920 CAT SN 62R13790 APE 892									
63 LOADER	07	004	09	3	3525	32920029	300	04781	2902	02	06	12	82	01	14,162.00
						SKID-STEER SN 11568									
63 BIN	07	004	09	3	3525	32920029	300	04818	2902	02	06	06	82	01	31,099.00
						VENTING IMPROVEMENTS									
63 CLASSIFIER	07	005	04	4	3525	32920029	300	04020	2901	05	04	03	84	01	51,573.57
						JET STREAM - APE 63-17 ADDL DETAILS REQD									
63 CLASSIFIER	07	006	08	4	3525	32920029	300	04020	2902	02	06	08	84	01	244.62
						JET STREAM APE 63-17 ADDL COST									
62 CONTROLLER	03	030	10	5	3525	32920029	300	04032	2901	02	04	10	85	01	442.13
						ROLLER MILL REJECT									
63	09	003	11	5	3525	32920029	300	04032	2902	02	04	11	85	01	1,351.71
						ADDL COST									
63 SYSTEM	07	010	12	5	3525	32920029	300	04034	2901	02	06	12	85	01	28,021.29
						SEMI-BULK PACKAGING APE 85-03									
									TOTAL COST CTR ACCNT						32920029 1,620,122.20
									TOTAL PRIMARY SUBACCOUNT						300 1,620,122.20
									TOTAL MAIN ACCOUNT						3525 1,620,122.20
63 SHED	07	004	09	3	3526	32920029	300	03223	2902	02	04	09	79	90	34,442.00
						RAIL CAR									
63 MILL	07	004	09	3	3526	32920029	300	03224	2902	02	04	09	79	90	119,762.00
						BUILDING									
63 WAREHOUSE	07	004	09	3	3526	32920029	300	03225	2902	02	04	09	79	90	152,378.00
63 WAREHOUSE	07	004	09	3	3526	32920029	300	03225	2904	02	04	09	79	90	26,179.00
						ADDITION									
63 SHOP & LAB	07	004	09	3	3526	32920029	300	03227	2904	02	04	09	79	90	37,573.00
						ADDITION									

I FHMAN 00092

TYPE	SECT	VOUCHER REF NO.	MONTH	YEAR	MAIN ACCT	CC IDENT	ORI SUB	EQUIP NO.	CONTROL NUMBER	NT CD	TS CD	ACQ MO	DATE YR	IC CD	AMOUNT
ARTICLE						DESCRIPTION									
63	07	004	09	3	3526	32920029	300	03227	2905	02	04	09	79	80	151,335.00
OFFICE & LAB															
63	07	004	09	3	3526	32920029	300	03287	2902	02	01	10	79	01	17,378.00
STORAGE PAD			PAVING CRUDE AFE 3004												
63	07	004	09	3	3526	32920029	300	04095	2902	02	06	03	81	01	915.00
RAIL DOCK			PLATE AFE 730												
63	07	004	09	3	3526	32920029	300	04145	2902	02	06	04	81	01	17,152.00
PLANT			GUARDS & RAILING AFE 3086												
63	07	004	09	3	3526	32920029	300	04146	2902	02	01	12	80	01	1,635.00
PLANT			ACCESS DOORS AFE 3086												
63	07	004	09	3	3526	32920029	300	04203	2902	02	06	07	81	01	474.00
CONDITIONER			AIR DIOLAB 12000 BTU CARRIER AFE 013												
63	07	004	02	3	3526	32920029	300	04333	2902	02	07	11	81	90	2,594.00
AREA			WAITING-FOR TRUCK DRIVER ADDL COST CR4333 AF												
63	07	004	02	3	3526	32920029	300	04547	2902	02	06	01	82	01	2,219.00
DOCK SEALS			AFE 992												
63	07	009	03	3	3526	32920029	300	05048	2902	02	06	12	82	01	1,103.92
HOIST			50 FT IR53 ELECTRIC JET AFE 1075												
63	07	009	03	3	3526	32920029	300	05049	2902	02	06	12	82	01	1,650.00
SAW			JET BAND NVES 712 AFE 1035												
63	07	009	03	3	3526	32920029	300	05050	2902	02	06	12	82	01	1,961.00
WELDER			MILLER CP-300 MIG W/WIRE FEED SN JC646062												
62	03	032	11	3	3526	32920029	300	93011	2901	02	06	10	83	01	2,550.00
RAMP			RAIL RAMP 200												
63	09	002	11	3	3526	32920029	300	93012	2901	02	06	10	83	01	181.88
FREIGHT			ON UNIDENTIFIED ARTICLE												
63	07	008	08	4	3526	32920029	300	93013	2904	02	06	07	84	01	453.46
RECORDER			VIDEO VJ285												
63	07	008	08	4	3526	32920029	300	93013	2903	02	06	07	84	01	301.94
COLOR TV			PJC42300												
62	03	029	12	3	3526	32920029	300	93013	2902	02	06	12	83	01	950.00
PLATE			FABRICATED DOCK PLATE FOR CRUDE UNLOADING RA												
62	03	029	12	3	3526	32920029	300	93013	2901	02	06	12	83	01	3,400.00
RAMP			CRUDE UNLOADING RAMP AND PAD												

SCHEDULE: A
COMPANY CODE: 329

CIM TALC - DIVISION OF CYPRUS MINES 3
PROPERTY RECORD LISTING
DEC 1986

TYPE	SECT	VOUCHER NO.	REF MONTH	YEAR	MAIN ACCT	CC IDENT	PRI SUB	EQUIP NO.	CONTROL NUMBER	MT CD	TB CD	ACQ MO	DATE YR	IC CD	AMOUNT
ARTICLE			DESCRIPTION												
62	03	007	12	3	3526	32920029	300	93020	2901	02	06	11	83	90	425.00
PROJECTOR			USED MOVIE PROJECTOR												
63	07	005	01	4	3526	32920029	300	93023	2901	02	06	12	83	01	3,400.00
PLATFORM			CRUDE UNLOADING												
62	03	020	07	4	3526	32920029	300	93038	2901	02	06	06	84	01	410.00
			AIRCONDITIONING UNIT (CARRIER) S/N S300144												
62	03	020	07	4	3526	32920029	300	93038	2902	07	06	06	84	90	24.60
			SALES TAX												
62	03	024	01	5	3526	32920029	300	93076	2901	02	06	01	85	01	535.95
DOOR			2/0 X 7/0 STEEL												
62	03	024	01	5	3526	32920029	300	93076	2902	07	06	01	85	90	32.16
			TAX												
63	07	008	10	5	3526	32920029	300	93124	2904	02	06	02	85	01	348.09
			ADDL COST LABOR												
62	03	020	03	5	3526	32920029	300	93124	2901	02	06	02	85	01	2,569.00
			TRAILER RESTRAINT												
62	03	034	03	5	3526	32920029	300	93124	2902	02	06	03	85	01	247.35
			ADDL COST												
62	03	034	03	5	3526	32920029	300	93124	2903	07	06	03	85	90	15.00
			SALES TAX												
62	03	029	08	5	3526	32920029	300	93147	2901	02	06	07	85	01	3,094.00
BULKRAILSYST			MAGNET FBAST												
62	03	029	08	5	3526	32920029	300	93147	2902	02	06	08	85	01	34.51
			ADDL COST												
63	07	008	10	5	3526	32920029	300	93148	2901	02	06	03	85	01	2,399.00
CURTAIN			NOISE CONTROL												
63	07	008	10	5	3526	32920029	300	93148	2902	07	06	03	85	90	18.01
			TAX												
63	07	008	10	5	3526	32920029	300	93148	2903	02	06	05	85	01	127.41
			ADDL COST												
63	07	007	12	6	3526	32920029	300	93206	2901	00	00	12	86	90	86,931.60
MEC/ADE			ELECTRICAL POWER SERVICE APR 86-89												
62	03	035	01	5	3526	32920029	300	93999	2903	01	06	01	85	01	858.41
RAILCARACCES			3T4-489 16GACARBON STEEL-6 SLIPCOUPLIN												

TYPE	VOUCHER REF SECT	NO.	MONTH	YEAR	MAIN ACCT	CC AGENT	PRI SUB	EQUIP NO.	CONTROL NUMBER	WT CD	TD CD	ACQ DATE MO	ACQ DATE YR	IC CD	AMOUNT
ARTICLE									DESCRIPTION						
62 RAILCARACCES	03	035	01	5	3526	32920029	300	93999	2905	01	06	01	85	01	585.66
									STEEL TUBING						
62 RAILCARACCES	03	039	01	5	3526	32920029	300	93999	2904	01	06	01	85	01	2,717.09
									ADDITIONAL ACCESSORIES						
63 RAILCARACCES	19	003	01	5	3526	32920029	300	93999	2906	02	06	01	85	01	239.23
									ADDL COST						
62 RAILCARACCES	03	020	03	5	3526	32920029	300	93999	2907	01	06	02	85	01	22.52
									ADDL COST						
62	03	025	10	3	3526	32920029	300	93999	2901	02	06	09	83	01	759.00
63 STORAGE BLDG	07	006	02	6	3526	32920029	300	97006	2904	00	00	01	86	90	400.00
									ADD COST AFE 85-20						
63 BLDG	07	007	11	5	3526	32920029	300	97006	2902	02	06	11	85	01	1,280.00
									ADD COST						
62 BLDG	07	007	11	5	3526	32920029	300	97006	2901	02	07	11	85	90	79,909.84
									CANOE STORAGE BLDG						
63 BLDG	07	007	11	5	3526	32920029	300	97006	2903	07	06	11	85	90	76.00
									TAXES						
										TOTAL COST CTR 32920029					759,060.59
										TOTAL PRIMARY SUBACCOUNT 300					759,240.59
										TOTAL MAIN ACCOUNT 3526					759,840.59
										TOTAL LOCATION 29					2,389,133.12

I FHMAN 00095

SOS

STATEMENT

[redacted] INC. 1100 HARRISON AVE, KEARNY, N.J. 07029 • (201) [redacted]/114 EGEL AVE, [redacted]SEX, N.J. [redacted] • (201) [redacted]

PLEASE REMIT TO 1100 HARRISON AVE., KEARNY, N.J. 07029

TO
CYPRUS MINERALS CO
651 METUCHEN RD *
SO PLAINFIELD
N J 07080

ACCOUNT NO. MC600 STATEMENT DATE 02/31/88

PAYMENTS RECEIVED AFTER THIS DATE
WILL APPEAR ON YOUR NEXT STATEMENT

DATE	REFERENCE	CHARGES	CREDITS	
11/30/87	[redacted]	[redacted]		
12/23/87	584097	22.72		P
12/23/87	584212	30.18		P
12/31/87	[redacted]	[redacted]		
01/13/88	586497	26.45		P
01/18/88	586728	16.20		P
01/27/88	587763	241.15		
01/31/88	589549 R	36.25		
02/29/88	[redacted]	[redacted]		
02/01/88	1868		52.90-	P
02/16/88	7575		26.45-	P
02/22/88	9079		16.20-	P

CURRENT	30 DAYS PAST DUE	60 DAYS PAST DUE	90 DAYS PAST DUE	120 DAYS & OVER	TOTAL AMOUNT DUE
36.25	277.40	36.25	40.28		390.18

I FHMAN 00096

BULK LIFT
INTERNATIONAL INCORPORATED

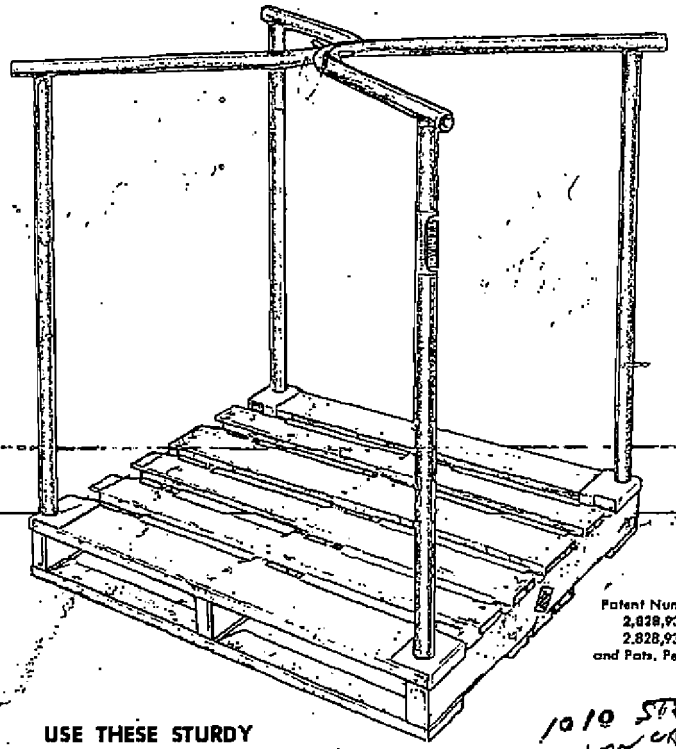
HARRY WILKE
Regional Sales Manager

455 Maple Avenue
Carpentersville, IL 60110

(312) 428-6059
Telex: 282565

CONVERT A NUMBER OF YOUR PALLETS TO PORTABLE

QUICKLY . . . EASILY



Patent Numbers
2,828,932
2,828,933
and Pats. Pending

USE THESE STURDY SNAP-ON TIER-RACK* FRAMES FOR MORE COMPACT AND FLEXIBLE STORAGE OF HARD-TO-STACK ITEMS.

* Ask others about TIER-RACK. They are also called "Attachable Pallet Frames", "Pallet Spacers", "Portable Pallet Racks", "Pallet Storage Frames".

TIER-RACK
REG. U.S. PAT. OFF.
PALLET STACKING FRAMES

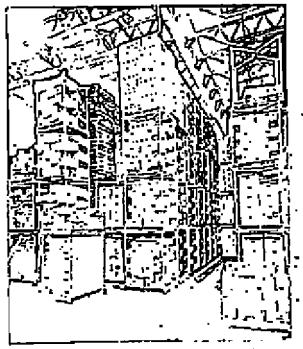
TIER-RACK CORPORATION • 706 CHESTNUT ST.

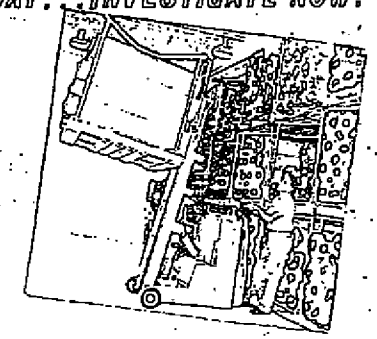
INCREASE YOUR WAREHOUSE CAPACITY

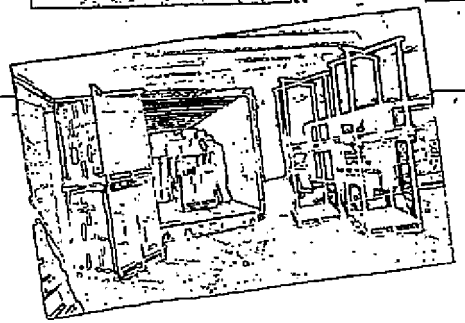
TIER-RACK CORPORATION
816 OLIVE STREET
ST. LOUIS, MO. 63101 • (314) 241-5451

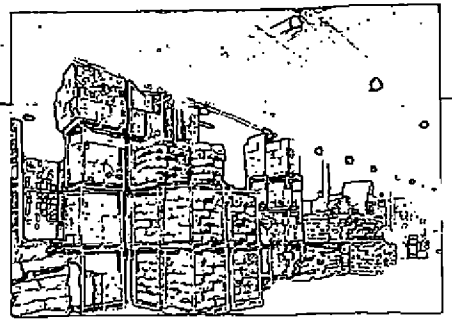
BULK RATE
U.S. POSTAGE
PAID
Permit No. 3197
St. Louis, Mo.

MORE THAN TWO MILLION TIER-RACKS IN USE TODAY . . . INVESTIGATE NOW!





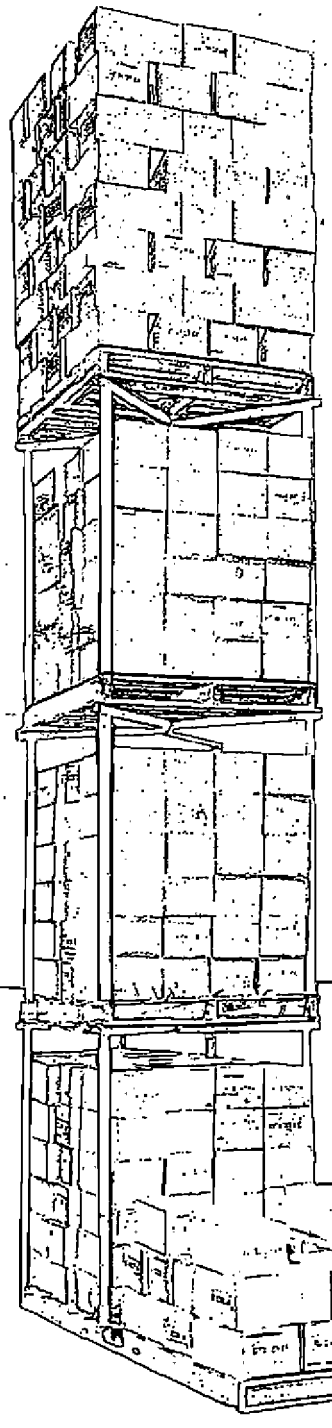


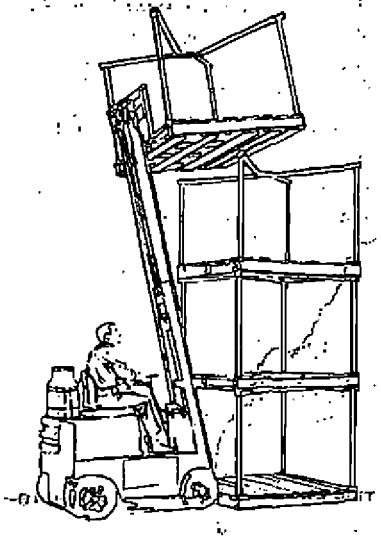


TIER-RACK CORPORATION
706 CHESTNUT ST.
ST. LOUIS, MO. 63101
CHestnut 1-5458

1 FHMAN 00098

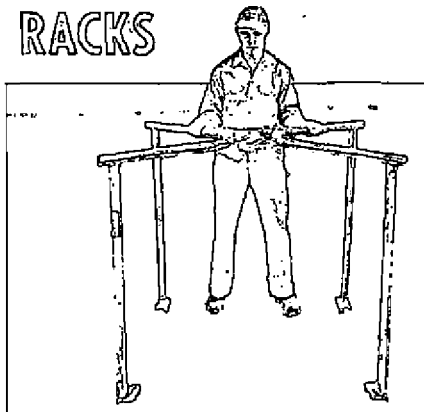
TIER-RACK INCREASES THE CAPACITY OF YOUR WAREHOUSE and HAS THE ADVANTAGE OF FLEXIBILITY OVER FIXED RACKS

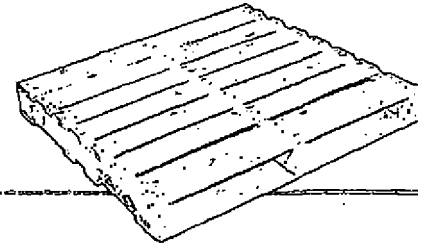




These versatile snap-on pallet storage frames basically provide a means of handling and storing difficult to stack material in modern unitized-load fashion without using fixed racking and permanently layed out aisles.

Any floor storage pattern can quickly be set up with TIER-RACK to meet changing conditions — to save space and provide better accessibility and protection of stored items, thus increasing the capacity of your existing warehouse area and reducing overall operational costs.

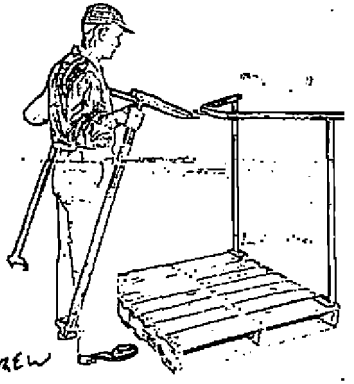




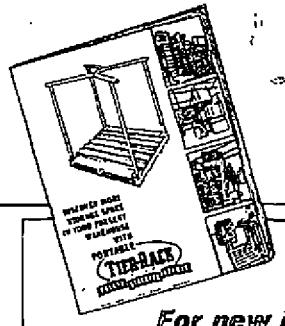
EASY TO ASSEMBLE — SIMPLY SNAPS-ON ORDINARY WAREHOUSE PALLETS

No Nuts, Bolts or Fixtures Required

TIER-RACK Frames are made of 10-20 electric-welded hot roll mechanical steel tubing, of finest quality workmanship, in various diameters and wall thicknesses to fit the required use and load. Frames are finished in either gray or yellow enamel.



ANDREW
MR. BELL JERSEY CITY



For new ideas in making maximum use of your warehouse, send this card in today for FREE brochure.

TIER-RACK

- Increases the capacity of your warehouse
- Vertically stores hard-to-stack items without fixed racking
- Can be stored in depth reducing number of aisles needed
- Contains and protects items on the pallet
- Prevents damage to crushable goods
- Stacks irregular shaped merchandise
- Improves housekeeping
- Cuts handling costs
- Facilitates taking inventory

TIER-RACK
REG. U.S. PAT. OFF.
PALLET STACKING FRAMES

TIER-RACK CORPORATION

TIER-RACK CORPORATION
618 OLIVE STREET
ST. LOUIS, MO. 63101 • (314) 241-5451

MISSOURI 63101

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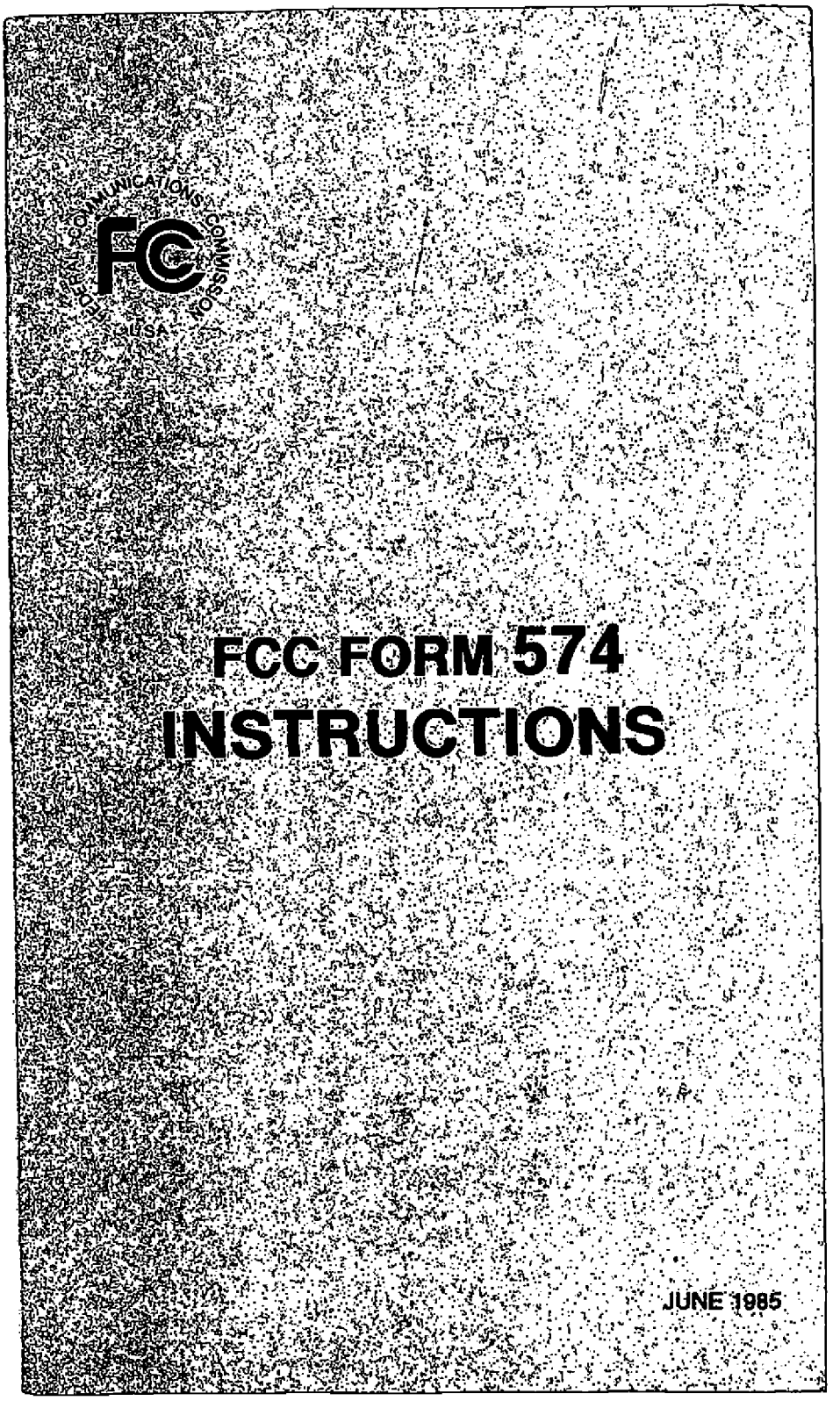
FEDERAL COMMUNICATIONS COMMISSION
USA
FCC FORM 574
INSTRUCTIONS
JUNE 1985

Federal Communications Commission

Approved by OMB
3060-0128
Expires 9/30/87

INSTRUCTIONS FOR COMPLETION OF FCC FORM 574

JUNE 1985

PRIVATE LAND MOBILE AND GENERAL MOBILE RADIO SERVICES

(Use Instruction Sheet Bearing Same Date As Application Form)

FCC Form 574 is used to apply for new or modified radio station authorizations in the Private Land Mobile (Part 90) and General Mobile (Part 95) Radio Services. The following instructions tell what information is needed in each item of Form 574. For your convenience, they are numbered the same as the corresponding item numbers on the form. FCC Form 574A is required when applying for trunked or conventional systems to operate in the 806-821 MHz and 851-866 MHz frequency bands (Subparts M and S of Part 90).

WARNING

As a signatory party to international treaty agreements, the FCC performs certain actions regarding the use of radio. The technical details of your station parameters may be reported to the International Telecommunication Union, Geneva, Switzerland and to countries which border on or are in close proximity to the United States. This information along with data reported by other nations will be used to protect reported stations and aid in resolution of interference disputes between licensees in different countries.

LEHMAN 00101

Certain stations, because of their geographic location, would be best protected by provision of additional information. Specifically, this includes any proposed station which is located in the region north of Line "A" as defined in Section. 1.955 of the Commission's Rules, or in the State of Alaska east of Line "C". If the desired station is to operate in the 806-821/851-866 MHz bands, please consult Public Notice 3465 or Subpart S of Part 90 of the Rules for available frequencies near the United States/Canada/Mexico borders.

For your convenience and ease of determination, a list of all States and counties within those States above line "A", for which applicants may wish to submit additional information, has been included at the end of these instructions and designated Appendix 1. In addition, a new form labeled FCC Form 574-B has been developed for supplying this information. However, in the belief that the operational characteristics for the majority of Land Mobile and General Mobile stations are quite similar, submission of all of the data requested by the ITU or other nations imposes a somewhat heavier burden on applicants than would seem necessary.

Therefore, the FCC will make certain assumptions which reflect the typical station in these services. Carefully review the list below with respect to your particular situation. If you believe that these assumptions would leave your station insufficiently protected, provide the correct data on an FCC Form 574-B and attach it with your application. If you do not provide the actual data and an interference problem arises involving another country's station, your station will be protected only to the limit of the FCC's assumptions.

The following station parameters will be assumed unless otherwise stated:

1. **Antenna Polarization.** All stations will be reported as having antennas with vertical polarization.

2. **Antenna Gain.** Since the output power and effective radiated power are requested, antenna gain will be calculated by the FCC.

3. **Antenna Azimuth of Main Lobe.** We will report each base or mobile relay station as having an omnidirectional (360 degrees) azimuth. We will assume that each control station associated with a mobile relay station has a directional antenna with its azimuth of maximum radiation directed toward the mobile relay station.

4. **Beamwidth.** Where an omnidirectional antenna is assumed, beamwidth has no relevance, and therefore, no assumed value will be used. For control stations we will assume 20 degrees.

5. **Regular Hours of Operation.** All stations will be shown to operate twenty-four hours per day (000 to 2400).

6. **Class of Operation for HF Fixed Stations.** All HF Fixed applicants must file Form 574-B. Therefore no assumption will be made.

7. **Receiver Information.** All stations specified on the same application form are assumed to be communicating with each other as a system. Receivers will be assumed to operate at the same location as the transmitter.

LEHMAN 00102

In other words, we will assume that the receiver site for a mobile station transmission is the location of the associated base station. The receiver site for a base station transmission will be assumed to be the area of operation of the associated mobile stations. For a control station transmission, the location of the associated mobile relay station is the location of the receiver.

HF STATION NOTICE

All stations proposing to operate on Frequencies below 27.5 MHz must complete an FCC Form 574-B and submit it along with a completed Form 574. Failure to do so will result in the return of your application without further action.

GENERAL INSTRUCTIONS

Tear off the front sheet of the Form 574 labeled "Work Sheet" and complete each item. After you are certain that all information on the work sheet is correct, complete the license application by using a typewriter. If additional space is needed for any item, use additional Forms 574 (with pages numbered), attachments, or the reverse side of the application, whichever is appropriate. In the event the frequency you are requesting is subject to the frequency coordination requirements (see Rule 90.175) and you intend to comply with those provisions by obtaining a recommendation from one of the recognized frequency coordinating committees, you may, at your option, remove the "yellow" carbon copy and mail it to that organization with your request. After you have complied with all requirements of the rules, send the completed application form, with the remaining carbon copies attached, to Federal Communications Commission, Gettysburg, PA 17325. Keep the work sheet for your file copy. Applications should be filed with the Commission at least sixty (60) days prior to the date upon which the radio facilities are required to be in operation.

The application Form 574 has been designed to accommodate six (6) permanent locations. Letters A through F are to designate the separate locations for each page of the Form 574. PLEASE NOTE THAT WHEN SECOND AND SUBSEQUENT PAGES ARE REQUIRED, THE SECOND AND SUBSEQUENT PAGES WILL USE LETTERS A THROUGH F TO DESIGNATE THE ADDITIONAL LOCATIONS ON EACH OF THESE PAGES, AND THE PAGES SHOULD BE NUMBERED APPROPRIATELY. NO MORE THAN SIX (6) DIFFERENT PERMANENT LOCATIONS MAY BE LICENSED UNDER ONE CALL SIGN. SEE INSTRUCTIONS FOR COMPLETION OF ITEM 33 "SYSTEM LICENSING".

Letters A through F for Items 1-11 correspond to Letters A through F information in Items 13-17 and 26-29. When more than one class of station (see Item 2 of these instructions) is proposed to be at a common location, use the same permanent location letter A through F and a separate horizontal line entry for each class of station, and furnish the information required by Items 1-11 for each separate class of station. For example, if it is proposed to install a base station, a mobile relay station, and a

I FHMAN 00103

fixed relay station at common location "A", the appropriate information for Items 1-11 must be entered on three (3) separate horizontal lines. The next separate permanent location would use letter "B", etc., (see sample 5). It is requested that the applicant begin by inserting the parameters of the principal base or mobile relay station on line "A" (plus any other different class of station at that location), followed by control station, fixed relay stations, etc.

Applicants for all control stations in the 470-512 MHz band must furnish the information requested in Items 1-11. Applicants for mobile units in the 470-512 MHz band must furnish the information requested in Items 1-6. Applicants for control stations with antenna heights meeting the 20 foot criteria and/or for mobile units in the 806-821/851-866 MHz bands must furnish the information requested in Items 1-6.

All other control stations with antenna heights meeting the 20 foot criteria, itinerant stations at unspecified locations, stations at temporary locations and mobile units are required to enter the information requested in Items 1 through 5. Items 6 through 11 should be left blank. Since letters A through F are reserved for permanent location stations, entries for control stations meeting the 20 foot antenna criteria, itinerant stations, temporary location stations, and mobiles begin with the letter (G), (see samples). The total number of control stations on the same frequency meeting the 20 foot criteria may be inserted on one line. However, separate letters and separate lines should be used for cases where different areas of operation are involved.

If additional pages of Form 574 are required to detail all of the stations and/or frequencies to be used, only Items 1-29 need be completed on pages numbered 2 or greater. However, the application must be signed on all pages.

If your application is approved, a license will be mailed to you. This authorization permits you to commence operations. (Note: It is a violation of Federal Law to begin transmitting prior to obtaining an authorization.) If your application is incomplete or filled out incorrectly, it will be returned along with the reasons for its return. Applications which are not in good order will take additional time to process. You are, therefore, urged to be very careful when completing the application. Each entry on the Form 574 must be complete in itself, so please do not skip any item which is required. Do not use entries such as "On File", "No Changes", "Does Not Apply", "Same as.. ", etc. Also, if corrections are found to be necessary on items 1 thru 25, please retype the FCC Form 574.

I FHMAN 00104

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128

Refer to "Instructions for Completion of FCC Form 574 (June 1985)" and FCC Rules for requested service.
Detach Work Sheet. Fill out in Pencil. Complete Remaining Sheets on a Typewriter. Submit with Carbons Attached to
Federal Communications Commission, Gettysburg, PA 17325.

FCC Form 574 (June 1985) — Federal Communications Commission, Gettysburg, PA 17325 — Commission File Copy

	1. Frequency (MHz)	2. Bureau Class	3. No. of Units	4. Emission Designator	5. Output Power W	6. ERP	7. A.A.T.	8. Ground Elevation	9. Ant. Str. Ht.	10. Latitude	11. Longitude	12. Number of Mobiles By Category
A	461.125	FB6	1	20F3	100	200		2117	460	32-11-07N	99-12-08W	Vehicular 10
B	461.550	FB6	1	20F3	100	190		1970	506	32-12-29N	99-25-16W	Portable
C	466.125	FX1	1	20F3	100	200		2385	412	32-22-01N	99-58-42W	Aircraft
"	468.550	"	1	"	"	"		"	"	"	"	Marine
G	466.125	FX1	7	20F3	100							Repeater
H	461.125	MO	10	20F3	100							13. Area of Operation by Antenna, Transmitter, or Transmitter Multiple
"	466.125	"	10	"	"							
I	463.550	MO	10	20F3	100							
"	468.550	"	10	"	"							

Circle 13:
H 30 mile radius of Station A
I 30 mile radius of Station B

SAMPLE APPLICATION NUMBER 1

for a system consisting of two separate community repeaters: one control station with the antenna height exceeding the 20 ft. criteria; two control stations meeting the 20 ft. antenna height criteria; and ten mobile units.

☐ Countywide ☐ Statewide ☐ Nationwide ☒ Other (Specify below)
*

	14. Station Address or Geographic Location	15. City	16. County	17. State
A	On Hwy. 36, 5.5 miles northwest of	Cross Plains	Callahan	TX
B	8 miles west of	Albany	Shackleford	"
C	8 miles east-southeast of	Merkel	Taylor	"
D				
E				
F				

18. Location of Primary Control Point (Applicant Telephone Number), and location of all Radio Control Stations with antenna under 20 Ft.
8 miles east-southeast of Merkel, TX (817) 353-9000
7 Maynard Avenue, Albany, TX
15 Mine Lane, Merkel, TX

19. Filing Advisory Comm. No. BJ2451682 — 20. Radio Service: IB

21. Applicant's (Licensee) Name (Say Who/Attn:/Care of)
S & T Stockfarm, Inc.

22. Mailing Address (Number & Street, P.O. Box or RFD No.)
6912 Lincoln Road

23. City: Abilene — 24. State: TX — 25. ZIP Code: 79605

If the Applicant authorized herein will not exist (1) on application, other eligibility must be established through questions in Section II and Exhibits as the Commission may require; (2) on assignment of authorization from the present holder; and (3) on transfer of control of the corporate holder, eligibility must be established through questions in Section II and Exhibits as the Commission may require.

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY
Callsign _____ File Number _____
Frequency Coordination Designation _____
Special Conditions

This authorization is effective _____
and will expire 5:00 AM EST _____
Federal Communications Commission
Private Radio Bureau

	26. Will antenna be mounted on an existing structure? If yes, give call sign and FCC antenna registration number.			27. Will antenna be mounted on a new structure or a change in an existing structure? If yes, give height of the structure or proposed additional and the type of structure.				28. If item 27 is "yes", give the name of the nearest airport, landing area and the distance and direction (if the nearest airport)		
	NB	Yes	Call Sign	Radio Service	Yes	No	Height of Structure	Type of Structure	Airport, Landing Area Name	Dist.	Direction
A		X	KNBA601	IB		X	466 feet	Tower	Clyco Airport	25 mi.	NNE
B		X	KNAB222	IB		X	490 feet	Tower	Albany Airport	10 mi.	N
C		X	KNEY313	IS		X	400 feet	Tower	Dyess Air Force Base	12 mi.	NE
D											
E											
F											

29. If item 27 is "yes", has notice of construction or alteration been submitted on FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA office listed below?

	NB	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
A		X	9-14-83	Carson, Inc.	Ft. Worth, TX
B		X	3-29-69	Helium Piping	Ft. Worth, TX
C		X	6-15-80	Flash Storage	Ft. Worth, TX
D					
E					
F					

30. Applicant Classification: ☐ Individual ☐ Partnership ☐ Association ☐ Corporation ☐ Governmental ☐ Non-Profit

31. Explain citizenship of Applicant:
Applicant is engaged in the business of operating several ranches. Radios will be used to coordinate field activities.

32. Application is for (Check one): ☒ New Station ☐ Modification ☐ Assignment ☐ Reinstatement ☐ Renewal

33. Is applicant requesting a System Licensee? ☒ Yes ☐ No

Basis & Purpose: 90.75(a)(1)

34. Where geographic coordinates are required, are they NAD 27 (Default) ☐ or NAD 83 ☐?

35. Specify number of channels requested, if applicable.

36. List Standard Call Signal, if any

37. Individual completing this application for filing:
N. L. Minek
Telephone No. (817) 353-9110
DO NOT WRITE IN THIS BLOCK

READ CAREFULLY BEFORE SIGNING

1) If application is for Land Mobile Service license, applicant certifies that a current copy of the relevant Part 90 rules will be retained.
2) Applicant waives any claim to the use of any particular frequency regardless of prior use by licensee or otherwise.
3) Applicant may have authorized access to the radio equipment and will maintain control so it shall not constitute an operation for hire.
4) Neither applicant nor any member thereof is a foreign government or representative thereof.
5) Applicant certifies that all statements made in this application and attachments are true, complete, correct and made in good faith.

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See Privacy Act Notice for Private Land Mobile, Aeronautical Advisory and Special Emergency Radio Services for additional information.

Typed or Printed Name: James B. Baxter — Telephone No. (817) 353-9000
Signature: James B. Baxter — Date: 6-18-83

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☐ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

LEHMAN 00105

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128

Refer to "Instructions for Completion of FCC Form 574 (June 1985)" and FCC Rules for requested service. Detach Work Sheets. Fill-out in Pencil. Complete Remaining Sheets on a Typewriter, Submit with Carbons Attached to Federal Communications Commission, Gettysburg, PA 17325.

FCC Form 574 (June 1985)

Federal Communications Commission
Gettysburg, PA 17325

Commission File Copy

4	820.3375	FXO	1	20F3	30	50					
"	819.3375	"	"	"	"	"					
"	818.3375	"	"	"	"	"					
"	817.3375	"	"	"	"	"					
"	816.3375	"	"	"	"	"					
R	820.3375	MO	4	20F3	45	70					
"	819.3375	"	"	"	"	"					
"	818.3375	"	"	"	"	"					
"	817.3375	"	"	"	"	"					
"	816.3375	"	"	"	"	"					

SAMPLE APPLICATION NUMBER 2

For a user of a 5-channel trunked SMRS station. One control station meeting the 20 ft. antenna height criteria and mobile units. FCC Form 574-A must be completed and stapled to the Form 574.

17. Area of Operation: Metropolitan Area or Nearest Town — Stanislaus, Cty., CA

18a. Station Address or Geographic Location | 18b. City | 18c. County | 18d. State

A
B
C
D
E
F

19. Location of Primary Control Point (Include Telephone Number, and Location of all Radio Control Stations with antennas under 20 Ft.)

1436 Oak Ridge Road
Los Banos, CA 93635 (209) 652-3337

20. Radio Service: YB

21. Applicant's (Licensee) Name (See Instructions):
John A. Smith, dba
J. A. Disposal Company

22. Mailing Address (Number & Street, PO Box or Rte):
P.O. Box 740

23a. City: Los Banos | 23b. State: CA | 23c. ZIP Code: 93635

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY

Call Sign: | File Number:
Authority Pursuant to Legislative Specifications:
Special Conditions:

This authority issued in accordance with
and will expire 200 Air ESP.

Federal Communications Commission
Private Radio Bureau

	24. Is property to be referenced on an accepting antenna structure? If yes, give FCC and/or FAA study number.			25. Is proposed antenna structure (including all antennas, and their type of structure).				26. If item 25 is "yes", give the name of and the point (ground elevation, and distance and direction to the nearest airport).			
	No	Yes	Call Sign	Radio Service	Yes	No	Height of Structure	Type of Structure	Airport Landing Area Name	Distance	Direction
A											
B											
C											
D											
E											
F											

27. If item 25 is "yes", has notice of construction or alteration been filed with the FAA? If yes, give date filed, the office where filed, and the FAA office's response.

28. Subscriber Classification: ☒ Individual ☐ Partnership ☐ Association ☐ Corporation ☐ Govt. Entity

	No	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
A					
B					
C					
D					
E					
F					

29a. Eligibility (Describe Activity):
The applicant is engaged in the business of disposing of trash and related matter. The radios will be used to coordinate those business activities.

30. Association is for (check one): ☒ New Station ☐ Modification ☐ Assignment ☐ Renewal

31. Is applicant regulated by a Common Carrier? ☐ Yes ☒ No

32. Class of Station: 90.75(a)(1)

33. Would grant of this application be a "Major Action" under the provisions of Section 1.1301 et seq.? ☐ Yes ☒ No
If yes, submit the required Statement per Rule Section 1.1311.

34. Description of Operations (If Required):

35. Additional Information (If Required):

37. Individual submitting this application (Name):
Mary Smith
Telephone No.: (209) 652-3337
DO NOT write in this block

READ CAREFULLY BEFORE SIGNING

a. Station(s) in the Land Mobile Service licensed, authorized or applied for herein will be operated in accordance with the Communications Act of 1934, as amended, and the Rules, Regulations and Policies of the Federal Communications Commission.
b. Applicant is not a foreign government or representative thereof.
c. Applicant has not and will not agree to modification or cancellation of any license granted hereunder upon demand except by action of the Commission after opportunity for hearing.
d. Applicant waives any claim to the use of any particular frequency regardless of the period of time during which it has been assigned or authorized to the station or otherwise operated.
e. Applicant has read and will comply with Section 1.65 of the Rules, and certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862, because of a conviction for possession or distribution of a controlled substance. See Section 1.2002(b) for the definition of "party to the application" as used in this certification.
f. Applicant has read and will comply with Section 1.2105(a) of the Rules, which requires, in certain cases involving pending broadcast applications, certification regarding the existence of agreements for the management or operation of such stations.
g. Applicant certifies that all statements made in this application and attachments are true, complete, correct and made in good faith.

Typed Name of Person Signing: John A. Smith | Telephone No.: (209) 652-3337
Signature: John A. Smith | Date: 4-28-83

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☒ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See reverse of this form for Privacy Act Notice, additional communication requirements, and space for additional information.

FHMAN 00106

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES

(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128

Refer to "Instructions for Completion of FCC Form 574" (June 1985) and FCC Rules for requested service.

Detach Work Sheet, Fill out in Pencil, Complete Remaining Sheets on a Typewriter, Submit with Carbons Attached to Federal Communications Commission, Gettysburg, PA 17325

U.S. GOVERNMENT PRINTING OFFICE: 1985-461-705

FCC Form 574 (June 1985)

Federal Communications Commission
Gettysburg, PA 17325

Commission File Copy

	1. Frequencies (MHz)	2. Station Class	3. No. of Units	4. Emission Designator	5. Output Power	6. ERP	7. A.A.T.	8. Ground Elevation	9. Ant. Hgt. Above Str.	10. Antenna Latitude	11. Antenna Longitude	12. Number of Stations by Category
a		FB2	1	20F3	100	250	876	780	240	39-54-00N	77-15-00W	Vehicular
b	"	"	"	"	"	"	"	"	"	"	"	Portable
c	"	"	"	"	"	"	"	"	"	"	"	Aircraft
d	"	"	"	"	"	"	"	"	"	"	"	Marine
e	"	"	"	"	"	"	"	"	"	"	"	Property

SAMPLE APPLICATION NUMBER 3

For an entrepreneur applicant requesting an authorization to operate a 5-channel trunked SMRS mobile relay station to serve eligible users who will obtain their own licenses to operate control stations and mobile units. Frequencies have not been typed in item 1. Refer to Rules 90.360 and 90.621. Sample Form 574-A to Form 574.

13. Area of Operation for Initial, Temporary, or Renewal Stations: To ____ within radius of station A; or To ____ within radius of coordinates: Lat ____ Long ____ If not, Stations Check One: ☐ Countywide ☐ Statewide ☐ Nationwide ☐ Other (Specify Below)

	14. Station Address or Geographic Location	15. City	16. County	17. State
a	3 miles NW of U.S. Hwy. 30, Hett Ridge Road	Gettysburg	Adams	PA
b				
c				
d				
e				
f				

18. Location of Primary Control Point (Include Telephone Number), and location of all Radio Control Stations with antenna under 20 Ft.

Associated control stations and mobiles licensed to users of this SMRS trunked facility.

19. Civil Advisory Comm. No. | 20. Radio Service: YX

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY

21. Applicant/Licensee Name (See Instructions): Historical Communications, Inc.

22. Mailing Address (Number & Street, P.O. Box or Rt. No.): P. O. Box 906

23. City: Gettysburg | 24. State: PA | 25. ZIP Code: 17325

26. If the Stations authorized / leased are not located in incorporated areas and/or the assigned frequencies are not used and shall be returned to the Commission for reassignment within or between incorporated areas, list below and specify the nearest city and state in which each station will be located. If applicant does not have specific plans for operation, so indicate. (Attach additional sheet if necessary.)

Federal Communications Commission
Private Radio Bureau

	28. Will antenna be mounted on an existing structure? If "yes" give FCC Registration Number (if any) and ASR Number (if any)				27. Will proposed antenna exceed 200 Ft. above ground or any other height limitation? If "yes" give total height of the structure (including appurtenances) and the type of structure				29. If item 27 was "yes", give the name of the nearest airport, heliport or landing area and the distance and direction to the nearest runway		
	No	Yes	Call Sign	Prior Authority	No	Yes	Height of Structure	Type of Structure	Name of Landing Area Nearest	Distance	Direction
a		X	WXA619	JR		X	200' Base	Tower	Goldrock Airport	3 Mi.	NW
b											
c											
d											
e											
f											

30. If item 27 was "yes", has notice of proposed construction been filed with the FAA? If not, give the date filed. If not filed, explain why not, and the FAA office where filed.

	No	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
a		X	9-14-81	Jones Trucking Co.	Eastern Regional Off
b					Jamaica, NY
c					
d					
e					
f					

35. Applicant Classification: ☐ Individual ☐ Partnership ☐ Association ☐ Corporation ☐ Govt. Entity

31. Explanation (Use Separate Attachment if necessary): Applicant proposes to provide on a commercial basis mobile relay station facilities for use of persons eligible for licensing under Subparts B, C, D, and E of Part 90 of the Commission's Rules and Regulations.

Cross Reference Showings: 90.603(c)

32. Application is for (check one): ☒ New Station ☐ Modification ☐ Assignment ☐ Renewal of License ☐ Removal

33. Is Applicant requesting a System Exception? ☐ Yes ☒ No

34. Would grant of this application be a "Major Action" (see Rule Section 1.1301)? ☐ Yes ☒ No. If yes, submit the required statement per Rule Section 1.1311.

36. List exhibits not listed, if any:

37. Individual completing this application (name): John Scanley
Telephone No. (717) 337-8109
DO NOT WRITE IN THIS BLOCK

READ CAREFULLY BEFORE SIGNING

I) If application is for all, and Mobile Service licensing, applicant certifies that a current copy of the applicable radio service's rules will be obtained.
2) Applicant realizes any claim to the use of any particular frequency regardless of prior use by license or otherwise.
3) Applicant will have unlimited access to the radio equipment and will grant no access to persons unauthorized to operate.
4) Neither applicant nor any member thereof is a foreign government or representative thereof.
5) Applicant certifies that all statements made in this application and attachments are true, complete, correct and made in good faith.

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See reverse of this form for Privacy Act Notice, additional authorization provisions, and basis for additional information.

Typed Signer Name: Samuel J. Collins | Telephone No.: (717) 334-0900

Signature: Samuel J. Collins | Date: 4-28-83

☒ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☐ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

I FHMAN 00107

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0126

Refer to "Instructions for Completion of FCC Form 574 (June 1985)" and FCC Rules for requested service.
Detach Work Sheet, Fill out in Pencil, Complete Remaining Sheets on a Typewriter, Submit with Carbons Attached to Federal Communications Commission, Gettysburg, PA 17325.

FCC Form 574 (June 1985) — Federal Communications Commission, Gettysburg, PA 17325 — Commission File Copy

	Frequencies (MHz)	Station Class	No. of Units	Emission Designator	Output Power	E.R.P.	Ant. Haat Above Ave. Terr.	Ground Elevation	Latitude	Longitude	Number of Mobiles by Category
G	461.100	FB2T	1	20F3	100						Volunteer 10
H	466.100	FX1T	1	20F3	70						Forestry
I	461.100	MO	10	20F3	100						Amateur
J	466.100	"	"	"	"						Marine
											Power

SAMPLE APPLICATION NUMBER 4

For a system consisting of one mobile relay station to operate at temporary locations; one control station to operate at temporary locations; and mobile units to operate on both frequencies within the area of the mobile relay and control stations.

Area of Operation for Mobiles, Temporary, or Itinerant Stations: South Central PA

	Station Address or Geographic Location	City	County	State
A				
B				
C				
D				
E				
F				

Location of Primary Control Point: 116 Main Street, McKnightstown, PA 17350, (717) 555-3200

Note: An itinerant system; systems operating at temporary locations; and mobile only systems do not have permanently located control points. However, the applicant should insert an address and telephone number where a person responsible for the radio operations of the applicant can be reached.

18 Free Advisory Comm. No. 831734623 — 20 Radio Service IB

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY

17. Applicant's (Licensee Name if an Individual): Jonte Construction, Inc.

19. Mailing Address (Number & Street, P.O. Box or Rt. No.): P. O. Box 35420

21. City: McKnightstown — 22. State: PA — 23. ZIP Code: 17350

If the Statement authorized herein are not issued in accordance with your request this authorization (telegram) should not be returned to the Commission for cancellation unless but no portion of construction data has been performed. (Expenses being paid with FPN/NW/2 Stations which have not yet be completed, specify)

Special Conditions:

This authorization is effective:

Federal Communications Commission
Private Radio Bureau

	24. Will antenna be mounted on an existing structure? If yes, give call sign and radio service of existing station.				25. Will antenna exceed 20 ft. above ground or above any other structure? If yes, give total height of the structure and proposed antenna and type of structure.			27. If item 17 was "yes", give the name of the nearest aircraft landing area and the distance and direction to the nearest runway.		
	Yes	No	Call Sign	Radio Service	Yes	No	Height of Structure	Type of Structure	Name of Landing Area	Distance	Direction
A											
B											
C											
D											
E											
F											

	28. If item 27 was "yes", has a notice of construction or alteration been filed with the FAA? If not, give the date filed, the name under which filed, and the FAA office where filed.				
	Yes	No	Date Filed	Name Under Which Filed	FAA Office Where Filed
A					
B					
C					
D					
E					
F					

33. Applicant Classification: ☐ Individual ☐ Partnership ☐ Limitation ☒ Corporation ☐ Govt. Entity

34. Eligibility (Describe Activity): Applicant is engaged in the business of constructing apartment complexes. Radio will be used to coordinate men and materials.

Core Rule Section: 90.75(a)(1)

32. Application is for (check one): ☒ New Station ☐ Modification ☐ Assignment ☐ Renewal ☐ Reinstatement

35. Is applicant requesting a System Identifier? ☒ Yes ☐ No

34. Would grant of this application be a "Major Action" per Sec. Section 1.1301? ☐ Yes ☒ No

If yes, submit the required statement per Rule Section 1.1311.

31. Specify purpose of special condition, if applicable:

36. List of previous call signs, if any:

37. Individual completing this application (please type or print): Fred E. Jones, telephone No. (717) 555-3200

DO NOT WRITE IN THIS BLOCK

READ CAREFULLY BEFORE SIGNING

I. If modification is for a Land Mobile Service license, applicant certifies that a current copy of the responsible radio service's rules will be followed.
☐ Applicant assures any claim to the use of any particular frequency regardless of prior use by licensee or otherwise.
☐ Applicant will have unlimited access to the radio equipment and will control access to exclude unauthorized persons.
☐ Neither applicant nor any member thereof is a foreign government or representative thereof.
☐ Applicant declares that all statements made in this application and attachments are true, complete and made in good faith.

Typed Signer Name: Fred E. Jones — Telephone No.: (717) 555-3200

Signature: Fred E. Jones — Date: 4-20-85

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☐ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See reverse of this form for Privacy Act notice, additional authorization provisions, and names for additional information.

FHMAN 00108

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128

Refer to "Instructions for Completion of FCC Form 574 (June 1986)" and FCC Rules for requested service.
Detach Work Sheet. Fill out in Pencil. Complete Remaining Sheets on a Typewriter. Submit with Cashier's Attached to
Federal Communications Commission, Gettysburg, PA 17325.

FCC Form 574 (June 1986)

Federal Communications Commission
Gettysburg, PA 17325

Commission File Copy

	1. Frequencies (MHz)	2. Station Class	3. No. of Units	4. Emission Designator	5. Output Power	6. ERP	7. AAT	8. Ground Elevation	9. Ant. Str. Hgt. (ft.)	10. Antenna Latitude	11. Antenna Longitude	12. Number of Stations By Category
A	461.800	FB2	1	20F3	75	125		2410	80	34-52-15N	99-17-36W	Vehicular 10
B	461.800	FB	1	20F3	75	125		"	61	"	"	Portable
C	75.58	FX2	1	20F3	30	85		"	"	"	"	Aircraft
D	72.76	FX1	1	20F3	30	85		1400	10	34-38-19N	99-20-25W	Marine
E	461.800	MO	10	20F3	75							Fixed 5
F	466.800	MO	10	20F3	75							

SAMPLE APPLICATION NUMBER 5

For a system consisting of one mobile relay station, one base station, one fixed relay station at the same location; one control station; and mobile units to operate on two frequencies.

13. Area of Operation (for Multiple, Temporary, or Temporary Stations)
Within radius of point A: 50 miles
Point A: Lat. 34-43-00N Long. 99-12-10W
Area Other than Circle (Check one)
☐ Countywide ☐ Statewide ☐ Nationwide ☐ Other (Specify below)

	14. Station Address or Geographic Location	15. City	16. County	17. State
A	On top of King Mt., Quartz Mt. State Park	Lone Wolf	Kiowa	OK
B	105-C Crain Street	Altus	Jackson	OK
C				
D				
E				
F				

18. Location of Primary Control Point (Include Telephone Number) and location of all Radio Control Stations with antenna under 20 Ft:
105-C Crain Street
Altus, OK 73521
(405) 444-1134

19. Fed. Advisory Comm. No. 637620934 20. Radio Service ES

21. Applicant/Licensee Name (See Instructions):
Samuel J. Parnelli, dba
Parnelli's Packmules

22. Mailing Address (Number & Street, P.O. Box or Rt. No.):
P. O. Box 462

23. City: Altus 24. State: OK 25. ZIP Code: 73521

If the Station(s) requested herein are not eligible for automatic action under applicable Rules, check here and explain in Exhibit No. ____ the basis for the requested action.

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY
Call sign: _____ File Number: _____
Antenna Painting & Lighting Specifications:
Special Conditions:
This authorization is effective: _____
and will expire at 0001 local time on: _____
Federal Communications Commission
Private Radio Bureau

	26. Will antenna be mounted on a building or other man-made structure? If yes, give total height of the structure (base, antenna and the type of structure				27. If there is an "other" type, give the name of the nearest airport, heliport, or airstrip, and the distance and direction to the nearest one		
	Yes	No	Height of Structure	Type of Structure	Airport/Landing Area Name	Distance	Direction
A	X		180 Feet	Tower	Altus Air Force Base	5 mi.	S
B	X						
C							
D							
E							
F							

	28. If item 27 was "yes", has a notice of construction or alteration been filed with the FAA? If yes, give the date filed, the name under which filed, and the FAA office where filed			
	No	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
A	X				
B					
C					
D					
E					
F					

29. Applicant is (Check one): ☐ Individual ☐ Partnership ☐ Corporation ☐ Association ☐ Cooperative ☐ Governmental

30. Application is for (Check one): ☐ New Station ☐ Additional Facilities ☐ Assignment ☐ Reinstatement ☐ Renewal ☐ Modification

31. Is applicant requesting a Section I license? ☐ Yes ☐ No
This is a complete system.

32. Is applicant requesting a Section II license? ☐ Yes ☐ No

33. Is applicant requesting a Section III-A license? ☐ Yes ☐ No

34. Would grant of this application be a "major action" (see Section 1.1301)? ☐ Yes ☐ No
If yes, submit the required statement (see Public Section 1.1311).

35. Description of Operations (Describe fully the nature of the applicant's business and the proposed radio service. Indicate the number of mobile units and/or base stations to be operated.)
Applicant is engaged in the business of providing packmules and guided tours. Radios will be used in connection with the conduct of these activities.

36. Give Rule Section: 90.75(a)(1)

37. Individual Completing this Application (print):
Samuel J. Parnelli
Telephone No.: 405 444-1134

38. List previous call sign(s), if any:

DO NOT WRITE IN THIS BLOCK

PLEASE CAREFULLY BEFORE SIGNING

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

I certify that statements in this application are true, complete, correct and made in good faith.

Typed Signature Name: Samuel J. Parnelli
Telephone No.: (405) 444-1134
Signature: Samuel J. Parnelli
Date: 5-20-85

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☒ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

Estimated burden for this form for Private Radio Services, including authority given, paperwork, and space for additional information

LEHMAN 00109

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128

Refer to "Instructions for Completion of FCC Form 574 ..." (June 1985) and FCC Rules for requested service.

Detach Work Sheet(s) Used in Pencil. Complete Remaining Sheets in a Typewriter. Submit with Original Attached to ...

... Federal Communications Commission, Gettysburg, PA 17325.

FCC Form 574 (June 1985) — Federal Communications Commission, Gettysburg, PA 17325 — Commission File Copy

	1. Frequency (MHz)	2. Station Class	3. No. of Units	4. Emission Designator	5. On-site Power	6. ERP	7. HAAT	8. Ground Elevation	9. Ant. Height Above Supp.	10. Antenna Latitude	11. Antenna Longitude
A	462.600	FB4	1	20F3	50	90		430	250	38-25-55N	77-10-15W
B	462.600	FB	1	20F3	40	73		450	60	39-30-33N	77-31-00W
C	467.600	FXI	1	20F3	30						
B	462.600	MO	5	20F3	50						
H	467.600	MO	5	20F3	50						

12. Number of stations (By Category): Mobile/car 2; Portable 3; Aircraft; Marine; Pagers

13. Area of Operation for Mobiles, Fixed Stations, or Individual Stations: Lat; Long; Counties: Montgomery Co. MD; Municipalities; Other (Specify Below)

SAMPLE APPLICATION NUMBER 6

For a GMRS system consisting of one community repeater: one base station/control station meeting the 20 ft. antenna height criterion; and mobile units to operate on both frequencies.

	14. Station Address or Geographic Location	15. City	16. County	17. State
A	5000 Industrial Blvd.	Rockville	Montgomery	MD
B	6235 West Street	Gaithersburg		
C				
D				
E				
F				

18. Location of Primary Control Point (Include Telephone Number) and location of all Base Control Stations with antenna under 20 Ft.

1234 Smith Road, Rockville, MD (301) 337-6789
6235 West Street, Gaithersburg, MD 20760

19. Fred, Advisory District, MO — 20. Radio Service: ZA

DO NOT WRITE IN THIS BLOCK — FOR FCC USE ONLY

Call sign ____ File Number ____
Antenna Painting and Lighting Specifications
Special Conditions
This authorization is effective ____
and shall expire 3:00 AM EST ____
Federal Communications Commission
Private Radio Bureau

21. Applicant's, Licensee Name (See Instructions): Jones, John James

22. Mailing Address (Number & Street, P.O. Box or Rt. No.): 6235 West Street

23. City: Gaithersburg — 24. State: MD — 25. Zip Code: 20760

I the Applicant authorized herein am not placed in interference within eight statute miles (unless otherwise limited) and does not represent to the Commission for coordination purposes (unless an assessment of compatibility does not have been submitted) (Exception Existing 800 MHz TRUNKED Stations which have been prior to assignment coordinated)

	26. Is a response to question 27 required? No	Yes	Call Sign	Radio Service	27. Is antenna structure over 20 ft. above ground or any man-made structure? No	Yes	Height of Structure	Type of Structure
A		X	KAAG001	ZA		X	230 feet	Tower
B	X				X			
C								
D								
E								
F								

28. If item 27 is "Yes", list name(s) of nearest airport(s) landing area, and the distance and direction to the nearest runway: Nearest Landing Area Name: Montgomery County; Distance: 6 mi.; Direction: SSW

29. If item 27 is "Yes", has notice of construction or alteration been filed with the FAA? If yes, give the date filed, the nearest airport which filed, and the FAA office where filed.

	n/a	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
A		X	4-1-83	ABC Company	Jamaica, NY
B					
C					
D					
E					
F					

30. Applicant Classification: Individual; Partnership; Association; Corporation; Other Entity

31. Eligibility (Describe Activity): The applicant is over 18 years of age. The radios will be used for personal communications.

32. Application is for (check one): New Station; Modification; Assignment; Reinstatement; Renewal

33. Is applicant registered to operate a transmitter? Yes / No

34. Should grant of this application be a "major action" (see Rule Section 1.1301)? Yes / No. If yes, submit the required statement, per Rule Section 1.1301.

35. Specification of station(s) requested, if applicable.

36. If the questions call for it, explain.

Grid Rule Section: 95.5

37. Individual completing this application (please type):
Barry Jones
Telephone No. (301) 338-2345

DO NOT WRITE IN THIS BLOCK

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See reverse of this form for Privacy Act Notice, additional certification provisions, and other information.

READ CAREFULLY BEFORE SIGNING

1) If application is for a Land Mobile Service Bureau, applicant certifies that a current copy of the requested rules and/or rules will be obtained.
2) Applicant waives any claim to the use of any particular frequency regardless of prior use by licensee or otherwise.
3) Applicant will have controlling access to the radio equipment and will control access to and/or substitution of persons.
4) If foreign applicant has any legal interest in a foreign government or representative thereof.
5) Applicant certifies that all statements made in this application and attachments are true, complete, correct and made in good faith.

Typed Name of Person Signing: John James Jones
Telephone No.: (301) 337-3344
Signature: John James Jones
Date: 4-20-83

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☑ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

LEHMAN 00110

INSTRUCTIONS FOR COMPLETING INDIVIDUAL ITEMS

Item 1—Frequency(ies)

Enter the specific frequency(ies) in megahertz. The requested frequency(ies) must be available in the Commission's rules governing the radio service in which you are seeking eligibility. Use a separate line for each frequency. (See the general instructions and samples. Use a different letter (A–F) for each permanent location and refer to Item 2 of these instructions for different classes of stations.) If supplementary information is required, e.g., evidence of frequency coordination or additional frequency justification, attach it to the application.

NOTE: Use of more than one pair of frequencies below 800 MHz in a given area of operations should be explained and justified. Call signs of existing systems in this operating area should be listed under "Remarks".

If it is proposed to use certain frequencies in the 470–512 MHz band or commercial (SMRS) frequencies in the 806–866 MHz band to be assigned by the Federal Communications Commission, leave this item blank and explain by attachment what is requested.

Item 2—Station Class

Enter in this column the appropriate class of station code from the following table.

Class of Station	Code
Base	FB
Mobile Relay	FB2
Community Repeater	FB4
Control	FX1
Mobile	MO
Mobile/Vehicular Repeater	MO3
Operational Fixed	FXO
Fixed Relay	FX2
Fixed	FX
Auxiliary Test	FLT
Interzone	FXY
Zone	FXZ
Radiolocation Land	LR
Radiolocation Mobile	MR

Definitions for most of these items are listed in Sections 90.7, 95.23 and 95.25 of the Rules.

NOTE: Where appropriate follow each code with "T" for Temporary (see Section 90.137), "I" for Itinerant (see Section 90.138), or "S" for Standby (e.g. FBT meaning Temporary Base).

Item 3—Number of Units

Enter in this column the number of actual transmitting units at each location. Normally, for a station at a permanent/fixed location (base, mobile relay, etc.) only one transmitter is involved;

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therefore, the figure "1" should be entered on lines (A) through (F). However, if more than one transmitter is placed at the same location, so indicate. For operations above 470 MHz or below 866 MHz, the total number of mobile units is the sum of the units to be placed in operation at the time of grant plus the units for which purchase orders have already been signed and will be in use within eight (8) months. For operations in the Public Safety and Special Emergency Radio Services (see Section 90.127) there are exceptions which should be noted. For operations in the 806–866 MHz band, mobile loading must meet the criteria set forth in Subparts M and S of Part 90 of the Rules.

For this item vehicular, portable, aircraft, and marine units are considered to be mobiles. Paging receivers should not be counted as mobile units, but must be listed separately in Item 12.

Item 4—Emission Designators

Enter the necessary bandwidth and class of emission for each station. Normally land mobile operations are intended to provide voice communications. Examples of the most common necessary bandwidths and classes of emissions are listed below.

Frequency modulated (FM) voice	20F3
Amplitude modulated (AM) voice	8A3

If you are proposing a different emission, see Rule 90.207 or Rule 95.627(a), depending on your radio service, to determine the designator. If, after reading the appropriate Rule, you are still not sure of the correct emission, you may check the Commission's Rules as set out at 47 CFR 2.201, et seq., (1984 or earlier edition), or leave Item 4 blank and attach a supplementary statement describing the operation including the make and model of the transmitter. The new ITU emission designators put into use in 1985 for certain of the Commission's radio services are *not* to be used on any private land mobile radio service applications until further notice is given.

Note: If you propose to use more than one bandwidth and emission (e.g. 20F3 & 19F2 for voice and paging) enter both separated by a slash (e.g. 20F3/19F2). 20F3/F2 may be used if the bandwidths are the same. Only one emission (voice) may be used in GMRS. See Rule 95.75(n).

Item 5—Output Power (Includes Peak Envelope and Mean Output Power)

When operating with single side band (A3J) emission enter the peak envelope power, in Watts, followed by the letter "X" which represents peak envelope power in accordance with Appendix 1, ITU Radio Regulations. For operations using A0, A1, A2, A3, A9, F0, F1, F2, F3 and F9 emissions, enter the mean RF output power, in Watts, normally supplied by the transmitter to the antenna feedline (see Section 90.205). Note: The power entered in this column should be the minimum required for satisfactory oper-

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ation. In GMRS, no station may transmit with more than 50 watts output power. See Rule 95.135.

Item 6—Effective Radiated Power (ERP)

This information is required, for operations above 10 MHz, from applicants requesting new station authorizations, and for major modifications described in Rule 90.135.

If a complete FCC Form 574 has never been filed prior to this time for an existing station, applicants with systems below 470 MHz wishing to renew and those modifying minor items which do not specifically alter the parameters of a station at a permanent location may omit Item 6. Though not required in these cases, completion of Item 6 is encouraged.

Enter the effective radiated power. The ERP is the transmitter output power times the net gain of the antenna system. The net gain of the antenna system is the gain of the antenna minus the transmission losses which include losses attributable to the transmission line, duplexers, cavity filters and isolators. The actual formula is: ERP (watts) equals Power (watts) times Antilog (net gain in db divided by 10).

Item 7—Antenna Height Above Average Terrain (feet)

For operations in the 470–512 MHz, 806–866 MHz, and 929–930 MHz bands, enter the height of the antenna above ground elevation for the average terrain. See Rule 90.309(a)(4) for instructions for computing the height above average terrain for the antenna. All other applicants may omit Item 7, including add-on SMRS users in the 800 MHz band.

Item 8—Ground Elevation (feet) at Antenna Site

Enter to the nearest foot the elevation above mean sea level of the ground at the antenna location. This information can be determined using a 7.5 minute topographical quadrangle map of the area or you may consult the city or county surveyor in your area. Topographical maps may be purchased from the U.S. Geological Survey, Washington, D.C. 20242, or from its office in Denver, Colorado 80225.

Item 9—Antenna Height to Tip (feet)

Enter the overall height above ground to the nearest foot of the highest part of your antenna (antenna structure plus the length of the antenna, if top mounted; the total height to the tip of the antenna, if side-mounted).

Item 10—Latitude of Antenna Site

Enter the geographic coordinate of latitude in degrees, minutes, and seconds to the nearest second followed by "N" for north or "S" for south.

I FHMAN 00113

Item 11—Longitude of Antenna Site

Enter the geographic coordinate of longitude in degrees, minutes, and seconds to the nearest second followed by "W" for west or "E" for east.

Item 12—Number of Mobiles By Category

For mobile operations, enter the total number of units in the system that will be employed in each of the categories: Vehicular, Portable, Aircraft, and Marine. Do not include pagers in your mobile count under Item 3, but be sure to list the number of paging receivers in your system in this item.

Item 13—Area of Operation

This item is for mobile units, stations operating at temporary locations, and for itinerant stations. For mobiles operating with an associated station(s) shown on Lines (A) through (F), enter the radius in miles of the normal area of operation centered upon the location of the primary land station(s) in your system. For example, 45 mile radius of station A. In the event a specific mile radius of station A is an inadequate description for your system, enter a radius in miles of the geographical coordinates (latitude and longitude in degrees, minutes and seconds), the county and state of the center of your operating area, e.g., 50 mile radius of 42-29-47N, 87-41-16W, Cook County, IL. (If the name of the county and the abbreviation for the state cannot be typed under the geographical coordinates in Item 13 of the Form 574, continue below under "Other".) IF THE AREA OF OPERATION CANNOT BE DEFINED AS THE SAME FOR ALL MOBILE FREQUENCIES, THE AREA OF OPERATION SHOULD BE DESCRIBED IN THE "OTHER" BLOCK. IN CASE DIFFERENT MOBILE FREQUENCIES HAVE DIFFERENT AREAS OF OPERATION, INDICATE THE CORRESPONDING LETTER(S) OF THE MOBILE FREQUENCY(S) BEFORE EACH AREA OF OPERATION IN THE "OTHER" BLOCK. For example, H 30 mile radius of Station A, I 30 mile radius of Station B. See sample application number 1.

If your application is for mobiles only, for stations operating at temporary locations or for itinerant stations, enter the radius in miles of the geographic coordinates, the county and state of the center of your operating area, e.g., 60 mile radius of 33-33-45N, 86-42-06W, Jefferson County, AL. (If the name of the county and the abbreviation for the state cannot be typed under the geographic coordinates in Item 13, continue below "Other".)

Indicate the area of operation as outlined in one of the examples shown above. However, if you are unable to do so, check the box next to "Countywide" for operations within a single county and identify the county and state below under "Other".

Check the box "Statewide" for operations within a single state and type the abbreviation for the state (see Table 1 of these instructions) after the word "Statewide" in Item 13, e.g., NJ. Check the box "Nationwide" if your area covers the entire continental United States and indicate "South of Line 'A'."

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If none of the above choices adequately describes your area of operation, check the box next to "Other" and give a brief description of the area of operation. If additional space is required, continue at the bottom of Items 1–11. EXAMPLES: States of WV, VA and MD; States of ME, NH and VT, south of Line "A"; City of Seattle, WA. In the event you have a "ribbon" system, identify it and give the abbreviation for the states in which its route traverses, e.g., Natural Gas Pipe Line Company in TX, LA, MS, AL, GA, SC, NC, VA, WV, MD, PA, NJ, NY: The XYZ Railroad System in FL, GA, SC, NC, VA, MD, PA, NJ, NY.

Item 14—Transmitter Antenna Street Address or Geographic Location

For each station listed on lines (A) through (F), enter the street address or specific geographic description for the transmitter antenna location.

Item 15—Transmitter Antenna City

For each station listed on lines (A) through (F), enter the name of the city or town in which the transmitter antenna is located. For rural or unincorporated areas enter the nearest city or town to the transmitter antenna location.

Item 16—Transmitter Antenna County

For each station listed on lines (A) through (F), enter the name of the county in which the transmitter antenna is located.

Item 17—Transmitter Antenna State

For each station listed on lines (A) through (F), enter the two letter abbreviation for the state in which the transmitter antenna is located. The abbreviations for each state are provided in Table 1.

Item 18—Location of Control Station(s) and Control Point(s)

Enter the street address or geographic description, city, state, and telephone number of the primary control point (wireline or radio) where a person responsible for system operation may be reached. In addition, list the location of all radio control stations which are not contained in Items 14–17. All other wireline control points need not be listed. If the control station(s) you list is currently licensed separately, enter the call sign under the address of the control station(s). If the mobile units which are part of the system are licensed separately, enter the call sign(s) of such mobile units in Item 18.

For rural locations, indicate the name of a building, if any, the route numbers of nearest intersection and its distance and direction, or the distance and direction from the nearest town. Your description must be in sufficient detail to enable someone unfamiliar with the area to locate your control station or control point. (Note: Do not include dispatch points.) See Rules 90.429,

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90.463 and 95.125 for information relating to transmitter control points.

An itinerant radio system, a radio system operating at temporary locations or a mobile only radio system do not have permanently located control points. However, the applicant for such systems should enter an address and telephone number where a person responsible for the radio operations of the applicant can be reached.

TABLE 1

Abbreviations for States and Jurisdictions, and Areas

AL Alabama	ME Maine	RI Rhode Island
AK Alaska	MD Maryland	SC South Carolina
AZ Arizona	MA Massachusetts	SD South Dakota
AR Arkansas	MI Michigan	TN Tennessee
CA California	MN Minnesota	TX Texas
CO Colorado	MS Mississippi	UT Utah
CT Connecticut	MO Missouri	VT Vermont
DE Delaware	MT Montana	VA Virginia
DC District of Columbia	NE Nebraska	WA Washington
	NV Nevada	WV West Virginia
FL Florida	NH New Hampshire	WI Wisconsin
GA Georgia	NJ New Jersey	WY Wyoming
GM Gulf of Mexico	NM New Mexico	AS American Samoa
HI Hawaii	NY New York	GU Guam
ID Idaho	NC North Carolina	MQ Midway Island
IL Illinois	ND North Dakota	CM Northern Mariana Islands
IN Indiana	OH Ohio	
IA Iowa	OK Oklahoma	PR Puerto Rico
KS Kansas	OR Oregon	VI Virgin Islands
KY Kentucky	PA Pennsylvania	WQ Wake Island
LA Louisiana		

Item 19—Frequency Advisory Committee Number

Applicants who are required to comply with the frequency coordination requirements and do so by obtaining a recommendation from a recognized coordinating committee should attach that document to the Form 574, and insert the identification number assigned to the recommendation in this item. Applicants submitting a report based on the engineering study should leave this item blank.

Item 20—Radio Service

Enter the code for the Radio Service in which you are applying. The codes and names of Radio Services are provided in Table 2.

Item 21—Applicant/Licensee Name

Enter the legal name of the person or entity applying for the license. If you are an individual doing business in your name, insert your full name only as used in your business. The same

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procedure applies for individuals using the General Mobile Radio Service for either business or personal activities. However, GMRS applicants should enter last name first, first name, and middle name last.

Example: Smith, John Albert

If you are an individual doing business under a firm or trade name (sole proprietorship) insert both your name and the firm or trade name.

Example: John Henry Doe, DBA
Circle Construction Company

Do not apply in the name of more than one individual, except on behalf of a legally recognized partnership or unincorporated association. If the applicant is a partnership, list the names of all general partners. However, when a large number of partners is involved, list just two names in Item 21 and the others on an attachment.

Example: John Henry Doe & Richard
Robert Doe, DBA
Circle Construction Company

If you are an officer or authorized employee of a corporation, insert the exact name of the corporation as it appears in the Articles of Incorporation. If you are an officer and a member of an unincorporated association, insert the name of the association as it appears in its Articles of Association or Bylaws. If you are an official of a Governmental entity, insert the full legal name.

Examples: City of Baltimore, MD
County of Fairfax, VA
State of Maryland
Commonwealth of Virginia

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TABLE 2

Codes and Names of the Radio Services

Part I *All frequencies except 800 and 900 MHz Bands*

	Industrial
(IB)	Business
(IF)	Forest Products
(IM)	Motion Picture
(IP)	Petroleum
(IS)	Special Industrial
(IT)	Telephone Maintenance
(IW)	Power
(IX)	Manufacturers
(IY)	Relay Press

	Land Transportation
(LA)	Automobile Emergency
(LR)	Railroad
(LX)	Taxicab

	Motor Carrier
(LI)	Interurban Passenger
(LJ)	Interurban Property
(LU)	Urban Passenger
(LV)	Urban Property

	Public Safety
(PF)	Fire
(PH)	Highway Maintenance
(PL)	Local Government
(PP)	Police
(PO)	Forestry Conservation
(PS)	Special Emergency
(RS)	Radiolocation
(ZA)	General Mobile

Part II *806–821/851–866 MHz Bands*

Conventional	Category	Trunked
(GB)	Business	(YB)
(GO)	Industrial/Land Transportation	(YO)
(GP)	Public Safety/Special Emergency	(YP)
(GX)	Commercial (SMRS)	(YX)

Part III *929–930 MHz Band*

(GS) Private carrier paging systems (PCPS) (All other applicants use the code for the radio service in which eligibility is claimed. See Part I of this table)

(Note: All manual and automated records are filed in alphabetical order; it is therefore extremely important that the licensee name on applications for modifications and renewals is entered precisely the same as it is on the current license unless the modification involves a change in the name.)

Item 22—Applicant/Licensee Mailing Address

Enter the mailing address to which the radio station authorization and any future correspondence related to your station is to be mailed. Indicate street number, Post Office box numbers, or rural route numbers whenever appropriate.

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Item 23—City

Enter the city name for the applicant/licensee mailing address.

Item 24—State

Enter the two-letter state abbreviation (see Table 1) for the applicant/licensee mailing address.

Item 25—ZIP Code

Enter the Zip Code for the applicant/licensee mailing address. Do not omit the ZIP Code.

(Note: Failure to provide the Commission with a current and valid mailing address in the United States, and subsequent failure to respond to Commission correspondence sent to the specified address may result in revocation of your authorization to operate a radio station. Furthermore, it is mandated that the address provided be the applicant's legal address and not the address of the radio equipment supplier, service shop or other third party.)

Item 26—Antenna Mounted on Existing Antenna Structure

If your antenna will be mounted on an existing antenna structure (tower or pole) place an (X) in the box below "yes". If yes, enter the call sign and radio service of one existing licensee using the structure. If you propose to construct a new antenna structure or use one which contains no existing licensees, check the box below "no" and leave the remainder of this question blank.

Item 27-Antenna Height Exceeds 20 feet

Place and (X) in the appropriate space to indicate whether or not your proposed antenna will exceed a height of 20 feet above the ground, a natural formation or a man-made structure (i.e., building, water tower, etc.). If you check "yes", enter the height and the type of structure. The term "man-made structure" applies to any construction not erected for the sole purpose of mounting receive or transmit antennas. A tower, pole, mast or pipe is considered to be constructed for the mounting of antennas. If the answer to Item 27 is "no" you may skip to Item 30.

Item 28—Nearest Aircraft Landing Area

Give the name of the nearest aircraft landing area, the distance in miles to the nearest runway and the direction to the nearest runway. The distance is the shortest airline distance between the nearest point of the nearest runway and your proposed antenna location.

Item 29—FAA Notification

Place an (X) in the appropriate space to indicate whether a Notice of Construction or Alteration has been filed with the FAA. You must notify the Federal Aviation Administration on FAA Form 7460–1 (obtainable from any FAA office), with certain limited exceptions as set forth in Part 17 of the FCC Rules and Part 77

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of the FAA Rules, of any of the following construction or alterations of an antenna structure:

(1) Construction of any new antenna structure or alteration of any existing antenna structure, which would result in the top of the antenna or the antenna structure exceeding a height of 200 feet above ground level at the antenna site.

(2) Construction of any new antenna structure or alteration of any existing structure, which would result in the top of the antenna or the antenna structure exceeding the height of an imaginary surface extending outward and upward at one of the following slopes:

(a) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport with at least one runway more than 3,200 feet in length, excluding helicopter and seaplane bases with specified boundaries, if that airport is either listed in the Airport Directory of the current Airman's Information Manual or is operated by a Federal military agency.

(b) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport with its longest runway 3,200 feet or less in length, excluding helicopter and seaplane bases without specified boundaries, if that airport is either listed in the Airport Directory or is operated by a Federal military agency.

(c) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport listed in the Airport Directory or is operated by a Federal military agency.

(3) Any construction of an antenna structure (or any alteration of an antenna structure that would increase its height) on an airport listed in the Airport Directory of the current Airman's Information Manual.

(4) When requested by the FAA, any construction or alteration that would be in an instrument approach area (defined in the FAA standards governing instrument approach procedures) and available information indicates it might exceed an obstruction standard of the FAA. If you intend to install towers of unusual height or at locations in close proximity to aircraft landing areas, it will be to your advantage to discuss the location and height of the antenna in detail with the appropriate FAA area office before filing your application. If you entered "yes", enter the date filing was made with the FAA, the name under which the filing was made, and the name of the FAA office where the filing was made.

Item 30—Applicant Classification

Place an (X) in the appropriate box following the type of entity to indicate the type of legal entity applying for this authorization.

Item 31—Eligibility

Enter the number and paragraph of the FCC Rule Section which describes the eligibility for the particular radio service you specified in Item 20. Provide a statement to clearly indicate your

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qualifications for the chosen service. This statement should include:

(1) A general description of your business or activity.

(2) A description of how radio will be employed in the activity.

(3) Any other information which you believe will aid in a determinaton of your eligibility for the service requested.

(4) If the applicant requests a General Mobile station license as an individual or partnership, the eligibility statement must also state that the individual, or each general partner is at least 18 years of age.

Note: Failure to provide clear and complete details justifying eligibility will result in return of your application for clarification. Do not use terms such as "No Change" or "On File."

Item 32—Reason for Filing

Indicate by placing an (X) in the appropriate box(es) for what purpose you are filing the application.

New Station

An (X) in this box indicates that this is an application for a radio station not presently licensed in the service listed in Item 20.

Modification

An (X) in this box indicates a desired change in the terms and conditions of a license(s) during the current authorized period. If checked, use Item 35 to describe the change(s) desired. Also enter your current call sign in Item 36. Complete the form in full as for a new station. (Note: Once a license(s) is modified all previous copies of the license(s) are no longer valid regardless of the expiration date shown).

Assignment of Authorization

An (X) in this box indicates you request assignment of the right, title, and interest to a station presently authorized to another person or entity. Prepare the application in your own name and complete it in the same manner as for a new station with all questions answered and include a detailed statement of your eligibility for Item 31. Include a letter from the assignor meeting the requirements of the Commission's Rules. For your convenience, FCC Form 1046, "Assignment of Authorization" may be obtained from any Commission office for this purpose. General Mobile radio station licenses may not be assigned. In this service a new application must be filed on Form 574, by the new owner.

Reinstatement of Expired Authorization

An (X) in this box indicates that you wish to reinstate an authorization which has expired. Complete the form in full as for a new station and list the call sign of the expired license in Item 36. Licenses that have expired more than 6 months may not be reinstated; in these cases, the former licensee should submit an appli-

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cation, complete in every respect (including frequency coordination when applicable), for a new license if there is still a need to operate the radio facilities.

Renewal

An (X) in this box indicates that you wish to renew an existing authorization which has not expired and you are not eligible to use the abbreviated FCC Form 405-A.

Item 33—System Licensing

Place an (X) in the appropriate box to indicate whether this application by itself is for a complete system. If for other than a complete system, please explain. The application may consist of multiple classes of stations and multiple frequencies. Each group of six locations shall constitute a station to which a separate call sign will be assigned. In addition to the six permanent locations, an unlimited number of control stations with antenna heights meeting the 20 foot criteria and an unlimited number of mobile units may be included on the application. (While up to six locations may be combined on one application, it is not mandatory that you do so.) If your system consists of more than six different permanent locations, the additional locations may be applied for by filing a separate application for each additional permanent location or you may combine up to six additional permanent locations on a single additional application. Notwithstanding the above, a system with more than six transmitter locations with a common control point used for system dispatching purposes may file multiple pages of Form 574 and a single call sign will be issued to such a multiple page system authorization. NOTE: Only locations that are an integral part of a system should be included on one application.

Item 34—Environmental Impact

Place an (X) in the appropriate box to indicate whether a Commission grant to the proposed communication facility(ies) would be a "major action" as defined by Section 1.1305 of the Commission's Rules. Briefly, Commission grant of an application would be a "major action" if any of the following are proposed:

(a) Antenna or antenna structure height exceeds 300 feet. (Only if new structure or an increase of 20% or more to an existing antenna structure.)

(b) Facilities are to be located in an officially designated wilderness area, wildlife preserve area, or a nationally recognized scenic or recreational area.

(c) Facilities will physically or visually affect sites significant in American history.

(d) Construction which involves extensive changes in surface features. If several stations are listed in the application (system license) and only some of the proposed stations are "major actions", reference the horizontal line(s) (A, B, C, etc.) on which these stations are listed. Further details may be found in Section 1.1305 of the Commission's Rules. If you checked "yes", submit

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the required environmental impact statement with your application. Section 1.1311 of the Rules provides details of what must be included in your statement.

Note: If any of the above conditions apply, you **MUST** obtain Commission approval **BEFORE** you begin construction.

Item 35—Specifications of Item(s) Modified

If the application is intended to modify a current license(s) indicate the modifications(s) desired and the call signs affected. If additional space is required use the back of the form. If you have previously filed a Form 574, you may reference the item number. Example: If changing the Output Power of the station listed on line (A), the reference would be "5A". (Note: Certain modifications may require new frequency coordination or notification to the FAA).

Item 36—Previous Call Sign

If you are proposing to modify or reinstate a license, list the existing call sign(s) assigned to that station. If your application is for a new station, leave Item 36 blank. If you are changing to system licensing, you should indicate which of your existing fixed call signs you would prefer to retain.

Item 37—Individual Completing Application

Enter the name and telephone number (including area code) of the person who has completed the application, i.e., salesman, technical representative, engineer, communications officer, etc. This item must be completed even if you have completed the Form 574 yourself without assistance.

SYSTEM DIAGRAM

Attach a functional system diagram when the application(s) involves four or more stations at different permanent locations or where system is not clearly defined in Items 1 thru 11. Where a number of applications are filed simultaneously for a single integrated communications network, enclose only one diagram. When an application(s) is filed to modify part of a system, the diagram should show all stations involved. Functional system diagrams should be in sufficient detail to locate the radio stations for which application(s) is made with a reasonable degree of accuracy. Example: Show station call sign, class of station, transmitting and receiving frequencies, etc. Particular care should be used in describing station locations and station classifications on the system diagram to be certain that such entries are identical with the classifications and locations set forth in the associated applications.

COMPLETENESS

Each application must be complete by itself. The information shown in Items 1 thru 37 should describe the entire system of

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communications. If it does not, then all other associated "points of communications" should be included in either the systems diagram, the "remarks" section, or a separate attachment.

CERTIFICATION

Enter the typed name, telephone number (including area code), signature, and date signed. Place an "X" in the appropriate box to indicate the classification of the person signing the application. (Note: The typed name must be an individual authorized to sign the application. Do not enter company or entity name.)

BE SURE ALL NECESSARY ATTACHMENTS ARE INCLUDED AND MAIL TO:

FEDERAL COMMUNICATIONS COMMISSION
GETTYSBURG, PA 17325

FOR A CHECK LIST OF ATTACHMENTS, SEE RULE 90.129 ENTITLED "SUPPLEMENTAL INFORMATION TO BE ROUTINELY SUBMITTED WITH APPLICATIONS"

APPLICATION MUST BE SIGNED AND DATED

Appendix I

List of Counties, by State, having areas north of Line A:

IDAHO

Bonner
Boundary
Shoshone

INDIANA

Allen
De Kalb
Steuben

MAINE

Aroostook
Franklin
Hancock
Kennebec
Oxford
Penobscot
Piscataquis
Somerset
Waldo
Washington

MICHIGAN

Alcona
Alger
Alpena
Antrim
Arenac
Baraga
Bay
Branch
Calhoun
Charlevoix
Cheboygan
Chippewa
Claire
Clinton
Crawford
Delta
Dickinson
Eaton
Emmett
Genesee
Gladwin
Gogebic
Gratiot
Hillsdale
Houghton
Huron
Ingham
Ionia
Iosco
Iron
Isabella
Jackson
Kalkaska
Keweenaw
Lapeer
Leelanau
Lenawee
Livingston
Luce
Mackinac
Macomb
Marquette
Menominee
Midland
Missaukee
Monroe
Montcalm
Montmorency
Oakland
Ogemaw

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Ontonagon
Oscoda
Otsego
Presque Isle
Roscommon
Saginaw
Sanilac
Schoolcraft
Shiawassee
St. Clair
Tuscola
Washtenaw
Wayne

MINNESOTA

Beltrami
Carlton
Clearwater
Cook
Itasca
Kittson
Koochiching
Lake
Lake of the Woods
Marshall
Pennington
Polk
Roseau
St. Louis

MONTANA

Blaine
Chouteau
Daniels
Flathead
Glacier
Hill
Lake
Liberty
Lincoln
McCone
Phillips
Pondera
Richland
Roosevelt
Sanders
Sheridan
Teton
Toole
Valley

NEW HAMPSHIRE

Coos
Grafton
Carrol

NEW YORK

Alleghany
Cattaraugus
Cayuga
Chautaugua
Clinton
Erie
Essex
Franklin
Genesee
Hamilton
Herkimer
Jefferson
Lewis
Livingston
Madison
Monroe
Niagara
Oneida
Onondaga
Ontario
Orleans
Oswego
Seneca
Steuben
St. Lawrence
Warren
Washington
Wayne
Wyoming
Yates

NORTH DAKOTA

Benson
Bottineau
Burke
Cavalier
Divide
Grand Forks
McHenry
McKenzie
Mountrail
Nelson
Pembina
Pierce
Ramsey
Renville
Rolette
Towner
Walsh
Ward
Williams

OHIO

Ashland
Ashtabula
Cuyahoga
Defiance
Erie
Fulton
Geauga
Hancock
Henry
Huron
Lake
Lorain
Lucas
Medina
Ottawa
Paudling
Portage
Putnam
Sandusky
Seneca
Summit
Trumbull
Williams
Woods

PENNSYLVANIA

Crawford
Erie
Warren

VERMONT

Addison
Caledonia
Chittenden
Essex
Franklin
Grand Isle
Lamoille
Orange
Orleans
Rutland
Washington
Windsor

WASHINGTON

Chelan
Clallam
Douglas
Ferry

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Grays Harbor	Pierce	WISCONSIN
Island	San Juan	Ashland
Jefferson	Skagit	Bayfield
King	Snohomish	Douglas
Kitsap	Spokane	Florence
Mason	Stevens	Forest
Okanogan	Whatcom	Iron
Pend Oreille		Vilas

COMMISSION FIELD OFFICES

The Commission's field offices and the mailing addresses are listed below. Correspondence with the field offices should be addressed to: *Federal Communications Commission, Engineer-in-Charge.* The street address of any office may be found in the local directory, for the city in which the office is located, under the heading *United States Government.*

ALASKA
Anchorage 99510 P.O. Box 102955

CALIFORNIA
San Diego 92041
San Francisco 94111
Long Beach 90807

COLORADO
Denver 80228

FLORIDA
Miami 33166
Tampa 33607

GEORGIA
Atlanta 30309

HAWAII
Honolulu 96850 P.O. Box 50023

ILLINOIS
Chicago 60068

LOUISIANA
New Orleans 70130

MARYLAND
Baltimore 21201

MASSACHUSETTS
Boston 02190

MICHIGAN
Detroit 48010

MINNESOTA
St. Paul 55101

MISSOURI
Kansas City 64133

NEW YORK
Buffalo 14202
New York 10014

OREGON
Portland 97204

PENNSYLVANIA
Philadelphia 19047

PUERTO RICO
San Juan 00918-2251

TEXAS
Dallas 75243
Houston 77002

VIRGINIA
Norfolk 23502

WASHINGTON
Seattle 98174

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Licensees are required to have a current copy of the Commission's Land Mobile rules governing the radio service in which the authorization is granted. The rules may be ordered by using the form below. Since prices are subject to change without notice, it is suggested that you contact the United States Government Printing Office, Washington, DC 20402, or telephone 202-783-3238 for the correct price.

ORDER FORM

☐ Please send _____ copies of Code of Federal Regulations, Title 47, Part 80 to End, containing Parts 90 and 95, among others, of the Federal Communications Commission Rules and Regulations.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No.

☐☐☐☐☐☐-☐

MAIL ORDER FORM TO:

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

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GOVERNMENT PRINTING OFFICE

SUPERINTENDENT OF DOCUMENTS

PUBLIC DOCUMENTS DEPARTMENT
Washington, DC 20402

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CYPRUS

Corporate Headquarters

Cyprus Minerals Company
7200 South Alton Way
Post Office Box 3299
Englewood, Colorado 80155
Telephone (303) 740-5000
Telex 216190 CMCO UR

Annual Meeting

May 22, 1986
Thursday
10:00 am (EDT)

Irving Trust—Main Floor
245 Park Avenue
(corner of Park and 46th)
New York City, New York

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The terms *Cyprus*, *company*, *we*, *our*, and *its* used in this report may refer collectively to the parent Cyprus Minerals Company and its subsidiaries and affiliates, or to one or more of them, depending upon the context.

Company History

Cyprus Minerals Company, prior to the spin-off in July 1985, was Amoco Corporation's mining subsidiary. It was formed in 1969 and in 1979 acquired Cyprus Mines Corporation, which owned copper and industrial minerals (talc, calcium carbonate and kaolin) mines and conducted exploration for uranium, gold, and molybdenum.

During the early 1980's, coal mines in Colorado, Pennsylvania and Kentucky were acquired. The Thompson Creek molybdenum mine in Idaho was built, the Bagdad copper mine in Arizona was expanded, and various marginal assets were sold.

Shortly after spin-off, Cyprus completed the acquisition of coal mines in Utah, Colorado, and Virginia.

Cyprus Name and Logo

Mining on Cyprus, "The Copper Island," began as early as 3000 B.C. The island's chief product was "cyprium," which means "copper."

In 1912, a group of American investors backed exploration in the eastern Mediterranean area. In 1914, a major copper deposit was discovered at ancient workings on the island of Cyprus. Cyprus Mines was formed to mine this deposit.

When Cyprus Minerals Company was spun off, the well-known and respected *Cyprus* name was considered especially appropriate.

The Cyprus Minerals Company logo displays two lions, first seen on the shield of Richard Coeur de Lion on the island of Cyprus when Richard captured it in 1191 during the Third Crusade. The motto relating to the lions was "Passant Regardant" —"Moving Forward Watchfully."

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Corporate Profile

Cyprus Minerals Company conducts its business through Cyprus Coal Company, Cyprus Metals Company, and Cyprus Industrial Minerals Company, and markets its products worldwide.

Cyprus Coal produces low and medium sulfur steam and metallurgical coal at mines in Colorado, Kentucky, Pennsylvania, Utah and Virginia.

Cyprus Metals produces copper at the Bagdad mine in Arizona and molybdenum at the Thompson Creek mine in Idaho.

Cyprus Industrial Minerals produces talc in Montana, calcium carbonate, kaolin, and barite in the southeastern United States. These minerals are used by the paper, paint, rubber, plastics and cosmetics industries.

Financial Highlights

(In thousands except as noted)	1985			1984
	1st Half	2nd Half	Full Year	Full Year
Revenues	$ 296,131	$ 409,893	$ 706,024	$ 618,478
Operating Income (Loss)				
Coal	9,076	50,866	59,942	45,855
Metals	(26,573)	(6,762)	(33,335)	(109,397)
Industrial Minerals	5,231	7,632	12,863	11,086
Other	—	—	—	1,229
	$ (12,266)	$ 51,736	$ 39,470	$ (51,227)
Earnings (Loss) Before Write-Down [1]	$ (51,839)	$ 32,207	$ (19,632)	$(100,211)
Net Loss[1]	$ (51,839)	$(400,250)	$(452,089)	$(100,211)
Net Loss Per Share	$ (1.98)	$ (15.25)[2]	$ (17.23)[2]	$ (3.82)
Funds Provided by Operations	$ 52,775	$ 73,346	$ 126,121	$ 64,871

[1]Earnings (loss) have been adjusted to eliminate taxes which would not have been provided by Cyprus as an independent company.
[2]Includes net loss per share of $16.48 resulting from the 1985 write-down.

(For the Year)	1985	1984
Sales:		
Coal (tons)	10,755	10,120
Copper (pounds)	159,189	106,009
Molybdenum (pounds)	21,294	8,177
Fine Ground Industrial Minerals (tons)	980	958
Limestone (tons)	3,571	3,875

(At December 31)	1985	1984
Working Capital	$ 209,352	$ 41,902
Total Assets	$1,136,865	$1,778,322
Long-Term Debt	$ 155,384	$ 165,167
Net Worth	$ 809,105	$1,130,671
Book Value Per Share	$ 30.73	$ 43.11
Current Assets/Current Liabilities	3.1 : 1	1.3 : 1
Debt/Capitalization Ratio	16.1%	12.7%
Shares Outstanding	26,328	26,226

LEHMAN 00131

To Our Shareholders

We are pleased to report that Cyprus Minerals Company has emerged from the spin-off from Amoco Corporation as a strong, viable, diversified natural resource company. It has a solid base in coal, metals, and industrial minerals. We are well-positioned for growth, both operationally and financially.

Our remarks in this letter are primarily directed to the six months Cyprus has been independent; however, basic data for the full year are also included in this report.

Earnings

Earnings for our first six months as an independent company, July through December of 1985, were $32.2 million or $1.23 a share prior to the write-down of certain assets in the fourth quarter. During the same period in 1984, we lost $70.5 million.

This major swing in earnings was due to several years of cost-cutting that finally gelled and whose effects should be long lasting. All groups benefited, but metals' improvement was the most dramatic. Metals lost only $6.8 million in the last half of 1985 as compared with a loss of $70.8 million in the same period in 1984. Coal earned $50.9 million compared with $20.6 million a year ago, and industrial minerals earned $7.6 million versus $3.5 million in the last half of 1984. Second half results benefited from the earnings of newly acquired coal mines, coal contract settlements, and the sale of surplus properties.

Write-Downs

During 1985, based upon our analysis of market conditions resulting from overcapacity, we concluded that recovery of certain of our investments would be unlikely.

Therefore, in the fourth quarter we wrote off the entire investment in our Thompson Creek molybdenum mine in Idaho and in certain undeveloped coal reserves. We also wrote down our investments in the Bagdad copper mine and in our barge operations.

The write-downs, totaling $675.7 million before tax, resulted in a $432.5 million after tax charge against earnings.

The company's net worth at year-end was $809.1 million, or $30.73 a share, which we believe to be a more realistic reflection of the value of our assets under current industry conditions.

Financial Condition

The turnaround in operating profits had a positive effect on cash flow. In the second half, we held capital expenditures to modest levels and partially offset them with proceeds from our asset disposition program. Funds provided by operations were sufficient to repay the $75 million bank debt incurred at the time of the spin-off, leaving our full $125 million line of credit available for the future.

We ended the year with $72.8 million in cash and a ratio of current assets to current liabilities of a healthy 3.1 to 1. $50 million of year-end cash was derived from a sale and lease-back of mining equipment.

Long-term debt at year-end totaled $155.4 million, representing only 16.1 percent of total capitalization. This debt primarily consists of long-term, low-interest debentures and industrial revenue bonds, with some non-recourse debt related to our 1985 coal acquisitions.

We have established a policy of maintaining a strong balance sheet, with low debt and sufficient working capital and cash to meet contingencies. This financial posture, as well as the excellent physical condition of our mines, places Cyprus in an enviable position in the industry to capitalize on opportunities for growth.

Operations

During the first half of 1985, we reduced our corporate staff and delegated more authority and responsibility to our operating divisions. As a result, we are now a leaner and more entrepreneurial organization.

The long established goal of the company has been to become a low cost, safe producer of each of our products and an effective marketer. We have made significant progress toward achieving this goal.

Coal We operate efficient longwall mining systems at our three large underground mines and large capacity draglines, shovels and trucks at our surface mines to produce low-cost coal.

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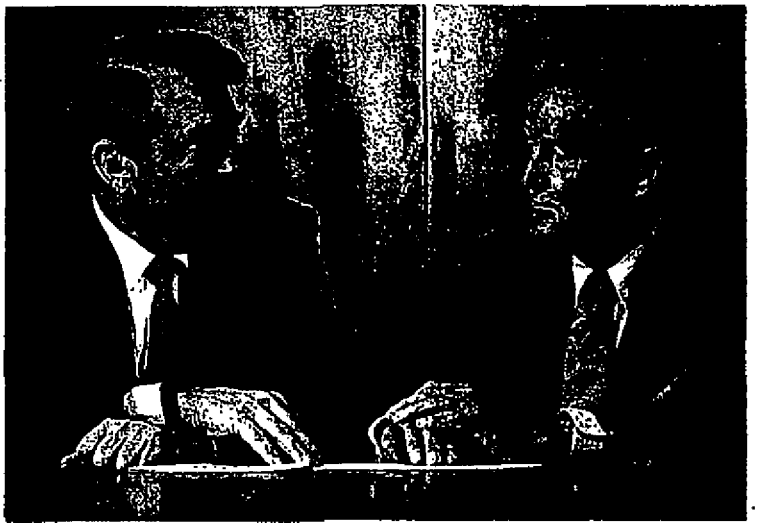
In a depressed coal market, we improved our profits and obtained new coal sales contracts. We renegotiated several long-term contracts that were under price pressure, but we were able to maintain adequate margins by cost reductions.

Metals Our open-pit Bagdad copper and Thompson Creek molybdenum mines have undergone major restructuring. Their unit costs are now among the lowest in the U.S. industry.

Metals markets continued under heavy pressure; however, all our copper and molybdenum production was sold, and cost reductions allowed Bagdad to generate cash profits. Thompson Creek had break-even cash margins, but the steady decline in molybdenum prices required adoption of a new, short-term mine plan which reduces stripping costs. Long-term operation of the mine is contingent on market improvement.

Industrial Minerals Despite increasing competition, we had record sales and earnings, led by sharp improvements in our talc and calcium carbonate operations.

Cost reduction programs at all operations contributed substantially to profits and enhanced our competitive position.



From left to right:
Kenneth J. Barr, President and Chief Executive Officer
John C. Duncan Chairman

Future

Since the spin-off, Cyprus has not only survived in a depressed industry, but has established a firm base on which to grow. Our best prospects for growth exist in the business we know best—mining.

We see opportunities for expansion through additional sales to fill existing capacity at our coal and industrial minerals facilities, and through development of our promising gold prospects, which were identified by our ongoing metals exploration program.

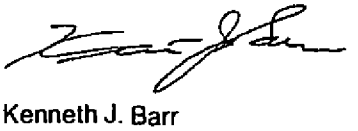
The major opportunity for expansion will be from acquisitions arising from the depressed conditions in the natural resource industry. As other companies have become disillusioned with mining, we have seized opportunities that have special advantage for Cyprus, such as our recent acquisition of coal mines and our current negotiations to buy a major copper and molybdenum mine. Our acquisitions have been structured to minimize financial risk through imaginative financings.

As the motto relating to the lions in our logo states, we plan on "moving forward—watchfully."

Summary

Cyprus Minerals Company is well-positioned with modern, large, low operating cost mining assets. It is staffed by experienced, enthusiastic, and dedicated mining managers and employees, committed to building a strong company. Cyprus is financially sound and has excellent prospects for increasing shareholder value.

John C. Duncan
Chairman of the Board



Kenneth J. Barr
President and
Chief Executive Officer

LEHMAN 00133

What is your view of the spin-off?

Mr. Barr:

My first impression upon hearing of the spin-off was concern about the new company's viability under depressed industry conditions. As planning proceeded with Amoco, I became more comfortable and convinced that it was the correct thing to do to add value for Amoco's shareholders.

When the conditions Amoco established became reality and the Cyprus balance sheet took shape, it became obvious the spin-off provided a unique opportunity to build a strong mining company that could grow and create additional value for its owners. Also, employees responded with enthusiasm for the new company. I'm happy to be a part of it.

How would you compare Cyprus to other mining companies?

Mr. Duncan:

Cyprus is in a unique and very strong position by comparison to other mining companies. We are major producers in a broad range of businesses. Our low cost coal operations are spread throughout the country, with most of our coal production committed under long-term contracts. Our cost positions in our two metals mines—Bagdad and Thompson Creek—are among the lowest in the United States. Our industrial minerals operations are diversified and customer-oriented.

Aside from the basic strength of its businesses, Cyprus' competitive position is further enhanced by its secure financial position. Unlike many mining companies having only equity positions in some of their businesses, Cyprus owns 100 percent of most of its properties. We, therefore, directly control our operating cash flow. In addition, our properties have a secure U.S. location.

At a time when our competitors have been battered by prolonged depressed industry conditions, we have benefited from Amoco's commitment to investment in modern equipment. At spin-off, we emerged with low debt, well equipped and in a very strong position relative to our competitors.

Why was the fourth quarter write-down necessary?

Mr. Stone:

Many of the investments in Cyprus, particularly in metals, were made at the very top of the economic cycle in the late 1970's. There followed a period of overcapacity in the early 1980's which led to price deterioration.

The persistence of depressed markets over the last few years led us to conclude that some of our assets were overvalued in light of anticipated market conditions. We therefore wrote down certain investments to their estimated net realizable value.

What was the impact of the write-down?

Mr. Stone:

The result of the write-down, in our view, is a more realistic net worth of $809.1 million or $30.73 a share at year-end 1985. While there is no impact on cash flow, future earnings will benefit from reduced depreciation charges of roughly $30 million a year on a pre-tax basis.

What is the philosophy of your cost-cutting program?

Mr. Barr:

Over the last three years, Cyprus has had the objective of becoming a low cost, safe producer in each of its business lines. These efforts have resulted in cost savings and productivity gains in nearly all operations, with cuts at certain metals operations ranging up to 30 percent. Being a low cost producer will allow Cyprus to survive economic downturns and eam good profits during market upswings.

What does supply and demand look like in coal, metals, and industrial minerals?

Mr. Duncan:

Coal markets have been characterized by soft demand. Because most of Cyprus' coal production is under long-term contract, we

Kenneth J. Barr
President and
Chief Executive Officer

"The long established goals of the company have been to become a low cost, safe producer and effective marketer of each of our minerals. We believe we have made significant progress toward achieving these goals."

LEHMAN 00134

are largely protected against weak, short-term markets.

The metals industry is characterized by volatile commodity prices and strong competition. World consumption of copper in 1985 remained high, and stocks have dropped substantially, which should tend to strengthen the world copper price. The molybdenum market is hurt by excess capacity; however, actual demand has remained steady over the last few years.

The industrial minerals business serves small, segmented markets tied closely to the general economy. Although competition is increasing, Cyprus' position is strengthened by its reserve base and its commitment to technical service support programs for its customers.

What level of capital expenditures do you expect to maintain?

Mr. Barr:

Cyprus' facilities and equipment are relatively new, have benefited from major modernization programs, and are well maintained. Consequently, we expect spending to be less than $50 million a year, increasing as profitable investment opportunities are identified.

What are your plans to become a gold producer?

Mr. Barr:

We have formed a gold group, within our metals company, whose objective is to move Cyprus into gold production promptly. We expect to develop gold prospects in Australia, New Zealand, and the United States, which we believe will be profitable and provide opportunities for expansion. Production could begin as soon as 1987.

What are you doing to reduce dependence on coal sales to LTV Steel?

Mr. Stone:

A major source of Cyprus' revenue and earnings is its Emerald and Knox Creek long-term contracts with LTV Steel Company, Inc.

We have negotiated new long-term coal sales contracts with three electric utilities and significantly lowered our mining costs at Emerald.

We have implemented cost reductions at Knox Creek and financed this acquisition through non-recourse debt.

While we expect to continue to serve this important customer, we will continue our efforts to expand our sales to others, which should help to ensure continued production.

Why haven't you declared a dividend?

Mr. Duncan:

Our agreement with the banks that have provided our line of credit precludes our declaring a dividend until we have achieved a certain level of profitability. Based on our performance, we can now begin to consider an appropriate dividend policy under currently anticipated business conditions.

Where is Cyprus going?

Mr. Duncan:

We aim to become one of the world's leading diversified natural resource companies. Cyprus has positioned itself to be a survivor during economic downturns, while building a solid base for future growth. Our primary emphasis will be on acquisitions or development of exploration prospects in our current business areas, coal, metals, and industrial minerals. However, as a diversified natural resource company, we will pursue other natural resource investments that offer major opportunities to utilize our financial and management strengths.

John C. Duncan
Chairman

"Cyprus is staffed with an outstanding group of experienced, enthusiastic, and dedicated mining managers and employees, who are committed to building a strong company."

Chester B. Stone, Jr.
Executive Vice President and Chief Financial Officer

"We have implemented a policy of maintaining a strong balance sheet, low debt, and more than adequate working capital and cash reserves to meet contigencies. This financial strength can be the engine for future growth."

LEHMAN 00135

Cyprus Coal Company

Cyprus Coal is a fast growing company that has been profitable every year since its inception in 1980. In the second half of 1985, we shipped 6.5 million tons of coal and had operating profits of $50.9 million on revenues of $238.9 million. This represents a 30 percent increase in sales volume and a major increase in operating income over the second half of 1984. Funds provided by operations were at a record high of $69.6 million for the second half of 1985, of which only $14.7 million was used for capital expenditures.

Operations

Cyprus' coal operations are geographically diversified in Pennsylvania, Virginia, Kentucky, Colorado and Utah and are able to serve many coal markets. We produce steam and industrial coal at all of our operations and metallurgical coal in Pennsylvania and Virginia.

In order to maintain a competitive edge, we have emphasized cost reduction for several years, and have been successful at all operations. At some mines, these savings have ranged as high as 40 percent. We have achieved these reductions by installing large, efficient equipment, such as longwalls, draglines, shovels and large-capacity haul trucks, and by focusing on methods of improving productivity.

Marketing

Cyprus sells coal to 17 utilities and numerous industrial customers in many of the major coal consuming states and exports coal to Taiwan and Japan. Most of our metallurgical coal is sold to LTV Steel Company, Inc.

Over 85 percent of our sales are under long-term contracts. Due to market pressures, we renegotiated several contracts in 1985 and reduced prices in exchange for increased tonnage, improved operating flexibility or extended contract life. Most of the impacts of these price reductions were offset by cost reductions.

We also signed several new contracts for a total of about one million tons per year. Cyprus has over 11 million tons a year under long-term contract for the next five years.

We produce high quality, low and medium sulfur coal and have a service-oriented marketing effort. Our long-term contracts and service orientation had a favorable impact on profitability in 1985.

Acquisitions

Cyprus acquired mines in Colorado, Utah, and Virginia during 1985. These mines can be competitive, low cost producers. These acquisitions increased our total production capacity to over 18 million tons a year, broadened our market base, and positioned us to penetrate new markets.

Outlook

The coal market in 1985 was depressed and we expect only a one percent increase in U.S. coal consumption in 1986. However, with our long-term contracts and recent acquisitions, we expect our sales to increase to 14 million tons and our operating profit to increase significantly.

During 1986 we will continue to reduce costs and to search for acquisitions that will complement our current operations.

Donald P. Bellum, Vice President–Coal and President, Cyprus Coal Company.

"We develop a competitive edge by operating low cost mines and providing superior service to our customers."

Coal
Full Year 1985

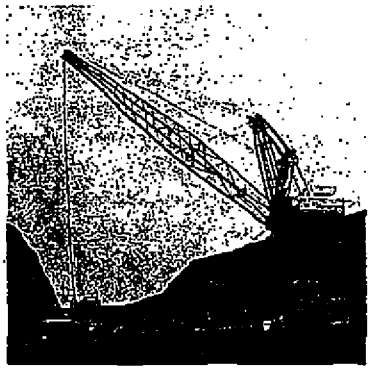
Sales: 10.8 million tons

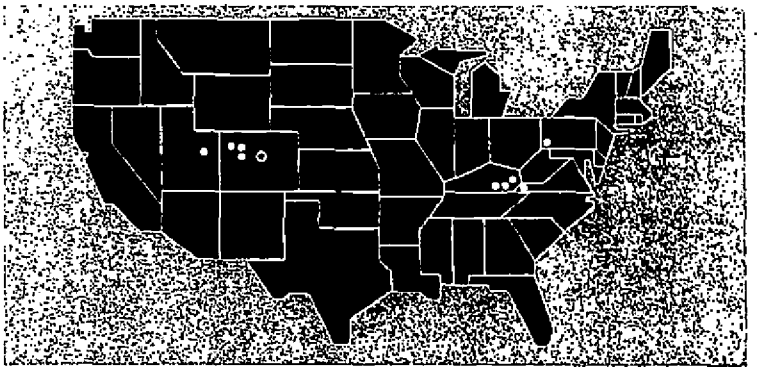
Revenue: *$394.0 million*

Operating Profit: $59.9 million

Reserves: 662.4 million tons

Employees: 2,383



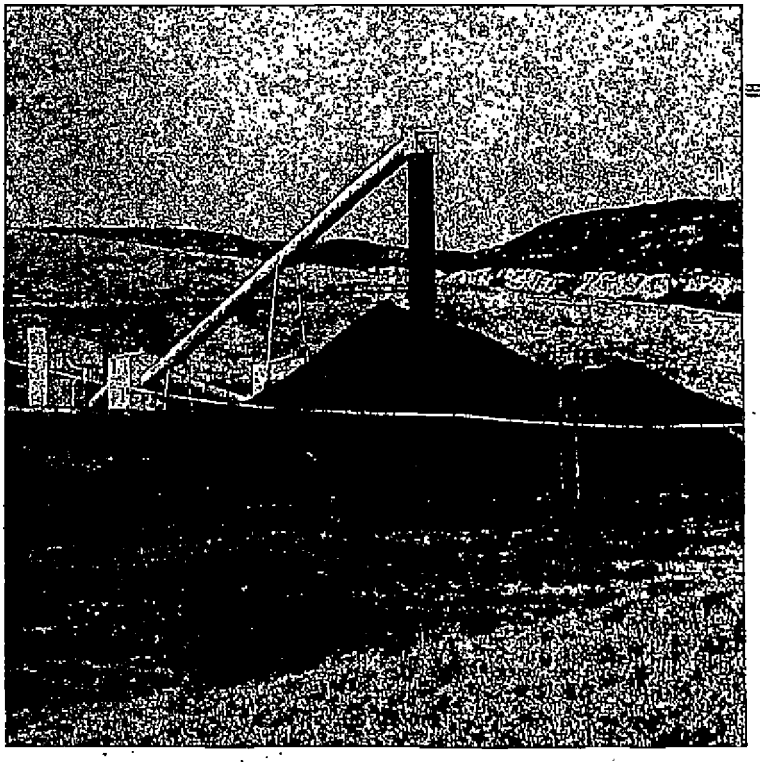


Far Left:
We have large efficient equipment at our surface mines, such as this dragline in Kentucky, to keep our costs low.

○ Mine Operations
⊛ Headquarters

FHMAN 00136

We have installed longwalls, such as this one at Empire, at our three large underground mines to make them low cost producers.



Photos on Far Left: Enthusiastic, dedicated miners made productivity improvements possible at our coal mines.

Most of our major operations have unit train loading facilities, such as the one at Colorado Yampa. Most of the coal is shipped by unit trains to reduce costs to our customers.

LEHMAN 00137

Cyprus Metals Company

Cyprus Metals Company, faced with depressed metals prices over the last several years, has responded with cost-cutting measures that produced a convincing turnaround in 1985. Operating losses were reduced from $70.8 million in the last six months of 1984 to $6.8 million in the last half of 1985. Contributing $8.1 million to this performance was the sale of the Pima copper ore deposit and the Mungana gold property. Funds provided by operations also increased significantly in 1985, particularly in the second half when $11.5 million was generated, of which only $1.3 million was used for capital expenditures.

Cyprus' primary achievement in 1985 was the reduction of costs which minimized the effects of current depressed metals markets and positioned Cyprus to benefit from any increase in copper or molybdenum prices.

Copper

Operating at full capacity, our Bagdad copper mine produced 167 million pounds of copper and five million pounds of by-product molybdenum. This production level was achieved after major restructuring in 1984 to reduce costs.

Bagdad's modern mining and milling facilities, coupled with reduced manpower and lower smelting and supply costs, should make it a low cost producer of copper for many years to come.

Molybdenum

Our Thompson Creek molybdenum mine near Challis, Idaho, operated at 80 percent of capacity in 1985 in order to reduce costs and respond to market conditions.

Production costs were lower in 1985, due largely to the resolution of normal mine start-up problems. 1985 further benefited from reduced stripping, improvements in mill recovery and mine productivity, better electrical energy management and lower roasting and supply costs.

Continued deterioration of molybdenum prices offset the cost improvement, jeopardizing the long-term operation of Thompson Creek. A new mine plan that further defers stripping of overburden was adopted. This plan calls for production of 17.5 million tons of ore over the next three years, when the mine is scheduled to shut down, with future operation of the mine dependent on market improvement.

Exploration and Development

During 1985, Cyprus continued its gold exploration activities in Australia, New Zealand, the Solomon Islands, and the United States.

We formed a new operating group to expedite development of promising gold prospects in Australia, New Zealand, and the United States. Its goal is to establish Cyprus as a low-cost gold producer by 1988, with initial production anticipated for 1987 in both Australia and the U.S.

Preliminary feasibility studies were started on the Bismark zinc-silver deposit located in Mexico.

Outlook

While copper and molybdenum prices remained depressed, demand for both metals was steady and is expected to continue in 1986. Further reduction in copper inventories and further rationalization of the molybdenum industry could improve conditions. Bagdad and Thompson Creek are well positioned to benefit.

Successful conclusion of our negotiations to purchase the Sierrita copper and molybdenum mine would greatly expand our opportunity to increase earnings with little downside risk.

We will continue cost reduction efforts in 1986, as well as efforts to strengthen marketing. Acquisitions that complement our current position in metals will also be pursued.

James C. Compton, Vice President--Metals and President, Cyprus Metals Company.
"Modern production facilities and the determination of our employees assure low costs at our metals mines."

Metals
Full Year 1985

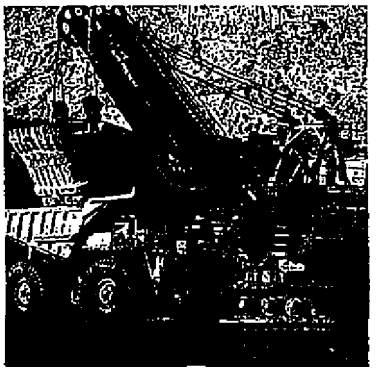
Sales: Copper 159.2 million pounds
Molybdenum 21.3 million pounds

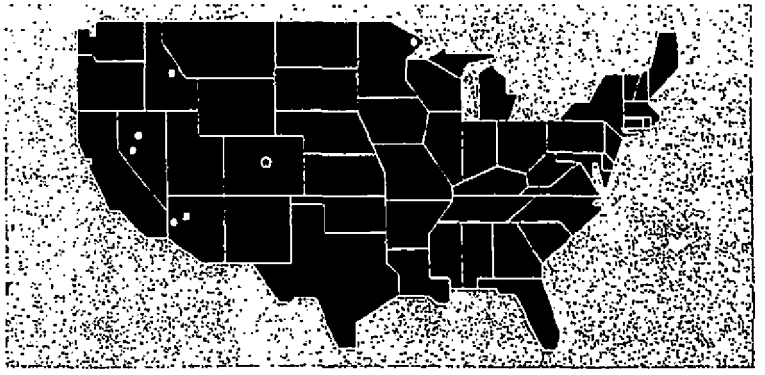
Revenue: $182.8 million

Operating Loss: $33.3 million

Reserves: Copper 417.0 million tons of ore
Molybdenum 15.4 million tons of ore

Employees: 965

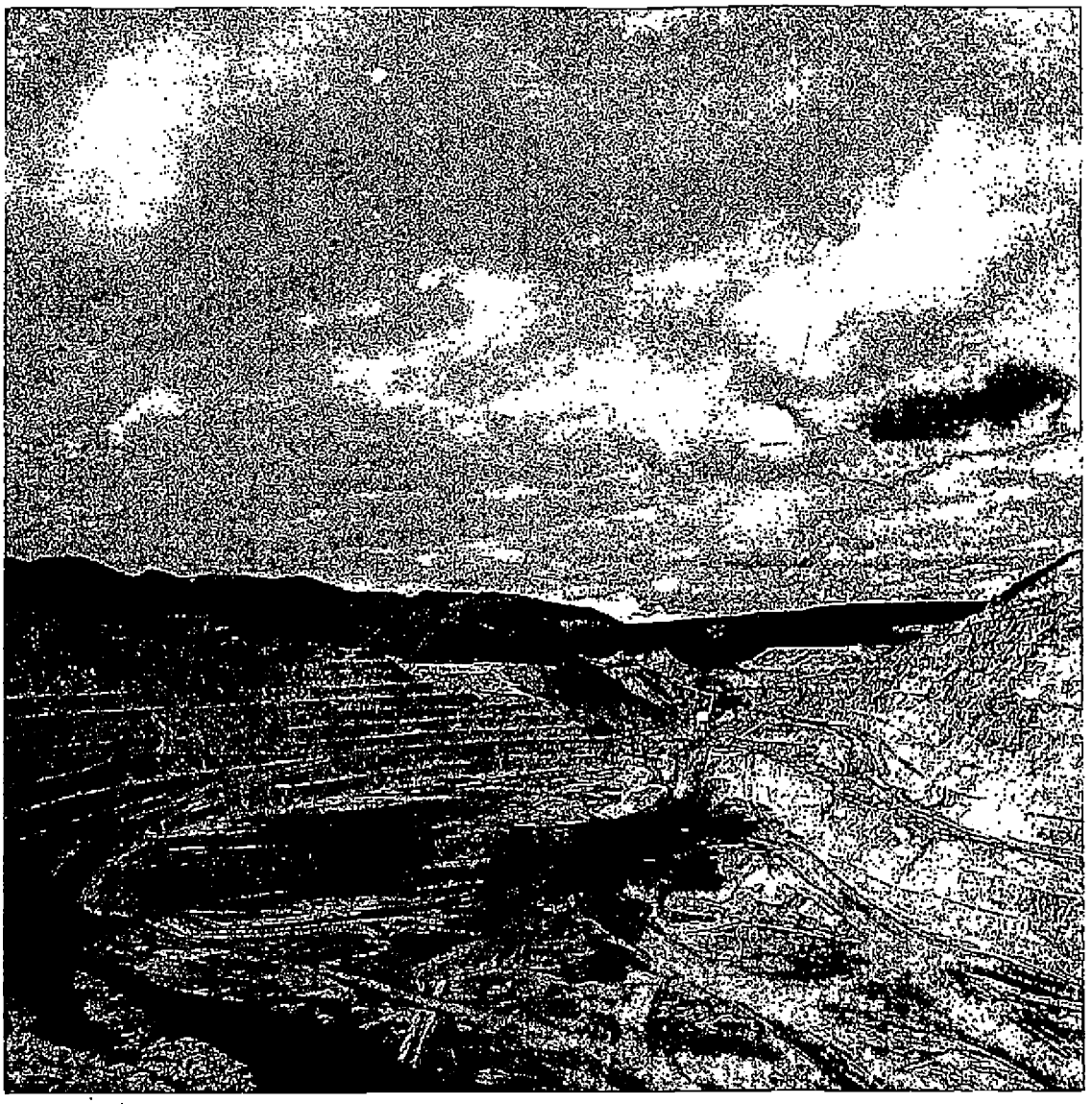




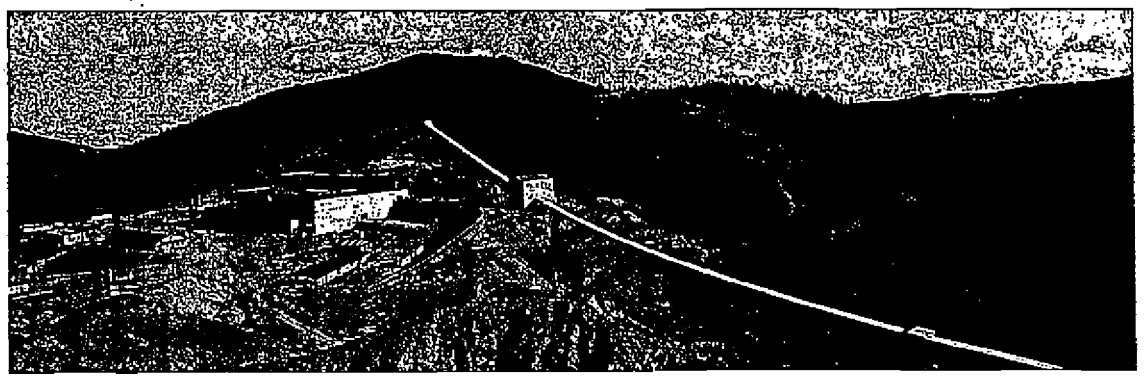
Far Left:
Large modern mining equipment at Bagdad contributes to low cost operation. We produce copper in Arizona and molybdenum in Idaho.

☐ Metals Operations
○ Gold Exploration
⊛ Headquarters

LEHMAN 00138



The in-pit crusher at our Bagdad copper mine allows low cost transportation of the ore to the mills by means of conveyor belts instead of trucks.



The newest U.S. molybdenum mine—Cyprus Thompson Creek—began production in late 1983.

Photos on Far Left: The dedication of our employees has helped make Cyprus one of the lower cost metals producers in the U. S.

Extension drilling continues at our gold prospect in the Golden Cross area of New Zealand.

FHMAN 00139

Cyprus Industrial Minerals Company

Cyprus Industrial Minerals met the challenge of an increasingly competitive environment in 1985. In the last half of the year we produced $7.6 million in operating earnings and $13.4 million in funds provided by operations, of which $3.7 million was used for capital expenditures. Sales revenues in the second half of 1985 were $63.8 million, compared with $60.3 million in 1984.

Operations

Our talc operation set new records for sales and profits. Its flagship product, Mistron® Vapor, which controls organic impurities in pulp and paper manufacture, set new sales records in North America, Europe, and Japan. The paper for this Annual Report was made from pulp in which Mistron® Vapor was used as a processing aid.

The talc operation benefited from the full effects of reduced costs through the implementation of new processing methods at its principal facilities in the United States, Europe, and Japan.

Although paper mills converted more slowly to alkaline paper making than expected in 1985, Cyprus' new line of calcium carbonate pigments for paper filling and coating provided much of the impetus for record revenues and earnings for that operation. The paper on which our Annual Report is printed is filled with Atomite® and its coating contains Ultramite® calcium carbonates.

Marketing and Research

Our marketing approach is to create specialized niches in market segments by adding value through product innovation and emphasis on technical service to customers. By specializing, Cyprus has become a significant factor in all of its markets and a leader in many. This strategy has been largely responsible for growth in earnings.

In 1985, Cyprus' research group developed a chemical modification which permits substitution of Montana talc for that of its last California mine which was depleted and shut down at year-end. This modification allows us to continue to serve important plastics markets.

Cyprus constructed the first of a projected series of bulk distribution systems for Mistron® Vapor talc which will markedly reduce delivered costs to pulp and paper mills.

In the plastics industry, the talc business made its first significant sales of high quality specialty talc to producers of a new line of heat-resistant cookware.

Outlook

Cyprus' industrial minerals markets generally track GNP, which is expected to continue modest growth through 1986. We should benefit from continued paper industry conversion to alkaline-based systems, which can use our calcium carbonate pigments. Also, a new calcium carbonate product, our Copycoat® for carbonless paper, is expected to contribute. We should also realize benefits from our on-going cost-cutting program.

In addition, we will actively pursue acquisitions which complement our existing businesses.

H. T. Mulryan, Vice President—Industrial Minerals and President, Cyprus Industrial Minerals Company.
"We believe in profitable growth through marketing and technical innovation."

Industrial Minerals
Full Year 1985

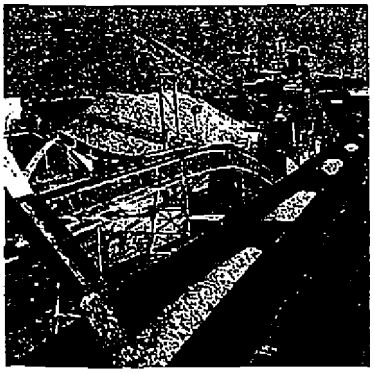
Sales: Fine Ground Industrial Minerals 1.0 million tons
Limestone 3.6 million tons

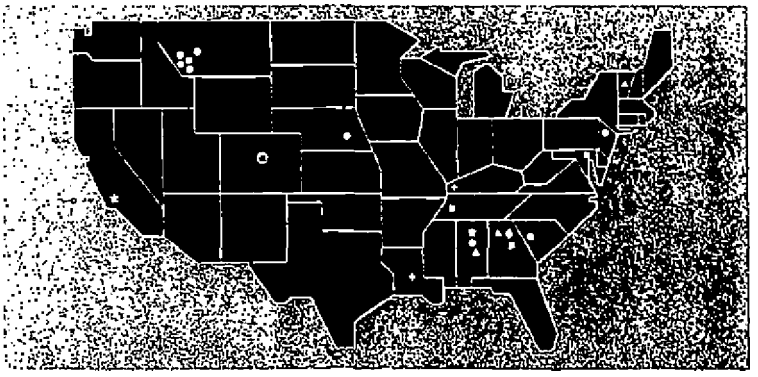
Revenue: $129.2 million

Operating Profit: $12.9 million

Reserves: Fine Ground Industrial Minerals 47.7 million tons
Limestone 172.5 million tons

Employees: 1,220



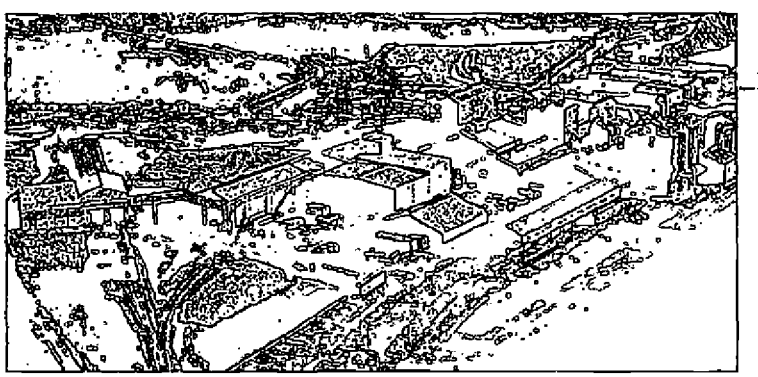


Far Left:
High quality calcium carbonate produced at our Alabama mine is shipped to our mill in Georgia.

- ○ Talc
- ✣ Limestone
- △ Calcium Carbonate
- □ Clay
- ◇ Barite
- ☆ Research Facility
- ⊛ Headquarters

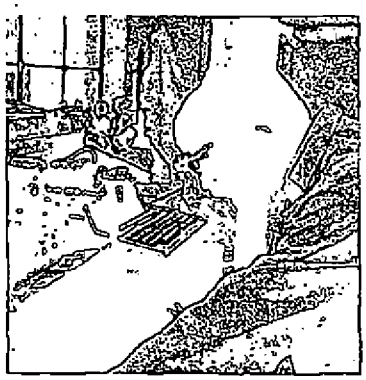
FHMAN 00140

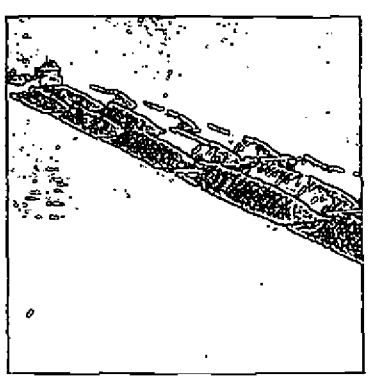
The Yellowstone mine in Montana is Cyprus' primary source for high quality talc.



Far Left:
This Georgia clay mine provides kaolin for production of ceramics and fiberglass.

New sales from our expanded calcium carbonate mill in Alabama helped produce record sales and earnings in 1985.





Photos on Far Left:
Concern for quality pervades our activities, from hand sorting ore to sophisticated product evaluations.

Our limestone aggregate, for construction of roads and levees, is transported along the Mississippi River by our boats and barges.

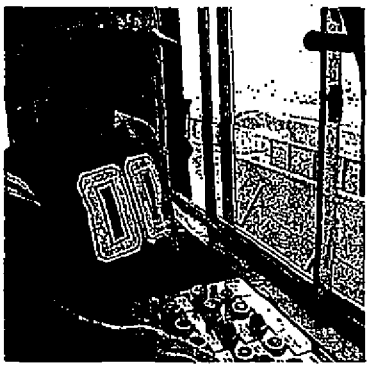
I FHMAN 00141

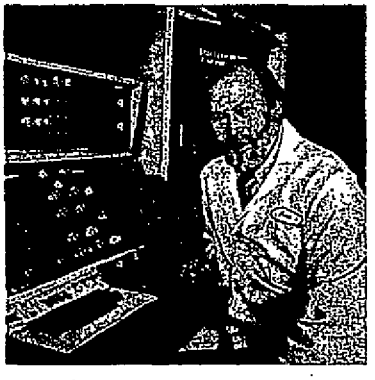
People Dedicated to Building Cyprus

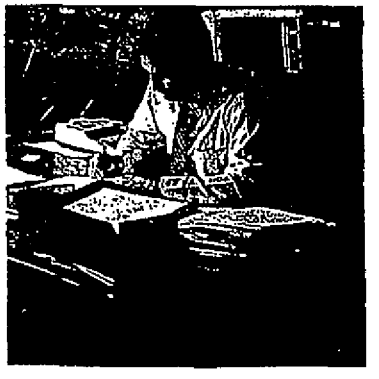
In addition to modern facilities and a sound financial base, Cyprus benefits from an outstanding team of experienced mining people. Here are some of them, representing all areas of the company—men and women of talent, competence, and dedication. These individuals are only a few of the more than 5,000 people who are building your company.

The Cyprus Management Committee, shown at the right, is composed of experienced executives, chosen to meet the needs of a dynamic mining company today.

The company's directors, shown on page 32, were selected for their business and industry experience to guide Cyprus' operating management in increasing the value of your company.

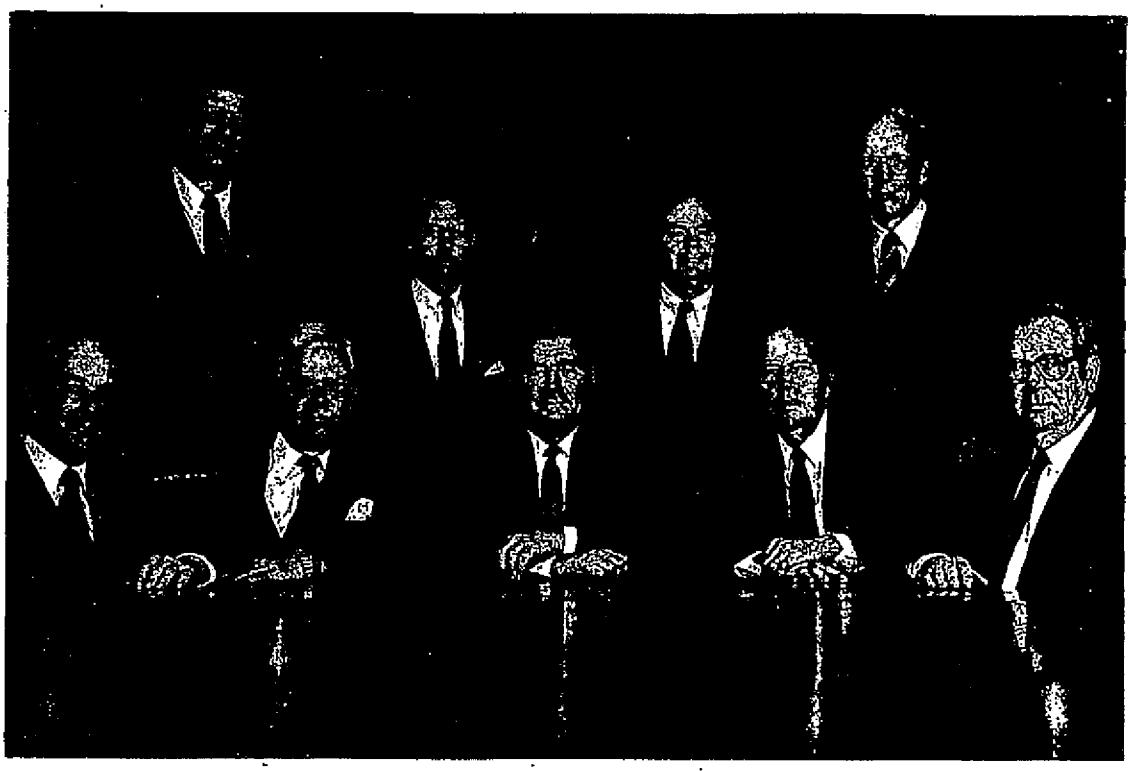






The results produced in the first six months of Cyprus Minerals' independence reflect the efforts of people such as those pictured. They are your best assurance that this performance will continue in the future.

LEHMAN 00142



From left to right (seated):

Roger A. Kaufmann, Vice President--Human Resources and Administration

Chester B. Stone, Jr., Executive Vice President and Chief Financial Officer

Kenneth J. Barr, President and Chief Executive Officer

Donald P. Bellum, President, Cyprus Coal Company

James C. Compton, President, Cyprus Metals Company

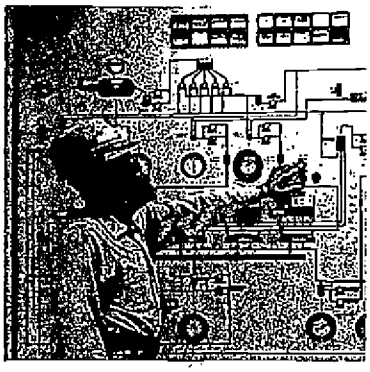
From left to right (standing):

Gerald J. Malys, Vice President and Corporate Controller

Philip C. Wolf, General Counsel and Corporate Secretary

H. T. Mulryan, President, Cyprus Industrial Minerals Company

Dennis C. Haugh, Vice President and Treasurer



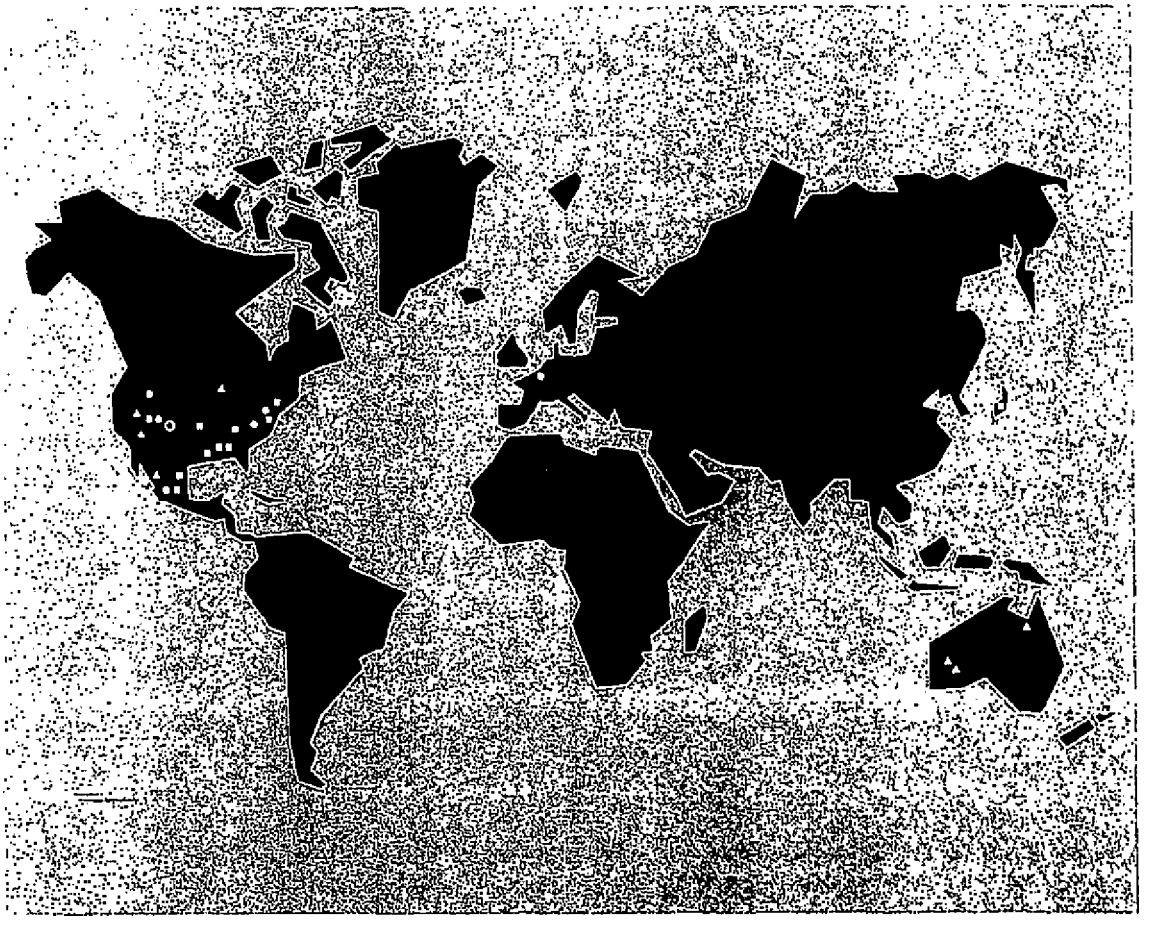
LEHMAN 00143

Cyprus Locations

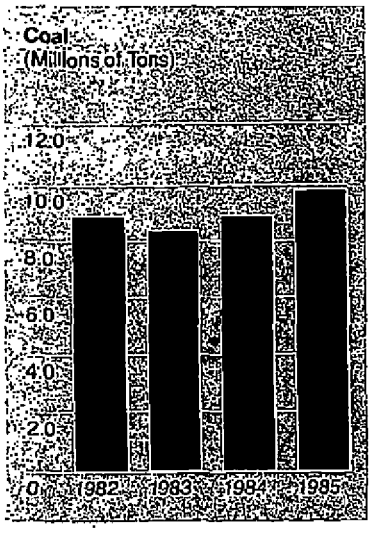
Cyprus production facilities are located primarily in the United States and are, for the most part, 100 percent owned and operated. Coal mines are well positioned to serve most U.S. and export markets.

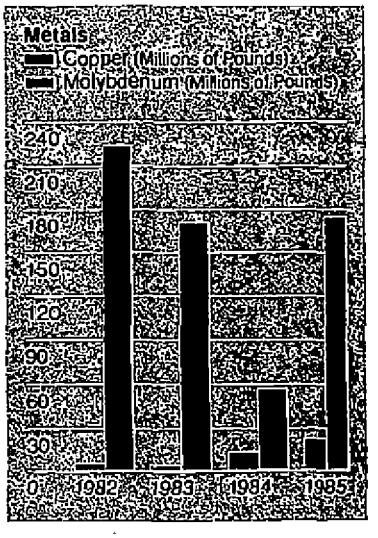
Industrial minerals facilities consist of talc mines in Montana, a calcium carbonate mine in Alabama, clay mines in Tennessee and South Carolina, and barite and clay mines in Georgia. Talc processing plants are located in Nebraska, Alabama and New Jersey. Talc plants in Japan and Mexico and calcium carbonate operations in Vermont are partially owned.

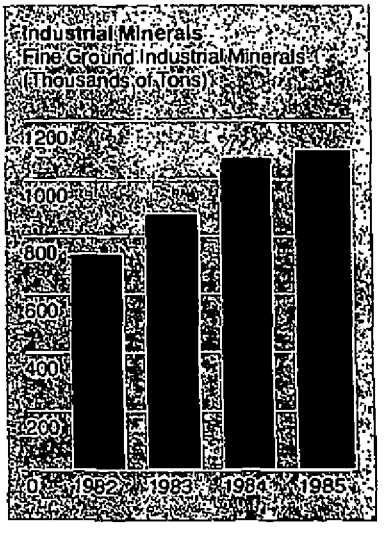
Complementing our metals activity in the U.S., which includes mines in Arizona and Idaho and gold exploration in Arizona and Nevada, are joint venture gold projects in Australia, New Zealand, the Solomon Islands and a joint venture zinc/silver project in Mexico.



○ Coal
△ Metals
□ Industrial Minerals
⊛ Headquarters







Production
Over the last few years, production of coal, industrial minerals and molybdenum has increased steadily. Growth in production of all products is expected in 1986 due to new coal contracts and acquisitions, an anticipated copper-molybdenum acquisition, and growth in demand for specialty industrial minerals.

LEHMAN 00144

Cyprus Marketing

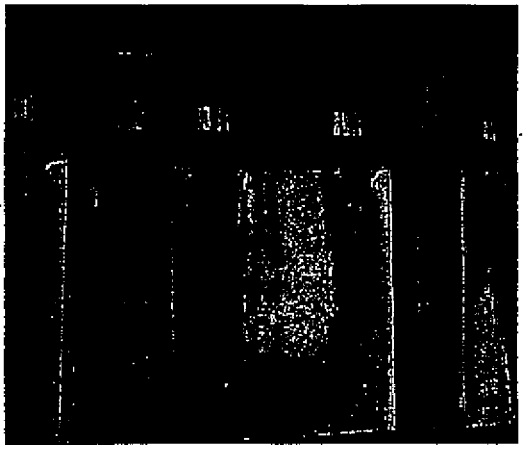
Cyprus' goal is to be the most effective marketer in each of its lines of business.

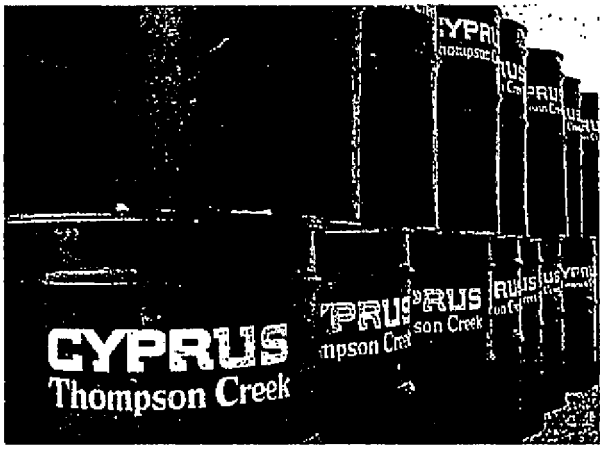
Cyprus sells coal into many utility, industrial, and metallurgical markets. Sales representatives, supported by experts in combustion engineering and transportation, use a system of market intelligence to maintain an aggressive, technical sales effort. In the highly competitive coal market, we aim to demonstrate that our delivered coal can be utilized to produce lower cost electricity at specific plants.

Cyprus is well established with customers of copper and molybdenum worldwide. We emphasize flexibility in meeting customer requirements, and we provide quality products. Our copper and molybdenum marketing teams have sold all production at producer premium levels. In molybdenum, our staff is assisted by an international commodities trader through an agency agreement under which Cyprus establishes all terms of contracts and sales.

Sales of talc, clay, calcium carbonate, and limestone products are handled by technical sales staffs assigned to each product group. They are supported by technical service laboratories at key locations to assure delivery of high quality products that meet customer needs.

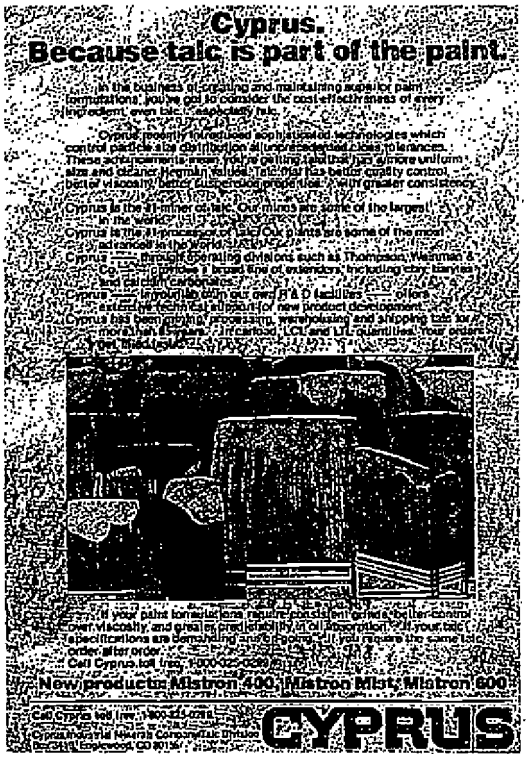
Our industrial minerals research department provides a broad back up of scientists with modern analytical equipment to assist local sales support teams. However, the research department's primary mission is to develop new products from and applications for our basic raw materials.





Far Left:
Cyprus' high quality copper cathode was the first to be traded on the London Metals Exchange.

Molybdenum from Thompson Creek is shipped to customers in Europe, Japan and the United States.



Far Left:
Cyprus' industrial minerals products are used by a wide range of industrial consumers in all fifty states and many foreign countries.

You will find our coal in many coal consuming states, because our marketing program focuses on both the quality and service requirements of customers.

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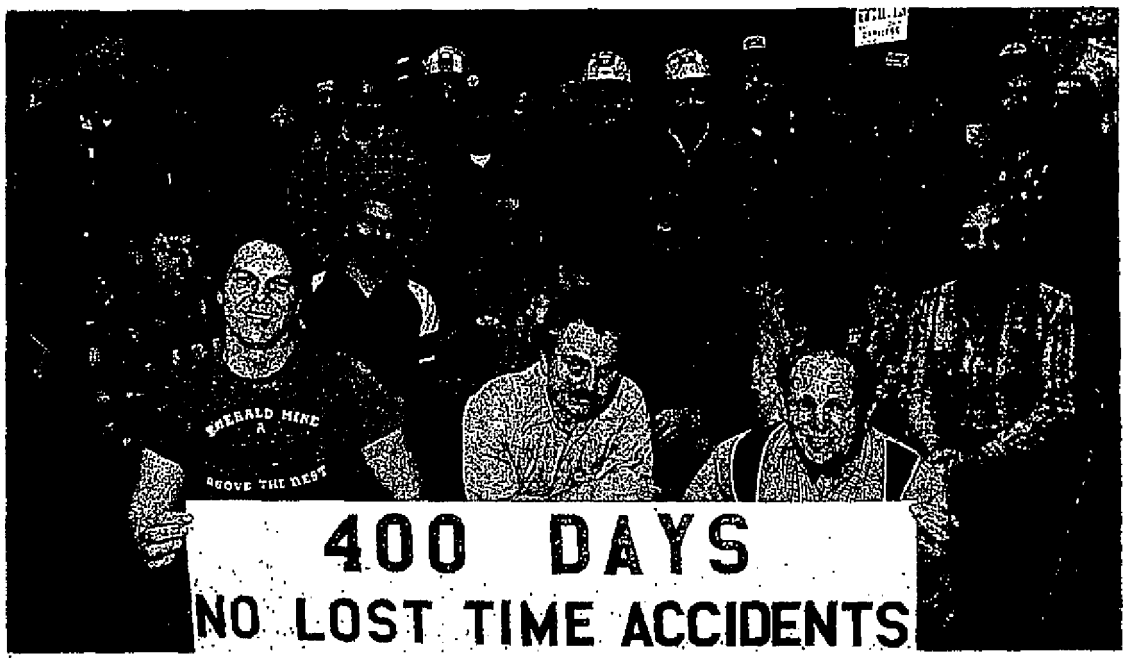
Cyprus' objective is to become a low cost, safe producer. Our policy of providing safe and healthy working conditions reflects not only concern for the people who are essential to our success, but also represents good business. Safety, morale, and productivity are inseparable in achieving low operating costs. Safety receives the attention of management throughout the company.

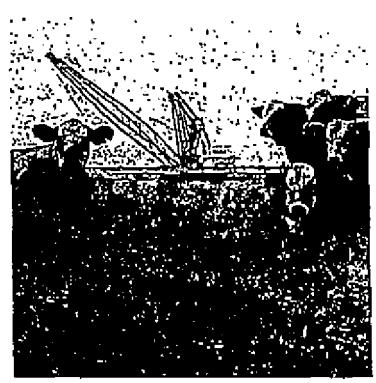
Cyprus policy on the environment recognizes the necessity of responsible programs to protect the environment. Mining affects the environment, and minimization of those impacts to meet regulatory standards and to win the acceptance of the surrounding community is important. If this is not done, operations and costs will be adversely affected.

We are proud that our newest mine, Thompson Creek, was commended by the Idaho Conservation League for its "outstanding land reclamation project which should be an industry standard, and for cooperation in working toward beneficial environmental goals".



Emerald preparation plant employees have good safety habits that are an important part of being a low cost producer.

Cyprus rescue teams, like this one practicing mine rescue techniques, have consistently placed high in state and regional competitions. Our Bailey Hill team placed fourth in the national mine rescue contest in 1985. Tom Bochna, an Emerald mine employee, won the 1985 *National Benchman Award.*



Photos on Left:
We put a lot of effort into reclaiming our surface coal operations such as these in Kentucky.

LEHMAN 00146

Management's Discussion and Analysis of Results of Operations and Financial Condition

Results of Operations for the Three Years Ended December 31, 1985

Prior to July 1, 1985, Cyprus was a wholly-owned subsidiary of Amoco. On July 1, 1985, Amoco distributed the shares of Cyprus to its shareholders and Cyprus became an independent publicly owned company. The following discussion of operations compares Cyprus' results for the three years ended December 31, 1985, as well as the first and second halves of 1985. Results for 1985 and 1984 have been adjusted to remove tax charges and credits which resulted from Cyprus' inclusion in Amoco's tax returns and which would not have been recorded if Cyprus had been an independent company. See Notes 1 and 9 to the Financial Statements.

In the fourth quarter of 1985, Cyprus wrote down the value of certain assets to reflect weaknesses in mineral prices and markets. The write-down resulted in a charge against 1985 net income of $432.5 million and is more fully discussed in Note 2 to the Financial Statements.

Excluding the write-down, Cyprus reported profits of $32.2 million for the second half of 1985 compared with losses of $51.8 million in the first half. Operating profits improved by $64.0 million and are discussed in the segment presentations which follow.

Corporate expenses were $19.8 million lower in the second half of 1985 principally due to a first half loss of $11.6 million on the sale of notes receivable obtained in the Cyprus Mines Corporation acquisition in 1979 and a reduction in the second half of $7.0 million in corporate staff expenses and overhead.

Excluding the write-down, Cyprus lost $19.6 million in the full year of 1985 compared to a loss of $100.2 million in 1984. The 1984 losses were largely attributable to a $109.4 million metals segment operating loss offset only partly by operating profits from the coal and industrial minerals segments. 1985 improvements in the three operating segments are discussed below. The increase in 1985 corporate expenses primarily reflects the loss on the sale of the notes receivable in the first quarter of 1985. Cyprus had net income of $19.0 million in 1983 which included operating losses of $15.9 million compared to operating losses of $51.2 million in 1984. These are discussed in the operating segment presentations which follow. Items favorably affecting 1983 results were a $29.9 million gain on the disposition of General Electric Company stock and capitalization of $18.8 million of interest expense associated with development of the Thompson Creek mine.

Cyprus' summarized financial results for the past three years follow:

	1985			1984	1983
	1st Half	2nd Half	Year	Year	Year
Revenues (in thousands)					
Coal	$ 155,118	$ 238,901	$ 394,019	$ 381,180	$ 333,950
Metals	75,695	107,149	182,844	108,768	149,462
Industrial Minerals	65,318	63,843	129,161	125,188	107,422
Other	—	—	—	3,342	11,457
	$ 296,131	$ 409,893	$ 706,024	$ 618,478	$ 602,291
Operating Income (in thousands)					
Coal	$ 9,076	$ 50,866	$ 59,942	$ 45,855	$ 39,718
Metals	(26,573)	(6,762)	(33,335)	(109,397)	(61,573)
Industrial Minerals	5,231	7,632	12,863	11,086	7,596
Other	—	—	—	1,229	(1,646)
	(12,266)	51,736	39,470	(51,227)	(15,905)
Corporate and Other	(36,988)	(17,174)	(54,162)	(43,730)	5,455
Income (Taxes) Credits	27,889	(9,776)	18,113	49,891	29,449
Net Income (Loss) Before Tax Adjustment and Write-Down	(21,365)	24,786	3,421	(45,066)	$ 18,999
Tax Adjustment	(30,474)	7,421	(23,053)	(55,145)	
Adjusted Net Income (Loss) Before Write-Down	(51,839)	32,207	(19,632)	(100,211)	
Asset Write-Down Net of Tax	—	(432,457)	(432,457)	—	
Adjusted Net Income (Loss)	$ (51,839)	$(400,250)	$(452,089)	$(100,211)	

A discussion of the results of operations of Cyprus' principal industry segments follows. This discussion should be read in conjunction with the information by industry segment presented in Note 14 to the Financial Statements and the supplemental information on mineral reserves and selected operating statistics on page 31. Also, see supplemental information on the impact of inflation on page 30.

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Coal

Coal operating profits of $50.9 million in the second half of 1985 were $41.8 million higher than the first half. This reflected an increase in revenues of $83.8 million primarily resulting from acquisitions made during the second half of 1985 (see Note 5 to the Financial Statements), from contract settlements and from improved sales volumes which more than offset reduced revenues due to a price reduction, effective April 1, 1985, under the Emerald mine long-term coal contract with LTV Steel Company, Inc. In addition, operating costs were reduced at the Empire mine in Colorado due to improved efficiency as longwall mining equipment was installed in May 1985.

Full year 1985 coal profits of $59.9 million were $14.1 million higher than 1984 and revenues increased by $12.8 million to $394.0 million. The profit and revenue improvements were due to the 1985 acquisitions and contract settlements which more than offset the effect of coal contract price reductions and lower sales volumes at the Kentucky mines due to the soft spot market in 1985. The profit improvement was also due to cost reductions achieved at the Empire, Emerald and Straight Creek mines.

Coal operating profits of $45.9 million in 1984 were $6.1 million higher than 1983, due to the absence of a $10.9 million charge in 1983 for the abandonment of a partially developed mine in Colorado. Excluding that item, coal profits in 1984 declined nine percent despite an increase of 14 percent in revenues and sales volumes. The revenue increase reflected general increases in domestic coal consumption by electric utilities and their stockpiling of coal during the first nine months of 1984 in anticipation of a national UMWA strike which did not occur. The benefits of the increased revenues were more than offset by higher operating costs and the effects of an 11-week UMWA local strike at the Empire mine.

Metals

Metals operations lost $6.8 million on revenues of $107.1 million in the second half of 1985 compared with losses of $26.6 million on revenues of $75.7 million in the first half. The increase in revenue primarily reflects a 65 percent increase in copper sales as first half sales were limited during the build up of an inventory pipeline after the Bagdad copper mine returned to full capacity in January 1985. The mine had been shut down from February to October 1984 due to low copper prices. The improvement in operating profit was due to increased sales volumes, lower unit costs at Thompson Creek and second half gains of $8.1 million resulting from the sale of the Pima ore body and the Mungana gold property. Also included in the first half was a loss of $6.9 million for the operation and sale of the Northumberland gold property. Second half operating profits also benefited from lower depreciation charges at Bagdad and Thompson Creek due to the asset write-down discussed in Note 2 to the Financial Statements.

Full year 1985 metals operating losses of $33.3 million represented an improvement of $76.1 million over 1984. 1985 revenues of $182.8 million were $74.1 million higher than 1984. These improvements were mainly due to the 1984 shutdown of Bagdad and start-up problems at Thompson Creek. In addition, 1985 operating costs at both Bagdad and Thompson Creek were significantly reduced as a result of various cost cutting programs. 1984 operating results were also adversely affected by a $19.6 million third quarter charge to terminate a high cost smelting and refining contract for Bagdad concentrates, a $9.0 million fourth quarter charge reflecting a downward revision of Northumberland's gold reserves and establishment of reserves totaling $10.2 million relating to certain land, housing and power contracts for various operations.

Metals 1984 revenues were $40.7 million lower than in 1983 and operating losses of $109.4 million in 1984 were $47.8 million worse than in 1983. The lower revenues and higher losses primarily reflect the 1984 Bagdad shutdown, the Thompson Creek start-up problems and the charges discussed above. 1984 revenues did benefit from higher molybdenum sales volumes from the Thompson Creek mine, which began production in December 1983.

Industrial Minerals

Although industrial minerals revenues were essentially flat in both halves of 1985, second half operating profits of $7.6 million represented a $2.4 million improvement over the first half. Most of this improvement was due to lower costs in the talc division. Full year 1985 revenues increased by $4.0 million to $129.2 million and operating profits increased by $1.8 million to $12.9 million. The revenue increase occurred principally in the fine ground industrial minerals, due to higher volumes and improved product mix, despite increased competitive pressures and flat prices. In particular, Cyprus' new line of calcium carbonate for paper filling and coating increased in market share. The improvement in operating profit was also due to lower operating costs in all divisions.

1984 revenues represented an increase of $17.8 million over 1983 and operating profits were $3.5 million higher than 1983. The revenue increase resulted from higher sales volumes for all major products. Sales of fine ground industrial minerals increased 16 percent, reflecting higher shipments to most industrial markets, including the paper, plastics and ceramics industries. Limestone sales showed the largest volume growth due to temporarily stepped up Mississippi River construction activity by the Army Corps of Engineers for navigability and flood control projects. Prices for industrial minerals products were essentially flat. The operating profit improvement also reflected reduced unit

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costs at most operations. Higher volumes provided operating efficiencies and complemented cost-control efforts, which included the installation of new energy-efficient mills at talc processing facilities in Montana and Belgium.

Liquidity and Capital Resources

At December 31, 1985, Cyprus' net working capital was $209.4 million including cash and equivalents of $72.8 million. The ratio of current assets to current liabilities was 3.1 to 1 and long-term debt as a percentage of total capitalization was 16.1 percent.

In connection with the spin-off, Cyprus borrowed $75 million from Chemical Bank while completing arrangements with a group of banks for a $125 million revolving credit facility. Cyprus used $60.5 million of this loan to repay indebtedness to Amoco. In the third quarter of 1985, Cyprus drew $25 million under the revolving credit facility and used these funds as well as currently generated cash flow to repay the Chemical loan. By December 31, 1985, Cyprus had repaid the funds drawn under the revolver so that the entire amount of $125 million was available.

In the second half of 1985, the company acquired certain coal properties which were financed primarily through non-recourse loan arrangements. Debt of approximately $46 million related to these acquisitions is secured only by the acquired properties and is payable from the cash flows of these properties. See Notes 5 and 7 to the Financial Statements.

In late 1985, Cyprus arranged for the sale and operating leaseback of certain coal mining equipment in Kentucky and Colorado. This transaction generated approximately $50 million in cash.

Cyprus' capital expenditures in the last half of 1985 were $20.0 million and 1986 capital expenditures are expected to be less than $50 million. The company expects to generate sufficient funds internally to meet these capital expenditures and to fund operating needs. Additional cash was generated in 1985 and is expected to be generated in 1986 from an asset redeployment program which began in the second half of 1985.

Net funds provided by operations for the full year of 1985 were $135.0 million of which $97.4 million was generated in the second half. 1985 working capital increased by $167.5 million reflecting a build-up in cash and equivalents of $62.8 million, a reduction in current debt of $54.5 million and net working capital of $40.9 million acquired in connection with the coal property purchases.

During 1985, coal sales generated $394.0 million in revenues and $59.9 million in operating profits. In recent years, Cyprus has renegotiated most of its long-term sales contracts. In general, this has led to coal sales contract price reductions, increased contract sales volumes and extensions in the terms of the contracts. In 1985, Cyprus agreed to a price reduction under the Emerald mine long-term coal supply contract with LTV Steel Company, Inc. and entered into a second long-term coal sales contract with LTV for coal produced at Knox Creek. Total 1986 sales volumes under these contracts are estimated to be approximately three million tons and the related revenues and operating profits are expected to be significant in relation to Cyprus' total revenues and profits. Cyprus expects to be able to offset the effects on revenue and profit resulting from the contract sales price reductions by reducing operating costs and increasing sales volumes, in part due to the recent coal acquisitions.

In early 1986, Cyprus offered to purchase up to a total of 500,000 shares of its common stock held by owners of 25 or fewer shares. This offer resulted in the purchase of approximately 490,000 shares.

Common Stock Market Information

Since May 30, 1985, Cyprus Common Stock has been traded over the counter on the NASDAQ National Market System. Its symbol is "CYPM." The range of closing bid quotations for the Common Stock, as reported by NASDAQ, during 1985 by quarters was as follows:

Period	High	Low
2nd Quarter (beginning May 30)	$15¼	$11
3rd Quarter	$15½	$11¾
4th Quarter	$17⅜	$11⅞

The quotations reflect inter-dealer prices without retail mark-ups, mark-downs or commissions and may not necessarily represent actual transactions. The closing sale price per share of the Common Stock on March 10, 1986, as reported by NASDAQ was $18¼.

Cyprus has not yet declared, nor paid, cash dividends. Under the terms of a loan agreement, the company's ability to declare dividends is restricted. See Note 7 to the Financial Statements.

As of March 10, 1986, the number of record holders of Cyprus shares was approximately 116,265.

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Cyprus Minerals Company and Subsidiaries
Supplemental Information

Quarterly Results (Unaudited)

(In thousands)	Revenues	Operating Profit/(Loss)	Net Income (Loss)	Adjusted Net Income (Loss)	Adjusted Net Income (Loss) Per Share
1984–First Quarter	$ 159,989	$ (7,468)	$ (7,819)	$ (18,869)	$ (.72)
–Second Quarter	$ 163,853	$ 1,710	$ (2,977)	$ (10,827)	$ (.41)
–Third Quarter	$ 156,783	$ (19,283)	$ (12,756)	$ (31,027)	$ (1.18)
–Fourth Quarter	$ 137,853	$ (26,186)	$ (21,514)	$ (39,488)	$ (1.51)
1985–First Quarter	$ 145,760	$ 1,146	$ (11,278)	$ (20,900)	$ (.80)
–Second Quarter	$ 150,371	$ (13,412)	$ (10,087)	$ (30,939)	$ (1.18)
–Third Quarter	$ 191,225	$ 22,957	$ 10,582	$ 15,452	$ .59
–Fourth Quarter	$ 218,668	$ 28,779	$(418,253)	$(415,702)	$ (15.84)

See Management's Discussion and Analysis of Results of Operations and Financial Condition on pages 17 to 19 and Notes 1 and 2 to the Financial Statements.

Selected Financial Data

(In thousands except per share amounts)	1985(1)(2)	1984	1983	1982	1981(1)
Statement of Operations Data					
Revenues	$ 706,024	$ 618,478	$ 602,291	$ 625,080	$ 637,230
Operating Income (Loss)	$ 39,470	$ (51,227)	$ (15,905)	$ (69,636)	$ 29,657
Net Income (Loss)	$ (429,036)	$ (45,066)	$ 18,999(3)	$ (26,144)	$ 52,370
Per Share Net (Loss) (4)	$ (17.23)	$ (3.82)			
Statement of Financial Position Data					
Total Assets	$1,136,865	$1,778,322	$1,833,517	$1,782,249	$1,673,987
Long-Term Debt	$ 155,384	$ 165,167	$ 229,986	$ 224,739	$ 277,010
Shareholders' Equity	$ 809,105	$1,130,671	$1,239,173	$1,259,783	$1,124,433

(1) 1985 and 1981 data reflect the acquisitions of coal operations accounted for as purchase transactions. 1981 includes an after-tax gain of $80 million from the sale of Cyprus' interest in Cyprus Anvil Mining Corporation.

(2) 1985 data includes the effect of certain asset write-downs. See Note 2 to the Financial Statements.

(3) Includes a gain of $29.9 million on the disposition of stock. See Note 6 to the Financial Statements.

(4) Per share data has been calculated as if all of the Cyprus shares distributed on July 1, 1985, had been outstanding since January 1, 1984. See Note 1 to the Financial Statements.

Report of Independent Accountants

To the Board of Directors and Shareholders of Cyprus Minerals Company

In our opinion, the accompanying consolidated statement of financial position and the related consolidated statements of operations, of changes in financial position and of shareholders' equity, present fairly the financial position of Cyprus Minerals Company and its subsidiaries at December 31, 1985 and 1984 and the results of their operations and the changes in their financial position for each of the three years in the period ended December 31, 1985, in conformity with generally accepted accounting principles consistently applied. Our examinations of these statements were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Price Waterhouse

Denver, Colorado
February 21, 1986

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Cyprus Minerals Company and Subsidiaries
Consolidated Statement of Operations

(In thousands except per share data)	1985	1984	1983
Revenues	$ 706,024	$ 618,478	$ 602,291
Costs and Expenses			
Cost of Sales and Operating Expenses	499,659	511,881	454,745
Taxes Other than Income	42,895	39,998	40,777
Selling and Administrative Expenses	27,558	29,625	26,676
Depreciation, Depletion and Amortization	88,646	76,586	83,522
Exploration Expenses	7,796	11,615	12,476
Operating Income (Loss)	39,470	(51,227)	(15,905)
Other Income (Expense)			
Interest Income	1,469	1,463	1,420
Interest Expense	(20,514)	(21,749)	(2,821)
Gain on Stock Sale (Note 6)	—	—	29,865
Corporate Overhead and Other	(35,117)	(23,444)	(23,009)
Asset Write-Down (Note 2)	(675,657)	—	—
Loss Before Income Taxes	(690,349)	(94,957)	(10,450)
Income Tax Credits (Notes 2 and 9)	(261,313)	(49,891)	(29,449)
Net Income (Loss) Before Adjustment	(429,036)	(45,066)	$ 18,999
Adjustment (Note 1)	(23,053)	(55,145)	
Adjusted Net Loss	$(452,089)	$(100,211)	
Adjusted Loss Per Share (Note 1)	$ (17.23)	$ (3.82)	
Average Common Shares Outstanding	26,243	26,226	

The accompanying notes are an integral part of these statements.

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Cyprus Minerals Company and Subsidiaries

Consolidated Statement of Financial Position

At December 31

(In thousands except share amounts)	1985	1984
Assets		
Current Assets		
Cash and Equivalents	$ 72,822	$ 10,070
Accounts and Notes Receivable—Net	98,727	72,241
Inventories	126,619	106,283
Prepaid Expenses	13,217	7,432
Total Current Assets	311,385	196,026
Properties—At Cost, Less Accumulated Depreciation, Depletion, Amortization and Write-Downs of $1,052,747 at December 31, 1985 and $328,607 at December 31, 1984	798,120	1,553,078
Investments and Other Assets	27,360	29,218
Total Assets	$1,136,865	$1,778,322
Liabilities and Shareholders' Equity		
Current Liabilities		
Current Portion of Long-Term Debt	$ 6,540	$ 61,042
Accounts Payable	55,902	47,041
Accrued Liabilities	30,070	35,130
Taxes Payable	9,521	10,911
Total Current Liabilities	102,033	154,124
Noncurrent Liabilities and Deferred Credits		
Long-Term Debt	155,384	165,167
Amounts Due Amoco	—	46,032
Deferred Income Taxes	22,008	231,861
Other	48,335	50,467
Commitments and Contingent Liabilities (Notes 8 and 12)	—	—
Total Noncurrent Liabilities and Deferred Credits	225,727	493,527
Shareholders' Equity		
Preferred Stock, $1 Par Value		
Authorized—10,000,000 Shares		
Issued—None		
Common Stock, Without Par Value		
Authorized—50,000,000 Shares		
Issued—26,327,549 Shares	472	1
Paid-in Surplus	1,436,040	1,330,203
Accumulated Deficit	(624,237)	(195,201)
Foreign Currency Translation Adjustment	(3,170)	(4,332)
Total Shareholders' Equity	809,105	1,130,671
Total Liabilities and Shareholders' Equity	$1,136,865	$1,778,322

The accompanying notes are an integral part of these statements.

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Cyprus Minerals Company and Subsidiaries

Consolidated Statement of Changes in Financial Position

(In thousands)	1985	1984	1983
Funds Provided by Operations			
Net Income (Loss)	$(429,036)	$ (45,066)	$ 18,999
Depreciation, Depletion and Amortization	89,353	77,366	84,387
Deferred Income Taxes	(209,853)	32,571	65,204
Asset Write-Down	675,657	—	—
Funds Provided by Operations	126,121	64,871	168,590
Funds Required for Operations			
Capital Expenditures	51,376	68,324	171,859
Net Book Value of Property Dispositions	(74,522)	(28,082)	(19,954)
Businesses Acquired (Note 5)	6,084	—	—
Other—Net	8,230	(6,676)	293
Funds Required for Operations	(8,832)	33,566	152,198
Net Funds Provided by Operations	134,953	31,305	16,392
Financing Activities			
Net Amounts Received from (Paid to) Amoco	58,910	(43,544)	(2,530)
Additions to Long-Term Debt	61,000	300	27,000
Reductions of Long-Term Debt	(87,413)	(65,119)	(21,753)
Net Financing Activities	32,497	(108,363)	2,717
Increase (Decrease) in Working Capital	$ 167,450	$ (77,058)	$ 19,109
Changes in Components of Working Capital			
Cash and Equivalents	$ 62,752	$ (6,422)	$ 4,767
Accounts and Notes Receivable—Net	26,486	19,698	(5,857)
Inventories	20,336	(22,614)	2,302
Prepaid Expenses	5,785	(4,839)	5,302
Current Portion of Long-Term Debt	54,502	(54,483)	(3,629)
Accounts Payable	(8,861)	(87)	17,444
Accrued Liabilities	5,060	(8,731)	(1,942)
Taxes Payable	1,390	420	722
Increase (Decrease) in Working Capital	$ 167,450	$ (77,058)	$ 19,109

The accompanying notes are an integral part of these statements.

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Cyprus Minerals Company and Subsidiaries
Consolidated Statement of Shareholders' Equity

(In thousands)	Common Stock Shares	Common Stock Amount	Paid-In Surplus	Accumulated Deficit	Foreign Currency Translation Adjustment
Balance, December 31, 1982	**26,226**	**$ 1**	**$1,431,096**	**$(169,134)**	**$(2,180)**
Net Income				18,999	
Returns of Capital			(38,301)		
Foreign Currency Translation Adjustment					(1,308)
Balance, December 31, 1983	**26,226**	**1**	**1,392,795**	**(150,135)**	**(3,488)**
Net Loss				(45,066)	
Returns of Capital			(62,592)		
Foreign Currency Translation Adjustment					(844)
Balance, December 31, 1984	**26,226**	**1**	**1,330,203**	**(195,201)**	**(4,332)**
Net Loss				(429,036)	
Contributions to Capital			104,942		
Common Stock Issued for Employees' Savings Plans and Stock Grants	102	471	895		
Foreign Currency Translation Adjustment					1,162
Balance, December 31, 1985	**26,328**	**$472**	**$1,436,040**	**$(624,237)**	**$(3,170)**

The accompanying notes are an integral part of these statements.

Cyprus Minerals Company and Subsidiaries
Notes to Consolidated Financial Statements

Note 1: Summary of Significant Accounting Policies

Distribution of Stock—On July 1, 1985, Amoco Corporation ("Amoco") distributed to holders of Amoco common stock of record as of June 19, 1985, without any consideration being paid by such holders, one share of Cyprus common stock for each ten shares of Amoco common stock held. Approximately 26.2 million shares of Cyprus common stock were thus distributed to Amoco shareholders. As of July 1, 1985, Cyprus ceased to be a wholly-owned subsidiary of Amoco and became a publicly held company.

Principles of Consolidation and Basis of Presentation—The financial statements include the accounts of Cyprus and its more than 50 percent owned subsidiaries. All material intercompany balances and transactions have been eliminated. Certain previously reported amounts have been reclassified to conform to classifications adopted in 1985 and reporting formats have been revised. Investments in 20 percent to 50 percent owned companies are accounted for by the equity method. Other investments are generally carried at cost.

Inventories—Inventories are carried at the lower of current market value or cost. The cost of certain copper inventories is determined under the last-in, first-out (LIFO) method. The costs of coal and the remaining metals inventories are determined on the first-in, first-out (FIFO) method. Industrial minerals and materials and supplies inventories are generally valued on the basis of average costs.

Exploration and Development Costs—Expenditures for exploration are charged against income as incurred. Property acquisition costs and mine development costs incurred to expand capacity of operating mines, develop new ore bodies or develop mine areas substantially in advance of current production are capitalized and charged to operations on the unit-of-production method. Mine development costs related to current production are expensed.

Depreciation, Depletion and Amortization—Property acquisition costs, intangible mine development costs (including certain stripping costs) and certain tangible assets which are expected to be in service for the life of the mine are amortized on the unit-of-production basis. Mobile mining equipment and most other assets are depreciated on a straight-line basis.

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Retirements—Gains or losses upon retirement or replacement of equipment and facilities are credited or charged to income.

Income Taxes—For periods prior to July 1, 1985, Cyprus was included in Amoco's consolidated federal income tax returns. Amoco allocated income taxes and related benefits to each member of the consolidated group on the basis of such member's contribution to the consolidated tax liability. Under this method, Cyprus recorded the benefit of tax deductions and credits which were utilized by Amoco. Investment tax credits are reflected in income as realized.

Adjusted Net Income and Earnings Per Share—In order to report Cyprus' results on a basis which will be comparable with future reporting, 1985 and 1984 net losses have been adjusted to eliminate the federal tax benefits resulting from the inclusion of Cyprus in the consolidated income tax return of Amoco. Accordingly, earnings per share have been calculated based on adjusted earnings and the weighted average number of shares of common stock outstanding. For periods prior to July 1, 1985, the calculation of the average number of shares outstanding assumes that Cyprus common stock distributed by Amoco to its shareholders as of July 1, 1985, had been distributed on January 1, 1984.

Translation of Foreign Currencies—Amounts in foreign currencies are translated into U.S. dollars using the translation procedures specified in FASB Statement No. 52. For application of such procedures, the U.S. dollar has been determined to be the appropriate functional currency for all operations except for the industrial minerals operation in Belgium.

Note 2: Asset Write-Down

Due to the weaknesses in mineral prices, Cyprus re-evaluated its operating plans and its ability to recover the carrying value of certain of its investments. As a result, the company wrote down its investment in certain assets by $675.7 million during the fourth quarter of 1985. After giving effect to the reversal of related deferred tax credits of $243.2 million, this action resulted in a charge against fourth quarter and full year 1985 net income of $432.5 million. The following assets were included in the write-down.

Cyprus adopted a new mining plan at its Thompson Creek molybdenum mine under which approximately 17.5 million tons of molybdenum ore will be mined within the next three years. The remaining ore estimated to approximate 163.3 million tons cannot be economically produced without significant improvement in molybdenum prices. As a result, the company's $398.1 million investment related to this mine was written down to zero.

At anticipated future real copper price levels, Cyprus will not be able to recover its total investment in the Bagdad copper mine. This investment was, therefore, written down by $194.8 million to its estimated realizable value of $189.2 million.

A write-down of $67.9 million was taken on certain undeveloped coal totaling 222.7 million tons in Colorado and Pennsylvania which cannot be economically developed under current and anticipated market conditions.

The company also wrote down its investment in its industrial minerals' barge and other operations to reflect their expected net realizable value. These write-downs totaled $14.9 million.

Note 3: Inventories

Inventories detailed by component and industry segment are summarized below:

	December 31	
(In thousands)	1985	1984
Component		
Ores, Concentrates and Other In-Process Inventories	$ 27,047	$ 35,651
Finished Goods	46,290	26,312
Materials and Supplies	53,282	44,320
Total	$126,619	$106,283
Industry Segment		
Coal	$ 35,261	$ 21,764
Metals	63,587	61,143
Industrial Minerals	27,771	23,376
Total	$126,619	$106,283

All metal inventories, including those for which cost is determined on the last-in, first-out basis, have been valued at market as of each of the dates shown above.

Note 4: Property, Plant and Equipment

	December 31			
	1985		1984	
(In thousands)	Gross	Net	Gross	Net
Coal	$ 701,847	$ 489,800	$ 707,527	$ 580,911
Metals	982,289	209,307	1,020,371	857,998
Industrial Minerals	161,182	95,687	147,247	111,192
Corporate and Other	5,549	3,126	6,540	2,977
	$1,850,867	$ 798,120	$1,881,685	$1,553,078

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Note 5: Business Acquisitions

Cyprus completed two coal acquisitions in 1985. The Plateau Mine in Utah and the Colorado Yampa and Twentymile mines in Colorado were acquired from Texaco, Inc. on August 30. The Knox Creek operations in Virginia were acquired from LTV Steel Company, Inc. and several individual investors on October 1. These acquisitions were accounted for as purchases, and accordingly, the results of operations of the acquired companies have been consolidated from the respective dates of acquisition. Long-term assets acquired consisted of $24.1 million in property, and long-term liabilities assumed included $15.8 million in debt and $2.2 million in other liabilities. In addition, the company acquired $40.9 million in working capital.

If the acquired properties had been included in Cyprus results for the full years of 1985 and 1984 on an unaudited pro forma basis, combined revenues would have been $819.3 and $786.6 million, combined adjusted net loss would have been $436.4 and $93.8 million and combined adjusted loss per share would have been $16.63 and $3.58 for 1985 and 1984, respectively.

Note 6: Related Party Transactions

Through June 30, 1985, transactions with Amoco were considered related party transactions. Amounts due to Amoco were comprised of the following:

(In thousands)	1985	1984	1983
Balance, Beginning of Year	$ 46,032	$ 26,984	$ 13,435
Credit for Income Tax Benefits (Note 1)	(58,869)	(94,404)	(94,215)
(Contributions to) Returns of Capital	(104,942)	62,592	38,301
Distribution of General Electric Company Stock to Amoco	—	—	(52,087)
Cash Advances, Net of Corporate Charges and Credits	117,779	50,860	121,550
Balance, End of Year	$ -0-	$ 46,032	$ 26,984

Advances from Amoco were generally non-interest bearing and fluctuated on a daily basis. In management's opinion, the allocated corporate expenses would not have been materially different on a stand-alone basis.

The shares of General Electric Company stock distributed to Amoco in 1983 were owned by Cyprus Mines Corporation when Cyprus Mines was acquired by Amoco in 1979 and had a cost basis of $22.2 million. The distribution to Amoco was recorded at the fair market value of the stock at the date of distribution and resulted in a non-taxable gain of $29.9 million.

Note 7: Long-Term Debt

The components of long-term debt are summarized below:

	December 31	
(In thousands)	1985	1984
8½% Sinking Fund Debentures, Due 2001	$ 82,000	$ 96,000
8¾% Notes Due January 15, 1985	—	100,000
Various Pollution Control and Industrial Development Revenue Bonds, Due from 2003 through 2013	27,000	27,000
Promissory Notes, Due through 1994 Variable Interest Rate, 10½% at December 31, 1985	16,500	—
Note Payable, Due through 1992, Variable Interest Rate, 10½% at December 31, 1985	15,692	—
Notes Payable, Due 1987 through 1995, Variable Interest Rates, 8.97 to 9.25% at December 31, 1985	14,000	—
Other	6,732	3,209
	161,924	226,209
Less: Current Installments	6,540	61,042
Total Long-Term Debt	$155,384	$165,167

Scheduled maturities of the amounts outstanding as of December 31, 1985, during the next five years are as follows (in millions): $6.5 in 1986, $6.7 in 1987, $5.8 in 1988, $11.9 in 1989 and $12.1 in 1990.

Under its revolving credit agreement, Cyprus can borrow up to $125 million through June 1989, with the available amount declining thereafter in four approximately equal annual amounts and all loans maturing in June 1992. Interest is payable based on the prime rate, the London Interbank Offered Rate or an adjusted certificate of deposit rate, at the company's option. This agreement prohibits Cyprus from paying dividends until 1988 or unless and until consolidated net income (excluding write-downs and certain other items) after July 1, 1985, exceeds $50 million. At December 31, 1985, such income was $29.6 million. At December 31, 1985, the company had no loans outstanding under this revolving credit agreement. Cyprus also has $12 million of credit available for specified capital expenditures and certain other purposes.

The promissory notes and two notes payable are related to the coal acquisitions and are secured only by the acquired properties. See Note 5.

During 1983, gross interest expense was $21.6 million of which $18.8 million was capitalized as part of mine development costs at Thompson Creek. No interest was capitalized in 1985 or 1984.

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Note 8: Leases and Mineral Royalty Obligations

Cyprus leases mineral interests and various other types of properties, including draglines, shovels, longwalls, barges, offices and miscellaneous equipment. Certain of the company's mineral leases require minimum annual royalty payments, whereas others provide only for royalties based on production.

Summarized below as of December 31, 1985, are future minimum rentals and royalties.

(In thousands)	Operating Leases	Mineral Royalties
1986	$ 8,646	$ 11,300
1987	7,455	9,774
1988	6,192	9,175
1989	5,944	8,977
1990	5,806	9,157
After 1990	71,281	147,632
Total	$105,324	$196,015

Rentals and mineral royalties charged to expense were as follows:

(In thousands)	1985	1984	1983
Rental Expense	$ 6,910	$ 6,285	$ 6,688
Mineral Royalties	$17,639	$13,522	$12,556

Note 9: Income Taxes

For periods prior to July 1, 1985, Cyprus was included in Amoco's consolidated federal income tax returns and received benefits from Amoco for consolidated tax savings attributable to Cyprus' tax losses and tax credits. Therefore, there are essentially no net operating loss or investment credit carryforwards available to Cyprus from periods prior to July 1, 1985. Any adjustments to Cyprus' federal taxes for periods prior to July 1, 1985, will be the responsibility of Amoco. Cyprus will file a separate federal income tax return for the period July 1 through December 31, 1985.

The provision for income taxes for 1985 (detailed below) has been calculated separately for the first half and the second half of 1985. However, adjustments to these provisions have been made in the consolidated statement of operations to reflect Cyprus' tax provision as if it had been an independent company.

The provision (credit) for income taxes is composed of:

(In thousands)	1985	1984	1983
Federal–Current	$ (58,569)	$ (94,404)	$ (94,215)
–Deferred	(207,684)	39,259	61,003
State and Other	4,940	5,254	3,763
	$(261,313)	$ (49,891)	$ (29,449)

The aggregate deferred income tax provision (credit) represents the tax effect of the following timing differences between book and tax income:

(In thousands)	1985	1984	1983
Accelerated Depreciation	$ 31,377	$ 45,151	$ 42,411
Capitalized Interest	(1,328)	(1,038)	8,642
Exploration and Development Costs	(2,457)	1,301	15,101
Valuation Reserves–Net	12,054	(6,270)	(5,173)
Asset Write-Down	(243,200)	—	—
All Other	(4,130)	115	22
	$(207,684)	$ 39,259	$ 61,003

The following is a reconciliation between the credit for income taxes and the amount determined by applying the federal statutory rate to loss before income taxes:

(In thousands)	1985	1984	1983
Income Taxes (Credits) at Statutory Rate	$(317,561)	$ (43,680)	$ (4,807)
Increases (Decreases) Resulting from:			
Investment Tax Credits	(5,034)	(4,287)	(7,516)
Excess Percentage Depletion	(8,503)	(11,008)	(9,476)
Nontaxable Gain on Distribution of General Electric Company Stock	—	—	(13,738)
Nondeductible Amortization and Write-Down of Property Costs	70,030	3,483	5,335
Capital Gains Rate Differential	(1,977)	(1,206)	(2,823)
Foreign Operations	1,575	2,135	1,529
State Income Taxes–Net of Federal Benefit	2,532	2,758	1,850
All Other–Net	(2,375)	1,914	197
	$(261,313)	$ (49,891)	$ (29,449)

At December 31, 1985, the company had a federal net operating loss carryforward for tax purposes of $10.2 million and an investment tax credit carryforward for tax purposes of $1.1 million, both of which expire in 2000.

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Note 10: Retirement Plans

Prior to July 1, 1985, Cyprus and its subsidiaries had a number of pension plans covering many of their employees. As of that date, responsibility for most of these plans and for employees retired prior to July 1, 1985, was transferred to Amoco. Cyprus and its subsidiaries then established new plans. Total pension expense for 1985, 1984 and 1983 was $5.8, $3.1 and $5.2 million, respectively. Substantially all of the employees not covered under these new plans are covered under multi-employer plans administered by the United Mine Workers of America. Contributions to these multi-employer pension trusts, based primarily upon tons of coal produced and hours worked, amounted to $2.9, $2.8 and $2.7 million in 1985, 1984 and 1983, respectively.

The actuarial present value of accumulated pension benefits for active employees of Cyprus and its subsidiaries will be determined on a plan termination basis and assets equal to that present value will be transferred to Cyprus from Amoco during 1986. All other benefits, primarily those for employees who retired prior to July 1, 1985, and all other assets, will be retained by Amoco's plans.

Cyprus provides certain medical and life insurance benefits for most retired employees under various plans. Those benefits and similar benefits for active employees are generally provided through insurance companies whose premiums are based on benefits paid during the year. Cyprus expenses the cost of providing those benefits currently. The estimated cost of providing benefits for retirees amounted to $.5 million in 1985 and $.8 million in 1984. As of July 1, 1985, the responsibility for providing these benefits to employees retired prior to that date was transferred to Amoco.

Note 11: Common Stock Plans

Under a stock option plan adopted in 1985, key employees of Cyprus may, from time to time, be granted options to purchase Cyprus common stock at fair market value as of the grant date. These options will be in the form of either incentive stock options, to the extent permitted by applicable tax law, or non-qualified options and may be granted with stock appreciation rights (SARs). SARs permit holders to surrender exercisable options in exchange for a payment, in either shares or cash, determined by the amount by which the market price of the shares on the dates the rights are exercised exceeds the grant price. The plan also permitted the issuance of Cyprus options at other than fair market value to replace outstanding but unexercisable Amoco options that were held by Cyprus employees.

Options granted are typically exercisable in respect of 50 percent of the shares beginning one year from the date of the grant and in respect of the remainder beginning two years from the date of the grant. Unexercised options expire at the end of ten years.

Cyprus also has a restricted stock grant plan under which certain employees may be granted shares of Cyprus common stock. These grants are subject to forfeiture if the recipient fails to remain in the employ of Cyprus during the specified restriction period. No grants were made during 1985 under this plan.

In 1985, options to purchase 538,743 shares of common stock were granted at option prices ranging from $11.44 to $13.56 per share, of which options to purchase 104,713 shares were exercisable at December 31, 1985. No options were exercised, surrendered or terminated during 1985.

The maximum number of shares which may be granted under both the stock option plan and the restricted stock grant plan through June 30, 1990 is 1,315,000, with no more than 131,500 to be issued under the restricted stock grant plan.

Under consulting agreements, Cyprus has granted an option to purchase 23,100 shares to one of its directors and has made restricted stock grants totaling 30,800 shares to two of its directors.

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Note 12: Contingent Liabilities

Consolidated litigation is pending in the United States District Court for the Eastern District of Kentucky regarding challenges to Cyprus' title to the property constituting a portion of the reserves related to the Mountain Coals operations. To the extent any of the title challenges are successful, Cyprus could lose the right to mine approximately 2,500 acres, which represents about seven percent of the acreage controlled by Mountain Coals, and be required to account for coal previously removed. While Cyprus is unable to predict the outcome of this litigation at this time, based on facts currently known to it Cyprus does not believe that the ultimate resolution of this matter will have any material adverse effect on its financial condition.

Many coal operators in eastern Kentucky, including Cyprus, base their surface mining rights on coal rights acquired under "broad form" deeds. Under these deeds, coal operators acquired title to the coal and rights to mine the coal from land owners who retained all other interests in the land. Kentucky courts have construed the right to mine conveyed by broad form deeds to include the right to mine by any method, including surface mining. Following these court decisions, the Kentucky General Assembly in 1984 enacted a law (HB 32) which creates a presumption that, unless surface mining rights were expressly conveyed, the broad form deed allows the coal operator to use only those methods of mining common when the deed was executed. Should this law be upheld, those mining companies, including Cyprus, whose coal rights were acquired under broad form deeds at a time when large-scale surface mining of coal was not common, may be required to obtain the specific permission of each surface owner before conducting surface mining operations. Although no complaints have been filed against Cyprus under HB 32, Cyprus is an interested party in court proceedings in both Kentucky and federal courts to declare HB 32 unconstitutional. Cyprus also has an ongoing program in eastern Kentucky to obtain surface mining rights from surface owners of those tracts for which surface mining rights have not previously been obtained specifically. Cyprus does not expect current mining plans to be affected.

Note 13: Subsequent Events

On February 18, 1986, Cyprus announced that it had begun negotiations to purchase the Sierrita open-pit mine in southern Arizona from Duval Corporation, a wholly owned subsidiary of Pennzoil Company. Sierrita produces approximately 200 million pounds of copper and 19 million pounds of molybdenum a year. The purchase would include the mine, mill, materials, supplies and in-process inventories at the Sierrita-Esperanza complex and Duval's Mineral Park property at Kingman, Arizona. The purchase is subject to approval by Cyprus' Board of Directors and appropriate regulatory agencies.

Note 14: Information by Industry Segment

Cyprus operates in three principal industry segments—coal, metals and industrial minerals. The financial information prescribed by FASB Statement No. 14 for these industry segments for the three years ended December 31, 1985, is presented in the table below:

(In thousands)	1985	1984	1983
Revenues			
Coal	$ 394,019	$ 381,180	$ 333,950
Metals	182,844	108,768	149,462
Industrial Minerals	129,161	125,188	107,422
Other	—	3,342	11,457
Total	$ 706,024	$ 618,478	$ 602,291
Operating Profit (Loss)			
Coal	$ 59,942	$ 45,855	$ 39,718
Metals	(33,335)	(109,397)	(61,573)
Industrial Minerals	12,863	11,085	7,596
Other	—	1,229	(1,646)
Total	39,470	(51,227)	(15,905)
Corporate Overhead and Other	(33,648)	(21,981)	8,276
Interest Expense	(20,514)	(21,749)	(2,821)
Asset Write-Down	(675,657)	—	—
Loss Before Income Taxes	$ (690,349)	$ (94,957)	$ (10,450)
Identifiable Assets			
Coal	$ 605,294	$ 639,617	$ 646,086
Metals	316,292	950,398	1,014,833
Industrial Minerals	145,513	155,526	145,013
Other	—	180	3,791
Total	1,067,099	1,745,721	1,809,723
Unallocated Corporate Amounts	69,766	32,601	23,794
Total Assets	$1,136,865	$1,778,322	$1,833,517
Capital Expenditures			
Coal	$ 31,882	$ 32,774	$ 26,337
Metals	6,892	16,482	128,056
Industrial Minerals	12,127	18,833	16,997
Corporate and Other	475	235	469
Total	$ 51,376	$ 68,324	$ 171,859
Depreciation, Depletion and Amortization			
Coal	$ 34,958	$ 32,228	$ 43,838
Metals	41,235	34,343	30,558
Industrial Minerals	12,453	10,015	8,966
Corporate and Other	707	780	1,025
Total	$ 89,353	$ 77,366	$ 84,387

During the three years ended December 31, 1985, Cyprus' coal sales to each of two customers exceeded ten percent of total revenues. 1985 total export sales for the company exceeded ten percent of total revenues. Sales information is presented below:

(In thousands)	1985	1984	1983
Georgia Power Company	$ 107,608	$ 126,248	$ 119,367
LTV Steel Company, Inc.	$ 99,461	$ 102,018	$ 83,419
Export Sales	$ 76,954	$ 33,823	$ 19,351

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Cyprus Minerals Company and Subsidiaries
Supplemental Information

Impact of Inflation (Unaudited)

Cyprus' financial statements are expressed in terms of historical cost accounting and thus do not reflect changes in the purchasing power of the dollar caused by inflation. FASB Statement No. 33 requires the reporting of historical cost financial statements adjusted for the effects of specific changes in prices of individual types of assets (current costs).

The following consolidated statement of operations compares operating results as reported in the historical cost financial statements with operating results measured under the current cost method. Net losses in 1985 increased $14.7 million when measured on a current cost basis primarily due to higher depreciation, depletion and amortization expense stated in current cost dollars.

In determining operating results under the current cost method, only the cost of goods sold and depreciation, depletion and amortization expense are adjusted to reflect changes in specific prices. The current cost of inventory and property, plant and equipment are based on estimates derived generally from appropriate externally and internally developed indices. The effect of general inflation on Cyprus' net holding of monetary assets and liabilities is also presented.

Development of inflation-adjusted information involves the use of many assumptions and estimates. The information presented should be viewed in that context and not as a precise indication of the effects of inflation on Cyprus.

Consolidated Statement of Operations Adjusted for Changing Prices for the Year Ended December 31, 1985

(In thousands)	As Reported (Historical Cost)	Adjusted For Specific Prices (Current Costs)
Revenues	$ 706,024	$ 706,024
Costs and Expenses		
Cost of Sales and Operating Expenses	499,659	502,877
Taxes Other Than Income Taxes	42,895	42,895
Selling and Administrative Expenses	27,558	27,558
Depreciation, Depletion and Amortization	88,646	99,878
Exploration Expenses	7,796	7,796
Operating Income (Loss)	39,470	25,020
Other Income (Expense)		
Interest Expense	(20,514)	(20,514)
Corporate and Other	(33,648)	(33,941)
Asset Write-Down	(675,657)	(675,657)
Loss Before Income Taxes	(690,349)	(705,092)
Income Taxes (Credits)	(261,313)	(261,313)
Net Loss	$(429,036)	$(443,779)
Unrealized Gain from Decline in Purchasing Power of Net Amounts Owed		$ 13,493
Increase in Specific Prices (Current Cost) of Inventory and Property, Plant and Equipment Held During the Year		$ 70,719
Increase Due to General Inflation		331,278
Difference Between Increase in Specific Prices and the Increase Due to General Inflation		$(260,559)

*At December 31, 1985, current cost of inventory was $123,401 and current cost of property, plant and equipment was $872,058.

Five-Year Comparison of Selected Financial Information Adjusted for Effects of Changing Prices Stated in Average 1985 Dollars

(In thousands, except as noted)	1985	1984	1983	1982	1981
Revenues					
—As Reported	$ 706,024	$ 618,478	$ 602,291	$ 625,080	$ 637,230
—Adjusted for General Inflation	$ 706,024	$ 640,545	$ 650,329	$ 696,647	$ 753,728
Net Income (Loss)					
—As Reported	$(429,036)	$ (45,066)	$ 18,999	$ (26,144)	$ 52,370
—Current Costs	$(443,779)	$ (63,434)	$ 265	$ (46,107)	$ 39,232
Net Assets at Year-End					
—As Reported	$ 809,105	$1,130,671	$1,239,173	$1,259,783	$1,124,433
—Current Costs	$ 879,824	$1,375,850	$1,499,966	$1,521,979	$1,413,036
Difference Between Increase in Specific Prices and Increase Due to General Inflation	$(260,559)	$ (90,978)	$ (82,620)	$ (80,917)	$ (51,210)
Unrealized Gain from Decline in Purchasing Power of Net Amounts Owed	$ 13,493	$ 20,297	$ 17,825	$ 18,287	$ 35,518
Average Consumer Price Index (1967 = 100)	322.2	311.1	298.4	289.1	272.4

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Mineral Reserves and Selected Operating Statistics (Unaudited)

The following table presents proved reserves and the proved and probable reserves of Cyprus as of December 31, 1981-1985 and selected operating statistics for the years then ended. Proved reserves represent those reserves that, under presently anticipated conditions, will be commercially recoverable from known mineral deposits with a high degree of certainty. Proved and probable coal reserves include reserves that are less well defined than proved reserves, but which have been indicated to exist on the basis of geological and engineering data. Reserve estimates were prepared by Cyprus' engineers.

	1985	1984	1983	1982	1981
Coal					
Proved and Probable Reserves (Millions of Tons) (1)	662.4	590.3	582.5	607.0	615.4
Production (Millions of Tons)	9.8	8.9	8.4	8.9	3.6
Average Sales Price (Dollars Per Ton)	$ 34.53	$ 37.07	$ 37.56	$ 35.49	$36.77
Metals (2)(4)					
Proved Ore Reserves					
Copper (Millions of Tons)	417.0	436.0	508.4	528.5	554.2
Average Grade (Percent)	.44	.44	.47	.47	.47
Molybdenum (Millions of Tons)	15.4	185.3	193.1	194.1	193.0
Average Grade (Percent)	.12	.11	.11	.11	.11
Gold (Millions of Tons)	—	.8	8.7	9.6	10.2
Average Grade (Ounces Per Ton)	—	.07	.05	.05	.05
Production					
Copper (Millions of Pounds)	173.5	56.6	171.8	223.4	235.0
Molybdenum (Millions of Pounds)	21.3	11.2	3.1	3.7	4.1
Gold (Thousands of Ounces)	13.7	40.6	22.8	19.7	11.4
Silver (Thousands of Ounces)	625	215	504	713	1,739
Average Market Price* (Dollars Per Pound)					
Copper					
Comex	$ .61	$ .61	$ .72	$ .66	$ .79
Producer Cathode	$ .67	$ .67	$ .77	$ .73	$ .84
Molybdenum	$ 3.25	$ 3.56	$ 3.64	$ 4.10	$ 6.40
Industrial Minerals (3)(4)					
Proved Reserves (Millions of Tons)					
Fine Ground Industrial Minerals	47.7	47.7	45.9	45.4	38.9
Limestone	172.5	176.0	180.0	183.0	185.0
Production (Thousands of Tons)					
Fine Ground Industrial Minerals	1,109	1,087	893	748	975
Limestone	3,501	3,723	2,902	2,523	997
Average Sales Price (Dollars Per Ton)					
Fine Ground Industrial Minerals	$ 103.68	$ 98.99	$ 99.73	$100.52	$93.20
Limestone	$ 5.80	$ 6.04	$ 6.63	$ 7.08	$ 7.24

*Market prices represent annual averages of prices as published in *Metals Week*.

(1) Coal reserve amounts include purchases of reserves in place as follows: 272.8 million tons in 1981, 8.4 million tons in 1984, and 287.6 million tons in 1985. Coal reserves in Pennsylvania and Colorado were reduced by 222.7 million tons in 1985. See Note 2 to the Financial Statements. Undeveloped coal properties adjacent to the Emerald mine acquired on December 31, 1985, have not been included as Cyprus engineers have not as yet gathered data sufficient to determine accurately the amount of reserves.

(2) Metals data reflect the following significant changes in operations during the 1981-1985 period:

- Copper reserve additions at the Bagdad mine totaled 138.4 million tons in 1981 and 55.2 million tons in 1984. Cyprus' investment in the Bagdad mine was written down in 1985. See Note 2 to the Financial Statements. Copper reserves of 123.2 million tons at the Pima and Johnson mines were eliminated in 1984 since they were no longer considered to be commercially recoverable.
- Molybdenum reserves at Thompson Creek were reduced by 163.3 million tons in the fourth quarter of 1985 due to a change in mining plans. See Note 2 to the Financial Statements.
- Remaining gold reserves at Northumberland were sold in 1985.

(3) Fine ground industrial minerals include talc, clay, calcium carbonate and barite. Limestone reserves of 186.0 million tons were acquired in 1981.

(4) Metals and limestone reserve and production data are stated gross and include amounts applicable to minority interests. Metal ore reserves exclude precious metals and molybdenum producible as by-products.

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Board of Directors

John C. Duncan
Chairman of the Board
Former Chairman and Chief Executive Officer of St. Joe Minerals Corporation
Executive, Nominating, Compensation and Benefits Committees
Age 65; Term Expires 1988

Kenneth J. Barr
President and Chief Executive Officer
Executive and Nominating Committees
Age 59; Term Expires 1988

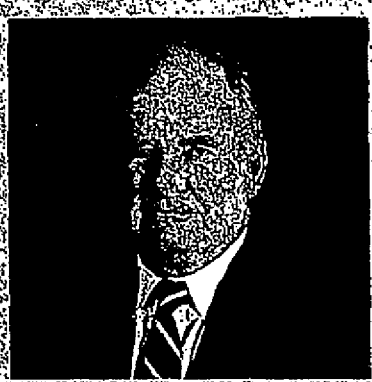
Chester B. Stone, Jr.
Executive Vice President and Chief Financial Officer
Executive Committee
Age 50; Term Expires 1987

Calvin A. Campbell, Jr.
President and Chief Executive Officer of Goodman Equipment Corporation
Audit Committee
Age 51; Term Expires 1988

Kenneth F. Julin
Former President of Cyprus Industrial Minerals Company
Audit Committee
Age 67; Term Expires 1986

James J. Kerley
Former Vice Chairman of Emerson Electric Company
Audit and Executive Committees
Age 63; Term Expires 1988

Michael A. Morphy
President of MorMarketing, Inc.
Compensation and Benefits Committee
Age 53; Term Expires 1987



Frank C. Osment
Former Executive Vice President and Director of Amoco Corporation
Compensation and Benefits Committee
Age 67; Term Expires 1987

Vernon F. Taylor, Jr.
President of Westhoma Oil Company
Compensation and Benefits Committee
Age 70; Term Expires 1986

Philip C. Walsh
Former Vice Chairman of St. Joe Minerals Corporation
Audit Committee
Age 64; Term Expires 1986

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Cyprus Minerals Company Major U.S. Operations

Steam Coal

Colorado Yampa Coal Company
Oak Creek, Colorado

Cumberland Mountain Coal Company
Middlesboro, Kentucky

Empire Energy Corporation
Craig, Colorado

Mountain Coals, Inc.
Buian, Kentucky

Plateau Mining Company
Price, Utah

Straight Creek Resources, Inc.
Stoney Fork, Kentucky

Twentymile Coal Company
Oak Creek, Colorado

Metallurgical and Steam Coal

Emerald Resources, Inc.
Washington, Pennsylvania

Knox Creek Coal Corporation
Grundy, Virginia

Copper

Cyprus Bagdad Copper Company
Bagdad, Arizona

Molybdenum

Cyprus Thompson Creek Mining Company
Challis, Idaho

Talc

Mines:
Yellowstone and Beaverhead
Ennis, Montana

Mills:
Three Forks, Montana
Grand Island, Nebraska

Calcium Carbonate

Thompson, Weinman and Company
Mine and Mill:
Sylacauga, Alabama
Mill: Cartersville, Georgia

Barite

Mine and Mill: Paga, Georgia

Clay

Mines and Mills:
Sandersville, Georgia
Gleason, Tennessee
Aiken, South Carolina

Limestone

Louisiana Limestone Aggregates
Baton Rouge, Louisiana

Harcon Barge Company
Paducah, Kentucky

Three Rivers Rock Company
Smithland, Kentucky

Research and Development

Research Laboratory
Los Angeles, California

Process Engineering Facility
Alpine, Alabama

Stock Trading

Since May 30, 1985, Cyprus Minerals Company has been trading over-the-counter on the National Association of Securities Dealers, Inc. Automated Quotation System. NASDAQ symbol: CYPM

Listed here are the 1985 high and low trade prices by calendar quarters as reported by NASDAQ.

1985	High	Low
2nd quarter (beginning May 30)	16	11
3rd quarter	15⅝	11⅜
4th quarter	17⅝	11⅜

Stock Transfer Agent and Registrar

The Chase Manhattan Bank, N.A. acts as both transfer agent and registrar.

Questions on change of stock ownership, consolidation of accounts, lost certificates, change of address and other such matters should be sent to:

The Chase Manhattan Bank
Stock Transfer Division
One New York Plaza
14th Floor
New York, NY 10081

1985 10-K Report

The company's 1985 Annual Report on Form 10-K is available without charge. Requests should be addressed to Cyprus Minerals Company, Investor Relations, P.O. Box 3299, Englewood, CO 80155.

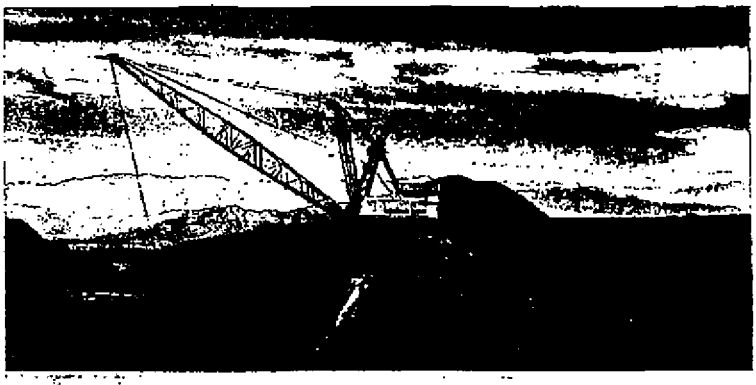
Duplicate Mailings

If there are multiple shareholder accounts registered at the same address, duplicate mailings of annual and quarterly reports can be eliminated. Please write to our stock transfer agent, Chase Manhattan Bank, stating which account should receive reports and which accounts should be suppressed. Mailings of proxy materials will not be affected.

For assistance write to The Chase Manhattan Bank, N.A., Stock Transfer Division, One New York Plaza, 14th Floor, New York, NY 10081.

Affirmative Action

Cyprus policy requires taking affirmative action in the recruiting, hiring, development, promotion, transfer, compensation and training of employees to ensure that equal opportunity is available to everyone regardless of race, creed, religion, national origin, sex or age.



Cyprus Minerals Company
P.O. Box 3299
Englewood, CO 80155

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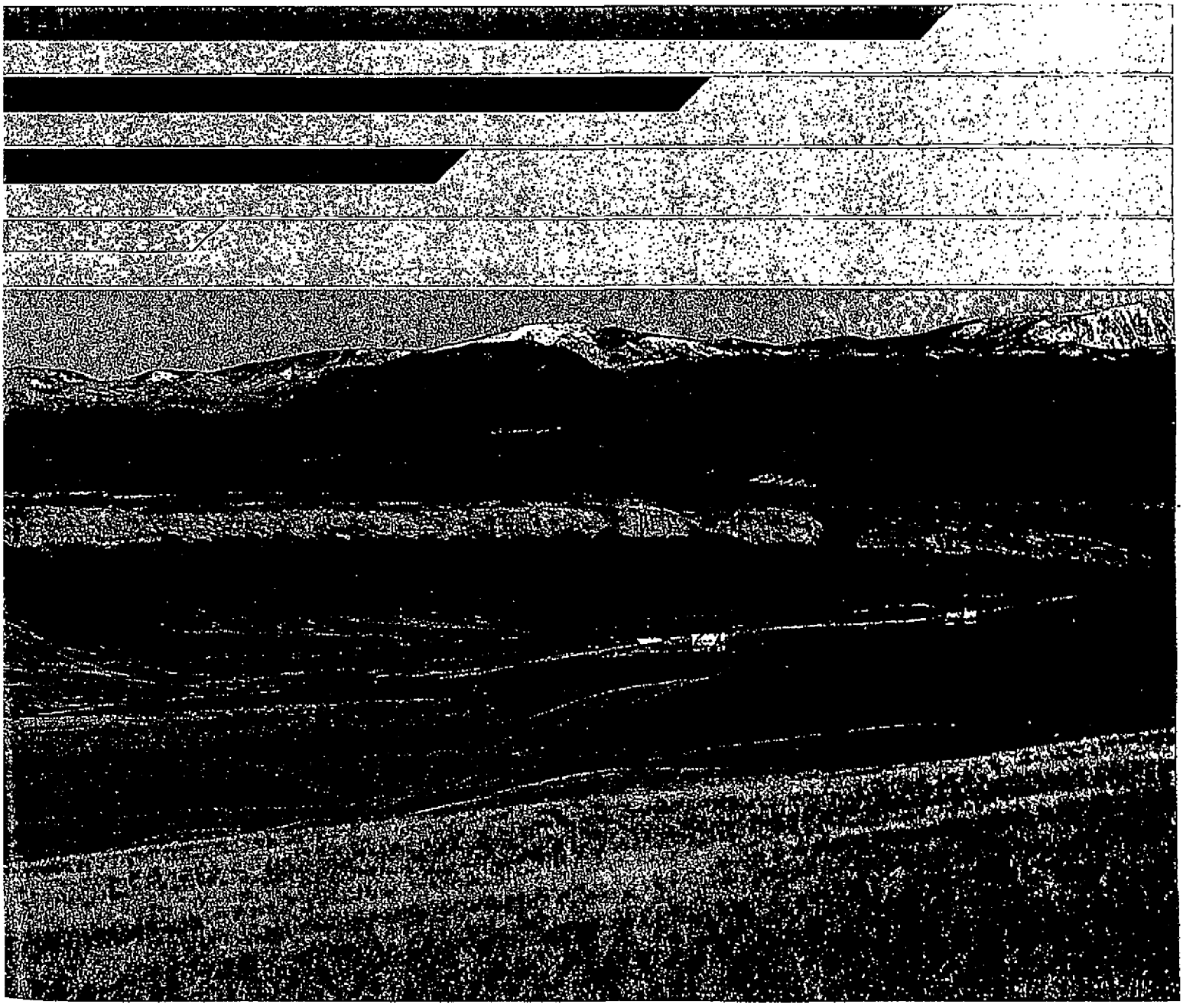
CYPRUS
Minerals Company

1987 ANNUAL REPORT



Corporate Profile

Cyprus Minerals Company conducts its business through Cyprus Metals Company, Cyprus Coal Company, and Cyprus Industrial Minerals Company, and markets its products worldwide.

Cyprus Metals produces gold in Arizona and Australia, copper in Arizona and New Mexico, molybdenum in Arizona and Idaho, and specialty molybdenum products in New Jersey.

Cyprus Coal produces low and medium sulfur steam and metallurgical coal at mines in Colorado, Kentucky, Pennsylvania, Utah and Wyoming.

Cyprus Industrial Minerals produces talc in Montana and Alabama, and calcium carbonate, kaolin, and barite in the southeastern United States. These minerals are used by the paper, paint, ceramics, plastics and cosmetics industries, and are sold in 48 states and 62 countries.

Cyprus Minerals' Goal

Cyprus Minerals' goal is to be a premier mining and minerals company. Cyprus aims to profitably grow internally and through acquisitions to increase shareholder value. Cyprus seeks to be a low-cost producer, a technologically superior mining and processing company, a reliable customer-oriented supplier, an effective marketer of quality mineral products, and a safe and fair employer.

Annual Meeting

April 20, 1988
Wednesday
10:00 am (EDT)

Irving Trust—Main Floor
245 Park Avenue
(Corner of Park & 46th)
New York, New York

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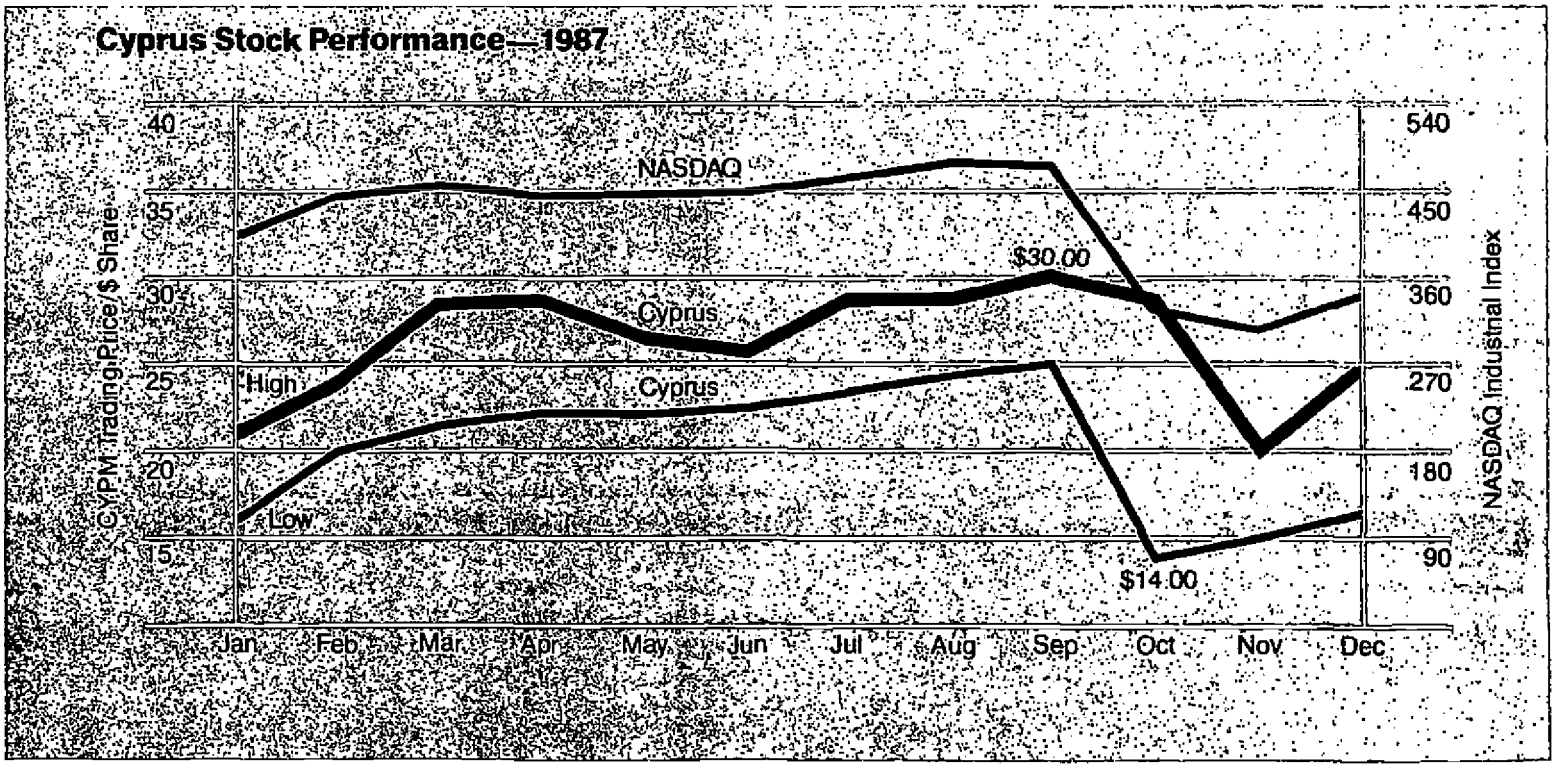
The terms *Cyprus*, *Company*, *we*, *our*, and *its* used in this report may refer collectively to the parent Cyprus Minerals Company and its subsidiaries and affiliates, or to one or more of them, depending upon the context.

This Annual Report was printed on paper containing three products from Cyprus Industrial Minerals Company. The paper was made from pulp in which Mistron® Vapor talc was used as a processing aid. Atomite® calcium carbonate pigments were used as paper filling. The paper coating contains Ultramite® calcium carbonate.

Cover Photo
At Colorado Yampa, Cyprus' coal mine in northwestern Colorado, reclaimed land has been restored to its approximate original contour following surface mining activities. The slopes have been vegetated with grasses that can withstand semi-arid conditions and harsh winters. The coal from Yampa's surface operations has a high BTU and extremely low sulfur content. Most of this coal is delivered to power plants in the Denver metropolitan area.

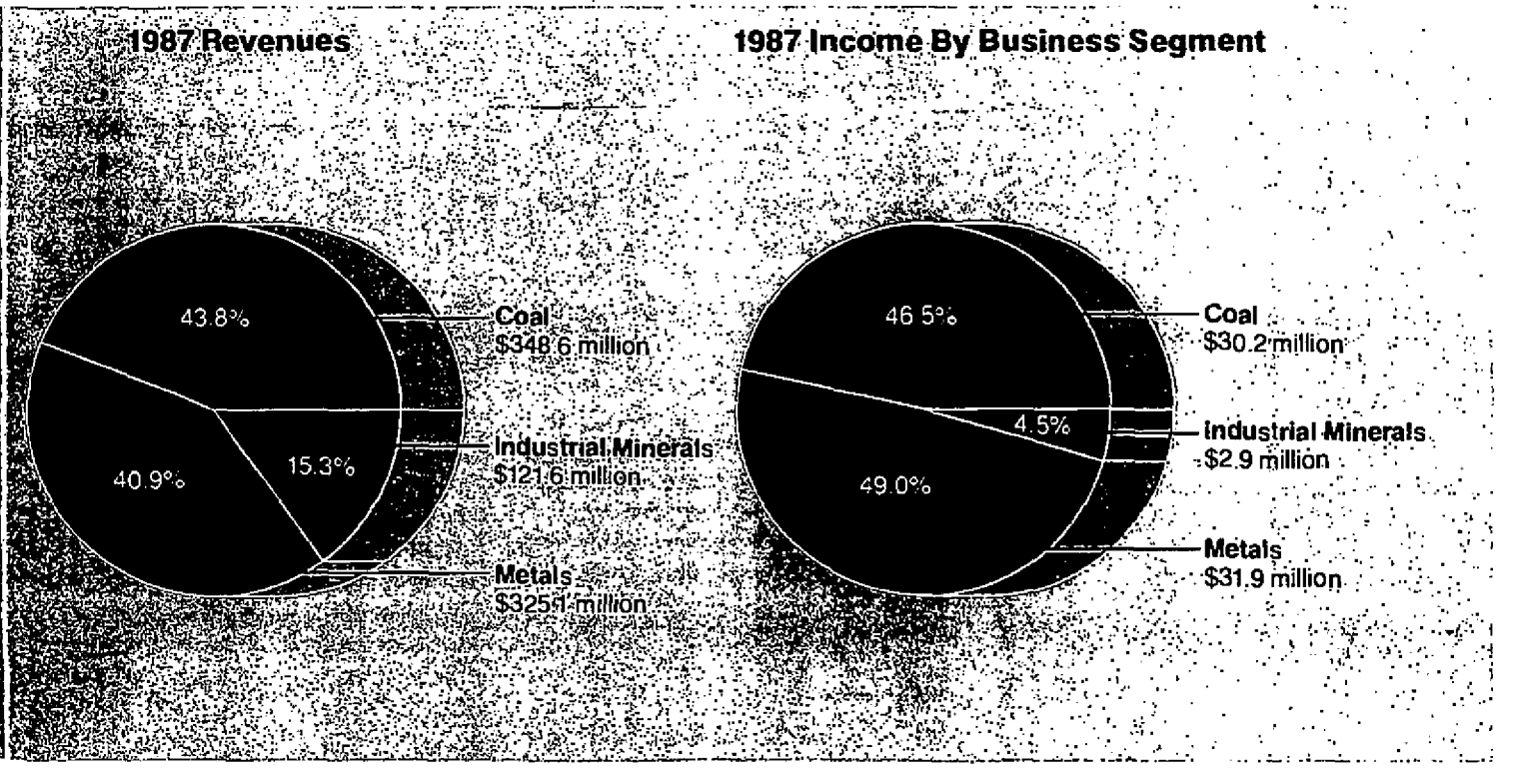


FINANCIAL HIGHLIGHTS

(In thousands except as noted)	1987	1986	1985
Revenues	$ 795,303	$ 810.822	$ 706.024
Segment Income (Loss)			
Coal	$ 30,225	$ 40.682	$ 59.942
Metals	31,895	15.848	(33,335)
Industrial Minerals	2,949	5,520	12.863
Asset Write-Down	—	—	(675.657)
	$ 65,069	$ 62.050	$ (636.187)
Net Income (Loss)	$ 26,156	$ 21,125	$ (452.089)
Earnings (Loss) Per Share	$ 1.02	$ .81	$ (17.23)
Funds Provided by Operations	$ 85,504	$ 79,630	$ 126,121
Capital Expenditures	$ 73,673	$ 42.872	$ 51.376

(For the Year)	1987	1986	1985
Sales:			
Coal (thousand tons)	12,082	13.195	10.755
Copper (million pounds)	336	301	159
Fine Ground Industrial Minerals (thousand tons)	921	924	980

(At December 31)	1987	1986	1985
Working Capital	$ 242,708	$ 234,585	$ 209,352
Total Assets	$1,147,627	$1,106.263	$1.126.408
Long-Term Debt	$ 115,491	$ 114.836	$ 155.384
Net Worth	$ 849,598	$ 816,765	$ 809,105
Book Value Per Share	$ 32.92	$ 32.01	$ 30.73
Current Assets/Current Liabilities	3.5:1	3.4:1	3.3:1
Debt/Capitalization	12.0%	12.3%	16.1%
Shares Outstanding	25,805	25,516	26.328



LEHMAN 00167

CYPRUS SHAREHOLDERS:

Cyprus continued its earnings growth in 1987, in spite of the loss of profits from key coal contracts that added to earnings in 1986. We earned $26.2 million or $1.02 per share in 1987, approximately 25 percent more than in 1986.

Gold mining became a significant new activity during 1987. The Gidgee gold mine in Australia and our Copperstone mine in Arizona began production. Early in 1988 the Sheahan-Grants gold mine in Australia started production, and the Selwyn mine, also in Australia, will begin gold production in March. In addition, we have approved the construction of the Moline mine in Australia, where production could begin by year-end.

We also continued to grow through seizing acquisition opportunities. In 1987 we bought the Shoshone coal mine in Wyoming, the Casa Grande copper mine in Arizona, the Pinos Altos copper mine in New Mexico, and Metec, a producer of specialty molybdenum products, located in New Jersey.

From left to right:

Kenneth J. Barr, President and Chief Executive Officer

John C. Duncan Chairman of the Board

Expansion is continuing in 1988 through the acquisition of Foote Mineral Company, a producer of lithium in the U.S. and Chile. We are also acquiring the Twin Buttes copper mine in southern Arizona, which will complement the operations of our nearby Sierrita copper mine.

Financial Results

Earnings of $26.2 million were based on revenues of $795.3 million. Our financial position remained strong, with working capital of $242.7 million and debt of 12 percent of capitalization. Total assets at the close of 1987 were $1.1 billion. Net worth was $849.6 million. Book value per share was $32.92. The ratio of current assets to current liabilities was 3.5:1. Cyprus' 1987 profits from metals, coal, and industrial minerals were $65.1 million.

Metals

Metals' profits doubled in 1987, reaching $31.9 million. We sold 336 million pounds of copper and 26 million pounds of molybdenum. The Bagdad copper mine is operating at full capacity and Sierrita's production is increasing to take advantage of strong copper prices.

Shrinking supplies of copper caused spot prices to increase from 60 cents a pound in February to over $1.40 in December 1987. Cyprus' participation in this price increase was limited by forward sales of a large amount of second half production. Copper supply-demand fundamentals appear sound, and firm copper prices are expected in 1988.

We expect our copper production to climb to approximately 400 million pounds this year. New production of copper will come from the two properties acquired in 1987 and one being acquired in 1988. Casa Grande, a large oxide copper mine in Arizona, should produce about 10 million pounds of low cost *in situ* leached copper in 1988. Pinos Altos, an underground mine in New Mexico, is expected to produce approximately 3 to 5 million pounds of copper in 1988. The Twin Buttes mine should produce at least 25 million pounds of copper in 1988, after the acquisition is completed.

Molybdenum demand strengthened in late 1987 and early 1988 due to improved conditions in the steel industry. Higher sales in 1988 would allow significant inventory reductions. Our primary molybdenum mine at Thompson Creek is poised to increase production if required by continuing strong demand.

In February 1988 we acquired Newmont Mining Corporation's 82 percent interest in Foote Mineral Company, one of the world's major producers of lithium, used in aluminum smelting, greases, and ceramics, as a metal in high performance batteries, and as an alloying agent in aluminum. The production of this specialty metal will lessen our dependence on volatile commodity metals markets.

Gold

The start-up of gold production in 1987 from the Gidgee mine and the Copperstone mine contributed sufficient income to help offset our precious metals exploration and development expenses. This production, as well as that from the Sheahan-Grants and Selwyn mines, should provide substantial earnings in 1988.

Continued exploration and development drilling is suggesting additional gold deposits in the vicinity of each of our operations. At Copperstone, drilling around and under the current open pit mining area has revealed higher grade ore that may be obtained through underground mining. The addition of underground reserves could significantly increase Copperstone's gold output.

The Moline gold mine, which will be built this year, is expected to produce more than 11,000 ounces a year for Cyprus. Gold production from operating gold mines should increase to more than 130,000 ounces in 1989. In 1988 we will evaluate several promising precious metals prospects in Mexico and the South Pacific.

LEHMAN 00168

Coal
Coal had profits of $30.2 million in 1987, down from 1986 due to the loss of LTV coal contracts which contributed substantially to first half 1986 income. Late last year, we filed a claim for $1.07 billion against LTV Steel and its parent LTV Corporation, for damages from the loss of coal sales contracts. The claim is now subject to negotiation with LTV.

Western coal operations increased profits through higher sales volumes and improved productivity. Operations in the east suffered from depressed coal markets. At our Pennsylvania underground mine, where we are installing new mining equipment to reduce costs, new utility contracts replaced some of the sales lost by LTV's contract cancellation.

In September we acquired the inactive Shoshone mine in Wyoming's coal-rich Hanna Basin. We have reactivated the mine and sold 250,000 tons of coal in the spot market. Recently, we reached an agreement with a midwest utility to sell about 1.3 million tons of coal a year for 14 years.

In 1988 we expect coal markets to continue to be soft as a result of level demand, excess capacity, and pressure on spot markets. Therefore, the profitability of our operations depends upon long-term coal supply contracts and continued cost reductions.

Industrial Minerals
Industrial Minerals' earnings declined to $2.9 million in 1987 from $5.5 million in 1986, due to continued pressure from new producers eroding both our market share and prices. We produce approximately 130 different products from talc, calcium carbonate, and clay for use primarily in the plastics, paper, paint, ceramics, cosmetics, pharmaceutical, automotive and construction industries. This highly competitive business requires high levels of technical service and quality assurance, as well as a continuing emphasis on customer relations and product development.

To counter market erosion from new producers, we realigned our marketing and sales forces, reduced overhead, and are focusing on reducing operating costs and introducing new products to regain market share.

We are expanding the Alabama calcium carbonate facility to produce engineered specialty mineral products. We are also expanding the Ghent, Belgium, talc processing plant to supply growing demand in Europe and the United Kingdom.

In 1988 profitability should improve as a result of new marketing strategies, reduced operating costs, the introduction of new products, and sale of low margin operations such as the Kentucky limestone quarry and barge operations.

Board of Directors
During 1987, we were saddened by the deaths of two of our directors, Frank C. Osment, retired executive vice president of Amoco Corporation, and Kenneth F. Julin, retired president of Cyprus Industrial Minerals Company. Both were close friends of Cyprus and instrumental in building the company that exists today. We miss their vision and counsel.

In December George S. Ansell, President of the Colorado School of Mines, was elected to the Board. As president of one of the premier mining schools in the world, Dr. Ansell will provide knowledge on the latest technological developments in mining and metallurgy, which will aid Cyprus in its efforts to reduce operating costs and improve competitiveness. We look forward to his contribution.

General
Cyprus Minerals Company and a number of other mining companies have dramatically shown what can be done to cut costs to compete worldwide. We have restructured, developed new attitudes, and committed capital to use the latest technology.

We were pleased in 1987 to see recognition by the Administration of the depressed condition of the U.S. molybdenum industry by allowing the usual and customary tariff to be applied to moly imports. But we often are disappointed to see the lack of recognition by all branches of government of the importance of maintaining a strong basic industry, including mining, in this country.

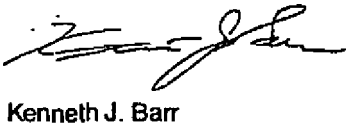
Much of the mining industry, despite great strides, still remains in a precarious position with its future primarily dependent upon the health of U.S. basic industry.

We critically need recognition by government and the people of this nation that basic industry is worth saving and that the entire country—not just individual companies, industries or regions—is competing in a world economy. Legislation or trade agreements, that increase our costs or ignore ways that competing countries assist their industries, should be adopted only after careful consideration of the impact on our basic industries and their competitive position in the world.

Summary
Cyprus' basic strategy of acquiring attractive mining properties, while improving current operations through cost reduction and marketing improvements, remains viable.

We believe that focusing our efforts on this strategy in our core business area—low-cost mineral products for basic industry—is the best means of increasing shareholder value. This remains our primary objective.

John C. Duncan
Chairman



Kenneth J. Barr
President and Chief Executive Officer

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METALS

Cyprus Metals Company's earnings doubled in 1987 because of increased copper prices and increased production. In 1987 Metals had profits of $31.9 million, compared with $15.8 million in 1986.

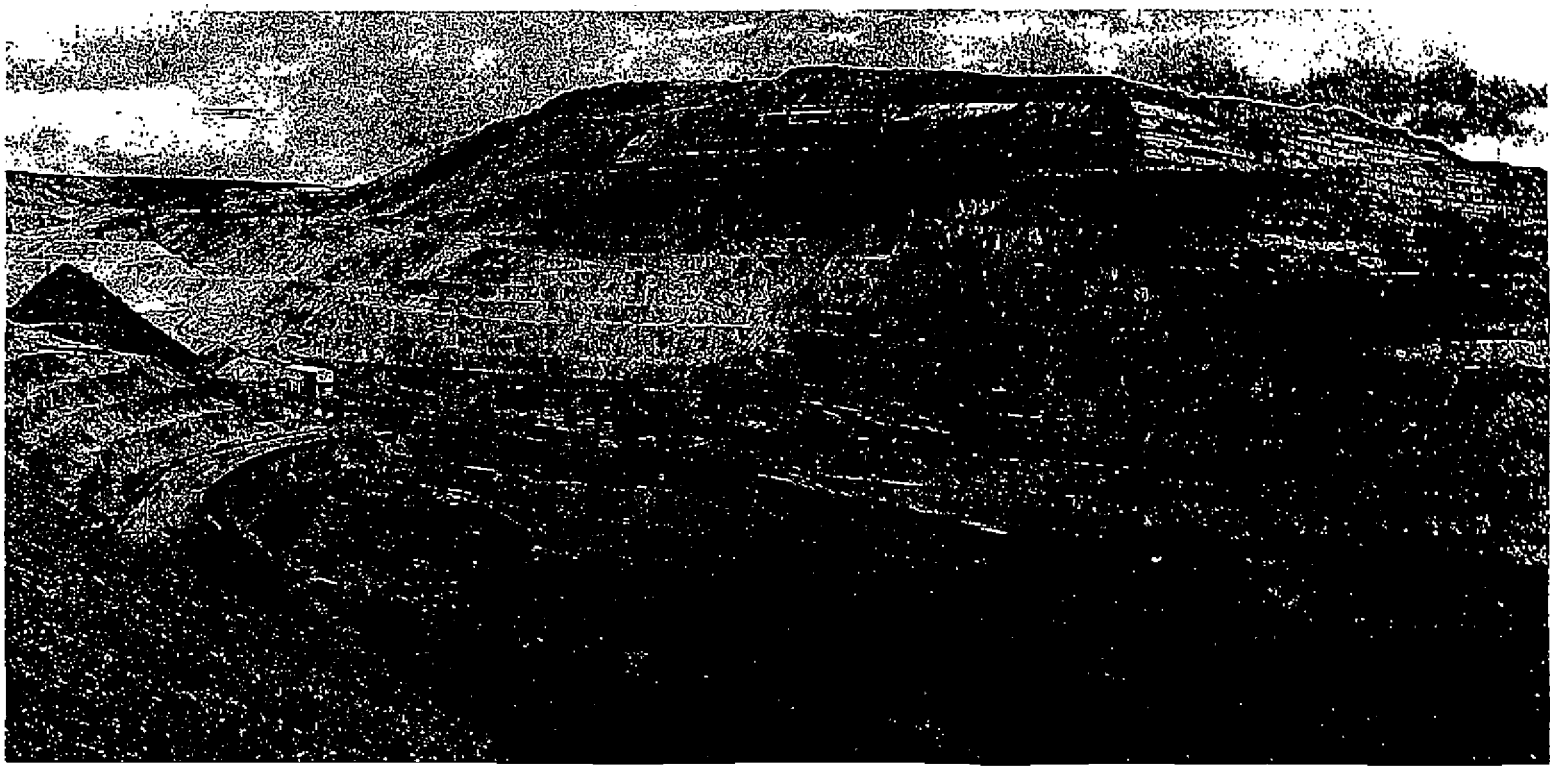
During 1987, copper prices rose to the highest levels in several years. The decision in early spring to sell forward a portion of second half production was made in order to shield the Company from an expected late-year price slump, but prevented us from taking full advantage of rising prices.

In June 1987 we acquired the Lakeshore copper property in Arizona and renamed it Casa Grande. Production from this oxide ore deposit, by means of *in situ* leaching, is expected to reach 10 million pounds of low-cost copper this year. Roaster capacity at Casa Grande is 150,000 tons of copper concentrate annually. This year Casa Grande is expected to process about 40,000 tons of concentrates from Sierrita. By integrating the mine's leaching and roasting operations, Casa Grande is expected to be a low-cost copper producer and to reduce Sierrita concentrate treatment costs. Work will continue to develop *in situ* recovery of additional leachable copper from large deposits on the property.

In September we acquired the Pinos Altos mine near Silver City, New Mexico. In a joint venture with St. Cloud Mining Company, silica flux is now mined and sold to a local smelter. Cyprus expects to produce 3 to 5 million pounds of low-cost copper and some silver at Pinos Altos in 1988. We are also evaluating the gold potential of the mine.

We expect to acquire the Twin Buttes copper mine, located about four miles from the large Sierrita copper operations in southern Arizona. We plan to heap-leach oxide ore and produce low-cost copper at the mine. Twin Buttes' high grade sulfide ore will be transported to the Sierrita mill nearby. Twin Buttes will complement the activities at Sierrita, making each more cost efficient. Copper production from Twin Buttes in 1988 should exceed 25 million pounds.

The molybdenum market, soft during much of 1987, strengthened significantly toward the end of the year, allowing us to increase sales to record levels by aggressive marketing. The co-product Sierrita mine and by-product Bagdad mine are producing molybdenum at



LEHMAN 00170

SALES:	336 million pounds (copper)
REVENUES:	$325.1 million
PROFIT:	$31.9 million
RESERVES:	Copper, 442.6 million tons of ore
	Copper and Molybdenum, 325.7 million tons of ore
EMPLOYEES:	1,730

near capacity. The primary mine, Thompson Creek, is operating at roughly twenty percent of capacity.

Stronger markets in the United States and Europe allowed us to increase our posted producer price for technical grade molybdenum oxide from $3.25 to $3.40 a pound this year. This new price level, plus lower moly costs resulting from capacity production and high copper prices at Bagdad and Sierrita, are expected to result in earnings from molybdenum, while inventories will be reduced.

In March 1987 we acquired the specialty molybdenum business of Metec, Inc. This acquisition has added high value materials to our product lines and increased sales volumes.

We have completed the acquisition of Newmont Mining's 82 percent interest in Foote Mineral Company. We expect to acquire the remaining 18 percent of Foote in the second quarter of 1988 following approval by Foote's shareholders. Foote produces low cost lithium from salt brines recovered from wells located in Nevada and Chile. The acquisition, in addition to providing earnings and cash flow in 1988, adds specialty materials that are less subject to commodity market cycles.

Core drilling in 1987 defined a high-grade beryllium deposit at the Sierra Blanca, Texas, joint venture with Cabot Corporation. Beryllium is a specialty metal used in the electronics and space industries. Feasibility studies indicate that this deposit could be a low-cost beryllium producer. We are investigating markets before proceeding to the mine development stage.

Outlook for 1988

We believe our growth in copper and in specialty metals will continue in 1988, as will sales of molybdenum, bringing further earnings improvement. Cyprus Metals is the fastest growing segment of our business at this time and is well-positioned to capitalize on the current strength of metals markets.

We will continue to pursue acquisition opportunities that promise earnings and cash flow growth for Cyprus.

The Cyprus Bagdad copper mine, located near Bagdad in western Arizona, is expected to produce approximately 180 million pounds of copper this year, part of Cyprus' planned production of 400 million pounds.

LEHMAN 00171

GOLD

During 1987, Cyprus Gold achieved its primary objective of developing its most advanced gold prospects and producing gold at cash costs of about $200 an ounce.

The Gidgee mine in Western Australia began production last April. Cyprus' share of Gidgee's gold production is expected to be about 10,000 ounces a year over the next five years. Cash costs are estimated at $220 an ounce.

In November the first gold was poured at the Copperstone mine in Arizona. The open pit mine is expected to produce 60,000 ounces of gold a year over the next seven years. Cash costs are expected to average $180 an ounce. Exploration is underway to determine the extent of a higher grade underground deposit at Copperstone. The mining of this deposit could add significantly to Cyprus' gold production.

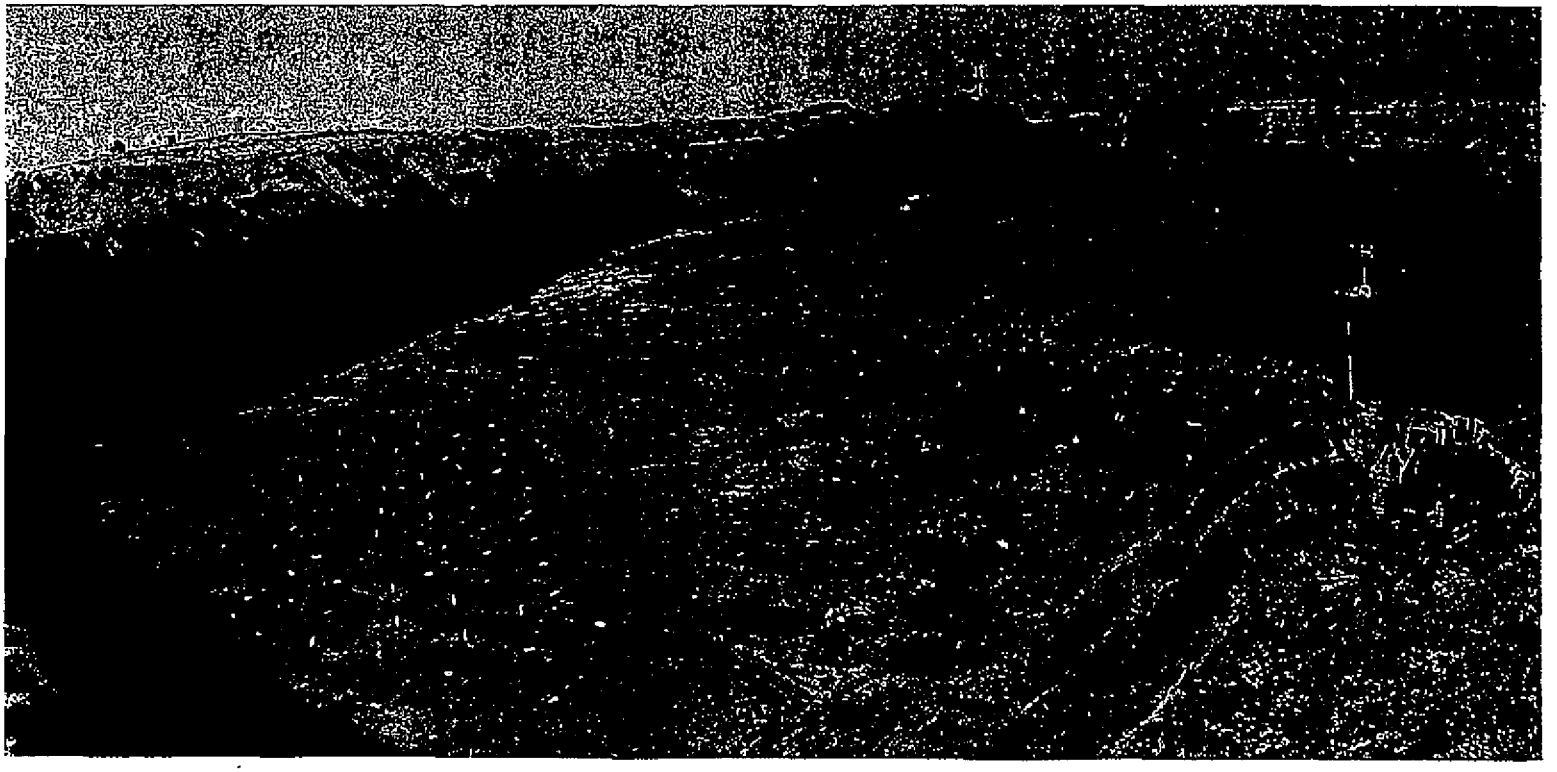
In early January the Sheahan-Grants gold mine, also in Australia, began production and is expected to produce 7,000 ounces a year for Cyprus. Cash costs of $175 an ounce are estimated.

Production is planned to begin during the first quarter of 1988 at the Selwyn mine, another Australian property, which is expected to produce more than 35,000 ounces of gold a year for Cyprus. Cash costs, including credit for by-product copper, are estimated at $150 an ounce. We recently approved construction of the Moline mine in Australia. The mine is expected to provide Cyprus with more than 11,000 ounces a year, when production begins in December 1988.

The Golden Cross property in New Zealand is currently in the mine-permitting stage, with production planned by late 1990. The mine is expected to produce more than 65,000 ounces of gold a year for Cyprus.

Gold properties in the advanced exploration stage include Carlton, German Well, Mount McClure and Forrestania in Australia; Karangahake in New Zealand; and Gold Ridge in the Solomon Islands. Several joint venture precious metals prospects are also being pursued in Mexico.

Gold exploration is underway on approximately 60 prospects in nine countries, including the United States, Mexico, Australia, New Zealand, Canada, Ecuador, Papua New Guinea, French Guiana and the Solomon Islands.



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Outlook for 1988

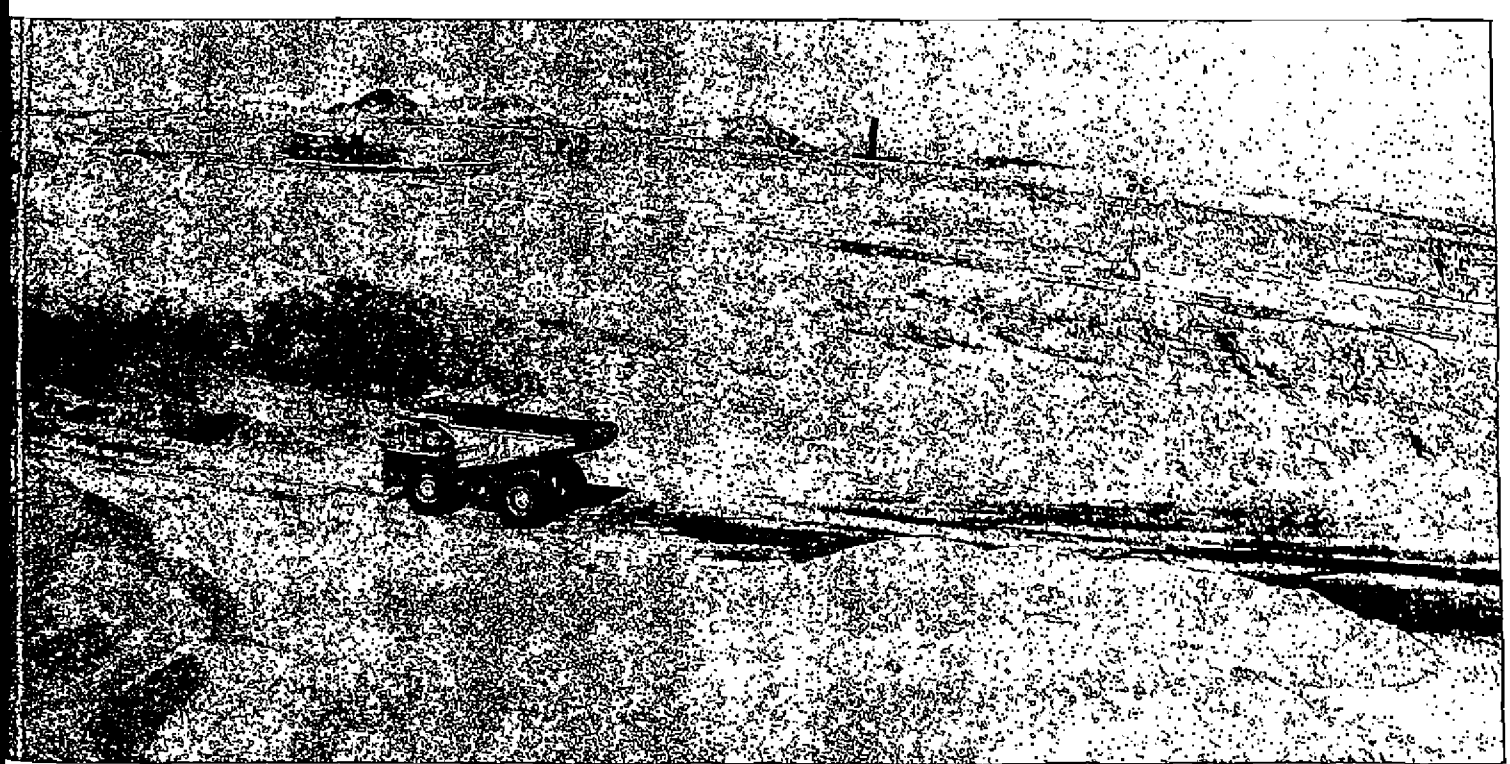
Our gold production was marginally profitable in 1987 after exploration and other expenses, and it is expected to contribute substantially to earnings in 1988, as planned gold production increases to 110,000 ounces.

The growing output of our gold operations in the U.S. and the South Pacific is one of the more important developments since Cyprus became an independent company in 1985.

Cyprus Gold Properties—1988

	Estimated Recoverable Ozs./Grade	Cyprus % Ownership	Cyprus Net Ounces	Estimated Mine Life	Manager/ Operator	Orebody Identified By Cyprus
Mines in Operation						
Gidgee (Australia)	193,000/0.090	26.5	51,000	5 years	Cyprus	Yes
Copperstone (U.S.A.)	446,000/0.083	100.0	446,000	7 years	Cyprus	Yes
Sheahan-Grants (Australia)	110,000/0.080	25.0	28,000	4 years	Other	Yes
1988 "Startups"						
Selwyn (Australia)—March	580,000/0.131	37.5	218,000	6 years	Cyprus	Yes
Moline (Australia)—Dec.	190,000/0.091	25.0	47,000	4 years	Cyprus	Yes
1989 "Possibles"						
Copperstone Underground (U.S.A.)	–	100.0	–	–	Cyprus	Yes
Carlton "Gandy's Hill" (Australia)	–	50.0	–	–	Cyprus	Yes
Forrestania (Australia)	–	22.5	–	–	Other	No
1990-1991 Future Production						
Golden Cross (New Zealand)	840,000/0.167	80.0	605,000	9 years	Cyprus	Yes
Promising Prospects						
German Well (Australia)	–	25.5	–	–	Cyprus	Yes
Mt. McClure (Australia)	–	25.5	–	–	Cyprus	Yes
Gold Ridge (Solomon Islands)	–	40.0	–	–	Cyprus	Yes
Karangahake (New Zealand)	–	Up to 52%	–	–	Cyprus	No

Cyprus' Copperstone gold mine, located near Quartzsite, in western Arizona, is expected to produce 60,000 ounces of gold this year, its first full year of production.



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COAL

Cyprus Coal earned $30.2 million in 1987, down almost $10.5 million from 1986 when we enjoyed a half-year's earnings from contract sales to LTV Steel.

LTV filed for reorganization under Chapter 11 of the U.S. Bankruptcy Code in July 1986, and Cyprus lost two profitable, long-term contracts. Last November we filed a claim against LTV for more than $1 billion for lost future profits under the two contracts.

The Knox Creek mine in Virginia, which could not compete in today's spot coal market after loss of the LTV contract, was sold by Cyprus early in 1987. This sale eliminated approximately $30 million of mine-related debt.

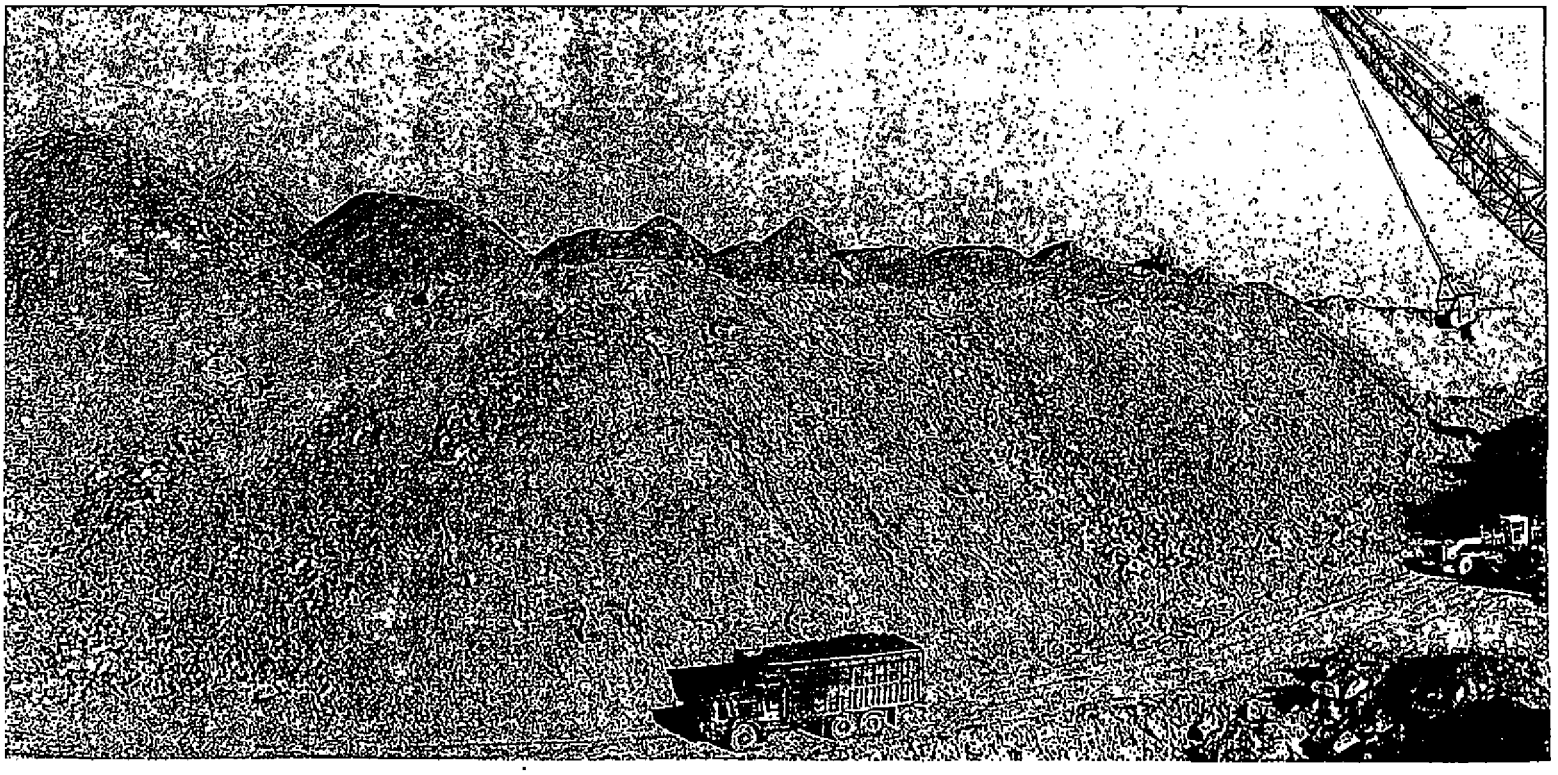
The Emerald mine in Pennsylvania suffered substantial reductions in production and earnings in 1986 as a result of its LTV contract cancellation. But 1987 was a year of recovery for the mine as it reduced costs and replaced lost tonnage mainly with new sales to utilities in the northeast and midwest. These sales will restore Emerald's annual production to about 1.7 million tons of coal in 1988.

A second longwall mining machine is expected to begin operation at Emerald in early 1989. This equipment will enable Emerald to significantly reduce costs and provide customers with a greater variety of coal qualities. The recent settlement of its United Mine Workers' contract ensures a stable labor situation for five years, well into the 1990's.

In 1987 our Kentucky operations encountered higher than expected unit costs caused by lower plant yield, lower productivity, and higher equipment maintenance expense. Despite these disappointments and depressed coal markets, our Kentucky operations were profitable in 1987.

We are restructuring Kentucky coal operations in 1988 to increase productivity and reduce costs. Organizational improvements, improved materials management, and capital projects, such as the $5 million coal preparation plant that went into service in 1987 at Cyprus Straight Creek, should contribute to improved results well into the 1990's.

In western Colorado the Empire mine has completed access to a 10-foot thick coal seam that underlies the present mine, thus providing a long-term low



LEHMAN 00174

SALES:	12.1 million tons
REVENUES:	$348.6 million
PROFIT:	$30.2 million
RESERVES:	824.1 million tons
EMPLOYEES:	2,033

cost reserve for its customers. The Yampa mine is continuing to produce coal from its rapidly depleting low-cost reserves, but the adjacent Twentymile mine is poised to rapidly expand the production of low-cost, low sulfur coal. The Colorado mines are well-positioned for future growth.

At the Plateau mine in Utah, high productivity and low costs contributed to excellent earnings in 1987. Cyprus Plateau is one of the few western mines that exports coal to Asia. We expect to ship approximately 400,000 tons of steam coal to Taiwan in 1988.

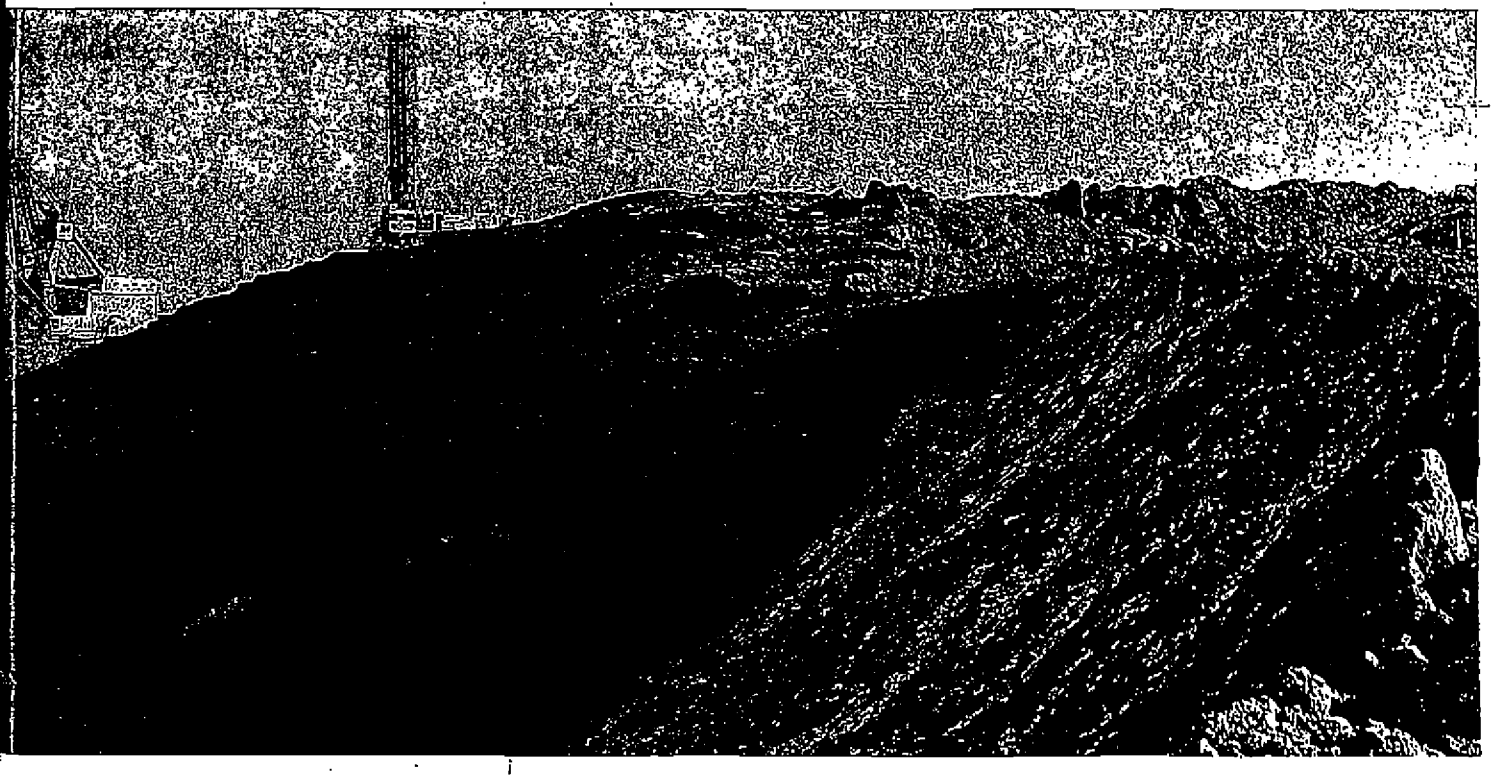
The recently acquired Shoshone underground coal mine near Hanna, Wyoming, contains over 65 million tons of the highest quality low sulfur coal in the west. Customer interest has been high, and to date we have produced 250,000 tons of coal for industrial and utility customers. We also recently reached an agreement with a midwestern utility to supply approximately 1.3 million tons of coal a year for 14 years. Cyprus Shoshone has one of the largest, most productive longwall mining systems in the United States. The mine can be expanded to 3 million tons a year, as demand for this high quality coal increases.

Outlook for 1988

Cyprus Coal earnings for 1988 will decline from 1987 levels due to contract price reductions in Colorado and to higher costs in Utah due to development of a new mining area at Plateau. Offsetting this to some degree are improvements expected in Kentucky and Pennsylvania. We are continuing to reduce costs and aggressively pursue new markets, as well as acquisitions, to return profits to former levels.

Current markets are depressed but we believe Cyprus Coal will continue to produce earnings and cash flow from its long-term contracts. We have excellent coal properties throughout the United States, staffed with quality mining people and superior physical assets. We expect significant growth in the 1990's, when coal markets should improve.

Cyprus Mountain Coals' mines, located near Hazard in eastern Kentucky, are expected to produce 3.5 million tons of steam coal this year using the mountain top removal method, which employs the large dragline in the center of the picture.



I FHMAN 00175

INDUSTRIAL MINERALS

We reorganized the Industrial Minerals Company in 1987 to improve profitability. Although overhead costs were reduced, 1987 profits of $2.9 million were down from $5.5 million in 1986. Further organizational and operations improvements are being implemented to enhance performance.

Cyprus sells talc for use in cosmetics, pitch control in paper making, paint, plastics and a host of other uses. Talc earnings were impacted in 1987 by intense competition, affecting market share and margins. Critical to improvement of talc results is cost reduction. A major step was the installation in 1987 of a mechanical talc sorter at the Yellowstone Mine. This new equipment, invented by Cyprus employees, will cut talc processing costs by eliminating hand sorting. These lower costs provide a solid base for our new aggressive market initiatives in the paper, plastics and paint markets.

Cyprus' Beaverhead underground talc mine in Montana began production in the fall of 1987 and production is expected to begin shortly at the Alpine talc mine in Alabama. High quality talc from these new mines will allow us to improve service to customers in specialty markets, such as cosmetics and pharmaceuticals.

International sales and earnings continue to grow. We are expanding our Ghent, Belgium, talc processing facility to process more talc from Australia, Spain and the United States to meet increased demand from British and European customers.

Facilities at Sylacauga, Alabama, and at Cartersville, Georgia, produce specialty calcium carbonate products for use in paper processing, caulking materials, paint and plastics. Sales continued strong in 1987 but margins were hurt by intense competition due to industry overcapacity.

LEHMAN 00176

SALES:	921,000 tons
REVENUES:	$121.6 million
PROFIT:	$2.9 million
RESERVES:	Fine ground industrial minerals, 57.7 million tons of ore
EMPLOYEES:	1,082

An engineered products facility is being built at Sylacauga to allow us to produce specialty products tailor-made for use by our customers in making plastic automotive panels and grills, large and small appliances, construction materials, packaging and coated papers.

New 1988 sales of calcium carbonate are planned to a major producer of plastic parts for a new generation of American-made passenger vans and to a large manufacturer of plastic grocery bags.

Cyprus' barite plant in Georgia is running at capacity. Sales of our high purity barite, which is used in plastics, paint and rubber, remain strong. Bottlenecks at this facility are being eliminated to increase output.

Clay operations in Tennessee, Georgia, and South Carolina supply the fiberglass, paper and rubber industries. Customers served by our clay products face flat or declining markets due to imports and low growth.

To improve earnings, we are selling our limestone and barge businesses, which have been unprofitable and the source of unexpected costs over the last several years. In 1987 we sold a Nevada diatomaceous earth facility and our half interest in a Vermont calcium carbonate business where growth prospects were limited.

Outlook for 1988

With the disposal of some unprofitable operations, reduced costs, expansion and aggressive marketing, earnings improvements, especially in talc and calcium carbonate, are expected in 1988.

We will concentrate on engineered talc and calcium carbonate specialty products, which have historically provided us with the greatest profitability and growth.

We will also seek to grow in industrial minerals through acquisitions, particularly in talc.

The Cyprus Yellowstone talc mine and the new Beaverhead underground talc mine, both located near Ennis, Montana, provide high purity cosmetic grade talc for application in the cosmetic, pharmaceutical, paper, paint and plastics industries.

I FHMAN 00177

ENVIRONMENT

Cyprus recognizes the need for responsible programs to protect the environment. Minimization of mining impacts on the environment to meet regulatory standards and to win the acceptance of surrounding communities is important. If this is not done, operations and costs will be adversely affected.

The United States Office of Surface Mining usually requires mined land reclamation to recreate the "approximate original contour" of the pre-mining topography. But in southeastern Kentucky, where Cyprus surface-mines coal, the lack of level land suitable for industries, housing, and special wildlife habitats makes alternate reclamation plans desirable.

In 1987 the University of Kentucky and Cyprus Coal Company initiated research aimed at integrating mining, reclamation, and long-term land development to achieve the highest and best use of Cyprus Coal Company's mined land near Hazard, Kentucky. Cyprus is creating scarce flat land through mining.

Cyprus Empire coal mine in northwest Colorado received the Colorado Mining Association's Mined Land Reclamation Award for numerous environmental achievements in 1987. This award is given primarily for timely permitting and completion of reclamation activities.

Environmental assessments and the permitting processes for new gold mining projects were a high priority in 1987. An environmental impact study completed in 1987 for the Golden Cross prospect in New Zealand should cut by a year the permit-processing time for this gold property.

Environmental evaluation of liabilities associated with current activities and acquisitions is critical. Complying with regulatory requirements, correcting historic or current operating practices, disposing of hazardous materials and handling any potential long-term liabilities are important elements of successful operations.

At Cyprus Mountain Coals, located near Hazard, Kentucky, valuable flat land is created in the mountainous areas of eastern Kentucky during the mining process, and revegetated with lespedeza, a soil improving legume.

I FHMAN 00178

SAFETY

Cyprus plans to continue to be a low-cost safe producer. Safety, morale and productivity are inseparable in achieving low operating costs. Providing safe working conditions not only reflects concern for the people who are essential to our success, but also represents good business.

At the Cyprus Thompson Creek molybdenum mine in central Idaho, our employees are continuing a record of no lost-time injury accidents since September of 1986. This record of over 500 days is especially notable since many Thompson Creek employees have undertaken new assignments within the mine or mill as required by the innovative mine plan developed to match production to sales.

In 1987 we recognized an individual safety record achieved by Metals employee, Ray Marquez, a crusher technician who has worked 25 years without a lost-time accident!

The preparation plant and surface crews at Cyprus Emerald coal mine in western Pennsylvania have worked more than 450 days without a lost-time injury accident. They aim to surpass their previous record of 601 days.

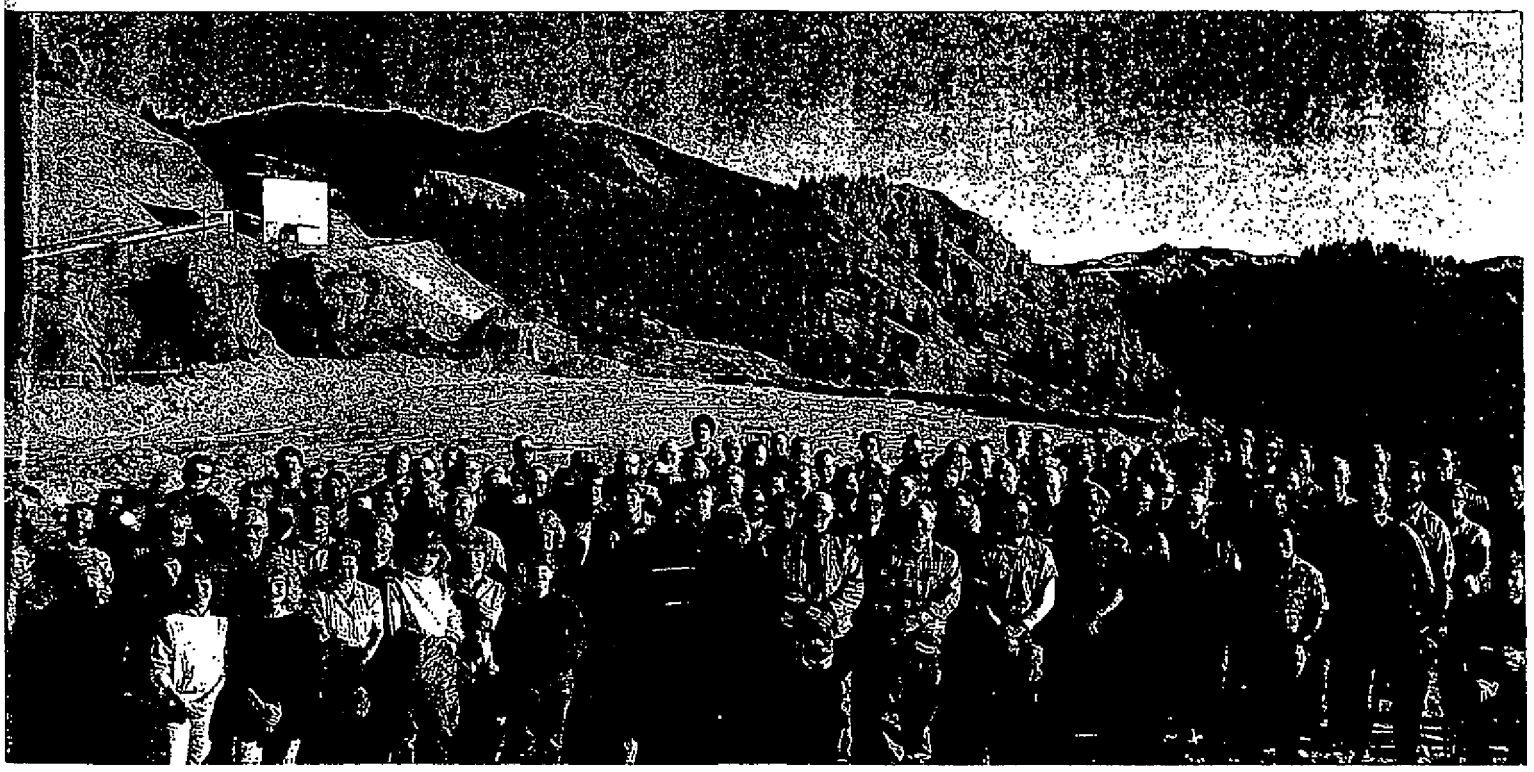
The 31 member surface crew at Cyprus Plateau coal mine in central Utah extended its no lost-time injury work days to 1,323. During this record five-year period, this crew safely negotiated temporary hazards during construction of a $17 million unit train loadout facility.

In 1987 Cyprus Industrial Minerals' calcium carbonate, barite and kaolin operations in Georgia received safety awards from The Mine Health and Safety Administration and the Georgia Mining Association for working a full year without a lost-time accident.

Our Industrial Minerals' talc operations, with over 230 employees at seven facilities in four states, had only three lost-time injury accidents in 1987. Record lost-time injury-free days worked include the South Plainfield, New Jersey mill—4 years; the Alpine, Alabama mill—4 years; the Grand Island, Nebraska mill—2½ years; the Three Forks, Montana mill—3 years; the Alder mine, Montana—6 years; and the Beaverhead mine, Montana—1½ years.

Cyprus is committed to high standards of safety in job performance and facilities maintenance. The safety records listed above attest to our employees' contributions to Cyprus' goal of being the "Safest Low-Cost Producer."

Cyprus Thompson Creek molybdenum mine and mill employees have not suffered a lost-time accident since September 1986.



I FHMAN 00179

MANAGEMENT'S DISCUSSION AND ANALYSIS OF RESULTS OF OPERATIONS AND FINANCIAL CONDITION

Results of Operations for the Three Years Ended December 31, 1987

Cyprus had net earnings of $26.2 million in 1987 compared with earnings of $21.1 million in 1986 and losses of $19.6 million in 1985, excluding a $432.5 million asset write-down taken in the fourth quarter 1985. This write-down is more fully discussed in Note 9 to the Financial Statements. Profits from Cyprus' three major business segments were $65.1 million in 1987 compared with $62.1 million in 1986 and $39.5 million in 1985, excluding the write-down. These are discussed in the segment presentations which follow.

Corporate expenses were $32.2, $32.8 and $54.2 million in 1987, 1986 and 1985, respectively. Expenses in 1987 included a $2.5 million insurance loss on a copper shipment that sank enroute to Japan late in the year. Excluding this charge, expenses decreased $3.1 million because of lower minority interest charges and lower net interest expense. 1986 expenses were lower than 1985 due to a reduction in corporate staff expenses and overhead, and reduced net interest expense. In addition, 1985 expenses included a loss of $11.6 million on the sale of notes receivable obtained in the Cyprus Mines Corporation acquisition in 1979.

Cyprus' summarized financial results for the past three years follow:

(In thousands)	1987	1986	1985
Revenues			
Coal	$348,586	$436,035	$ 394,019
Metals	325,111	250,226	182,844
Industrial Minerals	121,606	124,561	129,161
	$795,303	$810,822	$ 706,024
Segment Income (Loss)			
Coal	$ 30,225	$ 40,682	$ 59,942
Metals	31,895	15,848	(33,335)
Industrial Minerals	2,949	5,520	12,863
Asset Write-Down	—	—	(675,657)
	65,069	62,050	(636,187)
Corporate and Other	(32,210)	(32,763)	(54,162)
Income Tax (Provision) Credit	(6,703)	(8,162)	238,260
Net Income (Loss)	$ 26,156	$ 21,125	$(452,089)

A discussion of the results of operations of Cyprus' principal industry segments follows. This discussion should be read in conjunction with the information by industry segment presented in Note 10 to the Financial Statements and the supplemental information on mineral reserves and selected operating statistics on page 27.

Coal

Coal segment income of $30.2 million in 1987 represents a $10.5 million decline from 1986, and coal revenues of $348.6 million represent an $87.4 million decline from 1986. The loss of long-term supply contracts with LTV Steel Company, Inc. was the most significant factor accounting for these decreases. LTV filed for reorganization under Chapter 11 of the Federal Bankruptcy Code on July 17, 1986. In October 1986, the bankruptcy court allowed LTV to reject two long-term metallurgical coal purchase contracts with Cyprus' Emerald and Knox Creek mines.

Since the bankruptcy filing, Cyprus has been shipping reduced volumes of coal to LTV at prices consistent with current metallurgical coal spot market prices, which are significantly less than prices under the two long-term contracts. The loss of the contracts was responsible for a decrease in coal profits of approximately $40 million in 1987 and approximately $24 million in the second half of 1986. The Knox Creek mine was sold in March 1987 at no gain or loss to Cyprus.

The 1986 results include a reserve of $13.3 million established on receivables of $16.6 million due from LTV. Cyprus' 1987 earnings include $2.1 million for partial collection of those receivables. Cyprus was also allowed to collect $20 million from an escrow account upon LTV's rejection of the contracts in 1986, but these funds were accounted for as a reduction in the Company's investment in the Emerald mine and did not have an impact on 1986 profits.

LEHMAN nn18n

The decrease in 1987 profits at Cyprus' eastern coal mines caused by loss of the LTV contracts was somewhat offset by higher productivity and lower costs at the Emerald mine in Pennsylvania. Despite decreasing realizations in the highly competitive western coal market, Cyprus' western coal operations showed improved results overall in 1987 because of higher sales volumes and increased productivity resulting in lower costs. An exception was the Yampa mine in Colorado, where lower realizations, lower volumes and higher costs combined to reduce profits. Sales realizations for a major coal supply contract at the western mines will decrease in 1988, reducing revenues by about $10 million.

Full year 1986 coal profits of $40.7 million were $19.2 million lower than 1985. The unfavorable impact on 1986 coal profits which resulted from the LTV bankruptcy was somewhat offset by improved profits at the Company's western mines and by higher profits at the Company's Kentucky mines. These improvements reflected the first full year of operations for some of the western mines acquired in late 1985 and lower costs at the Company's western mines and at Mountain Coals' operations in Kentucky. In addition, a workforce reduction at Emerald and several other Cyprus coal mines resulted in a favorable adjustment of $5 million for long-term employee liabilities; principally black lung, which was included in 1986 fourth quarter profits. 1986 coal revenues increased $42.0 million, as the full year revenues from the 1985 coal acquisitions more than offset the loss of revenues from the two cancelled LTV coal contracts and lower prices at the Kentucky operations due to indices adjustments for lower diesel fuel costs.

In November 1987 Cyprus filed a $1.07 billion claim against LTV Steel and The LTV Corporation for damages due to lost profits from the rejected contracts and for unpaid receivables. This claim will be subject to review and approval by the bankruptcy court, and Cyprus is unable to predict the timing or amount of the final settlement.

Metals

Metals operations recorded profits of $31.9 million in 1987 on revenues of $325.1 million, compared with 1986 profits of $15.8 million on revenues of $250.2 million. Higher copper sales volumes and realizations largely account for the increase in revenues and income. Increased copper sales volumes reflect the full-year impact of the Sierrita copper and molybdenum mine which was acquired on March 31, 1986. In addition, production at Sierrita during 1987 was increased in response to improved market conditions for copper.

Tight worldwide supplies of copper drove the New York Commodity Exchange ("Comex") spot price from 60¢ per pound at the beginning of 1987 to $1.46 at the end of the year. Most of this increase occurred in the second half, when the Comex copper price averaged 91¢, compared with a 64¢ average for the first half of 1987, and a 62¢ average for 1986. Cyprus, however, did not benefit fully from the increased market prices due to a copper hedging program. Early in 1987, copper forward sales were made for more than half of Cyprus' sales for the last six months of 1987. Part of 1988 copper production has also been sold forward under this program.

Metals income in 1987 also included gains, before minority interest and taxes, of $3.2 million from the sale of surplus property in Arizona in the third quarter compared with a similar gain of $11.9 million, before minority interest and taxes, in the third quarter of 1986.

Cyprus' gold operations recorded a small profit in 1987, compared with a loss in 1986. In 1987 two gold properties, the Gidgee mine in Australia and the Copperstone mine in Arizona, were placed in operation and produced 10,800 ounces of gold. Profits from these mines, the impact of higher gold prices on existing royalty income, and lower exploration expenses account for most of the improvement. Cyprus expects to continue its gold exploration efforts and begin production from three additional properties in 1988.

In late 1986 Cyprus began a feasibility study of the Sierra Blanca beryllium deposit located in west Texas. The 1987 results included expenses related to this project. Cyprus expects to decide in 1988 whether to exercise its option to purchase the entire prospect and begin development.

1986 Metals profits of $15.8 million represented an improvement of $49.1 million over 1985. 1986 revenues of $250.2 million were $67.4 million higher than 1985. The acquisition of the Sierrita mine in 1986 contributed both to increased earnings and increased revenues. Metals 1986 results also benefited from lower depreciation as a result of the write-downs taken in 1985. 1985 included gains of $8.1 million from the sale of the Pima ore body and the Mungana gold property and a loss of $6.9 million for the operation and sale of the Northumberland gold property.

Industrial Minerals

Industrial Minerals segment income of $2.9 million in 1987 represents a decrease of $2.6 million compared with 1986, with a corresponding decrease of $3.0 million in revenues to $121.6 million.

Earnings from Cyprus' fine-ground minerals declined from 1986 and reflect continued intense competition in most domestic markets. Domestic talc operations account for the largest share of the decline due to a combination of higher costs, lower volumes and lower realizations. Calcium carbonate and barite profits also declined because of lower realizations and higher costs. This has been offset in part by higher sales volumes and higher realizations on European talc sales.

The 1986 results reflected expenses of $1.1 million associated with the reorganization of Industrial Minerals, including costs of relocation and workforce reduction, and provisions totaling about $3.0 million for several unusual items, including litigation involving a 1982 barge accident and the write-down of certain inventories.

LEHMAN 00181

Full year 1986 revenues decreased from 1985 by $4.6 million and profits decreased by $7.3 million to $5.5 million. The variance was attributable to increased competition which resulted in lower volumes and margins in most of Industrial Minerals' product lines and to the loss of a major limestone customer.

Liquidity and Capital Resources

At December 31, 1987 Cyprus' net working capital was $242.7 million of which $8.4 million was cash and equivalents, the ratio of current assets to current liabilities was 3.5 to 1 and debt as a percentage of total capitalization was 12.0 percent. Comparable items at December 31, 1986 were: working capital, $234.6 million; cash and equivalents, $60.2 million; current ratio, 3.4 to 1; and debt to capitalization, 12.3 percent.

In May 1987 Cyprus signed a new agreement for a revolving credit facility with a group of banks under which the Company can borrow up to $150 million through April 1991, with the available amount declining thereafter in four equal annual amounts, and all loans maturing in May 1994. This new facility replaced a $125 million facility. At December 31, 1987 the entire amount of $150 million was available.

During the first quarter of 1986, Cyprus completed the acquisition of the Sierrita copper and molybdenum mine complex and the Mineral Park property in Arizona. Cyprus arranged long-term non-recourse financing related to this acquisition which allows Cyprus to borrow up to $40 million based upon and secured by the receivables and inventories of Sierrita. No such borrowings have been made to date.

In December 1987 Cyprus agreed in principle to acquire Foote Mineral Company for approximately $90 million and the assumption of certain debt obligations. In February 1988 Cyprus acquired Newmont Mining Corporation's 82 percent interest in Foote and expects to complete the acquisition during the second quarter of 1988. The acquisition is being financed by a combination of cash and borrowing under Cyprus' credit facilities.

Cyprus' capital expenditures in 1987 were $73.7 million. Capital expenditures in 1988 are expected to be at approximately the same level. The Company expects to generate sufficient funds internally to meet its capital expenditures and to fund operating needs.

Net funds provided by operations were $9.0 million in 1987 compared with $63.5 million in 1986. The decrease reflected the absence of collection of the $20 million escrow account in connection with the LTV bankruptcy and higher capital and acquisition spending. In 1987, working capital increased by $8.1 million. Cash and equivalents decreased by $51.9 million principally due to an increase of $60.0 million in non-cash working capital. Inventories increased by $32.7 million, reflecting an increase in copper and molybdenum inventories, offset partly by a reduction in materials and supplies inventories. In addition, accounts and notes receivable increased by $24.5 million from 1986 largely due to higher copper realizations and sales volumes in the 1987 fourth quarter.

In December 1987 the Financial Accounting Standards Board released *Statement of Financial Accounting Standards No. 96, Accounting for Income Taxes*. Cyprus has not yet decided whether it will adopt the new rules in 1988 or 1989 and is unable to estimate the impact of this change.

Report of Independent Accountants

To the Board of Directors and Shareholders of
Cyprus Minerals Company

In our opinion, the accompanying consolidated statement of financial position and the related consolidated statements of operations, of changes in financial position and of shareholders' equity present fairly the financial position of Cyprus Minerals Company and its subsidiaries at December 31, 1987 and 1986 and the results of their operations and the changes in their financial position for each of the three years in the period ended December 31, 1987, in conformity with generally accepted accounting principles consistently applied. Our examinations of these statements were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Price Waterhouse

Denver, Colorado
February 19, 1988

LEHMAN 00182

Cyprus Minerals Company and Subsidiaries

CONSOLIDATED STATEMENT OF OPERATIONS

(In thousands except per share data)	1987	1986	1985
Revenues	**$ 795,303**	$ 810,822	$ 706,024
Costs and Expenses			
Cost of Sales and Operating Expenses	**582,535**	586,649	499,659
Taxes Other than Income	**47,719**	52,765	42,895
Selling and Administrative Expenses	**36,965**	46,227	27,558
Depreciation, Depletion and Amortization	**54,345**	55,516	88,646
Exploration Expenses	**8,670**	7,615	7,796
Asset Write-Down (Note 9)	**—**	—	675,657
Corporate Overhead and Other	**23,491**	21,144	35,117
Total Costs and Expenses	**753,725**	769,916	1,377,328
Other Income (Expense)			
Interest Income	**2,349**	4,475	1,469
Interest Expense	**(11,068)**	(16,094)	(20,514)
Income (Loss) Before Income Taxes	**32,859**	29,287	(690,349)
Income Tax Provision (Credit) (Notes 4 and 9)	**6,703**	8,162	(261,313)
Net Income (Loss) Before Adjustment	**$ 26,156**	$ 21,125	$ (429,036)
Adjustment (Note 1)			(23,053)
Adjusted Net Loss			$ (452,089)
Earnings (Loss) Per Share (Note 1)	**$ 1.02**	$ .81	$ (17.23)
Average Common Shares Outstanding	**25,697**	26,027	26,243

The accompanying notes are an integral part of these statements.

LEHMAN 00183

Cyprus Minerals Company and Subsidiaries

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

At December 31 (In thousands except share amounts)	1987	1986
Assets		
Current Assets		
Cash and Equivalents	$ 8,367	$ 60,246
Accounts and Notes Receivable—Net	112,022	87,508
Inventories	209,378	176,709
Prepaid Expenses	11,810	9,590
Total Current Assets	341,577	334,053
Properties—At Cost, Less Accumulated Depreciation, Depletion, Amortization and Write-Downs of $1,117,873 at December 31, 1987 and $1,077,802 at December 31, 1986	777,236	741,779
Investments and Other Assets	28,814	30,431
Total Assets	$1,147,627	$1,106,263
Liabilities and Shareholders' Equity		
Current Liabilities		
Current Portion of Long-Term Debt	$ 937	$ 2,330
Accounts Payable	48,558	50,635
Accrued Liabilities	39,467	32,357
Taxes Payable	9,907	14,146
Total Current Liabilities	98,869	99,468
Noncurrent Liabilities and Deferred Credits		
Long-Term Debt	115,491	114,836
Deferred Income Taxes	28,780	24,424
Other	54,889	50,770
Commitments and Contingent Liabilities (Notes 8 and 11)	—	—
Total Noncurrent Liabilities and Deferred Credits	199,160	190,030
Shareholders' Equity		
Preferred Stock, $1 Par Value Authorized—10,000,000 Shares Issued—None		
Common Stock, Without Par Value Authorized—50,000,000 Shares Issued 26,353,020 Shares	498	498
Paid-In Surplus	1,436,748	1,436,454
Accumulated Deficit	(577,632)	(603,474)
Foreign Currency Translation Adjustment	153	(1,189)
	859,767	832,289
Less Treasury Stock—547,687 Shares at Cost	(10,169)	(15,524)
Total Shareholders' Equity	849,598	816,765
Total Liabilities and Shareholders' Equity	$1,147,627	$1,106,263

The accompanying notes are an integral part of these statements.

LEHMAN 00184

Cyprus Minerals Company and Subsidiaries

CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION

(In thousands)	1987	1986	1985
Funds Provided by Operations			
Net Income (Loss)	$ 26,156	$ 21,125	$(429,036)
Depreciation, Depletion and Amortization	54,992	56,089	89,353
Deferred Income Taxes	4,356	2,416	(209,853)
Asset Write-Down	—	—	675,657
Funds Provided by Operations	85,504	79,630	126,121
Funds Required for Operations			
Capital Expenditures	73,673	42,872	51,376
Proceeds from Sale/Leaseback	—	—	(50,055)
Collection of LTV Escrow Account	—	(20,000)	—
Net Book Value of Property Dispositions	(10,993)	(7,601)	(28,694)
Businesses Acquired	8,438	154	6,084
Other—Net	5,338	754	12,457
Funds Required for Operations	76,456	16,179	(8,832)
Net Funds Provided by Operations	9,048	63,451	134,953
Financing Activities			
Reductions of Long-Term Debt	(925)	(19,171)	(87,413)
Purchase of Common Stock	—	(19,047)	—
Net Amounts Received from Amoco	—	—	58,910
Additions to Long-Term Debt	—	—	61,000
Net Financing Activities	(925)	(38,218)	32,497
Increase in Working Capital	$ 8,123	$ 25,233	$ 167,450
Changes in Components of Working Capital			
Cash and Equivalents	$(51,879)	$ (2,119)	$ 62,365
Accounts and Notes Receivable—Net	24,514	(11,219)	26,486
Inventories	32,669	50,090	20,336
Prepaid Expenses	2,220	(3,627)	5,785
Current Portion of Long-Term Debt	1,393	4,210	54,502
Accounts Payable	2,077	(5,190)	(8,474)
Accrued Liabilities	(7,110)	(2,287)	5,060
Taxes Payable	4,239	(4,625)	1,390
Increase in Working Capital	$ 8,123	$ 25,233	$ 167,450

The accompanying notes are an integral part of these statements.

LEHMAN 00185

Cyprus Minerals Company and Subsidiaries

CONSOLIDATED STATEMENT OF SHAREHOLDERS' EQUITY

(In thousands)	Common Stock Shares Outstanding	Common Stock Amount	Paid-In Surplus	Accumulated Deficit	Foreign Currency Translation Adjustment	Treasury Stock
Balance, December 31, 1984	**26,226**	**$ 1**	**$1,330,203**	**$(195,201)**	**$(4,332)**	**$ —**
Net Loss				(429,036)		
Contributions to Capital			104,942			
Common Stock Issued for Employees' Savings Plans and Stock Grants	102	471	895			
Foreign Currency Translation Adjustment					1,162	
Balance, December 31, 1985	**26,328**	**472**	**1,436,040**	**(624,237)**	**(3,170)**	**—**
Net Income				21,125		
Common Stock Issued for Employees' Savings Plans and Exercise of Stock Options	199	26	414	(362)		3,523
Purchase of Treasury Shares	(1,011)					(19,047)
Foreign Currency Translation Adjustment					1,981	
Balance, December 31, 1986	**25,516**	**498**	**1,436,454**	**(603,474)**	**(1,189)**	**(15,524)**
Net Income				26,156		
Common Stock Issued for Employees' Savings Plans and Exercise of Stock Options	289		294	(314)		5,355
Foreign Currency Translation Adjustment					1,342	
Balance, December 31, 1987	**25,805**	**$498**	**$1,436,748**	**$(577,632)**	**$ 153**	**$(10,169)**

The accompanying notes are an integral part of these statements.

Cyprus Minerals Company and Subsidiaries

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1: Summary of Significant Accounting Policies

Principles of Consolidation—The financial statements include the accounts of Cyprus and its more than 50 percent owned subsidiaries. All material intercompany balances and transactions have been eliminated. Investments in 20 percent to 50 percent owned companies are accounted for by the equity method.

Distribution of Stock—On July 1, 1985, Amoco distributed to holders of Amoco common stock of record as of June 19, 1985, without any consideration being paid by such holders, one share of Cyprus Minerals Company common stock for each ten shares of Amoco common stock held. Approximately 26.2 million shares of Cyprus common stock were thus distributed to Amoco shareholders. As of July 1, 1985, Cyprus ceased to be a wholly-owned subsidiary of Amoco and became a publicly held company.

Inventories—Inventories are carried at the lower of current market value or cost. The costs of coal and metals inventories are determined on the first-in, first-out (FIFO) method. Industrial minerals and materials and supplies inventories are generally valued on the basis of average costs.

Exploration and Development Costs—Expenditures for exploration are charged against income as incurred. Property acquisition costs and mine development costs incurred to expand capacity of operating mines, develop new ore bodies or develop mine areas substantially in advance of current production are capitalized and charged to operations on the unit-of-production method. Mine development costs related to current production are expensed.

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Depreciation, Depletion and Amortization—Property acquisition costs, intangible mine development costs and certain tangible assets which are expected to be in service for the life of the mine are amortized on the unit-of-production basis. Mobile mining equipment and most other assets are depreciated on a straight-line basis.

Retirements—Gains or losses upon retirement or replacement of equipment and facilities are credited or charged to income.

Income Taxes—Deferred income taxes result from timing differences in the recognition of accounting transactions for tax and financial reporting purposes. The principal timing differences relate to depreciation. Investment tax credits are reflected in income as realized. For periods prior to July 1, 1985, Cyprus was included in Amoco's consolidated federal income tax returns. Amoco allocated income taxes and related benefits to Cyprus on the basis of Cyprus' contribution to the consolidated tax liability. Under this method, Cyprus recorded the benefit of tax deductions and credits which were utilized by Amoco. In December 1987, the Financial Accounting Standards Board released Statement of Financial Accounting Standards (SFAS) No. 96, *Accounting for Income Taxes*. Cyprus has not yet decided whether it will adopt the new rules in 1988 or 1989 and is unable to estimate the impact of this change.

Adjusted Net Income and Earnings Per Share—In order to report Cyprus' 1985 results on a basis which is comparable with subsequent reporting, the net loss for 1985 has been adjusted to eliminate the federal tax benefits resulting from the inclusion of Cyprus in the consolidated income tax return of Amoco. Accordingly, earnings per share have been calculated on adjusted earnings and the weighted average number of shares of common stock outstanding. Prior to July 1, 1985, the calculation of the average number of shares outstanding assumes that Cyprus common stock distributed by Amoco to its shareholders as of July 1, 1985, had been distributed on January 1, 1985.

Translation of Foreign Currencies—Amounts in foreign currencies are translated into U.S. dollars using the translation procedures specified in SFAS No. 52. For application of such procedures, the U.S. dollar has been determined to be the appropriate functional currency for all operations except for an industrial minerals operation in Belgium.

Retirement Plans—In 1987 Cyprus adopted SFAS No. 87, *Employers' Accounting for Pensions*, which requires use of the "projected unit credit" actuarial method for financial reporting purposes. The effects of this change were not material. See Note 6.

Futures Contracts—Gains or losses from futures contracts hedging the prices of mineral products are included in income when the related mineral product is sold. Unrealized gains or losses from open contracts are included in inventory values.

Note 2: Inventories

Inventories detailed by component and industry segment are summarized below:

	December 31	
(In thousands)	1987	1986
Component		
Ores, Concentrates and Other In-Process Inventories	$ 82,436	$ 28,983
Finished Goods	83,229	91,323
Materials and Supplies	43,713	56,403
	$209,378	$176,709
Industry Segment		
Coal	$ 30,216	$ 33,569
Metals	153,173	116,473
Industrial Minerals	25,989	26,667
	$209,378	$176,709

Note 3: Property, Plant and Equipment

(At December 31)	1987		1986	
(In thousands)	Gross	Net	Gross	Net
Coal	$ 689,502	$438,735	$ 660,494	$438,721
Metals	1,025,213	244,839	981,769	205,094
Industrial Minerals	175,289	91,719	172,281	95,607
Corporate and Other	5,105	1,943	5,037	2,357
	$1,895,109	$777,236	$1,819,581	$741,779

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Note 4: Income Taxes

The provision (credit) for income taxes is composed of:

(In thousands)	1987	1986	1985
Federal—Current	$ 1,644	$ 4,137	$ (58,569)
—Deferred	3,933	1,416	(207,684)
State and Other	1,126	2,609	4,940
	$ 6,703	$ 8,162	$(261,313)

The aggregate deferred income tax provision (credit) represents the tax effect of the following timing differences between book and tax income:

(In thousands)	1987	1986	1985
Accelerated Depreciation	$ 19,468	$ 27,817	$ 31,377
Capitalized Interest	(326)	(765)	(1,328)
Exploration and Development Costs	1,198	1,671	(2,457)
Valuation Reserves—Net	(1,840)	(627)	12,054
Asset Write-Down	—	—	(243,200)
All Other	81	99	1,893
Deferred Tax Loss Not Currently Deductible	(14,648)	(26,779)	(6,023)
	$ 3,933	$ 1,416	$(207,684)

The following is a reconciliation between the provision (credit) for income taxes and the amount determined by applying the federal statutory rate (40 percent for 1987 and 46 percent for 1986 and 1985) to income (loss) before income taxes:

(In thousands)	1987	1986	1985
Income Taxes (Credits) at Statutory Rate	$ 13,144	$ 13,472	$(317,561)
Increases (Decreases) Resulting from:			
Excess Percentage Depletion	(11,768)	(9,887)	(8,503)
Alternative Minimum Tax	7,220	—	—
Minimum Tax	—	2,672	—
Nondeductible Amortization and Write-Down of Property Costs and Negative Goodwill	1,037	2,191	70,030
Capital Gains Differential	(1,161)	(2,135)	(1,977)
State Income Taxes—Net of Federal Benefit	196	1,339	2,532
Foreign Operations	1,420	1,287	1,575
Disposed Operations	(1,048)	—	—
Investment Tax Credits	(218)	(1,055)	(5,034)
All Other—Net	(2,119)	278	(2,375)
	$ 6,703	$ 8,162	$(261,313)

For income tax reporting purposes, the Company had a federal net operating loss carryforward of $134.7 million and an investment tax credit carryforward of $2.3 million at December 31, 1987. These carryforwards expire in the years 2000 through 2002.

Note 5: Long-Term Debt

The components of long-term debt are summarized below:

	December 31	
(In thousands)	1987	1986
8½% Sinking Fund Debentures, Due 2001	$ 82,000	$ 82,000
Various Pollution Control and Industrial Development Revenue Bonds, Due from 2003 through 2013	27,000	27,000
Other	7,428	8,166
	116,428	117,166
Less: Current Installments	937	2,330
Total Long-Term Debt	$115,491	$114,836

Scheduled maturities of the amounts outstanding as of December 31, 1987, during the next five years are as follows (in millions): $.9 in 1988, $6.8 in 1989, $6.7 in 1990, $6.6 in 1991, and $6.5 in 1992.

Under its revolving credit agreement, Cyprus can borrow up to $150 million through April 1991, with the available amount declining thereafter in four approximately equal annual amounts, and all loans maturing in May 1994. Interest is payable based on an adjusted base rate, the London Interbank Offered Rate or an adjusted certificate of deposit rate, at the Company's option. This agreement prohibits Cyprus from paying dividends in excess of 50 percent of cumulative consolidated net income (excluding write-downs and certain other items) after July 1, 1985. At December 31, 1987, the Company had no loans outstanding under this revolving credit agreement. Cyprus also has up to $40 million of credit available based upon and secured by the receivables and inventories of Sierrita. No such borrowings have been made to date.

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Note 6: Employee Benefit Plans

Prior to July 1985, Cyprus and its subsidiaries had a number of defined benefit pension plans covering many of their employees. As of that date, responsibility for most of these plans and for employees retired prior to July 1, 1985, was transferred to Amoco. Cyprus and its subsidiaries retained one set of plans and established new plans to replace the plans retained by Amoco. Benefits are based on either the employee's compensation prior to retirement or stated amounts for each year of service with the Company. Cyprus makes annual contributions to these plans in accordance with the requirements of ERISA. Plan assets are invested in equity and fixed income funds.

In 1987, Amoco transferred funds to Cyprus which represented the actuarial present value of accumulated pension benefits for active employees of Cyprus and its subsidiaries who were covered before the spin-off by plans retained by Amoco, determined on a plan termination basis as of June 30, 1985. The liability for all other benefits under those plans, primarily those for employees who retired prior to July 1, 1985, and all other assets, were retained by Amoco.

Effective January 1, 1987, Cyprus adopted SFAS No. 87, *Employers' Accounting for Pensions*. The effect of the 1987 change in accounting was not material. Net annual pension cost included the following components:

(In thousands)	1987
Service cost	$2,396
Interest cost	2,420
Actual loss on plan assets	1,580
Other, net	(4,712)
Net annual pension cost	$1,684

The assumptions used in calculating the cost were an 8 percent discount rate, a 6 percent rate of increase in compensation levels and a 9 percent expected long-term rate of return on assets.

Prior to January 1, 1987, Cyprus accounted for its retirement plans in accordance with Accounting Principles Board Opinion Number 8, *Accounting for the Cost of Pension Plans*. Pension expense in 1986 and 1985 relating to these plans was $1.2 million and $2.9 million, respectively. At January 1, 1986, the actuarial present value of accumulated plan benefits for vested and non-vested individuals totaled $15.1 million and $6.6 million, respectively and net assets available for benefits totaled $28.6 million. The assumed rate of return used in determining annual expense and the actuarial value of accumulated plan benefits was 8 percent.

The following table sets forth the funded status of the plans based on a 9 percent discount rate and a 6 percent rate of increase in compensation levels:

(In thousands)	December 31, 1987
Actuarial present value of benefit obligations:	
Vested benefit obligation	$18,946
Accumulated benefit obligation	$23,800
Projected benefit obligation	$26,779
Plan assets at fair value	31,207
Plan assets in excess of projected benefit obligation	4,428
Unrecognized net gain	(417)
Prior service cost not yet recognized in net annual pension cost	450
Unrecognized transition credit at January 1, 1987	(3,445)
Prepaid pension cost	$ 1,016

Substantially all of the employees not covered under the plans administered by Cyprus are covered under multi-employer defined benefit plans administered by the United Mine Workers of America. Contributions by Cyprus to these multi-employer plans are based primarily upon tons of coal produced and hours worked, and amounted to $2.2, $2.8 and $2.9 million for 1987, 1986 and 1985, respectively.

Cyprus sponsors several defined contribution savings plans covering substantially all of its employees. The Company contributes Cyprus stock in an amount equal to specified percentages of each plan participant's contribution, and the aggregate Company contributions amounted to $3.3, $3.2 and $2.4 million for 1987, 1986 and 1985, respectively.

Cyprus provides certain medical and life insurance benefits for most employees retired after June 30, 1985. Those benefits and similar benefits for active employees are generally provided through insurance companies whose premiums are based on benefits paid during the year. Cyprus expenses the cost of providing these benefits currently.

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Note 7: Common Stock Plans

Under a stock option plan adopted in 1985, key employees of Cyprus may, from time to time, be granted options to purchase Cyprus common stock at fair market value as of the grant date. These options will be in the form of either incentive stock options or non-qualified options and may be granted with stock appreciation rights (SARs). SARs permit holders to surrender exercisable options in exchange for a payment, in either shares or cash, determined by the amount by which the market price of the shares on the dates the rights are exercised exceeds the grant price.

Options granted in 1987 are exercisable two years after the date of grant. Previous grants were typically exercisable in respect of 50 percent of the shares beginning one year from the date of the grant and in respect of the remainder, beginning two years from the date of the grant. Unexercised options expire at the end of ten years.

Cyprus also has a restricted stock grant plan under which certain employees may be granted shares of Cyprus common stock. These grants are subject to forfeiture if the recipient fails to remain in the employ of Cyprus during the specified restriction period. No grants have been made to date under this plan.

The following table summarizes the activity under the stock option plan:

	1987		1986		1985	
	Number of Shares	Option Price Per Share	Number of Shares	Option Price Per Share	Number of Shares	Option Price Per Share
Outstanding at Beginning of Year	793,831	$11.44-$22.69	538,743	$11.44-$13.56	—	—
Granted	242,800	$18.50-$29.38	277,500	$16.19-$22.69	538,743	$11.44-$13.56
Exercised	(282,128)	$11.44-$18.56	(21,912)	$11.83-$13.00	—	—
Cancelled	(22,550)	$13.00-$16.19	(500)	$13.00	—	—
Outstanding at End of Year	731,953	$11.44-$29.38	793,831	$11.44-$22.69	538,743	$11.44-$13.56
Exercisable at End of Year	360,447	$11.44-$22.69	388,820	$11.44-$13.56	104,713	$11.44-$13.00
Available for Grant at End of Year	279,007		499,257		776,257	

Note 8: Contingent Liabilities

Consolidated litigation is pending in the United States District Court for the Eastern District of Kentucky and additional legal challenges are threatened regarding Cyprus' title to the property constituting a portion of the reserves related to the Mountain Coals operations. To the extent any of the title challenges are successful, Cyprus could lose the right to mine several thousand acres currently controlled by Mountain Coals and be required to account for coal previously removed. Although the Company will continue to defend its title to this property, Cyprus faces exposure to claims for substantial damages and possible attempts to obtain an injunction to prohibit the Company from further mining. While Cyprus is unable to predict the outcome of this litigation at this time, based on the facts currently known to it, Cyprus does not believe that the ultimate resolution of this matter will have any material adverse effect on its financial condition.

Note 9: 1985 Asset Write-Down

Due to weaknesses in mineral prices in 1985, Cyprus re-evaluated its operating plans and its ability to recover the carrying value of certain of its investments. As a result, the Company wrote down its investments in the Thompson Creek molybdenum mine, the Bagdad copper mine, certain undeveloped coal properties in Colorado and Pennsylvania, and certain industrial minerals operations by $675.7 million during the fourth quarter of 1985. After giving effect to the reversal of related deferred tax credits of $243.2 million, this action resulted in a charge against fourth quarter and full year 1985 net income of $432.5 million.

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Note 10: Information by Industry Segment

Cyprus operates in three principal industry segments—coal, metals and industrial minerals. Financial information for these segments is presented below:

(In thousands)	1987	1986	1985
Revenues			
Coal	$ 348,586	$ 436,035	$ 394,019
Metals	325,111	250,226	182,844
Industrial Minerals	121,606	124,561	129,161
	$ 795,303	$ 810,822	$ 706,024
Segment Profit (Loss)			
Coal	$ 30,225	$ 40,682	$ 59,942
Metals	31,895	15,848	(33,335)
Industrial Minerals	2,949	5,520	12,863
Asset Write-Down	—	—	(675,657)
	65,069	62,050	(636,187)
Corporate Overhead and Other	(21,142)	(16,669)	(33,648)
Interest Expense	(11,068)	(16,094)	(20,514)
Income (Loss) Before Income Taxes	$ 32,859	$ 29,287	$ (690,349)
Identifiable Assets			
Coal	$ 510,434	$ 505,674	$ 604,980
Metals	491,243	389,285	316,292
Industrial Minerals	141,441	143,087	145,459
	1,143,118	1,038,246	1,066,731
Corporate and Other	4,509	68,017	59,677
Total Assets	$1,147,627	$1,106,263	$1,126,408
Capital Expenditures			
Coal	$ 21,938	$ 27,266	$ 31,882
Metals	44,201	5,352	6,892
Industrial Minerals	7,337	10,189	12,127
Corporate and Other	197	65	475
	$ 73,673	$ 42,872	$ 51,376
Depreciation, Depletion and Amortization			
Coal	$ 31,665	$ 36,251	$ 34,958
Metals	11,726	8,494	41,235
Industrial Minerals	10,954	10,771	12,453
Corporate and Other	647	573	707
	$ 54,992	$ 56,089	$ 89,353

During the three years ended December 31, 1987, Cyprus' coal sales to two customers have exceeded 10 percent of total revenues. Total export sales for the Company exceeded 10 percent of total revenues in each of the three years. Sales information is presented below:

(In thousands)	1987	1986	1985
Georgia Power Company	$ 94,562	$102,547	$107,608
LTV Steel Company, Inc.	$ 11,090	$105,704	$ 99,461
Export Sales	$116,030	$108,056	$ 76,954

Note 11: Leases and Mineral Royalty Obligations

Cyprus leases mineral interests and various other types of properties, including draglines, shovels, longwalls, offices and miscellaneous equipment. Certain of the Company's mineral leases require minimum annual royalty payments, whereas others provide only for royalties based on production.

Summarized below as of December 31, 1987, are future minimum rentals and royalties.

(In thousands)	Operating Leases	Mineral Royalties
1988	$ 8,799	$ 7,697
1989	8,218	7,487
1990	7,779	7,828
1991	7,349	8,186
1992	7,213	7,742
After 1992	55,792	121,686
Total	$95,150	$160,626

Rents and mineral royalties charged to expense were as follows:

(In thousands)	1987	1986	1985
Rental Expense	$12,166	$11,195	$ 6,910
Mineral Royalties	$19,617	$24,888	$17,639

Note 12: Subsequent Events

In December 1987, Cyprus agreed in principle to acquire Foote Mineral Company for approximately $90 million and the assumption of certain debt. In February 1988, Cyprus acquired Newmont Mining Corporation's 82 percent interest in Foote and expects to complete the acquisition during the second quarter of 1988.

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Cyprus Minerals Company and Subsidiaries

SUPPLEMENTAL INFORMATION

Quarterly Results (Unaudited)

(In thousands)	Revenues	Profit (Loss) Before Corporate Expenses	Net Income (Loss)	Net Income (Loss) Per Share
1986—First Quarter	$191,145	$25,343	$12,981	$ .50
—Second Quarter	$219,973	$27,524	$13,523	$ .52
—Third Quarter	$205,811	$ (2,913)	$ (9,492)	$(.37)
—Fourth Quarter	$193,893	$12,096	$ 4,113	$ .16
1987—First Quarter	**$172,134**	**$ 9,403**	**$ 590**	**$ .02**
—Second Quarter	**$179,254**	**$15,745**	**$ 7,040**	**$ .28**
—Third Quarter	**$213,822**	**$17,679**	**$ 8,518**	**$ .33**
—Fourth Quarter	**$230,093**	**$22,242**	**$10,008**	**$ .39**

See Management's Discussion and Analysis of Results of Operations and Financial Condition on pages 14 to 16 and Notes 1 and 9 to the Financial Statements.

Selected Financial Data

(In thousands except per share data)	1987	1986[1]	1985[1][2]	1984	1983
Statement of Operations Data					
Revenues	$ 795,303	$ 810,822	$ 706,024	$ 618,478	$ 602,291
Net Income (Loss)	$ 26,156	$ 21,125	$ (429,036)	$ (45,066)	$ 18,999[3]
Per Share Net Income (Loss)[4]	$ 1.02	$ .81	$ (17.23)	$ (3.82)	
Statement of Financial Position Data					
Total Assets	$1,147,627	$1,106,263	$1,126,408	$1,768,252	$1,823,851
Long-Term Debt	$ 115,491	$ 114,836	$ 155,384	$ 165,167	$ 229,986
Shareholders' Equity	$ 849,598	$ 816,765	$ 809,105	$1,130,671	$1,239,173

(1) 1986 reflects the acquisition of the Sierrita copper/molybdenum mine and 1985 reflects the acquisitions of coal operations.

(2) 1985 data includes the effect of certain asset write-downs. See Note 9 to the Financial Statements.

(3) Includes a gain of $29.9 million on the disposition of a stock investment.

(4) Per share data has been calculated as if all of the Cyprus shares distributed by Amoco at the spin-off on July 1, 1985, had been outstanding since January 1, 1984. See Note 1 to the Financial Statements.

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Cyprus Minerals Company and Subsidiaries

SUPPLEMENTAL INFORMATION

Mineral Reserves and Selected Operating Statistics (Unaudited)

The following table presents proved reserves and the proved and probable reserves of Cyprus as of December 31, 1983-1987, and selected operating statistics for the years then ended. Proved reserves represent those reserves that, under presently anticipated conditions, will be commercially recoverable from known mineral deposits with a high degree of certainty. Proved and probable coal reserves include reserves that are less well defined than proved reserves, but which have been indicated to exist on the basis of geological and engineering data. Reserve estimates were prepared by Cyprus' engineers.

	1987	1986	1985	1984	1983
COAL					
Proved and Probable Reserves (Millions of Tons)[1]	824.1	751.5	662.4	590.3	582.5
Production (Millions of Tons)	11.6	12.7	9.8	8.9	8.4
Average Sales Price (Dollars Per Ton)	$ 28.34	$ 32.02	$ 34.53	$ 37.07	$ 37.56
METALS[2][4]					
Proved Ore Reserves					
Copper (Millions of Tons)	442.6	397.3	417.0	436.0	508.4
Average Grade (Percent)	.47	.44	.44	.44	.47
Copper and Molybdenum (Millions of Tons)	325.7	343.3	—	—	—
Copper Average Grade (Percent)	.30	.31	—	—	—
Molybdenum Average Grade (Percent)	.037	.036	—	—	—
Gold (Millions of Tons)	13.4	7.2	—	.8	8.7
Average Grade (Ounces Per Ton)	.116	.094	—	.07	.05
Production					
Copper (Millions of Pounds)	347.1	294.1	173.5	56.6	171.8
Molybdenum (Millions of Pounds)	28.6	31.2	21.3	11.2	3.1
Gold (Thousands of Ounces)	10.8	—	13.7	40.6	22.8
Silver (Thousands of Ounces)	1,260	1,050	625	215	504
Average Market Price* (Dollars Per Pound)					
Copper					
Comex	$ .78	$ .62	$ .61	$ .61	$ .72
Producer Cathode	$ .82	$ .66	$ .67	$ .67	$ .77
Molybdenum	$ 2.90	$ 2.87	$ 3.25	$ 3.56	$ 3.64
INDUSTRIAL MINERALS[3]					
Proved Reserves (Millions of Tons)					
Fine Ground Industrial Minerals	57.7	47.5	47.7	47.7	45.9
Production (Thousands of Tons)					
Fine Ground Industrial Minerals	958	994	1,109	1,087	893
Average Sales Price (Dollars Per Ton)					
Fine Ground Industrial Minerals	$107.64	$107.17	$103.68	$ 98.99	$ 99.73

*Market prices represent annual averages of prices as published in *Metals Week*.

(1) Coal reserve amounts include purchases of reserves in place as follows: 8.4 million tons in 1984, 287.6 million tons in 1985, 169.8 million tons in 1986 and 64.6 million tons in 1987. Coal reserves in Pennsylvania and Colorado were reduced by 222.7 million tons in 1985. See Note 9 to the Financial Statements.

(2) Metals data reflect the following significant changes in operations during the 1983-1987 period:

- Copper and molybdenum reserve additions of 348.5 million tons in 1986 represent the reserves of the Sierrita mine complex acquired on March 31.
- Copper reserve additions in 1987 represent reserve revisions at the Bagdad mine and the purchase of the Casa Grande and Pinos Altos mines. In 1984, copper reserves of 123.2 million tons were eliminated due to discontinuing operations at the Pima and Johnson mines, partially offset by reserve additions of 55.2 million tons at the Bagdad mine.
- The gold reserve increase in 1987 reflects Cyprus' share of an additional Australian mine and a New Zealand mine and upward reserve revisions at producing mines. Gold reserves in 1986 represent Cyprus' 100 percent share of the Copperstone gold mine in Arizona and its share in three Australian gold mines. Gold reserves in 1983-1984 represented the Northumberland mine which was sold in 1985.

(3) Fine ground industrial minerals include talc, clay, calcium carbonate and barite.

(4) Metals ore reserves exclude precious metals and molybdenum producible as by-products. In addition, molybdenum bearing ore at the Company's Thompson Creek mine has been excluded as the Company cannot reasonably estimate the amount of reserves which will ultimately prove to be commercially recoverable.

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Common Stock Market Information

Cyprus Common Stock is traded over the counter on the NASDAQ National Market System. Its symbol is "CYPM." The range of actual trade prices and closing bid quotations for the Common Stock, as reported by NASDAQ, during 1987 and 1986 by quarters is set forth below.

The closing bid quotations reflect inter-dealer prices without retail mark-ups, mark-downs, or commissions and may not necessarily represent actual transactions.

	Actual Trade Prices				Closing Bid Quotations			
	1987		1986		1987		1986	
Period	High	Low	High	Low	High	Low	High	Low
1st Quarter	$28⅛	$16¼	$24¼	$16⅜	$27¾	$16¼	$24	$16⅜
2nd Quarter	$28⅝	$22¼	$24⅞	$21⅜	$28⅜	$22½	$24¾	$21⅜
3rd Quarter	$30	$23½	$22½	$14⅜	$29¼	$23¾	$21⅝	$14⅜
4th Quarter	$28¾	$14	$17¼	$14½	$28½	$14½	$16⅞	$14⅜

Cyprus has not declared or paid cash dividends. The Board of Directors will continue to evaluate the Company's performance and the appropriateness of a dividend, but no dividend is anticipated in the near term. On May 9, 1986, the Board of Directors of Cyprus declared a dividend of one preferred share purchase right on each share of common stock of Cyprus payable to stockholders of record on May 23, 1986. The Rights are not presently exercisable nor separable from the common stock, but will become exercisable following the occurrence of certain specified events.

The closing trade price per share of the Common Stock on February 17, 1988 as reported by NASDAQ was $22.25. As of February 17, 1988, the number of record holders of Cyprus shares was approximately 70,363.

Stock Transfer Agent
The Chase Manhattan Bank, N.A. acts as both transfer agent and registrar.

Questions on change of stock ownership, consolidation of accounts, lost certificates, change of address and other such matters should be sent to:

The Chase Manhattan Bank, N.A.
Stock Transfer Division
One New York Plaza
14th Floor
New York, NY 10081

1987 10-K Report
The Company's 1987 Annual Report on Form 10-K is available without charge. Requests should be addressed to Cyprus Minerals Company, Investor Relations, P.O. Box 3299, Englewood, CO 80155.

Affirmative Action
Cyprus policy requires affirmative action in the recruiting, hiring, development, promotion, transfer, compensation and training of employees to ensure that equal opportunity is available to everyone regardless of race, creed, religion, national origin, sex or age.

Auditors
Price Waterhouse
950 17th Street, Suite 2600
Denver, Colorado 80202

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Cyprus Board of Directors

John C. Duncan
Chairman of the Board; Former Chairman and Chief Executive Officer of St. Joe Minerals Corporation

Kenneth J. Barr
President and Chief Executive Officer of Cyprus Minerals Company

Chester B. Stone, Jr.
Executive Vice President and Chief Financial Officer of Cyprus Minerals Company

George S. Ansell
President of Colorado School of Mines

Calvin A. Campbell, Jr.
President and Chief Executive Officer of Goodman Equipment Corporation

James J. Kerley
Former Vice Chairman of Emerson Electric Company

Michael A. Morphy
President of MorMarketing, Inc.

Vernon F. Taylor, Jr.
President of Westhoma Oil Company

Philip C. Walsh
Former Vice Chairman of St. Joe Minerals Corporation

Cyprus Officers

(Members of the Cyprus Management Committee)

Kenneth J. Barr
President and Chief Executive Officer

Chester B. Stone, Jr.
Executive Vice President and Chief Financial Officer

Donald P. Bellum
Executive Vice President, Coal and Industrial Minerals

James C. Compton
Executive Vice President
President, Cyprus Metals Company

H. T. Mulryan
Senior Vice President, Marketing, Corporate Administration and Human Resources

Donald P. Brown
President, Cyprus Coal Company

Philip C. Wolf
President, Cyprus Industrial Minerals Company

Dennis C. Haugh
Vice President and Treasurer

Kevin Loughrey
General Counsel and Corporate Secretary

Gerald J. Malys
Vice President and Corporate Controller

Cyprus Minerals Company Major Operations

Steam Coal
Cyprus Yampa Valley
Oak Creek, Colorado
Cyprus Cumberland Mountain
Middlesboro, Kentucky
Cyprus Empire
Craig, Colorado
Cyprus Mountain Coals
Bulan, Kentucky
Cyprus Plateau Mining
Price, Utah
Cyprus Shoshone
Hanna, Wyoming
Cyprus Straight Creek
Stoney Fork, Kentucky
Cyprus Twentymile
Oak Creek, Colorado

Steam/Metallurgical Coal
Cyprus Emerald
Waynesburg, Pennsylvania

Copper
Cyprus Bagdad
Bagdad, Arizona
Cyprus Sierrita
Tucson, Arizona
Cyprus Casa Grande
Casa Grande, Arizona

Gold
Cyprus Copperstone
Quartzsite, Arizona

Molybdenum
Cyprus Thompson Creek
Challis, Idaho
Cyprus Metec
Winslow, New Jersey

Talc
Cyprus Yellowstone
Cyprus Beaverhead
Ennis, Montana
Cyprus Alpine
Alpine, Alabama
Cyprus Three Forks (mill)
Three Forks, Montana
Cyprus Grand Island (mill)
Grand Island, Nebraska
Cyprus Ghent (mill)
Ghent, Belgium

Calcium Carbonate
Cyprus Sylacauga (mine/mill)
Sylacauga, Alabama
Cyprus Cartersville (mill)
Cartersville, Georgia

Barite
Cyprus Paga (mine/mill)
Paga, Georgia

Clay
Cyprus Sandersville (mine/mill)
Sandersville, Georgia
Cyprus Gleason (mine/mill)
Gleason, Tennessee
Cyprus Aiken (mine/mill)
Aiken, South Carolina

Research and Development

Research Laboratory
Los Angeles, California
Process Engineering Facility
Alpine, Alabama

Corporate Headquarters

Cyprus Minerals Company
7200 South Alton Way
Post Office Box 3299
Englewood, Colorado 80155
Telephone (303) 740-5000
Telex 216190 CMCO UR

Photography by Bob Lynn, Denver, Colorado

FHMAN 00195

Cyprus Minerals Company
P.O. Box 3299
Englewood, CO 80155

Bulk Rate
U.S. Postage
PAID
Permit No. 176
Englewood, CO

cont STDS

I FHMAN 00197

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND COPY

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

FEB 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	80.0	ON-PEAK	8.170000			653.60
	8.0	INTERMED	1.060000			8.48
	518.0	OFF-PEAK	1.060000			549.08
					SUB-TOTAL	1,211.16
		ON-PEAK 5200	.090090			468.47
		INTERMED 400	.078830			31.53
		OFF-PEAK 16400	.058480			959.07
		ENERGY ADJUSTMENT				-637.14
					SUB-TOTAL	2,033.09
		SERVICE CHARGE				400.00

TOT KWH 22000 TOTAL $2,433.09

KW CONSTANT 200.000

95-3391

November 19, 1987

Memo to Distribution

1988 Standards

Enclosed is all the information I have to date on 1988 standards.

Michael J. Lorang

MJL/km

cc: M. R. McCune
J. P. Close
K. B. Lehman
G. R. M. Dugan
G. C. Jeske
M. B. Toelle

LOC# 29 REVISED 10/26/87
SOUTH PLAINFIELD MILL
1988 STANDARD COST CRUDES PF13

MINERAL	TYPE OF CRUDE	CODE	TOTAL COST	LABOR	SUPP	M&R	CRUDE USED
7	YELLOWSTONE DRIED	2075	116.59				
~~7~~	~~BIGO DRIED~~	~~2075~~	~~116.59~~				
7	BEAVERHEAD HQ DRIED	2815	156.93				
7	BEAVERHEAD LQ DRIED	2835	156.39				
7	AUSTRALIAN	2015	~~????~~ 123.18				
7	KOREAN	2099	257.20				
7	ITALIAN	2010	230.09				

I FHMAN 00200

POWER COSTS	OTHER	STRIP	PROC TAX	FRT MILL	PRIOR COSTS	PURCHASE COSTS
				77.04	39.55	
				77.04	39.55	
				77.04	79.89	
				77.04	79.35	
						123.18
						257.20
						230.09

PRODUCT SUMMARY BY PRODUCING LOCAT.
1988 FORECAST

SOUTH PLAINFIELD, N.J. MILL

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
0407	NISTRON ZSC													
TNS	40	20	100	20	0	100	80	20	0	100	40	0	520	
1035	NISTRON RCS													
TNS	21	5	0	1	0	3	0	21	0	5	0	0	56	
1135	OREAN													
TNS	0	0	12	0	0	0	0	0	0	0	0	0	12	
1515	OLYMPIC													
TNS	18	1	0	20	31	1	0	0	2	0	11	6	90	
1725	Australian 2CD DPRODUCT200291725******													
TNS	20	40	60	40	10	40	60	100	45	80	40	60	595	
1726	Australian 4CD DPRODUCT200291726******													
TNS	0	0	0	400	400	400	400	400	400	400	400	400	3600	
1740	STEAWHITE 200 BULK													
TNS	0	46	0	0	0	46	0	0	0	46	0	0	138	
~~1803~~	DPRODUCT200291803******													
~~TNS~~	0	0	0	0	0	0	0	0	0	0	0	0	0	
20029	SOUTH PLAINFIELD, NJ MILL													
TNS	99	112	172	481	441	590	540	541	447	631	491	466	5011	

I FHMAN 00201

PRODUCT P/L MINERAL DESCRIPTION	TOTAL COST	LABOR	SUPP	M&R	CRUDE USED	OTHER COSTS	D&D	POWER	FUEL& WATER	BAGS	CHEM	FRT MILL	FRT WHSE	PRIOR COST	PURCH COST
290407 29 7 MISTRON ZSC	200.26	22.46	9.67	7.70	120.20	.23	-	12.49	3.69	9.75	14.07				
291035 29 7 MISTRON RCS	229.38	22.46	11.83	7.70	161.23	.23	-	12.49	3.69	9.75	-	-	-	-	-
291135 29 7 OREAN	318.45	17.20	11.61	6.80	265.15	.23	-	5.99	3.69	7.78	-	-	-	-	-
291515 29 7 OLYMPIC	216.27	17.97	11.61	6.91	161.78	.23	-	6.30	3.69	7.78	-	-	-	-	-
291700 29 7 SUPRA BULK	274.94	11.97	1.27	6.78	244.78	.23	-	6.22	3.69						
291705 29 7 SUPRA	299.56	18.16	11.61	6.93	244.78	.23	-	6.38	3.69	7.78	-	-	-	-	-
291706 29 7 SUPRAFINO	315.75	22.82	11.83	8.53	244.78	.23	-	14.12	3.69	9.75	-	-	-	-	-
291725 29 7 AUSTRALIAN 200	186.49	18.16	11.61	6.93	131.04	.23	-	7.05	3.69	7.78	-	-	-	-	-
291726 29 7 AUSTRALIAN 400	225.43	22.82	11.83	8.53	131.04	.23	-	14.12	3.69	9.75	23.42				
291740 29 7 STEAWHITE BULK	194.58	14.14	1.27	7.13	161.23	.23	-	6.89	3.69	-	-	-	-	-	-
291745 29 7 STEAWHITE BAG	216.36	19.79	9.45	7.14	161.23	.23	-	7.05	3.69	7.78	-	-	-	-	-
291750 29 7 SUPRA EF SB	299.75	19.79	9.45	7.14	244.78	.23	-	6.89	3.69	7.78	-	-	-	-	-
291755 29 7 SUPRA EF	301.31	20.56	8.24	8.98	244.78	.23		7.05	3.69	7.78					
291765 29 7 MONOBLEND	258.41	19.79	9.45	7.14	203.28	.23	-	7.05	3.69	7.78	-	-	-	-	-
291856 23 7 ALTALC 400	237.57	-	-	-	-	-	-	-	-	-	-	-	54.13	183.44	-

PRODUCT P/L MINERAL DESCRIPTION	TOTAL COST	LABOR	SUPP	M&R	CRUDE USED	OTHER COSTS	D&D	POWER	FUEL& WATER	BAGS	CHEM	FRT MILL	FRT WHSE	PRIOR COST	PURCH COST
291883 29 7 BLANK	1.00	1.00													
291885 29 7 OLYMPIC B-GRADE	232.75	22.82	11.83	8.53	161.78	.23	-	14.12	3.69	9.75	-	-	-	-	-

I FHMAN 00203

LOC# 29 REVISED 10/26/87
SOUTH PLAINFIELD MILL
1988 STANDARD COST CRUDES PF13

MINERAL	TYPE OF CRUDE	CODE	TOTAL COST	LABOR
7	YELLOWSTONE DRIED	2075	116.59	
7	DYBO DRIED	2075	116.59	
7	BEAVERHEAD HO DRIED	2815	156.93	
7	BEAVERHEAD LO DRIED	2835	156.39	
7	AUSTRALIAN	7777	123.18	
7	KOREAN	2099	257.20	
7	ITALIAN	2010	230.09	

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I FHMAN 00204

SUPP	M&R	CRUDE USED	POWER COSTS	OTHER	STRIP	PROC TAX	FRT MILL	PRIOR COSTS	PURCHASE COSTS
							77.04	39.55	
							77.04	39.55	
							77.04	79.89	
							77.04	79.35	
									123.18
									257.20
									230.09

LOC# 29 REVISED 10/26/87
SOUTH PLAINFIELD MILL
1988 STANDARD COST FINISHED GOODS PF14

MINERAL	PRODUCT DESCRIPTION	CODE	TOTAL	LABOR	SUPP	M & R	CRUDE USED	OTHER	POWER
7	MISTRON ZSC	0407	200.26	22.46	9.67	7.70	120.20	0.23	12.49
7	MISTRON RCS	1035	229.39	22.46	11.83	7.70	161.23	0.23	12.49
7	SUPRAFINO	1706	315.75	22.82	11.83	8.53	244.78	0.23	14.12
7	AUSTRALIAN 400	1726	225.43	22.82	11.83	8.53	131.04	0.23	14.12
7	OLYMPIC B-GRADE	1885	232.76	22.82	11.83	8.53	161.78	0.23	14.12
7	OREAN	1135	318.46	17.20	11.61	6.80	265.15	0.23	5.99
7	OLYMPIC	1515	216.27	17.97	11.61	6.91	161.78	0.23	6.30
7	SUPRA BULK	1700	274.94	11.97	1.27	6.78	244.78	0.23	6.22
7	SUPRA	1705	299.55	18.16	11.61	6.93	244.78	0.23	6.38
7	AUSTRALIAN 200	1725	186.49	18.16	11.61	6.93	131.04	0.23	7.05
7	STEAWHITE BULK	1740	194.58	14.14	1.27	7.13	161.23	0.23	6.89
7	STEAWHITE BAG	1745	216.36	19.79	9.45	7.14	161.23	0.23	7.05
7	SUPRA EF SB	1750	314.63	19.79	9.45	7.14	244.78	0.23	6.89
7	SUPRA EF	1755	301.31	20.56	8.24	8.98	244.78	0.23	7.05
7	MONOBLEND	1765	258.40	19.79	9.45	7.14	203.28	0.23	7.05

I FHMAN 00205

FUEL& WATER	BAGS	CHEM	FRT WESE	PRIOR COST
3.69	9.75	14.07		
3.69	9.75			
3.69	9.75			
3.69	9.75	23.42		
3.69	9.75			
3.69	7.78			
3.69	7.78			
3.69	0.00			
3.69	7.78			
3.69	7.78			
3.69	0.00			
3.69	7.78			
3.69	22.67			
3.69	7.78			
3.69	7.78			

SOUTH PLAINFIELD MILL REVISED 10/26/87
1988 PLAN
VARIABLE COSTS

PRODUCT DESCRIPTION	CODE	1988 PLAN TONS	TOTAL	LABOR	SUPP	M & R	CRUDE USED	OTHER	POWER
MISTRON ZSC	0407	520	104136	11681	5029	4002	62502	120	6495
MISTRON RCS	1035	56	12846	1258	663	431	9029	13	698
SUPRAFINO	1706		0	0	0	0	0	0	0
AUSTRALIAN 400	1726	3600	811563	82143	42605	30694	471753	832	50832
OLYMPIC B-GRADE	1885		0	0	0	0	0	0	0
OREAN	1135	12	3821	206	139	82	3182	3	72
OLYMPIC	1515	90	19464	1617	1045	622	14561	21	567
SUPRA BULK	1700		0	0	0	0	0	0	0
SUPRA	1705		0	0	0	0	0	0	0
AUSTRALIAN 200	1725	595	110959	10804	6907	4123	77970	137	4195
STEAMRITE BULK	1740	138	26852	1951	175	984	22249	32	951
STEAMRITE BAG	1745		0	0	0	0	0	0	0
SUPRA EF SB	1750		0	0	0	0	0	0	0
SUPRA EF	1755		0	0	0	0	0	0	0
MONOBLEND	1765		0	0	0	0	0	0	0
TOTAL S. PLAINFIELD VARIABLE COSTS		5011	1069641	109662	56563	40938	661246	1158	63811

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I FHMAN 00206

FUEL& WATER	BAGS	CHEM	FRT WHSE	PRIOR COST
1919	5071	7316	0	0
207	546	0	0	0
0	0	0	0	0
13284	35109	84312	0	0
0	0	0	0	0
44	93	0	0	0
332	700	0	0	0
0	0	0	0	0
0	0	0	0	0
2196.	4627	0	0	0
509	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
18491	46146	91628	0	0

SOUTH PLAINFIELD MILL REVISED 10/27/87
1988 PLAN

SALES FORECAST - TONS

	PRODUCT DESCRIPTION	CODE	TOTAL	JAN	FEB
29	MISTRON ZSC	0407	520	40	20
29	MISTRON RCS	1035	56	21	5
29	SUPRAFINO	1706	0	0	0
29	AUSTRALIAN 400	1726	3600	0	0
29	OLYMPIC B-GRADE	1885	0	0	0
29	OREAN	1135	12	0	0
29	OLYMPIC	1515	90	18	1
29	SUPRA BULK	1700	0	0	0
29	SUPRA	1705	0	0	0
29	AUSTRALIAN 200 NEW	1725	595	20	40
29	STEAMWHITE BULK	1740	138	0	46
29	STEAMWHITE BAG	1745	0	0	0
29	SUPRA EF S.B.	1750	0	0	0
29	SUPRA EF	1755	0	0	0
29	MONOBLEND	1765	0	0	0
	TOTAL SOUTH PLAINFIELD		5011	99	112

I FHMAN 00207

MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
100	20	0	100	80	20	0	100	40	0
0	1	0	3	0	21	0	5	0	0
0	0	0	0	0	0	0	0	0	0
0	400	400	400	400	400	400	400	400	400
0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0
0	20	31	1	0	0	2	0	11	6
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
60	40	10	40	60	100	45	80	40	60
0	0	0	46	0	0	0	46	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
172	481	441	590	540	541	447	631	491	466

SOUTH PLAINFIELD MILL REVISED 10/27/87
1988 PLAN

CRUDE BLENDS

PRODUCT DESCRIPTION	CODE	YELSTN (2070)	% RECOVERY	BY80 (2070)	% RECOVERY	BVRHD #1 (2820)	% RECOVERY	BVRHD #2 (2830)	% RECOVERY	AUSTRALIAN	% RECOVERY	KOREAN (2099)	% RECOVERY	ITALIAN (2010)	% RECOVERY
MISTRON ZSC	0407	100	97												
MISTRON RCS	1035							100	97						
SUPRA	1705													100	94
AUSTRALIAN 400	1726									100	94				
OLYMPIC B-GRADE	1885					100	97								
OREAN	1135											100	97		
OLYMPIC	1515					100	97								
SUPRA BULK	1700													100	94
SUPRA	1705													100	94
AUSTRALIAN 200 NEW	1725									100	94				
STEAMHITE BULK	1740							100	97						
STEAMHITE BAG	1745							100	97						
SUPRA EF S.B.	1750													100	94
SUPRA EF	1755													100	94
MONOBLEND	1765					50	97							50	94

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I FHMAN 00208

SOUTH PLAINFIELD MILL REVISED 10/27/87
1988 PLAN
CRUDE REQUIREMENTS BY MONTH (TONS)

TYPE OF CRUDE	TOTAL	JAN	FEB
YELLOWSTONE	536	41	21
BYRO	0	0	0
BEAVERHEAD #1	93	19	1
BEAVERHEAD #2	200	22	53
AUSTRALIAN	4663	21	43
KOREAN	12	0	0
ITALIAN	0	0	0
TOTAL	5304	103	117

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I FHMAN 00209

MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
103	21	0	103	82	21	0	103	41	0
0	0	0	0	0	0	0	0	0	0
0	21	32	1	0	0	2	0	11	6
0	1	0	51	0	22	0	53	0	0
64	468	436	468	489	532	473	511	468	489
12	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
179	510	468	623	572	574	475	666	521	496

SOUTH PLAINFIELD MILL REVISED 10/27/87
1988 PLAN

MONTHLY CRUDE HAULING COSTS		TOTAL	JAN	FEB
YELLOWSTONE	6.67	3576	275	138
BY80	6.67	0	0	0
YELLOWSTONE HAULING		3576	275	138
BEAVERHEAD #1	9.89	918	184	10
BEAVERHEAD #2	9.89	1978	214	520
BEAVERHEAD HAULING		2896	398	530
YELLOWSTONE	75.96	40721	3132	1566
BY80	75.96	0	0	0
BEAVERHEAD #1	75.96	7048	1410	78
BEAVERHEAD #2	75.96	15192	1644	3994
FREIGHT TO MILLS		62961	6186	5638
TOTAL CRUDE HAULING COSTS		69432	6859	6306

SOUTH PLAINFIELD MILL REVISED 10/27/87
1988 PLAN

PURCHASED CRUDE USAGE		TOTAL	JAN	FEB
AUSTRALIAN	123.18	549724	2621	5242
KOREAN	257.20	3182	0	0
ITALIAN	230.09	0	0	0
TOTAL PURCHASED CRUDE USED		552905	2621	5242

EXHIBIT 00210

MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
688	138	0	688	550	138	0	688	275	0
0	0	0	0	0	0	0	0	0	0
688	138	0	688	550	138	0	688	275	0
0	204	316	10	0	0	20	0	112	61
0	10	0	500	0	214	0	520	0	0
0	214	316	510	0	214	20	520	112	61
7831	1566	0	7831	6265	1566	0	7831	3132	0
0	0	0	0	0	0	0	0	0	0
0	1566	2428	78	0	0	157	0	861	470
0	78	0	3837	0	1644	0	3994	0	0
7831	3211	2428	11746	6265	3211	157	11825	3994	470
8519	3562	2744	12944	6815	3562	177	13032	4381	531

MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7863	57659	53727	57659	60280	65521	58314	62900	57659	60280
3182	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
11044	57659	53727	57659	60280	65521	58314	62900	57659	60280

K.B.LEHMAN
249 9343

DATE 11/19/87 PRDFLSAA PRODUCT COST MASTER LIST - FINISHED GOODS SO.PLAINFIELD PAGE 16

PRODUCT TOTAL COST	P/L	MINERAL	DESCRIPTION	LABOR	SUPP	M&R	CRUDE USED	OTHER COSTS	D&D	POWER	FUEL& WATER	BAGS	CHEM	FRT MILL	FRT WHSE	PRIOR COST	PURCH COST
290407	29	7	MISTRON ZSC														
200.26				22.46	9.67	7.70	120.20	.23	-	12.49	3.69	9.75	14.07	-	-	-	-
291035	29	7	MISTRON RCS														
229.38				22.46	11.83	7.70	161.23	.23	-	12.49	3.69	9.75	-	-	-	-	-
291135	29	7	UREAN														
318.45				17.20	11.61	6.80	265.15	.23	-	5.99	3.69	7.78	-	-	-	-	-
291515	29	7	OLYMPIC														
216.27				17.97	11.61	6.91	161.78	.23	-	6.30	3.69	7.78	-	-	-	-	-
291700	29	7	SUPRA BULK														
274.94				11.97	1.27	6.78	244.78	.23	-	6.22	3.69	-	-	-	-	-	-
291705	29	7	SUPRA														
299.56				18.16	11.61	6.93	244.78	.23	-	6.38	3.69	7.78	-	-	-	-	-
291706	29	7	SUPRAFINO														
315.75				22.82	11.83	8.53	244.78	.23	-	14.12	3.69	9.75	-	-	-	-	-
291725	29	7	AUSTRALIAN 200														
186.49				18.16	11.61	6.93	131.04	.23	-	7.05	3.69	7.78	-	-	-	-	-
291726	29	7	AUSTRALIAN 400														
225.43				22.82	11.83	8.53	131.04	.23	-	14.12	3.69	9.75	23.42	-	-	-	-
291740	29	7	STEAWHITE BULK														
194.58				14.14	1.27	7.13	161.23	.23	-	6.89	3.69	-	-	-	-	-	-
291745	29	7	STEAWHITE BAG														
216.36				19.79	9.45	7.14	161.23	.23	-	7.05	3.69	7.78	-	-	-	-	-
291750	29	7	SUPRA EF SB														
299.75				19.79	9.45	7.14	244.78	.23	-	6.89	3.69	7.78	-	-	-	-	-
291755	29	7	SUPRA EF														
301.31				20.56	8.24	8.98	244.78	.23	-	7.05	3.69	7.78	-	-	-	-	-
291765	29	7	MONOBLEND														
258.41				19.79	9.45	7.14	203.28	.23	-	7.05	3.69	7.78	-	-	-	-	-
291856	23	7	ALTALC 400														
237.57				-	-	-	-	-	-	-	-	-	-	-	54.13	183.44	-

I FHMAN 00241

DATE 11/19/87 PRDFLSAA PRODUCT COST MASTER LIST - FINISHED GOODS SO.PLAINFIELD PAGE 17

PRODUCT	P/L	MINERAL	DESCRIPTION	TOTAL COST	LABOR	SUPP	M&R	CRUDE USED	OTHER COSTS	D&D	POWER	FUEL& WATER	BAGS	CHEM	FRT MILL	FRT WHSE	PRIOR COST	PURCH COST
291883	29	7	BLANK															
1.00	1.00	-	-	-	-	-	-	-	-	-								
291885	29	7	OLYMPIC B-GRADE															
232.75	22.82	11.83	8.53	161.78	.23	-	14.12	3.69	9.75	-								

DATE 11/19/87 PRDFL6AA PRODUCT COST MASTER LIST - CRUDES SO.PLAINFIELD PAGE 16

PRODUCT	P/L	MINERAL	DESCRIPTION	TOTAL COST	LABOR	SUPP	M&R	CRUDE USED	POWER COSTS	OTHER	STRIP	DRILL	LAND RECL	CONT HAUL	ROY	PROC TAX	DEFRL	MIT	FRT MILL	TRAN HAUL	PRIOR COST	PURCH COST
292010	29	7	ITALIAN																			
				230.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230.09
								EQ RENT	-													
292015	29	7	AUSTRALIAN																			
				123.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123.18
								EQ RENT	-													
292075	25	7	YELLOWSTONE DRIED																			
				116.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77.04	-	39.55	-
								EQ RENT	-													
292099	29	7	KOREAN																			
				257.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	257.20
								EQ RENT	-													
292815	25	7	BEAVERHEAD HQ DRIED																			
				156.93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77.04	-	79.89	-
								EQ RENT	-													
292835	25	7	BEAVERHEAD LQ DRIED																			
				156.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77.04	-	79.35	-
								EQ RENT	-													

I FHMAN 00213

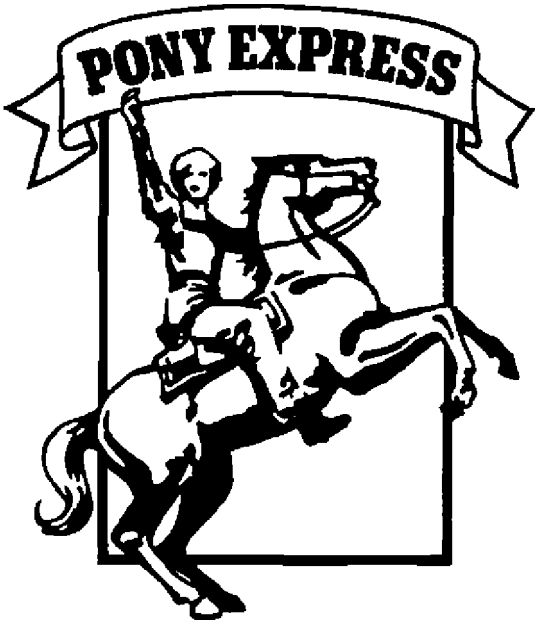
DATE 11/19/87 PRDFL6AA PRODUCT COST MASTER LIST - CRUDES PAGE 17

PRODUCT	P/L	MINERAL	DESCRIPTION	TOTAL COST	LABOR	SUPR	M&R	CRUDE USED	POWER COSTS	OTHER	STRIP	DRILL	LAND RECL	CONT HAUL	ROY	PROC TAX	DEFRL	MIT	FRT MILL	TRAN HAUL	PRIOR COST	PURCH COST
352005	35	7	ALABAMA CRUDE	9.49	2.17	1.18	1.62	-	1.52	-	-	-	-	-	3.00	-	-	-	-	-	-	-
								EQ RENT														

END OF JOB

STAFF

PONY EXPRESS



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* 201-287-8869 201-572-3948

LEHMAN 00218

Stamp

A. C. I.

62 REDWOOD LANE

FREEHOLD, NEW JERSEY 07728

ATTENTION: Paul L. Pollara
President

Please fill in the requested information and check one or more of the following items. Return this card to A. C. I.

Company Name .....

Address ..... P.O. Box .....

City ..... State .....

Phone # ..... Your Name .....

I Am Interested In ☐ L-T-L, ☐ TRAILER LOAD, ☐ TRAILER LOAD, ☐ AIR
local local long haul

A.C.I.

TERMINAL: (201) 560-4624

Dear Shipping Manager,

A.C.I. has a fleet of ten trucks and sixteen trailers serving the metropolitan area. We are located in Bridgewater, New Jersey with administrative offices located in Freehold, New Jersey.

A.C.I. is primarily a LOCAL CARTAGE company. Within the last year our clients have required us to branch out and fulfill their LONG HAUL TRAILER LOAD, and AIR FREIGHT needs. Thanks to our customers, we have been successful.

We would appreciate the opportunity to serve you in one of, or all of, our areas of expertise. Enclosed you will find a response card. Please take one minute to fill in the pertinent information and return the card to us. I will contact you, personally. No sales peopel will haunt you.

At A.C.I., we keep things simple.. Only the President will contact you once you have responded. The President will also insure that your freight is handled efficiently.

We thank you for taking a moment to consider A.C.I. as your cartage company. I look forward to speaking with you soon.

Sincerely,
A.C.I.

Paul L. Pollara
President

SALES & ADMINISTRATION: 62 REDWOOD LANE, FREEHOLD, NEW JERSEY 07728 • (201) 577-9646

LEHMAN 00221

A C I
SALES & ADMIN. (201) 577-9646

TERMINAL (201) 560-4624
Bound Brook, N.J.

LOCAL RATE STRUCTURE

wt.	N.N.J.	NYC	L.I/West
0-25#....	22.00	24.00	27.00
26-50....	24.00	26.00	29.00
51-100...	27.00	29.00	31.00
101-150..	29.00	31.00	36.00
151-200..	32.00	34.00	39.00
201-250..	35.00	37.00	45.00
521-300..	38.50	41.00	49.00
301-350..	42.00	46.00	54.00
351.400..	46.00	50.00	57.00
401-450..	49.00	53.00	59.00
451-500..	51.00	55.00	61.00
501-600..	56.00	59.00	66.00
601-700..	63.00	66.00	73.00
701-800..	73.50	78.00	87.00
801-900..	81.00	86.00	91.00
901-999..	85.00	90.00	97.00
1000-1999	113.00	118.00	135.00
2000-2999	140.00	149.00	172.00
3000-3999	165.00	175.00	197.00
4000-4999	188.00	195.00	225.00

5000 over call for quotation

N.N.J is from Trenton North

acord CERTIFICATE OF INSURANCE

SET TAB STOPS AT ARROWS

ISSUE DATE (MM/DD/YY): 4/17/87

PRODUCER

Kelter Thorner Inc. of NJ
671 King Georges Road
Fords, NJ 08863

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

Priority Trucking/A.C.I.Inc.
Bldg. 14E Easy Street
Bound Brook, New Jersey
08805

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	CAIP
COMPANY LETTER B	Lloyd's of London
COMPANY LETTER C	
COMPANY LETTER D	
COMPANY LETTER E	

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS	EACH OCCURRENCE	AGGREGATE
	GENERAL LIABILITY						
	☐ COMPREHENSIVE FORM				BODILY INJURY	$	$
	☐ PREMISES/OPERATIONS				PROPERTY DAMAGE	$	$
	☐ UNDERGROUND EXPLOSION & COLLAPSE HAZARD				BI & PD COMBINED	$	$
	☐ PRODUCTS/COMPLETED OPERATIONS						
	☐ CONTRACTUAL				PERSONAL INJURY		$
	☐ INDEPENDENT CONTRACTORS						
	☐ BROAD FORM PROPERTY DAMAGE						
	☐ PERSONAL INJURY						
	AUTOMOBILE LIABILITY				BODILY INJURY (PER PERSON)	$	
	☐ ANY AUTO						
	☐ ALL OWNED AUTOS (PRIV. PASS.)				BODILY INJURY (PER ACCIDENT)	$	
A	☒ ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)	Binder SLA #562-87-01	4/16/87	4/16/88	PROPERTY DAMAGE	$	
	☐ HIRED AUTOS				BI & PD COMBINED	$500,	
	☐ NON-OWNED AUTOS						
	☐ GARAGE LIABILITY						
	EXCESS LIABILITY				BI & PD COMBINED	$	$
	☐ UMBRELLA FORM						
	☐ OTHER THAN UMBRELLA FORM						
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY		
					$	(EACH ACCIDENT)	
					$	(DISEASE-POLICY LIMIT)	
					$	(DISEASE-EACH EMPLOYEE)	
	OTHER						
B	*Motor Cargo	Binder	4/16/87	4/16/88	100,000 Limit with 1,000 deductible		

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

*THIS INSURANCE IS ISSUED PURSUANT TO THE NEW JERSEY SURPLUS LINE LAW.

CERTIFICATE HOLDER

A.C.I. Sales Inc.
62 Redwood Lane
Freehold, New Jersey
07728

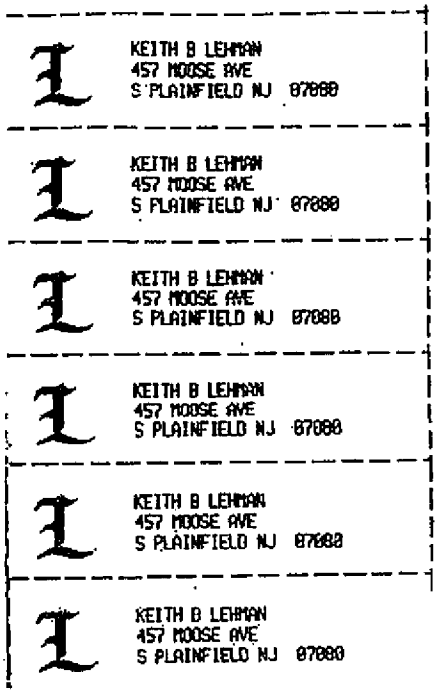
CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL ____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

REJECTS TESTING ROLLER MILL

I FHMAN 00224


KEITH B LEHMAN
457 MOOSE AVE
S PLAINFIELD NJ 07080
KEITH B LEHMAN
457 MOOSE AVE
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457 MOOSE AVE
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KEITH B LEHMAN
457 MOOSE AVE
S PLAINFIELD NJ 07080

June 14, 1985

M.J. Lorang
260A

Throw-out Ports for South Plainfield Williams Mill

With all the attention that has been given to the tremolite/asbestos issue, another potential health problem area with talc has been overshawdowed. This problem area concerns crystalline silica (quartz).

In order to avoid labelling the fact that our product contains crystalline silica, our product must contain less than 1% total quartz. Perhaps just as important, many of our customers require products to contain <1% quartz as a raw material specification. For most of our products, meeting this spec is usually no problem. One product we manufacturer where it is becoming a problem is Supra.

Since Supra is used in the cosmetic industry as well as the rubber industry as a dusting agent, both segments are particularly sensitive to crystalline silica. Mineralogical analyses of Supra products over the last six months have identified many samples that contain up to 2% silica. If this situation continues and remains unchecked, we will undoubtly lose business as well as being subject to potential product liability.

It is suggested that plans proceed without delay to install reject ports in the South Plainfield Williams Mill. Our recent test work at Alpine and Los Angeles confirm that this action would alleviate the problem. This positive action would probably prove beneficial to us in our dealings with Dartco as well. As you witnessed at our meeting with them, they are beginning to be concerned with the abrasiveness of Supra. We could tell Dartco that we have undertaken these efforts to reduce the quartz concentration as a result of our meeting and their expressed concerns. I'm sure they would interpret this action as one of a concerned supplier.

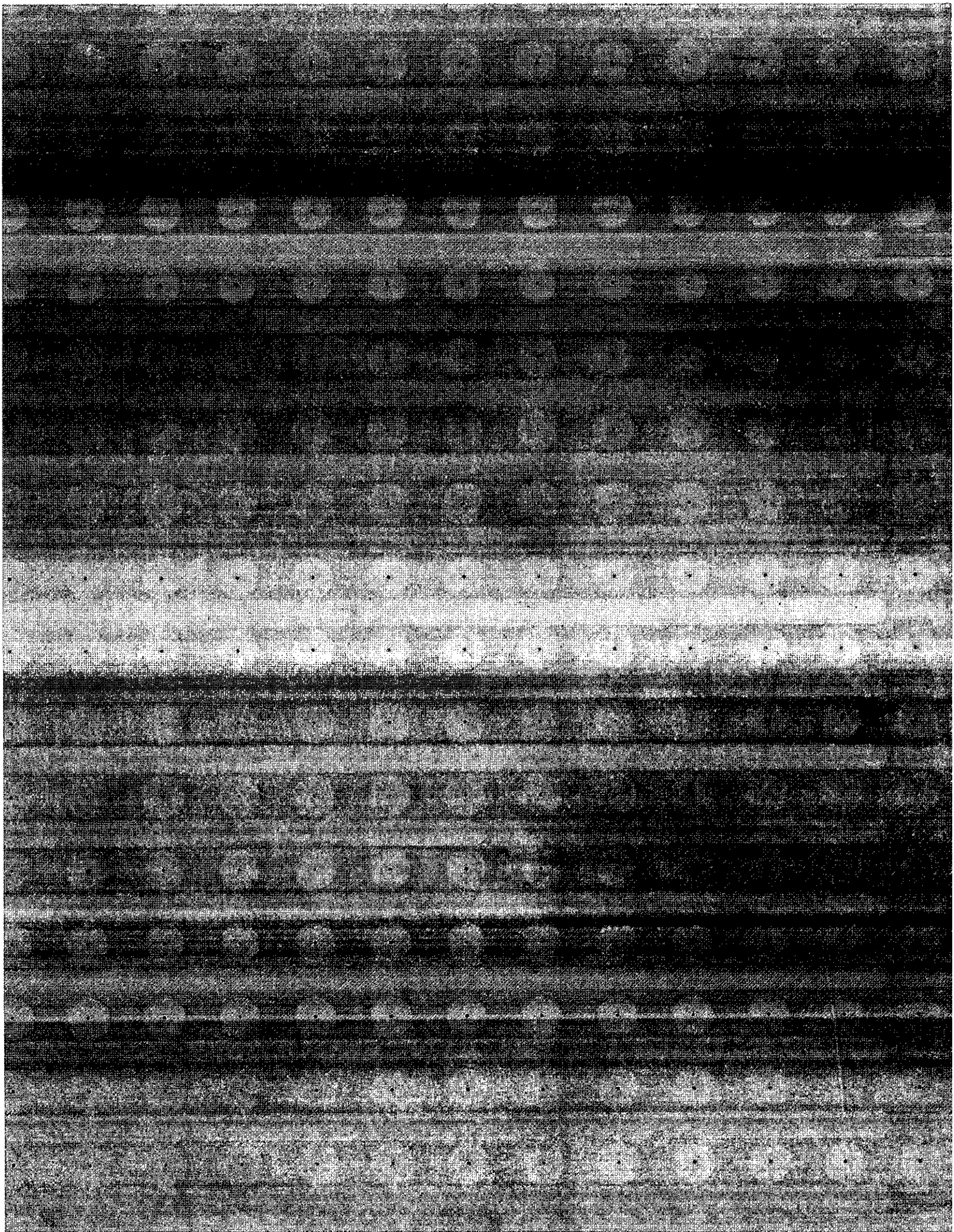
Please let me know at your earliest convenience, your thoughts on this issue.

Rich Zazenski

R.J. Zazenski
237A

RJZ/nne

R.D. Baker
R.J. Buettner
M.D. Held
K. Lehman
G.D. Lessner
L.H. Morse



Sample	Pyrite	Chlorite	Quartz	Feldspar	Calcite	Dolomite	Magnesite	Talc
Test #4								
4:50 P		~7	(~3)	N.D.	~1	~10	~½	~78
5:35 P		~9	~1	N.D.	~½	~1	~8	~80
6:00 P		~7	~1	~½	tr	~½	~½	~90
8:40 P		~8	(~3)	N.D.	~1	~1	~½	~86
9:30 P		~8	(~2)	N.D.	tr	~1	~1	~88
4:50 AM P		~7	(~7)	~5	tr	~2	~2	~77
6:50 AM P		~9	~1	~½	tr	~2	<½	~87
6:59 AM R	tr	~10	~9	<1	~½	~10	tr	~69
2:00 AM P		~6	(~2)	~½	tr	~2	~½	~89
7:10 AM P		~7	~½	tr	tr	~3	~½	~89
TEST #5								
7:15 R		~13	~9	<½	~2	~8	~5	~62
7:20 P		~5	<1	N.D.	N.D.	~1	~½	~92
9:00 P		~7	~½	N.D.	~1	~2	~1	~88

2 ? Xrystal out. comp 15 min. 7% resets

Sample	Pyrite	Chlorite	Quartz	Feldspar	Calcite	Dolomite	Magnesite	Talc
Test #1								
10:35 P		~5	~1	tr	N.D.	~2	tr	~92
10:50 R		~14	~5	< ½	~½	~4	~½	~75
0:51 P		~5	~½	N.D.	N.D.	~2	tr	~92
1:05 P		~9	~½	tr	N.D.	~1	~½	~89
1:06 R	~2	~5	~9	~½	<1	~8	tr	~75
1:07 P		~10	~½	tr	tr	~1	~½	~88
1:20 P		~9	<1	tr	N.D.	~1	tr	~89
1:21 R	~4	~10	~6	N.D.	tr	~3	~2	~75
1:23 P		~9	< ½	N.D.	N.D.	<2	~½	~88
1:35 P		~7	~2	N.D.	tr	~1	~½	~89
1:36 R		~11	~9	~1	<1	~4	~½	~73
1:38 P		~6	<1	< ½	~½	<2	~6	~84
1:50 P		~6	< ½	tr	tr	<8	~½	~85
1:51 R		~13	~6	N.D.	<1	~4	tr	~76
1:53 P		~7	~½	N.D.	tr	~½	~½	~91
2:05 P		~9	~1	tr	tr	~½	~½	~89
2:06 R		~14	~3	<1	<3	~2	~½	~76
2:08 P		~6	~1	N.D.	tr	~½	< ½	~92
2:20 P		~8	~½	N.D.	tr	~½	tr	~91
2:21 R		~12	~6	N.D.	tr	~8	tr	~74
2:23 P		~9	tr	N.D.	N.D.	~½	~1	~89

KBL, 2-28-83

For your info.

RJB

Cyprus Industrial Minerals Company
Talc Division
7200 South Alton Way
Post Office Box 3419
Englewood, Colorado 80155
303-740-5444

February 21, 1983

Mr. Giovanni Sotgiu
Directtore Commerciale
Societa Talco e Grafite Val Chisone s.p.a.
Piazza Garibaldi 25
10064 Pinerolo
Italy

Dear Mr. Sotgiu:

I am aware that your company is reviewing the supply contract for Italian talc. This letter to a degree is related to that contract, but is more for information purposes.

As previously discussed, we inserted a clause in the contract to the effect that the crude should meet CTFA protocal, namely 90% talc minimum. With your last shipment to the United States, we have had a difficult time achieving this protocal. Attached for your information is our laboratory report #83-017. This lot of Supra talc was made from your latest crude shipment to us and was to be submitted to Johnson & Johnson for the cancer testing program. Knowing their efficiency, we did not want to send them a sample of talc that was not 90% pure. Therefore, the sample of Supra that was ground was not sent.

In order to meet the minimum 90% talc, the crude had to be hand-picked and run through our mill. As I see it, the problem was the amount of chlorite in the crude. Somehow a better sorting job has to be done to remove excess chlorite.

Another problem we had with the latest lot is one from a manufacturing viewpoint. Because there are so many fines in this lot, we are having a very difficult time getting the proper densities for our customers. Our experience has shown that the more fines in the crude, the lower the bulk density. This particular lot is grinding so that the bulk densities are in the 18-20 pounds per cubic foot category, whereas our customer specifications are usually 24-30 pounds per cubic foot. This lot also had many bags of ground Italian talc in it. The paper bags had not even been removed. I have three different types of bags in my office that were found in this lot all marked in Italian. I am concerned as to the reasons why ground Italian talc in bags were thrown in a crude lot shipment. Some of my concerns are aimed towards quality, others are precautionary because we cannot separate the paper from the crude in grinding.

Please recognize that this letter is not a letter of complaint, but rather one that I am sure you as a supplier and we as consumers should view as an aim towards improving quality so that we can increase the sales of Italian talc in the United States. Without your help and cooperation, we will have a far more difficult time.

In summary, I would like you to investigate the following:

1. Improvement in talc content
2. Elimination of fines
3. Elimination of bags in future bulk shipments

The cosmetic market in the United States is a very difficult one at this time. We are noticing more suppliers, namely Australian, Korean and Canadian. The more help you can give us, the better our future sales will be. Looking forward to future meetings.

Sincerely,

Louis D. Murino
Vice President, Marketing

LDM:kam

Enclosure

R. J. Buettner
D. R. Ferry
R. W. Grexa
G. D. Lessner

AMOCO

FEB 10 1983

LABORATORY REPORT

REFERENCES: Johnson & Johnson - CTFA Protocol
Skillman, New Jersey

REPORT NO: 83-017

KEY WORDS: Supra

DATE OF REPORT: 2/7/83

DATE OF WORK REQUEST / BY: 1/20/83 - O. R. Ferry

REPORTED BY: K. W. Olson

APPROVED BY: C. R. Moebus

STATUS: Complete As Requested

COPIES: .HTM, RSL, GOL, [illegible], CRM, WWG, RJB, RWG, ORF, FFB, RAP, KWO, File

SUBJECT: One sample packet of talc from Mr. George Lee of Johnson & Johnson labelled:
Cyprus Supra
Lot 721 205A
Jan. 19, 1983

OBJECTIVE: Check this sample lot of Supra for conformance to CTFA specifications (the sample lot must be at least 90% talc) by XRO.

SUMMARY: XRO analysis of Cyprus Supra, Lot 721205A, indicates that the sample lot contains approximately 15% chlorite. Therefore, the sample lot does not conform to CTFA specifications for cosmetic talc. ORF was informed of this by telephone on 1/21/83.

DETAILS: Mineralogy by XRO of Cyprus Supra, Lot 721205A (average of 5 determinations by XRO):

% Chlorite	~ 15%
% Dolomite	~ 2%
% Quartz	~ 2%
% Calcite	~ 0.5%
% Talc	~ 80%

K. W. Olson
K. W. Olson

KWO/mc

Cyprus Industrial Minerals Company/Talc Division
Box 3419, Englewood, CO 80155/(303) 740-5440

CYPRUS
LR-7-82

Regents Y.S.

2 hour Log 14 Hz

Sample	17:00	14 Hz.	2%
	02:00	28 Hz.	8%
	04:00	53 Hz.	12%

B.T.

	15:00	53 Hz.	10%
	~~24:00~~ 0:00	35 Hz.	6%
	02:00	17 Hz.	3%

LOT 5050664

4 S screens 5/6/86 5/7

14:00 — 17:00 = 14 HZ 2%

22:00 - 02:00 = 28 HZ 8%

02:08 — 04:55 = 53 HZ 12%

LOT 5050768

BT screens 5/7 - 5/8

13:00 - 15:30 = 53 HZ 10%

15:45 - 16:30 = 35 HZ. > 6%

22:00 - 04:03 = 35
23:00

0:06 - 01:55 17 HZ. 3%

Y.S. SCREENS 303 MESH
LOT S050664
2% REJECT RATE

Y.S

3 1. Composites 2%, 8%, 12%
3 2. Rejects representative of 2%, 8%, 12%
1 3. CRUDE Sample
1 4. Composite of Packer product
8

LOT 5

3 1. Composites 10%, 6%, 3%
3 2. Rejects representative of 10, 6, 3%
1 3. Crude sample
1 4. Composite of Packer product
8

ce -
ulypin
n
Testing

Cyprus Industrial Minerals Company

555 South Flower Street
Los Angeles, California 90071
Telephone 213) 489-3700
TWX 910) 321-5753

August 26, 1980

Mr. George Dippold
Whittaker, Clark and Daniels, Inc.
1000 Coolidge Street
South Plainfield, NJ 07080

Dear Mr. Dippold:

Our product Monolblend 4609 Talc, Lot No. 119059, has been checked in our Los Angeles laboratory. It was checked by X-Ray Diffraction and Scanning Electron Microscopy and found to be free of asbestos. The X-Ray Diffraction analysis for free silica indicated the presence of ~1% quartz.

Sincerely,

Maral Kazazian

Maral M. Kazazian
Chemist

MMK:rh

cc - G. J. Gill
C. R. Moebus
J. P. Stiff

CYPRUS

04236 - 1% 1% +

85 05056 ~ 1%

05126 ~ ≤ 1/2 %

05196 - < 1/2 %

5266 - 1%

5286 - 1%

.3

.4 1/2

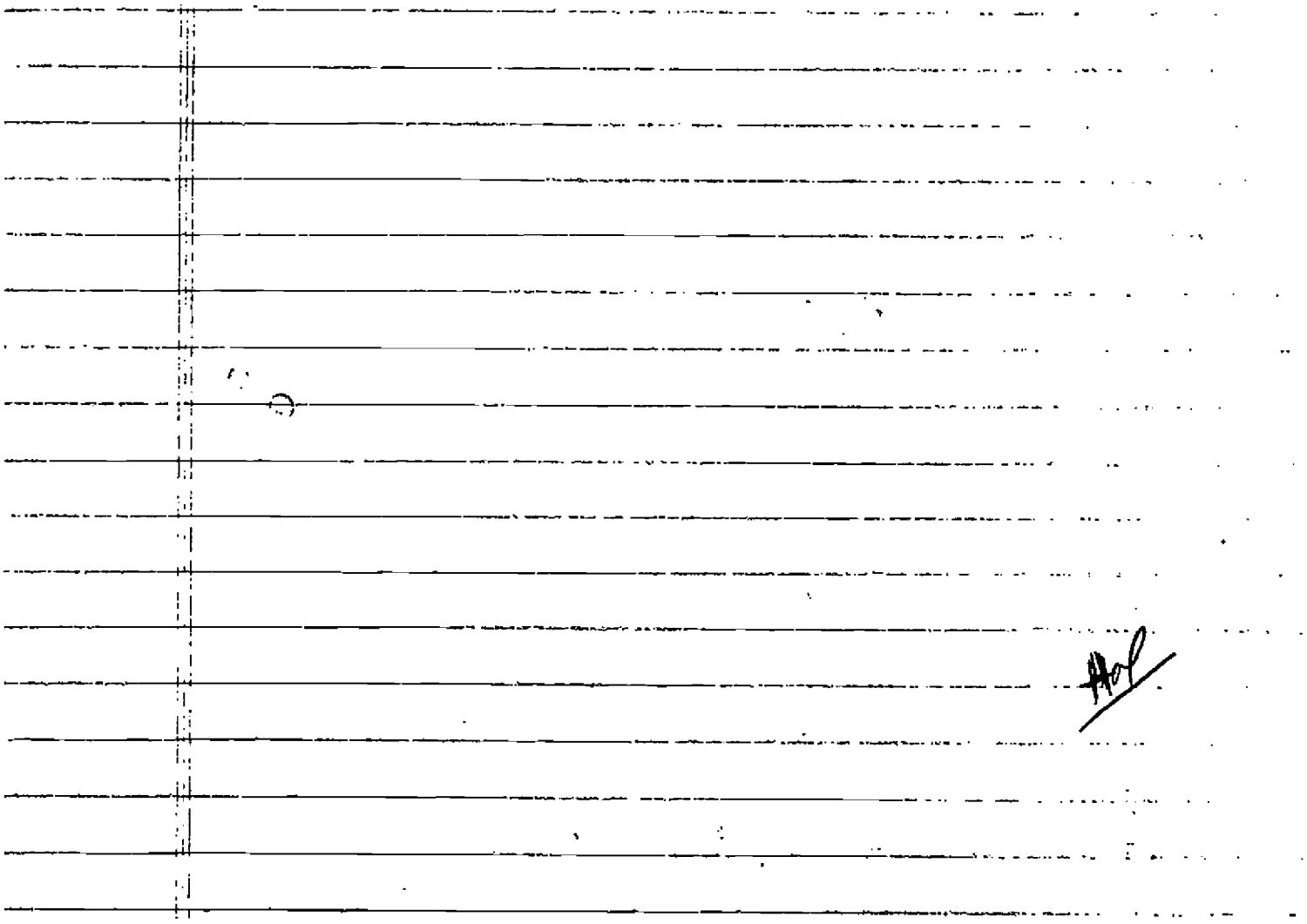
.5

.7 1/2

.8 < 1

.9

505286 1%



TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 86-098 DATE OF REPORT: 6-5-86

SUBJECT: MANUFACTURING ASSISTANCE REQUEST: Yellowstone Screenings - Quartz Removal at South Plainfield

Problem: Talc Technical Services has been asked to perform XRD mineralogy testing for quartz on 8 samples (products, rejects, crude and composite) produced from Yellowstone screenings, Lot #S05066Y, at South Plainfield using the bottom throwout port on their Williams Roller Mill.

Tests/ Results: See Addendum (attached).

Conclusions:

1. The best quartz rejection takes place at the 12% reject rate. The 8% reject rate gave a quartz content in the 325 mesh product of approximately 3/4% (listed in the table as <1%).

2. At the 2% reject rate, approximately 17% of the material rejected is quartz. This means that 6.8 lbs. of quartz are rejected per ton of ore processed. At the 8% reject rate, 22.4 lbs. of quartz are rejected per ton of ore processed. At the 12% reject rate, 28.8 lbs. of quartz are rejected per ton of ore processed. The XRD data indicates that the Yellowstone crude contains approximately 20 lbs. of quartz (~1%) per ton of ore. If the percent quartz varied to 1½%, the quartz content would be 30 lbs./ton. Thus, it would appear that a reject rate of 12% is nearly ideal.

3. The data indicates that quartz and chlorite are the most susceptible to rejection in Yellowstone screenings. At a 2% reject rate, the throwouts are composed of 17% quartz and 15% chlorite. (Note the inverse relationship between % quartz (or % chlorite), and percent reject rate.) It may be that the chlorite is interfoliated or at least strongly associated with the quartz in some Yellowstone ore.

REFERENCES: CIMC - S. Plainfield, N.J.

KEY WORDS: Throwouts, YS, Quartz, Williams

COPIES: MJL, KBL, EPT, KWO, RDB, FILE

REPORTED BY: K. W. Olson

REQUESTED BY: M. J. Lorang

STATUS: Complete

CYPRUS

Conclusions (continued):

The quartz-feldspar-biotite, metamorphism to chlorite sequence may explain this. At higher reject rates, more talc and more carbonates are rejected. This may make it appear as though less quartz is rejected. However, since the quartz content is 20-30 lbs. per ton of ore, once the quartz is rejected, then the use of a higher rejection rate than necessary to reject 20-30 lbs. of quartz per ton of ore results in the needless rejection of more talc and carbonates. The highest quartz rejection in lbs. of quartz/ton of ore occurs with the 12% mill reject rate (see Conclusion #2).

4. The data predicts that a 10% mill rejection rate would result in a 13% quartz value in the throwouts, which translates to 25 lbs. of quartz/ton of ore. Because this is nearly midway between 20 and 30 lbs. of quartz/ton of ore (the expected quartz range in Yellowstone screenings), a 10% mill reject rate may be satisfactory.

5. A graphic plot of reject rate in percent versus lbs. of quartz rejected per ton of ore (this data is contained in Conclusion #2) predicts that a 13% reject rate would be required to remove 30 lbs. of quartz per ton of ore. Thus, the greatest anticipated percentage of quartz in Yellowstone screenings would be rejected at a 13% mill reject rate.

K. W. Olson

K. W. Olson, Ph.D.

KWO/mc

Attachment

Received & Typed 6-10-86

Report No: 86-098
Date of Report: 6-5-86

ADDENDUM

Sample	% Quartz	% Feldspar	% Talc	% Chlorite
325 M Product, 2% Reject Rate	∿1	N.D.	∿91	∿½
325 M Product, 8% Reject Rate	<1	N.D.	∿91	∿1
325 M Product, 12% Reject Rate	∿½	N.D.	∿91	∿1
Rejects, 2% Reject Rate	∿17	∿1	∿58	∿15
Rejects, 8% Reject Rate	∿14	∿2	∿62	∿6
Rejects, 12% Reject Rate	∿12	∿½	∿68	∿2
YS Crude, Lot S05066Y	∿1	N.D.	∿91	tr
325 M Product, Composite	∿½	N.D.	∿91	∿1

I FHMAN 00242

% Calcite	% Dolomite	% Magnesite	% Mica
∿2	∿6	tr	N.D.
∿1	<7	N.D.	N.D.
∿2	∿6	tr	N.D.
∿1	∿6	<2	tr
∿1	<15	tr	N.D.
∿2	∿16	tr	N.D.
<2	∿6	N.D.	N.D.
<2	<6	tr	N.D.

45-4

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 86-098 Addendum DATE OF REPORT: 7-2-86

SUBJECT: MANUFACTURING ASSISTANCE REQUEST: Yellowstone Screenings - Quartz Removal at South Plainfield

Problem: Provide GEB testing results for 8 talc samples (products, rejects, crude and composite) produced from Yellowstone screenings, Lot #S05066Y, at South Plainfield using the bottom throwout port on the Williams Roller Mill.

Tests/
Results:

Sample	GEB
325 M Product 2% Reject Rate	79
325 M Product 8% Reject Rate	80
325 M Product 12% Reject Rate	77
Rejects, 2% Reject Rate	61
Rejects, 8% Reject Rate	75
Rejects, 12% Reject Rate	75
YS Crude Lot S05066Y	75
325 M Product Composite	80

K.W. Olson

K. W. Olson, Ph.D.

KWO/mc

(Received 7/2, Typed 7/7)

REFERENCES: CIMC - S. Plainfield, N.J.

KEY WORDS: Throwouts, YS, Quartz, Williams

COPIES: MJL, KBL, EPT, KWO, RDB, FILE

REPORTED BY: K. W. Olson

REQUESTED BY: M. J. Lorang

STATUS: Complete

CYPRUS

BT-1 ✓

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 86-099 DATE OF REPORT: 7-2-86

SUBJECT: MANUFACTURING ASSISTANCE REQUEST: B.T. Screenings - Quartz Removal at South Plainfield

Problem: Talc Technical Services has been asked to perform XRD mineralogy testing for quartz on products, rejects, crude and composite samples of BT talc that were milled at South Plainfield using the Williams Roller Mill with the bottom throwout port. GEB and LOI testing were also performed.

Tests/ Results: See Appendix.

Conclusions:

1. The greatest quartz rejection in pounds of quartz rejected per ton of ore occurred with the 10% reject rate, in which 14 pounds of quartz per ton of ore were rejected. At the 6% reject rate, 7.2 pounds of quartz per ton of ore were rejected. At the 3% reject rate, 6 pounds of quartz per ton of ore were rejected.
2. At a theoretical 20 pounds of quartz per ton of ore (i.e. 1% quartz), which is typically found in BT talc by XRD, it would seem that a reject rate of at least 7% (assuming a 7% quartz content of the rejects at the 7% reject rate) would be necessary to reduce the quartz content in the product to 1/2%.
3. The data indicates that quartz rejection of BT ore is feasible using the Williams Roller Mill bottom throwout port. This is evidenced in the 325 Mesh 10% Reject Rate sample in which the quartz has been reduced to ∿1/2% and the magnesite has also been rejected.

REFERENCES:	CIMC - South Plainfield, NJ	REPORTED BY:	K. W. Olson
KEY WORDS:	Throwouts, BT, Quartz, Williams	REQUESTED BY:	M. J. Lorang
COPIES:	MJL, KBL, EPT, KWO, RDB, FILE	STATUS:	Complete

CYPRUS

BT-2 ✓

Conclusions (continued):

4. In throwout studies such as this, extreme care should be taken to submit representative samples of products, rejects, crude, and composite samples to the laboratory. In this study, the BT crude sample was not representative of the overall crude. This is evidenced by the low dolomite and magnesite (and as a consequence, the low LOI) values obtained. The BT crude XRD and LOI testing was performed in triplicate with excellent reproducibility. The analysis cannot compensate for poor sampling. Thus, for studies such as these to be the most meaningful, extreme care in sampling must be taken.

K. W. Olson

K. W. Olson, Ph.D.

KWO/mc

Attachment

(Received 7/2, Typed 7/7)

APPENDIX

MINERALOGY BY XRD; LOI; GEB: LOT #S05076B

Sample	% Talc	% Quartz	% Chlorite	% Dolomite	% Magnesite	% Feldspar	% LOI	% GEB
325 M Product 3% Reject Rate	~89	<1	~7	~3	--	--	6.53	80
325 M Product 6% Reject Rate	~89	<1	~7	~2	~1	~½	6.50	77
325 M Product 10% Reject Rate	~89	~½	~8	<3	--	--	6.49	77
Rejects, 3%	~72	~10	~11	~6	~1	~½	8.15	73
Rejects, 6%	~77	~6	~10	~5	~2	--	8.30	72
Rejects, 10%	~77	~7	~7	~5	~4	--	9.08	74
B. T. Crude	~89	~1	~8	<2	tr	--	5.99	77
325 M Composite	~89	~½	~9	~2	--	--	6.52	76

I FHMAN 00245

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
	5/7/81	BT	~~[illegible]~~ Screens	325

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOT
					17=3% AVE.		53 =	10% AVE
		3, 6, 10 %					35 =	6% AVE.
		BT					(15 Sec)	(1 MINUTE)
							↓	↓

TIME	BULK ~~TEST~~	~~READ~~	COLOR ~~METER~~	~~VISUAL~~	SCREEN No.	SCREEN %	~~ANAL.~~ HEG.	HZ	PROD. RATE	REJECT RATE	SPINNER R.P.M	%
1300	21	84	81.	5	325	99.7	4.0	53		3.5	823	5%
1345					325			53	4560	8.5#	839	11%
1400	22	40	80	0	325	99.7	3.5	53		9.0	828	12%
1430										8.8	839	11%
1445								53	5040		842	11%
15:00	22	40	80.	0	325	99.7	3.5	53				11%
1530								53	4320	8.2	850	11%
1545			78.	5				35		3.8	850	5%
16:00	22	40	79.	0	325	98.8	3.50	35		5.2	850	7%
16:15								35	4560	3.7	850	5%
1630								35		5.7		7%

Down Time - Cause - Produotion Notes:

14 HZ = 1.4# = 1.8%

16 HZ = 1.75 = 2.3

15 should be 2%

CK. INIT.

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
5/8/86	Night	D.D.	BT Screens	385

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTE

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	Hz	Hz	Prod Rate	Reject Rate	SPINNER R.P.M	
23:22	21	47	—		325	99.6	3	35		4.80	831	7%
24:03	22	28	79	0	325	99.6	3.5	35	17.68 / 4243.2	3.24	840	5%
00:08	22	65	79	0	325	99.7	3.5	17	18.56 / 4454.4	3.14	844	4%
01:07	22	78	78	0	325	99.8	4	17	19.12 / 4588.8	1.74	844	2%
02:03	24	52	78	0	325	99.9	4	53		8.14	870	10%
									1.32 / 76.8	1.66		2%
Mill EMPTY 03:07 / 233.3												
Change to E.F.												
03:54	23	03	85	0	200	HVY.		14			668	
04:15	22	90	—		200			"			678	
04:38	22	90	85	0	200	99.2		"			702	
05:10	22	46	84	0	200	99.2		"			701	
06:01	21	78						"			700	
06:00 surge bin alarm on												
Mill down 06:17												

Down Time - Cause - Production Notes:

Start up ~~X~~ rpm (Spinner) - Rejects 35 Hz

00:06 pm / Rejects 17 Hz

Low Feed Ball = 01:55

Reject to 53 Hz

Back up - 02:10

Low Feed Ball = 02:55

Changed hopper - 35 Hz

ROLLER MILL REPORT

E	SHIFT	OPERATOR	PRODUCT	LOT No.
5/6/86	Day		YSSCRESS	505066Y

ME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	~~DAMPER~~ #/in	~~D.C.~~ Time	PRODUCTION - NOTES
4 Hz = 2 Hrs Lag Time Reject						12.5	15:00	P.R. 2868 .04
						15	15:15	PR 3600
						15.8	16:10	3,800 .02%

ME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	~~ANAL.~~ AEG.	HZ.	Mag Off	Reject Rate	SPINNER R.P.M
00	22	46	80	.5	325	99.9	3.5	14	12		786
00	22	96	80	5	325	99.90	3.75	14	12	.36#	791 .8%
30	23	15	80	5	325	99.90	4.0	14	13	[illegible]	745
15								14	13	1.3	745 2%
0			80	-				14	13	.9	745 1%
00	22	15	80	0	325	99.9	3.8	14	13	1.98	745 3%

Time - Cause - Production Notes:

.05 = .1 = 99.9
X 2

CK. INIT.

ROLLER MILL REPORT

E	SHIFT	OPERATOR	PRODUCT	LOT No.
2/7/86	Night	D.D.	45 Screens	325

IME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES
			2,	8,	12,	AVE.		14.98
				4.5.				14 = 2 ½
								28 = 8.4 AVE
								53 = 12 AVE

IME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	~~AMPS~~ Hz.	Hz	Feed Rate	Reject Rate	SPINNER R.P.M	MAG AMPS
2:19	20	47	80	0	325	99.6	3.0	28	2956.8	3.96	759	1:87
:03	20.65		80.	5	325	99.8	3.5	28	12.00 / 2860	4.34	753	1:92
:02	20	78	81.	0	325	99.9	3.5	28	13.60 / 3264	3.38	756	1:62
:03	21.	97	81.	0	325	99.9	3.5	28	13.10 / 3144	2.48	755	1:57
:00	22	53	81.	0	325	99.8	3.5	28	13.72* / 3292.8	7.96*	754	1:47
:00*	23.	09	76.	5	325	99.8	3.5	53	15.66 / 3758.4	7.12	756	1:11
:04	22	03	78	0	325	99.8	3.5	53	15.88 / 3811.2	8.02	753	1:13
Mill	Shutdown		04:55	am	military time							

n Time - Cause - Production Notes:

ACTUAL (ON VERTEC)	TIME	NIGHT

½ scoops BT screens *53 Hz / 2:08 am OR 02:08

CK. INIT.

March 31, 1986

M. J. Lorang

Roller Mill Beneficiation

As per our discussion on the Williams roller mill throwout system, we need to test the "bottom" drawoff on Montana screenings. If the mill beneficiates the screenings anywhere near as well as it beneficiates the Italian crude, we should incorporate "bottom" drawoff on our Three Forks roller mill. I suggest we send a boxcar of BVH-22 (which has high quartz content and consequently high valley abrasion) to South Plainfield for test purposes. If you would like, I can make the shipping arrangements.

E. P. Tiritas

EPT:jsf

R. D. Baker
G. R. M. Dugan
K. B. Lehman
R. G. Morris
L. H. Morse
C. W. Nichols
R. B. Rickard

ORDER

2080 ALD. 42 LIGHT Y.S. SCREENINGS 25 TON
GLACIER

2825 ALD. 22 LIGHT BT SCREENINGS 25 TONS

TOMORROW

1-10% Rejects

Throwouts

A throwout is provided with a Vertical Mill when it is necessary to remove hard un-grindable or undesirable material from the grinding chamber. The throwout is mounted into a hole in the lower corner of the grinding chamber. This throwout consists of a small screw driven by a universal type gear motor. The screw is driven in a direction that feeds material away from the mill, and the throwout is normally furnished with about 50% of the end of the feed screw blocked off. It may be necessary to remove part of this restriction in some cases, and in other cases it may be necessary to add additional restrictions ahead of the throwout in order to get proper operation. The necessary adjustments must be made by experiment in the field to obtain satisfactory results.

FHMAN 00252

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 85-244

DATE OF REPORT: 10-14-85

SUBJECT: MANUFACTURING ASSISTANCE: Quality check of Italian talc

BACKGROUND: South Plainfield is experiencing low brigtness of Italian talc. We will test brightness in an attempt to determine at what point in the manufacturing process it is acquiring a dark color.

RESULTS:

	SAMPLE	GEB		SAMPLE	GEB
1.	Dryer feed	89	11.	Fines and discharge	82
2.	Dryer feed	82	12.	Fines and discharge	87
3.	Dryer feed	87	13.	Cyclone discharge	88
4.	Dryer feed	89	14.	Cyclone discharge	86
5.	Dryer discharge	87	15.	Cyclone discharge	87
6.	Dryer discharge	85	16.	Throwouts	74
7.	Dryer discharge	88	17.	Throwouts	77
8.	Dryer discharge	85	18.	Packer product	86
9.	Baghouse fines	83	19.	Packer product	86
10.	Baghouse fines	84			

M. Lankford

M. Lankford

ML/cc

KBL
FYI
MJL

REFERENCES: CIM, Englewood

KEY WORDS: Color, So. Plainfield

COPIES: CWN, EPT, MJL, ML, RDB, FILE

REPORTED BY: M. Lankford

REQUESTED BY: C. W. Nichols

STATUS: Complete

CYPRUS

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 85-273 DATE OF REPORT: 10-31-85

SUBJECT: QUALITY CHECK: ITALIAN CRUDE

PROBLEM: Some darkening has been noted in Supra. We will attempt to determine at what point in the process this occurs.

SAMPLES: From Lot # S10215, lab sample # S-226-85
Composite dryer feed
Composite dryer discharge
Composite mill discharge
Composite packer discharge

TEST/RESULTS:

	G.E.B.	HUNTER L*	HUNTER a* (Green)	HUNTER b* (Yellow)
Dryer feed	88	95.34	-.75	.99
Dryer discharge	89	96.08	-.56	1.19
Mill discharge	87	96.00	-.81	1.71
Packer discharge	85	95.31	-.52	1.61

COMMENTS: It appears that loss of brightness begins in the mill and continues through the packer. These results are inconclusive in terms of isolating the cause. We might consider the possibility of some darker residue in the mill and packer from a previous lot. Lower G.E.B. samples show a very slight increase in yellow cast.

M. Lankford

M. Lankford

ML/cc

REFERENCES: CIM - South Plainfield
Supra

KEY WORDS:

COPIES: MJL, KBL, RJZ, EPT, ML, RDB, FILE

REPORTED BY: M. Lankford

REQUESTED BY: K. B. Lehman

STATUS: Complete

CYPRUS

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 86-065 DATE OF REPORT: 3-26-86

SUBJECT: MANUFACTURING SERVICE REQUEST: Roller Mill Rejection of Undesired Minerals in Supra

Problem: XRD mineralogy testing on eight product/reject pairs (3/7/86) for roller milled Supra with reject ports were requested by South Plainfield. The first and last pairs in the eight pair series were characterized per R. D. Baker.

Rests/
Results: *Mineralogy by XRD:*

Product, 10:15 P.M.		Rejects, 10:15 P.M.	
Chlorite	∿3%	Chlorite	∿6%
Quartz	∿½%	Quartz	∿30%
Feldspar	∿½%	Feldspar	∿1%
Calcite	∿½%	Calcite	∿1%
Dolomite	∿1%	Dolomite	∿10%
Magnesite	∿½%	Magnesite	∿2%
Talc	∿94%	Mica	tr
L.O.I. =	5.86%	Talc	∿50%
		L.O.I. =	9.43%

Product, 12:00 A.M.		Rejects, 12:00 A.M.	
Chlorite	∿3%	Chlorite	∿7%
Quartz	∿½%	Quartz	∿25%
Feldspar	∿½%	Feldspar	∿1%
Calcite	∿½%	Calcite	∿1%
Dolomite	∿1%	Dolomite	∿10%
Magnesite	∿½%	Magnesite	∿2%
Talc	∿94%	Mica	∿1%
L.O.I. =	5.85%	Talc	∿53%
		L.O.I. =	9.66%

REFERENCES: CIMC - South Plainfield, N.J.
REPORTED BY: K. W. Olson
KEY WORDS: Supra Rejects
REQUESTED BY: K. B. Lehman
COPIES: MJL, KBL, EPT, KWO, RDB, FILE
STATUS: Complete as directed

CYPRUS

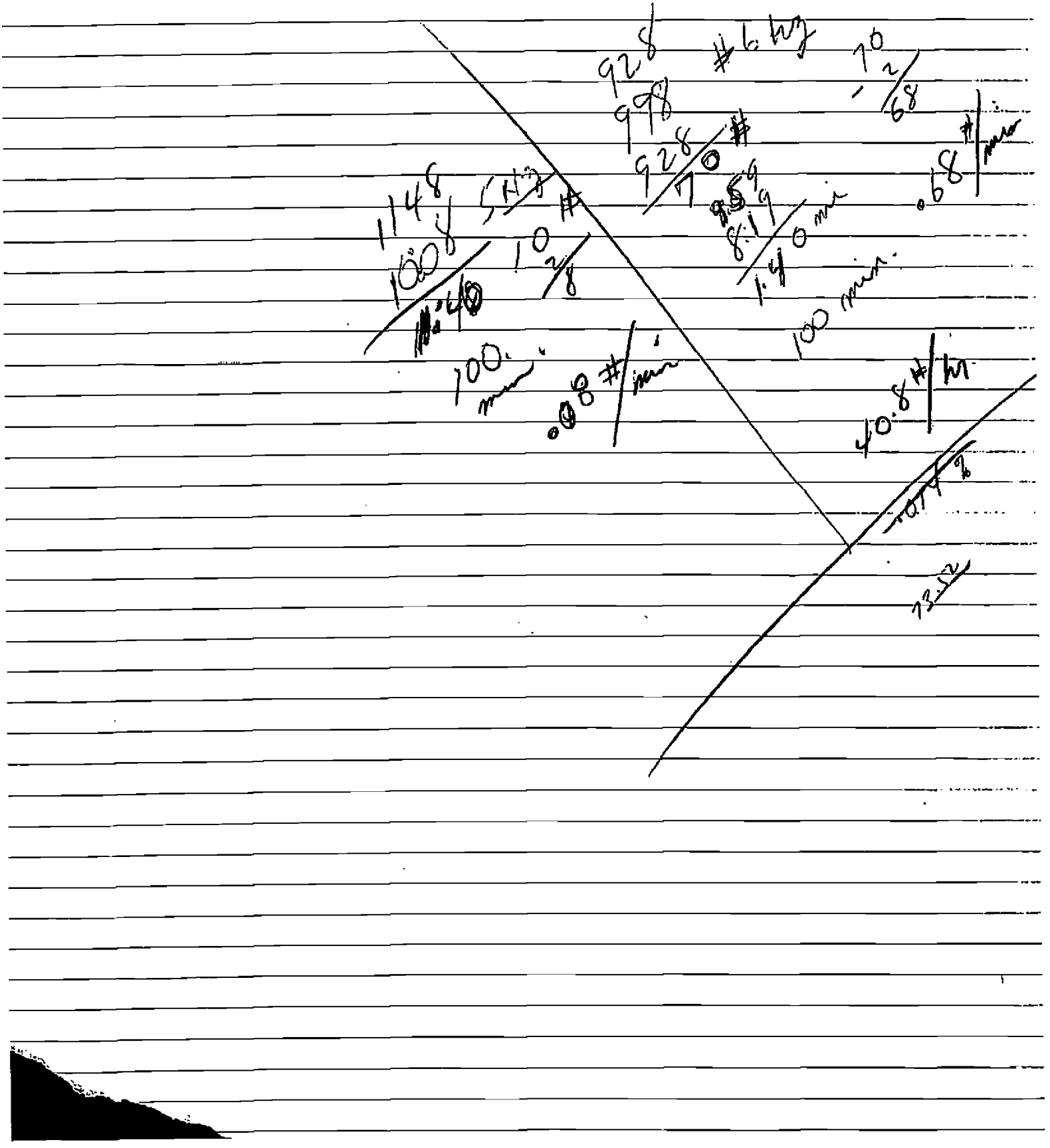
Conclusion: The data indicates that the efficiency of the roller mill reject port(s) is the same at the beginning and at the end of the testing period.

K. W. Olson

K. W. Olson, Ph.D.

KWO/mc

(Received & Typed 3-26-86)



Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES
LABORATORY REPORT

REPORT NO: 86-016 DATE OF REPORT: 1-23-86

SUBJECT: CUSTOMER SERVICE REQUEST: Supra Quality Check - Dartco

ackground: All Supra talc shipments to Dartco are characterized by Talc Technical Services at the request of the customer. Preshipment samples are obtained from the South Plainfield mill and the results forwarded to Dartco.

mple: Lot #SO1156, Car #ACFX-59796.

sults:

GEB	86.2
SRO	32.8 lbs/100 lbs.
Surface Area	4.1 m^2/g
Acid Solubles as % CO^2	0.76%
LOI	5.88%

Mineralogy by XRD:

Chlorite	~5%
Quartz	~1/2%
Feldspar	~1/2%
Dolomite	~1%
Magnesite	~1/2%
Talc	~92%
Calcite	<1/2%

R. C. Cloud

RCC/mc

REFERENCES: Dartco - Augusta, GA
KEY WORDS: Dartco/Supra
COPIES: MJL, KBL, RJZ, RDB, RCC, DARTCO (2), FILE

REPORTED BY: R. C. Cloud
REQUESTED BY: K. B. Lehman
STATUS: Complete

CYPRUS

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

KBL F.J.I. MJL

REPORT NO: 85-278 DATE OF REPORT: 11/7/85

SUBJECT: MANUFACTURING SUPPORT: Italian Talc

Problem: Some darkening has been noted in Supra. We will attempt to determine at what point in the manufacturing process this occurs.

Samples: From Lot #S10215A, Lab Sample #S-229-85:

Composite Dryer Feed
Composite Dryer Discharge
Composite Mill Discharge

Results: See Page 2.

Refer to report #85-273 in which the darkening appeared to begin in the mill. The results are included in this report.

Refer also to report #85-244, in which the brightness loss appeared to begin in the dryer. That report is attached.

Comment: It was noted that the mill discharge (which is tested as received from the plant) appeared coarser than the dryer feed and discharge (which arrive crude and are ground by Tech Services). Lab personnel then put the mill discharge through the Mikro-pulverizer one time and retested it. As seen in Table II, the brightness rose 1.6 points.

Conclusion: In the series of samples from Lot #10215A, there appears to be no loss of brightness at any point.

For any future testing on this problem, we may wish to screen and grind samples to make sure the samples we are comparing are consistent.

M. Lankford

M. Lankford

ML/mc

Attachments

REFERENCES: CIM - South Plainfield
KEY WORDS: Supra
COPIES: CWN, EPT, MJL, ML, RDB, FILE

REPORTED BY: M. Lankford
REQUESTED BY: K. B. Lehman
STATUS: Complete

CYPRUS

TABLE I

(From Report #85-278, Lot #S10215)

	GEB	HUNTER L*	HUNTER a* (Green)	HUNTER b* (Yellow)
Dryer feed*	88	95.34	-.75	.99
Dryer discharge*	89	96.08	-.56	1.19
Mill discharge**	87	96.00	-.8I	1.71
Packer discharge**	85	95.31	-.52	1.61

TABLE II

(Current Samples)

	GEB	HUNTER L*	HUNTER a* (Green)	HUNTER b* (Yellow)
Dryer feed*	86.8	95.25	-.55	1.05
Dryer discharge*	89.4	96.32	-.32	.90
Mill discharge**	87	95.97	-.16	1.02
Mill discharge re-ground, Mikro-pulverizer, one pass	88.6			

*Ground by Tech Services, Mikro-pulverizer, 3 passes
**As received from S. Plainfield

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 85-244

DATE OF REPORT: 10-14-85

SUBJECT: MANUFACTURING ASSISTANCE: Quality check of Italian talc

BACKGROUND: South Plainfield is experiencing low brigtness of Italian talc. We will test brightness in an attempt to determine at what point in the manufacturing process it is acquiring a dark color.

RESULTS:

	SAMPLE	GE8		SAMPLE	GE8
1.	Dryer feed	89	11.	Fines and discharge	82
2.	Dryer feed	82	12.	Fines and discharge	87
3.	Dryer feed	87	13.	Cyclone discharge	88
4.	Dryer feed	89	14.	Cyclone discharge	86
5.	Dryer discharge	87	15.	Cyclone discharge	87
6.	Dryer discharge	85	16.	Throwouts	74
7.	Dryer discharge	88	17.	Throwouts	77
8.	Dryer discharge	85	18.	Packer product	86
9.	Baghouse fines	83	19.	Packer product	86
10.	Baghouse fines	84			

M. Lankford

M. Lankford

ML/cc

REFERENCES: CIM, Englewood

KEY WORDS: Color, So. Plainfield

COPIES: CWN, EPT, MJL, ML, RDB, FILE

REPORTED BY: M. Lankford

REQUESTED BY: C. W. Nichols

STATUS: Complete

CYPRUS

Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 85-279 DATE OF REPORT: 11-4-85

SUBJECT: MANUFACTURING SERVICE REQUEST: Throwout Efficiency at S. Plainfield

Problem: Operational evaluation of throwout beneficiation on Williams roller mill at S. Plainfield.

Results: Sample mineralogy and impurity trend chart are included in the appendix.

Conclusions:

1. Reject material is high in quartz and dolomite. Trends indicate cycles of quartz and dolomite content of the product which may match reject periods (see trend chart). Feed variation and actual reject quantities will affect relationship.

2. Talc content of reject material averages about 50% which will be a consideration. Probably should attempt to get to continuous system where talc content can be established relative to percentage throwouts and efficiency.

Doug Baker

RDB/mc

Attachments

REFERENCES: South Plainfield REPORTED BY: R. D. Baker

KEY WORDS: Throwouts REQUESTED BY: K. B. Lehman

COPIES: RJB, MJL, EPT, KBL, RDB, File STATUS: Complete

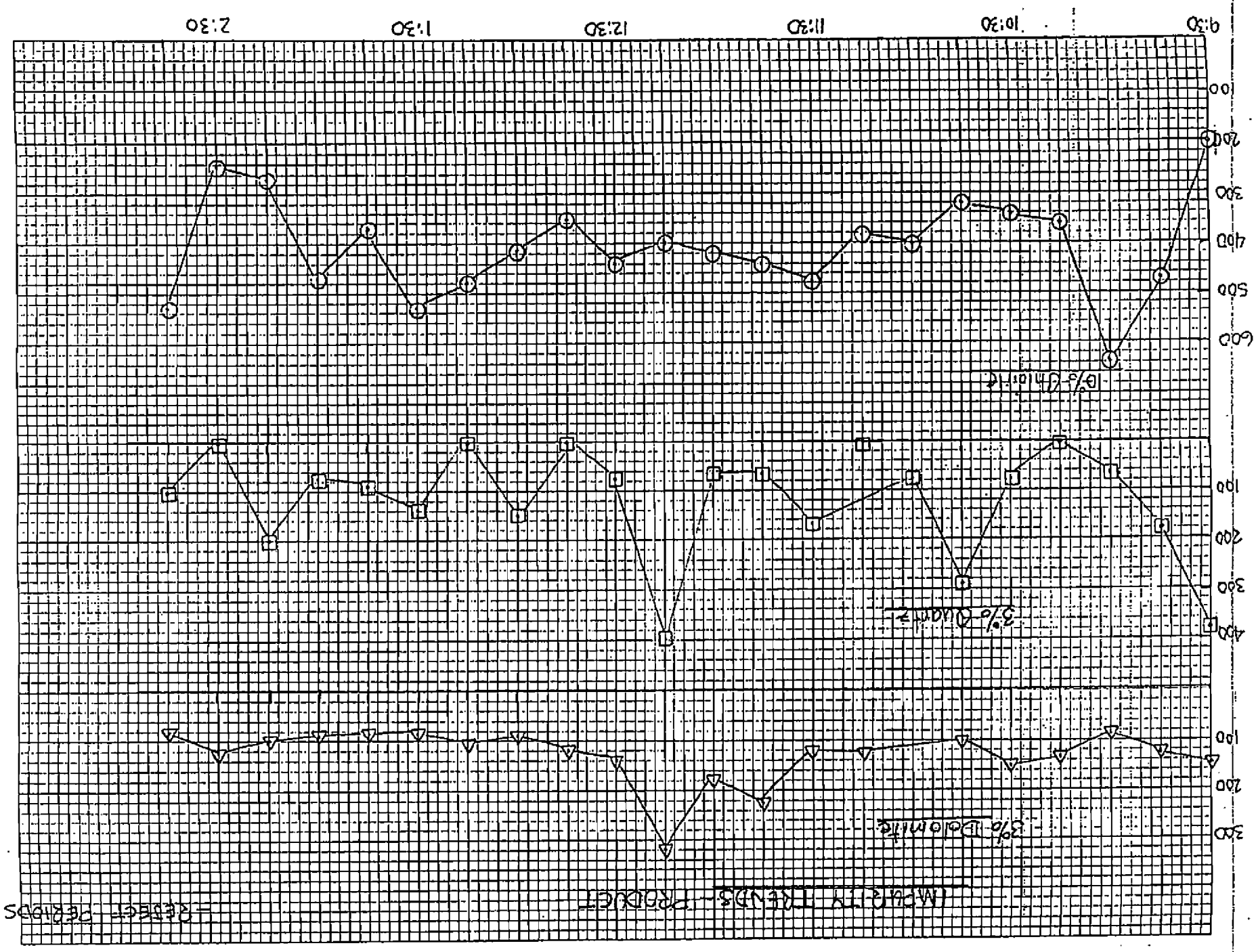
CYPRUS

APPENDIX - MINERALOGY

Sample	Chlorite	Quartz	Dolomite	Calcite	Magnesite	Talc
9:30R	7	18	6	2	1	66
9:31P	3	3	2	tr	1	91
9:45P	8	1	1	tr	-	90
10:00P	11	½	1	tr	-	87
10:15P	6	tr	1	tr	-	93
10:30R	12	12	19	2	3	52
10:31P	5	½	2	tr	-	92
10:45P	5	2	1	-	-	92
11:00P	7	½	3	-	-	89
11:15P	6	tr	1	-	-	93
11:30R	11	19	16	1	1	52
11:31P	8	1	1	1	-	89
11:45P	6	½	2	tr	-	91
12:00P	7	½	1	-	-	91
12:15P	6	2	3	-	1	88
12:30R	13	13	25	4	3	42
12:31P	7	½	1	-	-	91
12:45P	6	tr	1	-	-	93
1:00P	7	1	1	-	-	91
1:15P	8	tr	1	-	-	91
1:30R	10	11	8	1	3	67
1:31P	9	1	1	-	-	89
1:45P	6	½	1	-	-	92
2:00P	8	½	1	-	-	90
2:15P	4	1½	1	-	-	93
2:30R	11	14	13	1	2	59
2:31	4	tr	1	tr	-	94
2:45P	9	1	1	tr	-	89

K•E 5 X 5 TO THE CENTIMETER 18 X 24 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 1610



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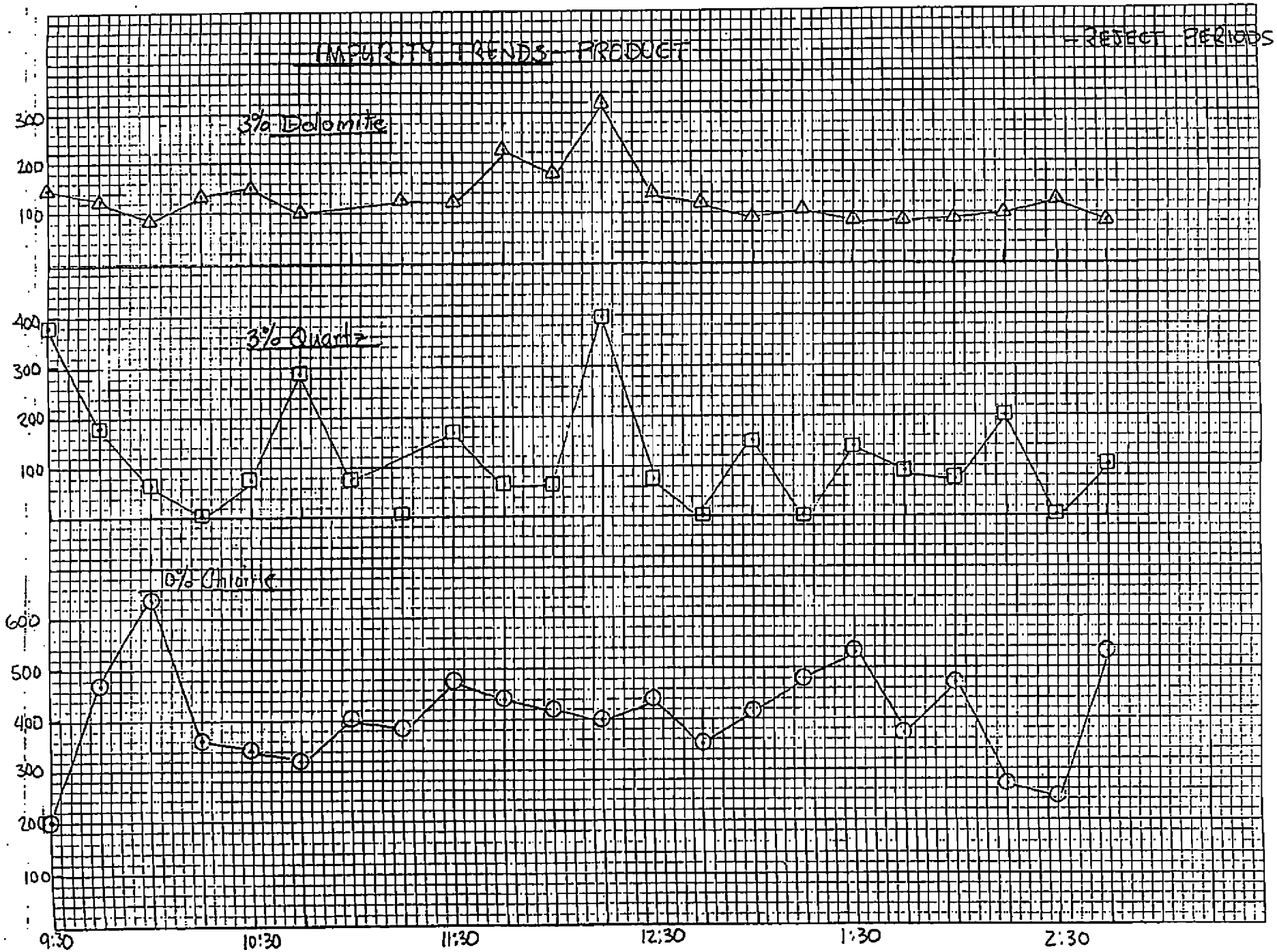

K+E 5 X 5 TO THE CENTIMETER 18 X 24 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 1610

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K+E 5 X 5 TO THE CENTIMETER 18 X 24 CM.
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3/86 .2% 8,000/40 6 Hz. .08 RPM ⑨

Product	Sample	10:15 Rejects	12:00 Am Rejects
Chlorite	3 %	6 %	7 %
Quartz	1/2 %	30 %	25 %
Feldspar	1/2 %	1 %	1 %
Calcite	1/2 %	1 %	1 %
Dolomite	1 %	10 %	10 %
Magnesite	1/2 %	2 %	2 %
Talc	94 %	50 %	53 %
LOI	5.85 %	9.43 %	9.66 %
	5.86		

100

Rejects 7hz

Test 1
3:40 pm - 1.35 lbs per min
81 lbs per he

Test 2
4:48 1.05 lbs per min.
63 lbs per hr.

Test 3 - 0.90 lbs. per min
6:00 54 lbs per he.

1.10 lbs per min
66 lbs per he

6,600#

Lista de Inspeccion Antes del Turno Para Operadores de Equipo

Nombre del Operador _____ Número de Equipo _____

Fecha _____ Turno (circule uno) madrugada día tarde

CAMINE ALREDEDOR DEL EQUIPO. Verifique el compartimiento del motor, líneas hidraulicas, nivel de líquido. El equipo debe estar razonablemente libre de aceite, grasa y otros peligros de fuego. El área debe estar limpio.

VERIFIQUE TODO LO SIGUIENTE EN SU EQUIPO		BIEN	DEFECTO
FRENO	El freno de estacionamiento debe retenerse con la unidad de energía hacia adelante. Los frenos deben aplicarse igualmente para que el vehículo no se desvie.		
LLANTAS	Observe la presión de aire. ¿Está la superficie de rodadura adecuada y en buena condición?		
BOCINA	Opere la bocina.		
EXTINGUIDOR DE FUEGO	¿Está instalado seguramente? ¿Esta cargado? ¿Está la empaquetadura rota? ¿Está la presión en propio lacance?		
DIRECCION	¿Responde bien, está flojo o espasmódico? ¿La dirección de emergencia trabaja en caminoes de remolque?		
REFUERZO DE ALARMA	¿Está funcionando apropiadamente?		
LUCES	Verifique TODAS las luces instaladas para operación apropiada.		
LIMPIADOR DE PARABRISAS	¿Limpian bien, sin rayas?		
VIDRIOS	¿Hay grietas o excesivas rajaduras?		
CORREAS DE SEGURIDAD DE ASIENTOS	¿Estan en buena condición? Úselas.		

Los renglones que no aplican deben ser marcados N/A.

Observaciones: _____

Entréguele esta lista a su supervisor antes de que usted opere el equipo. Llene otro formulario si algo sale mal durante su turno de trabajo.

1/82 Nombre del supervisor _____ Manténgalo en archivo por seis meses.

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Cyprus Industrial Minerals Company
Talc Division

TECHNICAL SERVICES LABORATORY REPORT

REPORT NO: 85-275 DATE OF REPORT: 11-7-85

SUBJECT: QUALITY CHECK: Italian Talc

Background: This is a new 5000 MT shipment of Italian crude to be quality checked for moisture, brightness, cast and mineralogy.

Samples: Seven survey samples taken off the ship, labeled 1 through 7.

Results: See Appendix.

Conclusion: This shipment is a high brightness, high purity crude with no significant color cast. Its moisture content will be driven off in the plant dryer.

M. Lankford

M. Lankford

ML/mc

Attachment

REFERENCES: CIM - S. Plainfield

KEY WORDS: Italian Talc

COPIES: RJB, LHM, GDL, MJL, KBL, RJZ, RMP, ML, RDB, FILE

REPORTED BY: M. Lankford

REQUESTED BY: R. J. Zazenski

STATUS: Complete

CYPRUS

	1
% Moisture	1.1
GEB	90.4
L *(black-white)	96.44
a *(red-green)	-.55
b *(blue-yellow)	.74
% LOI	5.07

Mineralogy by XRD:

% Chlorite	~2
% Quartz	~½
% Feldspar	tr
% Calcite	tr
% Dolomite	<½
% Magnesite	tr
% Talc	~97

I FHMAN 00274

APPENDIX

2	3	4	5	6	7
.60	1.5	0.2	1.5	2.1	1.8
88.6	91	91.6	91.8	91.6	91.7
95.80	96.25	96.89	97.32	96.51	97.18
-.38	-.55	-.56	-.62	-.58	-.55
.68	.47	.67	.89	.76	.80
5.21	4.92	5.52	5.34	5.79	5.12

~3	~1	~2	~2	~3	~2
tr	~½	tr	N.D.	~1	~½
~½	~½	~½	~½	tr	tr
N.D.	N.D.	N.D.	tr	N.D.	N.D.
tr	<½	~1	<1	~2	~½
~½	tr	<½	<½	tr	tr
~96	~97	~96	~96	~94	~97

Williams Mill Test

	Screen	B. D.	Amps Mill	Amps Fan	Inlet Δp Plenum	Inlet Δp Mill	Inlet Δp Fan
		21.9	115	130	-7	14"	29"
	98.6	23.03 22.09	115	130	-2	14	29
3	97.4	24.0 24.4	107	140	-2	10	28
4	98.6	23.5 23.3	112	135	-7	14	29

October 9, 1987

J. P. Close
T. F. Deems
G. R. M. Dugan
C. R. Geary
J. M. Hooks
F. F. Hutchison
G. C. Jeske
C. W. Kinzeler
T. D. Landels
K. B. Lehman
J. W. Massari
E. F. McCarthy
M. R. McCune
M. B. Toelle

M&D Asset Listing

As mentioned in R. J. Buettner's memo of September 30 regarding the Risk Management Identification Survey, attached is a copy of the M&D asset listing covering your location(s) for the period ending September 30, 1987. This listing will now be sent to your on a quarterly basis.

As you may recall, the previous asset system required the use of two schedules to determine the net book value of assets. This is no longer the case. All pertinent information is included on this one listing. Net book value can easily be calculated by subtracting the "Book Accm Depr" amount from the "Book Cost" amount.

The asset number in the M&D System is referred to as an "Item Number" and is comprised of ten digits - company code (three digits), the equipment number or asset number used in the previous asset system (five digits), plus two additional digits which were randomly assigned.

The "Physical Location" numbers as shown on this listing are not the ones you are accustomed to using. The entire list of physical location numbers is shown on Table T-0113 in the Chart of Accounts. A copy of the most recent version is attached.

As you are aware, whenever an asset is sold, traded, transferred, or scrapped, an AM-777 form is required. This form is the source document for any additions, deletions, or changes to the asset system. It is your responsibility to insure that this form is submitted on a timely basis. (Note: AM-777's for Southeast Operations are prepared by Pat Cline in Cartersville.) As a reminder, AM-777's on transfers within CIM are to be handled by the receiving location.

It should be noted that when an asset is transferred from one location to another, traded, sold, or scrapped and the AM-777 form is properly completed, the item will still appear on your M&O asset listing. However, the "Book Cost" and "Book Accm Depr" columns will show all zeros until the end of the year at which time the item will be cleared. In the case of transfers, the five digits which represent the prior equipment number are generally retained. For example, a VCR was recently transferred from Los Angeles to South Plainfield. The asset number at Los Angeles was 3293502701; the asset number at South Plainfield is 3293502705. Both locations are in Company 329. Also, some assets have separate item numbers for sales tax and freight. Please be sure that the AM-777's include all the item numbers in order to properly clear the asset from the books.

If you have any questions or problems, please contact Pat Cline or me.

Joanne Felger

J. S. Felger

jsf

R. J. Buettner
D. K. Hullock
M. J. Lorang
R. G. Morris
E. H. Reade

M&D-FA Physical Locations

Identifier Code No.	
	CIM Headquarters #309
309	CIM Headquarters - Admin. and General, Colorado
331	CIM R&D - Admin. and General, California
332	CIM P&E - Admin. and General, Colorado
054	Alpine Plant, Alabama
143	CIM TW - Admin. & General - Georgia
144	Louisiana Limestone - Admin. & General
	CIM Talc #329
026	Miscellaneous California Properties - Inyo County
027	Miscellaneous California Properties - San Bernadino County
030	Talc Operations, Denver
033	Yellowstone Mine, Montana
034	Los Angeles Mill, California
035	Alpine Mill, Alabama
036	Beaverhead Mine, Montana
037	Three Forks Mill, Montana
038	Alder Wash Plant, Montana
039	Grand Island Mill, Nebraska
040	South Plainfield Mill, New Jersey
041	VanHorn Mine, Texas
042	Fernley Mine, Nevada
043	Fernley Mill, Nevada
045	Mining and Land Management, Montana
046	Engineering, Denver
047	Admin. and General, Denver
048	Marketing Headquarters, Denver
049	Bulk Distribution Center, Maine
052	Talc Search, Alabama
053	Technical Services, Denver
329	CIM Talc - Exploration, Montana
	CIM Clay #333
055	Aiken Mill, South Carolina
056	Aiken Mine, South Carolina
057	Sandersville Mine, Georgia
058	Sandersville Dry Mill, Georgia
059	Sandersvilee Wet Mill, Georgia
060	Sandersville Kaolin Dry Mill, Georgia
061	Gleason Mill - General, Tennessee
062	Gleason Mill - Slurry, Tennessee
063	Gleason Mill - Air Float, Tennessee
064	Gleason Mine, Tennessee
065	White Marsh Mill, Maryland
066	White Marsh Mine, Maryland
067	Sandersville Marketing, Georgia
068	Sandersville Tech. Services, Georgia
069	Sandersville Land Management, Georgia
146	Gleason Mill - Dry Tennessee WEA Tenn Weakley
333	CIM Clay - Admin. and General, Georgia

Identifier Code No.	
	CIM Thompson Weinman #334
070	Sylacauga Quarry, Alabama
071	Paga Mine, Georgia
072	Sylacauga Mill, Alabama
073	Cartersville Mill, Georgia
074	Paga Mill, Georgia
075	Research Center, New Jersey
141	Knickerson Property, Vermont
334	CIM Thompson Weinman - Admin. and General, Georgia
	Louisiana Limestone Aggregates #350
076	Morgan City Yard
077	Lake Charles Yard
078	Houma Yard
079	Krotz Springs Yard
080	General - Marine
081	Spud Barge Ellis
082	Spur Barge #1
099	Baton Rouge Yard
350	Louisiana Limestone - Admin. and General
	Three Rivers Rock Company #352
083	Primary Crusher
084	Secondary Crusher
085	1981 Crushing Plant
086	Aglime Plant
087	Barge Loading
088	Equipment Department
135	Limestone Quarry
136	Aggregate Pit, Tennessee
352	Three Rivers Rock - Admin. and General
	Harcon Barge Company #353
016	American Spirit
017	Marie Thompson
018	Cumberland Express
019	Rip Rap
020	Les Limestone
021	Workboat
022	Barges
023	Barge Loading
024	American Challenge
025	Spud Barge Ellis
089	Cyprus
090	Three Rivers Lady
353	Harcon Barge - Admin. and General

Identifier Code No.	
	CIM Equipment Company #367
026	Miscellaneous California Properties - Inyo County
033	Yellowstone Mine, Montana
036	Beaverhead Mine, Montana
037	Three Forks Mill, Montana
038	Alder Wash Plant, Montana
049	Bulk Distribution Center, Maine
057	Sandersville Mine, Georgia
058	Sandersville Dry Mill, Georgia
059	Sandersvilee Wet Mill, Georgia
060	Sandersville Kaolin Dry Mill, Georgia
070	Sylacauga Quarry, Alabama
071	Paga Mine, Georgia
072	Sylacauga Mill, Alabama
073	Cartersville Mill, Georgia
074	Paga Mill, Georgia
	Buckhorn Processing Company #344
091	Prep. Plant, Bulan and Haddix Tipple
092	Jakes Fork Tipple
344	Buckhorn Processing
	Cyprus Coal Equipment Company #355
337	Cyprus Mountain Coals
338	Cyprus Straight Creek Corporation
339	Cyprus Cumberland Mountain Corporation
340	Cumberland Processing Division
343	Bailey Hill
344	Buckhorn Processing
345	Lost Mountain
346	Mountain Drive
348	Star Fire Coals
349	Straight Creek
356	Brownies Creek
358	Pine Mountain
390	Cyprus Empire
	Pine Mountain Resources #358
145	Mining
358	Pine Mountain Resources - Admin. and General
	Cyprus Empire Corporation #390
093	Craig Office
094	Loadout Facility
095	Eagle Mine #5
390	Cyprus Empire

UNITED STATES MINERAL RESOURCES

TALC

Pre Cambrian Rock with dolomite composition

By C. Ervin Brown

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ABSTRACT OF CONCLUSIONS

Talc as mined and used industrially is a rock containing a mixture of magnesium-rich silicates and ranging in mineral composition from pure talc to predominant tremolite. Other minerals commonly present in talc rock are serpentine, diopside, anthophyllite, and chlorite and less abundantly the carbonates calcite, dolomite, and magnesite.

Industrial talc is used in the pulverized form as a ceramic base for floor and wall tile; a paint extender; a filler for rubber, paper, plastics, roofing, and many other products; a diluent or carrier for pesticides; and a polishing or dusting agent.

Talc is mined from metamorphosed dolomitic and quartzose sedimentary rocks or from hydrothermally altered ultramafic and mafic rocks. The main producing areas are in the eastern States from New England to Alabama and in the west in California, Nevada, Montana, and Texas.

In 1969 and 1970, total consumption was over a million tons—double that of 20 years ago. The projected demand for the year 2,000 ranges from 2.28 to 3.36 million tons. Resources of talc are large and should be adequate to meet this demand, although deposits meeting the rigid chemical and physical specifications of some consumer industries are relatively scarce. Although all talc mining districts contain known reserves and have a good to excellent potential for the discovery of additional reserves, the great bulk of reserves are in New York and Vermont.

Most industrial areas of the United States are fairly close to a source of industrial talc, except for the industries of the midcontinent. There, shipping charges are a much larger part of the cost of talc because most supplies are shipped from Montana and Texas. Areas of metamorphic rocks in Wisconsin and Michigan could contain talc deposits more favorably located for the midcontinent market.

INTRODUCTION

The purposes of this report are to present a current picture of the resources of industrial talc in the United States and to assess the potential for additional resources. A talc resource study by Chidester, Engel, and Wright (1964) is the latest extensive account giving detailed descriptions of many of the talc deposits in the United States and a discussion of all talc-producing districts. Subsequent studies have been published for deposits in Alabama (Neathery, 1968; Neathery and others, 1967), California (Wright, 1968), and New York (Brown, 1969). Bibliographies of talc in the United States are available in works of Engel and Wright (1960) and Merrill

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(1963), and a map locating all talc-mining areas was published by Chidester and Worthington (1962).

MINERALOGY AND PHYSICAL PROPERTIES

Talc is a hydrous magnesium silicate mineral with the theoretical formula $H_2Mg_3(SiO_3)_4$. As used industrially, however, the term "talc" refers to a rock composed mainly of magnesium-rich silicate minerals and having the mineral talc as an important constituent. Mineral content of industrial talc can range from pure talc to predominantly tremolite.

Minerals other than talc that are most commonly present in industrial talcs are serpentine ($H_4Mg_3SiO_6$), chlorite (hydrous Mg-Fe-Al silicate), tremolite ($Ca_2Mg_5H_2(SiO_3)_8$), anthophyllite ($(Mg,Fe)_7(OH)_2Si_8O_{22}$), and diopside ($CaMg(SiO_3)_2$); less commonly present are quartz (SiO_2), calcite ($CaCO_3$), dolomite ($CaMg(CO_3)_2$), and magnesite ($MgCO_3$). Pyrophyllite, an aluminum silicate ($Al_2Si_4O_{10}(OH)_2$) closely related to talc in structure, properties, and uses, is generally lumped with talc and soapstone in production and consumption statistics, but it is not included in this discussion.

The constituents of industrial talc differ considerably in physical and mineralogic properties, consequently, rocks having different mineral proportions vary accordingly in their properties. The mineral talc is extremely soft and slippery, having a hardness of 1 on the Mohs scale; and because of a strong basal cleavage, it is flaky. The associated tremolite and anthophyllite have a hardness of 5 to 6 and when ground produce a fibrous powder because of their prismatic cleavage. Other minerals, such as serpentine, vary in hardness and in shape of pulverized particles. Most of the major constituent minerals of industrial talc are chemically inert and generally grind to a white powder and have high dielectric constants, therefore, these minerals naturally occuring in varying proportions produce inert light-colored rocks with a range of hardness and particle shape when pulverized, making industrial talc an unusually versatile and widely used mineral product.

USES

Industrial talc is used where certain combinations of the following properties are desired: Extreme whiteness when powdered or fired, softness or smoothness, fibrous or flaky particle shape, various degrees of oil absorption, chemical inertness, high fusion point, low water absorption and shrinkage when fired as a ceramic body, low electrical and thermal conductivity, good retention as fillers, and ease of grinding to extreme fineness (Industrial Minerals, 1968).

Talc in the form of soapstone has been used since prehistoric times for carved cooking utensils; current uses of talc are intimately tied to the demands of a complex industrial society. It is important to the manufacturing and building industries, and periodic fluctuations in consumption are directly related to the economic conditions of those industries.

Talc is used as a ceramic base material for wall and floor tile; as a filler by the plastic, paper, roofing, and rubber, industries; as a paint extender; and as an insecticide diluent and carrier. Other special uses are diverse, ranging from a polish for rice, wood turnings, nails, and white shoes to a dusting powder for salami. In the massive form of soapstone, it is cut for laboratory table tops and sinks, steel-marking crayons, and blocks for art carvings. High-frequency ceramic insulator shapes are machined and fired from another massive variety known as block steatite, and block talc is machined and fired for burner nozzles. Talc and soapstone sold or used in the United States in 1969 and 1970 are listed by use in table 128. Figure 69 shows consumption of talc by the major consuming industries during 1950–70. Talc used for ceramic wall tiles and extender in paint now accounts for half of the annual consumption. The roofing, paper, insecticide, and rubber industries together consume an additional quarter, and the many miscellaneous special uses account for the remainder. The only recent outstanding increase in the consumption of talc is in the "other uses" category in figure 69. This curve since 1966 shows an exponential growth which I attribute to the use of talc as a filler pigment in white plastic insulation, containers, and sheeting.

TABLE 128.—*Talc and soapstone sold or used by producers in the United States, by uses*

[In short tons. From Wells (1970)]

Use	1969	1970
Ceramics[1]	245,704	228,595
Insecticides	53,722	33,697
Paint	166,170	154,265
Paper	54,554	52,328
Roofing	30,526	44,997
Rubber	24,464	28,348
Textile	7,974	6,187
Toilet preparations	12,235	13,721
Other[1]	279,168	289,644
Total	874,517	851,782

[1] Includes asphalt filler, crayons, exports, fertilizer, floor and wall tile, foundry facings, insulated wire and cable, joint cement, plastics, rice polishing, and miscellaneous products.

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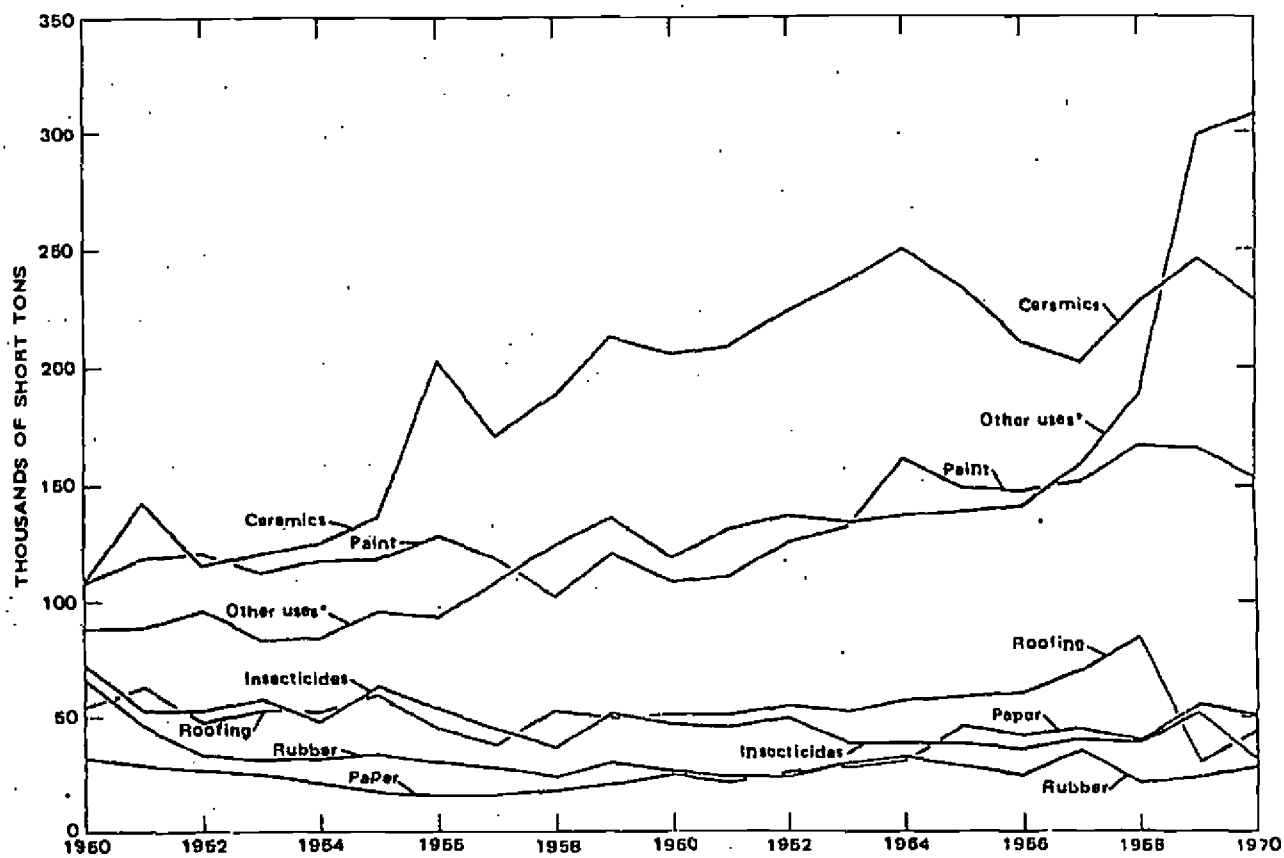

FIGURE 69.—Talc and soapstone produced and used by major consuming industries in the United States, 1950–1970. Other uses include asphalt filler, crayons, exports, fertilizer, floor and wall tile, foundry facings, electrical insulation, joint cement, plastics, rice polishing, textile coating, toilet preparations, and miscellany.

The United States has abundant reserves and resources of talc, but is deficient in certain grades such as block steatite used for high-frequency insulators, and cosmetic talc. In 1970, imports of talc were 29,988 short tons, and exports were about 105,000 tons. Use of flotation and magnetic separation methods in the processing of talc has made us less dependent on imports for cosmetic-grade talc, although in 1970 imports of cosmetic-grade talc from Italy were markedly increased. Phosphate-bonded synthetic "lava" talc and die-formed steatite is being increasingly substituted for block steatite for ceramic insulator needs; however, a residual demand for block steatite for high-frequency insulators will probably continue.

COMPETITIVE MINERALS

Many minerals are competitive with talc for ceramic and filler uses. Kaolin is commonly used as a base for wall tile, but such clay-base tile absorbs water and expands causing the glaze to craze (Gaskins, 1952). Addition of a certain amount of talc to the base material alleviates this condition and improves translucency and toughness of the tile. Another important competitive use of kaolin is as paper filler and coater. Ground limestone is substituted for talc as a paint pigment extender, but it is reactive and does not have the scaly and fibrous particle shape of talc that aids in both coating and holding pigment in suspension. Wollastonite ($CaSiO_3$) has most of the good qualities of talc and is directly competitive in the ceramic and paint industries (Andrews, 1970). However, reserves of wollastonite are relatively small in the United States, and this mineral is now mined only in Essex County, N.Y., and in Riverside and Inyo Counties, Calif. Synthetic molded laboratory work surfaces are increasingly being used as a substitute for sawed soapstone slabs. Some of the synthetic material probably contains talc as a filler, and the overall tonnage of talc consumption may therefore not be seriously decreased, but a much less expensive form of industrial talc will be consumed.

Pyrophyllite, a mineral with physical properties

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similar to talc. has many of the same uses as talc nnd is in fact generally included with talc in resource studies. In the United States it is produced in North Carolina and California (Espenshade. 1962). and in the past 10 years pyrophyllite consumption averaged about 13 percent of talc consumption. Resources of pyrophyllite are much less extensive than those of talc. so although its substitutability for talc is high. its percentage of the industrial talc market probably will not increase significantly.

EXPLOITATION

Talc was used by the Indians and early settlers for cooking utensils carved from soapstone that occurred mainly in altered ultramafic bodies. Mining of talc and soapstone deposits for other uses began in some districts in the early 1800's. but because industrial talc is tied closely to the demands of a modern industrial society. extensive mining has occurred only in about the past 50 years. Figure 70

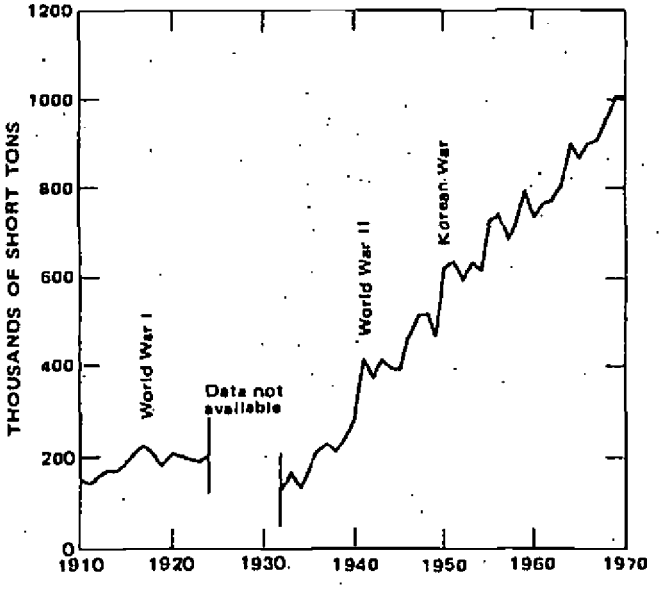

FIGURE 70.—United States consumption of talc. soapstone. and pyrophyllite. 1910–70.

shows the consumption curve for talc, soapstone. and pyrophyllite during 1910–70. The figures are from the Bureau of Mines yearbooks. and the included pyrophyllite ranges from 10 to 15 percent of the total. The graph shows increases during national emergencies and other fluctuations owing to changing economic conditions of industry during more normal periods. The overall slope of the curve is straight and steep.

Because of the diversity of uses for industrial talc. total consumption increases steadily, even when demnnd for individual consumer products fluctuates drastically. As technology develops new products, such as the widespread use of plastic insulation in place of rubber. the demand for talc as a filler may continue because both plastic and rubber require an inert mineral filler. Likewise. increasing use of talc as a base by the ceramic industry since about 1955 has offset decreased consumption by the rubber and insecticide industries (fig. 69). and the booming use of white plastic by our society has apparently caused an increase in talc consumption as a white filler. Other, more sophisticated uses are being developed: for example talc reduced to minus 50-millimicron particle size was used in a patented method by which an electrically insulating surface layer can be induced by electrophoresis on the exterior of an article that in itself is electrically conducting (Wells. 1970. p. 7).

BYPRODUCTS AND COPRODUCTS

Talc mining generally produces no byproducts. Because of the great variety of talc grades required by different consumers. selective mining. milling, and laboratory control results in high recovery of numerous marketable grades from most deposits. In effect, the many grades of industrial talc are coproducts. Bilbrey (1962. p. 22) reported that a cobalt-nickel concentrate was a byproduct of talc flotation in Vermont for a few years in the 1940's. The U.S. Bureau of Mines "Minerals Yearbooks, 1940–48" indicate a total sale of 109 tons of concentrate containing 1.16 percent cobalt and 12.7 percent nickel. Other potential byproducts are anthophyllite asbestos at Dadeville. Ala. (Neathery and others. 1967), and magnesite from Johnson. Vt. (Cooper and Hartwell. 1970).

The recent discovery of scheelite in soapstone deposits in Madison County. N.C., raises the possibility of coproduction from these deposits. (See "Tungsten.")

ENVIRONMENTAL PROBLEMS

Mining of industrial talc is from both underground and opencut mines. Inasmuch as recovery is higher than that in mining for vein minerals. far less of the landscape is disrupted by the operation, and waste piles are relatively small. Only a few operations. such as at Johnson. Vt.. use flotation methods for mineral separation; therefore, most talc mining does not have tailings ponds.

One environmental problem does confront the industry. however: research mainly by a group in

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Mt. Sinai School of Medicine in New York City has shown a positive correlation between incidence of lung disease and working with or near asbestos without safety precautions (New York Academy of Sciences, 1965). Because many of the talc deposits mined in the United States contain asbestiform tremolite and anthophyllite, emission-control standards will undoubtedly be established for mining and milling them. The tremolite and anthophyllite content of talc used as a cosmetic or for food processing, such as polishing rice or dusting salami, also will probably be carefully monitored, as will that in talc used as a carrier for pesticide dusts.

GEOLOGIC ENVIRONMENT

Talc and soapstone deposits of commercial importance occur mainly in metamorphosed dolomite and altered ultramafic igneous rocks. These rocks and contained talc deposits are present in metamorphosed terranes throughout the world. In the United States, talc is found in the older Appalachians and Piedmont from New England to Alabama in the east and in California, Nevada, Washington, and Montana in the west (Chidester and Worthington, 1962). Important deposits also occur in Texas, but most of the Central United States, from the Appalachians to the Rocky Mountains, lack a convenient source of industrial talc.

TALC FROM REGIONALLY METAMORPHOSED DOLOMITE

Dolomites with associated siliceous sediments can be metamorphosed to form talc. In many deposits derived from sedimentary dolomite and silica, talc forms as a final retrograde hydrothermal phase from earlier magnesian silicates such as tremolite, forsterite, and diopside. These three minerals result from high-grade metamorphism with the addition of silica and limited water. Retrograde alteration of the earlier minerals to talc and serpentine is accomplished hydrothermally with the release of calcite and CO_2.

Most of the major talc deposits in the United States are in metamorphosed dolomite; this type accounts for more than half the total production. The largest producers in the country are mines on such deposits in St. Lawrence County, N.Y., where talc, tremolite, and serpentine rocks occur in Precambrian carbonate and siliceous sedimentary rocks. The talc zones are stratigraphic units that have been tectonically swelled in axial parts of folds and at places are pinched out on fold limbs. Shearing has played a major role in the development of talc schist zones.

Similar talc deposits are in the Murphy Marble belt of North Carolina, the Dillon-Ennis district of southwestern Montana, and the Inyo and Panamint Ranges of California. The deposits in North Carolina are lens shaped and follow a zone of quartzose dolomitic marble. Some of the North Carolina talc is exceptionally white, and locally massive varieties are sawed for steel-marking crayons. The deposits in Montana are rather large but require considerable selective mining and sorting because of interlayered unaltered wallrock. The Montana deposits and those in the Inyo and Panamint Ranges of California provide some rock of steatite or near-steatite grade.

Deposits in the Chatsworth district of Georgia and the Allamoore district of Texas, also formed from metasedimentary rocks, are not so closely related to dolomitic parent rocks. These deposits are associated with phyllites, schists, and quartzites, and required extensive metasomatism for their development.

The Winterboro deposits in Talladega County, Ala., occur in or as residual deposits derived from Cambrian and Ordovician dolomite that is relatively unmetamorphosed. The talc is virtually unfoliated and preserves the crystallinity of the parent rock (Wedow and Sweeney, 1968). These deposits should be studied further because of their low metamorphic grade. Possibly they result from prograde metamorphism, with talc being the highest grade mineral produced, in contrast to other deposits in which retrograde metamorphism was important.

TALC DEPOSITS FORMED FROM ULTRAMAFIC AND MAFIC IGNEOUS ROCKS

Talc deposits associated with serpentinized ultramafic rocks occur in regionally metamorphosed and folded sedimentary and volcanic rocks such as those in the older Appalachian Mountains and Piedmont in a belt from New England to Alabama (Larrabee, 1966, 1971). These deposits generally occur as rinds on serpentine bodies but in places have completely replaced them. Some deposits occur where sodic pegmatites intrude serpentine. Steatitization, the formation of talc-rich-rock, was accomplished by either of two processes—the metasomatic reaction between serpentinite and introduced CO_2 or a metamorphic reaction between serpentinite and siliceous country rock. These two processes, though independent, can work together. Generally, the deposits formed mainly by CO_2 metasomatism have an abundance of talc-carbonate rock; and where metamorphic reaction was important, talc rock is dominant. The largest producing talc mines in altered ultramafic rocks are in Vermont; many similar but

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smaller deposits have been mined in the eastern serpentine belts and in California, Texas, and other States.

Talc deposits that formed by intrusion of sodic pegmatites into serpentinite are mined in Harford County, Md. (Pearre and Heyl, 1960, p. 795). Apparently the igneous intrusions provided solution and heat for the reaction with serpentinite to produce a thin contact-zone rind of vermiculite and actinolite, and farther into the country rock, an irregular zone of massive talc rock.

Some talc deposits were formed by pervasive steatitization of mafic rocks associated with ultramafic rocks. At Schuyler, Va., tabular or lenticular bodies of hypersthene gabbro have been altered to greenish-gray soapstone (Hess, 1933). Steatitization here is related either to regional metamorphism or to igneous activity deep in the crust. The altered rock consists of varying proportions of amphibole, chlorite, carbonate, talc, and magnetite and therefore varies from hard to soft. The rock is tough because of an interlocked felted texture of the minerals and is desirable for sawed shapes such as laboratory tables and sinks.

TALC DEPOSITS FORMED BY CONTACT METAMORPHISM OF DOLOMITIC SEDIMENTS

Granite plutons and diabase dikes that intrude favorable dolomitic strata provided the heat and solutions for the steatitization of the sedimentary rocks, and in some places granite itself has been replaced by talc. Southern California contains excellent examples of talc deposits formed by such contact metamorphism. A mining district that extends from the Panamint Range eastward across southern Death Valley to the Kingston Range in Inyo and San Bernardino Counties contains talc deposits that occur mainly along the upper contacts of diabase sills with cherty dolomite of Precambrian age. These ore bodies average 10–25 feet in width and are 1,000 feet to at least 1 mile in length. Most of the talc produced in California comes from them. Wright (1968) presented a detailed description of more than 40 deposits in this district.

Talc deposits of northeastern San Bernardino County in the Silver Lake–Yucca Grove district are genetically associated with granitic plutons. The deposits occur as lenses in a terrane composed of lower Precambrian metasedimentary and intrusive rocks. Dolomitic strata were selectively tremolitized when granitic rocks were emplaced nearby. Subsequently, during retrograde metamorphism, the tremolite was altered to talc schist along the borders of the deposits. The industrial talc in these deposits is snowy white and medium to coarse grained. Minable talc bodies are about 10 feet wide and as much as 800 feet long (Chidester and others, 1964, p. 25).

RESOURCES

IDENTIFIED AND HYPOTHETICAL RESOURCES

The United States is self-sufficient in most grades of talc and soapstone. In the past, we have imported most of our block steatite and cosmetic-grade talc. Because of technical refinements in the use of phosphate-bonded domestic ground talc of steatite grade and die-formed steatite as a substitute for insulator forms machined from block steatite, we are no longer dependent on foreign supplies, and stockpiled material probably will be sold. About half the cosmetic-grade talc consumed (Industrial minerals, 1971) is still imported, but selective-flotation techniques using domestic talc have eliminated much of our dependence on foreign sources.

Chidester, Engel, and Wright (1964) estimated our identified resources at a minimum of 89 million tons, with the possibility of additional discoveries being good to excellent in all mining districts. Resources should be adequate to meet the demands for many decades. The Bureau of Mines, in its Commodity Data Summary of January 1972, estimated United States reserves at 150 million tons and world reserves at 360 million tons. Projected demand for talc in the United States for the year 2,000 by the U.S. Bureau of Mines is 2.28 to 3.36 million tons (Cooper and Hartwell, 1970). Worldwide demand for talc is increasing faster than demand in the United States as societies become more complex, but the world's identified resources appear adequate to meet demand.

SPECULATIVE RESOURCES

Most talc deposits are found in areas of high-grade or contact metamorphism. The deposits in Talledega County, Ala., however, are in relatively unmetamorphosed Cambrian and Ordovician dolomite. Similar dolomites exist at many other places in the United States. The Alabama deposits should be carefully studied to determine their genesis so that similar deposits might be predicted elsewhere. Many areas of dolomitic marble in the southeastern Piedmont, such as the Wakefield and Cockeysville Marbles in Maryland, might contain talc deposits. Another intriguing possibility is the dolomite and marble units in areas of Precambrian rocks in Wisconsin and Michigan. For example, the Randville Dolomite in Dickinson County, Mich., locally consists of white tremolitic marble (James and others,

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1961: p. 128), although this formation at most places is not metamorphosed. This area is particularly important as a potential source of industrial talc because of its proximity to the industrial areas of the Middle West, which are hundreds of miles from all current sources of talc.

PROSPECTING TECHNIQUES

Detailed geologic mapping is currently the best technique in prospecting for industrial talc. For deposits derived from dolomite, the stratigraphy and structure must be known in order to predict the occurrence of talc zones in the subsurface: for instance, previously unknown deposits were recently identified in the town of DeKalb in St. Lawrence County, N.Y., through use of 1:12,000-scale geologic mapping (Brown, 1969; Bannerman, 1972). Although these deposits are exposed at the surface, estimation of continuation to depth can only be attempted through un understanding of the geologic structure. Where talc is a product of contact metamorphism, such as along the diabase sills in the southern Death Valley region, detailed knowledge of the location of dolomitic sediments and diabase sills is important for the location of talcose zones and prediction of their continuation in the subsurface. For deposits formed from ultramafic rocks, too, detailed geologic mapping is important. Geophysical methods, mainly magnetic, can be applied to help locate the parent ultramafic rock. Detailed geologic mapping and drilling then are needed to find talcose zones.

For most of the ceramic and filler grades of talc, the consumer industries have rigid chemical and physical specifications for the milled rock. Therefore, after a deposit is located, considerable careful testing of chemical and physical properties is required to ascertain the minable parts of a deposit.

PROBLEMS FOR RESEARCH

Even though the resources of talc in the United States are large, restrictive specifications of color and other properties make many deposits unusable for high-priced grades of talc. Sampling and laboratory testing of all known talc deposits would establish the quality and marketability of known resources. As already discussed, new deposits are likely to be found primarily as a result of detailed mapping in geologically favorable terranes. A program of concurrent field and laboratory research is ut present being conducted by the North Carolina Department of Conservation and Development for deposits in Madison County, N.C. (L. S. Wiener, written commun., 1972), and a similar study recently was completed for Tallapoosa and Chamber Counties, Ala. (Neathery, 1968).

Industrial talc is an extremely versatile mineral product, and new uses are continually being found. Close cooperation between the research laboratories of the manfacturers and those of the mining companies could probably develop even more functional grades of talc depending on the demands of new products. Research on new pulverizing techniques capable of producing submicron particle sizes would help in opening new markets, as consumers seem to desire ever finer material despite the high costs.

High reflectance or whiteness is a required quality of industrial talc used in the ceramic, paint, paper, and a few other industries. During the quest for this higher priced product, much subgrade rock is discarded. Some of the waste could be sold locally for mineral filler not requiring white rock, such as in rubber, roofing, insecticide, and some dusting applications. Some progress has apparently been made in improving the color of off-white talc (Wells, 1970). More research in this field is needed.

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CYPRUS INDUSTRIAL MINERALS
South Plainfield, N.J. 07080

December 1986

NAME	ADDRESS	PHONE	S.S. #	HIRE DATE	
PINEDA, Daniel	532 West 6th. St. Plainfield, N.J. 07060	754-0843	147-74-1157	3/31/80	960
CONTRERAS, MIGUEL	822 St. Mary's Avenue Plainfield, N.J. 07062 P.O. Box 2936	754-8273	103-46-0840	6/8/81	960 1035
DAMEN, DANIEL	555 Old Post Road Apt. D1 Edison, N.J. 08817	248-0358	153-56-8117	9/23/85	1025 35 75 1135
ESPOSITO, JULIUS	540 Butler St Avenal, N.J.	636-5292	137-48-1780	8/29/83	1110
HERNANDEZ, MANUEL	924 Linwood Pl. N. Brunswick, N.J. 08902 P.O. Box 2842	246-2707	146-50-3103	12/3/73	975
Downey, Carol	326 Hillside Avenue South Plainfield, N.J. 07080	561-1661	150-32-5306	8/25/86	
KOPSAFTIS, JAMES	1329 Rock Avenue No. Plainfield, N.J.	755-0971	147-44-8961	6/11/74	
LEHMAN, KEITH	457 Moose Avenue So. Plainfield, N.J. 07080	668-1856	158-44-3319	11/27/73	

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SUPERVISION

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If we say "he," "his," "him," "man" or "men" in our workbooks or oral presentation, we, of course, mean "he or she," "his or hers," "him or her," "man or woman," "men or women,"...the generic sense of the words as defined by Webster's Dictionary.

Hiring & Firing℠

BY

Padgett–Thompson

PRESENTER

DATE

NOTE: The Federal Statutes and Regulations discussed in this workbook and accompanying program are subject to frequent revision and interpretation by amendments and judicial decisions. Additionally, Federal Laws may be significantly affected by state and local laws. Therefore, seminar participants are encouraged to seek professional legal counsel regarding specific questions about personnel practices in their particular companies.

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WHAT'S YOUR OPINION?

	T	F
1. It is legal to specify that being a certain race is a job requirement.	( )	( )
2. It is legal to ask applicants about citizenship.	(✓)	( )
3. It is legal to terminate a problem employee who exceeds by one day the allowed disability leave after her childbirth.	( )	( )
4. It is legal to promote a 25 year old man ahead of a 58 year old woman who is equally qualified because the man is related to the company president.	( )	( )
5. It is legal to terminate an employee whose religious sabbath prevents his availability for shift work on Friday night or Saturday.	✓	( )

LEHMAN 00293

1. An employer wins a discrimination case only by _____ charges.

2. The key to winning is_____.

MAJOR FEDERAL PROTECTED CLASSES AND COVERED EMPLOYERS

LEGISLATION	RACE/COLOR	NATIONAL ORIGIN/ANCESTRY	SEX	RELIGION	AGE	HANDICAPPED	UNION	COVERED EMPLOYERS	FEDERAL AGENCY
Title VII Civil Rights Act	X	X	X	X				*Employers with 15+EEs;* Unions, emp. agencies	EEOC
Equal Pay Act (EPA)			X					Minimum Wage Law coverage ("administrative employees" not exempted)	EEOC
Age, Discrimination in Employment Act (ADEA)					X (40 to 70)			20+EEs (Unions with 25+ members) Emp. agencies	EEOC
*Age Discrimination; Act of 75 (AOA)					X 40 +			Receives Federal Money	EEOC
*Executive Order 11246	X	X	X	X				All Federal Contractors and Subcontractors	OFCCP
*Title VI Civil Rights Act	X	X	X	X				Federally-assisted program or activity—public schools & colleges also covered by Title IX	Funding Agency & EEOC
*Rehabilitation Act of '73						X		Receives Federal Money: Federal Contractor, $2,500+	DOL & Funding Agency
National Labor Relation Act (NLRA)	X	X	X	X			X	ER in Interstate Commerce	NLRB
Civil Rights Act of 1866	X							All Employers	Courts
Fair Labor Standards Act	Includes Minimum Wage Law and Equal Pay Act with complex method of coverage								DOL
Federal Privacy Act of '74	Federal Agencies only								
Freedom of Information Act	Federal Agencies only								
Family Educational Rights & Privacy Act	Schools, Colleges, and Universities; Federally assisted								

*Applies to Federal Agencies Contractors or Assisted Programs only.

1. Know your STATE laws also.

2. Federal law is the MODEL

3. Federal law CONTROL (unless state law gives more rights to the employee)

THE GOOD NEWS:

You have the right to hire QUALIFIED employees.

LEHMAN 00295

The ERROR℠ Test — EEOC

A guide to winning

Equal treatment and ADVERSE impact upon protected groups

Required to do the job

1. Business Necessity— JOB RELATED
2. Bona Fide Occupational Qualification— ESSENSE
3. We have the right to hire employees who will enable us to run our business PRIVACY MORALITY DECENCY

Records

Objectivity - FACTS THAT MEASURE CONDUCT

Results - STATIC. DEFENSE % of community

A final check:

1. REASON
2. CONSISTANT
3. AVOID CARELESSNESS

LEHMAN 00296

1. HIGH school grads 17-38 that want to learn printing & newspaper management. Call 221-5844

AGE DIS., 40-70, H.S.

NEED VALID RELATIONSHIP

2.

ARE YOU THINKING ABOUT LOOKING FOR A PART TIME DAY JOB?

LACK of experience and skills are no problem. We train . . . and pay you $3.25 per hour while you are training.

MEN, RACE, AGE, NATIONAL ORIG.

3. MAINTENANCE MAN
Large Johnson County apartment project must be experienced and sober. Married man preferred, air conditioning knowledge helpful but not necessary, salary open, apartment and utilities furnished, call

WOMEN, MARITAL STAT.,

4. **SECURITY GUARDS**
and
ALARM DISPATCHER

Excellent starting salary, all shifts available, paid vacation, state certification paid, all uniforms and equipment furnished free.

Applicant must be at least 20 years of age and must be U.S. citizen, have a high school diploma or equivalent, have own transportation and a telephone in residence. Call—

N.Y. 18

RIGHT TO HIRE CITIZENS

5. MOTEL MAID unincumbered, over 35, car & references necessary. High School graduate to qualify for advancement. 48 hour week top salary. Above average or ambitious person.

← VAGUE MARITAL?

AGE, ED., SEX

6. SECRETARY
GAL FRIDAY

MEN

RECRUITING

Getting Started Right: KNOW THE JOB

1. Questions to be answered: WHAT is done?
WHO does it?
WHEN is it done?
WHERE is it done?
HOW is it done?

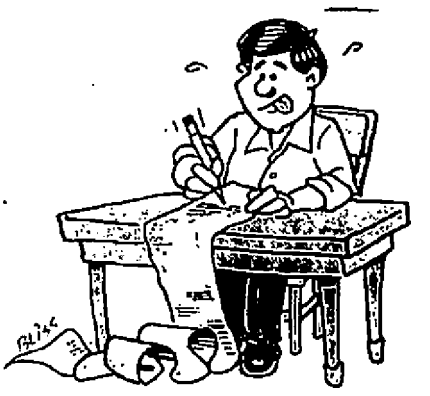
2. The process: A JOB ANAL.

3. Results: Provides a meaningful JOB DISCRIPTION and a solid basis for:

- writing ERROR-free ads
- conducting ERROR-free interviews
- making ERROR-free firing decisions
- hiring qualified persons who best match the job requirements

LEHMAN 00298

THE APPLICATION FORM



1. Avoid SENSITIVE questions.

2. The burden of proof is on the EMPLOYER.

3. Ask only what you need to make the HIRING DECISION.

WHAT'S YOUR OPINION?

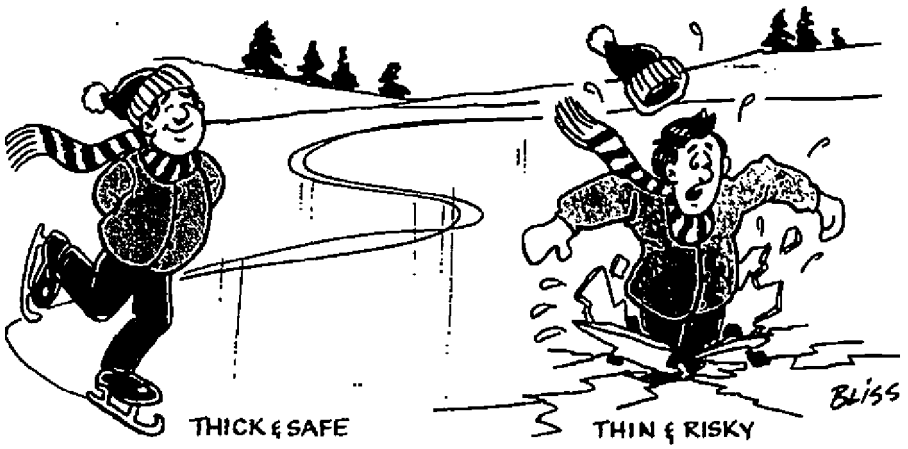
1. ✓ T or ___ F It's OK to decline an application when no openings exist.

2. ___ T or ✓ F A good approach to sensitive questions: leave them off the application but ask them orally in private.

LEHMAN 00299

The Acme Manufacturing Application Form

WHAT'S YOUR OPINION?



1. Position _____ Date _____
2. Name—Mr. ☐ Mrs. ☐ Miss ☐ _____ (LAST / FIRST / MIDDLE INITIAL / MAIDEN NAME)
3. Address _____ Telephone _____
4. Date of Birth R. 40-70 Place of Birth R.

The Age Discrimination Employment Act prohibits discrimination based on age of persons 40–70 years old.

5. Sex R Height R Weight R Social Security Number S W. 42 & UNDER 5'2"
6. Marital Status _____ Number of Dependents _____
7. Next of kin to be notified in case of emergency A PERSON
8. Do you have a high school diploma? _____ Major Courses _____
9. College Degree? _____ Major _____
10. Military Service? _____ Dates _____ Type Discharge _____
11. List any reason known to you why you might be unable to perform consistently and promptly any of the job duties.
S
12. Have you ever applied for workmen's compensation? _____
13. Have you ever been arrested? R Convicted? FELONY S IMPACT ON JOB
14. Have your wages ever been garnished? _____ Dates: _____
15. Reason for interest in this job? _____
16. Have you ever been affiliated with a labor union? _____
17. Can you speak English? _____ Other language: _____ How was foreign language learned? _____
18. Any objection to Saturday work? _____ Religion _____
19. Any objection to travel, if required by job? _____ Objection to overtime? _____
20. Have you ever been addicted to narcotic drugs? _____
21. Work history: (list all prior employers within last 5 years)
22. Have you ever been disciplined or fired? R S Why? S
23. Are you pregnant? R Sexual preference? R S NO LAWS
24. If hired, could you give written evidence of a right to work in this country? R EMPLOYER NO LIABILITY
25. I hereby authorize Acme Co. to contact prior employers listed above to obtain any and all information related to my past work performance. S

_____ APPLICANT

FOLLOW ALL RULES YRS. OF CO.

Any item above which you believe would discriminate against you may be omitted. Completion is voluntary.

LEHMAN 00300

CFIL - G 12

APPLICANT LOGGING

WHAT? A record of the race, sex and national origin of each APPLICANTS by date and job desired.

WHO? All employers with 15 or more employees.

WHY? It's your best DEFENSE - ADV. IMPACT NO LAW

HOW? a. Applicant completes LOG record, or
b. VISUAL survey.

FOUR-FIFTHS RULE

SAMPLE			
	Whites	Blacks	Hispanics
Number Applied	80	40	20
Number Hired	48	12	10
Percent of Selection Rate	60%	30%	50%

Q - 10-25 ADV. IMPACT

1. Group with highest selection rate = [60%] Whites

2. Multiply 4/5 × [60%] = [48%] Comparison Percentage %

3. Groups below comparison percentage
[30%] Blacks = Adverse impact of some element of selection process
*Charges will be pursued.

4. Groups above comparison percentage
[50%] Hispanics = No adverse impact
*Charges will be dropped

SAMPLE

APPLICANT FLOW DATA

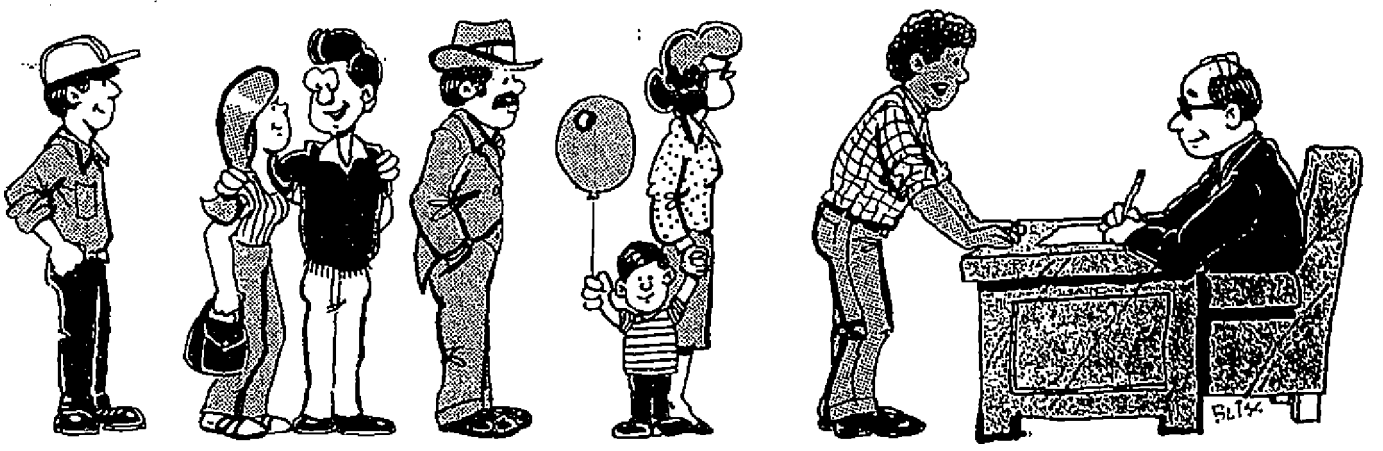
Organization Unit
Location
(Time Period)
Person Preparing Report

UNDER 100 EMPLOYEES

DATE	NAME	RACE	SEX	POSITION APPLYING FOR	REFERRAL SOURCE	EEO CATEGORY OF JOB	DISPOSITION	COMPLETE ONLY IF HIRED			
								JOB TITLE	DATE OF HIRE	RATE OF PAY	ORG. UNIT WHO HIRED

*1—Interviewed, no offer
2—Interviewed, offer extended and hired
3—Interviewed, offer extended, but rejected

LEHMAN 00302



SELECTION

TESTING I.Q. TEST - MUST VALIDATE
SKILL TESTING
MEDICAL TEST BY JOB CLASSIFICATION
POLYGRAPH - UNLAWFUL

INTERVIEWING - HAVE DOCUMENTED records

REFERENCE CHECKING

1. Former boss— VERIFY factual conduct information supplied by the applicant.

STATE LAWS - LIBEL & SLANDER - NO recorded cases
FACSE DEFAMATION - PROVE THE TRUTH

WOULD YOU REHIRE? - NOT OUR POLICY TO ANSWER THAT.

not required to reveal ref. source
NOT NECESSARY TO give any reference

REJECTING

1. "We hired the qualified person who best MATCHED the job requirements." I SORRY WE DO NOT DISCUSS REASONS for rejections
SUGGEST GIVE VALID REASON TO AVOID DISC CHARGES

HIRING

1. Have employee read and sign the JOB DESCRIPTION.
2. Have employee sign for THE DISIPLINE RULES rules.
3. If refuses to sign, have a WITNESS.

LEHMAN 00303

SAMPLE

SCREENING AND INTERVIEWING REPORT

To: Person Responsible for Making Staffing Recommendations

The Personnel Office will collect all applications received in response to a specific job posting. In addition, it will collect applications of qualified candidates in the active application files. When collected, these applications will be sent to you. This form will be attached to each application forwarded and is intended to assist you comply with non-discrimination guidelines. Completed forms should be returned to the Personnel Office with the applications when a decision is made.

Routed to: _____ Date: _____

Name of Applicant Position Posting Number

To Be Completed by Person Responsible for Staffing Recommendation

_____ Yes _____ No 1. Was the above applicant interviewed:

A. If Yes: Date interviewed _____ Place.

Person(s) present other than applicant _____

B. If No: Reason for not interviewing _____
(See box below)

_____ Yes _____ No 2. Is applicant recommended for hire?

A. If Yes: Job related reasons applicant is considered best qualified _____

B. If No: Reason for negative recommendation: (See box below)

IN REGARD TO ITEMS 1.B and 2.B:
The law does not require the selection of unqualified persons for job vacancies. It does require that selections are based on *valid* and *job-related* criteria and furthermore that these criteria are *applied consistently* to all applicants. Any of the following numbered statements, if applicable, would be suitable reasons for rejection as long as the selected candidate could not be ruled out by the same statement, or another appropriate job related statement may be used. Write in the appropriate number or complete number 9 with your reason in the spaces above (1.B and 2.B).

1. Does not meet *minimum* requirements as posted.
2. Does not meet *preferred* requirements as posted.
3. Cannot meet *work schedule*.
4. Cannot *physically perform* job duties.
5. *Unrelated experience*.
6. *Less related experience* than person selected.
7. *Less related training/education* than person selected.
8. *Lower skill level* than person selected.
9. Other: (Specify) _____

Signature of Supervisor Date

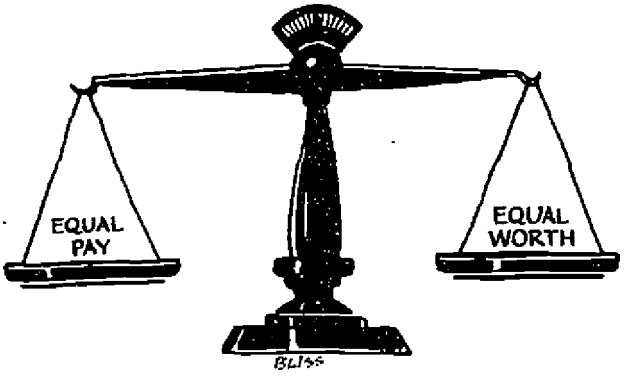
LEHMAN 00304

COMPENSATION

Factors that Justify Pay Differential

JOB FACTORS

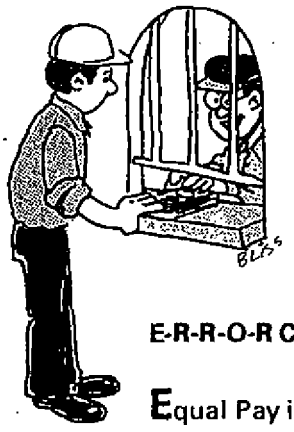
SKILL Ability Training/Education Leadership	**EFFORT** Time Energy—Physical and Mental
RESPONSIBILITY Accountability Control of Equipment, Money	**CONDITIONS** Physical Environment Hazards



PERSONAL FACTORS

SENIORITY	**MERIT/QUALITY** Objective Measure of Quality
OUTPUT/QUANTITY	**ANY** Business Factor Unrelated to Protected Status

LEHMAN 00305



TAKE HOME CHECK LIST

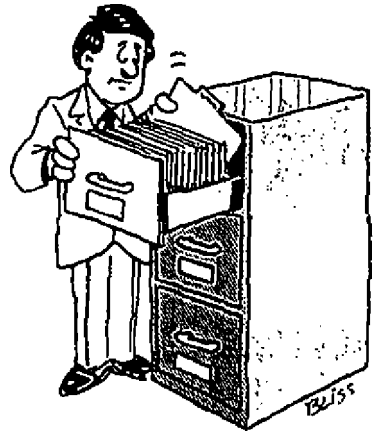
E-R-R-O-R CHECKLIST

	Yes	No
Equal Pay in Same Class?		
1. Are jobs with similar duties classified the same?	( )	( )
2. Do any employees in the same class have different wage rates?	( )	( )
3. Are traditionally female job classes paid less than traditionally male jobs which are of comparable worth to company in terms of SERC contribution?	( )	( )
Required Pay Differentials?		
4. Are different pay rates within the same class based on differences in duties, skill, effort, responsibilities or conditions?	( )	( )
5. Are such pay differences due to bona fide systems of: seniority adjustments, merit increases, production incentives?	( )	( )
Recorded?		
6. Are pay policies recorded in personnel policy manual?	( )	( )
7. In addition to a written job analysis to show duties assigned, do records prove that "additional duties" assigned were actually performed to justify pay increase?	( )	( )
8. Do written performance evaluation records document specific facts supporting merit increases?	( )	( )
9. Do records support production incentive payments to individuals?	( )	( )
Objective?		
10. Do evaluations focus more on performance than subjective opinions about persons?	( )	( )
11. Are evaluation criteria measurable?	( )	( )
Results?		
12. Are protected groups under-represented in any class?	( )	( )
13. Are protected groups under-represented in any system of pay adjustments?	( )	( )
14. Are some classes dominated by one race or sex, while another similar job class is dominated by another race of sex and paid substantially more?	( )	( )

CHALLENGE: Watch for news on the "Comparable Worth" issue!

LEHMAN 00306

EMPLOYEE RECORDS



1. Required Reports

EEO-1	Companies with 100+ employees and Affirmative Action Employers
EEO-2	Apprenticeship program sponsors
EEO-4,5,6	State, Local governments, public school systems

2. Company Personnel Records

1. POLICY
   A. PRIVACY - OUTSIDERS - NO LAWS - GOOD POLICY TO VERIFY & ASK EMPLOYEE & CALL BACK.
   B. RETENSION of records - APPLICATION + general records 1 yr.
   C. ACCESS - TO EMPLOYEES. payrecords 3 yr.
   Medical records 30 yrs

LEHMAN 00307

3. Retention of Records

MEDICAL 30 YRS.

NO TIME CARDS only payroll & rec. of pay 3 years

APPLICANTS 1 YR. - NOT HIRED

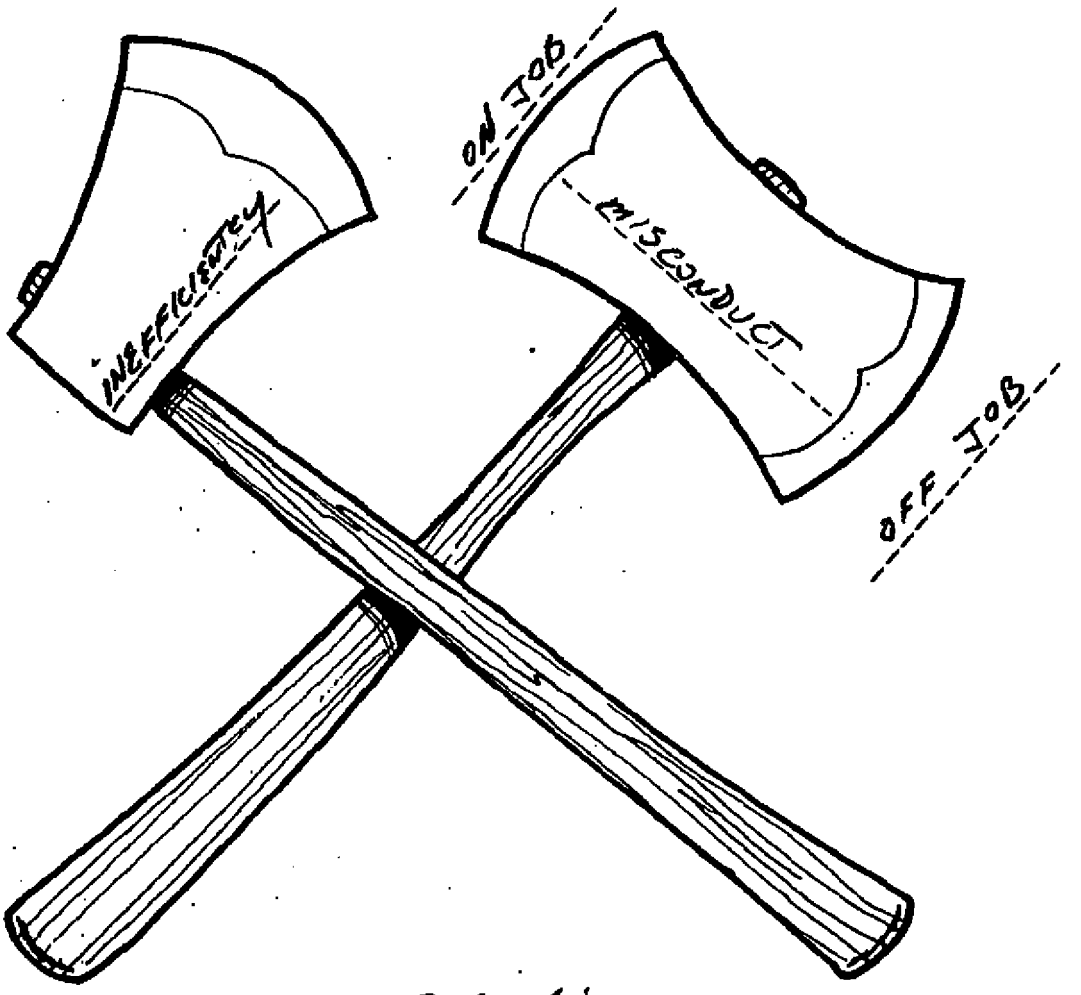
4. Access to Records

FEDERAL LAW - NONE OTHER THAN MEDICAL - SUPPLY WITHIN 15 Days WITHOUT COST

UNIONS ACCESS - MUST BE APPROPRIATE

LEHMAN 00308

TERMINATION



DOCUMENT to prove

THE GOOD NEWS:

1. YOU CAN FIRE ANY BODY FOR ANY REASON OR NO REASON UNLESS YOU VIOLATE CIVIL RIGHTS OR UNION CONTRACT. (JUDGES PREFER GOOD REASON

EMPLOYEE AT FAULT

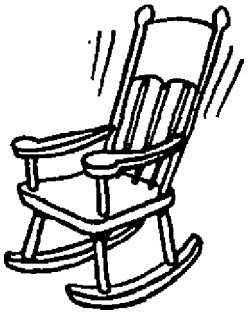
Inefficiency CAN'T DO THE JOB. LACK OF ABILITY

Misconduct WON'T DO JOB.

NO FAULT OF EMPLOYEE

FIRE NOT LAYOFF. HAVE SYSTEM.

Layoffs



70 YR. / MUST BE ABLE TO DO JOB.

Retirement

LEHMAN 00310

ABSENTEEISM

Acme Manufacturing Company's absenteeism rule reads as follows: "Absences shall be classified as scheduled or unscheduled. Scheduled absences are approved by a supervisor on a leave of absence form. Unscheduled absences, with or without a good excuse have not been previously authorized by a supervisor on a leave of absence form."

Unscheduled absences in excess of 10% of the scheduled monthly work hours for an employee shall result in the following:

1st infraction—written warning
2nd infraction within a 12-month period—3-day suspension
3rd infraction within the same 12-month period—discharge

In three consecutive months, Joe Doaks has unscheduled absences totaling 15.5%, 13.9% and 9.6% respectively. Some of the absences during the third month were due to doctor and dental appointments for Joe's children, which Joe failed to tell the supervisor about in advance. Joe previously received a warning letter and suspension. Can Mr. Acme fire Joe Doaks? What factors should be considered?

ESTABLISH POLICY. BE CONSISTENT.

LEHMAN 00311

SEXUAL HARASSMENT

New Guidelines

1. UNWELCOME sexual advances.
2. Physical or VERBAL conduct of a sexual nature.
3. SUBMISSION is expressed or implied as a condition of employment.
4. Conduct has purpose of effect of INTERFERING with work performance, or creating a hostile or offensive work environment.

WHAT'S YOUR OPINION?

In which cases is Acme Company vulnerable for a charge of sexual harassment?

☑ 1. A female supervisor tells Joe Doaks during a break that having an affair with her will get him promoted, while refusing will get him fired. Mr. Acme has no knowledge of this proposal.

1. POLICY - TO PREVENT HARRASSMENT.
2. GRIEV- PROCEEDURES, DOCUMENT COMPLAINTS, DATES & WORDS, TAPE RECOR
3. PENALTIES
4. TRAINING SUPERVISORS & EMPLOYEES

☑ 2. Macho, another Acme clerk, daily tells Jane at work that she is sexually irresistible and refers to her as a "little ball of fluff." She complains to Mr. Acme that Macho's comments are obnoxious and offensive.

COMPANY MUST TAKE ACTION

☑ 3. Joe Doaks is apparently so irresistible that Mr. Acme frequently sees female customers walk up to Joe's desk, small talk with him and then lean over his desk and pinch his dimpled cheeks. Joe backs away only to be reminded that the customer is always right.

LEHMAN 00312

RELIGION

Rule of Thumb

Employers should make a REASONABLE effort to accommodate ALL religions. PRACTICES

WHAT'S YOUR OPINION?

Joe Doaks joins the Sabbatarian fellowship which observes the Sabbath from sundown Friday until sundown Saturday. Under the union contract, shifts are assigned by seniority and Joe is junior man in his section. He has been working Tuesday-Saturday, but now refuses. The union refuses to permit substitution of a senior man and no other employee is available to fill Joe's job on Saturday.

What does "reasonable accommodation" require Mr. Acme to do? CHANGE Schedule if possible of JOB

Can Mr. Acme question all applicants about availability for weekend work, to avoid these problems? YES - BUT HAVE GOOD REASON TO ASK.

UNDUE HARDSHIP on EMPLOYER.

HOLIDAYS REASONABLE - FLOATING HOLIDAYS POSSIBILITY

LEHMAN 00313

PREGNANCY

Rule of Thumb

Employer must treat pregnancy, childbirth and related medical conditions the SAME as other DISABLITIES. (Pregnancy Discrimination Act of 1978)

WHAT'S YOUR OPINION?

	OK	NoK
1. Acme's health insurance plan for employees covers most disabilities, but excludes pregnancy and childbirth expenses.	( )	(✓)
2. Acme's sick leave policy allows up to 90 days of absence on doctor's orders, except for maternity leave, which is for a maximum of 6 weeks. TREAT EQUAL	( )	(✓)
3. Employees returning from sick leave are not guaranteed the same job back, but may be restored to similar work and pay, if such a job is reasonably available, without displacing any employee.	(✓)	( )
4. Acme's health insurance plan excludes any pre-existing conditions, including pregnancy which began prior to employment or within six months after the date of hiring.	(✓)	( )
5. If, for pregnancy related reasons, an employee is unable to perform the duties of her job, the company must modify job assignments to the same extent as has been done for other temporarily disabled employees.	(✓)	( )
6. If employer disagrees with a fitness or unfitness finding of an employee's personal physician, Acme Co. may require employee to submit to an exam by a company selected doctor, at company expense.	(✓)	( )
7. Health insurance benefits for childbirth shall be limited to married employees.	( )	(✓)
8. Sick leave and other fringe benefits for medical disabilities shall apply equally to abortions for employees. However, Acme's health insurance will cover only therapeutic abortions not voluntary abortions.	(✓)	( )

LEHMAN 00314

APPEARANCE

Dress codes are legal.

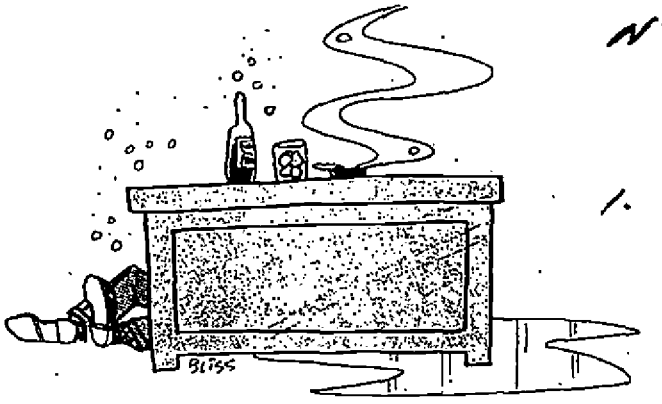
SAFETY, DISTRACTIONS

PUBLIC IMAGE

BE CONSISTENT

Health, RINGS, HAIRNETS, STEEL TOES

DRUGS AND ALCOHOL



NOT TOLERATE ANY USE ON JOB

1. JUDGEMENT CALL -
   STATEMENT: YOU MAY BE REQUIRED TO TAKE A PYSICAL EXAM AT ANY TIME.
2. YOU ARE ~~NOT~~ PHYSICALLY FIT TO DO JOB.
3. GIVE DAY OFF OR OPTION TO TAKE PHYSICAL EXAM.

LEHMAN 00315

CONTROLLING MISCONDUCT

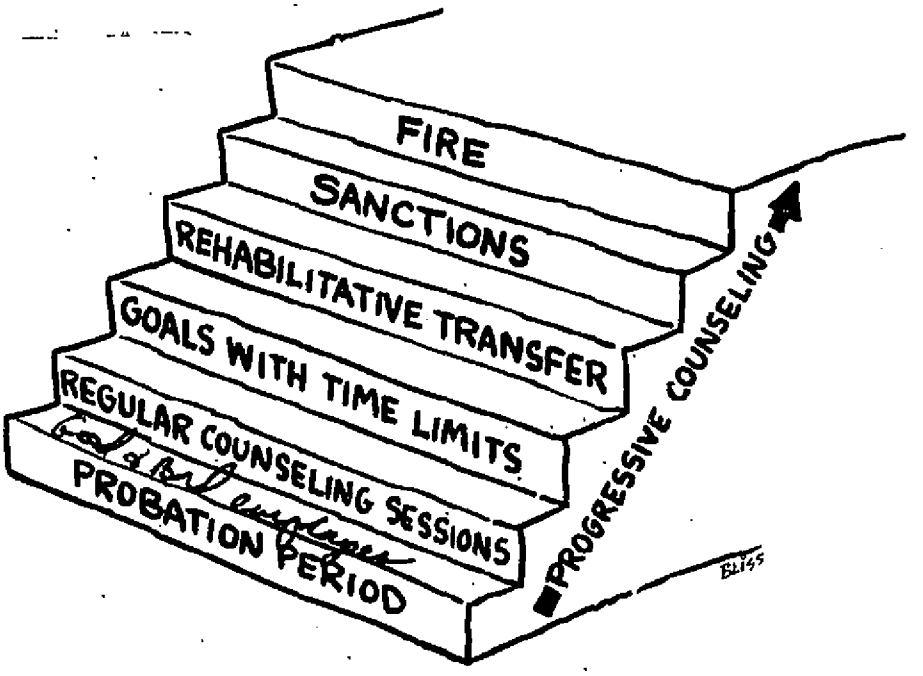
WHAT WOULD YOU DO?

N—No Action **O**—Oral Reprimand **W**—Written Reprimand **S**—Suspension **F**—Fire

ON THE JOB	1ST OFFENSE	2ND OFFENSE	3RD	4TH
1. Smoking in no-smoking area				
2. Excessive talking/interfering with others on the job				
3. Excessive absenteeism				
4. Sleeping on the job				
5. Loitering in other work areas				
6. Tardy return from breaks				
7. Leaving premises during work hours w/o reason/permission				
8. Gambling on company property				
9. Alcohol on breath				
10. Consuming or under influence of alcohol				
11. Possession or under influence of marijuana				
12. Stopping work before quitting time				
13. Using obscene/abusive language				
14. Insubordination				
15. Stealing on the job				
16. Willfully falsifying job application				
17. Punching another employee's timecard				
18. Horseplay				
19. Threatening or intimidating other employees				
20. Fighting—mutual affray				
21. Sexual harrassment				

OFF THE JOB	1ST OFFENSE	2ND OFFENSE
1. Drunk driving		
2. Shoplifting		
3. Assault		
4. Armed Robbery		
5. Sale of marijuana		
6. Sexual harrassment of employee		
7. Moonlighting		

LEHMAN 00316



WHY?

1. To CHANGE THE EMPLOYEE
2. To DOCUMENT THE firing if it becomes necessary

HOW?

1. Clear STD.
2. INCREASE sanctions PENALTY
3. FOLLOW-UP
4. Employee's SIGN THE DOCUMENTATION ✓

EACH EMPLOYEE MUST SIGN COMPANY DOCUMENTS THAT support F. & State Statute requirements concern employment. refusal is grounds for term.

42 US CODE – FRIVOLOUS CHARGE - NO BASIS IN LAW, UNREASONABLE OR PART OF EMPLOYEE

LEHMAN 00317

COUNSELING STATEMENT

FROM: Name _____ Date _____
Dept. _____
Position _____

RE: Employee _____ Position _____

1. I have made the following observation of employee's conduct:

2. I have informed employee of the following standards that will be expected from them in the future:

3. These standards are important because of the following impact on the work environment:

4. I have advised employee of the following consequences if employee fails to follow the above standards:

5. These matters will be reviewed within _____ days.

Supervisor

I have read and received a copy of the above statement. I do/do not wish to submit written comments of my own about this matter.

Employee

LEHMAN 00318

THE FIRING DECISION

REVIEW DOCUMENTATION_ GOOD REASONING

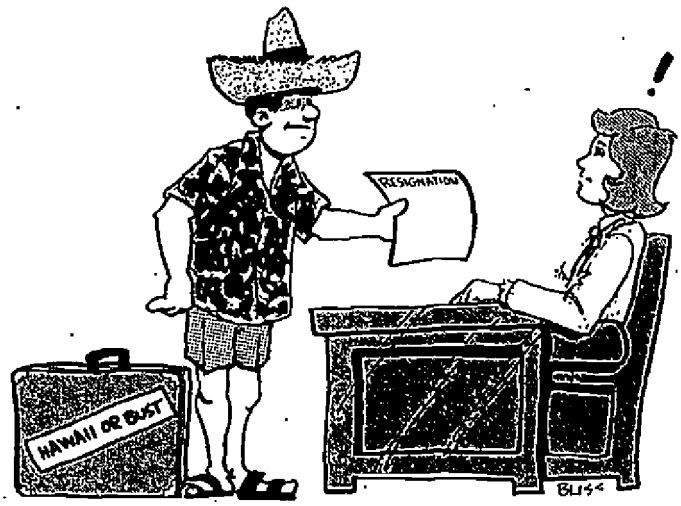
FIRE IMMEDIATELY!

PRACTICAL TIPS

BUSINESS SETTING. CALL IN PRIVATE. IN THEIR OFFICE OR NEUTRAL AREA. HAVE WITNESS, LIVE OR TAPE RECORDER OR BOTH. TELL PEOPLE THE GENUINE REASON FOR FIRING; HEAD OFF DISC. CHARGES.

UNEMPLOYMENT DAYS.

PAY THEM OR TELL THEM WHEN. N.J. NEXT scheduled Pay Day. TEXAS IMMEDIATELY.



RESIGNATIONS

Voluntary FILL OUT FORM

Name _____ Date _____

Employee No. _____ Time _____

I hereby submit my resignation to Acme Manufacturing Company effective ~~immediately~~. 2 wks.

I wish to make clear that I have no claims, or grounds for any claims against my employer based on my time of employment with the company.

_____

Employee Signature

Witness: _____

Constructive Discharge

FORCED RESIGNATIONS.

APPENDIX

A BRIEF SUMMARY OF FEDERAL FAIR EMPLOYMENT LAWS

1. CIVIL RIGHTS ACT OF 1866 (42 USC 1981)

This Civil War Reconstruction era statute provides that "all persons" within the United States shall have the same right to make and enforce contracts, etc., as is enjoyed by "white persons." The law was intended to prohibit discrimination against blacks in contract and property rights. Hence the law would apply to all employers, whether or not engaged in interstate commerce with one or more employees. Employees must base their claim on a contract promise by employer, which is being performed in a discriminatory manner as to race or color. Since this federal law has no statute of limitations, state statutes of limitations on employment contracts generally would apply. Such limits range normally from 2–5 years. Civil rights lawyers resort to this statute primarily when the complainant has failed to file a charge with EEOC within the required time of 6 months from the date of violation. Some courts have held that the law prohibits discrimination against national origin as well as race. Manzanares v. Safeway Stores, Inc. (CA10, Colo.) No. 77-1690, Mar. 12, 1979. Most charges of race discrimination will be pursued through EEOC under Title VII first, rather than suing under 1981 at the outset.

2. CIVIL RIGHTS ACT OF 1871 42 USC 1983

This law primarily applies to prohibit public officials from violating any constitutional rights of persons, including discrimination against race, sex, etc.

3. 42 USC 1985 (3)

Also part of the 1871 statute, this provision prohibits the conspiring of 2 or more persons for the purpose of denying any person equal protection of the laws. Hence, if for some reason an employer was not covered by the modern civil rights acts, and if one manager had agreed with another manager to discriminate against employees based on race, sex, etc., this statute could provide the basis for an alternative claim. Above discussion about statutes of limitation applies here also.

4. TITLE VII, CIVIL RIGHTS ACT OF 1964, 1972 (42 USC 2000[e])

This foundation statute for modern civil rights law forbids discrimination in employment on the basis of race, color, religion, sex, or national origin. Employers in industries affecting interstate commerce, with fifteen or more employees are covered, along with employment agencies and labor unions. Title VII forbids discriminatory preferences for any protected class, majority or minority, and requires the removal of artificial, arbitrary and unnecessary banners to employment when they operate to discriminate against protected groups. Unlike the early civil rights laws, Title VII prohibits practices caused by statistically determined adverse impact as well as intentional unequal treatment. Elaborate administrative procedures must be followed through the Equal Employment Opportunity Commission, seeking voluntary conciliation before the complainant may resort to courts. Other sections of the 1964 Act apply similar rules to federally assisted programs, schools, colleges, etc. (Title VI, IX, etc.)

5. EQUAL PAY ACT (29 USC 206[d])

This subsection of the Fair Labor Standards Act (Wage and Hour Law) prohibits a covered employer from discriminating in wage payments, to exempt or non-exempt employees, on the basis of sex for jobs which require substantially similar skill, effort, responsibility and working conditions in the same work place, unless the wage differentials are due to bona fide systems of seniority, merit, output or some business factor other than sex (Title VII also may be used by employees for pay claims involving sex or other discrimination).

EHMAN 00321

6. AGE DISCRIMINATION IN EMPLOYMENT ACT OF 1967 (29 USC 633)

The ADEA prohibits employers in industries affecting commerce with twenty or more employees from discriminating in employment practices against persons age 40 to 70, on account of age, except for bona fide occupational qualifications related to age. Certain apprenticeship programs, retirement or benefit systems are excepted from these prohibitions. Forty-four states also have age laws, some of which have no "40–70" limitation; hence, all ages would be protected.

7. EXECUTIVE ORDER 11246

Prohibits job discrimination based on race, color, religion, sex or national origin by federal contractors or sub-contractors. Office of Federal Contract Compliance Programs requires an EEO clause in any federal contract of $10,000 or more, reciting duties similar to Title VII. Non-construction contractors with 50 or more employees and a prime or sub-contract exceeding $50,000 must go beyond Title VII duties by submitting and implementing written affirmative action plans with goals and timetables. Amendments: No. 11375; No. 12086; No. 11141 prohibits age discrimination by contractors, and all ages are protected, not just 40- to 70-year-olds.

8. 503, REHABILITATION ACT OF 1973 (29 USC 793[a])

Any contract in excess of $2,500 entered into by a federal agency for obtaining personal property and non-personal services must contain a clause requiring affirmative action by the contractor to employ and advance handicapped persons. "Handicap" may include a physical or mental impairment which substantially limits one or more "major life activities." The term does not include an alcoholic or drug abuser whose current use of alcohol or drugs prevents him from performing the duties of the job, or whose employment would constitute a direct threat to property or safety of others. 29 USC 706 (7) Affirmative Action Guidelines, 41 CFR 670-741. Penalty is debarrment from federal contracts; no private lawsuit is allowed for employee.

9. AGE DISCRIMINATION ACT OF 1975 (42 USC 6101)

Prohibits discrimination based on any person's age (not just 40–70-year-olds) in federally assisted programs.

10. VIETNAM ERA VETERANS READJUSTMENT ASSISTANCE ACT OF 1974

(38 USC 2012) Any federal contract for $10,000 or more must contain clause promising affirmative action to employ and advance qualified disabled veterans and Vietnam era veterans. DOL enforces, with cooperation from Veterans Administration.

LEHMAN 00322

PPENDIX

Job Title: Chief Clerk

JOB ANALYSIS

Date . . . . .

DUTIES	SKILL	+ EFFORT	+ RESPONSIBILITY = QUALIFICATION	
Ranked by Importance	Ability, Knowledge, Exper.	% Time, Effort, Motivation	Accountability	
1. Type	60 wpm IBM Selectric Spelling	Hi—Large volume 35% of time	Hi—For Mr. Acme	Good vocabulary English language Grammar Typing
2. Directs, reviews daily work activities of 3 clks.	Leadership experience, record keeping, attn to detail, motivates	Hi—30% of time	Med	Leadership experience
3. Screens calls for Mr. Acme		Med—10% of time		
4. Receives staff and visitors		Med—10% of time		
5. Routes in-house mail		Lo—5% of time		
6. Takes shorthand from Mr. Acme		Lo—5% of time		
7. Files		Lo—5% of time		

PERFORMS OTHER DUTIES AS ASSIGNED

LEHMAN 00323

APPENDIX

JOB DESCRIPTION

POSITION TITLE: Chief Clerk DATE

REPORTS TO: President

SUMMARY: Types all correspondence for company president; responsible for directing and reviewing the daily work and activities of three front office secretaries; performs a variety of receptionist and clerical duties in the front office.

DUTIES AND RESPONSIBILITIES:

1. Types all correspondence for company president
2. Assigns duties, reviews work and rates performance of three secretaries in front office
3. Screens telephone calls
4. Receives staff and visitors
5. Routes in-house mail
6. Takes shorthand from president; composes and types routine correspondence
7. Performs other duties as assigned
8. Overtime as required HAVE RIGHT - NO LAWS
9. Maintains control of property or cash in custody.

EXPERIENCE: One to two years general clerical activities with some use of business machines. Must be able to type 50–60 wpm.

EDUCATION: Completion of typing and secretarial courses in high school or equivalent; satisfactory performance in English courses.

Employee Acknowledgement

UNION - O.T.
1. PERSON DOING JOB
2. SENIOR
3. JUNIOR QUAL.

EXEMPT OR NON-EXEMPT LAW APPLIES

LEHMAN 00324

APPENDIX

COMMENTS ON APPLICATION FORM (Refer to Page 8)

1. THICK. Identifying position being applied for is definitely job related. Can staple job description to application. CAUTION: OFCCP may require ER to show that EE's are not placed in traditional jobs for their sex or race merely because that is all applicant asked about. TIP: List on form all jobs open and let applicant state preference. Avoids later claim that applicant was only told about and considered for jobs that are "women's work" etc. THICK. Let applicant enter date of application to fix period of retention rules. See pg. 16.
2. THIN. Identifies sex and marital status. Possible sex discrimination when employers assume difficulties in such areas as travel and child care. Ask about prior attendance record for individual applicant instead of assuming a problem.
3. THICK. ADDRESS: THICK. Telephone.
4. THIN. Persons in protected age group will be identified. Could ask "Are you over 18?." for liquor laws or insurance rules. Guideline suggests disclaimer (as in box) if age inquiry made. but ER still has burden to prove business reason for age information.
   THIN. Foreigner might suspect national origin discrimination. If concerned about illegal (unregistered) aliens. "If hired can you give written evidence of your right to work in U.S.?"
5. THIN. Sex inquiry raises suspicion of sex discrimination. O.K. If sex is a bona fide occupational qualification (BFOQ).
   THIN. Height/weight may result in discrimination as to sex or national origin (e.g. Asian-Americans). May have to prove "business necessity." THICK. Note: Federal agencies subject to Privacy Act of 1974 must obtain consent of person before requesting Social Security No.
6. THIN. While marital status inquiry is not expressly prohibited by federal laws, it is suspect because often used as a guise to discriminate against sex. THIN. Inquiry about dependents is suspect (see No. 2 above).
7. THIN. May reveal marital status or national origin. TIP: Ask "name of person to be notified..." Ask after hired, not on application.
8. THIN. Since, in most urban areas, minority races have a higher rate of drop-out from high school, diploma requirement has a greater impact on minorities. TIP: Base inquiry on specific skill requirement (e.g., literacy, math, training)
9. THIN. Need for college degree is frequently unfounded—O.K. if "business necessity." See pg. 4.
10. THICK. U.S. Military service—don't inquire about foreign service; national origin problems.
    THIN. Minorities receive other-than-honorable discharges more often than others.
11. THICK. Good power question! HEW fund recipients may not make pre-employment inquiry or exam as to handicap, but may ask about ability to perform job duties.
12. THIN. Some state laws prohibit employers from rejecting or firing an employee on the basis of prior workmen's compensation claims. Check with your state agency about handling claim abusers.
13. THIN. Arrest—innocent until proven guilty. Statistics show that minorities have been arrested more often than whites, and often for racial prejudice. Exception: Where bonding required. THICK. Conviction—however, such factors as frequency, seriousness, how long ago, age at time of conviction should be given consideration.
14. THIN. Same logic as No. 8.
15. THICK. Good job-related question.
16. THIN. If used to discriminate against union member, violates NLRA.
17. THICK. Unless language is not a "business necessity." How language was learned may identify national origin, so avoid inquiry.
18. THICK. Employer has right to establish work days. If Saturday is required in the available jobs. But see new guideline on religion. *Federal Register*, Nov. 10, 1980. THIN. Inference of discrimination. Identifying religion risky.
19. THICK. If some travel is required. THICK.
20. THICK for private companies. Federal agencies or federally assisted activities under the Rehabilitation Act of 1973 must consider drug addiction as a handicap or disability. However, physical condition or behavior caused by present drug use may be grounds for rejection or discharge. Some may argue in future that a "no drug history" requirement has adverse impact on minorities—but this is not yet proved.
21. THICK. THIN. If a protected class is under-represented in company's workforce, a policy favoring in-house referrals perpetuates the imbalance.
22. THICK. Definitely job related.
23. THIN. Sex discrimination. TIP: Ask: is there any reason why you cannot perform the duties and responsibilities of the job during the next year?
    THICK. Sex preference. Homosexuals not protected by federal law; may be protected by local ordinances. Federal law applies to natural biological gender only.
24. THICK.
25. THICK. "bio-feed back" questions. Likely to get an accurate answer as to supervisor's evaluating but from applicant "voluntary completion" note is ineffective to disclaim liability for asking sensitive questions.

LEHMAN 00325

Table 3.A Occupations of Employed Persons, by Sex and Minority Status, 1978

Occupation	BOTH SEXES						FEMALE					
	Total	White	Black	Other Races	Spanish American	Minority Group*	Total	White	Black	Other Races	Spanish American	Minority Group*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
All occupations—Number 1978	659,600						261,800					
Number 1970												
Percent 1970												
Prof., technical & related	96,537	92.9	6.5	0.6	1.5	8.6	41,645	89.5	9.9	0.6	1.2	11.7
Engineers	9,583	98.0	1.4	0.6	1.4	3.4	183	NA	NA	NA	NA	NA
Medical & health workers	14,937	89.1	9.3	1.6	1.4	12.3	9,770	86.7	11.8	1.5	1.0	14.3
Teachers, elem. & sec. sch.	19,364	91.1	8.7	0.2	1.4	10.3	14,585	90.5	9.3	0.2	1.6	11.1
Other professional	52,593	93.8	5.8	0.5	1.6	7.9	17,321	90.0	9.5	0.5	0.9	10.9
Managers & admrs., nonfarm	57,184	96.9	2.9	0.2	1.0	4.1	9,740	93.6	6.1	0.3	1.4	7.8
Sales	52,587	96.6	3.1	0.2	0.9	4.3	19,523	95.5	4.1	0.3	1.1	5.5
Retail stores	25,548	96.0	3.8	0.3	1.2	5.2	15,250	95.8	3.8	0.4	1.2	5.4
Other sales workers	27,019	97.3	2.5	0.2	0.6	3.3	4,116	94.5	5.4	0.1	0.7	6.2
Clerical	145,497	91.6	8.1	0.3	1.5	9.9	108,225	92.4	7.3	0.3	1.4	9.0
Sec., stenos., & typists	35,497	95.2	4.6	0.2	1.4	6.2	34,476	95.3	4.5	0.2	1.3	6.0
Other clerical workers	110,027	90.5	9.2	0.3	1.5	11.0	73,599	91.0	8.7	0.3	1.5	10.5
Craftsmen, foremen & related	90,425	93.6	6.0	0.4	1.5	7.9	4,834	87.6	11.3	1.1	2.5	14.9
Construction craftsmen	19,597	94.9	4.9	0.2	1.1	6.2	262	NA	NA	NA	NA	NA
Mechanics & repairmen	21,938	94.9	4.6	0.4	1.4	6.4	524	NA	NA	NA	NA	NA
Machst. & other metal crftsm.	8,855	95.6	3.8	0.6	1.9	6.3	262	NA	NA	NA	NA	NA
Other craftsmen	39,619	91.8	7.9	0.4	1.7	10.0	3,665	NA	NA	NA	NA	NA
Operatives except transport	75,675	84.5	15.0	0.5	2.8	18.3	27,528	83.2	16.3	0.5	3.4	20.2
Durable goods mfg.	34,810	84.2	15.3	0.5	2.4	18.2	9,462	83.8	15.7	0.5	1.9	18.1
Nondurable goods mfg.	20,286	85.5	13.7	0.8	3.7	18.2	11,472	88.0	11.3	0.7	3.9	15.9
Nonmanufacturing	20,491	83.9	15.8	0.3	2.7	18.8	6,592	73.2	26.5	0.3	4.5	31.3
Transport equip. operatives	27,168	89.8	9.9	0.3	2.0	12.2	1,348	92.6	6.7	0.7	0.8	8.2
Laborers, nonfarm	31,412	76.4	23.0	0.5	2.6	26.2	3,171	76.1	23.2	0.7	2.2	26.1
Service exc. priv. household	69,360	76.3	23.2	0.5	1.9	25.6	38,684	75.9	23.7	0.4	1.9	26.0
Cleaning & food service	34,327	77.1	22.3	0.6	2.1	25.0	17,771	79.8	19.8	0.4	2.0	22.2
Protective service	7,235	91.2	8.7	0.1	1.1	9.8	307	83.4	16.6	0	0	16.6
Personal, health & other serv.	28,151	71.6	27.9	0.5	1.9	30.3	20,586	72.3	27.2	0.5	1.9	29.6
Private household workers	6,723	40.6	58.3	1.1	1.0	60.4	6,407	40.1	58.9	1.0	1.1	61.0
Farm workers	6,787	91.0	8.8	0.2	0.4	9.4	666	63.4	36.6	0	0	36.6

Notes: NA = Not available

*Sum of Spanish American and all races except white. Some duplication possible since Spanish American may include nonwhite races in addition to white.

Source: Census of Population, 1970 and Missouri Division of Employment Security.

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APPENDIX

SELECTED POWER QUESTIONS

Tell me about yourself...

What were the circumstances concerning your leaving?

Would you mind expanding on those aspects of your schooling (or job) which you found to be most satisfying?

Did you finance part of your own education?...Doing what type work?

You mentioned you enjoyed your last job...what type people were you working with?...type supervisor?

What experience have you had with...

Why do you think the company should hire you?

How long have you been planning for this kind of work?

How did you happen to go to work for them?

What do you expect from the company that hires you?

What are some things you wish to avoid in the next job?

What has accounted for your progress (grades, awards...)?

What is your greatest strength?...Weakness?

How would you describe yourself?

What do you plan to be doing five years from now?...What are your long range goals?...Short range?

How does this job relate to your plans?

Do you consider yourself a self-starter?...Why?

What assignments don't you like?

What would you do if your supervisor made a decision that you strongly disagree with?

Others:

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APPENDIX

PERSONNEL RECORDS RETENTION TIME TABLE

LAW	AGENCY	RECORD	RETENTION PERIOD
Title VII • All covered ER's	EEOC	All personnel or employment records (including application forms of rejected persons)	6 months from creation of record or until any complaint is disposed of, whichever is longer
• ER's W/100+ EE's	EEOC	EEO-1	File each March 31 information from the preceding 12 months
• Apprenticeship program sponsors	EEOC	Application records, all records used in compiling EEO-2 and EEO-2E	Two years from creation
Age Discrimination Employment Act	EEOC	Payroll and related records. All other personnel records including solicited application forms	Three years One year
Equal Pay Act	EEOC	Records of wages, hours, job classes, benefits, etc.	Three years
Rehabilitation Act of 1973	OFCCP	Records relating to any complaint brought under Act	One year
Civil Rights Act of 1964 State/Local Governments; Public School Systems	EEOC/ HEW	Records used to compile annual employee information reports EEO-4, 5 or 6	Three years
OSHA ER's in maritime, construction or general industry work	OSHA	Medical records, including records of exposure to toxias	Thirty years from creation or from termination of subject employee as to personal medical records

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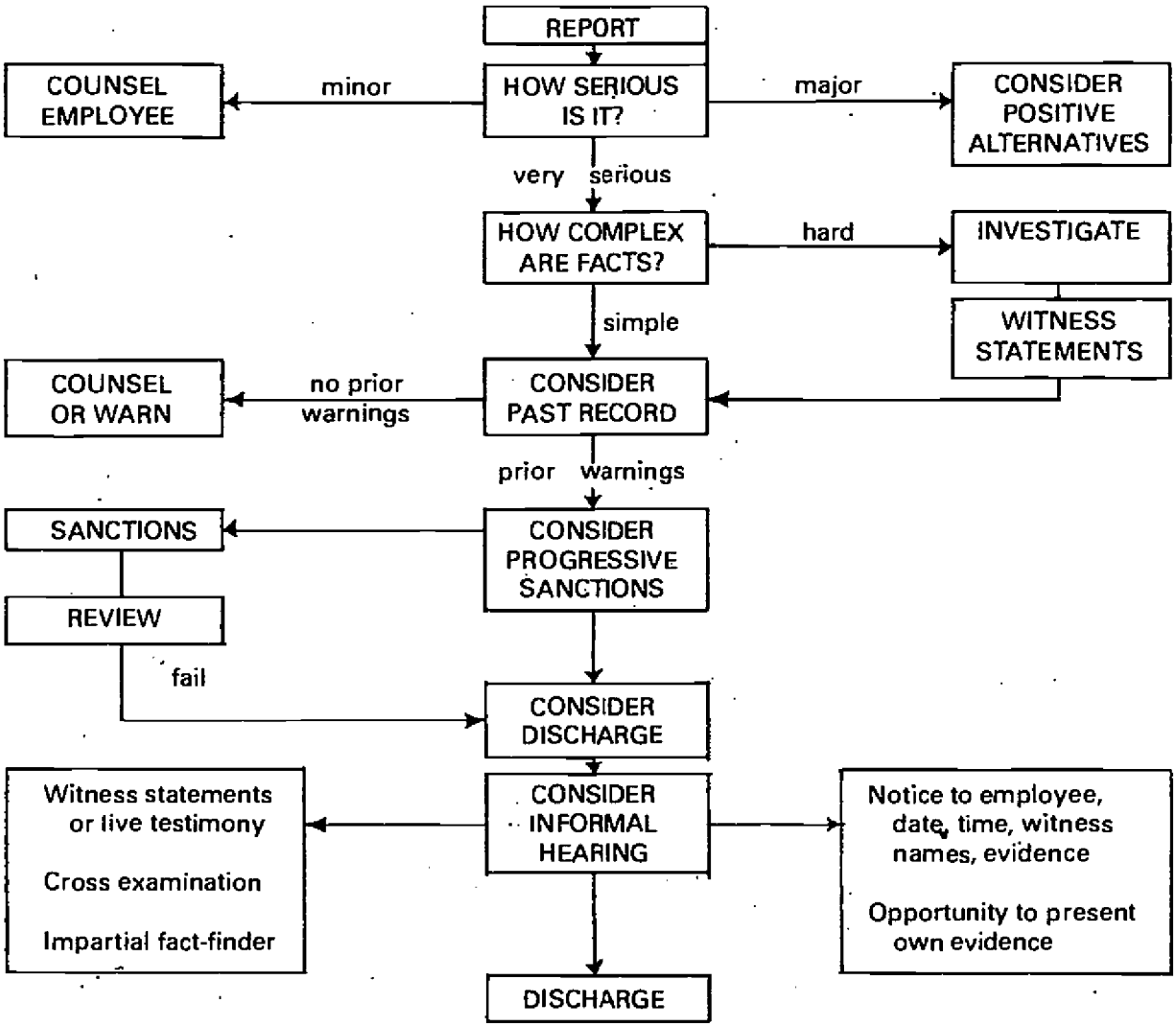
APPENDIX

SAMPLE MISCONDUCT PROCEDURE



NOTE: You can act at any step when you feel confident of the factual basis of your decision! Document your "reasonable basis" to believe misconduct was committed by employee.

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ADV. PACKAGES

APPENDIX

REFERENCES

1. LABOR MARKET ETHNIC DATA—for Affirmative Action Planning.
   Most state employment departments can furnish you with information about the sex or ethnic composition of your labor market according to job skills. Ask for *Data Package for Affirmative Action, US Dept. of Labor.*
   Additionally, your nearest EEOC area office can supply you with these packets.
   Or you may write to:

   Office of Voluntary Programs
   EEOC, Room 4295
   2401 E Street, NW
   Washington, DC 20506

   Bureau of Labor Statistics
   US Dept. of Labor
   Washington, DC 20210
   (ask for Georgraphical—*Profile of Employment and Unemployment*)

2. POSTERS
   Each fair employment law normally has a poster required to be placed in a conspicuous place on a covered employer's premises, where applicants and employees may see it. For state posters, contact your local fair employment agency office. For federal fair employment posters, contact your nearest EEOC area office, or write the Office of Voluntary Programs (address above).

3. APPLICATION FORMS
   Obtain a form from your business form supplier which purports to be legally reviewed for fair employment law compliance. Then ask your local counsel to review it with you for local variations, up-dating, and individual tailoring for facts you need to know.
   Several form publishers have legally reviewed forms, without recommending or warranting these forms, we mention the following:

   Amsterdam Printing and Litho Corporation
   Amsterdam, NY 12010 form #23960

   E.F. Wonderlich
   Box 7,
   Northfield, IL 60094

4. UNIFORM GUIDELINES ON EMPLOYEE SELECTION PROCEDURES
   43 Federal Register 38290. Also available from EEOC area offices.

5. TESTING
   You or your counsel may find a table listing the company names and test names for a variety of professionally designed ability or skill tests in most law libraries, in *Federal Regulation of Employment Service,* volume 1 section 2:63. A bi-monthly newsletter is also available, for updating on labor law in general. Write: Lawyer's Coop, Rochester, NY 14694.
   Some additional resources on testing:
   E.F. Wonderlich and Associates, Box 7, Northfield, IL 60094
   California Test Bureau, Del Monte Research Park, Monterey, CA 94306
   Houghton Mifflin Corp., 1 Beacon St., Boston, MA 02107

6. GENERAL UPDATING—on EEOC law.
   1981 Guidebook to Fair Employment Practices, CCH, Inc.
   4025 W. Peterson Ave.
   Chicago, IL 60646 ($3.00 each)

7. *SEXUAL HARASSMENT GUIDELINES,* EEOC
   November 10, 1980 Federal Register

8. *RELIGIOUS DISCRIMINATION GUIDELINES*
   October 31, 1980 Federal Register

9. *AFFIRMATIVE ACTION PLANNING*
   Stock #052-015-0024-3
   US Government Printing Office
   Washington, DC 20402

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APPENDIX

OTHER LEGAL CITATIONS:

1. High school diploma requirement:
   Griggs v. *Duke Power Co*, 401 US 424, (1971) (laborer—invalid)
   Payne v. *Travenol*, 416 F Supp 248 (clerical worker—invalid)
   Thompson v. *McDonnell Douglas Corp*, 416 F Supp 972 (computer programmer trainer—two years college—valid)
   Dobbins v. *IBEW*, 292 F Supp 413 (electrician apprentice—valid)
   EEOC Dec No. 74-53, (1973) (janitor—invalid)
   EEOC Dec No. 72-0591, (1971) (salesman—invalid)
   Johnson v. *Georgia Highway Express, Inc.*, 4CCH EPD P7753, (1972) (truck driver—invalid)
   EEOC Dec No. 71-1563, (1971) (keypunch operator—invalid)
   Rice v. *City of St. Louis*, 464 F Supp 138, (1978) (public health program representative, B.A.—valid)
2. Unequal impact:
   McDonnell Douglas Corp v. *Green*, 411 US 792, (1973)
3. Word of mouth referrals:
   Furnco v. *Waters*, 216 USLW 4967, (1978)
   (also discusses use of statistics)
4. Conviction record inquiry:
   Carter v. *Gallagher*, 452 F2d 315 (8CA, 1971)
   EEOC Dec No. 75-199 Feb. 27, 1976 (meat cutter job—heroin sale conviction was improperly considered)
5. Reverse Discrimination:
   Kaiser Alum. Co. v. *Weber*, 99 S. Ct. 2721 (1979)
   Fullilove v. *Klutznick*, No. 78-1007, July 2, 1980
6. Use of statistics; determining labor market
   EEOC v. *North Hills Passavnt Hospital*, 466 F Supp 783 (1979)
7. Drug Record
   New York City Transit Authority v. *Beazer*, 59 L. Ed. 587 (1979)
8. Religion
   TWA v. *Hardison*, 432 US 63 (1977)
   Draper v. *US Pipe Foundry*, 527 F2d 515 (CA6, 1975)

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Padgett–Thompson
CORPORATE WOODS
10950 Grandview suite 170
Overland Park, Kansas 66210
800-255-4141 • (913) 381-9810

V. ALETVS

Archives

Cyprus Industrial Minerals Company

651 Metuchen Road
South Plainfield, N.J. 07080
Telephone (201) 754-4880

TWX 710-997-9528

July 13, 1981

O.K. Towel & Uniform Supply, Inc.
65 Cherry Street
Elizabeth, New Jersey 07202

Gentlemen:

The existing contract on service for our plant runs out on August 13, 1981.

We wish to notify you that we will not be renewing a new contract with you this year. The service has not been what we consider up to our expectations and, we will be retaining the services of another firm.

Very truly yours,

CYPRUS INDUSTRIAL MINERALS

Vern Alltus
Plant Superintendent

VA/hbt

CYPRUS

P06 2553033

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

SENT TO
O.K. Towel & Uniform
STREET AND NO.
65 Cherry St.
P.O., STATE AND ZIP CODE
Elizabeth, N.J. 07202

POSTAGE		$ .15
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	.75 ¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED	.60 ¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$ 1.50
POSTMARK OR DATE		

SOUTH PLAINFIELD NJ

PS Form 3800, Apr. 1976

Cyprus Industrial Minerals Company

651 Metuchen Road
South Plainfield, N.J. 07080
Telephone (201) 754-4880

TWX 710-997-9528

July 16, 1981

Mr. Ralph Clayton
O.K. Towel & Uniform Supply, Inc.
65 Cherry Street
Eliz abeth, New Jersey 07202

Dear Mr. Clayton:

I am very embarrased to write this letter and, I find that we have done you an injustice. First, I wish to apologize for the way we have handled your account. My wife filled in as secretary until a new secretary could be located and she was telling me the bills were coded and sent in but, unfortunately they were not and consequently, I was unaware of any problems existing.

I really want to apologize for this being out of control. Our company policy is to pay bills on a timely basis.

I sent you a letter that I did not want to continue your service after August 13th:

> First, I have not engaged any other company to take over the service.
>
> Second, in a Union election here to bring in a Union for the employees, they listed the clothing situation as one of their complaints to the Union.

We were very fortunate to keep the Union out of here this time. I am really at a loss of why they complained unless we are not furnishing the proper changes. We may have to increase the amount of weekly changes in order to satisfy their demands. I have one other problem that I would like to discuss with you and that is the rugs we rent. They do not have enough rubber on the bottom to keep them from sliding on the floor. Also, some are getting quite old and have tears in them and we had to take them up to keep people from tripping.

This is not a letter of complaint but to apologize to you once again for the wrong we have done on the billing. I would like to do it in person at luncheon where we can also develop a better relationship between us.

CYPRUS

Mr. Ralph Clayton
O.K. Towel & Uniform Supply, Inc. July 16, 1981

Please disregard my previous letter and let's get together and work out a better coming year for both of us. I will endeavor to do my part.

Sincerely,

CYPRUS INDUSTRIAL MINERALS

Vern Alltus
Plant Superintendent

VA/hbt

W

CORRECTIVE DISCIPLINE

BEFORE TAKING DISCIPLINARY ACTIONS

A SUPERVISOR SHOULD CONSIDER --

1. What is the violation, to what rules, policies, clauses?
2. Were there any offenses committed before?
3. What is his personal record?
4. What is the period of time since last penalty?
5. What are local practices?
6. What are company policies and/or labor contracts?

THE SKILL OF QUESTIONING

1. How do you think you should go about improving these weaknesses?

2. You have done a good job in improving yourself on other weaknesses. What ideas do you have on how you can improve on these?

3. Your efforts have been a failure. What should we do now?

4. I am being criticized by management for your poor work results. What are you going to do about it?

5. What are some of the problems you encounter in doing your job? Which frustrates you the most? What do you do about them?

6. What do you think are your greatest strengths?

7. Where do you feel less competent?

8. Is there any way in which you think that I, or someone else, could help you to make yourself more valuable to the Company?

9. How do you guess other employees get their reports in on time?

10. I have to get some action on improving your overall performance. What can I do to get you to pay more attention to what you are doing?

11. Do you understand how to organize your work effort?

12. How do you feel about the progress you are making?

13. What are some of the things you feel you have done particularly well, or in which you have achieved the greatest success, and why do you feel this way?

14. What are some of the things about your job that you found difficult to do, and why do you feel this way about them?

HIERARCHY OF NEEDS

A. Physiological Needs

Physiological needs are the most basic human needs. These needs are concerned with sustaining and reproducing life itself, and we satisfy these needs through the food we eat, the water we drink and fulfilling our biological functions.

If a person has barely enough food, water, and shelter to survive, his energy and effort will mainly be devoted to his basic need of sustaining and existing. His higher level needs will have a less important influence on his behavior.

B. Security or Safety Needs

When physiological needs are reasonably satisfied, the next higher levels of need which begin to dominate our behavior are our security or safety needs. The physiological needs become relatively less important in influencing our behavior pattern.

Security needs are essentially concerned with maintaining and improving our present level of well-being against external threats, harm, accidents, personal inadequacy, unknowns, and uncertainties. As a result, people want to have stability, job security, savings, life and medical insurance, pension plans, social security programs, unions, and other reinforcements for their safety and security. Anyone who has witnessed poverty, recessions, or depressions can understand the motivating effect of job instability and the desire to satisfy the security need.

Some specific behaviors of employees which indicate an attempt to satisfy security needs are as follows:

1. A preference for doing a familiar job.
2. Resistance to change.
3. Avoiding decision making.
4. Conforming to group norms.
5. Being a follower.
6. Playing safe.
7. Trying to impress others that he is busy working.
8. Organizing or joining a union.

C. Social Needs

Some of the social needs of human beings are to associate, belong, gain acceptance, and to give and to receive friendship and affection. When physiological and security needs are reasonably fulfilled, these social needs become important motivators and can be observed in a person's behavior. For example, a subordinate can usually sense when his supervisor disapproves of his behavior. If it becomes apparent by the supervisor's behavior that he dislikes one of his subordinates, this can be a cause of anxiety, tension, and frustration for that subordinate, and these emotional distresses are often reflected in the employee's performance.

Because of their social needs, people normally join several types of social groups, such as:

1. Church
2. Recreational Club
3. Sports Club
4. Community Service Group
5. Union
6. Informal work group

Supervisors should also be aware that frequently informal relationships among members of the same work group are a kind of "two-edged sword" which can influence performance positively or negatively. Some supervisors misinterpret these relationships as a threat to the work unit and actively strive to break up the clique. This can result in having the individuals affected become antagonistic, resistant, and uncooperative because the supervisor has thwarted fulfillment of one of their social needs, and perhaps can also affect their security needs. Often, this results in developing undesirable changes in behavior among group members as a consequence of the supervisor's actions.

D. Ego Needs

The next level of need to be satisifed is the ego need, which is the desire for status, importance, praise, and appreciation from others. Everyone likes to be respected as individuals and recognized for what we have accomplished, be it big or small. Satisfying ego needs, if properly utilized by a supervisor, can lead to higher productive performance from subordinates, as well as to improving their personal

satisfaction from their jobs. If thwarted, unfulfilled ego needs can result in feelings of frustration, inferiority, and disinterest in a work situation. Ego needs, unlike some of the lower level needs, are rarely completely fulfilled. Once they have become important to a person, he seeks indefinitely for more satisfaction because ego has no physical limitation. The competitive desire to excel and to be recognized is a universal human trait and is becoming increasingly important in business and industry. As other needs are satisfied through a stable business environment, good salaries, benefit plans, and many company and community activites, ego needs gradually rise in importance for the individual.

E. Self-Fulfillment Needs

The next needs to be recognized by a good supervisor are the self-fulfillment needs. The self-fulfillment need is concerned primarily with a person's view or conception of himself, and it is considered to be the highest level of human need. Our need for self-fulfillment is concerned with the desire to improve ourselves, to realize our own talents or potentials, to be creative, to achieve excellence and identify, and to be ultimately satisfied with one's self. An example of the self-fulfillment needs for a scholar might be his desire for intellectual accomplishment.

A person with high self-fulfillment needs can usually find satisfaction through the performance of the job itself. He looks for challenging work which can satisfy his need for internal reward.

WHAT A MANAGER IS AND IS NOT

Managing vs. Doing.
Analysis of authority form .
How do I rate as a supervisor?

PLANNING AND ORGANIZING THE SUPERVISORS JOB

What are good objective's?
Questions to ask in planning.
A Supervisors activities.
A sample time budget.
How to make a time budget.
Managing paperwork.

BUILDING EFFECTIVE COMMUNICATIONS

Domino Outline #1.
Domino outline #2.
Exercise Team Assignments.
Feedback in Communications.

UNDERSTANDING PERFORMANCE STANDARDS & PERFORMANCE APPRAISALS

Presidents to be ranked.
Section Level Jobs.
Employee progress report.
Planning and conducting performance appraisal descussions.
Overall appraisal of job performance.
The skill of questioning.
Handy tools for use in Appraisal Discussions.

MOTIVATING & COUNSELING

Exercise - motivation questionaire.
Hierarchy of needs.
Corrective Discipline.
Case study - counseling.

WHAT ARE GOOD OBJECTIVES ?

A good objective for planning and communication purposes is:

1) Stated clearly and understandably

All personnel involved, including yourself, must know what it is that a plan or series of actions is trying to accomplish. Fuzzy, poorly clarified goals are usually not only hard to communicate, but do not prove a guide to subsequent action. Further they will not determine "when you have arrived". For example, a goal which sounds good in the saying but really gives no guide for subsequent decision is

"That group which has the least accidents over the longest period of time will be considered for a safety award."

2) Attainable but challenging

Naturally many day to day objectives or goals are not necessarily challenging, but where longer range goals are involved, including your own objectives for development and performance improvement, they should make you reach, however, they should not be so overly ambitious as to be unattainable.

3) Neither too broad nor too rigid

This is similar to the first point. If it is too broad it tends to be vague usually and a poor guide to action. On the other hand if it is too rigid, it prevents practical adaptation and flexibility as the plan unfolds. Persistence is a virtue, but rigidity of purpose can also be a great constraint on us. As we move along in our plans, we gain additional information and have to meet new and unexpected problems. Our goals should be sufficiently flexible to adapt to changing circumstances.

4) Realistic:

A good objective recognizes those factors within our own situations and work environment which may affect our reaching of the goal. Such things as; availability of men, money and time; priorities, skills, etc., all affect the kind of goals we can set in terms of realism and practicality.

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5) Action Oriented:

An objective must indicate positive action to the individual. Objectives setting is an actions process where individuals are performing activities; striving to reach a target. For example a goal such as "reduce accidents" gives no action guidance, a goal which is much clearer and closer and more suggestive of action would be.

To reduce road accidents by training in "preventive driving."

6) Does not conflict with other objectives:

The final tests for a goal or objective is to ensure that it is not in conflict with your other goals, your superior's goals, your subordinate's goals and the organization's goals. Goals must be integrated and their positions as sub-objectives of larger objectives considered.

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SUPERVISOR DEVELOPMENT PROGRAM

HOW DO I RATE AS A SUPERVISOR?

This sheet should afford a supervisor the opportunity to make a candid and useful evaluation of essential characteristics of good leadership. Make an honest, self-appraisal when checking each item. When all items are checked, total your score by giving each check mark its column value (weak, 1; average, 2; strong, 3; super, 4) and add up.

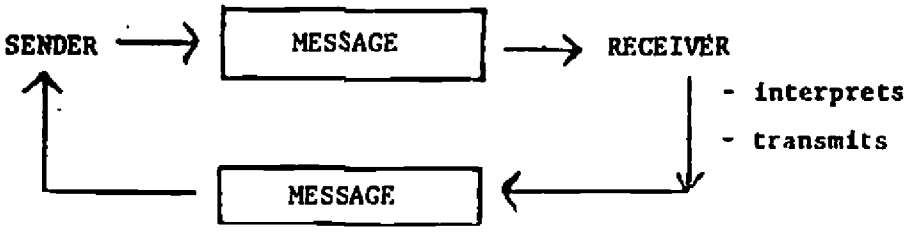
	RATINGS			
	Weak	Average	Strong	Super
How well do I understand the work I am supervising?				
Do I know the abilities of my employees?				
Do I properly instruct every man?				
Have I established adequate and clear standards for every job?				
Do my employees understand the standards by which they are judged?				
Am I always fair and impartial with my employees?				
Do I always have a 'listening ear' for their complaints?				
To what extent do I inspire their confidence?				
Do I always keep all promises I make?				
Do I always give ample credit where due?				
Do I keep my temper when they make errors?				
Do I seek employee advice in making plans and decisions?				
Do I back up my employees to the limit?				
Are they absoluetely loyal to me?				
Am I constantly pursuing a plan of self-improvement?				
Do I try to encourage self-improvement of my employees?				
Am I quick and accurate in my decisions?				

	RATINGS			
	Weak	Average	Strong	Super
Am I constantly on the alert for work simplification and improvement?				
Do I plan my own time?				
Am I loyal to my supervisors?				
Do I inform my employees in advance about changes which will affect them?				
Do I practice the use of tact in my daily contacts?				
Do I reprimand without the use of harshness or rancor?				
Do I accept criticism cheerfully?				
Just how good a supervisor am I?				
TOTAL SCORE				

Feedback in Communication

If we examine the process of communication between two people, we might describe it with the diagram below.

This is one-way communication. The sender, using some communicating means, imparts information to the receiver. However, he has no way of knowing what the receiver actually received.



This is two-way communication. Here the receiver transmits back to the sender in some way his understanding, interpretation or comprehensions of what has been communicated. This is called feedback. Its use permits the sender to test for understanding, to clarify those points not clear, and to confirm correct receipt of the communication.

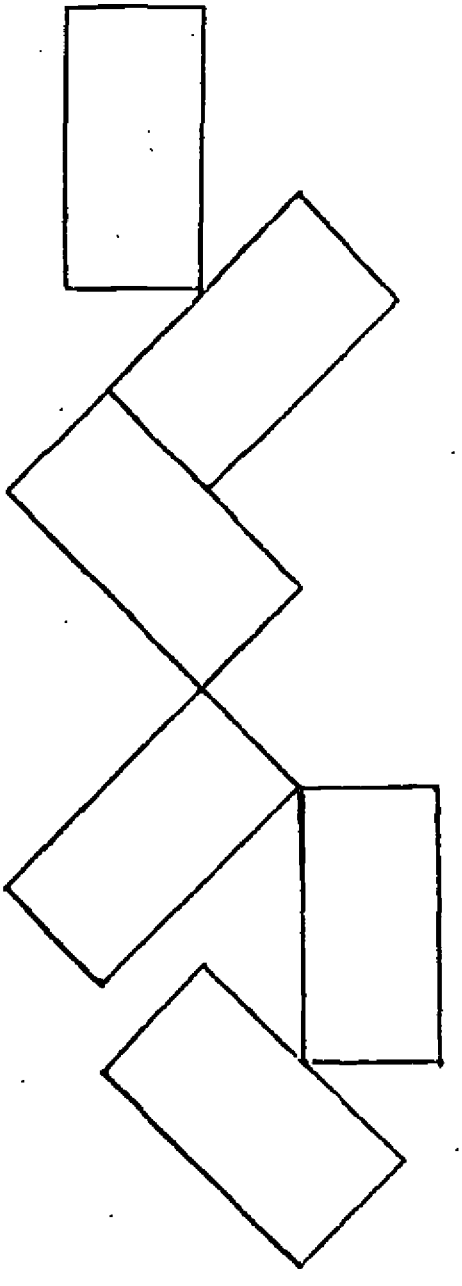
This concept of feedback is a general principle of communication theory. For example, the employee publication is essentially an open or one-way communication instrument. An employee attitude survey with its information to management on the effect of some policy or practice could be considered a feedback or a two-way communication instrument.

The actor in a Broadway play, as compared to the actor on television, is another example of feedback. On television the actor performs, the audience sees and hears, but the one-way communication prevents the actor from detecting how the audience is responding to his performance. On Broadway the actor performs, the audience responds or gives feedback to the actor on his performance that he can detect (two-way communication) through applause, through quietness or restlessness, attentiveness, cheers or jeers, laughter or silence. Each form of audience behavior gives feedback to the actor which can modify or change the actor's performance.

DOMINO OUTLINE #1

1) The long side of the rectangles will be either at 90° or 45° with top edge of paper.

2) The rectangles will touch at the corners and midpoints of the long side of the rectangles.



DOMINO OUTLINE #1

OVERALL APPRAISAL OF JOB PERFORMANCE

NAME	DEPARTMENT	DATE
POSITION	APPRAISED BY	

Points to Remember in Using Scale

1. This rating is for performance on the present job. It is not a rating on potential.
2. Performance on the job is to be judged based on the VALUE of the individual's contribution.
3. The Value of a contribution is a combination of the RESULTS the man is getting today, plus the PROMISE of results ahead.
4. Compare the man against others doing work comparable in type and level. Use your standards as to what is typical or usual performance in this type of job.

1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
☐	☐	☐	☐	☐	☐	☐	☐	☐
Exceptionally high - far above what is typical		Very high - considerably above what is typical		Moderately high - somewhat above what is typical		Moderately low - somewhat below what is typical		Evidence of unsatisfactory performance

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TEST OF FOLLOWING DIRECTIONS

The knack of giving instructions depends on your knack of following directions. This is a timed test. You will have two minutes to complete it. Do not converse with your neighbor in any possible way. When you are finished, turn your paper over.

1. Read everything before doing anything.
2. Put your name in the upper right hand corner of this paper.
3. Circle the word "name" in sentence two.
4. Draw five small squares in the upper left hand corner of this paper.
5. Put an "x" in each square.
6. Put a circle around each square.
7. Sign your name under the title.
8. After the title, write "yes, yes, yes".
9. Put a circle around each word in sentence No. 7.
10. Put an "x" in the lower left hand corner of this paper.
11. Draw a triangle around the "x" you just put down.
12. On the reverse side of this paper, multiply 708 x 9,805.
13. Draw a rectangle around the word "paper" in sentence No. 4.
14. Call out your first name when you get to this point in the test.
15. If you think you have followed directions up to this point, call out: "I have".
16. Count out loud in your normal speaking voice backwards from ten to one
17. Now that you have finished reading carefully, do only sentences one a two.

ods ORGANIZATIONAL DEVELOPMENT SERVICES, INC.

Presents

THE ART OF SUPERVISION

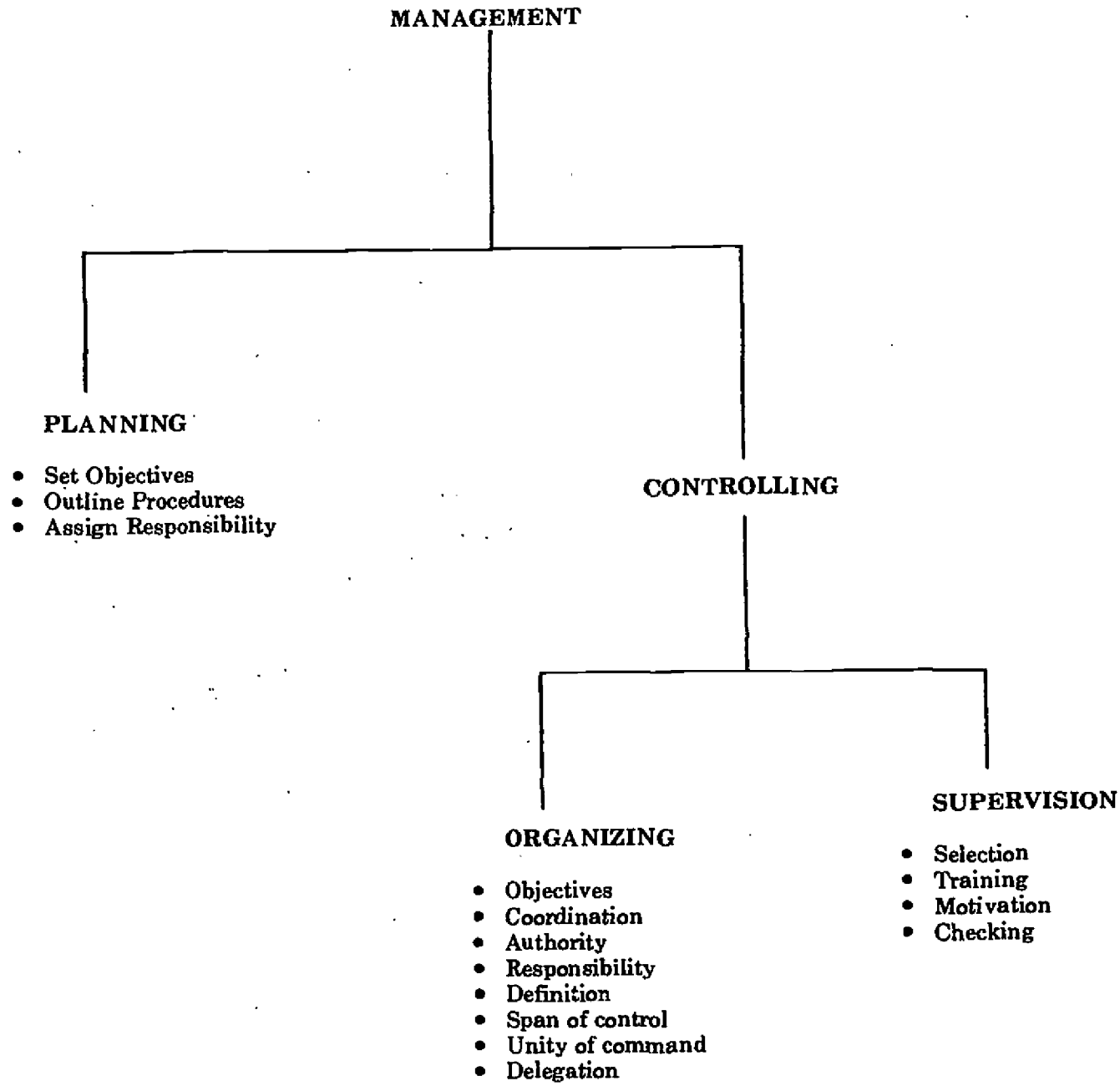
MANAGEMENT

A. GETTING THINGS DONE THROUGH AND WITH OTHER PEOPLE.

B. GUIDING HUMAN AND PHYSICAL RESOURCES INTO DYNAMIC ORGANIZATIONAL UNITS WHICH ATTAIN THEIR OBJECTIVES TO THE SATISFACTION OF THOSE SERVED AND WITH A HIGH DEGREE OF MORALE AND SENSE OF ATTAINMENT ON THE PART OF THOSE RENDERING THE SERVICE.

C. APPLYING YOUR INBRED INSTINCTS TO ACCEPTED PRINCIPLES AND PRACTICES.

I FHMAN 00353



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A SUPERVISOR'S ACTIVITIES

/5 **Routine Work: e.g.**

- giving routine information
- completing routine reports
- answering routine mail
- answering routine phone calls
- checking who is absent
- checking time cards
- etc.

60 **Regular Work: e.g.**

- on-the-job training and coaching
- assigning work and checking assignments
- checking methods and quality
- checking with the boss on new or special instructions
- giving personal attention through daily contacts to those you supervise
- spotting and correcting production difficulties
- regular planning and organizing
- etc.

/0 **Special Assignments and Emergencies:**

- special reports
- special committee assignments
- special change to equipment
- emergency work orders
- etc.

/5 **Creative Work:**

- devising cost-reduction and profit improvement procedures
- devising and eliminating useless reports and paper work
- devising quicker and better training methods
- devising new work methods and eliminating bottle-necks
- etc.

LEHMAN 00355

PLANNING

(The Beginning of the Management Action)

Elements of the Planning Activity:

A. Set Objectives
B. Outline Procedures
C. Assign Responsibility

Three Criteria Good Objectives Must Meet:

A. Specific
B. Consistent
C. Attainable

Four Steps in Outlining Procedures:

A. Define Activities
B. Establish Times
C. Review Resources
D. Determine Locations

Resources to Review:

A. Equipment
B. Materials
C. Skills
D. Money

Planning Techniques:

A. GANTT Chart
B. P.E.R.T.
C. Critical Path

THE MANAGEMENT CYCLE

- We Plan to meet our objectives.
- We Organize the work of the plan.
- We Control our actions to meet our original objectives.

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QUESTIONS TO ASK IN PLANNING

1. What are my Objectives?
   - what is it that needs to be achieved?
   - why does it need to be done?
     - to solve a problem?
     - to improve things?

2. What are my Resources?
   - my own skills?
   - the skills and understanding in my group
     - what are their attitudes?
   - the materials and methods available?
   - the money?
   - time?

3. Who else is involved or can contribute?
   - other departments?
   - my superiors?
   - how can I coordinate all those involved?
   - what is the quality of my relations with them?

4. How can I schedule things and actions?
   - when can I start? when must I start?
   - when does it need to be completed?
   - what steps come in order, which has the priority?
   - will the right materials, men, equipment, etc., be available at the right time?

5. Who will be responsible for what?
   - who has the special skills or knowledge?
   - how many people are needed?
   - how can I effectively delegate?

6. What will slow down of hinder progress?
   - what obstacles or problems can I foresee?
   - what alternate plans have I?

7. What are my follow-up procedures?
   - how will I arrange for checking quality, quantity and "on schedule"?
   - am I sure it is meeting with established policies and standards?

HOW CAN I MOST EFFECTIVELY COMMUNICATE THE OBJECTIVES AND THE PLAN

TO ENSURE MAXIMUM COMMITMENT AND COOPERATION FROM THOSE INVOLVED?

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ORGANIZING

The Principles of Organization:

A.	Unity of command	- A position is to have no more than one boss for each key result area.
B.	Coordination	- Every position must have clearly identified official channels of communication.
C.	Definition	- Each position in an organization should have a written position description.
D.	Delegation	- Decision making should be delegated as far down in an organization as possible.
E.	Objective	- Every position must have a specific reason for existing in an organization.
F.	Authority	- Every position must have the necessary authority to make the decisions for which it is responsible. This authority is passed down through an organization.
G.	Span of control	- The number of key result areas accountable to one position should be kept within manageable limits.
H.	Responsibility	- A manger is responsible for using his authority to meet his objectives.

Organizing - Establishing a structure within which the work of the plan can be done.

Responsibility, Authority, and Accountability -

Responsibility and authority flow down in an organization, while accountability flows up.

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CONTROLLING

Control is a process or procedure used to be sure that results conform to plan.

Types of Controls:

- Continuing Controls	**- designed to prevent problems from occuring.**
- Warning Controls	**- designed to alert the supervisor that something has gone wrong.**

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TIME MANAGEMENT

How to Make a Time Budget

1. Make a list of the things you do during a week's time.

   (a) Those that you must do every day.

   (b) Those that you do at definite, stated intervals.

   (c) Those that you must do, but which come at unpredictable times and require unpredictable amounts of time.

   (d) Those you would like to do if you had the time.

   (e) Consider what emergencies may arise.

   (f) Allow time for planning and thinking.

2. Determine the time you now spend on each job or duty — the average time under normal circumstances.

   (a) Spot duplications of effort or jobs that could be done in less time.

   (b) Determine what job or duty you are now doing that could be delegated to a subordinate.

3. Prepare a time table based on the above factors for each day for a week. Try to fix a time of the day to do each job.

4. Allow time for special and creative work.

5. Use the budget and correct it from time to time.

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MANAGING "PAPER WORK"

1. **Put a stop to what you don't need:**

   - Turn off the things you may previously have requested but now no longer need.
   - Turn off the "helpful" things that you never use.

2. **Act Fast:**

   - Sort out the important things and do them right away, don't put it off until later.
   - Don't handle an important piece of paper more than once, don't just leap into action without thinking but handle it when if first comes up.
   - Fill out reports the day they come up and answer letters as they arrive.
   - Get in the habit of being decisive.

3. **Set aside the less important material for later:**

   - Keep it off your work desk.
   - Put it back in the stream if it's an article or book, and indicate you wish its return (only if you really want it). Others may be waiting.

4. **Dispose of all mail that day:**

   - Don't leave over until tomorrow today's unanswered mail. Tomorrow will have its own problems. Handle today's before you go home tonight.

REMEMBER, YOUR MAIN JOB IS OUT WITH THOSE YOU SUPERVISE — and in PLANNING AND ORGANIZING THEIR WORK.

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A SAMPLE TIME BUDGET

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8	ROUTINE	ROUTINE	ROUTINE	ROUTINE	ROUTINE
9	Inspection and supervision of operations REGULAR	Individual work with staff REGULAR	Inspection and supervision of operations REGULAR	Individual work with staff REGULAR	SPECIAL WORK
10		Inspection and supervision of operations REGULAR		Control studies and reports REGULAR	Inspection and supervision of operations REGULAR
11			Division staff meeting REGULAR		Our staff meeting REGULAR
12					
1	L	U	N	C	H
2	Interviews and contacts REGULAR	Interviews and contacts REGULAR	Interviews and contacts REGULAR	Interviews and contacts REGULAR	CREATIVE WORK
3	Planning and organizing	Inspection and supervision of operations	SPECIAL WORK	Inspection and supervision of operations	
4	REGULAR	REGULAR	REGULAR	REGULAR	
5	ROUTINE	ROUTINE	ROUTINE	ROUTINE	ROUTINE

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PERFORMANCE APPRAISAL

Four Steps of Appraisal:

A. Check Off
B. Review
C. Interview
D. Set New Standards

Steps for Assuring a Good Appraisal Interview:

A. Preparation
B. Set Time in Advance
C. Privacy
D. Objectivity

Areas to Cover in Appraisal Interview:

A. Employee's Strengths
B. Employee's Weaknesses
C. Employee Development Plan
D. Employee Potential

TYPES OF STANDARDS

a. Comparative	- Desired results as based on the performance of others.
b. Negative	- Tells what is not wanted.
c. Historic	- Desired results as based on past performance.
d. Zero	- Nothing is to happen.
e. Engineered	- Desired results as based on the objective of the operation.
f. Objective	- Measurable and specific standards exist.
g. Positive	- Exactly what is wanted.
h. Subjective	- Personal preferences - not measurable.

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SELLING PERFORMANCE APPRAISALS TO EMPLOYEES

Handy Tools for Use in Appraisal-Discussions

QUESTION - Use Questions.

- Find out what they think, what they like, what they want, what their problem is.
- Get them to do a good deal of talking.
- Test for resistance, attitudes, or opinions indicating they are refusing to listen.
- Test for agreement and understanding.

LISTEN - Be a Good Listener.

- Give them a chance to express their ideas without interruption.
- Determine if they are dealing with a fact or an attitude.
- Show sympathy for their views.
- Provide a friendly atmosphere which permits expression of feeling and drains off hostility.
- Build confidence and trust so they can be receptive to your news.
- Build them up and demonstrate understanding.
- Give them time to enlarge, correct, or modify a suggestion or idea so it becomes their own.

TALK BENEFITS - Show Values to them.

- Show how they can get the benefits they want.
- Talk about their problems or what they want to do.
- Show how your idea affects their personal hopes, fears, or desires.

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USE EXPERIENCES - Capitalize on Experience.

- Build understanding by tying the idea into their knowledge or experience.
- Use the experience of others.

EXPLAIN CLEARLY - Express Yourself Clearly and Simply.

- Lead gently, but firmly, toward your idea.
- Give them a chance to justify their own opinion — they may then voluntarily accept yours.
- Tell them why — express the reason behind the idea in a way that it becomes valid from their point of view.
- Use words which they can understand

HANDLE OBJECTION - Turn Objections to Advantage.

- Bring into the open the objections you anticipate or sense.
- Avoid arguing, contradicting, or telling a man he is wrong.

USE ASSURANCES - Build Confidence.

- Use assurances in meeting objections or making any unusual statement.
- Show willingness to reexamine your opinion, position, or assumption.

GIVE RECOGNITION - Give Credit When Due.

- Make him feel important by showing real interest in his needs.
- Make it easy for him to accept in a manner where he does not lose face.
- Talk in terms of "you", "your", "yours".
- Study your ideas from his point of view and show how they tie into the common goal.
- Find a common ground of interest.

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COMMUNICATION

Types of Communication Procedures:

A. Written

B. Oral

C. Non-Verbal

The Elements of Every Communication:

A. Sender

B. Message

C. Receiver

Barriers to Communications:

A. Distortion

B. Stating Inferences as Facts

C. Jumping to Conclusions

D. Confusion over the Meaning of Words

E. Personal Prejudices

F. Failure to Listen

Critical Steps to Communications:

A. Clarify the Message

B. Test the Receptivity of the Message

C. Convey the Message

D. Check the Feedback

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THE TEN COMMANDMENTS OF COMMUNICATION

1. Seek to clarify your ideas before communication.
2. Examine the true purpose of each communication.
3. Consider the total physical and human setting whenever you communicate.
4. Consult with others, where appropriate, in planning communications.
5. Be mindful, while you communicate, of the overtones as well as the basic content of your message.
6. Take the opportunity, when it arises, to convey something of help or value to the receiver.
7. Follow up your communication.
8. Communicate for tomorrow as well as today.
9. Be sure your actions support your communications.
10. Last, but by no means least: Seek not only to be understood but to understand — be a good listener.

DECISION MAKING

Decision Making Process:

A. Define the Problem
B. Gather the Facts
C. Interpret and Evaluate the Facts
D. Develop Alternate Solutions
E. Select the Most Appropriate Solution

Decision Making - A conscious choice or selection of alternatives from a group of two or more alternatives to achieve an objective.

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NOTES:

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FEDERAL REGISTER

FRIDAY, MARCH 2, 1979

PART IV

EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

OFFICE OF PERSONNEL MANAGEMENT

DEPARTMENT OF JUSTICE

DEPARTMENT OF LABOR

DEPARTMENT OF THE TREASURY

■

ADOPTION OF QUESTIONS AND ANSWERS TO CLARIFY AND PROVIDE A COMMON INTERPRETATION OF THE UNIFORM GUIDELINES ON EMPLOYEE SELECTION PROCEDURES

THIS REPRINT COURTESY OF Padgett–Thompson

[6570-06-M]

Title 29—Labor

CHAPTER XIV—EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

PART 1607—UNIFORM GUIDELINES ON EMPLOYEE SELECTION PROCEDURES (1978)

Title 5—Administrative Personnel

OFFICE OF PERSONNEL MANAGEMENT

PART 300—EMPLOYMENT (GENERAL)

Title 28—Judicial Administration

CHAPTER I—DEPARTMENT OF JUSTICE

PART 50—STATEMENTS OF POLICY

Title 31—Money and Finance: Treasury

CHAPTER I—MONETARY OFFICES: DEPARTMENT OF THE TREASURY

PART 51—FISCAL ASSISTANCE TO STATE AND LOCAL GOVERNMENTS

Title 41—Public Contracts and Property Management

CHAPTER 60—OFFICE OF FEDERAL CONTRACT COMPLIANCE PROGRAMS, DEPARTMENT OF LABOR

PART 60-3—UNIFORM GUIDELINES ON EMPLOYEE SELECTION PROCEDURES (1978)

Adoption of Questions and Answers To Clarify and Provide a Common Interpretation of the Uniform Guidelines on Employee Selection Procedures

AGENCIES: Equal Employment Opportunity Commission, Office of Personnel Management, Department of Justice, Department of Labor and Department of Treasury.

ACTION: Adoption of questions and answers designed to clarify and provide a common interpretation of the Uniform Guidelines on Employee Selection Procedures.

SUMMARY: The Uniform Guidelines on Employee Selection Procedures were issued by the five Federal agencies having primary responsibility for the enforcement of Federal equal employment opportunity laws, to establish a uniform Federal government position. See 43 FR 38290, et seq. (Aug. 25, 1978) and 43 FR 40223 (Sept. 11, 1978). They became effective on September 25, 1978. The issuing agencies recognize the need for a common interpretation of the Uniform Guidelines, as well as the desirability of providing additional guidance to employers and other users, psychologists, and investigators, compliance officers and other Federal enforcement personnel. These Questions and Answers are intended to address that need and to provide such guidance.

EFFECTIVE DATE: March 2, 1979.

FOR FURTHER INFORMATION CONTACT:

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Peter C. Robertson, Director, Office of Policy Implementation, Equal Employment Opportunity Commission, 2401 E Street, NW., Washington, D.C. 20506, 202/634-7060.

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Donald J. Schwartz, Psychologist, Office of Federal Contract Compliance Programs, Room C-3324, Department of Labor, 200 Constitution Avenue, NW., Washington, D.C. 20210, 202/523-9426.

Herman Schwartz, Chief Counsel, Office of Revenue Sharing, Department of the Treasury, 2401 E Street, NW., Washington, D.C. 20220, 202/634-5182.

James O. Taylor, Jr., Research Psychologist, Office of Systemic Programs, Equal Employment Opportunity Commission, 2401 E St., NW., Washington, D.C. 20506, 202/254-3030.

INTRODUCTION

The problems addressed by the Uniform Guidelines on Employee Selection Procedures (43 FR 38290 et seq., August 25, 1978) are numerous and important, and some of them are complex. The history of the development of those Guidelines is set forth in the introduction to them (43 FR 38290-95). The experience of the agencies has been that a series of answers to commonly asked questions is helpful in providing guidance not only to employers and other users, but also to psychologists and others who are called upon to conduct validity studies, and to investigators, compliance officers and other Federal personnel who have enforcement responsibilities.

The Federal agencies which issued the Uniform Guidelines—the Departments of Justice and Labor, the Equal Employment Opportunity Commission, the Civil Service Commission (which has been succeeded in relevant part by the Office of Personnel Management), and the Office of Revenue Sharing, Treasury Department—recognize that the goal of a uniform position on these issues can best be achieved through a common interpretation of the same guidelines. The following Questions and Answers are part of such a common interpretation. The material included is intended to interpret and clarify, but not to modify, the provisions of the Uniform Guidelines. The questions selected are commonly asked questions in the field and those suggested by the Uniform Guidelines themselves and by the extensive comments received on the various sets of proposed guidelines prior to their adoption. Terms are used in the questions and answers as they are defined in the Uniform Guidelines.

The agencies recognize that additional questions may be appropriate for similar treatment at a later date, and contemplate working together to provide additional guidance in interpreting the Uniform Guidelines. Users and other interested persons are invited to submit additional questions.

ELEANOR HOLMES NORTON,
Chair, Equal Employment Opportunity Commission.

ALAN K. CAMPBELL,
Director, Office of Personnel Management.

DREW S. DAYS III,
Assistant Attorney General, Civil Rights Division, Department of Justice.

WELDEN ROUGEAU,
Director, Office of Federal Contract Compliance, Department of Labor.

KENT A. PETERSON,
Acting Deputy Director, Office of Revenue Sharing.

I. PURPOSE AND SCOPE

1. Q. What is the purpose of the *Guidelines*?

A. The guidelines are designed to aid in the achievement of our nation's

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goal of equal employment opportunity without discrimination on the grounds of race. color. sex. religion or national origin. The Federal agencies have adopted the Guidelines to provide a uniform set of principles governing use of employee selection procedures which is consistent with applicable legal standards and validation standards generally accepted by the psychological profession and which the Government will apply in the discharge of its responsibilities.

2. Q. What is the basic principle of the Guidelines?

A. A selection process which has an adverse impact on the employment opportunities of members of a race. color. religion. sex. or national origin group (referred to as "race. sex. and ethnic group." as defined in Section 16P) and thus disproportionately screens them out is unlawfully discriminatory unless the process or its component procedures have been validated in accord with the Guidelines. or the user otherwise justifies them in accord with Federal law. See Sections 3 and 6.[1] This principle was adopted by the Supreme Court unanimously in *Griggs* v. *Duke Power Co.*. 401 U.S. 424. and was ratified and endorsed by the Congress when it passed the Equal Employment Opportunity Act of 1972. which amended Title VII of the Civil Rights Act of 1964.

3. Q. Who is covered by the Guidelines?

A. The Guidelines apply to private and public employers. labor organizations. employment agencies. apprenticeship committees. licensing and certification boards (see Question 7). and contractors or subcontractors. who are covered by one or more of the following provisions of Federal equal employment opportunity law: Title VII of the Civil Rights Act of 1964. as amended by the Equal Employment Opportunity Act of 1972 (hereinafter Title VII): Executive Order 11246. as amended by Executive Orders 11375 and 12086 (hereinafter Executive Order 11246): the State and Local Fiscal Assistance Act of 1972. as amended: Omnibus Crime Control and Safe Streets Act of 1968. as amended: and the Intergovernmental Personnel Act of 1970. as amended. Thus. under Title VII. the Guidelines apply to the Federal Government with regard to Federal employment. Through Title VII they apply to most private employers who have 15 or more employees for 20 weeks or more a calendar year. and to most employment agencies. labor organizations and apprenticeship committees. They apply to state and local governments which employ 15 or more employees. or which receive revenue sharing funds. or which receive funds from the Law Enforcement Assistance Administration to impose and strengthen law enforcement and criminal justice. or which receive grants or other federal assistance under a program which requires maintenance of personnel standards on a merit basis. They apply through Executive Order 11246 to contractors and subcontractors of the Federal Government and to contractors and subcontractors under federally-assisted construction contracts.

4. Q. Are college placement officers and similar organizations considered to be users subject to the Guidelines?

A. Placement offices may or may not be subject to the Guidelines depending on what services they offer. If a placement office uses a selection procedure as a basis for any employment decision. it is covered under the definition of "user". Section 16. For example. if a placement office selects some students for referral to an employer but rejects others. it is covered. However. if the placement office refers all interested students to an employer. it is not covered. even though it may offer office space and provision for informing the students of job openings. The Guidelines are intended to cover all users of employee selection procedures. including employment agencies. who are subject to Federal equal employment opportunity law.

5. Q. Do the Guidelines apply only to written tests?

A. No. They apply to all selection procedures used to make employment decisions. including interviews. review of experience or education from application forms. work samples. physical requirements. and evaluations of performance. Sections 2B and 16Q. and see Question 6.

6. Q. What practices are covered by the Guidelines?

A. The Guidelines apply to employee selection procedures which are used in making employment decisions. such as hiring. retention. promotion. transfer. demotion. dismissal or referral. Section 2B. Employee selection procedures include job requirements (physical. education. experience). and evaluation of applicants or candidates on the basis of application forms. interviews. performance tests. paper and pencil tests. performance in training programs or probationary periods. and any other procedures used to make an employment decision whether administered by the employer or by an employment agency. See Section 2B.

7. Q. Do the Guidelines apply to the licensing and certification functions of state and local governments?

A. The Guidelines apply to such functions to the extent that they are covered by Federal law. Section 2B. The courts are divided on the issue of such coverage. The Government has taken the position that at least some kinds of licensing and certification which deny persons access to employment opportunity may be enjoined in an action brought pursuant to Section 707 of the Civil Rights Act of 1964. as amended.

8. Q. What is the relationship between Federal equal employment opportunity law. embodied in these Guidelines. and State and Local government merit system laws or regulations requiring rank ordering of candidates and selection from a limited number of the top candidates?

A. The Guidelines permit ranking where the evidence of validity is sufficient to support that method of use. State or local laws which compel rank-ordering generally do so on the assumption that the selection procedure is valid. Thus. if there is adverse impact and the validity evidence does not adequately support that method of use. proper interpretation of such a state law would require validation prior to ranking. Accordingly. there is no necessary or inherent conflict between Federal law and State or local laws of the kind described.

Under the Supremacy Clause of the Constitution (Art. VI. Cl. 2). however. Federal law or valid regulation overrides any contrary provision of state or local law. Thus. if there is any conflict. Federal equal opportunity law prevails. For example. in *Rosenfeld* v. *So. Pacific Co.*. 444 F. 2d 1219 (9th Cir.. 1971). the court held invalid state protective laws which prohibited the employment of women in jobs entailing long hours or heavy labor. because the state laws were in conflict with Title VII. Where a State or local official believes that there is a possible conflict. the official may wish to consult with the State Attorney General. County or City attorney. or other legal official to determine how to comply with the law.

II. Adverse Impact. the Bottom Line and Affirmative Action

9. Q. Do the Guidelines require that only validated selection procedures be used?

A. No. Although validation of selection procedures is desirable in personnel management. the Uniform Guidelines require users to produce evidence of validity only when the selection procedure adversely affects the opportunities of a race. sex. or ethnic group

[1] Section references throughout these questions and answers are to the sections of the *Uniform Guidelines on Employee Selection Procedures* (herein referred to as "Guidelines") that were published by the Equal Employment Opportunity Commission. the Civil Service Commission. the Department of Labor. and the Department of Justice on Aug. 25. 1978. 43 FR 38290. The Uniform Guidelines were adopted by the Office of Revenue Sharing of the Department of Treasury on September 11. 1978. 43 FR 40223.

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for hire, transfer, promotion, retention or other employment decision. If there is no adverse impact, there is no validation requirement under the Guidelines. Sections 1B and 3A. See also, Section 6A.

10. Q. What is adverse impact?

A. Under the Guidelines adverse impact is a substantially different rate of selection in hiring, promotion or other employment decision which works to the disadvantage of members of a race, sex or ethnic group. Sections 4D and 16B. See Questions 11 and 12.

11. Q. What is a substantially different rate of selection?

A. The agencies have adopted a rule of thumb under which they will generally consider a selection rate for any race, sex, or ethnic group which is less than four-fifths (4/5ths) or eighty percent (80%) of the selection rate for the group with the highest selection rate as a substantially different rate of selection. See Section 4D. This "4/5ths" or "80%" rule of thumb is not intended as a legal definition, but is a practical means of keeping the attention of the enforcement agencies on serious discrepancies in rates of hiring, promotion and other selection decisions.

For example, if the hiring rate for whites other than Hispanics is 60%, for American Indians 45%, for Hispanics 48%, and for Blacks 51%; and each of these groups constitutes more than 2% of the labor force in the relevant labor area (see Question 16), a comparison should be made of the selection rate for each group with that of the highest group (whites). These comparisons show the following impact ratios: American Indians 45/60 or 75%; Hispanics 48/60 or 80%; and Blacks 51/60 or 85%. Applying the 4/5ths or 80% rule of thumb, on the basis of the above information alone, adverse impact is indicated for American Indians but not for Hispanics or Blacks.

12. Q. How is adverse impact determined?

A. Adverse impact is determined by a four step process.

(1) calculate the rate of selection for each group (divide the number of persons selected from a group by the number of applicants from that group).

(2) observe which group has the highest selection rate.

(3) calculate the impact ratios, by comparing the selection rate for each group with that of the highest group (divide the selection rate for a group by the selection rate for the highest group).

(4) observe whether the selection rate for any group is substantially less (i.e., usually less than 4/5ths or 80%) than the selection rate for the highest group. If it is, adverse impact is indicated in most circumstances. See Section 4D.

For example:

Applicants	Hires	Selection rate Percent hired
80 White	48	48/80 or 60%
40 Black	12	12/40 or 30%

A comparison of the black selection rate (30%) with the white selection rate (60%) shows that the black rate is 30/60, or one-half (or 50%) of the white rate. Since the one-half (50%) is less than 4/5ths (80%) adverse impact is usually indicated.

The determination of adverse impact is not purely arithmetic however: and other factors may be relevant. See, Section 4D.

13. Q. Is adverse impact determined on the basis of the overall selection process or for the components in that process?

A. Adverse impact is determined first for the overall selection process for each job. If the overall selection process has an adverse impact, the adverse impact of the individual selection procedure should be analyzed. For any selection procedures in the process having an adverse impact which the user continues to use in the same manner, the user is expected to have evidence of validity satisfying the Guidelines. Sections 4C and 5D. If there is no adverse impact for the overall selection process, in most circumstances there is no obligation under the Guidelines to investigate adverse impact for the components, or to validate the selection procedures used for that job. Section 4C. But see Question 25.

14. Q. The Guidelines designate the "total selection process" as the initial basis for determining the impact of selection procedures. What is meant by the "total selection process"?

A. The "total selection process" refers to the combined effect of all selection procedures leading to the final employment decision such as hiring or promoting. For example, appraisal of candidates for administrative assistant positions in an organization might include initial screening based upon an application blank and interview, a written test, a medical examination, a background check, and a supervisor's interview. These in combination are the total selection process. Additionally, where there is more than one route to the particular kind of employment decision, the total selection process encompasses the combined results of all routes. For example, an employer may select some applicants for a particular kind of job through appropriate written and performance tests. Others may be selected through an internal upward mobility program, on the basis of successful performance in a directly related trainee type of position. In such a case, the impact of the total selection process would be the combined effect of both avenues of entry.

15. Q. What is meant by the terms "applicant" and "candidate" as they are used in the Uniform Guidelines?

A. The precise definition of the term "applicant" depends upon the user's recruitment and selection procedures. The concept of an applicant is that of a person who has indicated an interest in being considered for hiring, promotion, or other employment opportunities. This interest might be expressed by completing an application form, or might be expressed orally, depending upon the employer's practice.

The term "candidate" has been included to cover those situations where the initial step by the user involves consideration of current employees for promotion, or training, or other employment opportunities, without inviting applications. The procedure by which persons are identified as candidates is itself a selection procedure under the Guidelines.

A person who voluntarily withdraws formally or informally at any stage of the selection process is no longer an applicant or candidate for purposes of computing adverse impact. Employment standards imposed by the user which discourage disproportionately applicants of a race, sex or ethnic group may, however, require justification. Records should be kept for persons who were applicants or candidates at any stage of the process.

16. Q. Should adverse impact determinations be made for all groups regardless of their size?

A. No. Section 15A(2) calls for annual adverse impact determinations to be made for each group which constitutes either 2% or more of the total labor force in the relevant labor area, or 2% or more of the applicable workforce. Thus, impact determinations should be made for any employment decision for each group which constitutes 2% or more of the labor force in the relevant labor area. For hiring, such determination should also be made for groups which constitute more than 2% of the applicants: and for promotions, determinations should also be made for those groups which constitute at least 2% of the user's workforce. There are record keeping obligations for all groups, even those which are less than 2%. See Question 86.

17. Q. In determining adverse impact, do you compare the selection rates for males and females, and blacks and whites, or do you compare selection rates for white males, white females, black males and black females?

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A. The selection-rates for males and females are compared, and the selection rates for the race and ethnic groups are compared with the selection rate of the race or ethnic group with the highest selection rate. Neutral and objective selection procedures free of adverse impact against any race, sex or ethnic group are unlikely to have an impact against a subgroup. Thus there is no obligation to make comparisons for subgroups (e.g., white male, white female, black male, black female). However, there are obligations to keep records (see Question 87), and any apparent exclusion of a subgroup may suggest the presence of discrimination.

18. Q. Is it usually necessary to calculate the statistical significance of differences in selection rates when investigating the existence of adverse impact?

A. No. Adverse impact is normally indicated when one selection rate is less than 80% of the other. The federal enforcement agencies normally will use only the 80% (⅘ths) rule of thumb, except where large numbers of selections are made. See Questions 20 and 22.

19. Q. Does the ⅘ths rule of thumb mean that the Guidelines will tolerate up to 20% discrimination?

A. No. The ⅘ths rule of thumb speaks only to the question of adverse impact, and is not intended to resolve the ultimate question of unlawful discrimination. Regardless of the amount of difference in selection rates, unlawful discrimination may be present, and may be demonstrated through appropriate evidence. The ⅘ths rule merely establishes a numerical basis for drawing an initial inference and for requiring additional information.

With respect to adverse impact, the Guidelines expressly state (section 4D) that differences in selection rates of less than 20% may still amount to adverse impact where the differences are significant in both statistical and practical terms. See Question 20. In the absence of differences which are large enough to meet the ⅘ths rule of thumb or a test of statistical significance, there is no reason to assume that the differences are reliable, or that they are based upon anything other than chance.

20. Q. Why is the ⅘ths rule called a rule of thumb?

A. Because it is not intended to be controlling in all circumstances. If, for the sake of illustration, we assume that nationwide statistics show that use of an arrest record would disqualify 10% of all Hispanic persons but only 4% of all whites other than Hispanic (hereafter non-Hispanic), the selection rate for that selection procedure is 90% for Hispanics and 96% for non-Hispanics. Therefore, the ⅘ rule of thumb would not indicate the presence of adverse impact (90% is approximately 94% of 96%). But in this example, the information is based upon nationwide statistics, and the sample is large enough to yield statistically significant results, and the difference (Hispanics are 2½ times as likely to be disqualified as non-Hispanics) is large enough to be practically significant. Thus, in this example the enforcement agencies would consider a disqualification based on an arrest record alone as having an adverse impact. Likewise, in *Gregory v. Litton Industries*, 472 F. 2d 631 (9th Cir., 1972), the court held that the employer violated Title VII by disqualifying persons from employment solely on the basis of an arrest record, where that disqualification had an adverse impact on blacks and was not shown to be justified by business necessity.

On the other hand, a difference of more than 20% in rates of selection may not provide a basis for finding adverse impact if the number of persons selected is very small. For example, if the employer selected three males and one female from an applicant pool of 20 males and 10 females, the ⅘ths rule would indicate adverse impact (selection rate for women is 10%; for men 15%; 1½ or 66⅔% is less than 80%), yet the number of selections is too small to warrant a determination of adverse impact. In these circumstances, the enforcement agency would not require validity evidence in the absence of additional information (such as selection rates for a longer period of time) indicating adverse impact. For recordkeeping requirements, see Section 15A(2)(c) and Questions 84 and 85.

21. Q. Is evidence of adverse impact sufficient to warrant a validity study or an enforcement action where the numbers involved are so small that it is more likely than not that the difference could have occurred by chance? For example:

Applicants	Not hired	Hired	Selection rate percent hired
80 White	64	16	20
20 Black	17	3	15

White Selection Rate 20
Black Selection Rate 15
15 divided by 20=75% (which is less than 80%).

A. No. If the numbers of persons and the difference in selection rates are so small that it is likely that the difference could have occurred by chance, the Federal agencies will not assume the existence of adverse impact, in the absence of other evidence. In this example, the difference in selection rates is too small, given the small number of black applicants, to constitute adverse impact in the absence of other information (see Section 4D). If only one more black had been hired instead of a white the selection rate for blacks (20%) would be higher than that for whites (18.7%). Generally, it is inappropriate to require validity evidence or to take enforcement action where the number of persons and the difference in selection rates are so small that the selection of one different person for one job would shift the result from adverse impact against one group to a situation in which that group has a higher selection rate than the other group.

On the other hand, if a lower selection rate continued over a period of time, so as to constitute a pattern, then the lower selection rate would constitute adverse impact, warranting the need for validity evidence.

22. Q. Is it ever necessary to calculate the statistical significance of differences in selection rates to determine whether adverse impact exists?

A. Yes. Where large numbers of selections are made, relatively small differences in selection rates may nevertheless constitute adverse impact if they are both statistically and practically significant. See Section 4D and Question 20. For that reason, if there is a small difference in selection rates (one rate is more than 80% of the other), but large numbers of selections are involved, it would be appropriate to calculate the statistical significance of the difference in selection rates.

23. Q. When the ⅘th rule of thumb shows adverse impact, is there adverse impact under the Guidelines?

A. There usually is adverse impact, except where the number of persons selected and the difference in selection rates are very small. See Section 4D and Questions 20 and 21.

24. Q. Why do the Guidelines rely primarily upon the ⅘ths rule of thumb, rather than tests of statistical significance?

A. Where the sample of persons selected is not large, even a large real difference between groups is likely not to be confirmed by a test of statistical significance (at the usual .05 level of significance). For this reason, the Guidelines do not rely primarily upon a test of statistical significance, but use the ⅘ths rule of thumb as a practical and easy-to-administer measure of whether differences in selection rates are substantial. Many decisions in day-to-day life are made without reliance upon a test of statistical significance.

25. Q. Are there any circumstances in which the employer should evaluate components of a selection process, even though the overall selection process results in no adverse impact?

A. Yes, there are such circumstances: (1) Where the selection proce-

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dure is a significant factor in the continuation of patterns of assignments of incumbent employees caused by prior discriminatory employment practices. Assume, for example, an employer who traditionally hired blacks as employees for the "laborer" department in a manufacturing plant, and traditionally hired only whites as skilled craftsmen. Assume further that the employer in 1962 began to use a written examination not supported by a validity study to screen incumbent employees who sought to enter the apprenticeship program for skilled craft jobs. The employer stopped making racial assignments in 1972. Assume further that for the last four years, there have been special recruitment efforts aimed at recent black high school graduates and that the selection process, which includes the written examination, has resulted in the selection of black applicants for apprenticeship in approximately the same rates as white applicants.

In those circumstances, if the written examination had an adverse impact, its use would tend to keep incumbent black employees in the laborer department, and deny them entry to apprenticeship programs. For that reason, the enforcement agencies would expect the user to evaluate the impact of the written examination, and to have validity evidence for the use of the written examination if it has an adverse impact.

(2) Where the weight of court decisions or administrative interpretations holds that a specific selection procedure is not job related in similar circumstances.

For example, courts have held that because an arrest is not a determination of guilt, an applicant's arrest record by itself does not indicate inability to perform a job consistent with the trustworthy and efficient operation of a business. Yet a no arrest record requirement has a nationwide adverse impact on some—minority groups. Thus, an employer who refuses to hire applicants solely on the basis of an arrest record is on notice that this policy may be found to be discriminatory. *Gregory* v. *Litton Industries*, 472 F. 2d 631 (9th Cir., 1972) (excluding persons from employment solely on the basis of arrests, which has an adverse impact, held to violate Title VII). Similarly, a minimum height requirement disproportionately disqualifies women and some national origin groups, and has been held not to be job related in a number of cases. For example, in *Dothard* v. *Rawlinson*, 433 U.S. 321 (1977), the Court held that height and weight requirements not shown to be job related were violative of Title VII. Thus an employer using a minimum height requirement should have evidence of its validity.

(3) In addition, there may be other circumstances in which an enforcement agency may decide to request an employer to evaluate components of a selection process, but such circumstances would clearly be unusual. Any such decision will be made only at a high level in the agency. Investigators and compliance officers are not authorized to make this decision.

26. Q. Does the bottom line concept of Section 4C apply to the administrative processing of charges of discrimination filed with an issuing agency, alleging that a specific selection procedure is discriminatory?

A. No. The bottom line concept applies only to enforcement actions as defined in Section 16 of the Guidelines. Enforcement actions include only court enforcement actions and other similar proceedings as defined in Section 16I. The EEOC administrative processing of charges of discrimination (investigation, finding of reasonable cause/no cause, and conciliation) required by Section 706(b) of Title VII are specifically exempted from the bottom line concept by the definition of an enforcement action. The bottom line concept is a result of a decision by the various enforcement agencies that, as a matter of prosecutorial discretion, they will devote their limited enforcement resources to the most serious offenders of equal employment opportunity laws. Since the concept is not a rule of law, it does not affect the discharge by the EEOC of its statutory responsibilities to investigate charges of discrimination, render an administrative finding on its investigation, and engage in voluntary conciliation efforts. Similarly, with respect to the other issuing agencies, the bottom line concept applies not to the processing of individual charges, but to the initiation of enforcement action.

27. Q. An employer uses one test or other selection procedure to select persons for a number of different jobs. Applicants are given the test, and the successful applicants are then referred to different departments and positions on the basis of openings available and their interests. The Guidelines appear to require assessment of adverse impact on a job-by-job basis (Section 15A(2)(a)). Is there some way to show that the test as a whole does not have adverse impact even though the proportions of members of each race, sex or ethnic group assigned to different jobs may vary?

A. Yes, in some circumstances. The Guidelines require evidence of validity only for those selection procedures which have an adverse impact, and which are part of a selection process which has an adverse impact. If the test is administered and used in the same fashion for a variety of jobs, the impact of that test can be assessed in the aggregate. The records showing the results of the test, and the total number of persons selected, generally would be sufficient to show the impact of the test. If the test has no adverse impact, it need not be validated.

But the absence of adverse impact of the test in the aggregate does not end the inquiry. For there may be discrimination or adverse impact in the assignment of individuals to, or in the selection of persons for, particular jobs. The Guidelines call for records to be kept and determinations of adverse impact to be made of the overall selection process on a job by job basis. Thus, if there is adverse impact in the assignment or selection procedures for a job even though there is no adverse impact from the test, the user should eliminate the adverse impact from the assignment procedure or justify the assignment procedure.

28. Q. The Uniform Guidelines apply to the requirements of Federal law prohibiting employment practices which discriminate on the grounds of race, color, religion, sex or national origin. However, records are required to be kept only by sex and by specified race and ethnic groups. How can adverse impact be determined for religious groups and for national origin groups other than those specified in Section 4B of the Guidelines?

A. The groups for which records are required to be maintained are the groups for which there is extensive evidence of continuing discriminatory practices. This limitation is designed in part to minimize the burden on employers for recordkeeping which may not be needed.

For groups for which records are not required, the person(s) complaining may obtain information from the employer or others (voluntarily or through legal process) to show that adverse impact has taken place. When that has been done, the various provisions of the Uniform Guidelines are fully applicable.

Whether or not there is adverse impact, Federal equal employment opportunity law prohibits any deliberate discrimination or disparate treatment on grounds of religion or national origin, as well as on grounds of sex, color, or race.

Whenever "ethnic" is used in the Guidelines or in these Questions and Answers, it is intended to include national origin and religion, as set forth in the statutes, executive orders, and regulations prohibiting discrimination. See Section 16P.

29. Q. What is the relationship between affirmative action and the requirements of the Uniform Guidelines?

A. The two subjects are different, although related. Compliance with the Guidelines does not relieve users of

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their affirmative action obligations, including those of Federal contractors and subcontractors under Executive Order 11246. Section 13.

The Guidelines encourage the development and effective implementation of affirmative action plans or programs in two ways. First, in determining whether to institute action against a user on the basis of a selection procedure which has adverse impact and which has not been validated, the enforcement agency will take into account the general equal employment opportunity posture of the user with respect to the job classifications for which the procedure is used and the progress which has been made in carrying out any affirmative action program. Section 4E. If the user has demonstrated over a substantial period of time that it is in fact appropriately utilizing in the job or group of jobs in question the available race, sex or ethnic groups in the relevant labor force, the enforcement agency will generally exercise its discretion by not initiating enforcement proceedings based on adverse impact in relation to the applicant flow. Second, nothing in the Guidelines is intended to preclude the use of selection procedures, consistent with Federal law, which assist in the achievement of affirmative action objectives. Section 13A. See also, Questions 30 and 31.

30. Q. When may a user be race, sex or ethnic-conscious?

A. The Guidelines recognize that affirmative action programs may be race, sex or ethnic conscious in appropriate circumstances. (See Sections 4E and 13; See also Section 17, Appendix). In addition to obligatory affirmative action programs (See Question 29), the Guidelines encourage the adoption of voluntary affirmative action programs. Users choosing to engage in voluntary affirmative action are referred to EEOC's Guidelines on Affirmative Action (44 F.R. 4422, January 19, 1979). A user may justifiably be race, sex or ethnic-conscious in circumstances where it has reason to believe that qualified persons of specified race, sex or ethnicity have been or may be subject to the exclusionary effects of its selection procedures or other employment practices in its work force or particular jobs therein. In establishing long and short range goals, the employer may use the race, sex, or ethnic classification as the basis for such goals (Section 17(3) (a)).

In establishing a recruiting program, the employer may direct its recruiting activities to locations or institutions which have a high proportion of the race, sex, or ethnic group which has been excluded or underutilized (section 17(3) (b)). In establishing the pool of qualified persons from which final selections are to be made, the employer may take reasonable steps to assure that members of the excluded or underutilized race, sex, or ethnic group are included in the pool (Section 17(3) (e)).

Similarly, the employer may be race, sex or ethnic-conscious in determining what changes should be implemented if the objectives of the programs are not being met (Section 17(3) (g)).

Even apart from affirmative action programs a user may be race, sex or ethnic-conscious in taking appropriate and lawful measures to eliminate adverse impact from selection procedures (Section 6A).

31. Q. Section 6A authorizes the use of alternative selection procedures to eliminate adverse impact, but does not appear to address the issue of validity. Thus, the use of alternative selection procedures without adverse impact seems to be presented as an option in lieu of validation. Is that its intent?

A. Yes. Under Federal equal employment opportunity law the use of any selection procedure which has an adverse impact on any race, sex or ethnic group is discriminatory unless the procedure has been properly validated, or the use of the procedure is otherwise justified under Federal law. *Griggs* v. *Duke Power Co.*, 401 U.S. 424 (1971); Section 3A. If a selection procedure has an adverse impact, therefore, Federal equal employment opportunity law authorizes the user to choose lawful alternative procedures which eliminate the adverse impact rather than demonstrating the validity of the original selection procedure.

Many users, while wishing to validate all of their selection procedures, are not able to conduct the validity studies immediately. Such users have the option of choosing alternative techniques which eliminate adverse impact, with a view to providing a basis for determining subsequently which selection procedures are valid and have as little 'adverse' impact as possible.

Apart from Federal equal employment opportunity law, employers have economic incentives to use properly validated selection procedures. Nothing in Section 6A should be interpreted as discouraging the use of properly validated selection procedures; but Federal equal employment opportunity law does not require validity studies to be conducted unless there is adverse impact. See Section 2C.

III. General Questions Concerning Validity and the Use of Selection Procedures

32. Q. What is "validation" according to the Uniform Guidelines?

A. Validation is the demonstration of the job relatedness of a selection procedure. The Uniform Guidelines recognize the same three validity strategies recognized by the American Psychological Association:

(1) Criterion-related validity—a statistical demonstration of a relationship between scores on a selection procedure and job performance of a sample of workers.

(2) Content validity—a demonstration that the content of a selection procedure is representative of important aspects of performance on the job.

(3) Construct validity—a demonstration that (a) a selection procedure measures a construct (something believed to be an underlying human trait or characteristic, such as honesty) and (b) the construct is important for successful job performance.

33. Q. What is the typical process by which validity studies are reviewed by an enforcement agency?

A. The validity study is normally requested by an enforcement officer during the course of a review. The officer will first determine whether the user's data show that the overall selection process has an adverse impact, and if so, which component selection procedures have an adverse impact. See Section 15A(3). The officer will then ask for the evidence of validity for each procedure which has an adverse impact. See Sections 15B, C, and D. This validity evidence will be referred to appropriate personnel for review. Agency findings will then be communicated to the user.

34. Q. Can a user send its validity evidence to an enforcement agency before a review, so as to assure its validity?

A. No. Enforcement agencies will not review validity reports except in the context of investigations or reviews. Even in those circumstances, validity evidence will not be reviewed without evidence of how the selection procedure is used and what impact its use has on various race, sex, and ethnic groups.

35. Q. May reports of validity prepared by publishers of commercial tests and printed in test manuals or other literature be helpful in meeting the Guidelines?

A. They may be. However, it is the user's responsibility to determine that the validity evidence is adequate to meet the Guidelines. See Section 7, and Questions 43 and 66. Users should not use selection procedures which are likely to have an adverse impact without reviewing the evidence of validity to make sure that the standards of the Guidelines are met.

The following questions and answers (36-81) assume that a selection procedure has an adverse impact and is part of a selection process that has an adverse impact.

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36. Q. How can users justify continued use of a procedure on a basis other than validity?

A. Normally, the method of justifying selection procedures with an adverse impact and the method to which the Guidelines are primarily addressed, is validation. The method of justification of a procedure by means other than validity is one to which the Guidelines are not addressed. See Section 6B. In *Griggs* v. *Duke Power* Co., 401 U.S. 424, the Supreme Court indicated that the burden on the user was a heavy one, but that the selection procedure could be used if there was a "business necessity" for its continued use; therefore, the Federal agencies will consider evidence that a selection procedure is necessary for the safe and efficient operation of a business to justify continued use of a selection procedure.

37. Q. Is the demonstration of a rational relationship (as that term is used in constitutional law) between a selection procedure and the job sufficient to meet the validation requirements of the Guidelines?

A. No. The Supreme Court in *Washington* v. *Davis*, 426 U.S. 229 (1976) stated that different standards would be applied to employment discrimination allegations arising under the Constitution than would be applied to employment discrimination allegations arising under Title VII. The *Davis* case arose under the Constitution, and no Title VII violation was alleged. The Court applied a traditional constitutional law standard of "rational relationship" and said that it would defer to the "seemingly reasonable acts of administrators and executives." However, it went on to point out that under Title VII, the appropriate standard would still be an affirmative demonstration of the relationship between the selection procedure and measures of job performance by means of accepted procedures of validation and it would be an "insufficient response to demonstrate some rational basis" for a selection procedure having an adverse impact. Thus, the mere demonstration of a rational relationship between a selection procedure and the job does not meet the requirement of Title VII of the Civil Rights Act of 1964, or of Executive Order 11246, or the State and Local Fiscal Assistance Act of 1972, as amended (the revenue sharing act) or the Omnibus Crime Control and Safe Streets Act of 1968, as amended, and will not meet the requirements of these Guidelines for a validity study. The three validity strategies called for by these Guidelines all require evidence that the selection procedure is related to successful performance on the job. That evidence may be obtained through local validation or through validity studies done elsewhere.

38. Q. Can a user rely upon written or oral assertions of validity instead of evidence of validity?

A. No. If a user's selection procedures have an adverse impact, the user is expected to produce evidence of the validity of the procedures as they are used. Thus, the unsupported assertion by anyone, including representatives of the Federal government or State Employment Services, that a test battery or other selection procedure has been validated is not sufficient to satisfy the Guidelines.

39. Q. Are there any formal requirements imposed by these Guidelines as to who is allowed to perform a validity study?

A. No. A validity study is judged on its own merits, and may be performed by any person competent to apply the principles of validity research, including a member of the user's staff or a consultant. However, it is the user's responsibility to see that the study meets validity provisions of the Guidelines, which are based upon professionally accepted standards. See Question 42.

40. Q. What is the relationship between the validation provisions of the Guidelines and other statements of psychological principles, such as the *Standards for Educational and Psychological Tests*, published by the American Psychological Association (Wash., D.C., 1974) (hereinafter "American Psychological Association *Standards*")?

A. The validation provisions of the Guidelines are designed to be consistent with the generally accepted standards of the psychological profession. These Guidelines also interpret Federal equal employment opportunity law, and embody some policy determinations of an administrative nature. To the extent that there may be differences between particular provisions of the Guidelines and expressions of validation principles found elsewhere, the Guidelines will be given precedence by the enforcement agencies.

41. Q. When should a validity study be carried out?

A. When a selection procedure has adverse impact on any race, sex or ethnic group, the Guidelines generally call for a validity study or the elimination of adverse impact. See Sections 3A and 6, and Questions 9, 31, and 36. If a selection procedure has adverse impact, its use in making employment decisions without adequate evidence of validity would be inconsistent with the Guidelines. Users who choose to continue the use of a selection procedure with an adverse impact until the procedure is challenged increase the risk that they will be found to be engaged in discriminatory practices and will be liable for back pay awards, plaintiffs' attorneys' fees, loss of Federal contracts, subcontracts or grants, and the like. Validation studies begun on the eve of litigation have seldom been found to be adequate. Users who choose to validate selection procedures should consider the potential benefit from having a validation study completed or well underway before the procedures are administered for use in employment decisions.

42. Q. Where can a user obtain professional advice concerning validation of selection procedures?

A. Many industrial and personnel psychologists validate selection procedures, review published evidence of validity and make recommendations with respect to the use of selection procedures. Many of these individuals are members or fellows of Division 14 (Industrial and Organizational Psychology) or Division 5 (Evaluation and Measurement) of the American Psychological Association. They can be identified in the membership directory of that organization. A high level of qualification is represented by a diploma in Industrial Psychology awarded by the American Board of Professional Psychology.

Individuals with the necessary competence may come from a variety of backgrounds. The primary qualification is pertinent training and experience in the conduct of validation research.

Industrial psychologists and other persons competent in the field may be found as faculty members in colleges and universities (normally in the departments of psychology or business administration) or working as individual consultants or as members of a consulting organization.

Not all psychologists have the necessary expertise. States have boards which license and certify psychologists, but not generally in a specialty such as industrial psychology. However, State psychological associations may be a source of information as to individuals qualified to conduct validation studies. Addresses of State psychological associations or other sources of information may be obtained from the American Psychological Association, 1200 Seventeenth Street, NW., Washington, D.C. 20036.

43. Q. Can a selection procedure be a valid predictor of performance on a job in a certain location and be invalid for predicting success on a different job or the same job in a different location?

A. Yes. Because of differences in work behaviors, criterion measures, study samples or other factors, a selection procedure found to have validity in one situation does not necessarily have validity in different circumstances. Conversely, a selection proce-

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dure not found to have validity in one situation may have validity in different circumstances. For these reasons, the Guidelines requires that certain standards be satisfied before a user may rely upon findings of validity in another situation. Section 7 and Section 14D. See also. Question 66. Cooperative and multi-unit studies are however encouraged. and, when those standards of the Guidelines are satisfied. validity evidence specific to each location is not required. See Section 7C and Section 8.

44. Q. Is the user of a selection procedure required to develop the procedure?

A. No. A selection procedure developed elsewhere may be used. However, the user has the obligation to show that its use for the particular job is consistent with the Guidelines. See Section 7.

45. Q. Do the Guidelines permit users to engage in cooperative efforts to meet the Guidelines?

A. Yes. The Guidelines not only permit but encourage such efforts. Where users have participated in a cooperative study which meets the validation standards of these Guidelines and proper account has been taken of variables which might affect the applicability of the study to specific users. validity evidence specific to each user will not be required. Section 8.

46. Q. Must the same method for validation be used for all parts of a selection process?

A. No. For example. where a selection process includes both a physical performance test and an interview. the physical test might be supported on the basis of content validity. and the interview on the basis of a criterion-related study.

47. Q. Is a showing of validity sufficient to assure the lawfulness of the use of a selection procedure?

A. No. The use of the selection procedure must be consistent with the validity evidence. For example. if a research study shows only that. at a given passing score the test satisfactorily screens out probable failures, the study would not justify the use of substantially different passing scores. or of ranked lists of those who passed. See Section 5G. Similarly. if the research shows that a battery is valid when a particular set of weights is used. the weights actually used must conform to those that were established by the research.

48. Q. Do the Guidelines call for a user to consider and investigate alternative selection procedures when conducting a validity study?

A. Yes. The Guidelines call for a user. when conducting a validity study. to make a reasonable effort to become aware of suitable alternative selection procedures and methods of use which have as little adverse impact as possible. and to investigate those which are suitable. Section 3B.

An alternative procedure may not previously have been used by the user for the job in question and may not have been extensively used elsewhere. Accordingly. the preliminary determination of the suitability of the alternative selection procedure for the user and job in question may have to be made on the basis of incomplete information. If on the basis of the evidence available. the user determines that the alternative selection procedure is likely to meet its legitimate needs. and is likely to have less adverse impact than the existing selection procedure. the alternative should be investigated further as a part of the validity study. The extent of the investigation should be reasonable. Thus. the investigation should continue until the user has reasonably concluded that the alternative is not useful or not suitable. or until a study of its validity has been completed. Once the full validity study has been completed. including the evidence concerning the alternative procedure. the user should evaluate the results of the study to determine which procedure should be used. See Section 3B and Question 50.

49. Q. Do the Guidelines call for a user *continually* to investigate "suitable alternative selection procedures and suitable alternative methods of using the selection procedure which have as little adverse impact as possible"?

A. No. There is no requirement for continual investigation. A reasonable investigation of alternatives is called for by the Guidelines as a part of any validity study. Once the study is complete and validity has been found. however. there is generally no obligation to conduct further investigations. until such time as a new study is called for. See. Sections 3B and 5K. If a government agency. complainant. civil rights organization or other person having a legitimate interest shows such a user an alternative procedure with less adverse impact and with substantial evidence of validity for the same job in similar circumstances. the user is obliged to investigate only the particular procedure which has been presented. Section 3B.

50. Q. In what circumstances do the Guidelines call for the use of an alternative selection procedure or an alternative method of using the procedure?

A. The alternative selection procedure (or method of use) should be used when it has less adverse impact and when the evidence shows that its validity is substantially the same or greater for the same job in similar circumstances. Thus. if under the original selection procedure the selection rate for black applicants was only one half (50 percent) that of the selection rate for white applicants. whereas under the alternative selection procedure the selection rate for blacks is two-thirds (67 percent) that of white applicants. the new alternative selection procedure should be used when the evidence shows substantially the same or greater validity for the alternative than for the original procedure. The same principles apply to a new user who is deciding what selection procedure to institute.

51. Q. What are the factors to be considered in determining whether the validity for one procedure is substantially the same as or greater than that of another procedure?

A. In the case of a criterion-related validity study. the factors include the importance of the criteria for which significant relationships are found. the magnitude of the relationship between selection procedure scores and criterion measures, and the size and composition of the samples used. For content validity. the strength of validity evidence would depend upon the proportion of critical and/or important job behaviors measured. and the extent to which the selection procedure resembles actual work samples or work behaviors. Where selection procedures have been validated by different strategies. or by construct validity. the determination should be made on a case by case basis.

52. Q. The Guidelines require consideration of alternative procedures and alternative methods of use. in light of the evidence of validity and utility and the degree of adverse impact of the procedure. How can a user know that any selection procedure with an adverse impact is lawful?

A. The Uniform Guidelines (Section 5G) expressly permit the use of a procedure in a manner supported by the evidence of validity and utility. even if another method of use has a lesser adverse impact. With respect to consideration of alternative selection procedures. If the user made a reasonable effort to become aware of alternative procedures, has considered them and investigated those which appear suitable as a part of the validity study. and has shown validity for a procedure. the user has complied with the Uniform Guidelines. The burden is then on the person challenging the procedure to show that there is another procedure with better or substantially equal validity which will accomplish the same legitimate business purposes with less adverse impact. Section 3B. See also. *Albemarle Paper Co. v. Moody*, 422 U.S. 405.

53. Q. Are the Guidelines consistent with the decision of the Supreme Court in *Furnco Construction Corp. v. Waters*. —— *U.S.* ——. 98 S. Ct. 2943 (1978) where the Court stated: "Title

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VII * * * does not impose a duty to adopt a hiring procedure that maximizes hiring of minority employees."

A. Yes. The quoted statement in *Furnco* v. *Waters* was made on a record where there was no adverse impact in the hiring process, no different treatment, no intentional discrimination, and no contractual obligations under E.O. 11246. Section 3B of the Guidelines is predicated upon a finding of adverse impact. Section 3B indicates that, when two or more selection procedures are available which serve a legitimate business purpose with substantially equal validity, the user should use the one which has been demonstrated to have the lesser adverse impact. Part V of the Overview of the Uniform Guidelines, in elaborating on this principle, states: "Federal equal employment opportunity law has added a requirement to the process of validation. In conducting a validation study, the employer should consider available alternatives which will achieve its legitimate purpose with lesser adverse impact."

Section 3B of the Guidelines is based on the principle enunciated in the Supreme Court decision in *Albermarle Paper Co.* v. *Moody*, 422 U.S. 405 (1975) that, even where job relatedness has been proven, the availability of other tests or selection devices which would also serve the employer's legitimate interest in "efficient and trustworthy workmanship" without a similarly undesirable racial effect would be evidence that the employer was using its tests merely as a pretext for discrimination.

Where adverse impact still exists, even though the selection procedure has been validated, there continues to be an obligation to consider alternative procedures which reduce or remove that adverse impact if an opportunity presents itself to do so without sacrificing validity. Where there is no adverse impact, the *Furnco* principle rather than the *Albermarle* principle is applicable.

IV. Technical Standards

54. Q. How does a user choose which validation strategy to use?

A. A user should select a validation strategy or strategies which are (1) appropriate for the type of selection procedure, the job, and the employment situation, and (2) technically and administratively feasible. Whatever method of validation is used, the basic logic is one of prediction: that is, the presumption that level of performance on the selection procedure will, on the average, be indicative of level of performance on the job after selection. Thus, a criterion-related study, particularly a predictive one, is often regarded as the closest to such an ideal. See American Psychological Association *Standards*, pp. 26-27.

Key conditions for a criterion-related study are a substantial number of individuals for inclusion in the study, and a considerable range of performance on the selection and criterion measures. In addition, reliable and valid measures of job performance should be available, or capable of being developed. Section 14B(1). Where such circumstances exist, a user should consider use of the criterion-related strategy.

Content validity is appropriate where it is technically and administratively feasible to develop work samples or measures of operationally defined skills, knowledges, or abilities which are a necessary prerequisite to observable work behaviors. Content validity is not appropriate for demonstrating the validity of tests of mental processes or aptitudes or characteristics; and is not appropriate for knowledges, skills or abilities which an employee will be expected to learn on the job. Section 14C(1)

The application of a construct validity strategy to support employee selection procedures is newer and less developed than criterion-related or content validity strategies. Continuing research may result in construct validity becoming more widely used. Because construct validity represents a generalization of findings, one situation in which construct validity might hold particular promise is that where it is desirable to use the same selection procedures for a variety of jobs. An overriding consideration in whether or not to consider construct validation is the availability of an individual with a high level of expertise in this field.

In some situations only one kind of validation study is likely to be appropriate. More than one strategy may be possible in other circumstances. In which case administrative considerations such as time and expense may be decisive. A combination of approaches may be feasible and desirable.

55. Q. Why do the Guidelines recognize only content, construct and criterion-related validity?

A. These three validation strategies are recognized in the Guidelines since they represent the current professional consensus. If the professional community recognizes new strategies or substantial modifications of existing strategies, they will be considered and, if necessary, changes will be made in the Guidelines. Section 5A.

56. Q. Why don't the Uniform Guidelines state a preference for criterion-related validity over content or construct validity?

A. Generally accepted principles of the psychological profession support the use of criterion-related, content or construct validity strategies as appropriate. American Psychological Association *Standards*, E, pp. 25-26. This use was recognized by the Supreme Court in *Washington* v. *Davis*, 426 U.S. 229, 247, fn. 13. Because the Guidelines describe the conditions under which each validity strategy is inappropriate, there is no reason to state a general preference for any one validity strategy.

57. Q. Are the Guidelines intended to restrict the development of new testing strategies, psychological theories, methods of job analysis or statistical techniques?

A. No. The Guidelines are concerned with the validity and fairness of selection procedures used in making employment decisions, and are not intended to limit research and new developments. See Question 55.

58. Q. Is a full job analysis necessary for all validity studies?

A. It is required for all content and construct studies, but not for all criterion-related studies. See Sections 14A and 14B(2). Measures of the results or outcomes of work behaviors such as production rate or error rate may be used without a full job analysis where a review of information about the job shows that these criteria are important to the employment situation of the user. Similarly, measures such as absenteeism, tardiness or turnover may be used without a full job analysis if these behaviors are shown by a review of information about the job to be important in the specific situation. A rating of overall job performance may be used without a full job analysis only if the user can demonstrate its appropriateness for the specific job and employment situation through a study of the job. The Supreme Court held in *Albemarle Paper Co.* v. *Moody*, 422 U.S. 405 (1975), that measures of overall job performance should be carefully developed and their use should be standardized and controlled.

59. Q. Section 5J on interim use requires the user to have available substantial evidence of validity. What does this mean?

A. For purposes of compliance with 5J, "substantial evidence" means evidence which may not meet all the validation requirements of the Guidelines but which raises a strong inference that validity pursuant to these standards will soon be shown. Section 5J is based on the proposition that it would not be an appropriate allocation of Federal resources to bring enforcement proceedings against a user who would soon be able to satisfy fully the standards of the Guidelines. For example, a criterion-related study may have produced evidence which meets almost all of the requirements of the Guidelines with the exception that the gathering of the data of test fair-

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ness is still in progress and the fairness study has not yet produced results. If the correlation coefficient for the group as a whole permits the strong inference that the selection procedure is valid, then the selection procedure may be used on an interim basis pending the completion of the fairness study.

60. Q. What are the potential consequences to a user when a selection procedure is used on an interm basis?

A. The fact that the Guidelines permit interim use of a selection procedure under some conditions does not immunize the user from liability for back pay, attorney fees and the like, should use of the selection procedure later be found to be in violation of the Guidelines. Section 5J. For this reason, users should take steps to come into full compliance with the Guidelines as soon as possible. It is also appropriate for users to consider ways of minimizing adverse impact during the period of interim use.

61. Q. Must provisions for retesting be allowed for job-knowledge tests, where knowledge of the test content would assist in scoring well on it the second time?

A. The primary intent of the provision for retesting is that an applicant who was not selected should be given another chance. Particularly in the case of job-knowledge tests, security precautions may preclude retesting with the same test after a short time. However, the opportunity for retesting should be provided for the same job at a later time, when the applicant may have acquired more of the relevant job knowledges.

62 Q. Under what circumstances may a selection procedure be used for ranking?

A. Criterion-related and construct validity strategies are essentially empirical, statistical processes showing a relationship between performance on the selection procedure and performance on the job. To justify ranking under such validity strategies, therefore, the user need show mathematical support for the proposition that persons who receive higher scores on the procedure are likely to perform better on the job.

Content validity, on the other hand, is primarily a judgmental process concerned with the adequacy of the selection procedure as a sample of the work behaviors. Use of a selection procedure on a ranking basis may be supported by content validity if there is evidence from job analysis or other empirical data that what is measured by the selection procedure is associated with differences in levels of job performance. Section 14C(9); see also Section 5G.

Any conclusion that a content validated procedure is appropriate for ranking must rest on an inference that higher scores on the procedure are related to better job performance. The more closely and completely the selection procedure approximates the important work behaviors, the easier it is to make such an inference. Evidence that better performance on the procedure is related to greater productivity or to performance of behaviors of greater difficulty may also support such an inference.

Where the content and context of the selection procedure are unlike those of the job, as, for example, in many paper-and-pencil job knowledge tests, it is difficult to infer an association between levels of performance on the procedure and on the job. To support a test of job knowledge on a content validity basis, there must be evidence of a specific tie-in between each item of knowledge tested and one or more work behaviors. See Question 79. To justify use of such a test for ranking, it would also have to be demonstrated from empirical evidence either that mastery of more difficult work behaviors, or that mastery of a greater scope of knowledge corresponds to a greater scope of important work behaviors.

For example, for a particular warehouse worker job, the job analysis may show that lifting a 50-pound object is essential, but the job analysis does not show that lifting heavier objects is essential or would result in significantly better job performance. In this case a test of ability to lift 50 pounds could be justified on a content validity basis for a pass/fail determination. However, ranking of candidates based on relative amount of weight that can be lifted would be inappropriate.

In another instance, a job analysis may reflect that, for the job of machine operator, reading of simple instructions is not a major part of the job but is essential. Thus, reading would be a critical behavior under the Guidelines. See Section 14C(8), since the job analysis in this example did not also show that the ability to read such instructions more quickly or to understand more complex materials would be likely to result in better job performance, a reading test suported by content validity alone should be used on a pass/fail rather than a ranking basis. In such circumstances, use of the test for ranking would have to be supported by evidence from a criterion-related (or construct) validity study.

On the other hand, in the case of a person to be hired for a typing pool, the job analysis may show that the job consists almost entirely of typing from manuscript, and that productivity can be measured directly in terms of finished typed copy. For such a job, typing constitutes not only a critical behavior, but it constitutes most of the job. A higher score on a test which measured words per minute typed, with adjustments for errors, would therefore be likely to predict better job performance than a significantly lower score. Ranking or grouping based on such a typing test would therefore be appropriate under the Guidelines.

63. Q. If selection procedures are administered by an employment agency or a consultant for an employer, is the employer relieved of responsibilities under the Guidelines?

A. No. The employer remains responsible. It is therefore expected that the employer will have sufficient information available to show: (a) What selection procedures are being used on its behalf; (b) the total number of applicants for referral by race, sex and ethnic group; (c) the number of persons, by race, sex and ethnic group, referred to the employer; and (d) the impact of the selection procedures and evidence of the validity of any such procedure having an adverse impact as determined above.

A. CRITERION-RELATED VALIDITY

64. Q. Under what circumstances may success in training be used as a criterion in criterion-related validity studies?

A. Success in training is an appropriate criterion when it is (1) necessary for successful job performance or has been shown to be related to degree of proficiency on the job and (2) properly measured. Section 14B(3). The measure of success in training should be carefully developed to ensure that factors which are not job related do not influence the measure of training success. Section 14B(3).

65. Q. When may concurrent validity be used?

A. A concurrent validity strategy assumes that the findings from a criterion-related validity study of current employees can be applied to applicants for the same job. Therefore, if concurrent validity is to be used, differences between the applicant and employee groups which might affect validity should be taken into account. The user should be particularly concerned with those differences between the applicant group and current employees used in the research sample which are caused by work experience or other work related events or by prior selection of employees and selection of the sample. See Section 14B(4).

66. Q. Under what circumstances can a selection procedure be supported (on other than an interim basis) by a criterion-related validity study done elsewhere?

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A. A validity study done elsewhere may provide sufficient evidence if four conditions are met (See. 7B):

1. The evidence from the other studies clearly demonstrates that the procedure was valid in its use elsewhere.

2. The job(s) for which the selection procedure will be used closely matches the job(s) in the original study as shown by a comparison of major work behaviors as shown by the job analyses in both contexts.

3. Evidence of fairness from the other studies is considered for those groups constituting a significant factor in the user's labor market. Section 7B(3). Where the evidence is not available the user should conduct an internal study of test fairness, if technically feasible. Section 7B(3).

4. Proper account is taken of variables which might affect the applicability of the study in the new setting, such as performance standards, work methods, representativeness of the sample in terms of experience or other relevant factors, and the currency of the study.

67. Q. What does "unfairness of a selection procedure" mean?

A. When a specific score on a selection procedure has a different meaning in terms of expected job performance for members of one race, sex or ethnic group than the same score does for members of another group, the use of that selection procedure may be unfair for members of one of the groups. See section 16V. For example, if members of one group have an average score of 40 on the selection procedure, but perform on the job as well as another group which has an average score of 50, then some uses of the selection procedure would be unfair to the members of the lower scoring group. See Question 70.

68. Q. When should the user investigate the question of fairness?

A. Fairness should be investigated generally at the same time that a criterion-related validity study is conducted, or as soon thereafter as feasible. Section 14B(8).

69. Q. Why do the Guidelines require that users look for evidence of unfairness?

A. The consequences of using unfair selection procedures are severe in terms of discriminating against applicants on the basis of race, sex or ethnic group membership. Accordingly, these studies should be performed routinely where technically feasible and appropriate, whether or not the probability of finding unfairness is small. Thus, the Supreme Court indicated in *Albemarle Paper Co. v. Moody*, 422 U.S. 405, that a validation study was "materially deficient" because, among other reasons, it failed to investigate fairness where it was not shown to be unfeasible to do so. Moreover, the American Psychological Association *Standards* published in 1974 call for the investigation of test fairness in criterion-related studies wherever feasible (pp. 43-44).

70. Q. What should be done if a selection procedure is unfair for one or more groups in the relevant labor market?

A. The Guidelines discuss three options. See Section 14B(8)(d). First, the selection instrument may be replaced by another validated instrument which is fair to all groups. Second, the selection instrument may be revised to eliminate the sources of unfairness. For example, certain items may be found to be the only ones which cause the unfairness to a particular group, and these items may be deleted or replaced by others. Finally, revisions may be made in the method of use of the selection procedure to ensure that the probability of being selected is compatible with the probability of successful job performance.

The Federal enforcement agencies recognize that there is serious debate in the psychological profession on the question of test fairness, and that information on that concept is developing. Accordingly, the enforcement agencies *will* consider developments in this field in evaluating actions occasioned by a finding of test unfairness.

71. Q. How is test unfairness related to differential validity and to differential prediction?

A. Test unfairness refers to use of selection procedures based on scores when members of one group characteristically obtain lower scores than members of another group, and the differences are not reflected in measures of job performance. See Sections 16V and 14B(8)(a), and Question 67.

Differential validity and test unfairness are conceptually distinct. Differential validity is defined as a situation in which a given instrument has significantly different validity coefficients for different race, sex or ethnic groups. Use of a test may be unfair to some groups even when differential validity is not found.

Differential prediction is a central concept for one definition of test unfairness. Differential prediction occurs when the use of the same set of scores systematically overpredicts or underpredicts job performance for members of one group as compared to members of another group.

Other definitions of test unfairness which do not relate to differential prediction may, however, also be appropriately applied to employment decisions. Thus these Guidelines are not intended to choose between fairness models as long as the model selected is appropriate to the manner in which the selection procedure is used.

72. Q. What options does a user have if a criterion-related study is appropriate but is not feasible because there are not enough persons in the job?

A. There are a number of options the user should consider, depending upon the particular facts and circumstances, such as:

1. Change the procedure so as to eliminate adverse impact (see Section 6A);

2. Validate a procedure through a content validity strategy, if appropriate (see Section 14C and Questions 54 and 74);

3. Use a selection procedure validated elsewhere in conformity with the Guidelines (see Sections 7-8 and Question 66);

4. Engage in a cooperative study with other facilities or users (in cooperation with such users either bilaterally or through industry or trade associations or governmental groups), or participate in research studies conducted by the state employment security system. Where different locations are combined, care is needed to insure that the jobs studied are in fact the same and that the study is adequate and in conformity with the Guidelines (see Sections 8 and 14 and Question 45).

5. Combine essentially similar jobs into a single study sample. See Section 14B(1).

B. CONTENT VALIDITY

73. Q. Must a selection procedure supported by content validity be an actual "on the job" sample of work behaviors?

A. No. The Guidelines emphasize the importance of a close approximation between the content of the selection procedure and the observable behaviors or products of the job, so as to minimize the inferential leap between performance on the selection procedure and job performance. However, the Guidelines also permit justification on the basis of content validity of selection procedures measuring knowledges, skills, or abilities which are not necessarily samples of work behaviors if: (1) The knowledge, skill, or ability being measured is operationally defined in accord with Section 14C(4); and (2) that knowledge, skill, or ability is a prerequisite for critical or important work behaviors. In addition users may justify a requirement for training, or for experience obtained from prior employment or volunteer work, on the basis of content validity, even though the prior training or experience does not duplicate the job. See Section 14B(6).

74. Q. Is the use of a content validity strategy appropriate for a procedure measuring skills or knowledges which are taught in training after initial employment?

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A. Usually not. The Guidelines state (Section 14C(1)) that content validity is not appropriate where the selection procedure involves knowledges, skills, or abilities which the employee will be expected to learn "on the job". The phrase "on the job" is intended to apply to training which occurs after hiring, promotion or transfer. However, if an ability, such as speaking and understanding a language, takes a substantial length of time to learn, is required for successful job performance, and is not taught to those initial hires who possess it in advance, a test for that ability may be supported on a content validity basis.

75. Q. Can a measure of a trait or construct be validated on the basis of content validity?

A. No. Traits or constructs are by definition underlying characteristics which are intangible and are not directly observable. They are therefore not appropriate for the sampling approach of content validity. Some selection procedures, while labeled as construct measures, may actually be samples of observable work behaviors. Whatever the label, if the operational definitions are in fact based upon observable work behaviors, a selection procedure measuring those behaviors may be appropriately supported by a content validity strategy. For example, while a measure of the construct "dependability" should not be supported on the basis of content validity, promptness and regularity of attendance, in a prior work record are frequently inquired into as a part of a selection procedure, and such measures may be supported on the basis of content validity.

76. Q. May a test which measures what the employee has learned in a training program be justified for use in employment decisions on the basis of content validity?

A. Yes. While the Guidelines (Section 14C(1)) note that content validity is not an appropriate strategy for knowledges, skills or abilities which an employee "will be expected to learn on the job", nothing in the Guidelines suggests that a test supported by content validity is not appropriate for determining what the employee has learned on the job, or in a training program. If the content of the test is relevant to the job, it may be used for employment decisions such as retention or assignment. See Section 14C(7).

77. Q. Is a task analysis necessary to support a selection procedure based on content validity?

A. A description of all tasks is not required by the Guidelines. However, the job analysis should describe all important work behaviors and their relative importance and their level of difficulty. Sections 14C(2) and 15C(3). The job analysis should focus on observable work behaviors and, to the extent appropriate, observable work products, and the tasks associated with the important observable work behaviors and/or work products. The job analysis should identify how the critical or important work behaviors are used in the job, and should support the content of the selection procedure.

78. Q. What is required to show the content validity of a paper-and-pencil test that is intended to approximate work behaviors?

A. Where a test is intended to replicate a work behavior, content validity is established by a demonstration of the similarities between the test and the job with respect to behaviors, products, and the surrounding environmental conditions. Section 14B(4).

Paper-and-pencil tests which are intended to replicate a work behavior are most likely to be appropriate where work behaviors are performed in paper and pencil form (e.g., editing and bookkeeping). Paper-and-pencil tests of effectiveness in interpersonal relations (*e.g.*, sales or supervision), or of physical activities (*e.g.*, automobile repair) or ability to function properly under danger (*e.g.*, firefighters) generally are not close enough approximations of work behaviors to show content validity.

The appropriateness of tests of job knowledge, whether or not in pencil and paper form, is addressed in Question 79.

79. Q. What is required to show the content validity of a test of a job knowledge?

A. There must be a defined, well recognized body of information, and knowledge of the information must be prerequisite to performance of the required work behaviors. The work behavior(s) to which each knowledge is related should be identified on an item by item basis. The test should fairly sample the information that is actually used by the employee on the job, so that the level of difficulty of the test items should correspond to the level of difficulty of the knowledge as used in the work behavior. See Section 14C(1) and (4).

80. Q. Under content validity, may a selection procedure for entry into a job be justified on the grounds that the knowledges, skills or abilities measured by the selection procedure are prerequisites to successful performance in a training program?

A. Yes, but only if the training material and the training program closely approximate the content and level of difficulty of the job and if the knowledges, skills or abilities are not those taught in the training program. For example: If training materials are at a level of reading difficulty substantially in excess of the reading difficulty of materials used on the job, the Guidelines would not permit justification on a content validity basis of a reading test based on those training materials for entry into the job.

Under the Guidelines a training program itself is a selection procedure if passing it is a prerequisite to retention or advancement. See Section 2C and 14C(17). As such, the content of the training program may only be justified by the relationship between the program and critical or important behaviors of the job itself, or through a demonstration of the relationship between measures of performance in training and measures of job performance.

Under the example given above, therefore, where the requirements in the training materials exceed those on the job, the training program itself could not be validated on a content validity basis if passing it is a basis for retention or promotion.

C. CONSTRUCT VALIDITY

81. Q. In Section 5, "General Standards for Validity Studies," construct validity is identified as no less acceptable than criterion-related and content validity. However, the specific requirements for construct validity, in Section 14D, seem to limit the generalizability of construct validity to the rules governing criterion-related validity. Can this apparent inconsistency be reconciled?

A. Yes. In view of the developing nature of construct validation for employment selection procedures, the approach taken concerning the generalizability of construct validity (section 14D) is intended to be a cautious one. However, construct validity may be generalized in circumstances where transportability of tests supported on the basis of criterion-related validity would not be appropriate. In establishing transportability of criterion-related validity, the jobs should have substantially the same major work behaviors. Section 7B(2). Construct validity, on the other hand, allows for situations where only some of the important work behaviors are the same. Thus, well-established measures of the construct which underlie particular work behaviors and which have been shown to be valid for some jobs may be generalized to other jobs which have some of the same work behaviors but which are different with respect to other work behaviors. Section 14D(4).

As further research and professional guidance on construct validity in employment situations emerge, additional extensions of construct validity for employee selection may become generally accepted in the profession. The agencies encourage further research and professional guidance with respect

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to the appropriate use of construct validity.

V. RECORDS AND DOCUMENTATION

82. Q. Do the Guidelines have simplified recordkeeping for small users (employers who employ one hundred or fewer employees and other users not required to file EEO-1, *et seq.* reports)?

A. Yes. Although small users are fully covered by Federal equal employment opportunity law, the Guidelines have reduced their record-keeping burden. See option in Section 15A(1). Thus, small users need not make adverse impact determinations nor are they required to keep applicant data on a job-by-job basis. The agencies also recognize that a small user may find that some or all validation strategies are not feasible. See Question 54. If a small user has reason to believe that its selection procedures have adverse impact and validation is not feasible, it should consider other options. See Sections 7A and 8 and Questions 31, 36, 45, 66, and 72.

83. Q. Is the requirement in the Guidelines that users maintain records of the race, national origin, and sex of employees and applicants constitutional?

A. Yes. For example, the United States Court of Appeals for the First Circuit rejected a challenge on constitutional and other grounds to the Equal Employment Opportunity Commission regulations requiring State and local governmental units to furnish information as to race, national origin and sex of employees. *United States* v. *New Hampshire*, 539 F. 2d 277 (1st Cir. 1976), *cert. denied*, sub nom. *New Hampshire* v. *United States*, 429 U.S. 1023. The Court held that the recordkeeping and reporting requirements promulgated under Title VII of the Civil Rights Act of 1964, as amended, were reasonably necessary for the Federal agency to determine whether the state was in compliance with Title VII and thus were authorized and constitutional. The same legal principles apply to recordkeeping with respect to applicants.

Under the Supremacy Clause of the Constitution, the Federal law requiring maintenance of records identifying race, sex and national origin overrides any contrary provision of State law. See Question 8.

The agencies recognize, however, that such laws have been enacted to prevent misuse of this information. Thus, employers should take appropriate steps to ensure proper use of all data. See Question #88.

84. Q. Is the user obliged to keep records which show whether its selection processes have an adverse impact on race, sex, or ethnic groups?

A. Yes. Under the Guidelines users are obliged to maintain evidence indicating the impact which their selection processes have on identifiable race, sex or ethnic groups. Sections 4 A and B. If the selection process for a job does have an adverse impact on one or more such groups, the user is expected to maintain records showing the impact for the individual procedures. Section 15A(2).

85. Q. What are the recordkeeping obligations of a user who cannot determine whether a selection process for a job has adverse impact because it makes an insufficient number of selections for that job in a year?

A. In such circumstances the user should collect, maintain, and have available information on the impact of the selection process and the component procedures until it can determine that adverse impact does not exist for the overall process or until the job has changed substantially. Section 15A(2)(c).

86. Q. Should applicant and selection information be maintained for race or ethnic groups constituting less than 2% of the labor force and the applicants?

A. Small employers and other small users are not obliged to keep such records. Section 15A(1). Employers with more than 100 employees and other users required to file EEO-1 *et seq.* reports should maintain records and other information upon which impact determinations could be made, because section 15A2 requires the maintenance of such information for "any of the groups for which records are called for by section 4B above." See also, Section 4A.

No user, regardless of size, is required to make adverse impact determinations for race or ethnic groups constituting less than 2% of the labor force and the applicants. See Question 16.

87. Q. Should information be maintained which identifies applicants and persons selected both by sex and by race or ethnic group?

A. Yes. Although the Federal agencies have decided not to require computations of adverse impact by subgroups (white males, black males, white females, black females—see Question 17), the Guidelines call for record keeping which allows identification of persons by sex, combined with race or ethnic group, so as to permit the identification of discriminatory practices on any such basis. Section 4A and 4B.

88. Q. How should a user collect data on race, sex or ethnic classifications for purposes of determining the impact of selection procedures?

A. The Guidelines have not specified any particular procedure, and the enforcement agencies will accept different procedures that capture the necessary information. Where applications are made in person, a user may maintain a log or applicant flow chart based upon visual observation, identifying the number of persons expressing an interest, by sex and by race or national origin; may in some circumstances rely upon personal knowledge of the user; or may rely upon self-identification. Where applications are not made in person and the applicants are not personally known to the employer, self-identification may be appropriate. Wherever a self-identification form is used, the employer should advise the applicant that identification by race, sex and national origin is sought, not for employment decisions, but for record-keeping in compliance with Federal law. Such self-identification forms should be kept separately from the application, and should not be a basis for employment decisions; and the applicants should be so advised. See Section 4B.

89. Q. What information should be included in documenting a validity study for purposes of these Guidelines?

A. Generally, reports of validity studies should contain all the information necessary to permit an enforcement agency to conclude whether a selection procedure has been validated. Information that is critical to this determination is denoted in Section 15 of the Guidelines by the word "(essential)".

Any reports completed after September 25, 1978, (the effective date of the Guidelines) which do not contain this information will be considered incomplete by the agencies unless there is good reason for not including the information. Users should therefore prepare validation reports according to the format of Section 15 of the Guidelines, and should carefully document the reasons if any of the information labeled "(essential)" is missing.

The major elements for all types of validation studies include the following:

When and where the study was conducted.

A description of the selection procedure, how it is used, and the results by race, sex, and ethnic group.

How the job was analyzed or reviewed and what information was obtained from this job analysis or review.

The evidence demonstrating that the selection procedure is related to the job. The nature of this evidence varies, depending upon the strategy used.

What alternative selection procedures and alternative methods of using the selection procedure were studied and the results of this study.

The name, address and telephone number of a contact person who can

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provide further information about the study.

The documentation requirements for each validation strategy are set forth in detail in Section 15 B, C, D, E, F, and G. Among the requirements for each validity strategy are the following:

1. *Criterion-Related Validity*

A description of the criterion measures of job performance, how and why they were selected, and how they were used to evaluate employees.

A description of the sample used in the study, how it was selected, and the size of each race, sex, or ethnic group in it.

A description of the statistical methods used to determine whether scores on the selection procedure are related to scores on the criterion measures of job performance, and the results of these statistical calculations.

2. *Content Validity*

The content of the job, as identified from the job analysis.

The content of the selection procedure.

The evidence demonstrating that the content of the selection procedure is a representative sample of the content of the job.

3. *Construct Validity*

A definition of the construct and how it relates to other constructs in the psychological literature.

The evidence that the selection procedure measures the construct.

The evidence showing that the measure of the construct is related to work behaviors which involve the construct.

90. Q. Although the records called for under "Source Data", Section 15B(11) and section 15D(11), are not listed as "Essential", the Guidelines state that each user should maintain such records, and have them available upon request of a compliance agency. Are these records necessary? Does the absence of complete records preclude the further use of research data compiled prior to the issuance of the Guidelines?

A. The Guidelines require the maintenance of these records in some form "as a necessary part of the study." Section 15A(3)(c). However, such records need not be compiled or maintained in any specific format. The term "Essential" as used in the Guidelines refers to information considered essential to the validity report. Section 15A(3)(b). The Source Data records need not be included with reports of validation or other formal reports until and unless they are specifically requested by a compliance agency. The absence of complete records does not preclude use of research data based on those records that are available. Validation studies submitted to comply with the requirements of the Guidelines may be considered inadequate to the extent that important data are missing or there is evidence that the collected data are inaccurate.

[FR Doc. 79-6323 Filed 3-1-79; 8:45 am]

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wage survey 1982 - 87

I FHMAN 00385

No. of Employees	Job Titles	South Plainfield Current Rate	South Plainfield Proposed 70¢
2	Packer	$7.30	$8.00
1	Warehouse Man	$7.40	$8.10
1	Mobil Equip. Oper.	$7.50	$8.20
1	Mill Operator	$7.90	$8.60
1	Mechanic	$8.70	$9.40
6	TOTAL		
	Straight Time Average	$7.68	$8.38
	Date Last Increase		
	Number Hourly Employees	6	
	Union	No	
	Dental Plan	No	

FHMAN 00386

WAGE SURVEY

Chevron	Tenneco	American Cyanamid	Natl. Lead Industries	Survey Average	Survey Average vs. Cyprus Proposed	% Difference Survey Average and Proposed
$8.54	$9.35		$9.09	$8.99	$-.99	12%
$8.54	$9.29	$8.35	$9.15	$8.83	$-.73	9%
		$8.35		$8.35	$-.15	2%
$8.54	$9.35	$8.35	$9.09	$8.83	$-.23	3%
$9.50	$10.49	$8.90	$9.98	$9.72	$-.32	3%
$8.84	$9.59	$8.49	$9.33	$9.06	$-.68	-8%
6/27/82	4/1/82	1/25/82	2/1/82			
25		680	575			
AFL-CIO	OCAW	TCWU	OCAW			
Yes	Yes	Yes	Yes			

MJK associates

Time sharing of computerized data, programmed to user specifications.

1983 Survey of Wage Rates
and Working Conditions
SOUTH PLAINFIELD, NJ AREA

Mr. Keith Lehman
Cyprus Industrial Minerals
Metuchen & Harmich Roads
South Plainfield, NJ 07080

Dear Mr. Lehman:

Chevron Chemical Company has asked me to send you a copy of the report of the results of their recent mail update of the 1980 wage survey conducted in the South Plainfield area. Companies that participated in the survey were:

American Cyanamid Co.	Bound Brook
Tingley Rubber Corp.	South Plainfield
Cyprus Industrial Minerals	South Plainfield
Northeastern Products Co.	South Plainfield
Union Carbide Corp.	Bound Brook
E. R. Squibb & Sons, Inc.	New Brunswick
National Starch & Chemical Corp.	Plainfield

The report consists of:

1. Response to Wage Rate questionnaire - These data identify the job(s) in your company that was/were evaluated against the Chevron job and show how your wage rates were adjusted because of differences in job value.
2. Summary of Adjusted Rates - This summarizes each of the participant's adjusted rates for the jobs in the survey. Your rate can be determined from the adjustment shown on your copy of the Response to Wage Rate Questionnaire.
3. Responses to General Working Conditions - This identifies your individual responses to the General Questionnaire.
4. Summary of General Working Conditions - This summarizes all company responses to the General questionnaire.

If you have any questions on survey results or have difficulty understanding data, etc., please call MJK Associates in Santa Clara (408-247-5102). Thank you again for your participation.

Very truly yours,

Susan T Held

Mrs. Susan T. Held
President

Enclosure

122 Saratoga Ave Suite 11, Santa Clara, CA 95050 408/247-5102

NOTE: SEE ATTACHED GENERAL QUESTIONNAIRE
FOR EXPLANATION OF ITEM

(04) UNION REPRESENTED: NO- 2 YES- 6

(10) SHIFT DIFFERENTIALS: AFTERNOON(EG. 4-MIDNIGHT)/GRAVEYARD(EG. MIDNIGHT-8)

%10.00/%10.00 $ 0.35/$ 0.50 $ 0.35/$ 0.40 $ 0.25/$ 0.25 $ 0.23/$ 0.34
$ 0.19/$ 0.38 $ 0.15/$ 0.25 $ 0.08/$ 0.15

OTHER: OVER 8 HOURS GETS 2X

SAT. BASE + $.50/HR:SUN. BASE + $1.00/HR

PAY OR PREMIUM FACTORS
(TOTAL PAY = STRAIGHT-TIME PAY FOR HOURS WORKED TIMES FACTOR)

(11) PAY FOR 6TH CONSECUTIVE DAY

1.50: 8 COMPANIES

(12) PAY FOR 7TH CONSECUTIVE DAY

1.50: 2 COMPANIES 2.00: 6 COMPANIES

(13) PAY FOR SATURDAY (AS REG. WORK WEEK DAY)

1.00: 3 COMPANIES 1.50: 3 COMPANIES

(14) PAY FOR SUNDAY (AS REG. WORK WEEK DAY)

1.00: 3 COMPANIES 1.50: 1 COMPANY 2.00: 3 COMPANIES

(15) OVERTIME MEAL ALLOWANCE

$/MEAL 3.25 2.50 1.50

REASONABLE AMOUNT - 3 COMPANIES

(21) COST OF LIVING ALLOWANCE: NO- 6 YES- 2

(22) VACATIONS - YEARS OF SERVICE REQUIRED FOR:

1 WEEK:

1.00: 4 COMPANIES

2 WEEKS:

1.00: 4 COMPANIES 2.00: 2 COMPANIES 3.00: 2 COMPANIES

3 WEEKS:

5.00: 7 COMPANIES 10.00: 1 COMPANY

4 WEEKS:

10.00: 4 COMPANIES 12.00: 2 COMPANIES 15.00: 1 COMPANY

5 WEEKS:

20.00: 6 COMPANIES 24.00: 1 COMPANY

6 WEEKS:

25.00: 1 COMPANY 30.00: 3 COMPANIES

OTHER VACATIONS: BL
BL

(16) HOLIDAYS:

OVERALL AVERAGE 11.1

01-NEW YEARS DAY	8	02-MEMORIAL DAY	8
03-JULY 4TH	8	04-LABOR DAY	8
05-THANKSGIVING DAY	8	06-CHRISTMAS DAY	8
07-PRESIDENT DAY/WASH.BIRTHDAY	5	08-GOOD FRIDAY	8
09-EASTER MONDAY	1	10-JULY 3RD	0
11-VETERAN'S DAY	0	12-DAY BEFORE THANKSGIVING	0
13-DAY AFTER THANKSGIVING	8	14-DAY BEFORE CHRISTMAS	7
15-DAY AFTER CHRISTMAS	1	16-EMPLOYEE'S BIRTHDAY	1
17-FLAG DAY	0	18-PERSONAL HOLIDAY	0
19-DAY BEFORE NEW YEARS DAY	2	20-LINCOLN'S BIRTHDAY	1
21-MARTIN L. KING'S BIRTHDAY	0	22-JULY 5	0
23-COLUMBUS DAY	2	24-SPECIAL HOLIDAY- 3/YR.	0
25-FLOATING HOLIDAY- 1/YR.	2	26-FLOATING HOLIDAY- 2/YR.	1
27-FLOATING HOLIDAY- 3/YR.	0	28-FLOATING HOLIDAY- 4/YR.	0
29-SPECIAL HOLIDAY- 1/YR.	2	30-SPECIAL HOLIDAY- 2/YR.	0

(17) EMPLOYEE RECEIVED GUARANTEED PAY FOR HOLIDAY: NO- 1 YES- 7

(18) PAY FACTOR HOLIDAY WORKED
(TOTAL HOLIDAY PAY=STRAIGHT-TIME PAY FOR HOURS WORKED TIMES FACTOR)

FIRST 8 HOURS 2.50: 6 COMPANIES 3.00: 2 COMPANIES

OVER 8 HOURS 1.50: 4 COMPANIES 2.50: 1 COMPANY 3.00: 2 COMPANIES

(19) SERVICE REQUIREMENT FOR HOLIDAY PAY

DAYS

1.00: 4 COMPANIES 5.00: 1 COMPANY 30.00: 1 COMPANY
60.00: 2 COMPANIES

SUMMARY OF ADJUSTED RATES - ALL PARTICIPANTS DATE: 07/01/83
SURVEY - SO. PLNFLD., N.J. OFFICE JOBS PAGE: 01 OF 01

CHEVRON PARTICIPANT'S RATES - SEE NOTE BELOW

JOB NO.	JOB TITLE							
1.	MKTNG ASST	01	12.55					
2.	TRAFFIC CL	02	10.74	10.16	9.73	9.61		
3.	LD STENO	02	11.22	10.74	10.71			
4.	HD ACCT CL	02	11.22	10.74	10.67			
5.	SR STENO	03	10.06	9.29	8.42	8.36	7.60	
6.	PROD AC CL	03	9.87	9.29	8.56	7.83	7.66	6.60
7.	PYRL&ACCTS	03	10.61	9.29	8.53	7.22		
8.	GENL STENO	04	8.06	7.76	7.63	7.28		
9.	KEY P OPR	04	8.22	8.06	7.37	6.56		
10.	TYP/RECEP	05	8.15	7.36	7.30	7.15	6.92	5.87
11.	FILE CLRK	05	7.97	7.32	6.92			
12.	ENTRY LVL		6.43	5.97	5.79	5.25		

NOTE: RATES FOR EACH PARTICIPATING COMPANY HAVE BEEN ADJUSTED - CONSIDERING 1) STRENGTH OF PARTICIPANT'S JOBS VERSUS CHEVRON'S AND 2) WEIGHTED AVERAGE OF PARTICIPANT'S JOBS AT EACH CHEVRON JOB LEVEL.

SUMMARY OF ADJUSTED RATES - ALL PARTICIPANTS DATE: 07/01/83
SURVEY - SO.PLNFLD,N.J. TECHNICIAN JOBS PAGE: 01 OF 01

CHEVRON PARTICIPANT'S RATES - SEE NOTE BELOW

JOB NO.	JOB TITLE							
1.	SR LAB AN	T2	12.82	12.70	12.40	11.54		
2.	LAB ANAL	T3	11.04	10.71	10.58	8.96	7.54	
3.	QC TECH	T3	11.04					
4.	LAB TECH	T4	9.59	8.68	8.59	8.43	7.00	6.38
5.	DRFTSMN A	T1	14.67	12.76				
6.	DRFTSMN B	T2	12.70	10.62				
7.	DRFTSMN C	T3	11.04					

NOTE: RATES FOR EACH PARTICIPATING COMPANY HAVE BEEN ADJUSTED - CONSIDERING 1) STRENGTH OF PARTICIPANT'S JOBS VERSUS CHEVRON'S AND 2) WEIGHTED AVERAGE OF PARTICIPANT'S JOBS AT EACH CHEVRON JOB LEVEL.

SUMMARY OF ADJUSTED RATES - ALL PARTICIPANTS DATE: 07/01/83
SURVEY - SO. PLNFLD.,N.J. O&M JOBS PAGE: 01 OF 01

CHEVRON PARTICIPANT'S RATES - SEE NOTE BELOW

As of 3/83

JOB NO.	JOB TITLE						CIM		AVE.
1.	SR MTCE RPN	1	12.25	11.51	11.47	11.23	10.75	10.04	9.86	- 9.87
2.	MTCE RPRMN	2	10.72	10.58	10.00	9.58	9.50	9.40	9.35	
3.	HD PACKER	2	10.10	9.50						
4.	3R OPR	3	11.18	10.11	10.10	9.09	9.06	8.90	8.49	- 9.56
5.	LD WHSEMAN	3	10.72	10.24	10.18	9.78	9.09	8.77	8.53	- 9.61
6.	OPERATOR A	4	10.50	8.90	8.77	8.54				
7.	OPERATOR B	4	10.04	9.47	8.77	8.54	8.38	8.10	7.65	8.70
8.	OPERATOR C	4	10.50	8.77	8.54	8.38				
9.	TRAINEE 2A	5	10.04	8.28	8.18	8.00		8.00		8.50
0.	TRAINEE 2B	5	8.28	8.18						
1.	TRAINEE 1	6	10.20	9.24	8.43	8.03				
2.	TRAIN CAND	7	9.12	8.18	7.92	7.52	7.46	7.29	6.56	

NOTE: RATES FOR EACH PARTICIPATING COMPANY HAVE BEEN ADJUSTED - CONSIDERING 1) STRENGTH OF PARTICIPANT'S JOBS VERSUS CHEVRON'S AND 2) WEIGHTED AVERAGE OF PARTICIPANT'S JOBS AT EACH CHEVRON JOB LEVEL.

CHEVRON CYPRUS INDUSTRIAL MINERALS CO.

CHEVRON JOB NO.	CHEVRON JOB TITLE		CYPRUS JOB NO.	CYPRUS JOB TITLE	POPN	RATE	EVALUATION	ADJUSTED RATE SEE SUMMARY PAGE
1.0	SR MTCE RPN	1						
2.0	MTCE RPRMN	2	2.0	MECHANIC	2.0	9.40	=	9.40
3.0	HD PACKER	2						
4.0	SR OPR	3	4.0	MILL OPERATOR	1.0	8.90	=	8.90
5.0	LD WHSEMAN	3						
6.0	OPERATOR A	4						
7.0	OPERATOR B	4	7.0	WAREHOUSEMAN	1.0	8.10	=	8.10
8.0	OPERATOR C	4						
9.0	TRAINEE 2A	5	9.0	PACKER	2.0	8.00	=	8.00
10.0	TRAINEE 2B	5						
11.0	TRAINEE 1	6						
12.0	TRAIN CAND	7						

NOTE: + MEANS PARTICIPANT'S JOB IS STRONGER THAN CHEVRON'S JOB
= MEANS PARTICIPANT'S JOB IS EQUAL TO CHEVRON'S JOB
- MEANS PARTICIPANT'S JOB IS WEAKER THAN CHEVRON'S JOB

CHEVRON DOES NOT RECEIVE A COPY OF THESE DATA

CHEVRON | CYPRUS INDUSTRIAL MINERALS CO.

JOB NO.	JOB TITLE		JOB NO.	JOB TITLE	POPN	RATE	EVALUATION	ADJUSTED RATE SEE SUMMARY PAGE
1.0	SR LAB AN	T2						
2.0	LAB ANAL	T3						
3.0	QC TECH	T3						
4.0	LAB TECH	T4	4.0	LAB TECH	1.0	7.00	=	7.00
5.0	DRFTSMN A	T1						
6.0	DRFTSMN B	T2						
7.0	DRFTSMN C	T3						

NOTE: + MEANS PARTICIPANT'S JOB IS STRONGER THAN CHEVRON'S JOB
= MEANS PARTICIPANT'S JOB IS EQUAL TO CHEVRON'S JOB
- MEANS PARTICIPANT'S JOB IS WEAKER THAN CHEVRON'S JOB

CHEVRON DOES NOT RECEIVE A COPY OF THESE DATA

	WORKING CONDITIONS	PARTICIPATING COMPANY CYPRUS INDUSTRIAL MINERALS CO.
(04)	UNION	N
(19)	SHIFT DIFFERENTIALS	
	AFTERNOON(EG 4-MIDNIGHT)	$ 0.15
	GRAVEYARD(EG MIDNIGHT-8)	$ 0.25
	PAY OR PREMIUM FACTOR (TOTAL PAY STRAIGHT-TIME PAY FOR HRS WORKED TIMES FACTOR)	
(11)	6TH CONSECUTIVE DAY (RATE)	1.50
(12)	7TH CONSECUTIVE DAY (RATE)	2.00
(13)	SAT(AS REG. WORK WEEK DAY)	1.00
(14)	SUN(AS REG. WORK WEEK DAY)	1.00
(15)	OVERTIME MEAL ALLOWANCE	0.00
(21)	COST OF LIVING	
	ALLOWANCE	N
	FREQUENCY	
	SIZE	
(22)	VACATIONS - YEARS OF SERVICE REQUIRED FOR:	
	1 WEEK :	1.0
	2 WEEKS:	3.0
	3 WEEKS:	10.0
	4 WEEKS:	0.0
	5 WEEKS:	0.0
	6 WEEKS:	0.0
	OTHER:	BL
(23)	OVERALL WAGE DATA	
	LOWEST STRAIGHT-TIME PAID	8.00
	HIGHEST STRAIGHT-TIME PAID	9.40
	AVERAGE STRAIGHT-TIME PAID	8.50
	HOLIDAYS	
(17)	GUARANTEED PAY	N
	PREMIUM FACTOR(TOTAL HOLIDAY PAY=STRAIGHT-TIME PAY FOR HOURS WORKED TIMES FACTOR):	
	FIRST 8 HOURS	2.50
	OVER 8 HOURS	3.00
(19)	SERVICE REQUIREMENT	1D

WORKING CONDITIONS

PARTICIPATING COMPANY

CYPRUS INDUSTRIAL MINERALS CO.

(16) RECOGNIZED HOLIDAYS

01-NEW YEARS DAY	Y
02-MEMORIAL DAY	Y
03-JULY 4TH	Y
04-LABOR DAY	Y
05-THANKSGIVING DAY	Y
06-CHRISTMAS DAY	Y
07-PRESIDENT DAY/WASH.BIRTHDAY	
08-GOOD FRIDAY	Y
09-EASTER MONDAY	
10-JULY 3RD	
11-VETERAN'S DAY	
12-DAY BEFORE THANKSGIVING	
13-DAY AFTER THANKSGIVING	Y
14-DAY BEFORE CHRISTMAS	Y
15-DAY AFTER CHRISTMAS	Y
16-EMPLOYEE'S BIRTHDAY	
17-FLAG DAY	
18-PERSONAL HOLIDAY	
19-DAY BEFORE NEW YEARS DAY	
20-LINCOLN'S BIRTHDAY	
21-MARTIN L. KING'S BIRTHDAY	
22-JULY 5	
23-COLUMBUS DAY	
24-SPECIAL HOLIDAY- 3/YR.	
25-FLOATING HOLIDAY- 1/YR.	
26-FLOATING HOLIDAY- 2/YR.	
27-FLOATING HOLIDAY- 3/YR.	
28-FLOATING HOLIDAY- 4/YR.	
29-SPECIAL HOLIDAY- 1/YR.	Y
30-SPECIAL HOLIDAY- 2/YR.	

September 20, 1983

Confidential

G.H. Peppard
7000 Building
M/C S218

Hourly Wage Increase - South Plainfield

The CIM Talc Division requests authorization to grant a 5.3% (45¢) across-the-board general wage increase for the 6 non-represented employees in the South Plainfield mill, effective October 1, 1983. The straight time annualized cost of the proposed increase is $5,616.

In the past, Chevron Chemicals and Tenneco Chemicals were surveyed due to their immediate proximity to the South Plainfield mill. This year, Tenneco would not participate in our wage survey. As a result, this wage proposal is based on the June 1983 new hourly rates for Chevron Chemicals. The 25 union employees at Chevron received a 5% across-the-board general wage increase on June 27, 1983. This 5% increase resulted in a 43¢ increase for the lowest hourly classification up to a 47¢ increase for the highest hourly classification. On an average, wages rose 44¢ per hour to a 1983 straight time average of $9.28 per hour. The results of this wage survey are attached.

The general hourly wages in South Plainfield have historically been lower than in other South Plainfield, New Jersey companies. This is due to the South Plainfield area being highly industrialized with a concentration of unionized companies.

The proposed wage increase for South Plainfield hourly employees will result in a wage scale lower than competition. Due to the low level of business and resulting hourly lay-offs experienced at South Plainfield during 1983 and projected for 1984, it is local management's contention that this proposal represents an equitable increase.

The current and proposed straight time rates for hourly employees are as follows:

No. of Employees	Hourly Classified	Current Rate	Proposed 10-1-83 Rate
2	Packer	$8.00	$8.45
1	Warehouse Man	8.10	8.55
1	Mobil Equip. Opr.	8.20	8.65
1	Mill Operator	8.60	9.05
1	Mechanic	9.40	9.85
Straight Time Average		8.46	8.91

CYPRUS SCPD

.....

CYPRUS SCPD

RCA SEP 27 1985

9-27-85

TO:S PLAINFIELD
ATTN: KEITH

WE ARE PLEASED TO ANNOUNCE A GENERAL WAGE INCREASE OF $.50 PER HOUR FOR ALL S PLAINFIELD MILL REGULAR HOURLY EMPLOYEES. THE FOLLOWING RATES ARE EFFECTIVE 10/1/85=

MACHANIC	$ 10.85
MILL OPERATOR	- 10.00
WAREHOUSEMAN	-9.50
PACKER	- 9.35

I WOULD LIKE TO THANK EVERYONE FOR A JOB WELL DONE AND ASK THAT THE SAME ATTITUDE AND SPIRIT OF COOPERATION THAT MADE 1985 A SUCCESS CARRY-OVER TO 1986.

M.J. LORANG

ALSO

EFFECTIVE OCTOBER 1, 1985, SHIFT DIFFERENTIAL WILL BE INCREASED IN CERTAIN CIRCUMSTANCES AS OUTLINED BELOW:

NORMAL SHIFT DIFFERENTIAL

DAY SHIFT	NONE
AFTERNOON	$ .45 / HR
NIGHT SHIFT	$ .25 / HR

THIS SHIFT DIFFERENTIAL WILL REMAIN IN EFFECT FOR THE FIRST 2 WEEKS AN EMPLOYEE WORKS ON A SHIFT. THE THIRD AND ALL OTHER CONTINUOUS WEEKS WORKED, THE DIFFERENTIAL WILL FWILL BE INCREASED TO THE FOLLOWING:

DAY SHIFT	NONE
AFTERNOON	$ .45/HR
NIGHT SHIFT	$.75/HR

AN INCREASE IN SHIFT DIFFERENTIAL WILL NOT BE APPLIED WHEN A SHIFT IS TRADED WITH A COWORKER OR FOR VACATION, LEAVE, OR HOLIDAY PAY.

K.S. LEHMAN

VACATION:
2 wk. 1 yr.
3 wk. 5
4 wk. 10

CYPRUS SCPD

.....

2 yr. Con. 1/87 3.3 88 3.25 up 5% 1/25/83 2 yr. 5% 1/84

American Cyanimid

Leaderly Labs

356-2000

John GUMBEDIA or

560-2000

ray KONKLE?

TOP

1. —

2. Maintenance Mechanics 1st CLASS 10.75 +.51 5%

3 —

4 Warehouse operators 8.77 +.42

5 Leadman Rate - chief operator 9.69 10.17

Shifts ?

emp. 600

Last INC. 1/25/83 5% 1/25/84 + 5%

2 year contract

9/1984

SHIFT DIFFERENTIAL 2ND .24

3RD .48

VAC.	after in yrs.
1 wk.	1-2
2 wk.	2-5
3	5-10
4	10-20
5	20+
6	

SUN. / SAT. $1.00

16X17

Tenneco

~~SUE WILSON~~

ESTER Wolf

~~OLAW~~ OLAW JACKSON NIXON PLANT 287-5000

→ ~~JOHN WILCZYNSKI~~ ~~981-5210~~ 5225

CLASS A chemical operators packers	TOP 10.25	LAST INCREASE 10.90	
Maintenance Mechanics	11.39	LAST INCREASE 12.04	
Material Handlers warehouse	10.19	10.84	
machine operators millop	10.25	10.90	
cheifs rate	10.39	11.04	

How many employees = 20 40 760 Z PLANTS

CODE 672

shift Differentials 2ND .30 3RD .45 1984

rotate .25 all

Last increase (3/84 .65) (.63 1985) (.62 1986)

NUODEX PISCATAWAY

ELIZABETH paint Dryers

ESTER wolf

3 - op. eng.

4 - Boiler

9 - mant.

* - OCAW PRODUCTION 40 +20=60

3 year

gen. accross Board

march, 84 .65, .63, .62 86

1st 2nd 3rd

steady rotating .25

2ND .30 3RD .45

2ND 3RD

STEEL workers NIXON 9/84 4.5% .44 44 .42 .41 .40

2 YR. .90 .90 4.2% 4.0%

STEEL WORKERS 9.10 .27 2ND .38 3RD

1984 Texaco NVDGX

	4 yrs.
1 wk.	6m - 2y.
2 wk.	2-5
3	5-10
4	10-20
5	20-30
6	30+

Disc. LABOR Relation

(ELIZ. RITTER 2913)

UNION carb.

~~[illegible]~~ / ~~Jeff [illegible]~~

356-8000

EXT. - 3503

~~LINDA [illegible]~~

tim GALUSHA

356-2913

1.

2.

3.

4.

5.

5.

356-8000

563-5000

EXT. 2913

GALUSHA 5913

over 13%

4.42 % 1st YR.

4.94 % 2nd YR.

tim

MAY '86

NEW contract

'86 4½%

'87 4.25%

2ND ½ may '84

3.6 (84)

3.9 (85)

100 Ded net

200.00

Rotating

Last inc. - ~~[illegible]~~ (5/82) 5/83 as of

No. employ - ~~500~~ 380

UNION what - OCAW

Shift Dif. 2ND ~~.35~~ .38 '85 Bonus ~~.20~~ .18 Rotating

3RD ~~.50~~ .53

chemical, plastics, powders

- OCAW -

2 TIER WAGE STRUCTURE

10. START

3 months 10.12

6 10.21

1 YR. ENTRE

LEHMAN 00402

[redacted]

UNION CARBIDE

1. 10.10 lowest
2. 10.22
3. 10.31
4. 10.41 ← janitor, material handlers - helpers (general) (packer)
5. 10.53
6. 10.86 -
7. 11.02 warehouseman -
8. 11.32
9. 11.54 mechanics, A 13.28
10. 11.80 chem. op. 11.80 [redacted] - 12044 SR. OPer.
11. 12.00
12. 12.13
13. 12.33
14. 12.44
15. 12.54
16. 12.65

MR. SHIVERS

3 LINE DRAFT

1660

561 - ~~[illegible]~~

Northeastern Products
S. Clinton Ave. S.P.

1.
2.
3.
4
5.
6.

'86 → JACK SHERLOCK
RECIPROCATE
6% Jan. '86
18 months

1/87
55%

6 WK SICK

FISCAL 7/87
YEAR
4.% effect for '87

SHIFT 6-6 +10% per hr.

How Many - 50

Last INCREASE 6/83

SPICE, (RESINS), DRY, + FLUID

NON-UNION

10 holidays

Dental Plan with families

helpers – start 8.73 material handlers

mech. – (11.55) – 12.08 lead

operator Tech. 9.78 (mill op?)

lead person – (lead 10.58) process Tech. lead

warehouse 10.58 charge shipping SHIPPER

WAGE SURVEY SEPTEMBER 1986

NO. OF EMPLOYEES	JOB TITLES	SOUTH PLAINFIELD CURRENT RATE		NUODEX	AMERICAN CYANAMID	UNION CARBIDE	NORTHEASTERN Products	SURVEY AVERAGE
2	Packer	9.35	12.53	12.15	10.08	11.70	10.30	10.86
1	Warehouse Man	9.60	12.86	12.09	10.08	12.36	12.48	13.16
1	Mobil Equip. Oper.	9.60	12.53	12.15	10.08	12.36	11.53	12.16
1	Mill Operator	10.00	12.67	12.29	11.15	13.96	12.48	13.16
1	Mechanic	10.85	13.70	13.29	12.35	13.87	13.62	14.37
6	TOTAL							
Straight Time Average		9.86	12.85	12.46	11.19	12.98	12.08	12.18
Date Last Increase		10/86	4/87	4/86	1/86	5/86	1/86	
AMOUNT		5%		6%	4.5%	4.42%	6%	5.2%
Number Hourly Employees	6				600	500	65	
Union	No			OCAW	ICWU	OCAW	NO	
Dental Plan	Yes			Yes	Yes	Yes	Yes	
2nd Shift	.15				.25	.35	10%	
3rd Shift	.25				.50	.50 + .20		
Products	Talc			Stearates	Calcium Chemicals	Rotating Chemicals Powders Plastics etc.		

I FHMAN 000406

WAGE SURVEY SEPTEMBER 1986

NO. OF EMPLOYEES	JOB TITLES	SOUTH PLAINFIELD CURRENT RATE	NUODEX	AMERICAN CYANAMID	UNION CARBIDE	NORTHEASTERN Products	SURVEY AVERAGE
2	Packer						
1	Warehouse Man						
1	Mobil Equip. Oper.						
1	Mill Operator						
1	Mechanic						
6	TOTAL						
Straight Time Average							
Date Last Increase							
AMOUNT							
Number Hourly Employees	6						
Union	No		OCAW	ICWU	OCAW	NO	
Dental Plan	Yes		Yes	Yes	Yes	Yes	
2nd Shift	.15			.25	.35	10%	
3rd Shift	.25			.50	.50 + .20		
Products	Talc		Stearates	Calcium Chemicals	Rotating Chemicals Powders Plastics etc.		

I FHMAN 00407

WAGE SURVEY SEPTEMBER 1987

NO. OF EMPLOYEES	JOB TITLES	SOUTH PLAINFIELD CURRENT RATE	NUODEX	AMERICAN CYANAMID	UNION CARBIDE	NORTHEASTERN Products	SURVEY AVERAGE
2	Packer	9.60	12.53	10.43	12.19	10.86	
1	Warehouse Man	9.75	12.46	10.43	12.88	13.16	
1	Mobil Equip. Oper.	9.85	12.53	10.43	12.88	12.16	
1	Mill Operator	10.25	12.67	11.54	13.93	13.16	
1	Mechanic	11.10	13.70	12.78	14.45	14.37	
6	TOTAL						
Straight Time Average		10.11	12.85	11.58	13.53	12.74	12.68
Date Last Increase		10/86	4/87	1/87	5/87	1/87	
AMOUNT			3.1%	3.5%	4.24%	5.5%	4.0%
Number Hourly Employees	6			600	500	65	
Union	Nc		OCAW	ICWU	OCAW	NO	
Dental Plan	Yes		Yes	Yes	Yes	Yes	
2nd Shift	.15			.25	.35	10%	
3rd Shift	.25			.50	.50 + .20		
Products	Talc		Stearates	Calcium Chemicals	Rotating Chemicals, Powders, Plastics etc.		

I FHMAN 000408

WAGE SURVEY SEPTEMBER 1987

NO. OF EMPLOYEES	JOB TITLES	SOUTH PLAINFIELD CURRENT RATE	NUODEX	AMERICAN CYANAMID	UNION CARBIDE	NORTHEASTERN Products	SURVEY AVERAGE
2	Packer	9.60	12.53	10.43	12.19	10.86	
1	Warehouse Man	9.75	12.46	10.43	12.88	13.16	
1	Mobil Equip. Oper.	9.85	12.53	10.43	12.88	12.16	
1	Mill Operator	10.25	12.67	11.54	13.93	13.16	
1	Mechanic	11.10	13.70	12.78	14.45	14.37	
6	TOTAL						
Straight Time Average		10.11	12.85	11.58	13.53	12.74	12.68
Date Last Increase		10/86	4/87	1/87	5/87	1/87	
AMOUNT			3.1%	3.5%	4.24%	5.5%	4.0%
Number Hourly Employees	6			600	500	65	
Union	No		OCAW	ICWU	OCAW	NO	
Dental Plan	Yes		Yes	Yes	Yes	Yes	
2nd Shift	.15			.25	.35	10%	
3rd Shift	.25			.50	.50 + .20		
Products	Talc		Stearates	Calcium Chemicals	Rotating Chemicals, Powders, Plastics etc.		

I FHMAN 000409

WAGE SURVEY SEPTEMBER 1986

NO. OF EMPLOYEES	JOB TITLES	SOUTH PLAINFIELD CURRENT RATE	NUODEX
2	Packer	9.35	12.15
1	Warehouse Man	9.50	12.09
1	Mobil Equip. Oper.	9.60	12.15
1	Mill Operator	10.00	12.29
1	Mechanic	10.85	13.29
6	TOTAL		
	Straight Time Average	9.86	12.46
	Date Last Increase	10/85	4/86
	AMOUNT		6%
	Number Hourly Employees	6	
	Union	No	OCAW
	Dental Plan	Yes	Yes
	2nd Shift	.15	
	3rd Shift	.25	
	Products	Talc	Stearates

I FHMAN 00410

AMERICAN CYANAMID	UNION CARBIDE	NORTHEASTERN Products	SURVEY AVERAGE
10.08	11.70	10.30	
10.08	12.36	12.48	
10.08	12.36	11.53	
11.15	13.96	12.48	
12.35	13.87	13.62	
11.19	12.98	12.08	12.18
1/86	5/86	1/86	
4.5%	4.42%	6%	5.2%
600	500	50	
ICWU	OCAW	NO	
Yes	Yes	Yes	
.25	.35	10%	
.50	.50 + .20		
Calcium Chemicals	Rotating Chemicals Powders Plastics etc.		

1985 Survey Sept.

AVE may 13 '86 ~~10.78~~ ~~11.80~~

WAGE SURVEY

No. Of Employees	Job Titles	South Plainfield Current Rate	5%	CHEVRON	NUODEX TENNECO	American Cyanamid		Natl Lead Industries	Union Carbide		Northeastern Products		Survey Average
2	Packer	~~$8.00~~	8.85 9.29	$8.97	11.53	$8.77	9.65	$9.72	~~$10.41~~	11.20	~~$8.73~~	9.71	$9.32
1	Warehouse Man	~~8.10~~	9.00 9.45	8.97	11.47	8.77	9.65	9.79	~~11.02~~	11.84	~~10.58~~	11.77	9.82
1	Mobil Equip. Oper	~~8.20~~	9.20	8.97	11.53	8.77	9.65	9.79	11.02	11.84	~~9.78~~	10.88	9.66
1	Mill Operator	~~8.60~~	9.50 9.97	9.54	11.67	9.69	10.67	9.73	~~12.44~~	13.37	~~10.58~~	11.77	10.39
1	Mechanic	~~9.40~~	10.35 10.86	9.97	12.67	10.75	11.82	10.66	~~11.54~~	13.28	~~11.55~~	12.85	10.89
6	TOTAL												
Straight Time Average		8.38	9.42	9.28	AVE 11.83	~~9.35~~ 10.71		9.93	~~11.28~~ 12.42		~~10.24~~ 11.39		~~10.01~~ 11.58
Date Last Increase			(9.99 6% 9.89 5%)	6/27/83	4/1/85	1/25/83	1/85	2/1/83	5/83	5/84-85 3.6 '84		6/85	
AMOUNT				5%	6% .62	5%	5% 4.5% '86	7%	5/86 2 yr. N/A.	3.9 '85	N/A	6%	1/86 6% 6wk Sick Time
Number Hourly Employees		6		25	3yr end	600		48	4.42% '86 4.24% '87 ~~500~~ 380	400	50		
Union		No		AFL-CIO		ICWU		OCAW	OCAW		No		
Dental Plan		Yes		Yes		Yes		Yes	Yes		Yes		
2nd Shift	.25	.15	.25	.25	.30	.25		.21	.38 ~~.35~~		10% of hour wage per hr.		
3rd Shift	.50	.25	.75	.25	.45	.50		.21	.53 ~~.50~~ + .20		" "		
Products		Talc		Chemicals	.25 all on Rotate SHIFTS	Calcium, Chemicals		Titanium	Rotating Chemicals, Powders, Plastics etc.		Resins, Dry & Fluid		

ED MULASKI ~~CONSENGETY~~ FEDERAL Statements

10% shift Differential

AVE- 4.5-5.5

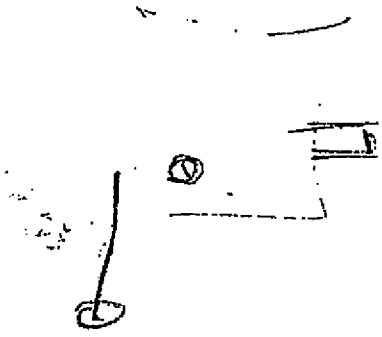
CONSISTENCY NON-REP Benefit levels

Troy?

PAINT GUNS

I FHMAN 00412

NOISE UNLIMITED, INC. 1983



CLEANING

Use only mild soap and a damp cloth to clean the tool. Many household cleaners contain chemicals which could seriously damage the plastic. Also, do not use gasoline, turpentine, lacquer or paint thinner, dry cleaning fluids or similar products. Never let any liquid get inside the tool; never immerse any part of the tool into a liquid.

IMPORTANT

To assure product SAFETY and RELIABILITY, repairs, maintenance and adjustment (including brush inspection and replacement) should be performed by Black & Decker Service Centers or other qualified service organizations, always using Black & Decker replacement parts. When servicing Double-Insulated Tools, it is extremely important that ONLY IDENTICAL REPLACEMENT PARTS BE USED and that REASSEMBLY OF TOOL IS IDENTICAL TO THE ORIGINAL ASSEMBLY.

HOME USE WARRANTY (A Full One Year Warranty)

Black & Decker warrants this product for one year against any defects that are due to faulty material or workmanship. Please return the complete unit, transportation prepaid, to the seller (if participating retailer) for free replacement (proof of purchase may be required). The unit may also be returned to a Black & Decker Service Center or Authorized Service Station, listed under "Tools Electric" in the yellow pages for free replacement or repair at our option. This warranty does not apply to accessories. This warranty gives you specific legal rights and you may have other rights which vary from state to state. Should you have any questions, contact your nearest Black & Decker Service Center Manager.

Black & Decker® and B&D® are registered trademarks of The Black and Decker Manufacturing Company, Towson, Maryland, U.S.A.

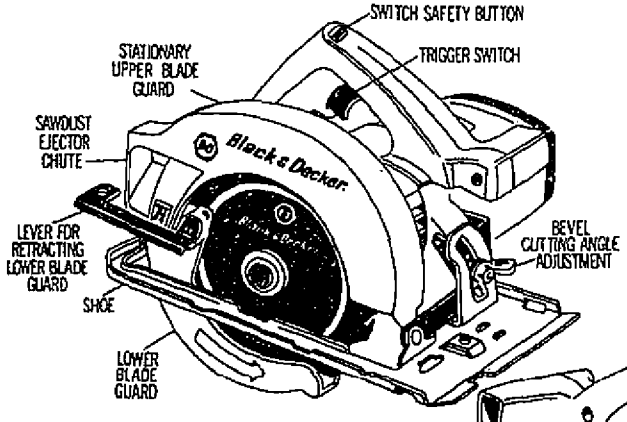
BLACK & DECKER (U.S.) INC., TOWSON, MD. 21204, U.S.A.

Form No. 724863 (FEB80-CD) Printed in U.S.A.

I FHMAN 00414

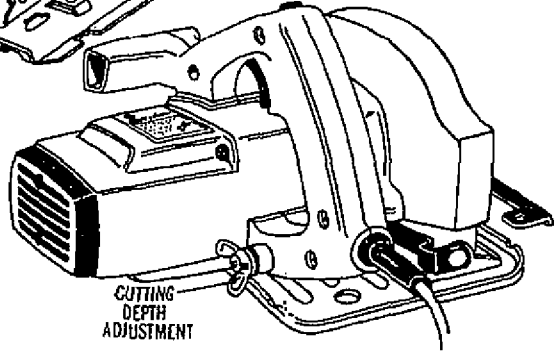
Black & Decker®

OWNER'S MANUAL



VALUE-PLUS™

TM: The Black & Decker Mfg. Co.



Your new Saw offers you top value and years of time-saving convenience and service. Its cutting depth is adjustable, and the saw shoe tilts for bevel sawing. For added electrical safety, it is DOUBLE INSULATED throughout.

Safety and proper usage are of the utmost importance with power saws! Before trying out your new saw, please read all of the safety rules and instructions carefully.

Don't forget to send in the owner registration card.

THANK YOU for buying BLACK & DECKER!

NO. 7390 7-1/4" SAW

*** DOUBLE INSULATED ***

MAXIMUM CUTTING DEPTH: At 90° — 2 7/16". At 45° bevel — 1 7/8"

BEVEL ADJUSTMENT: 0° to 45°

SAFETY RULES FOR POWER TOOLS

1. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
2. **AVOID DANGEROUS ENVIRONMENT.** Don't expose power tools to rain. Don't use power tools in damp or wet locations. And keep work area well lit.
3. **KEEP CHILDREN AWAY.** All visitors should be kept a safe distance from work area.
4. **STORE IDLE TOOLS.** When not in use, tools should be stored in dry, high or locked-up place — out of reach of children.
5. **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
6. **USE RIGHT TOOL.** Don't force a small tool or attachment to do the job of a heavy duty tool.
7. **WEAR PROPER APPAREL.** No loose clothing or jewelry to get caught in moving parts. Rubber gloves and footwear are recommended when working outdoors.
8. **USE SAFETY GLASSES** with most tools. Also face or dust mask if cutting operation is dusty.
9. **DON'T ABUSE CORD.** Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges.
10. **SECURE WORK.** Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.
11. **DON'T OVERREACH.** Keep proper footing and balance at all times.
12. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp, at all times, and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
13. **DISCONNECT TOOLS.** When not in use, before servicing; when changing accessories such as blades, bits, cutters, etc.
14. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
15. **AVOID ACCIDENTAL STARTING.** Don't carry plugged-in tool with finger on switch. Be sure switch is off when plugging in.
16. **OUTDOOR USE EXTENSION CORDS.** When tool is used outdoors, use only extension cords suitable for use outdoors and so marked.
17. **DO NOT OPERATE** portable electric tools in gaseous or explosive atmospheres. Motors in these tools normally spark, and the sparks might ignite fumes.

ADDITIONAL SAW SAFETY RULES

1. **DISCONNECT PLUG** from power supply before changing blades, making cutting depth or cutting angle adjustments, inspecting, cleaning or when saw is not being used.
2. **WHEN RETRACTING** the lower blade guard, always use the retracting lever on the guard.
3. **KEEP GUARDS** in place and in working order **NEVER TIE BACK** the lower blade guard or its retracting lever.
4. **KEEP HANDS AWAY** from cutting area. Never reach underneath the material for any reason.
5. **KEEP BLADE SHARP.** Dull blades may cause the saw to swerve or stall under pressure.
6. **IF YOU DROP OR DAMAGE** the saw, unplug it first; then check to see if the blade and lower blade guard operate freely before resuming operations.
7. **NEVER REMOVE** the lower guard spring for any reason. If spring should become damaged, replace spring before attempting to use the saw.
8. **PERIODICALLY CHECK LOWER GUARD** for correct operation - retracting & return.
9. **PERIODICALLY CHECK** clamp washers, spindle bolt, spindle, and saw blade mounting hold for damage.
10. **NEVER** use a defective or substitute clamp washer or spindle bolt for mounting blade.
11. **NEVER** use blades with incorrect size mounting hole in relation to spindle size.

DOUBLE-INSULATION

Your tool is DOUBLE-INSULATED to give you added safety. This means that it is constructed throughout with TWO separate "layers" of electrical insulation or one DOUBLE thickness of insulation between you and the tool's electrical system.

Tools built with this improved insulation system are not intended to be grounded. As a result, your tool is equipped with a two-prong plug which permits you to use any conventional 120 volt electrical outlet without concern for maintaining a ground connection.

NOTE: DOUBLE-INSULATION does not take the place of normal safety precautions when operating this tool. The improved insulation system is for added protection against injury resulting from a possible electrical insulation failure within the tool.

CAUTION: When servicing Double Insulated Tools, USE ONLY IDENTICAL REPLACEMENT PARTS. Replace or repair damaged cords.

EXTENSION CORD

When using the tool at a considerable distance from the power source, an extension cord of adequate size must be used for safety, and to prevent loss of power and over-heating. Use the table below to determine minimum wire size required.

Before using cords, inspect them for loose or exposed wires and damaged insulation. Make any needed repairs or replacement before using your power tool.

Extension Cord Length in Feet	25	50	75	100
Minimum Wire Size (American Wire Gauge):				
120 Volt Tools	16	14	12	10
220 Volt Tools	18	18	16	14

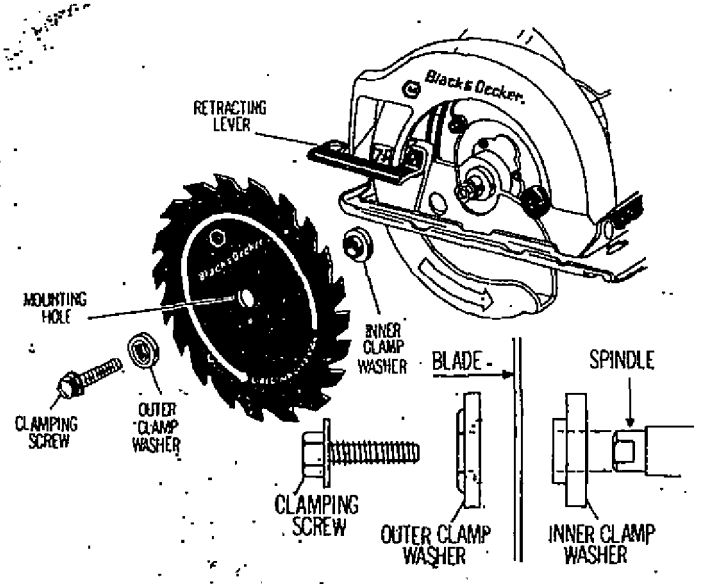
Note: The lower the wire size number, the heavier the wire, and the farther it will carry current without a voltage drop.

MOTOR

Your Black and Decker tool is powered by a B&D-built motor. Be sure your power supply agrees with nameplate marking. **120 Volts 50/60 Hz** means **Alternating Current** (normal 120 volt, 60 cycle house current). Voltage variation of more than 10% will cause loss of power and over-heating. All B&D tools are factory-tested; if this tool does not operate, check the supply line for blown fuses; plug and receptacle for contact.

LUBRICATION

Self lubricating bearings are used in the tool and periodic relubrication is not required. However, it is recommended that, once a year, you take or send the tool to a B&D Service Center for a thorough cleaning, inspection and lubrication of the gear case. Service Center addresses are shown on the owner registration card packed with your tool.



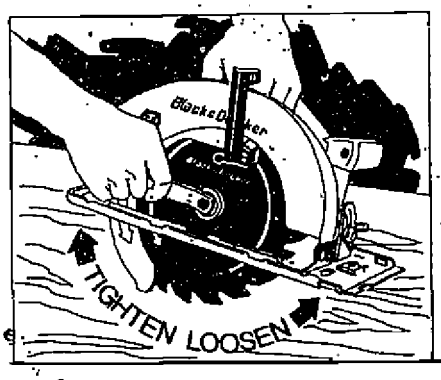


FIGURE 2

ATTACHING & REMOVING BLADES

1. BE SURE SAW IS DISCONNECTED FROM POWER SUPPLY!
2. **To remove blade clamping screw (Fig. 1):**

—a. ON NEW SAWS (without blade attached). Turn screw counter-clockwise with blade wrench provided. If screw does not loosen easily from spindle, tap the outer end of the wrench sharply in a counter-clockwise direction with a piece of wood to "free" the screw threads. Remove screw and outer clamp washer.

—b. ON SAWS WITH BLADE ATTACHED. Using the retracting lever, retract the lower blade guard and place the Saw on a piece of scrap lumber as shown in Figure 2. Press down on the Saw so that the blade teeth dig slightly into the lumber and prevent the blade from turning. Then, with the blade wrench provided, turn the clamping screw counter-clockwise and remove the screw and outer clamp washer. Disengage the blade teeth from the lumber, and with the lower blade guard still retracted, lift off the blade.

3. **To attach the blade:** Place inner clamp washer on spindle if previously removed. Retract lower blade guard and place blade over inner clamp washer with printed side of blade out (teeth at bottom of blade pointing forward). Fit outer clamp washer onto spindle . . . "flats" on the outer washer must mesh with the "flats" on the spindle. Thread on clamping screw firmly by hand to hold washers in position. Place Saw on piece of scrap lumber as shown in Figure 2 and press down on the Saw so that blade teeth dig slightly into wood and prevent the blade from turning. Tighten clamping screw (clockwise) firmly with the blade wrench.

NOTE: An alternate way to keep the blade from turning, when tightening or loosening the blade screw, is to hold a large nail through the hole in the blade and against the forward part of the shoe. Rest the nail on top of the shoe when tightening, against the bottom when loosening. CAUTION: Remove nail before connecting plug.

CUTTING DEPTH ADJUSTMENT

DISCONNECT PLUG FROM POWER SUPPLY BEFORE MAKING THIS OR ANY OTHER ADJUSTMENT.

For the most efficient cutting action, set the Depth Adjustment so that one tooth of the blade will project below the material to be cut. This distance is from the tip of the tooth to the bottom of the gullet in front of it. This keeps blade friction at a minimum, removes sawdust from the cut, and results in cooler, faster sawing.

NOTE: When using Carbide-Tipped Blades, make an exception to the above rule and allow only one-half of a tooth to project below the material being cut.

To adjust the cutting depth:

1. BE SURE THE SAW IS DISCONNECTED FROM THE POWER SUPPLY!
2. Place the saw in the position shown in Figure 3 and loosen depth adjustment wing nut "A".
3. Place a scrap piece of the material to be cut along the side of the blade as shown. Raise or lower the shoe until the blade projects from the shoe the desired distance. Retighten wing nut "A" firmly.

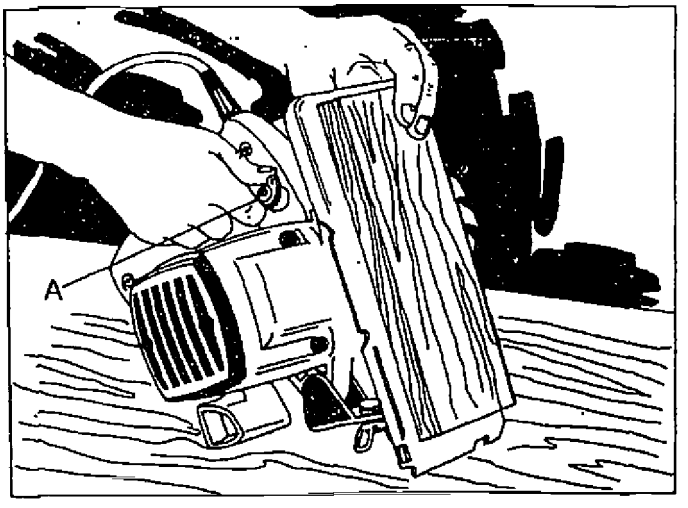


FIGURE 3

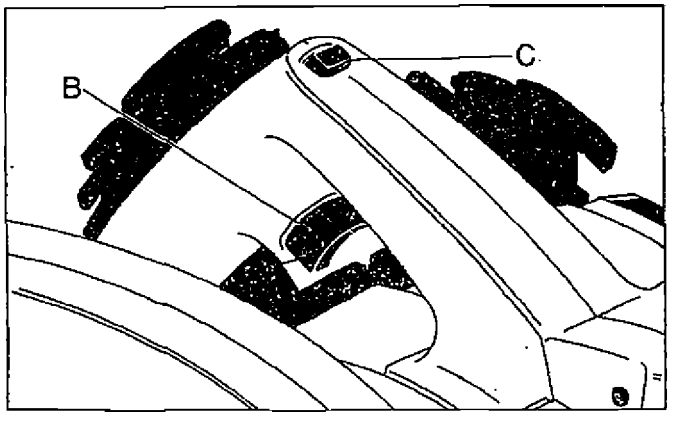


FIGURE 4

SWITCH

To prevent the Trigger Switch "B" (Figure 4) from being accidentally depressed, a Switch Locking Button "C" is provided on the top of the main handle as a safety feature.

TO TURN SAW "ON", press in the locking button "C" with your thumb, and hold it in momentarily, while you depress the trigger switch "B". Depressing the trigger turns the tool "ON".

TO TURN TOOL "OFF", merely release the trigger. The locking button will snap forward and lock the trigger "OFF".

1 FHMAN 00416

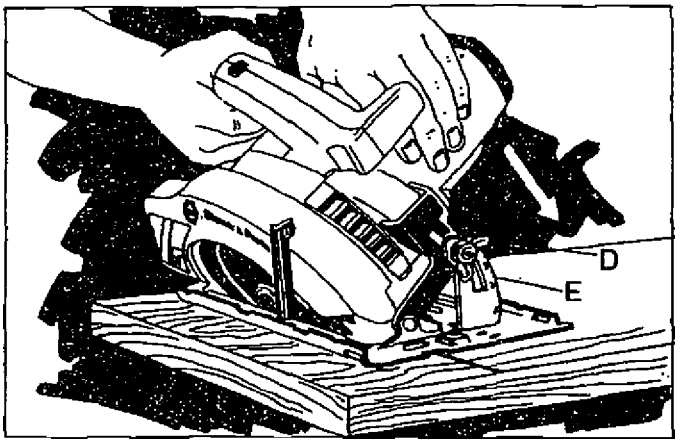


FIGURE 5

BEVEL ANGLE ADJUSTMENT

DISCONNECT THE SAW FROM THE POWER SUPPLY BY PULLING THE PLUG, BEFORE MAKING THIS, OR ANY OTHER ADJUSTMENT! On the front of the saw is a bevel angle adjustment device (Figure 5) consisting of calibrated quadrant "E" and a wing nut "D". To set the saw for a bevel cut, loosen wing nut and tilt shoe to angle desired. Retighten wing nut firmly.

CAUTION:When making bevel cuts, place one hand on the motor housing as shown in Figure 5. Exert only enough pressure in the direction of the arrow to keep the saw shoe flat on the work. This will insure an accurate bevel cutting angle and help prevent the blade from binding in the cut.

GUIDE EDGES

An Adjustable Guide on the front of the saw shoe has two guide edges (Figure 7) — one for vertical cutting, and one for 45°bevel cutting. These edges enable you to guide the saw along penciled lines, and the edges line up with the left (inner) side of the saw blade. This makes the slot or "kerf" cut by the moving blade fall to the right of the guide mark.

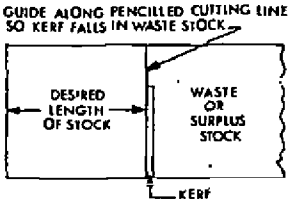


FIGURE 6

Guide along the penciled cutting line so that the kerf falls into the waste or surplus material — See Figure 6.

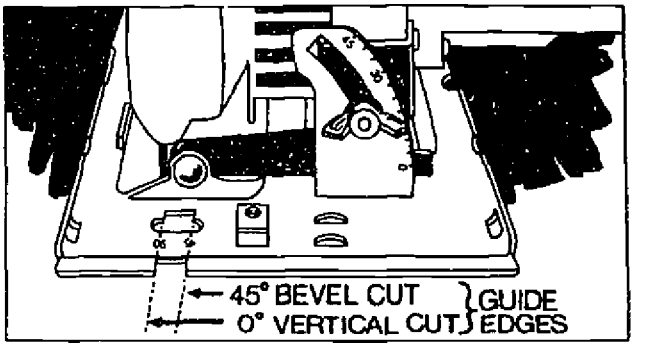
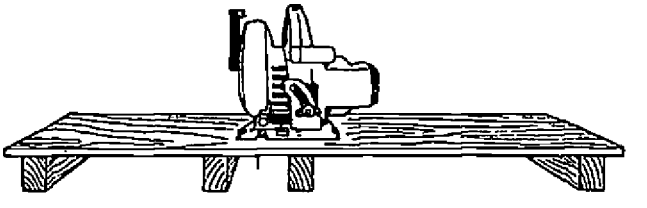


FIGURE 7

FIGURE 8

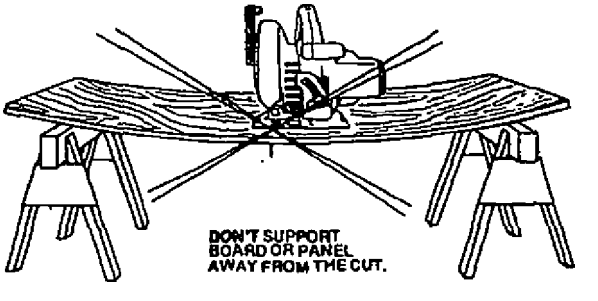
OPERATION

Figure 8 shows proper sawing position. Note that hands are kept away from cutting area, safety glasses are worn, power cord is kept clear of cutting area, and that clothing is not loose to the point where it might get caught in moving parts.



TO AVOID KICKBACK, DO SUPPORT BOARD OR PANEL NEAR THE CUT.

FIGURE 9



OPERATION

ALWAYS DISCONNECT SAW BEFORE MAKING ANY ADJUSTMENTS! Place the work with its "good" side—the one on which appearance is most important—down. The saw cuts upward, so any splintering will be on the work face that is up when you saw it.

Support the work so that the cut will be on your right. Place the wider portion of the saw shoe on that part of the work piece which is solidly supported, not on the section that will fall off when the cut is made. As examples, Figure 10 illustrates the RIGHT way to cut off the end of a board, and Figure 11 the WRONG way. If the work is short or small, clamp it down. Don't try to hold short pieces by hand!

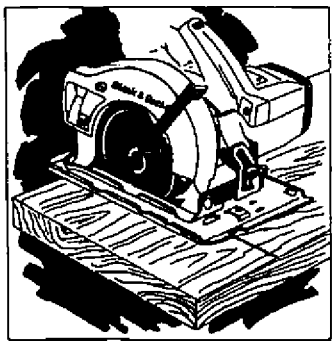


FIG. 10 — RIGHT

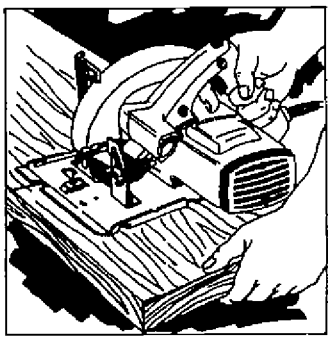


FIG. 11 — WRONG

Draw the required guide lines. Then rest the front of the saw shoe on the work with the guide edge lined up with the drawn guide line. Before starting the motor, push the blade lightly against the edge of the work and then back it off about 1/4". Now, start the motor, and when the blade gains full speed, push the saw forward and begin sawing. As you begin cutting, the lower blade guard will automatically begin to telescope into the upper blade guard. This telescoping action will continue as you advance the saw until it reaches the position in Figure 10.

Push the saw forward at a speed which allows the blade to cut without laboring. Hardness and toughness can vary even in the same piece of material, and a knotty or damp section can put a heavy load on the saw. When this happens, push the saw more slowly, but hard enough to keep it working without much decrease in speed. Forcing it beyond this makes for rough cuts, inaccuracy and overheating of the motor.

Should your cut begin to go off the line, don't try to force the saw back on. Release trigger and allow blade to come to a complete stop. Then you can withdraw the saw, sight anew, and start a new cut a trifle inside the wrong one. In any event, withdraw the saw if you must shift the cut. Forcing a correction inside the cut can stall the saw and perhaps spoil the work. **IF SAW STALLS, RELEASE THE TRIGGER, BACK THE SAW UNTIL IT IS LOOSE. BE SURE BLADE IS STRAIGHT IN THE CUT BEFORE RESTARTING.**

As you finish a cut, release the trigger and allow the blade to stop before lifting the saw from the work. As you lift the saw the spring-tensioned telescoping guard will automatically close under the saw. Remember the blade is exposed until this occurs; **never reach under the work for any reason whatsoever.** When you have to retract the telescoping guard manually (as is necessary for starting pocket cuts) always use the retracting lever.

POCKET CUTTING

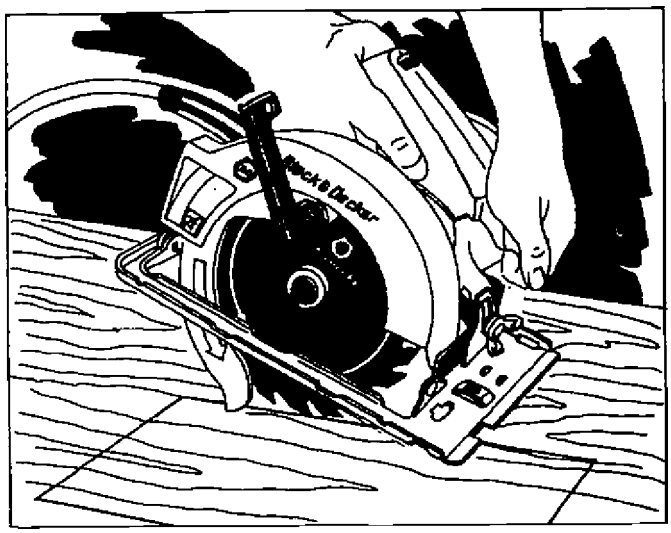


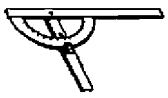
FIGURE 12

DISCONNECT SAW FROM POWER SUPPLY BEFORE MAKING CUTTING DEPTH ADJUSTMENT! Adjust saw shoe so blade cuts at desired depth. Tilt saw forward and rest front of shoe on material to be cut. Using the retracting lever, retract blade guard to an upward position. Lower rear of shoe until blade teeth almost touch cutting line. Now release the blade guard and its contact with the work will keep it in position to open freely as you start the cut (Figure 12). Start the motor and gradually lower the saw until its shoe rests flat on the material to be cut. Advance saw along cutting line until cut is completed. Release trigger and allow blade to stop completely before withdrawing the blade from the material. When starting each new cut, repeat as above. **Never tie the blade guard in a raised position.**

ACCESSORIES

The accessories listed in this manual are available at extra cost from your local dealer, Black & Decker Service Center, or by writing to: Customer Services, Black & Decker (U.S.) Inc., Towson, Maryland 21204

A. **73-501 RIP FENCE...** Attaches to top of Saw shoe. Permits rip cuts without pencilled guide lines.



B. **U1812 SAW PROTRACTOR...** Guides Saw for accurate cut-off work. Adjusts from 0° to 70°.

C. **U1918 ADJUSTABLE CUT-OFF GUIDE** Adjusts to any angle from 0° to 45°. Use as a handy square, or for transferring inside corner angles to the board being cut.

D. **U2106 SAFETY GLASSES...** Lightweight, one-piece, impact resistant, clear plastic safety glasses with side shields. Can be worn directly over eyes or over prescription glasses. Comfortable.

73-510 SAW CARRYING CASE... Protect your saw, keep saw accessories and extra blades handy on the job.

CAUTION: Recommended accessories and saw blades for your Saw are listed above and on the next page of this manual. The use of any other type of blade or accessory might be hazardous.

LEHMAN 00418

BLACK & DECKER CIRCULAR SAW BLADES

A dull blade will cause slow, inefficient cutting and an overload on the saw motor. It is a good practice to keep extra blades on hand so that sharp blades are available while the dull ones are being sharpened (See "SAWS — SHARPENING" in Yellow Pages). In fact, many lower priced blades can be replaced with new ones at very little cost over the sharpening price. USE ONLY 7¼", 7⅛" or 7" BLADES, WITH ⅝" ARBOR HOLE, ON YOUR SAW.

Hardened gum on the blade will slow down the cutting. This gum can best be removed with trichlorethylene, kerosene or turpentine. Remove blade before cleaning to prevent solvent from damaging plastic parts of saw. Black & Decker manufactures a complete line of saw blades and the following types are available.

Standard: Outstanding value for the price.

Teflon-S*: Teflon coated blades stay sharp longer, resist rust, and cut easier in resinous, wet, or green woods such as plywood, paneling, uncured, and/or pitchfilled woods.

Premium: Industrial chrome plating gives twice the cutting life of unplated blades.

PART NUMBERS AND SIZES

TYPE OF BLADE	TOOTH SHAPE	STANDARD	TEFLON-S*	PREMIUM
COMBINATION Chisel tooth configuration means this blade is the fastest cutting blade in our line. Specifically designed for general-purpose ripping and cross-cutting where the finish of the cut is not critical.		73-307 (7") 73-007 (7¼")	73-407 (7") 73-207 (7¼")	73-417 (7") 73-107 (7¼")
MASTER COMBINATION General-purpose blade designed for ripping, cutting off and mitering wood where a fine, smooth cut is needed. No sanding is necessary.		73-357 (7")		
FRAMING/RIP An all-purpose blade for smooth, fast cutting in any direction. Rips, crosscuts, miters, etc. Gives especially fast, smooth finishes when cutting with the grain of both soft and hard woods.		73-037 (7¼")		73-137 (7¼")
METAL CUTTING Teeth shaped and set specifically for cutting aluminum, cooper, lead and other soft metals.				73-487 (7") 73-187 (7¼")
HOLLOW GROUND PLANER Specially ground for satin-smooth finish cuts (cross-cuts, rips and miters) in all solid woods. A professional quality blade for use in cabinet work, furniture, etc. Specifically designed to make extremely smooth cuts in wood.				73-457 (7") 73-157 (7¼")
CARBIDE TIPPED (8 tooth) Specially designed for cutting tough-to-cut materials such as: Transite, Cemesto board, asbestos, Formica and Masonite. Will also cut wood where speed and finish are not critical.				73-477 (7") 73-177 (7¼")
CARBIDE TIPPED (20 tooth) Chisel tooth combination blade for fast general-purpose cutting in all types of woods. Tips are of tungsten carbide material which outlasts regular steel blades up to 10 to 1. Teeth are accurately set for ease of cutting.				73-247 (7¼")
FLOORING For use where nails or other metal objects may be encountered, such as cutting reclaimed lumber, flooring, opening crates. Allows crosscuts as well as miters.				73-467 (7") 73-167 (7¼")
HOLLOW GROUND PLYWOOD Special taper grinding on the sides of this thin-rim blade gives an absolutely smooth cut in plywood, veneers and laminates, etc. Can be used in crosscutting and mitering for a professional finish on all types of cabinet work.		73-347 (7") 73-047 (7¼")	73-437 (7") 73-227 (7¼")	73-447 (7") 73-147 (7¼")
STEEL CUTTING FRICTION Designed for cutting corrugated or sheet roofing, black iron, furnace pipe or thin bar stock. Cuts faster with less filings than abrasive blades. Cuts by friction action.				73-197 (7⅛")
CROSS-CUT Specifically designed for smooth, fast cutting cross the grain of both hard and soft woods where finish is an important factor. May also be used for rip and crosscuts on extremely hard woods.		73-327 (7") 73-027 (7¼")		73-427 (7") 73-127 (7¼")

* Reg. U.S. Pat. Off. for DuPont's stratified non-stick self-lubricating finish.

FHMAN 00419

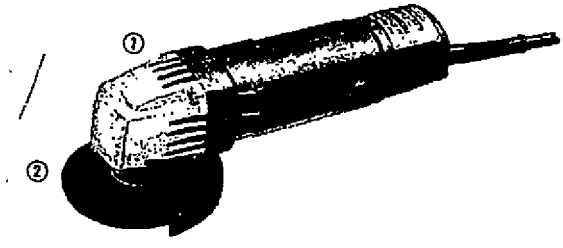
Makita

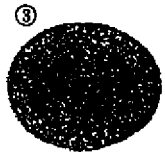
100mm (4") Sander-Grinder

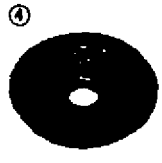
9501B

INSTRUCTION MANUAL

Sander·Grinder & Standard Equipment







① Tool body
② Depressed center wheel
③ Abrasive disc
④ Rubber pad
⑤ Lock nut (For abrasive disc)
⑥ Lock nut wrench
⑦ Spanner wrench

DOUBLE INSULATION

SPECIFICATIONS

MODEL NO.	Continuous rating		No load speed	Overall length	Net weight	Power supply cord	Spindle thread
	Input	Output					
9501B	385 W	210 W	10,000 R/min.	260 mm (10-1/4")	1.8 kg (4 lbs)	2.5 m (8.2 ft.)	M10 x 1.25

* Manufacturer reserves the right to change specifications of parts and accessories without notice.
* Note: Specifications of parts and accessories may vary from country to country.

LEHMAN 00420

BEFORE CONNECTING YOUR TOOL TO A POWER SOURCE

Be sure you have read all GENERAL POWER TOOL SAFETY RULES

GENERAL SAFETY PRECAUTIONS

1. KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.
2. AVOIO OANGEROUS ENVIRONMENT. Oon't use power tools in damp or wet locations. Keep work area well lit. Oo not expose power tool in rain.
3. KEEP CHILDREN AWAY. All visitors should be kept safe distance from work area.
4. STORE IOLE TOOLS. When not in use, tools should be stored in dry, high or locked-up place—out of the reach of children.
5. DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was designed.
6. USE RIGHT TOOL. Oon't force small tool or attachment to do the job of a heavy-duty tool.
7. WEAR PROPER APPAREL. No loose clothing or jewelry to get caught in moving parts. Rubber gloves and footwear are recommended when working outdoors.
8. USE SAFETY GLASSES. Use safety glasses with most tools. Also face or dust mask if cutting operation is dusty.
9. DON'T ABUSE CORD. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges.
10. SECURE WORK. Use clamps or vise to hold work. It's safer than using your hand and it frees both hands to operate tool.
11. OON'T OVERREACH. Keep proper footing and balance at all times.
12. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
13. DISCONNECT TOOLS. When not in use; before servicing; when changing discs.
14. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that adjusting wrenches are removed from tool before turning it on.
15. AVOID ACCIDENTAL STARTING. Don't carry plugged-in tool with finger on switch. Be sure switch is OFF when plugging in.
16. OUTDOOR USE EXTENSION CORDS. When tool is used outdoors, use only extension cords suitable for use outdoors and so marked.
17. Keep Guards in Place.
18. Use Only Grinding Wheels with "Safe Speed" at least as high as "Minimum Recommended RPM" marked on the caution label.
19. REPLACEMENT PARTS. When servicing use only identical replacement parts.

I FHMAN 00421

PRELIMINARY INSTRUCTIONS

Your electric tool is precision built and manufactured to satisfy the highest standards. For maximum performance, long tool life, and your safety, follow these instructions carefully.

VOLTAGE WARNING : Before connecting the tool to a power source (receptacle, outlet, etc.) be sure the voltage supplied is the same as that specified on the nameplate of the tool. A power source with voltage greater than that specified for the tool can result in SERIOUS INJURY to the user — as well as damage to the tool. If in doubt, DO NOT PLUG IN THE TOOL. Using a power source with voltage *less than the nameplate rating is harmful* to the motor.

HOW TO USE

- Switch action

  There is a slide switch on the motor housing. Slide the button in the ON(I) or OFF(O) direction as desired.

- Installing the depressed center wheel

  Unplug the tool from the power source and perform the following steps:

  1. Mount the depressed center wheel flange onto the spindle. (Fig. 1)
  2. Fit the depressed center wheel on over the flange. (Fig. 1)
  3. Screw the wheel lock nut onto the spindle. (Fig. 1)

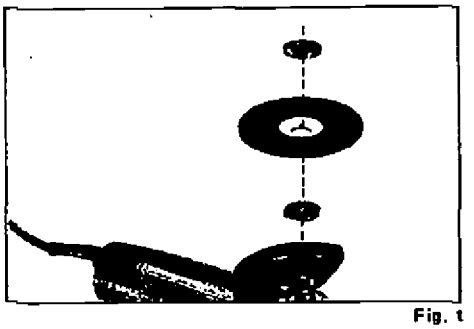


Fig. 1

  4. To tighten the wheel lock nut, grip the spindle (shaft) with the spanner so that it cannot revolve, then use the lock nut wrench and tighten firmly in clockwise direction. (Fig. 2)

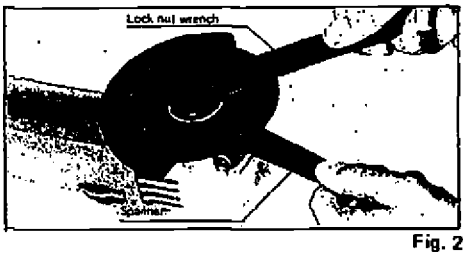


Fig. 2

- In general, keep the edge of the depressed center wheel at an angle of about 15° in relation to the workpiece surface. (Fig. 3)
- Using the disc grinder in A direction causes wear on a new wheel. Draw the tool in B direction. Either way is all right after the wheel is broken in. (Fig. 3)

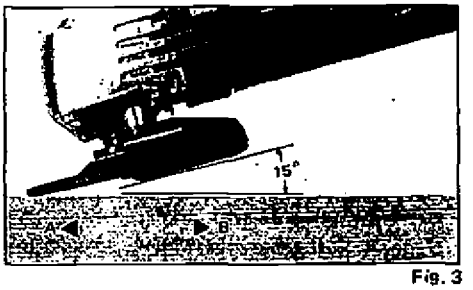


Fig. 3

I FHMAN 00422

- Check for loose or missing screws and cracks in the depressed center wheel.
- Always use the depressed center wheel safety cover (guard). It can prevent an accident if a wheel should ever break.
- Choose a wheel grit in terms of the workpiece material.
- Before using the disc grinder on an actual workpiece let it simply run for several minutes first. Watch for flutter that might be caused by poor installation or a poorly balanced wheel.
- Bring the depressed center wheel into gentle contact with the work surface. Do not bear down as this will slow the wheel revolution, make for a poor finish, and the load on the motor will cause undue wear.

- Installing the abrasive disc

1. For disc sanding, assemble tool as seen at right. (Remove the wheel cover on tool.)

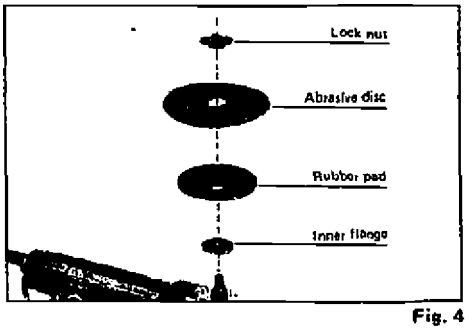


Fig. 4

2. When installing the abrasive disc, grip the spindle (shaft) with the spanner, put on the rubber pad, the abrasive disc and lock nut, then tighten the lock nut to the right (clockwise).

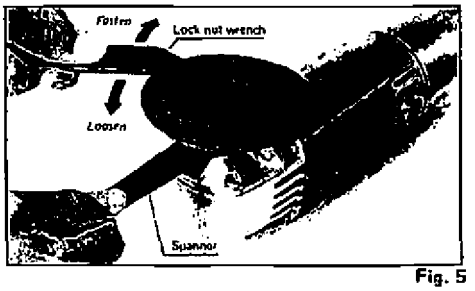


Fig. 5

- In general, keep the edge of the abrasive disc at an angle of about 10° – 15° in relation to the workpiece surface.
- Choose a abrasvie disc with the right grit (grade) for the right job.

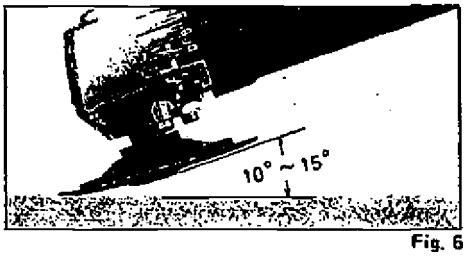


Fig. 6

- Use with optional grip

Remove the wheel cover (guard), fit the grip onto the gear housing and fasten together with the wheel cover.

I FHMAN 00423

MAINTENANCE

- **Carbon brushes**

  Replace carbon brushes when they wear down to about 3 mm (1/8") or sparking will occur.

  Both brushes should be changed at the same time.

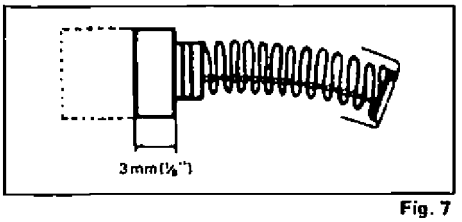
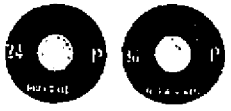


Fig. 7

ACCESSORIES

CAUTION: The use of any other accessories not specified in this manual might be hazardous.

- **Depressed center wheels**



Part No.	Size (mm)	Grit	Wheels per pkg
741402-8	100 (4") x 4 (5/32") x 16 (5/8")	24	5
741405-2		36	

- **Lock nut (Part No. 224503-2)**
  (For depressed center wheel & abrasive cut-off wheel)

- **Inner flange (Part No. 224030-9)**
  (For depressed center wheel)

- **Wire cup brushes**

Part No.	Diameter (mm)	Thread
743201-4	75 (3")	M10 x 1.25

- **Wire bevel brushes**

Part No.	Diameter (mm)	Thread
743203-0	85 (3-3/8")	M10 x 1.25

- **Abrasive discs**

100 mm (4") diameter

Part No.	Grit	Discs per pkg	Part No.	Grit	Discs per pkg
742036-0	24	10	742039-4	80	10
742037-8	30		742040-9	120	
742038-6	50				

- **Rubber pad**
  Part No. 743009-6

- **Lock nut (For abrasive disc)**
  Part No. 224501-6

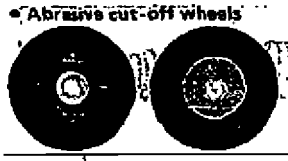
- **Grip holder set**
  Part No. 191081-6

- **Lock nut wrench**
  Part No. 782401-1

- **Spanner wrench**
  Part No. 781007-2

1 FHMAN 00424

- **Abrasive cut-off wheels**



Part No.	Size (mm)	Grit	Wheels per pkg
724104-1	100 (4") x 2.5 (3/32") x 16 (5/8")	C36	50
724107-5	100 (4") x 2 (1/16") x 16 (5/8")	A36	

- **Wheel cover**
  Part No. 343108-0

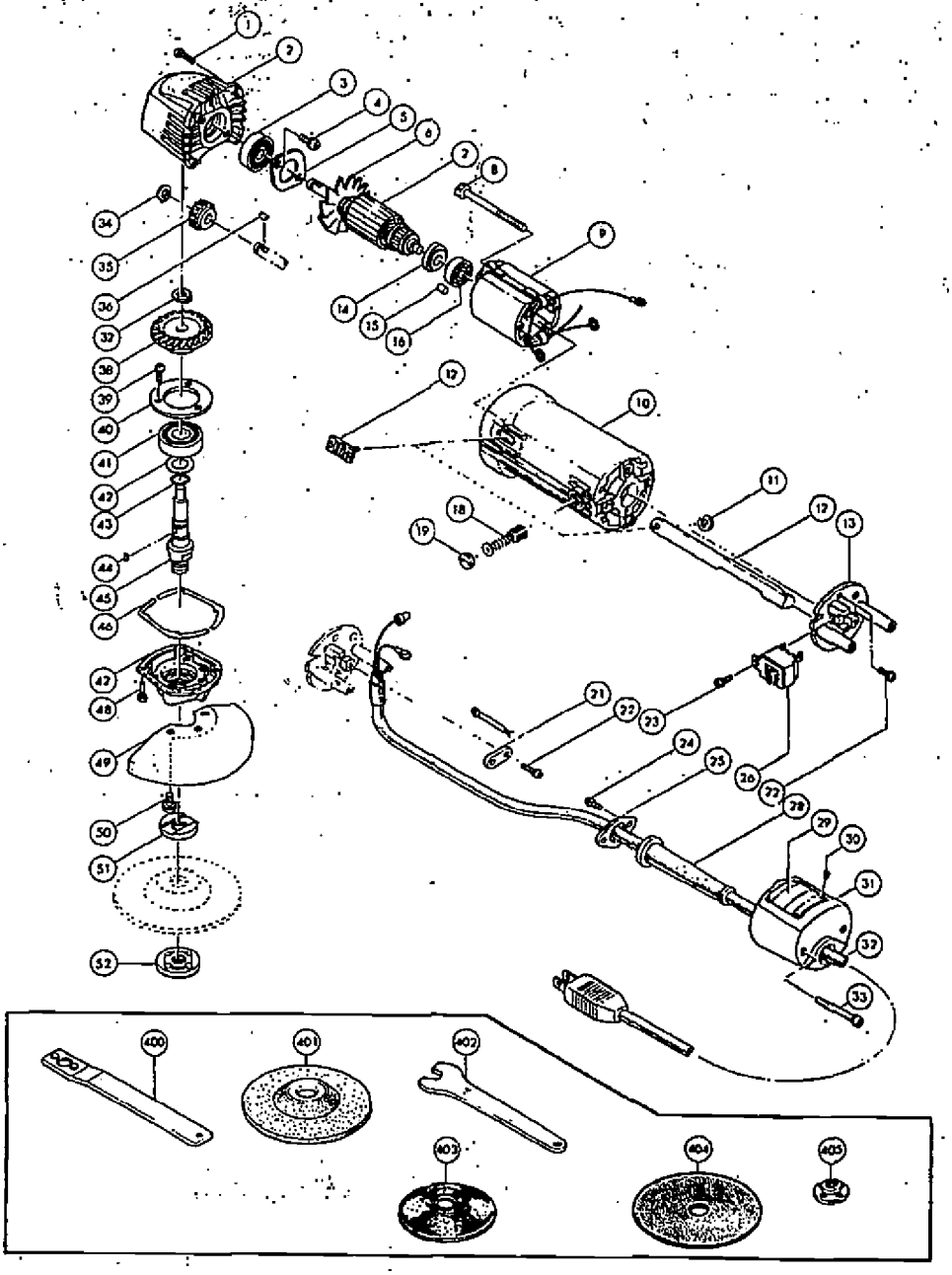
Always use with the depressed center wheel & abrasive cut-off wheel.

- **Inner flange** Part No. 224046-4
  (For abrasive cut-off wheel)

Fit this flange over one for depressed center wheel.

I FHMAN 00425

9501B
100mm(4") SANDER-GRINDER



LEHMAN 00426

ITEM NO.	PART NO.	NO. USED	DESCRIPTION
MACHINE			
1	911136-9	4	P. H. Screw M4x20 (With Washer)
2	156050-4	1	Gear Housing (With Plane Bearing 6 212006-4)
3	211063-3	1	Ball Bearing 6000LB
4	911216-1	2	P. H. Screw M5x14 (With Washer)
5	285604-1	1	Bearing Retainer 35
6	241068-9	1	Fan 60
7	511252-3	1	ARMATURE ASSEMBLY (Assembled Items 6, 7, 14 & 15)
8	925198-2	2	H. Bolt M4x20 (With Washer)
9	521092-1	1	FIELD ASSEMBLY (With Gasket Spring 6540x8-9 x 2)
10	156096-0	1	Motor Housing (With Brush Holder 643557-4 x 2)
11	257903-1	1	Stop Ring E-2.3
12	411491-4	1	Switch Rod
			For Dead-man Switch (AC/DC Type)
13	411a96-6	1	Switch Holder
			For Dead-man Switch (AC/DC Type)
14	681614-0	1	Insulation Washer
15	211028-5	1	Ball Bearing 627LB
16	263002-9	1	Retainer Pin 4
17	411492-2	1	Switch Lever
			For Dead-man Switch (AC/DC Type)
18	643052-4	2	Carbon Brush CB-52 100 V. – 250 V.
19	643550-8	2	Brush Holder Cap
21	687002-9	1	Strain Relief
			UL & CSA Listed (SJ Type), Orska, SEV Listed & SPanish Type Cord
22	911121-2	2	P. H. Screw M4x14 (With Washer)
23	911006-2	1	P. H. Screw M3x8 (With Washer)
24	911106-8	2	P. H. Screw M4x8 (With Washer)
25	687637-6	1	Set Plate
26	651460-5	1	Switch
			Double Pole (For Dead-man AC/DC Type)
27	911133-5	2	P. H. Screw M4x18 (With Washer)
28	682504-0	1	Cord Guard
			For Black-White, Blue-Brown, UL & CSA Listed (SJT & SJ Type) & Orska Cord

ITEM NO.	PART NO.	NO. USED	DESCRIPTION
MACHINE			
29	811817-4	1	Name Plate
30	953106-2	4	Rivet 0-5
31	411218-2	1	Rear Cover
32	664013-1	1	CORD ASSEMBLY (Assembled Cord & Plug)
			UL & CSA Listed (SJT Type With Plug)
33	911188-0	2	P. H. Screw M4x60
34	961004-6	1	Retaining Ring S-8
35	221229-7	1	Spiral Bevel Gear 15
36	254002-0	1	Woodruff Key 3
37	961006-2	1	Retaining Ring S-10
38	221232-8	1	Spiral Bevel Gear 35
39	911121-2	3	P. H. Screw M4x14 (With Washer)
40	285616-4	1	Bearing Retainer 40
41	211106-1	1	Ball Bearing 6201LLB
42	253055-6	1	F. Washer 12
43	213255-0	1	O Ring 18
44	254002-0	1	Woodruff Key 3
45	325329-6	1	Spindle
46	341262-4	A.R.	Shim
47	911121-2	4	P. H. Screw M4x14 (With Washer)
48	312629-3	1	Bearing Box
49	343108-0	1	Wheel Cover
50	911221-8	3	P. H. Screw M5x16 (With Washer)
51	224030-9	1	Inner Flange 30
52	224503-2	1	Wheel Lock Nut 10-30
ACCESSORIES			
400	782401-1	1	Lock Nut Wrench 20
401	741436-1	1	Depressed Center Wheel 100-24
402	781007-2	1	Spanner 14
403	743009-6	1	Rubber Pad
404	742039-4	1	Abrasive Disc 100-80
405	224501-5	1	Sanding Disc Lock Nut 10-30

Makita Electric Works, Ltd.

Anjo, Aichi, Japan

PRINTED IN JAPAN

1979 11 10000EU

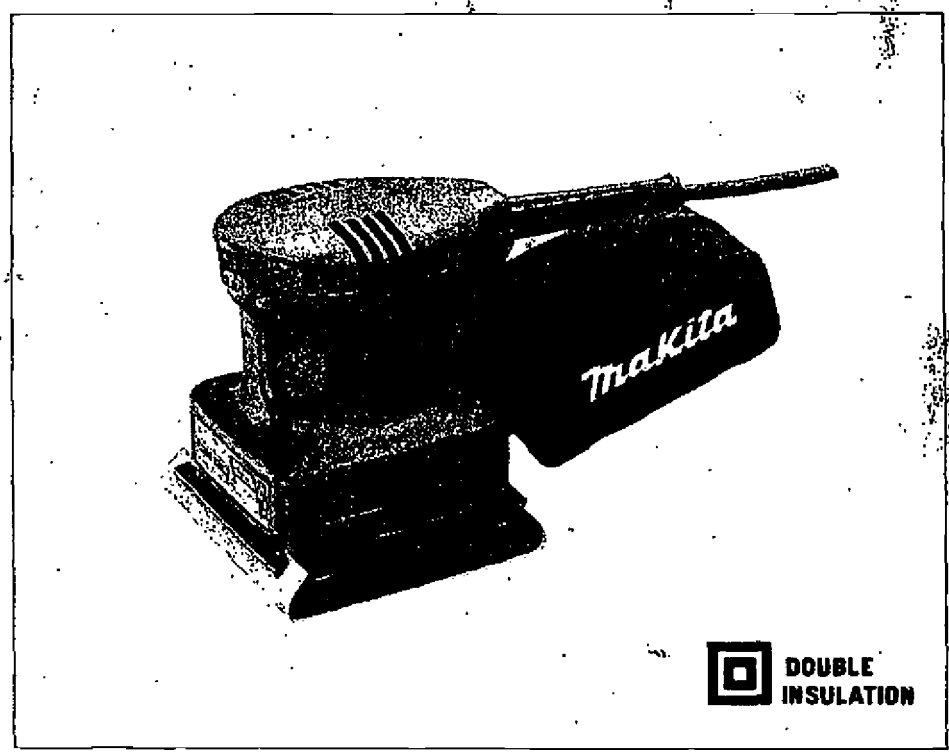
I FHMAN 00427

Makita

Finishing Sander

MODEL BO4550
MODEL BO4550Z
Without dust bag and punch plate

INSTRUCTION MANUAL



SPECIFICATIONS

Pad size	No load speed (OPM)	Dimensions (L x W x H)	Net weight
112 mm x 100 mm (4-3/8" x 4")	14,000	115 mm x 112 mm x 130 mm (4-1/2" x 4-3/8" x 5-1/8")	0.95 kg (2.1 lbs)

- Manufacturer reserves the right to change specifications without notice.
- Note: Specifications may differ from country to country.

LEHMAN 00428

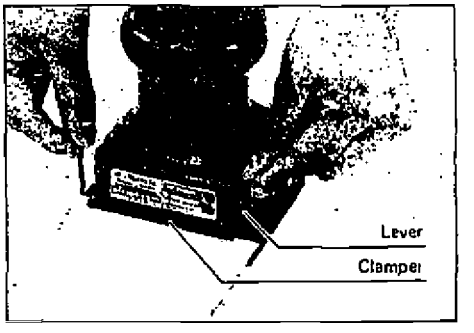
Attaching abrasive paper

CAUTION:

Always be sure that the tool is switched off and unplugged before installing or removing the paper.

Raise the lever. Insert the paper end into the clamper, aligning the paper edges even and parallel with the sides of the base. (Prebending the paper makes attachment easier.) Once the paper is in place, return the lever to its original position.

Repeat the same process for the other end of the base, maintaining the proper paper tension.



CAUTION:

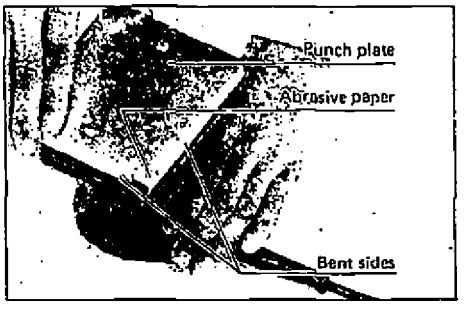
After inserting the paper, make sure the teeth of the clamper hold it securely. Otherwise the paper will be loose and subject to slippage, resulting in uneven sanding operation.

Punch plate

(standard equipment for Model BO4550 optional accessory for Model BO4550Z)

When using the dust bag, make holes in the paper using the punch plate as follows:

Hold the tool with the paper surface facing up. Place the punch plate over the paper so that the bent sides of the punch plate are flush with the paper edges. Then press the punch plate to make holes in the paper.



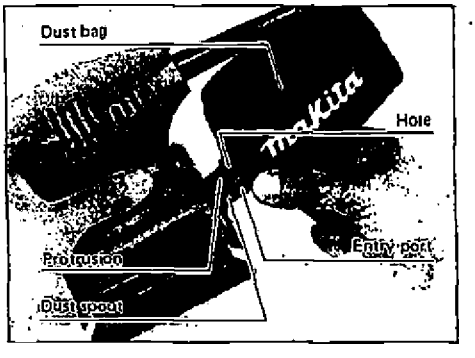
Dust bag

(standard equipment for Model BO4550 optional accessory for Model BO4550Z)

The use of the dust bag makes sanding operations clean and dust collection easy.

To attach the dust bag, fit the bag's entry port onto the dust spout on the tool so that the hole in the entry port is just over the protrusion on the dust spout.

For the best results, empty the dust bag when it becomes about half full, tapping it lightly to remove as much dust as possible.



LEHMAN 00429

Stamp

Makita U.S.A., Inc.

14930-C Northam Street
La Mirada, CA 90638-5753

MAIL THIS PORTION TO MAKITA POWER TOOLS

Makita
IT'S ALL THE POWER YOU NEED™

Your answers to the following questions are appreciated.

1. This product was purchased from:
   - ☐ Home Center
   - ☐ Industrial Supply
   - ☐ Hardware/Lumber Store
   - ☐ Construction Supply
   - ☐ Tool Distributor
   - ☐ Other ( )

2. Use of the product is intended for:
   - ☐ Construction Trade
   - ☐ Hobby
   - ☐ Industrial Maintenance
   - ☐ Other ( )
   - ☐ Home Maintenance

3. How did you first learn of Makita Power Tools:
   - ☐ Magazine
   - ☐ Radio
   - ☐ From Dealer
   - ☐ Exhibition
   - ☐ Newspaper
   - ☐ From Friend
   - ☐ Store Display
   - ☐ Other ( )
   - ☐ Catalog

4. Most favored points are:
   - ☐ Design
   - ☐ Repair Service
   - ☐ Features
   - ☐ Durability
   - ☐ Size
   - ☐ Power
   - ☐ Price
   - ☐ Other ( )
   - ☐ Makita Brand

Month Day Year 19
Date Purchased

Model No.

Serial No.

Init. Last Name

Single Married M F

Street Address

City State Zip Code

Age: ☐ Under 19 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ Over 50

5. Any comments: _____

3/88 **BE SURE TO COMPLETE THE CUSTOMER'S PORTION OF THIS FORM AND RETAIN FOR YOUR RECORDS.**

LEHMAN 00431

FACTORY SERVICE CENTERS

ALASKA
1200 E. 78th St., Ste. 1201
Anchorage, AK 99518
(907) 344-4599

ARIZONA
3707 E. Broadway, Ste. 6
Phoenix, AZ 85040
(602) 437-2850

CALIFORNIA
14930-B Northern St.
La Mirada, CA 90638-5753
(714) 522-8088

44388 Old Warm Springs Blvd.
Fremont, CA 94538
(415) 657-9881

1401 N. Clovis Ave., Ste. 110
Fresno, CA 93727
(209) 252-5186

130A Hamilton Dr.
Novato, CA 94949
(415) 883-5949

271 Opportunity St., Ste. A
Sacramento, CA 95838
(916) 648-1444

392 S. Arrowhead, #A-1
San Bernardino, CA 92408
(714) 885-1289

7674 Clairemont Mesa Blvd.
San Diego, CA 92111
(619) 278-4471

2230 Palou Ave.
San Francisco, CA 94124
(415) 696-2700

15722-B Tustin Village Way
Tustin, CA 92680
(714) 667-5066

16735 Saticoy St., Ste. 105
Van Nuys, CA 91406
(818) 782-2440

COLORADO
11839 E. 51st Ave.
Denver, CO 80239
(303) 371-2850

FLORIDA
5815 N. Andrews Way, #1088
Fort Lauderdale, FL 33309
(305) 492-1144

5425 Beaumont Ctr. Blvd. #902
Tampa, FL 33634
(813) 886-8292

1717 Fairbanks Ave.
Winter Park, FL 32789
(305) 629-1477

GEORGIA
2861-G Bankers Industrial Dr.
Atlanta, GA 30360
(404) 447-6192

3007 Riverdale Ct.
Atlanta, GA 30337
(404) 997-6654

HAWAII
1111 Dillingham Blvd.
Unit E-1B
Honolulu, HI 96817
(808) 847-6565

ILLINOIS
1450 Fashanville Dr.
Mt. Prospect, IL 60056
(312) 297-3100

INDIANA
6330 E. 75th St., Ste. 154
Indianapolis, IN 46250
(317) 842-3286

LOUISIANA
1508 Edwards Ave., Ste. DD
Harahan, LA 70123
(504) 733-4138

MARYLAND
8813 Annapolis Rd.
Lanham, MD 20706
(301) 577-7757

MASSACHUSETTS
51 Morgan Dr.
Norwood, MA 02728
(617) 769-9044

MICHIGAN
10021 Telegraph Rd.
Redford, MI 48239
(313) 535-0020

RETAIN THIS PORTION FOR YOUR RECORDS

MINNESOTA
6427 Penn Ave., South
Richfield, MN 55423
(612) 869-5199

MISSOURI
121 E. Tenth St.
North Kansas City, MO 64116
(816) 421-1605

8000 Watson Rd.
Crestwood, MO 63126
(314) 843-5775

NEW JERSEY
251 Herbod Blvd.
S. Brunswick Ind. Park
Dayton, NJ 08810
(609) 655-1212

NEW MEXICO
3351 Candelaria N.E.
Albuquerque, NM 87107
(505) 881-4619

NEW YORK
3637 Union Rd.
Cheektowaga, NY 14225
(716) 681-5706

NORTH CAROLINA
3501-G So. Tryon St.
Charlotte, NC 28217
(704) 527-0811

OHIO
6379 Pearl Rd.
Parma Heights, OH 44130
(216) 843-7565

2300 E. Kemper Rd., Ste. 11
Sharonville, OH 45241
(513) 771-0788

887 S. Hamilton Rd.
Whitehall, OH 43213
(614) 237-8871

OKLAHOMA
2122 W. Reno
Oklahoma City, OK 73107
(405) 232-6110

OREGON
828 N.W. 18th Ave.
Portland, OR 97209
(503) 222-1823

PENNSYLVANIA
384 Wilmington West
Chester Pike Springwater Plaza
Glen Mills, PA 19342
(715) 459-4122

7513 McKnight Rd.
Pittsburgh, PA 15237
(412) 366-6363

TENNESSEE
800 Third Ave., South
Nashville, TN 37210
(615) 242-2327

TEXAS
1611 N. I-35, Ste. 112
Carrollton, TX 75006
(214) 242-1226

10775 Kempwood Dr., Ste. 4
Houston, TX 77043
(713) 690-6800

5608 Randolph Blvd.
San Antonio, TX 78233
(512) 650-6733

UTAH
387 W. Lawndale Dr.
2500 South
Salt Lake City, UT 84115
(801) 487-1285

VIRGINIA
3807 Gaskins Rd.
Richmond, VA 23233
(804) 346-4805

WASHINGTON
22653 83rd Ave., South
Kent, WA 98032
(206) 395-8056

WISCONSIN
2246 S. 108th St.
Lincoln Plaza Shopping Ctr.
West Allis, WI 53227
(414) 541-4776

CUSTOMER'S RECORD

When you need service: Send complete tool (prepaid) to one of the Makita Factory Service Centers listed or to an Authorized Makita Service Center. Be sure to attach a letter to the outside of the carton detailing the problem with your tool.

DATE PURCHASED:
DEALER'S NAME & ADDRESS
MODEL NO.
SERIAL NO.

MAKITA LIMITED ONE YEAR WARRANTY

Warranty Policy

Every Makita tool is thoroughly inspected and tested before leaving the factory. It is warranted to be free of defects from workmanship and materials for the period of ONE YEAR from the date of original purchase. Should any trouble develop during this one-year period, return the COMPLETE tool, freight prepaid, to one of Makita's Factory or Authorized Service Centers. If inspection shows the trouble is caused by defective workmanship or material, Makita will repair (or, at our option, replace) without charge.

This Warranty does not apply where:

- repairs have been made or attempted by others
- repairs are required because of normal wear and tear
- the tool has been abused, misused or improperly maintained
- alterations have been made to the tool

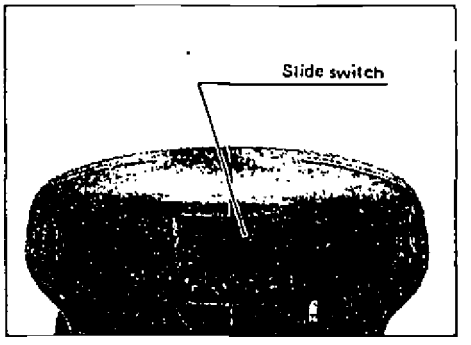
In no event shall Makita be liable for any indirect, incidental or consequential damages from the sale or use of the product. This disclaimer applies both during and after the term of warranty.

Makita disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose", after the one-year term of this warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

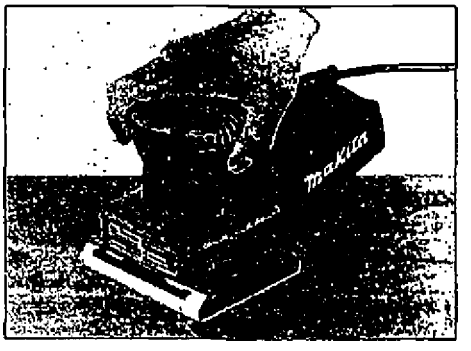
Switch action

To start the tool, move the slide switch to the "ON" position. To stop, move the slide switch to the "OFF" position.



Operation

Hold the tool firmly. Turn the tool on and wait until it attains full speed. Then gently place the tool on the workpiece surface. A finishing sander is generally used to remove only a small amount of material at a time. Since the quality of the surface is more important than the amount of stock removed, do not bear down on the tool. Keep the base flush with the workpiece at all times. Excessive pressure may damage the paper and shorten tool life.



You can put a high polish on furniture or other fine surfaces by using a cloth under the tool.

CAUTION:

- Do not block motor vent with your finger or hand.
- Never run the tool without paper. You may seriously damage the pad.

MAINTENANCE

CAUTION:

Always be sure that the tool is switched off and unplugged before attempting to perform inspection or maintenance.

The tool will stop when the carbon brushes wear to a certain length. When this occurs, both carbon brushes should be replaced.

To maintain product SAFETY and RELIABILITY, repairs, carbon brush inspection and replacement, any other maintenance or adjustment should be performed by Makita Authorized or Factory Service Centers, always using Makita replacement parts.

LFHMAN 00434

ACCESSORIES

CAUTION:

These accessories or attachments are recommended for use with your Makita tool specified in this manual. The use of any other accessories or attachments might present a risk of injury to persons. The accessories or attachments should be used only in the proper and intended manner.

Abrasive papers

Grit	Part No.	use	Sheets per pack
60	742509-3	Coarse	10
100	742510-8	Medium	
150	742511-6	Fine	

- **Dust bag**
  Part No. 166027-1

- **Punch plate**
  Part No. 163247-8

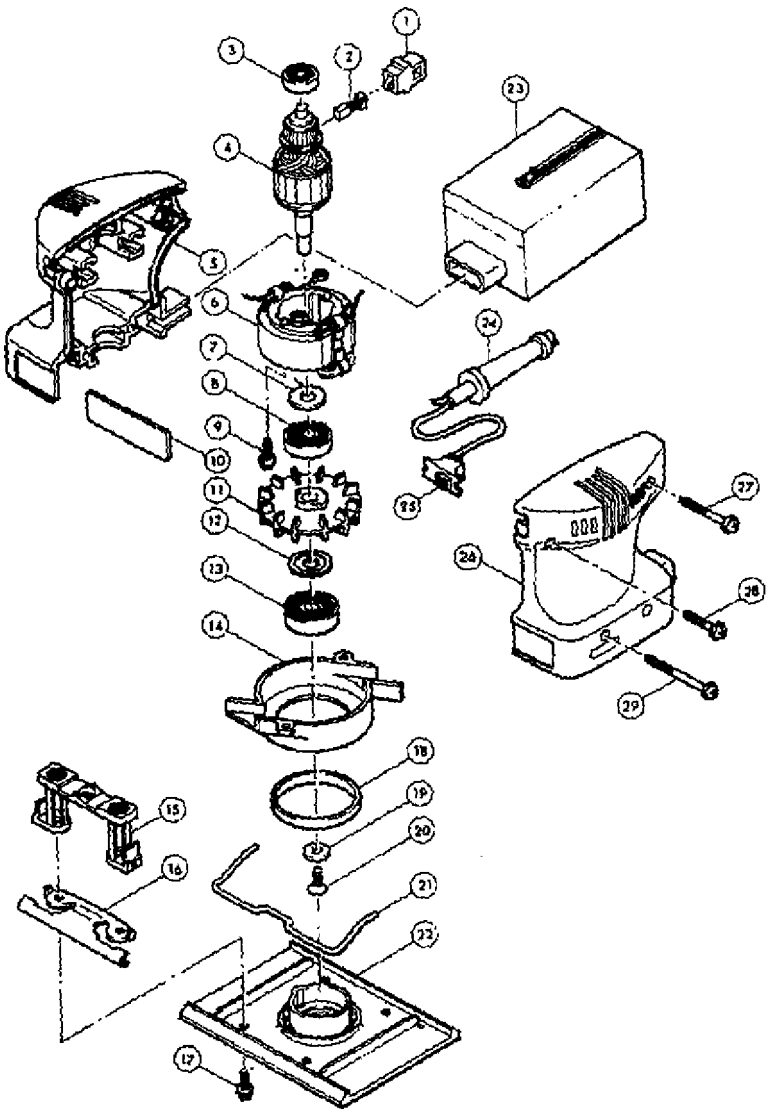
MODEL BO4550

ITEM NO.	NO. USED	DESCRIPTION
MACHINE		
1	2	Bush Holder
2	2	Carbon Brush
3	1	Ball Bearing 626LLB
4	1	ARMATURE ASSEMBLY (With Item 3, 4, 7, & 8)
5	1	Housing Set (With Item 26)
6	1	FIELD ASSEMBLY
7	1	Flat Washer 9
8	1	Hall Bearing 629LLB
9	2	Tapping Screw BT 4x16
10	1	Name Plate
11	1	Fan 63
12	1	Dust Seal 10
13	1	Ball Bearing 6200LLB
14	1	Fan Guide
15	2	Foot
16	2	Clamper
17	4	Pan Head Screw M4x12 (With Washer)
18	1	Rubber Sleeve 48
19	1	Flat Washer 6
20	1	Countersunk Head Screw M4x12
21	2	Lever
22	1	Base
23	1	Dust Bag
24	1	Cord
25	1	Switch
26	1	Housing Set (With Item 5)
27	1	Tapping Screw BT 4x40
28	1	Tapping Screw BT 4x25
29	2	Tapping Screw BT 4x50

LEHMAN 00435

Makita

FINISHING SANDER
Model BO4550
Model BO4550Z



LEHMAN 00436

MAKITA LIMITED ONE YEAR WARRANTY

Warranty Policy

Every Makita tool is thoroughly inspected and tested before leaving the factory. It is warranted to be free of defects from workmanship and materials for the period of ONE YEAR from the date of original purchase. Should any trouble develop during this one-year period, return the COMPLETE tool, freight prepaid, to one of Makita's Factory or Authorized Service Centers. If inspection shows the trouble is caused by defective workmanship or material, Makita will repair (or, at our option, replace) without charge.

This Warranty does not apply where:

- repairs have been made or attempted by others
- repairs are required because of normal wear and tear
- the tool has been abused, misused or improperly maintained
- alterations have been made to the tool

In no event shall Makita be liable for any indirect, incidental or consequential damages from the sale or use of the product. This disclaimer applies both during and after the term of warranty.

Makita disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose", after the one-year term of this warranty.

This Warranty gives you specific legal rights, and you may also have the other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

Makita Corporation of America

Buford, GA

883509-992

PRINTED IN USA
1990-4-C

SPEEDAIRE

ASSEMBLY INSTRUCTIONS & PARTS LIST

AIRLESS PAINT SPRAYER

MODEL 4Z242A

FORM 5S1435 02433

DAYTON ELECTRIC MANUFACTURING CO. CHICAGO 60648

0981/289/2A

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR SERVICE YOUR SPEEDAIRE AIRLESS PAINT SPRAYER! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

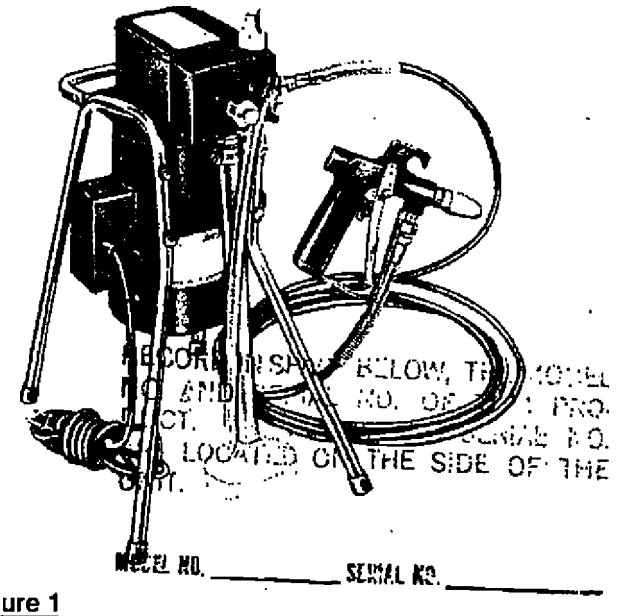


Figure 1

RETAIN THESE NUMBERS FOR FUTURE REFERENCE

Description

The Speedaire airless paint sprayer is designed to operate on 115 A.C. electric power. It utilizes a hydraulic pumping action which builds pressures up to 2500 psi and atomizes the paint to a fine mist. As a result, the large amount of over-spray associated with air spray methods is reduced with the airless sprayer. Sprays latex, enamel, lacquer paints, varnishes & stains.

Specifications

Motor	Totally enclosed fan-cooled 1/3 H.P., 115 Volts, 60 Hz.
Spray rate	1/3 gallon per minute
Tip size	.015 x .050° — 9" spray width
Weight	44 lbs.

Unpacking

After unpacking the unit, inspect carefully for any damage that may have occurred during transit.

IN117800AV

LIMITED WARRANTY

Speedaire airless paint sprayer, Model 4Z242A, is warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use (rental use excluded), for 90 days after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be repaired or replaced at Dayton's option. For warranty claim procedures, see "Prompt Disposition" below. This warranty gives purchasers specific legal rights, and purchasers may also have other rights which vary from state to state.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton, and Dayton's liability in all events is limited to the purchase price paid.

Certain aspects of disclaimers are not applicable to consumer products: e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within warranty. For any product believed to be defective within warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. If product was damaged in transit to you, file claim with carrier.

DAYTON ELECTRIC MFG. CO., 5959 W. HOWARD ST. CHICAGO, ILLINOIS 60648

I FHMAN 00438

General Safety Information

1. Never point gun at anyone or any part of your body. High pressure spray can cause injury by penetrating the skin. If penetration occurs, immediate medical aid must be obtained.
2. This unit is capable of producing 2500 PSI. All components in this system are rated equal to or above this pressure.

   CAUTION: Do not substitute parts having working pressure less than 2500 PSI.
3. Inspect hose before using. Check for worn or damaged areas which could fail during operation of the sprayer.
4. Static electricity sparking can be developed by airless spraying. Make sure the object being sprayed is grounded to prevent static sparks. The unit is grounded through the three wire, three prong grounded supply cord. If an extension cord is used make sure it has three wires and is of the following wire size:

   25' Cord — not less than 16 ga. wire
   50' Cord — not less than 14 ga. wire
   100' Cord — not less than 12 ga. wire
5. Electrical damage or personal injury results from using improperly grounded outlets. Use only a properly grounded outlet that will accept a three pronged plug.
6. Before servicing, cleaning or removing any parts, turn motor switch to off position, retieve pressure by turning combination valve counterclockwise to positive stop and pulling gun trigger.
7. Always keep trigger lock in locked position when gun is not in use.
8. During steps 6 & 7 of servicing and maintenance, ground gun to solvent container to prevent static spark.
9. When spraying a flammable paint keep area well ventilated.
10. Follow all electric & safety codes including the National Electric Code (NEC) and the Occupational Safety & Health Act (OSHA).
11. Wear eye protection when using sprayer.
12. Motor becomes hot during operation. Do not touch when moving sprayer.

Assembly

HOW TO SET UP YOUR NEW PAINT SPRAYER

Read carefully through your owner's manual BEFORE OPERATING your new paint sprayer. It contains many tips and operating features designed to help you get the most from your sprayer.

ASSEMBLE THE LEGS AS FOLLOWS:

1. Lay pump on a bench face down with the large white control knob just off the edge of the bench. Do not remove paper tube from push valves until you are ready to operate unit. This tube will help prevent damage to the push valves during leg assembly. Attach each leg using two 5/16-18 x 1/4" machine screws and special locking nuts as shown in Figure 2.

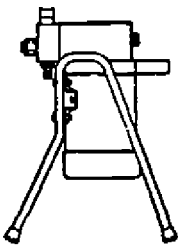


Figure 2

2. Place rubber leg tips on the open ends of the legs.
3. Slip the flexible tubing over each fitting (large and small). Tighten clamp over large tube. SPRAYER WILL NOT PRIME IF CLAMP IS NOT TIGHT! Attach the paint suction head and strainer to the bottom end of the large flex-tube. Figure 3.
4. Connect the adapter and the high pressure airless hose to the side of the lower block. Figure 3. Hose and adapter will leak if not well tightened:

   NOTE: If additional length of hose is used, it should not be longer than 100 feet total.

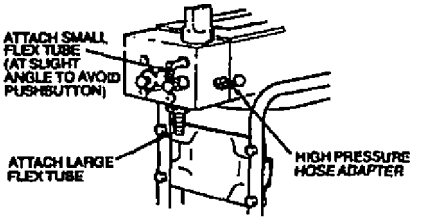


Figure 3

5. Place the spray tip and washer inside of the tip guard and align tip in the slot (Figure 4). Screw this assembly onto the end of the gun. Rotate tip guard to desired position for painting. TIGHTEN securely. Attach filter to gun as shown on page 7. Attach hose to filter and tighten securely.

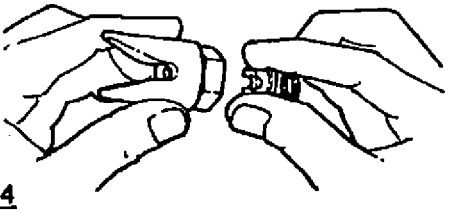


Figure 4

6. Lay the pump down with small white oil filler plug on top and motor in horizontal position. Check the oil level of the pump. The correct level is about one inch from the top of the pump. DO NOT OVERFILL! Use 10W-30 motor oil. (Your sprayer should have the proper amount of oil in the pump when it comes from the factory). Replace the oil filler plug. TIGHTEN.

Operation

NOTE: If an extension cord is necessary the following wire size recommendations must be used:

25' Cord — Not less than 16 ga. wire
50' Cord — Not less than 14 ga. wire
100' Cord — Not less than 12 ga. wire

CAUTION: Improper wire size may cause malfunction of the motor.

1. Strain the paint.

I FHMAN 00439

Operation (con't.)

IMPORTANT: Do not use lumpy or dirty paint. It will clog the spray tip and the line filter. Follow paint manufacturer's directions and thin if needed. If clogging occurs, clean or replace the mesh element in the line filter and strain the paint to prevent further clogging.

2. Prime your sprayer. The airless sprayer pump is equipped with two special push buttons. These push buttons manually operate the inlet and the outlet valves. Pressing each one once before start up will serve to make sure the valves are not stuck closed by paint residue. Turn control knob counterclockwise as far as it will go. (Figure 5). Start the motor. Paint will travel up the tube and circulate through the unit. If unit does not prime, stop the motor. Paint should rise up the tube a few inches. Restart the motor. If necessary, stop and start the motor several times. If unit will not prime; see Special Priming Instructions Section, below.
3. To adjust spraying pressure turn the control knob fully clockwise to increase pressure. (Figure 6). Try a test area at several different pressures to become familiar with AIRLESS spraying.

   NOTE: To assure the longest life of your sprayer, use the lowest pressure necessary to paint. This will give less over-spray. (Over pressurizing will also shorten the life of spray tip.) When not actually using the sprayer turn control knob fully counterclockwise (to release pressure) and shut the motor off.

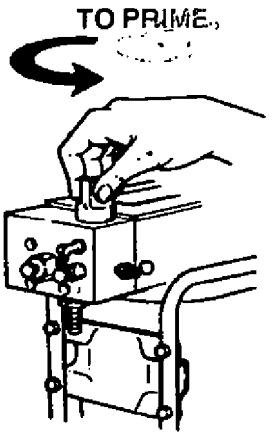


Figure 5

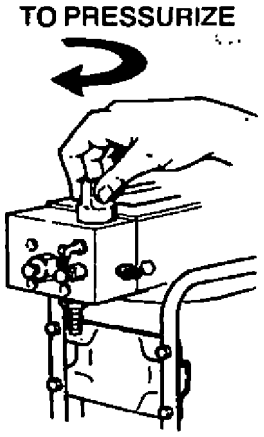


Figure 6

4. After the first hour of operation, turn motor off. Tighten the four bolts in the lower block assembly to a torque of 200-250 in./lbs.

SPECIAL PRIMING INSTRUCTIONS

If the valves in the unit stick and unit does not prime following startup procedures, proceed as follows:

1. If the material comes up the suction tube but does not prime, turn motor off. Allow it to come to a complete stop, then restart it. Repeat procedure 3 or 4 times.
2. The main cause for the pump failing to prime is improper clean up. Occasionally a small amount of paint will remain in the inlet or the outlet valve chamber causing the valve(s) to stick. If the unit will not prime, shut off the motor and fully depress the inlet and the outlet valve buttons once again. Start the unit. If it will not prime go to the next step.
3. Remove large inlet tube and start motor. Test for suction with palm of hand at inlet valve. If no suction is felt, this valve may require cleaning or replacement (Figure 7).

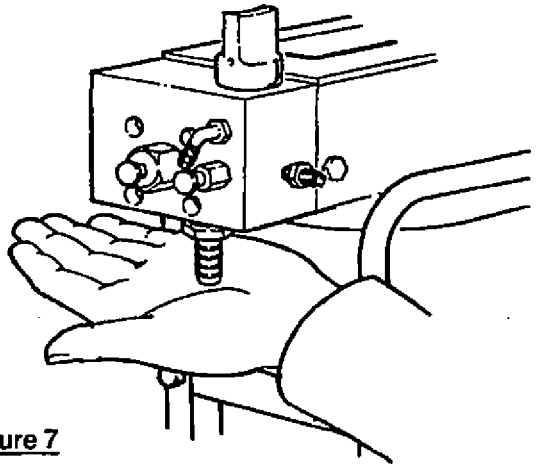


Figure 7

4. If inlet valve and button assembly is removed, diaphragm movement can be checked with unit on and finger touching diaphragm. Should no movement be noticed, the unit must have air bled from the system. Refer to item 6 under Diaphragm Replacement in Maintenance Section.

   NOTE: When replacing inlet button assembly do not overtighten. It should be hand tightened and then turned approximately 1/2 turn further with a wrench.

HINTS FOR AIRLESS SPRAYING

1. The correct distance from the workpiece is 10 to 15 inches. Adjust distance for the best spray pattern on your particular job.
2. Move the gun parallel to the surface with a smooth constant speed movement of the arm, left to right and right to left. The gun tip must be kept at the same distance from the surface throughout the stroke.
3. Keep the gun perpendicular to the working surface at all times when painting.
4. The gun should be triggered just after starting the stroke and the trigger should be released before stopping the paint stroke.
5. Paint should be slightly overlapped just as the trigger is being released at each end of the stroke.

   CAUTION: Use care when overlapping to avoid paint runs at the point of overlap.
6. Paint should overlap all along the previous stroke sufficient to make an even joining of the two strokes without causing the paint to run.
7. The standard spray tip supplied with this unit is .015"×50° (No. 6X902). Depending on the type of material being sprayed, you may have to use other size tips as shown in Table 1, Page 4. For flexibility and time-saving the Titan-Tip Adjustable Spray tip (No. 6X095) is recommended.

I FHMAN 00440

Operation (con't.)

SPRAY TIP RECOMMENDATIONS

TIP SIZE	MODEL NO.	APPROX. PATTERN SIZE	APPLICATION
.011"×50°	6X900	9"	For light bodied materials such as lacquers and stain. Use on small or limited area work.
.015"×50°	6X902	9"	Finer finish and more uniform coverage with latex and oil based paints.
.018"×65°	6X905	13"	Large area work and faster applications of latex and oil based paints.
Titan-Tip* Adjustable	6X095	Adjustable	For all types of materials and small to large areas of application.

*Recommended

Table 1

Maintenance

CAUTION: Before servicing or doing any maintenance, relieve pressure and unplug unit.

IMPORTANT: ONE OF THE LARGEST PROBLEM AREAS WITH PAINT SPRAYING IS THE RESULT OF IMPROPER CLEAN-UP. KEEP YOUR SPRAYER AT ITS BEST BY FOLLOWING THESE SPECIAL CLEANING & MAINTENANCE INSTRUCTIONS.

CAUTION: Any paint equipment should be well flushed with solvent after each use, failure to properly flush your airless sprayer pump, hose and gun will result in clogged openings and stuck valves.

CLEANING

1. Turn control knob counterclockwise to a positive stop (Figure 5, Page 3).
2. With trigger lock engaged, remove sprayer tip, washer and tip guard from gun and place parts in a container of suitable solvent (Figure 4, Page 2).
3. Put flexible tubes in empty container and run unit allowing fluid remaining to be expelled.
4. Turn control clockwise to positive stop (Figure 6, Page 3). Disengage lock and trigger the spray gun into the container. This will allow fluid remaining in hose to be expelled (Figure 8).

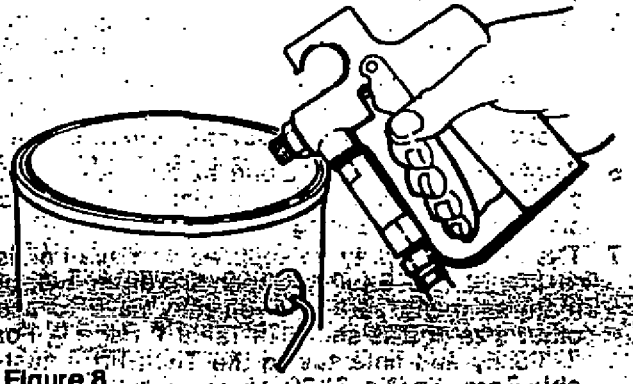


Figure 8

5. Turn control knob counterclockwise to a positive stop (Figure 5, Page 3). Replace empty container with container of suitable solvent and allow unit to circulate solvent.
6. Trigger the gun in container while holding the diffuser assembly submerged in the solvent to avoid splashing.
7. Replace solvent 2 or 3 times until solvent runs clear. Repeat steps 3 and 4 to remove solvent from the system.
8. If spraying a latex paint, clean the sprayer with warm soapy water. Mineral spirits or other lubricant MUST ALSO be run through sprayer (after cleaning) to lubricate parts and prevent sticking of moving parts.

   CAUTION: Mineral spirits must not be mixed with latex paint.
9. If unit is to be stored for a period of time, it is recommended that a light oil be drawn through the complete system.

SUCTION FILTER CLEANING

The suction filter should be cleaned daily with suitable solvent.

If filter is damaged or has large holes, replace.

NOTE: Cleaning filter is very important. Clogged filters will reduce sprayer working pressure.

COMBINATION VALVE

The combination valve has been preset at the factory for proper operation. Should the valve need cleaning, remove set screw on the side of the block and unscrew valve. Clean parts and reinstall in reverse sequence. (Figure 9).

If valve does not function properly, return sprayer for repair.

I FHMAN 00441

Maintenance (con't.)

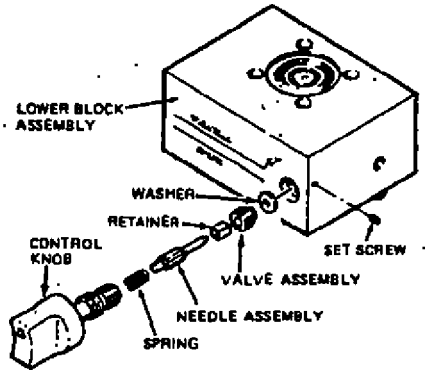


Figure 9

DIAPHRAGM REPLACEMENT

Check oil in reservoir regularly for discoloration. Discoloration indicates that the diaphragm has ruptured. To replace diaphragm, proceed as follows:

1. Remove pump filler cap, turn unit upside down and drain through the filler hole. Flush and clean oil reservoir.
2. With unit upside down, remove lower block assembly. This will expose diaphragm. Remove diaphragm assembly. See parts list, item
3. Clean lower block assembly and oil reservoir, fill piston cavity with 10W-30 motor oil and reassemble in reverse sequence.
4. Retighten lower block assembly to 200-250 in/lb. torque.
5. Turn unit upright and fill with 10W-30 motor oil. Proper oil level is one inch from the top of the pump.
6. Loosen bleeder valve assembly on side of unit no more than 5 full turns.

   CAUTION: DO NOT TAMPER WITH THE SET SCREW NOR REMOVE ANY OF THE VALVE PARTS. THIS VALVE IS FACTORY SET. (Figure 10.)

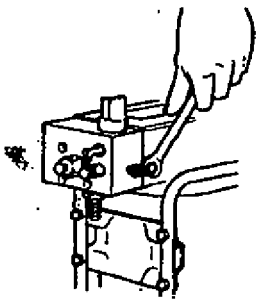


Figure 10

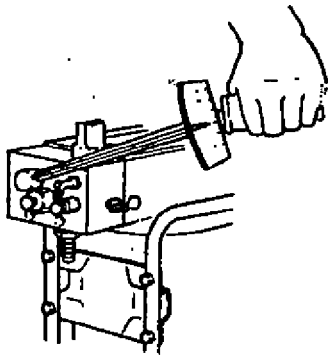


Figure 11

7. Run pump for approximately 2 minutes and retighten bleeder valve.
8. After the first hour's operation, it is important that the four bolts retaining the lower block assembly are retightened. Figure 11.

The diaphragm has a long service life, but it is subject to highly abrasive materials and heavy loads; therefore, it is suggested to have a replacement diaphragm in stock, item 20 of Parts List.

SPRAY GUN

Because the gun has few parts, little maintenance is required. However, should the gun have to be disassembled, the following procedure should be followed:

WARNING: Never disassemble gun while connected to unit. Turn off unit, unplug and relieve all pressure from system, engage safety lock on gun before removing gun.

1. Remove hole plug and stop nut. See items 10 and 27 of Spray Gun Parts List.
2. Remove diffuser assembly, item 4. See Spray Gun Parts List.
3. Remove needle and ball assembly. At this time, the spring and spring retainer will come out. (Figure 12.)

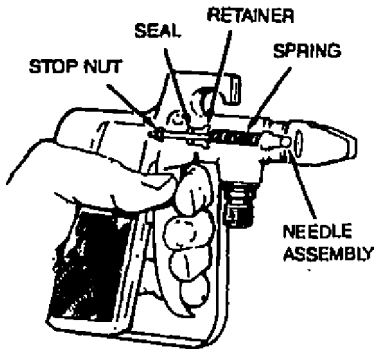


Figure 12

4. The only part remaining in the gun at this time is the seal. The seal should never be removed unless it is to be replaced with a new one. This can be accomplished by sliding needle assembly into seal and rotating needle around opening in gun while pulling outward.

IN-LINE FILTER

Use Figure 14 for reference:

An in-line filter is installed in the hose at the gun to help prevent clogging at the tip caused by lumpy paint or any foreign particles.

The filter will normally not require any special attention as long as proper cleaning procedures for the equipment are followed as per instructions set forth in this manual.

If there is a reduction in pressure or material flow through the gun, check the filter. Remove the filter element (Ref. No. 24) and clean with solvent. If contamination cannot be cleaned the element must be replaced. The filter may require frequent cleaning if the paint being sprayed has a very coarse pigment or a large amount of dirt or sand contamination. Occasional batches of what is normally satisfactory paint may contain excessive contamination.

If there is a reduction in pressure or material flow through the gun, check the filter. Remove the filter element (Ref. No. 24) and clean with solvent. If contamination cannot be cleaned the element must be replaced.

NOTE: When reassembling filter, make sure that open end of filter cartridge (Ref. No. 24) is installed towards gun body.

Replacement Parts List For Paint Sprayer

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	ST056300AV	Machine Screw (9 used)	40	ST056700AV	"O" Ring
2	AL011400BE	Face Plate	41	AL029100AV	Plunger
3	AL013700AV	Gasket	42	ST070128AV	"O" Ring
4	KE000900AV	Key 3/16 x 1"	43	AL020902LD	Lower Block
5	AL022500AV	Eccentric	44	AL007200AV	Knob
6	AL022400AV	Bearing	45	AL021200AV	Adjusting Screw
7	ST070215AV	Retaining Ring	46	AL021100AV	Combination Valve
8	AL013000AV	Spring Retainer	47	ST070118AV	"O" Ring
9	AL019300AV	Piston	48	AL020800AV	Spring
10	AL006600AV	Spring	49	AL115200AJ	Needle Assembly
11	ST062700AV	"O" Ring	50	AL027700AV	Valve Retainer
12	AL025300AV	Filler Cap	51	AL107400AJ	Valve Assembly
13	AL026901AV	Handle	52	AL015600AV	Washer
14	ST016000AV	Hex Hd Mach Screw (2 used)	53	AL028702AV	Washer
			54	AL029200AV	Outlet Valve Plug
15	AL201000BG	Housing Assembly (Includes #9 & 16)	55	AL001400AV	Spring
			56	AL010700AV	Spring Retainer
16	—	Bleeder Valve	57	AL001900AV	Outlet Ball
17	AL013300AV	Bearing	58	AL115400AJ	Outlet Valve Assembly
18	AL013200AV	Seal	59	AL015600AV	Washer
19	HF001800AV	Hose Adapter	60	ST070505AV	Set Screw
20	AL108500AJ	Diaphragm Assembly	61	AL012900AV	Washer
21	AL001200AV	Washer	62	ST070001AV	Spring Pin
22	HA211800AV	Hose	63	AL029100AV	Plunger
23	ST012800AV	Machine Screw 5/16-18	64	ST056700AV	"O" Ring
24	9K537	Motor	65	AL028600AV	Valve Retainer, Outlet
25	ST067700AV	Rubber Foot (4 used)	66	AL029000AV	Spring
26	AL023001AV	Left Leg	67	AL028900AV	Button
27	AL023002AV	Right Leg	68	AL117002AJ	Spray Gun (See Figure)
28	AL014000AV	Lock Nut (4 used)	69	AL121900AJ	Inlet Cartridge Assembly
29	AL005100AV	Strainer	70	AL028701AV	Washer
30	AL017200AV	Suction Head	—	4Z243	Cart (Optional)
31	AL017500AV	Suction Tube	—	4Z429	25' Airless Hose Extension (Optional)
32	ST069400AV	Hose Clamp			
33	ST069600AV	Hose Fitting	—	4Z430	50' Airless Hose Extension (Optional)
34	AL017601AV	Bypass Tube			
35	ST093500AV	Bypass Fitting	—	AL026701AV	Switch for Motor (not shown)
36	ST070808AV	Soc Hd Cap Screw (4 used)			
37	AL028900AV	Button	—	3R724	Cooling Fan for Motor (not shown)
38	AL029000AV	Spring			
39	AL028500AV	Valve Retainer, Inlet			

Replacement Parts List For Spray Gun

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	**AL108800AJ	Tip Guard	15	AL024100AV	Trigger Pin
2	6X902	Tip .015 x 50°	16	AL024200AV	Spring
3	**AL009900AV	Washer	17	ST002500AV	Retaining Ring (2 used)
4	AL114900AJ	Diffuser Assembly	18	AL023600AV	Trigger
5	AL115000AV	Needle Assembly	19	ST070218AV	Retaining Ring
6	AL020100AV	Spring	20	ST070217AV	Retaining Ring
7	AL020200AV	Spring Retainer	21	AL027900AV	Washer
8	AL020300AV	Seal	22	†AL005500AV	Washer
9	AL024002AV	Gun Body	23	†AL005300AV	Filter Body
10	ST073706AV	Hole Plug	24	†AL005700AV	Filter
11	AL028000AV	Washer	25	†AL005400AV	Washer
12	AL023801AV	Trigger Lock	26	†AL005200AV	Adapter
13	AL023101AV	Lock Sleeve	27	ST073804AV	Stop Nut
14	AL023700AV	Trigger Guard			

To order a complete gun as shown *except* for the tip guard assembly and the filter assembly, order AL117002AJ.
To order the tip guard assembly and the filter assembly order MP214700AJ (see below).
†Part of Filter Assembly, Part No. AL11800AJ
**Part of Tip Guard Assembly, Part No. MP213900AJ
} Included in Gun Parts Package No. MP214700AJ.

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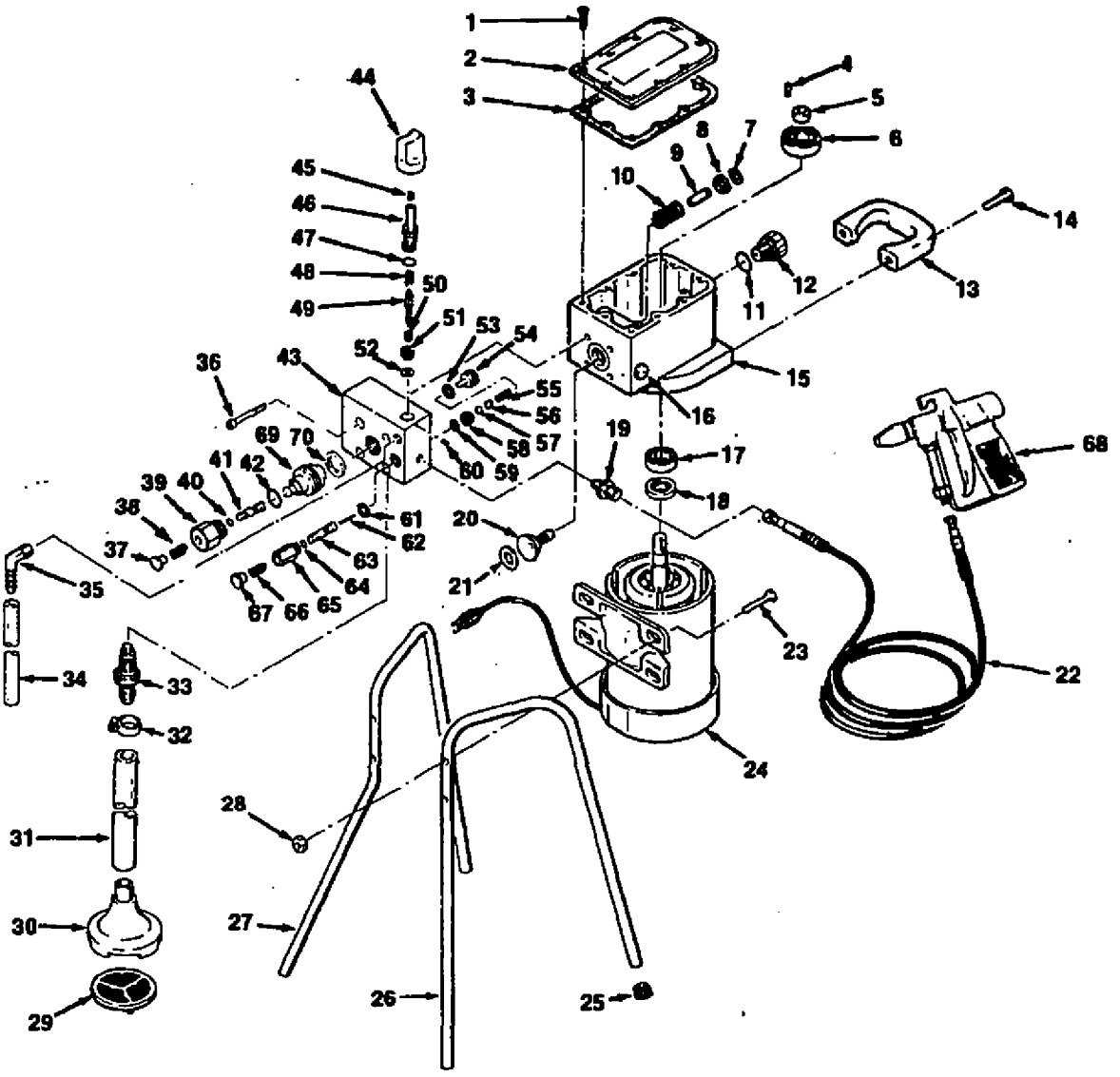

Figure 13 — Replacement Parts Illustration For Paint Sprayer

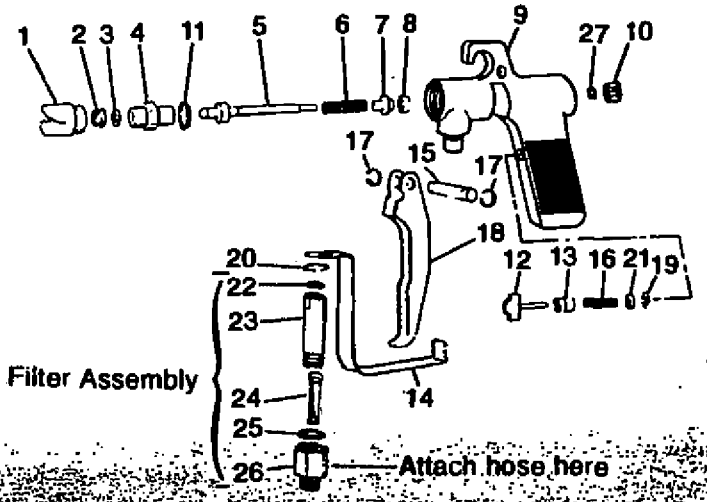

Figure 14 — Replacement Parts Illustration For Spray Gun

I FHMAN 00444

Trouble Shooting Chart

PROBLEM	POSSIBLE CAUSES REF. NOS. (See Below)
SPRAY PATTERN	
Tails:	1, 2, 3, 5, 6
Hour glass:	1, 2, 3, 5, 6
Round:	2
Distortion:	2, 5
Too much overspray	19
Pump will not prime	6, 7, 8, 9, 10, 11, 12, 13, 14
Spray gun fails to spray	2, 6
Pump does not run when turned "on"	14, 15, 16, 18
Spraying pressure drops when gun is triggered	4, 6, 8, 12
Pump primes, but pressure does not build up	8, 9, 10, 11, 12
Spray gun will not shut off; leaks point	17
Motor runs hot and trips overload switch	14, 15, 16

POSSIBLE CAUSES	CORRECTIVE ACTION
1. Material pressure too low	1. Increase pressure by turning combination valve clockwise.
2. Spray tip is clogged or worn	2. Clean or replace spray tip as required.
3. Spray tip orifice size is too small	3. Replace with larger orifice size appropriate for material being sprayed.
4. Spray tip orifice size too large	4. Replace with smaller orifice size appropriate for material being sprayed.
5. Material being sprayed is too thick (viscous)	5. Reduce viscosity of material by thinning with appropriate thinner.
6. Filter(s) are clogged	6. Clean or replace filter(s) as required.
7. Not enough material in container	7. Add material to container. Do not allow material level in container to get below suction strainer.
8. Leak in suction tube connections	8. Tighten as necessary.
9. Air in hydraulic system	9. Bleed air from system as per instructions in "Maintenance" section.
10. Intake valve stuck or dirty	10. Follow "Special Priming" instructions in "Maintenance" section.
11. Outlet valve stuck or dirty	11. Follow "Special Priming" instructions in "Maintenance" section.
12. Combination valve not open or dirty	12. Turn combination valve counter-clockwise to positive stop. *If unit fails to prime*, remove combination valve assembly and check for wear or foreign material that may be effecting performance.
13. Hydraulic fluid level too low	13. Check level. Add a good grade 10W30 oil to housing, but not higher than one inch from the top.
14. Improperly sized extension cord	14. Check the chart shown in the "Operation" section to properly size the cord.
15. Defective motor or switch	15. Repair or replace as necessary.
16. Loss of electrical power to unit, line voltage too low	16. Check line fuse, a 15 amp fuse must be used.
17. Worn or dirty diffuser assembly or ball in spray gun	17. Trigger gun several times while under pressure. If gun still leaks remove diffuser assembly (Fig. 15) and clean or replace as necessary.
18. Unit under pressure	18. Turn combination valve counter-clockwise to positive stop.
19. Pressure too high	19. Turn valve counterclockwise to reduce pressure.

SAVE AND DISPLAY PROMINENTLY IN SPRAYING AREA

WARNING

BECAUSE AIRLESS SPRAY UNITS DEVELOP EXTREMELY HIGH PRESSURES, DO NOT USE TIPS LARGER THAN .018". SEVERE INJURY MAY RESULT FROM ANY SKIN PENETRATION.

NEVER

- Never put your hand or fingers in front of gun.
- Never point gun at your body - or any one else.
- Never leave gun unattended without releasing pressure and engaging trigger lock.

BEFORE turning "ON" pump:	ALWAYS	• Follow the manufacturer's recommendations on maximum pressures and operating instructions. • Make sure trigger lock is properly adjusted. • Lock the gun trigger in "OFF" position — and check all connections.
BEFORE removing or adjusting any part of equipment (including tip):	ALWAYS*	• 1. Shut off pump. • 2. Turn combination valve counter clockwise to positive stop. • 3. Discharge contents of gun to eliminate pressure. • 4. Lock the gun trigger in "OFF" position by engaging trigger lock.
	*NOTE: Also follow 1, 2, 3, and 4 when discontinuing spraying operation.	

•Follow the manufacturer's recommendations for periodic cleaning and maintenance procedures.

STAY SAFE!

CAUTION: If skin is hit by sprayed liquid, paint or solvent, contact physician immediately because any skin penetration can cause permanent injury.

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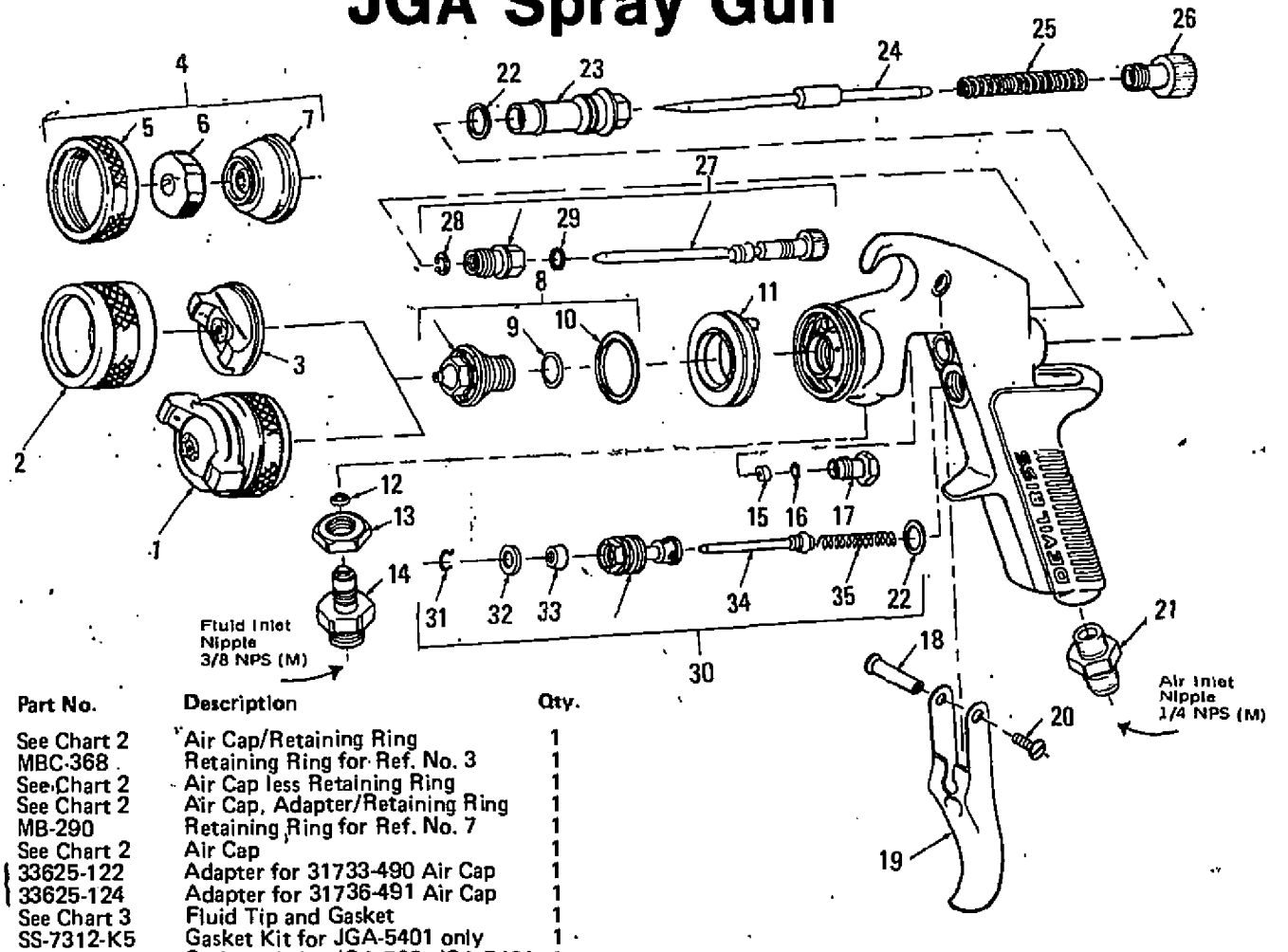
LEHMAN 00446

DEVILBISS

SERVICE BULLETIN
SB-2-251-E
Replaces SB-2-251-D

JGA Spray Gun



Ref. No.	Part No.	Description	Qty.
1	See Chart 2	Air Cap/Retaining Ring	1
2	MBC-368	Retaining Ring for Ref. No. 3	1
3	See Chart 2	Air Cap less Retaining Ring	1
4	See Chart 2	Air Cap, Adapter/Retaining Ring	1
5	MB-290	Retaining Ring for Ref. No. 7	1
6	See Chart 2	Air Cap	1
7	33625-122	Adapter for 31733-490 Air Cap	1
	33625-124	Adapter for 31736-491 Air Cap	1
8	See Chart 3	Fluid Tip and Gasket	1
* 9	SS-7312-K5	Gasket Kit for JGA-5401 only	1
*10	AV-1-K5	Gasket Kit for JGA-502, JGA-5401	1
11	JGA-1225	Baffle for JGA-502, JGA-5401	1
	JGA-408-2	Baffle for JGA-5023, JGA-5027	1
*12	23165-001-K5	O Ring for JGA-502 only	1
13	JGA-51-K5	Lock Nut Kit	1
14	P-JGA-2-2	Nipple for JGA-502	1
	P-JGA-55	Nipple for JGA-5023, JGA-5027	1
	P-JGA-73	Nipple for JGA-5401 (See Note Below)	1
*15	JGA-7-K5	Packing Kit for JGA-502, JGA-5027, JGA-5401	1
16	MBC-1164-K5	O Ring Kit for JGA-5023	1
17	34411-122-K3	Packing Gland Kit for all except JGA-5023	1
	34423-121	Packing Gland for JGA-5023 only	1
*18	JGA-35-K5	Trigger Bearing Stud Kit	1
19	JGA-108	Trigger	1
*20	A-42-K5	Screw Kit	1
21	P-MB-51	Nipple	1
*22	JGS-72-K10	Gasket Kit	2
23	JGA-17	Bushing	1
24	See Chart 3	Fluid Needle	1
*25	MBD-19-K5	Spring Kit	1
26	JGS-16	Adjusting Screw	1
27	MGB-405-1	Fan Adjustment Assembly	1
*28	SST-8405-K5	Retaining Ring Kit	1
*29	SSG-8020-K5	O Ring Kit	1
30	JGS-449	Air Valve Assembly	1
31	JGA-14-K5	Snap Ring Kit	1
32	JGA-15-K5	Washer Kit	1
*33	JGS-26-K5	U Cup Seal	1
*34	JGS-431	Air Valve	1
*35	MBD-12-K5	Spring Kit	1
36	See Chart 3	Lapped Tip, Needle and Gasket Assembly for JGA-502 only	1

36 Includes Ref. Nos. 8, 10 and 24.

FOR PARTS PURCHASE

Contact your local distributor. See the "Yellow Pages" of your telephone directory.

*A quantity of necessary parts is included in repair kit KK-4059 for complete gun repair.

Suffixes -K3, -K5, -K10 designate kits of multiple parts.

EXAMPLE: SS-7312-K5 is a kit of (5) gaskets.

NOTE: Optional nipple for JGA-5401 with built-in metering valve for adjusting fluid flow. Order P-JGA-459.

LEHMAN 00447

MODELS

JGA-502 — Standard spray gun, has hardened alloy steel fluid tip, stainless steel fluid needle and brass baffle.

JGA-5023 — For ceramic and latex materials, has carboloy fluid tip, fluid needle and nylon baffle.

JGA-5027 — For latex materials, has stainless steel fluid tip, fluid needle and nylon baffle.

JGA-5401 — Quick-purging spray gun, has restricted fluid passage, stainless steel fluid tip, fluid needle and brass baffle. Most suited for recirculating systems.

SERVICE NOTES

For complete guide on air spray equipment use, see *Data Bulletin* SB-2-001.

Strain material thru 60 or 90 mesh screen.

To clean gun passages, blow back paint to material supply source and flush fluid passage with clean solvent. Wipe gun clean with solvent soaked cloth.

To clean air cap, soak in thinner, brush with a stiff bristle brush. If necessary, use a broom straw or toothpick. Never use a wire or hard instrument; this may scratch or burr holes causing a distorted spray pattern.

After gun has been cleaned and dried, apply a drop of oil at trigger bearing stud, on stem of air valve assembly at washer, and on shank of fluid needle at packing gland.

Chart 1

NOZZLE COMBINATIONS

Models JGA-502	JGA-5023	JGA-5027	JGA-5401	Air Cap Sizes Order from Chart 2	Fluid Tip and Needle Sizes Order from Chart 3 D	E	EE	EX	FF	FX	FZ
●		●		24	P	P				P	
●		●		30		P/S		S	S	S	
●		●		43				S	S		
●		●		58		P/S			P/S	P/S	
	●			67			P				
	●			69	P						
●		●	●	78		P			P	P	P
●		●		264					P		
●		●		490		P			P	P	
●				491	P						
●		●	●	704		P			P	P	
●		●	●	705		P			P	P	
●		●	●	765		P			P	P	
●		●	●	770					P	P	P
●		●		777					P		

P—Pressure Feed Combination
S—Suction Feed Combination

Chart 2

AIR CAPS

No. on Cap—Order ↓	Ref. Nos. 1 and (4) Air Cap with Ring	Ref. Nos. 3 and (5) Air Cap less Ring
24		AV-40-24
30	MB-4039-30	
43		31767-043
58	AV-439-58	
67	MB-4039-67	
69	MB-4039-69	
78	MB-4039-78	
264		31767-264
**490	(45134-490)	(31733-490)
**491	(45134-491)	(31736-491)
704		AV-1239-704
705		AV-1239-705
765		AV-1239-765
770		AV-1239-770
777		31767-777

**—Internal MIX

Chart 3

FLUID TIPS AND NEEDLES

If this is No. on Tip Order →	Ref. No. 8 Fluid Tip & Gasket Assy.	Ref. No. 24 Fluid Needle No. on Needle	Ref. No. 36 Lapped Tip & Needle Assy.
	JGA-502		
AV-15-D	AV-601-D	JGA-402-DEX	JGA-440-D
AV-15-E	AV-601-E	JGA-402-E	JGA-440-E
AV-15-EX	AV-601-EX	JGA-402-DEX	None
AV-15-FF	AV-601-FF	JGA-402-FF	JGA-440-FF
AV-15-FX	AV-601-FX	JGA-402-FX	JGA-440-FX
AV-15-FZ	AV-601-FZ	JGA-402-FZ	JGA-440-FZ
	JGA-5023		
AV-1415-D	†AV-617-D	JGA-409-D	None
AV-1415-EE	†AV-617-EE	JGA-409-DEEE	None
	JGA-5027		
AV-1115-E	†AV-641-E	JGA-402-E	None
AV-1115-FF	†AV-641-FF	JGA-402-FF	None
AV-1115-FX	†AV-641-FX	JGA-402-FX	None
	JGA-5401		
AV-1715-FF	AV-489-FF	JGA-402-FF	None

† Do not use AV-1 gasket with nylon baffle.

ACCESSORIES

P-H-5616 AIR ADJUSTING VALVE

Enables user to control and reduce air usage at the gun. Ideal for low pressure spraying.

42884-214 3/8" DIA. 42884-215 5/8" DIA. CLEANING BRUSHES

These brushes are helpful in cleaning threads and recesses of gun body.

HD-501 HOSE CLEANER

Hose cleaner used to clean the inside of hose and material passages of gun.

JGA-408-2 NYLON BAFFLE MAY BE USED ON JGA-502, JGA-5401

Use in place of brass baffle. Do not use AV-1 gasket with this nylon baffle.

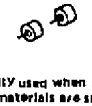
WR-103 WRENCH

Contains all necessary tip, hose and nut sizes used on or with gun.

41677-205 (FX) 41677-206 (FF) 41677-409 (E) RESILENT TIPPED NEEDLE

Suited for use with organic finishing materials and many wood sealers containing silica.

JGA-52 LEATHER PACKINGS



Usually used when abrasive materials are sprayed. Use (2) JGA-52 packings in place of JGA-7 packing on JGA-502, JGA-5027 and JGA-5401 guns.

THE DEVILBISS COMPANY
TOLEDO, OHIO 43692

Division of Champion Spark Plug Company

1/30/78

Litho in U.S.A.

1 FHMAN 00448

[redacted]

CORPORATE SAFETY AUDITS
No. 1 - 4/30/80

FHMAN 00449

V. Dibby

CYPRUS MINES CORPORATION

CORPORATE SAFETY AUDIT PROGRAM

OPERATION Cyprus Industrial Minerals, South Plainfield, N.J.

PLANT OFFICER John Stiff

CORPORATE AUDITOR Key L. Phillips

DATE OF AUDIT April 30, 1980

CYPRUS

Yes or No

1. MSHA Training Requirements

a) Is a copy of the training plan available with the training plan approval letter? No

Action taken: State to do training. No plan on property.

b) Are certificates of training (MSHA Form 5000-23 completed for each worker completing new hire, refresher and task training? No

Action taken: Recommended calling state to determine actually what can be done. Contacted.

c) Is "hazard training" program for visitors and vendors in use? Are records available? No

Action taken: Forms sent from Corporate Safety Office.

d) Is training up-to-date for all employees? No

Action taken: To be done at once.

2. Property Loss Prevention Reports

a) Were there any property loss reports in past 12 months? No

Action taken:

b) Was there an annual boiler inspection? (55/56.13-30) No

Action taken:

c) Was there an annual pressure vessel inspection? (55/56.13-15) No

Action taken:

LEHMAN 00451

Yes or No

2. Insurance Reports - Continued

d) Is all fire fighting equipment inspected every 90 days and tested annually? No

Action taken: S. Plainsfield Fire Department nearby. Have been in.

e) Does operation have fire fighting plan with evacuation and rescue plans? (55/56.4-23) No

Action taken: See above.

f) Does operation hold fire fighting drills every 6 months? (55/56.4-39B) No

Action taken: See above.

Fire ext Drill every 6 mo in safety Meeting

g) Does operation have fire alarm signal and procedures instruction record - 1 per year? (55/56.4-48) No

Action taken: Not sure if necessary.

annual training

3. Accident Records

a) Make comparison check on insurance reports and MSHA 7000-1 reports. No

Action taken: Have not received 7000-1 reports. Using N.J. Form. Forms to be sent from Corporate Safety Office.

b) Are MSHA 7000-1 reports up-to-date? No

Action taken: See above.

c) Were there any permanent disability cases during past 12 month? No

Action taken:

	Yes or No
3. Accident Reports - Continued	
d) Is there a method of following up on disabling injury cases? (Insurance reports, medical records, etc.)	No
Action taken: Informally	
e) Is there a need to do an injury analysis?	No
Action taken: Not at this time.	
4. MSHA/OSHA Inspections and Citations	
a) Total number of inspections in past 12 months.	1
b) Total number of citations in past 12 months.	3
c) Compare Corporate summary and review Corporate reporting requirements if needed.	Done
Action taken: Report up to date.	
5. Environmental Areas	
a) Are there current MSHA citation extensions for:	
1. Dust conditions?	Yes
2. Noise conditions?	No
Comments:	
b) Has a list of substances that could be considered toxic or dangerous used at this property been compiled?	No
Action taken: Not necessary at this time.	

LEHMAN 00453

Yes or No

5. Environmental Areas - Continued

c) Are there current Environmental Protection Agency (EPA) or state citations for:

1. Air pollution? No

2. Water pollution? No

Comments:

d) Are there other employee health related or environmental problems not recognized by a state or federal agency that should be addressed? No

Comments:

e) Are employee medical records maintained at the property? Yes

If yes, is there evidence of occupationally related patterns of illness or disease? None

Comments:

f) Are new employees given pre-employment physicals? Yes

Comments: Sporadic

g) Are current employees being given annual physicals? Yes

Comments: *Review needed.*

h) Are there indications that certain illnesses, diseases or conditions are occupationally induced? No

Comments:

LEHMAN 00454

Yes or No

5. Environmental Areas - Continued

i) Are there currently any employees diagnosed as having an illness, disease or condition that could be related to employment at this operation? No

Comments:

j) Are there former employees who have filed a workman's compensation or other claim against the company for a disease, illness or condition that may have developed as a result of employment at this operation? No

Comments:

k) Are there physical extremes such as heat, cold, dampness, etc. that could result in excessive employee stress? Yes

Comments: Cold.

6. Other Reports or Records

a) Pre-shift equipment inspections for past 6 months? (55/56.9-1) No

Action taken: Past 4 months only.

b) Working area inspection reports for past 12 months? (55/56.18-2) No

Action taken: To be started immediately.

c) Continuity and resistance of grounding systems immediately after installation, repair or modification and annually thereafter. Are most recent test records available? (55/56.12-28) Yes

Action taken: Small, hand held equipment to be tested in the future.

LEHMAN 00455

Yes or No

6. Other Reports or Records - Continued

d) Review employee safety meeting minutes. Yes

Action taken:

e) Review joint safety committee minutes. N/A

Action taken: Not needed at this time.

f) Review accident investigating committee reports. No

Action taken: Not needed at this time.

7. Miscellaneous Safety Items

a) Is there a written supervisor's safety program which details management's safety responsibilities? No

Action taken: Corporate Staff to complete as time is available.

b) Is the operation receiving the Safety and Health Newsletter? Yes

Action taken:

c) Is the operation using a safety rule book? Yes

Action taken:

d) Does the operation have discipline procedures established for violatons of safety rules? No

If yes, how many employees were disciplined in the past 12 months? None

Action taken:

LFHMAN 00456

	Yes or No
8. Other Items	
a) Personnel problems?	Yes
Comments: Language	
b) General liability problems?	None
Comments:	
c) Quality control problems?	None
Comments:	

9. Attach Current Safety and Health Inspections

a) Dust

b) Noise

c) Housekeeping and Defects

d) Injury Analysis

e) Others:

Distribution:

S. J. Perkins
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W. Gaskins
P. Bixby
J. Stiff
P. Kilijanski

LEHMAN 00457

4/28-30/80

Key Phillips' Visit.

CYPRUS MINES CORPORATION

CORPORATE SAFETY AUDIT PROGRAM

OPERATION Location 29 – So. Plainfield

PLANT OFFICER John Stiff (Plant Mgr.) – Phil Kilijanski (Safety)

CORPORATE AUDITOR _____

DATE OF AUDIT _____

CYPRUS

Yes or No

1. MSHA Training Requirements

a) Is a copy of the training plan available with the training plan approval letter? STATE-New Jersey

Action taken: N.J. has been requested to schedule training sessions - N.J. is Funded by MSHA for training.

b) Are certificates of training (MSHA Form 5000-23 completed for each worker completing new hire, refresher and task training?

Action taken:

c) Is "hazard training" program for visitors and vendors in use? Are records available?

Action taken: Visitor's Forms not Rec'd. -

d) Is training up-to-date for all employees? No

Action taken: a

2. Property Loss Prevention Reports

a) Were there any property loss reports in past 12 months? No. -

Action taken:

b) Was there an annual boiler inspection? (55/56.13-30) No. -

Action taken: Call Farmers. -

c) Was there an annual pressure vessel inspection? (55/56.13-15) No. -

Action taken:

LEHMAN 00459

Yes or No

2. Insurance Reports - Continued

d) Is all fire fighting equipment inspected every 90 days and tested annually? _____

Action taken: within Fire Dept.

e) Does operation have fire fighting plan with evacuation and rescue plans? (55/56.4-23) _____

Action taken: Marked Exit Signs, etc. — add to training Plan + Use of Fire Extinguishers

f) Does operation hold fire fighting drills every 6 months? (55/56.4-39B) _____

Action taken: add to training plan

g) Does operation have fire alarm signal and procedures instruction record - 1 per year? (55/56.4-48) _____

Action taken:

3. Accident Records

a) Make comparison check on insurance reports and MSHA 7000-1 reports. _____

Action taken: Using MSHA Forms. check with MSHA.

b) Are MSHA 7000-1 reports up-to-date? _____

Action taken: ?

c) Were there any permanent disability cases during past 12 month? No.

Action taken:

LEHMAN 00460

Yes or No

3. Accident Reports - Continued

d) Is there a method of following up on disabling injury cases? (Insurance reports, medical records, etc.) This unit uses a Co. physician. —

Action taken:

e) Is there a need to do an injury analysis? _____

Action taken:

4. MSHA/OSHA Inspections and Citations

a) Total number of inspections in past 12 months. 1

b) Total number of citations in past 12 months. 1

c) Compare Corporate summary and review Corporate reporting requirements if needed. _____

Action taken:

5. Environmental Areas

a) Are there current MSHA citation extensions for:

1. Dust conditions? — this is the one violation Yes.

2. Noise conditions? _____

Comments: Extension has been requested.

b) Has a list of substances that could be considered toxic or dangerous used at this property been compiled? _____

Action taken:

LFHMAN 00461

Yes or No

5. Environmental Areas - Continued

c) Are there current Environmental Protection Agency (EPA) or state citations for:

1. Air pollution? No.

2. Water pollution? No.

Comments: Dryer Dust collector is the most troublesome. High Temp. maintenance problem.

d) Are there other employee health related or environmental problems not recognized by a state or federal agency that should be addressed? Basically - clean up pocher.

Comments:

e) Are employee medical records maintained at the property? YES.

If yes, is there evidence of occupationally related patterns of illness or disease? No.

Comments:

f) Are new employees given pre-employment physicals? that is policy - skipping this year

Comments: employ conditionally.

g) Are current employees being given annual physicals? YES.

Comments:

h) Are there indications that certain illnesses, diseases or conditions are occupationally induced? No.

Comments:

I FHMAN 00462

Yes or No

5. Environmental Areas - Continued

i) Are there currently any employees diagnosed as having an illness, disease or condition that could be related to employment at this operation? No.-

Comments:

j) Are there former employees who have filed a workman's compensation or other claim against the company for a disease, illness or condition that may have developed as a result of employment at this operation? YES

Comments: Todate - grievance suits. - out of court settlements. -

k) Are there physical extremes such as heat, cold, dampness, etc. that could result in excessive employee stress? only summer & winter extremes

Comments:

6. Other Reports or Records

a) Pre-shift equipment inspections for past 6 months? (55/56.9-1) ~ 4 months.-

Action taken:

b) Working area inspection reports for past 12 months? (55/56.18-2) ok 4 months.

Action taken:

c) Continuity and resistance of grounding systems immediately after installation, repair or modification and annually thereafter. Are most recent test records available? (55/56.12-28) Yes - 2/28/00

Action taken:

Yes or No

6. Other Reports or Records - Continued

d) Review employee safety meeting minutes. _____

Action taken: Started in April.

e) Review joint safety committee minutes. _____

Action taken: N.A.

f) Review accident investigating committee reports. We mail N.S. Form. _____

Action taken:

7. Miscellaneous Safety Items

a) Is there a written supervisor's safety program which details management's safety responsibilities? No. (Elton?) _____

Action taken: developing.

b) Is the operation receiving the Safety and Health Newsletter? Yes _____

Action taken:

c) Is the operation using a safety rule book? Yes _____

Action taken: Them were received from N.A.

d) Does the operation have discipline procedures established for violatons of safety rules? No. _____

If yes, how many employees were disciplined in the past 12 months? None. _____

Action taken:

LEHMAN 00464

Yes or No

8. Other Items

a) Personnel problems? Training — Follow-up; Turnovers

Comments:

b) General liability problems? Normal —

Comments:

c) Quality control problems? No —

Comments:

9. Attach Current Safety and Health Inspection ~~Audit~~ review. Full Audit Given to Kay

a) Dust

b) Noise

c) Housekeeping and Defects

d) Injury Analysis

e) Others:

LEHMAN 00465

MSHA Administrative Manual 30 CFR Part 48 - Training and Retraining of Miners

JK

U.S. Department of Labor
Mine Safety and Health Administration

July 1, 1985

LEHMAN 00466

The policy contained in this manual supersedes all previous policies under 30 CFR Part 48.

August 26, 1985

SUBCHAPTER H-EDUCATION AND TRAINING

PART 48-TRAINING AND

RETRAINING OF MINERS

Subpart A-Training and Retraining of

Underground Miners

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Section 48.1 Scope.

REGULATION

The provisions of this Subpart A set forth the mandatory requirements for submitting and obtaining approval of programs for training and retraining miners working in underground mines. Requirements regarding compensation for training and retraining are also included. The requirements for training and retraining miners working at surface mines and surface areas of underground mines are set forth in Subpart B of this part.

Policy

General

Section 115 of the Federal Mine Safety and Health Act of 1977 (Mine Act) and 30 CFR Part 48 require operators to submit and obtain approval of training plans under which miners are provided training. The training required by these plans must be provided to miners before they begin work at a mine, or before they receive new work tasks or assignments. Accordingly, when a miner is hired, transferred to a new work location, or is recalled from a panel under a collective bargaining agreement, the miner must be given the minimum training specified by Part 48.

Prohibited Practices

The statutory requirement that operators train miners before they begin work is not to be frustrated by employment practices that shift the operator's compliance responsibility for miner training to the miner. Therefore, operators may not make hiring, recall, transfer, or other employment decisions on the basis of the amount of training a miner has received or needs in order for the operator to achieve compliance. Miners who would otherwise be hired, recalled, or transferred cannot be bypassed merely because they need training under Part 48.

It is not inconsistent with Part 48 if a miner voluntarily acquires training prior to application for employment. Similarly, State required and conducted miner training can satisfy the requirements of Part 48.

Compliance Responsibility

Each operator is responsible for compliance with all applicable provisions of Part 48. Therefore, operators should be prepared to provide all necessary miner training. This compliance responsibility is not limited by training plans that do not provide for certain training, such as that required for a new miner.

Industries Affected by Congressional Resolution

A continuing resolution of the United States Congress currently prohibits MSHA from expending funds to administer or enforce Part 48 for the following industries: surface stone, surface clay, sand and gravel, surface limestone, colloidial phosphate, and shell dredging. Each of these industries, however, continues to be responsible for compliance with Part 48. The resolution does not affect training required by other applicable standards or regulations.

LEHMAN 00469

Section 48.2 Definitions.

Section 48.2 (a)(1) "Miner"

REGULATION

For the purpose of this Subpart A -

"Miner" means, for purposes of Sections 48.3 through 48.10 of this Subpart A, any person working in an underground mine and who is engaged in the extraction and production process, or who is regularly exposed to mine hazards, or who is a maintenance or service worker employed by the operator or a maintenance or service worker contracted by the operator to work at the mine for frequent or extended periods. This definition shall include the operator if the operator works underground on a continuing, even if irregular, basis. Short term, specialized contract workers, such as drillers and blasters, who are engaged in the extraction and production process and who have received training under Section 48.6 (Training of newly-employed experienced miners) of this Subpart A may, in lieu of subsequent training under that section for each new employment, receive training under Section 48.11 (Hazard training) of this Subpart A. This definition does not include:

(i) Workers under Subpart C of this part 48, including shaft and slope workers, workers engaged in construction activities ancillary to shaft and slope sinking, and workers engaged in the construction of major additions to an existing mine which requires the mine to cease operations;

(ii) Supervisory personnel subject to MSHA approved State certification requirements; and,

(iii) Any person covered under paragraph (a)(2) of this section.

POLICY

General

A miner as defined by Section 48.2 (a)(1) must receive the applicable training specified by Sections 48.5 through 48.8. The term "miner" includes all individuals who are engaged in activities that expose them to mining hazards on a "regular" or "frequent" basis. Regular exposure is a recognizable pattern of exposure on a recurring basis. Exposure to hazards for more than five consecutive working days is frequent exposure.

Supervisors

Mining supervisors who are certified in accordance with MSHA-approved state certification requirements are not required to be trained under Part 48 to the extent that they perform supervisory work. However, if non-supervisory work is performed, the appropriate training must have been completed. For example, if a supervisor operates mining equipment, or performs extraction, production, and maintenance work, that supervisor is a "miner" when performing this work and must have been given task training under Section 48.7. Performance of incidental tasks related to mining, such as assisting experienced miners, does not require that a supervisor be given Part 48 training.

LEHMAN 00470

Persons Performing Construction, Maintenance, or Repair Work

Construction work includes the building, rebuilding, alteration, or demolition of any facility, or addition to an existing facility. Installing or rebuilding of a conveyor system would normally be considered construction. Maintenance or repair work includes routine upkeep of operable equipment or facilities, and the fixing or equipment of facilities. Replacement of a conveyor belt would normally be considered maintenance or repair.

The training required for persons performing construction, or maintenance or repair work often depends upon: 1) whether or not a mine is operational; 2) whether the work is performed on a regular basis; and 3) whether the exposure to mining hazards is frequent. Generally, a mine is operational if it is producing material or if a regular maintenance shift is ongoing; it is not operational if it is not producing material due to miners' vacations, strikes, or other shutdown periods. Work performed on a frequent basis is work performed for more than five consecutive working days. Regular exposure to mine hazards is exposure that follows a recognizable pattern on a recurring basis.

The following guidelines should be used to apply the above factors:

(1) If workers are performing shaft and slope construction work, whether or not the mine is operational - No training is required.

(2) If the mine is not operational and workers are performing construction work - No training is required.

(3) If the workers are performing maintenance or repair work on an infrequent or irregular basis, and they are independent contractors or their employees, Hazard training under 48.11 is required. However, if such workers are employees of the operator - Comprehensive training under Subpart A is required.

(4) If workers are performing maintenance or repair work on a frequent or regular basis, whether or not the mine is operational - Comprehensive training under Subpart A is required.

LEHMAN 00471

Section 48.2 (a)(2) "Miner"

Regulation

For purposes of this Subpart A -

Miner means, for purposes of Section 48.11 (Hazard training) of this Subpart A, any person working in an underground mine and excluding persons covered under paragraph (a)(1) of this Section and Subpart C of this part and supervisory personnel subject to MSHA approved State certification. requirements. This definition includes any delivery, office, or scientific worker or occasional, short term maintenance or service worker contracted by the operator, and any student engaged in academic projects involving his or her extended presence at the mine.

POLICY

For purposes of hazard training (Section 48.11) a "miner" is a person who is exposed to mine hazards for a short time (five or less consecutive working days) and who will not be exposed to these hazards on a regular basis. Regular exposure is a recognizable pattern of exposure on a recurring basis.

Miners included within this definition must be accompanied by an experienced miner at all times while underground. The required training should be commensurate with the expected exposure to hazards.

I FHMAN 00472

Section 48.2 (b) "Experienced Miner"

REGULATION

For purposes of this Subpart A -

"Experienced miner" means a person who is employed as an underground miner, as defined in paragraph (a)(1) of this section, on the effective date of these rules; or a person who has received training acceptable to MSHA from an appropriate State agency within the preceding 12 months; or a person who has had at least 12 months experience working in an underground mine during the preceding 3 years; or a person who has received the training for a new miner within the preceding 12 months as prescribed in Section 48.5 (Training of new miners) of this Subpart A.

POLICY

Under Section 48.2(b) an "experienced miner" is an underground miner who:

(1) Was employed as an underground miner on October 13, 1978; or

(2) Received State training acceptable to MSHA within the 12 months immediately preceding employment; or

(3) Had at least 12 months underground work experience in the 3 years immediately preceding employment; or

(4) Received MSHA approved new miner training within the 12 months immediately preceding employment.

Miners included within any of the above categories need not be provided new miner training (Section 48.5). Newly employed experienced miner (Section 48.6), annual refresher (Section 48.8), and when appropriate, task training (Section 48.7) are required.

LEHMAN 00473

Section 48.2 (c) "New Miner"

REGULATION

For purposes of this Subpart A -

"New miner" means a miner who is not an experienced miner.

POLICY

An experienced surface miner who begins work in an underground mine is for training purposes a new miner, and must be provided new miner training under Section 48.5. Credit is allowed for applicable surface training (Subpart B).

I FHMAN 00474

Section 48.2(d) "Normal working hours"

REGULATION

For purposes of this Subpart A -

"Normal working hours" means a period of time during which a miner is otherwise scheduled to work. This definition does not preclude scheduling training classes on the sixth or seventh working day if such a work schedule has been established for a sufficient period of time to be accepted as the operator's common practice. Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks.

POLICY

Training may only be conducted during "normal working hours." "Normal working hours" are determined on a case-by-case basis. Factors such as past practices and patterns of scheduling work should be considered.

Miners attending a Part 48 training session during "normal working hours" must be paid at the rate they would receive if they were working at the time. A reasonable rest period between training sessions and working shifts should be provided.

LEHMAN 00475

Section 48.2(e) "Operator"

REGULATION

For purposes of the Subpart A -

"Operator" means any owner, lessee, or other person who operates, controls or supervises an underground mine; or any independent contractor identified as an operator performing services or construction at such mine.

POLICY

Independent contractors are responsible for the Part 48 training of their employees (see Federal Register Tuesday, July 1, 1980 Procedures and Requirements for Identification of Independent Contractors 30 CFR Part 45, Supplementary Information; IV Enforcement Guidelines). A contractor may have its own training plan or may utilize the mine operator's plan.

Section 48.2 (f) "Task"

REGULATION

For purposes of the Subpart A -

"Task" means a work assignment that includes duties of a job that occur on a regular basis and which requires physical abilities and job knowledge.

POLICY

An example of a task for an individual with the job title of roof or rock bolter is torquing bolts.

LEHMAN 00477

Section 48.3 Training plans; time of submission; where filed; information required; time for approval; method for disapproval; commencement of training; approval of instructors.

REGULATION

(a) Each operator of an underground mine shall have an MSHA approved plan containing programs for training new miners, training newly-employed experienced miners, training miners for new tasks, annual refresher training, and hazard training for miners as follows:

(1) In the case of an underground mine which is operating on the effective date of this Subpart A, the operator of the mine shall submit such plan for approval within 90 days after the effective date of this Subpart A.

(2) Within 60 days after the operator submits the plan for approval, unless extended by MSHA, the operator shall have an approved plan for the mine.

(3) In the case of a new underground mine which is to be opened or a mine which is to be reopened or reactivated after the effective date of this Subpart A, the operator shall have an approved plan prior to opening the new mine, or reopening or reactivating the mine.

(b) The training plan shall be filed with the District Manager for the area in which the mine is located.

(c) Each operator shall submit to the District Manager the following information:

(1) The company name, mine name, and MSHA identification number of the mine.

(2) The name and position of the person designated by the operator who is responsible for health and safety training at the mine. This person may be the operator.

(3) A list of MSHA approved instructors with whom the operator proposes to make arrangements to teach the courses, and the courses each instructor is qualified to teach.

(4) The location where training will be given for each course.

(5) A description of the teaching methods and the course materials which are to be used in training.

(6) The approximate number of miners employed at the mine and the maximum number who will attend each session of training.

(7) The predicted time or periods of time when regularly scheduled refresher training will be given. This schedule shall include the titles of courses to be taught, the total number of instruction hours for each course, and the predicted time and length of each session of training.

I FHMAN 00478

(8) For the purposes of Section 48.7 (New task training of miners) of this Subpart A, the operator shall submit:

(i) A complete list of task assignments to correspond with the definition of "task" in Section 48.2 (f) of this Subpart A.

(ii) The titles of personnel conducting the training for this section.

(iii) The outline of training procedures used in training miners in those work assignments listed according to paragraph (c) (8) (i) of this section.

(iv) The evaluation procedures used to determine the effectiveness of training under Section 48.7 of this Subpart A.

(d) The operator shall furnish to the representative of the miners a copy of the training plan 2 weeks prior to its submission to the District Manager. Where a miners' representative is not designated, a copy of the plan shall be posted on the mine bulletin board 2 weeks prior to its submission to the District Manager. Written comments received by the operator from miners or their representatives shall be submitted to the District Manager. Miners or their representatives may submit written comments directly to the District Manager.

(e) All training required by the training plan submitted to and approved by the District Manager as required by this Subpart A shall be subject to evaluation by the District Manager to determine the effectiveness of the training programs. If it is deemed necessary, the District Manager may require changes in, or additions to, programs. Upon request from the District Manager the operator shall make available for evaluation the instructional materials, handouts, visual aids and other teaching accessories used or to be used in the training programs. Upon request from the District Manager the operator shall provide information concerning schedules of upcoming training.

(f) The operator shall make a copy of the MSHA approved training plan available at the mine site for MSHA inspection and for examination by the miners and their representatives.

(g) Except as provided in Section 48.7 (New task training of miners) and Section 48.11 (Hazard training) of this Subpart A, all courses shall be conducted by MSHA approved instructors.

(h) Instructors shall be approved by the District Manager in one or more of the following ways:

(1) Instructors shall take an instructor's training course conducted by the District Manager or given by persons designated by the District Manager to give such instruction; and instructors shall have satisfactorily completed a program of instruction approved by the Office of Educational Policy and Development, MSHA, in the subject matter to be taught.

(2) Instructors may be designated by MSHA as approved instructors to teach specific courses based on written evidence of the instructors' qualifications and teaching experience.

LEHMAN 00479

(3) At the discretion of the District Manager, instructors may be designated by MSHA as approved instructors to teach specific courses based on the performance of the instructors while teaching classes monitored by MSHA. Operators shall indicate in the training plans submitted for approval whether they want to have instructors approved based on monitored performance. The District Manager shall consider such factors as the size of the mine, the number of employees, the mine safety record and remoteness from a training facility when determining whether instructor approval based on monitored performance is appropriate.

(4) On the effective date of this Subpart A, cooperative instructors who have been designated by MSHA to teach MSHA approved courses and who have taught such courses within the 24 months prior to the effective date of this Subpart shall be considered approved instructors for such courses.

(i) Instructors may have their approval revoked by MSHA for good cause which may include not teaching a course at least once every 24 months. Before any revocation is effective, the District Manager must send written reasons for revocation to the instructor and the instructor shall be given an opportunity to demonstrate or achieve compliance before the District Manager on the matter. A decision by the District Manager to revoke an instructor's approval may be appealed by the instructor to the Administrator for Coal Mine Safety and Health or Administrator for Metal and Nonmetal Safety and Health, as appropriate, MSHA, 4015 Wilson Boulevard, Arlington, Va 22203. Such an appeal shall be submitted to the Administrator within 5 days of notification of the District Manager's decision. Upon revocation of an instructor's approval, the District Manager shall immediately notify operators who use the instructor for training.

(j) The District Manager for the area in which the mine is located shall notify the operator and the miners' representative, in writing, within 60 days from the date on which the training plan is filed, of the approval or status of the approval of the training programs.

(l) If revisions are required for approval, or to retain approval thereafter, the revisions required shall be specified to the operator and the miners' representative and the operator and miners' representative shall be afforded an opportunity to discuss the revisions with the District Manager, or to propose alternate revisions or changes. The District Manager, in consultation with the operator and the representative of the miners, shall fix a time within which the discussion will be held, or alternate revisions or changes submitted, before final approval is made.

(2) The District Manager may approve separate programs of the training plan and withhold approval of other programs, pending discussion of revisions or submission of alternate revisions or changes.

(k) Except as provided under Section 48.8 (c) (Annual refresher training of miners) of this Subpart A, the operator shall commence training of miners within 60 days after approval of the training plan, or approved programs of the training plan.

I FHMAN 00480

(l) The operator shall notify the District Manager of the area in which the mine is located, and the miners' representative of any changes or modifications the operator proposes to make in the approved training plan. The operator shall obtain the approval of the District Manager for such changes or modifications.

(m) In the event the District Manager disapproves a training plan or a proposed modification of a training plan or requires changes in a training plan or modification, the District Manager shall notify the operator and the miners' representative in writing of:

(1) The specific changes or items of deficiency.

(2) The action necessary to effect the changes or bring the disapproved training plan or modification into compliance.

(3) The deadline for completion of remedial action to effect compliance, which shall serve to suspend punitive action under the provisions of Sections 104 and 110 of the Act and other related regulations until that established deadline date, except that no such suspension shall take place in imminent danger situations.

(n) The operator shall post on the mine bulletin board, and provide to the miners' representative, a copy of all MSHA revisions and decisions which concern the training plan at the mine and which are issued by the District Manager.

POLICY

Sections 48.3 (a)(1), 48.3 (a)(2), and 48.3 (k) are no longer applicable. These sections were intended to allow operators time for initial implementation of Part 48. Each operator now has ample time to prepare a training plan prior to opening a new mine or reopening a closed mine, and is therefore expected to provide training prior to assigning work duties.

Each operator must submit the information required by 48.3(c), and may use any format that is logical and reasonable. Operators must indicate a predicted time that training will occur, such as the first week of each quarter. Specific days and times can be obtained as needed upon request.

Instructors for Task Training

Under Section 48.3 (g) task training required by Section 48.7 may be given by a qualified trainer, experienced supervisor, or by persons experienced in the particular task. Section 48.3 (c)(8)(ii) requires listing in the training plan only the job titles of the persons conducting the task training, and not their names.

I FHMAN 00481

Section 48.4 Cooperative training program.

REGULATION

(a) An operator of a mine may conduct his own training programs, or may participate in training programs conducted by MSHA, or may participate in MSHA approved training programs conducted by State or other Federal agencies, or associations of mine operators, miners' representatives, other mine operators, private associations, or educational institutions.

(b) Each program and course of instruction shall be given by instructors who have been approved by MSHA to instruct in the courses which are given, and such courses and the training programs shall be adapted to the mining operations and practices existing at the mine and shall be approved by the District Manager for the area in which the mine is located.

LEHMAN 00482

Section 48.5 Training of new miners; minimum courses of instruction; hours of instruction.

REGULATION

(a) Each new miner shall receive no less than 40 hours of training as prescribed in this section before such miner is assigned to work duties. Such training shall be conducted in conditions which as closely as practicable duplicate actual underground conditions, and approximately 8 hours of training shall be given at the mine site.

(b) The training program for new miners shall include the following courses:

(1) Instruction in the statutory rights of miners and their representatives under the Act; authority and responsibility of supervisors. The course shall include instruction in the statutory rights of miners and their representatives under the Act, including a discussion of Section 2 of the Act; a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(2) Self rescue and respiratory devices. The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices used at the mine. Such course shall be given before the new miner goes underground.

(3) Entering and leaving the mine; transportation; communications. The course shall include instruction on the procedures in effect for entering and leaving the mine; the check-in and check out system in effect at the mine; the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(4) Introduction to the work environment. The course shall include a visit and tour of the mine, or portions of the mine which are representative of the entire mine. A method of mining utilized at the mine shall be observed and explained.

(5) Mine map; escapeways; emergency evacuation; barricading. The course shall include a review of the mine map; the escapeway system; the escape, firefighting, and emergency evacuation plans in effect at the mine; and the location of abandoned areas. Also included shall be an introduction to the methods of barricading and the locations of the barricading materials, where applicable. The program of instruction for escapeways and emergency evacuation plans approved by the District Manager shall be used for this course.

(6) Roof or ground control and ventilation plans. The course shall include an introduction to and instruction on the roof or ground control plan in effect at the mine and procedures for roof and rib or ground control; and an introduction to and instruction in the ventilation plan in effect at the mine and the procedures for maintaining and controlling ventilation.

LEHMAN 00483

(7) Health. The course shall include instruction on the purpose of taking dust, noise, and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(8) Cleanup; rock dusting. The course shall include instruction on the purpose of rock dusting and the cleanup and rock dusting program in effect at the mine, where applicable.

(9) Hazard recognition. The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

(10) Electrical hazards. The course shall include recognition and avoidance of electrical hazards.

(11) First aid. The course shall include instruction in first aid methods acceptable to MSHA.

(12) Mine gases. The course shall include instruction in the detection and avoidance of hazards associated with mine gases.

(13) Health and safety aspects of the tasks to which the new miner will be assigned. The course shall include instruction in the health and safety aspects of the tasks to be assigned, the safe work procedures of such tasks, and mandatory health and safety standards pertinent to such tasks.

(14) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(c) Methods, including oral, written, or practical demonstration, to determine successful completion of the training shall be included in the training plan. The methods for determining such completion shall be administered to the miner before he is assigned work duties.

(d) Upon proof by an operator that a newly employed miner has received the courses and hours of instruction set forth in paragraphs (a) and (b) of this section within 12 months preceding initial employment at a mine, such miner need not repeat the training, but the operator shall give and the miner shall receive and complete the instruction and program of training set forth in paragraph (b) of Section 48.6 (Training of newly employed experienced miners), and Section 48.7 (New task training of miners), if applicable, before commencing work.

POLICY

An experienced surface miner who begins work in an underground mine is for training purposes a new miner, and must be provided new miner training under Section 48.5. Credit is allowed for applicable surface training (Subpart B).

LEHMAN 00484

Job Site Training

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Job site training must be completed under close and continuous supervision of an approved instructor with training, not production, as the primary goal. The training is acceptable if the following conditions are met:

1. Instructors must follow an outline in which each step of the job is broken down into instructional units. The students must demonstrate safe performance of each job step. Several units may be combined in the same instructional period.

2. All health and safety standards must be observed.

I FHMAN 00485

Section 48.6 Training of newly employed experienced miners; minimum courses of instruction.

REGULATION

(a) A newly employed experienced miner shall receive and complete training in the program of instruction prescribed in this section before such miner is assigned to work duties.

(b) The training program for newly employed experienced miners shall include the following:

(1) Introduction to work environment. The course shall include a visit and tour of the mine. The methods of mining utilized at the mine shall be observed and explained.

(2) Mandatory health and safety standards. The course shall include the mandatory health and safety standards pertinent to the tasks to be assigned.

(3) Authority and responsibility of supervisors and miners' representatives. The course shall include a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and procedures for reporting hazards.

(4) Entering and leaving the mine; transportation; communications. The course shall include instruction in the procedures in effect for entering and leaving the mine; the check-in and check-out system in effect at the mine; the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(5) Mine map; escapeways; emergency evacuation; barricading. The course shall include a review of the mine map; the escapeway system; the escape, firefighting, and emergency evacuation plans in effect at the mine; the location of abandoned areas; and where applicable, methods of barricading and the locations of barricading materials. The program of instruction for escapeways and emergency evacuation plans approved by the District Manager shall be used for this course.

(6) Roof or ground control and ventilation plans. The course shall include an introduction to and instruction on the roof or ground control plan in effect at the mine and procedures for roof and rib or ground control; and an introduction to and instruction on the ventilation plan in effect at the mine and the procedures for maintaining and controlling ventilation.

(7) Hazard recognition. The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

LEHMAN 00486

(8) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

POLICY

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Guidelines for job site training are set out in Section 48.5 Policy.

LEHMAN 00487

Section 48.7 Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.

REGULATION

(a) Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor systems operators, roof and ground control machine operators, and those in blasting operations shall not perform new work tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed. This training shall not be required for miners who have been trained and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. This training shall also not be required for miners who have performed the new work tasks and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. The training program shall include the following:

(1) Health and safety aspects and safe operating procedures for work tasks, equipment, and machinery. The training shall include instruction in the health and safety aspects and the safe operating procedures related to the assigned tasks, and shall be given in an on-the-job environment; and

(2) (i) Supervised practice during nonproduction. The training shall include supervised practice in the assigned tasks, and the performance of work duties at times or places where production is not the primary objective; or

(ii) Supervised operation during production. The training shall include, while under direct and immediate supervision and production is in progress, operation of the machine or equipment and the performance of work duties.

(3) New or modified machines and equipment. Equipment and machine operators shall be instructed in safe operating procedures applicable to new or modified machines or equipment to be installed or put into operation in the mine, which require new or different operating procedures.

(4) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(b) Miners under paragraph (a) of this section shall not operate the equipment or machine or engage in blasting operations without direction and immediate supervision until such miners have demonstrated safe operating procedures for the equipment or machine or blasting operation to the operator or the operator's agent.

(c) Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task, prior to performing such task.

I FHMAN 00488

(d) Any person who controls or directs haulage operations at a mine shall receive and complete training courses in safe haulage procedures related to the haulage system, ventilation system, firefighting procedures, and emergency evacuation procedures in effect at the mine before assignment to such duties.

(e) All training and supervised practice and operation required by this section shall be given by a qualified trainer, or a supervisor experienced in the assigned tasks, or other person experienced in the assigned tasks.

LEHMAN 00489

Section 48.8 Annual refresher training of miners; minimum courses of instruction; hours of instruction.

REGULATION

(a) Each miner shall receive a minimum of 8 hours of annual refresher training as prescribed in this section.

(b) The annual refresher training program for all miners shall include the following courses of instruction:

(1) Mandatory health and safety standards. The course shall include mandatory health and safety standard requirements which are related to the miner's tasks.

(2) Transportation controls and communication systems. The course shall include instruction on the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(3) Barricading. The course shall include a review of the methods of barricading and locations of barricading materials, where applicable.

(4) Roof or ground control and ventilation plans. The course shall include a review of roof or ground control plans in effect at the mine and the procedures for maintaining and controlling ventilation.

(5) First aid. The course shall include a review of first aid methods acceptable to MSHA.

(6) Electrical hazards. The course shall include recognition and avoidance of electrical hazards.

(7) Prevention of accidents. The course shall include a review of accidents and causes of accidents, and instruction in accident prevention in the work environment.

(8) Self-rescue devices and respiratory devices. The course shall include instruction in the use, care and maintenance of self-rescue and respiratory devices.

(9) Explosives. The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when there are no explosives used or stored on the mine property.

(10) Mine gases. The course shall include instruction in the detection and avoidance of hazards associated with mine gases.

(11) Health. The course shall include instruction on the purpose of taking dust, noise, and other health measurements and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

LEHMAN 00490

(12) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(c) All experienced miners already employed at a mine on the effective date of the Act (March 9, 1978) shall receive refresher training, as prescribed in this section and in accordance with the approved plan, to begin not more than 90 days after the date of approval of the training program required by this Subpart A.

(d) Where annual refresher is conducted periodically, such sessions shall not be less than 30 minutes of actual instruction time and the miners shall be notified that the session is part of annual refresher training.

POLICY

Section 48.8 (c) applied during the implementation of the regulation and is no longer applicable.

Operators may provide annual refresher training any time during the last calendar month of the miners' annual refresher training cycle. To illustrate this policy: miners who began work in June 1984, may complete their annual refresher training any time in June 1985. Accordingly, training records and schedules may be maintained on a monthly basis, rather than tracking each miner's individual training date. Also, operators should be encouraged to schedule annual refresher training at the beginning of the month so that if for some reason a miner misses the regularly scheduled training, there will still be a reasonable opportunity for the training to be made-up before the end of the month.

Refresher Training Following an Absence

The following training is required for experienced miners as defined in Section 48.2(b) who return to work following an absence:

(1) When an experienced miner returns to the same mine following an absence and less than 12 months have elapsed since the miner received new miner, newly employed experienced miner, or annual refresher training, the mine operator should provide training that covers any changes in conditions or procedures at the mine, before the miner is assigned to work duties. This training may be credited toward the miner's annual refresher training. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task. The miner shall be given annual refresher training within 12 months of the last completion date of new miner, newly employed experienced miner, or annual refresher training.

(2) When an experienced miner returns to the same mine following an absence and more than 12 months have elapsed since the miner received new miner, newly employed experienced miner, or annual refresher training, the operator shall provide annual refresher training before the miner begins work unless there has been an extension of time by the District Manager. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task.

I FHMAN 00491

(3) When an experienced miner is assigned to a different mine following an absence, the mine operator shall provide the miner with newly employed experienced miner training before the miner begins work. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task.

The above does not apply to experienced surface miners assigned to work underground for the first time. These miners are "new miners" under the training regulations and must receive new miner training. Credit can be given for applicable surface training.

Extension of Time to Complete Annual Refresher Training

The unexpected return of miners after extended absence or similar unforeseeable circumstances may create a strain between the completion of quality refresher training and prompt return of the miners to productive employment.

In order to accommodate unforeseeable events, District Managers may consider requests for limited extensions of time to complete annual refresher training. Such requests will be considered on a case-by-case basis, and be granted only if:

(1) The miners involved are experienced, as defined by Section 48.2(b);

(2) Good faith efforts were made by the operator to train the miners before the annual refresher training anniversary date passed;

(3) The miners, before returning to work, will be given any task training required by Section 48.7, and will be thoroughly instructed in any changes in procedure at the mine or in the mining environment, including changes in roof control, ventilation, emergency escapeways, and transportation controls; and,

(4) The required annual refresher training will be promptly completed.

Subject to additional conditions that the District Manager may require, a request for a limited extension of time to complete annual refresher training may be granted when these factors are met. In no case, however, should extensions be granted to correct poor scheduling practices or failure to anticipate foreseeable training needs, nor should provisions for an extension of time appear in an operator's approved training plan or otherwise be routinely granted.

When extensions of time to complete annual refresher training are granted, such extensions should be confirmed in writing to the operator, stating the conditions of the extension, and the date that refresher training will be completed. The completion date of an annual refresher training cycle initiates a new anniversary date.

LEHMAN 00492

Approval of Training Plans

An effective refresher training program must be adapted to changes in mining conditions, accident history, and other training concerns. Time spent for each course may vary to meet specific needs. The following guidelines should be used to evaluate provisions for annual refresher training:

(a) The annual required refresher training courses listed in Section 48.8 that are not applicable to a particular mine may be omitted from that mine's training plan. A notation of which courses that are not applicable should appear in the training plan.

(b) An 8 hour minimum is required for the total annual refresher training program. However, the time spent on individual courses may vary from year to year or from one area of the mine to another depending on specific safety or health problems encountered. The mine's accident experience should significantly influence the amount and type of training miners receive throughout the year.

(c) All applicable refresher training courses listed in the approved training plan are to be given during each 12-month cycle. However, two or more of the courses may be covered in one training session or safety meeting. For example, a well structured safety meeting may cover ground control, related safety standards, prevention of accidents, and other topics without the necessity of separate blocks of instruction.

(d) Safety meetings of at least 30 minutes duration, conducted by an MSHA approved instructor, and addressing appropriate course content are acceptable training sessions that satisfy the annual refresher requirements.

Training plans may be revised to reflect training needs. Requests for revisions should be submitted in accordance with Section 48.3 (l).

Job Site Training

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Guidelines for job site training are set out in Section 48.5 Policy.

LEHMAN 00493

Section 48.9 Records of Training.

REGULATION

(a) Upon a miner's completion of each MSHA approved training program, the operator shall record and certify on MSHA Form 5000-23 that the miner has received the specified training. A copy of the training certificate shall be given to the miner at the completion of the training. The training certificates for each miner shall be available at the mine site for inspection by MSHA and for examination by the miners, the miners' representative, and State inspection agencies. When a miner leaves the operator's employ, the miner shall be entitled to a copy of his training certificates.

(b) False certification that training was given shall be punishable under Section 110(a) and (f) of the Act.

(c) Copies of training certificates for currently employed miners shall be kept at the mine site for 2 years, or for 60 days after termination of employment.

POLICY

Approved Forms

All Part 48 training must be properly recorded by the operator on an MSHA Form 5000-23 (training certificate), or on an MSHA approved alternate form. Alternate forms must include at least as much information as a Form 5000-23, and should be labeled MSHA Approved Alternate Form 5000-23 (current month and year). Forms proposed by the operator must be sent for approval to the Director of Educational Policy and Development, MSHA, 4015 Wilson Blvd., Arlington, Virginia, 22203.

Record-Keeping Requirements

Operators are required under Section 48.9 to give a copy of the training certificate, MSHA Form 5000-23 or alternate, to the miner upon completion of each MSHA approved training program. A "training program" is any miner training (i.e., new miner, newly employed experienced miner, task, or annual refresher training) completed during a 12-month training cycle.

In order to simplify record-keeping, all MSHA approved training programs completed within a miner's 12-month training cycle may be recorded on one Form 5000-23, provided the following procedures are used:

(1) Each time a miner completes an MSHA approved training program, the operator must initial and date the form to certify that the miner has received the specified training. Initialing and dating can be done in the space on the form adjacent to the type of training. Also, the miner should be given an opportunity to sign or initial the form.

(2) When an MSHA approved program is completed and recorded by the operator, a copy of the certificate must be given to the miner upon request.

FHMAN 00494

(3) At the end of the 12-month training cycle, or when the miner signs item 8 of the form, a copy of the completed form listing all completed training programs and signed by the person responsible for training at the mine must be given to the miner.

The training certificate, MSHA Form 5000-23, has been revised so that all training completed by a miner during the 12-month cycle may be recorded on one form.

Miscellaneous

Section 48.4 Cooperative Training Program - The cooperative trainer may sign the training certificate upon partial completion of cooperative training. Final signature upon completion of the program must be by the operator or his representative.

LEHMAN 00495

Section 48.10 Compensation for training.

REGULATION

(a) Training shall be conducted during normal working hours; miners attending such training shall receive the rate of pay as provided in Section 48.2(d) (Definition of normal working hours) of this Subpart A.

(b) If such training shall be given at a location other than the normal place of work, miners shall be compensated for the additional cost, such as mileage, meals, and lodging, they may incur in attending such training sessions.

POLICY

Section 48.10 implements Section 115(b) of the Mine Act ("miners shall be paid at their normal rate of compensation while taking such training"). Section 48.2(d), which defines "normal working hours", states in part that: "Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks."

The purpose of both the statute and the regulations is to assure that miners are not financially penalized when they receive training during working hours. For example, if a miner is "cross shifted," and the "cross shift" is considered normal working hours, the rate of pay the miner would receive if working is the rate the miner must receive while in training.

LEHMAN 00496

Section 48.11 Hazard Training.

REGULATION

(a) Operators shall provide to those miners, as defined in Section 48.2(a)(2) (Definition of miner) of this Subpart A, a training program before such miners commence their work duties. This training program shall include the following instruction, which is applicable to the duties of such miners:

(1) Hazard recognition and avoidance;

(2) Emergency and evacuation procedures;

(3) Health and safety standards, safety rules, and safe working procedures;

(4) Self-rescue and respiratory devices; and

(5) Such other instruction as may be required by the District Manager based on circumstances and conditions at the mine.

(b) Miners shall receive the instruction required by this section at least once every 12 months.

(c) The training program required by this section shall be submitted with the training plan required by Section 48.3(a) (Training plans: Submission and approval) of this Subpart A and shall include a statement on the methods of instruction to be used.

(d) In accordance with Section 48.9 (Records of training) of this Subpart A, the operator shall maintain and make available for inspection certificates that miners have received the hazard training required by this section.

(e) Miners subject to hazard training shall be accompanied at all times while underground by an experienced miner, as defined in Section 48.2(b) (Definition of miner) of this Subpart A.

POLICY

The exposure to mining hazards varies according to task. The greater the hazard exposure, the greater the need for training.

Hazard training should be:

1. Mine specific, so that persons are advised of the hazards they may encounter at a particular mine; and

2. Conducted each time a person enters a different mine.

Although the amount of required hazard training will vary, the following are examples of appropriate hazard training:

I FHMAN 00497

Employees of Equipment Manufacturers

1. Employees who are on the mine site in a service or maintenance capacity must be given training in accordance with their exposure to hazards. If the specific job will not entail extended exposure to hazards at the mine, they need only be given hazard training. If the job assignment of a service or maintenance worker exceeds five consecutive working days at a particular mine, comprehensive training must be given — either new miner training or newly employed experienced miner training, as appropriate.

2. Manufacturers' field representatives, such as sales representatives and delivery personnel, must be given hazard training. If they are frequently exposed to mine hazards (more than 5 consecutive working days), they must be given comprehensive training — either new miner or newly employed experienced miner training, as appropriate.

Labor, Management or Government Officials

1. Labor, management, or government officials visiting the mine site need not be given training. However, such persons should be accompanied by experienced miners and be provided with appropriate safety equipment. In addition, visitors to coal mines shall be provided with and instructed in the use and location of the self-rescue device made available at the mine as required by 30 CFR 75.1714. Visitors to metal/nonmetal mines shall be provided with the self-rescue device required by 30 CFR 57.15-30 and 57.15-31, and trained pursuant to 57.18-28(b).

2. Contractors doing work for the government that requires their presence at the mine to observe conditions or to collect information must be given hazard training.

3. Authorized Representatives of the Secretary of Labor or Secretary of Health and Human Services need not be given any training or be accompanied when carrying out duties required by 30 CFR or by the Mine Act.

Other Visitors

1. Short-term visitors to mine sites who are not required to be provided Part 48 training must be provided with and instructed in the use and location of the self rescue device made available at the mine as required by 30 CFR 75.1714, or be provided with the self rescue device required by 30 CFR 57.15-30 and 57.15-31, and trained pursuant to 57.18-28(b), as applicable.

LEHMAN 00498

Section 48.12 Appeals Procedures.

REGULATION

The operator, miner, and miners' representative shall have the right of appeal from a decision of the District Manager.

(a) In the event an operator, miner, or miners' representative decides to appeal a decision by a District Manager, such an appeal shall be submitted, in writing, to the Administrator for Coal Mine Safety and Health or Administrator for Metal and Non-metal Safety and Health, as appropriate, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203, within 30 days of notification of the District Manager's decision.

(b) The Administrator may require additional information from the operator, the miners, or their representatives, and the District Manager, if the Administrator determines such information is necessary.

(c) The Administrator shall render a decision on the appeal within 30 days after receipt of the appeal.

LEHMAN 00499

Subpart B-Training and Retraining of

Miners Working at Surface Mines and Surface Areas of

Underground Mines

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LEHMAN 00500

Section 48.21 Scope.

REGULATION

The provisions of this Subpart B set forth the mandatory requirements for submitting and obtaining approval of programs for training and retraining miners working in surface mines and surface areas of underground mines. Requirements regarding compensation for training and retraining are also included. The requirements for training and retraining miners working in underground mines are set forth in Subpart A of this part.

Policy

General

Section 115 of the Federal Mine Safety and Health Act of 1977 (Mine Act) and 30 CFR Part 48 require operators to submit and obtain approval of training plans under which miners are provided training. The training required by these plans must be provided to miners before they begin work at a mine, or before they receive new work tasks or assignments. Accordingly, when a miner is hired, transferred to a new work location, or is recalled from a panel under a collective bargaining agreement, the miner must be given the minimum training specified by Part 48.

Prohibited Practices

The statutory requirement that operators train miners before they begin work is not to be frustrated by employment practices that shift the operator's compliance responsibility for miner training to the miner. Therefore, operators may not make hiring, recall, transfer, or other employment decisions on the basis of the amount of training a miner has received or needs in order for the operator to achieve compliance. Miners who would otherwise be hired, recalled, or transferred cannot be bypassed merely because they need training under Part 48.

It is not inconsistent with Part 48 if a miner voluntarily acquires training prior to application for employment. Similarly, State required and conducted miner training can satisfy the requirements of Part 48.

Compliance Responsibility

Each operator is responsible for compliance with all applicable provisions of Part 48. Therefore, operators should be prepared to provide all necessary miner training. This compliance responsibility is not limited by training plans that do not provide for certain training, such as that required for a new miner.

Industries Affected by Congressional Resolution

A continuing resolution of the United States Congress currently prohibits MSHA from expending funds to administer or enforce Part 48 for the following industries: surface stone, surface clay, sand and gravel, surface limestone, colloidial phosphate, and shell dredging. Each of these industries, however, continues to be responsible for compliance with Part 48. The resolution does not affect training required by other applicable standards or regulations.

LEHMAN 00501

Section 48.22 Definitions.

Section 48.22 (a)(1) "Miner"

REGULATION

For the purpose of this Subpart B -

"Miner" means, for purposes of Sections 48.23 through 48.30 of this Subpart B, any person working in a surface mine or surface areas of an underground mine and who is engaged in the extraction and production process, or who is regularly exposed to mine hazards, or who is a maintenance or service worker employed by the operator or a maintenance or service worker contracted by the operator to work at the mine for frequent or extended periods. This definition shall include the operator if the operator works at the mine on a continuing, even if irregular, basis. Short-term, specialized contract workers, such as drillers and blasters, who are engaged in the extraction and production process and who have received training under Section 48.26 (Training of newly-employed experienced miners) of this Subpart B, may in lieu of subsequent training under that section for each new employment, receive training under Section 48.31 (Hazard training) of this Subpart B.

This definition does not include:

(i) Construction workers and shaft and slope workers under Subpart C of this Part 48;

(ii) Supervisory personnel subject to MSHA approved State certification requirements; and

(iii) Any person covered under paragraph (a)(2) of this section.

POLICY

General

A "miner" as defined by Section 48.22 (a)(1) must receive the applicable training specified by Sections 48.25 through 48.28. The term "miner" includes all individuals who are engaged in activities that expose them to mining hazards on a "regular" or "frequent" basis. Regular exposure is a recognizable pattern of exposure on a recurring basis. Exposure to hazards for more than five consecutive working days is frequent exposure.

Supervisors

Mining supervisors who are certified in accordance with MSHA-approved state certification requirements are not required to be trained under Part 48 to the extent that they perform supervisory work. However, if non-supervisory work is being performed, the appropriate training must have been completed. For example, if a supervisor operates mining equipment, or performs extraction, production, and maintenance work, that supervisor is a "miner" when performing this work and must have been given task training under Section 48.27. Performance of incidental tasks related to mining, such as assisting experienced miners, does not require that a supervisor be given Part 48 training.

I FHMAN 00502

Persons Performing Construction, Maintenance, or Repair Work

Construction work includes the building, rebuilding, alteration, or demolition of any facility, or addition to an existing facility. Installing or rebuilding of a conveyor system would normally be considered construction. Maintenance or repair work includes routine upkeep of operable equipment or facilities, and the fixing of equipment or facilities. Replacement of a conveyor belt would normally be considered maintenance or repair.

The training required for persons performing construction, or maintenance or repair work often depends upon: 1) whether or not a mine is operational; 2) whether the work is performed on a regular basis; and 3) whether the exposure to mining hazards is frequent. Generally, a mine is operational if it is producing material or if a regular maintenance shift is ongoing; it is not operational if it is not producing material due to miners' vacations, strikes, or other shutdown periods. Work performed on a frequent basis is work performed for more than five consecutive working days. Regular exposure to mine hazards is exposure that follows a recognizable pattern on a recurring basis.

The following guidelines should be used to apply the above factors:

(1) If workers are performing shaft and slope construction work, whether or not the mine is operational - No training is required.

(2) If the mine is not operational and workers are performing construction work - No training is required.

(3) If the workers are performing maintenance or repair work on an infrequent or irregular basis, and they are independent contractors or their employees, Hazard training under 48.31 is required. However, if such workers are employees the operator - Comprehensive training under Subpart B is required.

(4) If workers are performing maintenance or repair work on a frequent or regular basis, whether or not the mine is operational - Comprehensive training under Subpart B is required.

LEHMAN 00503

Section 48.22 (a)(2) "Miner"

Regulation

For purposes of this Subpart B -

Miner means, for purposes of Section 48.31 (Hazard training) of this Subpart B, any person working in a surface mine or surface areas of an underground mine excluding persons covered under paragraph (a)(1) of this section and Subpart C of this part and supervisory personnel subject to MSHA approved State certification requirements. This definition includes any delivery, office, or scientific worker, or occasional, short term maintenance or service worker contracted by the operator, and any student engaged in academic projects involving his or her extended presence at the mine.

POLICY

For purposes of hazard training (Section 48.31) a "miner" is a person who is exposed to mine hazards for a short time (five or less consecutive working days) and who will not be exposed to these hazards on a regular basis. Regular exposure is a recognizable pattern of exposure on a recurring basis.

The required training should be commensurate with the expected exposure to hazards.

LEHMAN 00504

Section 48.22 (b) "Experienced Miner"

REGULATION

For purposes of this Subpart B -

"Experienced miner" means a person who is employed as a miner, as defined in paragraph (a)(1) of this section, on the effective date of these rules; or a person who has received training acceptable to MSHA from an appropriate State agency within the preceding 12 months; or a person who has had at least 12 months experience working in a surface mine or surface area of an underground mine during the preceding 3 years; or a person who has received the training for a new miner within the preceding 12 months as prescribed in Section 48.25 (Training of new miners) of this Subpart B.

POLICY

Under Section 48.22(b) an "experienced miner" is a surface miner who:

(1) Was employed as a surface miner on October 13, 1978; or

(2) Received State training acceptable to MSHA within the 12 months immediately preceding employment; or

(3) Had at least 12 months surface work experience in the 3 years immediately preceding employment; or

(4) Received MSHA approved new miner training within the 12 months immediately preceding employment.

Miners included within any of the above categories need not be provided new miner training (Section 48.25). Newly employed experienced miner (Section 48.26), annual refresher (Section 48.28), and when appropriate, task training (Section 48.27) are required.

LEHMAN 00605

Section 48.22 (c) "New Miner"

REGULATION

For purposes of this Subpart B -

"New miner" means a miner who is not an experienced miner.

POLICY

An experienced underground miner who begins work in a surface mine or surface area of an underground mine is for training purposes a new miner, and must be provided new miner training under Section 48.25. Credit is allowed for applicable underground training (Subpart A).

LEHMAN 00506

Section 48.22 (d) "Normal working hours"

REGULATION

For purposes of this Subpart B -

"Normal working hours" means a period of time during which a miner is otherwise scheduled to work. This definition does not preclude scheduling training classes on the sixth or seventh working day if such a work schedule has been established for a sufficient period of time to be accepted as the operator's common practice. Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks.

POLICY

Training may only be conducted during "normal working hours." "Normal working hours" are determined on a case-by-case basis. Factors such as past practices and patterns of scheduling work should be considered.

Miners attending a Part 48 training session during "normal working hours" must be paid at the rate they would receive if they were working at the time. A reasonable rest period between training sessions and working shifts should be provided.

I FHMAN 00507

Section 48.22 (e) "Operator"

REGULATION

For purposes of this Subpart B -

"Operator" means any owner, lessee, or other person who operates, controls or supervises a surface mine or surface area of an underground mine; or any independent contractor identified as an operator performing services or construction at such mine.

POLICY

Independent contractors are responsible for the Part 48 training of their employees (see Federal Register Tuesday, July 1, 1980 Procedures and Requirements for Identification of Independent Contractors 30 CFR Part 45, Supplementary Information; IV Enforcement Guidelines). A contractor may have its own training plan or may utilize the mine operator's plan..

LEHMAN 00508

Section 48.22 (f) "Task"

REGULATION

For purposes of this Subpart B -

"Task" means a work assignment that includes duties of a job that occur on a regular basis and which requires physical abilities and job knowledge.

POLICY

An example of a task for an individual with the job title of front-end loader operator is loading trucks.

LEHMAN 00509

Section 48.23 Training plans; time of submission; where filed; information required; time for approval; method for disapproval; commencement of training; approval of instructors.

REGULATION

(a) Each operator of a mine shall have an MSHA approved plan containing programs for training new miners, training newly-employed experienced miners, training miners for new tasks, annual refresher training, and hazard training for miners as follows:

(1) In the case of a mine which is operating on the effective date of this Subpart B, the operator of the mine shall submit such plan for approval within 150 days after the effective date of this Subpart B.

(2) Within 60 days after the operator submits the plan for approval, unless extended by MSHA, the operator shall have an approved plan for the mine.

(3) In the case of a new mine which is to be opened or a mine which is to be reopened or reactivated after the effective date of this Subpart B, the operator shall have an approved plan prior to opening the new mine, or reopening or reactivating the mine unless the mine is reopened or reactivated periodically using portable equipment and mobile teams of miners as a normal method of operation by the operator. The operator to be so excepted shall maintain an approved plan for training covering all mine locations which are operated with portable equipment and mobile teams of miners.

(b) The training plan shall be filed with the District Manager for the area in which the mine is located.

(c) Each operator shall submit to the District Manager the following information:

(1) The company name, mine name, and MSHA identification number of the mine.

(2) The name and position of the person designated by the operator who is responsible for health and safety training at the mine. This person may be the operator.

(3) A list of MSHA approved instructors with whom the operator proposes to make arrangements to teach the courses, and the courses each instructor is qualified to teach.

(4) The location where training will be given for each course.

(5) A description of the teaching methods and the course materials which are to be used in training.

(6) The approximate number of miners employed at the mine and the maximum number who will attend each session of training.

I FHMAN 00510

(7) The predicted time or periods of time when regularly scheduled refresher training will be given. This schedule shall include the titles of courses to be taught, the total number of instruction hours for each course, and the predicted time and length of each session of training.

(8) For the purposes of Section 48.27 (New task training of miners) of this Subpart B, the operator shall submit:

(i) A complete list of task assignments to correspond with the definition of "task" in Section 48.22 (f) of this Subpart B.

(ii) The titles of personnel conducting the training for this section.

(iii) The outline of training procedures used in training miners in those work assignments listed according to paragraph (c) (8) (i) of this section.

(iv) The evaluation procedures used to determine the effectiveness of training under Section 48.27 of this Subpart B.

(d) The operator shall furnish to the representative of the miners a copy of the training plan 2 weeks prior to its submission to the District Manager. Where a miners' representative is not designated, a copy of the plan shall be posted on the mine bulletin board 2 weeks prior to its submission to the District Manager. Written comments received by the operator from miners or their representatives shall be submitted to the District Manager. Miners or their representatives may submit written comments directly to the District Manager.

(e) All training required by the training plan submitted to and approved by the District Manager as required by this Subpart B shall be subject to evaluation by the District Manager to determine the effectiveness of the training programs. If it is deemed necessary, the District Manager may require changes in, or additions to, programs. Upon request from the District Manager, the operator shall make available for evaluation the instructional materials, handouts, visual aids, and other teaching accessories used or to be used in the training programs. Upon request from the District Manager, the operator shall provide information concerning schedules of upcoming training.

(f) The operator shall make a copy of the MSHA approved training plan available at the mine site for MSHA inspection and for examination by the miners and their representatives.

(g) Except as provided in Section 48.27 (New task training of miners) and Section 48.31 (Hazard training) of this Subpart B, all courses shall be conducted by MSHA approved instructors.

LEHMAN 00511

(h) Instructors shall be approved by the District Manager in one or more of the following ways:

(1) Instructors shall take an instructor's training course conducted by the District Manager or given by persons designated by the District Manager to give such instruction; and instructors shall have satisfactorily completed a program of instruction approved by the Office of Educational Policy and Development, MSHA, in the subject matter to be taught.

(2) Instructors may be designated by MSHA as approved instructors to teach specific courses based on written evidence of the instructors' qualifications and teaching experience.

(3) At the discretion of the District Manager, instructors may be designated by MSHA as approved instructors to teach specific courses based on the performance of the instructors while teaching classes monitored by MSHA. Operators shall indicate in the training plans submitted for approval whether they want to have instructors approved based on monitored performance. The District Manager shall consider such factors as the size of the mine, the number of employees, the mine safety record and remoteness from a training facility when determining whether instructor approval based on monitored performance is appropriate.

(4) On the effective date of this Subpart B, cooperative instructors who have been designated by MSHA to teach MSHA approved courses and who have taught such courses within the 24 months prior to the effective date of this Subpart shall be considered approved instructors for such courses.

(i) Instructors may have their approval revoked by MSHA for good cause which may include not teaching a course at least once every 24 months. Before any revocation is effective, the District Manager must send written reasons for revocation to the instructor and the instructor shall be given an opportunity to demonstrate or achieve compliance before the District Manager on the matter. A decision by the District Manager to revoke an instructor's approval may be appealed by the instructor to the Administrator for Coal Mine Safety and Health or Administrator for Metal and Nonmetal Safety and Health, as appropriate, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203. Such an appeal shall be submitted to the Administrator within 5 days of notification of the District Manager's decision. Upon revocation of an instructor's approval, the District Manager shall immediately notify operators who use the instructor for training.

(j) The District Manager for the area in which the mine is located shall notify the operator and the miners' representative, in writing, within 60 days from the date on which the training plan is filed, of the approval or status of the approval of the training programs.

(l) If revisions are required for approval, or to retain approval thereafter, the revisions required shall be specified to the operator and the miners' representative and the operator and miners' representative shall be afforded an opportunity to discuss the revisions with the District Manager or to propose alternate revisions or changes. The District Manager, in consultation with the operator and the representative of the miners, shall fix a time within which the discussion will be held, or alternate revisions or changes submitted, before final approval is made.

I FHMAN 00512

(2) The District Manager may approve separate programs of the training plan and withhold approval of other programs, pending discussion of revisions or submission of alternate revisions or changes.

(k) Except as provided under Section 48.28 (c) (Annual Refresher Training of Miners) of this Subpart B, the operator shall commence training of miners within 60 days after approval of the training plan, or approved programs of the training plan.

(l) The operator shall notify the District Manager of the area in which the mine is located, and the miners' representative of any changes or modifications which the operator proposes to make in the approved training plan. The operator shall obtain the approval of the District Manager for such changes or modifications.

(m) In the event the District Manager disapproves a training plan or a proposed modification of a training plan or requires changes in a training plan or modification, the District Manager shall notify the operator and the miners' representative in writing of:

(1) The specific changes or items of deficiency.

(2) The action necessary to effect the changes or bring the disapproved training plan or modification into compliance.

(3) The deadline for completion of remedial action to effect compliance, which shall serve to suspend punitive action under the provisions of Sections 104 and 110 of the Act and other related regulations until that established deadline date, except that no such suspension shall take place in imminent danger situations.

(n) The operator shall post on the mine bulletin board, and provide to the miners' representative, a copy of all MSHA revisions and decisions which concern the training plan at the mine and which are issued by the District Manager.

POLICY

Sections 48.23 (a)(1), 48.23 (a)(2), and 48.23 (k) are no longer applicable. These sections were intended to allow operators time for initial implementation of Part 48. Each operator now has ample time to prepare a training plan prior to opening a new mine or reopening a closed mine, and is therefore expected to provide training prior to assigning work duties.

Each operator must submit the information required by 48.23 (c), and may use any format that is logical and reasonable. Operators must indicate a predicted time that training will occur, such as the first week of each quarter. Specific days and times can be obtained as needed upon request.

LEHMAN 00513

Instructors for Task Training

Under Section 48.23 (g) task training required by Section 48.27 may be given by a qualified trainer, experienced supervisor, or by persons experienced in the particular task. Section 48.23 (c)(8)(ii) requires listing in the training plan only the job titles of the persons conducting the task training, and not their names.

Section 48.24 Cooperative training program.

REGULATION

(a) An operator of a mine may conduct his own training programs, or may participate in training programs conducted by MSHA, or may participate in MSHA approved training programs conducted by State or other Federal agencies, or associations of mine operators, miners' representatives, other mine operators, private associations, or educational institutions.

(b) Each program and course of instruction shall be given by instructors who have been approved by MSHA to instruct in the courses which are given, and such courses and the training programs shall be adapted to the mining operations and practices existing at the mine and shall be approved by the District Manager for the area in which the mine is located.

I FHMAN 00514

Section 48.25 Training of new miners; minimum courses of instruction; hours of instruction.

REGULATION

(a) Each new miner shall receive no less than 24 hours of training as prescribed in this section. Except as otherwise provided in this paragraph, new miners shall receive this training before they are assigned to work duties. At the discretion of the District Manager, new miners may receive a portion of this training after assignment to work duties: Provided, that no less than 8 hours of training shall in all cases be given to new miners before they are assigned to work duties. The following courses shall be included in the 8 hours of training: Introduction to work environment, hazard recognition, and health and safety aspects of the tasks to which the new miners will be assigned. Following the completion of this preassignment training, new miners shall then receive the remainder of the required 24 hours of training, or up to 16 hours, within 60 days. Operators shall indicate in the training plans submitted for approval whether they want to train new miners after assignment to duties and for how many hours. In determining whether new miners may be given this training after they are assigned duties, the District Manager shall consider such factors as the mine safety record, rate of employee turnover and mine size. Miners who have not received the full 24 hours of new miner training shall be required to work under the close supervision of an experienced miner.

(b) The training program for new miners shall include the following courses:

(1) Instruction in the statutory rights of miners and their representatives under the Act; authority and responsibility of supervisors. The course shall include instruction in the statutory rights of miners and their representatives under the Act, including a discussion of Section 2 of the Act; a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(2) Self rescue and respiratory devices. The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices, where applicable.

(3) Transportation controls and communication systems. The course shall include instruction on the procedures in effect for riding on and in mine conveyances where applicable; the controls for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(4) Introduction to the work environment. The course shall include a visit and tour of the mine, or portions of the mine which are representative of the entire mine. A method of mining or operation utilized shall be observed and explained.

LEHMAN 00515

(5) Escape and emergency evacuation plans; firewarning and firefighting. The course shall include a review of the mine escape system, and escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and firefighting procedures.

(6) Ground control; working in areas of highwalls, water hazards, pits and spoil banks; illumination and night work. The course shall include, where applicable, an introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits and spoil banks; the illumination of work areas; and safe work procedures during the hours of darkness.

(7) Health. The course shall include instruction on the purpose of taking dust measurements, where applicable, and noise and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(8) Hazard recognition. The course shall include the recognition and avoidance of hazards present in the mine.

(9) Electrical hazards. The course shall include recognition and avoidance of electrical hazards.

(10) First aid. The course shall include instruction in first aid methods acceptable to MSHA.

(11) Explosives. The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when no explosives are used or stored on mine property.

(12) Health and safety aspects of the tasks to which the new miner will be assigned. The course shall include instruction in the health and safety aspects of the tasks to be assigned, the safe work procedures of such tasks, and the mandatory health and safety standards pertinent to such tasks.

(13) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(c) Methods, including oral written or practical demonstration, to determine successful completion of the training shall be included in the training plan. Upon completion of training, the methods for determining successful completion shall be administered to the miner. The method for determining successful completion of preassignment training under paragraph (a) of this section shall be administered to the miner before he is assigned to work duties.

LEHMAN 00516

(d) Upon proof by an operator that a newly employed miner has received the courses and hours of instruction set forth in paragraphs (a) and (b) of this section within 12 months preceding initial employment at a mine, such miner need not repeat the training, but the operator shall give and the miner shall receive and complete the instruction and program of training set forth in paragraph (b) of Section 48.26 (Training of newly employed experienced miners) and Section 48.27 (New task training of miners), if applicable, before commencing work.

POLICY

An experienced underground miner who begins work in a surface mine or surface area of an underground mine is for training purposes a new miner, and must be provided new miner training under Section 48.25. Credit is allowed for applicable underground training (Subpart A).

Job Site Training

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Job site training must be completed under close and continuous supervision of an approved instructor with training, not production, as the primary goal. The training is acceptable if the following conditions are met:

1. Instructors must follow an outline in which each step of the job is broken down into instructional units. The students must demonstrate safe performance of each job step. Several units may be combined in the same instructional period.

2. All health and safety standards must be observed.

I FHMAN 00517

Section 48.26 Training of newly employed experienced miners; minimum courses of instruction.

REGULATION

(a) A newly employed experienced miner shall receive and complete training in the program of instruction prescribed in this section before such miner is assigned to work duties.

(b) The training program for newly employed experienced miners shall include the following:

(1) Introduction to work environment. The course shall include a visit and tour of the mine. The methods of mining or operations utilized at the mine shall be observed and explained.

(2) Mandatory health and safety standards. The course shall include the mandatory health and safety standards pertinent to the tasks to be assigned.

(3) Authority and responsibility of supervisors and miners' representatives. The course shall include a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(4) Transportation controls and communication systems. The course shall include instruction on the procedures in effect for riding on and in mine conveyances; the controls for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(5) Escape and emergency evacuation plans; firewarning and firefighting. The course shall include a review of the mine escape systems; escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and firefighting procedures.

(6) Ground controls; working in areas of highwalls, water hazards, pits, and spoil banks; illumination and night work. The course shall include, where applicable, an introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits, and spoil banks; the illumination of work areas, and safe work procedures for miners during hours of darkness.

(7) Hazard recognition. The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

(8) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

POLICY

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Guidelines for job site training are set out in Section 48.25 Policy.

LEHMAN 00518

Section 48.27 Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.

REGULATION

(a) Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor systems operators, ground control machine operators, and those in blasting operations shall not perform new work tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed. This training shall not be required for miners who have been trained and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. This training shall also not be required for miners who have performed the new work tasks and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. The training program shall include the following:

(1) Health and safety aspects and safe operating procedures for work tasks, equipment, or machinery. The training shall include instruction in the health and safety aspects and safe operating procedures related to the assigned tasks, and shall be given in an on-the-job environment; and,

(2) (i) Supervised practice during nonproduction. The training shall include supervised practice in the assigned tasks, and the performance of work duties at times or places where production is not the primary objective; or,

(ii) Supervised operation during production. The training shall include, while under direct and immediate supervision and production is in progress, operation of the machine or equipment and the performance of work duties.

(3) New or modified machines and equipment. Equipment and machine operators shall be instructed in safe operating procedures applicable to new or modified machines or equipment to be installed or put into operation in the mine, which require new or different operating procedures.

(4) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(b) Miners under paragraph (a) of this section shall not operate the equipment or machine or engage in blasting operations without direction and immediate supervision until such miners have demonstrated safe operating procedures for the equipment or machine or blasting operation to the operator or the operator's agent.

(c) Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task, prior to performing such task.

(d) All training and supervised practice and operation required by this section shall be given by a qualified trainer, or a supervisor experienced in the assigned tasks, or other person experienced in the assigned tasks.

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Section 48.28 Annual refresher training of miners; minimum courses of instruction; hours of instruction.

REGULATION

Section (a) Each miner shall receive a minimum of 8 hours of annual refresher training as prescribed in this section.

Section (b) The annual refresher training program for all miners shall include the following courses of instruction:

(1) Mandatory health and safety standards. The course shall include mandatory health and safety standard requirements which are related to the miner's tasks.

(2) Transportation controls and communication systems. The course shall include instruction on the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(3) Escape and emergency evacuation plans; firewarning and firefighting. The course shall include a review of the mine escape system; escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and firefighting procedures.

(4) Ground control; working in areas of highwalls, water hazards, pits and spoil banks; illumination and night work. The course shall include, where applicable, a review and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits, and spoil banks; the illumination of work areas; and safe work procedures during hours of darkness.

(5) First aid. The course shall include a review of first aid methods acceptable to MSHA.

(6) Electrical hazards. The course shall include recognition and avoidance of electrical hazards.

(7) Prevention of accidents. The course shall include a review of accidents and causes of accidents, and instruction in accident prevention in the work environment.

(8) Health. The course shall include instruction on the purpose of taking dust measurements, where applicable, and noise and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(9) Explosives. The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when there are no explosives used or stored on the mine property.

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(10) Self-rescue and respiratory devices. The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices, where applicable.

(11) Such other courses as may be required by the District Manager based on circumstances and conditions at the mine.

(c) All experienced miners already employed at a mine on the effective date of the Act (March 9, 1978) shall receive refresher training, as prescribed in this section and in accordance with an approved plan, to begin not more than 90 days after the date of approval of the training program required by this Subpart B.

(d) Where annual refresher training is conducted periodically, such sessions shall not be less than 30 minutes of actual instruction time and the miners shall be notified that the session is part of annual refresher training.

POLICY

Section 48.28 (c) applied during the implementation of the regulation and is no longer applicable.

Operators may provide annual refresher training any time during the last calendar month of the miners' annual refresher training cycle. To illustrate this policy: miners who began work in June 1984, may complete their annual refresher training any time in June 1985. Accordingly, training records and schedules may be maintained on a monthly basis, rather than tracking each miner's individual training date. Also, operators should be encouraged to schedule annual refresher training at the beginning of the month so that if for some reason a miner misses the regularly scheduled training, there will still be a reasonable opportunity for the training to be made-up before the end of the month.

Refresher Training Following an Absence

The following training is required for experienced miners as defined in Section 48.22(b) who return to work following an absence:

(1) When an experienced miner returns to the same mine following an absence and less than 12 months have elapsed since the miner received new miner, newly employed experienced miner, or annual refresher training, the mine operator should provide training that covers any changes in conditions or procedures at the mine, before the miner is assigned to work duties. This training may be credited toward the miner's annual refresher training. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task. The miner shall be given annual refresher training within 12 months of the last completion date of new miner, newly employed experienced miner, or annual refresher training.

(2) When an experienced miner returns to the same mine following an absence and more than 12 months have elapsed since the miner received new

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miner, newly employed experienced miner, or annual refresher training, the operator shall provide annual refresher training before the miner begins work unless there has been extension of time by the District Manager. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task.

(3) When an experienced miner is assigned to a different mine following an absence, the mine operator shall provide the miner with newly employed experienced miner training before the miner begins work. If the miner is assigned a new work task, the operator shall provide new task training prior to having the miner perform that task.

The above does not apply to experienced underground miners assigned to surface work the first time. These miners are "new miners" under the training regulations and must receive new miner training. Credit can be given for applicable underground training.

Extension of Time to Complete Annual Refresher Training

The unexpected return of miners after extended absence or similar unforseeable circumstances may create a strain between the completion of quality refresher training and prompt return of the miners to productive employment.

In order to accommodate unforeseeable events, District Managers may consider requests for limited extensions of time to complete annual refresher training. Such requests will be considered on a case-by-case basis, and be granted only if:

(1) The miners involved are experienced, as defined by Section 48.22(b);

(2) Good faith efforts were made by the operator to train the miners before the annual refresher training anniversary date passed;

(3) The miners, before returning to work, will be given any task training required by Section 48.27, and will be thoroughly instructed in any changes in procedure at the mine or in the mining environment; and

(4) The required annual refresher training will be promptly completed.

Subject to additional conditions that the District Manager may require, a request for a limited extension of time to complete annual refresher training may be granted when these factors are met. In no case, however, should extensions be granted to correct poor scheduling practices or failure to anticipate foreseeable training needs, nor should provisions for an extension of time appear in an operator's training plan or otherwise be routinely granted.

When extensions of time to complete annual refresher training are granted, such extensions should be confirmed in writing to the operator, stating the conditions of the extension, and the date that refresher training will be completed. The completion date of an annual refresher training cycle initiates a new anniversary date.

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Approval of Training Plans

An effective refresher training program must be adapted to changes in mining conditions, accident history and other training concerns. Time spent for each course may vary to meet specific needs. The following guidelines should be used to evaluate provisions for annual refresher training:

(a) The annual required refresher training courses listed in Section 48.28 that are not applicable to a particular mine may be omitted from that mine's training plan. A notation of which courses that are not applicable should appear in the training plan.

(b) An 8-hour minimum is required for the total annual refresher training program. However, the time spent on individual courses may vary from year to year or from one area of the mine to another depending on specific safety or health problems encountered. The mine's accident experience should significantly influence the amount and type of training miners receive throughout the year.

(c) All applicable refresher training courses listed in the approved training plan are to be given during each 12-month cycle. However, two or more of the courses may be covered in one training session or safety meeting. For example, a well structured safety meeting may cover safety standards, prevention of accidents and other topics without the necessity of separate blocks of instruction.

(d) Safety meetings of at least 30 minutes duration, conducted by an MSHA approved instructor, and addressing appropriate course content are acceptable training sessions that satisfy the annual refresher requirements.

Training plans may be revised to reflect training needs. Requests for revisions should be submitted in accordance with Section 48.23 (1).

Job Site Training

Health and safety training may be conducted at the job site and may involve performance of actual job tasks. Guidelines for job site training are set out in Section 48.25 Policy.

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(2) When an MSHA approved program is completed and recorded by the operator, a copy of the certificate must be given to the miner upon request.

(3) At the end of the 12-month training cycle, or when the miner signs items 8 of the form, a copy of the completed form listing all completed training programs and signed by the person responsible for training at the mine must be given to the miner.

The training certificate, MSHA Form 5000-23, has been revised so that all training completed by a miner during the 12-month cycle may be recorded on one form.

Miscellaneous

Section 48.24 Cooperative Training Program - The cooperative trainer may sign the training certificate upon partial completion of cooperative training. Final signature upon completion of the program must be by the operator or his representative.

Section 48.31 Hazard Training--The operator may use a Form 5000-23 for hazard training. The Form 5000-23 need not be used, however, if the following situations satisfy hazard training requirements:

(1) Verbal instruction of mine hazard avoidance procedures are given by mine personnel and the person receiving the instructions signs a log sheet.

(2) Written instruction of mine hazard avoidance procedures are supplied. The written instructions, signed by the person receiving them, or a log sheet must be maintained as a record.

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Section 48.30 Compensation for training.

REGULATION

(a) Training shall be conducted during normal working hours; miners attending such training shall receive the rate of pay as provided in Section 48.22(d) (Definition of normal working hours) of this Subpart B.

(b) If such training shall be given at a location other than the normal place of work, miners shall be compensated for the additional costs, such as mileage, meals, and lodging, they may incur in attending such training sessions.

POLICY

Section 48.30 implements Section 115(b) of the Mine Act ("miners shall be paid at their normal rate of compensation while taking such training"). Section 48.22(d), which defines "normal working hours", states in part that: "Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks."

The purpose of both the statute and the regulations is to assure that miners are not financially penalized when they receive training during working hours. For example, if a miner is "cross shifted" and the "cross shift" is considered normal working hours, the rate of pay the miner would receive if working is the rate the miner must receive while in training.

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Section 48.31 Hazard training.

REGULATION

(a) Operators shall provide to those miners, as defined in Section 48.22(a)(2) (Definition of miner) of this Subpart B, a training program before such miners commence their work duties. This training program shall include the following instruction, which is applicable to the duties of such miners:

(1) Hazard recognition and avoidance;

(2) Emergency and evacuation procedures;

(3) Health and safety standards, safety rules and safe working procedures;

(4) Self-rescue and respiratory devices; and

(5) Such other instruction as may be required by the District Manager based on circumstances and conditions at the mine.

(b) Miners shall receive the instruction required by this section at least once every 12 months.

(c) The training program required by this section shall be submitted with the training plan required by Section 48.23(a) (Training plans: Submission and approval) of this Subpart B and shall include a statement on the methods of instruction to be used.

(d) In accordance with Section 48.29 (Records of training) of this Subpart B, the operator shall maintain and make available for inspection, certificates that miners have received the instruction required by this section.

POLICY

The exposure to mining hazards varies according to task. The greater the hazard exposure, the greater the need for training.

Hazard training should be:

1. Mine specific, so that persons are advised of the hazards they may encounter at a particular mine; and

2. Conducted each time a person enters a different mine.

Section 48.31 requires operators to give hazard training to persons who are exposed to mine hazards. For example, a person driving a vehicle onto mine property to pick up a load of material who remains in the vehicle at all times would ordinarily not be exposed to hazards peculiar to the mine, and consequently would not be required to receive training under Part 48.

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Although the amount of required hazard training will vary, the following are examples of appropriate hazard training:

Employees of Equipment Manufacturers

1. Employees who are on the mine site in a service or maintenance capacity must be given training in accordance with their exposure to hazards. If the specific job will not entail extended exposure to hazards at the mine, they need only be given hazard training. If the job assignment of a service or maintenance worker exceeds five consecutive working days at a particular mine, comprehensive training must be given--either new miner training, or newly employed experienced miner training, as appropriate.

2. Manufacturers' field representatives, such as sales representatives and delivery personnel, must be given hazard training. If they are frequently exposed to mine hazards (more than 5 consecutive working days), they must be given comprehensive training - either new miner training, or newly employed experienced miner training, as appropriate.

Labor, Management or Government Officials

1. Labor, management, or government officials visiting the mine site need not be given training. However, such persons should be accompanied by experienced miners and be provided with appropriate safety equipment.

2. Contractors doing work for the government which requires their presence at the mine to observe conditions or to collect information must be given hazard training.

3. Authorized Representatives of the Secretary of Labor or Secretary of Health and Human Services need not be given any training or be accompanied when carrying out duties required by 30 CFR or by the Mine Act.

Pickup and Delivery Drivers

1. Persons coming onto mine sites to pick up mined materials or to deliver supplies and who remain inside their vehicles need not be given training. If they leave their vehicles they must be given hazard training.

Other Visitors

1. Students on field trips and other short term visitors (1 day or less) need not be given Part 48 training. However, they should be accompanied by experienced miners and be provided with appropriate safety equipment.

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Section 48.32 Appeals procedures.

REGULATION

The operator, miner, and miners' representative shall have the right of appeal from a decision of the District Manager.

(a) In the event an operator, miner, or miners' representative decides to appeal a decision by the District Manager, such an appeal shall be submitted, in writing, to the Administrator for Coal Mine Safety and Health or Administrator for Metal and Nonmetal Safety and Health, as appropriate, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203, within 30 days of notification of the District Manager's decision.

(b) The Administrator may require additional information from the operator, the miners or their representatives, and the District Manager, if the Administrator determines such information is necessary.

(c) The Administrator shall render a decision on the appeal within 30 days after receipt of the appeal.

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FORM 1000-22

UNITED STATES
DEPARTMENT OF LABOR

NATIONAL MINE HEALTH AND SAFETY ACADEMY
P.O. BOX 1166
BECKLEY, WEST VIRGINIA 25802-1166

OFFICIAL BUSINESS
PENALTY PRIVATE USE, $300

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LAB-441

U.S.MAIL

Cyprus Industrial Minerals Co.
ATTN: Keith B. Lehman
651 Metuchen Rd,
South Plainfield, NJ 07080

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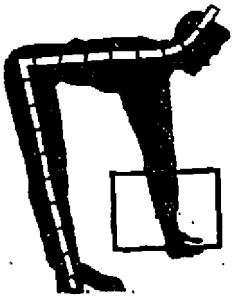
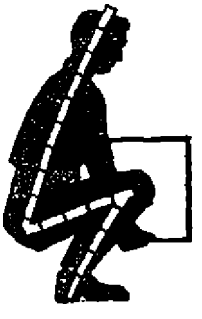
LEARN TO LIFT SAFELY





INDUSTRIAL SAFETY GUIDE
Number 1

REVISED SEPTEMBER, 1966.

STATE OF NEW JERSEY
DEPARTMENT OF LABOR & INDUSTRY
BUREAU OF ENGINEERING & SAFETY
Trenton, N.J.

LEHMAN 00531

This bulletin is published by the Bureau of Engineering and Safety of the New Jersey Department of Labor and Industry as part of the Department's worker safety promotion effort. Its purpose is to aid industry and its workers in reducing the number of injuries resulting from on-the-job accidents.

The revision is based upon Bulletin 110 (revised 1965) issued by the U. S. Department of Labor and prepared by the Office of Occupational Safety, Division of Programming and Research.

TEACH THEM TO LIFT

Manual Lifting Problem

Searching for a solution

THE problem of injuries resulting from the manual handling of materials continues to plague industry. The accident preventionist still seeks to reduce the toll of this type injury by setting broad brush restrictions on how much a person should be permitted to lift. The Bureau often receives requests from many quarters for regulations which set a limit on how much a person, male or female, can be expected to lift. Everyone is searching for a solution. Many are seeking that one magical "cook-book" formula to solve all of their manual lifting and carrying problems. Unfortunately, there is no easy way out.

Complexities of the problem

Few people appreciate the complexities of the overall lifting problem. It is noted with considerable concern that the majority of the inquiries pertain to only the weight-lifting limitations. Little if any concern is expressed about the other aspects of the problem, i.e., how much, how often, how far, how high, or for how long a period of time the weight is to be carried or handled. A typical inquiry is quoted verbatim, "I should like to know if there are rules or regulations .... the amount of weight a person should lift while working in a factory; if so, please advise." It is quite obvious from inquiries of this type that there is need for a considerable amount of education in the overall "manual lifting problem." Too often, many look for a panacea, rule, or criterion of some kind, usually established by someone else, that can be applied by them so as to avoid a "total professional evaluation" of their own specific manual materials handling and lifting problems.

The subject is a very controversial one and it is still a most difficult one to comprehend by those who fail to understand the complexities involved in setting maximum lifting and carrying limits. There is no panacea or "one-shot" formula which can be validly applied as an unrestricted and unconditional safe lifting criterion.

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Worldwide (manual lifting) concern

The national and international concern over this problem is evidenced by the fact that several studies of considerable scope have been completed in this area. Great Britain has for some time conducted extensive research in the area. A most comprehensive study was concluded in March 1964, in Geneva, under the auspices of the International Labor Organization (*ILO*), where experts from 11 countries met specifically for the purpose of attempting to establish a realistic criterion "On the Maximum Permissible Weight To Be Carried By One Worker" (the adult male and female workers, as well as children). This group will meet again in 1966 to continue Phase II of this study. This phase will deal primarily with the evaluation of reaction and review of comment received from interested parties from all over the world on the recommendations the experts presented to the ILO on setting weight lifting limits. These recommendations are described in the following paragraphs.

Setting the limits

Where operations are such that manual handling cannot be avoided, it is incumbent upon the accident preventionist and management to set realistic, "tailor-made" limits around both the person and the task. There are no simple solutions to the setting of maximum permissible weights to be carried by any one worker.

Due regard must be given to the physiological aspects of lifting and load carrying. Externally, we must give consideration to the climatic conditions, as well as the degree of training and experience each worker has had in lifting and carrying. The setting of manual lifting and carrying limits must be predicated upon, among other things, the size and type of load to be carried (compact or loose), distance of lift, height and position of the lift, the working or walking level, the incline of the surface, etc. These factors play a vital part in the development of weight limits on the load that can be lifted or carried for one time, for one day, a few days, or on a continuing and repetitive basis. The total energy expended plays a very important role in fixing limits. The fatigue factor contributes to the injury picture. There are medicophysical aspects that come into play with respect to the consumption of oxygen, pulse beat, wastes produced by muscular activity and their inadequate elimination. The effects of such accumulations may cause fatigue. Conclusions did emerge from the ILO meeting of experts on maximum permissible weights. There still remains some question with respect to the unrestricted application of tentative limits recommended by this group. The limits were set by the experts on the basis of "values obtained in the course of this research for individuals of normal constitution."

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The limits set by the experts are as follows:

1. ***Male worker.*** To be carried by *adult male* employed in operations requiring lifting and carrying should not normally exceed 40 kilograms (88.2 pounds). *The experts agreed that the total daily load could be suitably adjusted to varying working and environmental conditions, state of nutrition and fatigue of the worker, by adjusting the number of packages and weights to be handled.*

2. ***Women workers and boys.*** They also agreed that the maximum permissible weight for women workers and boys aged 16–18 years should be fixed between 15 and 20 kilograms (33 and 44.1 pounds).

3. ***Girls.*** For girls aged 16–18, between 12 and 15 kilograms (26.4 and 33 pounds).

Department's position: caution

While many have been waiting for some time for such a criterion and the setting of permissible weight-lifting maximums by some outside expertise, the Department of L.&I. is somewhat reluctant to accept these limits unless they are properly surrounded by qualifications which spell out the conditions that the weights to be carried, lifted, and handled are in compact form with available means for assuming a grip on them, and that such weights should be in such a position that they can be lifted vertically, and that they are going to be lifted properly from a position below the waist level to another position below the waist level, or from a position above the waist level to another position above the waist level. The aforementioned qualifications and conditions, as well as the physical capabilities and physiological makeup of the individual worker, climatic conditions, etc., must play another vital part in the adoption and setting of the aforementioned limits. The recommended limits are not supported in their present form without the qualifications described above.

The Department's caution with respect to an unconditional adoption of the recommendations made by the experts to the ILO on lifting limits is perhaps more readily understood when one reviews some of the reservations made by the experts themselves:

• ***Nutritional problems.*** "The participants always stress the importance of the state of nutrition of the person employed to perform such work. A diet providing a sufficient amount of calories and an adequate amount of other nutrients is essential if the worker was to perform this work (maximum weight lifting) without injuring his health. The average food ration varies considerably in different parts

of the world and inevitably has repercussion on physical efficiency and muscle strength. These factors should be taken into account when fixing a maximum weight applicable to all countries."

• ***Physical conditions.*** "The physical conditions of men can vary considerably not only from one region to another but also within the same community. This factor should be taken into account in defining a maximum weight applicable internationally."

• ***Climatic conditions.*** "The climatic conditions exert a direct influence on the output of their work. It should again be stressed that a hot and humid climate often considerably reduces the amount of work which can be done."

• ***Definition of task.*** "The participants concluded that their task was to define the maximum weight of individual loads in terms of physiological capabilities, however, it was also important that normal handling operations performed during the workday should not have harmful repercussions on the worker's health. If the weight of the individual load is fixed at a suitable level the total daily amount of work *can be adapted to the environmental conditions, the worker's state of nutrition, his constitution, etc., by modifying the number of loads handled during the working period.*"

The above serves to reiterate the caution which must be exercised when attempting to set weight lifting limits.

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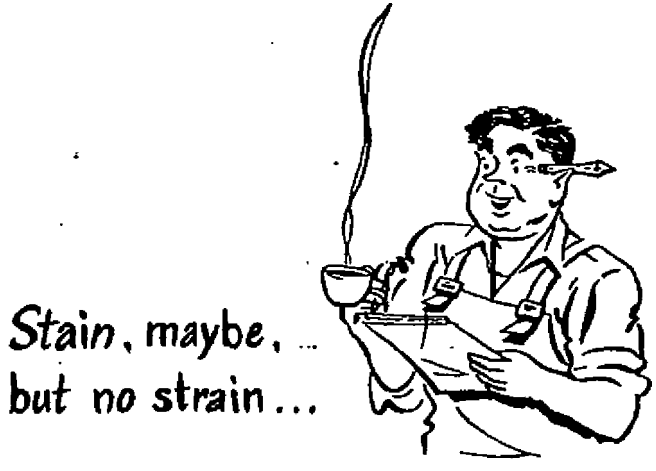
TEACH THEM HOW TO LIFT

Pick it up—put it down

From the time you cut off the alarm clock this morning, you have been picking things up and putting them down—your shoes, cup of coffee, fork loaded with scrambled eggs, the morning paper. Did you strain yourself or get a hernia? Not likely—*but* do you know that the simple process of picking up and putting down results in strains or hernias for thousands of workers every year?



At this moment, some of your workers are going through similar actions on a larger scale—picking up boxes, loaded cartons, moving lumber or pipe or metal, or in some way moving materials from one place to another. Each time they lift something, they may receive a strain or hernia if they do not use the safe method.

Here's help for you

As a foreman or supervisor, you are charged by management with seeing that your workers get out production *safely*. Here are some suggestions on how you can help them prevent injuries, such as hernias, sprains, and strains.

The names of these injuries do not sound as final or as terrifying as *death*, but the effects of such injuries on loss of production, loss of use of workers, and physical suffering to the workers themselves are national problems which extend right into your plant and to your workers.

In the job of preventing injuries, it is not necessary to split hairs on the difference between sprains and strains. Either term may be considered as explaining a condition caused by excessive stretching or overuse of a part, possibly involving a joint or ligament. Whether a worker pulls a muscle, gets a "crick" in his back, or twists a knee, it still hurts; he may lose time from the job; and it could have been prevented by proper methods.

Lifting, carrying, or placing large or heavy objects, or using some parts or muscles too much, usually results in an injury chalked up against your department.

Why do it the hard way?

Untrained persons often do a job the hard way. As a result, they have injuries, they soon lose their pep and energy, and they take more time—which slows up production.

Lifting is one of the jobs that is more often done wrong than right. By training workers in *safe lifting* you are making an improvement in work methods beneficial to your workers and to your employers.

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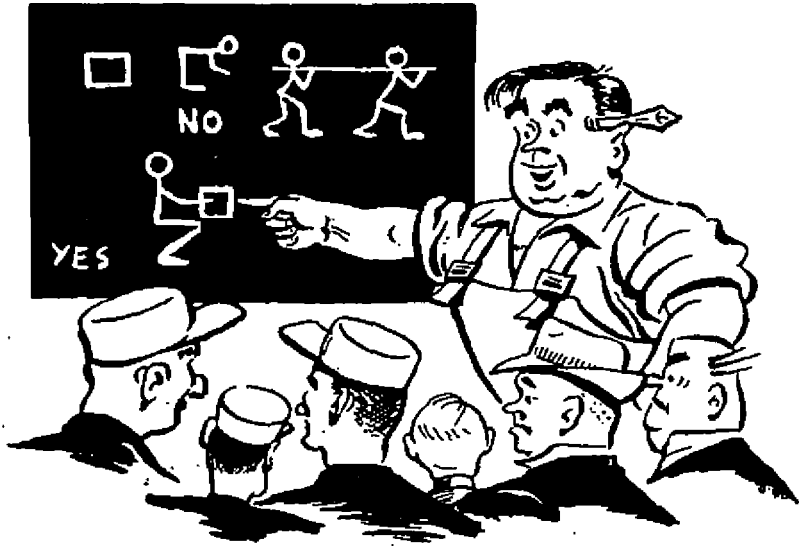
Get these facts in mind

Workers must be trained in safe lifting.

Most people give little or no thought to the matter of lifting until they meet some exceptional lifting problem or are injured through wrong lifting methods.



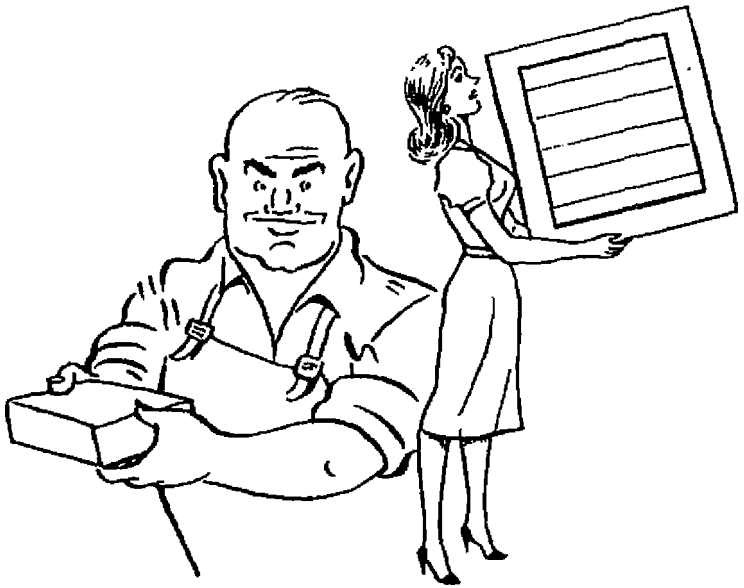
Mechanical devices promote safety where the load is great.

While mechanical aids are one solution to the prevention of injuries from handling materials, there are instances where such devices are not practical or suitable. It is well known, however, that lifting or carrying injuries can be minimized by substituting mechanical for manual lifting. Cranes, hoists, elevators, conveyors, lift trucks, and similar devices are made for this purpose. Where mechanical devices can be used, injuries to workers from lifting can be prevented.

There are limits to the weight each person can lift safely.

The physical condition, build, and stature of the individual has a lot to do with a person's ability to lift heavy objects or to work on a repetitive lifting job. Workers with known physical weaknesses (such as tendency toward hernia) should not be put on jobs where lifting is required. How much or how long a person can lift safely depends upon the person. Underweight or overweight workers or workers with deformities of the spine are especially liable to strain

from lifting. Also, arthritis, or previous injuries to joints may be aggravated by lifting. The strain of lifting is dangerous to persons with weak hearts, high blood pressure, or to those who have had lung disease.



Never overestimate the power of a woman

There also are important physical factors that must be considered as applying particularly to women. In assignment of women to jobs requiring heavy lifting or carrying, the physical ability of the individual woman should be determined not only on the basis of her weight and height but on the amount of strength she has and on her physical condition. It has been found that heavy lifting tends to aggravate menstrual difficulties, and is especially to be avoided during pregnancy. Some States have laws that limit the amount of weight that women workers may lift or carry. The regulations differ in the various States.

Job placement, too

The foreman should make use of all available information from physical examination records to personal discussion before assigning persons to lifting or carrying jobs.

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While the carnival expert can size you up and guess your weight before you step on his scales, the same method does not work when it come to lifting. By giving a person the "once-over," you cannot determine how much he can lift safely. His capacity for work may be scaled by the amount he is required to lift and the number of times he must lift. Possibly your worker could lift a certain object several times in a day safely—but what about lifting it many times an hour all day long?

Teamwork takes practice

Where the load or material is too much for one person to handle safely, and mechanical equipment is not practical for this purpose, as many additional workers as required should be assigned to assist in the job. This brings up another problem—"teamwork." Workers of approximately the same size should be used, and they should be trained in team-lifting. If one worker lifts too soon, or shifts the load, or lowers improperly, either he or his partner may be overloaded and strained. One person should be assigned to giving orders to assure the necessary coordination.

There is a proper position for lifting heavy objects

Position and knack, or tricks of the trade, probably hold equal rank with the other factors of safe lifting. These require training and practice, and many workers, not understanding their importance, fail to realize this. Taking the proper stance and using the muscles most capable of doing the job are subjects to be stressed in your training. An example of the knack, or tricks of the trade, can be illustrated by grain workers who, by taking proper stance and grip, swing heavy sacks of grain up onto their shoulders—while inexperienced persons could barely move them.

Analyze before you start

In order to make your training most effective, take the time to analyze the lifting or carrying jobs done by each of your workers. Taking each in turn, determine:

What does he lift or carry?
How much does it weigh?
How far does he carry it?
How often does he lift or carry it?
Does he carry it up or down stairs or ramps?
Is mechanical lifting equipment provided?
Should mechanical lifting equipment be provided?
Are arrangements made for other workers to assist?

Now, from your analysis, determine which workers need instruction in safe lifting methods. It may be necessary to divide them into groups for separate instructions on lifting different materials or objects.

Call your group together for training

Keep the group small for convenient handling and clear instruction without disturbing the rest of the department. In this manner you can eventually reach every person under your supervision at your convenience. You will probably want to plan your groups so that those who do the greatest amount of manual handling will be called first.

Describe plant experiences

By checking the plant records, you probably can review several years of work injuries, among which are several important back strains, hernias, and sprains. Check the amount of lost time from work and, where possible, get estimates on the cost of medical and compensation expense. Some of these may be familiar enough to you, personally, to give a detailed account of what actually was done wrong.

Try this experiment

Place an object weighing 2 or 3 pounds on a table. Stand close to the table and raise the object to the level of your chest. Now replace the object on the table and step back a full arm's length. With your arms extended and held out straight, lift the object again to your chest

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level. Feel the difference? Now you have shown a cardinal principle of good lifting—*Keep the object close to the body.*

Demonstrate the proper way to lift

Prepare in advance a 20- or 25-pound box for practicing. Use this prop to demonstrate the principles of safe lifting. There are about 10 of these principles that you can learn sufficiently to carry on a running talk during your demonstration. They are as follows:

1. Size up the load first—do not attempt to lift it alone if there is any doubt in your mind about your ability to do so.
2. Make sure that your footing is secure. Get a good balance—this means feet fairly wide apart (8 to 12 inches).
3. Place the feet close to the base of the object to be lifted. This is important because it prevents the back muscles from taking all the load.
4. Bend the knees outward and "straddle" the load somewhat, keeping the back as straight as possible.
5. Now start pushing up with your legs, using your strongest set of muscles. Keep the load close to your body as you come up, taking full advantage of the mechanical leverage your body now possesses.
6. Lift the object to the carrying position. If necessary to change your direction when in the upright position, be careful not to twist the body. Turn your body with changes of foot position.
7. If you deposit the load on a bench or table, place it on the edge to make the table take part of the load and then push it forward with the arms or, if necessary, with part of the body in a forward motion.
8. In putting the load down to the floor surface from a waist-high carrying position, bend the knees and, with a straight back and load close to the body, lower the load with the arm and leg muscles.

NOTE.—In placing your load down on the floor, first be sure that you have blocks placed to support the load—allowing room to put it down without danger to the fingers.

It all adds up to . . .

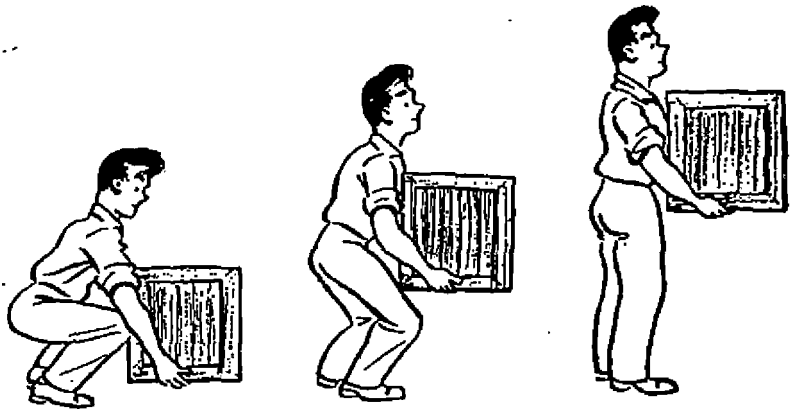
A final summary of the points you want these people to keep always in their minds when carrying materials in your department.

1. **Always carry the load close to the body.**
2. **Keep the back as straight as possible.**
3. **Lift with the leg and arm muscles.**

4. **Always have a clear vision over the load.**
5. **If the load interferes with normal walking—get help.**
6. **Never be afraid to ask for help in handling a load.**
7. **Bring in suggestions when you think some type of mechanical equipment will do a better job.**
8. **Housekeeping is important. Tripping hazards or objects on the floor can cause persons carrying a load to fall and be seriously injured.**

Have your workers practice proper lifting methods and remind them that the safe method should be used at *all* times.

You can make SAFE LIFTING A HABIT in your department.



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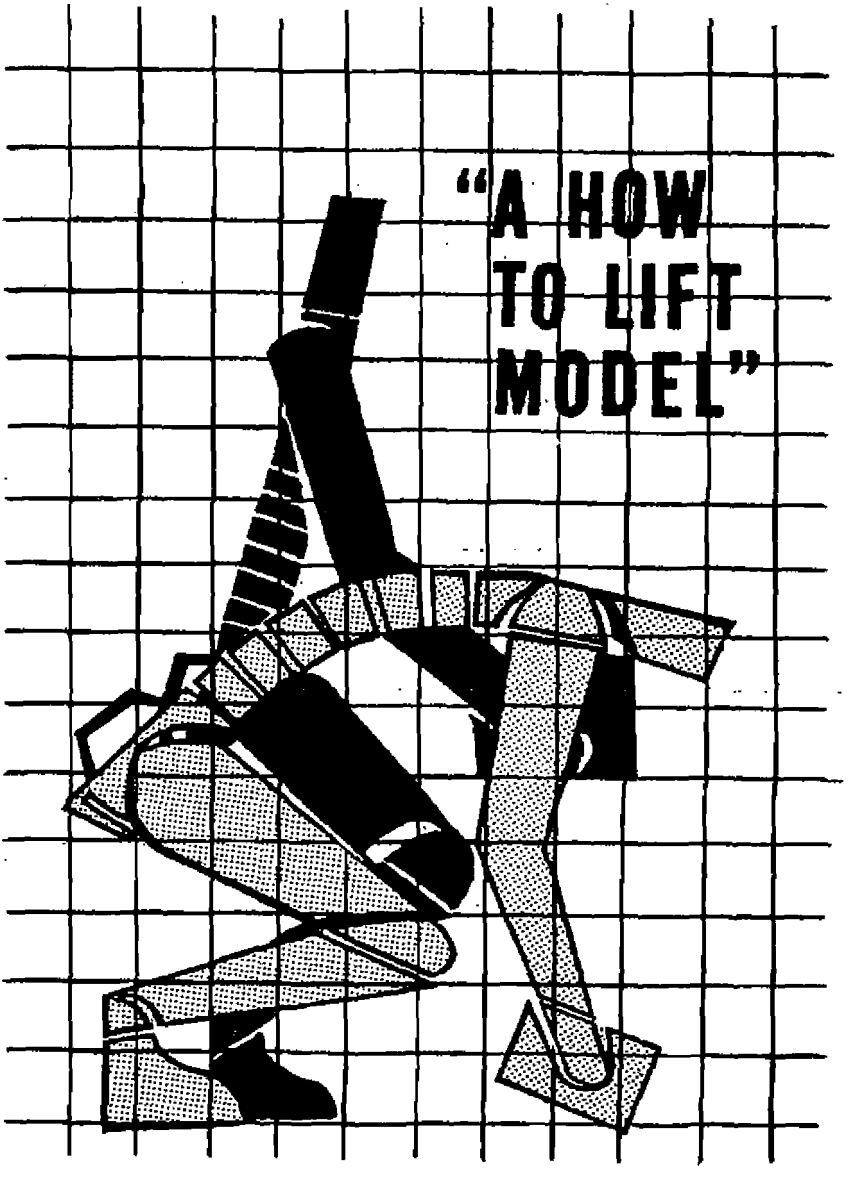
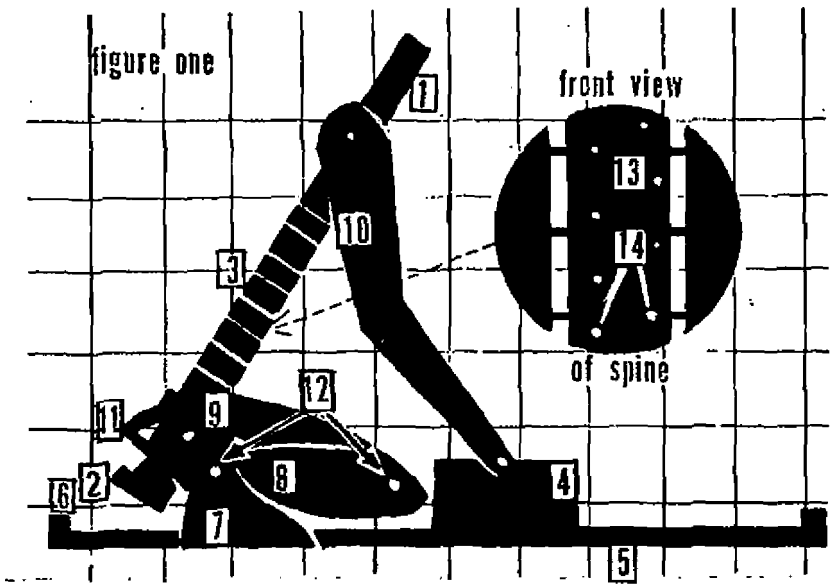
HOW TO BUILD A DEMONSTRATOR



HOW TO BUILD IT



PARTS LIST

Part No.	*Part Name*	*No. Req.*	*Part No.*	*Part Name*	*No. Req.*
1	Head	1	8	Leg	2
2	Hip	1	9	Thigh	2
3	Spine	8	10	Arm	2
4	Weight	1	11	Handle	1
5	Base	1	12	Rivet	4
6	Stop	2	13	Strap	1
7	Foot	2	14	Nail	20

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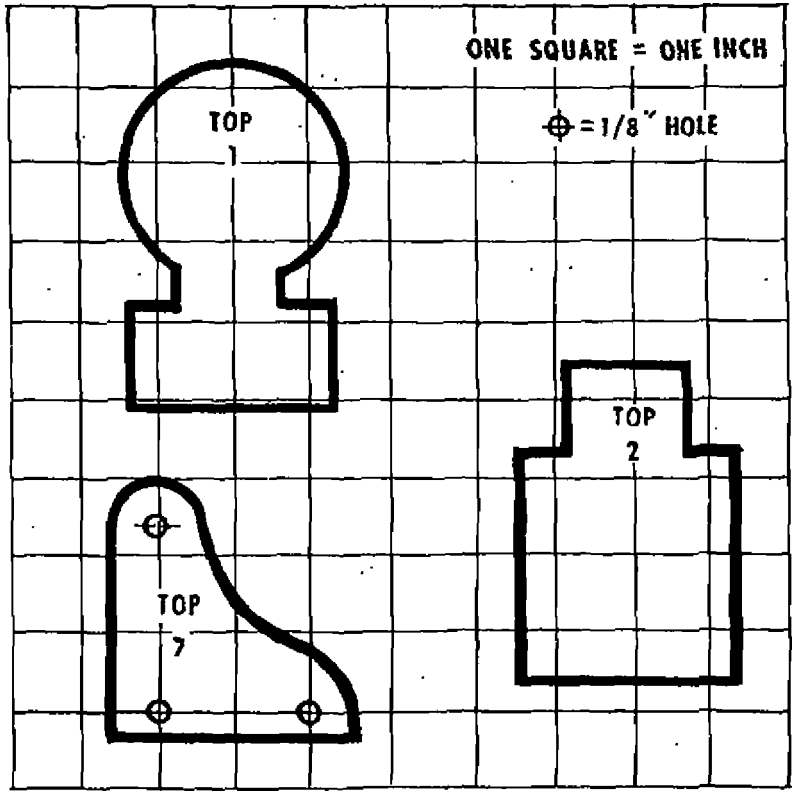
MATERIALS LIST

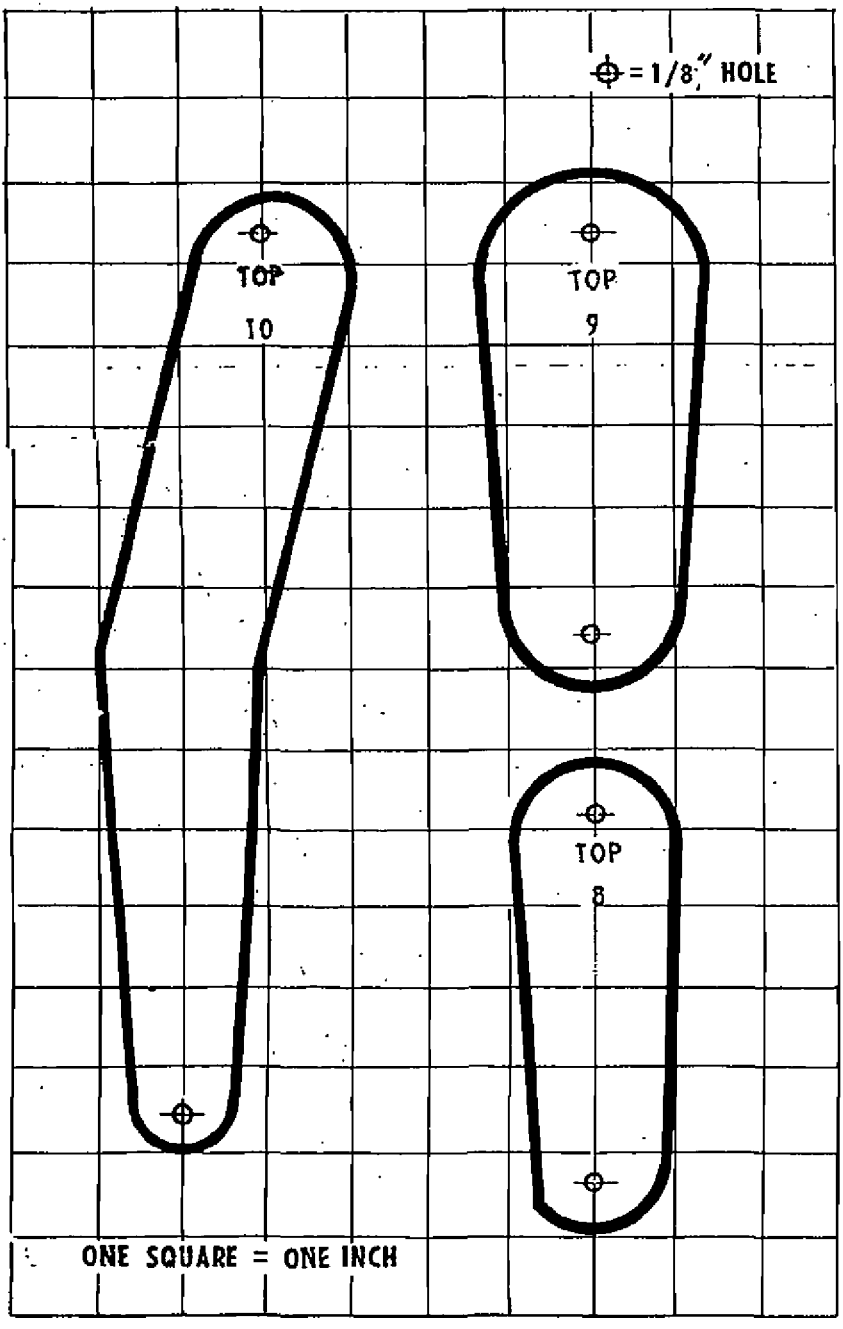
Item	*Amount needed*	*Specification*
Clear pine	1	2″×6″×12″ long
Clear pine	1	4″×4″×4½″ long
Clear pine	1	1″×4″×18″ long
Clear pine	2	½″×¾″×3½″ long
Hardboard	1	⅛″×16″×20″
Screen door spring	1	No. 4*
Drawer pull/screws	1	"C" shaped 3 inch
Hollow rivets	4	⅛″×⅝″ copper
Brass screws	10	No. 6×¾″ long roundhead
Nails	20	⅝″ long
Brads	2	1¼″ long
Brads	4	1″ long
Leather strap	1	⅛″×1¾″×10″
Paint		(4 colors)

*To insure correct operation of the spine, a No. 4 screen door spring must be used.

Draw full size templates on heavy paper or cardboard for Parts 1, 2, and 7 from the scaled drawings below.



Draw full size templates on heavy paper or cardboard for Parts 8, 9, and 10 from the scaled drawings below.



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INSTRUCTIONS

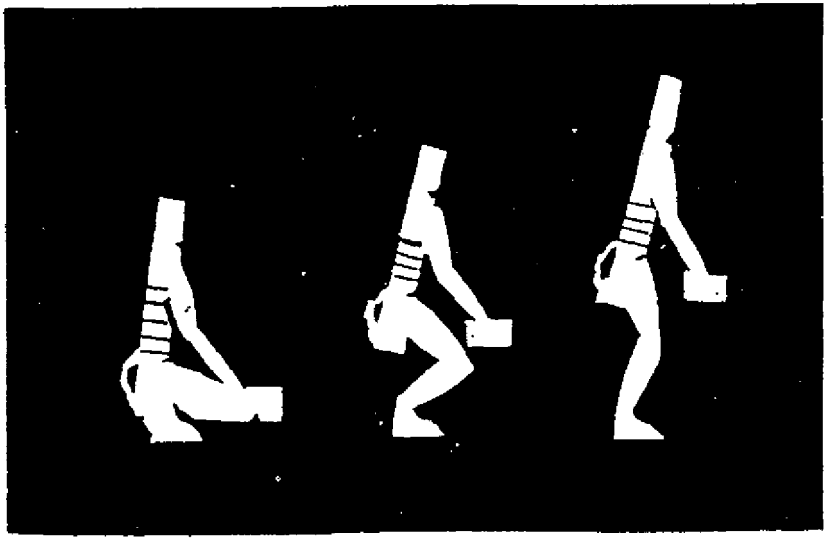
Step A. *Spine:* From the 2″ x 6″ x 12″ stock cut and dress one piece to the dimension of 1½″ x 1½″ x 9″. Locate center and drill a ⅜-inch hole through the center of the 9-inch length. From this, cut eight sections, each 1-inch long. Sand and paint outer surfaces *buff* and top and bottom (containing ⅜-inch hole) *red.*

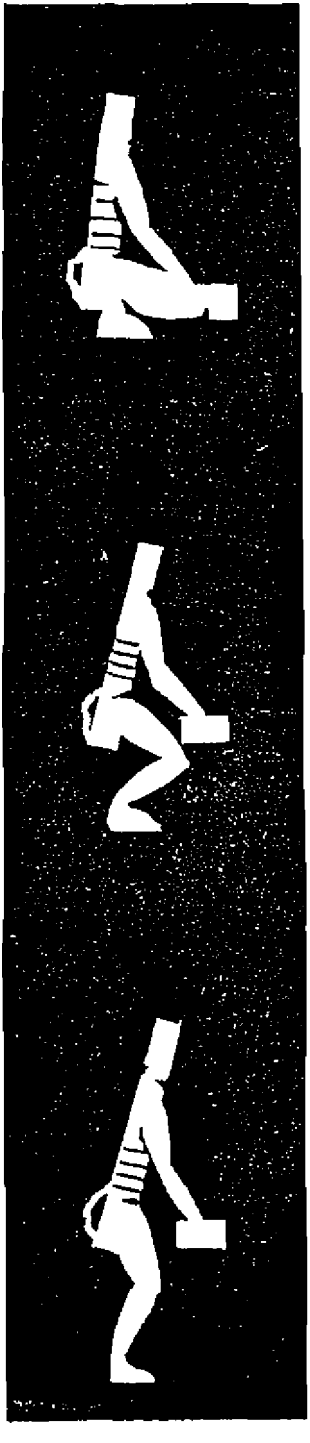
Step B. *Head and Hips:* From the remaining 2″ x 6″ x 12″ stock, using templates 1 and 2 as patterns, cut out and dress to 1½-inch thick Parts 1 and 2. In bottom center of Part 1 and top center of Part 2 drill a ⅜-inch hole to the depth of 1½ inches. Sand and paint *buff.*

Step C. *Arms and Legs:* From hardboard, using templates 7 through 10 as patterns, cut out one each of Parts 7 through 10. Reverse sides of templates and again cut out one each of Parts 7 through 10 to form opposite side. Sand edges and paint *buff.*

Step D. *Weight:* Dress surface of Part 4 to 3″ x 3″ x 4″. Paint *blue.*

Step E. *Base:* Dress surfaces of Part 5 to ¾″ x 3½″ x 18″. Nail Parts 6 to Part 5 as shown in Figure 1. Paint *black.*





Step F. Cut spring to length of 9 inches and form new eye. Insert spring 1 inch in hole in top of Part 2. Secure with 1¼-inch wire brad through eye of spring.

Step G. Thread 7 sections of Part 3 over end of spring. Expand the spring approximately 3 inches and temporarily secure in place by inserting a hacksaw blade in coil of spring at top of spine. Thread remaining section of Part 3 over the spring.

Step H. Insert spring 1 inch in hole in bottom of Part 1. Secure as in Step F above. Remove hacksaw blade.

Step I. Using Parts 14, nail Part 13 to Parts 1, 2, and 3.

Step J. Attach Part 11 to center of Part 2, as shown in Figure 1.

Step K. Using Parts 12, assemble (smooth side out) Parts 7, 8, and 9.

Step L. Attach Parts 7 to Part 5 (smooth side out) with screws so that heel is 2¾ inches from end (see Figure 1).

Step M. Attach Parts 9 to Part 2 at a point 2½ inches from bottom center of hips.

Step N. Attach Parts 10 (smooth side out) to center of shoulder portion of Part 1 with screws. Arms should be snug without binding.

Step O. Complete model by attaching Parts 10 to Part 4, ½ inch above center, with screws. *All joints should be snug without binding.*

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HOW TO DEMONSTRATE IT

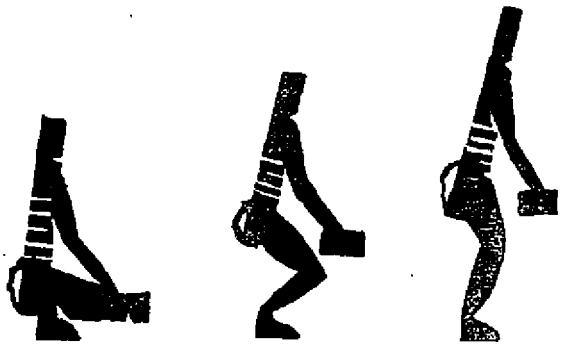
INCORRECT LIFTING

Step 1. Place the model in a squatting position, side view to the audience, with weight at the front of the base.

Step 2. Grasp handle and lift until legs are nearly straight..

Step 3. Hold the legs in this position and make model slowly lift the weight from base. Note extreme strain taking place in the lower section of the back.

CORRECT LIFTING

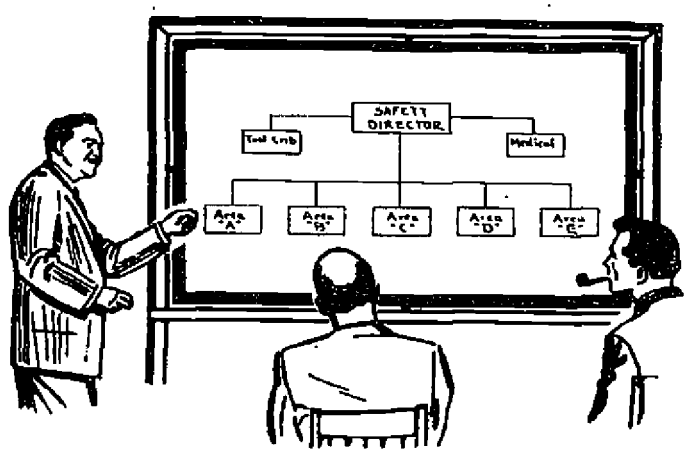


Step 4. Again place the model in a squatting position, but this time with the weight between the knees and the back nearly vertical.

Step 5. Grasp handle and lift, straigthening the legs, keeping the weight as near the body as possible and the back nearly vertical. Point out to the students that the spine is braced from all sides by the tensed muscles of the back and abdomen, and the lifting is done with the strong leg muscles. Returning the model to resting position, drive home the fact that if this technique of lifting is followed—even though difficult for a while—it will soon become habitual and the spine will be constantly protected from injury.

LEHMAN 00543

Organization and Responsibility of Safety Committees



INDUSTRIAL SAFETY GUIDE
NUMBER 10

STATE OF NEW JERSEY
DEPARTMENT OF LABOR & INDUSTRY
BUREAU OF ENGINEERING & SAFETY
Trenton, N.J.

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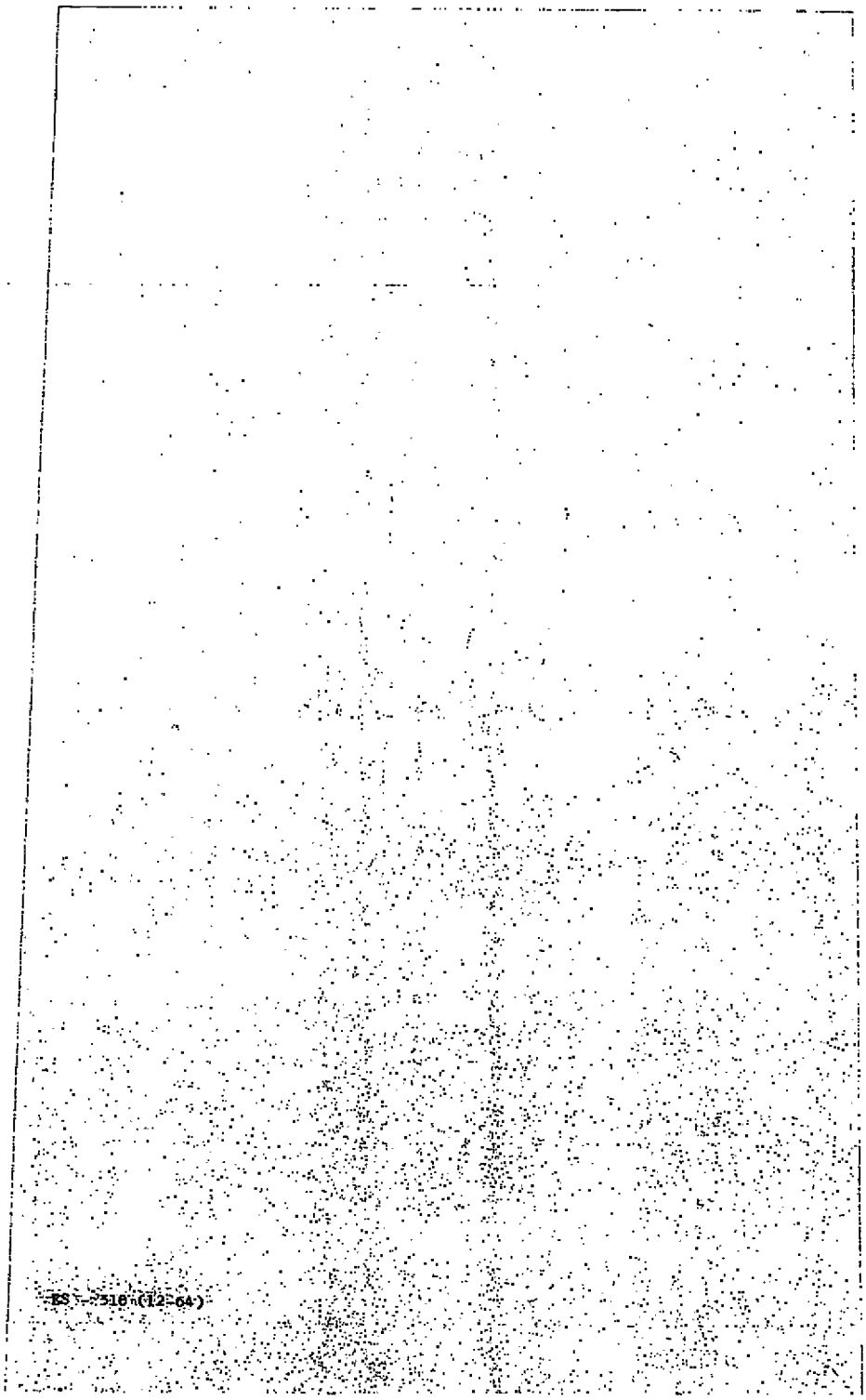
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This Booklet is one of a series designed to aid and inform all those who share the responsibility for the Health and Safety of the New Jersey Industrial Work Force.

ORGANIZATION AND RESPONSIBILITY OF SAFETY COMMITTEES

INTRODUCTION

"SAFETY PROGRAM" is a term usually used to describe the sum of *all safety activities*. To reach and maintain top safety performance, the cooperation of everyone in an organization is needed. A planned program must be developed to interest, educate and stimulate all employees in safety and demand their active partication in the elimination of accident-producing causes. *Management must* supply the leadership and executive drive.

In the ever-increasing complex of quantity production, careful planning for, and accurate control of, all operations must be clearly understood. Safety must be made an essential part of every production activity to attain efficient quantity production.

The key to safety is: it is far better to spend time and money preventing industrial accidents than to compensate for the human and economic losses they cause.

This booklet is published by the Bureau of Engineering and Safety, New Jersey Department of Labor and Industry, for the purpose of assisting industries interested in developing an active Safety Committee program.

Safety Responsibility

In management is vested the determination of policies and executive direction. Therefore, from management must come the drive for safety. No business can expect to have a good safety performance unless its president, chief executive officer or owner demonstrates through his attitude and conduct that he expects and demands all employees to do their part.

Management should make it clear to all levels of supervision and to all employees that it supports the Safety Program and that every supervisor will be held accountable for success in his area. This policy must be clearly set forth in writing and must be brought to the attention of everyone in the plant.

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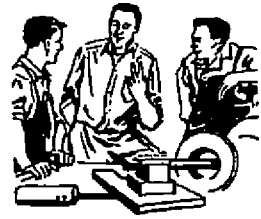
A policy statement, alone; is not enough; management must provide a safe and healthful place to work, and plan processes and operations with careful attention to safety. Safe and efficient operations are a product of good management. It pays off for the employer in better production, better employee relations and employee morale, high plant efficiency and lower workmen's compensation and medical costs.

Management of any business is confronted with daily "emergency" problems which require immediate handling. On such occasions it is tempting to defer or overlook the dictates of accident prevention with regrettable results. Unless accident prevention work (administration of the Safety Program) is considered as a daily responsibility, comparable in importance with all other daily problems, the job will not be done.



Why a Safety Committee

In small, as in large plants, the organization of SAFETY COMMITTEES has become one of the most effective means of arousing an active interest in safety among all levels of the working force. Safety Committees provide a medium whereby the plant operating manager, the safety engineer or the person designated to coordinate the plant's safety activities, can secure the advice of other qualified employees and obtain assistance to work out problems relating to accident prevention.

With operating officials, supervisors, foremen and production workers officially enlisted in the safety effort by membership on the safety committees, attempts to bring about changes in work practices and the removal of physical hazards have a much better chance of success.

The on-the-job experience of a committee member is valuable in determining hazardous conditions and methods of work and in suggesting corrective measures.

A Safety Committee cannot take away the supervisor's responsibility for safety. It does, however, provide the additional help he needs for his continuous effort to prevent accidents.

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The Purposes of Safety Committees

The general purposes of any plant safety committee are:

(1) To arouse and maintain the interest of superintendents, foremen and group leaders in safety by keeping them fully informed on all safety activities.

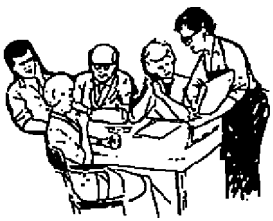
(2) To arouse and maintain the interest of all workmen and to convince them that their cooperation is needed to prevent accidents.

(3) To make all safety activities an integral part of all operating methods and procedures.

(4) To improve the relationship between management and employees by working together in the interest of safety. Maxium results can only be accomplished when the rank and file of the workers have an intelligent understanding of the problem and have some responsibility for making the safety program work.

(5) To provide a means of free discussion of plant accidents and the advancement of ways and means to prevent them.

(6) To help management evaluate safety suggestions.



Types of Committees

The most commonly used types of committees are:

1. Plant Safety Committee (main or governing committee)
2. Workmen's Committee
3. Technical Committee
4. Special Purpose Committee

There are many other titles committees bear, especially in companies with multi-plant operations and large plants, such as central, company, departmental, foremen's and labor-management committees.

Primarily, the size of a plant determines the type and number of Safety Committees that will function most effectively. In a small plant, a single committee may combine all of the functions and activities outlined in this guide. Large plants may make use of a variety of committees to accomplish the various functions at different levels or in different areas.

1. Plant Safety Committee

This committee functions as the main or governing body which acts on behalf of top management in supervising and controlling the accident prevention program. The duties of the committee usually cover the entire field of accident prevention. In small plants this committee is sometimes referred to as the "Shop Safety Committee."

Such a Shop Committee might have the following membership:

Plant manager
Plant superintendent
Plant engineer
Maintenance supervisor
One or more foremen
One or more workers
Employment manager
Safety engineer or safety supervisor
Nurse or company physician

The chairman of the committee should be the member who holds the position of greatest authority in the plant. The safety engineer or person assigned to coordinate the every-day safety activities should serve as secretary and advisor.

To be effective, the Safety Committee membership should be rotated from time to time, but only a few of the members at any one time. Usually a committee member serves for a period of six months or one year. In this way a large segment of the employees have an opportunity to receive the training, experience and inspiration developed through committee action. Rotation of members, however, should not affect the chairman or the secretary.

This committee should meet at least once each month. A copy of the minutes prepared by the secretary should be sent to the operating manager or chief executive of the plant. He should also be invited to attend the meetings whenever possible.

The committee organization for a *medium sized plant* can be the same as for a small plant but usually is supported by a Workmen's Safety Committee composed of a foreman and a number of workers. The larger the plant the more desirable it is to organize a number of Workmen's Safety Committees to support the Plant Safety Committee. Some companies organize a Workmen's Safety Committee in each principal department.

2. Workmen's Safety Committee

The Workmen's Safety Committee is usually found in the medium size and large plants. A foreman is selected by the Plant Safety Committee to serve as chairman of the Workmen's Safety Committee. Usually he is an active member of the Plant Safety Committee. His appointment should be for a period of no less than six months. By rotating the chairmanship all foremen will have an opportunity to serve.

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The Workmen's Safety Committee should consist of three or more workers plus the chairman. Each member should serve for a three to six month term depending upon the size of the plant and the plan of organization. However, the important thing is to have enough members to insure a variety of ideas and opinions, and a small enough number to make sure that everyone will have an opportunity to express himself during a relatively short meeting.

Such a committee gives valuable aid in the education and training of workers, in the investigation of all serious accidents or near accidents, the correction of hazards, and in providing continuous inspection for unsafe conditions and practices.

By studying and discussing accidents and their causes, the workers on the committee are convinced of the large part played by the workman himself in causing and preventing accidents. By giving the workman some active part in safety work — some recognition, some responsibility — his interest in safety is secured.

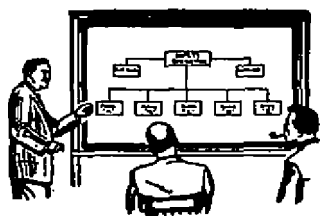
The committee should meet monthly. Minutes of the meeting should be kept and a copy sent to the Plant Safety Committee.

3. Technical Committee

Technical Committees, as the name implies, are useful on specific problems and activities for which specialized knowledge is needed. Whenever the Plant Safety Committee is faced with a problem requiring an engineering revision, a guard design or a special process problem, it can be referred to a special committee, chaired by the chief engineer. The committee membership should be made up of the master mechanic, the safety engineer (if there is one) and other technical personnel.

4. Special Purpose Committees

Special purpose committees are usually set up for specific jobs and normally dismissed when their purpose is accomplished. Such jobs include contests, safety celebrations and awards, special investigation of specific problems, off-the-job safety, fire safety drives, the investigation of a major accidental occurrence, etc.



The Functions of Safety Committees

The basic function of all safety activities is to create and maintain an active interest in safety in order to reduce accidents. The functions may be broadly classified as:

1. LEGISLATIVE—To determine policies and safe practices and recommend their adoption to management.
2. EXECUTIVE—To see that safety is a real part of the everyday plant operations—to get things done.
3. EDUCATIVE—To teach safety to each committee member and through him to the rank and file of workers.

Legislative

In any industry, large or small, there are any decisions to be made as to the policy of the company in connection with its accident prevention program such as:

(a) Standards for guarding machinery and equipment.

(b) Standards for the purchase of equipment, machinery, buildings and safety equipment.

(c) Standard operating practices including safety rules and systems of reward and penalty.

(d) Establishing accident statistical programs, accident reporting, etc.

(e) Assisting management in working out the details of the company safety policy.

Executive

This function is primarily one of translating into action the policies that have been adopted. To accomplish this the Safety Committee should:

(a) Make, or have made, investigations of all accidents and make recommendations for the prevention of a recurrence.

(b) Make, or have made, regular plant inspections for the purpose of eliminating accident or health hazards. Follow up to determine action taken.

(c) Review all safety suggestions and follow them through until their disposal.

(d) Supervise all safety promotion activities such as safety contests, awards, special purpose drives, etc.

Educative

As an educative force, Safety Committees cannot be surpassed. Service on a Safety Committee is the best way of arousing and holding the interest of men in safety. By promoting interest in the program, they can develop a good safety attitude among their co-workers.

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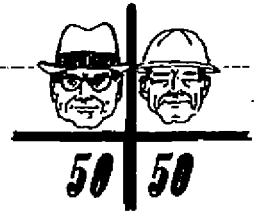
The ultimate success of any safety program is based upon two important factors: first, maintaining interest, and second, giving recognition to employees who render a service to safety.

As an educative force, many of the following promotional items can be used successfully:

Sound safety movies
Bulletin board system
Safety poster displays
Safety instruction cards
Plant safety manual
Fire prevention week activities
Suggestion systems
Safety displays
Plant safety contests — awards, etc.
Safety literature passouts, etc.



EVERYONE'S PROBLEM

Organization of Safety Committees

There are certain fundamentals that should be observed in organizing a Safety Committee. To be effective, a committee must have prestige. Therefore, a committee should be composed of key management personnel, supervisors, foremen and workers, well known and respected by management and workers.

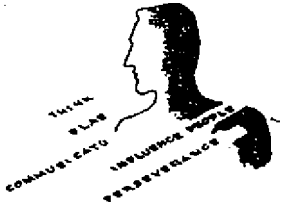
The work of a committee may be best accomplished in a prompt, effective and orderly manner when chaired by the person of highest authority among its membership. The person selected must be a real leader — someone who will make the committee go. He must have practical familiarity with the accident problems, be enthusiastic about the safety program and have the respect of the other members of the committee.

The chairman should prepare the agenda for the monthly safety meetings. The meetings should be held during regularly scheduled working hours under the most favorable conditions.

The following is a brief outline of the suggested order of business that may be adopted by the Safety Committees:

(a) Call to order — promptly at the appointed time
(b) Roll call — by the secretary
(c) Introduction of visitors
(d) Reading of minutes of the previous meeting

(e) Unfinished business
(f) Review of accidents and statistics
(g) Special program presentation such as a talk, presentation of a movie, etc.
(h) Discussion of safety inspections made during the month and action taken
(i) New business — any problems, plans, programs, etc.
(j) Adjournment



What the Safety Committee Does

The successful Safety Committee, regardless of the type, has the responsibility of helping to plan the safety program and then following up to see that it operates effectively. Usually, follow-up action decided upon is assigned to an individual or a small sub-committee.

The committee can gain little success without the cooperation of the workers, foremen and the safety program coordinator, all of whom must contribute to the support of the program. The Safety Committee ties together, guides and supports the various groups. Therefore, it is advisable to establish definite policies for the conduct of its activities. These should include the following:

1. Establish procedures for handling suggestions and recommendations of the committee.
2. Conduct regularly scheduled meetings for the purpose of discussing accident prevention methods, safety promotion activities, items noted during inspections, injuries and injury records, and any other pertinent subjects.
3. Arrange for an inspection of a selected area or areas of the establishment to discover and eliminate accident-producing conditions. Select a specific group of the committee membership to make the inspection.
4. Investigate, record and discuss accidents and determine causes for the purpose of devising preventive measures.
5. Recommend changes or additions to protective devices or equipment.
6. Develop or revise safe practice rules to meet current needs.
7. Provide safety and first-aid training for the committee members and workers.
8. Stimulate worker interest in safety by setting an example for all employees to follow.

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9. Participate in special program activities such as "off-the-job safety," "plant protection against fire," "visitors' safety," etc.
10. Keep records of all minutes of meetings.
11. *DON'T FORGET* that the Safety Committee acts in a staff capacity. Neither the committee as a whole nor its individual membership should assume that they have a big stick to enforce company rules. *DON'T FORGET* the supervisor is responsible for everything in his department. Get his cooperation.
12. OBEY ALL SAFETY RULES — SET AN EXAMPLE FOR OTHERS.

How to Measure Results

Each injury is, in itself, proof that some hazard or combination of hazards has not been adequately controlled. Therefore, the occurrence of injuries in any plant constitutes the only final measure of safety in that plant's operations. A bad injury record is proof that something is wrong. To use the injury record as a measure of safety performance, it is necessary to know how often the injuries occur and how serious they are.

The accepted practice is to include, as a basis of measurement only those injuries which prevents the injured worker from resuming work on the next day or shift, or results in some permanent bodily impairment such as death, loss of a member of the body, loss of sight, etc.

This unit of measure is called "INJURY FREQUENCY RATE." It is the number of disabling injuries for each million man-hours worked. Written as a formula it is:

$$\text{INJURY FREQUENCY RATE} = \frac{\text{Number of disabling injuries} \times 1{,}000{,}000}{\text{Total number of man-hours worked}}$$

The total number of man-hours worked can usually be obtained directly from pay-roll figures or determined by multiplying the number of employees by the average number of hours worked per person during any given period.

Using the Formula

Assuming that a plant with 250 employees who worked 24 days at 8 hours per day, experienced two disabling injuries during the month while working 48,000 man-hours:

$$\text{Injury Frequency Rate} = \frac{2 \times 1{,}000{,}000}{48{,}000}$$

Injury Frequency Rate 41.6 for the month

By figuring the Frequency Rate at regular periods (monthly, quarterly, annually) the safety committee can judge the progress and effectiveness of the plant safety program.

A comparison of current injury rates with those of similar companies and with those of the industry as a whole, will provide the safety committee with a reliable evaluation of the plant's safety performance. If the Frequency Rate is above the average rate there is a definite need for positive action by the committee.

The American Standards Association has published a set of standards relating to the recording and measuring of work injuries known as Z16.1 which can be obtained for a small fee. The contents of the standard are valuable in recording and interpreting injuries.

In addition to this standard method however the reporting, recording and investigation of minor, non-disabling injuries can be very helpful to the prevention of more serious occurrences.

Plan Some Safety Feature For Each Month

One aid to a successful safety program is an objective for each month. By spot-lighting this objective throughout the organization and directing the efforts in inspections, posters and discussion in this direction, the committee can expect results on the subject featured. Special safety programs, current accident sources as indicated by accident reports, or other activities may suggest subjects to be featured.

The following example suggests the type of subjects which may be considered:

January	Housekeeping
February	Floors, aisles, etc.
March	Machine hazards
April	Eye protection
May	Stairs, ramps
June	Electrical equipment
July	Heat exhaustion
August	Material handling
September	Handling acids, chemicals
October	Fire protection
November	Safety shoes
December	Safe work methods

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ID - 28-00959

Federal Mine Safety & Health Act of 1977,
Public Law 91-173,
as amended by Public Law 95-164*

An Act

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That this Act may be cited as the "Federal Mine Safety and Health Act of 1977".

FINDINGS AND PURPOSE

SEC. 2. Congress declares that—

(a) the first priority and concern of all in the coal or other mining industry must be the health and safety of its most precious resource—the miner;

(b) deaths and serious injuries from unsafe and unhealthful conditions and practices in the coal or other mines cause grief and suffering to the miners and to their families;

(c) there is an urgent need to provide more effective means and measures for improving the working conditions and practices in the Nation's coal or other mines in order to prevent death and serious physical harm, and in order to prevent occupational diseases originating in such mines;

(d) the existence of unsafe and unhealthful conditions and practices in the Nation's coal or other mines is a serious impediment to the future growth of the coal or other mining industry and cannot be tolerated;

(e) the operators of such mines with the assistance of the miners have the primary responsibility to prevent the existence of such conditions and practices in such mines;

(f) the disruption of production and the loss of income to operators and miners as a result of coal or other mine accidents or occupationally caused diseases unduly impedes and burdens commerce; and

(g) it is the purpose of this Act (1) to establish interim mandatory health and safety standards and to direct the Secretary of Health, Education, and Welfare and the Secretary of Labor to develop and promulgate improved mandatory health or safety standards to protect the health and safety of the Nation's coal or other miners; (2) to require that each operator of a coal or other mine and every miner in such mine comply with such standards; (3) to cooperate with, and provide assistance to, the States in the development and enforcement of effective State coal

** This document was prepared within the Office of the Solicitor, Division of Mine Health and Safety, Department of the Interior, and reflects changes to the Federal Coal Mine Health and Safety Act of 1969 [Pub. L. 91-173]. The Changes are based upon the Federal Mine Safety and Health Amendments Act of 1977 [Pub. L. 95-164]. Do not use this document as a legal citation to authority.*

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or other mine health and safety programs; and (4) to improve and expand, in cooperation with the States and the coal or other mining industry, research and development and training programs aimed at preventing coal or other mine accidents and occupationally caused diseases in the industry.

DEFINITIONS

SEC. 3. For the purpose of this Act, the term—

(a) "Secretary" means the Secretary of Labor or his delegate;

(b) "commerce" means trade, traffic, commerce, transportation, or communication among the several States, or between a place in a State and any place outside thereof, or within the District of Columbia or a possession of the United States, or between points in the same State but through a point outside thereof;

(c) "State" includes a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Trust Territory of the Pacific Islands;

(d) "operator" means any owner, lessee, or other person who operates, controls, or supervises a coal or other mine or any independent contractor performing services or construction at such mine;

(e) "agent" means any person charged with responsibility for the operation of all or a part of a coal or other mine or the supervision of the miners in a coal or other mine;

(f) "person" means any individual, partnership, association, corporation, firm, subsidiary of a corporation, or other organization;

(g) "miner" means any individual working in a coal or other mine;

(h) (1) "coal or other mine" means (A) an area of land from which minerals are extracted in nonliquid form or, if in liquid form, are extracted with workers underground, (B) private ways and roads appurtenant to such area, and (C) lands, excavations, underground passageways, shafts, slopes, tunnels and workings, structures, facilities, equipment, machines, tools, or other property including impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to be used in, or resulting from, the work of extracting such minerals from their natural deposits in nonliquid form, or if in liquid form, with workers underground, or used in, or to be used in, the milling of such minerals, or the work of preparing coal or other minerals, and includes custom coal preparation facilities. In making a determination of what constitutes mineral milling for purposes of this Act, the Secretary shall give due consideration to the convenience of administration resulting from the delegation to one Assistant Secretary of all authority with respect to the health and safety of miners employed at one physical establishment;

(2) For purposes of titles II, III, and IV, "coal mine" means an area of land and all structures, facilities, ma-

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chinery, tools, equipment, shafts, slopes, tunnels, excavations, and other property, real or personal, placed upon, under, or above the surface of such land by any person, used in, or to be used in, or resulting from, the work of extracting in such area bituminous coal, lignite, or anthracite from its natural deposits in the earth by any means or method, and the work of preparing the coal so extracted, and includes custom coal preparation facilities;

(i) "work of preparing the coal" means the breaking, crushing, sizing, cleaning, washing, drying, mixing, storing and loading of bituminous coal, lignite, or anthracite, and such other work of preparing such coal as is usually done by the operator of the coal mine;

(j) "imminent danger" means the existence of any condition or practice in a coal or other mine which could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated;

(k) "accident" includes a mine explosion, mine ignition, mine fire, or mine inundation, or injury to, or death of, any person;

(l) "mandatory health or safety standard" means the interim mandatory health or safety standards established by titles II and III of this Act, and the standards promulgated pursuant to title I of this Act;

(m) "Panel" means the Interim Compliance Panel established by this Act; and

(n) "Administration" means the Mine Safety and Health Administration in the Department of Labor.

(o) "Commission" means the Federal Mine Safety and Health Review Commission.

MINES SUBJECT TO ACT

SEC. 4. Each coal or other mine, the products of which enter commerce, or the operations or products of which affect commerce, and each operator of such mine, and every miner in such mine shall be subject to the provisions of this Act.

INTERIM COMPLIANCE PANEL

SEC. 5. (a) There is hereby established the Interim Compliance Panel, which shall be composed of five members as follows:

(1) Assistant Secretary of Labor for Labor Standards, Department of Labor, or his delegate;

(2) Director of the Bureau of Standards, Department of Commerce, or his delegate;

(3) Administrator of Consumer Protection and Environmental Health Service, Department of Health, Education, and Welfare, or his delegate;

(4) Director of the Bureau of Mines, Department of the Interior, or his delegate; and

(5) Director of the National Science Foundation, or his delegate.

(b) Members of the Panel shall serve without compensation in addition to that received in their regular employment, but shall be entitled to reimbursement for travel, subsistence, and

other necessary expenses incurred by them in the performance of duties vested in the Panel.

(c) Notwithstanding any other provision of law, the Secretary of Health, Education, and Welfare, the Secretary of Commerce, the Secretary of the Interior, and the Secretary shall, upon request of the Panel, provide the Panel such personnel and other assistance as the Panel determines necessary to enable it to carry out its functions under this Act.

(d) Three members of the Panel shall constitute a quorum for doing business. All decisions of the Panel shall be by majority vote. The chairman of the Panel shall be selected by the members from among the membership thereof.

(e) The Panel is authorized to appoint as many hearing examiners as are necessary for proceedings required to be conducted in accordance with the provisions of this Act. The provisions applicable to hearing examiners appointed under section 3105 of title 5 of the United States Code shall be applicable to hearing examiners appointed pursuant to this subsection.

(f) (1) It shall be the function of the Panel to carry out the duties imposed on it pursuant to this Act and to provide an opportunity for a public hearing, after notice, at the request of an operator of the affected coal mine or the representative of the miners of such mine. Any operator or representative of miners aggrieved by a final decision of the Panel may file a petition for review of such decision under section 106 of this Act. The provisions of this section shall terminate upon completion of the Panel's functions as set forth under this Act. Any hearing held pursuant to this subsection shall be of record and the Panel shall make findings of fact and shall issue a written decision incorporating its findings therein in accordance with section 554 of title 5 of the United States Code.

(2) The Panel shall make an annual report, in writing, to the Secretary for transmittal by him to the Congress concerning the achievement of its purposes, and any other relevant information (including any recommendations) which it deems appropriate.

TITLE I—GENERAL

MANDATORY SAFETY AND HEALTH STANDARDS

SEC. 101. (a) The Secretary shall by rule in accordance with procedures set forth in this section and in accordance with section 553 of title 5, United States Code (without regard to any reference in such section to sections 556 and 557 of such title), develop, promulgate, and revise as may be appropriate, improved mandatory health or safety standards for the protection of life and prevention of injuries in coal or other mines.

(1) Whenever the Secretary, upon the basis of information submitted to him in writing by an interested person, a representative of any organization of employers or employees, a nationally recognized standards-producing organization, the Secretary of Health, Education, and Welfare, the National Institute for Occupational Safety and Health, or a State or

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political subdivision, or on the basis of information developed by the Secretary or otherwise available to him, determines that a rule should be promulgated in order to serve the objectives of this Act, the Secretary may request the recommendation of an advisory committee appointed under section 102 (c). The Secretary shall provide such an advisory committee with any proposals of his own or of the Secretary of Health, Education, and Welfare, together with all pertinent factual information developed by the Secretary or the Secretary of Health, Education, and Welfare, or otherwise available, including the results of research, demonstrations, and experiments. An advisory committee shall submit to the Secretary its recommendations regarding the rule to be promulgated within 60 days from the date of its appointment or within such longer or shorter period as may be prescribed by the Secretary, but in no event for a period which is longer than 180 days. When the Secretary receives a recommendation, accompanied by appropriate criteria, from the National Institute for Occupational Safety and Health that a rule be promulgated, modified, or revoked, the Secretary must, within 60 days after receipt thereof, refer such recommendation to an advisory committee pursuant to this paragraph, or publish such as a proposed rule pursuant to paragraph (2), or publish in the Federal Register his determination not to do so, and his reasons therefor. The Secretary shall be required to request the recommendations of an advisory committee appointed under section 102 (c) if the rule to be promulgated is, in the discretion of the Secretary which shall be final, new in effect or application and has significant economic impact.

(2) The Secretary shall publish a proposed rule promulgating, modifying, or revoking a mandatory health or safety standard in the Federal Register. If the Secretary determines that a rule should be proposed and in connection therewith has appointed an advisory committee as provided by paragraph (1), the Secretary shall publish a proposed rule, or the reasons for his determination not to publish such rule, within 60 days following the submission of the advisory committee's recommendation or the expiration of the period of time prescribed by the Secretary in such submission. In either event, the Secretary shall afford interested persons a period of 30 days after any such publication to submit written data or comments on the proposed rule. Such comment period may be extended by the Secretary upon a finding of good cause, which the Secretary shall publish in the Federal Register. Publication shall include the text of such rules proposed in their entirety, a comparative text of the proposed changes in existing rules, and shall include a comprehensive index to the rules, cross-referenced by subject matter.

(3) On or before the last day of the period provided for the submission of written data or comments under paragraph (2), any interested person may file with the Secretary written objections to the proposed mandatory health or safety standard, stating the grounds therefor and requesting a public hearing on such objections. Within 60 days after the last day for filing such objections, the Secretary shall publish in the Federal Register a notice specifying the mandatory health or safety standard to which objections have been filed and a

hearing requested, and specifying a time and place for such hearing. Any hearing under this subsection for the purpose of hearing relevant information shall commence within 60 days after the date of publication of the notice of hearing. Hearings required by this subsection shall be conducted by the Secretary, who may prescribe rules and make rulings concerning procedures in such hearings to avoid unnecessary cost or delay. Subject to the need to avoid undue delay, the Secretary shall provide for procedures that will afford interested parties the right to participate in the hearing, including the right to present oral statements and to offer written comments and data. The Secretary may require by subpoena the attendance of witnesses and the production of evidence in connection with any proceeding initiated under this section. If a person refuses to obey a subpoena under this subsection, a United States district court within the jurisdiction of which a proceeding under this subsection is conducted may, upon petition by the Secretary, issue an order requiring compliance with such subpoena. A transcript shall be taken of any such hearing and shall be available to the public.

(4) (A) Within 90 days after certification of the record of the hearing held pursuant to paragraph (3), the Secretary shall by rule promulgate, modify, or revoke such mandatory health or safety standards, and publish his reasons therefor.

(B) In the case of a proposed mandatory health or safety standard to which objections requesting a public hearing have not been filed, the Secretary, within 90 days after the period for filing such objections has expired, shall by rule promulgate, modify, or revoke such mandatory standards, and publish his reasons therefor.

(C) In the event the Secretary determines that a proposed mandatory health or safety standard should not be promulgated he shall, within the times specified in subparagraphs (A) and (B) publish his reasons for his determination.

(5) Any mandatory health or safety standard promulgated as a final rule under this section shall be effective upon publication in the Federal Register unless the Secretary specifies a later date.

(6) (A) The Secretary, in promulgating mandatory standards dealing with toxic materials or harmful physical agents under this subsection, shall set standards which most adequately assure on the basis of the best available evidence that no miner will suffer material impairment of health or functional capacity even if such miner has regular exposure to the hazards dealt with by such standard for the period of his working life. Development of mandatory standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the miner, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws. Whenever practicable, the mandatory health or safety standard promulgated shall be expressed in terms of objective criteria and of the performance desired.

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(B) The Secretary of Health, Education, and Welfare, as soon as possible after the date of enactment of the Federal Mine Safety and Health Amendments Act of 1977 but in no event later than 18 months after such date and on a continuing basis thereafter, shall, for each toxic material or harmful physical agent which is used or found in a mine, determine whether such material or agent is potentially toxic at the concentrations in which it is used or found in a mine. The Secretary of Health, Education, and Welfare shall submit such determinations with respect to such toxic substances or harmful physical agents to the Secretary. Thereafter, the Secretary of Health, Education, and Welfare shall submit to the Secretary all pertinent criteria regarding any such substances determined to be toxic or any such harmful agents as such criteria are developed. Within 60 days after receiving any criteria in accordance with the preceding sentence relating to a toxic material or harmful physical agent which is not adequately covered by a mandatory health or safety standard promulgated under this section, the Secretary shall either appoint an advisory committee to make recommendations with respect to a mandatory health or safety standard covering such material or agent in accordance with paragraph (1), or publish a proposed rule promulgating such a mandatory health or safety standard in accordance with paragraph (2), or shall publish his determination not to do so.

(7) Any mandatory health or safety standard promulgated under this subsection shall prescribe the use of labels or other appropriate forms of warning as are necessary to insure that miners are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure. Where appropriate, such mandatory standard shall also prescribe suitable protective equipment and control or technological procedures to be used in connection with such hazards and shall provide for monitoring or measuring miner exposure at such locations and intervals, and in such manner so as to assure the maximum protection of miners. In addition, where appropriate, any such mandatory standard shall prescribe the type and frequency of medical examinations or other tests which shall be made available, by the operator at his cost, to miners exposed to such hazards in order to most effectively determine whether the health of such miners is adversely affected by such exposure. Where appropriate, the mandatory standard shall provide that where a determination is made that a miner may suffer material impairment of health or functional capacity by reason of exposure to the hazard covered by such mandatory standard, that miner shall be removed from such exposure and reassigned. Any miner transferred as a result of such exposure shall continue to receive compensation for such work at no less than the regular rate of pay for miners in the classification such miner held immediately prior to his transfer. In the event of the transfer of a miner pursuant to the preceding sentence, increases in wages of the transferred miner shall be based upon the new work classification. In the event such medical examinations are in the nature of research, as determined by the Secretary of Health, Education, and Welfare, such examinations may be

furnished at the expense of the Secretary of Health, Education, and Welfare. The results of examinations or tests made pursuant to the preceding sentence shall be furnished only to the Secretary or the Secretary of Health, Education, and Welfare, and, at the request of the miner, to his designated physician.

(8) The Secretary shall, to the extent practicable, promulgate separate mandatory health or safety standards applicable to mine construction activity on the surface.

(9) No mandatory health or safety standard promulgated under this title shall reduce the protection afforded miners by an existing mandatory health or safety standard.

(b) (1) The Secretary shall provide, without regard to the requirements of chapter 5, title 5, United States Code, for an emergency temporary mandatory health or safety standard to take immediate effect upon publication in the Federal Register if he determines (A) that miners are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful, or to other hazards, and (B) that such emergency standard is necessary to protect miners from such danger.

(2) A temporary mandatory health or safety standard shall be effective until superseded by a mandatory standard promulgated in accordance with the procedures prescribed in paragraph (3) of this subsection.

(3) Upon publication of such standard in the Federal Register, the Secretary shall commence a proceeding in accordance with section 101 (a), and the standards as published shall also serve as a proposed rule for the proceeding. The Secretary shall promulgate a mandatory health or safety standard under this paragraph no later than nine months after publication of the emergency temporary standard as provided in paragraph (2).

(c) Upon petition by the operator or the representative of miners, the Secretary may modify the application of any mandatory safety standard to a coal or other mine if the Secretary determines that an alternative method of achieving the result of such standard exists which will at all times guarantee no less than the same measure of protection afforded the miners of such mine by such standard, or that the application of such standard to such mine will result in a diminution of safety to the miners in such mine. Upon receipt of such petition the Secretary shall publish notice thereof and give notice to the operator or the representative of miners in the affected mine, as appropriate, and shall cause such investigation to be made as he deems appropriate. Such investigation shall provide an opportunity for a public hearing at the request of such operator or representative or other interested party, to enable the operator or the representative of miners in such mine or other interested party to present information relating to the modification of such standard. Before granting any exception to a mandatory safety standard, the findings of the Secretary or his authorized representative shall be made public and shall be available to the representative of the miners at the affected mine. The Secretary shall issue a decision incorporating his findings of fact therein, and send a copy thereof to the operator or the representative of the miners, as

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appropriate. Any such hearing shall be of record and shall be subject to section 554 of title 5 of the United States Code.

(d) Any person who may be adversely affected by a mandatory health or safety standard promulgated under this section may, at any time prior to the sixtieth day after such standard is promulgated, file a petition challenging the validity of such mandatory standard with the United States Court of Appeals for the District of Columbia Circuit or the circuit wherein such person resides or has his principal place of business, for a judicial review of such standard. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary. The filing of such petition shall not, unless otherwise ordered by the court, operate as a stay of the standard. No objection that has not been urged before the Secretary shall be considered by the court, unless the failure or neglect to urge such objection shall be excused for good cause shown. The validity of any mandatory health or safety standard shall not be subject to challenge on the grounds that any of the time limitations in this section have been exceeded. The procedures of this subsection shall be the exclusive means of challenging the validity of a mandatory health or safety standard.

(e) The Secretary shall send a copy of every proposed mandatory health or safety standard or regulation at the time of publication in the Federal Register to the operator of each coal or other mine and the representative of the miners at such mine and such copy shall be immediately posted on the bulletin board of the mine by the operator or his agent, but failure to receive such notice shall not relieve anyone of the obligation to comply with such standard or regulation.

ADVISORY COMMITTEES

SEC. 102. (a) (1) The Secretary of the Interior shall appoint an advisory committee on coal or other mine safety research composed of—

(A) the Director of the Office of Science and Technology or his delegate, with the consent of the Director;

(B) the Director of the National Bureau of Standards, Department of Commerce, or his delegate, with the consent of the Director;

(C) the Director of the National Science Foundation, or his delegate, with the consent of the Director; and

(D) such other persons as the Secretary of the Interior may appoint who are knowledgeable in the field of coal or other mine safety research.

The Secretary of the Interior shall designate the chairman of the committee.

(2) The advisory committee shall consult with, and make recommendations to, the Secretary of the Interior on matters involving or relating to coal or other mine safety research. The Secretary of the Interior shall consult with, and consider the recommendations of, such committee in the conduct of such research, the making of any grants, and the entering into of contracts for such research.

(3) The chairman of the committee and a majority of the persons appointed by the Secretary of the Interior pursuant to paragraph (1) (D) shall be individuals who have no economic

interests in the coal or other mining industry, and who are not operators, miners, or officers or employees of the Federal Government or any State or local government.

(b) (1) The Secretary of Health, Education, and Welfare shall appoint an advisory committee on coal or other mine health research composed of—

(A) the Director, Bureau of Mines, or his delegate, with the consent of the Director;

(B) the Director of the National Science Foundation, or his delegate, with the consent of the Director;

(C) the Director of the National Institutes of Health, or his delegate, with the consent of the Director; and

(D) such other persons as the Secretary of Health, Education, and Welfare may appoint who are knowledgeable in the field of coal or other mine health research.

The Secretary of Health, Education, and Welfare shall designate the chairman of the committee.

(2) The advisory committee shall consult with, and make recommendations to, the Secretary of Health, Education, and Welfare on matters involving or relating to coal or other mine health research. The Secretary of Health, Education, and Welfare shall consult with, and consider the recommendations of, such committee in the conduct of such research, the making of any grants, and the entering into of contracts for such research.

(3) The chairman of the committee and a majority of the persons appointed by the Secretary of Health, Education, and Welfare pursuant to paragraph (1) (D) shall be individuals who have no economic interests in the coal or other mining industry, and who are not operators, miners, or officers or employees of the Federal Government or any State or local government.

(c) The Secretary or the Secretary of Health, Education, and Welfare may appoint other advisory committees as he deems appropriate to advise him in carrying out the provisions of this Act. The Secretary or the Secretary of Health, Education, and Welfare, as the case may be, shall appoint the chairman of each such committee. A majority of the members (including the chairman) of any such advisory committee appointed pursuant to this subsection shall be composed of individuals who have no economic interests in the coal or other mining industry, and who are not operators, miners, or officers or employees of the Federal Government or any State or local government.

(d) Advisory committee members, other than officers or employees of Federal, State, or local governments, shall be, for each day (including traveltime) during which they are performing committee business, entitled to receive compensation at a rate fixed by the appropriate Secretary but not in excess of the maximum rate of pay for grade GS-18 as provided in the General Schedule under section 5332 of title 5 of the United States Code, and shall, notwithstanding the limitations of sections 5703 and 5704 of title 5 of the United States Code, be fully reimbursed for travel, subsistence, and related expenses.

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INSPECTIONS, INVESTIGATIONS, AND RECORDKEEPING

SEC. 103. (a) Authorized representatives of the Secretary or the Secretary of Health, Education, and Welfare shall make frequent inspections and investigations in coal or other mines each year for the purpose of (1) obtaining, utilizing, and disseminating information relating to health and safety conditions, the causes of accidents, and the causes of diseases and physical impairments originating in such mines, (2) gathering information with respect to mandatory health or safety standards, (3) determining whether an imminent danger exists, and (4) determining whether there is compliance with the mandatory health or safety standards or with any citation, order, or decision issued under this title or other requirements of this Act. In carrying out the requirements of this subsection, no advance notice of an inspection shall be provided to any person, except that in carrying out the requirements of clauses (1) and (2) of this subsection, the Secretary of Health, Education, and Welfare may give advance notice of inspections. In carrying out the requirements of clauses (3) and (4) of this subsection, the Secretary shall make inspections of each underground coal or other mine in its entirety at least four times a year, and of each surface coal or other mine in its entirety at least two times a year. The Secretary shall develop guidelines for additional inspections of mines based on criteria including, but not limited to, the hazards found in mines subject to this Act, and his experience under this Act and other health and safety laws. For the purpose of making any inspection or investigation under this Act, the Secretary, or the Secretary of Health, Education, and Welfare, with respect to fulfilling his responsibilities under this Act, or any authorized representative of the Secretary or the Secretary of Health, Education, and Welfare, shall have a right of entry to, upon, or through any coal or other mine.

(b) For the purpose of making any investigation of any accident or other occurrence relating to health or safety in a coal or other mine, the Secretary may, after notice, hold public hearings, and may sign and issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and administer oaths. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of contumacy or refusal to obey a subpoena served upon any person under this section, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Secretary or to appear and produce documents before the Secretary, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(c) The Secretary, in cooperation with the Secretary of Health, Education, and Welfare, shall issue regulations requiring operators to maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured under

any applicable mandatory health or safety standard promulgated under this Act. Such regulations shall provide miners or their representatives with an opportunity to observe such monitoring or measuring, and to have access to the records thereof. Such regulations shall also make appropriate provisions for each miner or former miner to have access to such records as will indicate his own exposure to toxic materials or harmful physical agents. Each operator shall promptly notify any miner who has been or is being exposed to toxic materials or harmful physical agents in concentrations or at levels which exceed those prescribed by an applicable mandatory health or safety standard promulgated under section 101, or mandated under title II, and shall inform any miner who is being thus exposed of the corrective action being taken.

(d) All accidents, including unintentional roof falls (except in any abandoned panels or in areas which are inaccessible or unsafe for inspections), shall be investigated by the operator or his agent to determine the cause and the means of preventing a recurrence. Records of such accidents and investigations shall be kept and the information shall be made available to the Secretary or his authorized representative and the appropriate State agency. Such records shall be open for inspection by interested persons. Such records shall include man-hours worked and shall be reported at a frequency determined by the Secretary, but at least annually.

(e) Any information obtained by the Secretary or by the Secretary of Health, Education, and Welfare under this Act shall be obtained in such a manner as not to impose an unreasonable burden upon operators, especially those operating small businesses, consistent with the underlying purposes of this Act. Unnecessary duplication of effort in obtaining information shall be reduced to the maximum extent feasible.

(f) Subject to regulations issued by the Secretary, a representative of the operator and a representative authorized by his miners shall be given an opportunity to accompany the Secretary or his authorized representative during the physical inspection of any coal or other mine made pursuant to the provisions of subsection (a), for the purpose of aiding such inspection and to participate in pre- or post-inspection conferences held at the mine. Where there is no authorized miner representative, the Secretary or his authorized representative shall consult with a reasonable number of miners concerning matters of health and safety in such mine. Such representative of miners who is also an employee of the operator shall suffer no loss of pay during the period of his participation in the inspection made under this subsection. To the extent that the Secretary or authorized representative of the Secretary determines that more than one representative from each party would further aid the inspection, he can permit each party to have an equal number of such additional representatives. However, only one such representative of miners who is an employee of the operator shall be entitled to suffer no loss of pay during the period of such participation under the provisions of this subsection. Compliance with this subsection shall not be a jurisdictional prerequisite to the enforcement of any provision of this Act.

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(g) (1) Whenever a representative of the miners or a miner in the case of a coal or other mine where there is no such representative has reasonable grounds to believe that a violation of this Act or a mandatory health or safety standard exists, or an imminent danger exists, such miner or representative shall have a right to obtain an immediate inspection by giving notice to the Secretary or his authorized representative of such violation or danger. Any such notice shall be reduced to writing, signed by the representative of the miners or by the miner, and a copy shall be provided the operator or his agent no later than at the time of inspection, except that the operator or his agent shall be notified forthwith if the complaint indicates that an imminent danger exists. The name of the person giving such notice and the names of individual miners referred to therein shall not appear in such copy or notification. Upon receipt of such notification, a special inspection shall be made as soon as possible to determine if such violation or danger exists in accordance with the provisions of this title. If the Secretary determines that a violation or danger does not exist, he shall notify the miner or representative of the miners in writing of such determination.

(2) Prior to or during any inspection of a coal or other mine, any representative of miners or a miner in the case of a coal or other mine where there is no such representative, may notify the Secretary or any representative of the Secretary responsible for conducting the inspection, in writing, of any violation of this Act or of any imminent danger which he has reason to believe exists in such mine. The Secretary shall, by regulation, establish procedures for informal review of any refusal by a representative of the Secretary to issue a citation with respect to any such alleged violation or order with respect to such danger and shall furnish the representative of miners or miner requesting such review a written statement of the reasons for the Secretary's final disposition of the case.

(h) In addition to such records as are specifically required by this Act, every operator of a coal or other mine shall establish and maintain such records, make such reports, and provide such information, as the Secretary or the Secretary of Health, Education, and Welfare may reasonably require from time to time to enable him to perform his functions under this Act. The Secretary or the Secretary of Health, Education, and Welfare is authorized to compile, analyze, and publish, either in summary or detailed form, such reports or information so obtained. Except to the extent otherwise specifically provided by this Act, all records, information, reports, findings, citations, notices, orders, or decisions required or issued pursuant to or under this Act may be published from time to time, may be released to any interested person, and shall be made available for public inspection.

(i) Whenever the Secretary finds that a coal or other mine liberates excessive quantities of methane or other explosive gases during its operations, or that a methane or other gas ignition or explosion has occurred in such mine which resulted in death or serious injury at any time during the previous five years, or that there exists in such mine some other especially hazardous condition, he shall provide a minimum of one spot

inspection by his authorized representative of all or part of such mine during every five working days at irregular intervals. For purposes of this subsection, "liberation of excessive quantities of methane or other explosive gases" shall mean liberation of more than one million cubic feet of methane or other explosive gases during a 24-hour period. When the Secretary finds that a coal or other mine liberates more than five hundred thousand cubic feet of methane or other explosive gases during a 24-hour period, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine every 10 working days at irregular intervals. When the Secretary finds that a coal or other mine liberates more than two hundred thousand cubic feet of methane or other explosive gases during a 24-hour period, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine every 15 working days at irregular intervals.

(j) In the event of any accident occurring in any coal or other mine, the operator shall notify the Secretary thereof and shall take appropriate measures to prevent the destruction of any evidence which would assist in investigating the cause or causes thereof. In the event of any accident occurring in a coal or other mine, where rescue and recovery work is necessary, the Secretary or an authorized representative of the Secretary shall take whatever action he deems appropriate to protect the life of any person, and he may, if he deems it appropriate, supervise and direct the rescue and recovery activities in such mine.

(k) In the event of any accident occurring in a coal or other mine, an authorized representative of the Secretary, when present, may issue such orders as he deems appropriate to insure the safety of any person in the coal or other mine, and the operator of such mine shall obtain the approval of such representative, in consultation with appropriate State representatives, when feasible, of any plan to recover any person in such mine or to recover the coal or other mine or return affected areas of such mine to normal.

CITATIONS AND ORDERS

SEC. 104. (a) If, upon inspection or investigation, the Secretary or his authorized representative believes that an operator of a coal or other mine subject to this Act has violated this Act, or any mandatory health or safety standard, rule, order, or regulation promulgated pursuant to this Act, he shall, with reasonable promptness, issue a citation to the operator. Each citation shall be in writing and shall describe with particularity the nature of the violation, including a reference to the provision of the Act, standard, rule, regulation, or order alleged to have been violated. In addition, the citation shall fix a reasonable time for the abatement of the violation. The requirement for the issuance of a citation with reasonable promptness shall not be a jurisdictional prerequisite to the enforcement of any provision of this Act.

(b) If, upon any follow-up inspection of a coal or other mine, an authorized representative of the Secretary finds (1) that a

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violation described in a citation issued pursuant to subsection (a) has not been totally abated within the period of time as originally fixed therein or as subsequently extended, and (2) that the period of time for the abatement should not be further extended, he shall determine the extent of the area affected by the violation and shall promptly issue an order requiring the operator of such mine or his agent to immediately cause all persons, except those persons referred to in subsection (c), to be withdrawn from, and to be prohibited from entering, such area until an authorized representative of the Secretary determines that such violation has been abated.

(c) The following persons shall not be required to be withdrawn from, or prohibited from entering, any area of the coal or other mine subject to an order issued under this section:

(1) any person whose presence in such area is necessary, in the judgment of the operator or an authorized representative of the Secretary, to eliminate the condition described in the order;

(2) any public official whose official duties require him to enter such area;

(3) any representative of the miners in such mine who is, in the judgment of the operator or an authorized representative of the Secretary, qualified to make such mine examinations or who is accompanied by such a person and whose presence in such area is necessary for the investigation of the conditions described in the order; and

(4) any consultant to any of the foregoing.

(d) (1) If, upon any inspection of a coal or other mine, an authorized representative of the Secretary finds that there has been a violation of any mandatory health or safety standard, and if he also finds that, while the conditions created by such violation do not cause imminent danger, such violation is of such nature as could significantly and substantially contribute to the cause and effect of a coal or other mine safety or health hazard, and if he finds such violation to be caused by an unwarrantable failure of such operator to comply with such mandatory health or safety standards, he shall include such finding in any citation given to the operator under this Act. If, during the same inspection or any subsequent inspection of such mine within 90 days after the issuance of such citation, an authorized representative of the Secretary finds another violation of any mandatory health or safety standard and finds such violation to be also caused by an unwarrantable failure of such operator to so comply, he shall forthwith issue an order requiring the operator to cause all persons in the area affected by such violation, except those persons referred to in subsection (c) to be withdrawn from, and to be prohibited from entering, such area until an authorized representative of the Secretary determines that such violation has been abated.

(2) If a withdrawal order with respect to any area in a coal or other mine has been issued pursuant to paragraph (1), a withdrawal order shall promptly be issued by an authorized representative of the Secretary who finds upon any subsequent inspection the existence in such mine of violations similar to those that resulted in the issuance of the withdrawal

order under paragraph (1) until such time as an inspection of such mine discloses no similar violations. Following an inspection of such mine which discloses no similar violations, the provisions of paragraph (1) shall again be applicable to that mine.

(e) (1) If an operator has a pattern of violations of mandatory health or safety standards in the coal or other mine which are of such nature as could have significantly and substantially contributed to the cause and effect of coal or other mine health or safety hazards, he shall be given written notice that such pattern exists. If, upon any inspection within 90 days after the issuance of such notice, an authorized representative of the Secretary finds any violation of a mandatory health or safety standard which could significantly and substantially contribute to the cause and effect of a coal or other mine safety or health hazard, the authorized representative shall issue an order requiring the operator to cause all persons in the area affected by such violation, except those persons referred to in subsection (c), to be withdrawn from, and to be prohibited from entering, such area until an authorized representative of the Secretary determines that such violation has been abated.

(2) If a withdrawal order with respect to any area in a coal or other mine has been issued pursuant to paragraph (1), a withdrawal order shall be issued by an authorized representative of the Secretary who finds upon any subsequent inspection the existence in such mine of any violation of a mandatory health or safety standard which could significantly and substantially contribute to the cause and effect of a coal or other mine health or safety hazard. The withdrawal order shall remain in effect until an authorized representative of the Secretary determines that such violation has been abated.

(3) If, upon an inspection of the entire coal or other mine, an authorized representative of the Secretary finds no violations of mandatory health or safety standards that could significantly and substantially contribute to the cause and effect of a coal or other mine health and safety hazard, the pattern of violations that resulted in the issuance of a notice under paragraph (1) shall be deemed to be terminated and the provisions of paragraphs (1) and (2) shall no longer apply. However, if as a result of subsequent violations, the operator reestablishes a pattern of violations, paragraphs (1) and (2) shall again be applicable to such operator.

(4) The Secretary shall make such rules as he deems necessary to establish criteria for determining when a pattern of violations of mandatory health or safety standards exists.

(f) If, based upon samples taken, analyzed, and recorded pursuant to section 202(a), or samples taken during an inspection by an authorized representative of the Secretary, the applicable limit on the concentration of respirable dust required to be maintained under this Act is exceeded and thereby violated, the Secretary or his authorized representative shall issue a citation fixing a reasonable time for the abatement of the violation. During such time, the operator of the mine shall cause samples described in section 202(a) to be taken of the affected area during each production shift. If, upon

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the expiration of the period of time as originally fixed or subsequently extended, the Secretary or his authorized representative finds that the period of time should not be further extended, he shall determine the extent of the area affected by the violation and shall promptly issue an order requiring the operator of such mine or his agent to cause immediately all persons, except those referred to in subsection (c), to be withdrawn from, and to be prohibited from entering, such area until the Secretary or his authorized representative has reason to believe, based on actions taken by the operator, that such limit will be complied with upon the resumption of production in such mine. As soon as possible after an order is issued, the Secretary, upon request of the operator, shall dispatch to the mine involved a person, or team of persons, to the extent such persons are available, who are knowledgeable in the methods and means of controlling and reducing respirable dust. Such person or team of persons shall remain at the mine involved for such time as they shall deem appropriate to assist the operator in reducing respirable dust concentrations. While at the mine, such persons may require the operator to take such actions as they deem appropriate to insure the health of any person in the coal or other mine.

(g) (1) If, upon any inspection or investigation pursuant to section 103 of this Act, the Secretary or an authorized representative shall find employed at a coal or other mine a miner who has not received the requisite safety training as determined under section 115 of this Act, the Secretary or an authorized representative shall issue an order under this section which declares such miner to be a hazard to himself and to others, and requiring that such miner be immediately withdrawn from the coal or other mine, and be prohibited from entering such mine until an authorized representative of the Secretary determines that such miner has received the training required by section 115 of this Act.

(2) No miner who is ordered withdrawn from a coal or other mine under paragraph (1) shall be discharged or otherwise discriminated against because of such order; and no miner who is ordered withdrawn from a coal or other mine under paragraph (1) shall suffer a loss of compensation during the period necessary for such miner to receive such training and for an authorized representative of the Secretary to determine that such miner has received the requisite training.

(h) Any citation or order issued under this section shall remain in effect until modified, terminated or vacated by the Secretary or his authorized representative, or modified, terminated or vacated by the Commission or the courts pursuant to section 105 or 106.

PROCEDURE FOR ENFORCEMENT

SEC. 105. (a) If, after an inspection or investigation, the Secretary issues a citation or order under section 104, he shall, within a reasonable time after the termination of such inspection or investigation, notify the operator by certified mail of the civil penalty proposed to be assessed under section 110(a) for the violation cited and that the operator has 30 days with-

in which to notify the Secretary that he wishes to contest the citation or proposed assessment of penalty. A copy of such notification shall be sent by mail to the representative of miners in such mine. If, within 30 days from the receipt of the notification issued by the Secretary, the operator fails to notify the Secretary that he intends to contest the citation or the proposed assessment of penalty, and no notice is filed by any miner or representative of miners under subsection (d) of this section within such time, the citation and the proposed assessment of penalty shall be deemed a final order of the Commission and not subject to review by any court or agency. Refusal by the operator or his agent to accept certified mail containing a citation and proposed assessment of penalty under this subsection shall constitute receipt thereof within the meaning of this subsection.

(b) (1) (A) If the Secretary has reason to believe that an operator has failed to correct a violation for which a citation has been issued within the period permitted for its correction, the Secretary shall notify the operator by certified mail of such failure and of the penalty proposed to be assessed under section 110(b) by reason of such failure and that the operator has 30 days within which to notify the Secretary that he wishes to contest the Secretary's notification of the proposed assessment of penalty. A copy of such notification of the proposed assessment of penalty shall at the same time be sent by mail to the representative of the mine employees. If, within 30 days from the receipt of notification of proposed assessment of penalty issued by the Secretary, the operator fails to notify the Secretary that he intends to contest the notification of proposed assessment of penalty, such notification shall be deemed a final order of the Commission and not subject to review by any court or agency. Refusal by the operator or his agent to accept certified mail containing a notification of proposed assessment of penalty issued under this subsection shall constitute receipt thereof within the meaning of this subsection.

(B) In determining whether to propose a penalty to be assessed under section 110(b), the Secretary shall consider the operator's history of previous violations, the appropriateness of such penalty to the size of the business of the operator charged, whether the operator was negligent, the effect on the operator's ability to continue in business, the gravity of the violation, and the demonstrated good faith of the operator charged in attempting to achieve rapid compliance after notification of a violation.

(2) An applicant may file with the Commission a written request that the Commission grant temporary relief from any modification or termination of any order or from any order issued under section 104 together with a detailed statement giving the reasons for granting such relief. The Commission may grant such relief under such conditions as it may prescribe, if—

(A) a hearing has been held in which all parties were given an opportunity to be heard;

(B) the applicant shows that there is substantial likelihood that the findings of the Commission will be favorable

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to the applicant; and

(C) such relief will not adversely affect the health and safety of miners.

No temporary relief shall be granted in the case of a citation issued under subsection (a) or (f) of section 104. The Commission shall provide a procedure for expedited consideration of applications for temporary relief under this paragraph.

(c) (1) No person shall discharge or in any manner discriminate against or cause to be discharged or cause discrimination against or otherwise interfere with the exercise of the statutory rights of any miner, representative of miners or applicant for employment in any coal or other mine subject to this Act because such miner, representative of miners or applicant for employment has filed or made a complaint under or related to this Act, including a complaint notifying the operator or the operator's agent, or the representative of the miners at the coal or other mine of an alleged danger or safety or health violation in a coal or other mine, or because such miner, representative of miners or applicant for employment is the subject of medical evaluations and potential transfer under a standard published pursuant to section 101 or because such miner, representative of miners or applicant for employment has instituted or caused to be instituted any proceeding under or related to this Act or has testified or is about to testify in any such proceeding, or because of the exercise by such miner, representative of miners or applicant for employment on behalf of himself or others of any statutory right afforded by this Act.

(2) Any miner or applicant for employment or representative of miners who believes that he has been discharged, interfered with, or otherwise discriminated against by any person in violation of this subsection may, within 60 days after such violation occurs, file a complaint with the Secretary alleging such discrimination. Upon receipt of such complaint, the Secretary shall forward a copy of the complaint to the respondent and shall cause such investigation to be made as he deems appropriate. Such investigation shall commence within 15 days of the Secretary's receipt of the complaint, and if the Secretary finds that such complaint was not frivolously brought, the Commission, on an expedited basis upon application of the Secretary, shall order the immediate reinstatement of the miner pending final order on the complaint. If upon such investigation, the Secretary determines that the provisions of this subsection have been violated, he shall immediately file a complaint with the Commission, with service upon the alleged violator and the miner, applicant for employment, or representative of miners alleging such discrimination or interference and propose an order granting appropriate relief. The Commission shall afford an opportunity for a hearing; (in accordance with section 554 of title 5, United States Code, but without regard to subsection (a) (3) of such section) and thereafter shall issue an order, based upon findings of fact, affirming, modifying, or vacating the Secretary's proposed order, or directing other appropriate relief. Such order shall become final 30 days after its issuance. The Commission shall have authority in such proceedings to require a person

committing a violation of this subsection to take such affirmative action to abate the violation as the Commission deems appropriate, including, but not limited to, the rehiring or reinstatement of the miner to his former position with back pay and interest. The complaining miner, applicant, or representative of miners may present additional evidence on his own behalf during any hearing held pursuant to this paragraph.

(3) Within 90 days of the receipt of a complaint filed under paragraph (2), the Secretary shall notify, in writing, the miner, applicant for employment, or representative of miners of his determination whether a violation has occurred. If the Secretary, upon investigation, determines that the provisions of this subsection have not been violated, the complainant shall have the right, within 30 days of notice of the Secretary's determination, to file an action in his own behalf before the Commission, charging discrimination or interference in violation of paragraph (1). The Commission shall afford an opportunity for a hearing (in accordance with section 554 of title 5, United States Code, but without regard to subsection (a) (3) of such section), and thereafter shall issue an order, based upon findings of fact, dismissing or sustaining the complainant's charges and, if the charges are sustained, granting such relief as it deems appropriate, including, but not limited to, an order requiring the rehiring or reinstatement of the miner to his former position with back pay and interest or such remedy as may be appropriate. Such order shall become final 30 days after its issuance. Whenever an order is issued sustaining the complainant's charges under this subsection, a sum equal to the aggregate amount of all costs and expenses (including attorney's fees) as determined by the Commission to have been reasonably incurred by the miner, applicant for employment or representative of miners for, or in connection with, the institution and prosecution of such proceedings shall be assessed against the person committing such violation. Proceedings under this section shall be expedited by the Secretary and the Commission. Any order issued by the Commission under this paragraph shall be subject to judicial review in accordance with section 106. Violations by any person of paragraph (1) shall be subject to the provisions of sections 108 and 110 (a).

(d) If, within 30 days of receipt thereof, an operator of a coal or other mine notifies the Secretary that he intends to contest the issuance or modification of an order issued under section 104, or citation or a notification of proposed assessment of a penalty issued under subsection (a) or (b) of this section, or the reasonableness of the length of abatement time fixed in a citation or modification thereof issued under section 104, or any miner or representative of miners notifies the Secretary of an intention to contest the issuance, modification, or termination of any order issued under section 104, or the reasonableness of the length of time set for abatement by a citation or modification thereof issued under section 104, the Secretary shall immediately advise the Commission of such notification, and the Commission shall afford an opportunity for a hearing (in accordance with section 554 of title 5, United

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States Code, but without regard to subsection (a) (3) of such section), and thereafter shall issue an order, based on findings of fact, affirming, modifying, or vacating the Secretary's citation, order, or proposed penalty, or directing other appropriate relief. Such order shall become final 30 days after its issuance. The rules of procedure prescribed by the Commission shall provide affected miners or representatives of affected miners an opportunity to participate as parties to hearings under this section. The Commission shall take whatever action is necessary to expedite proceedings for hearing appeals of orders issued under section 104.

JUDICIAL REVIEW

SEC. 106. (a) (1) Any person adversely affected or aggrieved by an order of the Commission issued under this Act may obtain a review of such order in any United States court of appeals for the circuit in which the violation is alleged to have occurred or in the United States Court of Appeals for the District of Columbia Circuit, by filing in such court within 30 days following the issuance of such order a written petition praying that the order be modified or set aside. A copy of such petition shall be forthwith transmitted by the clerk of the court to the Commission and to the other parties, and thereupon the Commission shall file in the court the record in the proceeding as provided in section 2112 of title 28, United States Code. Upon such filing, the court shall have exclusive jurisdiction of the proceeding and of the questions determined therein, and shall have the power to make and enter upon the pleadings, testimony, and proceedings set forth in such record a decree affirming, modifying, or setting aside, in whole or in part, the order of the Commission and enforcing the same to the extent that such order is affirmed or modified. No objection that has not been urged before the Commission shall be considered by the court, unless the failure or neglect to urge such objection shall be excused because of extraordinary circumstances. The findings of the Commission with respect to questions of fact, if supported by substantial evidence on the record considered as a whole, shall be conclusive. If any party shall apply to the court for leave to adduce additional evidence and shall show to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the hearing before the Commission, the court may order such additional evidence to be taken before the Commission and to be made a part of the record. The Commission may modify its findings as to the facts, or make new findings, by reason of additional evidence so taken and filed, and it shall file such modified or new findings, which findings with respect to questions of fact, if supported by substantial evidence on the record considered as a whole, shall be conclusive. The Commission may modify or set aside its original order by reason of such modified or new findings of fact. Upon the filing of the record after such remand proceedings, the jurisdiction of the court shall be exclusive and its judgment and decree shall be final, except that the same shall be subject to review by the

Supreme Court of the United States, as provided in section 1254 of title 28, United States Code. Petitions filed under this subsection shall be heard expeditiously.

(2) In the case of a proceeding to review any order or decision issued by the Commission under this Act, except an order or decision pertaining to an order issued under section 107(a) or an order or decision pertaining to a citation issued under section 104 (a) or (f), the court may, under such conditions as it may prescribe, grant such temporary relief as it deems appropriate pending final determination of the proceeding, if—

(A) all parties to the proceeding have been notified and given an opportunity to be heard on a request for temporary relief;

(B) the person requesting such relief shows that there is a substantial likelihood that he will prevail on the merits of the final determination of the proceeding; and

(C) such relief will not adversely affect the health and safety of miners in the coal or other mine.

(3) In the case of a proceeding to review any order or decision issued by the Panel under this Act, the court may, under such conditions as it may prescribe, grant such temporary relief as it deems appropriate pending final determination of the proceeding, if—

(A) all parties to the proceeding have been notified and given an opportunity to be heard on a request for temporary relief; and

(B) the person requesting such relief shows that there is a substantial likelihood that he will prevail on the merits of the final determination of the proceeding.

(b) The Secretary may also obtain review or enforcement of any final order of the Commission by filing a petition for such relief in the United States court of appeals for the circuit in which the alleged violation occurred or in the Court of Appeals for the District of Columbia Circuit, and the provisions of subsection (a) shall govern such proceedings to the extent applicable. If no petition for review, as provided in subsection (a), is filed within 30 days after issuance of the Commission's order, the Commission's findings of fact and order shall be conclusive in connection with any petition for enforcement which is filed by the Secretary after the expiration of such 30-day period. In any such case, as well as in the case of a non-contested citation or notification by the Secretary which has become a final order of the Commission under subsection (a) or (b) of section 105, the clerk of the court, unless otherwise ordered by the court, shall forthwith enter a decree enforcing the order and shall transmit a copy of such decree to the Secretary and the operator named in the petition. In any contempt proceeding brought to enforce a decree of a court of appeals entered pursuant to this subsection or subsection (a), the court of appeals may assess the penalties provided in section 110, in addition to invoking any other available remedies.

(c) The commencement of a proceeding under this section shall not, unless specifically ordered by the court, operate as a stay of the order or decision of the Commission or the Panel.

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PROCEDURES TO COUNTERACT DANGEROUS CONDITIONS

SEC. 107. (a) If, upon any inspection or investigation of a coal or other mine which is subject to this Act, an authorized representative of the Secretary finds that an imminent danger exists, such representative shall determine the extent of the area of such mine throughout which the danger exists, and issue an order requiring the operator of such mine to cause all persons, except those referred to in section 104 (c), to be withdrawn from, and to be prohibitd from entering, such area until an authorized representative of the Secretary determines that such imminent danger and the conditions or practices which caused such imminent danger no longer exist. The issuance of an order under this subsection shall not preclude the issuance of a citation under section 104 or the proposing of a penalty under section 110.

(b) (1) If, upon any inspection of a coal or other mine, an authorized representative of the Secretary finds (A) that conditions exist therein which have not yet resulted in an imminent danger, (B) that such conditions cannot be effectively abated through the use of existing technology, and (C) that reasonable assurance cannot be provided that the continuance of mining operations under such conditions will not result in an imminent danger, he shall determine the area throughout which such conditions exist, and thereupon issue a notice to the operator of the mine or his agent of such conditions, and shall file a copy thereof, incorporating his findings therein, with the Secretary and with the representative of the miners of such mine. Upon receipt of such copy, the Secretary shall cause such further investigation to be made as he deems appropriate, including an opportunity for the operator or a representative of the miners to present information relating to such notice.

(2) Upon the conclusion of an investigation pursuant to paragraph (1), and an opportunity for a public hearing upon request by any interested party, the Secretary shall make findings of fact, and shall by decision incorporating such findings therein, either cancel the notice issued under this subsection or issue an order requiring the operator of such mine to cause all persons in the area affected, except those persons referred to in subsection (c) of section 104 to be withdrawn from, and be prohibited from entering, such area until the Secretary, after a public hearing affording all interested persons an opportunity to present their views, determines that such conditions have been abated. Any hearing under this paragraph shall be of record and shall be subject to section 554 of title 5 of the United States Code.

(c) Orders issued pursuant to subsection (a) shall contain a detailed description of the conditions or practices which cause and constitute an imminent danger and a description of the area of the coal or other mine from which persons must be withdrawn and prohibited from entering.

(d) Each finding made and order issued under this section shall be given promptly to the operator of the coal or other mine to which it pertains by the person making such finding or order, and all of such findings and orders shall be in writing, and shall be signed by the person making them. Any or-

der issued pursuant to subsection (a) may be modified or terminated by an authorized representative of the Secretary. Any order issued under subsection (a) or (b) shall remain in effect until vacated, modified, or terminated by the Secretary, or modified or vacated by the Commission pursuant to subsection (e), or by the courts pursuant to section 106(a).

(e) (1) Any operator notified of an order under this section or any representative of miners notified of the issuance, modification, or termination of such an order may apply to the Commission within 30 days of such notification for reinstatement, modification or vacation of such order. The Commission shall forthwith afford an opportunity for a hearing (in accordance with section 554 of title 5, United States Code, but without regard to subsection (a) (3) of such section) and thereafter shall issue an order, based upon findings of fact, vacating, affirming, modifying, or terminating the Secretary's order. The Commission and the courts may not grant temporary relief from the issuance of any order under subsection (a).

(2) The Commission shall take whatever action is necessary to expedite proceedings under this subsection.

INJUNCTIONS

SEC. 108. (a) (1) The Secretary may institute a civil action for relief, including a permanent or temporary injunction, restraining order, or any other appropriate order in the district court of the United States for the district in which a coal or other mine is located or in which the operator of such mine has his principal office, whenever such operator or his agent—

(A) violates or fails or refuses to comply with any order or decision issued under this Act,

(B) interferes with, hinders, or delays the Secretary or his authorized representative, or the Secretary of Health, Education, and Welfare or his authorized representative, in carrying out the provisions of this Act,

(C) refuses to admit such representatives to the coal or other mine,

(D) refuses to permit the inspection of the coal or other mine, or the investigation of an accident or occupational disease occurring in, or connected with, such mine,

(E) refuses to furnish any information or report requested by the Secretary or the Secretary of Health, Education, and Welfare in furtherance of the provisions of this Act, or

(F) refuses to permit access to, and copying of, such records as the Secretary or the Secretary of Health, Education, and Welfare determines necessary in carrying out the provisions of this Act.

(2) The Secretary may institute a civil action for relief, including permanent or temporary injunction, restraining order, or any other appropriate order in the district court of the United States for the district in which the coal or other mine is located or in which the operator of such mine has his principal office whenever the Secretary believes that the operator of a coal or other mine is engaged in a pattern of violation of the mandatory health or safety standards of this Act, which in the judgment of the Secretary constitutes a continuing hazard to the health or safety of miners.

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(b) In any action brought under subsection (a), the court shall have jurisdiction to provide (1) such relief as may be appropriate. In the case of an action under subsection (a) (2), the court shall in its order require such assurance or affirmative steps as it deems necessary to assure itself that the protection afforded to miners under this Act shall be provided by the operator. Temporary restraining orders shall be issued in accordance with rule 65 of the Federal Rules of Civil Procedure, as amended, except that the time limit in such orders, when issued without notice, shall be seven days from the date of entry. Except as otherwise provided herein, any relief granted by the court to enforce any order under paragraph (1) of subsection (a) shall continue in effect until the completion or final termination of all proceedings for review of such order under this title, unless prior thereto, the district court granting such relief sets it aside or modifies it. In any action instituted under this section to enforce an order or decision issued by the Commission or the Secretary after a public hearing in accordance with section 554 of title 5 of the United States Code, the findings of the Commission or the Secretary, as the case may be, if supported by substantial evidence on the record considered as a whole, shall be conclusive.

POSTING OF ORDERS AND DECISIONS

SEC. 109. (a) At each coal or other mine there shall be maintained an office with a conspicuous sign designating it as the office of such mine. There shall be a bulletin board at such office or located at a conspicuous place near an entrance of such mine, in such manner that orders, citations, notices and decisions required by law or regulation to be posted, may be posted thereon, and be easily visible to all persons desiring to read them, and be protected against damage by weather and against unauthorized removal. A copy of any order, citation, notice or decision required by this Act to be given to an operator shall be delivered to the office of the affected mine, and a copy shall be immediately posted on the bulletin board of such mine by the operator or his agent.

(b) The Secretary shall (1) cause a copy of any order, citation, notice, or decision required by this Act to be given to an operator to be mailed immediately to a representative of the miners in the affected coal or other mine, and (2) cause a copy thereof to be mailed to the public official or agency of the State charged with administering State laws, if any, relating to health or safety in such mine. Such notice, order, citation, or decision shall be available for public inspection.

(c) In order to insure prompt compliance with any notice, order, citation, or decision issued under this Act, the authorized representative of the Secretary may deliver such notice, order, citation, or decision to an agent of the operator, and such agent shall immediately take appropriate measures to insure compliance with such notice, order, citation, or decision.

(d) Each operator of a coal or other mine subject to this Act shall file with the Secretary the name and address of such mine and the name and address of the person who controls or operates the mine. Any revisions in such names or addresses

shall be promptly filed with the Secretary. Each operator of a coal or other mine subject to this Act shall designate a responsible official at such mine as the principal officer in charge of health and safety at such mine, and such official shall receive a copy of any notice, order, citation, or decision issued under this Act affecting such mine. In any case where the mine is subject to the control of any person not directly involved in the daily operations of the coal or other mine, there shall be filed with the Secretary the name and address of such person and the name and address of a principal official of such person who shall have overall responsibility for the conduct of an effective health and safety program at any coal or other mine subject to the control of such person, and such official shall receive a copy of any notice, order, citation, or decision issued affecting any such mine. The mere designation of a health and safety official under this subsection shall not be construed as making such official subject to any penalty under this Act.

PENALTIES

SEC. 110. (a) The operator of a coal or other mine in which a violation occurs of a mandatory health or safety standard or who violates any other provision of this Act, shall be assessed a civil penalty by the Secretary which penalty shall not be more than $10,000 for each such violation. Each occurrence of a violation of a mandatory health or safety standard may constitute a separate offense.

(b) Any operator who fails to correct a violation for which a citation has been issued under section 104(a) within the period permitted for its correction may be assessed a civil penalty of not more than $1,000 for each day during which such failure or violation continues.

(c) Whenever a corporate operator violates a mandatory health or safety standard or knowingly violates or fails or refuses to comply with any order issued under this Act or any order incorporated in a final decision issued under this Act, except an order incorporated in a decision issued under subsection (a) or section 105(c), any director, officer, or agent of such corporation who knowingly authorized, ordered, or carried out such violation, failure, or refusal shall be subject to the same civil penalties, fines, and imprisonment that may be imposed upon a person under subsections (a) and (d).

(d) Any operator who willfully violates a mandatory health or safety standard, or knowingly violates or fails or refuses to comply with any order issued under section 104 and section 107, or any order incorporated in a final decision issued under this title, except an order incorporated in a decision under subsection (a) or section 105(c), shall, upon conviction, be punished by a fine of not more than $25,000, or by imprisonment for not more than one year, or by both, except that if the conviction is for a violation committed after the first conviction of such operator under this Act, punishment shall be by a fine of not more than $50,000, or by imprisonment for not more than five years, or both.

(e) Unless otherwise authorized by this Act, any person who gives advance notice of any inspection to be conducted under

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this Act shall, upon conviction, be punished by a fine of not more than $1,000 or by imprisonment for not more than six months, or both.

(f) Whoever knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to this Act shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than five years, or both.

(g) Any miner who willfully violates the mandatory safety standards relating to smoking or the carrying of smoking materials, matches, or lighters shall be subject to a civil penalty assessed by the Commission, which penalty shall not be more than $250 for each occurrence of such violation.

(h) Whoever knowingly distributes, sells, offers for sale, introduces, or delivers in commerce any equipment for use in a coal or other mine, including, but not limited to, components and accessories of such equipment, which is represented as complying with the provisions of this Act, or with any specification or regulation of the Secretary applicable to such equipment, and which does not so comply, shall, upon conviction, be subject to the same fine and imprisonment that may be imposed upon a person under subsection (f) of this section.

(i) The Commission shall have authority to assess all civil penalties provided in this Act. In assessing civil monetary penalties, the Commission shall consider the operator's history of previous violations, the appropriateness of such penalty to the size of the business of the operator charged, whether the operator was negligent, the effect on the operator's ability to continue in business, the gravity of the violation, and the demonstrated good faith of the person charged in attempting to achieve rapid compliance after notification of a violation. In proposing civil penalties under this Act, the Secretary may rely upon a summary review of the information available to him and shall not be required to make findings of fact concerning the above factors.

(j) Civil penalties owed under this Act shall be paid to the Secretary for deposit into the Treasury of the United States and shall accrue to the United States and may be recovered in a civil action in the name of the United States brought in the United States district court for the district where the violation occurred or where the operator has its principal office. Interest at the rate of 8 percent per annum shall be charged against a person on any final order of the Commission, or the court. Interest shall begin to accrue 30 days after the issuance of such order.

(k) No proposed penalty which has been contested before the Commission under section 105(a) shall be compromised, mitigated, or settled except with the approval of the Commission. No penalty assessment which has become a final order of the Commission shall be compromised, mitigated, or settled except with the approval of the court.

(l) The provisions of this section shall not be applicable with respect to title IV of this Act

ENTITLEMENT OF MINERS

SEC. 111. If a coal or other mine or area of such mine is closed by an order issued under section 103, section 104, or section 107, all miners working during the shift when such order was issued who are idled by such order shall be entitled, regardless of the result of any review of such order, to full compensation by the operator at their regular rates of pay for the period they are idled, but for not more than the balance of such shift. If such order is not terminated prior to the next working shift, all miners on that shift who are idled by such order shall be entitled to full compensation by the operator at their regular rates of pay for the period they are idled, but for not more than four hours of such shift. If a coal or other mine or area of such mine is closed by an order issued under section 104 or section 107 of this title for a failure of the operator to comply with any mandatory health or safety standards, all miners who are idled due to such order shall be fully compensated after all interested parties are given an opportunity for a public hearing, which shall be expedited in such cases, and after such order is final, by the operator for lost time at their regular rates of pay for such time as the miners are idled by such closing, or for one week, whichever is the lesser. Whenever an operator violates or fails or refuses to comply with any order issued under section 103, section 104, or section 107 of this Act, all miners employed at the affected mine who would have been withdrawn from, or prevented from entering, such mine or area thereof as a result of such order shall be entitled to full compensation by the operator at their regular rates of pay, in addition to pay received for work performed after such order was issued, for the period beginning when such order was issued and ending when such order is complied with, vacated, or terminated. The Commission shall have authority to order compensation due under this section upon the filing of a complaint by a miner or his representative and after opportunity for hearing subject to section 554 of title 5, United States Code.

ADMINISTRATIVE PROVISIONS

SEC. 112. Except as provided in section 518(a) of title 28, United States Code, relating to litigation before the Supreme Court, the Solicitor of Labor may appear for and represent the Secretary in any civil litigation brought under this Act but all such litigation shall be subject to the direction and control of the Attorney General.

THE FEDERAL MINE SAFETY AND HEALTH REVIEW COMMISSION

SEC. 113. (a) The Federal Mine Safety and Health Review Commission is hereby established. The Commission shall consist of five members, appointed by the President by and with the advice and consent of the Senate, from among persons who by reason of training, education, or experience are qualified to carry out the functions of the Commission under this Act. The President shall designate one of the members of the Commission to serve as Chairman.

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(b) (1) The terms of the members of the Commission shall be six years, except that—

(A) members of the Commission first taking office after the date of enactment of the Federal Mine Safety and Health Amendments Act of 1977, shall serve, as designated by the President at the time of appointment, one for a term of two years, two for a term of four years and two for a term of six years; and

(B) a vacancy caused by the death, resignation, or removal of any member prior to the expiration of the term for which he was appointed shall be filled only for the remainder of such unexpired term.

Any member of the Commission may be removed by the President for inefficiency, neglect of duty, or malfeasance in office.

(2) The Chairman shall be responsible on behalf of the Commission for the administrative operations of the Commission. The Commission shall appoint such employees as it deems necessary to assist in the performance of the Commission's functions and to fix their compensation in accordance with the provisions of chapter 51 and subchapter III of chapter 53 of title 5, United States Code, relating to classification and general pay rates. Upon the effective date of the Federal Mine Safety and Health Amendments Act of 1977, the administrative law judges assigned to the Arlington, Virginia, facility of the Office of Hearings and Appeals, United States Department of the Interior, shall be automatically transferred in grade and position to the Federal Mine Safety and Health Review Commission. Notwithstanding the provisions of section 559 of title 5 of the United States Code, the incumbent Chief Administrative Law Judge of the Office of Hearings and Appeals of the Department of the Interior assigned to the Arlington, Virginia facility shall have the option, on the effective date of the Federal Mine Safety and Health Amendments Act of 1977, of transferring to the Commission as an administrative law judge, in the same grade and position as the other administrative law judges. The administrative law judges (except those presiding over Indian Probate Matters) assigned to the Western facilities of the Office of Hearings and Appeals of the Department of the Interior shall remain with that Department at their present grade and position or they shall have the right to transfer on an equivalent basis to that extended in this paragraph to the Arlington, Virginia administrative law judges in accordance with procedures established by the Civil Service Commission. The Commission shall appoint such additional administrative law judges as it deems necessary to carry out the functions of the Commission. Assignment, removal, and compensation of administrative law judges shall be in accordance with sections 3105, 3344, 5362 and 7521 of title 5, United States Code.

(c) The Commission is authorized to delegate to any group of three or more members any or all of the powers of the Commission, except that two members shall constitute a quorum of any group designated pursuant to this paragraph.

(d) (1) An administrative law judge appointed by the Commission to hear matters under this Act shall hear, and make a determination upon, any proceeding instituted before the

Commission and any motion in connection therewith, assigned to such administrative law judge by the chief administrative law judge of the Commission or by the Commission, and shall make a decision which constitutes his final disposition of the proceedings. The decision of the administrative law judge of the Commission shall become the final decision of the Commission 40 days after its issuance unless within such period of the Commission has directed that such decision shall be reviewed by the Commission in accordance with paragraph (2). An administrative law judge shall not be assigned to prepare a recommended decision under this Act.

(2) The Commission shall prescribe rules of procedure for its review of the decisions of administrative law judges in cases under this Act which shall meet the following standards for review:

(A) (i) Any person adversely affected or aggrieved by a decision of an administrative law judge, may file and serve a petition for discretionary review by the Commission of such decision within 30 days after the issuance of such decision. Review by the Commission shall not be a matter of right but of the sound discretion of the Commission.

(ii) Petitions for discretionary review shall be filed only upon one or more of the following grounds:

(I) A finding or conclusion of material fact is not supported by substantial evidence.

(II) A necessary legal conclusion is erroneous.

(III) The decision is contrary to law or to the duly promulgated rules or decisions of the Commission.

(IV) A substantial question of law, policy or discretion is involved.

(V) A prejudicial error of procedure was committed.

(iii) Each issue shall be separately numbered and plainly and concisely stated, and shall be supported by detailed citations to the record when assignments of error are based on the record, and by statutes, regulations, or principal authorities relied upon. Except for good cause shown, no assignment of error by any party shall rely on any question of fact or law upon which the administrative law judge had not been afforded an opportunity to pass. Review by the Commission shall be granted only by affirmative vote of two of the Commissioners present and voting. If granted, review shall be limited to the questions raised by the petition.

(B) At any time within 30 days after the issuance of a decision of an administrative law judge, the Commission may in its discretion (by affirmative vote of two of the Commissioners present and voting) order the case before it for review but only upon the ground that the decision may be contrary to law or Commission policy, or that a novel question of policy has been presented. The Commission shall state in such order the specific issue of law, Commission policy, or novel question of policy involved. If a party's petition for discretionary review has been granted, the Commission shall not raise or consider additional issues in such review proceedings except in compliance with the requirements of this paragraph.

(C) For the purpose of review by the Commission under paragraph (A) or (B) of this subsection, the record shall in-

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clude: (i) all matters constituting the record upon which the decision of the administrative law judge was based; (ii) the rulings upon proposed findings and conclusions; (iii) the decision of the administrative law judge; (iv) the petition or petitions for discretionary review, responses thereto, and the Commission's order for review; and (v) briefs filed on review. No other material shall be considered by the Commission upon review. The Commission either may remand the case to the administrative law judge for further proceedings as it may direct or it may affirm, set aside, or modify the decision or oder of the administrative law judge in conformity with the record. If the Commission determines that further evidence is necessary on an issue of fact it shall remand the case for further proceedings before the administrative law judge.

(The provisions of section 557(b) of title 5, United States Code, with regard to the review authority of the Commission are hereby expressly superseded to the extent that they are inconsistent with the provisions of subparagraphs (A), (B), and (C) of this paragraph.)

(e) In connection with hearings before the Commission or its administrative law judges under this Act, the Commission and its administrative law judges may compel the attendance and testimony of witnesses and the production of books, papers, or documents, or objects, and order testimony to be taken by deposition at any stage of the proceedings before them. Any person may be compelled to appear and depose and produce similar documentary or physical evidence, in the same manner as witnesses may be compelled to appear and produce evidence before the Commission and its administrative law judges. Witnesses shall be paid the same fees and mileage that are paid witnesses in the courts of the United States and at depositions ordered by such courts. In case of contumacy, failure, or refusal of any person to obey a subpoena or order of the Commission or an administrative law judge, respectively, to appear, to testify, or to produce documentary or physical evidence, any district court of the United States or the United States courts of any territory or possession, within the jurisdiction of which such person is found, or resides, or transacts business, shall, upon the application of the Commission, or the administrative law judge, respectively, have jurisdiction to issue to such person an order requiring such person to appear, to testify, or to produce evidence as ordered by the Commission or the administrative law judge, respectively, and any failure to obey such order of the court may be punished by the court as a contempt thereof.

AUTHORIZATION OF APPROPRIATIONS

SEC. 114. There are authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary to carry out the provisions of this title.

MANDATORY HEALTH AND SAFETY TRAINING

SEC. 115. (a) Each operator of a coal or other mine shall have a health and safety training program which shall be

approved by the Secretary. The Secretary shall promulgate regulations with respect to such health and safety training programs not more than 180 days after the effective date of the Federal Mine Safety and Health Amendments Act of 1977. Each training program approved by the Secretary shall provide as a minimum that—

(1) new miners having no underground mining experience shall receive no less than 40 hours of training if they are to work underground. Such training shall include instruction in the statutory rights of miners and their representatives under this Act, use of the self-rescue device and use of respiratory devices, hazard recognition, escapeways, walk around training, emergency procedures, basic ventilation, basic roof control, electrical hazards, first aid, and the health and safety aspects of the task to which he will be assigned;

(2) new miners having no surface mining experience shall receive no less than 24 hours of training if they are to work on the surface. Such training shall include instruction in the statutory rights of miners and their representatives under this Act, use of the self-rescue device where appropriate and use of respiratory devices where appropriate, hazard recognition, emergency procedures, electrical hazards, first aid, walk around training and the health and safety aspects of the task to which he will be assigned;

(3) all miners shall receive no less than eight hours of refresher training no less frequently than once each 12 months, except that miners already employed on the effective date of the Federal Mine Safety and Health Amendments Act of 1977 shall receive this refresher training no more than 90 days after the date of approval of the training plan required by this section;

(4) any miner who is reassigned to a new task in which he has had no previous work experience shall receive training in accordance with a training plan approved by the Secretary under this subsection in the safety and health aspects specific to that task prior to performing that task;

(5) any training required by paragraphs (1), (2) or (4) shall include a period of training as closely related as is practicable to the work in which the miner is to be engaged.

(b) Any health and safety training provided under subsection (a) shall be provided during normal working hours. Miners shall be paid at their normal rate of compensation while they take such training, and new miners shall be paid at their starting wage rate when they take the new miner training. If such training shall be given at a location other than the normal place of work, miners shall also be compensated for the additional costs they may incur in attending such training sessions.

(c) Upon completion of each training program, each operator shall certify, on a form approved by the Secretary, that the miner has received the specified training in each subject area of the approved health and safety training plan. A certif-

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icate for each miner shall be maintained by the operator, and shall be available for inspection at the mine site, and a copy thereof shall be given to each miner at the completion of such training. When a miner leaves the operator's employ, he shall be entitled to a copy of his health and safety training certificates. False certification by an operator that training was given shall be punishable under section 110 (a) and (f); and each health and safety training certificate shall indicate on its face, in bold letters, printed in a conspicuous manner the fact that such false certification is so punishable.

(d) The Secretary shall promulgate appropriate standards for safety and health training for coal or other mine construction workers.

(e) Within 180 days after the effective date of the Federal Mine Safety and Health Amendments Act of 1977, the Secretary shall publish proposed regulations which shall provide that mine rescue teams shall be available for rescue and recovery work to each underground coal or other mine in the event of an emergency. The costs of making advance arrangements for such teams shall be borne by the operator of each such mine.

TITLE II—INTERIM MANDATORY HEALTH STANDARDS

COVERAGE

SEC. 201. (a) The provisions of sections 202 through 206 of this title and the applicable provisions of section 318 of the title III shall be interim mandatory health standards applicable to all underground coal mines until superseded in whole or in part by improved mandatory health standards promulgated by the Secretary under the provisions of section 101 of this Act, and shall be enforced in the same manner and to the same extent as any mandatory health standard promulgated under the provisions of section 101 of this Act. Any orders issued in the enforcement of the interim standards set forth in this title shall be subject to review as provided in title I of this Act.

(b) Among other things, it is the purpose of this title to provide, to the greatest extent possible, that the working conditions in each underground coal mine are sufficiently free of respirable dust concentrations in the mine atmosphere to permit each miner the opportunity to work underground during the period of his entire adult working life without incurring any disability from pneumoconiosis or any other occupation-related disease during or at the end of such period.

DUST STANDARD AND RESPIRATORY EQUIPMENT

SEC. 202. (a) Each operator of a coal mine shall take accurate samples of the amount of respirable dust in the mine atmosphere to which each miner in the active workings of such mine is exposed. Such samples shall be taken by any device approved by the Secretary and the Secretary of Health, Education, and Welfare and in accordance with such methods, at such locations, at such intervals, and in such manner as the Secretaries shall prescribe in the Federal Register within six-

ty days from the date of enactment of this Act and from time to time thereafter. Such samples shall be transmitted to the Secretary in a manner established by him, and analyzed and recorded by him in a manner that will assure application of the provisions of section 104 (i) of this Act when the applicable limit on the concentration of respirable dust required to be maintained under this section is exceeded. The results of such samples shall also be made available to the operator. Each operator shall report and certify to the Secretary at such intervals as the Secretary may require as to the conditions in the active workings of the coal mine, including, but not limited to, the average number of working hours worked during each shift, the quantity and velocity of air regularly reaching the working faces, the method of mining, the amount and pressure of the water, if any, reaching the working faces, and the number, location, and type of sprays, if any, used.

(b) Except as otherwise provided in this subsection—

(1) Effective on the operative date of this title, each operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of such mine is exposed at or below 3.0 milligrams of respirable dust per cubic meter of air.

(2) Effective three years after the date of enactment of this Act, each operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of such mine is exposed at or below 2.0 milligrams of respirable dust per cubic meter of air.

(3) Any operator who determines that he will be unable, using available technology, to comply with the provisions of paragraph (1) of this subsection, or the provisions of paragraph (2) of this subsection, as appropriate, may file with the Panel, no later than sixty days prior to the effective date of the applicable respirable dust standard established by such paragraphs, an application for a permit for noncompliance. If, in the case of an application for a permit for noncompliance with the 3.0 milligram standard established by paragraph (1) of this subsection, the application satisfies the requirements of subsection (c) of this section, the Panel shall issue a permit for noncompliance to the operator. If, in the case of an application for a permit for noncompliance with the 2.0 milligram standard established by paragraph (2) of this subsection, the application satisfies the requirements of subsection (c) of this section and the Panel determines that the applicant will be unable to comply with such standard, the Panel shall issue to the operator a permit for noncompliance.

(4) In any case in which an operator, who has been issued a permit (including a renewal permit) for noncompliance under this section, determines, not more than ninety days prior to the expiration date of such permit, that he still is unable to comply with the standard established by paragraph (1) of this subsection or the standard established by paragraph (2) of this subsection, as appropriate, he may file with the Panel an application for renewal of

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the permit. Upon receipt of such application, the Panel, if it determines, after all interested persons have been notified and given an opportunity for a public hearing under section 5 of this Act, that the application is in compliance with the provisions of subsection (c) of this section, and that the applicant will be unable to comply with such standard, may renew the permit.

(5) Any such permit or renewal thereof so issued shall be in effect for a period not to exceed one year and shall entitle the permittee during such period to maintain continuously the average concentration of respirable dust in the mine atmosphere during each shift in the working places of such mine to which the permit applies at a level specified by the Panel, which shall be at the lowest level which the application shows the conditions, technology applicable to such mine, and other available and effective control techniques and methods will permit, but in no event shall such level exceed 4.5 milligrams of dust per cubic meter of air during the period when the 3.0 milligram standard is in effect, or 3.0 milligrams of dust per cubic meter of air during the period when the 2.0 milligram standard is in effect.

(6) No permit or renewal thereof for noncompliance shall entitle any operator to an extension of time beyond eighteen months from the date of enactment of this Act to comply with the 3.0 milligram standard established by paragraph (1) of this subsection, or beyond seventy-two months from the date of enactment of this Act to comply with the 2.0 milligram standard established by paragraph (2) of this subsection.

(c) Any application for an initial or renewal permit made pursuant to this section shall contain—

(1) a representation by the applicant and the engineer conducting the survey referred to in paragraph (2) of this subsection that the applicant is unable to comply with the standard applicable under subsection (b) (1) or (b) (2) of this section at specified working places because the technology for reducing the concentration of respirable dust at such places is not available, or because of the lack of other effective control techniques or methods, or because of any combination of such reasons;

(2) an identification of the working places in such mine for which the permit is requested; the results of an engineering survey by a certified engineer of the respirable dust conditions of each working place of the mine with respect to which such application is filed and the ability to reduce such dust to the level required to be maintained in such place under this section; a description of the ventilation system of the mine and its capacity; the quantity and velocity of air regularly reaching the working faces; the method of mining; the amount and pressure of the water, if any, reaching the working faces; the number, location, and type of sprays, if any; action taken to reduce such dust; and such other information as the Panel may require; and

(3) statements by the applicant and the engineer con-

ducting such survey, of the means and methods to be employed to achieve compliance with the applicable standard, the progress made toward achieving compliance, and an estimate of when compliance can be achieved.

(d) Beginning six months after the operative date of this title and from time to time thereafter, the Secretary of Health, Education, and Welfare shall establish, in accordance with the provisions of section 101 of this Act, a schedule reducing the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings is exposed below the levels established in this section to a level of personal exposure which will prevent new incidences of respiratory disease and the further development of such disease in any person. Such schedule shall specify the minimum time necessary to achieve such levels taking into consideration present and future advancements in technology to reach these levels.

(e) References to concentrations of respirable dust in this title mean the average concentration of respirable dust measured with a device approved by the Secretary and the Secretary of Health, Education, and Welfare.

(f) For the purpose of this title, the term "average concentration" means a determination which accurately represents the atmospheric conditions with regard to respirable dust to which each miner in the active workings of a mine is exposed (1) as measured, during the 18 month period following the date of enactment of this Act, over a number of continuous production shifts to be determined by the Secretary and the Secretary of Health, Education, and Welfare, and (2) as measured thereafter, over a single shift only, unless the Secretary and the Secretary of Health, Education, and Welfare find, in accordance with the provisions of section 101 of this Act, that such single shift measurement will not, after applying valid statistical techniques to such measurement, accurately represent such atmospheric conditions during such shift.

(g) The Secretary shall cause to be made such frequent spot inspections as he deems appropriate of the active workings of coal mines for the purpose of obtaining compliance with the provisions of this title.

(h) Respiratory equipment approved by the Secretary and the Secretary of Health, Education, and Welfare shall be made available to all persons whenever exposed to concentrations of respirable dust in excess of the levels required to be maintained under this Act. Use of respirators shall not be substituted for environmental control measures in the active workings. Each operator shall maintain a supply of respiratory equipment adequate to deal with occurrences of concentrations of respirable dust in the mine atmosphere in excess of the levels required to be maintained under this Act.

MEDICAL EXAMINATIONS

SEC. 203 (a) The operator of a coal mine shall cooperate with the Secretary of Health, Education, and Welfare in making available to each miner working in a coal mine the opportunity to have a chest roentgenogram within eighteen months

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after the date of enactment of this Act, a second chest roentgenogram within three years thereafter, and subsequent chest roentgenograms at such intervals thereafter of not to exceed five years as the Secretary of Health, Education, and Welfare prescribes. Each worker who begins work in a coal mine for the first time shall be given, as soon as possible after commencement of his employment, and again three years later if he is still engaged in coal mining, a chest roentgenogram; and in the event the second such chest roentgenogram shows evidence of the development of pneumoconiosis the worker shall be given, two years later if he is still engaged in coal mining, an additional chest roentgenogram. All chest roentgenograms shall be given in accordance with specifications prescribed by the Secretary of Health, Education, and Welfare and shall be supplemented by such other tests as the Secretary of Health, Education, and Welfare deems necessary. The films shall be read and classified in a manner to be prescribed by the Secretary of Health, Education, and Welfare, and the results of each reading on each such person and of such tests shall be submitted to the Secretary and to the Secretary of Health, Education, and Welfare, and, at the request of the miner, to his physician. The Secretary shall also submit such results to such miner and advise him of his rights under this Act related thereto. Such specifications, readings, classifications, and tests shall, to the greatest degree possible, be uniform for all coal mines and miners in such mines.

(b) (1) On and after the operative date of this title, any miner who, in the judgment of the Secretary of Health, Education, and Welfare based upon such reading or other medical examinations, shows evidence of the development of pneumoconiosis shall be afforded the option of transferring from his position to another position in any area of the mine, for such period or periods as may be necessary to prevent further development of such disease, where the concentration of respirable dust in the mine atmosphere is not more than 2.0 milligrams of dust per cubic meter of air.

(2) Effective three years after the date of enactment of this Act, any miner who, in the judgment of the Secretary of Health, Education, and Welfare based upon such reading or other medical examinations, shows evidence of the development of pneumoconiosis shall be afforded the option of transferring from his position to another position in any area of the mine, for such period or periods as may be necessary to prevent further development of such disease, where the concentration of respirable dust in the mine atmosphere is not more than 1.0 milligrams of dust per cubic meter of air, or if such level is not attainable in such mine, to a position in such mine where the concentration of respirable dust is the lowest attainable below 2.0 milligrams per cubic meter of air.

(3) Any miner so transferred shall receive compensation for such work at not less than the regular rate of pay received by him immediately prior to his transfer.

(c) No payment may be required of any miner in connection with any examination or test given him pursuant to this title. Where such examinations or tests cannot be given, due to the lack of adequate medical or other necessary facilities or per-

sonnel, in the locality where the miner resides, arrangements shall be made to have them conducted, in accordance with the provisions of this title, in such locality by the Secretary of Health, Education, and Welfare, or by an appropriate person, agency, or institution, public or private, under an agreement or arrangement between the Secretary of Health, Education, and Welfare and such person, agency, or institution. The operator of the mine shall reimburse the Secretary of Health, Education, and Welfare, or such person, agency, or institution, as the case may be, for the cost of conducting each examination or test made, in accordance with this title, and shall pay whatever other costs are necessary to enable the miner to take such examinations or tests.

(d) If the death of any active miner occurs in any coal mine, or if the death of any active or inactive miner occurs in any other place, the Secretary of Health, Education, and Welfare is authorized to provide for an autopsy to be performed on such miner, with the consent of his surviving widow or, if he has no such widow, then with the consent of his surviving next of kin. The results of such autopsy shall be submitted to the Secretary of Health, Education, and Welfare and, with the consent of such survivor, to the miner's physician or other interested person. Such autopsy shall be paid for by the Secretary of Health, Education, and Welfare.

DUST FROM DRILLING ROCK

SEC. 204. The dust resulting from drilling in rock shall be controlled by the use of permissible dust collectors, or by water or water with a wetting agent, or by ventilation, or by any other method or device approved by the Secretary which is at least as effective in controlling such dust. Respiratory equipment approved by the Secretary and the Secretary of Health, Education, and Welfare shall be provided persons exposed for short periods to inhalation hazards from gas, dusts, fumes, or mist. When the exposure is for prolonged periods, other measures to protect such persons or to reduce the hazard shall be taken.

DUST STANDARD WHEN QUARTZ IS PRESENT

SEC. 205. In coal mining operations where the concentration of respirable dust in the mine atmosphere of any working place contains more than 5 per centum quartz, the Secretary of Health, Education, and Welfare shall prescribe an appropriate formula for determining the applicable respirable dust standard under this title for such working place and the Secretary shall apply such formula in carrying out his duties under this title.

NOISE STANDARD

SEC. 206. On and after the operative date of this title, the standards on noise prescribed under the Walsh-Healey Public Contracts Act, as amended, in effect October 1, 1969, shall be applicable to each coal mine and each operator of such mine shall comply with them. Within six months after the date of

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enactment of this Act, the Secretary of Health, Education, and Welfare shall establish, and the Secretary shall publish, as provided in section 101 of this Act, proposed mandatory health standards establishing maximum noise exposure levels for all underground coal mines. Beginning six months after the operative date of this title, and at intervals of at least every six months thereafter, the operator of each coal mine shall conduct, in a manner prescribed by the Secretary of Health, Education, and Welfare, tests by a qualified person of the noise level at the mine and report and certify the results to the Secretary and the Secretary of Health, Education, and Welfare. In meeting such standard under this section, the operator shall not require the use of any protective device or system, including personal devices, which the Secretary or his authorized representative finds to be hazardous or cause a hazard to the miners in such mine.

TITLE III—INTERIM MANDATORY SAFETY STANDARDS FOR UNDERGROUND COAL MINES

COVERAGE

SEC. 301. (a) The provisions of sections 302 through 318 of this title shall be interim mandatory safety standards applicable to all underground coal mines until superseded in whole or in part by improved mandatory safety standards promulgated by the Secretary under the provisions of section 101 of this Act, and shall be enforced in the same manner and to the same extent as any mandatory safety standard promulgated under section 101 of this Act. Any orders issued in the enforcement of the interim standards set forth in this title shall be subject to review as provided in title I of this Act.

(b) The purpose of this title is to provide for the immediate application of mandatory safety standards developed on the basis of experience and advances in technology and to prevent newly created hazards resulting from new technology in coal mining. The Secretary of the Interior in coordination with the Secretary shall immediately initiate studies, investigations, and research to further upgrade such standards and to develop and promulgate new and improved standards promptly that will provide increased protection to the miners, particularly in connection with hazards from trolley wires, trolley feeder wires, and signal wires, the splicing and use of trailing cables, and in connection with improvements in vulcanizing of electric conductors, improvement in roof control measures, methane drainage in advance of mining, improved methods of measuring methane and other explosive gases and oxygen concentrations, and the use of improved underground equipment and other sources of power for such equipment.

ROOF SUPPORT

SEC. 302. (a) Each operator shall undertake to carry out on a continuing basis a program to improve the roof control system of each coal mine and the means and measures to accomplish such system. The roof and ribs of all active underground roadways, travelways, and working places shall be supported or

otherwise controlled adequately to protect persons from falls of the roof or ribs. A roof control plan and revisions thereof suitable to the roof conditions and mining system of each coal mine and approved by the Secretary shall be adopted and set out in printed form within sixty days after the operative date of this title. The plan shall show the type of support and spacing approved by the Secretary. Such plan shall be reviewed periodically, at least every six months by the Secretary, taking into consideration any falls of roof or ribs or inadequacy of support of roof or ribs. No person shall proceed beyond the last permanent support unless adequate temporary support is provided or unless such temporary support is not required under the approved roof control plan and the absence of such support will not pose a hazard to the miners. A copy of the plan shall be furnished the Secretary or his authorized representative and shall be available to the miners and their representatives.

(b) The method of mining followed in any coal mine shall not expose the miner to unusual dangers from roof falls caused by excessive widths of rooms and entries or faulty pillar recovery methods.

(c) The operator, in accordance with the approved plan, shall provide at or near each working face and at such other locations in the coal mine as the Secretary may prescribe an ample supply of suitable materials of proper size with which to secure the roof of all working places in a safe manner. Safety posts, jacks, or other approved devices shall be used to protect the workmen when roof material is being taken down, crossbars are being installed, roof boltholes are being drilled, roof bolts are being installed, and in such other circumstances as may be appropriate. Loose roof and overhanging or loose faces and ribs shall be taken down or supported. Except in the case of recovery work, supports knocked out shall be replaced promptly.

(d) When installation of roof bolts is permitted, such roof bolts shall be tested in accordance with the approved roof control plan.

(e) Roof bolts shall not be recovered where complete extractions of pillars are attempted, where adjacent to clay veins, or at the locations of other irregularities, whether natural or otherwise, that induce abnormal hazards. Where roof bolt recovery is permitted, it shall be conducted only in accordance with methods prescribed in the approved roof control plan, and shall be conducted by experienced miners and only where adequate temporary support is provided.

(f) Where miners are exposed to danger from falls of roof, face, and ribs the operator shall examine and test the roof, face, and ribs before any work or machine is started, and as frequently thereafter as may be necessary to insure safety. When dangerous conditions are found, they shall be corrected immediately.

VENTILATION

SEC. 303. (a) All coal mines shall be ventilated by mechanical ventilation equipment installed and operated in a manner

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approved by an authorized representative of the Secretary and such equipment shall be examined daily and a record shall be kept of such examination.

(b) All active workings shall be ventilated by a current of air containing not less than 19.5 volume per centum of oxygen, not more than 0.5 volume per centum of carbon dioxide, and no harmful quantities of other noxious or poisonous gases; and the volume and velocity of the current of air shall be sufficient to dilute, render harmless, and to carry away, flammable, explosive, noxious, and harmful gases, and dust, and smoke and explosive fumes. The minimum quantity of air reaching the last open crosscut in any pair or set of developing entries and the last open crosscut in any pair or set of rooms shall be nine thousand cubic feet a minute, and the minimum quantity of air reaching the intake end of a pillar line shall be nine thousand cubic feet a minute. The minimum quantity of air in any coal mine reaching each working face shall be three thousand cubic feet a minute. Within three months after the operative date of this title, the Secretary shall prescribe the minimum velocity and quantity of air reaching each working face of each coal mine in order to render harmless and carry away methane and other explosive gases and to reduce the level of respirable dust to the lowest attainable level. The authorized representative of the Secretary may require in any coal mine a greater quantity and velocity of air when he finds it necessary to protect the health or safety of miners. Within one year after the operative date of this title, the Secretary or his authorized representative shall prescribe the maximum respirable dust level in the intake aircourses in each coal mine in order to reduce such level to the lowest attainable level. *In robbing areas of anthracite* mines, where the air currents cannot be controlled and measurements of the air cannot be obtained, the air shall have perceptible movement.

(c) (1) Properly installed and adequately maintained line brattice or other approved devices shall be continuously used from the last open crosscut of an entry or room of each working section to provide adequate ventilation to the working faces for the miners and to remove flammable, explosive, and noxious gases, dust, and explosive fumes, unless the Secretary or his authorized representative permits an exception to this requirement, where such exception will not pose a hazard to the miners. When damaged by falls or otherwise, such line brattice or other devices shall be repaired immediately.

(2) The space between the line brattice or other approved device and the rib shall be large enough to permit the flow of a sufficient volume and velocity of air to keep the working face clear of flammable, explosive, and noxious gases, dust, and explosive fumes.

(3) Brattice cloth used underground shall be of flame-resistant material.

(d) (1) Within three hours immediately preceding the beginning of any shift, and before any miner in such shift enters the active workings of a coal mine, certified persons designated by the operator of the mine shall examine such workings and any other underground area of the mine designated by

the Secretary or his authorized representative. Each such examiner shall examine every working section in such workings and shall make tests in each such working section for accumulations of methane with means approved by the Secretary for detecting methane and shall make tests for oxygen deficiency with a permissible flame safety lamp or other means approved by the Secretary; examine seals and doors to determine whether they are functioning properly; examine and test the roof, face, and rib conditions in such working section; examine active roadways, travelways, and belt conveyors on which men are carried, approaches to abandoned areas, and accessible falls in such section for hazards; test by means of an anemometer or other device approved by the Secretary to determine whether the air in each split is traveling in its proper course and in normal volume and velocity: and examine for such other hazards and violations of the mandatory health or safety standards, as an authorized representative of the Secretary may from time to time require. Belt conveyors on which coal is carried shall be examined after each coal-producing shift has begun. Such mine examiner shall place his initials and the date and time at all places he examines. If such mine examiner finds a condition which constitutes a violation of a mandatory health or safety standard or any condition which is hazardous to persons who may enter or be in such area, he shall indicate such hazardous place by posting a "DANGER" sign conspiciously at all points which persons entering such hazardous place would be required to pass, and shall notify the operator of the mine. No person, other than an authorized representative of the Secretary or a State mine inspector or persons authorized by the operator to enter such place for the purpose of eliminating the hazardous condition therein, shall enter such place while such sign is so posted. Upon completing his examination, such mine examiner shall report the results of his examination to a person, designated by the operator to receive such reports at a designated station on the surface of the mine, before other persons enter the underground areas of such mine to work in such shift. Each such mine examiner shall also record the results of his examination with ink or indelible pencil in a book approved by the Secretary kept for such purpose in an area on the surface of the mine chosen by the operator to minimize the danger of destruction by fire or other hazard, and the record shall be open for inspection by interested persons.

(2) No person (other than certified persons designated under this subsection) shall enter any underground area, except during any shift, unless an examination of such area as prescribed in this subsection has been made within eight hours immediately preceding his entrance into such area.

(e) At least once during each coal-producing shift, or more often if necessary for safety, each working section shall be examined for hazardous conditions by certified persons designated by the operator to do so. Any such condition shall be corrected immediately. If such condition creates an imminent danger, the operator shall withdraw all persons from the area affected by such condition to a safe area, except those persons referred to in section 104(d) of this Act, until the danger is

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abated. Such examination shall include tests for methane with a means approved by the Secretary for detecting methane and for oxygen deficiency with a permissible flame safety lamp or other means approved by the Secretary.

(f) In addition to the pre-shift and daily examinations required by this section, examinations for hazardous conditions, including tests for methane, and for compliance with the mandatory health or safety standards, shall be made at least once each week by a certified person designated by the operator in the return of each split of air where it enters the main return, on pillar falls, at seals, in the main return, at least one entry of each intake and return aircourse in its entirety, idle workings, and, insofar as safety considerations permit, abandoned areas. Such weekly examination need not be made during any week in which the mine is idle for the entire week, except that such examination shall be made before any other miner returns to the mine. The person making such examinations and tests shall place his initials and the date and time at the places examined, and if any hazardous condition is found, such condition shall be reported to the operator promptly. Any hazardous condition shall be corrected immediately. If such condition creates an imminent danger, the operator shall withdraw all persons from the area affected by such condition to a safe area, except those persons referred to in section 104(d) of this Act, until such danger is abated. A record of these examinations, tests, and actions taken shall be recorded in ink or indelible pencil in a book approved by the Secretary kept for such purpose in an area on the surface of the mine chosen by the mine operator to minimize the danger of destruction by fire or other hazard, and the record shall be open for inspection by interested persons.

(g) At least once each week, a qualified person shall measure the volume of air entering the main intakes and leaving the main returns, the volume passing through the last open crosscut in any pair or set of developing entries and the last open crosscut in any pair or set of rooms, the volume and, when the Secretary so prescribes, the velocity reaching each working face, the volume being delivered to the intake end of each pillar line, and the volume at the intake and return of each split of air. A record of such measurements shall be recorded in ink or indelible pencil in a book approved by the Secretary kept for such purpose in an area on the surface of the coal mine chosen by the operator to minimize the danger of destruction by fire or other hazard, and the record shall be open for inspection by interested persons.

(h) (1) At the start of each shift, tests for methane shall be made at each working place immediately before electrically operated equipment is energized. Such tests shall be made by qualified persons. If 1.0 volume per centum or more of methane is detected, electrical equipment shall not be energized, taken into, or operated in, such working place until the air therein contains less than 1.0 volume per centum of methane. Examinations for methane shall be made during the operation of such equipment at intervals of not more than twenty minutes during each shift, unless more frequent examinations are required by an authorized representative of the Secretary. In

conducting such tests, such person shall use means approved by the Secretary for detecting methane.

(2) If at any time the air at any working place, when tested at a point not less than twelve inches from the roof, face, or rib, contains 1.0 volume per centum or more of methane, changes or adjustments shall be made at once in the ventilation in such mine so that such air shall contain less than 1.0 volume per centum of methane. While such changes or adjustments are underway and until they have been achieved, power to electric face equipment located in such place shall be cut off, no other work shall be permitted in such place, and due precautions shall be carried out under the direction of the operator or his agent so as not to endanger other areas of the mine. If at any time such air contains 1.5 volume per centum or more of methane, all persons, except those referred to in section 104(d) of this Act, shall be withdrawn from the area of the mine endangered thereby to a safe area, and all electric power shall be cut off from the endangered area of the mine, until the air in such working place shall contain less than 1.0 volume per centum of methane.

(i) (1) If, when tested, a split of air returning from any working section contains 1.0 volume per centum or more of methane, changes or adjustments shall be made at once in the ventilation in the mine so that such returning air shall contain less than 1.0 volume per centum of methane. Tests under this paragraph and paragraph (2) of this subsection shall be made at four-hour intervals during each shift by a qualified person designated by the operator of the mine. In making such tests, such person shall use means approved by the Secretary for detecting methane.

(2) *If, when tested, a split of air returning from* any working section contains 1.5 volume per centum or more of methane, all persons, except those persons referred to in section 104(d) of this Act, shall be withdrawn from the area of the mine endangered thereby to a safe area and all electric power shall be cut off from the endangered area of the mine, until the air in such split shall contain less than 1.0 volume per centum of methane.

(3) In virgin territory, if the quantity of air in a split ventilating the active workings in such territory equals or exceeds twice the minimum volume of air prescribed in subsection (b) of this section for the last open crosscut, if the air in the split returning from such workings does not pass over trolley wires or trolley feeder wires, and if a certified person designated by the operator is continually testing the methane content of the air in such split during mining operations in such workings, it shall be necessary to withdraw all persons, except those referred to in section 104(d) of this Act, from the area of the mine endangered thereby to a safe area and all electric power shall be cut off from the endangered area only when the air returning from such workings contains 2.0 volume per centum or more of methane.

(j) Air which has passed by an opening of any abandoned area shall not be used to ventilate any working place in the coal mine if such air contains 0.25 volume per centum or more of methane. Examinations of such air shall be made during

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the pre-shift examination required by subsection (d) of this section. In making such tests, a certified person designated by the operator shall use means approved by the Secretary for detecting methane. For the purposes of this subsection, an area within a panel shall not be deemed to be abandoned until such panel is abandoned.

(k) Air that has passed through an abandoned area or an area which is inaccessible or unsafe for inspection shall not be used to ventilate any working place in any mine. No air which has been used to ventilate an area from which the pillars have been removed shall be used to ventilate any working place in a mine, except that such air, if it does not contain 0.25 volume per centum or more of methane, may be used to ventilate enough advancing working places immediately adjacent to the line of retreat to maintain an orderly sequence of pillar recovery on a set of entries.

(l) The Secretary or his authorized representative shall require, as an additional device for detecting concentrations of methane, that a methane monitor, approved as reliable by the Secretary after the operative date of this title, be installed, when available, on any electric face cutting equipment, continuous miner, longwall face equipment, and loading machine, except that no monitor shall be required to be installed on any such equipment prior to the date on which such equipment is required to be permissible under section 305(a) of this title. When installed on any such equipment, such monitor shall be kept operative and properly maintained and frequently tested as prescribed by the Secretary. The sensing device of such monitor shall be installed as close to the working face as practicable. Such monitor shall be set to deenergize automatically such equipment when such monitor is not operating properly and to give a warning automatically when the concentration of methane reaches a maximum percentage determined by an authorized representative of the Secretary which shall not be more than 1.0 volume per centum of methane. An authorized representative of the Secretary shall require such monitor to deenergize automatically equipment on which it is installed when the concentration of methane reaches a maximum percentage determined by such representative which shall not be more than 2.0 volume per centum of methane.

(m) Idle and abandoned areas shall be inspected for methane and for oxygen deficiency and other dangerous conditions by a certified person with means approved by the Secretary as soon as possible but not more than three hours before other persons are permitted to enter or work in such areas. Persons, such as pumpmen, who are required regularly to enter such areas in the performance of their duties, and who are trained and qualified in the use of means approved by the Secretary for detecting methane and in the use of a permissible flame safety lamp or other means approved by the Secretary for detecting oxygen deficiency are authorized to make such examinations for themselves, and each such person shall be properly equipped and shall make such examinations upon entering any such area.

(n) Immediately before an intentional roof fall is made, pil-

lar workings shall be examined by a qualified person designated by the operator to ascertain whether methane is present. Such person shall use means approved by the Secretary for detecting methane. If in such examination methane is found in amounts of 1.0 volume per centum or more, such roof fall shall not be made until changes or adjustments are made in the ventilation so that the air shall contain less than 1.0 volume per centum of methane.

(o) A ventilation system and methane and dust control plan and revisions thereof suitable to the conditions and the mining system of the coal mine and approved by the Secretary shall be adopted by the operator and set out in printed form within ninety days after the operative date of this title. The plan shall show the type and location of mechanical ventilation equipment installed and operated in the mine, such additional or improved equipment as the Secretary may require, the quantity and velocity of air reaching each working face, and such other information as the Secretary may require. Such plan shall be reviewed by the operator and the Secretary at least every six months.

(p) Each operator shall provide for the proper maintenance and care of the permissible flame safety lamp or any other approved device for detecting methane and oxygen deficiency by a person trained in such maintenance, and, before each shift, care shall be taken to insure that such lamp or other device is in a permissible condition.

(q) Where areas are being pillared on the operative date of this title without bleeder entries, or without bleeder systems or an equivalent means, pillar recovery may be completed in the area, to the extent approved by an authorized representative of the Secretary, if the edges of pillar lines adjacent to active workings are ventilated with sufficient air to keep the air in open areas along the pillar lines below 1.0 volme per centum of methane.

(r) Each mechanized mining section shall be ventilated with a separate split of intake air directed by overcasts, undercasts, or the equivalent, except an extension of time, not in excess of nine months, may be permitted by the Secretary, under such conditions as he may prescribe, whenever he determines that this subsection cannot be complied with on the operative date of this title.

(s) In all underground areas of a coal mine, immediately before firing each shot or group of multiple shots and after blasting is completed, examinations for methane shall be made by a qualified person with means approved by the Secretary for detecting methane. If methane is found in amounts of 1.0 volume per centum or more, changes or adjustments shall be made at once in the ventilation so that the air shall contain less than 1.0 volume per centum of methane. No shots shall be fired until the air contains less than 1.0 volume per centum of methane.

(t) Each operator shall adopt a plan within sixty days after the operative date of this title which shall provide that when any mine fan stops, immediate action shall be taken by the operator or his agent (1) to withdraw all persons from the working sections, (2) to cut off the power in the mine in a

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timely manner, (3) to provide for restoration of power and resumption of work if ventilation is restored within a reasonable period as set forth in the plan after the working places and other active workings where methane is likely to accumulate are reexamined by a certified person to determine if methane in amounts of 1.0 volume per centum or more exists therein, and (4) to provide for withdrawal of all persons from the mine if ventilation cannot be restored within such reasonable time. The plan and revisions thereof approved by the Secretary shall be set out in printed form and a copy shall be furnished to the Secretary or his authorized representative.

(u) Changes in ventilation which materially affect the main air current or any split thereof and which may affect the safety of persons in the coal mine shall be made only when the mine is idle. Only those persons engaged in making such changes shall be permitted in the mine during the change. Power shall be removed from the areas affected by the change before work starts to make the change and shall not be restored until the effect of the change has been ascertained and the affected areas determined to be safe by a certified person.

(v) The mine foreman shall read and countersign promptly the daily reports of the pre-shift examiner and assistant mine foremen, and he shall read and countersign promptly the weekly report covering the examinations for hazardous conditions. Where such reports disclose hazardous conditions, they shall be corrected promptly. If such conditions create an imminent danger, the operator shall withdraw all persons from, or prevent any person from entering, as the case may be, the area affected by such conditions, except those persons referred to in section 104(d) of this Act, until such danger is abated. The mine superintendent or assistant superintendent of the mine shall also read and countersign the daily and weekly reports of such persons.

(w) Each day, the mine foreman and each of his assistants shall enter plainly and sign with ink or indelible pencil in a book approved by the Secretary provided for that purpose a report of the condition of the mine or portion thereof under his supervision, which report shall state clearly the location and nature of any hazardous condition observed by him or reported to him during the day and what action was taken to remedy such condition. Such book shall be kept in an area on the surface of the mine chosen by the operator to minimize the danger of destruction by fire or other hazard, and shall be open for inspection by interested persons.

(x) Before a coal mine is reopened after having been abandoned or declared inactive by the operator, the Secretary shall be notified, and an inspection shall be made of the entire mine by an authorized representative of the Secretary before mining operations commence.

(y) (1) In any coal mine opened after the operative date of this title, the entries used as intake and return aircourses shall be separated from belt haulage entries, and each operator of such mine shall limit the velocity of the air coursed through belt haulage entries to the amount necessary to provide an adequate supply of oxygen in such entries, and to insure that the air therein shall contain less than 1.0 volume

per centum of methane, and such air shall not be used to ventilate active working places. Whenever an authorized representative of the Secretary finds, in the case of any coal mine opened on or prior to the operative date of this title which has been developed with more than two entries, that the conditions in the entries, other than belt haulage entries, are such as to permit adequately the coursing of intake or return air through such entries, (1) the belt haulage entries shall not be used to ventilate, unless such entries are necessary to ventilate, active working places, and (2) when the belt haulage entries are not necessary to ventilate the active working places, the operator of such mine shall limit the velocity of the air coursed through the belt haulage entries to the amount necessary to provide an adequate supply of oxygen in such entries, and to insure that the air therein shall contain less than 1.0 volume per centum of methane.

(2) In any coal mine opened on or after the operative date of this title, or, in the case of a coal mine opened prior to such date, in any new working section of such mine, where trolley haulage systems are maintained and where trolley wires or trolley feeder wires are installed, an authorized representative of the Secretary shall require a sufficient number of entries or rooms as intake aircourses in order to limit, as prescribed by the Secretary, the velocity of air currents on such haulageways for the purpose of minimizing the hazards associated with fires and dust explosions in such haulageways.

(z) (1) While pillars are being extracted in any area of a coal mine, such area shall be ventilated in the manner prescribed by this section.

(2) Within nine months after the operative date of this title, all areas from which pillars have been wholly or partially extracted and abandoned areas, as determined by the Secretary or his authorized representative, shall be ventilated by bleeder entries or by bleeder systems or equivalent means, or be sealed, as determined by the Secretary or his authorized representative. When ventilation of such areas is required, such ventilation shall be maintained so as continuously to dilute, render harmless, and carry away methane and other explosive gases within such areas and to protect the active workings of the mine from the hazards of such methane and other explosive gases. Air coursed through underground areas from which pillars have been wholly or partially extracted which enters another split of air shall not contain more than 2.0 volume per centum of methane, when tested at the point it enters such other split. When sealing is required, such seals shall be made in an approved manner so as to isolate with explosion-proof bulkheads such areas from the active workings of the mine.

(3) In the case of mines opened on or after the operative date of this title, or in the case of working sections opened on or after such date in mines opened prior to such date, the mining system shall be designed in accordance with a plan and revisions thereof approved by the Secretary and adopted by such operator so that, as each working section of the mine is abandoned, it can be isolated from the active workings of the mine with explosion-proof seals or bulkheads.

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COMBUSTIBLE MATERIALS AND ROCK DUSTING

SEC. 304. (a) Coal dust, including float coal dust deposited on rock-dusted surfaces, loose coal, and other combustible materials, shall be cleaned up and not be permitted to accumulate in active workings, or on electric equipment therein.

(b) Where underground mining operations in active workings create or raise excessive amounts of dust, water or water with a wetting agent added to it, or other no less effective methods approved by the Secretary or his authorized representative, shall be used to abate such dust. In working places, particularly in distances less than forty feet from the face, water, with or without a wetting agent, or other no less effective methods approved by the Secretary or his authorized representative, shall be applied to coal dust on the ribs, roof, and floor to reduce dispersibility and to minimize the explosion hazard.

(c) All underground areas of a coal mine, except those areas in which the dust is too wet or too high in incombustible content to propagate an explosion, shall be rock dusted to within forty feet of all working faces, unless such areas are inaccessible or unsafe to enter or unless the Secretary or his authorized representative permits an exception upon his finding that such exception will not pose a hazard to the miners. All crosscuts that are less than forty feet from a working face shall also be rock dusted.

(d) Where rock dust is required to be applied, it shall be distributed upon the top, floor, and sides of all underground areas of a coal mine and maintained in such quantities that the incombustible content of the combined coal dust, rock dust, and other dust shall be not less than 65 per centum, but the incombustible content in the return aircourses shall be no less than 80 per centum. Where methane is present in any ventilating current, the per centum of incombustible content of such combined dusts shall be increased 1.0 and 0.4 per centum for each 0.1 per centum of methane where 65 and 80 per centum, respectively, of incombustibles are required.

(e) Subsections (b) through (d) of this section shall not apply to underground anthracite mines.

ELECTRICAL EQUIPMENT—GENERAL

SEC. 305. (a) (1) Effective one year after the operative date of this title—

(A) all junction or distribution boxes used for making multiple power connections inby the last open crosscut shall be permissible;

(B) all handheld electric drills, blower and exhaust fans, electric pumps, and such other low horsepower electric face equipment as the Secretary may designate within two months after the operative date of this title which are taken into or used inby the last open crosscut of any coal mine shall be permissible;

(C) all electric face equipment which is taken into or used inby the last open crosscut of any coal mine classified under any provision of law as gassy prior to the operative date of this title shall be permissible; and

(D) all other electric face equipment which is taken into or used inby the last crosscut of any coal mine, except a coal mine referred to in paragraph (2) of this subsection, which has not been classified under any provision of law as a gassy mine prior to the operative date of this title shall be permissible;

(2) Effective four years after the operative date of this title, all electric face equipment, other than equipment referred to in paragraph (1) (B) of this subsection, which is taken into or used inby the last open crosscut of any coal mine which is operated entirely in coal seams located above the watertable and which has not been classified under any provision of law as a gassy mine prior to the operative date of this title and in which one or more openings were made prior to the date of enactment of this Act, shall be permissible, except that any operator of such mine who is unable to comply with the provisions of this paragraph on such effective date may file with the Panel an application for a permit for noncompliance ninety days prior to such date. If the Panel determines, after notice to all interested persons and an opportunity for a public hearing under section 5 of this Act, that such application satisfies the provisions of paragraph (10) of this subsection and that such operator, despite his diligent efforts, will be unable to comply with such provisions, the Panel may issue to such operator such a permit. Such permit shall entitle the permittee to an additional extension of time to comply with the provisions of this paragraph of not to exceed twenty-four months, as determined by the Panel, from such effective date.

(3) The operator of each coal mine shall maintain in permissible condition all electric face equipment required by this *subsection to be permissible which is taken into* or *used* inby the last open crosscut of any such mine.

(4) Each operator of a coal mine shall, within two months after the operative date of this title, file with the Secretary a statement listing all electric face equipment by type and manufacturer being used by such operator in connection with mining operations in such mine as of the date of such filing, and stating whether such equipment is permissible and maintained in permissible condition or is nonpermissible on such date of filing, and, if nonpermissible, whether such nonpermissible equipment has ever been rated as permissible, and such other information as the Secretary may require.

(5) The Secretary shall promptly conduct a survey as to the total availability of new or rebuilt permissible electric face equipment and replacement parts for such equipment and, within six months after the operative date of this title, publish the results of such survey.

(6) Any operator of a coal mine who is unable to comply with the provisions of paragraph (1) (D) of this subsection within one year after the operative date of this title may file with the Panel an application for a permit for noncompliance. If the Panel determines that such application satisfies the provisions of paragraph (10) of this subsection, the Panel shall issue to such operator a permit for noncompliance. Such permit shall entitle the permittee to an extension of time to comply with such provisions of paragraph (1) (D) of not to exceed

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twelve months, as determined by the Panel, from the date that compliance with the provisions of paragraph (1) (D) of this subsection is required.

(7) Any operator of a coal mine issued a permit under paragraph (6) of this subsection who, ninety days prior to the termination of such permit, or renewal thereof, determines that he will be unable to comply with the provisions of paragraph (1) (D) of this subsection upon the expiration of such permit may file with the Panel an application for renewal thereof. Upon receipt of such application, the Panel, if it determines, after notice to all interested persons and an opportunity for a public hearing under section 5 of this Act, that such application satisfies the provisions of paragraph (10) of this subsection and that such operator, despite his diligent efforts, will be unable to comply with the provisions of paragraph (1) (D), may renew the permit for a period not exceeding twelve months.

(8) Any permit or renewal thereof issued pursuant to this subsection shall entitle the permittee to use such nonpermissible electric face equipment specified in the permit during the term of such permit.

(9) Permits for noncompliance issued under paragraphs (6) or (7) of this subsection shall, in the aggregate, not extend the period of noncompliance more than forty-eight months after the date of enactment of this Act.

(10) Any application for a permit of noncompliance filed under this subsection shall contain a statement by the operator—

(A) that he is unable to comply with paragraph (1) (D) or paragraph (2) of this subsection, as appropriate, within the time prescribed;

(B) listing the nonpermissible electric face equipment being used by such operator in connection with mining operations in such mine on the operative date of this title and the date of the application by type and manufacturer for which a noncompliance permit is requested and whether such equipment had ever been rated as permissible;

(C) setting forth the actions taken from and after the operative date of this title to comply with paragraph (1) (D) or paragraph (2) of this subsection, as appropriate, together with a plan setting forth a schedule of compliance with said paragraphs for each such equipment referred to in such paragraphs and being used by the operator in connection with mining operations in such mine with respect to which such permit is requested and the means and measures to be employed to achieve compliance; and

(D) including such other information as the Panel may require.

(11) No permit for noncompliance shall be issued under this subsection for any nonpermissible electric face equipment, unless such equipment was being used by an operator in connection with the mining operations in a coal mine on the operative date of this title.

(12) Effective one year after the operative date of this title, all replacement equipment acquired for use in any mine referred to in this subsection shall be permissible and shall be

maintained in a permissible condition, and in the event of any major overhaul of any item of equipment in use one year from the operative date of this title such equipment shall be put in, and thereafter maintained in, a permissible condition, unless, in the opinion of the Secretary, such equipment or necessary replacement parts are not available.

(b) A copy of any permit granted under this section shall be mailed immediately to a representative of the miners of the mine to which it pertains, and to the public official or agency of the State charged with administering State laws relating to coal mine health and safety in such mine.

(c) Any coal mine which, prior to the operative date of this title, was classed gassy under any provision of law and was required to use permissible electric face equipment and to maintain such equipment in a permissible condition shall continue to use such equipment and to maintain such equipment in such condition.

(d) All power-connection points, except where permissible power connection units are used, outby the last open crosscut shall be in intake air.

(e) The location and the electrical rating of all stationary electric apparatus in connection with the mine electric system, including permanent cables, switchgear, rectifying substations, transformers, permanent pumps and trolley wires and trolley feeder wires, and settings of all direct-current circuit breakers protecting underground trolley circuits, shall be shown on a mine map. Any changes made in a location, electric rating, or setting shall be promptly shown on the map when the change is made. Such map shall be available to an authorized representative of the Secretary and to the miners in such mine.

(f) All power circuits and electric equipment shall be deenergized before work is done on such circuits and equipment, except when necessary for trouble shooting or testing. In addition, energized trolley wires may be repaired only by a person trained to perform electrical work and to maintain electrical equipment and the operator of such mine shall require that such person wear approved and tested insulated shoes and wireman's gloves. No electrical work shall be performed on low-, medium-, or high-voltage distribution circuits or equipment, except by a qualified person or by a person trained to perform electrical work and to maintain electrical equipment under the direct supervision of a qualified person. Disconnecting devices shall be locked out and suitably tagged by the persons who performed such work, except that, in cases where locking out is not possible, such devices shall be opened and suitably tagged by such persons. Locks or tags shall be removed only by the persons who installed them or, if such persons are unavailable, by persons authorized by the operator or his agent.

(g) All electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept and made available

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to an authorized representative of the Secretary and to the miners in such mine.

(h) All electric conductors shall be sufficient in size and have adequate current-carrying capacity and be of such construction that a rise in temperature resulting from normal operation will not damage the insulating materials.

(i) All electrical connections or splices in conductors shall be mechanically and electrically efficient, and suitable connectors shall be used. All electrical connections or splices in insulated wire shall be reinsulated at least to the same degree of protection as the remainder of the wire.

(j) Cables shall enter metal frames of motors, splice boxes, and electric compartments only through proper fittings. When insulated wires other than cables pass through metal frames the holes shall be substantially bushed with insulated bushings.

(k) All power wires (except trailing cables on mobile equipment, specially designed cables conducting high-voltage power to underground rectifying equipment or transformers, or bare or insulated ground and return wires) shall be supported on well-insulated insulators and shall not contact combustible material, roof, or ribs.

(l) Power wires and cables, except trolley wires, trolley feeder wires, and bare signal wires, shall be insulated adequately and fully protected.

(m) Automatic circuit-breaking devices or fuses of the correct type and capacity shall be installed so as to protect all electric equipment and circuits against short circuit and overloads. Three-phase motors on all electric equipment shall be provided with overload protection that will deenergize all three phases in the event that any phase is overloaded.

(n) In all main power circuits, disconnecting switches shall be installed underground within five hundred feet of the bottoms of shafts and boreholes through which main power circuits enter the underground area of the mine and within five hundred feet of all other places where main power circuits enter the underground area of the mine.

(o) All electric equipment shall be provided with switches or other controls that are safely designed, constructed, and installed.

(p) Each ungrounded, exposed power conductor that leads underground shall be equipped with suitable lightning arresters of approved type within one hundred feet of the point where the circuit enters the mine. Lightning arresters shall be connected to a low resistance grounding medium on the surface which shall be separated from neutral grounds by a distance of not less than twenty-five feet.

(q) No device for the purpose of lighting any coal mine which has not been approved by the Secretary or his authorized representative shall be permitted in such mine.

(r) An authorized representative of the Secretary may require in any mine that electric face equipment be provided with devices that will permit the equipment to be deenergized quickly in the event of an emergency.

TRAILING CABLES

SEC. 306. (a) Trailing cables used in coal mines shall meet the requirements established by the Secretary for flame-resistant cables.

(b) Short-circuit protection for trailing cables shall be provided by an automatic circuit breaker or other no less effective device approved by the Secretary of adequate current-interrupting capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from trailing cables shall be plainly marked and identified and such devices shall be equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

(c) When two or more trailing cables junction to the same distribution center, means shall be provided to assure against connecting a trailing cable to the wrong size circuit breaker.

(d) One temporary splice may be made in any trailing cable. Such trailing cable may only be used for the next twenty-four hour period. No temporary splice shall be made in a trailing cable within twenty-five feet of the machine, except cable reel equipment. Temporary splices in trailing cables shall be made in a workmanlike manner and shall be mechanically strong and well insulated. Trailing cables or hand cables which have exposed wires or which have splices that heat or spark under load shall not be used. As used in this subsection, the term "splice" means the mechanical joining of one or more conductors that have been severed.

(e) When permanent splices in trailing cables are made, they shall be—

(1) mechanically strong with adequate electrical conductivity and flexibility;

(2) effectively insulated and sealed so as to exclude moisture; and

(3) vulcanized or otherwise treated with suitable materials to provide flame-resistant qualities and good bonding to the outer jacket.

(f) Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections. Trailing cables shall be adequately protected to prevent damage by mobile equipment.

(g) Trailing cable and power cable connections to junction boxes shall not be made or broken under load.

GROUNDING

SEC. 307. (a) All metallic sheaths, armors, and conduits enclosing power conductors shall be electrically continuous throughout and shall be grounded by methods approved by an authorized representative of the Secretary. Metallic frames, casings, and other enclosures of electric equipment that can become "alive" through failure of insulation or by contact with energized parts shall be grounded by methods approved by an authorized representative of the Secretary. Methods other than grounding which provide no less effective protection may be permitted by the Secretary or his autho-

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rized representative.

(b) The frames of all offtrack direct current machines and the enclosures of related detached components shall be effectively grounded, or otherwise maintained at no less safe voltages, by methods approved by an authorized representative of the Secretary.

(c) The frames of all stationary high-voltage equipment receiving power from ungrounded delta systems shall be grounded by methods approved by an authorized representative of the Secretary.

(d) High-voltage lines, both on the surface and underground, shall be deenergized and grounded before work is performed on them, except that repairs may be permitted, in the case of energized surface high-voltage lines, if such repairs are made by a qualified person in accordance with procedures and safeguards, including, but not limited to, a requirement that the operator of such mine provide, test, and maintain protective devices in making such repairs, to be prescribed by the Secretary prior to the operative date of this title.

(e) When not in use, power circuits underground shall be deenergized on idle days and idle shifts, except that rectifiers and transformers may remain energized.

UNDERGROUND HIGH-VOLTAGE DISTRIBUTION

SEC. 308. (a) High-voltage circuits entering the underground area of any coal mine shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against under-voltage, grounded phase, short circuit, and overcurrent.

(b) High-voltage circuits extending underground and supplying portable, mobile, or stationary high-voltage equipment shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the source transformers, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all high-voltage equipment supplied power from that circuit, except that the Secretary or his authorized representative may permit ungrounded high-voltage circuits to be extended underground to feed stationary electrical equipment if such circuits are either steel armored or installed in grounded, rigid steel conduit throughout their entire length, and upon his finding that such exception does not pose a hazard to the miners. Within one hundred feet of the point on the surface where high-voltage circuits enter the underground portion of the mine, disconnecting devices shall be installed and so equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected, except that the Secretary or his authorized representative may permit such devices to be installed at a greater distance from such area of the mine if he determines, based on existing physical conditions, that such installation will be more accessible at a greater distance and will not pose any hazard to the miners.

(c) The grounding resistor, where required, shall be of the proper ohmic value to limit the voltage drop in the grounding circuit external to the resistor to not more than 100 volts under fault conditions. The grounding resistor shall be rated for maximum fault current continuously and insulated from ground for a voltage equal to the phase-to-phase voltage of the system.

(d) Six months after the operative date of this title, high-voltage, resistance grounded systems shall include a fail safe ground check circuit to monitor continuously the grounding circuit to assure continuity and the fail safe ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken, or other no less effective device approved by the Secretary or his authorized representative to assure such continuity, except that an extension of time, not in excess of twelve months, may be permitted by the Secretary on a mine-by-mine basis if he determines that such equipment is not available.

(e) (1) Underground high-voltage cables used in resistance grounded systems shall be equipped with metallic shields around each power conductor, with one or more ground conductors having a total cross-sectional area of not less than one-half the power conductor, and with an insulated internal or external conductor not smaller than No. 8 (AWG) for the ground continuity check circuit.

(2) All such cables shall be adequate for the intended current and voltage. Splices made in such cables shall provide continuity of all components.

(f) Couplers that are used with medium-voltage or high-voltage power circuits shall be of the three-phase type with a full metallic shell, except that the Secretary may permit, under such guidelines as he may prescribe, no less effective couplers constructed of materials other than metal. Couplers shall be adequate for the voltage and current expected. All exposed metal on the metallic couplers shall be grounded to the ground conductor in the cable. The coupler shall be constructed so that the ground check continuity conductor shall be broken first and the ground conductors shall be broken last when the coupler is being uncoupled.

(g) Single-phase loads, such as transformer primaries, shall be connected phase to phase.

(h) All underground high-voltage transmission cables shall be installed only in regularly inspected aircourses and haulageways, and shall be covered, buried, or placed so as to afford protection against damage, guarded where men regularly work or pass under them unless they are six and one-half feet or more above the floor or rail, securely anchored, properly insulated, and guarded at ends, and covered, insulated, or placed to prevent contact with trolley wires and other low-voltage circuits.

(i) Disconnecting devices shall be installed at the beginning of branch lines in high-voltage circuits and equipped or designed in such a manner that it can be determined by visual observation that the circuit is deenergized when the switches are open.

(j) Circuit breakers and disconnecting switches underground

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shall be marked for identification.

(k) In the case of high-voltage cables used as trailing cables, temporary splices shall not be used and all permanent splices shall be made in accordance with section 306 (e) of this title. Terminations and splices in all other high-voltage cables shall be made in accordance with the manufacturer's specifications.

(l) Frames, supporting structures, and enclosures of stationary, portable, or mobile underground high-voltage equipment and all high-voltage equipment supplying power to such equipment receiving power from resistance grounded systems shall be effectively grounded to the high-voltage ground.

(m) Power centers and portable transformers shall be deenergized before they are moved from one location to another, except that, when equipment powered by sources other than such centers or transformers is not available, the Secretary may permit such centers and transformers to be moved while energized, if he determines that another equivalent or greater hazard may otherwise be created, and if they are moved under the supervision of a qualified person, and if such centers and transformers are examined prior to such movement by such person and found to be grounded by methods approved by an authorized representative of the Secretary and otherwise protected from hazards to the miner. A record shall be kept of such examinations. High-voltage cables, other than trailing cables, shall not be moved or handled at any time while energized, except that, when such centers and transformers are moved while energized as permitted under this subsection, energized high-voltage cables attached to such centers and transformers may be moved only by a qualified person and the operator of such mine shall require that such person wear approved and tested insulated wireman's gloves.

UNDERGROUND LOW- AND MEDIUM-VOLTAGE ALTERNATING CURRENT CIRCUITS

SEC. 309. (a) Low- and medium-voltage power circuits serving three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against under-voltage, grounded phase, short circuit, and over-current.

(b) Low- and medium-voltage three-phase alternating-current circuits used underground shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the power center, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all the electrical equipment supplied power from that circuit, except that the Secretary or his authorized representative may permit ungrounded low- and medium-voltage circuits to be used underground to feed such stationary electrical equipment if such circuits are either steel armored or installed in grounded rigid steel conduit throughout their entire length. The grounding resistor, where required, shall be of the proper ohmic value to limit the ground fault current to 25 amperes. The grounding resistor

shall be rated for maximum fault current continuously and insulated from ground for a voltage equal to the phase-to-phase voltage of the system.

(c) Six months after the operative date of this title, low- and medium-voltage resistance grounded systems shall include a fail safe ground check circuit to monitor continuously the grounding circuit to assure continuity which ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken, or other no less effective device approved by the Secretary or his authorized representative to assure such continuity, except that an extension of time, not in excess of twelve months, may be permitted by the Secretary on a mine-by-mine basis if he determines that such equipment is not available. Cable couplers shall be constructed so that the ground check continuity conductor shall be broken first and the ground conductors shall be broken last when the coupler is being uncoupled.

(d) Disconnecting devices shall be installed in conjunction with the circuit breaker to provide visual evidence that the power is disconnected. Trailing cables for mobile equipment shall contain one or more ground conductors having a cross sectional area of not less than one-half the power conductor, and, six months after the operative date of this title, an insulated conductor for the ground continuity check circuit or other no less effective device approved by the Secretary or his authorized representative to assure such continuity, except that an extension of time, not in excess of twelve months may be permitted by the Secretary on a mine-by-mine basis if he determines that such equipment is not available. Splices made in the cables shall provide continuity of all components.

(e) Single phase loads shall be connected phase to phase.

(f) Circuit breakers shall be marked for identification.

(g) Trailing cables for medium voltage circuits shall include grounding conductors, a ground check conductor, and ground metallic shields around each power conductor or a grounded metallic shield over the assembly, except that on equipment employing cable reels, cables without shields may be used if the insulation is rated 2,000 volts or more.

TROLLEY WIRES AND TROLLEY FEEDER WIRES

SEC. 310. (a) Trolley wires and trolley feeder wires shall be provided with cutout switches at intervals of not more than 2,000 feet and near the beginning of all branch lines.

(b) Trolley wires and trolley feeder wires shall be provided with overcurrent protection.

(c) Trolley wires and trolley feeder wires, high-voltage cables and transformers shall not be located inby the last open crosscut and shall be kept at least 150 feet from pillar workings.

(d) Trolley wires, trolley feeder wires, and bare signal wires shall be insulated adequately where they pass through doors and stoppings, and where they cross other power wires and cables. Trolley wires and trolley feeder wires shall be guarded adequately (1) at all points where men are required to work or pass regularly under the wires; (2) on both sides of all doors

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and stoppings; and (3) at man-trip stations. The Secretary or his authorized representative shall specify other conditions where trolley wires and trolley feeder wires shall be adequately protected to prevent contact by any person, or shall require the use of improved methods to prevent such contact. Temporary guards shall be provided where trackmen and other persons work in proximity to trolley wires and trolley feeder wires.

FIRE PROTECTION

SEC. 311. (a) Each coal mine shall be provided with suitable firefighting equipment adapted for the size and conditions of the mine. The Secretary shall establish minimum requirements for the type, quality, and quantity of such equipment, and the interpretations of the Secretary or the Director of the Bureau of Mines relating to such equipment in effect on the operative date of this title shall continue in effect until modified or superseded by the Secretary. After every blasting operation, an examination shall be made to determine whether fires have been started.

(b) Underground storage places for lubricating oil and grease shall be of fireproof construction. Except for specially prepared materials approved by the Secretary, lubricating oil and grease kept in all underground areas in a coal mine shall be in fireproof, closed metal containers or other no less effective containers approved by the Secretary.

(c) Underground transformer stations, battery-charging stations, substations, compressor stations, shops, and permanent pumps shall be housed in fireproof structures or areas. Air currents used to ventilate structures or areas enclosing electrical installations shall be coursed directly into the return. Other underground structures installed in a coal mine as the Secretary may prescribe shall be of fireproof construction.

(d) All welding, cutting, or soldering with arc or flame in all underground areas of a coal mine shall, whenever practicable, be conducted in fireproof enclosures. Welding, cutting or soldering with arc or flame in other than a fireproof enclosure shall be done under the supervision of a qualified person who shall make a diligent search for fire during and after such operations and shall, immediately before and during such operations, continuously test for methane with means approved by the Secretary for detecting methane. Welding, cutting, or soldering shall not be conducted in air that contains 1.0 volume per centum or more of methane. Rock dust or suitable fire extinguishers shall be immediately available during such welding, cutting, or soldering.

(e) Within one year after the operative date of this title, fire suppression devices meeting specifications prescribed by the Secretary shall be installed on unattended underground equipment and suitable fire-resistant hydraulic fluids approved by the Secretary shall be used in the hydraulic systems of such equipment. Such fluids shall be used in the hydraulic systems of other underground equipment unless fire suppression devices meeting specifications prescribed by the Secretary are installed on such equipment.

(f) Deluge-type water sprays or foam generators automatically actuated by rise in temperature, or other no less effective means approved by the Secretary of controlling fire, shall be installed at main and secondary belt-conveyor drives. Where sprays or foam generators are used they shall supply a sufficient quantity of water or foam to control fires.

(g) Underground belt conveyors shall be equipped with slippage and sequence switches. The Secretary shall, within sixty days after the operative date of this title, require that devices be installed on all such belts which will give a warning automatically when a fire occurs on or near such belt. The Secretary shall prescribe a schedule for installing fire suppression devices on belt haulageways.

(h) On and after the operative date of this title, all conveyor belts acquired for use underground shall meet the requirements to be established by the Secretary for flame-resistant conveyor belts.

MAPS

SEC. 312. (a) The operator of a coal mine shall have ina fireproof repository located in an area on the surface of the mine chosen by the mine operator to minimize the danger of destruction by fire or other hazard, an accurate and up-to-date map of such mine drawn on scale. Such map shall show the active workings, all pillared, worked out, and abandoned areas, except as provided in this section, entries and aircourses with the direction of airflow indicated by arrows, contour lines of all elevations, elevations of all main and cross or side entries, dip of the coalbed, escapeways, adjacent mine workings within one thousand feet, mines above or below, water pools above, and either producing or abandoned oil and gas wells located within five hundred feet of such mine and any underground area of such mine, and such other information as the Secretary may require. Such map shall identify those areas of the mine which have been pillared, worked out, or abandoned which are inaccessible or cannot be entered safely and on which no information is available. Such map shall be made or certified by a registered engineer or a registered surveyor of the State in which the mine is located. Such map shall be kept up to date by temporary notations and such map shall be revised and supplemented at intervals prescribed by the Secretary on the basis of a survey made or certified by such engineer or surveyor.

(b) The coal mine map and any revision and supplement thereof shall be available for inspection by the Secretary or his authorized representative, by coal mine inspectors of the State in which the mine is located, by miners in the mine and their representatives and by operators of adjacent coal mines and by persons owning, leasing, or residing on surface areas of such mines or areas adjacent to such mines. The operator shall furnish to the Secretary or his authorized representative and to the Secretary of Housing and Urban Development, upon request, one or more copies of such map and any revision and supplement thereof. Such map or revision and supplement thereof shall be kept confidential and its contents

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shall not be divulged to any other person, except to the extent necessary to carry out the provisions of this Act and in connection with the functions and responsibilities of the Secretary of Housing and Urban Development.

(c) Whenever an operator permanently closes or abandons a coal mine, or temporarily closes a coal mine for a period of more than ninety days, he shall promptly notify the Secretary of such closure. Within sixty days of the permanent closure or abandonment of the mine, or, when the mine is temporarily closed, upon the expiration of a period of ninety days from the date of closure, the operator shall file with the Secretary a copy of the mine map revised and supplemented to the date of the closure. Such copy of the mine map shall be certified by a registered surveyor or registered engineer of the State in which the mine is located and shall be available for public inspection.

BLASTING AND EXPLOSIVES

SEC. 313. (a) Black blasting powder shall not be stored or used underground. Mudcaps (adobes) or other unconfined shots shall not be fired underground.

(b) Explosives and detonators shall be kept in separate containers until immediately before blasting. In underground anthracite mines, (1) mudcaps or other open, unconfined shake shots may be fired, if restricted to battery starting when methane or a fire hazard is not present, and if it is otherwise impracticable to start the battery; (2) open, unconfined shake shots in pitching veins may be fired, when no methane or fire hazard is present, if the taking down of loose hanging coal by other means is too hazardous; and (3) tests for methane shall be made immediately before such shots are fired and if 1.0 volume per centum or more of methane is present, when tested, such shot shall not be made until the methane content is reduced below 1.0 volume per centum.

(c) Except as provided in this subsection, in all underground areas of a coal mine only permissible explosives, electric detonators of proper strength, and permissible blasting devices shall be used and all explosives and blasting devices shall be used in a permissible manner. Permissible explosives shall be fired only with permissible shot firing units. Only incombustible materials shall be used for stemming boreholes. The Secretary may, under such safeguards as he may prescribe, permit the firing of more than twenty shots and allow the use of nonpermissible explosives in sinking shafts and slopes from the surface in rock. Nothing in this section shall prohibit the use of compressed air blasting.

(d) Explosives or detonators carried anywhere underground in a coal mine by any person shall be in containers constructed of non-conductive material, maintained in good condition, and kept closed.

(e) Explosives or detonators shall be transported in special closed containers (1) in cars moved by means of a locomotive or rope, (2) on belts, (3) in shuttle cars, or (4) in equipment designed especially to transport such explosives or detonators.

(f) When supplies of explosives and detonators for use in one or more working sections are stored underground, they

shall be kept in section boxes or magazines of substantial construction with no metal exposed on the inside, located at least twenty-five feet from roadways and power wires, and in a dry, well rock-dusted location protected from falls of roof, except in pitching beds, where it is not possible to comply with the location requirement, such boxes shall be placed in niches cut into the solid coal or rock.

(g) Explosives and detonators stored in the working places shall be kept in separate closed containers which shall be located out of the line of blast and not less than fifty feet from the working face and fifteen feet from any pipeline, powerline, rail, or conveyor, except that, if kept in niches in the rib, the distance from any pipeline, powerline, rail, or conveyor shall be at least five feet. Such explosives and detonators, when stored, shall be separated by a distance of at least five feet.

HOISTING AND MANTRIPS

SEC. 314 (a) Every hoist used to transport persons at a coal mine shall be equipped with overspeed, overwind, and automatic stop controls. Every hoist handling platforms, cages, or other devices used to transport persons shall be equipped with brakes capable of stopping the fully loaded platform, cage, or other device; with hoisting cable adequately strong to sustain the fully loaded platform, cage, or other device; and have a proper margin of safety. Cages, platforms, or other devices which are used to transport persons in shafts and slopes shall be equipped with safety catches or other no less effective devices approved by the Secretary that act quickly and effectively in an emergency, and such catches shall be tested at least once every two months. Hoisting equipment, including automatic elevators, that is used to transport persons shall be examined daily. Where persons are transported into, or out of, a coal mine by hoists, a qualified hoisting engineer shall be on duty while any person is underground, except that no such engineer shall be required for automatically operated cages, platforms, or elevators.

(b) Other safeguards adequate, in the judgment of an authorized representative of the Secretary, to minimize hazards with respect to transportation of men and materials shall be provided.

(c) Hoists shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes used. An accurate and reliable indicator of the position of the cage, platform, skip, bucket, or cars shall be provided.

(d) There shall be at least two effective methods approved by the Secretary of signaling between each of the shaft stations and the hoist room, one of which shall be a telephone or speaking tube.

(e) Each locomotive and haulage car used in an underground coal mine shall be equipped with automatic brakes, where space permits. Where space does not permit automatic brakes, locomotives and haulage cars shall be subject to speed reduction gear, or other similar devices approved by the Secretary which are designed to stop the locomotives and haulage cars with the proper margin of safety.

(f) All haulage equipment acquired by an operator of a coal

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mine on or after one year after the operative date of this title shall be equipped with automatic couplers which couple by impact and uncouple without the necessity of persons going between the ends of such equipment. All haulage equipment without automatic couplers in use in a mine on the operative date of this title shall also be so equipped within four years after the operative date of this title.

EMERGENCY SHELTERS

SEC. 315. The Secretary or an authorized representative of the Secretary may prescribe in any coal mine that rescue chambers, properly sealed and ventilated, be erected at suitable locations in the mine to which persons may go in case of an emergency for protection against hazards. Such chambers shall be properly equipped with first aid materials, an adequate supply of air and self-contained breathing equipment, an independent communication system to the surface, and proper accommodations for the persons while awaiting rescue, and such other equipment as the Secretary may require. A plan for the erection, maintenance, and revisions of such chambers and the training of the miners in their proper use shall be submitted by the operator to the Secretary for his approval.

COMMUNICATIONS

SEC. 316. Telephone service or equivalent two-way communication facilities, approved by the Secretary or his authorized representative, shall be provided between the surface and each landing of main shafts and slopes and between the surface and each working section of any coal mine that is more than one hundred feet from a portal.

MISCELLANEOUS

SEC. 317. (a) Each operator of a coal mine shall take reasonable measures to locate oil and gas wells penetrating coalbeds or any underground area of a coal mine. When located, such operator shall establish and maintain barriers around such oil and gas wells in accordance with State laws and regulations, except that such barriers shall not be less than three hundred feet in diameter, unless the Secretary or his authorized representative permits a lesser barrier consistent with the applicable State laws and regulations where such lesser barrier will be adequate to protect against hazards from such wells to the miners in such mine, or unless the Secretary or his authorized representative requires a greater barrier where the depth of the mine, other geologic conditions, or other factors warrant such a greater barrier.

(b) Whenever any working place approaches within fifty feet of abandoned areas in the mine as shown by surveys made and certified by a registered engineer or surveyor, or within two hundred feet of any other abandoned areas of the mine which cannot be inspected and which may contain dangerous accumulations of water or gas, or within two hundred feet of any workings of an adjacent mine, a borehole or bore-

holes shall be drilled to a distance of at least twenty feet in advance of the working face of such working place and shall be continually maintained to a distance of at least ten feet in advance of the advancing working face. When there is more than one borehole, they shall be drilled sufficiently close to each other to insure that the advancing working face will not accidentally hole through into abandoned areas or adjacent mines. Boreholes shall also be drilled not more than eight feet apart in the rib of such working place to a distance of at least twenty feet and at an angle of forty-five degrees. Such rib holes shall be drilled in one or both ribs of such working place as may be necessary for adequate protection of miners in such place.

(c) No person shall smoke, carry smoking materials, matches, or lighters underground, or smoke in or around oil houses, explosives magazines, or other surface areas where such practice may cause a fire or explosion. The operator shall institute a program, approved by the Secretary, to insure that any person entering the underground area of the mine does not carry smoking materials, matches, or lighters.

(d) Persons underground shall use only permissible electric lamps approved by the Secretary for portable illumination. No open flame shall be permitted in the underground area of any coal mine, except as permitted under section 311 (d) of this title.

(e) Within nine months after the operative date of this title, the Secretary shall propose the standards under which all working places in a mine shall be illuminated by permissible lighting, within eighteen months after the promulgation of such standards, while persons are working in such places.

(f) (1) Except as provided in paragraphs (2) and (3) of this subsection, at least two separate and distinct travelable passageways which are maintained to insure passage at all times of any person, including disabled persons, and which are to be designated as escapeways, at least one of which is ventilated with intake air, shall be provided from each working section continuous to the surface escape drift opening, or continuous to the escape shaft or slope facilities to the surface, as appropriate, and shall be maintained in safe condition and properly marked. Mine openings shall be adequately protected to prevent the entrance into the underground area of the mine of surface fires, fumes, smoke, and flood water. Escape facilities approved by the Secretary or his authorized representative, properly maintained and frequently tested, shall be present at or in each escape shaft or slope to allow all persons, including disabled persons, to escape quickly to the surface in the event of an emergency.

(2) When new coal mines are opened, not more than twenty miners shall be allowed at any one time in any mine until a connection has been made between the two mine openings, and such connections shall be made as soon as possible.

(3) When only one mine opening is available, owing to final mining of pillars, not more than twenty miners shall be allowed in such mine at any one time, and the distance between the mine opening and working face shall not exceed five hundred feet.

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(4) In the case of all coal mines opened on or after the operative date of this title, and in the case of all new working sections opened on or after such date in mines opened prior to such date, the escapeway required by this section to be ventilated with intake air shall be separated from the belt and trolley haulage entries of the mine for the entire length of such entries to the beginning of each working section, except that the Secretary or his authorized representative may permit such separation to be extended for a greater or lesser distance so long as such extension does not pose a hazard to the miners.

(g) After the operative date of this title, all structures erected on the surface within one hundred feet of any mine opening shall be of fireproof construction. Unless structures existing on or prior to such date which are located within one hundred feet of any mine opening are of such construction, fire doors shall be erected at effective points in mine openings to prevent smoke or fire from outside sources endangering miners underground. These doors shall be tested at least monthly to insure effective operation. A record of such tests shall be kept in an area on the surface of the mine chosen by the operator to minimize the danger of destruction by fire or other hazard and shall be available for inspection by interested persons.

(h) Adequate measures shall be taken to prevent methane and coal dust from accumulating in excessive concentrations in or on surface coal-handling facilities, but in no event shall methane be permitted to accumulate in concentrations in or on surface coal-handling facilities in excess of limits established for methane by the Secretary within one year after the operative date of this title. Where coal is dumped at or near air-intake openings, provisions shall be made to avoid dust from entering the mine.

(i) Every operator of a coal mine shall provide a program, approved by the Secretary, of training and retraining of both qualified and certified persons needed to carry out functions prescribed in this Act.

(j) An authorized representative of the Secretary may require in any coal mine where the height of the coalbed permits that electric face equipment, including shuttle cars, be provided with substantially constructed canopies or cabs to protect the miners operating such equipment from roof falls and from rib and face rolls.

(k) On and after the operative date of this title, the opening of any coal mine that is declared inactive by its operator or is permanently closed or abandoned for more than ninety days, shall be sealed by the operator in a manner prescribed by the Secretary. Openings of all other mines shall be adequately protected in a manner prescribed by the Secretary to prevent entrance by unauthorized persons.

(l) The Secretary may require any operator to provide adequate facilities for the miners to change from the clothes worn underground, to provide for the storing of such clothes from shift to shift, and to provide sanitary and bathing facilities. Sanitary toilet facilities shall be provided in the active workings of the mine when such surface facilities are not

readily accessible to the active workings.

(m) Each operator shall make arrangements in advance for obtaining emergency medical assistance and transportation for injured persons. Emergency communications shall be provided to the nearest point of assistance. Selected agents of the operator shall be trained in first aid and first aid training shall be made available to all miners. Each coal mine shall have an adequate supply of first aid equipment located on the surface, at the bottom of shafts and slopes, and at other strategic locations near the working faces. In fulfilling each of the requirements of this subsection, the operator shall meet at least minimum requirements prescribed by the Secretary of Health, Education, and Welfare. Within two months after the operative date of this title, each operator shall file with the Secretary a plan setting forth in such detail as the Secretary may require the manner in which such operator has fulfilled the requirements in this subsection.

(n) A self-rescue device approved by the Secretary shall be made available to each miner by the operator which shall be adequate to protect such miner for one hour or longer. Each operator shall train each miner in the use of such device.

(o) The Secretary shall prescribe improved methods of assuring that miners are not exposed to atmospheres that are deficient in oxygen.

(p) Each operator of a coal mine shall establish a check-in and check-out system which will provide positive identification of every person underground, and will provide an accurate record of the persons in the mine kept on the surface in a place chosen to minimize the danger of destruction by fire or other hazard. Such record shall bear a number identical to an identification check that is securely fastened to the lamp belt worn by the person underground. The identification check shall be made of a rust resistant metal of not less than sixteen gauge.

(q) The Secretary shall require, when technologically feasible, that devices to prevent and suppress ignitions be installed on electric face cutting equipment.

(r) Whenever an operator mines coal from a coal mine opened after the operative date of this title, or from any new working section of a mine opened prior to such date, in a manner that requires the construction, operation, and maintenance of tunnels under any river, stream, lake, or other body of water, that is, in the judgment of the Secretary, sufficiently large to constitute a hazard to miners, such operator shall obtain a permit from the Secretary which shall include such terms and conditions as he deems appropriate to protect the safety of miners working or passing through such tunnels from cave-ins and other hazards. Such permits shall require, in accordance with a plan to be approved by the Secretary, that a safety zone be established beneath and adjacent to such body of water. No plan shall be approved unless there is a minimum of cover to be determined by the Secretary, based on test holes drilled by the operator in a manner to be prescribed by the Secretary. No such permit shall be required in the case of any new working section of a mine which is located under any water resource reservoir being constructed by a

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Federal agency on the date of enactment of this Act, the operator of which is required by such agency to operate in a manner that adequately protects the safety of miners working in such section from cave-ins and other hazards.

(s) An adequate supply of potable water shall be provided for drinking purposes in the active workings of the mine, and such water shall be carried, stored, and otherwise protected in sanitary containers.

(t) Within one year after the operative date of this title, the Secretary shall propose standards for preventing explosions from explosive gases other than methane and for testing for accumulations of such gases.

DEFINITIONS

SEC. 318. For the purpose of this title and title II of this Act, the term—

(a) "certified" or "registered" as applied to any person means a person certified or registered by the State in which the coal mine is located to perform duties prescribed by such titles, except that, in a State where no program of certification or registration is provided or where the program does not meet at least minimum Federal standards established by the Secretary, such certification or registration shall be by the Secretary;

(b) "qualified person" means, as the context requires,

(1) an individual deemed qualified by the Secretary and designated by the operator to make test and examinations required by this Act; and

(2) an individual deemed, in accordance with minimum requirements to be established by the Secretary, qualified by training, education, and experience, to perform electrical work, to maintain electrical equipment, and to conduct examinations and tests of all electrical equipment;

(c) "permissible" as applied to—

(1) equipment used in the operation of a coal mine, means equipment, other than permissible electric face equipment, to which an approval plate, label, or other device is attached as authorized by the Secretary and which meets specifications which are prescribed by the Secretary for the construction and maintenance of such equipment and are designed to assure that such equipment will not cause a mine explosion or a mine fire,

(2) explosives, shot firing units, or blasting devices used in such mine, means explosives, shot firing units, or blasting devices which meet specifications which are prescribed by the Secretary, and

(3) the manner of use of equipment or explosives, shot firing units, and blasting devices, means the manner of use prescribed by the Secretary;

(d) "rock dust" means pulverized limestone, dolomite, gypsum, anhydrite, shale, adobe, or other inert material, preferably light colored, 100 per centum of which will pass through a sieve having twenty meshes per linear inch and

70 per centum or more of which will pass through a sieve having two hundred meshes per linear inch; the particles of which when wetted and dried will not cohere to form a cake which will not be dispersed into separate particles by a light blast of air; and which does not contain more than 5 per centum of combustible matter or more than a total of 4 per centum of free and combined silica (SiO_2), or, where the Secretary finds that such silica concentrations are not available, which does not contain more than 5 per centum of free and combined silica;

(e) "anthracite" means coals with a volatile ratio equal to 0.12 or less;

(f) "volatile ratio" means volatile matter content divided by the volatile matter plus the fixed carbon;

(g)(1) "working face" means any place in a coal mine in which work of extracting coal from its natural deposit in the earth is performed during the mining cycle,

(2) "working place" means the area of a coal mine inby the last open crosscut,

(3) "working section" means all areas of the coal mine from the loading point of the section to and including the working faces,

(4) "active workings" means any place in a coal mine where miners are normally required to work or travel;

(h) "abandoned areas" means sections, panels, and other areas that are not ventilated and examined in the manner required for working places under section 303 of this title;

(i) "permissible" as applied to electric face equipment means all electrically operated equipment taken into or used inby the last open crosscut of an entry or a room of any coal mine the electrical parts of which, including, but not limited to, associated electrical equipment, components, and accessories, are designed, constructed, and installed, in accordance with the specifications of the Secretary, to assure that such equipment will not cause a mine explosion or mine fire, and the other features of which are designed and constructed, in accordance with the specifications of the Secretary, to prevent, to the greatest extent possible, other accidents in the use of such equipment; and the regulations of the Secretary or the Director of the Bureau of Mines in effect on the operative date of this title relating to the requirements for investigation, testing, approval, certification, and acceptance of such equipment as permissible shall continue in effect until modified or superseded by the Secretary, except that the Secretary shall provide procedures, including, where feasible, testing, approval, certification, and acceptance in the field by an authorized representative of the Secretary, to facilitate compliance by an operator with the requirements of section 305(a) of this title within the periods prescribed therein;

(j) "low voltage" means up to and including 660 volts; "medium voltage" means voltages from 661 to 1,000 volts; and "high voltage" means more than 1,000 volts;

(l) "coal mine" includes areas of adjoining mines connected underground.

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TITLE IV—BLACK LUNG BENEFITS

PART A—GENERAL

SEC. 401. Congress finds and declares that there are a significant number of coal miners living today who are totally disabled due to pneumoconiosis arising out of employment in one or more of the Nation's underground coal mines; that there are a number of survivors of coal miners whose deaths were due to this disease; and that few States provide benefits for death or disability due to this disease to coal miners or their surviving dependents. It is, therefore, the purpose of this title to provide benefits, in cooperation with the States, to coal miners who are totally disabled due to pneumoconiosis and to the surviving dependents of miners whose death was due to such disease; and to ensure that in the future adequate benefits are provided to coal miners and their dependents in the event of their death or total disability due to pneumoconiosis.

SEC. 402. For purposes of this title—

(a) The term "dependent" means a wife or child who is a dependent as that term is defined for purposes of section 8110 of title 5, United States Code.

(b) The term "pneumoconiosis" means a chronic dust disease of the lung arising out of employment in an underground coal mine.

(c) The term "Secretary" where used in part B means the Secretary of Health, Education, and Welfare, and where used in part C means the Secretary of Labor.

(d) The term "miner" means any individual who is or was employed in an underground coal mine.

(e) The term "widow" means the wife living with or dependent for support on the decedent at the time of his death, or living apart for reasonable cause or because of his desertion, who has not remarried.

(f) The term "total disability" has the meaning given it by regulations of the Secretary of Health, Education, and Welfare, but such regulations shall not provide more restrictive criteria than those applicable under section 223(d) of the Social Security Act.

PART B—CLAIMS FOR BENEFITS FILED ON OR BEFORE DECEMBER 31, 1972

SEC. 411. (a) The Secretary shall, in accordance with the provisions of this part, and the regulations promulgated by him under this part, make payments of benefits in respect of total disability of any miner due to pneumoconiosis, and in respect of the death of any miner whose death was due to pneumoconiosis.

(b) The Secretary shall by regulation prescribe standards for determining for purposes of section 411(a) whether a miner is totally disabled due to pneumoconiosis and for determining whether the death of a miner was due to pneumoconiosis. Regulations required by this subsection shall be promulgated and published in the Federal Register at the earliest practicable date after the date of enactment of this title, and in no event later than the end of the third month following

the month in which this title is enacted. Such regulations may be modified or additional regulations promulgated from time to time thereafter.

(c) For purposes of this section—

(1) if a miner who is suffering or suffered from pneumoconiosis was employed for ten years or more in one or more underground coal mines there shall be a rebuttable presumption that his pneumoconiosis arose out of such employment;

(2) if a deceased miner was employed for ten years or more in one or more underground coal mines and died from a respirable disease there shall be a rebuttable presumption that his death was due to pneumoconiosis; and

(3) if a miner is suffering or suffered from a chronic dust disease of the lung which (A) when diagnosed by chest roentgenogram, yields one or more large opacities (greater than one centimeter in diameter) and would be classified in category A, B, or C in the International Classification of Radiographs of the Pneumoconioses by the International Labor Organization, (B) when diagnosed by biopsy or autopsy, yields massive lesions in the lung, or (C) when diagnosis is made by other means, would be a condition which could reasonably be expected to yield results described in clause (A) or (B) if diagnosis had been made in the manner prescribed in clause (A) or (B), then there shall be an irrebuttable presumption that he is totally disabled due to pneumoconiosis or that his death was due to pneumoconiosis, as the case may be.

(d) Nothing in subsection (c) shall be deemed to affect the applicability of subsection (a) in the case of a claim where the *presumptions provided for therein are inapplicable.*

SEC. 412. (a) Subject to the provisions of subsection (b) of this section, benefit payments shall be made by the Secretary under this part as follows:

(1) In the case of total disability of a miner due to pneumoconiosis, the disabled miner shall be paid benefits during the disability at a rate equal to 50 per centum of the minimum monthly payment to which a Federal employee in grade GS-2, who is totally disabled, is entitled at the time of payment under chapter 81 of title 5, United States Code.

(2) In the case of death of a miner due to pneumoconiosis or of a miner receiving benefits under this part, benefits shall be paid to his widow (if any) at the rate the deceased miner would receive such benefits if he were totally disabled.

(3) In the case of an individual entitled to benefit payments under clause (1) or (2) of this subsection who has one or more dependents, the benefit payments shall be increased at the rate of 50 per centum of such benefit payments, if such individual has one dependent, 75 per centum if such individual has two dependents, and 100 per centum if such individual has three or more dependents.

(b) Notwithstanding subsection (a), benefit payments under this section to a miner or his widow shall be reduced, on a monthly or other appropriate basis, by an amount equal to any payment received by such miner or his widow under the workmen's compensation, unemployment compensation, or

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disability insurance laws of his State on account of the disability of such miner, and the amount by which such payment would be reduced on account of excess earnings of such miner under section 203(b) through (1) of the Social Security Act if the amount paid were a benefit payable under section 202 of such Act.

(c) Benefits payable under this part shall be deemed not to be income for purposes of the Internal Revenue Code of 1954.

SEC. 413. (a) Except as otherwise provided in section 414 of this part, no payment of benefits shall be made under this part except pursuant to a claim filed therefor on or before December 31, 1972, in such manner, in such form, and containing such information, as the Secretary shall by regulation prescribe.

(b) In carrying out the provisions of this part, the Secretary shall to the maximum extent feasible (and consistent with the provisions of this part) utilize the personnel and procedures he uses in determining entitlement to disability insurance benefit payments under section 223 of the Social Security Act. Claimants under this part shall be reimbursed for reasonable medical expenses incurred by them in establishing their claims. For purposes of determining total disability under this part, the provisions of subsections (a), (b), (c), (d), and (g) of section 221 of such Act shall be applicable.

(c) No claim for benefits under this section shall be considered unless the claimant has also filed a claim under the applicable State workmen's compensation law prior to or at the same time his claim was filed for benefits under this section; except that the foregoing provisions of this paragraph shall not apply in any case in which the filing of a claim under such law would clearly be futile because the period within which such a claim may be filed thereunder has expired or because pneumoconiosis is not compensable under such law, or in any other situation in which, in the opinion of the Secretary, the filing of a claim would clearly be futile.

SEC. 414. (a) No claim for benefits under this part on account of total disability of a miner shall be considered unless it is filed on or before December 31, 1972, or, in the case of a claimant who is a widow, within six months after the death of her husband or by December 31, 1972, whichever is the later.

(b) No benefits shall be paid under this part after December 31, 1972, if the claim therefor was filed after December 31, 1971.

(c) No benefits under this part shall be payable for any period prior to the date a claim therefor is filed.

(d) No benefits shall be paid under this part to the residents of any State which, after the date of enactment of this Act, reduces the benefits payable to persons eligible to receive benefits under this part, under its State laws which are applicable to its general work force with regard to workmen's compensation, unemployment compensation, or disability insurance.

(e) No benefits shall be payable to a widow under this part on account of the death of a miner unless (1) benefits under this part were being paid to such miner with respect to disa-

bility due to pneumoconiosis prior to his death, or (2) the death of such miner occurred prior to January 1, 1973.

PART C—CLAIMS FOR BENEFITS AFTER DECEMBER 31, 1972

SEC. 421. (a) On and after January 1, 1973, any claim for benefits for death or total disability due to pneumoconiosis shall be filed pursuant to the applicable State workmen's compensation law, except that during any period when miners or their surviving widows are not covered by a State workmen's compensation law which provides adequate coverage for pneumoconiosis they shall be entitled to claim benefits under this part.

(b) (1) For purposes of this section, a State workmen's compensation law shall not be deemed to provide adequate coverage for pneumoconiosis during any period unless it is included in the list of State laws found by the Secretary to provide such adequate coverage during such period. The Secretary shall, no later than October 1, 1972, publish in the Federal Register a list of State workmen's compensation laws which provide adequate coverage for pneumoconiosis and shall revise and republish in the Federal Register such list from time to time, as may be appropriate to reflect changes in such State laws due to legislation or judicial or administrative interpretation.

(2) The Secretary shall include a State workmen's compensation law on such list during any period only if he finds that during such period under such law—

(A) benefits must be paid for total disability or death of a miner due to pneumoconiosis;

(B) the amount of such cash benefits is substantially equivalent to or greater than the amount of benefits prescribed by section 412(a) of this title;

(C) the standards for determining death or total disability due to pneumoconiosis are substantially equivalent to those established by section 411, and by the regulations of the Secretary of Health, Education, and Welfare promulgated thereunder;

(D) any claim for benefits on account of total disability or death of a miner due to pneumoconiosis is deemed to be timely filed if such claim is filed within three years of the discovery of total disability due to pneumoconiosis, or the date of such death, as the case may be;

(E) there are in effect provisions with respect to prior and successor operators which are substantially equivalent to the provisions contained in section 422(i) of this part; and

(F) there are applicable such other provisions, regulations or interpretations, which are consistent with the provisions contained in Public Law 803, 69th Congress (44 Stat. 1424, approved March 4, 1927), as amended, which are applicable under section 422(a), but are not inconsistent with any of the criteria set forth in subparagraphs (A) through (E) of this paragraph, as the Secretary, in accordance with regulations promulgated by him, deter-

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mines to be necessary or appropriate to assure adequate compensation for total disability or death due to pneumoconiosis.

The action of the Secretary in including or failing to include any State workmen's compensation law on such list shall be subject to judicial review exclusively in the United States court of appeals for the circuit in which the State is located or the United States Court of Appeals for the District of Columbia.

SEC. 422. (a) During any period after December 31, 1972, in which a State workmen's compensation law is not included on the list published by the Secretary under section 421(b) of this part, the provisions of Public Law 803, 69th Congress (44 Stat. 1424, approved March 4, 1927), as amended (other than the provisions contained in sections 1, 2, 3, 4, 7, 8, 9, 10, 12, 13, 29, 30, 31, 32, 33, 37, 38, 41, 43, 44, 45, 46, 47, 48, 49, 50, and 51 thereof) shall (except as otherwise provided in this subsection and except as the Secretary shall by regulation otherwise provide), be applicable to each operator of an underground coal mine in such State with respect to death or total disability due to pneumoconiosis arising out of employment in such mine. In administering this part, the Secretary is authorized to prescribe in the Federal Register such additional provisions, not inconsistent with those specifically excluded by this subsection, as he deems necessary to provide for the payment of benefits by such operator to persons entitled thereto as provided in this part and thereafter those provisions shall be applicable to such operator.

(b) During any such period each such operator shall be liable for and shall secure the payment of benefits, as provided in this section and section 423 of this part.

(c) Benefits shall be paid during such period by each such operator under this section to the categories of persons entitled to benefits under section 412(a) of this title in accordance with the regulations of the Secretary and the Secretary of Health, Education, and Welfare applicable under this section: *Provided*, That, except as provided in subsection (i) of this section, no benefit shall be payable by any operator on account of death or total disability due to pneumoconiosis which did not arise, at least in part, out of employment in a mine during the period when it was operated by such operator.

(d) Benefits payable under this section shall be paid on a monthly basis and, except as otherwise provided in this section, such payments shall be equal to the amounts specified in section 412(a) of this title.

(e) No payment of benefits shall be required under this section:

(1) except pursuant to a claim filed therefor in such manner, in such form, and containing such information, as the Secretary shall by regulation prescribe;

(2) for any period prior to January 1, 1973; or

(3) for any period after seven years after the date of enactment of this Act.

(f) Any claim for benefits under this section shall be filed within three years of the discovery of total disability due to pneumoconiosis or, in the case of death due to pneumoconios-

is, the date of such death.

(g) The amount of benefits payable under this section shall be reduced, on a monthly or other appropriate basis, by the amount of any compensation received under or pursuant to any Federal or State workmen's compensation law because of death or disability due to pneumoconiosis.

(h) The regulations of the Secretary of Health, Education, and Welfare promulgated under section 411 of this title shall also be applicable to claims under this section. The Secretary of Labor shall by regulation establish standards, which may include appropriate presumptions, for determining whether pneumoconiosis arose out of employment in a particular underground coal mine or mines. The Secretary may also, by regulation, establish standards for apportioning liability for benefits under this subsection among more than one operator, where such apportionment is appropriate.

(i) (1) During any period in which this section is applicable with respect to a coal mine an operator of such mine who, after the date of enactment of this title, acquired such mine or substantially all the assets thereof from a person (hereinafter referred to in this paragraph as a "prior operator") who was an operator of such mine on or after the operative date of this title shall be liable for and shall, in accordance with section 423 of this part, secure the payment of all benefits which would have been payable by the prior operator under this section with respect to miners previously employed in such mine if the acquisition had not occurred and the prior operator had continued to operate such mine.

(2) Nothing in this subsection shall relieve any prior operator of any liability under this section.

SEC. 423. (a) During any period in which a State workmen's compensation law is not included on the list published by the Secretary under section 421(b) each operator of an underground coal mine in such State shall secure the payment of benefits for which he is liable under section 422 by (1) qualifying as a self-insurer in accordance with regulations prescribed by the Secretary, or (2) insuring and keeping insured the payment of such benefits with any stock company or mutual company or association, or with any other person or fund, including any State fund, while such company, association, person or fund is authorized under the laws of any State to insure workmen's compensation.

(b) In order to meet the requirements of clause (2) of subsection (a) of this section, every policy or contract of insurance must contain—

(1) a provision to pay benefits required under section 422, notwithstanding the provisions of the State workmen's compensation law which may provide for lesser payments;

(2) a provision that insolvency or bankruptcy of the operator or discharge therein (or both) shall not relieve the carrier from liability for such payments; and

(3) such other provisions as the Secretary, by regulation, may require.

(c) No policy or contract of insurance issued by a carrier to comply with the requirements of clause (2) of subsection (a) of

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this subsection shall be canceled prior to the date specified in such policy or contract for its expiration until at least thirty days have elapsed after notice of cancellation has been sent by registered or certified mail to the Secretary and to the operator at his last known place of business.

SEC. 424. If a totally disabled miner or a widow is entitled to benefits under section 422 and (1) an operator liable for such benefits has not obtained a policy or contract of insurance, or qualified as a self-insurer, as required by section 423, or such operator has not paid such benefits within a reasonable time, or (2) there is no operator who was required to secure the payment of such benefits, the Secretary shall pay such miner or such widow the benefits to which he or she is so entitled. In a case referred to in clause (1), the operator shall be liable to the United States in a civil action in an amount equal to the amount paid to such miner or his widow under this title.

SEC. 425. With the consent and cooperation of State agencies charged with administration of State workmen's compensation laws, the Secretary may, for the purpose of carrying out his functions and duties under section 422, utilize the services of State and local agencies and their employees and, notwithstanding any other provision of law, may advance funds to or reimburse such State and local agencies and their employees for services rendered for such purposes.

SEC. 426. (a) The Secretary of Labor and the Secretary of Health, Education, and Welfare are authorized to issue such regulations as each deems appropriate to carry out the provisions of this title. Such regulations shall be issued in conformity with section 553 of title 5 of the United States Code, notwithstanding subsection (a) thereof.

(b) Within 120 days following the convening of each session of Congress the Secretary of Health, Education, and Welfare shall submit to the Congress an annual report upon the subject matter of part B of this title, and, after January 1, 1973, the Secretary of Labor shall also submit such a report upon the subject matter of part C of this title.

(c) Nothing in this title shall relieve any operator of the duty to comply with any State workmen's compensation law, except insofar as such State law is in conflict with the provisions of this title and the Secretary by regulation, so prescribes. The provisions of any State workmen's compensation law which provide greater benefits than the benefits payable under this title shall not thereby be construed or held to be in conflict with the provisions of this title.

TITLE V ADMINISTRATION

RESEARCH

SEC. 501. (a) The Secretary of the Interior and the Secretary of Health, Education, and Welfare, as appropriate, shall conduct such studies, research, experiments, and demonstrations as may be appropriate—

(1) to improve working conditions and practices in coal or other mines, and to prevent accidents and occupational diseases originating in the coal or other mining industry;

(2) to develop new or improved methods of recovering persons in coal or other mines after an accident;

(3) to develop new or improved means and methods of communication from the surface to the underground area of a coal or other mine;

(4) to develop new or improved means and methods of reducing concentrations of respirable dust in the mine atmosphere of active workings of the coal or other mine;

(5) to develop epidemiological information to (A) identify and define positive factors involved in occupational diseases of miners, (B) provide information on the incidence and prevalence of pneumoconiosis and other respiratory ailments of miners, and (C) improve mandatory health standards;

(6) to develop techniques for the prevention and control of occupational diseases of miners, including tests for hypersusceptibility and early detection;

(7) to evaluate the effect on bodily impairment and occupational disability of miners afflicted with an occupational disease;

(8) to prepare and publish from time to time, reports on all significant aspects of occupational diseases of miners as well as on the medical aspects of injuries, other than diseases, which are revealed by the research carried on pursuant to this subsection;

(9) to study the relationship between coal or other mine environments and occupational diseases of miners;

(10) to develop new and improved underground equipment and other sources of power for such equipment which will provide greater safety;

(11) to determine, upon the written request by any operator or authorized representative of miners, specifying with reasonable particularity the grounds upon which such request is made, whether any substance normally found in a coal or other mine has potentially toxic effects in the concentrations normally found in the coal or other mine or whether any physical agents or equipment found or used in a coal or other mine has potentially hazardous effects, and shall submit such determinations to both the operators and miners as soon as possible; and

(12) for such other purposes as they deem necessary to carry out the purposes of this Act.

(b) Activities under this section in the field of coal or other mine health shall be carried out by the Secretary of Health, Education, and Welfare through the National Institute for Occupational Safety and Health established under the Occupational Safety and Health Act of 1970, and activities under this section in the field of coal or other mine safety shall be carried out by the Secretary of the Interior in coordination with the Secretary.

(c) In carrying out the provisions for research, demonstrations, experiments, studies, training, and education under this section and sections 301(b) and 502(a) of this Act, the Secretary of the Interior and the Secretary of Health, Education, and Welfare in coordination with the Secretary may enter into contracts with, and make grants to, public and private

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agencies and organizations and individuals. No research, demonstrations, or experiments shall be carried out, contracted for, sponsored, cosponsored, or authorized under authority of this Act, unless all information, uses, products, processes, patents, and other developments resulting from such research, demonstrations, or experiments will (with such exception and limitation, if any, as the Secretary of the Interior or the Secretary of Health, Education, and Welfare in coordination with the Secretary may find to be necessary in the public interest) be available to the general public.

(d) The Secretary of Health, Education, and Welfare shall also conduct studies and research into matters involving the protection of life and the prevention of diseases in connection with persons, who although not miners, work with, or around the products of, coal or other mines in areas outside of such mines and under conditions which may adversely affect the health and well-being of such persons.

(e) There is authorized to be appropriated to the Secretary of the Interior such sums as may be necessary to carry out his responsibilities under this section and section 301(b) of this Act at an annual rate of not to exceed $20,000,000 for the fiscal year ending June 30, 1970, $25,000,000 for the fiscal year ending June 30, 1971, and $60,000,000 for the fiscal year ending June 30, 1972, and for each succeeding fiscal year thereafter. There is authorized to be appropriated annually to the Secretary of Health, Education, and Welfare such sums as may be necessary to carry out his responsibilities under this Act. Such sums shall remain available until expended.

(f) The Secretary is authorized to grant on a mine-by-mine basis an exception to any mandatory health or safety standard under this Act for the purpose of permitting, under such terms and conditions as he may prescribe, accredited educational institutions the opportunity for experimenting with new and improved techniques and equipment to improve the health and safety of miners. No such exception shall be granted unless the Secretary finds that the granting of the exception will not adversely affect the health and safety of miners and publishes his findings.

(g) The Secretary of Health, Education, and Welfare is authorized to make grants to any public or private agency, institution, or organization, and operators or individuals for research and experiments to develop effective respiratory equipment.

TRAINING AND EDUCATION

SEC. 502. (a) The Secretary shall expand programs for the education and training of operators and agents thereof, and miners in—

(1) the recognition, avoidance, and prevention of accidents or unsafe or unhealthful working conditions in coal or other mines; and

(2) in the use of flame safety lamps, permissible methane detectors, and other means approved by the Secretary for detecting methane and other explosive gases accurately.

(b) The Secretary shall, to the greatest extent possible, provide technical assistance to operators in meeting the requirements of this Act and in further improving the health and safety conditions and practices in coal or other mines.

(c) (1) The National Mine Health and Safety Academy shall be maintained as an agency of the Department of the Interior. The Academy shall be responsible for the training of mine safety and health inspectors under section 505 of this Act, and in training of technical support personnel of the Mine Safety and Health Administration established under section 302 of the Federal Mine Safety and Health Amendments Act of 1977; and for any other training programs for mine inspectors, mining personnel, or other persons as the Secretaries of Labor and Interior shall designate. In performing this function, the Academy shall have the authority to enter into cooperative educational and training agreements with educational institutions, State governments, labor organizations, and mine operators and related industries. Such training shall be conducted by the Academy in accordance with curriculum needs and assignment of instructional personnel established by the user.

(2) In performing its function pursuant to this section, the National Mine Health and Safety Academy shall use the facilities and personnel of the Department of the Interior, and such other personnel as shall be mutually agreed upon by the Secretaries of Labor and Interior. The Secretary of the Interior may appoint or assign to the Academy such officers and employees as he deems necessary for the performance of the duties and functions of the Academy.

(3) The Secretary of the Interior shall conduct his safety research responsibilities under section 501 of this Act in coordination with the Secretary of Labor, and the Secretaries of Labor and the Interior are authorized to enter into contractual or other agreements for the performance of such safety related research.

ASSISTANCE TO STATES

SEC. 503. (a) The Secretary, in coordination with the Secretary of Health, Education, and Welfare and the Secretary of the Interior, is authorized to make grants in accordance with an application approved under this section to any State in which coal or other mining takes place—

(1) to assist such State in developing and enforcing effective coal or other mine health and safety laws and regulations consistent with the provisions of section 506 of this Act;

(2) to improve State workmen's compensation and occupational disease laws and programs related to coal or other mine employment; and

(3) to promote Federal-State coordination and cooperation in improving the health and safety conditions in the coal or other mines.

(b) The Secretary shall approve any application or any modification thereof, submitted under this section by a State, through its official coal or other mine inspection or safety

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agency, which—

(1) sets forth the programs, policies, and methods to be followed in carrying out the application in accordance with the purposes of subsection (a) of this section;

(2) provides research and planning studies to carry out plans designed to improve State workmen's compensation and occupational disease laws and programs, as they relate to compensation to miners for occupationally caused diseases and injuries arising out of employment in any coal or other mine;

(3) designates such State coal or other mine inspection or safety agency as the sole agency responsible for administering grants under this section throughout the State, and contains satisfactory evidence that such agency will have the authority to carry out the purposes of this section;

(4) gives assurances that such agency has or will employ an adequate and competent staff of trained inspectors qualified under the laws of such State to make coal or other mine inspections within such State;

(5) provides for the extension and improvement of the State program for the improvement of coal or other mine health and safety in the State, and provides that no advance notice of an inspection will be provided anyone;

(6) provides such fiscal control and fund accounting procedures as may be appropriate to assure proper disbursement and accounting of grants made to the States under this section;

(7) provides that the designated agency will make such reports to the Secretary in such form and containing such information as the Secretary may from time to time require;

(8) contains assurances that grants provided under this section will supplement, not supplant, existing State coal or other mine health and safety programs; and

(9) meets additional conditions which the Secretary may prescribe in furtherance of, and consistent with, the purposes of this section.

(c) The Secretary shall not finally disapprove any State application or modification thereof without first affording the State agency reasonable notice and opportunity for a public hearing.

(d) Any State aggrieved by a decision of the Secretary under subsection (b) or (c) of this section may file within thirty days from the date of such decision with the United States Court of Appeals for the District of Columbia a petition praying that such action be modified or set aside in whole or in part. The court shall hear such appeal on the record made before the Secretary. The decision of the Secretary incorporating his findings of fact therein, if supported by substantial evidence on the record considered as a whole, shall be conclusive. The court may affirm, vacate, or remand the proceedings to the Secretary for such further action as it directs. The filing of a petition under this subsection shall not stay the application of the decision of the Secretary, unless the court so orders. The provisions of section 106 (a), (b), and (c) of this Act shall not be applicable to this section.

(e) Any State application or modification thereof submitted to the Secretary under this section may include a program to train State inspectors.

(f) The Secretary shall cooperate with such State in carrying out the application or modification thereof and shall, as appropriate, develop and, where appropriate, construct facilities for, and finance a program of, training of Federal and State inspectors jointly. The Secretary shall also cooperate with such State in establishing a system by which State and Federal inspection reports of coal or other mines located in the State are exchanged for the purpose of improving health and safety conditions in such mines.

(g) The amount granted to any coal or other mining State for a fiscal year under this section shall not exceed 80 per centum of the amount expended by such State in such year for carrying out such application.

(h) There is authorized to be appropriated $3,000,000 for fiscal year 1970, and $10,000,000 annually in each succeeding fiscal year to carry out the provisions of this section, which shall remain available until expended. The Secretary shall provide for an equitable distribution of sums appropriated for grants under this section to the States where there is an approved application, except that no less than one-half of such sum shall be allocated to coal-producing States

ECONOMIC ASSISTANCE

SEC. 504. (a) Section 7(b) of the Small Business Act, as amended, is amended—

(1) by striking out the period at the end of paragraph (4) and inserting in lieu thereof "; and"; and

(2) by adding after paragraph (4) a new paragraph as follows: "(5) to make such loans (either directly or in cooperation with banks or other lending institutions through agreements to participate on an immediate or deferred basis) as the Administration may determine to be necessary or appropriate to assist any small business concern operating a coal mine in affecting additions to or alterations in the equipment, facilities, or methods of operation of such mine to requirements imposed by the Federal Coal Mine Health and Safety Act of 1969, if the Administration determines that such concern is likely to suffer substantial economic injury without assistance under this paragraph."

(b) The third sentence of section 7 (b) of such Act is amended by inserting "or (5)" after "paragraph (3)".

(c) Section 4 (c) (1) of the Small Business Act, as amended, is amended by inserting "7 (b) (5)," after "7 (b) (4),".

(d) Loans may also be made or guaranteed for the purposes set forth in section 7 (b) (5) of the Small Business Act, as amended pursuant to the provisions of section 202 of the Public Works and Economic Development Act of 1965, as amended.

INSPECTORS: QUALIFICATIONS: TRAINING

SEC. 505. The Secretary may, subject to the civil service

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laws, appoint such employees as he deems requisite for the administration of this Act and prescribe their duties. Persons appointed as authorized representatives of the Secretary shall be qualified by practical experience in mining or by experience as a practical mining engineer or by education: *Provided*, however, That, to the maximum extent feasible, in the selection of persons for appointment as mine inspectors, no person shall be so selected unless he has the basic qualification of at least five years practical mining experience and in assigning mine inspectors to the inspection and investigation of individual mines, due consideration shall be given to the extent possible to their previous experience in the particular type of mining operation where such inspections are to be made. Persons appointed to assist such representatives in the taking of samples of respirable dust for the purpose of enforcing title II of this Act shall be qualified by training, experience, or education. The provisions of section 201 of the Revenue and Expenditure Control Act of 1968 (82 Stat. 251, 270) shall not apply with respect to the appointment of such authorized representatives of the Secretary or to persons appointed to assist such representatives and to carry out the provisions of this Act, and, in applying the provisions of such section to other agencies under the Secretary and to other agencies of the Government, such appointed persons shall not be taken into account. Such persons shall be adequately trained by the Secretary. The Secretary shall develop programs with educational institutions and operators designed to enable persons to qualify for positions in the administration of this Act. In selecting persons and training and retraining persons to carry out the provisions of this Act, the Secretary shall work with appropriate educational institutions, operators, and representatives of miners in developing and maintaining adequate programs for the training and continuing education of persons, particularly inspectors, and where appropriate, the Secretary shall cooperate with such institutions in carrying out the provisions of this section by providing financial and technical assistance to such institutions.

EFFECT ON STATE LAWS

SEC. 506. (a) No State law in effect on the date of enactment of this Act or which may become effective thereafter shall be superseded by any provision of this Act or order issued or any mandatory health or safety standard, except insofar as such State law is in conflict with this Act or with any order issued or any mandatory health or safety standard.

(b) The provisions of any State law or regulation in effect upon the operative date of this Act, or which may become effective thereafter, which provide for more stringent health and safety standards applicable to coal or other mines than do the provisions of this Act or any order issued or any mandatory health or safety standard shall not thereby be construed or held to be in conflict with this Act. The provisions of any State law or regulation in effect on the date of enactment of this Act, or which may become effective thereafter, which provide for health and safety standards applicable to coal or

other mines for which no provision is contained in this Act or in any order issued or any mandatory health or safety standard, shall not be held to be in conflict with this Act.

ADMINISTRATIVE PROCEDURES

SEC. 507. Except as otherwise provided in this Act, the provisions of sections 551-559 and sections 701-706 of title 5 of the United States Code shall not apply to the making of any order, notice, or decision made pursuant to this Act, or to any proceeding for the review thereof.

REGULATIONS

SEC. 508. The Secretary, the Secretary of Health, Education, and Welfare, and the Panel are authorized to issue such regulations as each deems appropriate to carry out any provision of this Act.

OPERATIVE DATE AND REPEAL

SEC. 509. Except to the extent an earlier date is specifically provided in this Act, the provisions of titles I and III of this Act shall become operative ninety days after the date of enactment of this Act, and the provisions of title II of this Act shall become operative six months after the date of enactment of this Act. The provisions of the Federal Coal Mine Safety Act, as amended, are repealed on the operative date of titles I and III of this Act, except that such provisions shall continue to apply to any order, notice, decision, or finding issued under that Act prior to such operative date and to any proceedings related to such order, notice, decision or findings. All other provisions of this Act shall be effective on the date of enactment of this Act.

SEPARABILITY

SEC. 510. If any provision of this Act, or the application of such provision to any person or circumstance shall be held invalid, the remainder of this Act, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

REPORTS

SEC. 511. (a) Within one hundred and twenty days following the convening of each session of Congress the Secretary shall submit through the President to the Congress and to the Office of Science and Technology an annual report upon the subject matter of this Act, the progress concerning the achievement of its purposes, the needs and requirements in the field of coal or other mine health and safety, the amount and status of each loan made pursuant to this Act, a description and the anticipated cost of each project and program he has undertaken under sections 301 (b) and 501, and any other relevant information, including any recommendations he deems appropriate.

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(b) Within one hundred and twenty days following the convening of each session of Congress, the Secretary of Health, Education, and Welfare shall submit through the President to the Congress and to the Office of Science and Technology an annual report upon the health matters covered by this Act, including the progress toward the achievement of the health purposes of this Act, the needs and requirements in the field of coal or other mine health, a description and the anticipated cost of each project and program he has undertaken under sections 301 (b) and 501, and any other relevant information, including any recommendations he deems appropriate. The first such report shall include the recommendations of the Secretary of Health, Education, and Welfare as to necessary mandatory health standards, including his recommendations as to the maximum permissible individual exposure to miners from respirable dust during a shift.

SPECIAL REPORT

SEC. 512. (a) The Secretary shall make a study to determine the best manner to coordinate Federal and State activities in the field of coal or other mine health and safety so as to achieve (1) maximum health and safety protection for miners, (2) an avoidance of duplication of effort, (3) maximum effectiveness, (4) a reduction of delay to a minimum, and (5) most effective use of Federal inspectors.

(b) The Secretary shall make a report of the results of his study to the Congress as soon as practicable after the date of enactment of this Act.

JURISDICTION; LIMITATION

SEC. 513. In any proceeding in which the validity of any interim mandatory health or safety standard set forth in titles II and III of this Act is in issue, no justice, judge, or court of the United States shall issue any temporary restraining order or preliminary injunction restraining the enforcement of such standard pending a determination of such issue on its merits.

ADDENDUM

MISCELLANEOUS PROVISIONS OF THE "FEDERAL MINE SAFETY AND HEALTH AMENDMENTS ACT OF 1977".

TRANSFER MATTERS

SEC. 301. (a) Except with respect to the functions assigned to the Secretary of the Interior pursuant to section 501 of the Federal Coal Mine Health and Safety Act of 1969, the functions of the Secretary of the Interior under the Federal Coal Mine Health and Safety Act of 1969, as amended, and the Federal Metal and Nonmetallic Mine Safety Act are transferred to the Secretary of Labor, except those which are expressly transferred to the Commission by this Act.

(b) (1) The mandatory standards relating to mines, issued by the Secretary of the Interior under the Federal Metal and Nonmetallic Mine Safety Act and standards and regulations under the Federal Coal Mine Health and Safety Act of 1969 which are in effect on the date of enactment of this Act shall remain in effect as mandatory health or safety standards applicable to metal and nonmetallic mines and to coal mines respectively under the Federal Mine Safety and Health Act of 1977 until such time as the Secretary of Labor shall issue new or revised mandatory health or safety standards applicable to metal and nonmetallic mines and new or revised mandatory health or safety standards applicable to coal mines.

(2) Within 60 days after the date of enactment of this Act, the Secretary of Labor in consultation with the Secretary of the Interior shall establish an advisory committee under section 102 of the Federal Mine Safety and Health Act of 1977 which shall, within 180 days after the date of the establishment of such advisory committee, review the advisory health and safety standards issued by the Secretary of the Interior under the Federal Metal and Nonmetallic Mine Safety Act and recommend to the Secretary of Labor which of those standards (or any modifications of such standards which do not substantially diminish the health and safety of miners) should be promulgated as mandatory health or safety standards. The Secretary of Labor shall publish, within 60 days after any recommendations of the advisory committee under this paragraph, each of the standards so recommended for adoption with or without modifications as a proposed mandatory health or safety standard under this section by publication of such standard in the Federal Register, and afford interested persons a period of 25 days after publication to submit written data or comment. Within 30 days after the close of the comment period specified in the preceding sentence, the Secretary of Labor shall promulgate by publication in the Federal Register mandatory health or safety standards based upon the advisory committee recommendation with or without modification, and the data and comments received thereon, unless the Secretary of Labor determines that such standards will not promote the health and safety of miners and publishes an explanation of that determination in the Federal Register.

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(c) (1) All unexpended balances of appropriations, personnel, property, records, obligations, and commitments which are used primarily with respect to any functions transferred under the provisions of subsection (a) to the Secretary of Labor shall be transferred to the Department of Labor or the Commission, as appropriate. The transfer of personnel pursuant to this paragraph shall be without reduction in classification or compensation for one year after such transfer, except that the Secretary of Labor shall have full authority to assign personnel during such one-year period in order to efficiently carry out functions transferred to him under this Act.

(2) All orders, decisions, determinations, rules, regulations, permits, contracts, certificates, licenses, and privileges (A) which have been issued, made, granted, or allowed to become effective in the exercise of functions which are transferred under this section by any department or agency, any functions of which are transferred by this section, and (B) which are in effect at the time this section takes effect, shall continue in effect according to their terms until modified, terminated, superseded, set aside, revoked, or repealed by the Secretary of Labor, the Federal Mine Safety and Health Review Commission or other authorized officials, by any court of competent jurisdiction, or by operation of law.

(3) The provisions of this section shall not affect any proceedings pending at the time this section takes effect before any department, agency, or component thereof, functions of which are transferred by this section, except that such proceedings, to the extent that they relate to functions so transferred, shall be continued before the Secretary of Labor or the Federal Mine Safety and Health Review Commission. Orders shall be issued in such proceedings, appeals shall be taken therefrom, and payments shall be made pursuant to such orders, as if this section had not been enacted; and orders issued in any such proceedings shall continue in effect until modified, terminated, superseded, revoked, or repealed by the Secretary of Labor, the Federal Mine Safety and Health Review Commission, by a court of competent jurisdiction, or by operation of law. Nothing in this subsection shall be deemed to prohibit the discontinuance or modification of any proceeding under the same terms and conditions and to the same extent that such proceeding could have been discontinued if this section had not been enacted.

(4) The provisions of this section shall not affect suits commenced prior to the date this section takes effect and in all such suits proceedings shall be had, appeals taken, and judgments rendered, in the same manner and effect as if this section had not been enacted; except that if before the date on which this section takes effect, any department or agency (or officer thereof in his official capacity) is a party to a suit involving functions transferred to the Secretary, then such suit shall be continued by the Secretary of Labor. No cause of action, and no suit, action, or other proceeding, by or against any department or agency (or officer thereof in his official capacity) functions of which are transferred by this section, shall abate by reason of the enactment of this section. Causes of actions, suits, actions, or other proceedings may be asserted by or

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against the United States or the Secretary as may be appropriate and, in any litigation pending when this section takes effect, the court may at any time, on its own motion or that of any party, enter an order which will give effect to the provisions of this paragraph.

(d) For purposes of this section, (1) the term "function" includes power and duty, and (2) the transfer of a function, under any provision of law, of an agency or the head of a department shall also be a transfer of all functions under such law which are exercised by any officer or officer of such agency or department.

(e) The Director of the Office of Management and Budget in consultation with the Secretary of Labor and the Secretary of the Interior is authorized and directed to make such determinations as may be necessary with regard to the dispositions of personnel, personnel positions, property, records, assets, liabilities, contracts, obligations, commitments, unexpended balances of appropriations, authorizations, allocations, and other funds employed, held, used, arising from, available or to be made available, in connection with the functions transferred by this Act as he may deem necessary to accomplish the purposes of this Act.

MINE SAFETY AND HEALTH ADMINISTRATION

SEC. 302. (a) There is established in the Department of Labor a Mine Safety and Health Administration to be headed by an Assistant Secretary of Labor for Mine Safety and Health appointed by the President, by and with the advice and consent of the Senate. The Secretary, acting through the Assistant Secretary for Mine Safety and Health, shall have authority to appoint, subject to the civil service laws, such officers and employees as he may deem necessary for the administration of this Act, and to prescribe powers, duties, and responsibilities of all officers and employees engaged in the administration of this Act. The Secretary is authorized and directed, except as specifically provided otherwise to carry out his functions under the Federal Mine Safety and Health Act of 1977 through the Mine Safety and Health Administration.

(b) Section 5315 of title 5, United States Code, is amended by adding at the end thereof the following paragraphs:

"(120) Assistant Secretary of Labor for Mine Safety and Health.

"(121) Members, Federal Mine Safety and Health Review Commission.".

(c) (1) Section 5314 of title 5, United States Code, is amended by adding at the end thereof the following new paragraph:

"(66) Chairman, Federal Mine Safety and Health Review Commission.".

(d) The principal office of the Commission shall be in the District of Columbia. Whenever the Commission deems that convenience of the public or the parties may be promoted, or delay or expense may be minimized, it may hold hearings or conduct other proceedings at any other place.

SAVINGS PROVISION

SEC. 304. Nothing contained in this Act or any amendment made by this Act shall be construed to reduce the number of inspectors engaged in enforcement of the Federal Coal Mine Health and Safety Act of 1969 and the Federal Metal and Nonmetallic Mine Safety Act as in effect prior to the effective date of this Act or to reduce the number of inspectors engaged in the enforcement of the Occupational Safety and Health Act of 1970.

BUDGET PROVISION

SEC. 305. In the preparation of the Budget message required under section 201 of the Budget and Accounting Act, 1921 (31 U.S.C. 11), the President shall set forth as separate appropriation accounts amounts required for appropriation for mine health and safety pursuant to the Federal Mine Safety and Health Act of 1977 and for occupational safety and health pursuant to the Occupational Safety and Health Act of 1970.

REPEALER

SEC. 306. (a) The Federal Metal and Nonmetallic Mine Safety Act is repealed.

(b) Section 405 of the Act of November 16, 1973, Public Law 93-153 is repealed.

EFFECTIVE DATE

SEC. 307. Except as otherwise provided, this Act and the amendments made by this Act shall take effect 120 days after the date of enactment of this Act. The Secretary of Labor and the Secretary of the Interior are authorized to establish such rules and regulations as may be necessary for the efficient transfer of functions provided under this Act. The amendment to the Federal Coal Mine Health and Safety Act of 1969 made by section 202 of this Act shall be effective on the date of enactment.

Approved November 9, 1977

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Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations

30 CFR Parts 40, 41, 43, 44, 48, 50, 55, 56, and 57

Compiled by
U.S. Department of Labor
Mine Safety and Health Administration
Metal and Nonmetal Mine Safety and Health

January 1, 1980

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Compiled by
U.S. Department of Labor
Ray Marshall, Secretary

Mine Safety and Health Administration
Robert B. Lagather, Assistant Secretary

Metal and Nonmetal Mine Safety and Health

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FOREWORD

This document is a compilation of safety and health standards and regulations [as of January 1, 1980] affecting metal and nonmetal mining and milling operations. Certain editorial and codification changes have been made to improve the clarity of the standards. These corrections will appear in subsequent editions of the FEDERAL REGISTER and Title 30 of the CODE OF FEDERAL REGULATIONS.

The document has been prepared by the Mine Safety and Health Administration for the convenience of the metal and nonmetal mining communities, but is not intended for use as a citation of legal authority.

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CHAPTER I—MINE SAFETY AND ADMINISTRATION, DEPARTMENT OF LABOR

SUBCHAPTER G—FILING AND OTHER ADMINISTRATIVE REQUIREMENTS

PART 40—REPRESENTATIVE OF MINERS

Sec.
40.1 Definitions.
40.2 Requirements.
40.3 Filing procedures.
40.4 Posting at mine.
40.5 Termination of designation as representative of miners.

AUTHORITY: Secs. 5(f)(1), 101(c) and (e), 103(c), (f), (g)(1) and (g)(2), 104(c), 105(a), (b)(1), (c)(1), (c)(2), (c)(3) and (d), 107(b)(1) and (e)(1), 109(b), 115(a)(1) and (a)(2), 302(a), 305(b), 312(b), 505 and 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 83 Stat. 745, 91 Stat. 1294, 1295, 1298, 1299, 1301, 1303, 1304, 1305, 1308, 1310 and 1316, 83 Stat. 766, 777, 785, 802, and 803 (30 U.S.C. 804 (f)(1), 811(c) and (e), 813(c), (f), (g)(1) and (g)(2), 814(c), 815(a), (b)(1), (c)(1), (c)(2), (c)(3) and (d), 817(b)(1) and (c)(1), 819(b), 825(a)(1) and (a)(2), 862(a), 865(b), 872(b), 954 and 957); Sec. 307 of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95-164, 91 Stat. 1322 (30 U.S.C. 801 note).

§ 40.1 Definitions.

As used in this part:

(a) "Act" means the Federal Mine Safety and Health Act of 1977.

(b) "Representative of miners" means:

(1) Any person or organization which represents two or more miners at a coal or other mine for the purposes of the Act, and

(2) "Representatives authorized by the miners", "miners or their representative", "authorized miner representative", and other similar terms as they appear in the Act.

§ 40.2 Requirements.

(a) A representative of miners shall file with the Mine Safety and Health Administration District Manager for the district in which the mine is located the information required by § 40.3 of this part. Concurrently, a copy of this information shall be provided to the operator of the mine by the representative of miners.

(b) Miners or their representative organization may appoint or designate different persons to represent them under various sections of the Act relating to representatives of miners.

(c) All information filed pursuant to this part shall be maintained by the appropriate Mine Safety and Health Administration District Office and shall be made available for public inspection.

§ 40.3 Filing procedures.

(a) The following information shall be filed by a representative of miners with the appropriate District Manager, with copies to the operators of the affected mines. This information shall be kept current:

(1) The name, address, and telephone number of the representative of miners. If the representative is an organization, the name, address, and telephone number of the organization and the title of the official or position, who is to serve as the representative and his or her telephone number.

(2) The name and address of the operator of the mine where the represented miners work and the name, address, and Mine Safety and Health Administration identification number, if known, of the mine.

(3) A copy of the document evidencing the designation of the representative of miners.

(4) A statement that the person or position named as the representative of miners is the representative for all purposes of the Act; or if the representative's authority is limited, a statement of the limitation.

(5) The names, addresses, and telephone numbers of any representative to serve in his absence.

(6) A statement that copies of all information filed pursuant to this section have been delivered to the operator of the affected mine, prior to or concurrently with this filing of the statement.

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(7) A statement certifying that all information filed is true and correct followed by the signature of the representative of miners.

(b) The representative of miners shall be responsible for ensuring that the appropriate District Manager and operator have received all of the information required by this part and informing such District Manager and operator of any subsequent changes in the information.

§ 40.4 Posting at mine.

A copy of the information provided the operator pursuant to § 40.3 of this part shall be posted upon receipt by the operator on the mine bulletin board and maintained in a current status.

§ 40.5 Termination of designation as representative of miners.

(a) A representative of miners who becomes unable to comply with the requirements of this part shall file a statement with the appropriate District Manager terminating his or her designation.

(b) The Mine Safety and Health Administration shall terminate and remove from its files all designations of representatives of miners which have been terminated pursuant to paragraph (a) of this section or which are not in compliance with the requirements of this part. The Mine Safety and Health Administration shall notify the operator of such termination.

PART 41—NOTIFICATION OF LEGAL IDENTITY

Subpart A—Definitions

Sec.
41.1 Definitions.

Subpart B—Notification of Legal Identity

41.10 Scope.
41.11 Notification by operator.
41.12 Changes; notification by operator.
41.13 Failure to notify.

Subpart C—Operator's Report to the Mine Safety and Health Administration

41.20 Legal identity report.
41.30 Address of record and telephone number.

AUTHORITY: Secs. 103(h), 109(d) and 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 91 Stat. 1299 and 1310, 83 Stat. 803 (30 U.S.C. 813(h), 819(d) and 957); Sec. 307 of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95-164, 91 Stat. 1322 (30 U.S.C. 801 note).

Subpart A—Definitions

§ 41.1 Definitions.

As used in this part:

(a) "Operator" means any owner, lessee, or other person who operates, controls, or supervises a coal or other mine or any designated independent contractor performing services or construction at such mine.

(b) "Person" means any individual, sole proprietor, partnership, association, corporation, firm, subsidiary of a corporation, or other organization.

(c) "Coal or other mine" means (a) an area of land from which minerals are extracted in nonliquid form or, if in liquid form, are extracted with workers underground, (b) private ways and roads appurtenant to such area, and (c) lands, excavations, underground passageways, shafts, slopes, tunnels and workings, structures, facilities, equipment, machines, tools, or other property including impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to be used in, or resulting from, the work of extracting such minerals from their natural deposits in nonliquid form, or if in liquid form, with workers underground, or used in, or to be used in, the milling of such minerals, or the work of preparing coal or other minerals, and includes custom coal preparation facilities. In making a determination of what constitutes mineral milling for purposes of this Act, the Secretary shall give due consideration to the convenience of administration resulting from the delegation to one Assistant Secretary of all authority with respect to the health and safety of miners employed at one physical establishment.

Subpart B—Notification of Legal Identity

§ 41.10 Scope.

Section 109(d) of the Federal Mine Safety and Health Act of 1977 (Pub. L. 91-173, as amended by Pub. L. 95-164), requires each

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operator of a coal or other mine to file with the Secretary of Labor the name and address of such mine, the name and address of the person who controls or operates the mine, and any revisions in such names and addresses. Section 103(h) of the Act requires the operator of a coal or other mine to provide such information as the Secretary of Labor may reasonably require from time to time to enable the Secretary to perform his functions under the act. The regulations in this subpart B provide for the notification to the Mine Safety and Health Administration of the legal identity of the operator of a coal or other mine and the reporting of all changes in the legal identity of the operator as they occur. The submission of a properly completed Legal Identity Report Form No. 2000–7 required under subpart C of this part will constitute adequate notification of legal identity to the Mine Safety and Health Administration.

§ 41.11 Notification by operator.

(a) Not later than 30 days after (1) the effective date of this part, and (2) the opening of a new mine thereafter, the operator of a coal or other mine shall, in writing, notify the appropriate District Manager of the Mine Safety and Health Administration in the district in which the mine is located of the legal identity of the operator in accordance with the applicable provisions of paragraphs (b), (c), (d), or (e) of this section.

(b) If the operator is a sole proprietorship, the operator shall state: (1) his full name and address; (2) the name and address of the mine and the Federal mine identification number; (3) the name and address of the person at the mine in charge of health and safety; (4) the name and address of the person with overall responsibility for a health and safety program at all of the operator's mines, if the operator is not directly involved in the daily operation of the mine; (5) the Federal mine identification numbers of all other mines in which the sole proprietor has a 20 percent or greater ownership interest; and (6) the trade name, if any, and the full name, address of record and telephone number of the proprietorship.

(c) If the operator is a partnership, the operator shall state: (1) The name and address of the mine and the Federal mine identification number; (2) the name and address of the person at the mine in charge of health and safety; (3) the name and address of the person with overall responsibility for a health and safety program at all of the operator's mines, if the operator is not directly involved in the daily operation of the mine; (4) the Federal mine identification numbers of all other mines in which the partnership has a 20 percent or greater ownership interest; (5) the full name and address of all partners; (6) the trade name, if any, and the full name and address of record and telephone number of the partnership; and (7) the Federal mine identification numbers of all other mines in which any partner has a 20 percent or greater ownership interest.

(d) If the operator is a corporation, the operator shall state: (1) The name and address of the mine and the Federal mine identification number; (2) the name and address of the person at the mine in charge of health and safety; (3) the name and address of the person with overall responsibility for a health and safety program at all of the operator's mines, if the operator is not directly involved in the daily operation of the mine; (4) the Federal mine identification numbers of all other mines in which the corporation has a 20 percent or greater ownership interest; (5) the full name, address of record and telephone number of the corporation and the State of incorporation; (6) the full name and address of each officer and director of the corporation; (7) whether such corporation is a domestic or foreign corporation in the State in which the mine is located; (8) if the corporation is a subsidiary corporation, the operator shall state the full name, address, and State of incorporation of the parent corporation; and (9) the Federal mine identification numbers of all other mines in which any corporate officer has a 20 percent or greater ownership interest.

(e) If the operator is any organization other than a sole proprietorship, partnership, or corporation, the operator shall state: (1) The nature and type, or legal identity of the organization; (2) the name and address of the mine and the Federal mine identification number; (3) the name and address of the person at the mine in charge of health and safety; (4) the name and address of the person with overall responsibility for a health and safety pro-

gram at all of the operator's mines, if the operator is not directly involved in the daily operation of the mine; (5) the Federal mine identification numbers of all other mines in which the organization has a 20 percent or greater ownership interest; (6) the full name, address of record and telephone number of the organization; (7) the name and address of each individual who has an ownership interest in the organization; (8) the name and address of the principal organization officials or members; and (9) the Federal mine identification numbers of all other mines in which any official or member has a 20 percent or greater ownership interest.

§ 41.12 Changes; notification by operator.

Within 30 days after the occurrence of any change in the information required by § 41.11, the operator of a coal or other mine shall, in writing, notify the appropriate District Manager of the Mine Safety and Health Administration in the district in which the mine is located of such change.

§ 41.13 Failure to notify.

Failure of the operator to notify the Mine Safety and Health Administration, in writing, of the legal identity of the operator or any changes thereof within the time required under this part will be considered to be a violation of section 109(d) of the Act and shall be subject to penalties as provided in section 110 of the Act.

Subpart C—Operator's Report to the Mine Safety and Health Administration

§ 41.20 Legal identity report.

Each operator of a coal or other mine shall file notification of legal identity and every change thereof with the appropriate District Manager of the Mine Safety and Health Administration by properly completing, mailing, or otherwise delivering form 2000-7 "legal identity report" which shall be provided by the Mine Safety and Health Administration for this purpose. If additional space is required, the operator may use a separate sheet or sheets.

§ 41.30 Address of record and telephone number.

The address of record and telephone number required under this part shall be considered the operator's official address and telephone number for purposes of the Act. Service of documents upon the operator may be proved by a post office return receipt showing that the documents could not be delivered to such operator at the address of record because the operator had moved without leaving a forwarding address or because delivery was not accepted at that address, or because no such address existed. However, operators may request service by delivery to another appropriate address provided by the operator. The telephone number required under this part will be used in connection with proposed civil penalty assessments as provided in 30 CFR Part 100.

PART 43—PROCEDURES FOR PROCESSING HAZARDOUS CONDITIONS COMPLAINTS

Subpart A—General

Sec.
43.1 Definitions.
43.2 General.
43.3 Purpose and scope of this part.

Subpart B—Special Inspections

43.4 Requirements for giving notice.
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Subpart C—Informal Review

43.7 Informal review upon written notice given to an inspector on the mine premises.
43.8 Informal review upon the issuance of a notice of negative finding.

AUTHORITY: Secs. 103(g) and 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 91 Stat. 1298, 83 Stat. 803 (30 U.S.C. 813(g) and 957); Sec. 307 of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95-164, 91 Stat. 1322 (30 U.S.C. 801 note).

Subpart A—General

§ 43.1 Definitions.

For purposes of this part:

"Act" means the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173, as amended by Pub. L. 95-164.

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"Secretary" means the Secretary of Labor or his designee.

§ 43.2 General.

(a) Under section 103(g)(1) of the Act, a representative of miners, or where there is no such representative, a miner, who has reasonable grounds to believe that a violation of the Act or a mandatory health or safety standard exists, or an imminent danger exists, has a right to obtain a special inspection if he or she gives notice of such violation to the Secretary or his duly authorized representative. The notice shall be reduced to writing and signed by the miners' representative or miner, and a copy that does not reveal the name of the person giving the notice must be served on the operator no later than at the time of the inspection. If the Secretary determines that a violation or danger does not exist, he must so notify the miners' representative or miner in writing.

(b) Under section 103(g)(2) of the Act, a representative of miners or, if there is no such representative, a miner, may notify in writing an authorized representative of the Secretary who is on mine premises prior to or during an inspection, of any violation or imminent danger which he or she has reason to believe exists in the mine. There shall be procedures for the informal review of any refusal by the Secretary's authorized representative to issue a citation with respect to such alleged violation or danger, including notification to the miners' representative or miner of the reasons for his disposition of the case.

§ 43.3 Purpose and scope of this part.

This part sets forth the procedures for giving notice to the Secretary under section 103(g)(1) of the Act, for responding to such notices and for reviewing refusals by authorized representatives of the Secretary to issue citations or orders under section 103 (g)(1) or (g)(2). Specifically, subpart B details the steps to be taken by a representative of miners or a miner in making a request for a special inspection and by the Secretary in processing and taking action on such a request under section 103(g)(1). Subpart C sets forth informal review procedures which a representative of miners or a miner may request under sections 103(g)(1) and (g)(2) where no citation or order is issued under those sections.

Subpart B—Special Inspections

§ 43.4 Requirements for giving notice.

(a) A representative of miners or, where there is no such representative, a miner, who has reasonable grounds to believe that a violation of the Act or a mandatory health or safety standard exists, or that an imminent danger exists, may obtain a special inspection by giving notice to the Secretary or any authorized representative of the Secretary of such violation or danger.

(b) Any such notice shall set forth the alleged violation or imminent danger and the location of such violation or danger and shall be reduced to a writing signed by the representative of miners or miner giving such notice.

(c) A copy of such written notice shall be provided to the operator or his agent by the Secretary or his authorized representative no later than the time that the inspection begins. In addition, if the notice indicates that an imminent danger exists, the operator or his agent shall be notified as quickly as possible of the alleged danger. The name of the person giving such notice and the names of any individual miners referred to therein shall not appear in the copy of the written notice or in a notification provided to the operator.

§ 43.5 Action by the Secretary.

(a) As soon as possible after the receipt of a notice of alleged violation or imminent danger under this subpart, the Secretary or his authorized representative shall make a special inspection to determine if a citation or withdrawal order should be issued, unless on the face of the notice, the condition complained of, even if it were found to exist, would clearly not constitute a violation or imminent danger.

(b) Where the Secretary or his authorized representative makes a special inspection under this subpart and finds a violation or imminent danger, a citation or withdrawal order, as appropriate, shall be issued.

§ 43.6 Notice of negative finding.

(a) If it is determined that a special inspection is not warranted, a written no-

ice of negative finding shall be issued as soon as possible following such determination.

(b) If it is determined that an inspection is warranted and upon such inspection it is determined that neither a citation nor a withdrawal order should be issued for the alleged violation or imminent danger, a written notice of negative finding shall be issued by the authorized representative of the Secretary prior to leaving the mine premises.

(c) Any notice of negative finding issued under this part shall be issued to the representative of miners or miner seeking the special inspection and a copy shall be served upon the operator.

Subpart C—Informal Review

§ 43.7 Informal review upon written notice given to an inspector on the mine premises.

(a) A representative of miners or, where there is no such representative, a miner, who has reason to believe that a violation of the Act or a mandatory health or safety standard exists, or an imminent danger exists, may notify an authorized representative of the Secretary in writing prior to or during an inspection conducted by such representative of any violation of the Act or mandatory health or safety standard or of any imminent danger which he or she has reason to believe exists in the mine being inspected. Where the authorized representative or the Secretary refuses to issue a citation or order with respect to such alleged violation or imminent danger, the representative of miners or miner may obtain review of such refusal in accordance with paragraphs (b) through (d) of this section.

(b) A request for informal review shall be sent in writing to the appropriate District Manager within 10 days of the date of the refusal to issue a citation or order and shall be accompanied by any supporting information the person requesting review wishes to submit.

(c) After receipt of the request for informal review, the District Manager or his agent may hold, at his or her discretion, an informal conference where the person requesting review can present his views.

(d) After review of all written and oral statements submitted, the District Manager may either affirm the refusal to issue a citation or order or may direct that a new inspection be conducted with respect to the alleged violation or imminent danger. The District Manager shall furnish the person requesting the review with a written statement of the reasons for his or her final disposition of the request as soon thereafter as possible. A copy of such statement shall be furnished the operator. The District Manager's determination in the matter shall be final.

§ 43.8 Informal review upon issuance of a notice of negative finding.

A person to whom a notice of negative finding has been issued pursuant to section 43.6 of this part may request informal review of such finding in accordance with the provisions of section 43.7(b)–(d) of this subpart.

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PART 44—RULES OF PRACTICE FOR PETITIONS FOR MODIFICATION OF MANDATORY SAFETY STANDARDS

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44.52 Revocation or modification.

AUTHORITY: Secs. 101 and 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 91 Stat. 1291, 83 Stat. 803 (30 U.S.C. 811 and 957); Sec. 301(c)(3) of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95-164, 91 Stat. 1318 (30 U.S.C. 961(c)(3)).

Subpart A—General

§ 44.1 Scope and construction.

(a) The procedures and rules of practice set forth in this part shall govern petitions for modification of the application of mandatory safety standards filed under section 101(c) of the Act and, to the extent applicable, pending petitions for modification initially filed with the Office of Hearings and Appeals of the Department of the Interior.

(b) These rules shall be liberally construed to carry out the purpose of the Act by assuring adequate protection of miners and to secure just and prompt determination of all proceedings consistent with adequate consideration of the issues involved.

§ 44.2 Definitions.

As used in this part, unless the context clearly requires otherwise, the term—

(a) "Act" means the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173, as amended by Pub. L. 95-164.

(b) "Secretary," "operator," "agent," "person," "miner," and "coal or other mine," have the meanings set forth in section 3 of the Act.

(c) "Assistant Secretary" means the Assistant Secretary of Labor for Mine Safety and Health.

(d) "Administrative Law Judge" means an Administrative Law Judge of the Department of Labor appointed under section 3105 of title 5 of the United States Code.

(e) "Representative of miners" means a person or organization designated by two or more miners to act as their representative for purposes of the Act and who is in compliance with 30 CFR Part 40.

(f) "Pending petitions for modification" means proceedings initially filed with the Department of the Interior under section 301(c) of the Federal Coal Mine Health and Safety Act of 1969 prior to March 9, 1978, and in which there had not been a final departmental decision as of March 9, 1978.

§ 44.3 Parties.

Parties to proceedings under this part shall include the Mine Safety and Health Administration, the operator of the mine, and any representative of the miners in the affected mine. Any other person claiming a right of participation as an interested party in a proceeding may become a party upon application to the Assistant Secretary and the granting of such application. After referral of a petition to the Chief Administrative Law Judge, all applications for status as a party shall be made to the Chief Administrative Law Judge for his disposition.

§ 44.4 Standard of evaluation of petitions; effect of petitions granted.

(a) A petition for modification of application of a mandatory safety standard may be granted upon a determination that—

(1) an alternative method of achieving the result of the standard exists that will at all times guarantee no less than the same measure of protection afforded by the standard, or

(2) application of the standard will result in a diminution of safety to the miners.

(b) Except as may be provided in § 44.50 of this part for relief pending appeal, a decision by an Administrator or an Ad-

ministrative Law Judge granting or denying a petition for modification shall not be effective until time for appeal has expired under § 44.14 or § 44.33 of this part, as appropriate.

(c) All petitions for modification granted pursuant to this part shall have only future effect; *Provided*, that the granting of the modification under this part shall be considered as a factor in the resolution of any enforcement action previously initiated for claimed violation of the subsequently modified mandatory safety standard. Orders granting petitions for modification may contain special terms and conditions to assure adequate protection to miners. The modification, together with any conditions, shall have the same effect as a mandatory safety standard.

§ 44.5 Notice of a granted petition for modification.

(a) Every final action granting a petition for modification under this part shall be published in the FEDERAL REGISTER. Every such final action published shall specify the statutory grounds upon which the modification is based and a summary of the *facts which warranted the modification*.

(b) Every final action or a summary thereof granting a petition for modification under this part shall be posted by the operator on the mine bulletin board at the affected mine and shall remain posted as long as the modification is effective. If a summary of the final action is posted on the mine bulletin board, a copy of the full decision shall be kept at the affected mine office and made available to the miners.

§ 44.6 Service.

(a) Copies of all documents filed in any proceeding described in this part and copies of all notices pertinent to such proceeding shall be served by the filing party on all other persons made parties to the proceeding under § 44.3. If a request for hearing has been filed by any party, a copy of all subsequent documents filed shall be served upon the Mine Safety and Health Administration through its representative, the Office of the Solicitor, Department of Labor.

(b) Provisions for service of requests for expedited proceedings are stated in § § 44.16(i) and 44.50(b)(10) of this part. All other documents filed subsequent to a petition for modification may be served personally or by first-class mail to the last known address of the party.

(c) Whenever a party is represented by an attorney who has signed any document filed on behalf of such party or otherwise entered an appearance on behalf of such party, service thereafter shall be made upon the attorney.

(d) Any party filing a petition for modification under these rules shall file proof of service in the form of a return receipt where service is by registered or certified mail or an acknowledgment by the party served or a verified return where service is made personally. A certificate of service shall accompany all other documents filed by a party under these rules.

(e) Except as otherwise provided in § 44.10 of this part for petitions for modification and in § § 44.16(i) and 44.50(b)(10) of this part for expedited proceedings, service by mail shall be complete upon mailing.

(f) Whenever a party has the right or is required to do some act within a prescribed period after the service of a document or other material upon him and the *document or other material is served* upon him by mail, three days shall be added to the prescribed period; *Provided*, that specific provision may, for good cause, be made otherwise by an order of an Administrative Law Judge or the Assistant Secretary in a particular proceeding pending before that person.

§ 44.7 Transfer of pending petitions for modification.

(a) On March 9, 1978, all petitions pending before the Office of Hearings and Appeals of the Department of the Interior are transferred to the Department of Labor as provided herein. All transferred cases shall be subject to the regulations of this part, as applicable.

(b) Where an investigation report and amended answer have been filed, the case is transferred to the docket of the Chief Administrative Law Judge, Department of Labor, for further proceedings.

(c) Where an investigation report has not been filed, the case is transferred to the appropriate Administrator, Mine Safety and Health Administration, for a

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proposed decision and order pursuant to these regulations.

§ 44.8 Ex parte communication.

There shall be no ex parte communication with respect to the merits of any case not concluded between the Administrative Law Judge, including any employee or agent of the Administrative Law Judge, and any of the parties, intervenors, representatives, or other interested persons.

§ 44.9 Posting of petition.

An operator of a mine for which there is no representative of miners shall post a copy of each petition concerning the mine on the mine bulletin board and shall maintain the posting until a ruling on the petition becomes final.

Subpart B—Initial Procedure for Petitions for Modification

§ 44.10 Filing of petition; service.

A petition under section 101(c) of the Act for modification of the application of a mandatory safety standard may be filed only by the operator of the affected mine or any representative of miners at such mine. All petitions must be in writing and must be filed with the Assistant Secretary of Labor for Mine Safety and Health, U.S. Department of Labor, 4015 Wilson Boulevard, Arlington, Va. 22203. If the petition is filed by a mine operator, a copy of the petition shall be served by the mine operator upon a representative of miners at the affected mine. If the petition is filed by a representative of the miners, a copy of the petition shall be served by the representative of miners upon the mine operator. Service shall be accomplished personally or by registered or certified mail, return receipt requested.

§ 44.11 Contents of petition.

(a) A petition for modification filed pursuant to § 44.10 shall contain:

(1) The name and address of the petitioner.

(2) The mailing address and mine identification number of the mine or mines affected.

(3) The mandatory safety standard to which the petition is directed.

(4) A concise statement of the modification requested, and whether the petitioner proposes to establish an alternate method in lieu of the mandatory safety standard or alleges that application of the standard will result in diminution of safety to the miners affected or requests relief based on both grounds.

(5) A detailed statement of the facts the petitioner would show to establish the grounds upon which it is claimed a modification is warranted.

(6) Identification of any representative of the miners at the affected mine, if the petitioner is a mine operator.

(b) A petition for modification shall not include a request for modification of the application of more than one mandatory safety standard. A petition for modification shall not request relief for more than one operator. However, an operator may file a petition for modification pertaining to more than one mine where it can be shown that identical issues of law and fact exist as to the petition for each mine.

§ 44.12 Procedure for public notice of petition received.

(a) Promptly upon receipt of a petition for modification, the Mine Safety and Health Administration will give notice of the petition to each known representative of miners or the operator of the affected mine, as appropriate, and shall publish notice of the petition in the FEDERAL REGISTER.

(b) The FEDERAL REGISTER notice shall contain a statement that the petition has been filed, identify the petitioner and the mine or mines to which the petition relates, cite the mandatory safety standard for which modification is sought, describe the requested relief, and summarize the facts claimed by petitioner to warrant the requested modification.

(c) All such notices shall advise interested parties that they may, within 30 days from the date of publication in the FEDERAL REGISTER, in writing comment upon or provide information relative to the proposed modification.

§ 44.13 Proposed decision.

Upon receipt of a petition for modification, the Mine Safety and Health Administration shall cause an investigation to be made as to the merits of the

petition. As soon thereafter as is practicable, the appropriate Administrator shall make a proposed decision and order based upon all available information, including the results of the investigation. The proposed decision and order shall be served on all parties to the proceeding. The proposed decision shall become final upon the 30th day after service thereof, unless a request for hearing has been filed with the appropriate Administrator, as provided in § 44.14 of this part. Service of the proposed decision is complete upon mailing.

§ 44.14 Request for hearing

A request for hearing filed in accordance with § 44.13 of this part must be filed within 30 days after service of the proposed decision and shall include:

(a) A concise summary of position on the issues of fact or law desired to be raised by the party requesting the hearing, including specific objections to the proposed decision. A party other than petitioner who has requested a hearing shall also comment upon all issues of fact or law presented in the petition; and

(b) An indication of a desired hearing site.

§ 44.15 Referral to Chief Administrative Law Judge.

Upon receipt of a request for hearing as provided in § 44.14 of this part or upon his own initiative, the appropriate Administrator shall refer to the Chief Administrative Law Judge the original petition, the proposed decision and order, all information upon which the proposed decision was based, any written request for a hearing on the petition filed, and any other written comments or information received and considered in making the proposed decision.

§ 44.16 Application for interim relief.

(a) *Time for filing.* An application for interim relief from enforcement of a mandatory safety standard may be filed at any time before a final departmental decision on the petition for modification to which the application relates.

(b) *With whom filed.* If a hearing is pending on the petition for modification, the application shall be filed with and decided by the Administrative Law Judge assigned or the Chief Administrative Law Judge if assignment has not been made. If the petition is pending before an Administrator or the Assistant Secretary, the application shall be filed with and decided by the Administrator or Assistant Secretary, as appropriate.

(c) *Appeal to Administrative Law Judge.* If the application for interim relief is denied by an Administrator, the applicant may request, within 15 days of the denial, a hearing on the application. The request shall be addressed to the Administrator and shall be referred by him to the Chief Administrative Law Judge for hearing and decision by an Administrative Law Judge.

(d) *Contents of application.* An application for interim relief shall comply with applicable general requirements of this part, state the specific relief requested, and state how the applicant meets the criteria set forth in paragraph (e) of this section.

(e) *Criteria.* Before interim relief is granted, the applicant must clearly show that: (1) the petition seeking modification has been filed in good faith, and the applicant is not using the proceeding solely to postpone or avoid abatement; (2) the requested relief will not adversely affect the health or safety of miners in the affected mine; and (3) there is a substantial likelihood that the decision on the merits of the petition for modification will be favorable to the applicant.

(f) *Response.* All parties to the proceeding in which the application is filed shall have 3 days from date of receipt of the application to file a written response.

(g) *Evidence.* An application for temporary relief or response thereto may be supported by affidavits or other evidentiary matter.

(h) *Hearing.* The Administrator, Assistant Secretary, or Administrative Law Judge may order that a hearing be held on any of the issues raised in the application.

(i) *Expedited proceedings.* A party may request that the decision on interim relief be expedited. The request shall be in writing, addressed to the person designated in paragraph (b) of this section, and accompanied by supporting documents that establish the party's claim of exigent circumstances warranting expedited proceedings. Service of such requests, where

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possible shall be by personal delivery to all parties; otherwise, service shall be by telegram followed by registered or certified mail. Parties shall have 3 days from receipt of the request to file a response. The official considering the request may order that a hearing be held on any of the issues raised in the request. The official may order expedited proceedings, including expedited schedules for pleadings, prehearing conference, and hearing, as he considers appropriate, provided that a hearing on the merits of the application for modification of a mandatory safety standard shall not be scheduled with less than 5 days notice to the parties, unless all parties to the proceeding consent to an earlier hearing.

Subpart C—Hearings

§ 44.20 Designation of Administrative Law Judge.

Upon receipt of a request for hearing in a petition for modification proceeding, the Chief Administrative Law Judge shall designate an Administrative Law Judge appointed under section 3105 of title 5 of the United States Code to preside over the hearing.

§ 44.21 Filing and form of documents.

(a) *Where to file.* After a petition has been referred to the Office of the Chief Administrative Law Judge, the parties will be notified of the name and address of the Administrative Law Judge assigned to the case. All further documents shall be filed with the Administrative Law Judge at the address designated or with the Chief Administrative Law Judge, if the assignment has not been made. While the petition is before the Assistant Secretary at any stage of the proceeding, all documents should be filed with the Assistant Secretary of Labor for Mine Safety and Health, 4015 Wilson Boulevard, Arlington, Va. 22203.

(b) *Caption, title and signature.* (1) The documents filed in any proceeding under this part shall be captioned in the name of the operator of the mine to which the proceeding relates and in the name of the mine or mines affected. After a docket number has been assigned to the proceeding by the Office of the Chief Administrative Law Judge, the caption shall contain such docket number.

(2) After the caption each such document shall contain a title which shall be descriptive of the document and which shall identify the party by whom the document is submitted.

(3) The original of all documents filed shall be signed at the end by the party submitting the document or, if the party is represented by an attorney, by such attorney. The address of the party or the attorney shall appear beneath the signature.

§ 44.22 Administrative Law Judges; powers and duties.

(a) *Powers.* An Administrative Law Judge designated to preside over a hearing shall have all powers necessary or appropriate to conduct a fair, full, and impartial hearing, including the following:

(1) To administer oaths and affirmations;

(2) To issue subpoenas on his own motion or upon written application of a party;

(3) To rule upon offers of proof and receive relevant evidence;

(4) To take depositions or have depositions taken when the ends of justice would be served;

(5) To provide for discovery and determine its scope;

(6) To regulate the course of the hearing and the conduct of parties and their counsel;

(7) To consider and rule upon procedural requests;

(8) To hold conferences for settlement or simplification of issues by consent to the parties;

(9) To make decisions in accordance with the Act, this part, and section 557 of title 5 of the United States Code; and

(10) To take any other appropriate action authorized by this part, section 556 of title 5 of the United States Code, or the Act.

(b) *Disqualification.* (1) When an Administrative Law Judge deems himself disqualified to preside over a particular hearing, he shall withdraw therefrom by notice on the record directed to the Chief Administrative Law Judge.

(2) Any party who deems an Administrative Law Judge for any reason to be

disqualified to preside or continue to preside over a particular hearing, may file with the Chief Administrative Law Judge of the Department of Labor a motion to be supported by affidavits setting forth the alleged grounds for disqualification. The Chief Administrative Law Judge shall rule upon the motion.

(c) *Contumacious conduct; failure or refusal to appear or obey rulings of a presiding Administrative Law Judge.* (1) contumacious conduct at any hearing before the Administrative Law Judge shall be grounds for exclusion from the hearing.

(2) If a witness or party refuses to answer a question after being directed to do so or refuses to obey an order to provide or permit discovery, the Administrative Law Judge may make such orders with regard to the refusal as are just and appropriate, including an order denying the application of a petitioner or regulating the contents of the record of the hearing.

(d) *Referral to Federal Rules of Civil Procedure and Evidence.* On any procedural question not regulated by this part, the Act, or the Administrative Procedure Act, and Administrative Law Judge shall be guided to the extent practicable by any pertinent provisions of the Federal Rules of Civil Procedure or Federal Rules of Evidence, as appropriate.

§ 44.23 Prehearing conferences.

(a) *Convening a conference.* Upon his own motion or the motion of a party, the Administrative Law Judge may direct the parties or their counsel to meet with him for a conference to consider:

(1) Simplification of issues;

(2) Necessity or desirability of amendments to documents for clarification, simplification, or limitation;

(3) Stipulations and admissions of facts;

(4) Limitation of the number of parties and expert witnesses; and

(5) Such other matters as may tend to expedite the disposition of the proceeding and assure a just conclusion thereof.

(b) *Record of conference.* The Administrative Law Judge may, where appropriate, issue an order which recites the action taken at the conference, amendments allowed to any filed documents, and agreements made between the parties as to any of the matters considered. The order shall limit the issues for hearing to those not disposed of by admissions or agreements. Such an order controls the subsequent course of the hearing, unless modified at the hearing to prevent manifest injustice.

§ 44.24 Discovery.

Parties shall be governed in their conduct of discovery by appropriate provisions of the Federal Rules of Civil Procedure, except as provided in § 44.25 of this part.

§ 44.25 Depositions.

(a) *Purpose.* For reasons of unavailability or for purpose of discovery, the testimony of any witness may be taken by deposition.

(b) *Form.* Depositions may be taken before any person having the power to administer oaths. Each witness testifying upon deposition shall be sworn, and the parties not calling him shall have the right to cross-examine him. Questions propounded and answers thereto, together with all objections made, shall be reduced to writing, read to or by the witness, subscribed by him, and certified by the officer before whom the deposition is taken. The officer shall send copies by registered mail to the Chief Administrative Law Judge or the presiding Administrative Law Judge.

§ 44.26 Subpoenas; witness fees.

(a) Except as provided in paragraph (b) of this section, the Chief Administrative Law Judge or the presiding Administrative Law Judge, as appropriate, shall issue subpoenas upon written application of a party requiring attendance of witnesses and production of relevant papers, books, documents, or tangible things in their possession and under their control. A subpoena may be served by any person who is not a party and is not less than 18 years of age, and the original subpoena bearing a certificate of service shall be filed with the Administrative Law Judge. A witness may be required to attend a deposition or hearing at a place not more than 100 miles from the place of service.

(b) If a party's written application for subpoena is submitted 3 working days or less before the hearing to which it relates, a subpoena shall be issued at the discretion of the Chief Administrative Law Judge

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or presiding Administrative Law Judge, as appropriate.

(c) Any person served with a subpoena may move in writing to revoke or modify the subpoena. All motions to revoke or modify shall be served on the party at whose request the subpoena was issued. The Administrative Law Judge shall revoke or modify the subpoena if in his opinion the evidence required to be produced does not relate to any matter under investigation or in question in the proceedings; the subpoena does not describe with sufficient particularity the evidence required to be produced; or, if for any other reason, sufficient in law, the subpoena is found to be invalid or unreasonable. The Administrative Law Judge shall make a simple statement of procedural or other grounds for the ruling on the motion to revoke or modify. The motion to revoke or modify, any answer filed thereto, and any ruling thereon shall become a part of the record.

(d) Witnesses subpoened by any party shall be paid the same fees for attendance and mileage as are paid in the District Courts of the United States. The fees shall be paid by the party at whose instance the witness appears.

§ 44.27 Consent findings and rules or orders.

(a) *General.* At any time before reception of evidence in any hearing or during any hearing, a reasonable opportunity may be afforded to permit negotiation by the parties of an agreement containing consent findings and a rule or order disposing of the whole or any part of the proceedings. Allowance of such opportunity and the duration thereof shall be in the discretion of the Chief Administrative Law Judge (if no Administrative Law Judge has been assigned) or of the presiding Administrative Law Judge. In deciding whether to afford such an opportunity, the Administrative Law Judge shall consider the nature of the proceeding, requirements of the public interest, representations of the parties, and probability of an agreement which will result in a just disposition of the issues involved.

(b) *Contents.* Any agreement containing consent findings and rule or order disposing of a proceeding shall also provide:

(1) That the rule or order shall have the same effect as if made after a full hearing;

(2) That the record on which any rule or order may be based shall consist solely of the petition and agreement;

(3) A waiver of further procedural steps before the Administrative Law Judge and Assistant Secretary; and

(4) A waiver of any right to challenge or contest the validity of the findings and rule or order made in accordance with the agreement.

(c) *Submission.* On or before expiration of the time granted for negotiations, the parties or their counsel may:

(1) Submit the proposed agreement to the Chief Administrative Law Judge or presiding Administrative Law Judge, as appropriate, for his consideration; or

(2) Inform the Chief Administrative Law Judge or presiding Administrative Law Judge, as appropriate, that agreement cannot be reached.

(d) *Disposition.* In the event an agreement containing consent findings and rule or order is submitted within the time allowed, the Chief Administrative Law Judge or presiding Administrative Law Judge, as appropriate, may accept the agreement by issuing his decision based upon the agreed findings.

§ 44.28 Notice of hearing.

(a) The Administrative Law Judge shall fix a place and date for the hearing and notify all parties at least 30 days in advance of the date set, unless at least one party requests and all parties consent to an earlier date, or the hearing date has been otherwise advanced in accordance with this part. The notice shall include:

(1) The time, place, and nature of the hearing; and

(2) The legal authority under which the hearing is to be held.

(b) In accordance with the provisions of section 554 of title 5 of the United States Code, a party may move for transfer of a hearing on the basis of convenience to parties and witnesses. Such motion should be filed with the Administrative Law Judge assigned to the case.

§ 44.29 Motions.

Each motion filed shall be in writing and shall contain a short and plain statement of the grounds upon which it is based. A statement in opposition to the motion may be filed by any party within 10 days after the date of service. The Ad-

ministrative Law Judge may permit oral motions during proceedings.

§ 44.30 Hearing procedures.

(a) *Order of proceeding.* Except as may be ordered otherwise by the Administrative Law Judge, the petitioner shall proceed first at a hearing.

(b) *Burden of proof.* The petitioner shall have the burden of proving his case by a preponderance of the evidence.

(c) *Evidence.* (1) *Admissibility.* A party shall be entitled to present its case or defense by oral or documentary evidence, to submit rebuttal evidence, and to conduct such cross-examination as may be required for full and true disclosure of the facts. Any oral or documentary evidence may be received, but the Administrative Law Judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(2) *Testimony of witnesses.* The testimony of a witness shall be upon oath or affirmation administered by the Administrative Law Judge.

(3) *Objections.* If a party objects to admission or rejection of any evidence, limitation of the scope of any examination or cross-examination, or failure to limit such scope, he shall state briefly the grounds for such objection. Rulings on such objections shall appear in the record.

(4) *Exceptions.* Formal exception to an adverse ruling is not required.

(d) *Official notice.* Official notice may be taken of any material fact not appearing in evidence in the record, which is among the traditional matters of judicial notice or concerning which the Department of Labor by reason of its functions is presumed to be expert; *Provided*, that the parties shall be given adequate notice at the hearing or by reference in the presiding Administrative Law Judge's decision of the matters so noticed and shall be given adequate opportunity to show the contrary.

(e) *Transcript.* Copies of the transcript of the hearing may be obtained by the parties upon written application filed with the reporter and payment of fees at the rate provided in the agreement with the reporter.

§ 44.31 Proposed findings of fact, conclusions, and orders.

After consultation with the parties, the Administrative Law Judge may prescribe a time not less than 20 days within which each party may file proposed findings of fact, conclusions of law, and rule or order, together with a supporting brief expressing the reasons for such proposals. Such proposals and brief shall be served on all other parties and shall refer to all portions of the record and to all authorities relied upon in support of each proposal.

§ 44.32 Initial decision.

(a) As soon as practicable after the time allowed for the filing of proposed findings of fact and conclusions of law, the Administrative Law Judge shall make and serve upon each party his decision, which shall become final upon the 30th day after service thereof, unless an appeal is filed as provided in § 44.33 of this part. The decision of the Administrative Law Judge shall include:

(1) A statement of numbered findings of fact and conclusions of law, with reasons therefor, upon each material issue of fact, law, or discretion presented on the record; and

(2) The appropriate rule, order, relief, or denial thereof.

(b) The decision of the Administrative Law Judge shall be based upon a consideration of the whole record and shall state all facts officially noticed and relied upon. It shall be made on the basis of a preponderance of reliable and probative evidence.

§ 44.33 Departmental review.

(a) *Notice of appeal.* Any party may appeal from the initial decision of the Administrative Law Judge by filing with the Assistant Secretary a notice of appeal within 30 days after service of the initial decision. The Assistant Secretary may consolidate related appeals. Copies of a notice of appeal shall be served on all parties to the proceeding in accordance with § 44.6 of this part.

(b) *Statement of objections.* Within 20 days after filing the notice of appeal, the appellant shall file his statement of objections to the decision of the Administrative Law Judge and serve copies on all other parties to the proceeding. The statement shall refer to the specific findings of fact, conclusions of law, or terms of the order objected to in the initial decision. Where any objection is based upon evi-

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dence of record, the objection need not be considered by the Assistant Secretary if specific record citations to the pertinent evidence are not contained in the statement of objections.

(c) *Responding statements.* Within 20 days after service of the statement of objections, any other party to the proceeding may file a statement in response.

(d) *Existing appeals of pending petitions.* The entire record of each pending petition or appeal within the Department of the Interior shall be transferred to the Assistant Secretary for decision in accordance with the provisions of § 44.35 of this part.

§ 44.34 Transmission of record.

If an appeal is filed, the Administrative Law Judge shall transmit the record of the proceeding to the Assistant Secretary for review. The record shall include: the application; any request for hearing thereon; motions and requests filed in written form; rulings thereon; the transcript of testimony taken at the hearing, together with exhibits admitted in evidence; any documents or papers filed in connection with prehearing conferences; such proposed findings of fact, conclusions of law, rules or orders, and supporting reasons, as may have been filed; and the Administrative Law Judge's decision.

§ 44.35 Decision of the Assistant Secretary.

Appeals from a decision rendered pursuant to § 44.32 of this part or appeals pursuant to § 44.33(d) of this part shall be decided by the Assistant Secretary based upon consideration of the entire record of the proceedings transmitted, together with the statements submitted by the parties. The decision may affirm, modify, or set aside, in whole or part, the findings, conclusions, and rule or order contained in the decision of the presiding Administrative Law Judge and shall include a statement of reasons for the action taken.

Subpart D—Summary Decisions

§ 44.40 Motion for summary decision.

(a) Any party may, at least 20 days before the date fixed for any hearing under subpart C of this part, move with or without supporting affidavits for a summary decision on all or any part of the proceeding. Any other party may, within 10 days after service of the motion, serve opposing affidavits or countermove for summary decision. The Administrative Law Judge may set the matter for argument and call for submission of briefs.

(b) Filing of any documents under paragraph (a) of this section shall be with the Administrative Law Judge, and copies of such documents shall be served in accordance with § 44.6 of this part.

(c) Any affidavits submitted with the motion shall set forth such facts as would be admissible in evidence in a proceeding subject to 5 U.S.C. 556 and 557 and shall show affirmatively that the affiant is competent to testify to the matters stated therein. When a motion for summary decision is made and supported as provided in this section, a party opposing the motion may not rest upon the mere allegations or denials of such pleading. Such response must set forth specific facts showing that there is a genuine issue of fact for the hearing.

(d) The Administrative Law Judge may grant the motion if the pleadings, affidavits, material obtained by discovery or otherwise, or matters officially noticed show that there is no genuine issue as to any material fact and a party is entitled to summary decision. The Administrative Law Judge may deny the motion whenever the moving party denies access to information by means of discovery to a party opposing the motion.

(e) The denial of all or part of a motion for summary decision by the Administrative Law Judge shall not be subject to interlocutory appeal to the Assistant Secretary unless the Administrative Law Judge certifies in writing that (1) the ruling involves an important question of law or policy as to which there are substantial grounds for difference of opinion, and (2) an immediate appeal from the ruling may materially advance termination of the proceeding. The allowance of an interlocutory appeal shall not stay the proceedings before the Administrative Law Judge unless ordered by the Assistant Secretary.

§ 44.41 Summary decision.

(a) *No genuine issue of material fact.* (1) Where no genuine issue of a material fact is found to have been raised the Admin-

istrative Law Judge may issue an initial decision to become final 30 days after service thereof, unless, within such time, any party has filed an appeal with the Assistant Secretary. Thereafter, the Assistant Secretary, after consideration of the entire record, may issue a final decision.

(2) An initial decision and a final decision made under this paragraph shall include a statement of—

(i) findings and conclusions, and the reasons therefor, on all issues presented; and

(ii) any terms and conditions of the rule or order.

(3) A copy of an initial decision and final decision under this paragraph shall be served on each party.

(b) *Hearings on issues of fact.* Where a genuine question of material fact is raised, the Administrative Law Judge shall, and in any other case may, set the case for an evidentiary hearing in accordance with subpart C of this part.

Subpart E—Effect of Initial Decision

§ 44.50 Effect of appeal on decision; application for relief pending appeal.

(a) Except as may result from procedures set forth in paragraph (b) of this section, a proposed decision of an Administrator is not operative pending appeal to an Administrative Law Judge, and a decision of an Administrative Law Judge is not operative pending appeal to the Assistant Secretary.

(b) *Application for relief pending appeal.* (1) *Purpose.* The purpose of an application for relief pending appeal is to give effect to a decision of an Administrator or Administrative Law Judge until the decision is affirmed or reversed on appeal.

(2) *Time for filing.* An application for relief pending appeal shall be filed within 10 days of the decision sought to be effectuated.

(3) *With whom filed.* If an Administrator's decision is the subject of the application, it shall be filed with and decided by the Administrative Law Judge assigned or the Chief Administrative Law Judge if assignment has not been made. If an Administrative Law Judge's decision is the subject of the application, it shall be filed with the Assistant Secretary and shall be decided by him.

(4) *Appeal.* A decision on the application for relief pending appeal is not subject to appeal, unless the Administrative Law Judge or Assistant Secretary certifies in writing that (i) the ruling involves an important question of law or policy as to which there are substantial grounds for difference of opinion, and (2) an immediate appeal from the ruling may materially advance termination of the proceeding. The allowance of an interlocutory appeal shall not stay the proceeding unless ordered by the Assistant Secretary.

(5) *Contents of application.* An application for relief pending appeal shall comply with applicable general requirements of this part, state the specific relief requested, and state how the applicant meets the criteria set forth in paragraph (b)(6) of this section.

(6) *Criteria.* Before relief is granted, the applicant must clearly show that (1) the requested relief will not adversely affect the health or safety of miners in the affected mine, and (2) there is a substantial likelihood that the decision on appeal will be favorable to the applicant.

(7) *Response.* All parties to the proceeding in which the application is filed shall have 3 days from date of receipt of the application to file a written response.

(8) *Evidence.* An application for relief pending appeal or response thereto shall ordinarily be decided solely by reference to the record as it exists at the time the application and response thereto are timely filed.

(9) *Hearing.* The Assistant Secretary or Administrative Law Judge may order that a hearing be held on any of the issues raised in the application.

(10) *Expedited proceedings.* A party may request that the decision on relief pending appeal be expedited. The request shall be in writing, addressed to the person designated in paragraph (b)(3) of this section, and accompanied by supporting documents that establish the party's claim of exigent circumstances warranting expedited proceedings. Service of such requests, where possible, shall be by personal delivery to all parties; otherwise, service shall be by telegram followed by registered or certified mail. Parties shall have 3 days from receipt of the request to file a response. The official considering the request may order that a hearing be held on any of the issues raised in the request. The official may order expedited proceed-

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ings, including expedited schedules for briefs and hearing, as he considers appropriate; *Provided*, that oral argument of the appeal shall not be scheduled with less than 5 days notice to the parties, unless all parties to the proceeding consent to an earlier hearing.

§ 44.51 Finality for purposes of judicial review.

Only a decision by the Assistant Secretary shall be deemed final agency action for purposes of judicial review. A decision by an Administrator or Administrative Law Judge which becomes final for lack of appeal is not deemed final agency action for purposes of 5 U.S.C. 704.

§ 44.52 Revocation of modification.

Any party to a proceeding under this part in which a petition for modification of a mandatory safety standard was granted may petition that the relief granted be revoked due to a change in circumstances, because findings which justified the relief are no longer valid. Such petition to revoke shall be filed with the Chief Administrative Law Judge for his disposition and shall be subject to all procedures of subparts C-E as if it were a petition filed under § 44.10 of this part.

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PART 45—INDEPENDENT CONTRACTORS [Reserved]

SUBCHAPTER H—EDUCATION AND TRAINING

PART 48—TRAINING AND RETRAINING OF MINERS

Subpart A—Training and Retraining of Underground Miners

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48.28 Annual refresher training of miners; minimum courses of instruction; hours of instruction.
48.29 Records of training.
48.30 Compensation for training.
48.31 Hazard training.
48.32 Appeals procedures.

AUTHORITY: Secs. 101 and 115(a), (b) and (c) of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 91 Stat. 1291, 1315-1316 (30 U.S.C. 811, 825(a), (b), and (c)).

Subpart A—Training and Retraining of Underground Miners

§ 48.1 Scope.

The provisions of this subpart A set forth the mandatory requirements for submitting and obtaining approval of programs for training and retraining miners working in underground mines. Requirements regarding compensation for training and retraining are also included. The requirements for training and retraining miners working at surface mines and surface areas of underground mines are set forth in subpart B of this part.

§ 48.2 Definitions.

For the purposes of this subpart A—

(a)(1) "Miner" means, for purposes of §§ 48.3 through 48.10 of this subpart A, any person working in an underground mine and who is engaged in the extraction and production process, or who is regularly exposed to mine hazards, or who is a maintenance or service worker employed by the operator or a maintenance or service worker contracted by the operator to work at the mine for frequent or extended periods. This definition shall include the operator if the operator works underground on a continuing, even if irregular, basis. Short term, specialized contract workers, such as drillers and blasters, who are engaged in the extraction and production process and who have received training under § 48.6 (Training of newly-employed experienced miners) of this subpart A may, in lieu of subsequent training under that section for each new employment, receive training under § 48.11 (Hazard training) of this subpart A. This definition does not include:

(i) Workers under subpart C of this part 48, including shaft and slope workers, workers engaged in construction activities ancillary to shaft and slope sinking, and workers engaged in the construction of major additions to an existing mine which requires the mine to cease operations;

(ii) Supervisory personnel subject to MSHA approved State certification requirements; and,

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(iii) Any person covered under paragraph (a)(2) of this section.

(2) "Miner" means, for purposes of § 48.11 (Hazard training) of this subpart A, any person working in an underground mine and excluding persons covered under paragraph (a)(1) of this section and subpart C of this part and supervisory personnel subject to MSHA approved State certification requirements. This definition includes any delivery, office, or scientific worker or occasional, short term maintenance or service worker contracted by the operator, and any student engaged in academic projects involving his or her extended presence at the mine.

(b) "Experienced miner" means a person who is employed as an underground miner, as defined in paragraph (a)(1) of this section, on the effective date of these rules; or a person who has received training acceptable to MSHA from an appropriate State agency within the preceding 12 months; or a person who has had at least 12 months experience working in an underground mine during the preceding 3 years; or a person who has received the training for a new miner within the preceding 12 months as prescribed in § 48.5 (Training of new miners) of this subpart A.

(c) "New miner" means a miner who is not an experienced miner.

(d) "Normal working hours" means a period of time during which a miner is otherwise scheduled to work. This definition does not preclude scheduling training classes on the sixth or seventh working day if such a work schedule has been established for a sufficient period of time to be accepted as the operator's common practice. Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks.

(e) "Operator" means any owner, lessee, or other person who operates, controls or supervises an underground mine; or any independent contractor identified as an operator performing services or construction at such mine.

(f) "Task" means a work assignment that includes duties of a job that occur on a regular basis and which requires physical abilities and job knowledge.

(g) "Act" means the Federal Mine Safety and Health Act of 1977.

§ 48.3 Training plans; time of submission; where filed; information required; time for approval; method for disapproval; commencement of training; approval of instructors.

(a) Each operator of an underground mine shall have an MSHA approved plan containing programs for training new miners, training newly-employed experienced miners, training miners for new tasks, annual refresher training, and hazard training for miners as follows:

(1) In the case of an underground mine which is operating on the effective date of this subpart A, the operator of the mine shall submit such plan for approval within 90 days after the effective date of this subpart A.

(2) Within 60 days after the operator submits the plan for approval, unless extended by MSHA, the operator shall have an approved plan for the mine.

(3) In the case of a new underground mine which is to be opened or a mine which is to be reopened or reactivated after the effective date of this subpart A, the operator shall have an approved plan prior to opening the new mine, or reopening or reactivating the mine.

(b) The training plan shall be filed with the Chief of the Training Center, MSHA, for the area in which the mine is located.

(c) Each operator shall submit to the Chief of the Training Center, MSHA, the following information:

(1) The company name, mine name, and MSHA identification number of the mine.

(2) The name and position of the person designated by the operator who is responsible for health and safety training at the mine. This person may be the operator.

(3) A list of MSHA approved instructors with whom the operator proposes to make arrangements to teach the courses, and the courses each instructor is qualified to teach.

(4) The location where training will be given for each course.

(5) A description of the teaching methods and the course materials which are to be used in training.

(6) The approximate number of miners employed at the mine and the maximum number who will attend each session of training.

(7) The predicted time or periods of time when regularly scheduled refresher train-

ing will be given. This schedule shall include the titles of courses to be taught, the total number of instruction hours for each course, and the predicted time and length of each session of training.

(8) For the purposes of § 48.7 (New task training of miners) of this subpart A, the operator shall submit:

(i) A complete list of task assignments to correspond with the definition of "task" in § 48.2 (f) of this subpart A.

(ii) The titles of personnel conducting the training for this section.

(iii) The outline of training procedures used in training miners in those work assignments listed according to paragraph (c)(8)(i) of this section.

(iv) The evaluation procedures used to determine the effectiveness of training under § 48.7 of this subpart A.

(d) The operator shall furnish to the representative of the miners a copy of the training plan two weeks prior to its submission to the Chief of the Training Center. Where a miners' representative is not designated, a copy of the plan shall be posted on the mine bulletin board 2 weeks prior to its submission to the Chief of the Training Center. Written comments received by the operator from miners or their representatives shall be submitted to the Chief of the Training Center. Miners or their representatives may submit written comments directly to the Chief of the Training Center.

(e) All training required by the training plan submitted to and approved by the Chief of the Training Center as required by this subpart A shall be subject to evaluation by the Office of Education and Training, MSHA, to determine the effectiveness of the training programs. If it is deemed necessary, the Chief of the Training Center may require changes in, or additions to, programs. Upon request from the Office of Education and Training, MSHA, the operator shall make available for evaluation by the Office of Education and Training the instructional materials, handouts, visual aids and other teaching accessories used or to be used in the training programs. Upon request from the Office of Education and Training, MSHA, the operator shall provide information concerning the schedules or upcoming training.

(f) The operator shall make a copy of the MSHA approved training plan available at the mine site for MSHA inspection and for examination by the miners and their representatives.

(g) Except as provided in § 48.7 (New task training of miners) and § 48.11 (Hazard training) of this subpart A, all courses shall be conducted by MSHA approved instructors.

(h) Instructors shall be approved by the Office of Education and Training, MSHA, in one or more of the following ways:

(1) Instructors shall take an instructor's training course conducted by the Office of Education and Training, MSHA, or given by persons designated by the Office of Education and Training, MSHA, to give such instruction; and instructors shall have satisfactorily completed a program of instruction approved by the Office of Education and Training, MSHA, in the subject matter to be taught.

(2) Instructors may be designated by MSHA as approved instructors to teach specific courses based on written evidence of the instructors' qualifications and teaching experience.

(3) At the discretion of the Chief of the Training Center, instructors may be designated by MSHA as approved instructors to teach specific courses based on the performance of the instructors while teaching classes monitored by MSHA. Operators shall indicate in the training plans submitted for approval whether they want to have instructors approved based on monitored performance. The Training Center Chief shall consider such factors as the size of the mine, the number of employees, the mine safety record and remoteness from a training facility when determining whether instructor approval based on monitored performance is appropriate.

(4) On the effective date of this subpart A, cooperative instructors who have been designated by MSHA to teach MSHA approved courses and who have taught such courses within the 24 months prior to the effective date of this subpart shall be considered approved instructors for such courses.

(i) Instructors may have their approval revoked by MSHA for good cause which may include not teaching a course at least once every 24 months. Before any revocation is effective, the Chief of the Training Center must send written reasons for revocation to the instructor and the instructor shall be given an opportunity to demonstrate or achieve compliance be-

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fore the Chief of the Training Center on the matter. A decision by the Chief of the Training Center to revoke an instructor's approval may be appealed by the instructor to the Director of Education and Training, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203. Such an appeal shall be submitted to the Director of Education and Training within 5 days of notification of the Chief of the Training Center's decision. Upon revocation of an instructor's approval, the Chief of the Training Center shall immediately notify operators who use the instructor for training.

(j) The Chief of the Training Center for the area in which the mine is located shall notify the operator and the miners' representative, in writing, within 60 days from the date on which the training plan is filed, of the approval or status of the approval of the training programs.

(1) If revisions are required for approval, or to retain approval thereafter, the revisions required shall be specified to the operator and the miners' representative and the operator and the miners' representative shall be afforded an opportunity to discuss the revisions with the Chief of the Training Center, or to propose alternate revisions or changes. The Chief of the Training Center, in consultation with the operator and the representative of the miners, shall fix a time within which the discussion will be held, or alternate revisions or changes submitted, before final approval is made.

(2) The Chief of the Training Center may approve separate programs of the training plan and withhold approval of other programs, pending discussion of revisions or submission of alternate revisions or changes.

(k) Except as provided under § 48.8(c) (Annual refresher training of miners) of this subpart A, the operator shall commence training of miners within 60 days after approval of the training plan, or approved programs of the training plan.

(l) The operator shall notify the Chief of the Training Center, MSHA, in the area in which the mine is located, and the miners' representative of any changes or modifications the operator proposes to make in the approved training plan. The operator shall obtain the approval of the Training Center Chief for such changes or modifications.

(m) In the event the Chief of the Training Center or the Director of Education and Training disapproves a training plan or a proposed modification of a training plan or requires changes in a training plan or modification, the Chief of the Training Center or the Director of Education and Training shall notify the operator and the miners' representative in writing of:

(1) The specific changes or items of deficiency.

(2) The action necessary to effect the changes or bring the disapproved training plan or modification into compliance.

(3) The deadline for completion of remedial action to effect compliance, which shall serve to suspend punitive action under the provisions of sections 104 and 110 of the Act and other related regulations until that established deadline date, except that no such suspension shall take place in imminent danger situations.

(n) The operator shall post on the mine bulletin board, and provide to the miners' representative, a copy of all MSHA revisions and decisions which concern the training plan at the mine and which are issued by the Chief of the Training Center or the Director of Education and Training.

§ 48.4 Cooperative training program.

(a) An operator of a mine may conduct his own training programs, or may participate in training programs conducted by MSHA, or may participate in MSHA approved training programs conducted by State or other Federal agencies, or associations of mine operators, miners' representatives, other mine operators, private associations, or educational institutions.

(b) Each program and course of instruction shall be given by instructors who have been approved by MSHA to instruct in the courses which are given, and such courses and the training programs shall be adapted to the mining operations and practices existing at the mine and shall be approved by the Chief of the Training Center for the area in which the mine is located.

§ 48.5 Training of new miners; minimum courses of instruction; hours of instruction.

(a) Each new miner shall receive no less than 40 hours of training as prescribed in this section before such miner is assigned to work duties. Such training shall be conducted in conditions which as closely as

practicable duplicate actual underground conditions, and approximately 8 hours of training shall be given at the mine site.

(b) The training program for new miners shall include the following courses:

(1) *Instruction in the statutory rights of miners and their representatives under the Act; authority and responsibility of supervisors.* The course shall include instruction in the statutory rights of miners and their representatives under the Act, including a discussion of section 2 of the Act; a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(2) *Self-rescue and respiratory devices.* The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices used at the mine. Such course shall be given before the new miner goes underground.

(3) *Entering and leaving the mine; transportation; communications.* The course shall include instruction on the *procedures in effect for entering and leaving* the mine; the check-in and check-out system in effect at the mine; the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(4) *Introduction to the work environment.* The course shall include a visit and tour of the mine, or portions of the mine which are representative of the entire mine. A method of mining utilized at the mine shall be observed and explained.

(5) *Mine map; escapeways; emergency evacuation; barricading.* The course shall include a review of the mine map, the escapeway system; the escape, fire fighting, and emergency evacuation plans in effect at the mine; and the location of abandoned areas. Also included shall be an introduction to the methods of barricading and the locations of the barricading materials, where applicable. The program of instruction for escapeways and emergency evacuation plans approved by the District Manager shall be used for this course.

(6) *Roof or ground control and ventilation plans.* The course shall include an introduction to and instruction on the roof or ground control plan in effect at the mine and procedures for roof and rib or ground control; and an introduction to and instruction on the ventilation plan in effect at the mine and the procedures for *maintaining* and controlling ventilation.

(7) *Health.* The course shall include instruction on the purpose of taking dust, noise, and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(8) *Cleanup; rock dusting.* The course shall include instruction on the purpose of rock dusting and the cleanup and rock dusting program in effect at the mine, where applicable.

(9) *Hazard recognition.* The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

(10) *Electrical hazards.* The course shall include recognition and avoidance of electrical hazards.

(11) *First aid.* The course shall include *instruction in first aid methods acceptable* to MSHA.

(12) *Mine gases.* The course shall include instruction in the detection and avoidance of hazards associated with mine gases.

(13) *Health and safety aspects of the tasks to which the new miners will be assigned.* The course shall include instruction in the health and safety aspects of the tasks to be assigned, the safe work procedures of such tasks, and the mandatory health and safety standards pertinent to such tasks.

(14) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

(c) Methods, including oral, written, or practical demonstration, to determine successful completion of the training shall be included in the training plan. The methods for determining such completion shall be administered to the miner before he ts assigned work duties.

(d) Upon proof by an operator that a newly employed miner has received the courses and hours of instruction set forth in paragraphs (a) and (b) of this section

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within 12 months preceding initial employment at a mine, such miner need not repeat the training, but the operator shall give and the miner shall receive and complete the instruction and program of training set forth in paragraph (b) of § 48.6 (Training of newly-employed experienced miners), and § 48.7 (New task training of miners), if applicable, before commencing work.

§ 48.6 Training of newly-employed experienced miners; minimum courses of instruction.

(a) A newly-employed experienced miner shall receive and complete training in the program of instruction prescribed in this section before such miner is assigned to work duties.

(b) The training program for newly-employed experienced miners shall include the following:

(1) *Introduction to work environment.* The course shall include a visit and tour of the mine. The methods of mining utilized at the mine shall be observed and explained.

(2) *Mandatory health and safety standards.* The course shall include the mandatory health and safety standards pertinent to the tasks to be assigned.

(3) *Authority and responsibility of supervisors and miners' representatives.* The course shall include a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(4) *Entering and leaving the mine; transportation; communications.* The course shall include instruction in the procedures in effect for entering and leaving the mine; the check-in and check-out system in effect at the mine; the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(5) *Mine map; escapeways; emergency evacuation; barricading.* The course shall include a review of the mine map; the escapeway system; the escape, fire fighting, and emergency evacuation plans in effect at the mine; the location of abandoned areas; and, where applicable, methods of barricading and the locations of barricading materials. The program of instruction for escapeways and emergency evacuation plans approved by the District Manager shall be used for this course.

(6) *Roof or ground control and ventilation plans.* The course shall include an introduction to and instruction on the roof or ground control plan in effect at the mine and procedures for roof and rib or ground control; and an introduction to and instruction on the ventilation plan in effect at the mine and the procedures for maintaining and controlling ventilation.

(7) *Hazard recognition.* The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

(8) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

§ 48.7 Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.

(a) Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor systems operators, roof and ground control machine operators, and those in blasting operations shall not perform new work tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed. This training shall not be required for miners who have been trained and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. This training shall also not be required for miners who have performed the new work tasks and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. The training program shall include the following:

(1) *Health and safety aspects and safe operating procedures for work tasks, equipment, and machinery.* The training shall include instruction in the health and safety aspects and the safe operating procedures related to the assigned tasks, and shall be given in an on-the-job environment; and

(2) (i) *Supervised practice during nonproduction.* The training shall include supervised practice in the assigned tasks, and the performance of work duties at times or places where production is not the primary objective; or

(ii) *Supervised operations during production.* The training shall include, while under direct and immediate supervision and production is in progress, operation of the machine or equipment and the performance of work duties.

(3) *New or modified machines and equipment.* Equipment and machine operators shall be instructed in safe operating procedures applicable to new or modified machines or equipment to be installed or put into operation in the mine, which require new or different operating procedures.

(4) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

(b) Miners under paragraph (a) of this section shall not operate the equipment or machine or engage in blasting operations without direction and immediate supervision until such miners have demonstrated safe operating procedures for the equipment or machine or blasting operation to the operator or the operator's agent.

(c) Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task, prior to performing such task.

(d) Any person who controls or directs haulage operations at a mine shall receive and complete training courses in safe haulage procedures related to the haulage system, ventilation system, fire fighting procedures, and emergency evacuation procedures in effect at the mine before assignment to such duties.

(e) All training and supervised practice and operation required by this section shall be given by a qualified trainer, or a supervisor experienced in the assigned tasks, or other person experienced in the assigned tasks.

§ 48.8 Annual refresher training of miners; minimum courses of instruction; hours of instruction.

(a) Each miner shall receive a minimum of 8 hours of annual refresher training as prescribed in this section.

(b) The annual refresher training program for all miners shall include the following courses of instruction:

(1) *Mandatory health and safety standards.* The course shall include mandatory health and safety standard requirements which are related to the miner's tasks.

(2) *Transportation controls and communication systems.* The course shall include instruction on the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(3) *Barricading.* The course shall include a review of the methods of barricading and locations of barricading materials, where applicable.

(4) *Roof or ground control and ventilation plans.* The course shall include a review of roof or ground control plans in effect at the mine and the procedures for maintaining and controlling ventilation.

(5) *First aid.* The course shall include a review of first aid methods acceptable to MSHA.

(6) *Electrical hazards.* The course shall include recognition and avoidance of electrical hazards.

(7) *Prevention of accidents.* The course shall include a review of accidents and causes of accidents, and instruction in accident prevention in the work environment.

(8) *Self-rescue devices and respiratory devices.* The course shall include instruction in the use, care, and maintenance of self-rescue and respiratory devices.

(9) *Explosives.* The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when there are no explosives used or stored on the mine property.

(10) *Mine gases.* The course shall include instruction in the detection and avoidance of hazards associated with mine gases.

(11) *Health.* The course shall include instruction on the purpose of taking dust, noise, and other health measurements and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(12) Such other courses as may be required by the Training Center Chief based

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on circumstances and conditions at the mine.

(c) All experienced miners already employed at a mine on the effective date of the Act (March 9, 1978) shall receive refresher training, as prescribed in this section and in accordance with the approved plan, to begin not more than 90 days after the date of approval of the training program required by this subpart A.

(d) Where annual refresher training is conducted periodically, such sessions shall not be less than 30 minutes of actual instruction time and the miners shall be notified that the session is part of annual refresher training.

§ 48.9 Records of training.

(a) Upon a miner's completion of each MSHA approved training program, the operator shall record and certify on MSHA form 5000-23 that the miner has received the specified training. A copy of the training certificate shall be given to the miner at the completion of the training. The training certificates for each miner shall be available at the mine site for inspection by MSHA and for examination by the miners, the miner's representative, and State inspection agencies. When a miner leaves the operator's employ, the miner shall be entitled to a copy of his training certificates.

(b) False certification that training was given shall be punishable under sections 110(a) and (f) of the Act.

(c) Copies of training certificates for currently employed miners shall be kept at the mine site for 2 years, or for 60 days after termination of employment.

§ 48.10 Compensation for training.

(a) Training shall be conducted during normal working hours; miners attending such training shall receive the rate of pay as provided in § 48.2(d) (Definition of normal working hours) of this subpart A.

(b) If such training shall be given at a location other than the normal place of work, miners shall be compensated for the additional costs, such as mileage, meals, and lodging, they may incur in attending such training sessions.

§ 48.11 Hazard training.

(a) Operators shall provide to those miners, as defined in § 48.2(a)(2) (Definition of miner) of this subpart A, a training program before such miners commence their work duties. This training program shall include the following instruction, which is applicable to the duties of such miners:

(1) Hazard recognition and avoidance;

(2) Emergency and evacuation procedures;

(3) Health and safety standards, safety rules, and safe working procedures;

(4) Self-rescue and respiratory devices; and

(5) Such other instruction as may be required by the Chief of the Training Center based on circumstances and conditions at the mine.

(b) Miners shall receive the instruction required by this section at least once every 12 months.

(c) The training program required by this section shall be submitted with the training plan required by § 48.3(a) (Training plans; Submission and approval) of this subpart A and shall include a statement on the methods of instruction to be used.

(d) In accordance with § 48.9 (Records of training) of this subpart A, the operator shall maintain and make available for inspection certificates that miners have received the hazard training required by this section.

(e) Miners subject to hazard training shall be accompanied at all times while underground by an experienced miner, as defined in § 48.2(b) (Definition of miner) of this subpart A.

§ 48.12 Appeals procedures.

The operator, miner, and miners' representative shall have the right of appeal from a decision of the Training Center Chief.

(a) In the event an operator, miner, or miners' representative decides to appeal a decision by a Training Center Chief, such an appeal shall be submitted, in writing, to the Director of Education and Training, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203, within 30 days of notification of the Chief of the Training Center's decision.

(b) The Director of Education and Training may require additional information from the operator, the miners, or their representatives, and the Chief of the Training Center, if the Director determines such information is necessary.

(c) The Director of Education and Training shall render a decision on the appeal within 30 days after receipt of the appeal.

Subpart B—Training and Retraining of Miners Working at Surface Mines and Surface Areas of Underground Mines

§ 48.21 Scope.

The provisions of this subpart B set forth the mandatory requirements for submitting and obtaining approval of programs for training and retraining miners working at surface mines and surface areas of underground mines. Requirements regarding compensation for training and retraining are also included. The requirements for training and retraining miners working in underground mines are set forth in subpart A of this part.

§ 48.22 Definitions.

For the purposes of this subpart B—

(a)(1) "Miner" means, for purposes of § 48.23 through 48.30 of this subpart B, any person working in a surface mine or surface areas of an underground mine and who is engaged in the extraction and production process, or who is regularly exposed to mine hazards, or who is a maintenance or service worker employed by the operator or a maintenance or service worker contracted by the operator to work at the mine for frequent or extended periods. This definition shall include the operator if the operator works at the mine on a continuing, even if irregular, basis. Short-term, specialized contract workers, such as drillers and blasters, who are engaged in the extraction and production process and who have received training under § 48.26 (Training of newly-employed experienced miners) of this subpart B, may in lieu of subsequent training under that section for each new employment, receive training under § 48.31 (Hazard training) of this subpart B. This definition does not include:

(i) Construction workers and shaft and slope workers under subpart C of this part 48;

(ii) Supervisory personnel subject to MSHA approved State certification requirements; and

(iii) Any person covered under paragraph (a)(2) of this section.

(a)(2) "Miner" means, for purposes of § 48.31 (Hazard training) of this subpart B, any person working in a surface mine or surface areas of an underground mine excluding persons covered under paragraph (a)(1) of this section and subpart C of this part and supervisory personnel subject to MSHA approved State certification requirements. This definition includes any delivery, office, or scientific worker, or occasional, short-term maintenance or service worker contracted by the operator, and any student engaged in academic projects involving his or her extended presence at the mine.

(b) "Experienced miner" means a person who is employed as a miner, as defined in paragraph (a)(1) of this section, on the effective date of these rules; or a person who has received training acceptable to MSHA from an appropriate State agency within the preceding 12 months; or a person who has had at least 12 months experience working in a surface mine or surface area of an underground mine during the preceding 3 years; or a person who has received the training for a new miner within the preceding 12 months as prescribed in § 48.25 (Training of new miners) of this subpart B.

(c) "New miner" means a miner who is not an experienced miner.

(d) "Normal working hours" means a period of time during which a miner is otherwise scheduled to work. This definition does not preclude scheduling training classes on the sixth or seventh working day if such a work schedule has been established for a sufficient period of time to be accepted as the operator's common practice. Miners shall be paid at a rate of pay which shall correspond to the rate of pay they would have received had they been performing their normal work tasks.

(e) "Operator" means any owner, lessee, or other person who operates, controls, or supervises a surface mine or surface area of an underground mine; or any independent contractor identified as an operator performing services or construction at such time.

(f) "Task" means a work assignment that includes duties of a job that occur on a regular basis and which requires physical abilities and job knowledge.

(g) "Act" means the Federal Mine Safety and Health Act of 1977.

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§ 48.23 Training plans; time of submission; where filed; information required; time for approval; method for disapproval; commencement of training; approval of instructors.

(a) Each operator of a mine shall have an MSHA approved plan containing programs for training new miners, training newly-employed experienced miners, training miners for new tasks, annual refresher training, and hazard training for miners as follows:

(1) In the case of a mine which is operating on the effective date of this subpart B, the operator of the mine shall submit such plan for approval within 150 days after the effective date of this subpart B.

(2) Within 60 days after the operator submits the plan for approval, unless extended by MSHA, the operator shall have an approved plan for the mine.

(3) In the case of a new mine which is to be opened or a mine which is to be reopened or reactivated after the effective date of this subpart B, the operator shall have an approved plan prior to opening the new mine, or reopening or reactivating the mine unless the mine is reopened or reactivated periodically using portable equipment and mobile teams of miners as a normal method of operation by the operator. The operator to be so excepted shall maintain an approved plan for training covering all mine locations which are operated with portable equipment and mobile teams of miners.

(b) The training plan shall be filed with the Chief of the Training Center, MSHA, for the area in which the mine is located.

(c) Each operator shall submit to the Chief of the Training Center, MSHA, the following information:

(1) The company name, mine name, and MSHA identification number of the mine.

(2) The name and position of the person designated by the operator who is responsible for health and safety training at the mine. This person may be the operator.

(3) A list of MSHA approved instructors with whom the operator proposes to make arrangements to teach the courses, and the courses each instructor is qualified to teach.

(4) The location where training will be given for each course.

(5) A description of the teaching methods and the course materials which are to be used in training.

(6) The approximate number of miners employed at the mine and the maximum number who will attend each session of training.

(7) The predicted time or periods of time when regularly scheduled refresher training will be given. This schedule shall include the titles of courses to be taught, the total number of instruction hours for each course, and the predicted time and length of each session of training.

(8) For the purposes of § 48.27 (New task training of miners) of this subpart B, the operator shall submit:

(i) A complete list of task assignments to correspond with the definition of "task" in § 48.22(f) of this subpart B.

(ii) The titles of personnel conducting the training for this section.

(iii) The outline of training procedures used in training miners in those work assignments listed according to paragraph (c)(8)(i) of this section.

(iv) The evaluation procedures used to determine the effectiveness of training under § 48.27 of this subpart B.

(d) The operator shall furnish to the representative of the miners a copy of the training plan 2 weeks prior to its submission to the Chief of the Training Center. Where a miners' representative is not designated, a copy of the plan shall be posted on the mine bulletin board 2 weeks prior to its submission to the Chief of the Training Center. Written comments received by the operator from miners or their representatives shall be submitted to the Chief of the Training Center. Miners or their representatives may submit written comments directly to the Chief of the Training Center.

(e) All training required by the training plan submitted to and approved by the Chief of the Training Center as required by this subpart B shall be subject to evaluation by the Office of Education and Training, MSHA, to determine the effectiveness of the training programs. If it is deemed necessary, the Chief of the Training Center may require changes in, or additions to, programs. Upon request from the Office of Education and Training, MSHA, the operator shall make available for evaluation by the Office of Education and Training the instructional materials, handouts, visual aids, and other teaching accessories used or to be used in the training programs. Upon request from the Of-

fice of Education and Training, MSHA, the operator shall provide information concerning schedules of upcoming training.

(f) The operator shall make a copy of the MSHA approved training plan available at the mine site for MSHA inspection and examination by the miners and their representatives.

(g) Except as provided in § 48.27 (New task training of miners) and § 48.31 (Hazard training) of this subpart B, all courses shall be conducted by MSHA approved instructors.

(h) Instructors shall be approved by the Office of Education and Training, MSHA, in one or more of the following ways:

(1) Instructors shall take an instructor's training course conducted by the Office of Education and Training, MSHA, or given by persons designated by the Office of Education and Training, MSHA, to give such instruction; and instructors shall have satisfactorily completed a program of instruction approved by the Office of Education and Training, MSHA, in the subject matter to be taught.

(2) Instructors may be designated by MSHA as approved instructors to teach specific courses based on written evidence of the instructors' qualifications and teaching experience.

(3) At the discretion of the Chief of the Training Center, instructors may be designated by MSHA as approved instructors to teach specific courses based on the performance of the instructors while teaching classes monitored by MSHA. Operators shall indicate in training plans submitted for approval whether they want to have instructors approved based on monitored performance. The Training Center Chief shall consider such factors as the size of the mine, the number of employees, the mine safety record and remoteness from a training facility when determining whether instructor approval based on monitored performance is appropriate.

(4) On the effective date of this subpart B, cooperative instructors who have been designated by MSHA to teach MSHA approved courses and who have taught such courses within 24 months prior to the effective date of this subpart shall be considered approved instructors for such courses.

(i) Instructors may have their approval revoked by MSHA for good cause which may include not teaching a course at least once every 24 months. Before any revocation is effective, the Chief of the Training Center must send written reasons for revocation to the instructor and the instructor shall be given an opportunity to demonstrate or achieve compliance before the Chief of the Training Center on the matter. A decision by the Chief of the Training Center to revoke an instructor's approval may be appealed by the instructor to the Director of Education and Training, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203. Such an appeal shall be submitted to the Director of Education and Training within 5 days of notification of the Chief of the Training Center's decision. Upon revocation of an instructor's approval, the Chief of the Training Center shall immediately notify operators who use the instructor for training.

(j) The Chief of the Training Center for the area in which the mine is located shall notify the operator and the miners' representative, in writing, within 60 days from the date on which the training plan is filed, of the approval or status of the approval of the training programs.

(1) If revisions are required for approval, or to retain approval thereafter, the revisions required shall be specified to the operator and the miners' representative and the operator and the miners' representative shall be afforded an opportunity to discuss the revisions with the Chief of the Training Center, or propose alternate revisions or changes. The Chief of the Training Center, in consultation with the operator and the representative of miners, shall fix a time within which the discussion will be held, or alternate revisions or changes submitted, before final approval is made.

(2) The Chief of the Training Center may approve separate programs of the training plan and withhold approval of other programs, pending discussion of revisions or submission of alternate revisions or changes.

(k) Except as provided under § 48.28(c) (Annual refresher training of miners) of this subpart B, the operator shall commence training of miners within 60 days after approval of the training plan, or approved programs of the training plan.

(l) The operator shall notify the Chief of the Training Center, MSHA, in the area

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in which the mine is located and the miners' representative of any changes or modifications which the operator proposes to make in the approval training plan. The operator shall obtain the approval of the Training Center Chief for such changes or modifications.

(m) In the event the Chief of the Training Center or the Director of Education and Training disapproves a training plan or a proposed modification of a training plan or requires changes in a training plan or modification, the Chief of the Training Center or the Director of Education and Training shall notify the operator and the miners' representative in writing of:

(1) The specific changes or items of deficiency.

(2) The action necessary to effect the changes or bring the disapproved training plan or modification into compliance.

(3) The deadline for completion of remedial action to effect compliance, which shall serve to suspend punitive action under the provisions of sections 104 and 110 of the Act and other related regulations until that established deadline date, except that no such suspension shall take place in imminent danger situations.

(n) The operator shall post on the mine bulletin board, and provide to the miners' representative, a copy of all MSHA revisions and decisions which concern the training plan at the mine and which are issued by the Chief of the Training Center or the Director of Education and Training.

§ 48.24 Cooperative training program.

(a) An operator of a mine may conduct his own training programs, or may participate in training programs conducted by MSHA, or may participate in MSHA approved training programs conducted by State or other Federal agencies, or associations of mine operators, miners' representatives, other mine operators, private associations, or educational institutions.

(b) Each program and course of instruction shall be given by instructors who have been approved by MSHA to instruct in the courses which are given, and such courses and the training programs shall be adapted to the mining operations and practices existing at the mine and shall be approved by the Chief of the Training Center for the area in which the mine is located.

§ 48.25 Training of new miners; minimum courses of instruction; hours of instruction.

(a) Each new miner shall receive no less than 24 hours of training as prescribed in this section. Except as otherwise provided in this paragraph, new miners shall receive this training before they are assigned to work duties. At the discretion of the Chief of the Training Center, new miners may receive a portion of this training after assignment to work duties: *Provided*, that no less than 8 hours of training shall in all cases be given to new miners before they are assigned to work duties. The following courses shall be included in the 8 hours of training: Introduction to work environment, hazard recognition, and health and safety aspects of the tasks to which the new miners will be assigned. Following the completion of the preassignment training, new miners shall then receive the remainder of the required 24 hours of training, or up to 16 hours, within 60 days. Operators shall indicate in the training plans submitted for approval whether they want to train new miners after assignment to duties and for how many hours. In determining whether new miners may be given this training after they are assigned duties, the Training Center Chief shall consider such factors as the mine safety record, rate of employee turnover and mine size. Miners who have not received the full 24 hours of new miner training shall be required to work under the close supervision of an experienced miner.

(b) The training program for new miners shall include the following courses:

(1) *Instruction in the statutory rights of miners and their representatives under the Act; authority and responsibility of supervisors.* The course shall include instruction in the statutory rights of miners and their representatives under the Act, including a discussion of section 2 of the Act; a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(2) *Self-rescue and respiratory devices.* The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory de-

vices, where applicable.

(3) *Transportation controls and communication systems.* The course shall include instruction on the procedures in effect for riding on and in mine conveyances where applicable; the controls for the transportation of miners and materials; and the use of mine communication systems, warning signals; and directional signs.

(4) *Introduction to work environment.* The course shall include a visit and tour of the mine, or portions of the mine which are representative of the entire mine. The method of mining or operation utilized shall be observed and explained.

(5) *Escape and emergency evacuation plans; firewarning and fire fighting.* The course shall include a review of the mine escape system, and escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and fire fighting procedures.

(6) *Ground control; working in areas of highwalls, water hazards, pits and spoil banks; illumination and night work.* The course shall include, where applicable, an introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits and spoil banks; the illumination of work areas; and safe work procedures during the hours of darkness.

(7) *Health.* The course shall include instruction on the purpose of taking dust measurements, where applicable, and noise and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(8) *Hazard recognition.* The course shall include the recognition and avoidance of hazards present in the mine.

(9) *Electrical hazards.* The course shall include recognition and avoidance of electrical hazards.

(10) *First aid.* The course shall include instruction in first aid methods acceptable to MSHA.

(11) *Explosives.* The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when no explosives are used or stored on mine property.

(12) *Health and safety aspects of the tasks to which the new miner will be assigned.* The course shall include instructions in the health and safety aspects of the tasks to be assigned, the safe work procedures of such tasks, and the mandatory health and safety standards pertinent to such tasks.

(13) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

(c) Methods, including oral, written or practical demonstration, to determine successful completion of the training shall be included in the training plan. Upon completion of training, the methods for determining successful completion shall be administered to the miner. The method for determining successful completion of preassignment training under paragraph (a) of this section shall be administered to the miner before he is assigned to work duties.

(d) Upon proof by an operator that a newly employed miner has received the courses and hours of instruction set forth in paragraphs (a) and (b) of this section within 12 months preceding initial employment at a mine, such miner need not repeat the training, but the operator shall give and the miner shall receive and complete the instruction and program of training set forth in paragraph (b) of § 48.26 (Training of newly-employed experienced miners) and § 48.27 (New task training of miners), if applicable, before commencing work.

§ 48.26 Training of newly-employed experienced miners; minimum courses of instruction.

(a) A newly-employed experienced miner shall receive and complete training in the program of instruction prescribed in this section before such miner is assigned to work duties.

(b) The training program for newly-employed experienced miners shall include the following:

(1) *Introduction to work environment.* The course shall include a visit and tour of the mine. The methods of mining or operations utilized at the mine shall be observed and explained.

(2) *Mandatory health and safety standards.* The course shall include the mandatory health and safety standards pertinent to the tasks to be assigned.

(3) *Authority and responsibility of su-*

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pervisors and miners' representatives. The course shall include a review and description of the line of authority of supervisors and miners' representatives and the responsibilities of such supervisors and miners' representatives; and an introduction to the operator's rules and the procedures for reporting hazards.

(4) *Transportation controls and communication systems.* The course shall include instruction on the procedures in effect for riding on and in mine conveyances; the controls for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(5) *Escape and emergency evacuation plans; firewarning and fire fighting.* The course shall include a review of the mine escape system; escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and fire fighting procedures.

(6) *Ground controls; working in areas of highwalls, water hazards, pits, and spoil banks; illumination and night work.* The course shall include, where applicable, an introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits, and spoil banks, the illumination of work areas, and safe work procedures for miners during hours of darkness.

(7) *Hazard recognition.* The course shall include the recognition and avoidance of hazards present in the mine, particularly any hazards related to explosives where explosives are used or stored at the mine.

(8) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

§ 48.27 Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.

(a) Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor systems operators, ground control machine operators, and those in blasting operations shall not perform new work tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed. This training shall not be required for miners who have been trained and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. This training shall also not be required for miners who have performed the new work tasks and who have demonstrated safe operating procedures for such new work tasks within 12 months preceding assignment. The training program shall include the following:

(1) *Health and safety aspects and safe operating procedures for work tasks, equipment, or machinery.* The training shall include instruction in the health and safety aspects and safe operating procedures related to the assigned tasks, and shall be given in an on-the-job environment; and,

(2)(i) *Supervised practice during nonproduction.* The training shall include supervised practice in the assigned tasks, and the performance of work duties at times or places where production is not the primary objective; or,

(ii) *Supervised operation during production.* The training shall include, while under direct and immediate supervision and production is in progress, operation of the machine or equipment and the performance of work duties.

(3)*New or modified machines and equipment.* Equipment and machine operators shall be instructed in safe operating procedures applicable to new or modified machines or equipment to be installed or put into operation in the mine, which require new or different operating procedures.

(4) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

(b) Miners under paragraph (a) of this section shall not operate the equipment or machine or engage in blasting operations without direction and immediate supervision until such miners have demonstrated safe operating procedures for the equipment or machine or blasting operation to the operator or the operator's agent.

(c) Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task, prior to performing such task.

(d) All training and supervised practice

and operation required by this section shall be given by a qualified trainer, or a supervisor experienced in the assigned tasks, or other person experienced in the assigned tasks.

§ 48.28 Annual refresher training of miners; minimum courses of instruction; hours of instruction.

(a) Each miner shall receive a minimum of 8 hours of annual refresher training as prescribed in this section.

(b) The annual refresher training program for all miners shall include the following courses of instruction:

(1) *Mandatory health and safety standards.* The course shall include mandatory health and safety standard requirements which are related to the miner's tasks.

(2) *Transportation controls and communication systems.* The course shall include instruction on the procedures for riding on and in mine conveyances; the controls in effect for the transportation of miners and materials; and the use of the mine communication systems, warning signals, and directional signs.

(3) *Escape and emergency evacuation plans; firewarning and fire fighting.* The course shall include a review of the mine escape system; escape and emergency evacuation plans in effect at the mine; and instruction in the firewarning signals and fire fighting procedures.

(4) *Ground control; working in areas of highwalls, water hazards, pits, and spoil banks; illumination and night work.* The course shall include, where applicable, a review and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits, and spoil banks; the illumination of work areas; and safe work procedures during hours of darkness.

(5) *First aid.* The course shall include a review of first aid methods acceptable to MSHA.

(6) *Electrical hazards.* The course shall include recognition and avoidance of electrical hazards.

(7) *Prevention of accidents.* The course shall include a review of accidents and causes of accidents, and instruction in accident prevention in the work environment.

(8) *Health.* The course shall include instruction on the purpose of taking dust measurements, where applicable, and noise and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.

(9) *Explosives.* The course shall include a review and instruction on the hazards related to explosives. The only exception to this course component is when there are no explosives used or stored on the mine property.

(10) *Self-rescue and respiratory devices.* The course shall include instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices, where applicable.

(11) Such other courses as may be required by the Training Center Chief based on circumstances and conditions at the mine.

(c) All experienced miners already employed at a mine on the effective date of the Act (March 9, 1978) shall receive refresher training, as prescribed in this section and in accordance with an approved plan, to begin not more than 90 days after the date of approval of the training program required by this subpart B.

(d) Where annual refresher training is conducted periodically, such sessions shall not be less than 30 minutes of actual instruction time and the miners shall be notified that the session is part of annual refresher training.

§ 48.29 Records of training.

(a) Upon a miner's completion of each MSHA approved training program, the operator shall record and certify on MSHA form 5000–23 that the miner has received the specified training. A copy of the training certificate shall be given to the miner at the completion of the training. The training certificates for each miner shall be available at the mine site for inspection by MSHA and for examination by the miners, the miners' representative and State inspection agencies. When a miner leaves the operator's employ, the miner shall be entitled to a copy of his training certificates.

(b) False certification that training was given shall be punishable under sections 110(a) and (f) of the Act.

(c) Copies of training certificates for currently employed miners shall be kept at the mine site for 2 years, or for 60 days after termination of employment.

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§ 48.30 Compensation for training.

(a) Training shall be conducted during normal working hours; miners attending such training shall receive the rate of pay as provided in § 48.22(d) (Definition of normal working hours) of this subpart B.

(b) If such training shall be given at a location other than the normal place of work, miners shall be compensated for the additional costs, such as mileage, meals, and lodging, they may incur in attending such training sessions.

§ 48.31 Hazard training.

(a) Operators shall provide to those miners, as defined in § 48.22(a)(2) (Definition of miner) of this subpart B, a training program before such miners commence their work duties. This training program shall include the following instruction, which is applicable to the duties of such miners:

(1) Hazard recognition and avoidance;

(2) Emergency and evacuation procedures;

(3) Health and safety standards, safety rules and safe working procedures;

(4) Self-rescue and respiratory devices; and,

(5) Such other instruction as may be required by the Chief of the Training Center based on circumstances and conditions at the mine.

(b) Miners shall receive the instruction required by this section at least once every 12 months.

(c) The training program required by this section shall be submitted with the training plan required by § 48.23(a) (Training plans; Submission and approval) of this subpart B and shall include a statement on the methods of instruction to be used.

(d) In accordance with § 48.29 (Records of training) of this subpart B, the operator shall maintain and make available for inspection, certificates that miners have received the instruction required by this section.

§ 48.32 Appeals procedures.

The operator, miner, and miners' representative shall have the right of appeal from a decision of the Training Center Chief.

(a) In the event an operator, miner, or miners' representative decides to appeal a decision by the Training Center Chief, such an appeal shall be submitted, in writing to the Director of Eductaion and Training, MSHA, 4015 Wilson Boulevard, Arlington, Va. 22203, within 30 days of notification of the Chief of the Training Center's decision.

(b) The Director of Education and Training may require additional information from the operator, the miners or their representatives, and the Chief of the Training Center, if the Director determines such information is necessary.

(c) The Director of Education and Training shall render a decision on the appeal within 30 days after receipt of the appeal.

[FR Doc. 78-29001 Filed 10-12-78; 8:45 am]

PART 49—MINE RESCUE TEAMS

[Reserved]

SUBCHAPTERS I-L-[RESERVED]
SUBCHAPTER M—ACCIDENTS, INJURIES, ILLNESSES, EMPLOYMENT, AND PRODUCTION IN MINES

PART 50—NOTIFICATION, INVESTIGATION, REPORTS AND RECORDS OF ACCIDENTS, INJURIES, ILLNESSES, EMPLOYMENT, AND COAL PRODUCTION IN MINES

Subpart A—General

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50.12 Preservation of Evidence.

Subpart C—Reporting of Accidents, Injuries, and Illnesses

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50.20–2 Criteria—Transfer to another job.
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50.20–4 Criteria—MSHA Form 7000–1, Section A.
50.20–5 Criteria—MSHA Form 7000–1, Section B.
50.20–6 Criteria—MSHA Form 7000–1, Section C.
50.20–7 Criteria—MSHA Form 7000–1, Section D.

Subpart D—Quarterly Employment and Coal Production Report

50.30 Preparation and Submission of MSHA Form 7000–2—Quarterly Employment and Coal Production Report.
50.30–1 General Instructions for Completing MSHA Form 7000–2.

Subpart E—Maintenance of Records; Verification of Information

50.40 Maintenance of Records.
50.41 Verification of Reports.

AUTHORITY: Secs. 301(a) and 302(a) of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95–164, 30 U.S.C. 961 and 951 and 29 U.S.C. 577a, 91 Stat. 1317 and 91 Stat. 1319; sec. 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91–173 as amended by Pub. L. 95–164, 30 U.S.C. 957, 80 Stat. 803; secs. 103(e), 111, and 508 of the Federal Coal Mine Health and Safety Act of 1969, 30 U.S.C. secs. 813(e), 821, and 957; and secs. 4 and 13 of the Federal Metal and Non-Metallic Mine Safety Act, 30 U.S.C. secs. 723, 732.

SOURCE: 42 FR 65535, Dec. 30, 1977, unless otherwise noted.

NOTE: Nomenclature changes to this part appear at 43 FR 12318, Mar. 24, 1978.

Subpart A—General

§ 50.1 Purpose and Scope.

This Part 50 implements § § 103(e) and 111 of the Federal Coal Mine Health and Safety Act of 1969, 30 U.S.C. 801 et seq., and § § 4 and 13 of the Federal Metal and Nonmetallic Mine Safety Act, 30 U.S.C. 721 et seq., and applies to operators of coal, metal, and nonmetallic mines. It requires operators to immediately notify the Mine Safety and Health Administration (MSHA) of accidents, requires operators to investigate accidents, and restricts disturbance of accident related areas. This Part also requires operators to file reports pertaining to accidents, occupational injuries and occupational illnesses, as well as employment, and coal production data, with MSHA, and requires operators to maintain copies of reports at relevant mine offices. The purpose of this Part is to implement MSHA's authority to investigate, and to obtain and utilize information pertaining to, accidents, injuries, and illnesses occurring or originating in mines. In utilizing information received under Part 50, MSHA will develop rates or injury occurrence (incident rates or IR), on the basis of 200,000 hours of employee exposure (equivalent to 100 employees working 2,000 hours per year). The incidence rate for a particular injury category will be based on the formula: NOTE:

$$IR = \frac{\text{no. of cases} \times 200{,}000}{\text{hours of employee exposure}}$$

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MSHA will develop data respecting injury severity using days away from work or days of restricted work activity and the 200,000 hour base as criteria. The severity measure (SM) for a particular injury category will be based on the formula:

$$SM = \frac{\text{sum of days} \times 200{,}000}{\text{hours of employee exposure}}$$

[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978, as amended at 43 FR 12318, Mar. 24, 1978]

§ 50.2 Definitions.

As used in this Part:

(a) "Mine" means: (1) an area of land from which minerals are extracted in nonliquid form or, if in liquid form, are extracted with workers underground; (2) private ways and roads appurtenant to such area; and (3) lands, excavations, underground passageways, shafts, slopes, tunnels and workings, structures, facilities, equipment, machines, tools, or other property including impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to be used in, or resulting from, the work of extracting such minerals from their natural deposits in nonliquid form, or if in liquid form, with workers underground, or used in, or to be used in, the milling of such minerals, or the work of preparing coal or other minerals, and includes custom coal preparation facilities.

(b) "Work of preparing the coal" means the breaking, crushing, sizing, cleaning, washing, drying, mixing, storing, and loading of bituminous coal, lignite, or anthracite, and such other work of preparing such coal as is usually done by the operator of the coal mine.

(c) "Operator" means:

(1) Any owner, lessee, or other person who operates, controls, or supervises a coal mine; or,

(2) The person, partnership, association, or corporation, or subsidiary of a corporation operating a metal or nonmetal mine, and owning the right to do so, and includes any agent thereof charged with responsibility for the operation of such mine.

(d) "Miner" means any individual working in a mine.

(e) "Occupational injury" means any injury to a miner which occurs at a mine for which medical treatment is administered, or which results in death or loss of consciousness, inability to perform all job duties on any day after an injury, temporary assignment to other duties, or transfer to another job.

(f) "Occupational illness" means an illness or disease of a miner which may have resulted from work at a mine or for which an award of compensation is made.

(g) "First aid" means one-time treatment, and any follow-up visit for observational purposes, of a minor injury.

(h) "Accident" means:

(1) A death of an individual at a mine;

(2) An injury to an individual at a mine which has a reasonable potential to cause death;

(3) An entrapment of an individual for more than thirty minutes;

(4) An unplanned inundation of a mine by a liquid or gas;

(5) An unplanned ignition or explosion of gas or dust;

(6) An unplanned mine fire not extinguished within 30 minutes of discovery;

(7) An unplanned ignition or explosion of a blasting agent or an explosive;

(8) An unplanned roof fall at or above the anchorage zone in active workings where roof bolts are in use; or, an unplanned roof or rib fall in active workings that impairs ventilation or impedes passage;

(9) A coal or rock outburst that causes withdrawal of miners or which disrupts regular mining activity for more than one hour;

(10) An unstable condition at an impoundment, refuse pile, or culm bank which requires emergency action in order to prevent failure, or which causes individuals to evacuate an area; or, failure of an impoundment, refuse pile, or culm bank;

(11) Damage to hoisting equipment in a shaft or slope which endangers an individual or which interferes with use of the equipment for more than thirty minutes; and

(12) An event at a mine which causes death or bodily injury to an individual not at the mine at the time the event occurs.

[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978, as amended at 43 FR 12318, Mar. 24, 1978]

Subpart B—Notification, Investigation, Preservation of Evidence

§ 50.10 Immediate Notification.

If an accident occurs, an operator shall immediately contact the MSHA District or Subdistrict Office having jurisdiction over its mine. If an operator cannot contact the appropriate MSHA District or Subdistrict Office it shall immediately contact the MSHA Headquarters Office in Washington, D.C., by telephone, collect at (202) 783-5582.
[42 FR 65535, Dec. 30, 1977, as amended at 43 FR 12318, Mar. 24, 1978]

§ 50.11 Investigation.

(a) After notification of an accident by an operator, the MSHA District or Subdistrict Manager will promptly decide whether to conduct an accident investigation and will promptly inform the operator of his decision. If MSHA decides to investigate an accident, it will initiate the investigation within 24 hours of notification.

(b) Each operator of a mine shall investigate each accident and each occupational injury at the mine. Each operator of a mine shall develop a report of each investigation. No operator may use Form 7000–1 as a report, except that an operator of a mine at which fewer than twenty miners are employed may, with respect to that mine, use Form 7000–1 as an investigation report respecting an occupational injury not related to an accident. No operator may use an investigation or an investigation report conducted or prepared by MSHA to comply with this paragraph. An operator shall submit a copy of any investigation report to MSHA at its request. Each report prepared by the operator shall include:

(1) The date and hour of occurrence;

(2) The date the investigation began;

(3) The names of individuals participating in the investigation;

(4) A description of the site;

(5) An explanation of the accident or injury, including a description of any equipment involved and relevant events before and after the occurrence, and any explanation of the cause of any injury, the cause of any accident or cause of any other event which caused an injury;

(6) The name, occupation, and experience of any miner involved;

(7) A sketch, where pertinent, including dimensions depicting the occurrence;

(8) A description of steps taken to prevent a similar occurrence in the future; and

(9) Identification of any report submitted under § 50.20 of this Part.

§ 50.12 Preservation of Evidence.

Unless granted permission by a MSHA District Manager or Subdistrict Manager, no operator may alter an accident site or an accident related area until completion of all investigations pertaining to the accident except to the extent necessary to rescue or recover an individual, prevent or eliminate an imminent danger, or prevent destruction of mining equipment.
[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978]

Subpart C—Reporting of Accidents, Injuries, and Illnesses

§ 50.20 Preparation and submission of MSHA Report Form 7000–1—Mine Accident, Injury, and Illness Report.

(a) Each operator shall maintain at the mine office a supply of MSHA Mine Accident, Injury, and Illness Report Form 7000–1. These may be obtained from MSHA Metal and Nonmetallic Mine Health and Safety Subdistrict Offices and from MSHA Coal Mine Health and Safety Subdistrict Offices. Each operator shall report each accident, occupational injury, or occupational illness at the mine. The principal officer in charge of health and safety at the mine or the supervisor of the mine area in which an accident or occupational injury occurs, or an occupational illness may have originated, shall complete or review the form in accordance with the instructions and criteria in § 50.20–1 through § 50.20–7. If an occupational illness is diagnosed as being one of those listed in § 50.20–6(b)(7), the operator must report it under this Part. The operator shall mail completed forms to MSHA within ten working days after an accident or occupational injury occurs or an occupational illness is diagnosed. When an accident specified in § 50.10 occurs, which does not involve an occupational injury, sections A, B, and items 5 through

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11 of section C of Form 7000–1 shall be completed and mailed to MSHA in accordance with the instructions in § 50.20–1 and criteria contained in § 50.20–4 through § 50.20–6.

(b) Each operator shall report each occupational injury or occupational illness on one set of forms. If more than one miner is injured in the same accident or is affected simultaneously with the same occupational illness, an operator shall complete a separate set of forms for each miner affected. To the extent that the form is not self-explanatory, an operator shall complete the form in accordance with the instructions in § 50.20–1 and criteria contained in § § 50.20–2 through 50.20–7.

§ 50.20–1 General Instructions for Completing MSHA Form 7000–1.

Each Form 7000–1 consists of four sheets, an original and three copies. The original form shall be mailed to: MSHA—Health and Safety Analysis Center, P.O. Box 25367, Denver Federal Center, Denver, Colo. 80225, within ten working days after an accident, occupational injury or occupational illness. At the same time, the first copy shall be mailed to the appropriate local MSHA Mine Health and Safety District or Subdistrict Office. If the first copy does not contain a completed Section D—Return to Duty Information—the second copy shall be retained by the operator until the miner returns to work or a final disposition is made respecting the miner. When the miner returns to work or a final disposition is made, the operator shall, within five days, complete Section D and mail the second copy to MSHA—Health and Safety Analysis Center (HSAC). A third copy, containing all the information in the first and second copies shall be retained at the mine office closest to the mine for a period of five years.

[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978]

§ 50.20–2 Criteria—"Transfer to another job."

"Transfer to another job" means transfers, either temporary, or permanent, which are occasioned by a work-related injury or illness. Permanent or temporary transfers to remove miners from further exposure to health hazards are considered preventive in nature and are not required to be reported. Controlling the amount of exposure to radiation during some period of time is one example. Transfer of a coal miner to a less dusty area of a mine when the miner elects to exercise rights under Section 203(b) of the Federal Coal Mine Health and Safety Act of 1977 is another example.

§ 50.20–3 Criteria—Differences between medical treatment and first aid.

(a) Medical treatment includes, but is not limited to, the suturing of any wound, treatment of fractures, application of a cast or other professional means of immobilizing an injured part of the body, treatment of infection arising out of an injury, treatment of bruise by the drainage of blood, surgical removal of dead or damaged skin (debridement), amputation or permanent loss of use of any part of the body, and treatment of second and third degree burns. Procedures which are diagnostic in nature are not considered by themselves to constitute medical treatments. Visits to a physician, physical examinations, X-ray examinations, and hospitalization for observations, where no evidence of injury or illness is found and no medical treatment given, do not in themselves constitute medical treatment. Procedures which are preventive in nature also are not considered by themselves to constitute medical treatment. Tetanus and flu shots are considered preventive in nature. First aid includes any one-time treatment, and follow-up visit for the purpose of observation, of minor injuries such as cuts, scratches, first degree burns, and splinters. Ointments, salves, antiseptics, and dressings to minor injuries are considered to be first aid.

(1) *Abrasion.* (i) First aid treatment is limited to cleaning a wound, soaking, applying antiseptic and nonprescription medication and bandages on the first visit and follow-up visits limited to observation including changing dressing and bandages. Additional cleaning and application of antiseptic constitutes first aid where it is required by work duties that soil the bandage.

(ii) Medical treatment includes examination for removal of imbedded foreign material, multiple soakings, whirlpool treatment, treatment of infection, or other

professional treatments and any treatment involving more than a minor spot-type injury. Treatment of abrasions occurring to greater than full skin depth is considered medical treatment.

(2) *Bruises.* (i) First aid treatment is limited to a single soaking or application of cold compresses, and follow-up visits if they are limited only to observation.

(ii) Medical treatment includes multiple soakings, draining of collected blood, or other treatment beyond observation.

(3) *Burns, Thermal and Chemical (resulting in destruction of tissue by direct contact).* (i) First aid treatment is limited to cleaning or flushing the surface, soaking, applying cold compresses, antiseptics or nonprescription medications, and bandaging on the first visit, and follow-up visits restricted to observation, changing bandages, or additional cleaning. Most first degree burns are amenable to first aid treatment.

(ii) Medical treatment includes a series of treatments including soaks, whirlpool, skin grafts, and surgical debridement (cutting away dead skin). Most second and third degree burns require medical treatment.

(4) *Cuts and Lacerations.* (i) First aid treatment is the same as for abrasions except the application of butterfly closures for cosmetic purposes only can be considered first aid.

(ii) Medical treatment includes the application of butterfly closures for non-cosmetic purposes, sutures, (stitches), surgical debridement, treatment of infection, or other professional treatment.

(5) *Eye Injuries.* (i) First aid treatment is limited to irrigation, removal of foreign material not imbedded in eye, and application of nonprescription medications. A precautionary visit (special examination) to a physician is considered as first aid if treatment is limited to above items, and follow-up visits if they are limited to observation only.

(ii) Medical treatment cases involve removal of imbedded foreign objects, use of prescription medications, or other professional treatment.

(6) *Inhalation of Toxic or Corrosive Gases.* (i) First aid treatment is limited to removal of the miner to fresh air or the one-time administration of oxygen for several minutes.

(ii) Medical treatment consists of any professional treatment beyond that mentioned under first aid and all cases involving loss of consciousness.

(7) *Foreign Objects.* (i) First aid treatment is limited to cleaning the wound, removal of any foreign object by tweezers or other simple techniques, application of antiseptics and nonprescription medications, and bandaging on the first visit. Follow-up visits are limited to observation including changing of bandages. Additional cleaning and applications of antiseptic constitute first aid where it is required by work duties that soil the bandage.

(ii) Medical treatment consists of removal of any foreign object by physician due to depth of imbedment, size or shape of object, or location of wound. Treatment for infection, treatment of a reaction to tetanus booster, or other professional treatment, is considered medical treatment.

(8) *Sprains and Strains.* (i) First aid treatment is limited to soaking, application of cold compresses, and use of elastic bandages on the first visit. Follow-up visits for observation, including reapplying bandage, are first aid.

(ii) Medical treatment includes a series of hot and cold soaks, use of whirlpools, diathermy treatment, or other professional treatment.

[42 FR 65535, Dec. 30, 1977; 43 FR 12318, Mar. 24, 1978]

§ 50.20–4 Criteria—MSHA Form 7000–1, Section A.

(a) *MSHA I.D. number.* Enter the seven digit number assigned to the mine operation by MSHA. If the number is unknown, the nearest MSHA Health and Safety District or Subdistrict Office should be contacted.

(b) *Mine name.* Enter the exact name of the operation to which the MSHA I.D. number was assigned.

(c) *Company name.* Enter the name of the mining company submitting this report or, if not a company, the operator's name.

§ 50.20–5 Criteria—MSHA Form 7000–1, Section B.

(a) This section shall be completed for all accidents immediately reported to MSHA as defined in § 50.10. Circle the

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code from the following list which best defines the accident.

Code 01—A death of an individual at a mine

Code 02—An injury to an individual at a mine which has a reasonable potential to cause death

Code 03—An entrapment of an individual for more than 30 minutes

Code 04—An unplanned mine inundation by a liquid or gas

Code 05—An unplanned ignition or explosion of dust or gas

Code 06—An unplanned mine fire not extinguished within 30 minutes of discovery

Code 07—An unplanned ignition of a blasting agent or an explosive

Code 08—An unplanned roof fall at or above the anchorage zone in active workings where roof bolts are in use; or a roof or rib fall on active workings that impairs ventilation or impedes passage

Code 09—A coal or rock outburst that causes withdrawal of miners or which disrupts regular mining activity for more than one hour

Code 10—An unstable condition at an impoundment, refuse pile, or culm bank which requires emergency action in order to prevent failure, or which causes individuals to evacuate an area; or, failure of an impoundment, refuse pile, or culm bank

Code 11—Damage to hoisting equipment in a shaft or slope which endangers an individual or which interferes with use of the equipment for more than thirty minutes

Code 12—An event at a mine which causes death or bodily injury to an individual not at the mine at the time the event occurs

§ 50.20–6 Criteria—MSHA Form 7000–1, Section C.

(a) Complete items 5 through 12 for each accident, occupational injury, or occupational illness.

(1) Item 5. Location and mining method. Circle the appropriate location code that was nearest to the location of the accident, injury or illness. If the accident, injury or illness occurred at the surface, circle only the surface location code in column (a). If the accident, injury or illness occurred underground, circle only the underground location code in column (b). Where applicable, circle the underground mining method code in column (c). Applicable codes for columns (a), (b), and (c) are as follows:

(i) Column (a)—Surface location codes. If the accident, injury or illness occurred at the surface of a mine, circle one of the following codes which best describes where the accident, injury or illness occurred and ignore columns (b) and (c).

Code 02—Surface shop, yard, etc., at an underground mine

Code 30—Mill operation, preparation plant, or breaker, including associated shops and yards

Code 03—Surface strip or open pit mine, including shop and yard

Code 04—Surface auger coal operation on a coal mine, including shop and yard

Code 05—Surface culm bank or refuse pile at a coal mine, including shop and yard

Code 06—Dredge mining, including shop and yard

Code 12—Other surface mining

Code 17—Independent shops

Code 99—Office facilities

(ii) Column (b)—Underground location codes. If the accident, injury or illness occurred underground, circle the one code which best describes where the accident, injury or illness occurred.

Code 01—Vertical shaft

Code 02—Slope/Inclined shaft

Code 03—Face

Code 04—Intersection

Code 05—Underground Shop/Office

Code 06—Other

(ii) Column (c)—Underground mining method. If the underground accident, injury or illness occurred on a working section or working place, enter the code for the mining method at that working section or working place.

Code 01—Longwall

Code 02—Shortwall

Code 03—Conventional/stoping

Code 05—Continuous Miners

Code 06—Hand Loading

Code 07—Caving

Code 08—Other

(2) Item 6. Date of accident, injury or illness. Enter the date the accident, injury or illness occurred.

(3) Item 9. Describe fully the conditions contributing to the accident, injury or illness and quantify the damage or impairment. Describe what happened and the

reasons therefor, identify the factors which led or contributed to the accident, injury or illness and identify any damage or impairment to the mining operation. The narrative shall clearly specify the actual cause or causes of the accident, injury or illness and shall include the following:

(i) Whether the accident, injury or illness involved any aspect of compliance with rules and regulations;

(ii) Whether the accident, injury or illness involved mine equipment or the mining system;

(iii) Whether the accident, injury or illness involved job skills and miner proficiency, training and attitude; and

(iv) Whether the accident injury or illness involved protective items relating to clothing, or protective devices on equipment.

(4) Item 10. If equipment was involved in the accident, injury or illness specify type (loader, shuttle car, dozer, etc.), name of manufacturer, and equipment model number.

(5) Item 11. Name of witness to accident, injury or illness. If any miner witnessed the accident, injury or illness enter the name.

(b) Complete items 13–27 for each occupational injury or occupational illness.

(1) Item 13. Name of injured/ill miner. Enter the miner's name (first, middle initial, and last).

(2) Item 17. Regular job title. Enter the miner's regular job title. For example: "shuttle car operator".

(3) Item 19. Check if this injury/illness resulted in permanent total or partial disability.

(i) "Permanent total disability." The classification for any injury or illness other than death which permanently and totally incapacitates an employee from following any gainful occupation or which results in the loss, or the complete loss of use, of any of the following in one accident, injury or illness:

(A) Both eyes;

(B) One eye and one hand, or arm, or leg, or foot;

(C) Any two of the following not on the same limb: hand, arm, foot, or leg.

(ii) "Permanent partial disability." The classification for any injury or illness other than death or permanent total disability which results in the loss, or complete loss of use, of any member or part of a member of the body, or any permanent impairment of functions of the body or part thereof, regardless of any preexisting disability of the affected member or impaired body function.

(4) Item 20. What directly inflicted injury or illness. Name the object or substance which directly affected the miner. For example: the machine or thing struck against or which struck the miner; the vapor or poison inhaled or swallowed; the chemical or non-ionizing radiation which irritated the skin; or in cases of strains or hernias, the thing lifted or pulled.

(5) Item 21. Nature of injury or illness. For injuries, use commonly used medical terms to answer this question such as puncture wound, third degree burn, fracture, dislocation, amputation. For multiple injuries, enter the injury which was the most serious. For illness, name the illness, such as pneumoconiosis, silicosis. Avoid general terms such as "hurt", "sore", "sick".

(6) Item 22. Part of body injured or affected. Name the part of the body with the most serious injury. For example, if an injured employee has a bruised finger and a broken ankle, write "ankle". If amputation, enter part of the body lost.

(7) Item 23. Occupational illness. Circle the code from the list below which most accurately describes the illness. These are typical examples and are not to be considered the complete listing of the types of illnesses and disorders that should be included under each category. In cases where the time of onset of illness is in doubt, the day of diagnosis of illness will be considered as the first day of illness.

(i) Code 21—*Occupational Skin Diseases or Disorders.* Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; chrome ulcers; chemical burns on inflammations.

(ii) Code 22—*Dust Diseases of the Lungs (Pneumoconioses).* Example: Silicosis, asbestosis, coal worker's pneumoconiosis, and other pneumoconioses.

(iii) Code 23—*Respiratory Conditions due to Toxic Agents.* Examples: Pneumonitis, pharyngitis, rhinitis, or acute congestion due to chemicals, dusts, gases, or fumes.

(iv) Code 24—*Poisoning (Systemic Effects of Toxic Materials).* Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals, poisoning by carbon monoxide, hydrogen sulfide or other gases;

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poisoning by benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays such as parathion, lead arsenate; poisoning by other chemicals such as formaldehyde, plastics and resins.

(v) Code 25—*Disorders Due to Physical Agents (Other than Toxic Materials).* Examples: Heatstroke, sunstroke, heat exhaustion and other effects of environmental heat; freezing, frostbite and effects of exposure to low temperatures; caisson disease; effects of ionizing radiation (radon daughters, non-medical, non-therapeutic X-rays, radium); effects of nonionizing radiation (welding flash, ultra-violet rays, micro-waves, sunburn).

(vi) Code 26—Disorders Associated with Repeated Trauma. Examples: Noise-induced hearing loss; synovitis, tenosynovitis, and bursitis; Raynaud's phenomena; and other conditions due to repeated motion, vibration or pressure.

(vii) Code 29—*All Other Occupational Illnesses.* Examples: Infectious hepatitis, malignant and benign tumors, any form of cancer, kidney diseases, food poisoning, histoplasmosis.

(8) Item 24. Miner's work activity when injury or illness occurred. Describe exactly the activity of the injured miner when the occupational injury or occupational illness occurred. For example: "Setting temporary support prior to drilling holes for roof bolts."

[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978]

§ 50.20–7 Criteria—MSHA Form 7000–1, Section *D*.

This section requires information concerning the miner's return to duty.

(a) Item 28. Permanently transferred or terminated. Check this block if the miner's employment was terminated or if the miner was permanently transferred to another regular job as a direct result of the occupational injury or occupational illness.

(b) Item 29. Show the date that the injured person returned to his regular job at full capacity (not to restricted work activity) or was transferred or terminated.

(c) Item 30. Number of days away from work. Enter the number of workdays, consecutive or not, on which the miner would have worked but could not because of occupational injury or occupational illness. The number of days away from work shall not include the day of injury or onset of illness or any days on which the miner would not have worked even though able to work. If an employee loses a day from work solely because of the unavailability of professional medical personnel for initial observation or treatment and not as a direct consequence of the injury or illness, the day should not be counted as a day away from work.

(d) Item 31. Number of days of restricted work activity. Enter the number of workdays, consecutive or not, on which because of occupational injury or occupational illness:

(1) The miner was assigned to another job on a temporary basis;

(2) The miner worked at a permanent job less than full time; or

(3) The miner worked at a permanently assigned job but could not perform all duties normally connected with it. The number of days of restricted work activity shall not include the day of injury or onset of illness, or any days the miner did not work even though able to work.

If an injured or ill employee receives scheduled follow-up medical treatment or observation which results in the loss of a full workday solely because of the unavailability of professional medical personnel, it will not be counted as a day of restricted work activity. Days of restricted work activity end as the result of any of the following:

(i) The miner returns to his regularly scheduled job and performs all of its duties for a full day or shift;

(ii) The miner is permanently transferred to another permanent job (which shall be reported under Item 28, Permanently Transferred or Terminated). If this happens, even though the miner could not perform this original job any longer, the Days of Restricted Work Activity will stop; or

(iii) The miner is terminated or leaves the mine. (Termination shall also be reported under Item 28, Permanently Transferred or Terminated).

Subpart D—Quarterly Employment and Coal Production Report

§ 50.30 Preparation and submission of MSHA Form 7000–2 Quarterly

Employment and Coal Production Report.

(a) Each operator of a mine in which an individual worked during any day of a calendar quarter shall complete a MSHA Form 7000–2 in accordance with the instructions and criteria in § 50.30–1 and submit the original to the MSHA Health and Safety Analysis Center, P.O. Box 25367, Denver Federal Center, Denver, Colo. 80225, within 15 days after the end of each calendar quarter. These forms may be obtained from MSHA Metal and Nonmetallic Mine Health and Safety Subdistrict Offices and from MSHA Coal Mine Health and Safety Subdistrict Offices. Each operator shall retain an operator's copy at the mine office nearest the mine for 5 years after the submission date.

(b) Each operator of a coal mine in which an individual worked during any day of a calendar quarter shall report coal production on Form 7000–2.

§ 50.30–1 General Instructions for Completing MSHA Form 7000–2.

(a) *MSHA I.D. Number* is the 7-digit number assigned to the mine operation by MSHA. Any questions regarding the appropriate I.D. number to use should be directed to your local MSHA Health and Safety District or Subdistrict Office.

(b) *Calendar Quarter:* First quarter is January, February, and March. Second quarter is April, May, and June. Third quarter is July, August, and September. Fourth quarter is October, November, and December.

(c) *County* is the name of the county, borough, or independent city in which the operation is located.

(d) *Operation Name* is the specific name of the mine or plant to which the MSHA I.D. number was assigned and for which the quarterly employment report is being submitted.

(e) *Company Name* is the name of the operating company that this report pertains to.

(f) *Mailing Address* is the address of the mine office where the quarterly employment report is to be retained. This should be as near the operation as possible.

(g) *Employment, Employee Hours, and Coal Production.*

(1) *Operation Sub-Unit:*

(i) Underground Mine: Report data for your underground workers on the first line. If you have personnel working at the surface of your underground mine, report data for those persons on the second line;

(ii) Surface Mine (Including Shops and Yards): Report on the appropriate line. employment and coal production for the mining operation. For surface mining subunits 03, 04, 05 and 06, include all work associated with shops and yards;

(iii) Mill Operations, Preparation Plants, Breakers: Report data on all persons employed at your milling (crushing, sizing, grinding, concentrating, etc.) operation, preparation plant, or breaker, including those working in associated shops and yards. (Do not include personnel reported in shops and yards associated with other sub-units.);

(iv) Office: Include in this category employees who work principally at the mine or preparation facility office.

(2) Average number of persons working during quarter: Show the average number of employees on the payroll during all active periods in the quarter. Include all classes of employees (supervisory, professional, technical proprietors, owners, operators, partners, and service personnel) on your payroll, full or part-time, Report *Each Employee Under One Activity Only.* For example: If one or more persons work both in the mine and the mill, report these employees under the activity where they spend most of their time. If necessary, estimate for the major activity. The average number may be computed by adding together the number of employees working during each pay period and then dividing by the number of pay periods. Do not include pay periods where no one worked. For example, during the quarter you had 5 pay periods where employees worked. The number of employees in each pay period was 10, 12, 13, 14 and 15, respectively. To compute the average, add the number of employees working each pay period (10 + 12 + 13 + 14 + 15 = 64). Then divide by the number of pay periods (64 divided by 5 = 12.8). Rounding this to the nearest whole number, we get 13 as the average number of persons working.

(3) *Total employee-hours worked during the quarter:* Show the total hours worked by all employees during the quarter covered. Include all time where the employee was actually on duty, but exclude vacation, holiday, sick leave, and all other off-duty time, even though paid

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for. Make certain that each overtime hour is reported as one hour, and not as the overtime pay multiple for an hour of work. The hours reported should be obtained from payroll or other time records. If actual hours are not available, they may be estimated on the basis of scheduled hours. Make certain not to include hours paid but not worked.

(4) *Production of clean coal (short tons):* This section is to be compiled only by operators of underground or surface mines, but not by operators of central or independent coal preparation plants or operators of metal or nonmetal mines. Enter the total production of clean coal from the mine. This must include coal shipped from the mine and coal used for fuel at the mine, but exclude refuse and coal produced at another mine and purchased for use at the mine.

(h) *Other Reportable Data.* Indicate the number of reportable injuries or illnesses occurring at your operation during the quarter covered by this report. Show the name, title, and telephone number of the person to be contacted regarding this report, and show the date that this report was completed.

Subpart E—Maintenance of Records; Verification of Information

§ 50.40 Maintenance of Records.

(a) Each operator of a mine shall maintain a copy of each investigation report required to be prepared under § 50.11 at the mine office closest to the mine for five years after the occurrence.

(b) Each operator shall maintain a copy of each report submitted under § § 50.20 or 50.30 at the mine office closest to the mine for five years after submission. Upon request by the Mine Safety and Health Administration, an operator shall make a copy of any report submitted under § § 50.20 or 50.30 available to MSHA for inspection or copying.

[42 FR 65535, Dec. 30, 1977, as amended at 43 FR 12318, Mar. 24, 1978]

§ 50.41 Verification of Reports.

Upon request by MSHA, an operator shall allow MSHA to inspect and copy information related to an accident, injury or illnesses which MSHA considers relevant and necessary to verify a report of investigation required by § 50.11 of this Part or relevant and necessary to a determination of compliance with the reporting requirements of this Part.

SUBCHAPTER N—METAL AND NONMETALLIC MINE SAFETY

PART 55—HEALTH AND SAFETY STANDARDS—METAL AND NONMETALLIC OPEN PIT MINES

Sec.
55.1 Purpose and scope.
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55.21 [Reserved]
55.22 [Reserved]
55.23 [Reserved]
55.24 [Reserved]
55.25 (Reserved)
55.26 Procedures.

AUTHORITY: Secs. 301(a) and 302(a) of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95-164, 30 U.S.C. 961 and 951 and 29 U.S.C. 577a, 91 Stat. 1317 and 91 Stat. 1319; sec. 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91-173 as amended by Pub. L. 95-164, 30 U.S.C. 957, 80 Stat. 803; sec. 6, 80 Stat. 774; 30 U.S.C. 725.

SOURCE: 34 FR 12504, July 31, 1969, unless otherwise noted.

NOTE: Nomenclature changes appear at 43 FR 12318, Mar. 24, 1978.

§ 55.1 Purpose and scope.

The regulations in this part are promulgated pursuant to section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) and prescribe health and safety standards for the purpose of the protection of life, the promotion of health and safety, and the prevention of accidents in open pit metal and nonmetallic mines which are subject to that Act. Each standard which is preceded by the word "Mandatory" is a mandatory standard. The violation of a mandatory standard will subject an operator to an order or notice under section 8 of the Act (30 U.S.C. 727).

§ 55.2 Definitions.

As used in this part:

"American Table of Distances" means the current edition of "The American Table of Distances for Storage of Explosives" published by the Institute of Makers of Explosives.

"Approved" means tested and accepted for a specific purpose by a nationally recognized agency.

"Authorized person" means a person approved or assigned by mine management to perform a specific type of duty or duties or to be at a specific location or locations in the mine.

"Barricaded" means obstructed to prevent the passage of persons, vehicles, or flying materials.

"Berm" means a pile or mound of material capable of restraining a vehicle.

"Blasting agent" means any substance classified as a blasting agent by the Department of Transportation in 49 CFR § 173.114a (44 FR 31182, May 31, 1979) which is incorporated by reference. This document is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Blasting area" means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury.

"Blasting cap" means a detonator which is initiated by a safety fuse.

"Blasting circuit" means the electrical circuit used to fire one or more electric blasting caps.

"Blasting switch" means a switch used to connect a power source to a blasting circuit.

"Booster" means any unit of explosive or blasting agent used for the purpose of perpetuating or intensifying an initial detonation.

"Capped fuse" means a length of safety fuse to which a blasting cap has been attached.

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"Capped primer" means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator.

"Circuit breaker" means a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent setting without injury to itself when properly applied within its rating.

"Combustible" means capable of being ignited and consumed by fire.

"Company official" means a member of the company supervisory or technical staff.

"Competent person" means a person having abilities and experience that fully qualify him to perform the duty to which he is assigned.

"Conductor" means a material, usually in the form of wire, cable, or bus bar, capable of carrying an electric current.

"Delay connector" means a non-electric short interval delay device for use in delaying blasts which are initiated by detonating cord.

"Detonating cord" means a flexible cord containing a solid core of high explosives.

"Detonator" means any device containing a detonating charge that is used to initiate an explosive and includes but is not limited to blasting caps, electric blasting caps and non-electric instantaneous or delay blasting caps.

"Distribution box" means a portable apparatus with an enclosure through which an electric circuit is carried to one or more cables from a single incoming feed line, each cable circuit being connected through individual overcurrent protective devices.

"Electric blasting cap" means a detonator designed for and capable of being initiated by means of an electric current.

"Electrical grounding" means to connect with the ground to make the earth part of the circuit.

"Employee" means a person who works for wages or salary in the service of an employer.

"Employer" means a person or organization which hires one or more persons to work for wages or salary.

"Explosive" means any substance classified as an explosive by the Department of Transportation in 49 CFR 173.53, 173.88 and 173.100 which are incorporated by reference. Title 49 CFR is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Face or bank" means that part of any mine where excavating is progressing or was last done.

"Flammable" means capable of being easily ignited and of burning rapidly.

"Flash point" means the minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure.

"Highway" means any public street, public alley, or public road.

"High potential" means more than 650 volts.

"Hoist" means a power driven windlass or drum used for raising ore; rock, or other material from a mine, and for lowering or raising men and material.

"Igniter cord" means a fuse, cordlike in appearance, which burns progressively along its length with an external flame at the zone of burning, and is used for lighting a series of safety fuses in the desired sequence.

"Insulated" means separated from other conducting surfaces by a dielectric substance permanently offering a high resistance to the passage of current and to disruptive discharge through the substance. When any substance is said to be insulated, it is understood to be insulated in a manner suitable for the conditions to which it is subjected. Otherwise, it is, within the purpose of this definition, uninsulated. Insulating covering is one means for making the conductor insulated.

"Insulation" means a dielectric substance offering a high resistance to the passage of current and to a disruptive discharge through the substance.

"Lay" means the distance parallel to the axis of the rope in which a strand makes one complete turn about the axis of the rope.

"Low potential" means 650 volts or less.

"Magazine" means a facility for the storage of explosives, blasting agents, or detonators.

"Major electrical installation" means an assemblage of stationary electrical equipment for the generation, transmission, distribution, or conversion of electrical power.

"Man trip" means a trip on which men are transported to and from a work area.

"Mill" includes any ore mill, sampling works, concentrator, and any crushing, grinding, or screening plant used at, and in connection with, an excavation or mine.

"Misfire" means the complete or partial failure of a blasting charge to explode as planned.

"Multipurpose dry-chemical fire extinguisher" means a listed or approved multipurpose dry-chemical fire extinguisher having a minimum rating of 2-A:10-B:C, by Underwriters Laboratories, Inc., and containing a minimum of 4.5 pounds of dry-chemical agent.

"Non-electric delay blasting cap" means a detonator with an integral delay element and capable of being initiated by miniaturized detonating cord.

"Overburden" means material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials or ores that are to be mined.

"Overload" means that current which will cause an excessive or dangerous temperature in the conductor or conductor insulation.

"Permissible" means a machine, material, apparatus, or device which has been investigated, tested, and approved by the Bureau of Mines or the Mine Safety and Health Administration and is maintained in permissible condition.

"Potable water" means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR Part 141, pages 169–182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR Part 72, Subpart J, pages 527–533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

"Powder chest" means a substantial, nonconductive, portable container equipped with a lid and used at blasting sites for explosives other than blasting agents.

"Primer" means a unit package, or cartridge of explosives used to initiate other explosives or blasting agents, and which contains a detonator.

"Reverse-current protection" means a method or device used on direct-current circuits or equipment to prevent the flow of current in the reverse direction.

"Roll protection" means a framework, safety canopy or similar protection for the operator when equipment overturns.

"Safety can" means an approved container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover.

"Safety fuse" means a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps or a black powder charge.

"Safety switch" means a sectionalizing switch that also provides shunt protection in blasting circuits between the blasting switch and the shot area.

"Scaling" means removal of insecure material from a face or highwall.

"Secondary safety connection" means a second connection between a conveyance and rope, intended to prevent the conveyance from running away or falling in the event the primary connection fails.

"Shaft" means a vertical or inclined shaft, a slope, incline, or winze.

"Short circuit" means an abnormal connection of relatively low resistance, whether made accidentally or intentionally, between two points of different potential in a circuit.

"Slurry" (as applied to blasting). See "Water gel."

"Stray current" means that portion of a total electric current that flows through paths other than the intended circuit.

"Substantial construction" means construction of such strength, material, and workmanship that the object will withstand all reasonable shock, wear, and usage, to which it will be subjected.

"Suitable" means that which fits, and has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Travelway" means a passage, walk or way regularly used and designated for persons to go from one place to another.

"Trip light" means a light displayed on the opposite end of a train from the locomotive or engine.

"Water gel" or "Slurry" (as applied to

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blasting) means an explosive or blasting agent containing substantial portions of water.

"Wet drilling" means the continuous application of water through the central hole of hollow drill steel to the bottom of the drill hole.

"Working place" means any place in or about a mine where work is being performed.

§ 55.3 Ground control.

55.3–1 *Mandatory.* Standards for the safe control of pit walls, including the overall slope of the pit wall, shall be established and followed by the operator. Such standards shall be consistent with prudent engineering design, the nature of the ground and the kind of material and mineral mined, and the ensuring of safe working conditions according to the degree of slope. Mining methods shall be selected which will ensure wall and bank stability, including benching as necessary to obtain a safe overall slope.

55.3–2 *Mandatory.* Loose, unconsolidated material shall be stripped for a safe distance, but in no case less than 10 feet, from the top of pit or quarry walls, and the loose, unconsolidated material shall be sloped to the angle of repose.

55.3–3 *Mandatory.* To ensure safe operation, the width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

55.3–4 *Mandatory.* Safe means for scaling pit banks shall be provided. Hazardous banks shall be scaled before other work is performed in the hazardous bank area.

55.3–5 *Mandatory.* Men shall not work near or under dangerous banks. Overhanging banks shall be taken down immediately and other unsafe ground conditions shall be corrected promptly, or the areas shall be barricaded and posted.

55.3–6 *Mandatory.* Men shall approach from above loose rock and areas to be scaled and shall scale from a safe location.

55.3–7 [Reserved]

55.3–8 *Mandatory.* The supervisor, or a competent person designated by him, shall examine working areas and faces for unsafe conditions at least at the beginning of each shift and after blasting. Any unsafe condition found shall be corrected before any further work is performed at the immediate area or face at which the unsafe condition exists.

55.3–9 *Mandatory.* Men shall examine their working places before starting work and frequently thereafter, and any unsafe condition shall be corrected.

55.3–10 and 55.3–11 [Reserved]

55.3–12 *Mandatory.* Men shall not work between equipment and the pit wall or bank where the equipment may hinder escape from falls or slides of the bank.

55.3–13 through 55.3–49 [Reserved]

55.3–50 *Mandatory.* Material, other than hanging material, to be broken by secondary drilling and blasting, or by any other method shall be positioned or blocked to prevent hazardous movement before persons commence breaking operations. Persons who perform those operations shall work from a location where, if movement of material occurs, those persons will not be endangered.

55.3–51 *Mandatory.* Where manual scaling may be required at a work place, a scaling bar of sufficient length to place the user out of danger of falling material shall be provided. The scaling bar shall be blunt on the end held by the user. Picks or other short tools shall not be used for scaling when their use places the user in danger of falling material.

55.3–52 [Reserved]

55.3–53 *Mandatory.* When rock bolts are used as a means of ground support, anchorage test procedures shall be established and tests shall be conducted to determine the anchorage capacity of rock-bolt installations. Test results shall be in writing and made available to the Secretary or his duly authorized representative.

55.3–54 *Mandatory.* Rock bolts used as a means of ground support and which require torquing shall be torqued to a value within the range determined from information obtained by tests in the strata in which the rock-bolt assembly is used. In no case shall the applied torque cause a bolt tension that would exceed the yield point or anchorage capacity of the rock-bolt assembly being used.

55.3–55 *Mandatory.* When installing point-anchor rock bolts:

(a) A torque test shall be conducted on at least every fourth installed bolt.

(b) Torque testing shall be conducted immediately after bolt installation.

(c) If the recommended torque has not

been achieved, the equipment used to install the bolt shall be adjusted and the next bolt installed shall then be tested.

(d) If the recommended torque has not been achieved on the majority of bolts installed in a working place through equipment adjustment, supplemental support equivalent to longer roof bolts with adequate anchorage, steel or wood sets, or cribs shall be installed.

55.3–56 *Mandatory.* Rock bolt hole drill bits shall be easily identifiable by sight or feel and diameters shall be within a tolerance of ±0.030 inches of the manufacturer's recommended hole diameter for the anchor used.

55.3–57 *Mandatory.* If used in rock-bolt assemblies to reduce friction between the bolt head and the bearing plate, washers shall: (a) Have hardness in the range of 35–45 HRC (Hardness Rockwell C Scale). (b) Conform to the shape of the bolt head and bearing plate. (c) Have sufficient strength to withstand loads up to the yield point of the rock bolt.

55.3–58 [Reserved]

§ 55.4 Fire prevention and control.

55.4–1 *Mandatory.* No person shall smoke or use an open flame—

(a) Where flammable solvents, liquids, fluids, or other flammable materials are stored, transported, handled, or used; or

(b) Where oil or grease is stored, transported, handled, or used, if smoking or the use of an open flame may cause a fire; or

(c) Within an unsafe distance of any area where smoking or the use of an open flame may cause a fire or an explosion.

55.4–2 *Mandatory.* Signs warning against smoking and open flames shall be posted so they can be readily seen in areas or places where fire or explosion hazards exist.

55.4–3 *Mandatory.* Areas surrounding electric substations and unburied tanks used for the storage of flammable or combustible liquids shall be free of combustible materials (including dry vegetation) for a distance of at least 25 feet.

55.4–4 *Mandatory.* Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association or other recognized agencies approved by the Mine Safety and Health Administration. Small quantities of flammable liquids drawn from storage shall be kept in appropriately labeled safety cans.

55.4–5 *Mandatory.* Effective February 13, 1980, fixed unburied tanks used for the storage of flammable or combustible liquids shall be securely mounted on firm foundations. Where necessary to prevent leaks caused by tanks settling, piping shall be provided with flexible connections or other special fittings.

55.4–6 [Reserved]

55.4–7 *Mandatory.* Means shall be provided to remove or control spilled flammable or combustible liquids.

55.4–8 *Mandatory.* Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.

55.4–9 *Mandatory.* All heat sources, including lighting equipment, capable of producing combustion shall be insulated or isolated from combustible materials.

55.4–10 *Mandatory.* Power wires and cables shall be adequately insulated where they pass through doors or walls or where they present a fire hazard.

55.4–11 *Mandatory.* Abandoned electrical circuits shall be deenergized and isolated so that they cannot become energized inadvertently.

55.4–12 *Mandatory.* All flammable and combustible waste materials, grease, lubricants or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

55.4–13 *Mandatory.* In areas where materials such as oily waste or oily rags create a fire hazard, the materials shall be placed in covered metal containers until disposed of properly.

55.4–14 *Mandatory.* Solvents with flash points lower than 100° F. (38° C.) shall not be used for cleaning.

55.4–15 *Mandatory.* Solvents shall not be used near an open flame or other ignition source, or near any source of heat, or in an atmosphere that can elevate the temperature of the solvent above the flash point.

55.4–16 *Mandatory.* Drip pans shall be provided to catch leakage or spillage whenever combustible or flammable liquids are dispensed in a place or manner which may create a fire hazard. Floor areas where drip pans are used shall be cleaned immediately after spills.

55.4–17 [Reserved]

55.4–18 *Mandatory.* Oxygen cylinders shall not be stored in rooms or areas used or designated for oil or grease storage.

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55.4–19 *Mandatory.* Gages and regulators used with oxygen or acetylene cylinders shall be kept clean and free of oil and grease.

55.4–20 *Mandatory.* Battery-charging stations shall be located in well-ventilated areas.

55.4–21 *Mandatory.* Equipment powered by internal combustion engines (except diesel engines), where the fuel tank is an integral part of the equipment, shall be shut off and stopped before being fueled.

55.4–22 *Mandatory.* Each mine shall have available or be provided with suitable fire fighting equipment adequate for the size of the mine.

55.4–23 *Mandatory.* Fire fighting equipment which is provided on the mine property shall be strategically located, readily accessible, plainly marked, properly maintained, and inspected periodically. Records shall be kept of such inspections.

55.4–24 *Mandatory.* Fire extinguishers and fire suppression devices shall be:

(a) Of the appropriate type for the particular fire hazard involved.

(b) Adequate in number and size for the particular fire hazard involved.

(c) Replaced with a fully charged extinguisher or device, or recharged immediately, after any discharge is made from the extinguisher or device.

(d) Inspected, tested, and maintained at regular intervals according to the manufacturer's recommendations.

(e) Approved by the Underwriter's Laboratories, Inc., or other competent testing agency acceptable to the Mine Safety and Health Administration.

55.4–25 *Mandatory.* Effective February 13, 1980, whenever fire hydrants are used, they shall be provided with—

(a) Uniform fittings;

(b) Readily available wrenches or keys to open the valves; and

(c) Readily available adapters that connect hydrant fittings to the hose equipment of local fire departments.

55.4–26 *Mandatory.* Water pipes, valves, outlets, hydrants, and hoses designated for fire fighting purposes shall be inspected every 90 days and tested annually.

55.4–27 *Mandatory.* Whenever self-propelled mobile equipment is used, such equipment shall be provided with a suitable fire extinguisher readily accessible to the equipment operator.

55.4–28 *Mandatory.* Welding, cutting, arc welding or soldering shall be performed by a competent person.

55.4–29 *Mandatory.* When welding or cutting, suitable precautions shall be taken to ensure that smoldering metal or sparks do not result in a fire. Fire extinguishing equipment shall be immediately available at the site.

55.4–30 through 55.4–32 [Reserved]

55.4–33 *Mandatory.* Valves on oxygen and acetylene tanks shall be kept closed when the contents are not being used.

55.4–34 [Reserved]

55.4–35 *Mandatory.* Before any heat is applied to pipelines or containers which have contained flammable or combustible substances, they shall be drained, ventilated, thoroughly cleaned of residual substances and filled with either an inert gas or, where compatible, filled with water.

55.4–36 through 55.4–38 [Reserved]

55.4–39A *Mandatory.* Effective February 13, 1980, storage buildings or rooms in which flammable or combustible liquids or other flammable materials are stored and which are within 100 feet of where miners normally work shall be well-ventilated and constructed of materials having a fire-resistance rating of no less than one (1) hour as tested under the appropriate National Fire Protection Association (NFPA) fire-resistance test or under a test of another approved testing agency.

55.4–39B *Mandatory.* Emergency fire fighting plans in combination with evacuation and rescue plans shall be established and coordinated with available fire fighting organizations. Emergency fire fighting drills shall be held for each shift at least once every six (6) months.

55.4–39C through 55.4–39Z [Reserved]

55.4–40 *Mandatory.* Fire alarm systems shall be provided and maintained in operating condition or adequate fire alarm procedures shall be established to warn promptly all persons endangered by a fire.

55.4–41 *Mandatory.* Every building or structure where persons normally work shall be provided with exits sufficient to permit the prompt escape of persons in case of fire.

55.4–42 through 55.4–46 [Reserved]

55.4–47 *Mandatory.* Belt conveyors shall be equipped with a safety switch capable of automatically stopping the drive pulley in the event of excessive slippage of the belt, where ignition of the belt could create a hazard to personnel. When it is nec-

essary to operate the conveyor while temporarily by-passing the safety switch or any automatic function of the switch, a person shall attend the belt at the drive pulley.

55.4-48 *Mandatory.* All employees shall be instructed at least once each calendar year on fire alarm signals and applicable procedures to be followed in case of fire or other emergency. Records of instruction shall be kept for two years.

55.4-49 [Reserved]

§ 55.5 Air quality and physical agents.

Air Quality

55.5-1 *Mandatory.* Except as permitted by § 55.5-5:

(a) Except as provided in paragraph (b), the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54, which are hereby incorporated by reference and made a part hereof. This publication may be obtained from the American Conference of Governmental Industrial Hygienists by writing to the Secretary-Treasurer, P.O. Box 1937, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration. Excursions above the listed thresholds shall not be of a greater magnitude than is characterized as permissible by the Conference.

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

(c) Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant.

55.5-2 *Mandatory.* Dust, gas, mist, and fume surveys shall be conducted as frequently as necessary to determine the adequacy of control measures.

55.5-3 *Mandatory.* Holes shall be collared and drilled wet, or other efficient dust control measures shall be used when drilling non-water-soluble material. Efficient dust control measures shall be used when drilling water-soluble materials.

55.5-4 [Reserved]

55.5-5 *Mandatory.* Control of employee exposure to harmful airborne contaminants shall be, insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. However, where accepted engineering control measures have not been developed or when necessary by the nature of work involved (for example, while establishing controls or occasional entry into hazardous atmospheres to perform maintenance or investigation), employees may work for reasonable periods of time in concentrations of airborne contaminants exceeding permissible levels if they are protected by appropriate respiratory protective equipment. Whenever respiratory protective equipment is used a program for selection, maintenance, training, fitting, supervision, cleaning, and use shall meet the following minimum requirements:

(a) Mine Safety and Health Administration approved respirators which are applicable and suitable for the purpose intended shall be furnished, and employees shall use the protective equipment in accordance with training and instruction.

(b) A respirator program consistent with the requirements of ANSI Z88.2-1969, published by the American National Standards Institute and entitled "American National Standards Practices for

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Respiratory Protection ANSI Z88 2–1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

(c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment.

55.5–6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-Nitrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethylenelmine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

55.5–7 through 55.5–9 [Reserved]

55.5–10 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

55.5–11 through 55.5–49 [Reserved]

Physical Agents

55.5–50 *Mandatory.* (a) No employee shall be permitted an exposure to noise in excess of that specified in the table below. Noise level measurements shall be made using a sound level meter meeting specifications for type 2 meters contained in American National Standards Institute (ANSI) Standard S1.4–1971, "General Purpose Sound Level Meters," approved April 27, 1971, which is hereby incorporated by reference and made a part hereof, or by a dosimeter with similar accuracy. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

Permissible Noise Exposures

Duration per day, hours of exposure:	*Sound level, dBA, slow response*
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

No exposure shall exceed 115 dBA. Impact or impulsive noises shall not exceed 140 dB, peak sound pressure level.

Note. When the daily noise exposure is composed of two or more periods of noise exposure at different levels, their combined effect shall be considered rather than the individual effect of each.

If the sum

$$(C_1/T_1)+(C_2/T_2)+\ldots(C_n/T_n)$$

exceeds unity, then the mixed exposure shall be considered to exceed the permissible exposure. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level. Interpolation between tabulated values may be determined by the following formula:

$$\log T = 6.322 - 0.0602\ SL$$

Where T is the time in hours and SL is the sound level in dBA.

(b) When employees' exposure exceeds that listed in the above table, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce exposure to within permissible levels, personal protection equipment shall be provided and used to reduce sound levels to within the levels of the table.

§ 55.6 Explosives.

The term "explosives" as used in this § 55.6 includes blasting agents. The standards in this section in which the term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

STORAGE

55.6-1 *Mandatory.* Detonators and explosives other than blasting agents shall be stored in magazines.

55.6-2 *Mandatory.* Detonators shall not be stored in the same magazine with explosives.

55.6-3 and 55.6-4 [Reserved]

55.6-5 *Mandatory.* Areas surrounding magazines and facilities for the storage of blasting agents shall be kept clear of rubbish, brush, dry grass, or trees (other than live trees 10 or more feet tall), for a distance not less than 25 feet in all directions, and other unnecessary combustible materials for a distance of not less than 50 feet.

55.6-6 [Reserved]

55.6-7 *Mandatory.* Explosives, detonators, and related materials such as safety fuse and detonating cord shall be:

(a) Stored in a manner to facilitate use of oldest stocks first.

(b) Stored according to brand and grade in such a manner as to facilitate identification.

(c) Stored with their top sides up.

(d) Stacked in a stable manner but not more than eight (8) feet high.

55.6-8 *Mandatory.* Ammonium nitrate-fuel oil blasting agents shall be physically separated from other explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the other explosives, safety fuse, or detonating cord.

55.6-9 [Reserved]

55.6-10 [Reserved]

55.6-11 *Mandatory.* Containers of explosives, blasting agents, and detonators shall be closed while being stored.

55.6-12 *Mandatory.* Prior to interior repair of facilities for storage of explosives, including blasting agents, all materials stored within the facility shall be removed and the interior cleaned. Prior to the exterior repair of such facilities, all materials stored within the facility shall be removed if there exists a possibility that such repairs may produce a spark or flame. The explosives removed from storage facilities to be repaired shall be placed either in other storage facilities appropriate for the storage of such materials under this section or a safe distance from the facilities under repair where they shall be properly guarded and protected until the repairs have been completed and the materials have been returned to storage within the facilities.

55.6-13 through 55.6-19 [Reserved]

55.6-20 *Mandatory.* Magazines shall be:

(a) Located in accordance with the current American Table of Distances for Storage of Explosives.

(b) Detached structures located away from powerlines, fuel storage areas, and other possible sources of fire.

(c) Constructed substantially of noncombustible material or covered with fire-resistant material.

(d) Reasonably bullet resistant.

(e) Electrically bonded and grounded if constructed of metal.

(f) Made of nonsparking materials on the inside, including floors.

(g) Provided with adequate and effectively screened ventilation openings near the floor and ceiling.

(h) Kept locked securely when unattended.

(i) Posted with suitable danger signs so located that a bullet passing through the face of a sign will not strike the magazine.

(j) Used exclusively for storage of explosives or detonators and kept free of all extraneous materials.

(k) Kept clean and dry in the interior, and in good repair.

(l) Unheated, unless heated in a manner that does not create a fire or explosion hazard. Electrical heating devices shall not be used inside a magazine.

55.6-21 through 55.6-39 [Reserved]

TRANSPORTATION

55.6-40 *Mandatory.* Explosives and detonators shall be transported in separate vehicles unless separated by 4 inches of hardwood or the equivalent.

55.6-41 *Mandatory.* When explosives and detonators are hauled by trolley locomotive, covered, electrically-insulated cars shall be used.

55.6-42 *Mandatory.* Self-propelled vehicles used to transport explosives or det-

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onators shall be equipped with suitable fire extinguishers.

55.6–43 *Mandatory.* Vehicles containing explosives or detonators shall be posted with proper warning signs.

55.6–44 *Mandatory.* When vehicles containing explosives or detonators are parked, the brakes shall be set, the motive power shut off, and the vehicles shall be blocked securely against rolling.

55.6–45 *Mandatory.* Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.

55.6–46 *Mandatory.* Vehicles containing explosives or detonators shall be maintained in good condition and shall be operated at a safe speed and in accordance with all safe operating practices.

55.6–47 *Mandatory.* Vehicles used to transport explosives, other than blasting agents, shall have substantially constructed bodies, no sparking metal exposed in the cargo space, and shall be equipped with suitable sides and tail gates; explosives shall not be piled higher than the side or end enclosures.

55.6–48 *Mandatory.* Explosives and blasting agents shall be transported without undue delay, and over routes and at times that expose a minimum number of persons.

55.6–49 [Reserved]

55.6–50 *Mandatory.* Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives, detonating cord or detonators, except for safety fuse, and except for properly secured, nonsparking equipment used expressly in the handling of such explosives, detonating cord or detonators.

55.6–51 *Mandatory.* Explosives or detonators shall not be transported on locomotives.

55.6–52 [Reserved]

55.6–53 *Mandatory.* Only the necessary attendants shall ride on or in vehicles containing explosives or detonators.

55.6–54 *Mandatory.* Explosives or detonators shall not be transported on man trips.

55.6–55 [Reserved]

55.6–56 *Mandatory.* Substantial nonconductive containers shall be used to carry explosives to blasting sites.

55.6–57 *Mandatory.* Nonconductive containers with tight-fitting covers shall be used to transport or carry capped fuses and electric detonators to blasting sites.

55.6–58 through 55.6–64 [Reserved]

55.6–65 *Mandatory.* Vehicles containing detonators or explosives, other than blasting agents, shall not be left unattended except in blasting areas where loading or charging is in progress.

55.6–66 through 55.6–89 [Reserved]

Use

55.6–90 *Mandatory.* Persons who use or handle explosives or detonators shall be experienced men who understand the hazards involved; trainees shall do such work only under the supervision of and in the immediate presence of experienced men.

55.6–91 *Mandatory.* Blasting operations shall be under the direct control of authorized persons.

55.6–92 *Mandatory.* Damaged or deteriorated explosives and blasting agents shall be destroyed in a safe manner under the instructions of the explosives or blasting agent manufacturer or its designated agent.

55.6–93 *Mandatory.* Boreholes shall be cleared of obstructions before charging.

55.6–94 *Mandatory.* Holes to be blasted shall be charged as near to blasting time as practical and such holes shall be blasted as soon as possible after charging has been completed. In no case shall the time elapsing between the completion of charging to the time of blasting exceed 72 hours unless prior approval has been obtained from the Mine Safety and Health Administration.

55.6–95 [Reserved]

55.6–96 *Mandatory.* Explosives shall be kept separated from detonators until charging is started.

55.6–97 *Mandatory.* Primers shall be made up only at the time of use and as close to the blasting area as conditions allow.

55.6–98 *Mandatory.*

(a) Primers containing a detonator shall be prepared with the detonator contained securely and completely within the explosive charge or within a suitable tunnel or cap well.

(b) When using detonating cord to initiate another explosive, a connection shall be prepared with the detonating cord threaded through, attached securely to, or otherwise in intimate contact with the explosive charge.

55.6–99 *Mandatory.* Only wooden or other nonsparking implements shall be

used to punch holes in an explosive cartridge.

55.6–100 *Mandatory.* Tamping poles shall be of wood or other material acceptable to the Mine Safety and Health Administration. Couplers of tamping poles shall be of nonsparking materials.

55.6–101 *Mandatory.* Tamping shall not be done directly on a primer.

55.6–102 *Mandatory.* Unused explosives and detonators shall be moved to a safe location as soon as charging operations are completed.

55.6–103 *Mandatory.* Areas in which charged holes are awaiting firing shall be guarded, or barricaded and posted, or flagged against unauthorized entry.

55.6–104 *Mandatory.* When safety fuse has been used, men shall not return to misfired holes for at least 30 minutes.

55.6–105 *Mandatory.* When electric blasting caps have been used, men shall not return to misfired holes for at least 15 minutes.

55.6–106 *Mandatory.* Faces and muck piles shall be examined by a competent person for undetonated explosives or blasting agents and any undetonated explosives or blasting agents found shall be disposed of safely.

55.6–107 *Mandatory.* Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

55.6–108 *Mandatory.* Fuse and igniters shall be stored in a cool, dry place away from oils or grease.

55.6–109 *Mandatory.* Safety fuse, igniter cord, and detonating cord shall not be used if they have been kinked, bent sharply, or otherwise damaged.

55.6–110 *Mandatory.* Fuses shall be cut and capped in safe, dry locations posted with "No Smoking" signs.

55.6–111 *Mandatory.* Blasting caps shall be crimped to fuses only with implements designed for that specific purpose.

55.6–112 *Mandatory.* The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all men concerned with blasting.

55.6–113 *Mandatory.* When firing from 1 to 15 blastholes with safety fuse ignited individually using hand-held lighters, the fuses shall be of such lengths to provide the minimum burning time specified in the following table for a particular size round:

Number of holes in a round	*Minimum burning time, minutes*
1	2
2–5	2½
6–10	3½
11–15	5

In no case shall any 40-second-per-foot safety fuse less than 36 inches long or any 30-second-per-foot safety fuse less than 48 inches long be used.

55.6–114 *Mandatory.* At least two men shall be present when lighting fuses, and no man shall light more than 15 individual fuses. If more than 15 holes per man are to be fired, igniter cord and connectors or electric blasting shall be used.

55.6–115 *Mandatory.* All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunklines.

55.6–116 *Mandatory.* Fuse shall be ignited with hot-wire lighters, lead spitters, igniter cord, or other such devices designed for this purpose. Carbide lights shall not be used to light fuses.

55.6–117 *Mandatory.* Fuse shall not be ignited before the primer and the entire charge are securely in place.

55.6–118 *Mandatory.* When using safety fuse, where fly rock might damage unlit or burning fuses, timing shall be such that all fuses are burning within the holes before any hole detonates.

55.6–119 *Mandatory.* Electric detonators of different brands shall not be used in the same round.

55.6–120 *Mandatory.* Except when being tested with a blasting galvanometer:

(a) Electric detonators shall be kept shunted until they are being connected to the blasting line or wired into a blasting round.

(b) Wired rounds shall be kept shunted until they are being connected to the blasting line.

(c) Blasting lines shall be kept shunted until immediately before blasting.

55.6–121 *Mandatory.* When blasting electrically a blasting galvanometer, or other instrument that is specifically designed for testing blasting circuits, shall be used to test:

(a) In surface operations:

(1) Continuity of each electric blasting cap in the borehole prior to the addition of stemming.

(2) Resistance of individual series or the

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resistance of multiple balanced series to be connected in parallel prior to their connection to the blasting line.

(3) Continuity of blasting lines prior to the connection of electric blasting cap series.

(4) Total blasting circuit resistance prior to connection to the power source.

(b) In underground operations:

(1) Continuity of each electric blasting cap series.

(2) Continuity of blasting lines prior to the connection of electric blasting caps.

55.6–122 *Mandatory.* Permanent blasting lines shall be properly supported, insulated and kept in good repair.

55.6–123 *Mandatory.* When electric detonators are used, charging shall be stopped immediately when the presence of static electricity or stray currents is detected; the condition shall be remedied before charging is resumed.

55.6–124 *Mandatory.* When electric detonators are used, charging shall be suspended in surface mining, shaft sinking, and tunneling and men withdrawn to a safe location upon the approach of an electrical storm.

55.6–125 *Mandatory.* If branch circuits are used when blasts are fired from power circuits, safety switches located at safe distances from the blast areas shall be provided in addition to the main blasting switch.

55.6–126 *Mandatory.* Electric power distribution circuits shall be de-energized within 50 feet of boreholes containing electric blasting caps which can be initiated by conventional power sources or extraneous electricity except that such circuits need not be de-energized between 25 and 50 feet of such boreholes when stray current tests, conducted as frequently as necessary, measure a maximum stray current less than 0.05 amperes through a one-ohm resistor measured at the location of the electric blasting cap.

55.6–127 *Mandatory.* Blasting switches shall be locked in the open position, except when closed to fire the blast. Lead wires shall not be connected to the blasting switch until the shot is ready to be fired.

55.6–128 *Mandatory.* The key or other control to an electrical firing device shall be entrusted only to the person designated to fire the round or rounds.

55.6–129 *Mandatory.* Electric circuits from the blasting switches to the blast area shall not be grounded.

55.6–130 *Mandatory.* At least a 15-foot air gap shall be provided between the blasting circuit and the electric power source.

55.6–131 *Mandatory.* Power sources shall be suitable for the number of electric detonators to be fired and for the type of circuits used.

55.6–132 *Mandatory.* Delay connectors shall be treated and handled with the same safety precautions as detonators.

55.6–133 *Mandatory.* If any part of a blast is connected in parallel and is to be initiated from powerlines or lighting circuits, the time of current flow shall be limited to a maximum of 25 milliseconds by incorporating an arcing control device in the blasting circuit or by interrupting the circuit with an explosive charge attached to one or both lead lines and initiated by a zero-delay electric blasting cap.

55.6–134 *Mandatory.* Tools used for opening metal or nailed wooden containers of explosives or detonators shall be of nonsparking materials.

55.6–135 *Mandatory.* Holes shall not be collared in bootlegs.

55.6–136 *Mandatory.* Black powder shall not be used for blasting except when a desired result cannot be obtained with another type of explosive such as in quarrying certain types of dimension stone.

55.6–137 *Mandatory.* In the use of black blasting powder:

(a) Containers shall not be opened in, or within 50 feet of, any magazine; within any building in which a fuel-fired or exposed-element electric heater is in operation; where electrical or incandescent-particle sparks could result in powder ignition; or within 50 feet of any open flame.

(b) Granular powder shall be transferred from containers only by pouring.

(c) Spills of granular powder shall be cleaned up promptly with nonsparking equipment; contaminated powder shall be put into a container of water and its content disposed of promptly after the granules have disintegrated, or the spill area shall be flushed with a copious amount of water to completely disintegrate the granules.

(d) Containers of powder shall be kept securely closed at all times other than when the powder is being transferred from or into a container.

(e) Containers of powder transported by vehicles shall be in a wholly enclosed cargo space.

(f) Misfires shall be disposed of by: (1) washing the stemming and powder charge from the borehole, and (2) removal and disposal of the initiator as a damaged explosive.

(g) Boreholes of shots that fire but fail to break, or fail to break properly, shall not be recharged for at least 12 hours.

55.6–138 *Mandatory.* Explosives or blasting agents shall not be loaded into drilled or sprung holes that could result in premature detonation from heat.

55.6–139 *Mandatory.* Blasting areas shall not be re-entered after firing until concentrations of smoke, dust, and fumes have been reduced to safe limits as required in, and determined by, mandatory standards 55.5–1 and 55.5–2, respectively.

55.6–140 *Mandatory.* Blasting circuits and electric blasting caps (which are capable of being initiated by conventional power sources) shall be protected from sources of extraneous electricity.

55.6–141 [Reserved]

55.6–142 *Mandatory.* Explosives or blasting agents shall not be loaded into boreholes through or with either drill stem equipment or other devices which could be extracted while containing explosives or blasting agents. The use of loading hose, collar sleeves or collar pipes is permitted.

55.6–143 through 55.6–158 [Reserved]

55.6–159 *Mandatory.* Powder chests shall be:

(a) Substantially constructed of nonsparking material on the inside.

(b) Posted with suitable warning signs.

(c) Located out of the blast area and out of the line of blasts.

(d) Emptied and their contents returned to the main magazine at the end of each shift unless the powder chest is located within the area continually attended by employees during shift changes.

(e) Separate for detonators and explosives unless separated by 4 inches of hardwood or the equivalent.

(f) Keep locked when unattended.

55.6–160 *Mandatory.* Ample warning shall be given before blasts are fired. All persons shall be cleared and removed from the blasting area unless suitable blasting shelters are provided to protect men endangered by concussion or flyrock from blasting.

55.6–161 *Mandatory.* If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one shall return to the hole until the danger has passed, but in no case within 1 hour.

55.6–162 *Mandatory.* Lead wires and blasting lines shall not be strung across power conductors, pipelines, railroad tracks, or within 20 feet of bare powerlines. They shall be protected from sources of static or other electrical contact.

55.6–163 *Mandatory.* The double-trunkline or loop system shall be used in detonating-cord blasting.

55.6–164 *Mandatory.* Trunklines, in multiple-row blasts, shall make one or more complete loops, with crossties between loops at intervals of not over 200 feet.

55.6–165 [Reserved]

55.6–166 [Reserved]

55.6–167 [Reserved]

55.6–168 *Mandatory.* Misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in that blasting area.

55.6–169 through 55.6–189 [Reserved]

Sensitized Ammonium Nitrate Blasting Agents

All of the standards in this § 55.6 in which the term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

55.6–190 through 55.6–192 [Reserved]

55.6–193 *Mandatory.* Where pneumatic loading is employed, before any type of blasting operation using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be made. Adequate steps, including the grounding and bonding of the conductive parts of pneumatic loading equipment, shall be taken to eliminate the hazard of static electricity before blasting agent use is commenced.

55.6–194 *Mandatory.* Pneumatic loading equipment shall not be grounded to waterlines, air lines, rails, or the permanent electrical grounding systems.

55.6–195 *Mandatory.* Hoses used in connection with pneumatic loading machines shall be of the semiconductive type, having a total resistance low enough to permit the dissipation of static electricity and high enough to limit the flow

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of stray electric currents to a safe level. Wire-countered hose shall not be used because of the potential hazard from stray electric currents.

55.6–196 and 55.6–197 [Reserved]

55.6–198 *Mandatory.* Plastic tubes shall not be used as hole liners if blasting agents are loaded pneumatically into holes containing an electric detonator.

55.6–199 [Reserved]

55.6–200 *Mandatory.* Vehicles used to transport blasting agents shall have substantially constructed bodies, no zinc or copper exposed in the cargo space and shall be freely vented. Blasting agents shall not be piled higher than the side or end enclosures of open-body vehicles. If an enclosed screw conveyor is used to discharge blasting agents from the vehicle the conveyor shall be protected against excessive internal pressure and excessive frictional heat.

55.6–201 through 55.6–249 [Reserved]

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55.6–250 *Mandatory.* Smoking and open flames, except for the use of suitable devices for igniting safety fuse or the use of approved heating devices, shall not be permitted within 50 feet as measured by the line of sight of explosives, blasting agents, or detonators or within 25 feet when out of line of sight and separated by permanent noncombustible barriers in underground active workings.

§ 55.7 Drilling.

55.7–1 [Reserved]

55.7–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

55.7–3 *Mandatory.* The drilling area shall be inspected for hazards before starting the drilling operations.

55.7–4 *Mandatory.* Men shall not be on a mast while the drill-bit is in operation unless they are provided with a safe platform from which to work and they are required to use safety belts to avoid falling.

55.7–5 *Mandatory.* Drill crews and others shall stay clear of augers or drill stems that are in motion. Persons shall not pass under or step over a moving stem or auger.

55.7–6 and 55.7–7 [Reserved]

55.7–8 *Mandatory.* When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position.

55.7–9 *Mandatory.* If a drill helper assists the drill operator during movement of a drill to a new location, the helper shall be in sight of, or in communication with, the operator at all times.

55.7–10 *Mandatory.* In the event of power failure, drill controls shall be placed in the neutral position until power is restored.

55.7–11 *Mandatory.* The drill stem shall be resting on the bottom of the hole or on the platform with the stem secured to the mast before attempts are made to straighten a crossed cable on a reel.

55.7–12 *Mandatory.* While in operation, drills shall be attended at all times.

55.7–13 *Mandatory.* Drill holes large enough to constitute a hazard shall be covered or guarded.

55.7–14 through 55.7–17 [Reserved]

55.7–18 *Mandatory.* Men shall not hold the drill steel while collaring holes, or rest their hands on the chuck or centralizer while drilling.

55.7–19 [Reserved]

55.7–20 through 55.7–49 [Reserved]

55.7–50 *Mandatory.* Receptacles or racks shall be provided for drill steel and tools stored or carried on drills.

55.7–51 *Mandatory.* To prevent injury to personnel, tools and other objects shall not be left loose on the mast or drill platform.

55.7–52 *Mandatory.* Persons shall not drill from—

(a) Positions which hinder their access to the control levers;

(b) Insecure footing or insecure staging; or

(c) Atop equipment not suitable for drilling.

55.7–53 *Mandatory* Before hand-held drills are moved from one working area to another, air shall be turned off and bled from the hose.

55.7–54 through 55.7–100 [Reserved]

§ 55.8 Rotary jet piercing.

55.8–1 *Mandatory.* Jet piercing drills shall be provided with—

(a) A system to pressurize the equipment operator's cab, when a cab is provided; and

(b) A protective cover over the oxygen flow indicator.

55.8–2 *Mandatory* Safety chains or other suitable locking devices shall be provided across connections to and between high pressure oxygen hose lines of 1-inch inside diameter or larger.

55.8–3 *Mandatory* A suitable means of protection shall be provided for the employee when lighting the burner.

55.8–4 *Mandatory.* When rotary jet piercing equipment requires refueling at locations other than fueling stations, a system for fueling without spillage shall be provided.

55.8–5 *Mandatory.* Men shall not smoke and open flames shall not be used in the vicinity of the oxygen storage and supply lines. Signs warning against smoking and open flames shall be posted in these areas.

55.8–6 *Mandatory.* The oxygen intake coupling on jet piercing drills shall be constructed so that only the oxygen hose can be coupled to it.

55.8–7 *Mandatory.* The combustion chamber of a jet drill stem which has been sitting unoperated in a drill hole shall be flushed with a suitable solvent after the stem is pulled up.

§ 55.9 Loading, hauling, dumping.

55.9–1 *Mandatory.* Self-propelled equipment that is to be used during a shift shall be inspected by the equipment operator before being placed in operation. Equipment defects affecting safety shall be reported to, and recorded by the mine operator. The records shall be maintained at the mine or nearest mine office for at least 6 months from the date the defects are recorded. Such records shall be made available for inspection by the Secretary of Labor or his duly authorized representative.

55.9–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

55.9–3 *Mandatory.* Powered mobile equipment shall be provided with adequate brakes.

55.9–4 [Reserved]

55.9–5 *Mandatory.* Operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.

55.9–6 *Mandatory.* When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor. When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

55.9–7 *Mandatory.* Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.

55.9–8 [Reserved]

55.9–9 *Mandatory.* Operators shall sound warning before starting trains and when trains approach crossings, other trains on adjacent tracks, persons, and any place where vision is obscured.

55.9–10 *Mandatory.* Equipment operators' cabs shall not be equipped, altered or otherwise modified in a manner which impairs operating visibility.

55.9–11 *Mandatory.* Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.

55.9–12 *Mandatory.* Cabs of mobile equipment shall be kept free of extraneous materials.

55.9–13 *Mandatory.* Adequate backstops or brakes shall be installed on inclined conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel would be caused.

55.9–14 *Mandatory.* No person shall be permitted to ride a power-driven chain, belt, or bucket conveyor, unless the belt is specifically designed for the transportation of persons.

55.9–15 *Mandatory.* Unless the operator is otherwise protected, slushers in excess of 10 horsepower shall be provided with backlash guards. All slushers shall be equipped with rollers, and drum covers, and anchored securely before slushing operations are started.

55.9–16 *Mandatory.* Roadbeds, rails, joints, switches, frogs, and other trackage elements on railroads subject to the control of the operator shall be designed, installed and maintained in a safe manner consistent with the speed and type of haulage.

55.9–17 *Mandatory.* Equipment operating speeds shall be consistent with conditions of roadways, grades, clearance, visibility, traffic, and the type of equipment used.

55.9–18 [Reserved]

55.9–19 *Mandatory.* Track guardrails, lead rails, and frogs shall be protected or

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blocked so as to prevent a person's foot from becoming wedged.

55.9–20 *Mandatory.* Positive-acting stoplocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from runaway or moving railroad equipment..

55.9–21 [Reserved]

55.9–22 *Mandatory.* Berms or guards shall be provided on the outer bank of elevated roadways.

55.9–23 *Mandatory.* Trackless haulage equipment shall be operated under power control at all times.

55.9–24 *Mandatory.* Mobile equipment operators shall have full control of the equipment while it is in motion.

55.9–25 *Mandatory.* Dippers, buckets, loading booms, or heavy suspended loads shall not be swung over the cabs of haulage vehicles until the drivers are out of the cabs and in safe locations, unless the trucks are designed specifically to protect the drivers from falling material.

55.9–26 *Mandatory.* A quick-close type air valve shall be provided on each piece of pneumatic-powered loading, hauling, and dumping equipment. The valve shall be closed except when the equipment is being operated.

55.9–27 *Mandatory.* When an operator is present, men shall notify him before getting on or off equipment.

55.9–28 *Mandatory.* Switch throws shall be installed so as to provide adequate clearance for switchmen.

55.9–29 [Reserved]

55.9–30 *Mandatory.* Men shall not work or pass under the buckets or booms of loaders in operation.

55.9–31 *Mandatory.* When traveling between work areas, the equipment shall be secured in the travel position.

55.9–32 *Mandatory.* Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.

55.9–33 [Reserved]

55.9–34 *Mandatory.* Haulage equipment shall be loaded in a manner to minimize spillage during haulage.

55.9–35 *Mandatory.* Movements of two or more pieces of rail equipment operating independently on the same track shall be suitably controlled for safe operation.

55.9–36 *Mandatory.* Electrically-powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set or other equivalent precautions are taken against rolling.

55.9–37 *Mandatory.* Mobile equipment shall not be left unattended unless the brakes are set. Mobile equipment with wheels or tracks, when parked on a grade, shall be either blocked or turned into a bank or rib; and the bucket or blade lowered to the ground to prevent movement.

55.9–38 [Reserved]

55.9–39 *Mandatory.* Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.

55.9–40 *Mandatory.* Men shall not be transported:

(a) In or on dippers, forks, clamshells, beds of trucks unless special provisions are made for their safety, or buckets except shaft buckets.

(b) On top of loaded haulage equipment.

(c) Outside the cabs and beds of mobile equipment, except trains.

(d) Between cars of trains.

(e) In conveyances equipped with unloading devices unless means are provided to prevent accidental starting of the unloading mechanism.

55.9–41 *Mandatory.* Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.

55.9–42 *Mandatory.* Rocker-bottom or bottom-dump rail cars shall be equipped with locking devices.

55.9–43 [Reserved]

55.9–44 [Reserved]

55.9–45 *Mandatory.* Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.

55.9–46 *Mandatory.* Backpoling of trolleys shall be avoided wherever possible; but when necessary, backpoling shall be done only at slow speeds.

55.9–47 *Mandatory.* Parked railcars, unless held effectively by brakes, shall be blocked securely.

55.9–48 *Mandatory.* Railroad cars with braking systems, when in use, shall be equipped with effective brake shoes.

55.9–49 *Mandatory.* When in the dark or under conditions of limited visibility, all vehicles carrying loads which project beyond the sides or more than four feet beyond the rear of the vehicles shall display a warning light at the end of the projection; or in the light, a warning flag not less

than 12 inches square shall be displayed at the end of the projection.

55.9–50 *Mandatory.* Railcars shall not be left on side tracks unless ample clearance is provided for traffic on adjacent tracks.

55.9–51 *Mandatory.* Persons shall not go over, under, or between cars unless the train is stopped and the motorman has been notified and the notice acknowledged.

55.9–52 *Mandatory.* Inability of a motorman to clearly recognize his brakeman's signals when the train is under the direction of the brakeman shall be construed by the motorman as a stop signal.

55.9–53 *Mandatory.* Water, debris, or spilled material which create hazards to moving equipment shall be removed.

55.9–54 *Mandatory.* Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.

55.9–55 *Mandatory.* Where there is evidence that the ground at a dumping place may fail to support the weight of a vehicle, loads shall be dumped back from the edge of the bank.

55.9–56 *Mandatory.* Where necessary, bumper blocks or the equivalent shall be provided at track dead ends.

55.9–57 *Mandatory.* Grizzlies, grates, and other stationary sizing devices shall be anchored securely.

55.9–58 *Mandatory.* If truck spotters are used, they shall be well in the clear while trucks are backing into dumping positions and dumping; lights shall be used at night to direct trucks.

55.9–59 *Mandatory.* Public and permanent railroad crossings shall be posted with warning signs or signals, or shall be guarded when trains are passing and shall be planked or otherwise filled between the rails.

55.9–60 *Mandatory.* Where overhead clearance is restricted, warning devices shall be installed and the restricted area shall be conspicuously marked.

55.9–61 *Mandatory.* Stockpile and muckpile faces shall be trimmed to prevent hazards to personnel.

55.9–62 *Mandatory.* Rocks too large to be handled safely shall be broken before loading.

55.9–63 *Mandatory.* Ramps and dumping facilities shall—

(a) Be of substantial construction; and

(b) Have a suitable width, clearance, and headroom to accommodate the equipment using the facilities.

55.9–64 *Mandatory.* Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position while loading cars.

55.9–65 *Mandatory.* Cars shall not be coupled, or uncoupled, manually from the inside of curves unless the railroad and cars are so designed to eliminate any hazard from manual coupling.

55.9–66 *Mandatory.* When a locomotive on one track is used to move equipment on a different track, a suitable chain, cable, or drawbar shall be used.

55.9–67 *Mandatory.* Facilities used to transport men to and from work areas shall not be overcrowded.

55.9–68 *Mandatory.* Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.

55.9–69 *Mandatory.* Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.

55.9–70 *Mandatory.* A tow bar of substantial construction or other suitable means of control shall be used to tow heavy equipment. A substantial safety chain or wire rope shall be used in conjunction with any primary rigging.

55.9–71 *Mandatory.* Traffic rules including speed, signals, and warning signs shall be standardized at each mine and posted.

55.9–72 *Mandatory.* Persons attempting to free hangups shall be experienced persons who understand the hazards involved.

55.9–73 *Mandatory.* Defective equipment, removed from service as unsafe to operate, shall be tagged to prohibit further use until repairs are completed.

55.9–74 *Mandatory.* Dust shall be suitably controlled at muck piles, material transfer points, crushers, and on haulage roads where hazards to personnel may be created as a result of impaired visibility.

55.9–75 through 55.9–82 [Reserved]

55.9–83 *Mandatory.* Where possible at least 30 inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one side of the tracks; all places where it is not possible to provide 30-inch clearance shall be marked conspicuously.

55.9–84 [Reserved]

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55.9–85 *Mandatory.* Tools, materials and equipment shall not be transported with persons in vehicles, rail cars, and other conveyances unless means have been provided to make such transportation safe.

55.9–86 [Reserved]

55.9–87 *Mandatory.* Heavy duty mobile equipment shall be provided with audible warning devices. When the operator of such equipment has an obstructed view to the rear, the equipment shall have either an automatic reverse signal alarm which is audible above the surrounding noise level or an observer to signal when it is safe to back up.

55.9–88 *Mandatory.* (a) Excluding equipment that is operated by remote control, all self-propelled track-type (crawler mounted) or wheeled (rubber-tired) scrapers; front-end loaders; dozers; tractors, including industrial and agricultural tractors but not including over-the-road type tractors (the type that pull trailers or vans on highways); and motor graders; and wheeled prime movers (a tractor of the type and kind normally used as the mode of power for rubber-tired scrapers); all as used in metal and nonmetal mining operations, with or without attachments, shall be used in such mining only when equipped with (1) roll-over protective structures (ROPS) in accordance with the requirements of paragraphs (b) through (g) of this standard, as applicable, and (2) seat belts meeting the requirements of the Society of Automotive Engineers (SAE), Motor Vehicle Seat Belts Assemblies—SAE J4c, approved November 1955, revised July 1965; Seat Belt Hardware Test Procedures—SAE J140a, approved April 1970, revised February 1973; Seat Belt Hardware Performance Requirements—SAE J141; Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and Seat Belts for Construction Equipment—SAE J386, approved March 1968; and in accordance with paragraphs (b), (c), and (e) of this standard, as applicable.

(b) Except as provided in paragraph (e) all self-propelled equipment described in paragraph (a) of this standard and manufactured on or after the effective date of this standard shall be equipped with (1) ROPS meeting the requirement of paragraph (d), and (2) seat belts meeting the requirements of SAE J4c, J140a, J141, J333a, and J386 specified in paragraph (a) of this standard.

(c) All self-propelled equipment described in paragraph (a) of this standard manufactured prior to the effective date of this standard and after June 30, 1969, shall be equipped with ROPS meeting the requirements of paragraphs (d) through (g) of this standard as appropriate, and seat belts, no later than the dates specified below:

(1) Equipment manufactured between July 1, 1971, and the effective date of this standard shall be equipped with ROPS and seat belts no later than 6 months after the effective date of this standard.

(2) Equipment manufactured between July 1, 1970, and June 30, 1971, shall be equipped with ROPS and seat belts no later than 10 months after the effective date of this standard.

(3) Equipment manufactured between July 1, 1969, and June 30, 1970, shall be equipped with ROPS and seat belts no later than 16 months after the effective date of this standard.

(4) Nothing in this standard shall preclude the issuance of an order because of imminent danger.

(d) Except as provided in paragraph (e) of this standard, self-propelled equipment described in paragraph (a) of this standard shall be deemed in compliance with the ROPS requirements of this standard if the ROPS meet the following requirements:

(1) The ROPS complies with the Society of Automotive Engineers, SAE Recommended Practice, Critical Zone—Characteristics and Dimensions for Operators of Construction and Industrial Machinery—SAE J397, approved July 1969, or Deflection Limiting Volume for Laboratory Evaluation of Roll-Over Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) of Construction and Industrial Vehicles—SAE J397a, approved July 1969, revised January 1972, editorial change July 1973; and, as appropriate, the ROPS and installation of the ROPS meet the requirements of either SAE Recommended Practice, Performance Criteria for Roll-Over Protective Structures (ROPS) for Earthmoving, Construction, Logging, and Industrial Vehicles—SAE J1040, approved April 1974, or any of the following applicable SAE standards or recommended practices:

(i) Minimum Performance Criteria for

Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers—SAE J320a, approved November 1967, revised July 1969, editorial change June 1970; or

(ii) Minimum Performance Criteria for Roll-Over Protective Structures for Prime Movers—SAE J320b, approved November 1967, revised January 1972, editorial change September 1972; or

(iii) Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers—SAE J394, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Wheeled Front-End Loaders and Wheeled Dozers—SAE J394a, approved July 1969, revised March 1972, editorial change September 1972; or

(iv) Minimum Performance Criteria for Roll-Over Structures for Crawler Tractors and Crawler-Type Loaders—SAE J395, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Track-Type Tractors and Track-Type Front-End Loaders—SAE J395a, approved July 1969, revised January 1972, editorial change September 1972; or

(v) Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders—J396, approved 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Motor Graders—SAE J396a, approved July 1969, revised March 1972, editorial change September 1972; or

(vi) Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and a Protective Frame Test Procedure and Performance Requirements—SAE J334a, approved April 1968, revised July 1970, conforms to ASAE S306.

(2) The ROPS is installed on the equipment in accordance with the recommendations of the ROPS manufacturer. If the installation includes bolts and nuts, the bolts and nuts used to attach the ROPS to the equipment frame and to connect structural parts of the ROPS shall be SAE Grade 5 or 8 (SAE J429g and J995b).

(e) All self-propelled equipment described in paragraph (a) of this standard, manufactured prior to the effective date of this standard, shall be deemed in compliance with the standard if ROPS and seat belt installations meet the ROPS and seat belt requirements of the State of California; or the U.S. Army Corps of Engineers; or the Bureau of Reclamation; or MSHA coal mine regulations of the U.S. Department of Labor; or the Occupational Safety and Health Administration of the U.S. Department of Labor. The requirements in effect are:

(1) State of California: Title 8 of the California Administrative Code: Construction Safety Orders, Article 10, "Haulage and Earth Moving," 1591(l) and 1596 (Register 70, No. 40–10–3–70); General Industry Safety Orders, Article 25, "Industrial Trucks, Tractors, Haulage Vehicles, and Earth Moving Equipment," 3650–55 (Register 72, No. 6–2–5–72); and Logging and Sawmill Safety Orders, Article 7, "Tractor Yarding," 5243 (Register 69, No. 10–3–8–69), all issued by the Division of Industrial Safety, State of California.

(2) U.S. Army Corps of Engineers: Manuals—Corps of Engineers, U.S. Army Safety-General Safety Requirements, EM–385–1–1 (March 1967), or Change 1, March 27, 1972.

(3) Bureau of Reclamation, U.S. Department of the Interior: Section 9, "Machinery and Mechanized Equipment," Safety and Health Regulations for Construction, Part II—Bureau of Reclamation (September 1971).

(4) Mine Safety and Health Administration, U.S. Department of Labor: Section 77.403a, Part 77, Title 30, Code of Federal Regulations—Mandatory Safety Standards, Surface Coal Mines and Surface Work Areas of Underground Coal Mines, promulgated in the FEDERAL REGISTER (39 FR 24006–24009).

(5) Occupational Safety and Health Administration, U.S. Department of Labor: Sections 1926.1001 and 1926.1002, Title 29, Code of Federal Regulations—Safety and Health Regulations for Construction, promulgated in the FEDERAL REGISTER (37 FR 27585–27590), and republished in the FEDERAL REGISTER (39 FR 22880–22886).

(f) Any alteration, repair, or welding of the ROPS and ROPS-to-vehicle frame mounts shall be performed only with prior approval and with instructions from the ROPS manufacturer or under the instructions of a registered professional engineer; and the manufacturer, or engineer, as the case may be, shall decide what qualifications the welders involved in this operation must have.

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(g) Each ROPS shall have the following information permanently affixed to the structure:

(1) Manufacturer's or fabricator's name and address; and

(2) ROPS model number, if any; and

(3) Make and model numbers of the equipment on which the ROPS is designed to fit.

(4) For equipment already in existence when this standard goes into effect, a satisfactory substitute for the above-required information will be a certificate from either the manufacturer of the ROPS or a registered professional engineer to the effect that the ROPS does meet the performance standards and is appropriate for the piece of equipment upon which it is installed.

(h) Publications to which references are made in this standard are hereby incorporated by reference and made a part hereof. The incorporated publications are available at each Metal and Nonmetal Mine Safety and Health Subdistrict Office, MSHA. State of California safety orders are available from the State of California Office of Procurement, Documents Section, Post Office Box 20191, Sacramento, California 95820. The U.S. Army Corps of Engineers, Safety-General Safety Requirements are available from the U.S. Government Printing Office, Washington, D.C. 20402. Bureau of Reclamation Safety and Health Regulations for Construction are available from the Bureau of Reclamation, Division of Safety, Engineering and Research Center, Denver, Colorado 80225. SAE documents are available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

55.9-89 through 55.9-94 [Reserved]

§ 55.10 Aerial tramways.

55.10-1 *Mandatory.* Buckets shall not be overloaded, and feed shall be regulated to prevent spillage.

55.10-2 *Mandatory.* Inspection and maintenance of carriers (including loading and unloading mechanisms), ropes and supports, and brakes shall be performed by competent persons according to the recommendations of the manufacturer.

55.10-3 *Mandatory.* Any hazardous defects shall be corrected before the equipment is used.

55.10-4 *Mandatory.* Positive-action-type brakes and devices which apply the brakes automatically in the event of a power failure shall be provided on aerial tramways.

55.10-5 *Mandatory.* Track cable connections shall not obstruct the passage of carriage wheels.

55.10-6 *Mandatory.* Towers shall be suitably protected from swaying buckets.

55.10-7 *Mandatory.* Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.

55.10-8 *Mandatory.* Persons other than maintenance men shall not ride aerial tramways unless the following features are provided:

(a) Two independent brakes, each capable of holding the maximum load;

(b) Direct communication between terminals;

(c) Power drives with emergency power available in case of primary power failure;

(d) Buckets equipped with positive locks to prevent accidental tripping or dumping.

55.10-9 *Mandatory.* Men shall not ride loaded buckets.

55.10-10 *Mandatory.* Where possible, aerial tramways shall not be started until the operator has ascertained that everyone is in the clear.

§ 55.11 Travelways.

55.11-1 *Mandatory.* Safe means of access shall be provided and maintained to all working places.

55.11-2 *Mandatory.* Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary, toeboards shall be provided.

55.11-3 *Mandatory.* Ladders shall be of substantial construction and maintained in good condition.

55.11-4 *Mandatory.* Portable rigid ladders shall be provided with suitable bases and placed securely when used.

55.11-5 *Mandatory.* Fixed ladders shall be anchored securely and installed to provide at least 3 inches of toe clearance.

55.11-6 *Mandatory.* Fixed ladders shall project at least 3 feet above landings, or substantial handholds shall be provided above the landings.

55.11-7 *Mandatory.* Wooden compo-

55.11–28 through 55.11–34 [Reserved]

55.11–8 [Reserved]

55.11–9 *Mandatory.* Walkways with outboard railings shall be provided wherever persons are required to walk alongside elevated conveyor belts. Inclined railed walkways shall be nonskid or provided with cleats.

55.11–10 *Mandatory.* Vertical clearance above stair steps shall be a minimum of seven (7) feet, or suitable warning signs or similar devices shall be provided to indicate an impaired clearance.

55.11–11 *Mandatory.* Persons using ladders shall face the ladders and have both hands free for climbing and descending.

55.11–12 *Mandatory.* Openings above, below, or near travelways through which men or materials may fall shall be protected by railings, barriers, or covers. Where it is impractical to install such protective devices, adequate warning signals shall be installed.

55.11–13 *Mandatory.* Crossovers shall be provided where it is necessary to cross conveyors.

55.11–14 *Mandatory.* Moving conveyors shall be crossed only at designated crossover points.

55.11–15 [Reserved]

55.11–16 *Mandatory.* Regularly used walkways and travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

55.11–17 *Mandatory.* Fixed ladders shall not incline backwards.

55.11–18 through 55.11–24 [Reserved]

55.11–25 *Mandatory.* Fixed ladders, except on mobile equipment, shall be offset and have substantial railed landings at least every 30 feet unless backguards or equivalent protection, such as safety belts and safety lines, are provided.

55.11–26 *Mandatory.* Fixed ladders 70 degrees to 90 degrees from the horizontal and 30 feet or more in length shall have backguards, cages or equivalent protection, starting at a point not more than seven (7) feet from the bottom of the ladders.

55.11–27 *Mandatory.* Scaffolds and working platforms shall be of substantial construction and provided with handrails and maintained in good condition. Floor boards shall be laid properly and the scaffolds and working platforms shall not be overloaded. Working platforms shall be provided with toeboards when necessary.

§ 55.12 Electricity.

55.12–1 *Mandatory.* Circuits shall be protected against excessive overload by fuses or circuit breakers of the correct type and capacity.

55.12–2 *Mandatory.* Electric equipment and circuits shall be provided with switches or other controls. Such switches or controls shall be of approved design and construction and shall be properly installed.

55.12–3 *Mandatory.* Individual overload protection or short circuit protection shall be provided for the trailing cables of mobile equipment.

55.12–4 *Mandatory.* Electrical conductors shall be of a sufficient size and current-carrying capacity to ensure that a rise in temperature resulting from normal operations will not damage the insulating materials. Electrical conductors exposed to mechanical damage shall be protected.

55.12–5 *Mandatory.* Mobile equipment shall not run over power conductors, nor shall loads be dragged over power conductors, unless the conductors are properly bridged or protected.

55.12–6 *Mandatory.* Distribution boxes shall be provided with a disconnecting device for each branch circuit. Such disconnecting devices shall be equipped or designed in such a manner that it can be determined by visual observation when such a device is open and that the circuit is deenergized, and the distribution box shall be labeled to show which circuit each device controls.

55.12–7 *Mandatory.* Trailing-cable and power-cable connections to junction boxes shall not be made or broken under load.

55.12–8 *Mandatory.* Power wires and cables shall be insulated adequately where they pass into or out of electrical compartments. Cables shall enter metal frames of motors, splice boxes, and electrical compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

55.12–9 [Reserved]

55.12–10 Mandatory. Telephone and low-potential signal wire shall be protected by isolation or suitable insulation, or both, from contacting energized power conductors or any other power source.

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55.12–11 *Mandatory.* High-potential electrical conductors shall be covered, insulated, or placed to prevent contact with low potential conductors.

55.12–12 *Mandatory.* The potential on bare signal wires accessible to contact by persons shall not exceed 48 volts.

55.12–13 *Mandatory.* Permanent splices and repairs made in power cables, including the ground conductor where provided, shall be: (a) Mechanically strong with electrical conductivity as near as possible to that of the original; (b) Insulated to a degree at least equal to that of the original, and sealed to exclude moisture; and (c) Provided with damage protection as near as possible to that of the original, including good bonding to the outer jacket.

55.12–14 *Mandatory.* Power cables energized to potentials in excess of 150 volts, phase-to-ground, shall not be moved with equipment unless sleds or slings, insulated from such equipment, are used. When such energized cables are moved manually, insulated hooks, tongs, ropes, or slings shall be used unless suitable protection for persons is provided by other means. This does not prohibit pulling or dragging of cable by the equipment it powers when the cable is physically attached to the equipment by suitable mechanical devices, and the cable is insulated from the equipment in conformance with other standards in this part.

55.12–15 [Reserved]

55.12–16 *Mandatory.* Electrically powered equipment shall be deenergized before mechanical work is done on such equipment. Power switches shall be locked out or other measures taken which shall prevent the equipment from being energized without the knowledge of the individuals working on it. Suitable warning notices shall be posted at the power switch and signed by the individuals who are to do the work. Such locks or preventive devices shall be removed only by the persons who installed them or by authorized personnel.

55.12–17 *Mandatory.* Power circuits shall be deenergized before work is done on such circuits unless hot-line tools are used. Suitable warning signs shall be posted by the individuals who are to do the work. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the knowledge of the individuals working on them. Such locks, signs, or preventive devices shall be removed only by the person who installed them or by authorized personnel.

55.12–18 *Mandatory.* Principal power switches shall be labeled to show which units they control, unless identification can be made readily by location.

55.12–19 *Mandatory.* Where access is necessary, suitable clearance shall be provided at stationary electrical equipment or switchgear.

55.12–20 *Mandatory.* Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal, non-current-carrying parts of the power switches to be operated may be used.

55.12–21 *Mandatory.* Suitable danger signs shall be posted at all major electrical installations.

55.12–22 *Mandatory.* Areas containing major electrical installations shall be entered only by authorized persons.

55.12–23 *Mandatory.* Electrical connections and resistor grids that are difficult or impractical to insulate shall be guarded, unless protection is provided by location.

55.12–24 [Reserved]

55.12–25 *Mandatory.* All metal enclosing or encasing electrical circuits shall be grounded or provided with equivalent protection. This requirement does not apply to battery-operated equipment.

55.12–26 *Mandatory.* Metal fencing and metal buildings enclosing transformers and switchgear shall be grounded.

55.12–27 *Mandatory.* Frame grounding or equivalent protection shall be provided for mobile equipment powered through trailing cables.

55.12–28 *Mandatory.* Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; and annually thereafter. A record of the resistance measured during the most recent tests shall be made available on a request by the Secretary or his duly authorized representative.

55.12–29 [Reserved]

55.12–30 *Mandatory.* When a potentially dangerous condition is found it shall be corrected before equipment or wiring is energized.

55.12–31 [Reserved]

55.12–32 *Mandatory.* Inspection and cover plates on electrical equipment and junction boxes shall be kept in place at all times except during testing or repairs.

55.12–33 *Mandatory.* Hand-held electric tools shall not be operated at high potential voltages.

5.12–34 *Mandatory.* Portable extension lights, and other lights that by their location present a shock or burn hazard, shall be guarded.

55.12–35 *Mandatory.* Lamp sockets shall be of a weatherproof type where they are exposed to weather or wet conditions that may interfere with illumination or create a shock hazard.

55.12–36 *Mandatory.* Fuses shall not be removed or replaced by hand in an energized circuit, and they shall not otherwise be removed or replaced in an energized circuit unless equipment and techniques especially designed to prevent electrical shock are provided and used for such purpose.

55.12–37 *Mandatory.* Fuse tongs or hotline tools shall be used when fuses are removed or replaced in high-potential circuits.

55.12–38 *Mandatory.* Trailing cables shall be attached to machines in a suitable manner to protect the cable from damage and to prevent strain on the electrical connections.

55.12–39 *Mandatory.* Surplus trailing cables to shovels, cranes and similar equipment shall be—

(a) Stored in cable boats;

(b) Stored on reels mounted on the equipment; or

(c) Otherwise protected from mechanical damage.

55.12–40. *Mandatory.* Operating controls shall be installed so that they can be operated without danger of contact with energized conductors.

55.12–41 *Mandatory.* Switches and starting boxes shall be of safe design and capacity.

55.12–42 *Mandatory.* Both rails shall be bonded or welded at every joint and rails shall be crossbonded at least every 200 feet if the track serves as the return trolley circuit. When rails are moved, replaced, or broken bonds are discovered, they shall be rebonded within three working shifts.

55.12–43 and 55.12–44 [Reserved]

55.12–45 *Mandatory.* Overhead high-potential powerlines shall be installed as specified by the National Electrical Code.

55.12–46 [Reserved]

55.12–47 *Mandatory.* Guy wires of poles supporting high-voltage transmission lines shall meet the requirements for grounding or insulator protection of the National Electrical Safety Code, Part 2, entitled "Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines," (also referred to as National Bureau of Standards Handbook 81, Nov. 1, 1961) and Supplement 2 thereof issued March 1968, which are hereby incorporated by reference and made a part hereof. These publications and documents may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

55.12–48 *Mandatory.* Telegraph, telephone, or signal wires shall not be installed on the same crossarm with power conductors. When carried on poles supporting powerlines, they shall be installed as specified by the National Electrical Code.

55.12–49 [Reserved]

55.12–50 *Mandatory.* Trolley wires shall be installed at least seven (7) feet above rails where height permits, and aligned and supported to suitably control sway and sag.

55.12–51 and 55.12–52 [Reserved]

55.12–53 *Mandatory.* Ground wires for lighting circuits powered from trolley wires shall be connected securely to the ground-return circuit.

55.12–54 through 55.12–64 [Reserved]

55.12–65 *Mandatory.* Powerlines, including trolley wires, and telephone circuits shall be protected against short circuits and lightning.

55.12–66 *Mandatory.* Where metallic tools or equipment can come in contact with trolley wires or bare powerlines, the lines shall be guarded or deenergized.

55.12–67. *Mandatory.* Transformers shall be totally enclosed, or shall be placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring.

55.12–68. *Mandatory.* Transformer enclosures shall be kept locked against unauthorized entry.

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55.12–69 *Mandatory.* Each ungrounded power conductor or telephone wire that leads underground and is directly exposed to lightning shall be equipped with suitable lightning arrestors of approved type within 100 feet of the point where the circuit enters the mine. Lightning arrestors shall be connected to a low resistance grounding medium on the surface and shall be separated from neutral grounds by a distance of not less than 25 feet.

55.12–70 [Reserved]

55.12–71 *Mandatory.* When equipment must be moved or operated near energized high-voltage powerlines (other than trolley lines) and the clearance is less than 10 feet, the lines shall be denergized or other precautionary measures shall be taken.

55.12–72 through 55.12–79 [Reserved]

§ 55.13 Compressed air and boilers.

General

55.13–1 *Mandatory.* All boilers and pressure vessels shall be constructed, installed, and maintained in accordance with the standards and specifications of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

55.13–2 through 55.13–9 [Reserved]

Compressed Air

55.13–10 *Mandatory.* (a) Reciprocating-type air compressors rated over 10 horsepower shall be equipped with automatic temperature-actuated shutoff mechanisms which shall be set or adjusted to the compressor when the normal operating temperature is exceeded by more than 25 percent.

(b) However, this standard does not apply to reciprocating-type air compressors rated over 10 horsepower if equipped with fusible plugs that were installed in the compressor discharge lines before November 15, 1979, and designed to melt at temperatures at least 50 degrees below the flash point of the compressors' lubricating oil.

55.13–11 *Mandatory.* Air receiver tanks shall be equipped with one or more automatic pressure-relief valves. The total relieving capacity of the relief valves shall prevent pressure from exceeding the maximum allowable working pressure in a receiver tank by not more than 10 percent. Air receiver tanks also shall be equipped with indicating pressure gages which accurately measure the pressure within the air receiver tanks.

55.13–12 *Mandatory.* Compressor air intakes shall be installed to insure that only clean, uncontaminated air enters the compressors.

55.13–13 and 55.13–14 [Reserved]

55.13–15 *Mandatory.* (a) Compressed-air receivers and other unfired pressure vessels shall be inspected by inspectors holding a valid National Board Commission and in accordance with the applicable chapters of the National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979. This code is incorporated by reference and made a part of this standard, may be examined at any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration, and may be obtained from the publisher, the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229.

(b) Records of inspections shall be kept in accordance with requirements of the National Board Inspection Code, and the records shall be made available to the Secretary or his authorized representative.

55.13–16 [Reserved]

55.13–17 *Mandatory.* Compressor discharge pipes where carbon build-up may occur shall be cleaned periodically as recommended by the manufacturer, but no less frequently than once every two (2) years.

55.13–18 [Reserved]

55.13–19 *Mandatory.* Repairs involving the pressure system of compressors, receivers, or compressed-air-powered equipment shall not be attempted until the pressure has been bled off.

55.13–20 *Mandatory.* At no time shall compressed air be directed toward a person. When compressed air is used, all necessary precautions shall be taken to protect persons from injury.

55.13–21 *Mandatory.* Except where automatic shutoff valves are used, safety chains or other suitable locking devices shall be used at connections to machines of high-pressure hose lines of ¾-inch inside diameter or larger, and between high-pressure hose lines of ¾-inch inside diameter or larger, where a connection failure would create a hazard.

55.13–22 through 55.13–29 [Reserved]

BOILERS

55.13–30 *Mandatory.* (a) Fired pressure vessels (boilers) shall be equipped with water level gages, pressure gages, automatic pressure-relief valves, blowdown piping, and other safety devices approved by the American Society of Mechanical Engineers to protect againt hazards from overpressure, flameouts, fuel interruptions and low water level, all as required by the appropriate sections, chapters and appendices listed in paragraphs (b) (1) and (2) below.

(b) These gages, devices and piping shall be designed, installed, operated, maintained, repaired, altered, inspected, and tested by inspectors holding a valid National Board Commission and in accordance with the following listed sections, chapters and appendices:

(1) The ASME Boiler and Pressure Vessel Code, 1977, published by the American Society of Mechanical Engineers.

Section and Title

I Power Boilers.
II Material Specifications—Part A—Ferrous.
II Material Specifications—Part B—Nonferrous.
II Material Specifications—Part C—Welding Rods, Electrodes, and Filler Metals.
IV Heating Boilers.
V Nondestructive Examination.
VI Recommended Rules for Care and Operation of Heating Boilers.
VII Recommended Rules for Care of Power Boilers.

(2) The National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979, published by the National Board of Boiler and Pressure Vessel Inspectors.

Chapter and Title

I Glossary of Terms.
II Inspection of Boilers and Pressure Vessels.
III Repairs and Alterations to Boiler and Pressure Vessels by Welding.
IV Shop Inspection of Boilers and Pressure Vessels.
V Inservice Inspection of Pressure Vessels by Authorized Owner-User Inspection Agencies.

Appendix and Title

A Safety and Safety Relief Valves.
B Non-ASME Code Boilers and Pressure Vessels.
C Storage of Mild Steel Covered Arc Welding Electrodes.
D–R National Board "R" (Repair) Symbol Stamp.
D–VR National Board "VR" (Repair of Safety and Safety Relief Valve) Symbol Stamp.
D–VR1 Certificate of Authorization for Repair Symbol Stamp for Safety and Safety Relief Valves.
D–VR2 Outline of Basic Elements of Written Quality Control System for Repairers of ASME Safety and Safety Relief Valves.
D–VR3 Nameplate Stamping for "VR".
E Owner-user Inspection Agencies.
F Inspection Forms.

(c) Records of inspections and repairs shall be kept in accordance with the requirements of the ASME Boiler and Pressure Vessel Code and the National Board Inspection Code. The records shall be made available to the Secretary or his authorized representative.

(d) Sections of the ASME Boiler and Pressure Vessel Code, 1977, listed in paragraph (b)(1) above, and chapters and appendices of the National Board Inspection Code, 1979, listed in paragraph (b) (2) above, are incorporated by reference and made a part of this standard. These publications may be obtained from the publishers, the American Society of Mechanical Engineers, 345 East Forty-seventh Street, New York, N.Y. 10017, and the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. The publications may be examined at any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration.

55.13–31 through 55.13–34 [Reserved]

§ 55.14 Use of equipment.

GUARDS

55.14–1 *Mandatory.* Gears; sprockets; chains; drive, head, tail, and takeup pulleys; flywheels; couplings; shafts; sawblades; fan inlets; and similar exposed moving machine parts which may be contacted by persons, and which may cause injury to persons, shall be guarded.

55.14–2 *Mandatory.* Overhead belts shall be guarded if the whipping action from a

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broken belt would be hazardous to persons below.

55.14–3 *Mandatory.* Guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from accidentally reaching behind the guard and becoming caught between the belt and the pulley.

55.14–4 and 55.14–5 [Reserved]

55.14–6 *Mandatory.* Except when testing the machinery, guards shall be securely in place while machinery is being operated.

55.14–7 *Mandatory.* Guards shall be of substantial construction and properly maintained.

55.14–8 *Mandatory.* Stationary grinding machines other than special bit grinders shall be equipped with:

(a) Peripheral hoods (less than 90° throat openings) capable of withstanding the force of a bursting wheel;

(b) Adjustable tool rests set as close as practical to the wheel;

(c) Safety washers.

55.14–9 *Mandatory.* Grinding wheels shall be operated within the specifications of the manufacturer of the wheel.

55.14–10 *Mandatory.* Hand-held power tools, other than rock drills, shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

55.14–11 *Mandatory.* Guards, shields, or other suitable protection shall be provided in areas where flying or falling materials present a hazard to personnel.

55.14–12 [Reserved]

55.14–13 *Mandatory.* Fork-lift trucks, front-end loaders, and bulldozers shall be provided with substantial canopies when necessary to protect the operator.

55.14–14 *Mandatory.* Face shields or goggles, in good condition, shall be worn when operating a grinding wheel.

55.14–15 through 55.14–24 [Reserved]

METHODS AND PROCEDURES

55.14–25 [Reserved]

55.14–26 *Mandatory.* Unsafe equipment or machinery shall be removed from service immediately.

55.14–27 *Mandatory.* Operation of machinery or equipment shall be assigned only to competent persons.

55.14–28 [Reserved]

55.14–29 *Mandatory.* Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.

55.14–30 *Mandatory.* Men shall not work on or from a piece of mobile equipment in a raised position until it has been blocked in place securely. This does not preclude the use of equipment specifically designed as elevated mobile work platforms.

55.14–31 *Mandatory.* Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.

55.14–32 *Mandatory.* Belts, chains, and ropes shall not be guided onto power-driven moving pulleys, sprockets, or drums with the hands except on slow moving equipment especially designed for hand feeding.

55.14–33 *Mandatory.* Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.

55.14–34 *Mandatory.* Belt dressing shall not be applied manually while belts are in motion unless an aerosol-type dressing is used.

55.14–35 *Mandatory.* Machinery shall not be lubricated while in motion where a hazard exists, unless equipped with extended fittings or cups.

55.14–36 *Mandatory.* Tools and equipment shall not be used beyond the design capacity intended by the manufacturer, where such use may create a hazard to personnel.

55.14–37 through 55.14–44 [Reserved]

55.14–45 *Mandatory.* Welding operations shall be shielded and well-ventilated.

55.14–46 through 55.14–54 [Reserved]

§ 55.15 Personal protection.

55.15–1 *Mandatory.* Adequate first-aid materials, including stretchers and blankets, shall be provided at places convenient to all working areas. Water or neutralizing agents shall be available where corrosive chemicals or other harmful substances are stored, handled, or used.

55.15–2 *Mandatory.* All persons shall wear suitable hard hats when in or around a mine or plant where falling objects may create a hazard.

55.15–3 *Mandatory.* All persons shall wear suitable protective footwear when in or around an area of a mine or plant where a hazard exists which could cause an injury to the feet.

55.15–4 *Mandatory.* All persons shall wear safety glasses, goggles, or face shields or other suitable protective devices when in or around an area of a mine or plant where a hazard exists which could cause injury to unprotected eyes.

55.15–5 *Mandatory.* Safety belts and lines shall be worn when men work where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.

55.15–6 *Mandatory.* Special protective equipment and special protective clothing shall be provided, maintained in a sanitary and reliable condition and used whenever (1) hazards of process or environment, (2) chemical hazards, (3) radiological hazards, or (4) mechanical irritants are encountered in a manner capable of causing injury or impairment.

55.15–7 *Mandatory.* Protective clothing or equipment and face-shields or goggles shall be worn when welding, cutting, or working with molten metal.

55.15–8 through 55.15–19 [Reserved]

55.15–20 *Mandatory.* Life jackets or belts shall be worn where there is danger from falling into water.

55.15–21 through 55.15–29 [Reserved]

§ 55.16 Materials storage and handling.

55.16–1 *Mandatory.* Supplies shall not be stacked or stored in a manner which creates tripping or fall-of-material hazards.

55.16–2 *Mandatory.* (a) Bins, hoppers, silos, tanks, and surge piles, where loose unconsolidated materials are stored, handled or transferred shall be—

(1) Equipped with mechanical devices or other effective means of handling materials so that during normal operations persons are not required to enter or work where they are exposed to entrapment by the caving or sliding of materials; and

(2) Equipped with supply and discharge operating controls. The controls shall be located so that spills or overruns will not endanger persons.

(b) Where persons are required to move around or over any facility listed in this standard, suitable walkways or passageways shall be provided.

(c) Where persons are required to enter any facility listed in this standard for maintenance or inspection purposes, ladders, platforms, or staging shall be provided. No person shall enter the facility until the supply and discharge of materials have ceased and the supply and discharge equipment is locked out. Persons entering the facility shall wear a safety belt or harness equipped with a lifeline suitably fastened. A second person, similarly equipped, shall be stationed near where the lifeline is fastened and shall constantly adjust it or keep it tight as needed, with minimum slack.

55.16–3 *Mandatory.* Materials that can create hazards if accidentally liberated from their container shall be stored in a manner that minimizes the dangers.

55.16–4 *Mandatory.* Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.

55.16–5 *Mandatory.* Compressed and liquid gas cylinders shall be secured in a safe manner.

55.16–6 *Mandatory.* Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

55.16–7 *Mandatory.* (a) Taglines shall be attached to loads that may require steadying or guidance while suspended.

(b) Hitches and slings used to hoist materials shall be suitable for the particular material handled.

55.16–8 [Reserved]

55.16–9 *Mandatory.* Men shall stay clear of suspended loads.

55.16–10 *Mandatory.* To protect personnel, material shall not be dropped from an overhead elevation until the drop area is first cleared of personnel and the area is then either guarded or a suitable warning is given.

55.16–11 *Mandatory.* Men shall not ride on loads being moved by cranes or derricks, nor shall they ride the hoisting hooks unless such method eliminates a greater hazard.

55.16–12 *Mandatory.* Chemical substances, including concentrated acids and alkalies, shall be stored to prevent inadvertent contact with each other or with other substances, where such contact

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could cause a violent reaction or the liberation of harmful fumes or gases.

55.16–13 *Mandatory.* Suitable warning shall be given before molten metal is poured and before a container of molten metal is moved.

55.16–14 *Mandatory.* Operator-carrying overhead cranes shall be provided with:

(a) Bumpers at each end of each rail;

(b) Automatic switches to halt uptravel of the blocks before they strike the hoist;

(c) Effective audible warning signals within easy reach of the operator;

(d) A means to lock out the disconnect switch.

55.16–15 *Mandatory.* No person shall work from or travel on the bridge of an overhead crane unless the bridge is provided with substantial footwalks with toeboards and railings the length of the bridge.

55.16–16 *Mandatory.* Fork and other similar types of lift trucks shall be operated with the—

(a) Upright tilted back to steady and secure the load;

(b) Load in the upgrade position when ascending or descending grades in excess of 10 percent;

(c) Load not raised or lowered enroute except for minor adjustments; and

(d) Load-engaging device downgrade when traveling unloaded on all grades.

55.16–17 through 55.16–34 [Reserved]

§ 55.17 Illumination.

55.17–1 *Mandatory.* Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and work areas.

55.17–2 through 55.17–9 [Reserved]

§ 55.18 Safety programs.

55.18–1 [Reserved]

55.18–2 *Mandatory.* (a) A competent person designated by the operator shall examine each working place at least once each shift for conditions which may adversely affect safety or health. The operator shall promptly initiate appropriate action to correct such conditions.

(b) A record that such examinations were conducted shall be kept by the operator for a period of one (1) year, and shall be made available for review by the Secretary or his authorized representative.

(c) In addition, conditions that may present an imminent danger which are noted by the person conducting the examination shall be brought to the immediate attention of the operator who shall withdraw all persons from the area affected (except persons referred to in section 104(c) of the Federal Mine Safety and Health Act of 1977) until the danger is abated.

55.18–3 through 55.18–5 [Reserved]

55.18–6 *Mandatory.* New employees shall be indoctrinated in safety rules and safe work procedures.

55.18–7 and 55.18–8 [Reserved]

55.18–9 *Mandatory.* When persons are working at the mine, a competent person designated by the mine operator shall be in attendance to take charge in case of an emergency.

55.18–10 *Mandatory.* Selected supervisors shall be trained in first aid. First aid training shall be made available to all interested employees.

55.18–11 [Reserved]

55.18–12 *Mandatory.* Emergency telephone numbers shall be posted at appropriate telephones.

55.18–13 *Mandatory.* A suitable communication system shall be provided at the mine to obtain assistance in the event of an emergency.

55.18–14 *Mandatory.* Arrangements shall be made in advance for obtaining emergency medical assistance and transportation for injured persons.

55.18–15 through 55.18–19 [Reserved]

55.18–20 *Mandatory.* No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others, can be heard, or can be seen.

55.18–21 through 55.18–24 [Reserved]

§ 55.19 Man hoisting.

The hoisting standards in this section apply to those hoists and appurtenances used for hoisting persons. However, where persons may be endangered by hoists and appurtenances used solely for handling ore, rock, and materials, the appropriate standards should be applied.

Emergency hoisting facilities should conform to the extent possible to safety requirements for other hoists, and should be adequate to remove the persons from the mine with a minimum of delay.

Hoists

55.19–1 *Mandatory.* Hoists shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes used.

55.19–2 *Mandatory.* Hoists shall be anchored securely.

55.19–3 *Mandatory.* Belt, rope, or chains shall not be used to connect driving mechanisms to man hoists.

55.19–4 *Mandatory.* Any hoist used to hoist men shall be equipped with a brake or brakes which shall be capable of holding its fully loaded cage, skip, or bucket at any point in the shaft.

55.19–5 *Mandatory.* The operating mechanism of the clutch of every manhoist drum shall be provided with a locking mechanism, or interlocked electrically or mechanically with the brake to prevent accidental withdrawal of the clutch.

55.19–6 *Mandatory.* Automatic hoists shall be provided with devices that automatically apply the brakes in the event of power failure.

55.19–7 *Mandatory.* All man hoists shall be provided with devices to prevent overtravel. When utilized in shafts exceeding 100 feet in depth, such hoists shall also be provided with overspeed devices.

55.19–8 *Mandatory.* Where creep or slip may alter the effective position of safety devices, friction hoists shall be equipped with synchronizing mechanisms that recalibrate the overtravel devices and position indicators.

55.19–9 *Mandatory.* An accurate and reliable indicator of the position of the cage, skip, bucket, or cars in the shaft shall be provided.

55.19–10 *Mandatory.* Hoist controls shall be placed or housed so that the noise from machinery or other sources will not prevent hoistmen from hearing signals.

55.19–11 *Mandatory.* Flanges on drums shall extend radially a minimum of 4 inches or three rope diameters beyond the last wrap, whichever is the lesser.

55.19–12 *Mandatory.* Where grooved drums are used, the grooves shall be of suitable size and pitch for the ropes used.

55.19–13 *Mandatory.* Where any diesel or similar fuel-injection engine is used to power a hoist, the engine shall be equipped with a damper or other cutoff in its air intake system. The control handle shall be clearly labeled to indicate that its intended function is for emergency stopping only.

55.19–14 *Mandatory.* In a friction hoist installation, tapered guides or other approved devices shall be installed above and below the limits of regular travel of the conveyance and arranged to prevent overtravel in the event of failure of other devices.

55.19–15 [Reserved]

55.19–16 [Reserved]

55.19–17 *Mandatory.* Each electric hoist shall be equipped with a manually-operable switch that will initiate emergency braking action to bring the conveyance and the counterbalance safely to rest. This switch shall be located within reach of the hoistman in case the manual controls of the hoist fail.

55.19–18 *Mandatory.* When an overtravel by-pass switch is installed, the switch shall function so as to allow the conveyance to be moved through the overtravel position when the switch is held in the closed position by the hoistman. The overtravel by-pass switch shall return automatically to the open position when released by the hoistman.

55.19–19 [Reserved]

Wire Rope

55.19–20 [Reserved]

55.19–21 *Mandatory.* The following static-load safety factors shall be used for selecting ropes to be used for hoisting men and for determining when such ropes shall be removed from man hoists:

Length of rope in shaft (feet)	Minimum factor of safety (new rope)	Minimum factor of safety (remove)
500 or less	8	6.4
501–1,000	7	5.8
1,001–2,000	6	5.0
2,001–3,000	5	4.3
3,001 or more	4	3.6

55.19–22 *Mandatory.* The end of the rope at the drum shall make at least one full turn on the drum shaft, or a spoke of the drum in the case of a free drum, and shall be fastened securely by means of rope clips or clamps. There shall be three

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full turns of cable or rope on the hoisting drum when the cable or rope is extended to its maximum working length. This standard does not apply to friction hoists.

55.19–23 [Reserved]

55.19–24 *Mandatory.* The rope shall be attached to the load by the thimble-and-clip method, the socketing method, or other approved method. If the socketing method is employed, zinc or its equivalent shall be used. The use of Babbitt metal or lead for socketing wire ropes is prohibited. If the thimble-and-clip method is used, the following shall be observed:

(a) The rope shall be attached to the load by passing one end around an oval thimble that is attached to the load bending the end back so that it is parallel to the long or "live" end of the rope and fastening the two parts of the rope together with clips.

(b) The U-bolt of each clip shall encircle the short or "dead" end of the rope and the distance between clips shall not be less than the figures given in the accompanying table.

(c) As a minimum, the following number of clips or equivalent shall be used for various diameters of six-strand, 19-wire, plow-steel ropes:

(Follow manufacturer's recommendations for other kinds of wire rope and clips.)

Diameter of rope, inches	Number of clips	Center-to-center spacing of clips, inches
¾	4	4½
⅞	4	5¼
1	4	6
1⅛	5	6¾
1¼	5	7½
1⅜	6	8¼
1½	6	9
1⅝	6	9¾
1¾	7	10½
1⅞	8	11¼
2	8	12
2⅛	8	13
2¼	8	14

(d) For all ropes less than three-quarter inch in diameter at least four clips or equivalent shall be used.

(e) When special conditions require the attachment of a sling to the hoisting cable to handle equipment in the shaft, the sling shall be attached by clips or equivalent in accordance with the table in paragraph (c) of this standard.

55.19–25 [Reserved]

55.19–26 *Mandatory.* Safety device attachments to hoist ropes shall be selected, installed, and maintained according to manufacturer's specifications to minimize internal corrosion and weakening of the hoist rope.

55.19–27 through 55.19–34 [Reserved]

Headframes and Sheaves

55.19–35 *Mandatory.* All headframes shall be constructed with suitable design considerations to allow for all dead loads, live loads, and wind loads.

55.19–36 *Mandatory.* Headframes shall be high enough to provide clearance for overtravel and safe stopping of the conveyance.

55.19–37 *Mandatory.* Fleet angles on hoists installed after November 15, 1979, shall not be greater than one and one-half degrees for smooth drums or two degrees for grooved drums.

55.19–38 *Mandatory.* Platforms with toeboards and handrails shall be provided around elevated head sheaves.

55.19–39 *Mandatory.* All personnel hoists, except emergency escape hoists and hoists with rope speeds of 200 feet per minute or less, installed after November 15, 1979, shall have drum and sheave tread diameters—

(1) Not less than 60 times the hoist rope diameter for slope or inclined shaft applications;

(2) Not less than 80 times the hoist rope diameter if the hoist ropes are one inch in diameter or greater, or not less than 60 times the hoist rope diameter if the hoist ropes are less than one inch in diameter for vertical shaft applications; or

(3) Not less than 100 times the hoist rope diameter for locked coil ropes.

55.19–40 *Mandatory.* Head, idler, knuckle, and curve sheaves shall have grooves of proper contour for the specific rope diameter used.

55.19–41 through 55.19–44 [Reserved]

Conveyances

55.19–45 *Mandatory.* Man cages and skips used for hoisting or lowering em-

ployees or other persons in any vertical shaft or any incline shaft with an angle of inclination of forty-five (45) degrees from the horizontal shall be covered with a metal bonnet.

55.19–46 through 55.19–48 [Reserved]

55.19–49 *Mandatory*. Buckets shall not be used to hoist men except during shaft sinking operations, inspection, maintenance, and repairs.

55.19–50 *Mandatory*. Buckets used to hoist persons during vertical shaft sinking operations shall: (a) Be securely attached to a crosshead when traveling in either direction between the lower and upper crosshead parking locations; (b) Have overhead protection when the shaft depth exceeds 50 feet; (c) Have sufficient depth or a suitably designed platform to transport persons safely in a standing position; and (d) Have devices to prevent accidental dumping where the bucket is supported by a bail attached to its lower half.

55.19–51 [Reserved]

55.19–52 [Reserved]

55.19–53 *Mandatory*. In shaft sinking where a platform is suspended by wire ropes, such ropes shall have an approved rating for the suspended load.

55.19–54 *Mandatory*. Where rope guides are used in shafts other than in shaft sinking operations, the rope guides shall be a type of lock coil construction.

Hoisting Procedures

55.19–55 *Mandatory*. When a manually operated hoist is used, a qualified hoistman shall remain within hearing of the telephone or signal device at all times while any person is underground.

55.19–56 *Mandatory*. When automatic hoisting is used, a competent operator of the hoist shall be readily available at or near the hoisting device while any person is underground.

55.19–57 *Mandatory*. No person shall operate a hoist unless within the preceding 12 months he has had a medical examination by a qualified, licensed physician who shall certify his fitness to perform this duty. Such certification shall be available at the mine.

55.19–58 *Mandatory*. Only experienced hoistmen shall operate the hoist except in cases of emergency and in the training of new hoistmen.

55.19–59 [Reserved]

55.19–60 [Reserved]

55.19–61 *Mandatory*. The safe speed for hoisting men shall be determined for each shaft, and this speed shall not be exceeded. Men shall not be hoisted at a speed faster than 2,500 feet per minute, except in an emergency.

55.19–62 *Mandatory*. Maximum normal operating acceleration and deceleration shall not exceed 6 feet per second per second. During emergency braking, the deceleration shall not exceed 16 feet per second per second.

55.19–63 *Mandatory*. Only authorized persons shall be in hoist rooms.

55.19–64 [Reserved]

55.19–65 *Mandatory*. Conveyances shall not be lowered by the brakes alone except during emergencies.

55.19–66 *Mandatory*. In shafts inclined over 45 degrees, the operator shall determine and post in the conveyance or at each shaft station the maximum number of persons permitted to ride in a hoisting conveyance at any one time. Each person shall be provided a minimum of 1.5 square feet of floor space.

55.19–67 *Mandatory*. During shift changes, an authorized person shall be in charge of each trip in which persons are hoisted.

55.19–68 *Mandatory*. Men shall enter, ride, and leave conveyances in an orderly manner.

55.19–69 *Mandatory*. Men shall not enter or leave conveyances which are in motion or after a signal to move the conveyance has been given to the hoistman.

55.19–70 *Mandatory*. Cage doors or gates shall be closed while men are being hoisted; they shall not be opened until the cage has come to a stop.

55.19–71 *Mandatory*. Men shall not ride in skips or buckets with muck, supplies, materials, or tools other than small hand tools.

55.19–72 *Mandatory*. When combinations of cages and skips are used in the same compartment, the cages shall be enclosed to protect personnel from flying material and the hoist speed reduced to man-speed as defined in standard 55.19–61, but not to exceed 1,000 feet per minute. Muck shall not be hoisted with personnel during shift changes.

55.19–73 *Mandatory*. Rock or supplies shall not be hoisted in the same shaft as men during shift changes, unless the compartments and dumping bins are parti-

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tioned to prevent spillage into the cage compartment.

55.19–74 *Mandatory.* Persons shall not ride the bail, rim, bonnet, or crosshead of any shaft conveyance except when necessary for inspection and maintenance, and then only when suitable protection for persons is provided.

55.19–75 *Mandatory.* Open hooks shall not be used to hoist buckets or other conveyances.

55.19–76 *Mandatory.* When men are hoisted in buckets, speeds shall not exceed 500 feet per minute and shall not exceed 200 feet per minute when within 100 feet of the intended station.

55.19–77 *Mandatory.* Buckets shall be stopped about 15 feet from the shaft bottom to await a signal from one of the crew on the bottom for further lowering.

55.19–78 *Mandatory.* All buckets shall be stopped after being raised about three (3) feet above the shaft bottom. A bucket shall be stabilized before a hoisting signal is given to continue hoisting the bucket to the crosshead. After a hoisting signal is given, hoisting to the crosshead shall be at a minimum speed. The signaling device shall be attended constantly until a bucket reaches the guides. When persons are hoisted, the signaling devices shall be attended until the crosshead has been engaged.

55.19–79 *Mandatory.* Where mine cars are hoisted by cage or skip, means for blocking cars shall be provided at all landings and also on the cage.

55.19–80 *Mandatory.* When tools, timbers, or other materials are being lowered or raised in a shaft by means of a bucket, skip, or cage, they shall be secured or so placed that they will not strike the sides of the shaft.

55.19–81 *Mandatory.* When conveyances controlled by a hoist operator are not in use, they shall be released and the conveyances shall be raised or lowered a suitable distance to prevent persons from boarding or loading the conveyances.

55.19–82 [Reserved]

55.19–83 *Mandatory.* A manually operated device shall be installed on each electric hoist that will allow the conveyance or counterbalance to be removed from an overtravel position. Such device shall not release the brake, or brakes, holding the overtravelled conveyance or counterbalance until sufficient drive motor torque has been developed to assure movement of the conveyance or counterbalance in the correct direction only.

55.19–84 through 59.19–89 [Reserved]

Signaling

55.19–90 *Mandatory.* There shall be at least two effective approved methods of signaling between each of the shaft stations and the hoist room, one of which shall be a telephone or speaking tube.

55.19–91 *Mandatory.* Hoist operators shall accept hoisting instructions only by the regular signaling system unless it is out of order. In such an event, and during other emergencies, the hoist operator shall accept instructions to direct movement of the conveyances only from authorized persons.

55.19–92 *Mandatory.* A method shall be provided to signal the hoist operator from cages or other conveyances at any point in the shaft.

55.19–93 *Mandatory.* A standard code of hoisting signals shall be adopted and used at each mine. The movement of a shaft conveyance on a "one bell" signal is prohibited.

55.19–94 *Mandatory.* A legible signal code shall be posted prominently in the hoist house within easy view of the hoistman, and at each place where signals are given or received.

55.19–95 *Mandatory.* Hoisting signal devices shall be positioned within easy reach of persons on the shaft bottom or constantly attended by a person stationed on the lower deck of the sinking platform.

55.19–96 *Mandatory.* Any person responsible for receiving or giving signals for cages, skips, and man trips when men or materials are being transported shall be familiar with the posted signaling code.

55.19–97 through 55.19–99 [Reserved]

Shafts

55.19–100 *Mandatory.* Shaft landings shall be equipped with substantial safety gates so constructed that materials will not go through or under them; gates shall be closed except when loading or unloading shaft conveyances.

55.19–101 *Mandatory.* Positive stopblocks or a derail switch shall be installed on all tracks leading to a shaft collar or landing.

55.19–102 *Mandatory.* A means shall be provided to guide the movement of a shaft conveyance.

55.19–103 *Mandatory.* Dumping facilities and loading pockets shall be constructed so as to minimize spillage into the shaft.

55.19–104 *Mandatory.* Suitable clearance at shaft stations shall be provided to allow safe movement of persons, equipment and materials.

55.19–105 *Mandatory.* A safe means of passage around open shaft compartments shall be provided on landings with more than one entrance to the shaft.

55.19–106 *Mandatory.* Shaft sets shall be kept in good repair and clean of hazardous material.

55.19–107 *Mandatory.* Hoistmen shall be informed when men are working in a compartment affected by that hoisting operation and a "Men Working in Shaft" sign shall be posted at the hoist.

55.19–108 *Mandatory.* When men are working in a shaft "Men Working in Shaft" signs shall be posted at all devices controlling hoisting operations that may endanger such men.

55.19–109 *Mandatory.* Shaft inspection and repair work in vertical shafts shall be performed from substantial platforms equipped with bonnets or equivalent overhead protection.

55.19–110 *Mandatory.* A substantial bulkhead or equivalent protection shall be provided above men at work deepening a shaft.

55.19–111 *Mandatory.* Substantial fixed ladders shall be provided from the collar to as near the shaft bottom as practical during shaft-sinking operations, or an escape hoist powered by an emergency power source shall be provided. When persons are on the shaft bottom, a chain ladder, wire rope ladder, or other extension ladders shall be used from the fixed ladder or lower limit of the escape hoist to the shaft bottom.

55.19–112 through 55.19–119 [Reserved]

INSPECTION AND MAINTENANCE

55.19–120 *Mandatory.* A systematic procedure of inspection, testing, and maintenance of shafts and hoisting equipment shall be developed and followed. If it is found or suspected that any part is not functioning properly, the hoist shall not be used until the malfunction has been located and repaired or adjustments have been made.

55.19–121 *Mandatory.* Complete records shall be kept for three years of inspections, tests, and maintenance of shafts and hoisting equipment.

55.19–122 *Mandatory.* Parts used to repair hoists shall have properties that will insure the proper and safe function of the hoist.

55.19–123 *Mandatory.* Wire ropes shall be lubricated or treated with dressing as recommended or approved by the rope manufacturer.

55.19–124 *Mandatory.* Hoist ropes other than those on friction hoists shall be cut off at least six (6) feet above the highest connection to the conveyance at time intervals not to exceed one (1) year unless a shorter time is required by standard 55.19–126, or by conditions of use. The portion of the rope that is cut off shall be examined and inspected by a competent person for damage, corrosion, wear and fatigue.

55.19–125 *Mandatory.* Hoist ropes wound in multiple layers shall have a length cut off at the drum end at least three (3) times during the anticipated life of the rope and whenever necessary as required by standard 55.19–126 to distribute the wear at change-of-layer and crossover points. The length of rope cut off shall not be a whole number multiple of the circumference of the drum.

55.19–126 *Mandatory.* Hoist ropes shall be examined over the entire active length at least every month to evaluate wear and possible damage. When such examinations or other inspections reveal that the rope is worn, and at least every six (6) months, caliper measurements or nondestructive tests shall be made at the following locations:

(a) Wherever wear is evident;

(b) Immediately above the socket or clips and above the safety connection;

(c) Where the rope rests on the sheaves;

(d) Where the ropes leave the drums when the conveyances are at the regular stopping point;

(e) Where a layer or rope begins to overlap another layer on the drum; and

(f) At 100 foot intervals (measurements shall be made midway between the last previously calipered points).

55.19–127 [Reserved]

55.19–128 *Mandatory.* Ropes shall not be used for hoisting when they have:

(a) More than six broken wires in any lay;

(b) Crown wires worn to less than 65 percent of the original diameter;

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(c) A marked amount of corrosion or distortion;

(d) A combination of similar factors individually less severe than those above but which in aggregate might create an unsafe condition.

55.19–129 *Mandatory.* Hoistmen shall examine their hoists and shall test overtravel, deadman controls, position indicators, and braking mechanisms at the beginning of each shift.

55.19–130 *Mandatory.* Before hoisting persons and to assure that the hoisting compartments are clear of obstructions, empty hoist conveyances shall be operated at least one round trip after—

(a) Any hoist or shaft repairs or related equipment repairs that might restrict or obstruct conveyance clearance;

(b) Any oversize or overweight material or equipment trips that might restrict or obstruct conveyance clearance;

(c) Blasting in or near the shaft that might restrict or obstruct conveyance clearance; or

(d) Remaining idle for one shift or longer.

55.19–131 *Mandatory.* Hoist conveyance connections shall be inspected at least once during any 24-hour period that the conveyance is used for hoisting persons.

55.19–132 *Mandatory.* (a) A performance drop test of hoist conveyance safety catches shall be made at the time of installation, or prior to installation, in a mockup of the actual installation. The test shall be certified to in writing by the manufacturer or by a registered professional engineer performing the test.

(b) After installation and before use, and at the beginning of any seven (7) day period during which the conveyance is to be used, the conveyance shall be suitably rested and the hoist rope slackened to test for the unrestricted functioning of the safety catches and their activating mechanisms.

(c) The safety catches shall be inspected by a competent person at the beginning of any 24-hour period that the conveyance is to be used.

55.19–133 *Mandatory.* Shafts that have not been inspected within the past 7 days shall not be used until an inspection has been conducted by a competent person.

55.19–134 *Mandatory.* Sheaves in operating shafts shall be inspected weekly and kept properly lubricated.

55.19–135 *Mandatory.* Rollers used in operating inclined shafts shall be lubricated, properly aligned, and kept in good repair.

§ 55.20 Miscellaneous.

55.20–1 *Mandatory.* Intoxicating beverages and narcotics shall not be permitted or used in or around mines. Persons under the influence of alcohol or narcotics shall not be permitted on the job.

55.20–2 *Mandatory.* An adequate supply of potable drinking water shall be provided at all active working areas.

(a) The common drinking cup and containers from which drinking water must be dipped or poured are prohibited.

(b) Where single service cups are supplied, a sanitary container for unused cups and a receptacle for used cups shall be provided.

(c) When water is cooled by ice, the ice shall either be of potable water or shall not come in contact with the water.

(d) Potable water outlets shall be posted.

(e) Potable water systems shall be constructed to prevent backflow or backsiphonage of non-potable water.

55.20–3 *Mandatory.* At all mining operations: (a) Workplaces, passageways, storerooms, and service rooms shall be kept clean and orderly. (b) The floor of every workplace shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places shall be provided where practicable. (c) Every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards, as practicable.

55.20–4 [Reserved]

55.20–5 *Mandatory.* Carbon tetrachloride shall not be used.

55.20–6 and 55.20–7 [Reserved]

55.20–8 *Mandatory.* (a) Toilet facilities shall be provided at locations that are compatible with the mine operations and that are readily accessible to mine personnel.

(b) The facilities shall be kept clean and sanitary. Separate toilet facilities shall be provided for each sex except where toilet rooms will be occupied by no more than one person at a time and can be locked from the inside.

55.20–9 *Mandatory.* Dusts suspected of being explosive shall be tested for explo-

sibility. If tests prove positive, appropriate control measures shall be taken.

55.20–10 *Mandatory.* If failure of a water or silt retaining dam will create a hazard, it shall be of substantial construction and inspected at regular intervals.

55.20–11 *Mandatory.* Areas where health or safety hazards exist that are not immediately obvious to employees shall be barricaded, or warning signs shall be posted at all approaches. Warning signs shall be readily visible, legible, display the nature of the hazard, and any protective action required.

55.20–12 *Mandatory.* Toxic materials used in conjunction with or discarded from mining or milling of a product shall be plainly marked or labeled so as to positively identify the nature of the hazard and the protective action required.

55.20–13 *Mandatory.* Receptacles with covers shall be provided at suitable locations and used for the disposal of waste food and associated materials. They shall be emptied frequently and shall be maintained in a clean and sanitary condition.

55.20–14 *Mandatory.* No person shall be allowed to consume or store food or beverages in a toilet room nor in any area exposed to a toxic material.

55.20–15 through 55.20–29 [Reserved]

§ 55.21 [Reserved]

§ 55.22 [Reserved]

§ 55.23 [Reserved]

§ 55.24 [Reserved]

§ 55.25 [Reserved]

§ 55.26 Procedures.

NOTIFICATION OF COMMENCEMENT OF OPERATIONS AND CLOSING OF MINES

55.26–1 *Mandatory.* The owner, operator, or person in charge of any metal and nonmetal mine shall notify the nearest Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration before starting operations of the approximate or actual date mine operation will commence. The notification shall include the mine name, location, the company name, mailing address, person in charge, and whether operations will be continuous or intermittent.

When any mine is closed, the person in charge shall notify the nearest subdistrict office as provided above, and indicate whether the closure is temporary or permanent.

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PART 56—HEALTH AND SAFETY STANDARDS—SAND, GRAVEL, AND CRUSHED STONE OPERATIONS

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56.26 Procedures.

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SOURCE: 34 FR 12511, July 31, 1969, unless otherwise noted.

NOTE: Nomenclature changes appear at 43 FR 12318, Mar. 24, 1978.

§ 56.1 Purpose and scope.

The regulations in this part are promulgated pursuant to section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) and prescribe health and safety standards for the purpose of the protection of life, the promotion of health and safety, and the prevention of accidents in sand (including industrial sands), gravel and crushed stone operations which are subject to that Act. Each standard which is preceded by the word "Mandatory" is a mandatory standard. The violation of a mandatory standard will subject an operator to an order or notice under section 8 of the Act (30 U.S.C. 727).

§ 56.2 Definitions.

As used in this part:

"American Table of Distances" means the current edition of "The American Table of Distances for Storage of Explosives" published by the Institute of Makers of Explosives.

"Approved" means tested and accepted for a specific purpose by a nationally recognized agency.

"Authorized person" means a person approved or assigned by mine management to perform a specific type of duty or duties or to be at a specific location or locations in the mine.

"Barricaded" means obstructed to prevent the passage of persons, vehicles, or flying materials.

"Berm" means a pile or mound of material capable of restraining a vehicle.

"Blasting agent" means any substance classified as a blasting agent by the Department of Transportation in 49 CFR § 173.114a (44 FR 31182, May 31, 1979) which is incorporated by reference. This document is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Blasting area" means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury.

"Blasting cap" means a detonator which is initiated by a safety fuse.

"Blasting ciruit" means the electrical circuit used to fire one or more electric blasting caps.

"Blasting switch" means a switch used to connect a power source to a blasting circuit.

"Booster" means any unit of explosive or blasting agent used for the purpose of perpetuating or intensifying an initial detonation.

"Capped fuse" means a length of safety fuse to which a blasting cap has been attached.

"Capped primer" means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator.

"Circuit breaker" means a device designed to open and close a circuit by non-

automatic means and to open the circuit automatically on a predetermined overcurrent setting without injury to itself when properly applied within its rating.

"Combustible" means capable of being ignited and consumed by fire.

"Company official" means a member of the company supervisory or technical staff.

"Competent person" means a person having abilities and experience that fully qualify him to perform the duty to which he is assigned.

"Conductor" means a material, usually in the form of a wire, cable, or bus bar, capable of carrying an electric current.

"Delay connector" means a non-electric short interval delay device for use in delaying blasts which are initiated by detonating cord.

"Detonating cord" means a flexible cord containing a solid core of high explosives.

"Detonator" means any device containing a detonating charge that is used to initiate an explosive and includes but is not limited to, blasting caps, electric blasting caps and non electric instantaneous or delay blasting caps.

"Distribution box" means a portable apparatus with an enclosure through which an electric circuit is carried to one or more cables from a single incoming feed line, each cable circuit being connected through individual overcurrent protective devices.

"Electric blasting cap" means a detonator designed for and capable of being initiated by means of an electric current.

"Electrical grounding" means to connect with the ground to make the earth part of the circuit.

"Employee" means a person who works for wages or salary in the service of an employer.

"Employer" means a person or organization which hires one or more persons to work for wages or salary.

"Explosive" means any substance classified as an explosive by the Department of Transportation in 49 CFR § § 173.53, 173.88, and 173.100 which are incorporated by reference. Title 49 CFR is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Face or bank" means that part of any mine where excavating is progressing or was last done.

"Flammable" means capable of being easily ignited and of burning rapidly.

"Flash point" means the minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure.

"Highway" means any public street, public alley, or public road.

"High potential" means more than 650 volts.

"Hoist" means a power driven windlass or drum used for raising ore, rock, or other material from a mine, and for lowering or raising men and material.

"Igniter cord" means a fuse, cordlike in appearance, which burns progressively along its length with an external flame at the zone of burning, and is used for lighting a series of safety fuses in the desired sequence.

"Insulated" means separated from other conducting surfaces by a dielectric substance permanently offering a high resistance to the passage of current and to disruptive discharge through the substance. When any substance is said to be insulated, it is understood to be insulated in a manner suitable for the conditions to which it is subjected. Otherwise, it is, within the purpose of this definition, uninsulated. Insulating covering is one means for making the conductor insulated.

"Insulation" means a dielectric substance offering a high resistance to the passage of current and to a disruptive discharge through the substance.

"Lay" means the distance parallel to the axis of the rope in which a strand makes one complete turn about the axis of the rope.

"Low potential" means 650 volts or less.

"Magazine" means a facility for the storage of explosives, blasting agents, or detonators.

"Major electrical installation" means an assemblage of stationary electrical equipment for the generation, transmission, distribution, or conversion of electrical power.

"Man trip" means a trip on which men are transported to and from a work area.

"Mill" includes any ore mill, sampling works, concentrator, and any crushing, grinding, or screening plant used at, and in connection with, an excavation or mine.

"Misfire" means the complete or partial

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failure of a blasting charge to explode as planned.

"Multipurpose dry-chemical fire extinguisher" means a listed or approved multipurpose dry-chemical fire extingisher having a minimum rating of 2-A:10-B:C, by Underwriters Laboratories, Inc., and containing a minimum of 4.5 pounds of dry-chemical agent.

"Non-electric delay blasting cap" means a detonator with an integral delay element and capable of being initiated by miniaturized detonating cord.

"Overburden" means material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials or ores that are to be mined.

"Overload" means that current which will cause an excessive or dangerous temperature in the conductor or conductor insulation.

"Permissible" means a machine, material, apparatus, or device which has been investigated, tested, and approved by the Bureau of Mines or the Mine Safety and Health Administration and is maintained in permissible condition.

"Potable water" means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR Part 141, pages 169–182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR Part 72, Subpart J, pages 527–533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

"Powder chest" means a substantial, nonconductive, portable container equipped with a lid and used at blasting sites for explosives other than blasting agents.

"Primer" means a unit, package, or cartridge of explosives used to initiate other explosives or blasting agents, and which contains a detonator.

"Reverse-current protection" means a method or device used on direct-current circuits or equipment to prevent the flow of current in the reverse direction.

"Roll protection" means a framework, safety canopy or similar protection for the operator when equipment overturns.

"Safety can" means an approved container, of not over five gallons capacity, having a spring-closing lid and spout cover.

"Safety fuse" means a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps or a black powder charge.

"Safety switch" means a sectionalizing switch that also provides shunt protection in blasting circuits between the blasting switch and the shot area.

"Scaling" means removal of insecure material from a face or high-wall.

"Secondary safety connection" means a second connection between a conveyance and rope, intended to prevent the conveyance from running away or falling in the event the primary connection fails.

"Shaft" means a vertical or inclined shaft, a slope, incline or winze.

"Short circuit" means an abnormal connection of relatively low resistance, whether made accidentally or intentionally, between two points of different potential in a circuit.

"Slurry" (as applied to blasting). See "Water gel".

"Spray current" means that portion of a total electric current that flows through paths other than the intended circuit.

"Substantial construction" means construction of such strength, material, and workmanship that the object will withstand all reasonable shock, wear, and usage, to which it will be subjected.

"Suitable" means that which fits and has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Travelway" means a passage, walk or way regularly used and designated for persons to go from one place to another.

"Trip light" means a light displayed on the opposite end of a train from the locomotive or engine.

"Water gel" or "Slurry" (as applied to blasting) means an explosive or blasting agent containing substantial portions of water.

"Wet drilling" means the continuous application of water through the central

hole of hollow drill steel to the bottom of the drill hole.

"Working place" means any place in or about a mine where work is being performed.

§ 56.3 Ground control.

56.3–1 *Mandatory.* Standards for the safe control of pit walls, including the overall slope of the pit wall, shall be established and followed by the operator. Such standards shall be consistent with prudent engineering design, the nature of the ground and the kind of material and mineral mined, and the ensuring of safe working conditions according to the degree of slope. Mining methods shall be selected which will ensure wall and bank stability, including benching as necessary to obtain a safe overall slope.

56.3–2 *Mandatory.* Loose, unconsolidated material shall be stripped for a safe distance, but in no case less than 10 feet, from the top of pit or quarry walls, and the loose, unconsolidated material shall be sloped to the angle of repose.

56.3–3 *Mandatory.* To insure safe operation, the width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

56.3–4. *Mandatory.* Safe means for scaling pit banks shall be provided. Hazardous banks shall be scaled before other work is performed in the hazardous bank area.

56.3–5 *Mandatory.* Men shall not work near or under dangerous banks. Overhanging banks shall be taken down immediately and other unsafe ground conditions shall be corrected promptly, or the areas shall be barricaded and posted.

56.3–6 *Mandatory.* Men shall approach from above loose rock and areas to be scaled and shall scale from a safe location.

56.3–7 [Reserved]

56.3–8 *Mandatory.* The supervisor, or a competent person designated by him, shall examine working areas and faces for unsafe conditions at least at the beginning of each shift and after blasting. Any unsafe condition found shall be corrected before any further work is performed at the immediate area or face at which the unsafe condition exists.

56.3–9 *Mandatory.* Men shall examine their working places before starting work and frequently thereafter, and any unsafe condition shall be corrected.

56.3–10 and 56.3–11 [Reserved]

56.3–12 *Mandatory.* Men shall not work between equipment and the pit wall or bank where the equipment may hinder escape from falls or slides of the bank.

56.3–13 through 56.3–49 [Reserved]

56.3–50 *Mandatory.* Material, other than hanging material, to be broken by secondary drilling and blasting, or by any other method shall be positioned or blocked to prevent hazardous movement before persons commence breaking operations. Persons who perform those operations shall work from a location where, if movement of material occurs, those persons will not be endangered.

56.3–51 *Mandatory.* Where manual scaling may be required at a work place, a scaling bar of sufficient length to place the user out of danger of falling material shall be provided. The scaling bar shall be blunt on the end held by the user. Picks or other short tools shall not be used for scaling when their use places the user in danger of falling material.

56.3–52 [Reserved]

56.3–53 *Mandatory.* When rock bolts are used as a means of ground support, anchorage test procedures shall be established and tests shall be conducted to determine the anchorage capacity of rock-bolt installations. Test results shall be in writing and made available to the Secretary or his duly authorized representative.

56.3–54 *Mandatory.* Rock bolts used as a means of ground support and which require torquing shall be torqued to a value within the range determined from information obtained by tests in the strata in which the rock-bolt assembly is used. In no case shall the applied torque cause a bolt tension that would exceed the yield point or anchorage capacity of the rock-bolt assembly being used.

56.3–55 *Mandatory.* When installing point-anchor rock bolts:

(a) A torque test shall be conducted on at least every fourth installed bolt.

(b) Torque testing shall be conducted immediately after bolt installation.

(c) If the recommended torque has not been achieved, the equipment used to install the bolt shall be adjusted and the next bolt installed shall then be tested.

(d) If the recommended torque has not been achieved on the majority of bolts installed in a working place through equipment adjustment, supplemental support

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equivalent to longer roof bolts with adequate anchorage, steel or wood sets, or cribs shall be installed.

56.3–56 *Mandatory.* Rock bolt hole drill bits shall be easily identifiable by sight or feel and diameters shall be within a tolerance of ± 0.030 inches of the manufacturer's recommended hole diameter for the anchor used.

56.3–57 *Mandatory.* If used in rock-bolt assemblies to reduce friction between the bolt head and the bearing plate, washers shall: (a) Have hardness in the range of 35–45 HRC (Hardness Rockwell C Scale). (b) Conform to the shape of the bolt head and bearing plate. (c) Have sufficient strength to withstand loads up to the yield point of the rock bolt.

56.3–58 [Reserved]

§ 56.4 Fire prevention and control.

56.4–1 *Mandatory.* No person shall smoke or use an open flame—

(a) Where flammable solvents, liquids, fluids, or other flammable materials are stored, transported, handled, or used; or

(b) Where oil or grease is stored, transported, handled, or used, if smoking or the use of an open flame may cause a fire; or

(c) Within an unsafe distance of any area where smoking or the use of an open flame may cause a fire or an explosion.

56.4–2 *Mandatory.* Signs warning against smoking and open flames shall be posted so they can be readily seen in areas or places where fire or explosion hazards exist.

56.4–3 *Mandatory.* Areas surrounding electric substations and unburied tanks used for the storage of flammable or combustible liquids shall be free of combustible materials (including dry vegetation) for a distance of at least 25 feet.

56.4–4 *Mandatory.* Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association or other recognized agencies approved by the Mine Safety and Health Administration. Small quantities of flammable liquids drawn from storage shall be kept in appropriately labeled safety cans.

56.4–5 *Mandatory.* Effective February 13, 1980, fixed unburied tanks used for the storage of flammable or combustible liquids shall be securely mounted on firm foundations. Where necessary to prevent leaks caused by tanks settling, piping shall be provided with flexible connections or other special fittings.

56.4–6 [Reserved]

56.4–7 *Mandatory.* Means shall be provided to remove or control spilled flammable or combustible liquids.

56.4–8 *Mandatory.* Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.

56.4–9 *Mandatory.* All heat sources, including lighting equipment, capable of producing combustion shall be insulated or isolated from combustible materials.

56.4–10 *Mandatory.* Power wires and cables shall be adequately insulated where they pass through doors or walls or where they present a fire hazard.

56.4–11 *Mandatory.* Abandoned electrical circuits shall be deenergized and isolated so that they cannot become energized inadvertently.

56.4–12 *Mandatory.* All flammable and combustible waste materials, grease, lubricants or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

56.4–13 *Mandatory.* In areas where materials such as oily waste or oily rags create a fire hazard, the materials shall be placed in covered metal containers until disposed of properly.

56.4–14 *Mandatory.* Solvents with flash points lower than 100° F. (38° C.) shall not be used for cleaning.

56.4–15 *Mandatory.* Solvents shall not be used near an open flame or other ignition source, or near any source of heat, or in an atmosphere that can elevate the temperature of the solvent above the flash point.

56.4–16 *Mandatory.* Drip pans shall be provided to catch leakage or spillage whenever combustible or flammable liquids are dispensed in a place or manner which may create a fire hazard. Floor areas where drip pans are used shall be cleaned immediately after spills.

56.4–17 [Reserved]

56.4–18 *Mandatory.* Oxygen cylinders shall not be stored in rooms or areas used or designated for oil or grease storage.

56.4–19 *Mandatory.* Gages and regulators used with oxygen or acetylene cylinders shall be kept clean and free of oil and grease.

56.4–20 *Mandatory.* Battery-charging stations shall be located in well-ventilated areas.

56.4–21 *Mandatory.* Equipment powered by internal combustion engines (ex-

cept diesel engines), where the fuel tank is an integral part of the equipment, shall be shut off and stopped before being fueled.

56.4–22 *Mandatory.* Each mine shall have available or be provided with suitable fire fighting equipment adequate for the size of the mine.

56.4–23 *Mandatory.* Fire fighting equipment which is provided on the mine property shall be strategically located, readily accessible, plainly marked, properly maintained, and inspected periodically. Records shall be kept of such inspections.

56.4–24 *Mandatory.* Fire extinguishers and fire suppression devices shall be:

(a) Of the appropriate types for the particular fire hazard involved.

(b) Adequate in number and size for the particular fire hazard involved.

(c) Replaced with a fully charged extinguisher or device, or recharged immediately, after any discharge is made from the extinguisher or device.

(d) Inspected, tested, and maintained at regular intervals according to the manufacturer's recommendations.

(e) Approved by the Underwriter's Laboratories, Inc., or other competent testing agency acceptable to the Mine Safety and Health Administration.

56.4–25 *Mandatory.* Effective February 13, 1980, whenever fire hydrants are used, they shall be provided with—

(a) Uniform fittings;

(b) Readily available wrenches or keys to open the valves; and

(c) Readily available adapters that connect hydrant fittings to the hose equipment of local fire departments.

56.4–26 *Mandatory.* Water pipes, valves, outlets, hydrants, and hoses designated for fire fighting purposes shall be inspected every 90 days and tested annually.

56.4–27 *Mandatory.* Whenever self-propelled mobile equipment is used, such equipment shall be provided with a suitable fire extinguisher readily accessible to the equipment operator.

56.4–28 *Mandatory.* Welding, cutting, arc welding or soldering shall be performed by a competent person.

56.4–29 *Mandatory.* When welding or cutting, suitable precautions shall be taken to ensure that smoldering metal or sparks do not result in a fire. Fire extinguishing equipment shall be immediately available at the site.

56.4–30 through 56.4–32 [Reserved]

56.4–33 *Mandatory.* Valves on oxygen and acetylene tanks shall be kept closed when the contents are not being used.

56.4–34 [Reserved]

56.4–35 *Mandatory.* Before any heat is applied to pipelines or containers which have contained flammable or combustible substances, they shall be drained, ventilated, thoroughly cleaned of residual substances and filled with either an inert gas or, where compatible, filled with water.

56.4–36 through 56.4–38 [Reserved]

56.4–39A *Mandatory.* Effective February 13, 1980, storage buildings or rooms in which flammable or combustible liquids or other flammable materials are stored and which are within 100 feet of where miners normally work shall be well-ventilated and constructed of materials having a fire-resistance rating of no less than one (1) hour as tested under the appropriate National Fire Protection Association (NFPA) fire-resistance test or under a test of another approved testing agency.

56.4–39B *Mandatory.* Emergency fire fighting plans in combination with evacuation and rescue plans shall be established and coordinated with available fire fighting organizations. Emergency fire fighting drills shall be held for each shift at least once every six (6) months.

56.4–39C through 56.4–39Z [Reserved]

56.4–40 *Mandatory.* Fire alarm systems shall be provided and maintained in operating condition or adequate fire alarm procedures shall be established to warn promptly all persons endangered by a fire.

56.4–41 *Mandatory.* Every building or structure where persons normally work shall be provided with exits sufficient to permit the prompt escape of persons in case of fire.

56.4–42 through 56.4–46 [Reserved]

56.4–47 *Mandatory.* Belt conveyors shall be equipped with a safety switch capable of automatically stopping the drive pulley in the event of excessive slippage of the belt, where ignition of the belt could create a hazard to personnel. When it is necessary to operate the conveyor while temporarily by-passing the safety switch or any automatic function of the switch, a person shall attend the belt at the drive pulley.

56.4–48 *Mandatory.* All employees shall be instructed at least once each calendar year on fire alarm signals and applicable procedures to be followed in case of fire

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or other emergency. Records of instruction shall be kept for 2 years.

56.4–49 [Reserved]

§ 56.5 Air quality and physical agents.

Air Quality

56.5–1 *Mandatory.* Except as permitted by § 56.5–5:

(a) Except as provided in paragraph (b), the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54, which are hereby incorporated by reference and made a part hereof. This publication may be obtained from the American Conference of Governmental Industrial Hygienists by writing to the Secretary-Treasurer, P.O. Box 1937, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration. Excursions above the listed thresholds shall not be of a greater magnitude than is characterized as permissible by the Conference.

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400–450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

(c) Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant.

56.5–2 *Mandatory.* Dust, gas, mist, and fume surveys shall be conducted as frequently as necessary to determine the adequacy of control measures.

56.5–3 *Mandatory.* Holes shall be collared and drilled wet, or other efficient dust control measures shall be used when drilling non-water-soluble material. Efficient dust control measures shall be used when drilling water-soluble materials.

56.5–4 [Reserved]

56.5–5 *Mandatory.* Control of employee exposure to harmful airborne contaminants shall be, insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. However, where accepted engineering control measures have not been developed or when necessary by the nature of work involved (for example, while establishing controls or occasional entry into hazardous atmospheres to perform maintenance or investigation), employees may work for reasonable periods of time in concentrations of airborne contaminants exceeding permissible levels if they are protected by appropriate respiratory protective equipment. Whenever respiratory protective equipment is used a program for selection, maintenance, training, fitting, supervision, cleaning, and use shall meet the following minimum requirements:

(a) Mine Safety and Health Administration approved respirators which are applicable and suitable for the purpose intended shall be furnished, and employees shall use the protective equipment in accordance with training and instruction.

(b) A respirator program consistent with the requirements of ANSI Z88.2–1969, published by the American National Standards Institute and entitled "American National Standards Practices for Respiratory Protection ANSI Z88.2–1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict

Office of the Mine Safety and Health Administration.

(c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment.

56.5–6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-Nitrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethylenelmine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

56.5–7 through 56.5–9 [Reserved]

56.5–10 *Mandatory.* Silica sand, or other materials containing more that 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

56.5–11 through 56.5–49 [Reserved]

– Physical Agents

56.5–50 *Mandatory.* (a) No employee shall be permitted an exposure to noise in excess of that specified in the table below. Noise level measurements shall be made using a sound level meter meeting specifications for type 2 meters contained in American National Standards Institute (ANSI) Standard S1.4–1971, "General Purpose Sound Level Meters," approved April 27, 1971, which is hereby incorporated by reference and made a part hereof, or by a dosimeter with similar accuracy. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

Permissible Noise Exposures

Duration per day, hours of exposure	Sound level dBA, slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

No exposure shall exceed 115 dBA. Impact or impulsive noises shall not exceed 140 dB, peak sound pressure level.

Note. When the daily noise exposure is composed of two or more periods of noise exposure at different levels, their combined effect shall be considered rather than the individual effect of each.

If the sum

$$(C_1/T_1)+(C_2/T_2)+\ldots(C_n/T_n)$$

exceeds unity, then the mixed exposure shall be considered to exceed the permissible exposure. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at th at level. Interpolation between tabulated values may be determined by the following formula:

$$\text{Log } T=6.322-0.0602\ SL$$

Where T is the time in hours and SL is the sound level in dBA.

(b) When employees' exposure exceeds that listed in the above table, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce exposure to within permissible levels, personal protection equipment shall be provided and used to reduce sound levels to within the levels of the table.

§ 56.6 Explosives.

The term "explosives" as used in this § 56.6 includes blasting agents. The standards in this section in which the

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term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

STORAGE

56.6–1 *Mandatory.* Detonators and explosives other than blasting agents shall be stored in magazines.

56.6–2 *Mandatory.* Detonators shall not be stored in the same magazine with explosives.

56.6–3 and 56.6–4 [Reserved]

56.6–5 *Mandatory.* Areas surrounding magazines and facilities for the storage of blasting agents shall be kept clear of rubbish, brush, dry grass, or trees (other than live trees 10 or more feet tall), for a distance not less than 25 feet in all directions, and other unnecessary combustible materials for a distance of not less than 50 feet.

56.6–6 [Reserved]

56.6–7 *Mandatory.* Explosives, detonators, and related materials such as safety fuse and detonating cord shall be:

(a) Stored in a manner to facilitate use of oldest stocks first.

(b) Stored according to brand and grade in such a manner as to facilitate identification.

(c) Stored with their top sides up.

(d) Stacked in a stable manner but not more than eight (8) feet high.

56.6–8 *Mandatory.* Ammonium nitrate-fuel oil blasting agents shall be physically separated from other explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the other explosives, safety fuse, or detonating cord.

56.6–9 [Reserved]

56.6–10 [Reserved]

56.6–11 *Mandatory.* Containers of explosives, blasting agents, and detonators shall be closed while being stored.

56.6–12 *Mandatory.* Prior to interior repair of facilities for storage of explosives, including blasting agents, all materials stored within the facility shall be removed and the interior cleaned. Prior to the exterior repair of such facilities, all materials stored within the facility shall be removed if there exists a possibility that such repairs may produce a spark or flame. The explosives removed from storage facilities to be repaired shall be placed either in other storage facilities appropriate for the storage of such materials under this section or a safe distance from the facilities under repair where they shall be properly guarded and protected until the repairs have been completed and the materials have been returned to storage within the facilities.

56.6–13 through 56.6–19 [Reserved]

56.6–20 *Mandatory.* Magazines shall be:

(a) Located in accordance with the current American Table of Distances for Storage of Explosives.

(b) Detached structures located away from powerlines, fuel storage areas, and other possible sources of fire.

(c) Constructed substantially of noncombustible material or covered with fire-resistant material.

(d) Reasonably bullet resistant.

(e) Electrically bonded and grounded if constructed of metal.

(f) Made of nonsparking materials on the inside, including floors.

(g) Provided with adequate and effectively screened ventilation openings near the floor and ceiling.

(h) Kept locked securely when unattended.

(i) Posted with suitable danger signs so located that a bullet passing through the face of a sign will not strike the magazine.

(j) Used exclusively for storage of explosives or detonators and kept free of all extraneous materials.

(k) Kept clean and dry in the interior, and in good repair.

(l) Unheated, unless heated in a manner that does not create a fire or explosion hazard. Electrical heating devices shall not be used inside a magazine.

56.6–21 through 56.6–39 [Reserved]

TRANSPORTATION

56.6–40 *Mandatory.* Explosives and detonators shall be transported in separate vehicles unless separated by 4 inches of hardwood or the equivalent.

55.6–41 *Mandatory.* When explosives and detonators are hauled by trolley locomotive, covered, electrically-insulated cars shall be used.

56.6–42 *Mandatory.* Self-propelled vehicles used to transport explosives or detonators shall be equipped with suitable fire extinguishers.

56.6–43 *Mandatory.* Vehicles containing explosives or detonators shall be posted with proper warning signs.

56.6–44 *Mandatory.* When vehicles containing explosives or detonators are

parked, the brakes shall be set, the motive power shut off, and the vehicles shall be blocked securely against rolling.

56.6–45 *Mandatory.* Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.

56.6–46 *Mandatory.* Vehicles containing explosives or detonators shall be maintained in good condition and shall be operated at a safe speed and in accordance with all safe operating practices.

56.6–47 *Mandatory.* Vehicles used to transport explosives, other than blasting agents, shall have substantially constructed bodies, no sparking metal exposed in the cargo space, and shall be equipped with suitable sides and tail gates; explosives shall not be piled higher than the side or end enclosures.

56.6–48 *Mandatory.* Explosives and blasting agents shall be transported without undue delay, and over routes and at times that expose a minimum number of persons.

56.6–49 [Reserved]

56.6–50 *Mandatory.* Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives, detonating cord or detonators, except for safety fuse and except for properly secured, nonsparking equipment used expressly in the handling of such explosives, detonating cord or detonators.

56.6–51 *Mandatory.* Explosives or detonators shall not be transported on locomotives.

56.6–52 [Reserved]

56.6–53 *Mandatory.* Only the necessary attendants shall ride on or in vehicles containing explosives or detonators.

56.6–54 *Mandatory.* Explosives or detonators shall not be transported on man trips.

56.6–55 [Reserved]

56.6–56 *Mandatory.* Substantial nonconductive containers shall be used to carry explosives to blasting sites.

56.6–57 *Mandatory.* Nonconductive containers with tight-fitting covers shall be used to transport or carry capped fuses and electric detonators to blasting sites.

56.6–58 through 56.6–64 [Reserved]

56.6–65 *Mandatory.* Vehicles containing detonators or explosives, other than blasting agents, shall not be left unattended except in blasting areas where loading or charging is in progress.

56.6–66 through 56.6–89 [Reserved]

Use

56.6–90 *Mandatory.* Persons who use or handle explosive or detonators shall be experienced men who understand the hazards involved; trainees shall do such work only under the supervision of and in the immediate presence of experienced men.

56.6–91 *Mandatory.* Blasting operations shall be under the direct control of authorized persons.

56.6–92 *Mandatory.* Damaged or deteriorated explosives and blasting agents shall be destroyed in a safe manner under the instructions of the explosives or blasting agent manufacturer or its designated agent.

56.6–93 *Mandatory.* Boreholes shall be cleared of obstructions before charging.

56.6–94 *Mandatory.* Holes to be blasted shall be charged as near to blasting time as practical and such holes shall be blasted as soon as possible after charging has been completed. In no case shall the time elapsing between the completion of charging to the time of blasting exceed 72 hours unless prior approval has been obtained from the Mine Safety and Health Administration.

56.6–95 [Reserved]

56.6–96 *Mandatory.* Explosives shall be kept separated from detonators until charging is started.

56.6–97 *Mandatory.* Primers shall be made up only at the time of use and as close to the blasting area as conditions allow.

56.6–98 *Mandatory.*

(a) Primers containing a detonator shall be prepared with the detonator contained securely and completely within the explosive charge or within a suitable tunnel or cap well.

(b) When using detonating cord to initiate another explosive, a connection shall be prepared with the detonating cord threaded through, attached securely to, or otherwise in intimate contact with the explosive charge.

56.6–99 *Mandatory.* Only wooden or other nonsparking implements shall be used to punch holes in an explosive cartridge.

56.6–100 *Mandatory.* Tamping poles shall be of wood or other material acceptable to the Mine Safety and Health Administration. Couplers of tamping poles shall be of nonsparking materials.

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56.6–101 *Mandatory.* Tamping shall not be done directly on a primer.

56.6–102 *Mandatory.* Unused explosives and detonators shall be moved to a safe location as soon as charging operations are completed.

56.6–103 *Mandatory.* Areas in which charged holes are awaiting firing shall be guarded, or barricaded and posted, or flagged against unauthorized entry.

56.6–104 *Mandatory.* When safety fuse has been used, men shall not return to misfired holes for at least 30 minutes.

56.6–105 *Mandatory.* When electric blasting caps have been used, men shall not return to misfired holes for at least 15 minutes.

56.6–106 *Mandatory.* Faces and muck piles shall be examined by a competent person for undetonated explosives or blasting agents and any undetonated explosives or blasting agents found shall be disposed of safely.

56.6–107 *Mandatory.* Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

56.6–108 *Mandatory.* Fuse and igniters shall be stored in a cool, dry place away from oils or grease.

56.6–109 *Mandatory.* Safety fuse, igniter cord, and detonating cord shall not be used if they have been kinked, bent sharply, or otherwise damaged.

56.6–110 *Mandatory.* Fuses shall be cut and capped in safe, dry locations posted with "No Smoking" signs.

56.6–111 *Mandatory.* Blasting caps shall be crimped to fuses only with implements designed for that specific purpose.

56.6–112 *Mandatory.* The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all men concerned with blasting.

56.6–113 *Mandatory.* When firing from 1 to 15 blastholes with safety fuse ignited individually using hand-held lighters, the fuses shall be of such lengths to provide the minimum burning time specified in the following table for a particular size round:

Number of holes in a round	*Minimum burning time, minutes*
1	2
2–5	2½
6–10	3½
11–15	5

In no case shall any 40-second-per-foot safety fuse less than 36 inches long or any 30-second-per-foot safety fuse less than 48 inches long be used.

56.6–114 *Mandatory.* At least two men shall be present when lighting fuses, and no man shall light more than 15 individual fuses. If more than 15 holes per man are to be fired, igniter cord and connectors or electric blasting shall be used.

56.6–115 *Mandatory.* All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunklines.

56.6–116 *Mandatory.* Fuse shall be ignited with hot-wire lighters, lead spitters, igniter cord, or other such devices designed for this purpose. Carbide lights shall not be used to light fuses.

56.6–117 *Mandatory.* Fuse shall not be ignited before the primer and the entire charge are securely in place.

56.6–118 *Mandatory.* When using safety fuse, where fly rock might damage unlit or burning fuses, timing shall be such that all fuses are burning within the holes before any hole detonates.

56.6–119 *Mandatory.* Electric detonators of different brands shall not be used in the same round.

56.6–120 *Mandatory.* Except when being tested with a blasting galvanometer:

(a) Electric detonators shall be kept shunted until they are being connected to the blasting line or wired into a blasting round.

(b) Wired rounds shall be kept shunted until they are being connected to the blasting line.

(c) Blasting lines shall be kept shunted until immediately before blasting.

56.6–121 *Mandatory.* When blasting electrically a blasting galvanometer, or other instrument that is specifically designed for testing blasting circuits, shall be used to test:

(a) In surface operations:

(1) Continuity of each electric blasting cap in the borehole prior to the addition of stemming.

(2) Resistance of individual series or the resistance of multiple balanced series to be connected in parallel prior to their connection to the blasting line.

(3) Continuity of blasting lines prior to the connection of electric blasting cap series.

(4) Total blasting circuit resistance prior to connection to the power source.

(b) In underground operations:

(1) Continuity of each electric blasting cap series.

(2) Continuity of blasting lines prior to the connection of electric blasting caps.

56.6–122 *Mandatory.* Permanent blasting lines shall be properly supported, insulated, and kept in good repair.

56.6–123 *Mandatory.* When electric detonators are used, charging shall be stopped immediately when the presence of static electricity or stray currents is detected; the condition shall be remedied before charging is resumed.

56.6–124 *Mandatory.* When electric detonators are used, charging shall be suspended in surface mining, shaft sinking, and tunneling and men withdrawn to a safe location upon the approach of an electrical storm.

56.6–125 *Mandatory.* If branch circuits are used when blasts are fired from power circuits, safety switches located at safe distances from the blast areas shall be provided in addition to the main blasting switch.

56.6–126 *Mandatory.* Electric power distribution circuits shall be de-energized within 50 feet of boreholes containing electric blasting caps which can be initiated by conventional power sources or extraneous electricity except that such circuits need not be de-energized between 25 and 50 feet of such boreholes when stray current tests, conducted as frequently as necessary, measure a maximum stray current less than 0.05 amperes through a one-ohm resistor measured at the location of the electric blasting cap.

56.6–127 *Mandatory.* Blasting switches shall be locked in the open position, except when closed to fire the blast. Lead wires shall not be connected to the blasting switch until the shot is ready to be fired.

56.6–128 *Mandatory.* The key or other control to an electrical firing device shall be entrusted only to the person designated to fire the round or rounds.

56.6–129 *Mandatory.* Electric circuits from the blasting switches to the blast area shall not be grounded.

56.6–130 *Mandatory.* At least a 15-foot air gap shall be provided between the blasting circuit and the electric power source.

56.6–131 *Mandatory.* Power sources shall be suitable for the number of electric detonators to be fired and for the type of circuits used.

56.6–132 *Mandatory.* Delay connectors shall be treated and handled with the same safety precautions as detonators.

56.6–133 *Mandatory.* If any part of a blast is connected in parallel and is to be initiated from powerlines or lighting circuits, the time of current flow shall be limited to a maximum of 25 milliseconds by incorporating an arcing control device in the blasting circuit or by interrupting the circuit with an explosive charge attached to one or both lead lines and initiated by a zero-delay electric blasting cap.

56.6–134 *Mandatory.* Tools used for opening metal or nailed wooden containers of explosives or detonators shall be of nonsparking materials.

56.6–135 *Mandatory.* Holes shall not be collared in bootlegs.

56.6–136 *Mandatory.* Black powder shall not be used for blasting except when a desired result cannot be obtained with another type of explosive such as in quarrying certain types of dimension stone.

56.6–137 *Mandatory.* In the use of black blasting powder:

(a) Containers shall not be opened in, or within 50 feet of, any magazine; within any building in which a fuel-fired or exposed-element electric heater is in operation; where electrical or incandescent-particle sparks could result in powder ignition; or within 50 feet of any open flame.

(b) Granular powder shall be transferred from containers only by pouring.

(c) Spills of granular powder shall be cleaned up promptly with nonsparking equipment; contaminated powder shall be put into a container of water and its content disposed of promptly after the granules have disintegrated, or the spill area shall be flushed with a copious amount of water to completely disintegrate the granules.

(d) Containers of powder shall be kept securely closed at all times other than when the powder is being transferred from or into a container.

(e) Containers of powder transported by vehicles shall be in a wholly enclosed cargo space.

(f) Misfires shall be disposed of by: (1) washing the stemming and powder charge from the borehole, and (2) removal and disposal of the initiator as a damaged explosive.

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(g) Boreholes of shots that fire but fail to break or fail to break properly, shall not be recharged for at least 12 hours.

56.6–138 *Mandatory*. Explosives or blasting agents shall not be loaded into drilled or sprung holes that could result in premature detonation from heat.

56.6–139 *Mandatory*. Blasting areas shall not be re-entered after firing until concentrations of smoke, dust, and fumes have been reduced to safe limits as required in, and determined by, mandatory standards 56.5–1 and 56.5–2, respectively.

56.6–140 *Mandatory*. Blasting circuits and electric blasting caps (which are capable of being initiated by conventional power sources) shall be protected from sources of extraneous electricity.

56.6–141 [Reserved]

56.6–142 *Mandatory*. Explosives or blasting agents shall not be loaded into boreholes through or with either drill stem equipment or other devices which could be extracted while containing explosives or blasting agents. The use of loading hose, collar sleeves or collar pipes is permitted.

56.6–143 through 56.6–158 [Reserved]

56.6–159 *Mandatory*. Powder chests shall be:

(a) Substantially constructed of nonsparking material on the inside.

(b) Posted with suitable warning signs.

(c) Located out of the blast area and out of the line of blasts.

(d) Emptied and their contents returned to the main magazine at the end of each shift unless the powder chest is located within the area continually attended by employees during shift changes.

(e) Separate for detonators and explosives unless separated by 4 inches of hardwood or the equivalent.

(f) Kept locked when unattended.

56.6–160 *Mandatory*. Ample warning shall be given before blasts are fired. All persons shall be cleared and removed from the blasting area unless suitable blasting shelters are provided to protect men endangered by concussion or flyrock from blasting.

56.6–161 *Mandatory*. If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one shall return to the hole until the danger has passed, but in no case within 1 hour.

56.6–162 *Mandatory*. Lead wires and blasting lines shall not be strung across power conductors, pipelines, railroad tracks, or within 20 feet of bare powerlines. They shall be protected from sources of static or other electrical contact.

56.6–163 *Mandatory*. The double-trunkline or loop system shall be used in detonating cord blasting.

56.6–164 *Mandatory*. Trunklines, in multiple-row blasts, shall make one or more complete loops, with crossties between loops at intervals of not over 200 feet.

56.6–165 [Reserved]

56.6–166 [Reserved]

56.6–167 [Reserved]

56.6–168 *Mandatory*. Misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in that blasting area.

56.6–169 through 56.6–189 [Reserved]

Sensitized Ammonium Nitrate Blasting Agents

All of the standards in this § 56.6 in which the term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

56.6–190 through 56.6–192 [Reserved]

56.6–193 *Mandatory*. Where pneumatic loading is employed, before any type of blasting operation using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be made. Adequate steps, including the grounding and bonding of the conductive parts of pneumatic loading equipment, shall be taken to eliminate the hazard of static electricity before blasting agent use is commenced.

56.6–194 *Mandatory*. Pneumatic loading equipment shall not be grounded to waterlines, air lines, rails, or the permanent electrical grounding systems.

56.6–195 *Mandatory*. Hoses used in connection with pneumatic loading machines shall be of the semiconductive type, having a total resistance low enough to permit the dissipation of static electricity and high enough to limit the flow of stray electric currents to a safe level. Wire-countered hose shall not be used because of the potential hazard from stray electric currents.

56.6–196 and 56.6–197 [Reserved]

56.6–198 *Mandatory*. Plastic tubes shall not be used as hole liners if blasting

agents are loaded pneumatically into holes containing an electric detonator.

56.6–199 [Reserved]

56.6–200 *Mandatory.* Vehicles used to transport blasting agents shall have substantially constructed bodies, no zinc or copper exposed in the cargo space and shall be freely vented. Blasting agents shall not be piled higher than the side or end enclosures of open-body vehicles. If an enclosed screw conveyor is used to discharge blasting agents from the vehicle the conveyor shall be protected against excessive internal pressure and excessive frictional heat.

56.6–201 through 56.6–249 [Reserved]

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56.6–250 *Mandatory.* Smoking and open flames, except for the use of suitable devices for igniting safety fuse or the use of approved heating devices, shall not be permitted within 50 feet as measured by the line of sight of explosives, blasting agents, or detonators or within 25 feet when out of line of sight and separated by permanent noncombustible barriers in underground active workings.

§ 56.7 Drilling.

56.7–1 [Reserved]

56.7–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

56.7–3 *Mandatory.* The drilling area shall be inspected for hazards before starting the drilling operations.

56.7–4 *Mandatory.* Men shall not be on a mast while the drill-bit is in operation unless they are provided with a safe platform from which to work and they are required to use safety belts to avoid falling.

56.7–5 *Mandatory.* Drill crews and others shall stay clear of augers or drill stems that are in motion. Persons shall not pass under or step over a moving stem or auger.

56.7–6 and 56.7–7 [Reserved]

56.7–8 *Mandatory.* When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position.

56.7–9 *Mandatory.* If a drill helper assists the drill operator during movement of a drill to a new location, the helper shall be in sight of, or in communication with, the operator at all times.

56.7–10 *Mandatory.* In the event of power failure, drill controls shall be placed in the neutral position until power is restored.

56.7–11 *Mandatory.* The drill stem shall be resting on the bottom of the hole or on the platform with the stem secured to the mast before attempts are made to straighten a crossed cable on a reel.

56.7–12 *Mandatory.* While in operation, drills shall be attended at all times.

56.7–13 *Mandatory.* Drill holes large enough to constitute a hazard shall be covered or guarded.

56.7–14 through 56.7–17 [Reserved]

56.7–18 *Mandatory.* Men shall not hold the drill steel while collaring holes, or rest their hands on the chuck or centralizer while drilling.

56.7–19 [Reserved]

56.7–20 through 56.7–49 [Reserved]

56.7–50 *Mandatory.* Receptacles or racks shall be provided for drill steel and tools stored or carried on drills.

56.7–51 *Mandatory.* To prevent injury to personnel, tools and other objects shall not be left loose on the mast or drill platform.

56.7–52 *Mandatory.* Persons shall not drill from—

(a) Positions which hinder their access to the control levers;

(b) Insecure footing or insecure staging; or

(c) Atop equipment not suitable for drilling.

56.7–53 *Mandatory.* Before hand-held drills are moved from one working area to another, air shall be turned off and bled from the hose.

56.7–54 through 56.7–100 [Reserved]

§ 56.8 Rotary jet piercing.

56.8–1 *Mandatory.* Jet piercing drills shall be provided with—

(a) A system to pressurize the equipment operator's cab, when a cab is provided; and

(b) A protective cover over the oxygen flow indicator.

56.8–2 *Mandatory.* Safety chains or other suitable locking devices shall be provided across connections to and between high pressure oxygen hose lines of 1-inch inside diameter or larger.

56.8–3 *Mandatory.* A suitable means of protection shall be provided for the employee when lighting the burner.

56.8–4 *Mandatory.* When rotary jet

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piercing equipment requires refueling at locations other than fueling stations, a system for fueling without spillage shall be provided.

56.8–5 *Mandatory.* Men shall not smoke and open flames shall not be used in the vicinity of the oxygen storage and supply lines. Signs warning against smoking and open flames shall be posted in these areas.

56.8–6 *Mandatory.* The oxygen intake coupling on jet piercing drills shall be constructed so that only the oxygen hose can be coupled to it.

56.8–7 *Mandatory.* The combustion chamber of a jet drill stem which has been sitting unoperated in a drill hole shall be flushed with a suitable solvent after the stem is pulled up.

§ 56.9 Loading, hauling, dumping.

56.9–1 *Mandatory.* Self-propelled equipment that is to be used during a shift shall be inspected by the equipment operator before being placed in operation. Equipment defects affecting safety shall be reported to, and recorded by the mine operator. The records shall be maintained at the mine or nearest mine office for at least 6 months from the date the defects are recorded. Such records shall be made available for inspection by the Secretary of Labor or his duly authorized representative.

56.9–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

56.9–3 *Mandatory.* Powered mobile equipment shall be provided with adequate brakes.

56.9–4 [Reserved]

56.9–5 *Mandatory.* Operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.

56.9–6 *Mandatory.* When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor. When the entire length of the conveyor is not visible from the starting switch, a positive audible or visual warning system shall be installed and operated to warn persons that the conveyor will be started.

56.9–7 *Mandatory.* Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.

56.9–8 [Reserved]

56.9–9 *Mandatory.* Operators shall sound warning before starting trains and when trains approach crossings, other trains on adjacent tracks, persons, and any place where vision is obscured.

56.9–10 *Mandatory.* Equipment operators' cabs shall not be equipped, altered or otherwise modified in a manner which impairs operating visibility.

56.9–11 *Mandatory.* Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.

56.9–12 *Mandatory.* Cabs of mobile equipment shall be kept free of extraneous materials.

56.9–13 *Mandatory.* Adequate backstops or brakes shall be installed on inclined conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel would be caused.

56.9–14 *Mandatory.* No person shall be permitted to ride a power-driven chain, belt, or bucket conveyor, unless the belt is specifically designed for the transportation of persons.

56.9–15 *Mandatory.* Unless the operator is otherwise protected, slushers in excess of 10 horsepower shall be provided with backlash guards. All slushers shall be equipped with rollers, and drum covers, and anchored securely before slushing operations are started.

56.9–16 *Mandatory.* Roadbeds, rails, joints, switches, frogs, and other trackage elements on railroads subject to the control of the operator shall be designed, installed and maintained in a safe manner consistent with the speed and type of haulage.

56.9–17 *Mandatory.* Equipment operating speeds shall be consistent with conditions of roadways, grades, clearance, visibility, traffic, and the type of equipment used.

56.9–18 [Reserved]

56.9–19 *Mandatory.* Track guardrails, lead rails, and frogs shall be protected or blocked so as to prevent a person's foot from becoming wedged.

56.9–20 *Mandatory.* Positive-acting stop-blocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from runaway or moving railroad equipment.

56.9–21 [Reserved]

56.9–22 *Mandatory.* Berms or guards shall be provided on the outer bank of elevated roadways.

56.9–23 *Mandatory.* Trackless haulage equipment shall be operated under power control at all times.

56.9–24 *Mandatory.* Mobile equipment operators shall have full control of the equipment while it is in motion.

56.9–25 *Mandatory.* Dippers, buckets, loading booms, or heavy suspended loads shall not be swung over the cabs of haulage vehicles until the drivers are out of the cabs and in safe locations, unless the trucks are designed specifically to protect the drivers from falling material.

56.9–26 *Mandatory.* A quick-close type air valve shall be provided on each piece of pneumatic-powered loading, hauling, and dumping equipment. The valve shall be closed except when the equipment is being operated.

56.9–27 *Mandatory.* When an operator is present, men shall notify him before getting on or off equipment.

56.9–28 *Mandatory.* Switch throws shall be installed so as to provide adequate clearance for switchmen.

56.9–29 [Reserved]

56.9–30 *Mandatory.* Men shall not work or pass under the buckets or booms of loaders in operation.

56.9–31 *Mandatory.* When traveling between work areas, the equipment shall be secured in the travel position.

56.9–32 *Mandatory.* Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.

56.9–33 [Reserved]

56.9–34 *Mandatory.* Haulage equipment shall be loaded in a manner to minimize spillage during haulage.

56.9–35 *Mandatory.* Movement of two or more pieces of rail equipment operating independently on the same track shall be suitably controled for safe operation.

56.9–36 *Mandatory.* Electrically-powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set or other equivalent precautions are taken against rolling.

56.9–37 *Mandatory.* Mobile equipment shall not be left unattended unless the brakes are set. Mobile equipment with wheels or tracks, when parked on a grade, shall be either blocked or turned into a bank or rib; and the bucket or blade lowered to the ground to prevent movement.

56.9–38 [Reserved]

56.9–39 *Mandatory.* Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.

56.9–40 *Mandatory.* Men shall not be transported:

(a) In or on dippers, forks, clamshells, beds of trucks unless special provisions are made for their safety, or buckets except shaft buckets.

(b) On top of loaded haulage equipment.

(c) Outside the cabs and beds of mobile equipment, except trains.

(d) Between cars of trains.

(e) In conveyances equipped with unloading devices unless means are provided to prevent accidental starting of the unloading mechanism.

56.9–41 *Mandatory.* Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.

56.9–42 *Mandatory.* Rocker-bottom or bottom-dump rail cars shall be equipped with locking devices.

56.9–43 [Reserved]

56.9–44 [Reserved]

56.9–45 *Mandatory.* Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.

56.9–46 *Mandatory.* Backpoling of trolleys shall be avoided wherever possible; but when necessary, backpoling shall be done only at slow speeds.

56.9–47 *Mandatory.* Parked railcars, unless held effectively by brakes, shall be blocked securely.

56.9–48 *Mandatory.* Railroad cars with braking systems, when in use, shall be equipped with effective brake shoes.

56.9–49 *Mandatory.* When in the dark or under conditions of limited visibility, all vehicles carrying loads which project beyond the sides or more than four feet beyond the rear of the vehicles shall display a warning light at the end of the projection; or in the light, a warning flag not less than 12 inches square shall be displayed at the end of the projection.

56.9–50 *Mandatory.* Railcars shall not be left on side tracks unless ample clearance is provided for traffic on adjacent tracks.

56.9–51 *Mandatory.* Persons shall not go over, under, or between cars unless the train is stopped and the motorman has

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been notified and the notice acknowledged.

56.9–52 *Mandatory.* Inability of a motorman to clearly recognize his brakeman's signals when the train is under the direction of the brakeman shall be construed by the motorman as a stop signal.

56.9–53 *Mandatory.* Water, debris, or spilled material which create hazards to moving equipment shall be removed.

56.9–54 *Mandatory.* Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.

56.9–55 *Mandatory.* Where there is evidence that the ground at a dumping place may fail to support the weight of a vehicle, loads shall be dumped back from the edge of the bank.

56.9–56 *Mandatory.* Where necessary, bumper blocks or the equivalent shall be provided at track dead ends.

56.9–57 *Mandatory.* Grizzlies, grates, and other stationary sizing devices shall be anchored securely.

56.9–58 *Mandatory.* If truck spotters are used, they shall be well in the clear while trucks are backing into dumping positions and dumping; lights shall be used at night to direct trucks.

56.9–59 *Mandatory.* Public and permanent railroad crossings shall be posted with warning signs or signals, or shall be guarded when trains are passing and shall be planked or otherwise filled between the rails.

56.9–60 *Mandatory.* Where overhead clearance is restricted, warning devices shall be installed and the restricted area shall be conspicuously marked.

56.9–61 *Mandatory.* Stockpile and muckpile faces shall be trimmed to prevent hazards to personnel.

56.9–62 *Mandatory.* Rocks too large to be handled safely shall be broken before loading.

56.9–63 *Mandatory.* Ramps and dumping facilities shall—

(a) Be of substantial construction; and

(b) Have suitable width, clearance, and headroom to accommodate the equipment using the facilities.

56.9–64 *Mandatory.* Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position while loading cars.

56.9–65 *Mandatory.* Cars shall not be coupled, or uncoupled, manually from the inside of curves unless the railroad and cars are so designed to eliminate any hazard from manual coupling.

56.9–66 *Mandatory.* When a locomotive on one track is used to move equipment on a different track, a suitable chain, cable, or drawbar shall be used.

56.9–67 *Mandatory.* Facilities used to transport men to and from work areas shall not be overcrowded.

56.9–68 *Mandatory.* Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.

56.9–69 *Mandatory.* Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.

56.9–70 *Mandatory.* A tow bar of substantial construction or other suitable means of control shall be used to tow heavy equipment. A substantial safety chain or wire rope shall be used in conjunction with any primary rigging.

56.9–71 *Mandatory.* Traffic rules including speed, signals, and warning signs shall be standardized at each mine and posted.

56.9–72 *Mandatory.* Persons attempting to free hangups shall be experienced persons who understand the hazards involved.

56.9–73 *Mandatory.* Defective equipment, removed from service as unsafe to operate, shall be tagged to prohibit further use until repairs are completed.

56.9–74 *Mandatory.* Dust shall be suitably controlled at muck piles, material transfer points, crushers, and on haulage roads where hazards to personnel may be created as a result of impaired visibility.

56.9–75 through 56.9–82 [Reserved]

56.9–83 *Mandatory.* Where possible at least 30 inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one side of the tracks; all places where it is not possible to provide 30-inch clearance shall be marked conspicuously.

56.9–84 [Reserved]

56.9–85 *Mandatory.* Tools, materials and equipment shall not be transported with persons in vehicles, rail cars, and other conveyances unless means have been provided to make such transportion safe.

56.9–86 [Reserved]

56.9–87 *Mandatory.* Heavy duty mobile equipment shall be provided with audible warning devices. When the operator of

such equipment has an obstructed view to the rear, the equipment shall have either an automatic reverse signal alarm which is audible above the surrounding noise level or an observer to signal when it is safe to back up.

56.9-88 *Mandatory.* (a) Excluding equipment that is operated by remote control, all self-propelled track-type (crawler mounted) or wheeled (rubber-tired) scrapers; front-end loaders; dozers; tractors, including industrial and agricultural tractors but not including over-the-road type tractors (the type that pull trailers or vans on highways); and motor graders; and wheeled prime movers (a tractor of the type and kind normally used as the mode of power for rubber-tired scrapers); all as used in metal and nonmetal mining operations, with or without attachments, shall be used in such mining only when equipped with (1) roll-over protective structures (ROPS) in accordance with the requirements of paragraphs (b) through (g) of this standard, as applicable, and (2) seat belts meeting the requirements of the Society of Automotive Engineers (SAE), Motor Vehicle Seat Belts Assemblies—SAE J4c, approved November 1955, revised July 1965; Seat Belt Hardware Test Procedures—SAE J140a, approved April 1970, revised February 1973; Seat Belt Hardware Performance Requirements—SAE J141; Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and Seat Belts for Construction Equipment—SAE J386, approved March 1968; and in accordance with paragraphs (b), (c), and (e) of this standard, as applicable.

(b) Except as provided in paragraph (e) all self-propelled equipment described in paragraph (a) of this standard and manufactured on or after the effective date of this standard shall be equipped with (1) ROPS meeting the requirements of paragraph (d), and (2) seat belts meeting the requirements of SAE J4c, J140a, J141, J333a, and J386 specified in paragraph (a) of this standard.

(c) All self-propelled equipment described in paragraph (a) of this standard manufactured prior to the effective date of this standard and after June 30, 1969, shall be equipped with ROPS meeting the requirements of paragraphs (d) through (g) of this standard as appropriate, and seat belts, no later than the dates specified below:

(1) Equipment manufactured between July 1, 1971, and the effective date of this standard shall be equipped with ROPS and seat belts no later than 6 months after the effective date of this standard.

(2) Equipment manufactured between July 1, 1970, and June 30, 1971, shall be equipped with ROPS and seat belts no later than 10 months after the effective date of this standard.

(3) Equipment manufactured between July 1, 1969, and June 30, 1970, shall be equipped with ROPS and seat belts no later than 15 months after the effective date of this standard.

(4) Nothing in this standard shall preclude the issuance of an order because of imminent danger.

(d) Except as provided in paragraph (e) of this standard, self-propelled equipment described in paragraph (a) of this standard shall be deemed in compliance with the ROPS requirements of this standard if the ROPS meet the following requirements:

(1) The ROPS complies with the Society of Automotive Engineers, SAE Recommended Practice, Critical Zone—Characteristics and Dimensions for Operators of Construction and Industrial Machinery—SAE J397, approved July 1969, or Deflection Limiting Volume for Laboratory Evaluation of Roll-Over Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) of Construction and Industrial Vehicles—SAE J397a, approved July 1969, revised January 1972, editorial change July 1973; and, as appropriate, the ROPS and installation of the ROPS meet the requirements of either SAE Recommended Practice, Performance Criteria for Roll-Over Protective Structures (ROPS) for Earthmoving, Construction, Logging, and Industrial Vehicles—SAE J1040, approved April 1974, or any of the following applicable SAE standards or recommended practices:

(i) Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers—SAE J320a, approved November 1967, revised July 1969, editorial change June 1970; or

(ii) Minimum Performance Criteria for Roll-Over Protective Structures for Prime Movers—SAE J320b, approved November 1967, revised January 1972, editorial change September 1972; or

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(iii) *Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers*—SAE J394, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Wheeled Front-End Loaders and Wheeled Dozers—SAE J394a, approved July 1969, revised March 1972, editorial change September 1972; or

(iv) Minimum Performance Criteria for Roll-Over Structures for Crawler Tractors and Crawler-Type Loaders—SAE J395, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Track-Type Tractors and Track-Type Front-End Loaders—SAE J395a, approved July 1969, revised January 1972, editorial change September 1972; or

(v) Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders—J396, approved 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Motor Graders—SAE J396a, approved July 1969, revised March 1972, editorial change September 1972; or

(vi) Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and Protective Frame Test Procedure and Performance Requirements—SAE J334a, approved April 1968, revised July 1970, conforms to ASAE S306.

(2) The ROPS is *installed* on the equipment in accordance with the recommendations of the ROPS manufacturer. If the installation includes bolts and nuts, the bolts and nuts used to attach the ROPS to the equipment frame and to connect structural parts of the ROPS shall be SAE Grade 5 or 8 (SAE J429g and J995b).

(e) All self-propelled equipment described in paragraph (a) of the standard, manufactured prior to the effective date of this standard, shall be deemed in compliance with the standard if ROPS and seat belt installations meet the ROPS and seat belt requirements of the State of California; or the U.S. Army Corps of Engineers; or the Bureau of Reclamation; or MSHA coal mine regulations of the U.S. Department of Labor; or the Occupational Safety and Health Administration of the U.S. Department of Labor. The requirements in effect are:

(1) *State of California: Title 8* of the California Administrative Code: Construction Safety Orders, Article 10, "Haulage and Earth Moving," 1591 (i) and 1596 (Register 70, No. 40–10–3–70); General Industry Safety Orders, Article 25, "Industrial Trucks, Tractors, Haulage Vehicles, and Earth Moving Equipment," 3650–55 (Register 72, No. 6–2–5–72); and Logging and Sawmill Safety Orders, Article 7, "Tractor Yarding," 5243 (Register 69, No. 10–3–8–69), all issued by the Division of Industrial Safety, State of California.

(2) U.S. Army Corps of Engineers: Manuals—Corps of Engineers, U.S. Army Safety-General Safety Requirements, EM-385–1–1 (March 1967), or Change 1, March 27, 1972.

(3) Bureau of Reclamation, U.S. Department of the Interior: Section 9, "Machinery and Mechanized Equipment," Safety-General Safety Requirements, EM-385–1–1(March 1967), or Change 1, March 27, 1972.

(4) Mine Safety and Health Administration, U.S. Department of Labor: Section 77.403a, Part 77, Title 30, Code of Federal Regulations—Mandatory Safety Standards, Surface Coal Mines and Surface Work Areas of Underground Coal Mines, promulgated in the FEDERAL REGISTER (39 FR 24006–24009).

(5) Occupational Safety and Health Administration, U.S. Department of Labor: Sections 1926.1001 and 1926.1002, Title 29, Code of Federal Regulations—Safety and Health Regulations for Construction, promulgated in the FEDERAL REGISTER (37 FR 27585–27590), and republished in the FEDERAL REGISTER (39 FR 22880–22886).

(f) Any alteration, repair, or welding of the ROPS and ROPS-to-vehicle frame mounts shall be performed only with prior approval and with instructions from the ROPS manufacturer or under the instructions of a registered professional engineer; and the manufacturer, or engineer, as the case may be, shall decide what qualifications the welders involved in this operation must have.

(g) Each ROPS shall have the following information permanently affixed to the structure:

(1) Manufacturer's or fabricator's name and address; and

(2) ROPS model number, if any; and

(3) Make and model numbers of the equipment on which the ROPS is designed to fit.

(4) For equipment already in existence when this standard goes into effect, a satisfactory substitute for the above-required information will be a certificate from either the manufacturer of the ROPS or a registered professional engineer to the effect that the ROPS does meet the performance standards and is appropriate for the piece of equipment upon which it is installed.

(h) Publications to which references are made in this standard are hereby incorporated by reference and made a part hereof. The incorporated publications are available at each Metal and Nonmetal Mine Safety and Health Subdistrict Office, MSHA. State of California safety orders are available from the State of California Office of Procurement, Documents Section, Post Office Box 20191, Sacramento, California 95820. The U.S. Army Corps of Engineers, Safety-General Safety Requirements are available from the U.S. Government Printing Office, Washington, D.C. 20402. Bureau of Reclamation Safety and Health Regulations for Construction are available from the Bureau of Reclamation, Division of Safety, Engineering and Research Center, Denver, Colorado 80225. SAE documents are available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

56.9–89 through 56.9–94 [Reserved]

§ 56.10 Aerial tramways.

56.10–1 *Mandatory.* Buckets shall not be overloaded, and feed shall be regulated to prevent spillage.

56.10–2 *Mandatory.* Inspection and maintenance of carriers (including loading and unloading mechanisms), ropes and supports, and brakes shall be performed by competent persons according to the recommendations of the manufacturer.

56.10–3 *Mandatory.* Any hazardous defects shall be corrected before the equipment is used.

56.10–4 *Mandatory.* Positive-action-type brakes and devices which apply the brakes automatically in the event of a power failure shall be provided on aerial tramways.

56.10–5 *Mandatory.* Track cable connections shall not obstruct the passage of carriage wheels.

56.10–6 *Mandatory.* Towers shall be suitably protected from swaying buckets.

56.10–7 *Mandatory.* Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.

56.10–8 *Mandatory.* Persons other than maintenance men shall not ride aerial tramways unless the following features are provided:

(a) Two independent brakes, each capable of holding the maximum load;

(b) Direct communication between terminals;

(c) Power drives with emergency power available in case of primary power failure;

(d) Buckets equipped with positive locks to prevent accidental tripping or dumping.

56.10–9 *Mandatory.* Men shall not ride loaded buckets.

56.10–10 *Mandatory.* Where possible, aerial tramways shall not be started until the operator has ascertained that everyone is in the clear.

§ 56.11 Travelways.

56.11–1 *Mandatory.* Safe means of access shall be provided and maintained to all working places.

56.11–2 *Mandatory.* Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary, toeboards shall be provided.

56.11–3 *Mandatory.* Ladders shall be of substantial construction and maintained in good condition.

56.11–4 *Mandatory.* Portable rigid ladders shall be provided with suitable bases and placed securely when used.

56.11–5 *Mandatory.* Fixed ladders shall be anchored securely and installed to provide at least 3 inches of toe clearance.

56.11–6 *Mandatory.* Fixed ladders shall project at least 3 feet above landings, or substantial handholds shall be provided above the landings.

56.11–7 *Mandatory.* Wooden components of ladders shall not be painted except with a transparent finish.

56.11–8 [Reserved]

56.11–9 *Mandatory.* Walkways with outboard railings shall be provided wherever persons are required to walk alongside elevated conveyor belts. Inclined railed walkways shall be nonskid or provided with cleats.

56.11–10 *Mandatory.* Vertical clearance

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above stair steps shall be a minimum of seven (7) feet, or suitable warning signs or similar devices shall be provided to indicate an impaired clearance.

56.11–11 *Mandatory.* Persons using ladders shall face the ladders and have both hands free for climbing and descending.

56.11–12 *Mandatory.* Openings above, below, or near travelways through which men or materials may fall shall be protected by railings, barriers, or covers. Where it is impractical to install such protective devices, adequate warning signals shall be installed.

56.11–13 *Mandatory.* Crossovers shall be provided where it is necessary to cross conveyors.

56.11–14 *Mandatory.* Moving conveyors shall be crossed only at designated crossover points.

56.11–15 [Reserved]

56.11–16 *Mandatory.* Regularly used walkways and travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

56.11–17 *Mandatory.* Fixed ladders shall not incline backwards.

56.11–18 through 56.11–24 [Reserved]

56.11–25 *Mandatory.* Fixed ladders, except on mobile equipment, shall be offset and have substantial railed landings at least every 30 feet unless backguards or equivalent protection, such as safety belts and safety lines, are provided.

56.11–26 *Mandatory.* Fixed ladders 70 degrees to 90 degrees from the horizontal and 30 feet or more in length shall have backguards, cages or equivalent protection, starting at a point not more than seven (7) feet from the bottom of the ladders.

56.11–27 *Mandatory.* Scaffolds and working platforms shall be of substantial construction and provided with handrails and maintained in good condition. Floor boards shall be laid properly and the scaffolds and working platforms shall not be overloaded. Working platforms shall be provided with toeboards when necessary.

56.11–28 through 56.11–34 [Reserved]

§ 56.12 Electricity.

56.12–1 *Mandatory.* Circuits shall be protected against excessive overload by fuses or circuit breakers of the correct type and capacity.

56.12–2 *Mandatory.* Electric equipment and circuits shall be provided with switches or other controls. Such switches or controls shall be of approved design and construction and shall be properly installed.

56.12–3 *Mandatory.* Individual overload protection or short circuit protection shall be provided for the trailing cables of mobile equipment.

56.12–4 *Mandatory.* Electrical conductors shall be of a sufficient size and current-carrying capacity to ensure that a rise in temperature resulting from normal operations will not damage the insulating materials. Electrical conductors exposed to mechanical damage shall be protected.

56.12–5 *Mandatory.* Mobile equipment shall not run over power conductors, nor shall loads be dragged over power conductors, unless the conductors are properly bridged or protected.

56.12–6 *Mandatory.* Distribution boxes shall be provided with a disconnecting device for each branch circuit. Such disconnecting devices shall be equipped or designed in such a manner that it can be determined by visual observation when such a device is open and that the circuit is deenergized, and the distribution box shall be labeled to show which circuit each device controls.

56.12–7 *Mandatory.* Trailing-cable and power-cable connections to junction boxes shall not be made or broken under load.

56.12–8 *Mandatory.* Power wires and cables shall be insulated adequately where they pass into or out of electrical compartments. Cables shall enter metal frames of motors, splice boxes, and electrical compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

56.12–9 [Reserved]

56.12–10 *Mandatory.* Telephone and low-potential signal wire shall be protected by isolation or suitable insulation, or both, from contacting energized power conductors or any other power source.

56.12–11 *Mandatory.* High-potential electrical conductors shall be covered, insulated, or placed to prevent contact with low potential conductors.

56.12–12 *Mandatory.* The potential on bare signal wires accessible to contact by persons shall not exceed 48 volts.

56.12–13 *Mandatory.* Permanent splices and repairs made in power cables, including the ground conductor where provided,

shall be: (a) Mechanically strong with electrical conductivity as near as possible to that of the original; (b) Insulated to a degree at least equal to that of the original, and sealed to exclude moisture; and (c) Provided with damage protection as near as possible to that of the original, including good bonding to the outer jacket.

56.12–14 *Mandatory.* Power cables energized to potentials in excess of 150 volts, phase-to-ground, shall not be moved with equipment unless sleds or slings, insulated from such equipment, are used. When such energized cables are moved manually, insulated hooks, tongs, ropes, or slings shall be used unless suitable protection for persons is provided by other means. This does not prohibit pulling or dragging of cable by the equipment it powers when the cable is physically attached to the equipment by suitable mechanical devices, and the cable is insulated from the equipment in conformance with other standards in this part.

56.12–15 [Reserved]

56.12–16 *Mandatory.* Electrically powered equipment shall be deenergized before mechanical work is done on such equipment. Power switches shall be locked out or other measures taken which shall prevent the equipment from being energized without the knowledge of the individuals working on it. Suitable warning notices shall be posted at the power switch and signed by the individuals who are to do the work. Such locks or preventive devices shall be removed only by the persons who installed them or by authorized personnel.

56.12–17 *Mandatory.* Power circuits shall be deenergized before work is done on such circuits unless hot-line tools are used. Suitable warning signs shall be posted by the individuals who are to do the work. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the knowledge of the individuals working on them. Such locks, signs, or preventive devices shall be removed only by the person who installed them or by authorized personnel.

56.12–18 *Mandatory.* Principal power switches shall be labeled to show which units they control, unless identification can be made readily by location.

56.12–19 *Mandatory.* Where access is necessary, suitable clearance shall be provided at stationary electrical equipment or switchgear.

56.12–20 *Mandatory.* Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal, non-current-carrying parts of the power switches to be operated may be used.

56.12–21 *Mandatory.* Suitable danger signs shall be posted at all major electrical installations.

56.12–22 *Mandatory.* Areas containing major electrical installations shall be entered only by authorized persons.

56.12–23 *Mandatory.* Electrical connections and resistor grids that are difficult or impractical to insulate shall be guarded, unless protection is provided by location.

56.12–24 [Reserved]

56.12–25 *Mandatory.* All metal enclosing or encasing electrical circuits shall be grounded or provided with equivalent protection. This requirement does not apply to battery-operated equipment.

56.12–26 *Mandatory.* Metal fencing and metal buildings enclosing transformers and switchgear shall be grounded.

56.12–27 *Mandatory.* Frame grounding or equivalent protection shall be provided for mobile equipment powered through trailing cables.

56.12–28 *Mandatory.* Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; and annually thereafter. A record of the resistance measured during the most recent test shall be made available on a request by the Secretary or his duly authorized representative.

56.12–29 [Reserved]

56.12–30 *Mandatory.* When a potentially dangerous condition is found it shall be corrected before equipment or wiring is energized.

56.12–31 [Reserved]

56.12–32 *Mandatory.* Inspection and cover plates on electrical equipment and junction boxes shall be kept in place at all times except during testing or repairs.

56.12–33 *Mandatory.* Hand-held electric tools shall not be operated at high potential voltages.

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56.12–34 *Mandatory.* Portable extension lights, and other lights that by their location present a shock or burn hazard, shall be guarded.

56.12–35 *Mandatory.* Lamp sockets shall be of a weatherproof type where they are exposed to weather or wet conditions that may interfere with illumination or create a shock hazard.

56.12–36 *Mandatory.* Fuses shall not be removed or replaced by hand in an energized circuit, and they shall not otherwise be removed or replaced in an energized circuit unless equipment and techniques especially designed to prevent electrical shock are provided and used for such purpose.

56.12–37 *Mandatory.* Fuse tongs or hotline tools shall be used when fuses are removed or replaced in high-potential circuits.

56.12–38 *Mandatory.* Trailing cables shall be attached to machines in a suitable manner to protect the cable from damage and to prevent strain on the electrical connections.

56.12–39 *Mandatory.* Surplus trailing cables to shovels, cranes and similar equipment shall be—

(a) Stored in cable boats;

(b) Stored on reels mounted on the equipment; or

(c) Otherwise protected from mechanical damage.

56.12–40 *Mandatory.* Operating controls shall be installed so that they can be operated without danger of contact with energized conductors.

56.12–41 *Mandatory.* Switches and starting boxes shall be of safe design and capacity.

56.12–42 *Mandatory.* Both rails shall be bonded or welded at every joint and rails shall be crossbonded at least every 200 feet if the track serves as the return trolley circuit. When rails are moved, replaced, or broken bonds are discovered, they shall be rebonded within three working shifts.

56.12–43 and 56.12–44 [Reserved]

56.12–45 *Mandatory.* Overhead high-potential powerlines shall be installed as specified by the National Electrical Code.

56.12–46 [Reserved]

56.12–47 *Mandatory.* Guy wires of poles supporting high-voltage transmission lines shall meet the requirements for grounding or insulator protection of the National Electrical Safety Code, Part 2, entitled "Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines," (also referred to as National Bureau of Standards Handbook 81, November 1, 1961) and Supplement 2 thereof issued March 1968, which are hereby incorporated by reference and made a part hereof. These publications and documents may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

56.12–48 *Mandatory.* Telegraph, telephone, or signal wires shall not be installed on the same crossarm with power conductors. When carried on poles supporting powerlines, they shall be installed as specified by the National Electrical Code.

56.12–49 [Reserved]

56.12–50 *Mandatory.* Trolley wires shall be installed at least seven (7) feet above rails where height permits, and aligned and supported to suitably control sway and sag.

56.12–51 and 56.12–52 [Reserved]

56.12–53 *Mandatory.* Ground wires for lighting circuits powered from trolley wires shall be connected securely to the ground return circuit.

56.12–54 through 56.12–64 [Reserved]

56.12–65 *Mandatory.* Powerlines, including trolley wires, and telephone circuits shall be protected against short circuits and lightning.

56.12–66 *Mandatory.* Where metallic tools or equipment can come in contact with trolley wires or bare powerlines, the lines shall be guarded or deenergized.

56.12–67 *Mandatory.* Transformers shall be totally enclosed, or shall be placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring.

56.12–68 *Mandatory.* Transformer enclosures shall be kept locked against unauthorized entry.

56.12–69 *Mandatory.* Each ungrounded power conductor or telephone wire that leads underground and is directly exposed to lightning shall be equipped with suitable lightning arrestors of approved type within 100 feet of the point where the circuit enters the mine. Lightning arrestors shall be connected to a low resistance

grounding medium on the surface and shall be separated from neutral grounds by a distance of not less than 25 feet.

56.12–70 [Reserved]

56.12–71 *Mandatory.* When equipment must be moved or operated near energized high-voltage powerlines (other than trolley lines) and the clearance is less than 10 feet, the lines shall be deenergized or other precautionary measures shall be taken.

56.12–72 through 56.12–79 [Reserved]

§ 56.13 Compressed air and boilers.

General

56.13–1 *Mandatory.* All boilers and pressure vessels shall be constructed, installed, and maintained in accordance with the standards and specifications of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

56.13–2 through 56.13–9 [Reserved]

Compressed Air

56.13–10 *Mandatory.* (a) Reciprocating-type air compressors rated over 10 horsepower shall be equipped with automatic temperature-actuated shutoff mechanisms which shall be set or adjusted to the compressor when the normal operating temperature is exceeded by more than 25 percent.

(b) However, this standard does not apply to reciprocating-type air compressors rated over 10 horsepower if equipped with fusible plugs that were installed in the compressor discharge lines before November 15, 1979, and designed to melt at temperatures at least 50 degrees below the flash point of the compressors' lubricating oil.

56.13–11 *Mandatory.* Air receiver tanks shall be equipped with one or more automatic pressure-relief valves. The total relieving capacity of the relief valves shall prevent pressure from exceeding the maximum allowable working pressure in a receiver tank by not more than 10 percent. Air receiver tanks also shall be equipped with indicating pressure gages which accurately measure the pressure within the air receiver tanks.

56.13–12 *Mandatory.* Compressor air intakes shall be installed to insure that only clean, uncontaminated air enters the compressors.

56.13–13 and 56.13–14 [Reserved]

56.13–15 *Mandatory.* (a) Compressed-air receivers and other unfired pressure vessels shall be inspected by inspectors holding a valid National Board Commission and in accordance with the applicable chapters of the National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979. This code is incorporated by reference and made a part of this standard, may be examined at any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration, and may be obtained from the publisher, the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229.

(b) Records of inspections shall be kept in accordance with requirements of the National Board Inspection Code, and the records shall be made available to the Secretary or his authorized representative.

56.13–16 [Reserved]

56.13–17 *Mandatory.* Compressor discharge pipes where carbon build-up may occur shall be cleaned periodically as recommended by the manufacturer, but no less frequently than once every two (2) years.

56.13–18 [Reserved]

56.13–19 *Mandatory.* Repairs involving the pressure system of compressors, receivers, or compressed-air-powered equipment shall not be attempted until the pressure has been bled off.

56.13–20 *Mandatory.* At no time shall compressed air be directed toward a person. When compressed air is used, all necessary precautions shall be taken to protect persons from injury.

56.13–21 *Mandatory.* Except where automatic shutoff valves are used, safety chains or other suitable locking devices shall be used at connections to machines of high-pressure hose lines of ¾-inch inside diameter or larger, and between high-pressure hose lines of ¾-inch inside diameter or larger, where a connection failure would create a hazard.

56.13–22 through 56.13–29 [Reserved]

Boilers

56.13–30 *Mandatory.* (a) Fired pressure vessels (boilers) shall be equipped with water level gages, pressure gages, automatic pressure-relief valves, blowdown piping, and other safety devices approved

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by the American Society of Mechanical Engineers to protect against hazards from overpressure, flameouts, fuel interruptions and low water level, all as required by the appropriate sections, chapters and appendices listed in paragraphs (b) (1) and (2) below.

(b) These gages, devices and piping shall be designed, installed, operated, maintained, repaired, altered, inspected, and tested by inspectors holding a valid National Board Commission and in accordance with the following listed sections, chapters and appendices:

(1) The ASME Boiler and Pressure Vessel Code, 1977, published by the American Society of Mechanical Engineers.

Section and Title

I Power Boilers.
II Material Specifications—Part A—Ferrous.
II Material Specifications—Part B—Nonferrous.
II Material Specifications—Part C—Welding Rods, Electrodes, and Filler Metals.
IV Heating Boilers.
V Nondestructive Examination.
VI Recommended Rules for Care and Operation of Heating Boilers.
VII Recommended Rules for Care of Power Boilers.

(2) The National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979, published by the National Board of Boiler and Pressure Vessel Inspectors.

Chapter and Title

I Glossary of Terms.
II Inspection of Boilers and Pressure Vessels.
III Repairs and Alterations to Boiler and Pressure Vessels by Welding.
IV Shop Inspection of Boilers and Pressure Vessels.
V Inservice Inspection of Pressure Vessels by Authorized Owner-User Inspection Agencies.

Appendix and Title

A Safety and Safety Relief Valves.
B Non-ASME Code Boilers and Pressure Vessels.
C Storage of Mild Steel Covered Arc Welding Electrodes.
D-R National Board "R" (Repair) Symbol Stamp.
D-VR National Board "VR" (Repair of Safety and Safety Relief Valve) Symbol Stamp.
D-VR1 Certificate of Authorization for Repair Symbol Stamp for Safety and Safety Relief Valves.
D-VR2 Outline of Basic Elements of Written Quality Control System for Repairers of ASME Safety and Safety Relief Valves.
D-VR3 Nameplate Stamping for "VR".
E Owner-user Inspection Agencies.
F Inspection Forms.

(c) Records of inspections and repairs shall be kept in accordance with the requirements of the ASME Boiler and Pressure Vessel Code and the National Board Inspection Code. The records shall be made available to the Secretary or his authorized representative.

(d) Sections of the ASME Boiler and Pressure Vessel Code, 1977, listed in paragraph (b)(1) above, and chapters and appendices of the National Board Inspection Code, 1979, listed in paragraph (b)(2) above, are incorporated by reference and made a part of this standard. These publications may be obtained from the publishers, the American Society of Mechanical Engineers, 345 East Forty-seventh Street, New York, N.Y. 10017, and the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. The publications may be examined at any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration.

56.13-31 through 56.13-34 [Reserved]

§ 56.14 Use of equipment

GUARDS

56.14-1 *Mandatory.* Gears; sprockets; chains; drive, head, tail, and takeup pulleys; flywheels; couplings; shafts; sawblades; fan inlets; and similar exposed moving machine parts which may be contacted by persons, and which may cause injury to persons, shall be guarded.

56.14-2 *Mandatory.* Overhead belts shall be guarded if the whipping action from a broken belt would be hazardous to persons below.

56.14-3 *Mandatory.* Guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from accidentally reaching behind the guard and

becoming caught between the belt and the pulley.

56.14–4 and 56.14–5 [Reserved]

56.14–6 *Mandatory.* Except when testing the machinery, guards shall be securely in place while machinery is being operated.

56.14–7 *Mandatory.* Guards shall be of substantial construction and properly maintained.

56.14–8 *Mandatory.* Stationary grinding machines other than special bit grinders shall be equipped with:

(a) Peripheral hoods (less than 90° throat openings) capable of withstanding the force of a bursting wheel;

(b) Adjustable tool rests set as close as practical to the wheel;

(c) Safety washers.

56.14–9 *Mandatory.* Grinding wheels shall be operated within the specifications of the manufacturer of the wheel.

56.14–10 *Mandatory.* Hand-held power tools, other than rock drills, shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

56.14–11 *Mandatory.* Guards, shields, or other suitable protection shall be provided in areas where flying or falling materials present a hazard to personnel.

56.14–12 [Reserved]

56.14–13 *Mandatory.* Fork-lift trucks, front-end loaders, and bulldozers shall be provided with substantial canopies when necessary to protect the operator.

56.14–14 *Mandatory.* Face shields or goggles, in good condition, shall be worn when operating a grinding wheel.

56.14–15 through 56.14–24 [Reserved]

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56.14–25 [Reserved]

56.14–26 *Mandatory.* Unsafe equipment or machinery shall be removed from service immediately.

56.14–27 *Mandatory.* Operation of machinery or equipment shall be assigned only to competent persons.

56.14–28 [Reserved]

56.14–29 *Mandatory.* Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.

56.14–30 *Mandatory.* Men shall not work on or from a piece of mobile equipment in a raised position until it has been blocked in place securely. This does not preclude the use of equipment specifically designed as elevated mobile work platforms.

56.14–31 *Mandatory.* Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.

56.14–32 *Mandatory.* Belts, chains, and ropes shall not be guided onto power-driven moving pulleys, sprockets, or drums with the hands except on slow moving equipment especially designed for hand feeding.

56.14–33 *Mandatory.* Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.

56.14–34 *Mandatory.* Belt dressing shall not be applied manually while belts are in motion unless an aerosol-type dressing is used.

56.14–35 *Mandatory.* Machinery shall not be lubricated while in motion where a hazard exists, unless equipped with extended fittings or cups.

56.14–36 *Mandatory.* Tools and equipment shall not be used beyond the design capacity intended by the manufacturer, where such use may create a hazard to personnel.

56.14–37 through 56.14–44 [Reserved]

56.14–45 *Mandatory.* Welding operations shall be shielded and well-ventilated.

56.14–46 through 56.14–54 [Reserved]

§ 56.15 Personal protection.

56.15–1 *Mandatory.* Adequate first-aid materials, including stretchers and blankets, shall be provided at places convenient to all working areas. Water or neutralizing agents shall be available where corrosive chemicals or other harmful substances are stored, handled, or used.

56.15–2 *Mandatory.* All persons shall wear suitable hard hats when in or around a mine or plant where falling objects may create a hazard.

56.15–3 *Mandatory.* All persons shall wear suitable protective footwear when in or around an area of a mine or plant where a hazard exists which could cause an injury to the feet.

56.15–4 *Mandatory.* All persons shall wear safety glasses, goggles, or face shields or other suitable protective devices when

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in or around an area of a mine or plant where a hazard exists which could cause injury to unprotected eyes.

56.15–5 *Mandatory.* Safety belts and lines shall be worn when men work where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.

56.15–6 *Mandatory.* Special protective equipment and special protective clothing shall be provided, maintained in a sanitary and reliable condition and used whenever (1) hazards of process or environment, (2) chemical hazards, (3) radiological hazards, or (4) mechanical irritants are encountered in a manner capable of causing injury or impairment.

56.15–7 *Mandatory.* Protective clothing or equipment and face-shields or goggles shall be worn when welding, cutting, or working with molten metal.

56.15–8 through 56.15–19 [Reserved]

56.15–20 *Mandatory.* Life jackets or belts shall be worn where there is danger from falling into water.

56.15–21 through 56.15–29 [Reserved]

§ 56.16 Materials storage and handling.

56.16–1 *Mandatory.* Supplies shall not be stacked or stored in a manner which creates tripping or fall-of-material hazards.

56.16–2 *Mandatory.* (a) Bins, hoppers, silos, tanks, and surge piles, where loose unconsolidated materials are stored, handled or transferred shall be—

(1) Equipped with mechanical devices or other effective means of handling materials so that during normal operations persons are not required to enter or work where they are exposed to entrapment by the caving or sliding of materials; and

(2) Equipped with supply and discharge operating controls. The controls shall be located so that spills or overruns will not endanger persons.

(b) Where persons are required to move around or over any facility listed in this standard, suitable walkways or passageways shall be provided.

(c) Where persons are required to enter any facility listed in this standard for maintenance or inspection purposes, ladders, platforms, or staging shall be provided. No person shall enter the facility until the supply and discharge of materials have ceased and the supply and discharge equipment is locked out. Persons entering the facility shall wear a safety belt or harness equipped with a lifeline suitably fastened. A second person, similarly equipped, shall be stationed near where the lifeline is fastened and shall constantly adjust it or keep it tight as needed, with minimum slack.

56.16–3 *Mandatory.* Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.

56.16–4 *Mandatory.* Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.

56.16–5 *Mandatory.* Compressed and liquid gas cylinders shall be secured in a safe manner.

56.16–6 *Mandatory.* Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

56.16–7 *Mandatory.* (a) Taglines shall be attached to loads that may require steadying or guidance while suspended.

(b) Hitches and slings used to hoist materials shall be suitable for the particular material handled.

56.16–8 [Reserved]

56.16–9 *Mandatory.* Men shall stay clear of suspended loads.

56.16–10 *Mandatory.* To protect personnel, material shall not be dropped from an overhead elevation until the drop area is first cleared of personnel and the area is then either guarded or a suitable warning is given.

56.16–11 *Mandatory.* Men shall not ride on loads being moved by cranes or derricks, nor shall they ride the hoisting hooks unless such method eliminates a greater hazard.

56.16–12 *Mandatory.* Chemical substances, including concentrated acids and alkalies, shall be stored to prevent inadvertent contact with each other or with other substances, where such contact could cause a violent reaction or the liberation of harmful fumes or gases.

56.16–13 *Mandatory.* Suitable warning shall be given before molten metal is poured and before a container of molten metal is moved.

56.16–14 *Mandatory.* Operator-carrying overhead cranes shall be provided with:

(a) Bumpers at each end of each rail;

(b) Automatic switches to halt uptravel of the blocks before they strike the hoist;
(c) Effective audible warning signals within easy reach of the operator;
(d) A means to lock out the disconnect switch.

56.16–15 *Mandatory.* No person shall work from or travel on the bridge of an overhead crane unless the bridge is provided with substantial footwalks with toeboards and railings the length of the bridge.

56.16–16 *Mandatory.* Fork and other similar types of lift trucks shall be operated with the—
(a) Upright tilted back to steady and secure the load;
(b) Load in the upgrade position when ascending or descending grades in excess of 10 percent;
(c) Load not raised or lowered enroute except for minor adjustments; and
(d) Load-engaging device downgrade when traveling unloaded on all grades.

56.16–17 through 56.16–34 [Reserved]

§ 56.17 Illumination.

56.17–1 *Mandatory.* Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and work areas.

56.17–2 through 56.17–9 [Reserved]

§ 56.18 Safety programs.

56.18–1 [Reserved]

56.18–2 *Mandatory.* (a) A competent person designated by the operator shall examine each working place at least once each shift for conditions which may adversely affect safety or health. The operator shall promptly initiate appropriate action to correct such conditions.

(b) A record that such examinations were conducted shall be kept by the operator for a period of one (1) year, and shall be made available for review by the Secretary or his authorized representative.

(c) In addition, conditions that may present an imminent danger which are noted by the person conduding the examination shall be brought to the immediate attention of the operator who shall withdraw all persons from the area affected (except persons referred to in section 104(c) of the Federal Mine Safety and Health Act of 1977) until the danger is abated.

56.18–3 through 56.18–5 [Reserved]

56.18–6 *Mandatory.* New employees shall be indoctrinated in safety rules and safe work procedures.

56.18–7 and 56.18–8 [Reserved]

56.18–9 *Mandatory.* When persons are working at the mine, a competent person designated by the mine operator shall be in attendance to take charge in case of an emergency.

56.18–10 *Mandatory.* Selected supervisors shall be trained in first aid. First aid training shall be made available to all interested employees.

56.18–11 [Reserved]

56.18–12 *Mandatory.* Emergency telephone numbers shall be posted at appropriate telephones.

56.18–13 *Mandatory.* A suitable communication system shall be provided at the mine to obtain assistance in the event of an emergency.

56.18–14 *Mandatory.* Arrangements shall be made in advance for obtaining emergency medical assistance and transportation for injured persons.

56.18–15 through 56.18–19 [Reserved]

56.18–20 *Mandatory.* No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others, can be heard, or can be seen.

56.18–21 through 56.18–24 [Reserved]

§ 56.19 Man hoisting.

The hoisting standards in this section apply to those hoists and appurtenances used for hoisting persons. However, where persons may be endangered by hoists and appurtenances used solely for handling ore, rock, and materials, the appropriate standards should be applied.

Emergency hoisting facilities should conform to the extent possible to safety requirements for other hoists, and should be adequate to remove the persons from the mine with a minimum of delay.

HOISTS

56.19–1 *Mandatory.* Hoists shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes used.

56.19–2 *Mandatory.* Hoists shall be anchored securely.

56.19–3 *Mandatory.* Belt, rope, or chains

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shall not be used to connect driving mechanisms to man hoists.

56.19–4 *Mandatory.* Any hoist used to hoist men shall be equipped with a brake or brakes which shall be capable of holding its fully loaded cage, skip, or bucket at any point in the shaft.

56.19–5 *Mandatory.* The operating mechanism of the clutch of every man-hoist drum shall be provided with a locking mechanism, or interlocked electrically or mechanically with the brake to prevent accidental withdrawal of the clutch.

56.19–6 *Mandatory.* Automatic hoists shall be provided with devices that automatically apply the brakes in the event of power failure.

56.19–7 *Mandatory.* All man hoists shall be provided with devices to prevent overtravel. When utilized in shafts exceeding 100 feet in depth, such hoists shall also be provided with overspeed devices.

56.19–8 *Mandatory.* Where creep or slip may alter the effective position of safety devices, friction hoists shall be equipped with synchronizing mechanisms that recalibrate the overtravel devices and position indicators.

56.19–9 *Mandatory.* An accurate and reliable indicator of the position of the cage, skip, bucket, or cars in the shaft shall be provided.

56.19–10 *Mandatory.* Hoist controls shall be placed or housed so that the noise from machinery or other sources will not prevent hoistmen from hearing signals.

56.19–11 *Mandatory.* Flanges on drums shall extend radially a minimum of 4 inches or three rope diameters beyond the last wrap, whichever is the lesser.

56.19–12 *Mandatory.* Where grooved drums are used, the grooves shall be of suitable size and pitch for the ropes used.

56.19–13 *Mandatory.* Where any diesel or similar fuel-injection engine is used to power a hoist, the engine shall be equipped with a damper or other cutoff in its air intake system. The control handle shall be clearly labeled to indicate that its intended function is for emergency stopping only.

56.19–14 *Mandatory.* In a friction hoist installation, tapered guides or other approved devices shall be installed above and below the limits of regular travel of the conveyance and arranged to prevent overtravel in the event of failure of other devices.

56.19–15 [Reserved]

56.19–16 [Reserved]

56.19–17 *Mandatory.* Each electric hoist shall be equipped with a manually-operable switch that will initiate emergency braking action to bring the conveyance and the counterbalance safely to rest. This switch shall be located within reach of the hoistman in case the manual controls of the hoist fail.

56.19–18 *Mandatory.* When an overtravel by-pass switch is installed, the switch shall function so as to allow the conveyance to be moved through the overtravel position when the switch is held in the closed position by the hoistman. The overtravel by-pass switch shall return automatically to the open position when released by the hoistman.

56.19–19 [Reserved]

Wire Rope

56.19–20 [Reserved]

56.19–21 *Mandatory.* The following static-load safety factors shall be used for selecting ropes to be used for hoisting men and for determining when such ropes shall be removed from man hoists:

Length of rope in shaft (feet)	Minimum factor of safety (new rope)	Minimum factor of safety (remove)
500 or less	8	6.4
501–1,000	7	5.8
1,001–2,000	6	5.0
2,001–3,000	5	4.3
3,001 or more	4	3.6

56.19–22 *Mandatory.* The end of the rope at the drum shall make at least one full turn on the drum shaft, or a spoke of the drum in the case of a free drum, and shall be fastened securely by means of rope clips or clamps. There shall be three full turns of cable or rope on the hoisting drum when the cable or rope is extended to its maximum working length. This standard does not apply to friction hoists.

56.19–23 [Reserved]

56.19–24 *Mandatory.* The rope shall be attached to the load by the thimble-and-clip method, the socketing method, or other approved method. If the socketing method is employed, zinc or its equivalent shall be used. The use of Babbitt metal or lead for socketing wire ropes is prohib-

ited. If the thimble-and-clip method is used, the following shall be observed:

(a) The rope shall be attached to the load by passing one end around an oval thimble that is attached to the load bending the end back so that it is parallel to the long or "live" end of the rope and fastening the two parts of the rope together with clips.

(b) The U-bolt of each clip shall encircle the short or "dead" end of the rope and the distance between clips shall not be less than the figures given in the accompanying table.

(c) As a minimum, the following number of clips or equivalent shall be used for various diameters of six-strand, 19-wire, plow-steel ropes:

(Follow manufacturer's recommendations for other kinds of wire rope and clips.)

Diameter of rope, inches	Number of clips	Center-to-center spacing of clips, inches
¼	4	4½
⅜	4	5¼
½	4	6
⅝	5	6¾
¾	5	7½
⅞	6	8¼
1	6	9
1⅛	6	9¾
1¼	7	10½
1⅜	8	11¼
2	8	12
2⅛	8	13
2¼	8	14

(d) For all ropes less than three-quarter inch in diameter at least four clips or equivalent shall be used.

(e) When special conditions require the attachment of a sling to the hoisting cable to handle equipment in the shaft, the sling shall be attached by clips or equivalent in accordance with the table in paragraph (c) of this standard.

56.19–25 [Reserved]

56.19–26 *Mandatory.* Safety device attachments to hoist ropes shall be selected, installed, and maintained according to manufacturer's specifications to minimize internal corrosion and weaking of the hoist rope.

56.19–27 through 56.19–34 [Reserved]

HEADFRAMES AND SHEAVES

56.19–35 *Mandatory.* All headframes shall be constructed with suitable design considerations to allow for all dead loads, live loads, and wind loads.

56.19–36 *Mandatory.* Headframes shall be high enough to provide clearance for overtravel and safe stopping of the conveyance.

56.19–37 *Mandatory.* Fleet angles on hoists installed after November 15, 1979, shall not be greater than one and one-half degrees for smooth drums or two degrees for grooved drums.

56.19–38 *Mandatory.* Platforms with toeboards and handrails shall be provided around elevated head sheaves.

56.19–39 *Mandatory.* All personnel hoists, except emergency escape hoists and hoists with rope speeds of 200 feet per minute or less, installed after November 15, 1979, shall have drum and sheave tread diameters—

(1) Not less than 60 times the hoist rope diameter for slope or inclined shaft applications;

(2) Not less than 80 times the hoist rope diameter if the hoist ropes are one inch in diameter or greater, or not less than 60 times the hoist rope diameter if the hoist ropes are less than one inch in diameter for vertical shaft applications; or

(3) Not less than 100 times the hoist rope diameter for locked coil ropes.

56.19–40 *Mandatory.* Head, idler, knuckle, and curve sheaves shall have grooves of proper contour for the specific rope diameter used.

56.19–41 through 56.19–44 [Reserved]

CONVEYANCES

56.19–45 *Mandatory.* Man cages and skips used for hoisting or lowering employees or other persons in any vertical shaft or any incline shaft with an angle of inclination of forty-five (45) degrees from the horizontal shall be covered with a metal bonnet.

56.19–46 through 56.19–48 [Reserved]

56.19–49 *Mandatory.* Buckets shall not be used to hoise men except during shaft sinking operations, inspection, maintenance, and repairs.

56.19–50 *Mandatory.* Buckets used to hoist persons during vertical shaft sinking operations shall: (a) Be securely attached to a crosshead when traveling in either direction between the lower and

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upper crosshead parking locations; (b) Have overhead protection when the shaft depth exceeds 50 feet; (c) Have sufficient depth or a suitably designed platform to transport persons safely in a standing position; and (d) Have devices to prevent accidental dumping where the bucket is supported by a bail attached to its lower half.

56.19–51 [Reserved]

56.19–52 [Reserved]

56.19–53 *Mandatory.* In shaft sinking where a platform is suspended by wire ropes, such ropes shall have an approved rating for the suspended load.

56.19–54 *Mandatory.* Where rope guides are used in shafts other than in shaft sinking operations, the rope guides shall be a type of lock coil construction.

HOISTING PROCEDURES

56.19–55 *Mandatory.* When a manually operated hoist is used, a qualified hoistman shall remain within hearing of the telephone or signal device at all times while any person is underground.

56.19–56 *Mandatory.* When automatic hoisting is used, a competent operator of the hoist shall be readily available at or near the hoisting device while any person is underground.

56.19–57 *Mandatory.* No person shall operate a hoist unless within the preceding 12 months he has had a medical examination by a qualified, licensed physician who shall certify his fitness to perform this duty. Such certification shall be available at the mine.

56.19–58 *Mandatory.* Only experienced hoistmen shall operate the hoist except in cases of emergency and in the training of new hoistmen.

56.19–59 [Reserved]

56.19–60 [Reserved]

56.19–61 *Mandatory.* The safe speed for hoisting men shall be determined for each shaft, and this speed shall not be exceeded. Men shall not be hoisted at a speed faster than 2,500 feet per minute, except in an emergency.

56.19–62 *Mandatory.* Maximum normal operating acceleration and deceleration shall not exceed 6 feet per second per second. During emergency braking, the deceleration shall not exceed 16 feet per second per second.

56.19–63 *Mandatory.* Only authorized persons shall be in hoist rooms.

56.19–64 [Reserved]

56.19–65 *Mandatory.* Conveyances shall not be lowered by the brakes alone except during emergencies.

56.19–66 *Mandatory.* In shafts inclined over 45 degrees, the operator shall determine and post in the conveyance or at each shaft station the maximum number of persons permitted to ride in a hoisting conveyance at any one time. Each person shall be provided a minimum of 1.5 square feet of floor space.

56.19–67 *Mandatory.* During shift changes, an authorized person shall be in charge of each trip in which persons are hoisted.

56.19–68 *Mandatory.* Men shall enter, ride, and leave conveyances in an orderly manner.

56.19–69 *Mandatory.* Men shall not enter or leave conveyances which are in motion or after a signal to move the conveyance has been given to the hoistman.

56.19–70 *Mandatory.* Cage doors or gates shall be closed while men are being hoisted; they shall not be opened until the cage has come to a stop.

56.19–71 *Mandatory.* Men shall not ride in skips or buckets with muck, supplies, materials, or tools other than small hand tools.

56.19–72 *Mandatory.* When combinations of cages and skips are used in the same compartment, the cages shall be enclosed to protect personnel from flying material and the hoist speed reduced to man-speed as defined in standard 56.19–61, but not to exceed 1,000 feet per minute. Muck shall not be hoisted with personnel during shift changes.

56.19–73 *Mandatory.* Rock or supplies shall not be hoisted in the same shaft as men during shift changes, unless the compartments and dumping bins are partitioned to prevent spillage into the cage compartment.

56.19–74 *Mandatory.* Persons shall not ride the bail, rim, bonnet, or crosshead of any shaft conveyance except when necessary for inspection and maintenance, and then only when suitable protection for persons is provided.

56.19–75 *Mandatory.* Open hooks shall not be used to hoist buckets or other conveyances.

56.19–76 *Mandatory.* When men are hoisted in buckets, speeds shall not exceed 500 feet per minute, and shall not exceed 200 feet per minute when within 100 feet of the intended station.

56.19–77 *Mandatory.* Buckets shall be stopped about 15 feet from the shaft bottom to await a signal from one of the crew on the bottom for further lowering.

56.19–78 *Mandatory.* All buckets shall be stopped after being raised about three (3) feet above the shaft bottom. A bucket shall be stabilized before a hoisting signal is given to continue hoisting the bucket to the crosshead. After a hoisting signal is given, hoisting to the crosshead shall be at a minimum speed. The signaling device shall be attended constantly until a bucket reaches the guides. When persons are hoisted, the signaling devices shall be attended until the crossheads has been engaged.

56.19–79 *Mandatory.* Where mine cars are hoisted by cage or skip, means for blocking cars shall be provided at all landings and also on the cage.

56.19–80 *Mandatory.* When tools, timbers, or other materials are being lowered or raised in a shaft by means of a bucket, skip, or cage, they shall be secured or so placed that they will not strike the sides of the shaft.

56.19–81 *Mandatory.* When conveyances controlled by a hoist operator are not in use, they shall be released and the conveyances shall be raised or lowered a suitable distance to prevent persons from boarding or loading the conveyances.

56.19–82 [Reserved]

56.19–83 *Mandatory.* A manually operated device shall be installed on each electric hoist that will allow the conveyance or counterbalance to be removed from an overtravel position. Such device shall not release the brake, or brakes, holding the overtravelled conveyance or counterbalance until sufficient drive motor torque has been developed to assure movement of the conveyance or counterbalance in the correct direction only.

56.19–84 through 56.19–89 [Reserved]

Signaling

56.19–90 *Mandatory.* There shall be at least two effective approved methods of signaling between each of the shaft stations and the hoist room, one of which shall be a telephone or speaking tube.

56.19–91 *Mandatory.* Hoist operators shall accept hoisting instructions only by the regular signaling system unless it is out of order. In such an event, and during other emergencies, the hoist operator shall accept instructions to direct movement of the conveyances only from authorized persons.

56.19–92 *Mandatory.* A method shall be provided to signal the hoist operator from cages or other conveyances at any point in the shaft.

56.19–93. *Mandatory.* A standard code of hoisting signals shall be adopted and used at each mine. The movement of a shaft conveyance on a "one bell" signal is prohibited.

56.19–94 *Mandatory.* A legible signal code shall be posted prominently in the hoist house within easy view of the hoistman, and at each place where signals are given or received.

56.19–95 *Mandatory.* Hoisting signal devices shall be positioned within easy reach of persons on the shaft bottom or constantly attended by a person stationed on the lower deck of the sinking platform.

56.19–96 *Mandatory.* Any person responsible for receiving or giving signals for cages, skips, and man trips when men or materials are being transported shall be familiar with the posted signaling code.

56.19–97 through 56.19–99 [Reserved]

Shafts

56.19–100 *Mandatory.* Shaft landings shall be equipped with substantial safety gates so constructed that materials will not go through or under them; gates shall be closed except when loading or unloading shaft conveyances.

56.19–101 *Mandatory.* Positive stopblocks or a derail switch shall be installed on all tracks leading to a shaft collar or landing.

56.19–102 *Mandatory.* A means shall be provided to guide the movement of a shaft conveyance.

56.19–103 *Mandatory.* Dumping facilities and loading pockets shall be constructed so as to minimize spillage into the shaft.

56.19–104 *Mandatory.* Suitable clearance at shaft stations shall be provided to allow safe movements of persons, equipment and materials.

56.19–105 *Mandatory.* A safe means of passage around open shaft compartments shall be provided on landings with more than one entrance to the shaft.

56.19–106 *Mandatory.* Shaft sets shall be kept in good repair and clean of hazardous material.

56.19–107 *Mandatory.* Hoistmen shall be informed when men are working in a

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compartment affected by that hoisting operation and a "Men Working in Shaft" sign shall be posted at the hoist.

56.19–108 *Mandatory.* When men are working in a shaft "Men Working in Shaft" signs shall be posted at all devices controlling hoisting operations that may endanger such men.

56.19–109 *Mandatory.* Shaft inspection and repair work in vertical shafts shall be performed from substantial platforms equipped with bonnets or equivalent overhead protection.

56.19–110 *Mandatory.* A substantial bulkhead or equivalent protection shall be provided above men at work deepening a shaft.

56.19–111 *Mandatory.* Substantial fixed ladders shall be provided from the collar to as near the shaft bottom as practical during shaft-sinking operations, or an escape hoist powered by an emergency power source shall be provided. When persons are on the shaft bottom, a chain ladder, wire rope ladder, or other extension ladders shall be used from the fixed ladder or lower limit of the escape hoist to the shaft bottom.

56.19–112 through 56.19–119 [Reserved]

INSPECTION AND MAINTENANCE

56.19–120 *Mandatory.* A systematic procedure of inspection, testing, and maintenance of shafts and hoisting equipment shall be developed and followed. If it is found or suspected that any part is not functioning properly, the hoist shall not be used until the malfunction has been located and repaired or adjustments have been made.

56.19–121 *Mandatory.* Complete records shall be kept for three years of inspections, tests, and maintenance of shafts and hoisting equipment.

56.19–122 *Mandatory.* Parts used to repair hoists shall have properties that will insure the proper and safe function of the hoist.

56.19–123 *Mandatory.* Wire ropes shall be lubricated or treated with dressing as recommended or approved by the rope manufacturer.

56.19–124 *Mandatory.* Hoist ropes other than those on friction hoists shall be cut off at least six (6) feet above the highest connection to the conveyance at time intervals not to exceed one (1) year unless a shorter time is required by standard 56.19–126, or by conditions of use. The portion of the rope that is cut off shall be examined and inspected by a competent person for damage, corrosion, wear and fatigue.

56.19–125 *Mandatory.* Hoist ropes wound in multiple layers shall have a length cut off at the drum end at least three (3) times during the anticipated life of the rope and whenever necessary as required by standard 56.19–126 to distribute the wear at change-of-layer and crossover points. The length of rope cut off shall not be a whole number multiple of the circumference of the drum.

56.19–126 *Mandatory.* Hoist ropes shall be examined over the entire active length at least every month to evaluate wear and possible damage. When such examinations or other inspections reveal that the rope is worn, and at least every six (6) months, caliper measurements or nondestructive tests shall be made at the following locations:

(a) Wherever wear is evident;

(b) Immediately above the socket or clips and above the safety connection;

(c) Where the rope rests on the sheaves;

(d) Where the ropes leave the drums when the conveyances are at the regular stopping point;

(e) Where a layer of rope begins to overlap another layer on the drum; and

(f) At 100 foot intervals (measurements shall be made midway between the last previously calipered points).

56.19–127 [Reserved]

56.19–128 *Mandatory.* Ropes shall not be used for hoisting when they have:

(a) More than six broken wires in any lay;

(b) Crown wires worn to less than 65 percent of the original diameter;

(c) A marked amount of corrosion or distortion;

(d) A combination of similar factors individually less severe than those above but which in aggregate might create an unsafe condition.

56.19–129 *Mandatory.* Hoistmen shall examine their hoists and shall test overtravel, deadman controls, position indicators, and braking mechanisms at the beginning of each shift.

56.19–130 *Mandatory.* Before hoisting persons and to assure that the hoisting compartments are clear of obstructions, empty hoist conveyances shall be operated at least one round trip after—

(a) Any hoist or shaft repairs or related

equipment repairs that might restrict or obstruct conveyance clearance;

(b) Any oversize or overweight material or equipment trips that might restrict or obstruct conveyance clearance;

(c) Blasting in or near the shaft that might restrict or obstruct conveyance clearance; or

(d) Remaining idle for one shift or longer.

56.19–131 *Mandatory.* Hoist conveyance connections shall be inspected at least once during any 24-hour period that the conveyance is used for hoisting persons.

56.19–132 *Mandatory.* (a) A performance drop test of hoist conveyance safety catches shall be made at the time of installation, or prior to installation, in a mockup of the actual installation. The test shall be certified to in writing by the manufacturer or by a registered professional engineer performing the test.

(b) After installation and before use, and at the beginning of any seven (7) day period during which the conveyance is to be used, the conveyance shall be suitably rested and the hoist rope slackened to test for the unrestricted functioning of the safety catches and their activating mechanisms.

(c) The safety catches shall be inspected by a competent person at the beginning of any 24-hour period that the conveyance is to be used.

56.19–133 *Mandatory.* Shafts that have not been inspected within the past 7 days shall not be used until an inspection has been conducted by a competent person.

56.19–134 *Mandatory.* Sheaves in operating shafts shall be inspected weekly and kept properly lubricated.

56.19–135 *Mandatory.* Rollers used in operating inclined shafts shall be lubricated, properly aligned, and kept in good repair.

§ 56.20 Miscellaneous

56.20–1 *Mandatory.* Intoxicating beverages and narcotics shall not be permitted or used in or around mines. Persons under the influence of alcohol or narcotics shall not be permitted on the job.

56.20–2 *Mandatory.* An adequate supply of potable drinking water shall be provided at all active working areas.

(a) The common drinking cup and containers from which drinking water must be dipped or poured are prohibited.

(b) Where single service cups are supplied, a sanitary container for unused cups and a receptacle for used cups shall be provided.

(c) When water is cooled by ice, the ice shall either be of potable water or shall not come in contact with the water.

(d) Potable water outlets shall be posted.

(e) Potable water systems shall be constructured to prevent backflow or backsiphonage of non-potable water.

56.20–3 *Mandatory.* At all mining operations: (a) Workplaces, passageways, storerooms, and service rooms shall be kept clean and orderly. (b) The floor of every workplace shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places shall be provided where practicable. (c) Every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards, as practicable.

56.20–4 [Reserved]

56.20–5 *Mandatory.* Carbon tetrachloride shall not be used.

56.20–6 and 56.20–7 [Reserved]

56.20–8 *Mandatory.* (a) Toilet facilities shall be provided at locations that are compatible with the mine operations and that are readily accessible to mine personnel.

(b) The facilities shall be kept clean and sanitary. Separate toilet facilities shall be provided for each sex except where toilet rooms will be occupied by no more than one person at a time and can be locked from the inside.

56.20–9 *Mandatory.* Dusts suspected of being explosive shall be tested for explosibility. If tests prove positive, appropriate control measures shall be taken.

56.20–10 *Mandatory.* If failure of a water or silt retaining dam will create a hazard, it shall be of substantial construction and inspected at regular intervals.

56.20–11 *Mandatory.* Areas where health or safety hazards exist that are not immediately obvious to employees shall be barricaded, or warning signs shall be posted at all approaches. Warning signs shall be readily visible, legible, display the nature of the hazard, and any protective action required.

56.20–12 *Mandatory.* Toxic materials used in conjunction with or discarded from mining or milling of a product shall be plainly marked or labeled so as to pos-

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itively identify the nature of the hazard and the protective action required.

56.20–13 *Mandatory.* Receptacles with covers shall be provided at suitable locations and used for the disposal of waste food and associated materials. They shall be emptied frequently and shall be maintained in a clean and sanitary condition.

56.20–14 *Mandatory.* No person shall be allowed to consume or store food or beverages in a toilet room nor in any area exposed to a toxic material.

56.20–15 through 56.20–29 [Reserved]

§ 56.21 [Reserved]

§ 56.22 [Reserved]

§ 56.23 [Reserved]

§ 56.24 [Reserved]

§ 56.25 [Reserved]

§ 56.26 Procedures

NOTIFICATION OF COMMENCEMENT OF OPERATIONS AND CLOSING OF MINES

56.26–1 *Mandatory.* The owner, operator, or person in charge of any metal and nonmetal mine shall notify the nearest Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration before starting operations of the approximate or actual date mine operation will commence. The notification shall include the mine name, location, the company name, mailing address, person in charge, and whether operations will be continuous or intermittent.

When any mine is closed, the person in charge shall notify the nearest subdistrict office as provided above and indicate whether the closure is temporary or permanent.

PART 57—HEALTH AND SAFETY STANDARDS—METAL AND NONMETALLIC UNDERGROUND MINES

Sec.

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AUTHORITY: Secs. 301(a) and 302(a) of the Federal Mine Safety and Health Amendments Act of 1977, Pub. L. 95–164, 30 U.S.C. 961 and 951 and 29 U.S.C. 577a, 91 Stat. 1317 and 91 Stat. 1319; sec. 508 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91–173 as amended by Pub. L. 95–164, 30 U.S.C. 957, 80 Stat. 803; sec. 6, 80 Stat. 774; 30 U.S.C. 725.

SOURCE: 34 FR 12517, July 31, 1969, unless otherwise noted.

NOTE: Nomenclature changes to this Part appear at 43 FR 12319, Mar. 24, 1978.

§ 57.1 Purpose and scope.

The regulations in this part are promulgated pursuant to section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) and prescribe health and safety standards for the purpose of the protection of life, the promotion of health and safety, and the prevention of accidents in underground metal and nonmetallic mines which are subject to that Act. Each standard which is preceded by the work "Mandatory" is a mandatory standard. The violation of a mandatory standard will subject an operator to an order or notice under section 8 of the Act (30 U.S.C. 727). Those regulations in each subpart appearing under the heading "General—Surface and Underground" apply both to the underground and surface operations of underground mines; those appearing under the heading "Surface Only" apply only to the surface operations of underground mines; those appearing under the heading "Underground Only" apply only to the underground operations of underground mines.

§ 57.2 Definitions.

As used in this part:

"Abandoned mine" means all work has stopped on the mine premises and an office with a responsible person in charge is no longer maintained at the mine.

"Abandoned workings" means deserted mine areas in which further work is not intended.

"Active workings" means areas at, in, or around a mine or plant where men work or travel.

"American Table of Distances" means the current edition of "The American Table of Distances for Storage of Explosives" published by the Institute of Makers of Explosives.

"Approved" means tested and accepted for a specific purpose by a nationally recognized agency.

"Authorized person" means a person approved or assigned by mine manage-

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ment to perform a specific type of duty or duties or to be at a specific location or locations in the mine.

"Auxiliary fan" means a fan used to deliver air to a working place off the main airstream; generally used with ventilation tubing.

"Barricaded" means obstructed to prevent the passage of persons, vehicles, or flying materials.

"Berm" means a pile or mound of material capable of restraining a vehicle.

"Blasting agent" means any substance classified as a blasting agent by the Department of Transportation in 49 CFR § 173.114(a) (44 FR 31182, May 31, 1979) which is incorporated by reference. This document is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Blasting area" means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury.

"Blasting cap" means a detonator which is initiated by a safety fuse.

"Blasting circuit" means the electrical circuit used to fire one or more electric blasting caps.

"Blasting switch" means a switch used to connect a power source to a blasting circuit.

"Booster" means any unit of explosive or blasting agent used for the purpose of perpetuating or intensifying an initial detonation.

"Booster fan" means a fan installed in the main airstream or a split of the main airstream to increase airflow through a section or sections of a mine.

"Capped fuse" means a length of safety fuse to which a blasting cap has been attached.

"Capped primer" means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator.

"Circuit breaker" means a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent setting without injury to itself when properly applied within its rating.

"Combustible" means capable of being ignited and consumed by fire.

"Company official" means a member of the company supervisory or technical staff.

"Competent person" means a person having abilities and experience that fully qualify him to perform the duty to which he is assigned.

"Conductor" means a material, usually iin the form of a wire, cable, or bus bar, capable of carrying an electric current.

"Delay connector" means a non-electric short interval delay device for use in delaying blasts which are initiated by detonating cord.

"Detonating cord" means a flexible cord containing a solid core of high explosives.

"Detonator" means any device containing a detonating charge that is used to initiate an explosive and includes but is not limited to blasting caps, electric blasting caps and non-electric instantaneous or delay blasting caps.

"Distribution box" means a portable apparatus with an enclosure through which an electric circuit is carried to one or more cables from a single incoming feed line, each cable circuit being connected through individual overcurrent protective devices.

"Electric blasting cap" means a detonator designed for and capable of being initiated by means of an electric current.

"Electrical grounding" means to connect with the ground to make the earth part of the circuit.

"Employee" means a person who works for wages or salary in the service of an employer.

"Employer" means a person or organization which hires one or more persons to work for wages or salary.

"Escapeway" means a passageway by which persons may leave a mine.

"Explosive" means any substance classified as an explosive by the Department of Transportation in 49 CFR 173.53, 173.88 and 173.100 which are incorporated by reference. Title 49 CFR is available for inspection at each Metal and Nonmetal Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

"Face or bank" means that part of any mine where excavating is progressing or was last done.

"Fire door" means an openable closure for a passageway, shaft, or other mine opening to serve as barrier to fire, the effects of fire, and air leakage. A fire door shall be constructed of materials and assembled so as to be equivalent to a door having a fire resistance rating of 1½ hours or greater, and on exposure to fire on one side for 30 minutes, the temperature on the unexposed side shall not exceed 250° F, as determined by a nationally recognized testing agency in accordance with "Standard Method of Fire Tests of Door Assemblies", National Fire Protection Association (NFPA) Code No. 252, 1972, or equivalent. The framework assembly of a fire door and the surrounding bulkhead, if any, shall be at least equivalent to the fire door in fire and air-leakage resistance, and in physical strength. NFPA Code No. 252 is hereby incorporated by reference and made a part hereof.[1] This publication may be examined in any Metal and Nonmetal Mine Safety and Health Subdistrict Office, Mine Safety and Health Administration, or may be obtained from the National Fire Protection Association, 470 Atlantic Avenue, Boston, Mass. 02210.

"Flammable" means capable of being easily ignited and of burning rapidly.

"Flash point" means the minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure.

"Highway" means any public street, public alley, or public road.

"High potential" means more than 650 volts.

"Hoist" means a power driven windlass or drum used for raising ore, rock, or other material from a mine, and for lowering or raising men and material.

"Igniter cord" means a fuse, cordlike in appearance, which burns progressively along its length with an external flame at the zone of burning, and is used for lighting a series of safety fuses in the desired sequence.

"Insulated" means separated from other conducting surfaces by a dielectric substance permanently offering a high resistance to the passage of current and to disruptive discharge through the substance. When any substance is said to be insulated, it is understood to be insulated in a manner suitable for the conditions to which it is subjected. Otherwise, it is, within the purpose of this definition, uninsulated. Insulating covering is one means for making the conductor insulated.

"Insulation" means a dielectric substance offering a high resistance to the passage of current and to a disruptive discharge through the substance.

"Lay" means the distance parallel to the axis of the rope in which a strand makes one complete turn about the axis of the rope.

"Low potential" means 650 volts or less.

"Magazine" means a facility for the storage of explosives, blasting agents, or detonators.

"Main fan" means a fan that controls the entire airflow of the mine, or the airflow of one of the major air circuits.

"Major electrical installation" means an assemblage of stationary electrical equipment for the generation, transmission, distribution, or conversion of electrical power.

"Man trip" means a trip on which men are transported to and from a work area.

"Mill" includes any ore mill, sampling works, concentrator, and any crushing, grinding, or screening plant used at, and in connection with, an excavation or mine.

"Mine opening" means any opening or entrance from the surface into a mine.

"Misfire" means the complete or partial failure of a blasting charge to explode as planned.

"Multipurpose dry-chemical fire extinguisher" means a listed or approved multipurpose dry-chemical fire extinguisher having a minimum rating of 2-A:10-B:C, by Underwriters. Laboratories, Inc., and containing a minimum of 4.5 pounds of dry-chemical agent.

"Non-electric delay blasting cap" means a detonator with an integral delay element and capable of being initiated by miniaturized detonating cord.

"Overburden" means material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials or ores that are to be mined.

"Overload" means that current which will cause an excessive or dangerous temperature in the conductor or conductor insulation.

"Permissible" means a machine, material, apparatus, or device which has

[1] Note.—Incorporation by reference provisions approved by the Director of the Federal Register on September 20, 1977. The National Fire Code is on file in the Office of the Federal Register Library.

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been investigated, tested, and approved by the Bureau of Mines or the Mine Safety and Health Administration and is maintained in permissible condition.

"Potable water means water which shall meet the applicable minimum health requirements for drinking water established by the State or community in which the mine is located or by the Environmental Protection Agency in 40 CFR, Part 141, pages 169–182 revised as of July 1, 1977. Where no such requirements are applicable, the drinking water provided shall conform with the Public Health Service Drinking Water Standards, 42 CFR, Part 72 Subpart J, pages 527–533, revised as of October 1, 1976. Publications to which references are made in this definition are hereby made a part hereof. These incorporated publications are available for inspection at each Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

"Powder chest" means a substantial, nonconductive, portable container equipped with a lid and used at blasting sites for explosives other than blasting agents.

"Primer" means a unit, package, or cartridge of explosives used to initiate other explosives or blasting agents, and which contains a detonator.

"Reverse-current protection" means a method or device used on direct-current circuits or equipment to prevent the flow of current in a reverse direction.

"Roll protection" means a framework, safety canopy or similar protection for the operator when equipment overturns.

"Safety can" means an approved container, of not over 5 gallons capacity, having a spring-closing lid and spout cover.

"Safety fuse" means a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps or a black powder charge.

"Safety switch" means a sectionalizing switch that also provides shunt protection in blasting circuits between the blasting switch and the shot area.

"Scaling" means removal of insecure material from a face or highwall.

"Secondary safety connection" means a second connection between a conveyance and rope, intended to prevent the conveyance from running away or falling in the event the primary connection fails.

"Shaft" means a vertical or inclined shaft, a slope, incline or winze.

"Short circuit" means an abnormal connection of relatively low resistance, whether made accidentally or intentionally, between two points of different potential in a circuit.

"Slurry" (as applied to blasting) See "Water gel".

"Stray current" means that portion of a total electric current that flows through paths other than the intended circuit.

"Substantial construction" means construction of such strength, material, and workmanship that the object will withstand all reasonable shock, wear, and usage to which it will be subjected.

"Suitable" means that which fits, and has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

"Travelway" means a passage, walk or way regularly used and designated for persons to go from one place to another.

"Trip light" means a light displayed on the opposite end of a train from the locomotive or engine.

"Water gel" or "Slurry" (as applied to blasting) means an explosive or blasting agent containing substantial portions of water.

"Wet drilling" means the continuous application of water through the central hole of hollow drill steel to the bottom of the drill hole.

"Working level" (WL) means any combination of the short-lived radon daughters in one liter of air that will result in ultimate emission of 1.3×10^5 MeV (million electron volts) of potential alpha energy, and exposure to these radon daughters over a period of time is expressed in terms of "working level months" (WLM). Inhalation of air containing a radon daughter concentration of 1 WL for 173 hours results in an exposure of 1 WLM.

"Working place" means any place in or about a mine where work is being performed.

§ 57.3 Ground control.

SURFACE ONLY

57.3–1 *Mandatory.* Standards for the safe control of pit walls, including the overall slope of the pit wall, shall be established and followed by the operator. Such standards shall be consistent with prudent engineering design, the nature of

the ground and the kind of material and mineral mined, and the ensuring of safe working conditions according to the degree of slope. Mining methods shall be selected which will ensure wall and bank stability, including benching as necessary to obtain a safe overall slope.

57.3–2 *Mandatory.* Loose, unconsolidated material shall be stripped for a safe distance, but in no case less than 10 feet, from the top of pit or quarry walls, and the loose, unconsolidated material shall be sloped to the angle of repose.

57.3–3 *Mandatory.* To ensure safe operation, the width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

57.3–4 *Mandatory.* Safe means for scaling pit banks shall be provided. Hazardous banks shall be scaled before other work is performed in the hazardous bank area.

57.3–5 *Mandatory.* Men shall not work near or under dangerous banks. Overhanging banks shall be taken down immediately and other unsafe ground conditions shall be corrected promptly, or the areas shall be barricaded and posted.

57.3–6 *Mandatory.* Men shall approach from above loose rock and areas to be scaled and shall scale from a safe location.

57.3–7 [Reserved]

57.3–8 *Mandatory.* The supervisor, or a competent person designated by him, shall examine working areas and faces for unsafe conditions at least at the beginning of each shift and after blasting. Any unsafe condition found shall be corrected before any further work is performed at the immediate area or face at which the unsafe condition exists.

57.3–9 *Mandatory.* Men shall examine their working places before starting work and frequently thereafter, and any unsafe condition shall be corrected.

57.3–10 and 57.3–11 [Reserved]

57.3–12 *Mandatory.* Men shall not work between equipment and the pit wall or bank where the equipment may hinder escape from falls or slides of the bank.

57.3–13 through 57.3–19 [Reserved]

UNDERGROUND ONLY

57.3–20 *Mandatory.* Ground support shall be used if the operating experience of the mine, or any particular area of the mine, indicates that it is required. If it is required, support, including timbering, rock bolting, or other methods shall be consistent with the nature of the ground and the mining method used.

57.3–21 [Reserved]

57.3–22 *Mandatory.* Miners shall examine and test the back, face, and rib of their working places at the beginning of each shift and frequently thereafter. Supervisors shall examine the ground conditions during daily visits to insure that proper testing and ground control practices are being followed. Loose ground shall be taken down or adequately supported before any other work is done. Ground conditions along haulageways and travelways shall be examined periodically and scaled or supported as necessary.

57.3–23 through 57.3–25 [Reserved]

57.3–26 *Mandatory.* Timbers used for support of ground in active workings shall be set, blocked, or blocked and wedged so that a tight fit is achieved. Damaged, loosened, or dislodged timbers which create a hazardous condition shall be promptly repaired or replaced.

57.3–27 and 57.3–28 [Reserved]

57.3–29 *Mandatory.* Shaft pillars or other support systems shall have sufficient strength to support operating shafts.

57.3–30 and 57.3–31 [Reserved]

57.3–32 [Reserved]

57.3–33 *Mandatory.* Calibrated torque meters or torque wrenches shall be available at mines where rock bolts are used for ground control. Periodic tests shall be made to determine the torque meter or torque wrench accuracy. Periodic testing of torque wrenches means when repaired or at least annually, and whenever a torque wrench is suspected of being inaccurate or damaged.

57.3–34 [Reserved]

57.3–35 *Mandatory.* Operators of mines that have experienced rock bursts within the mine shall develop a comprehensive rock burst detection plan applicable to current conditions in that mine within 90 days after promulgation of this standard or, thereafter, within 90 days after a rock burst has been experienced. This plan shall be updated from time to time as conditions and available technology warrant. This comprehensive rock burst detection plan shall be available to the Secretary or his duly authorized representative, and to mine employees.

57.3–36 through 57.3–49 [Reserved]

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GENERAL—SURFACE AND UNDERGROUND

57.3–50 *Mandatory.* Material, other than hanging material, to be broken by secondary drilling and blasting, or by any other method shall be positioned or blocked to prevent hazardous movement before persons commence breaking operations. Persons who perform those operations shall work from a location where, if movement of material occurs, those persons will not be endangered.

57.3–51 *Mandatory.* Where manual scaling may be required at a work place, a scaling bar of sufficient length to place the user out of danger of falling material shall be provided. The scaling bar shall be blunt on the end held by the user. Picks or other short tools shall not be used for scaling when their use places the user in danger of falling material.

57.3–52 [Reserved]

57.3–53 *Mandatory.* When rock bolts are used as a means of ground support, anchorage test procedures shall be established and tests shall be conducted to determine the anchorage capacity of rock-bolt installations. Test results shall be in writing and made available to the Secretary or his duly authorized representative.

57.3–54 *Mandatory.* Rock bolts used as a means of ground support and which require torquing shall be torqued to a value within the range determined from information obtained by tests in the strata in which the rock-bolt assembly is used. In no case shall the applied torque cause a bolt tension that would exceed the yield point or anchorage capacity of the rock-bolt assembly being used.

57.3–55 *Mandatory.* When installing point-anchor rock bolts:

(a) A torque test shall be conducted on at least every fourth installed bolt.

(b) Torque testing shall be conducted immediately after bolt installation.

(c) If the recommended torque has not been achieved, the equipment used to install the bolt shall be adjusted and the next bolt installed shall then be tested.

(d) If the recommended torque has not been achieved on the majority of bolts installed in a working place through equipment adjustment, supplemental support equivalent to longer roof bolts with adequate anchorage, steel or wood sets, or cribs shall be installed.

57.3–56 *Mandatory.* Rock bolt hole drill bits shall be easily identifiable by sight or feel and diameters shall be within a tolerance of ± 0.030 inches of the manufacturer's recommended hole diameter for the anchor used.

57.3–57 *Mandatory.* If used in rock-bolt assemblies to reduce friction between the bolt head and the bearing plate, washers shall: (a) Have hardness in the range of 35–45 HRC (Hardness Rockwell C Scale). (b) Conform to the shape of the bolt head and bearing plate. (c) Have sufficient strength to withstand loads up to the yield point of the rock bolt.

57.3–58 *Mandatory.* When rock bolts are needed for ground support, they shall be installed as soon as practicable after an area is exposed.

§ 57.4 Fire prevention and control.

GENERAL—SURFACE AND UNDERGROUND

57.4–1 *Mandatory.* No person shall smoke or use an open flame—

(a) Where flammable solvents, liquids, fluids, or other flammable materials are stored, transported, handled, or used; or

(b) Where oil or grease is stored, transported, handled, or used, if smoking or the use of an open flame may cause a fire; or

(c) Within an unsafe distance of any area where smoking or the use of an open flame may cause a fire or an explosion.

57.4–2 *Mandatory.* Signs warning against smoking and open flames shall be posted so they can be readily seen in areas or places where fire or explosion hazards exist.

57.4–3 *Mandatory.* Areas surrounding electric substations and unburied tanks used for the storage of flammable or combustible liquids shall be free of combustible materials (including dry vegetation) for a distance of at least 25 feet.

57.4–4 *Mandatory.* Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association or other recognized agencies approved by the Mine Safety and Health Administration. Small quantities of flammable liquids drawn from storage shall be kept in appropriately labeled safety cans.

57.4–5 *Mandatory.* Effective February 13, 1980, fixed unburied tanks used for the storage of flammable or combustible liquids shall be securely mounted on firm

foundations. Where necessary to prevent leaks caused by tanks settling, piping shall be provided with flexible connections or other special fittings.

57.4–6 [Reserved]

57.4–7 *Mandatory.* Means shall be provided to remove or control spilled flammable or combustible liquids.

57.4–8 *Mandatory.* Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.

57.4–9 *Mandatory.* All heat sources, including lighting equipment, capable of producing combustion shall be insulated or isolated from combustible materials.

57.4–10 *Mandatory.* Power wires and cables shall be adequately insulated where they pass through doors or walls or where they present a fire hazard.

57.4–11 *Mandatory.* Abandoned electrical circuits shall be deenergized and isolated so that they cannot become energized inadvertently.

57.4–12 *Mandatory.* All flammable and combustible waste materials, grease, lubricants or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

57.4–13 *Mandatory.* In areas where materials such as oily waste or oily rags create a fire hazard, the materials shall be placed in covered metal containers until disposed of properly.

57.4–14 *Mandatory.* Solvents with flash points lower than 100° F. (38° C.) shall not be used for cleaning.

57.4–15 *Mandatory.* Solvents shall not be used near an open flame or other ignition source, or near any source of heat, or in an atmosphere that can elevate the temperature of the solvent above the flash point.

57.4–16 *Mandatory.* Drip pans shall be provided to catch leakage or spillage whenever combustible or flammable liquids are dispensed in a place or manner which may create a fire hazard. Floor areas where drip pans are used shall be cleaned immediately after spills.

57.4–17 [Reserved]

57.4–18 *Mandatory.* Oxygen cylinders shall not be stored in rooms or areas used or designated for oil or grease storage.

57.4–19 *Mandatory.* Gages and regulators used with oxygen or acetylene cylinders shall be kept clean and free of oil and grease.

57.4–20 *Mandatory.* Battery-charging stations shall be located in well-ventilated areas.

57.4–21 *Mandatory.* Equipment powered by internal combustion engines (except diesel engines), where the fuel tank is an integral part of the equipment, shall be shut off and stopped before being fueled.

57.4–22 *Mandatory.* Each mine shall have available or be provided with suitable fire fighting equipment adequate for the size of the mine.

57.4–23 *Mandatory.* Fire fighting equipment which is provided on the mine property shall be strategically located, readily accessible, plainly marked, properly maintained, and inspected periodically. Records shall be kept of such inspections.

57.4–24 *Mandatory.* Fire extinguishers and fire suppression devices shall be:

(a) Of the appropriate type for the particular fire hazard involved.

(b) Adequate in number and size for the particular fire hazard involved.

(c) Replaced with a fully charged extinguisher or device, or recharged immediately, after any discharge is made from the extinguisher or device.

(d) Inspected, tested, and maintained at regular intervals according to the manufacturer's recommendations.

(e) Approved by the Underwriter's Laboratories, Inc., or other competent testing agency acceptable to the Mine Safety and Health Administration.

57.4–25 *Mandatory.* Effective February 13, 1980, whenever fire hydrants are used, they shall be provided with—

(a) Uniform fittings;

(b) Readily available wrenches or keys to open the valves; and

(c) Readily available adapters that connect hydrant fittings to the hose equipment of local fire departments.

57.4–26 *Mandatory.* Water pipes, valves, outlets, hydrants, and hoses designated for fire fighting purposes shall be inspected every 90 days and tested annually.

57.4–27 *Mandatory.* Whenever self-propelled mobile equipment is used, such equipment shall be provided with a suitable fire extinguisher readily accessible to the equipment operator.

57.4–28 *Mandatory.* Welding, cutting, arc welding or soldering shall be performed by a competent person.

57.4–29 *Mandatory.* When welding or cutting, suitable precautions shall be taken

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to ensure that smoldering metal or sparks do not result in a fire. Fire extinguishing equipment shall be immediately available at the site.

57.4–30 through 57.4–32 [Reserved]

57.4–33 *Mandatory.* Valves on oxygen and acetylene tanks shall be kept closed when the contents are not being used.

57.4–34 [Reserved]

57.4–35 *Mandatory.* Before any heat is applied to pipelines or containers which have contained flammable or combustible substances, they shall be drained, ventilated, thoroughly cleaned of residual substances and filled with either an inert gas or, where compatible, filled with water.

57.4–36 through 57.4–38 [Reserved]

SURFACE ONLY

57.4–39A *Mandatory.* Effective February 13, 1980, storage buildings or rooms in which flammable or combustible liquids or other flammable materials are stored and which are within 100 feet of where miners normally work shall be well-ventilated and constructed of materials having a fire-resistance rating of no less than one (1) hour as tested under the appropriate National Fire Protection Association (NFPA) fire-resistance test or under a test of another approved testing agency.

57.4–39B *Mandatory.* Emergency fire fighting plans in combination with evacuation and rescue plans shall be established and coordinated with available fire fighting organizations. Emergency fire fighting drills shall be held for each shift at least once every six (6) months.

57.4–39C through 57.4–39Z [Reserved]

57.4–40 *Mandatory.* Fire alarm systems shall be provided and maintained in operating condition or adequate fire alarm procedures shall be established to warn promptly all persons endangered by a fire.

57.4–41 *Mandatory.* Every building or structure where persons normally work shall be provided with exits sufficient to permit the prompt escape of persons in case of fire.

57.4–42 *Mandatory.* (a) No combustible materials shall be permitted within 100 feet of main and booster fans and mine openings, except for one day's requirements of mine materials or supplies. However, such supplies or materials shall not be permitted within 25 feet of mine openings.

(b) In this standard, the phrase "combustible materials" includes dry vegetation which is within 25 feet of mine openings but does not include installed wiring, ground support and track support, headframes, any materials in transit, or any buildings and other structures in compliance with standard 57.4–43.

57.4–43 *Mandatory.* (a) Buildings and other similar structures, which are within 100 feet of mine openings used for intake air and mine openings that are designated escapeways in exhaust air, shall be constructed of materials having a fire-resistance rating of no less than one (1) hour as tested under the appropriate National Fire Protection Association (NFPA) fire-resistance test or under a test of another approved testing agency.

(b) An automatic fire suppression system may be substituted for the requirements of paragraph (a)—

(1) In buildings and structures occupied or in use on November 15, 1979, if the system is in operating condition by February 13, 1980; or

(2) In buildings and structures under construction on November 15, 1979, if the system is in operating condition prior to occupancy or use.

57.4–44 [Reserved]

57.4–45 *Mandatory.* Blacksmith shops shall be—

(a) Well-ventilated and equipped with exhaust vents over the forge;

(b) Inspected specifically for smoldering fires at the end of each shift;

(c) Constructed of materials having a fire-resistance rating of no less than one (1) hour as tested under the appropriate National Fire Protection Association (NFPA) fire-resistance test or under a test of another approved testing agency; and

(d) Located at least 100 feet from the mine openings or fan installations, and not in buildings or snowsheds adjoining mine openings or fan installations unless fire doors and walls, constructed according to the requirements of paragraph (c) of this standard, are provided between the *blacksmith shop and the mine openings* or fan installations.

57.4–46 *Mandatory.* Gasoline, diesel fuel, liquefied petroleum gases, and other flammable liquids when not buried, shall not be stored within 100 feet of the following:

(a) Mine openings.

(b) Buildings or snowsheds connected to mine openings.

(c) Fan installations or housings.

(d) Hoist houses.

57.4–47 *Mandatory.* Belt conveyors shall be equipped with a safety switch capable of automatically stopping the drive pulley in the event of excessive slippage of the belt, where ignition of the belt could create a hazard to personnel. When it is necessary to operate the conveyor while temporarily by-passing the safety switch or any automatic function of the switch, a person shall attend the belt at the drive pulley.

57.4–48 *Mandatory.* All employees shall be instructed at least once each calendar year on fire alarm signals and applicable procedures to be followed in case of fire or other emergency. Records of instruction shall be kept for 2 years.

57.4–49 [Reserved]

UNDERGROUND ONLY

57.4–50 *Mandatory.* All flammable and combustible waste materials, grease, lubricants or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

57.4–51 *Mandatory.* Fire alarm systems adequate to warn all employees shall be provided and maintained in operating condition.

57.4–52 *Mandatory.* Gasoline shall not be stored underground, but may be used only to power internal combustion engines in nongassy mines that have multiple horizontal or inclined roadways from the surface large enough to accommodate vehicular traffic. Roadways and other openings shall not be supported or lined with combustible material. All roadways and other openings shall be connected with another opening every 100 feet by a passage large enough to accommodate any vehicle in the mine.

57.4–53 *Mandatory.* The use of liquefied petroleum gases shall be limited to maintenance work.

57.4–54 *Mandatory.* Oil, grease, or diesel fuel stored underground shall be kept in suitable tightly sealed containers in fire-resistant areas, at safe distances from explosives magazines, electrical installations, and shaft stations.

57.4–55 *Mandatory.* Transformer stations, pump rooms, compressor rooms and similar installations, which are located in timbered areas or in areas where exposed rock is combustible, shall be provided with suitable fire protection.

57.4–56 [Reserved]

57.4–57 *Mandatory.* Effective November 12, 1980, trailing cables shall be flame-resistant in accordance with 30 CFR 18.64.

57.4–58 *Mandatory.* Fires shall not be built underground; open-flame torches and candles shall not be left underground.

57.4–59 and 57.4–60 [Reserved]

57.4–61A *Mandatory.* To prevent the spread of smoke or gas in the event of a fire, ventilation doors shall be installed at or near shaft stations of intake shafts and at any shaft designated as an escapeway under standard 57.11–53, or at other locations which provide equivalent protection. Effective February 13, 1980, the location (and relocation) of doors required by this standard shall be submitted to the District Manager for the district in which the mine is located, for review and approval by the Secretary.

Doors required by this standard shall be—

(a) Constructed and maintained in accordance with standard 57.5–31;

(b) Constructed according to the specifications within the definition of "fire door" in section 57.2, if located in a timbered area, in an area where the exposed rock is combustible, or in an area where a significant fire hazard is present;

(c) Provided with a means of remote closure unless other means of closing the door are assured;

(d) Constructed so that, once closed, they will not reopen as a result of a differential in air pressure;

(e) Constructed so that they can be opened from either side by one person, or provided with a man door that can be opened from either side; and

(f) Kept clear of obstructions and extraneous materials.

57.4–61B *Mandatory.* (a) To confine or prevent the spread of toxic gases from a fire originating in an underground shop, the mine operator shall install in each opening to the shop a fire door or bulkhead constructed in accordance with the definition of "fire door" contained in section 57.2.

(b) Each fire door shall be—

(1) Constructed so that, once closed, it will not reopen as a result of a differential in air pressure;

(2) Constructed so that it can be opened from either side by one person or be provided with a man door that can be opened from either side;

(3) Suitably airtight; and

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(4) Kept clear of obstructions and extraneous materials.

(c) This standard does not apply when mine shop exhaust air is routed directly to an exhaust system in such a manner that personnel would not be exposed to toxic gases in the event of a fire originating in the underground shop.

57.4–62 *Mandatory.* Timber in mine entrances shall be fire-retardant to the extent that the flame spread rating shall be 25 or less for at least 200 feet inside the mine portal or collar, or the mine entrance shall be provided with fire protection capable of controlling a fire for at least 200 feet inside the mine portal or collar.

57.4–63 *Mandatory.* Waterline outlets located at shaft stations shall have at least one fitting suitably located for, and capable of, immediate connection to fire fighting equipment.

57.4–64 [Reserved]

57.4–65 [Reserved]

57.4–66 *Mandatory.* Suitable fire protection shall be provided at the head, tail, drive, and takeup pulleys of belt conveyors and at intervals along the belt line.

57.4–67 *Mandatory.* A mine rescue station equipped with at least 10 sets of approved and properly maintained 2-hour self-contained breathing apparatus, adequate supplies, and spare parts shall be maintained at mines employing 75 or more men underground or, in lieu thereof, the mine shall be affiliated with a central mine rescue station.

57.4–68 [Reserved]

57.4–69 *Mandatory.* Approved mine rescue apparatus shall be properly maintained for immediate use. The equipment shall be tested at least once a month and records kept of the tests.

57.4–70 *Mandatory.* At mines employing 75 or more men underground, at least two rescue crews (10 Men) shall be trained at least annually in the use, care, and limitations of self-contained breathing and fire fighting apparatus and in mine-rescue procedures. Smaller mines shall have at least one man so trained for each 10 men employed underground.

54.4–71 [Reserved]

57.4–72 *Mandatory.* Only trained mine rescue team members shall participate in rescue and fire fighting operations in advance of the fresh air base.

57.4–73 *Mandatory.* Mine evacuation drills shall be held for each shift once every 6 months. These evacuation drills shall involve all employees on each shift and shall include:

(a) Activation of the fire-alarm system.

(b) Evacuation of all men from their work areas to the surface or to designated central evacuation points at some time other than a shift change.

Record of such drills, showing the time and date, shall be kept for at least 2 years after each drill.

57.4–74 *Mandatory.* All employees involved in the escape and evacuation plan for an underground operation shall be instructed at least once each calendar year on current escape and evacuation plans, fire alarm signals, and applicable procedures to be followed in case of fire or other emergency. New employees shall receive such instructions before going underground. Whenever an employee is assigned to work in another area of the mine he shall be instructed on the escapeway for that area at the time of such assignment. However, employees who normally work in more than one area of the mine shall be instructed at last once each calendar year in the location of escapeways for all areas of the mine in which they normally work or travel. Whenever a change is made in escape and evacuation plans and procedures for any area of the mine, all affected employees shall be instructed of such change. Records of instruction shall be kept for 2 years.

57.4–75 *Mandatory.* Belt conveyors shall be equipped with slippage and sequence switches.

57.4–76 *Mandatory.* Where welding or cutting with an arc or open flame, or thawing pipes electrically (excluding heat tape) or soldering with an open flame, a multipurpose dry-chemical fire extinguisher shall be provided.

57.4–77 *Mandatory.* Where welding or cutting with an arc or open flame, or thawing pipes electrically (excluding heat tape) within thirty five (35) feet, or where soldering with an open flame within ten (10) feet, of more than one (1) gallon of combustible liquid (unless the combustible liquid is in a closed noncombustible metal container) or more than fifty (50) pounds of non-fire-retardant wood, or more than ten (10) pounds of combustible plastic, the following precautions, in addition to a multipurpose dry-chemical fire extinguisher shall be taken:

(a) A second multipurpose dry-chemical fire extinguisher, or fire extinguishing

equipment having equivalent extinguishing capability and appropriate for the particular hazard involved, shall be provided.

(b) The combustible materials and the area between them and the operation shall be wetted down (precautions shall be taken against electrical shock, where necessary) before and after the operation. If wetting down is not practical, then the combustibles shall be isolated by noncombustible material or the operation shall be shielded to insure that smoldering metal or sparks do not result in a fire.

(c) If the precautions in (b) are not practical, then a second person shall be present to observe and extinguish fires.

(d) Inspection(s) of the affected areas shall be made during the first hour after the operation is terminated. If the mine operator deems that working conditions and the degree of potential hazard warrant it, additional inspections shall be made or other extra-precautionary measures shall be taken.

57.4–78 *Mandatory.* Where welding or cutting with an arc or open flame, or thawing pipes electrically (excluding heat tape) in or within thirty-five (35) feet, or where soldering with an open flame in or within ten (10) feet, of a shaft, raise, or winze and where there is a risk that combustible materials may be ignited by falling sparks or heated material, the following precautions, in addition to a multipurpose dry-chemical fire extinguisher, shall be taken:

(a) A second multipurpose dry-chemical fire extinguisher, or fire extinguishing equipment having equivalent extinguishing capability and appropriate for the particular hazard involved, shall be provided.

(b) The combustible materials and the area between them and the operation shall be wetted down (precautions shall be taken against electrical shock, where necessary) before and after the operation. If wetting down is not practical, then the combustibles shall be isolated by noncombustible material or the operation shall be shielded to insure that smoldering metal or sparks do not result in a fire.

(c) Or, if practical, the opening immediately below or adjacent to the operation shall be covered or bulkheaded with a noncombustible material.

(d) If the precautions in (b) or (c) are not practical, then a second person shall be present to observe and extinguish fires.

(e) Inspection(s) of the affected area shall be made during the first hour after the operation is terminated. If the mine operator deems that working conditions and the degree of potential hazard warrant it, additional inspections shall be made or other extra-precautionary measures shall be taken.

57.4–79 through 57.4–84 [Reserved]

57.4–85 *Mandatory.* Stationary diesel equipment shall not be supported on a combustible base.

57.4–86 *Mandatory.* Stationary diesel equipment shall be provided with a thermal sensor which automatically stops the diesel engine should overheating occur.

§ 57.5 Air quality, ventilation, radiation, and physical agents.

Air Quality

General—Surface and Underground

57.5–1 *Mandatory.* Except as permitted by § 57.5–5:

(a) Except as provided in paragraph (b), the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54, which are hereby incorporated by reference and made a part hereof. This publication may be obtained from the American Conference of Governmental Industrial Hygienists by writing to the Secretary-Treasurer, P.O. Box 1937, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration. Excursions above the listed thresholds shall not be of a greater magnitude than is characterized as permissible by the Conference.

(b) The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400–450 magnification (4 millimeter objective) phase

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contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos.

(c) Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant.

57.5–2 *Mandatory.* Dust, gas, mist, and fume surveys shall be conducted as frequently as necessary to determine the adequacy of control measures.

57.5–3 *Mandatory.* Holes shall be collared and drilled wet, or other efficient dust control measures shall be used when drilling non-water-soluble material. Efficient dust control measures shall be used when drilling water-soluble materials.

57.5–4 [Reserved]

57.5–5 *Mandatory.* Control of employee exposure to harmful airborne contaminants shall be, insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. However, where accepted engineering control measures have not been developed or when necessary by the nature of work involved (for example, while establishing controls or occasional entry into hazardous atmospheres to perform maintenance or investigation), employees may work for reasonable periods of time in concentrations of airborne contaminants exceeding permissible levels if they are protected by appropriate respiratory protective equipment. Whenever respiratory protective equipment is used a program for selection, maintenance, training, fitting, supervision, cleaning, and use shall meet the following minimum requirements:

(a) Mine Safety and Health Administration approved respirators which are applicable and suitable for the purpose intended shall be furnished, and employees shall use the protective equipment in accordance with training and instruction.

(b) A respirator program consistent with the requirements of ANSI Z88.2–1969, published by the American National Standards Institute and entitled "American National Standards Practices for Respiratory Protection ANSI Z88.2–1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

(c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment.

57.5–6 *Mandatory.* The following chemical substances shall not be used or stored except by competent persons under laboratory conditions approved by a nationally recognized agency acceptable to the Secretary.

(a) Carbon tetrachloride,
(b) Phenol,
(c) 4-Nitrobiphenyl,
(d) Alpha-naphthylamine,
(e) 4,4-Methylene Bis (2-chloroaniline),
(f) Methyl-chloromethyl ether,
(g) 3,3 Dichlorobenzidine,
(h) Bis (chloromethyl) ether,
(i) Beta-napthylamine,
(j) Benzidine,
(k) 4-Aminodiphenyl,
(l) Ethyleneimine,
(m) Beta-propiolactone,
(n) 2-Acetylaminofluorene,
(o) 4-Dimethylaminobenzene, and
(p) N-Nitrosodimethylamine.

57.5–7 through 57.5–9 [Reserved]

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57.5–10 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations without requiring full-flow respiratory protection, or equivalent, to all exposed persons.

57.5–11 through 57.5–14 [Reserved]

UNDERGROUND ONLY

57.5–15 *Mandatory.* Air in all active workings shall contain at least 19.5 volume percent oxygen.

57.5–16 *Mandatory.* Silica sand, or other materials containing more than 1 percent free silica, shall not be used as an abrasive substance in abrasive blasting cleaning operations.

57.5–17 [Reserved]

VENTILATION

GENERAL—SURFACE AND UNDERGROUND

57.5–18A [Reserved]

57.5–18B *Mandatory.* Areas within twenty-five (25) feet of main and booster fans shall be kept free of combustible materials except for installed wiring, materials used for fan maintenance, direct fired heaters, and materials used for ground support.

57.5–18C [Reserved]

57.5–18D *Mandatory.* (a) All mine main and booster fans installed and used to ventilate the active workings of the mine shall be operated continuously while persons are underground in the active workings. However, this provision is not applicable during scheduled production-cycle shutdowns or planned or scheduled fan maintenance or fan adjustments where air quality is maintained in compliance with the applicable standards of section 57.5 and all persons underground in the affected areas are advised in advance of such scheduled or planned fan shutdowns, maintenance, or adjustments.

(b) In the event of main or booster fan failure due to a malfunction, accident, power failure, or other such unplanned or unscheduled event:

(1) The air quality in the affected active workings shall be tested at least within 2 hours of the discovery of the fan failure and at least every 4-hours thereafter by a competent person for compliance with the requirements of the applicable standards of section 57.5 until normal ventilation is restored, or

(2) All persons, except those working on the fan, shall be withdrawn, the ventilation shall be restored to normal and the air quality in the affected active workings shall be tested by a competent person to assure that the air quality meets the requirements of the standards in section 57.5, before any other persons are permitted to enter the affected active workings.

57.5–18E [Reserved]

57.5–18F *Mandatory.* All underground main fans shall have controls placed at a suitable protected location remote from the fan and preferably on the surface.

57.5–18G through 57.5–18Z [Reserved]

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57.5–19A through 57.5–19Z [Reserved]

UNDERGROUND ONLY

57.5–20 *Mandatory.* A plan of the mine ventilation system shall be set out by the operator in written form. Revisions of the system shall be noted and updated at least annually. The ventilation plan or revisions thereto shall be submitted to the District Manager for review and comments upon his written request. The plan shall, where applicable, contain the following:

(a) The mine name,

(b) The current mine map or schematic or series of mine maps or schematics of an appropriate scale, not greater than five hundred (500) feet to the inch, showing:

(1) Direction and quantity of principal air flows;

(2) Locations of seals used to isolate abandoned workings;

(3) Locations of areas withdrawn from the ventilation system;

(4) Locations of all main, booster and auxiliary fans not shown in subsection (d) of this standard;

(5) Locations of air regulators and stoppings and ventilation doors not shown in subsection (d) of this standard;

(6) Locations of overcasts, undercasts and other airway crossover devices not shown in subsection (d) of this standard;

(7) Locations of known oil or gas wells;

(8) Locations of known underground mine openings adjacent to the mine;

(9) Locations of permanent underground shops, diesel fuel storage depots, oil fuel storage depots, hoist rooms, compressors, battery charging stations and explosive storage facilities. Permanent facilities are those intended to exist for one year or more; and

(10) Significant changes in the ventilation system projected for one year.

(c) Mine fan data for all active main and booster fans including manufacturer's name, type, size, fan speed, blade setting, approximate pressure at present operating point, and motor brake horsepower rating.

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(d) Diagrams, descriptions or sketches showing how ventilation is accomplished in each typical type of working place including the approximate quantity of air provided, and typical size and type of auxiliary fans used.

(e) The number and type of internal combustion engine units used underground, including make and model of *unit, type* of engine, *make and model* of engine, brake horsepower rating of engine, and approval number.

57.5–21 [Reserved]

57.5–22 *Mandatory.* Fan housings and air ducts connecting main fans to underground openings shall be fire-resistant.

57.5–23 and 57.5–24 [Reserved]

57.5–25 *Mandatory.* Main fans shall be maintained according to either the manufacturer's recommendations or a written periodic schedule adopted by the operator which shall be available at the operation on request of the Secretary or his authorized representative.

57.5–26 [Reserved]

57.5–27 *Mandatory.* Flame safety lamps or other suitable devices shall be used to test for acute oxygen deficiency.

57.5–28 *Mandatory.* Unventilated areas shall be sealed, or barricaded and posted against entry.

57.5–29 *Mandatory.* When auxiliary fan systems are used, such systems shall minimize recirculation and be maintained to provide ventilation air that effectively sweeps the working places.

57.5–30 [Reserved]

57.5–31 *Mandatory.* Ventilation doors shall be:

(a) Substantially constructed.

(b) Covered with fire-retardant material, if constructed of wood.

(c) Maintained in good condition.

(d) Self-closing, if manually operated.

(e) Equipped with audible or visual warning devices, if mechanically operated.

57.5–32 *Mandatory.* When ventilation control doors are opened as a part of the normal mining cycle, they shall be closed as soon as possible to re-establish normal ventilation to working places.

57.5–33 [Reserved]

RADIATION

UNDERGROUND ONLY

57.5–34 *Mandatory.* (a) Auxiliary fans installed and used to ventilate the active workings of the mine shall be operated continuously while persons are underground in the active workings, *except* for scheduled production-cycle shutdowns or planned or scheduled fan maintenance or fan adjustments where air quality is maintained in compliance with the applicable standards of section 57.5, and all persons underground in the affected areas are advised in advance of such scheduled or planned fan shutdowns, maintenance, or adjustments.

(b) In the event of auxiliary fan failure due to malfunction, accident, power failure, or other such unplanned or unscheduled event:

(1) The air quality in the affected active workings shall be tested at least within 2-hours of the discovery of the fan failure, and at least every 4-hours thereafter by a competent person for compliance with the requirements of the applicable standards of section 57.5 until normal ventilation is restored, or

(2) All persons, except those working on the fan, shall be withdrawn, the ventilation shall be restored to normal and the air quality in the affected active workings shall be tested by a competent person to assure that the air quality meets the requirements of the standards in section 57.5, before any other persons are permitted to enter the affected active workings.

57.5–35A *Mandatory.* Seals shall be provided with a means for checking the quality of air behind the seal and a means to prevent a water head from developing unless the seal is designed to impound water.

57.5–35B through 57.5–35Z [Reserved]

57.5–36 [Reserved]

57.5–37 *Mandatory.* (a) In all mines at least one sample shall be taken in exhaust mine air by a competent person to determine if concentrations of radon daughters are present. Sampling shall be done using suggested equipment and procedures described in section 14.3 of ANSI N13.8–1973, entitled "American National Standard Radiation Protection in Uranium Mines," approved July 18, 1973, pages 13–15, by the American National Standards Institute, Inc., which is incorporated by reference and made a part of the standard[1] or equivalent procedures and equipment acceptable to the Administrator, Metal and Nonmetal Mine Safety and

[1] Incorporation by reference provisions approved by Director of the Federal Register, September 23, 1975.

Health, Mine Safety and Health Administration. This publication may be examined at any Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration, or may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018. The mine operator may request that the required exhaust mine air sampling be done by the Mine Safety and Health Administration. If concentrations of radon daughters in excess of 0.1 WL are found in an exhaust air sample, thereafter—

(1) Where uranium is mined—radon daughter concentrations representative of worker's breathing zone shall be determined at least every two weeks at random times in all active working areas such as stopes, drift headings, travelways, haulageways, shops, stations, lunch rooms, magazines, and any other place or location where persons work, travel, or congregate. However, if concentrations of radon daughters are found in excess of 0.3 WL in an active working area, radon daughter concentrations thereafter shall be determined weekly in that working area until such time as the weekly determinations in that area have been 0.3 WL or less for 5 consecutive weeks.

(2) Where uranium is not mined—when radon daughter concentrations between 0.1 and 0.3 WL are found in an active working area, radon daughter concentration measurements representative of worker's breathing zone shall be determined at least every 3 months at random times until such time as the radon daughter concentrations in that area are below 0.1 WL, and annually thereafter. If concentrations of radon daughters are found in excess of 0.3 WL in an active working area radon daughter concentrations thereafter shall be determined at least weekly in that working area until such time as the weekly determinations in that area have been 0.3 WL or less for 5 consecutive weeks.

(b) If concentrations of radon daughters less than 0.1 WL are found in an exhaust mine air sample, thereafter:

(1) Where uranium is mined—at least one sample shall be taken in the exhaust mine air monthly.

(2) Where uranium is not mined—no further exhaust mine air sampling is required.

(c) The sample date, locations, and results obtained under (a) and (b) above shall be recorded and retained at the mine site or nearest mine office for at least two (2) years and shall be made available for inspection by the Secretary or his authorized representative.

57.5–38 *Mandatory.* No person shall be permitted to receive an exposure in excess of 4 WLM in any calendar year.

57.5–39 *Mandatory.* Except as provided by standard 57.5–5, persons shall not be exposed to air containing concentrations of radon daughters exceeding 1.0 WL in active workings.

57.5–40 *Mandatory:* (a) The operator shall calculate and record complete individual exposures to concentrations of radon daughters as follows:

(1) Where uranium is mined—the complete individual exposures of all mine personnel working underground shall be calculated and recorded. These records shall include the individual's time in each active working area such as stopes, drift headings, travelways, haulageways, shops, stations, lunch rooms, magazines and any other place or location where persons work, travel or congregate, and the concentration of airborne radon daughters for each active working area.

(2) Where uranium is not mined—the complete individual exposure of all mine personnel working in active working areas with radon daughter concentrations in excess of 0.3 WL shall be calculated and recorded. These records shall include the individual's time in each active working area and the concentrations of airborne radon daughters for each active working area. The operator may discontinue calculating and recording the individual exposures of any personnel assigned to work in active working areas where radon daughter concentrations have been reduced to 0.3 WL or less for 5 consecutive weeks provided that such exposure calculation and recordation shall not be discontinued with respect to any person who has accumulated more exposure than 1/12 (one-twelfth) of a WLM times the number of months for which exposures have been calculated and recorded in the calendar year in which the exposure calculation and recordation is proposed to be discontinued.

(b) The operator shall maintain the form entitled "Record of Individual Exposure to Radon Daughters" (Form 4000–9), or equivalent forms that are acceptable to

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the Administrator, Metal and Nonmetal Mine Safety and Health, Mine Safety and Health Administration, on which there shall be recorded the specific information required by the form with respect to each person's time-weighted current and cumulative exposure to concentrations of radon daughters.

(1) The form entitled "Record of Individual Exposure to Radon Daughters" (Form 4000–9), shall consist of an original of each form for the operator's records which shall be available for examination by the Secretary or his authorized representative.

(2) On or before February 15 of each calendar year, or within 45 days after the shutdown of mining operations for the calendar year, each mine operator shall submit to the Mine Safety and Health Administration a copy of the "Record of Individual Exposure to Radon Daughters" (Form 4000–9), or acceptable equivalent form, showing the data required by the form for all personnel for whom calculation and recording of exposure was required during the previous calendar year.

(3) Errors detected by the operator shall be corrected on any forms kept by the operator and a corrected copy of any forms submitted to the Mine Safety and Health Administration shall be submitted to the Mine Safety and Health Administration within 60 days of detection and shall identify the errors and indicate the date the corrections are made.

(4) The operator's records of individual exposure to concentrations of radon daughters and copies of "Record of Individual Exposure to Radon Daughters" (Form 4000–9) or acceptable equivalent form or true legible facsimiles thereof (microfilm or other), shall be retained at the mine or nearest mine office for a period as specified in paragraph 9.8, ANSI N13.8–1973, or shall be submitted to the Mine Safety and Health Administration. These records, if retained by the operator, shall be open for inspection by the Secretary of Labor, his authorized representative, and authorized representatives of the official mine inspection agency of the State in which the mine is located. Paragraph 9.8 ANSI N13.8–1973, is incorporate by reference and made a part of the standard.[1] ANSI N13.8–1973, may be examined by any Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration, and may be obtained from the American National Standards Institute, Inc., at 1430 Broadway, New York, New York 10018.

(5) Upon written request from a person who is a subject of these records, a statement of the year-to-date and cumulative exposure applicable to that person shall be provided to the person or to whomever such person designates.

(6) The blank form entitled "Record of Individual Exposure to Radon Daughters" (Form 4000–9) may be obtained on request from any Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration.

Note.—To calculate an individual's exposure to WLM for a given period of time, multiply the total exposure time (hours to the nearest half-hour) in an active working area by the average concentration of airborne radon daughters for the applicable active working area (average working level calculated to the nearest hundredth working level) and divide the product by the constant 173 hours per month.

An average airborne radon daughter concentration for a designated active working area shall be determined by averaging all sampling results for that working area during the time that persons are present. Any sample taken by Federal or State mine inspectors, which represents exposure to miners and reported to the operator within three (3) days of being taken, shall be included in the average concentration; *except* that if the mine operator samples simultaneously with the inspector, he may use his own sample results.

57.5–41 *Mandatory.* Smoking shall be prohibited in all working areas of a mine where exposure records are required to be kept in compliance with standard 57.5–40.

57.5–42 *Mandatory.* If levels of permissible exposures to concentrations of radon daughters different from those prescribed in standard 57.5–38 are recommended by the Environmental Protection Agency and approved by the President, no employee shall be permitted to receive exposures in excess of those levels after the effective dates established by the Agency.

[1] Incorporation by reference provisions approved by Director of the Federal Register September 23, 1975.

57.5–43 [Reserved]

57.5–44 *Mandatory.* The wearing of respirators approved for protection against radon daughters shall be required in environments exceeding 1.0 WL and respirator use shall be in compliance with standard 57.5–5.

57.5–45 *Mandatory.* Inactive workings, in which radon daughter concentrations are above 1.0 WL, shall be posted against unauthorized entry and designated by signs indicating them as areas in which approved respirators shall be worn.

57.5–46 *Mandatory.* Where radon daughter concentrations exceed 10 WL, respirator protection against radon gas shall be provided in addition to protection against radon daughters. Protection against radon gas shall be provided by supplied air devices or by face masks containing absorbent material capable of removing both the radon and its daughters.

57.5–47 *Mandatory.* Gamma radiation surveys shall be conducted annually in all underground mines where radioactive ores are mined: (a) Surveys shall be in accordance with American National Standards Institute (ANSI) Standard N13.8–1973, entitled "Radiation Protection in Uranium Mines", section 14.1, page 12, which is hereby incorporated by reference and made a part hereof. This publication may be examined in any Metal and Nonmetal Mine Safety and Health Subdistrict Office, Mine Safety and Health Administration, or may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018. (b) Where average gamma radiation measurements are in excess of 2.0 milliroentgens per hour in the working place, gamma radiation dosimeters shall be provided for all persons affected, and records of cumulative individual gamma radiation exposure shall be kept. (c) Annual individual gamma radiation exposure shall not exceed 5 Rems.

57.5–48 and 57.5–49 [Reserved]

Physical Agents

General—Surface and Underground

57.5–50 *Mandatory.* (a) No employee shall be permitted an exposure to noise in excess of that specified in the table below. Noise level measurements shall be made using a sound level meter meeting specifications for type 2 meters contained in American National Standards Institute (ANSI) Standard S1.4–1971, "General Purpose Sound Level Meters," approved April 27, 1971, which is hereby incorporated by reference and made a part hereof, or by a dosimeter with similar accuracy. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

Permissible Noise Exposure

Duration per day, hours of exposure	*Sound level dBA, slow response*
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

No exposure shall exceed 115 dBA. Impact or impulsive noises shall not exceed 140 dB, peak sound pressure level.

Note. When the daily noise exposure is composed of two or more periods of noise exposure at different levels, their combined effect shall be considered rather than the individual effect of each.

If the sum

$$(C_1/T_1)+(C_2/T_2)+\ldots(C_n/T_n)$$

exceeds unity, then the mixed exposure shall be considered to exceed the permissible exposure. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level. Interpolation between tabulated values may be determined by the following formula:

$$\log T = 6.322 - 0.0602\,SL$$

Where T is the time in hours and SL is the sound level in dBA.

(b) When employees' exposure exceeds that listed in the above table, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce exposure to within permissible levels, personal protection equipment shall be provided and used to reduce sound levels to within the levels of the table.

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§ 57.6 Explosives.

The term "explosives" as used in this § 57.6 includes blasting agents. The standards in this section in which the term, "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

STORAGE

GENERAL—SURFACE AND UNDERGROUND

57.6–1 *Mandatory.* Detonators and explosives other than blasting agents shall be stored in magazines.

57.6–2 *Mandatory.* Detonators shall not be stored in the same magazine with explosives.

57.6–3 and 57.6–4 [Reserved]

57.6–5 *Mandatory.* Areas surrounding magazines and facilities for the storage of blasting agents shall be kept clear of rubbish, brush, dry grass, or trees (other than live trees 10 or more feet tall); for a distance not less than 25 feet in all directions, and other unnecessary combustible materials for a distance of not less than 50 feet.

57.6–6 [Reserved]

57.6–7 *Mandatory.* Explosives, detonators, and related materials such as safety fuse and detonating cord shall be:

(a) Stored in a manner to facilitate use of oldest stocks first.

(b) Stored according to brand and grade in such a manner as to facilitate identification.

(c) Stored with their top sides up.

(d) Stacked in a stable manner but not more than eight (8) feet high.

57.6–8 *Mandatory.* Ammonium nitrate-fuel oil blasting agents shall be physically separated from other explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the other explosives, safety fuse, or detonating cord.

57.6–9 [Reserved]

57.6–10 [Reserved]

57.6–11 *Mandatory.* Containers of explosives, blasting agents, and detonators shall be closed while being stored.

57.6–12 *Mandatory.* Prior to interior repair of facilities for storage of explosives, including blasting agents, all materials stored within the facility shall be removed and the interior cleaned. Prior to the exterior repair of such facilities, all materials stored within the facility shall be removed if there exists a possibility that such repairs may produce a spark or flame. The explosives removed from storage facilities to be repaired shall be placed either in other storage facilities appropriate for the storage of such materials under this section or a safe distance from the facilities under repair where they shall be properly guarded and protected until the repairs have been completed and the materials have been returned to storage within the facilities.

57.6–13 through 57.6–19 [Reserved]

SURFACE ONLY

57.6–20 *Mandatory.* Magazines shall be:

(a) Located in accordance with the current American Table of Distances for Storage of Explosives.

(b) Detached structures located away from powerlines, fuel storage areas, and other possible sources of fire.

(c) Constructed substantially of noncombustible material or covered with fire-resistant material.

(d) Reasonably bullet resistant.

(e) Electrically bonded and grounded if constructed of metal.

(f) Made of nonsparking materials on the inside, including floors.

(g) Provided with adequate and effectively screened ventilation openings near the floor and ceiling.

(h) Kept locked securely when unattended.

(i) Posted with suitable danger signs so located that a bullet passing through the face of a sign will not strike the magazine.

(j) Used exclusively for storage of explosives or detonators and kept free of all extraneous materials.

(k) Kept clean and dry in the interior, and in good repair.

(l) Unheated, unless heated in a manner that does not create a fire or explosion hazard. Electrical heating devices shall not be used inside a magazine.

57.6–21 through 57.6–24 [Reserved]

UNDERGROUND ONLY

57.6–25 and 57.6–26 [Reserved]

57.6–27 *Mandatory.* Box-type underground-distribution storage magazines used to store explosives or detonators near working faces shall be constructed with only nonsparking material inside

and equipped with covers or doors and shall be located out of the line of blasts.

57.6–28 [Reserved]

57.6–29 *Mandatory.* Secondary underground and box-type underground magazines shall be labeled suitably.

57.6–30 *Mandatory.* Detonator-storage magazines shall be of the same construction as explosives-storage magazines and shall be separated by at least 25 feet from explosive-storage magazines.

57.6–31 through 57.6–39 [Reserved]

TRANSPORTATION

GENERAL—SURFACE AND UNDERGROUND

57.6–40 *Mandatory.* Explosives and detonators shall be transported in separate vehicles unless separated by 4 inches of hardwood or the equivalent.

57.6–41 *Mandatory.* When explosives and detonators are hauled by trolley locomotive, covered, electrically-insulated cars shall be used.

57.6–42 *Mandatory.* Self-propelled vehicles used to transport explosives or detonators shall be equipped with suitable fire extinguishers.

57.6–43 *Mandatory.* Vehicles containing explosives or detonators shall be posted with proper warning signs.

57.6–44 *Mandatory.* When vehicles containing explosives or detonators are parked, the brakes shall be set, the motive power shut off, and the vehicles shall be blocked securely against rolling.

57.6–45 *Mandatory.* Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.

57.6–46 *Mandatory.* Vehicles containing explosives or detonators shall be maintained in good condition and shall be operated at a safe speed and in accordance with all safe operating practices.

57.6–47 *Mandatory.* Vehicles used to transport explosives, other than blasting agents, shall have substantially constructed bodies, no sparking metal exposed in the cargo space, and shall be equipped with suitable sides and tail gates; explosives shall not be piled higher than the side or end enclosures.

57.6–48 *Mandatory.* Explosives and blasting agents shall be transported without undue delay, and over routes and at times that expose a minimum number of persons.

57.6–49 [Reserved]

57.6–50 *Mandatory.* Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives, detonating cord or detonators, except for safety fuse and except for properly secured, nonsparking equipment used expressly in the handling of such explosives, detonating cord or detonators.

57.6–51 *Mandatory.* Explosives or detonators shall not be transportated on locomotives.

57.6–52 [Reserved]

57.6–53 *Mandatory.* Only the necessary attendants shall ride on or in vehicles containing explosives or detonators.

57.6–54 *Mandatory.* Explosives or detonators shall not be transported on man trips.

57.6–55 [Reserved]

57.6–56 *Mandatory.* Substantial nonconductive containers shall be used to carry explosives to blasting sites.

57.6–57 *Mandatory.* Nonconductive containers with tight-fitting covers shall be used to transport or carry capped fuses and electric detonators to blasting sites.

57.6–58 through 57.6–64 [Reserved]

SURFACE ONLY

57.6–65 *Mandatory.* Vehicles containing detonators or explosives, other than blasting agents, shall not be left unattended except in blasting areas where loading or charging is in progress.

57.6–66 through 57.6–74 [Reserved]

UNDERGROUND ONLY

57.6–75 *Mandatory.* Men assigned to and responsible for hoisting shall be notified whenever explosives or detonators are being transported in a shaft conveyance.

57.6–76 *Mandatory.* Hoisting in adjacent shaft compartments shall be stopped when explosives or detonators are being handled.

57.6–77 *Mandatory.* Vehicles shall be attended, whenever practical and possible, while loaded with explosives or detonators.

57.6–78 through 57.6–89 [Reserved]

USE

GENERAL—SURFACE AND UNDERGROUND

57.6–90 *Mandatory.* Persons who use or handle explosives or detonators shall be experienced men who understand the

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hazards involved; trainees shall do such work only under the supervision of and in the immediate presence of experienced men.

57.6–91 *Mandatory.* Blasting operations shall be under the direct control of authorized persons.

57.6–92 *Mandatory.* Damaged or deteriorated explosives and blasting agents shall be destroyed in a safe manner under the instructions of the explosives or blasting agent manufacturer or its designated agent.

57.6–93 *Mandatory.* Boreholes shall be cleared of obstructions before charging.

57.6–94 *Mandatory.* Holes to be blasted shall be charged as near to blasting time as practical and such holes shall be blasted as soon as possible after charging has been completed. In no case shall the time elapsing between the completion of charging to the time of blasting exceed 72 hours unless prior approval has been obtained from the Mine Safety and Health Administration.

57.6–95 [Reserved]

57.6–96 *Mandatory.* Explosives shall be kept separated from detonators until charging is started.

57.6–97 *Mandatory.* Primers shall be made up only at the time of use and as close to the blasting area as conditions allow.

57.6–98 *Mandatory.*

(a) Primers containing a detonator shall be prepared with the detonator contained securely and completely within the explosive charge or within a suitable tunnel or cap well.

(b) When using detonating cord to initiate another explosive, a connection shall be prepared with the detonating cord threaded through, attached securely to, or otherwise in intimate contact with the explosive charge.

57.6–99 *Mandatory.* Only wooden or other nonsparking implements shall be used to punch holes in an explosive cartridge.

57.6–100 *Mandatory.* Tamping poles shall be of wood or other material acceptable to the Mine Safety and Health Administration. Couplers of tamping poles shall be of nonsparking materials.

57.6–101 *Mandatory.* Tamping shall not be done directly on a primer.

57.6–102 *Mandatory.* Unused explosives and detonators shall be moved to a safe location as soon as charging operations are completed.

57.6–103 *Mandatory.* Areas in which charged holes are awaiting firing shall be guarded, or barricaded and posted, or flagged against unauthorized entry.

57.6–104 *Mandatory.* When safety fuse has been used, men shall not return to misfired holes for at least 30 minutes.

57.6–105 *Mandatory.* When electric blasting caps have been used, men shall not return to misfired holes for at least 15 minutes.

57.6–106 *Mandatory.* Faces and muck piles shall be examined by a competent person for undetonated explosives or blasting agents and any undetonated explosives or blasting agents found shall be disposed of safely.

57.6–107 *Mandatory.* Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

57.6–108 *Mandatory.* Fuse and igniters shall be stored in a cool, dry place away from oils or grease.

57.6–109 *Mandatory.* Safety fuse, igniter cord, and detonating cord shall not be used if they have been kinked, bent sharply, or otherwise damaged.

57.6–110 *Mandatory.* Fuses shall be cut and capped in safe, dry locations posted with "No Smoking" signs.

57.6–111 *Mandatory.* Blasting caps shall be crimped to fuses only with implements designed for that specific purpose.

57.6–112 *Mandatory.* The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all men concerned with blasting.

57.6–113 *Mandatory.* When firing from 1 to 15 blastholes with safety fuse ignited individually using hand-held lighters, the fuses shall be of such lengths to provide the minimum burning time specified in the following table for a particular size round:

Number of holes in a round	*Minimum burning time, minutes*
1	2
2–5	2½
6–10	3½
11–15	5

In no case shall any 40-second-per-foot safety fuse less than 36 inches long or any 30-second-per-foot safety fuse less than 48 inches long be used.

57.6–114 *Mandatory.* At least two men shall be present when lighting fuses, and no man shall light more than 15 individual fuses. If more than 15 holes per man are to be fired, igniter cord and connectors or electric blasting shall be used.

57.6–115 *Mandatory.* All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunklines.

57.6–116 *Mandatory.* Fuse shall be ignited with hot-wire lighters, lead spitters, igniter cord, or other such devices designed for this purpose. Carbide lights shall not be used to light fuses.

57.6–117 *Mandatory.* Fuse shall not be ignited before the primer and the entire charge are securely in place.

57.6–118 *Mandatory.* When using safety fuse, where fly rock might damage unlit or burning fuses, timing shall be such that all fuses are burning within the holes before any hole detonates.

57.6–119 *Mandatory.* Electric detonators of different brands shall not be used in the same round.

57.6–120 *Mandatory.* Except when being tested with a blasting galvanometer:

(a) Electric detonators shall be kept shunted until they are being connected to the blasting line or wired into a blasting round.

(b) Wired rounds shall be kept shunted until they are being connected to the blasting line.

(c) Blasting lines shall be kept shunted until immediately before blasting.

57.6–121 *Mandatory.* When blasting electrically a blasting galvanometer, or other instrument that is specifically designed for testing blasting circuits, shall be used to test:

(a) In surface operations:

(1) Continuity of each electric blasting cap in the borehole prior to the addition of stemming.

(2) Resistance of individual series or the resistance of multiple balanced series to be connected in parallel prior to their connection to the blasting line.

(3) Continuity of blasting lines prior to the connection of electric blasting cap series.

(4) Total blasting circuit resistance prior to connection to the power source.

(b) In underground operations:

(1) Continuity of each electric blasting cap series.

(2) Continuity of blasting lines prior to the connection of electric blasting caps.

57.6–122 *Mandatory.* Permanent blasting lines shall be properly supported, insulated, and kept in good repair.

57.6–123 *Mandatory.* When electric detonators are used, charging shall be stopped immediately when the presence of static electricity or stray currents is detected; the condition shall be remedied before charging is resumed.

57.6–124 *Mandatory.* When electric detonators are used, charging shall be suspended in surface mining, shaft sinking, and tunneling and men withdrawn to a safe location upon the approach of an electrical storm.

57.6–125 *Mandatory.* If branch circuits are used when blasts are fired from power circuits, safety switches located at safe distances from the blast areas shall be provided in addition to the main blasting switch.

57.6–126 *Mandatory.* Electric power distribution circuits shall be de-energized within 50 feet of boreholes containing electric blasting caps which can be initiated by conventional power sources or extraneous electricity except that such circuits need not be de-energized between 25 and 50 feet of such boreholes when stray current tests, conducted as frequently as necessary, measure a maximum stray current less than 0.05 amperes through a one-ohm resistor measured at the location of the electric blasting cap.

57.6–127 *Mandatory.* Blasting switches shall be locked in the open position, except when closed to fire the blast. Lead wires shall not be connected to the blasting switch until the shot is ready to be fired.

57.6–128 *Mandatory.* The key or other control to an electrical firing device shall be entrusted only to the person designated to fire the round or rounds.

57.6–129 *Mandatory.* Electric circuits from the blasting switches to the blast area shall not be grounded.

57.6–130 *Mandatory.* At least a 15-foot air gap shall be provided between the blasting circuit and the electric power source.

57.6–131 *Mandatory.* Power sources shall be suitable for the number of electric detonators to be fired and for the type of circuits used.

57.6–132 *Mandatory.* Delay connectors

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shall be treated and handled with the same safety precautions as detonators.

57.6–133 *Mandatory.* If any part of a blast is connected in parallel and is to be initiated from powerlines or lighting circuits, the time of current flow shall be limited to a maximum of 25 milliseconds by incorporating an arcing control device in the blasting circuit or by interrupting the circuit with an explosive charge attached to one or both lead lines and initiated by a zero-delay electric blasting cap.

57.6–134 *Mandatory.* Tools used for opening metal or nailed wooden containers of explosives or detonators shall be of nonsparking materials.

57.6–135 *Mandatory.* Holes shall not be collared in bootlegs.

57.6–136 *Mandatory.* Black powder shall not be used for blasting except when a desired result cannot be obtained with another type of explosive such as in quarrying certain types of dimension stone.

57.6–137 *Mandatory.* In the use of black blasting powder:

(a) Containers shall not be opened in, or within 50 feet of, any magazine; within any building in which a fuel-fired or exposed-element electric heater is in operation; where electrical or incandescent particle sparks could result in powder ignition; or within 50 feet of any open flame.

(b) Granular powder shall be transferred from containers only by pouring.

(c) Spills of granular powder shall be cleaned up promptly with nonsparking equipment; contaminated powder shall be put into a container of water and its content disposed of promptly after the granules have disintegrated, or the spill area shall be flushed with a copious amount of water to completely disintegrate the granules.

(d) Containers of powder shall be kept securely closed at all times other than when the powder is being transferred from or into a container.

(e) Containers of powder transported by vehicles shall be in a wholly enclosed cargo space.

(f) Misfires shall be disposed of by: (1) washing the stemming and powder charge from the borehole, and (2) removal and disposal of the initiator as a damaged explosive.

(g) Boreholes of shots that fire but fail to break, or fail to break properly, shall not be recharged for at least 12 hours.

57.6–138 *Mandatory.* Explosives or blasting agents shall not be loaded into drilled or sprung holes that could result in premature detonation from heat.

57.6–139 *Mandatory.* Blasting areas shall not be re-entered after firing until concentrations of smoke, dust, and fumes have been reduced to safe limits as required in, and determined by, mandatory standards 57.5–1 and 57.5–2, respectively.

57.6–140 *Mandatory.* Blasting circuits and electric blasting caps (which are capable of being initiated by conventional power sources) shall be protected from sources of extraneous electricity.

57.6–141 *Mandatory.* In secondary blasting, if more than one shot is to be fired at one time in a blasting area, the shots shall be initiated from one source.

57.6–142 *Mandatory.* Explosives or blasting agents shall not be loaded into boreholes through or with either drill stem equipment or other devices which could be extracted while containing explosives or blasting agents. The use of loading hose, collar sleeves or collar pipes is permitted.

57.6–143 through 57.6–158 [Reserved]

57.6–159 *Mandatory.* Powder chests shall be:

(a) Substantially constructed of nonsparking material on the inside.

(b) Posted with suitable warning signs.

(c) Located out of the blast area and out of the line of blasts.

(d) Emptied and their contents returned to the main magazine at the end of each shift unless the powder chest is located within the area continually attended by employees during shift changes.

(e) Separate for detonators and explosives unless separated by 4 inches of hardwood or the equivalent.

(f) Kept locked when unattended.

Surface Only

57.6–160 *Mandatory.* Ample warning shall be given before blasts are fired. All persons shall be cleared and removed from the blasting area unless suitable blasting shelters are provided to protect men endangered by concussion or flyrock from blasting.

57.6–161 *Mandatory.* If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one shall return to the hole until the danger has passed, but in no case within 1 hour.

57.6–162 *Mandatory.* Lead wires and blasting lines shall not be strung across power conductors, pipelines, railroad tracks, or within 20 feet of bare power-lines. They shall be protected from sources of static or other electrical contact.

57.6–163 *Mandatory.* The double-trunk-line or loop system shall be used in detonating-cord blasting.

57.6–164 *Mandatory.* Trunklines, in multiple-row blasts, shall make one or more complete loops, with crossties between loops at intervals of not over 200 feet.

57.6–165 [Reserved]

57.6–166 [Reserved]

57.6–167 [Reserved]

57.6–168 *Mandatory.* Misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in that blasting area.

57.6–169 through 57.6–174 [Reserved]

UNDERGROUND ONLY

57.6–175 *Mandatory.* Ample warning shall be given before the blasts are fired. All persons shall be cleared and removed from areas endangered by the blast. Clear access to exits shall be provided for personnel firing the rounds.

57.6–176 [Reserved]

57.6–177 *Mandatory.* Misfires shall be reported to the proper supervisor. The blast area shall be dangered-off until misfired holes are disposed of. Where explosives other than black powder have been used, misfired holes shall be disposed of as soon as possible by one of the following methods:

(a) Washing the stemming and charge from the borehole with water;

(b) Reattempting to fire the holes if leg wires are exposed; or

(c) Inserting new primers after the stemming has been washed out.

57.6–178 [Reserved]

57.6–179 [Reserved]

57.6–180 [Reserved]

57.6–181 [Reserved]

57.6–182 *Mandatory.* Blasts in shafts or winzes shall be initiated from a safe location outside the shaft or winze.

57.6–183 through 57.6–189 [Reserved]

SENSITIZED AMMONIUM NITRATE BLASTING AGENTS

All of the standards in this § 57.6 in which the term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

GENERAL—SURFACE AND UNDERGROUND

57.6–190 through 57.6–192 [Reserved]

57.6–193 *Mandatory.* Where pneumatic loading is employed, before any type of blasting operation using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be made. Adequate steps, including the grounding and bonding of the conductive parts of pneumatic loading equipment, shall be taken to eliminate the hazard of static electricity before blasting agent use is commenced.

57.6–194 *Mandatory.* Pneumatic loading equipment shall not be grounded to waterlines, air lines, rails, or the permanent electrical grounding systems.

57.6–195 *Mandatory.* Hoses used in connection with pneumatic loading machines shall be of the semiconductive type, having a total resistance low enough to permit the dissipation of static electricity and high enough to limit the flow of stray electric currents to a safe level. Wire-countered hose shall not be used because of the potential hazard from stray electric currents.

57.6–196 and 57.6–197 [Reserved]

57.6–198 *Mandatory.* Plastic tubes shall not be used as hole liners if blasting agents are loaded pneumatically into holes containing an electric detonator.

57.6–199 [Reserved]

57.6–200 *Mandatory.* Vehicles used to transport blasting agents shall have substantially constructed bodies, no zinc or copper exposed in the cargo space and shall be freely vented. Blasting agents shall not be piled higher than the side or end enclosures of open-body vehicles. If an enclosed screw conveyor is used to discharge blasting agents from the vehicle the conveyor shall be protected against excessive internal pressure and excessive frictional heat.

57.6–201 through 57.6–219 [Reserved]

UNDERGROUND ONLY

57.6–220 *Mandatory.* Ammonium nitrate-fuel oil blasting agents shall not be mixed or otherwise "formulated" underground.

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57.6–221 through 57.6–249 [Reserved]

MISCELLANEOUS

GENERAL—SURFACE AND UNDERGROUND

57.6–250 *Mandatory.* Smoking and open flames, except for the use of suitable devices for igniting safety fuse or the use of approved heating devices, shall not be permitted within 50 feet as measured by the line of sight of explosives, blasting agents, or detonators or within 25 feet when out of line of sight and separated by permanent noncombustible barriers in underground active workings.

§ 57.7 Drilling.

SURFACE ONLY

57.7–1 [Reserved]

57.7–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

57.7–3 *Mandatory.* The drilling area shall be inspected for hazards before starting the drilling operations.

57.7–4 *Mandatory.* Men shall not be on a mast while the drill-bit is in operation unless they are provided with a safe platform from which to work and they are required to use safety belts to avoid falling.

57.7–5 *Mandatory.* Drill crews and others shall stay clear of augers or drill stems that are in motion. Persons shall not pass under or step over a moving stem or auger.

57.7–6 and 57.7–7 [Reserved]

57.7–8 *Mandatory.* When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position.

57.7–9 *Mandatory.* If a drill helper assists the drill operator during movement of a drill to a new location, the helper shall be in sight of, or in communication with, the operator at all times.

57.7–10 *Mandatory.* In the event of power failure, drill controls shall be placed in the neutral position until power is restored.

57.7–11 *Mandatory.* The drill stem shall be resting on the bottom of the hole or on the platform with the stem secured to the mast before attempts are made to straighten a crossed cable on a reel.

57.7–12 *Mandatory.* While in operation, drills shall be attended at all times.

57.7–13 *Mandatory.* Drill holes large enough to constitute a hazard shall be covered or guarded.

57.7–14 through 57.7–17 [Reserved]

57.7–18 *Mandatory.* Men shall not hold the drill steel while collaring holes, or rest their hands on the chuck or centralizer while drilling.

57.7–19 through 57.7–24 [Reserved]

UNDERGROUND ONLY

57.7–25 through 57.7–27 [Reserved]

57.7–28 *Mandatory.* Persons shall not rest their hands on the chuck or centralizer while drilling.

57.7–29 through 57.7–31 [Reserved]

57.7–32 *Mandatory.* Columns and the drills mounted on them shall be anchored firmly before and during drilling.

57.7–33 through 57.7–49 [Reserved]

GENERAL—SURFACE AND UNDERGROUND

57.7–50 *Mandatory.* Receptacles or racks shall be provided for drill steel and tools stored or carried on drills.

57.7–51 *Mandatory.* To prevent injury to personnel, tools and other objects shall not be left loose on the mast or drill platform.

57.7–52 *Mandatory.* Persons shall not drill from—

(a) Positions which hinder their access to the control levers;

(b) Insecure footing or insecure staging; or

(c) Atop equipment not suitable for drilling.

57.7–53 *Mandatory.* Before hand-held drills are moved from one working area to another, air shall be turned off and bled from the hose.

57.7–54 *Mandatory.* Drill operators shall not start or move drilling equipment unless all miners are in the clear.

57.7–55 through 57.7–100 [Reserved]

§ 57.8 Rotary jet piercing.

SURFACE ONLY

57.8–1 *Mandatory.* Jet piercing drills shall be provided with—

(a) A system to pressurize the equipment operator's cab, when a cab is provided; and

(b) A protective cover over the oxygen flow indicator.

57.8–2 *Mandatory.* Safety chains or other suitable locking devices shall be provided across connections to and between high

pressure oxygen hose lines of 1-inch inside diameter or larger.

57.8–3 *Mandatory.* A suitable means of protection shall be provided for the employee when lighting the burner.

57.8–4 *Mandatory.* When rotary jet piercing equipment requires refueling at locations other than fueling stations, a system for fueling without spillage shall be provided.

57.8–5 *Mandatory.* Men shall not smoke and open flames shall not be used in the vicinity of the oxygen storage and supply lines. Signs warning against smoking and open flames shall be posted in these areas.

57.8–6 *Mandatory.* The oxygen intake coupling on jet piercing drills shall be constructed so that only the oxygen hose can be coupled to it.

57.8–7 *Mandatory.* The combustion chamber of a jet drill stem which has been sitting unoperated in a drill hole shall be flushed with a suitable solvent after the stem is pulled up.

§ 57.9 Loading, hauling, dumping.

GENERAL—SURFACE AND UNDERGROUND

57.9–1 *Mandatory.* Self-propelled equipment that is to be used during a shift shall be inspected by the equipment operator before being placed in operation. Equipment defects affecting safety shall be reported to, and recorded by the mine operator. The records shall be maintained at the mine or nearest mine office for at least 6 months from the date the defects are recorded. Such records shall be made available for inspection by the Secretary of Labor or his duly authorized representative.

57.9–2 *Mandatory.* Equipment defects affecting safety shall be corrected before the equipment is used.

57.9–3 *Mandatory.* Powered mobile equipment shall be provided with adequate brakes.

57.9–4 [Reserved]

57.9–5 *Mandatory.* Operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.

57.9–6 *Mandatory.* When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor. When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

57.9–7 *Mandatory.* Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.

57.9–8 [Reserved]

57.9–9 *Mandatory.* Operators shall sound warning before starting trains and when trains approach crossings, other trains on adjacent tracks, persons, and any place where vision is obscured.

57.9–10 *Mandatory.* Equipment operators' cabs shall not be equipped, altered or otherwise modified in a manner which impairs operating visibility.

57.9–11 *Mandatory.* Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.

57.9–12 *Mandatory.* Cabs of mobile equipment shall be kept free of extraneous materials.

57.9–13 *Mandatory.* Adequate backstops or brakes shall be installed on inclined-conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel would be caused.

57.9–14 *Mandatory.* No person shall be permitted to ride a power-driven chain, belt, or bucket conveyor, unless the belt is specifically designed for the transportation of persons.

57.9–15 *Mandatory.* Unless the operator is otherwise protected, slushers in excess of 10 horsepower shall be provided with backlash guards. All slushers shall be equipped with rollers, and drum covers, and anchored securely before slushing operations are started.

57.9–16 *Mandatory.* Roadbeds, rails, joints, switches, frogs, and other trackage elements on railroads subject to the control of the operator shall be designed, installed and maintained in a safe manner consistent with the speed and type of haulage.

57.9–17 *Mandatory.* Equipment operating speeds shall be consistent with conditions of roadways, grades, clearance, visibility, traffic, and the type of equipment used.

57.9–18 [Reserved]

57.9–19 *Mandatory.* Track guardrails, lead rails, and frogs shall be protected or blocked so as to prevent a person's foot from becoming wedged.

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57.9–20 *Mandatory.* Positive-acting stopblocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from runaway or moving railroad equipment.

57.9–21 [Reserved]

57.9–22 *Mandatory.* Berms or guards shall be provided on the outer bank of elevated roadways.

57.9–23 *Mandatory.* Trackless haulage equipment shall be operated under power control at all times.

57.9–24 *Mandatory.* Mobile equipment operators shall have full control of the equipment while it is in motion.

57.9–25 *Mandatory.* Dippers, buckets, loading booms, or heavy suspended loads shall not be swung over the cabs of haulage vehicles until the drivers are out of the cabs and in safe locations, unless the trucks are designed specifically to protect the drivers from falling material.

57.9–26 *Mandatory.* A quick-close type air valve shall be provided on each piece of pneumatic-powered loading, hauling, and dumping equipment. The valve shall be closed except when the equipment is being operated.

57.9–27 *Mandatory.* When an operator is present, men shall notify him before getting on or off equipment.

57.9–28 *Mandatory.* Switch throws shall be installed so as to provide adequate clearance for switchmen.

57.9–29 [Reserved]

57.9–30 *Mandatory.* Men shall not work or pass under the buckets or booms of loaders in operation.

57.9–31 *Mandatory.* When traveling between work areas, the equipment shall be secured in the travel position.

57.9–32 *Mandatory.* Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.

57.9–33 [Reserved]

57.9–34 *Mandatory.* Haulage equipment shall be loaded in a manner to minimize spillage during haulage.

57.9–35 *Mandatory.* Movements of two or more pieces of rail equipment operating independently on the same track shall be suitably controlled for safe operation.

57.9–36 *Mandatory.* Electrically-powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set or other equivalent precautions are taken against rolling.

57.9–37 *Mandatory.* Mobile equipment shall not be left unattended unless the brakes are set. Mobile equipment with wheels or tracks, when parked on a grade, shall be either blocked or turned into a bank or rib; and the bucket or blade lowered to the ground to prevent movement.

57.9–38 [Reserved]

57.9–39 *Mandatory.* Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.

57.9–40 *Mandatory.* Men shall not be transported:

(a) In or on dippers, forks, clamshells, beds of trucks unless special provisions are made for their safety, or buckets except shaft buckets.

(b) On top of loaded haulage equipment.

(c) Outside the cabs and beds of mobile equipment, except trains.

(d) Between cars of trains.

(e) In conveyances equipped with unloading devices unless means are provided to prevent accidental starting of the unloading mechanism.

57.9–41 *Mandatory.* Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.

57.9–42 *Mandatory.* Rocker-bottom or bottom-dump rail cars shall be equipped with locking devices.

57.9–43 and 57.9–44 [Reserved]

57.9–45 *Mandatory.* Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.

57.9–46 *Mandatory.* Backpoling of trolleys shall be avoided wherever possible; but when necessary, backpoling shall be done only at slow speeds.

57.9–47 *Mandatory.* Parked railcars, unless held effectively by brakes, shall be blocked securely.

57.9–48 *Mandatory.* Railroad cars with braking systems, when in use, shall be equipped with effective brake shoes.

57.9–49 *Mandatory.* When in the dark or under conditions of limited visibility, all vehicles carrying loads which project beyond the sides or more than four feet beyond the rear of the vehicles shall display a warning light at the end of the projection; or in the light, a warning flag not less than 12 inches square shall be displayed at the end of the projection.

57.9–50 *Mandatory.* Railcars shall not

be left on side tracks unless ample clearance is provided for traffic on adjacent tracks.

57.9–51 *Mandatory.* Persons shall not go over, under, or between cars unless the train is stopped and the motorman has been notified and the notice acknowledged.

57.9–52 *Mandatory. Inability of a motorman to clearly recognize his brakeman's signals when the train is under the direction of the brakeman shall be construed by the motorman as a stop signal.*

57.9–53 *Mandatory.* Water, debris, or spilled material which create hazards to moving equipment shall be removed.

57.9–54 *Mandatory.* Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.

57.9–55 *Mandatory.* Where there is evidence that the ground at a dumping place may fail to support the weight of a vehicle, loads shall be dumped back from the edge of the bank.

57.9–56 *Mandatory.* Where necessary, bumper blocks or the equivalent shall be provided at track dead ends.

57.9–57 *Mandatory.* Grizzlies, grates, and other stationary sizing devices shall be anchored securely.

57.9–58 *Mandatory.* If truck spotters are used, they shall be well in the clear while trucks are backing into dumping positions and dumping; lights shall be used at night to direct trucks.

57.9–59 *Mandatory.* Public and permanent railroad crossings shall be posted with warning signs or signals, or shall be guarded when trains are passing and shall be planked or otherwise filled between the rails.

57.9–60 *Mandatory.* Where overhead clearance is restricted, warning devices shall be installed and the restricted area shall be conspicuously marked.

57.9–61 *Mandatory.* Stockpile and muckpile faces shall be trimmed to prevent hazards to personnel.

57.9–62 *Mandatory.* Rocks too large to be handled safely shall be broken before loading.

57.9–63 *Mandatory.* Ramps and dumping facilities shall—

(a) Be of substantial construction; and

(b) Have suitable width, clearance, and headroom to accommodate the equipment using the facilities.

57.9–64 *Mandatory.* Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position while loading cars.

57.9–65 *Mandatory.* Cars shall not be coupled, or uncoupled, manually from the inside of curves unless the railroad and cars are so designed to eliminate any hazard from manual coupling.

57.9–66 *Mandatory.* When a locomotive on one track is used to move equipment on a different track, a suitable chain, cable, or drawbar shall be used.

57.9–67 *Mandatory.* Facilities used to transport men to and from work areas shall not be overcrowded.

57.9–68 *Mandatory.* Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.

57.9–69 *Mandatory.* Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.

57.9–70 *Mandatory.* A tow bar of substantial construction or other suitable means of control shall be used to tow heavy equipment. A substantial safety chain or wire rope shall be used in conjunction with any primary rigging.

57.9–71 *Mandatory.* Traffic rules including speed, signals, and warning signs shall be standardized at each mine and posted.

57.9–72 *Mandatory.* Persons attempting to free hangups shall be experienced persons who understand the hazards involved.

57.9–73 *Mandatory.* Defective equipment, removed from service as unsafe to operate, shall be tagged to prohibit further use until repairs are completed.

57.9–74 *Mandatory.* Dust shall be suitably controlled at muck piles, material transfer points, crushers, and on haulage roads where hazards to personnel may be created as a result of impaired visibility.

57.9–75 through 57.9–80 [Reserved]

SURFACE ONLY

57.9–81 and 57.9–82 [Reserved]

57.9–83 *Mandatory.* Where possible at least 30 inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one side of the tracks; all places where it is not possible to provide 30-inch clearance shall be marked conspicuously.

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57.9-84 [Reserved]

57.9-85 *Mandatory.* Tools, materials and equipment shall not be transported with persons in rail cars and other vehicles and conveyances unless means have been provided to make such transportation safe.

57.9-86 [Reserved]

57.9-87 *Mandatory.* Heavy duty mobile equipment shall be provided with audible warning devices. When the operator of such equipment has an obstructed view to the rear, the equipment shall have either an automatic reverse signal alarm which is audible above the surrounding noise level or an observer to signal when it is safe to back up.

57.9-88 *Mandatory.* (a) Excluding equipment that is operated by remote control, all self-propelled track-type (crawler mounted) or wheeled (rubber-tired) scrapers; front-end loaders; dozers; tractors, including industrial and agricultural tractors but not including over-the-road type tractors (the type that pull trailers or vans on highways); and motor graders; and wheeled prime movers (a tractor of the type and kind normally used as the mode of power for rubber-tired scrapers); all as used in metal and nonmetal mining operations, with or without attachments, shall be used in such mining only when equipped with (1) roll-over protective structures (ROPS) in accordance with the requirements of paragraphs (b) through (g) of this standard, as applicable, and (2) seat belts meeting the requirements of the Society of Automotive Engineers (SAE), Motor Vehicle Seat Belts Assemblies—SAE J4c, approved November 1955, revised July 1965; Seat Belt Hardware Test Procedures—SAE J140a, approved April 1970, revised February 1973; Seat Belt Hardware Performance Requirements—SAE J141; Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and Seat Belts for Construction Equipment—SAE J386, approved March 1966; and in accordance with paragraphs (b), (c), and (e) of this standard, as applicable.

(b) Except as provided in paragraph (e) all self-propelled equipment described in paragraph (a) of this standard and manufactured on or after the effective date of this standard shall be equipped with (1) ROPS meeting the requirements of paragraph (d), and (2) seat belts meeting the requirements of SAE J4c, J140a, J141, J333a, and J386 specified in paragraph (a) of this standard.

(c) All self-propelled equipment described in paragraph (a) of this standard manufactured prior to the effective date of this standard and after June 30, 1969, shall be equipped with ROPS meeting the requirements of paragraphs (d) through (g) of this standard as appropriate, and seat belts, no later than the dates specified below:

(1) Equipment manufactured between July 1, 1971, and the effective date of this standard shall be equipped with ROPS and seat belts no later than 6 months after the effective date of this standard.

(2) Equipment manufactured between July 1, 1970, and June 30, 1971, shall be equipped with ROPS and seat belts no later than 10 months after the effective date of this standard.

(3) Equipment manufactured between July 1, 1969, and June 30, 1970, shall be equipped with ROPS and seat belts no later than 16 months after the effective date of this standard.

(4) Nothing in this standard shall preclude the issuance of an order because of imminent danger.

(d) Except as provided in paragraph (e) of this standard, self-propelled equipment described in paragraph (a) of this standard shall be deemed in compliance with the ROPS requirements of this standard if the ROPS meet the following requirements:

(1) The ROPS complies with the Society of Automotive Engineers, SAE Recommended Practice, Critical Zone—Characteristics and Dimensions for Operators of Construction and Industrial Machinery—SAE J397, approved July 1969, or Deflection Limiting Volume for Laboratory Evaluation of Roll-Over Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) of Construction and Industrial Vehicles—SAE J397a, approved July 1969, revised January 1972, editorial change July 1973; and, as appropriate, the ROPS and installation of the ROPS meet the requirements of either SAE Recommended Practice, Performance Criteria for Roll-Over Protective Structures (ROPS) for Earthmoving, Construction, Logging, and Industrial Vehicles—SAE J1040, approved April 1974, or any of the following applicable SAE standards or recommended practices:

(i) Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers—SAE J320a, approved November 1967, revised July 1969, editorial change June 1970; or

(ii) Minimum Performance Criteria for Roll-Over Protective Structures for Prime Movers—SAE J320b, approved November 1967, revised January 1972, editorial change September 1972; or

(iii) Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers—SAE J394, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Wheeled Front-End Loaders and Wheeled Dozers—SAE J394a, approved July 1969, revised March 1972, editorial change September 1972; or

(iv) Minimum Performance Criteria for Roll-Over Structures for Crawler Tractors and Crawler-Type Loaders—SAE J395, approved July 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Track-Type Tractors and Track-Type Front-End Loaders—SAE J395a, approved July 1969, revised January 1972, editorial change September 1972; or

(v) Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders—J396, approved 1969, editorial change July 1970, or Minimum Performance Criteria for Roll-Over Protective Structures for Motor Graders—SAE J396a, approved July 1969, revised March 1972, editorial change September 1972; or

(vi) Operator Protection for Wheel Type Agricultural and Industrial Tractors—SAE J333a, approved April 1968, revised July 1970, conforms to ASAE S305; and Protective Frame Test Procedure and Performance Requirements—SAE J334a, approved April 1968, revised July 1970, conforms to ASAE S306.

(2) The ROPS is installed on the equipment in accordance with the recommendations of the ROPS manufacturer. If the installation includes bolts and nuts, the bolts and nuts used to attach the ROPS to the equipment frame and to connect structural parts of the ROPS shall be SAE Grade 5 or 8 (SAE J429g and J995b).

(e) All self-propelled equipment described in paragraph (a) of this standard, manufactured prior to the effective date of this standard, shall be deemed in compliance with the standard if ROPS and seat belt installations meet the ROPS and seat belt requirements of the State of California; or the U.S. Army Corps of Engineers; or the Bureau of Reclamation; or MSHA coal mine regulations of the U.S. Department of Labor; or the Occupational Safety and Health Administration of the U.S. Department of Labor. The requirements in effect are:

(1) The State of California: Title 8 of the California Administrative Code: Construction Safety Orders, Article 10, "Haulage and Earth Moving," 1591(i) and 1596 (Register 70, No. 40—10-3-70); General Industry Safety Orders, Article 25, "Industrial Trucks, Tractors, Haulage, Vehicles, and Earth Moving Equipment," 3650-55 (Register 72, No. 6—2-5-72); and Logging and Sawmill Safety Orders, Article 7, "Tractor Yarding," 5243 (Register 69, No. 10—3-8-69), all issued by the Division of Industrial Safety, State of California.

(2) U.S. Army Corps of Engineers: Manuals—Corps of Engineers, U.S. Army Safety-General Safety Requirements, EM-385-1-1 (March 1967), or Change 1, March 27, 1972.

(3) Bureau of Reclamation, U.S. Department of the Interior: Section 9, "Machinery and Mechanized Equipment," Safety and Health Regulations for Construction, Part II—Bureau of Reclamation (September 1971).

(4) Mine Safety and Health Administration, U.S. Department of Labor: Section 77.403a, Part 77, Title 30, Code of Federal Regulations—Mandatory Safety Standards, Surface Coal Mines and Surface Work Areas of Underground Coal Mines, promulgated in the FEDERAL REGISTER (39 FR 24006-24009).

(5) Occupational Safety and Health Administration, U.S. Department of Labor: Sections 1926.1001 and 1926.1002, Title 29, Code of Federal Regulations—Safety and Health Regulations for Construction, promulgated in the FEDERAL REGISTER (37 FR 27585-27590), and republished in the FEDERAL REGISTER (39 FR 22880-22886).

(f) Any alteration, repair, or welding of the ROPS and ROPS-to-vehicle frame mounts shall be performed only with prior approval and with instructions from the ROPS manufacturer or under the instructions of a registered professional engineer; and the manufacturer, or engineer as the case may be, shall decide what

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qualifications the welders involved in this operation must have.

(g) Each ROPS shall have the following information permanently affixed to the structure:

(1) Manufacturer's or fabricator's name and address; and

(2) ROPS model number, if any; and

(3) Make and model numbers of the equipment on which the ROPS is designed to fit.

(4) For equipment already in existence when this standard goes into effect, a satisfactory substitute for the above-required information will be a certificate from either the manufacturer of the ROPS or a registered professional engineer to the effect that the ROPS does meet the performance standards and is appropriate for the piece of equipment upon which it is installed.

(h) Publications to which references are made in this standard are hereby incorporated by reference and made a part hereof. The incorporated publications are available at each Metal and Nonmetal Mine Safety and Health Subdistrict Office, MSHA. State of California safety orders are available from the State of California Office of Procurement, Documents Section, Post Office Box 20191, Sacramento, California 95820. The U.S. Army Corps of Engineers, Safety-General Safety Requirements are available from the U.S. Government Printing Office, Washington, D.C. 20402. Bureau of Reclamation Safety and Health Regulations for Construction are available from the Bureau of Reclamation, Division of Safety, Engineering and Research Center, Denver, Colorado 80225. SAE documents are available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

57.9–89 through 57.9–94 [Reserved]

UNDERGROUND ONLY

57.9–95 [Reserved]

57.9–96 *Mandatory.* Tools or materials, except properly located and secured rerailing devices, shall not be carried on top of locomotives. Tools or materials shall not be carried in the cab if they would interfere with the operation of the locomotive.

57.9–97 *Mandatory.* Trains shall be brought to a complete stop, then moved very slowly when coupling or uncoupling cars manually.

57.9–98 *Mandatory.* Makeshift couplings shall not be used.

57.9–99 *Mandatory.* Supplies, materials, and tools other than small handtools shall not be transported with men in man trip cars. Man trips shall be operated independently of ore and supply trips.

57.9–100 [Reserved]

57.9–101 [Reserved]

57.9–102 *Mandatory.* When a signalman is used during slushing operations he shall be positioned in a safe place.

57.9–103 *Mandatory.* Collars of open draw holes shall be kept free of muck and material.

57.9–104 *Mandatory.* Warning devices or conspicuous markings shall be installed where chute lips, ventilation doors, and obstructions create a hazard to persons on equipment.

57.9–105 *Mandatory.* To prevent rock from flying out when broken material is dumped into an empty chute—

(a) The chute shall be properly guarded prior to filling; or

(b) Sufficient material shall be left in the chute bottom.

57.9–106 *Mandatory.* Ample warning shall be given to men who may be affected by the draw or otherwise exposed to danger from chute-pulling operations.

57.9–107 *Mandatory.* Men shall not stand on broken rock or ore over draw points if there is danger that the chute will be pulled. Suitable platforms or safety lines shall be provided when work must be done in such areas.

57.9–108 [Reserved]

57.9–109 [Reserved]

57.9–110 *Mandatory.* Shelter holes shall be provided to ensure the safety of men along haulageways where continuous clearance of at least 30 inches from the farthest projection of moving equipment on at least one side of the haulageway cannot be maintained.

57.9–111 *Mandatory.* Shelter holes shall be at least 4-feet wide, marked conspicuously with lights or reflective signs or reflective tape or reflectors or luminous paint, provide a minimum of 40-inch clearance from the farthest projection of moving equipment, and shall not be used for storage of timber, tools, or other materials unless a 40-inch clearance is maintained.

57.9–112 *Mandatory.* On rail haulage, trip lights shall be used on the rear of pulled trips and on the front of pushed trips.

57.9–113 *Mandatory.* Man trips shall be operated at speeds consistent with the condition of tracks and equipment used.

57.9–114 *Mandatory.* Where man trips are used, discharge and boarding points shall be designated. Men shall not board or leave moving man trip cars.

57.9–115 *Mandatory.* Man trips shall be covered if there is danger of passengers contacting the trolley wire.

57.9–116 *Mandatory.* During shift changes the movement of rock or material trains shall be limited to areas where such trains could not present a hazard to men coming on or going off shift.

57.9–117 [Reserved]

§ 57.10 Aerial tramways.

SURFACE ONLY

57.10–1 *Mandatory.* Buckets shall not be overloaded, and feed shall be regulated to prevent spillage.

57.10–2 *Mandatory.* Inspection and maintenance of carriers (including loading and unloading mechanisms), ropes and supports, and brakes shall be performed by competent persons according to the recommendations of the manufacturer.

57.10–3 *Mandatory.* Any hazardous defects shall be corrected before the equipment is used.

57.10–4 *Mandatory.* Positive-action-type brakes and devices which apply the brakes automatically in the event of a power failure shall be provided on aerial tramways.

57.10–5 *Mandatory.* Track cable connections shall not obstruct the passage of carriage wheels.

57.10–6 *Mandatory.* Towers shall be suitably protected from swaying buckets.

57.10–7 *Mandatory.* Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.

57.10–8 *Mandatory.* Persons other than maintenance men shall not ride aerial tramways unless the following features are provided:

(a) Two independent brakes, each capable of holding the maximum load;

(b) Direct communication between terminals;

(c) Power drives with emergency power available in case of primary power failure;

(d) Buckets equipped with positive locks to prevent accidental tripping or dumping.

57.10–9 *Mandatory.* Men shall not ride loaded buckets.

57.10–10 *Mandatory.* Where possible, aerial tramways shall not be started until the operator has ascertained that everyone is in the clear.

§ 57.11 Travelways and escapeways.

TRAVELWAYS

GENERAL—SURFACE AND UNDERGROUND

57.11–1 *Mandatory.* Safe means of access shall be provided and maintained to all working places.

57.11–2 *Mandatory.* Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary, toeboards shall be provided.

57.11–3 *Mandatory.* Ladders shall be of substantial construction and maintained in good condition.

57.11–4 *Mandatory.* Portable rigid ladders shall be provided with suitable bases and placed securely when used.

57.11–5 *Mandatory.* Fixed ladders shall be anchored securely and installed to provide at least 3 inches of toe clearance.

57.11–6 *Mandatory.* Fixed ladders shall project at least 3 feet above landings, or substantial handholds shall be provided above the landings.

57.11–7 *Mandatory.* Wooden components of ladders shall not be painted except with a transparent finish.

57.11–8 [Reserved]

57.11–9 *Mandatory.* Walkways with outboard railings shall be provided wherever persons are required to walk alongside elevated conveyor belts. Inclined railed walkways shall be nonskid or provided with cleats.

57.11–10 *Mandatory.* Vertical clearance above stair steps shall be a minimum of seven (7) feet, or suitable warning signs or similar devices shall be provided to indicate an impaired clearance.

57.11–11 *Mandatory.* Persons using ladders shall face the ladders and have both hands free for climbing and descending.

57.11–12 *Mandatory.* Openings above, below, or near travelways through which men or materials may fall shall be protected by railings, barriers, or covers. Where it is impractical to install such protective devices, adequate warning signals shall be installed.

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57.11–13 *Mandatory.* Crossovers shall be provided where it is necessary to cross conveyors.

57.11–14 *Mandatory.* Moving conveyors shall be crossed only at designated crossover points.

57.11–15 [Reserved]

57.11–16 *Mandatory.* Regularly used walkways and travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

57.11–17 *Mandatory.* Fixed ladders shall not incline backwards.

57.11–18 through 57.11–24 [Reserved]

SURFACE ONLY

57.11–25 *Mandatory.* Fixed ladders, except on mobile equipment, shall be offset and have substantial railed landings at least every 30 feet unless backguards or equivalent protection. such as safety belts and safety lines, are provided.

57.11–26 *Mandatory.* Fixed ladders 70 degrees to 90 degrees from the horizontal and 30 feet or more in length shall have backguards, cages or equivalent protection, starting at a point not more than seven (7) feet from the bottom of the ladders.

57.11–27 *Mandatory.* Scaffolds and working platforms shall be of substantial construction and provided with handrails and maintained in good condition. Floorboards shall be laid properly and the scaffolds and working platforms shall not be overloaded. Working platforms shall be provided with toeboards when necessary.

57.11–28 through 57.11–34 [Reserved]

UNDERGROUND ONLY

57.11–35 [Reserved]

57.11–36 *Mandatory.* Trap doors or adequate guarding shall be provided in ladderways at each level. Doors shall be kept operable.

57.11–37 *Mandatory.* Ladderways constructed after November 15, 1979, shall have a minimum unobstructed cross-sectional opening of 24 inches by 24 inches measured from the face of the ladder.

57.11–38 *Mandatory.* Before entering a manway where persons may be working or traveling, a warning shall be given by the person entering the manway and acknowledged by any person present in the manway.

57.11–39 [Reserved]

57.11–40 *Mandatory.* Travelways steeper than 35 degrees from the horizontal shall be provided with ladders or stairways.

57.11–41 *Mandatory.* Fixed ladders with an inclination of more than 70 degrees from the horizontal shall be offset with substantial landings at least every 30 feet or have landing gates at least every 30 feet.

57.11–42 through 57.11–49 [Reserved]

ESCAPEWAYS

UNDERGROUND ONLY

57.11–50 *Mandatory.* Every mine shall have two or more separate, properly maintained escapeways to the surface from the lowest levels which are so positioned that damage to one shall not lessen the effectiveness of the others. A method of refuge shall be provided while a second opening to the surface is being developed. A second escapeway is recommended, but not required, during the exploration or development of an ore body.

In addition to separate escapeways, a method of refuge shall be provided for every employee who cannot reach the surface from his working place through at least two separate escapeways within a time limit of one hour when using the normal exit method. These refuges must be positioned so that the employee can reach one of them within 30 minutes from the time he leaves his workplace.

57.11–51 *Mandatory.* Escape routes shall be:

(a) Inspected at regular intervals and maintained in safe, travelable condition.

(b) Marked with conspicuous and easily read direction signs that clearly indicate the ways of escape.

57.11–52 *Mandatory.* Refuge areas shall be:

(a) Of fire-resistant construction, preferably in untimbered areas of the mine.

(b) Large enough to accommodate readily the normal number of men in the particular area of the mine.

(c) Constructed so they can be made gastight.

(d) Provided with compressed air lines, waterlines, suitable handtools, and stopping materials.

57.11–53 *Mandatory.* A specific escape and evacuation plan and revisions thereof suitable to the conditions and mining system of the mine and showing assigned responsibilities of all key personnel in the event of an emergency shall be developed

by the operator and set out in written form. Within 45 calendar days after promulgation of this standard a copy of the plan and revisions thereof shall be available to the Secretary or his authorized representative. Also, copies of the plan and revisions thereof shall be posted at locations convenient to all persons on the surface and underground. Such a plan shall be updated as necessary and shall be reviewed jointly by the operator and the Secretary or his authorized representative at least once every six months from the date of the last review. The plan shall include:

(a) Mine maps or diagrams showing directions of principal air flow, location of escape routes and locations of existing telephones, primary fans, primary fan controls, fire doors, ventilation doors, and refuge chambers. Appropriate portions of such maps or diagrams shall be posted at all shaft stations and in underground shops, lunchrooms, and elsewhere in working areas where men congregate.

(b) Procedures to show how the miners will be notified of emergency.

(c) An escape plan for each working area in the mine to include instructions showing how each working area should be evacuated. Each such plan shall be posted at appropriate shaft stations and elsewhere in working areas where men congregate.

(d) A fire fighting plan.

(e) Surface procedure to follow in an emergency, including the notification of proper authorities, preparing rescue equipment, and other equipment which may be used in rescue and recovery operations.

(f) A statement of the availability of emergency communication and transportation facilities, emergency power and ventilation and location of rescue personnel and equipment.

57.11–54 *Mandatory.* Telephone or other voice communication shall be provided between the surface and refuge chambers and such systems shall be independent of the mine power supply.

57.11–55 *Mandatory.* Any portion of a designated escapeway which is inclined more than 30 degrees from the horizontal and that is more than 300 feet in vertical extent shall be provided with an emergency hoisting facility.

57.11–56 *Mandatory.* The procedure for inspection, testing and maintenance required by standard 57.19–120 shall be utilized at least every 30 days for hoists designated as emergency hoists in any evacuation plan.

57.11–57 [Reserved]

57.11–58 *Mandatory.* Each operator of an underground mine shall establish a check-in and check-out system which shall provide an accurate record of persons in the mine. These records shall be kept on the surface in a place chosen to minimize the danger of destruction by fire or other hazards. Every person underground shall carry a positive means of being identified.

57.11–59 *Mandatory.* For the protection of operators of hoists located underground which are part of the mine escape and evacuation plan required under standard 57.11–53, the hoist operator shall be provided with a respirable atmosphere completely independent of the mine atmosphere. This independent ventilation system shall convert, without contamination, to an approved and properly maintained 2-hour self-contained breathing apparatus to provide a safe means of escape for the hoist operator after the hoisting duties have been completed as prescribed in the mine escape and evacuation plan for that hoist. The hoist operator's independent ventilation system shall be provided by one of the following methods:

(a) A suitable enclosure equipped with a positive pressure ventilation system which may be operated continuously or be capable of immediate activation from within the enclosure during an emergency evacuation. Air for the enclosure's ventilation system shall be provided in one of the following ways—

(1) Air coursed from the surface through a borehole into the hoist enclosure directly or through a metal pipeline from such borehole; or

(2) Air coursed from the surface through metal duct work into the hoist enclosure, although this duct work shall not be located in timber-supported active workings; or

(3) Air supplied by air compressors located on the surface and coursed through metal pipe into the hoist enclosure.

A back-up system shall be provided for a hoist enclosure ventilation system provided by either of the methods set forth in (a)(2) and (a)(3) above. This back-up system shall consist of compressed air stored in containers connected to the enclosure.

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This back-up system shall provide and maintain a respirable atmosphere in the enclosure for a period of time equal to at least twice the time necessary to complete the evacuation of all persons designated to use that hoist as prescribed in the mine escape and evacuation plan required under standard 57.11–53; or

(b) An approved and properly maintained self-contained breathing apparatus system which shall consist of a mask connected to compressed air stored in containers adjacent to the hoist controls. The self-contained breathing system shall provide a minimum of 24 hours of respirable atmosphere to the hoist operator. In addition, the self-contained breathing system shall be capable of a quick connect with the approved 2-hour self-contained breathing apparatus above.

§ 57.12 Electricity.

General—Surface and Underground

57.12–1 *Mandatory.* Circuits shall be protected against excessive overload by fuses or circuit breakers of the correct type and capacity.

57.12–2 *Mandatory.* Electric equipment and circuits shall be provided with switches or other controls. Such switches or controls shall be of approved design and construction and shall be properly installed.

57.12–3 *Mandatory.* Individual overload protection or short circuit protection shall be provided for the trailing cables of mobile equipment.

57.12–4 *Mandatory.* Electrical conductors shall be of a sufficient size and current-carrying capacity to ensure that a rise in temperature resulting from normal operations will not damage the insulating materials. Electrical conductors exposed to mechanical damage shall be protected.

57.12–5 *Mandatory.* Mobile equipment shall not run over power conductors, nor shall loads be dragged over power conductors, unless the conductors are properly bridged or protected.

57.12–6 *Mandatory.* Distribution boxes shall be provided with a disconnecting device for each branch circuit. Such disconnecting devices shall be equipped or designed in such a manner that it can be determined by visual observation when such a device is open and that the circuit is deenergized, and the distribution box shall be labeled to show which circuit each device controls.

57.12–7 *Mandatory.* Trailing-cable and power-cable connections to junction boxes shall not be made or broken under load.

57.12–8 *Mandatory.* Power wires and cables shall be insulated adequately where they pass into or out of electrical compartments. Cables shall enter metal frames of motors, splice boxes, and electrical compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

57.12–9 [Reserved]

57.12–10 *Mandatory.* Telephone and low-potential signal wire shall be protected by isolation or suitable insulation, or both, from contacting energized power conductors or any other power source.

57.12–11 *Mandatory.* High-potential electrical conductors shall be covered, insulated, or placed to prevent contact with low potential conductors.

57.12–12 *Mandatory.* The potential on bare signal wires accessible to contact by persons shall not exceed 48 volts.

57.12–13 *Mandatory.* Permanent splices and repairs made in power cables, including the ground conductor where provided, shall be: (a) Mechanically strong with electrical conductivity as near as possible to that of the original; (b) Insulated to a degree at least equal to that of the original, and sealed to exclude moisture; and, (c) Provided with damage protection as near as possible to that of the original, including good bonding to the outer jacket.

57.12–14 *Mandatory.* Power cables energized to potentials in excess of 150 volts, phase-to-ground, shall not be moved with equipment unless sleds or slings, insulated from such equipment, are used. When such energized cables are moved manually, insulated hooks, tongs, ropes, or slings shall be used unless suitable protection for persons is provided by other means. This does not prohibit pulling or dragging of cable by the equipment if powers when the cable is physically attached to the equipment by suitable mechanical devices, and the cable is insulated from the equipment in conformance with other standards in this part.

57.12–15 [Reserved]

57.12–16 *Mandatory.* Electrically powered equipment shall be deenergized before mechanical work is done on such

equipment. Power switches shall be locked out or other measures taken which shall prevent the equipment from being energized without the knowledge of the individuals working on it. Suitable warning notices shall be posted at the power switch and signed by the individuals who are to do the work. Such locks or preventive devices shall be removed only by the persons who installed them or by authorized personnel.

57.12–17 *Mandatory.* Power circuits shall be deenergized before work is done on such circuits unless hot-line tools are used. Suitable warning signs shall be posted by the individuals who are to do the work. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the knowledge of the individuals working on them. Such locks, signs, or preventive devices shall be removed only by the person who installed them or by authorized personnel.

57.12–18 *Mandatory.* Principal power switches shall be labeled to show which units they control, unless identification can be made readily by location.

57.12–19 *Mandatory.* Where access is necessary, suitable clearance shall be provided at stationary electrical equipment or switchgear.

57.12–20 *Mandatory.* Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal, non-current-carrying parts of the power switches to be operated may be used.

57.12–21 *Mandatory.* Suitable danger signs shall be posted at all major electrical installations.

57.12–22 *Mandatory.* Areas containing major electrical installations shall be entered only by authorized persons.

57.12–23 *Mandatory.* Electrical connections and resistor grids that are difficult or impractical to insulate shall be guarded, unless protection is provided by location.

57.12–24 [Reserved]

57.12–25 *Mandatory.* All metal enclosing or encasing electrical circuits shall be grounded or provided with equivalent protection. This requirement does not apply to battery-operated equipment.

57.12–26 *Mandatory.* Metal fencing and metal buildings enclosing transformers and switchgear shall be grounded.

57.12–27 *Mandatory.* Frame grounding or equivalent protection shall be provided for mobile equipment powered through trailing cables.

57.12–28 *Mandatory.* Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; and annually thereafter. A record of the resistance measured during the most recent test shall be made available on a request by the Secretary or his duly authorized representative.

57.12–29 [Reserved]

57.12–30 *Mandatory.* When a potentially dangerous condition is found it shall be corrected before equipment or wiring is energized.

57.12–31 [Reserved]

57.12–32 *Mandatory.* Inspection and cover plates on electrical equipment and junction boxes shall be kept in place at all times except during testing or repairs.

57.12–33 *Mandatory.* Hand-held electric tools shall not be operated at high potential voltages.

57.12–34 *Mandatory.* Portable extension lights, and other lights that by their location present a shock or burn hazard, shall be guarded.

57.12–35 *Mandatory.* Lamp sockets shall be of a weatherproof type where they are exposed to weather or wet conditions that may interfere with illumination or create a shock hazard.

57.12–36 *Mandatory.* Fuses shall not be removed or replaced by hand in an energized circuit, and they shall not otherwise be removed or replaced in an energized circuit unless equipment and techniques especially designed to prevent electrical shock are provided and used for such purpose.

57.12–37 *Mandatory.* Fuse tongs or hot-line tools shall be used when fuses are removed or replaced in high-potential circuits.

57.12–38 *Mandatory.* Trailing cables shall be attached to machines in a suitable manner to protect the cable from damage and to prevent strain on the electrical connections.

57.12–39 *Mandatory.* Surplus trailing cables to shovels, cranes and similar equipment shall be—

(a) Stored in cable boats;

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(b) Stored on reels mounted on the equipment; or

(c) Otherwise protected from mechanical damage.

57.12–40 *Mandatory.* Operating controls shall be installed so that they can be operated without danger of contact with energized conductors.

57.12–41 *Mandatory.* Switches and starting boxes shall be of safe design and capacity.

57.12–42 *Mandatory.* Both rails shall be bonded or welded at every joint and rails shall be crossbonded at least every 200 feet if the track serves as the return trolley circuit. When rails are moved, replaced, or broken bonds are discovered, they shall be rebonded within three working shifts.

57.12–43 and 57.12–44 [Reserved]

57.12–45 *Mandatory.* Overhead high-potential powerlines shall be installed as specified by the National Electrical Code.

57.12–46 [Reserved]

57.12–47 *Mandatory.* Guy wires of poles supporting high-voltage transmission lines shall meet the requirements for grounding or insulator protection of the National Electrical Safety Code, Part 2, entitled "Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines," (also referred to as National Bureau of Standards Handbook 81, Nov. 1, 1961) and Supplement 2 thereof issued March 1968, which are hereby incorporated by reference and made a part hereof. These publications and documents may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or may be examined in any Metal and Nonmetal Mine Safety and Health District or Subdistrict Office of the Mine Safety and Health Administration.

57.12–48 *Mandatory.* Telegraph, telephone, or signal wires shall not be installed on the same crossarm with power conductors. When carried on poles supporting powerlines, they shall be installed as specified by the National Electrical Code.

57.12–49 [Reserved]

57.12–50 *Mandatory.* Trolley wires shall be installed at least seven (7) feet above rails where height permits, and aligned and supported to suitably control sway and sag.

57.12–51 and 57.12–52 [Reserved]

57.12–53 *Mandatory.* Ground wires for lighting circuits powered from trolley wires shall be connected securely to the ground-return circuit.

57.12–54 through 57.12–64 [Reserved]

SURFACE ONLY

57.12–65 *Mandatory.* Powerlines, including trolley wires, and telephone circuits shall be protected against short circuits and lightning.

57.12–66 *Mandatory.* Where metallic tools or equipment can come in contact with trolley wires or bare powerlines, the lines shall be guarded or deenergized.

57.12–67 *Mandatory.* Transformers shall be totally enclosed, or shall be placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring.

57.12–68 *Mandatory.* Transformer enclosures shall be kept locked against unauthorized entry.

57.12–69 *Mandatory.* Each ungrounded power conductor or telephone wire that leads underground and is directly exposed to lightning shall be equipped with suitable lightning arrestors of approved type within 100 feet of the point where the circuit enters the mine. Lightning arrestors shall be connected to a low resistance grounding medium on the surface and shall be separated from neutral grounds by a distance of not less than 25 feet.

57.12–70 [Reserved]

57.12–71 *Mandatory.* When equipment must be moved or operated near energized high-voltage powerlines (other than trolley lines) and the clearance is less than 10 feet, the lines shall be deenergized or other precautionary measures shall be taken.

57.12–72 through 57.12–79 [Reserved]

UNDERGROUND ONLY

57.12–80 *Mandatory.* Trolley wires and bare power conductors shall be guarded at man trip loading and unloading points, and at shaft stations. Where such trolley wires and bare power conductors are less than 7 feet above the rail, they shall be guarded at all points where men work or pass regularly beneath.

57.12–81 *Mandatory.* All metallic pipelines, 1,000 feet or more in length running parallel to trolley tracks, that are used as a ground return circuit shall be bonded to the return circuit rail at the ends of the

pipeline and at intervals not to exceed 500 feet.

57.12–82 *Mandatory.* Powerlines shall be well separated or insulated from water-lines, telephone lines, and air lines.

57.12–83 *Mandatory.* Power cables in shafts and boreholes shall be fastened securely in such a manner as to prevent undue strain on the sheath, insulation, or conductors.

57.12–84 *Mandatory.* Disconnecting switches that can be opened safely under load shall be provided underground at all branch circuits extending from primary power circuits near shafts, adits, levels and boreholes.

57.12–85 *Mandatory.* Transformer stations shall be enclosed to prevent persons from unintentionally or inadvertently contacting energized parts.

57.12–86 *Mandatory.* Trolley and trolley feeder wire shall be installed opposite the clearance side of haulageways. However, this standard does not apply where physical limitations would prevent the safe installation or use of such trolley and trolley feeder wire.

57.12–87 [Reserved]

57.12–88 *Mandatory.* No splice, except a vulcanized splice or its equivalent, shall be made in a trailing cable within 25 feet of the machine unless the machine is equipped with a cable reel or other power feed cable payout-retrieval system. However, a temporary splice may be made to move the equipment for repair.

57.12–89 [Reserved]

§ 57.13 Compressed air and boilers.

General—Surface and Underground

57.13–1 *Mandatory.* All boilers and pressure vessels shall be constructed, installed, and maintained in accordance with the standards and specifications of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

57.13–2 through 57.13–9 [Reserved]

Compressed Air

57.13–10 *Mandatory.* (a) Reciprocating-type air compressors rated over 10 horsepower shall be equipped with automatic temperature-actuated shutoff mechanisms which shall be set or adjusted to the compressor when the normal operating temperature is exceeded by more than 25 percent.

(b) However, this standard does not apply to reciprocating-type air compressors rated over 10 horsepower if equipped with fusible plugs that were installed in the compressor discharge lines before November 15, 1979, and designed to melt at temperatures at least 50 degrees below the flash point of the compressors' lubricating oil.

57.13–11 *Mandatory.* Air receiver tanks shall be equipped with one or more automatic pressure-relief valves. The total relieving capacity of the relief valves shall prevent pressure from exceeding the maximum allowable working pressure in a receiver tank by not more than 10 percent. Air receiver tanks also shall be equipped with indicating pressure gages which accurately measure the pressure within the air receiver tanks.

57.13–12 *Mandatory.* Compressor air intakes shall be installed to insure that only clean, uncontaminated air enters the compressors.

57.13–13 and 57.13–14 [Reserved]

57.13–15 *Mandatory.* (a) Compressed-air receivers and other unfired pressure vessels shall be inspected by inspectors holding a valid National Board Commission and in accordance with the applicable chapters of the National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979. This code is incorporated by reference and made a part of this standard, may be examined at any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration, and may be obtained from the publisher, the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229.

(b) Records of inspections shall be kept in accordance with requirements of the National Board Inspection Code, and the records shall be made available to the Secretary or his authorized representative.

57.13–16 [Reserved]

57.13–17 *Mandatory.* Compressor discharge pipes where carbon build-up may occur shall be cleaned periodically as recommended by the manufacturer, but no less frequently than once every two (2) years.

57.13–18 [Reserved]

57.13–19 *Mandatory.* Repairs involving the pressure system of compressors, receivers, or compressed-air-powered

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equipment shall not be attempted until the pressure has been bled off.

57.13–20 *Mandatory.* At no time shall compressed air be directed toward a person. When compressed air is used, all necessary precautions shall be taken to protect persons from injury.

57.13–21 *Mandatory.* Except where automatic shutoff valves are used, safety chains or other suitable locking devices shall be used at connections to machines of high-pressure hose lines of ¾-inch inside diameter or larger, and between high-pressure hose lines of ¾-inch inside diameter or larger, where a connection failure would create a hazard.

57.13–22 through 57.13–29 [Reserved]

BOILERS

57.13–30 *Mandatory.* (a) Fired pressure vessels (boilers) shall be equipped with water level gages, pressure gages, automatic pressure-relief valves, blowdown piping, and other safety devices approved by the American Society of Mechanical Engineers to protect against hazards from overpressure, flameouts, fuel interruptions and low water level, all as required by the appropriate sections, chapters and appendices listed in paragraphs (b)(1) and (2) below.

(b) These gages, devices and piping shall be designed, installed, operated, maintained, repaired, altered, inspected, and tested by inspectors holding a valid National Board Commission and in accordance with the following listed sections, chapters and appendices:

(1) The ASME Boiler and Pressure Vessel Code, 1977, published by the American Society of Mechanical Engineers.

Section and Title

I Power Boilers.
II Material Specifications—Part A—Ferrous.
II Material Specifications—Part B—Nonferrous.
II *Material Specifications*—Part C—Welding Rods, Electrodes, and Filler Metals.
IV Heating Boilers.
V Nondestructive Examination.
VI Recommended Rules for Care and Operation of Heating Boilers.
VII Recommended Rules for Care of Power Boilers.

(2) The National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors. 1979, published by the National Board of Boiler and Pressure Vessel Inspectors.

Chapter and Title

I Glossary of Terms.
II Inspection of Boilers and Pressure Vessels.
III Repairs and Alterations to Boiler and Pressure Vessels by Welding.
IV Shop Inspection of Boilers and Pressure Vessels.
V Inservice Inspection of Pressure Vessels by Authorized Owner-User Inspection Agencies.

Appendix and Title

A Safety and Safety Relief Valves.
B Non-ASME Code Boilers and Pressure Vessels.
C Storage of Mild Steel Covered Arc Welding Electrodes.
D–R National Board "R" (Repair) Symbol Stamp.
D–VR National Board "VR" (Repair of Safety and Safety Relief Valve) Symbol Stamp.
D–VR1 Certificate of Authorization for Repair Symbol Stamp for Safety and Safety Relief Valves.
D–VR2 Outline of Basic Elements of Written Quality Control System for Repairers of ASME Safety and Safety Relief Valves.
D–VR3 Nameplate Stamping for "VR".
E Owner-user Inspection Agencies.
F Inspection Forms.

(c) Records of inspections and repairs shall be kept in accordance with the requirements of the ASME Boiler and Pressure Vessel Code and the National Board Inspection Code. The records shall be made available to the Secretary of his authorized representative.

(d) Sections of the ASME Boiler and Pressure Vessel Code, 1977, listed in paragraph (b)(1) above, and chapters and appendices of the National Board Inspection Code, 1979, listed in paragraph (b)(2) above, are incorporated by reference and made a part of this standard. These publications may be obtained from the publishers, the American Society of Mechanical Engineers, 345 East Forty-seventh Street, New York, N.Y. 10017, and the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. The publications may be examined at any Metal and Nonmetal

Mine Safety and Health District Office of the Mine Safety and Health Administration.

57.13–31 through 57.13–34 [Reserved]

§ 57.14 Use of equipment.

GUARDS

GENERAL—SURFACE AND UNDERGROUND

57.14–1 *Mandatory.* Gears; sprockets; chains; drive, head, tail, and takeup pulleys; flywheels; couplings; shafts; sawblades; fan inlets; and similar exposed moving machine parts which may be contacted by persons, and which may cause injury to persons, shall be guarded.

57.14–2 *Mandatory.* Overhead belts shall be guarded if the whipping action from a broken line would be hazardous to persons below.

57.14–3 *Mandatory.* Guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from accidentally reaching behind the guard and becoming caught between the belt and the pulley.

57.14–4 and 57.14–5 [Reserved]

57.14–6 *Mandatory.* Except when testing the machinery, guards shall be securely in place while machinery is being operated.

57.14–7 *Mandatory.* Guards shall be of substantial construction and properly maintained.

57.14–8 *Mandatory.* Stationary grinding machines other than special bit grinders shall be equipped with:

(a) Peripheral hoods (less than 90° throat openings) capable of withstanding the force of a bursting wheel;

(b) Adjustable tool rests set as close as practical to the wheel;

(c) Safety washers.

57.14–9 *Mandatory.* Grinding wheels shall be operated within the specifications of the manufacturer of the wheel.

57.14–10 *Mandatory.* Hand-held power tools, other than rock drills, shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

57.14–11 *Mandatory.* Guards, shields, or other suitable protection shall be provided in areas where flying or falling materials present a hazard to personnel.

57.14–12 [Reserved]

57.14–13 *Mandatory.* Fork-lift trucks, front-end loaders, and bulldozers shall be provided with substantial canopies when necessary to protect the operator.

57.14–14 *Mandatory.* Face shields or goggles, in good condition, shall be worn when operating a grinding wheel.

57.14–15 through 57.14–24 [Reserved]

METHODS AND PROCEDURES

GENERAL—SURFACE AND UNDERGROUND

57.14–25 [Reserved]

57.14–26 *Mandatory.* Unsafe equipment or machinery shall be removed from service immediately.

57.14–27 *Mandatory.* Operation of machinery or equipment shall be assigned only to competent persons.

57.14–28 [Reserved]

57.14–29 *Mandatory.* Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.

57.14–30 *Mandatory.* Men shall not work on or from a piece of mobile equipment in a raised position until it has been blocked in place securely. This does not preclude the use of equipment specifically designed as elevated mobile work platforms.

57.14–31 *Mandatory.* Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.

57.14–32 *Mandatory.* Belts, chains, and ropes shall not be guided onto power-driven moving pulleys, sprockets, or drums with the hands except on slow moving equipment especially designed for hand feeding.

57.14–33 *Mandatory.* Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.

57.14–34 *Mandatory.* Belt dressing shall not be applied manually while belts are in motion unless an aerosol-type dressing is used.

57.14–35 *Mandatory.* Machinery shall not be lubricated while in motion where a hazard exists, unless equipped with extended fittings or cups.

57.14–36 *Mandatory.* Tools and equipment shall not be used beyond the design capacity intended by the manufacturer, where such use may create a hazard to personnel.

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57.14–37 through 57.14–44 [Reserved]

SURFACE ONLY

57.14–45 *Mandatory.* Welding operations shall be shielded and well-ventilated.

57.14–46 through 57.14–54 [Reserved]

UNDERGROUND ONLY

57.14–55 *Mandatory.* Welding operations shall be shielded and well-ventilated.

§ 57.15 *Personal protection.*

GENERAL—SURFACE AND UNDERGROUND

57.15–1 *Mandatory.* Adequate first-aid materials, including stretchers and blankets, shall be provided at places convenient to all working areas. Water or neutralizing agents shall be available where corrosive chemicals or other harmful substances are stored, handled, or used.

57.15–2 *Mandatory.* All persons shall wear suitable hard hats when in or around a mine or plant where falling objects may create a hazard.

57.15–3 *Mandatory.* All persons shall wear suitable protective footwear when in or around an area of a mine or plant where a hazard exists which could cause an injury to the feet.

57.15–4 *Mandatory.* All persons shall wear safety glasses, goggles, or face shields or other suitable protective devices when in or around an area of a mine or plant where a hazard exists which could cause injury to unprotected eyes.

57.15–5 *Mandatory.* Safety belts and lines shall be worn when men work where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.

57.15–6 *Mandatory.* Special protective equipment and special protective clothing shall be provided, maintained in a sanitary and reliable condition and used whenever (1) hazards of process or environment, (2) chemical hazards, (3) radiological hazards, or (4) mechanical irritants are encountered in a manner capable of causing injury or impairment.

57.15–7 *Mandatory.* Protective clothing or equipment and face-shields or goggles shall be worn when welding, cutting, or working with molten metal.

57.15–8 through 57.15–19 [Reserved]

SURFACE ONLY

57.15–20 *Mandatory.* Life jackets or belts shall be worn where there is danger from falling into water.

57.15–21 through 57.15–29 [Reserved]

UNDERGROUND ONLY

57.15–30 *Mandatory*—A 1-hour self-rescue device approved by the Mine Safety and Health Administration shall be made available by the operator to all personnel underground. Each operator shall maintain self-rescue devices in good condition.

57.15–31 *Mandatory*—(a) Except as provided in paragraphs (b) and (c) of this section, self-rescue devices meeting the requirements of standard 57.15–30 shall be worn or carried by all persons underground.

(b) Where the wearing or carrying of self-rescue devices meeting the requirements of standard 57.15–30 is hazardous to a person, such self-rescue devices shall be located at a distance no greater than 25 feet from such person.

(c) Where a person works on or around mobile equipment, self-rescue devices may be placed in a readily accessible location on such equipment.

§ 57.16 Materials storage and handling.

GENERAL—SURFACE AND UNDERGROUND

57.16–1 *Mandatory.* Supplies shall not be stacked or stored in a manner which creates tripping or fall-of-material hazards.

57.16–2 *Mandatory.* (a) Bins, hoppers, silos, tanks, and surge piles, where loose unconsolidated materials are stored, handled or transferred shall be—

(1) Equipped with mechanical devices or other effective means of handling materials so that during normal operations persons are not required to enter or work where they are exposed to entrapment by the caving or sliding of materials; and

(2) Equipped with supply and discharge operating controls. The controls shall be located so that spills or overruns will not endanger persons.

(b) Where persons are required to move around or over any facility listed in this standard, suitable walkways or passageways shall be provided.

(c) Where persons are required to enter any facility listed in this standard for

maintenance or inspection purposes, ladders, platforms, or staging shall be provided. No person shall enter the facility until the supply and discharge of materials have ceased and the supply and discharge equipment is locked out. Persons entering the facility shall wear a safety belt or harness equipped with a lifeline suitably fastened. A second person, similarly equipped, shall be stationed near where the lifeline is fastened and shall constantly adjust it or keep it tight as needed, with minimum slack.

57.16–3 *Mandatory.* Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.

57.16–4 *Mandatory.* Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.

57.16–5 *Mandatory.* Compressed and liquid gas cylinders shall be secured in a safe manner.

57.16–6 *Mandatory.* Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

57.16–7 *Mandatory.* (a) Taglines shall be attached to loads that may require steadying or guidance while suspended.

(b) Hitches and slings used to hoist materials shall be suitable for the particular material handled.

57.16–8 [Reserved]

57.16–9 *Mandatory.* Men shall stay clear of suspended loads.

57.16–10 *Mandatory.* To protect personnel, material shall not be dropped from an overhead elevation until the drop area is first cleared of personnel and the area is then either guarded or a suitable warning is given.

57.16–11 *Mandatory.* Men shall not ride on loads being moved by cranes or derricks, nor shall they ride the hoisting hooks unless such method eliminates a greater hazard.

57.16–12 *Mandatory.* Chemical substances, including concentrated acids and alkalies, shall be stored to prevent inadvertent contact with each other or with other substances, where such contact could cause a violent reaction or the liberation of harmful fumes or gases.

57.16–13 *Mandatory.* Suitable warning shall be given before molten metal is poured and before a container of molten metal is moved.

57.16–14 *Mandatory.* Operator-carrying overhead cranes shall be provided with:

(a) Bumpers at each end of each rail;

(b) Automatic switches to halt uptravel of the blocks before they strike the hoist;

(c) Effective audible warning signals within easy reach of the operator;

(d) A means to lock out the disconnect switch.

57.16–15 *Mandatory.* No person shall work from or travel on the bridge of an overhead crane unless the bridge is provided with substantial footwalks with toeboards and railings the length of the bridge.

57.16–16 *Mandatory.* Fork and other similar types of lift trucks shall be operated with the—

(a) Upright tilted back to steady and secure the load;

(b) Load in the upgrade position when ascending or descending grades in excess of 10 percent;

(c) Load not raised or lowered enroute except for minor adjustments; and

(d) Load-engaging device downgrade when traveling unloaded on all grades.

57.16–17 *Mandatory.* Where the stretching or contraction of a hoist rope could create a hazard, chairs or other suitable blocking shall be used to support conveyances at shaft landings before heavy equipment or material is loaded or unloaded.

57.16–18 through 57.16–34 [Reserved]

UNDERGROUND ONLY

57.16–35 [Reserved]

§ 57.17 Illumination.

SURFACE ONLY

57.17–1 *Mandatory.* Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and working areas.

57.17–2 through 57.17–9 [Reserved]

UNDERGROUND ONLY

57.17–10 *Mandatory.* Individual electric lamps shall be carried for illumination by all persons underground.

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§ 57.18 Safety programs.

GENERAL—SURFACE AND UNDERGROUND

57.18–1 [Reserved]

57.18–2 *Mandatory.* (a) A competent person designated by the operator shall examine each working place at least once each shift for conditions which may adversely affect safety or health. The operator shall promptly initiate appropriate action to correct such conditions.

(b) A record that such examinations were conducted shall be kept by the operator for a period of one (1) year, and shall be made available for review by the Secretary or his authorized representative.

(c) In addition, conditions that may present an imminent danger which are noted by the person conducting the examination shall be brought to the immediate attention of the operator who shall withdraw all persons from the area affected (except persons referred to in section 104(c) of the Federal Mine Safety and Health Act of 1977) until the danger is abated.

57.18–3 through 57.18–5 [Reserved]

57.18–6 *Mandatory.* New employees shall be indoctrinated in safety rules and safe work procedures.

57.18–7 and 57.18–8 [Reserved]

57.18–9 *Mandatory.* When persons are working at the mine, a competent person designated by the mine operator shall be in attendance to take charge in case of an emergency.

57.18–10 *Mandatory.* Selected supervisors shall be trained in first aid. First aid training shall be made available to all interested employees.

57.18–11 [Reserved]

57.18–12 *Mandatory.* Emergency telephone numbers shall be posted at appropriate telephones.

57.18–13 *Mandatory.* A suitable communication system shall be provided at the mine to obtain assistance in the event of an emergency.

57.18–14 *Mandatory.* Arrangements shall be made in advance for obtaining emergency medical assistance and transportation for injured persons.

57.18–15 through 57.18–19 [Reserved]

SURFACE ONLY

57.18–20 *Mandatory.* No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others, can be heard, or can be seen.

57.18–21 through 57.18–24 [Reserved]

UNDERGROUND ONLY

57.18–25 *Mandatory.* No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless his cries for help can be heard or he can be seen.

57.18–26 [Reserved]

57.18–27 [Reserved]

57.18–28 *Mandatory.* (a) Within 6 months after promulgation of this standard and thereafter on an annual basis all persons who are required to go underground shall be instructed in the Mine Safety and Health Administration approved course contained in Bureau of Mines Instruction Guide 19, "Mine Emergency Training" (September 1972). The instruction shall be given by MSHA personnel or by persons who are certified by the Mine Safety and Health Administration, Division of Education and Training Operations, to give such instruction.

(b) Within 6 months after promulgation of this standard and thereafter on an annual basis all persons who go underground shall be instructed in the Mine Safety and Health Administration course contained in Bureau of Mines Instruction Guide 2, "MSA W–65 Self-Rescuer" (March 1972), or Bureau of Mines Instruction Guide 3, "Permissible Drager 810 Respirator for Self-Rescue" (March 1972). The instruction shall be given by MSHA personnel or by persons who are certified by the Mine Safety and Health Administration, Division of Education and Training Operations to give such instructions: Provided, however, that if a Mine Safety and Health Administration instructor or a certified instructor is not immediately available such instruction of new employees in self-rescuers may be conducted by qualified company personnel who are not certified, but who have obtained provisional approval from the Mine Safety and Health Administration, Division of Education and Training Operations, to give such instruction. Any person who has not had self-rescuer instruction within 12 months immediately preceding going underground shall be instructed in the use of self-rescuers before going underground.

(c) All instructional material, handouts,

visual aids, and other such teaching accessories used by the operator in the course prescribed in paragraphs (a) and (b) shall be available for inspection by the Secretary or his authorized representative.

(d) Records of all instruction shall be kept at the mine site or nearest mine office at least 2 years from the date of instruction. Upon completion of such instruction, copies of the record shall be submitted to the nearest Mine Safety and Health Administration training center.

(e) The Bureau of Mines instruction guides to which reference is made in paragraphs (a) and (b) of this standard are hereby incorporated by reference and made a part hereof. The incorporated instruction guides are available and shall be provided upon request made to any Mine Safety and Health Administration training center or Metal and Nonmetal Mine Safety and Health Subdistrict Office.

§ 57.19 Man hoisting.

The hoisting standards in this section apply to those hoists and appurtenances used for hoisting persons. However, where persons may be endangered by hoists and appurtenances used solely for handling ore, rock, and materials, the appropriate standards should be applied.

Emergency hoisting facilities should conform to the extent possible to safety requirements for other hoists, and should be adequate to remove the persons from the mine with a minimum of delay.

HOISTS

57.19–1 *Mandatory.* Hoists shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes used.

57.19–2 *Mandatory.* Hoists shall be anchored securely.

57.19–3 *Mandatory.* Belt, rope, or chains shall not be used to connect driving mechanisms to man hoists.

57.19–4 *Mandatory.* Any hoist used to hoist men shall be equipped with a brake or brakes which shall be capable of holding its fully loaded cage, skip, or bucket at any point in the shaft.

57.19–5 *Mandatory.* The operating mechanism of the clutch of every manhoist drum shall be provided with a locking mechanism, or interlocked electrically or mechanically with the brake to prevent accidental withdrawal of the clutch.

57.19–6 *Mandatory.* Automatic hoists shall be provided with devices that automatically apply the brakes in the event of power failure.

57.19–7 *Mandatory.* All man hoists shall be provided with devices to prevent overtravel. When utilized in shafts exceeding 100 feet in depth, such hoists shall also be provided with overspeed devices.

57.19–8 *Mandatory.* Where creep or slip may alter the effective position of safety devices, friction hoists shall be equipped with synchronizing mechanisms that recalibrate the overtravel devices and position indicators.

57.19–9 *Mandatory.* An accurate and reliable indicator of the position of the cage, skip, bucket, or cars in the shaft shall be provided.

57.19–10 *Mandatory.* Hoist controls shall be placed or housed so that the noise from machinery or other sources will not prevent hoistmen from hearing signals.

57.19–11 *Mandatory.* Flanges on drums shall extend radially a minimum of 4 inches or three rope diameters beyond the last wrap, whichever is the lesser.

57.19–12 *Mandatory.* Where grooved drums are used, the grooves shall be of suitable size and pitch for the ropes used.

57.19–13 *Mandatory.* Where any diesel or similar fuel-injection engine is used to power a hoist, the engine shall be equipped with a damper or other cutoff in its air intake system. The control handle shall be clearly labeled to indicate that its intended function is for emergency stopping only.

57.19–14 *Mandatory.* In a friction hoist installation, tapered guides or other approved devices shall be installed above and below the limits of regular travel of the conveyance and arranged to prevent overtravel in the event of failure of other devices.

57.19–15 [Reserved]

57.19–16 [Reserved]

57.19–17 *Mandatory.* Each electric hoist shall be equipped with a manually-operable switch that will initiate emergency braking action to bring the conveyance and the counterbalance safely to rest. This switch shall be located within reach of the hoistman in case the manual controls of the hoist fail.

57.19–18 *Mandatory.* When an overtravel by-pass switch is installed, the

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switch shall function so as to allow the conveyance to be moved through the overtravel position when the switch is held in the closed position by the hoistman. The overtravel by-pass switch shall return automatically to the open position when released by the hoistman.

57.19-19 [Reserved]

Wire Rope

57.19-20 [Reserved]

57.19-21 *Mandatory.* The following static-load safety factors shall be used for selecting ropes to be used for hoisting men and for determining when such ropes shall be removed from man hoists.

Length of rope in shaft (feet)	Minimum factor of safety (new rope)	Minimum factor of safety (remove)
500 or less	8	6.4
501–1,000	7	5.8
1,001–2,000	6	5.0
2,001–3,000	5	4.3
3,001 or more	4	3.6

57.19-22 *Mandatory.* The end of the rope at the drum shall make at least one full turn on the drum shaft, or a spoke of the drum in the case of a free drum, and shall be fastened securely by means of rope clips or clamps. There shall be three full turns of cable or rope on the hoisting drum when the cable or rope is extended to its maximum working length. This standard does not apply to friction hoists.

57.19-23 [Reserved]

57.19-24 *Mandatory.* The rope shall be attached to the load by the thimble-and-clip method, the socketing method, or other approved method. If the socketing method is employed, zinc or its equivalent shall be used. The use of Babbitt metal or lead for socketing wire ropes is prohibited. If the thimble-and-clip method is used, the following shall be observed:

(a) The rope shall be attached to the load by passing one end around an oval thimble that is attached to the load bending the end back so that it is parallel to the long or "live" end of the rope and fastening the two parts of the rope together with clips.

(b) The U-bolt of each clip shall encircle the short or "dead" end of the rope and the distance between clips shall not be less than the figures given in the accompanying table.

(c) As a minimum, the following number of clips or equivalent shall be used for various diameters of six-strand, 19-wire, plowsteel ropes:

(Follow manufacturer's recommendations for other kinds of wire rope and clips:)

Diameter of rope, inches	Number of clips	Center-to-center spacing of clips, inches
¾	4	4½
⅞	4	5¼
1	4	6
1⅛	5	6¾
1¼	5	7½
1⅜	6	8¼
1½	6	9
1⅝	6	9¾
1¾	7	10½
1⅞	8	11¼
2	8	12
2⅛	8	13
2¼	8	14

(d) For all ropes less than three-quarter inch in diameter at least four clips or equivalent shall be used.

(e) When special conditions require the attachment of a sling to the hoisting cable to handle equipment in the shaft, the sling shall be attached by clips or equivalent in accordance with the table in paragraph (c) of this standard.

57.19-25 [Reserved]

57.19-26 *Mandatory.* Safety device attachments to hoist ropes shall be selected, installed, and maintained according to manufacturer's specifications to minimize internal corrosion and weakening of the hoist rope.

57.19-27 [Reserved]

57.19-28 through 57.19-34 [Reserved]

Headframes and Sheaves

57.19-35 *Mandatory.* All headframes shall be constructed with suitable design considerations to allow for all dead loads, live loads, and wind loads.

57.19-36 *Mandatory.* Headframes shall be high enough to provide clearance for overtravel and safe stopping of the conveyance.

57.19-37 *Mandatory.* Fleet angles on

hoists installed after November 15, 1979, shall not be greater than one and one-half degrees for smooth drums or two degrees for grooved drums.

57.19–38 *Mandatory.* Platforms with toeboards and handrails shall be provided around elevated head sheaves.

57.19–39 *Mandatory.* All personnel hoists, except emergency escape hoists and hoists with rope speeds of 200 feet per minute or less, installed after November 15, 1979, shall have drum and sheave tread diameters—

(1) Not less than 60 times the hoist rope diameter for slope or inclined shaft applications;

(2) Not less than 80 times the hoist rope diameter if the hoist ropes are one inch in diameter or greater, or not less than 60 times the hoist rope diameter if the hoist ropes are less than one inch in diameter for vertical shaft applications; or

(3) Not less than 100 times the hoist rope diameter for locked coil ropes.

57.19–40 *Mandatory.* Head, idler, knuckle, and curve sheaves shall have grooves of proper contour for the specific rope diameter used.

57.19–41 through 57.19–44 [Reserved]

CONVEYANCES

57.19–45 *Mandatory.* Man cages and skips used for hoisting or lowering employees or other persons in any vertical shaft or any incline shaft with an angle of inclination of forty-five (45) degrees from the horizontal shall be covered with a metal bonnet.

57.19–46 through 57.19–48 [Reserved]

57.19–49 *Mandatory.* Buckets shall not be used to hoist men except during shaft sinking operations, inspection, maintenance, and repairs.

57.19–50 *Mandatory.* Buckets used to hoist persons during vertical shaft sinking operations shall: (a) Be securely attached to a crosshead when traveling in either direction between the lower and upper crosshead parking locations; (b) Have overhead protection when the shaft depth exceeds 50 feet; (c) Have sufficient depth or a suitably designed platform to transport persons safely in a standing position; and (d) Have devices to prevent accidental dumping where the bucket is supported by a bail attached to its lower half.

57.19–51 [Reserved]

57.19–52 [*Reserved*]

57.19–53 Mandatory. In shaft sinking where a platform is suspended by wire ropes, such ropes shall have an approved rating for the suspended load.

57.19–54 *Mandatory.* Where rope guides are used in shafts other than in shaft sinking operations, the rope guides shall be a type of lock coil construction.

HOISTING PROCEDURES

57.19–55 *Mandatory.* When a manually operated hoist is used, a qualified hoistman shall remain within hearing of the telephone or signal device at all times while any person is underground.

57.19–56 *Mandatory.* When automatic hoisting is used, a competent operator of the hoist shall be readily available at or near the hoisting device while any person is underground.

57.19–57 *Mandatory.* No person shall operate a hoist unless within the preceding 12 months he has had a medical examination by a qualified, licensed physician who shall certify his fitness to perform this duty. Such certification shall be available at the mine.

57.19–58 *Mandatory.* Only experienced hoistmen shall operate the hoist except in cases of emergency and in the training of new hoistmen.

57.19–59 [Reserved]

57.19–60 [Reserved]

57.19–61 *Mandatory.* The safe speed for hoisting men shall be determined for each shaft, and this speed shall not be exceeded. Men shall not be hoisted at a speed faster than 2,500 feet per minute, except in an emergency.

57.19–62 *Mandatory.* Maximum normal operating acceleration and deceleration shall not exceed 6 feet per second per second. During emergency braking, the deceleration shall not exceed 16 feet per second per second.

57.19–63 *Mandatory.* Only authorized persons shall be in hoist rooms.

57.19–64 [Reserved]

57.19–65 *Mandatory.* Conveyances shall not be lowered by the brakes alone except during emergencies.

57.19–66 *Mandatory.* In shafts inclined over 45 degrees, the operator shall determine and post in the conveyance or at each shaft station the maximum number of persons permitted to ride in a hoisting conveyance at any one time. Each person shall be provided a minimum of 1.5 square feet of floor space.

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57.19–67 *Mandatory.* During shift changes, an authorized person shall be in charge of each trip in which persons are hoisted.

57.19–68 *Mandatory.* Men shall enter, ride, and leave conveyances in an orderly manner.

57.19–69 *Mandatory.* Men shall not enter or leave conveyances which are in motion or after a signal to move the conveyance has been given to the hoistman.

57.19–70 *Mandatory.* Cage doors or gates shall be closed while men are being hoisted; they shall not be opened until the cage has come to a stop.

57.19–71 *Mandatory.* Men shall not ride in skips or buckets with muck, supplies, materials, or tools other than small hand tools.

57.19–72 *Mandatory.* When combinations of cages and skips are used in the same compartment, the cages shall be enclosed to protect personnel from flying material and the hoist speed reduced to man-speed as defined in standard 57.19–61, but not to exceed 1,000 feet per minute. Muck shall not be hoisted with personnel during shift changes.

57.19–73 *Mandatory.* Rock or supplies shall not be hoisted in the same shaft as men during shift changes, unless the compartments and dumping bins are partitioned to prevent spillage into the cage compartment.

57.19–74 *Mandatory.* Persons shall not ride the bail, rim, bonnet, or crosshead of any shaft conveyance except when necessary for inspection and maintenance, and then only when suitable protection for persons is provided.

57.19–75 *Mandatory.* Open hooks shall not be used to hoist buckets or other conveyances.

57.19–76 *Mandatory.* When men are hoisted in buckets, speeds shall not exceed 500 feet per minute and shall not exceed 200 feet per minute when within 100 feet of the intended station.

57.19–77 *Mandatory.* Buckets shall be stopped about 15 feet from the shaft bottom to await a signal from one of the crew on the bottom for further lowering.

57.19–78 *Mandatory.* All buckets shall be stopped after being raised about three (3) feet above the shaft bottom. A bucket shall be stabilized before a hoisting signal is given to continue hoisting the bucket to the crosshead. After a hoisting signal is given, hoisting to the crosshead shall be at a minimum speed. The signaling device shall be attended constantly until a bucket reaches the guides. When persons are hoisted, the signaling devices shall be attended until the crosshead has been engaged.

57.19–79 *Mandatory.* Where mine cars are hoisted by cage or skip, means for blocking cars shall be provided at all landings and also on the cage.

57.19–80 *Mandatory.* When tools, timbers, or other materials are being lowered or raised in a shaft by means of a bucket, skip, or cage, they shall be secured or so placed that they will not strike the sides of the shaft.

57.19–81 *Mandatory.* When conveyances controlled by a hoist operator are not in use, they shall be released and the conveyances shall be raised or lowered a suitable distance to prevent persons from boarding or loading the conveyances.

57.19–82 [Reserved]

57.19–83 *Mandatory.* A manually operated device shall be installed on each electric hoist that will allow the conveyance of counterbalance to be removed from an overtravel position. Such device shall not release the brake, or brakes, holding the overtravelled conveyance or counterbalance until sufficient drive motor torque has been developed to assure movement of the conveyance or counterbalance in the correct direction only.

57.19–84 through 57.19–89 [Reserved]

Signaling

57.19–90 *Mandatory.* There shall be at least two effective approved methods of signaling between each of the shaft stations and the hoist room, one of which shall be a telephone or speaking tube.

57.19–91 *Mandatory.* Hoist operators shall accept hoisting instructions only by the regular signaling system unless it is out of order. In such an event, and during other emergencies, the hoist operator shall accept instructions to direct movement of the conveyances only from authorized persons.

57.19–92 *Mandatory.* A method shall be provided to signal the hoist operator from cages or other conveyances at any point in the shaft.

57.19–93 *Mandatory.* A standard code of hoisting signals shall be adopted and used at each mine. The movement of a

shaft conveyance on a "one bell" signal is prohibited.

57.19–94 *Mandatory.* A legible signal code shall be posted prominently in the hoist house within easy view of the hoistman, and at each place where signals are given or received.

57.19–95 *Mandatory.* Hoisting signal devices shall be positioned within easy reach of persons on the shaft bottom or constantly attended by a person stationed on the lower deck of the sinking platform.

57.19–96 *Mandatory.* Any person responsible for receiving or giving signals for cages, skips, and man trips when men or materials are being transported shall be familiar with the posted signaling code.

57.19–97 through 57.19–99 [Reserved]

SHAFTS

57.19–100 *Mandatory.* Shaft landings shall be equipped with substantial safety gates so constructed that materials will not go through or under them; gates shall be closed except when loading or unloading shaft conveyances.

57.19–101 *Mandatory.* Positive stop-blocks or a derail switch shall be installed on all tracks leading to a shaft collar or landing.

57.19–102 *Mandatory.* A means shall be provided to guide the movement of a shaft conveyance.

57.19–103 *Mandatory.* Dumping facilities and loading pockets shall be constructed so as to minimize spillage into the shaft.

57.19–104 *Mandatory.* Suitable clearance at shaft stations shall be provided to allow safe movement of persons, equipment and materials.

57.19–105 *Mandatory.* A safe means of passage around open shaft compartments shall be provided on landings with more than one entrance to the shaft.

57.19–106 *Mandatory.* Shaft sets shall be kept in good repair and clean of hazardous material.

57.19–107 *Mandatory.* Hoistmen shall be informed when men are working in a compartment affected by that hoisting operation and a "Men Working in Shaft" sign shall be posted at the hoist.

57.19–108 *Mandatory.* When men are working in a shaft "Men Working in Shaft" signs shall be posted at all devices controlling hoisting operations that may endanger such men.

57.19–109 *Mandatory.* Shaft inspection and repair work in vertical shafts shall be performed from substantial platforms equipped with bonnets or equivalent overhead protection.

57.19–110 *Mandatory.* A substantial bulkhead or equivalent protection shall be provided above men at work deepening a shaft.

57.19–111 *Mandatory.* Substantial fixed ladders shall be provided from the collar to as near the shaft bottom as practical during shaft-sinking operations, or an escape hoist powered by an emergency power source shall be provided. When persons are on the shaft bottom, a chain ladder, wire rope ladder, or other extension ladders shall be used from the fixed ladder or lower limit of the escape hoist to the shaft bottom.

57.19–112 through 57.19–119 [Reserved]

INSPECTION AND MAINTENANCE

57.19–120 *Mandatory.* A systematic procedure of inspection, testing, and maintenance of shafts and hoisting equipment shall be developed and followed. If it is found or suspected that any part is not functioning properly, the hoist shall not be used until the malfunction has been located and repaired or adjustments have been made.

57.19–121 *Mandatory.* Complete records shall be kept for three years of inspections, tests, and maintenance of shafts and hoisting equipment.

57.19–122 *Mandatory.* Parts used to repair hoists shall have properties that will insure the proper and safe function of the hoist.

57.19–123 *Mandatory.* Wire ropes shall be lubricated or treated with dressing as recommended or approved by the rope manufacturer.

57.19–124 *Mandatory.* Hoist ropes other than those on friction hoists shall be cut off at least six (6) feet above the highest connection to the conveyance at time intervals not to exceed one (1) year unless a shorter time is required by standard 57.19–125, or by conditions of use. The portion of the rope that is cut off shall be examined and inspected by a competent person for damage, corrosion, wear and fatigue.

57.19–125 *Mandatory.* Hoist ropes wound in multiple layers shall have a length cut off at the drum end at least three (3) times during the anticipated life of the rope and whenever necessary as required by stand-

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ard 57.19–126 to distribute the wear at change-of-layer and crossover points. The length of rope cut off shall not be a whole number multiple of the circumference of the drum.

57.19–126 *Mandatory.* Hoist ropes shall be examined over the entire active length at least every month to evaluate wear and possible damage. When such examinations or other inspections reveal that the rope is worn, and at least every six (6) months, caliper measurements or nondestructive tests shall be made at the following locations:

(a) Wherever wear is evident;

(b) Immediately above the socket or clip and above the safety connection;

(c) Where the rope rests on the sheaves;

(d) Where the ropes leave the drums when the conveyances are at the regular stopping point;

(e) Where a layer of rope begins to overlap another layer on the drum; and

(f) At 100 feet intervals (measurements shall be made midway between the last previously calipered points).

57.19–127 [Reserved]

57.19–128 *Mandatory.* Ropes shall not be used for hoisting when they have:

(a) More than six broken wires in any lay;

(b) Crown wires worn to less than 65 percent of the original diameter;

(c) A marked amount of corrosion or distortion;

(d) A combination of similar factors individually less severe than those above but which in aggregate might create an unsafe condition.

57.19–129 *Mandatory.* Hoistmen shall examine their hoists and shall test overtravel, deadman controls, position indicators, and braking mechanisms at the beginning of each shift.

57.19–130 *Mandatory.* Before hoisting persons and to assure that the hoisting compartments are clear of obstructions, empty hoist conveyances shall be operated at least one round trip after—

(a) Any hoist or shaft repairs or related equipment repairs that might restrict or obstruct conveyance clearance;

(b) Any oversize or overweight material or equipment trips that might restrict or obstruct conveyance clearance;

(c) Blasting in or near the shaft that might restrict or obstruct conveyance clearance; or

(d) Remaining idle for one shift or longer.

57.19–131 *Mandatory.* Hoist conveyance connections shall be inspected at least once during any 24-hour period that the conveyance is used for hoisting persons.

57.19–132 *Mandatory.* (a) A performance drop test of hoist conveyance safety catches shall be made at the time of installation, or prior to installation, in a mockup of the actual installation. The test shall be certified to in writing by the manufacturer or by a registered professional engineer performing the test.

(b) After installation and before use, and at the beginning of any seven (7) day period during which the conveyance is to be used, the conveyance shall be suitably rested and the hoist rope slackened to test for the unrestricted functioning of the safety catches and their activating mechanisms.

(c) The safety catches shall be inspected by a competent person at the beginning of any 24-hour period that the conveyance is to be used.

57.19–133 *Mandatory.* Shafts that have not been inspected within the past 7 days shall not be used until an inspection has been conducted by a competent person.

57.19–134 *Mandatory.* Sheaves in operating shafts shall be inspected weekly and kept properly lubricated.

57.19–135 *Mandatory.* Rollers used in operating inclined shafts shall be lubricated, properly aligned, and kept in good repair.

§ 57.20 Miscellaneous.

GENERAL—SURFACE AND UNDERGROUND

57.20–1 *Mandatory.* Intoxicating beverages and narcotics shall not be permitted or used in or around mines. Persons under the influence of alcohol or narcotics shall not be permitted on the job.

57.20–2 *Mandatory.* An adequate supply of potable drinking water shall be provided at all active working areas.

(a) The common drinking cup and containers from which drinking water must be dipped or poured are prohibited.

(b) Where single service cups are supplied, a sanitary container for unused cups and a receptacle for used cups shall be provided.

(c) When water is cooled by ice, the ice shall either be of potable water or shall not come in contact with the water.

(d) Potable water outlets shall be posted.

(e) Potable water systems shall be constructed to prevent backflow or backsiphonage of non-potable water.

57.20–3 *Mandatory.* At all mining operations: (a) Workplaces, passageways, storerooms, and service rooms shall be kept clean and orderly. (b) The floor of every workplace shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used drainage shall be maintained, and false floors, platforms, mats, or other dry standing places shall be provided where practicable. (c) Every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards, as practicable.

57.20–4 [Reserved]

57.20–5 *Mandatory.* Carbon tetrachloride shall not be used.

57.20–6 and 57.20–7 [Reserved]

57.20–8 *Mandatory.* (a) Toilet facilities shall be provided at locations that are compatible with the mine operations and that are readily accessible to mine personnel.

(b) The facilities shall be kept clean and sanitary. Separate toilet facilities shall be provided for each sex except where toilet rooms will be occupied by no more than one person at a time and can be locked from the inside.

57.20–9 *Mandatory.* Dusts suspected of being explosive shall be tested for explosibility. If tests prove positive, appropriate control measures shall be taken.

57.20–10 *Mandatory.* If failure of a water retaining dam will create a hazard it shall be of substantial construction and inspected at regular intervals.

57.20–11 *Mandatory.* Areas where health or safety hazards exist that are not immediately obvious to employees shall be barricaded, or warning signs shall be posted at all approaches. Warning signs shall be readily visible, legible, display the nature of the hazard, and any protective action required.

57.20–12 *Mandatory.* Toxic materials used in conjunction with or discarded from mining or milling of a product shall be plainly marked or labeled so as to positively identify the nature of the hazard and the protective action required.

57.20–13 *Mandatory.* Receptacles with covers shall be provided at suitable locations and used for the disposal of waste food and associated materials. They shall be emptied frequently and shall be maintained in a clean and sanitary condition.

57.20–14 *Mandatory.* No person shall be allowed to consume or store food or beverages in a toilet room nor in any area exposed to a toxic material.

57.20–15 through 57.20–19 [Reserved]

SURFACE ONLY

57.20–20 *Mandatory.* Access to unattended mine openings shall be restricted by gates or doors, or the openings shall be fenced and posted.

57.20–21 *Mandatory.* Upon abandonment of a mine, the owner or operator shall effectively close or fence off all surface openings down which persons could fall or through which persons could enter. Upon or near all such safeguards, trespass warnings and appropriate danger notices shall be posted.

57.20–22 through 57.20–29 [Reserved]

UNDERGROUND ONLY

57.20–30 [Reserved]

57.20–31 *Mandatory.* In areas where dangerous accumulations of water, gas, mud, or fire atmosphere could be encountered, men shall be removed to safe places before blasting.

57.20–32 *Mandatory.* Telephones or other two-way communication equipment with instructions for their use shall be provided for communication from underground operations to the surface.

§ 57.21 Gassy mines.

Gassy mines shall be operated in accordance with all mandatory standards in this part. Such mines shall also be operated in accordance with the mandatory standards in this section. The standards in this section apply only to underground operations.

MINE CLASSIFICATION

57.21–1 *Mandatory.* A mine shall be deemed gassy, and thereafter operated as a gassy mine, if:

(a) The State in which the mine is located classifies the mine as gassy; or

(b) Flammable gas emanating from the orebody or the strata surrounding the orebody has been ignited in the mine; or

(c) A concentration of 0.25 percent or more, by air analysis, of flammable gas emanating only from the orebody or the strata surrounding the orebody has been detected not less than 12 inches from the back, face, or ribs in any open workings; or

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(d) The mine is connected to a gassy mine.

57.21–2 *Mandatory.* Flammable gases detected only while unwatering mines or flooded sections of mines or during other mine reclamation operations shall not be used to permanently classify a mine gassy. During such periods that any flammable gas is present in the mine, the affected areas of the mine shall be operated in accordance with appropriate standards in this Section 57.21.

57.21–3 through 57.21–9 [Reserved]

FIRE PREVENTION AND CONTROL

57.21–10 *Mandatory.* Men shall not smoke or carry smoking materials, matches, or lighters underground. The operator shall institute a reasonable program to ensure that persons entering the mine do not carry smoking materials, matches, or lighters.

57.21–11 *Mandatory.* Except when necessary for welding or cutting, open flames shall not be used in other than fresh air or in places where flammable gases are present or may enter the air current.

57.21–12 *Mandatory.* Immediately before and continuously during welding or cutting with an arc or open flame or soldering with an open flame, in other than fresh air, or in places where methane is present or may enter the air current, a competent person shall test for methane with a device approved by the Secretary for detecting methane.

57.21–13 *Mandatory.* Welding or cutting with an arc or open flame or soldering with an open flame shall not be performed in atmospheres containing more than 1 percent of methane as determined by a device approved by the Secretary for detecting methane.

57.21–14 through 57.21–19 [Reserved]

VENTILATION

57.21–20 *Mandatory.* Main fans shall be:

(a) Installed on the surface.

(b) Installed to permit prompt reversal of airflow.

(c) Powered electrically.

(d) Installed in noncombustible housing provided with noncombustible air ducts.

(e) Offset not less than 15 feet from the nearest side of the mine opening to which the fan is connected. The fan installation shall be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway. Such doors or weak-wall shall be in direct line with possible explosion forces.

(f) Provided with an automatic signal device to give warning or alarm should the fan system malfunction. The signal device shall be so located that it can be seen or heard by a responsible person at all times when persons are underground.

57.21–21 *Mandatory.* Main fans shall be:

(a) Operated continuously while persons are underground except when stopped or slowed down for fan maintenance and/or fan adjustments and related ventilation system adjustments and compliance is made with the provisions of mandatory standard 57.21–24.

(b) Provided with pressure-recording gages which shall be examined daily for good operating condition. The charts of such gages shall be changed after completing one revolution.

(c) Inspected daily and logs kept of such inspections and of fan maintenance. Charts and logs shall be retained for a minimum of one year. Such records and charts shall be available for inspection by the Secretary or his duly authorized representative.

57.21–22 *Mandatory.* The main intake and return air currents in mines shall be *in separate shafts, slopes,* or *drifts, except* that during shaft or slope development, vent tubing may be used in the same opening. Until a second opening to the surface can be provided, single shafts used for intake and return air shall be provided with a curtain wall or partition.

57.21–23 *Mandatory.* When single shafts are used for intake and return the curtain wall or partition shall be constructed of reinforced concrete or equivalent and provided with pressure relief devices.

57.21–24 *Mandatory.* (a) At mines where a single main fan is used and such fan stops, or at mines where multiple main fans are used and all such fans stop, the operator shall take the following immediate action:

(1) Withdraw all persons from the affected active workings.

(2) Deenergize the power in affected active workings.

(3) Withdraw all persons from the mine when a 1.0 percent concentration of methane in air is measured in any active working.

If ventilation has been interrupted for more than 15 minutes, all working places and active workings where methane may

accumulate shall be examined by a competent person(s). The power shall not be restored or persons permitted to reenter the affected active workings until the competent person(s) has determined the methane concentration in such active workings is less than 1.0 percent.

(b) At mines where multiple main fans are used and one or more but not all fans stop, and air flow in intake and return air courses is maintained, the operator shall take the following immediate action:

(1) Monitor the air in all active workings for methane content.

(2) Withdraw all persons from, and deenergize the power, in all active workings when a 1.0 percent concentration of methane in the air is measured.

(3) Comply with all related mandatory standards in section 57.21.

57.21–25 *Mandatory.* When there has been a failure of mine ventilation other than a failure of a main fan as described in standard 57.21–24, the operator shall take the following immediate actions:

(a) Withdraw all persons from the affected active workings.

(b) Deenergize the power in affected active workings. The power shall not be restored or persons permitted to reenter the affected active workings until a competent person(s) has determined that the methane concentration in such active workings is less than 1.0 percent.

57.21–26 [Reserved]

57.21–27 *Mandatory.* When the main fan or fans have been shut down with all men out of the mine, no person, other than those competent to examine the mine, or other authorized persons, shall go underground until the fans have been started and the mine is examined for methane and other hazards and declared safe.

57.21–28 *Mandatory.* Booster fans shall be:

(a) Operated by permissible drive units maintained in permissible condition.

(b) Operated only in air conditioning less than 1.0 percent methane.

(c) Kept in continuous operation when persons are in active workings of the mine affected by such fans.

57.21–29 *Mandatory.* Booster fans shall be:

(a) Provided with an automatic signal device to give warning or alarm should the fan system malfunction. The signal device shall be so located that it can be seen or heard by a responsible person at all times when persons are underground.

(b) Equipped with a device that automatically deenergizes the power in affected active workings should the fan system malfunction.

(c) Provided with air locks, the doors of which open automatically should the fan stop.

(d) Equipped with two sets of controls capable of starting, stopping, and reversing the fans. One set of controls shall be located at the fan. A second set of controls shall be at another location remote from the fans.

57.21–30 *Mandatory.* Auxiliary fans shall be of a permissible type, maintained in permissible condition, so located and operated to avoid recirculation of air. Auxiliary fans shall not be used to ventilate any working place during the interruption of normal mine ventilation. If the auxiliary fan is stopped or fails, the electrical equipment in the affected area shall be stopped and the power disconnected at the power source until ventilation in the affected area is restored. Tests shall be made at the fan for methane before auxiliary fans are started. The air passing over or through auxiliary fan units shall not exceed 1.0 percent of methane.

57.21–31 *Mandatory.* Auxiliary fans shall be inspected by competent persons at least twice each operating shift.

57.21–32 [Reserved]

57.21–33 *Mandatory.* The volume and velocity of the current of air coursed through all active areas shall be sufficient to dilute, render harmless, and carry away methane smoke, fumes, and dust.

57.21–34 *Mandatory.* The quantity of air coursed through the last open crosscut in pairs or sets of entries or through other ventilation openings nearest the face, shall be at least 6,000 cubic feet per minute, or 9,000 cubic feet per minute in longwall and continuous miner sections.

57.21–35 *Mandatory.* At least once each week, a qualified person shall measure the volume of air entering the main intakes and leaving the main returns, the volume of the intake and return of each split, and the volume through the last open crosscuts or other ventilation openings nearest the active faces. Records of such measurements shall be kept in a book on the surface.

57.21–36 *Mandatory.* Permanently installed batter-charging stations and transformer stations in combustible areas shall be ventilated by separate splits of air conducted directly to return air courses.

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Permanently installed means stations that are intended to exist for one year or more.

57.21–37 [Reserved]

57.21–38 *Mandatory.* Changes in ventilation that materially affect the main air current or any split thereof and may affect the safety of persons in the mine shall be made only when the mine is idle. Only those persons engaged in making such changes shall be permitted in the mine during the change. Power shall be removed from the areas affected by the change before work starts and not restored until the effect of the change has been ascertained and the affected areas determined to be safe by a qualified person.

57.21–39 *Mandatory.* If methane gas in excess of 1.0 percent is detected in the air not less than 12 inches from the back, face, or rib of an underground working place or places, adjustments shall be made in the ventilation immediately so that the concentration of methane gas in such air is reduced to 1.0 percent or less. While such changes or adjustments are underway and until they have been achieved, power to electric equipment located in such place shall be cut off, no other work shall be permitted in such place, and due precautions shall be carried out under the direction of the operator or his agent so as not to endanger other areas of the mine.

57.21–40 *Mandatory.* If 1.5 percent or higher concentration of methane gas is present in air returning from an underground working place or places, or is present in the air not less than 12 inches from the back, face, or rib of an underground working place, all men other than those persons referred to in section 104(c) of the Federal Mine Safety and Health Act of 1977 shall be withdrawn from the area of the mine endangered by such methane gas until the concentration of methane in such areas is reduced to 1.0 percent or less.

57.21–41 *Mandatory.* Air that has passed by an opening of any unsealed abandoned area and contains 0.25 percent or more of methane shall be coursed directly to a return airway. Examinations of such air shall be conducted during the preshift examinations required by § 57.21–59.

57.21–42 *Mandatory.* Air that has passed through an abandoned panel or area which is inaccessible or unsafe for inspection shall not be used to ventilate any working place in such mine. No air which has been used to ventilate an area from which the pillars have been removed shall be used to ventilate any working place in such mine, except that such air, if it does not contain 0.25 volume per centum or more of methane, may be used to ventilate enough advancing working places immediately adjacent to the line of retreat to maintain an orderly sequence of pillar recovery on a set of entries.

57.21–43 *Mandatory.* Abandoned areas shall be sealed or ventilated; areas that are not sealed shall be barricaded and posted against unauthorized entry.

57.21–44 *Mandatory.* Seals shall be of substantial construction. Exposed surfaces shall be made of fire-resistant material or, if the commodity mined is combustible, seals shall be made of incombustible material.

57.21–45 *Mandatory.* One or more seals of every sealed area shall be fitted with a pipe and a valve or cap to permit sampling of the atmosphere and measurement of the pressure behind such seals.

57.21–46 *Mandatory.* Crosscuts shall be made at intervals not in excess of 100 feet between entries and between rooms.

57.21–47 [Reserved]

57.21–48 *Mandatory.* Line brattice or other suitable devices shall be installed from the last open crosscut to a point near the face to assure positive air flow to the face of every active underground working place, unless the Secretary or his authorized representative permits an exception to this requirement.

57.21–49 *Mandatory.* Brattice cloth shall be of flame-resistant material.

57.21–50 *Mandatory.* Damaged brattices shall be repaired promptly.

57.21–51 *Mandatory.* Crosscuts shall be provided where practicable at or within eighteen (18) feet of the face of drifts, entries, and rooms before the workings are abandoned in any unsealed area of the mine. When crosscuts are not practicable, line brattice or other suitable means of ventilating shall be provided to the drifts, entries, or rooms.

57.21–52 *Mandatory.* Entries or rooms shall not be started off entries beyond the last open crosscuts, except that room necks and entries not to exceed 18 feet in depth may be turned off entries beyond the last open crosscuts if such room necks or entries are kept free of accumulations

of methane by use of line brattice or other adequate means.

57.21–53 *Mandatory.* Stoppings in crosscuts between intake and return airways, on entries other than room entries, shall be built of solid, substantial material; exposed surfaces shall be made of fire-resistant material or, if the material mined is combustible, stoppings shall be made of incombustible material.

57.21–54 [Reserved]

57.21–55 *Mandatory.* The main ventilation shall be so arranged by means of air locks, overcasts, or undercasts that the passage of trips or persons does not cause interruptions of air currents. Where air locks are impracticable, single doors may be used if they are attended constantly while the areas of the mine affected by the doors are being worked, unless they are operated mechanically or are self-closing.

57.21–56 *Mandatory.* Air locks shall be ventilated sufficiently to prevent accumulations of flammable gas inside the locks.

57.21–57 *Mandatory.* Doors which control the flow of air by being closed shall be kept closed, except when persons or equipment are passing through such doorways. Doors shall be plainly marked to indicate whether they shall be closed or open for ventilation control purposes.

57.21–58 *Mandatory.* Overcasts and undercasts shall be:

(a) Constructed tightly of incombustible material. (b) Of sufficient strength to withstand possible falls from the back. (c) Kept clear of obstruction.

57.21–59 *Mandatory.* Preshift examinations shall be made of all working areas by qualified persons within 3 hours before any workmen, other than the examiners, enter the mine.

57.21–60 [Reserved]

57.21–61 *Mandatory.* Only qualified examiners and persons authorized to correct the dangerous conditions shall enter places or areas where danger signs are posted.

57.21–62 *Mandatory.* Danger signs shall not be removed until the dangerous conditions have been corrected.

57.21–63 [Reserved]

57.21–64 *Mandatory.* Each operator shall use permissible devices accepted by the Secretary of Labor for detecting flammable gases, oxygen deficiency, carbon monoxide, and other air contaminants. Such permissible devices shall be provided and maintained in serviceable and permissible condition. In the detection of flammable gases, a permissible flame safety lamp may be used only as a supplementary testing device.

57.21–65 *Mandatory.* At intervals not greater than seven (7) days, the mine foreman (or other competent person designated by the mine foreman) shall examine for hazardous conditions and for compliance with health and safety standards, and shall test for methane and carbon monoxide. The tests shall be made with approved devices at the following locations:

(a) In the return of each split where it enters the main return;

(b) Adjacent to retreat areas, if accessible;

(c) At seals;

(d) In the main return;

(e) In at least one entry of each intake and return airway;

(f) In idle workings; and

(g) In unsealed abandoned workings, as conditions permit.

57.21–66 *Mandatory.* The mine foreman or other designated official shall read and countersign promptly the reports of the required examinations made by competent persons. Where such reports disclose hazardous conditions, the affected employees shall be so informed and such conditions shall be corrected promptly. If such conditions create an imminent danger, the operator shall withdraw all persons from, or pervent any person from entering, as the case may be, the area affected by such conditions, except those persons referred to in section 104(c) of the Federal Mine Safety and Health Act of 1977, until such danger is abated. A responsible mine official at the next highest level of authority, if such level exists, shall also read and countersign at least weekly the required reports to insure that proper inspections have been made and remedial action taken.

57.21–67 *Mandatory.* All gassy mines shall be ventilated mechanically.

57.21–68 *Mandatory.* Airflow shall be maintained in all intake and return air courses of a mine. When multiple main fans are used, such ventilation systems shall not develop neutral areas (areas without perceptible air movement).

57.21–69 *Mandatory.* In mines ventilated by a combination of multiple blow-

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ing or multiple exhausting main fans, each main fan installation shall be equipped with noncombustible doors designed and positioned so that, in the event of failure of a main fan, these doors will automatically close to prevent air reversal through the fan. The doors shall be located so that they are not in direct line with forces which would come out of the mine, should an explosion occur.

57.21–70 through 57.21–74 [Reserved]

EQUIPMENT

57.21–75 [Reserved]

57.21–76 *Mandatory.* Diesel-powered equipment shall not be taken into or operated in places where methane exceeds 1.0 percent at any point not less than 12 inches from the back, face, or rib.

57.21–77 *Mandatory.* Trolley wires and trolley feeder wires shall be on intake air and shall not extend into the last open crosscut or other ventilation opening. Such wires shall be kept at least 150 feet from pillar recovery workings.

57.21–78 *Mandatory.* Only permissible equipment maintained in permissible condition shall be used beyond the last open crosscut or in places where dangerous quantities of flammable gases are present or may enter the air current.

57.21–79 *Mandatory.* Only permissible distribution boxes shall be used in working places and other places where 1 percent or more of methane may be present or may enter the air current.

57.21–80 *Mandatory.* A methane monitoring device (methane monitor), approved by the Secretary of Labor, shall be installed and properly maintained on all continuous miners and longwall face equipment. The sensing unit of methane monitor shall be positioned as close to the working face as practicable. When the concentration of methane is 1.0 percent or more, the monitor shall give a warning and deenergize the equipment automatically when the concentration reaches 1.5 percent. The methane monitor also shall de-energize such equipment automatically when the monitor is not functioning properly.

57.21–81 [Reserved]

57.21–82 through 57.21–89 [Reserved]

ILLUMINATION

57.21–90 *Mandatory.* Only permissible electric lamps shall be used for portable illumination underground.

57.21–91 through 57.21–94 [Reserved]

EXPLOSIVES

57.21–95 *Mandatory.* Explosives not designated as permissible by the Bureau of Mines or the Mine Safety and Health Administration shall not be used in any underground gassy mine until the Bureau of Mines and State Inspector of Mines have given written approval for each such specific explosive to be used.

57.21–96 *Mandatory.* The Mine Safety and Health Administration and the State Inspector of Mines, in granting approval referred to in standard § 57.21–95, shall provide the operator with a written list of conditions for using the specific explosives covered by the approval and adapted to the mining operation.

57.21–97 *Mandatory.* Blasts in gassy mines shall be initiated electrically, and multiple-shot blasts shall be initiated only with millisecond-delay detonators. Permissible blasting units of capacity suitable for the number of holes in a round to be blasted shall be used unless the round is fired from the surface when all men are out of the mine.

57.21–98 *Mandatory.* Boreholes shall be stemmed as prescribed for the explosives used.

57.21–99 *Mandatory.* When blasting on shift, examinations for methane shall be made immediately before firing each shot or round, and again before other work is performed. Examinations shall be made by competent persons with devices approved by the Secretary for detecting methane.

57.21–100 *Mandatory.* Shots or rounds shall not be fired in places where 1.0 percent or more of methane is present at a point no less than 12 inches from the back, face, or rib. Tests to determine the presence of methane shall be made by a competent person with devices approved by the Secretary for detecting methane.

57.21–101 *Mandatory.* Shots and rounds shall be fired by competent persons.

§ 57.22 [Reserved]

§ 57.23 [Reserved]

§ 57.24 [Reserved]

§ 57.25 [Reserved]

§ 57.26 **Procedures.**

NOTIFICATION OF COMMENCEMENT OF OPERATIONS AND CLOSING OF MINES

57.26–1 Mandatory. The owner, operator, or person in charge of any metal and nonmetal mine shall notify the nearest Metal and Nonmetal Mine Safety and Health Subdistrict Office of the Mine Safety and Health Administration before starting operations of the approximate or actual date mine operation will commence. The notification shall include the mine name, location, the company name, mailing address, person in charge, and whether operations will be continuous or intermittent.

When any mine is closed, the person in charge shall notify the nearest subdistrict office as provided above and indicate whether the closure is temporary or permanent.

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/ACCOUNT CODE

PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 333A.

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Brown. O. P.	5846	236B	Cyprus Coal Company	President	340	Gunnare. Susan M.	234B	5130
Gengler. Darlene H.	5039	160B	Cyprus Coal Company	President	340	Gengler. Darlene H.	160B	5039
Gunnare. Susan M.	5130	234B	Cyprus Coal Company	President	340	Gunnare. Susan M.	234B	5130
Richards. William O.	5135	162B	Cyprus Coal Company	President	340	Gengler. Darlene H.	160B	5039
Spiecha. John J.	5652	242B	Cyprus Coal Company	V.P. - Operations	340	Gunnare. Susan M.	234B	5130
Caffarelli. Jr.. J.	5009	254B	Cyprus Coal Company	Controller	350	Thomas. Julie K.	261B	5398
Thomas. Julie K.	5398	261B	Cyprus Coal Company	Controller	350	Thomas. Julie K.	261B	5398
Bornhofen. Richard G.	5232	248B	Cyprus Coal Company	Controller-Accounting	351	Landres. Leigh	255B	5008
Hoffman. Randy D.	5654	250B	Cyprus Coal Company	Controller-Accounting	351	Thomas. Julie K.	261B	5498
Jackson. Paul R.	5805	253B	Cyprus Coal Company	Controller-Accounting	351	Landres. Leigh	255B	5008
Landres. Vernalee K.	5008	255B	Cyprus Coal Company	Controller-Accounting	351	Landres. Leigh	255B	5008
Schneider. Jr.. Robert H.	5242	251B	Cyprus Coal Company	Controller-Accounting	351	Landres. Leigh	255B	5008
Baum. John E.	5608	252B	Cyprus Coal Company	Planning & Analysis	352	Thomas. Julie K.	261B	5398
Chittenden. John	5180	259B	Cyprus Coal Company	Planning & Analysis	352	Thomas. Julie K.	261B	5398
Esterline. Steven C.	5235	258B	Cyprus Coal Company	Planning & Analysis	352	Thomas. Julie K.	261B	5398
Brown. Beth T.	5142	243B	Cyprus Coal Company	Human Resources	360	Brown. Beth T.	243B	5142
Caylor. John R.	5104	261A	Cyprus Coal Company	Human Resources	360	Brown. Beth T.	243B	5142
Eckstein. Donald A.	5609	246B	Cyprus Coal Company	Human Resources	360	Brown. Beth T.	243B	5142
Hake. James	5140	263A	Cyprus Coal Company	Human Resources	360	Brown. Beth T.	243B	5142
Krivanek. Julie A.	5190	244B	Cyprus Coal Company	Human Resources	360	Brown. Beth T.	243B	5142
Purswell. Robert L.	5185	230B	Cyprus Coal Company	Technical Services	370	Radcliffe. Carolyn L.	225B	5176
Radcliffe. Carolyn L.	5176	225B	Cyprus Coal Company	Technical Services	370	Radcliffe. Carolyn L.	225B	5176
Snow. Stuart R.	5237	226B	Cyprus Coal Company	Technical Services	370	Radcliffe. Carolyn L.	225B	5176
Brasseale. Frederick O.	5071	206B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe. Carolyn L.	225B	5176
Mercier. John M.	5127	204B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe. Carolyn L.	225B	5176
Wilson. Sue *	5822	207B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe. Carolyn L.	225B	5176
Colley. G. Lynn	5125	208B	Cyprus Coal Company	Engineering & Land	372	Radcliffe. Carolyn L.	225B	5176
Hoffer. Richard J.	5121	250A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Mateer. Raymond G.	5124	210B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Milliken. Frank R.	5382	264A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Nalven. James G.	5745	275B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Reeves. James	5126	250A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Skaggs. Gary L.	5175	266A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Trabits. George A.	5103	212B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Unutmaz. Orhan Z.	5113	216B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Baughn. Bruce	5314	220B	Cyprus Coal Company	Construction	373	Radcliffe. Carolyn L.	225B	5176
Cox. Victor L.	5734	224B	Cyprus Coal Company	Construction	373	Radcliffe. Carolyn L.	225B	5176
Hart. Wm. Mark	5426	153B	Cyprus Coal Company	Equipment & Maintenance	374	Gunnare. Sue M.	234B	5130
Miera. LeRoy	5724	214B	Cyprus Coal Company	Equipment & Maintenance	374	Radcliffe. Carolyn L.	225B	5176
McQuarrie. Marie C.	5101	156B	Cyprus Coal Company	Sales & Customer Service	380	McQuarrie. Marie C.	156B	5101
Mills. Richard D. (Dick)	5001	154B	Cyprus Coal Company	Sales & Customer Service	380	McQuarrie. Marie C.	156B	5101
Bunderson. Tracy V.	5668	170B	Cyprus Coal Company	Sales & Customer Service	381	Jann. Jenny M.	177B	5678
Orahant. Donald J.	5769	155B	Cyprus Coal Company	Sales & Customer Service	381	McQuarrie. Marie C.	156B	5101
Graber. Larry	5677	158B	Cyprus Coal Company	Sales & Customer Service	381	McQuarrie. Marie C.	156B	5101

*Temporary.

†Call directly regarding work, not administrative support.

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/ACCOUNT CODE

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Deal. Larry M.	5812	181B	Cyprus Coal Company	Contract Administration	383	Jann. Jenny M.	177B	5678
Jann. Jenny	5678	177B	Cyprus Coal Company	Contract Administration	383	Jann. Jenny M.	177B	5678
Norrell. Gerald B.	5354	168B	Cyprus Coal Company	Contract Administration	383	Jann. Jenny M.	177B	5678
Canter. Thomas C.	5114	174B	Cyprus Coal Company	Transportation	384	MacMillan. Janice L.	177B	5827
Irr. Thomas J.	5811	172B	Cyprus Coal Company	Transportation	384	MacMillan. Janice L.	177B	5827
MacMillan. Janice L.	5827	177B	Cyprus Coal Company	Transportation	384	MacMillan. Janice L.	177B	5827
Vogel. Craig G.	5239	187B	Cyprus Coal Company	Transportation	384	MacMillan. Janice L.	177B	5827
Burcar. Victoria L.	5685	119A	Cyprus Gold Company	Controller	457	Notheison. Betty A.	112A	5621
Coyner. J. Michael	5650	115A	Cyprus Gold Company	Controller	457	Notheisen. Betty A.	112A	5621
Harlan. Howard	5191	116A	Cyprus Gold Company	Acquisitions & Development	457	Dolan. Joanne L.	110A	5271
Thomas. Steve	5219	117A	Cyprus Gold Company	Acquisitions & Development	457	Dolan. Joanne L.	110A	5271
Martin. Michael O.	5177	113A	Cyprus Gold Company	Executive Vice President	457	Notheisen. Betty A.	112A	5621
Notheisen. Betty A.	5621	112A	Cyprus Gold Company	Executive Vice President	457	Notheisen. Betty A.	112A	5621
Radies. Jr.. Ernest A. †	5338	120A	Cyprus Gold Company	Controller	457	Notheisen. Betty A.	112A	5621
Tyszkiewicz. Kenneth A.	5002	118A	Cyprus Gold Company	Human Resources	457	Notheisen. Betty A.	112A	5621
Bauer. Herman L.	5270	109A	Cyprus Gold Exploration Co.	Exploration	457	Dolan. Joanne L.	110A	5271
Burton. William O.	5272	108A	Cyprus Gold Exploration Co.	Exploration	457	Dolan. Joanne L.	110A	5271
Dolan. Joanne	5271	110A	Cyprus Gold Exploration Co.	Exploration	457	Dolan. Joanne L.	110A	5271
Matlock. James A.	5627	105A	Cyprus Gold Exploration Co.	Exploration	457	Dolan. Joanne L.	110A	5271
Warnaars. Fred	5833	106A	Cyprus Gold Exploration Co.	Exploration	457	Dolan. Joanne L.	110A	5271
Leland. Stanley S. †	5637	121A	Cyprus Gold Exploration Co.	Drafting	457	Dolan. Joanne L.	110A	5271
Lamar. Richard S.	5157	S208	Cyprus Industrial Minerals	V.P. Sr. Scientist	100	Cloud. Mary S.	S245	5720
Longhofer. Deborah K.	5138	S237	Cyprus Industrial Minerals	President	100	Longhofer. Deborah K.	S237	5138
Wolf. Philip C.	5084	S238	Cyprus Industrial Minerals	President	100	Longhofer. Deborah K.	S237	5138
Lessner. George O.	5460	S236	Cyprus Industrial Minerals	Sr. VP-Sales & Marketing	110	Longhofer. Deborah K.	S237	5138
Beall. Stewart	5463	S100	Cyprus Industrial Minerals	Sales/Marketing	111	Wielenga. Sylvia J.	S127	5486
Johanson. Irene	5429	S243	Cyprus Industrial Minerals	Sales	111	Longhofer. Deborah K.	S237	5138
Metcalf. Del	5736	S126	Cyprus Industrial Minerals	Sales	111	Wielenga. Sylvia J.	S127	5486
Thornton. C. M.	5489	S128	Cyprus Industrial Minerals	Sales	111	Wielenga. Sylvia J.	S127	5486
Wielenga. Sylvia J.	5486	S127	Cyprus Industrial Minerals	Sales	111	Wielenga. Sylvia J.	S127	5486
Cavanagh. Bill A.	5021	S116	Cyprus Industrial Minerals	Sales - Paper	112	McCain. Cynthia	S120	5210
McCain. Cynthia	5210	S120	Cyprus Industrial Minerals	Sales - Paper	112	McCain. Cynthia	S120	5210
Roeder. Robert E.	5842	S122	Cyprus Industrial Minerals	Sales - Paper	112	McCain. Cynthia	S120	5210
Williams. Gary R.	5830	S118	Cyprus Industrial Minerals	Sales - Paper	112	McCain. Cynthia	S120	5210
Padden. Roger M.	5433	S146	Cyprus Industrial Minerals	Sales-Cosmetic.Pharm..Food	114			
Heath III. Sargent	5489	S134	Cyprus Industrial Minerals	Sales-Plastic. Rubber	116			
Sedillos. Sherry	5052	S102	Cyprus Industrial Minerals	Transportation	118	Everitt. Nicki	S137	5487
Sesson. Fernando †	5053	S114	Cyprus Industrial Minerals	Sales Service	118	Everitt. Nicki	S137	5487
Borowicz. Ginnie	5406	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Craig. Stella B.	5413	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Davidson. Jana	5786	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Jackson. Karen M.	5445	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Kiney. Joseph	5414	S230	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
King. Carolyn	5412	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Landolt. Brenda	5446	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Olsen. Karen D.	5410	S102	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Radies. Mary J.	5494	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Woods. Julie F.	5447	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/ACCOUNT CODE

PLEASE SEND ANY CHANGES TO THIS LIST TO M. J. NAGAN, MAIL CODE 333A.

Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Evans. Gary L.	5478	S104	Cyprus Industrial Minerals	Traffic	120	Everitt. Nicki	S137	5487
Mied. B.	5425	S106	Cyprus Industrial Minerals	Traffic	120	Everitt. Nicki	S137	5487
King. David	5053	S102	Cyprus Industrial Minerals	Data Management	121	Everitt. Nicki	S137	5487
Thorpe. J. Tim	5480	S112	Cyprus Industrial Minerals	Sales-Administration	121	Everitt. Nicki	S137	5487
Anderson. Janet L.	5443	S140	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Everitt. Nedra M. (Nicki)	5487	S137	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Pratt. Will *	5826	S138	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Sevy, W.	5431	S142	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Young. Darrell E.	5465	S144	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Baker. R. Doug	5701	S136	Cyprus Industrial Minerals	Market Development	131	Everitt. Nicki	S137	5487
Held. Merle D.	5479	S132	Cyprus Industrial Minerals	Market Development	131	Everitt. Nicki	S137	5487
Buettner. R. J. (Jack)	5472	S246	Cyprus Industrial Minerals	Operations	140	Felger. Joanne	S249	5476
Felger. Joanne	5476	S249	Cyprus Industrial Minerals	Operations	140	Felger. Joanne	S249	5476
Nichols. Carl W.	5693	S252	Cyprus Industrial Minerals	Operations	140	Felger. Joanne S.	S249	5476
Tiritas. E. P. (Manos)	5844	S250	Cyprus Industrial Minerals	Chief Engineer	142	Felger. Joanne S.	S249	5476
Weeks. Richard L.	5355	S215	Cyprus Industrial Minerals	Resource Development	143	Felger. Joanne S.	S249	5476
Cloud. Mary	5720	S245	Cyprus Industrial Minerals	Quality Assurance/Prod. Safety	160	Cloud. Mary S.	S245	5720
Zazenski. Richard J.	5484	S244	Cyprus Industrial Minerals	Quality Assurance/Prod. Safety	160	Cloud. Mary S.	S245	5720
Gill. Gordon	5182	S242	Cyprus Industrial Minerals	Product Safety	161	Cloud. Mary S.	S243	5720
Fischer. Donald	5435	S251	Cyprus Industrial Minerals	Mgr. Quality Assurance	163	Cloud. Mary S.	S245	5720
Bauer. Linda L.	5134	S200	Cyprus Industrial Minerals	Human Resources & Admn.	170	Bauer. Linda L.	S200	5134
Gleason. Terry J.	5141	S202	Cyprus Industrial Minerals	Human Resources & Admn.	170	Bauer. Linda L.	S200	5134
Phillips. Key L.	5470	S204	Cyprus Industrial Minerals	Human Resources-Safety&Ind.Hyg.	171	Bauer. Linda L.	S200	5134
Bush. Janette S.	5336	S212	Cyprus Industrial Minerals	Human Resources	173	Bauer. Linda L.	S200	5134
Fickle. Robin L.	5601	S207	Cyprus Industrial Minerals	Human Resources	173	Bauer. Linda L.	S200	5134
Rhodes. Tom C.	5802	S228	Cyprus Industrial Minerals	Controller	180		S223	5841
Fritz. Kimberly *	5758	S160	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Garceau. George †	5801	S230	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Horn. Jennifer	5837	S158	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Horne. Stephen *	5758	S160	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
McCoy, George C. †	5790	S154	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Schmutz. Dale J.	5836	S162	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Tuffield. Michael	5772	S156	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Turner. Susan *	5758	S149	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Ceranowicz. Jo †	5773	S155	Cyprus Industrial Minerals	Controller-Accounts Payable	181		S223	5841
Cole. Rosemary L. †	5326	S159	Cyprus Industrial Minerals	Controller-Accounts Payable	181		S223	5841
Ricardo. Mary L. †	5771	S155	Cyprus Industrial Minerals	Controller-Accounts Payable	181		S223	5841
Windholz. Joyce L. †	5088	S219	Cyprus Industrial Minerals	Controller-Accounts Receivable	181		S223	5841
Perkins. Diana K.	5482	S148	Cyprus Industrial Minerals	Controller-Budgets & Reporting	182		S223	5841
Wambolt. Larry O.	5784	S224	Cyprus Industrial Minerals	Controller-Budgets & Reporting	182		S223	5841
Borrelli. Mary A. †	5364	S253	Cyprus Industrial Minerals	International	190		S245	5439
Easter. Carol *	5439	S245	Cyprus Industrial Minerals	International	190	Easter. Carol	S245	5439
McLaughlin. Mike*	5352	S253	Cyprus Industrial Minerals	International	190		S245	5439
Murino. Louis O.	5619	S260	Cyprus Industrial Minerals	International	190		S245	5439

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Sabatoni, Maria S.	5738	S255	Cyprus Industrial Minerals	International-Export Sales	191		S245	5439
Bottorff, Mary Lou	5221	216A	Cyprus Metals Company	President	445	Bottorff, Mary Lou	216A	5221
Compton, J. C.	5263	200A	Cyprus Metals Company	President	445	Bottorff, Mary Lou	216A	5221
Mooney, F. Steve	5289	217A	Cyprus Metals Company	Sr. V.P. Operations	445	Bottorff, Mary Lou	216A	5221
Schillinger, Maxine	5282	241A	Cyprus Metals Company	Technology	449	Schillinger, Maxine I.	241A	5282
McDonald, Kerry A.	5356	244A	Cyprus Metals Company	V.P.-Business Development	449	Schillinger, Maxine I.	241A	5282
Sturgess, Jamie	5782	237A	Cyprus Metals Company	Environmental Affairs	449	Schillinger, Maxine I.	241A	5282
Bell, Robert H.	5225	233A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Blish, Susan A.	5139	219A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Brost, Joyce V.	5296	228A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Bruxvoort, Harlan	5659	231A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Caldwell, Steven W.	5218	235A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
DeMier, Patty L.	5261	219A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Earle, Carol E.	5358	222A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Lodenkamper, John	5721	230A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Loewen, Robert J.	5209	232A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
McHugh, Larry F.	5477	218A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
McKeenan, J. *	5295	224A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Spenner, Kathleen M.	5788	236A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Work, James R.	5038	234A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Adcock, J. M.	5108	206A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Byrne, Vicki P.	5160	207A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Cooper, Cheryl	5274	225A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Gaylord, Laurie M.	5226	216A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Horton, Peggy J. †	5204	214A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Lantz, Darlene C.	5161	213A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Loken, Bruce G.	5405	205A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
McFerrin, Mildred J.	5658	212A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Noel, Sharon K. †	5033	204A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Pereira, M. W.	5636	202A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Zang, Daniel G.	5244	203A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Crowl, Chris L.	5253	208A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Glau, Linda L.	5162	210A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
LeBlanc, Thomas J.	5288	260A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Pergrem, Dwayne W.	5148	259A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Duncan, John C.	5255	331C	Cyprus Minerals Company	Chairman of the Board	420	Frank, V. Florence	300C	5051
Barr, Kenneth J.	5050	301C	Cyprus Minerals Company	President	430	Frank, V. Florence	300C	5051
Frank, V. Florence	5051	300C	Cyprus Minerals Company	President	430	Frank, V. Florence	300C	5051
Bellum, Donald P.	5131	302C	Cyprus Minerals Company	Office of the President	430	Frank, V. Florence	300C	5051
Anderson, J. R. (Drew)	5256	311C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Carey, Paul A.	5469	309C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Cornette, Daniel J.	5629	310C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Griffith, Jr., John P.	5072	322C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Kelly, William S.	5229	308C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Lebert, Jr., Karl P.	5483	321C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Moomy, Ruthann C.	5055	307C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Ratcliff, Donald B.	5238	320C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Skeens, Janie	5491	338C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Taraba, John	5245	313C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Wilson, Mark A.	5361	312C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Anderson, Debbie K.	5010	125C	Cyprus Minerals Company	Law	435	Anderson, Debbie K.	125C	5010

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Anderson. Kristine K.	5020	109C	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Borlase. Priscilla S.	5063	118C	Cyprus Minerals Company	Law	435	Priddy. Kathy M.	115C	5030
Bird. James H.	5335	282B	Cyprus Minerals Company	Law - Land	435	Priddy. Kathy M.	115C	5030
Brotzman. Michael F.	5308	200B	Cyprus Minerals Company	Law - Land	435	Locks. Jocelyn. J.	280B	5669
Chandler. Barbara A.	5428	125C	Cyprus Minerals Company	Law	435	Chandler. Barbara A.	125C	5428
Erickson. Joyce P.	5079	115C	Cyprus Minerals Company	Law	435	Erickson. Joyce P.	115C	5079
Felger. Charles T.	5158	102B	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Friedman. Deborah J.	5657	114C	Cyprus Minerals Company	Law	435	Priddy. Kathy M.	115C	5030
Gardiner, Craig A.	5013	117C	Cyprus Minerals Company	Law	435	Erickson. Joyce P.	115C	5079
Godell. Ralph W.	5014	116C	Cyprus Minerals Company	Law	435	Erickson. Joyce P.	115C	5079
Gormley. Kathleen J.	5824	123C	Cyprus Minerals Company	Law	435	Chandler. Barbara A.	125C	5428
Huffman. Dale E.	5155	110C	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Kirchhoff. Bruce C.	5402	122C	Cyprus Minerals Company	Law	435	Chandler. Barbara A.	125C	5428
Landrum. Debra A.	5029	111C	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Locks. Jocelyn J.	5669	280B	Cyprus Minerals Company	Law	435	Locks. Jocelyn J.	280B	5669
Loughrey. Kevin	5062	124C	Cyprus Minerals Company	Law	435	Anderson. Debbie K.	125C	110
Miley. Karen	5455	104B	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Miller. Pamela A.	5012	119C	Cyprus Minerals Company	Law	435	Locks, Jocelyn J.	280B	5669
Priddy. Kathy M.	5030	115C	Cyprus Minerals Company	Law	435	Priddy, Kathy M.	115C	5030
Rodine. Phyllis *	5027	108C	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Shellhaas. S. Scott	5016	284B	Cyprus Minerals Company	Law	435	Locks. Jocelyn J.	280B	5669
Sherman. Sherrill A.	5085	121C	Cyprus Minerals Company	Law	435	Anderson. Debbie K.	125C	5010
Martin. Dianne L.	5058	315C	Cyprus Minerals Company	Chief Financial Officer	454	Martin. Dianne L.	315C	5058
Stone. Jr.. Chester B.	5057	314C	Cyprus Minerals Company	Chief Financial Officer	454	Martin. Dianne L.	315C	5058
Aaron. Kim A. *	5064	303A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Bensing. J. J.	5090	373A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Brady. Patricia J.	5188	367A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Dardanis. Mona C. *†	5201	304A	Cyprus Minerals Company	Property Management	481	Matthis. Karen	380A	5315
Gaskins. Lee T.	5087	370A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Matthis. Karen	5315	380A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Simmons. Jill K. *	5154	305A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Watt. Gina L.	5268	371A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Yoshida. Alan S.	5017	368A	Cyprus Minerals Company	Property Management	481	Matthis. Karen R.	380A	5315
Bury. Julie L.	5026	315C	Cyprus Minerals Company	Controller	500	Bury. Julie L.	315C	5026
Malys. Gerald J.	5060	316C	Cyprus Minerals Company	Controller	500	Bury. Julie L.	315C	5026
Oowell. Billie S. †	5381	354A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Driscoll. Veronica †	5317	359A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Fisher. Gregory A. †	5243	350A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
French. Claudene †	5044	357A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Fulgham. William N.	5762		Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Kear. Stephany †	5845	358A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Louis. Patricia A. (Patt) †	5171	356A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Pine. Julie A. †	5257	360A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Sheppard. Alan L. †	5309	361A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Sins. Paula F. †	5078	351A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Wittrig. Meredeth A. †	5385	355A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Brown. Rose L. †	5334	240C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Graybill. Ron	5194	233C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Hakimi. Farokh S.	5106	229C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Haugh. O. C.	5025	237C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
RatcliffF. Deborah S.	5116	235C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Strain. Robert O. †	5333	231C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Studer. Leslie R. †	5203	228C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Wegher. Linda	5208	230C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Williams. Patricia O.	5206	200C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Wilson, Linda G. †	5187	236C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia D.	200C	5206
Armbrister, Michael L. †	5031	234C	Cyprus Minerals Company	Treasurer - Credit & Collection	509	Williams, Patricia D.	200C	5206
Quinn, Sheryl D. †	5330	238C	Cyprus Minerals Company	Treasurer - Credit & Collection	509	Williams, Patricia D.	200C	5206
Arellano, Lidya J. †	5329	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5316
Born, Charolette E. †	5097	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
Davey, Maybelle S. †	5321	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
May, Janice L. †	5322	300A	Cyprus Minerals Company	Accounts Payable	510	Martin, Marcia J.	316A	5262
McLaughlin, Mary †	5327	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
Phinpraphat, Jeannine †	5320	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
Popish, Marilyn F. †	5069	374A	Cyprus Minerals Company	Accounts Payable	510	Martin, Marcia J.	316A	5262
Foley, Charles A. †	5083	308A	Cyprus Minerals Company	Capital Investment	510	Martin, Marcia J.	316A	5262
Schulte, J. M. †	5070	313A	Cyprus Minerals Company	Capital Investment	510	Martin, Marcia J.	316A	5262
Burke, Jacklyn †	5781	332A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Doster, E. Elizabeth	5089	307A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Gonzales, Marta G. †	5723	326A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Hill, Gail M. †	5241	302A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Knope, Paul T.	5806	321A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Mandell, Carol L.	5075	319A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Martin, Marcia J.	5262	316A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Monheit, Patricia E.	5312	320A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Monkus, Gail A.	5748	331A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Meier, Robert H.	5809	318A	Cyprus Minerals Company		511	Martin, Marcia J.	316A	5262
Bradley, Carol M.	5307	318C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Gaylord, Joy G.	5202	323C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Kent, Vicky B.	5651	319C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Adams, Susan E. †	5276	336A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Comer, K. Douglas †	5752	346A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Knoll, Kevin F. †	5096	334A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Ward, Sandra S. †	5655	348A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Bolger, James J. †	5765	103A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Duffy, Brett J. †	5488	285B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Evans, Alice L.	5302	128A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Garner, Andrietta C.	5331	138B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Krueger, Don C. †	5094	260B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Loew, George R.	5034	129A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Ryckman, Jeffrey S.	5370	132A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
West, Arnold J.	5006	130A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Yaros, Mary †	5628	102A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Behm, David W.	5383	139B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Buckley, Leonard J.	5430	170A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Christenson, Larry G.	5794	133B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Ouwe, Scott A.	5796	145B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Harp, Julie K.	5820	173A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Hebert, Fred J.	5607	175A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Hoffman, Roger M.	5035	136B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Jerez, Rodrigo	5795	135B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Jones, Byron C.	5197	141B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Landres, Ted B.	5803	142B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Lumley, L. Bruce	5793	174A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Magnuson, Wm. S.	5613	137B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Maher, Henry E. (Hank)	5797	145A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Mason, M. Chellie	5098	146B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
McCabe, Jon M.	5815	134B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Nace, R. H. (Dick)	5077	144B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820

*Temporary.

†Call directly regarding work, not administrative support.

ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/ACCOUNT CODE

PLEASE SEND ANY CHANGES TO THIS LIST TO M. J. MAGAN. MAIL CODE 333A.

Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Piwowarski. Anthony J.	5192	176A	Cyprus Minerals Company	System Development	532	Harp. Julie K.	173A	5820
Schwing. Lee	5828	177A	Cyprus Minerals Company	System Development	532	Harp. Julie K.	178A	5820
Strandjord. Mark C.	5036	178A	Cyprus Minerals Company	System Development	532	Harp. Julie K.	173A	5820
Whelpdale. David	5393	171A	Cyprus Minerals Company	System Development	532	Harp. Julie K.	173A	5820
Bulford. Jennifer L. †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Droppelman. James W. †	5275	106C	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Frederick. Diana *	5043	271A	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
James. Van †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Jefferies. Robert A. †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Mares. Julie M. †	5043	264B	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Pierce. Medra A. †	5043	106C	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Whigham. Edward G. †	5042	264B	Cyprus Minerals Company	Computer Operations	533			
Coburn. Dennis R.	5718	337C	Cyprus Minerals Company	Business Development-Clay	545	Kitchell. Carole T.	218C	5178
Harrington. Michael S.	515D	220C	Cyprus Minerals Company	Business Development	545	Kitchell. Carole T.	218C	5178
Kitchell. Carol	5178	218C	Cyprus Minerals Company	Business Development	545	Kitchell. Carole T.	218C	5178
Cox. Mark F.	5119	227C	Cyprus Minerals Company	Business Development	546	Kitchell. Carole T.	218C	5178
Maguire. Samuel G.	5151	219C	Cyprus Minerals Company	Business Development	546	Kitchell. Carole T.	218C	5178
Morris. James R.	5228	221C	Cyprus Minerals Company	Business Development	547	Kitchell. Carole T.	218C	5178
Schofield. Donald W.	5728	224C	Cyprus Minerals Company	Business Development	547	Kitchell. Carole T.	218C	5178
Wells. Robert	5348	223C	Cyprus Minerals Company	Business Development	547	Kitchell. Carole T.	218C	5178
Abercrombie. Gail A.	5216	305C	Cyprus Minerals Company	Public & Gov't Affairs	572	Martin. Dianne L.	315C	5058
Ball. Lola A.	5375	303C	Cyprus Minerals Company	Public & Gov't Affairs	572	Martin. Dianne L.	315C	5058
Hagman. R. H. (Dick)	5362	329C	Cyprus Minerals Company	Public & Gov't Affairs	572	Frank. V. Florence	300C	5051
Rounds. Michael	5186	306C	Cyprus Minerals Company	public & Gov't Affairs	572	Martin. Dianne L.	315C	5058
Andrews. C. R. †	5340	185B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Aydt. Greg D.	5249	164B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Marikis. Scott †	5603	169B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Pittenger. Mark †	5279	166B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Sackett. Sallie K. †	5217	173B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Studer. Stephen †	5346	171B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Flemming. J. D. (David)	5193	364A	Cyprus Minerals Company	Tax	576	Matthis. Karen R.	380A	5315
Morley. Susan	5040	362A	Cyprus Minerals Company	Tax	576	Matthis. Karen R.	380A	5315
Thienes. Katharine S.	5137	366A	Cyprus Minerals Company	Tax	576	Matthis. Karen R.	380A	5315
Vogels. Robert	5810	365A	Cyprus Minerals Company	Tax	576	Matthis. Karen R.	380A	5315
Fujita. Peggy	5319	183A	Cyprus Minerals Company	Health Services-Medical	580	Fujita. Peggy	183A	5319
Kluck. Clarence J., M.D.	5387	185A	Cyprus Minerals Company	Health Services-Medical	580	Fujita. Peggy	183A	5319
Tiffin. D. Steve	5388	180A	Cyprus Minerals Company	Health Services-Medical	580	Fujita. Peggy	183A	5319
Barrett. Thomas R.	5371	207C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Brier. Steve *	5408	203C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Felton. Diane A.	5128	205C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Miller. Donald O.	5252	202C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Peluso. Thomas F.	5076	206C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Pepparo. Gerard	5041	201C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Robinette. Patty *	5408	203C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Strub. Rosemary S.	5213	200C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Willcox. John S.	5328	208C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Maier. David C. †	5684	172A	Cyprus Minerals Company	System Development	582	Harp. Julie K.	173A	5820
Bondch. Sue E.	5672	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Bondch. Sue E.	333A	5672
Greeenwood. Melissa M.	5000	150B	Cyprus Minerals Company	Office Services-Reception	585	Greenwood. Melissa	150B	5000

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/ACCOUNT CODE

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Isaacs, Terry C.	5022	5C	Cyprus Minerals Company	Office Services-Reprographics	585	Isaacs, Terry C.	5C	5022
Middleton, Mary Lou	5166	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Middleton, Mary Lou	333A	5166
Nagan, Nancy J.	5670	333A	Cyprus Minerals Company	Office Services	585	Nagan, Nancy J.	333A	5670
Roe, Matt S.	5022	5C	Cyprus Minerals Company	Office Services-Reprographics	585	Roe, Matt S.	5C	5022
Von Rentzell, Sandy K.	5675	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Von Rentzell, Sandy	333A	5675
Vruwink, Dot B.	5146	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Vruwink, Dot B.	333A	5146
Wahrman, Jeanette M.	5673	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Wahrman, Jeanette M.	333A	5673
Edwards, Ruth M.	5019	2C	Cyprus Minerals Company	Office Services-Mail Room	586	Edwards, Ruth M.	2C	5019
Roberts, Sheri L.	5047	4C	Cyprus Minerals Company	Office Services-Rec. Retention	586	Roberts, Sheri L.	4C	5047
Tomasino, Tera	5152	3C	Cyprus Minerals Company	Office Services-Telephone/Records	586	Tomasino, Tera	3C	5152
Wilson, Bruce	5368	3C	Cyprus Minerals Company	Office Services-Supplies	586	Wilson, Bruce	3C	5368
Wisdom, Cheryl A.	5023	324C	Cyprus Minerals Company	Office Services	586	Schultz, Anna M.	300C	5061
Capobianco, Debra * †	5081	126C	Cyprus Minerals Company	Library/Information Center	587			
Gayner, Trudy * †	5081	126C	Cyprus Minerals Company	Library/Information Center	587			
Smart, Marriott W. †	5365	107C	Cyprus Minerals Company	Library/Information Center	587			
Hann, Herbert M. *	5254	176B	Cyprus Minerals Company	Consultant	589	Schultz, Anna M.	300C	5061
Mulryan, H. T. (Joe)	5153	330C	Cyprus Minerals Company	Sr. V.P.-Corp. Admin.	589	Schultz, Anna M.	300C	5061
Schultz, Anna M.	5061	300C	Cyprus Minerals Company	Sr. V.P.-Corp. Admin.	589	Schultz, Anna M.	300C	5061
Alme, Kent F.	5345	213C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Anderson, Debora L.	5380	212C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Hunt, Reuel J.	5378	216C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Kerschen, Carl E.	5093	222C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Marshall, Jean	5366	217C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E	218C	5259
Moser, Janice G.	5347	214C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Poganski, Gregory L.	5311	209C	Cyprus Minerals Company	Human Resources-Benefits Plans	592	Wagoner, Jean E.	218C	5259
Quinn, Kevin	5360	215C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Schaumburg, Erica F.	5384	243C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Sheremeta, Frank	5236	242C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Wagoner, Jean E.	5259	218C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Morse, Louis H.	5461	326C	Cyprus Minerals Company	Market Strategy-CIM & Coal	595	Schultz, Anna M.	300C	5061
Smith, Julie H.	5742	325C	Cyprus Minerals Company	Market Strategy-Coal	595	Schultz, Anna M.	300C	5061
DeCesare, Richard S.	5230	328C	Cyprus Minerals Company	Market Strategy-Metals	596	Schultz, Anna M.	300C	5061
Steckley, Robert C.	5172	317C	Cyprus Minerals Company	Market Strategy-Metals	596	Schultz, Anna M.	300C	5061
Burzinski, Susan *†	5823	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Cole, Michael *†	5376	335A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Erb, Larry *†	5777	310A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Hinkle, Leslie *†	5394	322A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Levinbook, Gary *†	5817	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Miller, Ric *†	5492	317A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Phoenix, Steve *†	5394	322A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Robinson, Rick *†	5823	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Sutterer, Tom *†	5823	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME

PLEASE SEND ANY CHANGES TO THIS LIST TO M. J. MAGAN, MAIL CODE 333A.

Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Aaron, Kim A. *	5064	303A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Abercrombie, Gail A.	5216	305C	Cyprus Minerals Company	Public & Gov't Affairs	572	Martin, Dianne L.	315C	5058
Adams, Susan E. †	5276	336A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Adcock, J. M.	5108	206A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Alme, Kent F.	5345	213C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Anderson, Debbie K.	5010	125C	Cyprus Minerals Company	Law	435	Anderson, Debbie K.	125C	5010
Anderson, Debora L.	5380	212C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Anderson, J. R. (Drew)	5256	311C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Anderson, Janet L.	5443	5140	Cyprus Industrial Minerals	Marketing	122	Everitt, Nicki	5137	5487
Anderson, Kristine K.	5020	109C	Cyprus Minerals Company	Law	435	Landrum, Debra A.	111C	5029
Andrews, C. R. †	5340	185B	Cyprus Minerals Company	Auditing & Procedures	574	Martin, Dianne L.	315C	5058
Arellano, Lidya J. †	5329	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5316
Armbrister, Michael L. †	5031	234C	Cyprus Minerals Company	Treasurer - Credit & Collection	509	Williams, Patricia D.	200C	5206
Aydt, Greg O.	5249	164B	Cyprus Minerals Company	Auditing & Procedures	574	Martin, Dianne L.	315C	5058
Baker, R. Doug	5701	5136	Cyprus Industrial Minerals	Market Development	131	Everitt, Nicki	5137	5487
Ball, Lola A.	5375	303C	Cyprus Minerals Company	Public & Gov't Affairs	572	Martin, Dianne L.	315C	5058
Barr, Kenneth J.	5050	301C	Cyprus Minerals Company	President	430	Frank, V. Florence	300C	5051
Barrett, Thomas R.	5371	207C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Bauer, Herman L.	5270	109A	Cyprus Gold Exploration Co.	Exploration	457	Oolan, Joanne L.	110A	5271
Bauer, Linda L.	5134	5200	Cyprus Industrial Minerals	Human Resources & Admn.	170	Bauer, Linda L.	5200	5134
Baughn, Bruce	5314	220B	Cyprus Coal Company	Construction	373	Radcliffe, Carolyn L.	225B	5176
Baum, John E.	5608	252B	Cyprus Coal Company	Planning & Analysis	352	Thomas, Julie K.	261B	5398
Beall, Stewart	5463	5100	Cyprus Industrial Minerals	Sales/Marketing	111	Wielenga, Sylvia J.	5127	5486
Behm, David W.	5383	139B	Cyprus Minerals Company	System Developnent	532	Harp, Julie K.	173A	5820
Bell, Robert H.	5225	233A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Bellum, Donald P.	5131	302C	Cyprus Minerals Company	Office of the President	430	Frank, V. Florence	300C	5051
Bensing, J. J.	5090	373A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Bird, James M.	5335	282B	Cyprus Minerals Company	Law - Land	435	Priddy, Kathy M.	115C	5030
Blish, Susan A.	5139	219A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Bolger, James J. †	5765	103A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Bondch, Sue E.	5672	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Bondch, Sue E.	333A	5672
Borlase, Priscilla S.	5063	118C	Cyprus Minerals Company	Law	435	Priddy, Kathy M.	115C	5030
Born, Charolette E. †	5097	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
Bornhofen, Richard G.	5232	248B	Cyprus Coal Company	Controller-Accounting	351	Landres, Leigh	255B	5008
Borowicz, Ginnie	5406	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
Borrelli, Mary A. †	5364	5253	Cyprus Industrial Minerals	International	190		5245	5439
Bottorff, Mary Lou	5221	216A	Cyprus Metals Company	President	445	Bottorff, Mary Lou	216A	5221
Bradley, Carol M.	5307	318C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Brady, Patricia J.	5188	367A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Brasseale, Frederick O.	5071	206B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe, Carolyn L.	225B	5176
Brier, Steve *	5408	203C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Brost, Joyce Y.	5296	228A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Brotzman, Michael F.	5308	200B	Cyprus Minerals Company	Law - Land	435	Locks, Jocelyn, J.	280B	5669
Brown, Beth T.	5142	243B	Cyprus Coal Company	Human Resources	360	Brown, Beth T.	243B	5142
Brown, O. P.	5846	236B	Cyprus Coal Company	President	340	Gunnare, Susan M.	234B	5130
Brown, Rose L. †	5334	240C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia D.	200C	5206
Bruxvoort, Harlan	5659	231A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Buckley, Leonard J.	5430	170A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Buettner, R. J. (Jack)	5472	5246	Cyprus Industrial Minerals	Operations	140	Felger, Joanne	5249	5476
Bulford, Jennifer L. †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
Bunderson, Tracy V.	5668	170B	Cyprus Coal Company	Sales & Customer Service	381	Jann, Jenny M.	177B	5678
Burcar, Victoria L.	5685	119A	Cyprus Gold Company	Controller	457	Wotheison, Betty A.	112A	5621

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Burke, Jacklyn †	5781	332A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Burton, William D.	5272	108A	Cyprus Gold Exploration Co.	Exploration	457	Dolan, Joanne L.	110A	5271
Bury, Julie L.	5026	315C	Cyprus Minerals Company	Controller	500	Bury, Julie L.	315C	5026
Burzinski, Susan *†	5823	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Bush, Janette S.	5336	5212	Cyprus Industrial Minerals	Human Resources	173	Bauer, Linda L.	5200	5134
Byrne, Vicki P.	5160	207A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Caffarelli, Jr., J.	5009	254B	Cyprus Coal Company	Controller	350	Thomas, Julie K.	261B	5398
Caldwell, Steven W.	5218	235A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Canter, Thomas C.	5114	174B	Cyprus Coal Company	Transportation	384	MacMillan, Janice L.	177B	5827
Capobianco, Debra * †	5081	126C	Cyprus Minerals Company	Library/Information Center	587			
Carey, Paul A.	5469	309C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Cavanagh, Bill A.	5021	5116	Cyprus Industrial Minerals	Sales - Paper	112	McCain, Cynthia	5120	5210
Caylor, John R.	5104	261A	Cyprus Coal Company	Human Resources	360	Brown, Beth T.	243B	5142
Ceranowicz, Jo †	5773	5155	Cyprus Industrial Minerals	Controller-Accounts Payable	181		5223	5841
Chandler, Barbara A.	5428	125C	Cyprus Minerals Company	Law	435	Chandler, Barbara A.	125C	5428
Chittenden, John	5180	259B	Cyprus Coal Company	Planning & Analysis	352	Thomas, Julie K.	261B	5398
Christenson, Larry G.	5794	133B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Cloud, Mary	5720	5245	Cyprus Industrial Minerals	Qlty. Assurance/Prod. Safety	160	Cloud, Mary S.	5245	5720
Coburn, Dennis R.	5718	337C	Cyprus Minerals Company	Business Development-Clay	545	Kitchell, Carole T.	218C	5178
Cole, Michael *†	5376	335A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Cole, Rosemary L. †	5326	5159	Cyprus Industrial Minerals	Controller-Accounts Payable	181		5223	5841
Colley, G. Lynn	5125	208B	Cyprus Coal Company	Engineering & Land	372	Radcliffe, Carolyn L.	225B	5176
Coner, K. Douglas †	5752	346A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Compton, J. C.	5263	200A	Cyprus Metals Company	President	445	Bottorff, Mary Lou	216A	5221
Cooper, Cheryl	5274	225A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Cornette, Daniel J.	5629	310C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Cox, Mark F.	5119	227C	Cyprus Minerals Company	Business Development	546	Kitchell, Carole T.	218C	5178
Cox, Victor L.	5734	224B	Cyprus Coal Company	Construction	373	Radcliffe, Carolyn L.	225B	5176
Coyner, J. Michael	5650	115A	Cyprus Gold Company	Controller	457	Notheisen, Betty A.	112A	5621
Craig, Stella B.	5413	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
Crowl, Chris L.	5253	208A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Dardanis, Mona C. *†	5201	304A	Cyprus Minerals Company	Property Management	481	Matthis, Karen	380A	5315
Davey, Maybelle S. †	5321	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
Davidson, Jana	5786	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
DeCesare, Richard S.	5230	328C	Cyprus Minerals Company	Market Strategy-Metals	596	Schultz, Anna M.	300C	5061
DeMier, Patty L.	5261	219A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Deal, Larry M.	5812	181B	Cyprus Coal Company	Contract Administration	383	Jann, Jenny M.	177B	5678
Dolan, Joanne	5271	110A	Cyprus Gold Exploration Co.	Exploration	457	Dolan, Joanne L.	110A	5271
Dooster, E. Elizabeth	5089	307A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Dowell, Billie S. †	5381	354A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Drabant, Donald J.	5769	155B	Cyprus Coal Company	Sales & Customer Service	381	McQuarrie, Marie C.	156B	5101
Driscoll, Veronica †	5317	359A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Droppelman, James W. †	5275	106C	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
Duffy, Brett J. †	5488	285B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Duncan, John C.	5255	331C	Cyprus Minerals Company	Chairman of the Board	420	Frank, V. Florence	300C	5051
Duwe, Scott A.	5796	145B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Earle, Carol E.	5358	222A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Easter, Carol *	5439	5245	Cyprus Industrial Minerals	International	190	Easter, Carol	5245	5439
Eckstein, Donald A.	5609	246B	Cyprus Coal Company	Human Resources	360	Brown, Beth T.	243B	5142
Edwards, Ruth M.	5019	2C	Cyprus Minerals Company	Office Services-Mail Room	586	Edwards, Ruth M.	2C	5019

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Erb, Larry *†	5777	310A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Erickson, Joyce P.	5079	115C	Cyprus Minerals Company	Law	435	Erickson, Joyce P.	115C	5079
Esterline, Steven C.	5235	258B	Cyprus Coal Company	Planning & Analysis	352	Thomas, Julie K.	261B	5398
Evans, Alice L.	5302	128A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Evans, Gary L.	5478	S104	Cyprus Industrial Minerals	Traffic	120	Everitt, Nicki	S137	5487
Everitt, Nedra N. (Nicki)	5487	S137	Cyprus Industrial Minerals	Marketing	122	Everitt, Nicki	S137	5487
Felger, Charles T.	5158	102B	Cyprus Minerals Company	Law	435	Landrum, Debra A.	111C	5029
Felger, Joanne	5476	S249	Cyprus Industrial Minerals	Operations	140	Felger, Joanne	S249	5476
Felton, Diane A.	5128	205C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Fickle, Robin L.	5601	S207	Cyprus Industrial Minerals	Human Resources	173	Bauer, Linda L.	S200	5134
Fischer, Donald	5435	S251	Cyprus Industrial Minerals	Mgr. Quality Assurance	163	Cloud, Mary S.	S245	5720
Fisher, Gregory A. †	5243	350A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Flemming, J. D. (David)	5193	364A	Cyprus Minerals Company	Tax	576	Matthis, Karen R.	380A	5315
Foley, Charles A. †	5083	308A	Cyprus Minerals Company	Capital Investment	510	Martin, Marcia J.	316A	5262
Frank, V. Florence	5051	300C	Cyprus Minerals Company	President	430	Frank, V. Florence	300C	5051
Frederick, Diana *	5043	271A	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
French, Claudene †	5044	357A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Friedman, Deborah J.	5657	114C	Cyprus Minerals Company	Law	435	Priddy, Kathy M.	115C	5030
Fritz, Kimberly *	5758	S160	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Fujita, Peggy	5319	183A	Cyprus Minerals Company	Health Services-Medical	580	Fujita, Peggy	183A	5319
Fulgham, William M.	5762		Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Garceau, George †	5801	S230	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Gardiner, Craig A.	5013	117C	Cyprus Minerals Company	Law	435	Erickson, Joyce P.	115C	5079
Garner, Andrietta C.	5331	138B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Gaskins, Lee T.	5087	370A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Gaylord, Joy G.	5202	323C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Gaylord, Laurie M.	5226	216A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Gayner, Trudy * †	5081	126C	Cyprus Minerals Company	Library/Information Center	587			
Gengler, Darlene M.	5039	160B	Cyprus Coal Company	President	340	Gengler, Darlene M.	160B	5039
Gill, Gordon	5182	S242	Cyprus Industrial Minerals	Product Safety	161	Cloud, Mary S.	S243	5720
Glau, Linda L.	5162	210A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Gleason, Terry J.	5141	S202	Cyprus Industrial Minerals	Human Resources & Admn.	170	Bauer, Linda L.	S200	5134
Godell, Ralph W.	5014	116C	Cyprus Minerals Company	Law	435	Erickson, Joyce P.	115C	5079
Gonzales, Marta G. †	5723	326A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Gormley, Kathleen J.	5824	123C	Cyprus Minerals Company	Law	435	Chandler, Barbara A.	125C	5428
Graber, Larry	5677	158B	Cyprus Coal Company	Sales & Customer Service	381	McQuarrie, Marie C.	156B	5101
Graybill, Ron	5194	233C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Greenwood, Melissa H.	5000	150B	Cyprus Minerals Company	Office Services-Reception	585	Greenwood, Melissa	150B	5000
Griffith, Jr., John P.	5072	322C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Gunnare, Susan M.	5130	234B	Cyprus Coal Company	President	340	Gunnare, Susan M.	234B	5130
Hagman, R. H. (Dick)	5362	329C	Cyprus Minerals Company	Public & Gov't Affairs	572	Frank, V. Florence	300C	5051
Hake, James	5140	263A	Cyprus Coal Company	Human Resources	360	Brown, Beth T.	243B	5142
Hakimi, Farokh S.	5106	229C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Harlan, Howard	5191	116A	Cyprus Gold Company	Acquisitions & Development	457	Dolan, Joanne L.	110A	5271
Harp, Julie K.	5820	173A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Harrington, Michael S.	5150	220C	Cyprus Minerals Company	Business Development	545	Kitchell, Carole T.	218C	5178
Hart, Wm. Mark	5426	153B	Cyprus Coal Company	Equipment & Maintenance	374	Gunnare, Sue M.	234B	5130
Haugh, O. C.	5025	237C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Heath III, Sargent	5489	S134	Cyprus Industrial Minerals	Sales-Plastic, Rubber	116			
Hebert, Fred J.	5607	175A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Held, Merle O.	5479	5132	Cyprus Industrial Minerals	Market Development	131	Everitt, Nicki	5137	5487
Hill, Gail M. †	5241	302A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Hinkle, Leslie *†	5394	322A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Hoffer, Richard J.	5121	250A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Hoffman, Randy O.	5654	250B	Cyprus Coal Company	Controller-Accounting	351	Thomas, Julie K.	261B	5498
Hoffman, Roger M.	5035	136B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Horn, Jennifer	5837	515B	Cyprus Industrial Minerals	Controller-Accounting	181		5223	5841
Horne, Stephen *	5758	5160	Cyprus Industrial Minerals	Controller-Accounting	181		5223	5841
Horton, Peggy J. †	5204	214A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Huffman, Dale E.	5155	110C	Cyprus Minerals Company	Law	435	Landrum, Debra A.	111C	5029
Hunt, Reuel J.	5378	216C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Irr, Thomas J.	5811	172B	Cyprus Coal Company	Transportation	384	MacMillan, Janice L.	177B	5827
Isaacs, Terry C.	5022	5C	Cyprus Minerals Company	Office Services-Reprographics	585	Isaacs, Terry C.	5C	5022
Jackson, Karen M.	5445	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
Jackson, Paul R.	5805	253B	Cyprus Coal Company	Controller-Accounting	351	Landres, Leigh	255B	5008
James, Van †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
Jann, Jenny	5678	177B	Cyprus Coal Company	Contract Administration	383	Jann, Jenny M.	177B	5678
Jefferies, Robert A. †	5042	264B	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
Jerez, Rodrigo	5795	135B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Johanson, Irene	5429	5243	Cyprus Industrial Minerals	Sales	111	Longhofer, Deborah K.	5237	5138
Jones, Byron C.	5197	141B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Kear, Stephany †	5845	358A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Kelly, William S.	5229	308C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Kent, Vicky B.	5651	319C	Cyprus Minerals Company	Budgets & Reporting	515	Bury, Julie L.	315C	5026
Kerschen, Carl E.	5093	222C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Kiney, Joseph	5414	5230	CyDrus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
King, Carolyn	5412	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
King, David	5053	5102	Cyprus Industrial Minerals	Data Management	121	Everitt, Nicki	5137	5487
Kirchhoff, Bruce C.	5402	122C	Cyprus Minerals Company	Law	435	Chandler, Barbara A.	125C	5428
Kitchell, Carol	5178	218C	Cyprus Minerals Company	Business Development	545	Kitchell, Carole T.	218C	5178
Kluck, Clarence J., M.D.	5387	185A	Cyprus Minerals Company	Health Services-Medical	580	Fujita, Peggy	183A	5319
Knoll, Kevin F. †	5096	334A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Knope, Paul T.	5806	321A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Krivanek, Julie A.	5190	244B	Cyprus Coal Company	Human Resources	360	Brown, Beth T.	243B	5142
Krueger, Don C. †	5094	260B	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Lamar, Richard S.	5157	520B	Cyprus Industrial Minerals	V.P. Sr. Scientist	100	Cloud, Mary S.	5245	5720
Landolt, Brenda	5446	5109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	5137	5487
Landres, Ted B.	5803	142B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Landres, Vernalee K.	5008	255B	Cyprus Coal Company	Controller-Accounting	351	Landres, Leigh	255B	5008
Landrum, Debra A.	5029	111C	Cyprus Minerals Company	Law	435	Landrum, Debra A.	111C	5029
Lantz, Darlene C.	5161	213A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
LeBlanc, Thomas J.	5288	260A	Cyprus Metals Company	Human Resources	525	Glau, Linda L.	210A	5162
Lebert, Jr., Karl P.	5483	321C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Leland, Stanley S. †	5637	121A	Cyprus Gold Exploration Co.	Drafting	457	Dolan, Joanne L.	110A	5271
Lessner, George O.	5460	5236	Cyprus Industrial Minerals	Sr. VP-Sales & Marketing	110	Longhofer, Deborah K.	5237	5138
Levinbook, Gary *†	5817	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Locks, Jocelyn J.	5669	280B	Cyprus Minerals Company	Law	435	Locks, Jocelyn J.	280B	5669
Lodenkamper, John	5721	230A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
Loew, George R.	5034	129A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Loewen, Robert J.	5209	232A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Loken, Bruce G.	5405	205A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Longhofer, Deborah K.	5138	5237	Cyprus Industrial Minerals	President	100	Longhofer, Deborah K.	5237	5138
Loughrey, Kevin	5062	124C	Cyprus Minerals Company	Law	435	Anderson, Debbie K.	125C	5010
Louis, Patricia A. (Patt) †	5171	356A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Lumley, L. Bruce	5793	174A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
MacMillan, Janice L.	5827	177B	Cyprus Coal Company	Transportation	384	MacMillan, Janice L.	177B	5827
Magnuson, Wm. S.	5613	137B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Maguire, Samuel G.	5151	219C	Cyprus Minerals Company	Business Development	546	Kitchell, Carole T.	218C	5178
Maher, Henry E. (Hank)	5797	145A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Maier, David C. †	5684	172A	Cyprus Minerals Company	System Development	582	Harp, Julie K.	173A	5820
Malys, Gerald J.	5060	316C	Cyprus Minerals Company	Controller	500	Bury, Julie L.	315C	5026
Mandell, Carol L.	5075	319A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Mann, Herbert M. *	5254	176B	Cyprus Minerals Company	Consultant	589	Schultz, Anna M.	300C	5061
Mares, Julie M. †	5043	264B	Cyprus Minerals Company	Computer Operations	533	Evans, Alice L.	128A	5302
Marikis, Scott †	5603	169B	Cyprus Minerals Company	Auditing & Procedures	574	Martin, Dianne L.	315C	5058
Marshall, Jean	5366	217C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E	218C	5259
Martin, Dianne L.	5058	315C	Cyprus Minerals Company	Chief financial Officer	454	Martin, Dianne L.	315C	5058
Martin, Marcia J.	5262	316A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Martin, Michael O.	5177	113A	Cyprus Gold Company	Executive Vice President	457	Nothelsen, Betty A.	112A	5621
Mason, M. Chellie	5098	146B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Mateer, Raymond G.	5124	210B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Matlock, James A.	5627	105A	Cyprus Gold Exploration Co.	Exploration	457	Dolan, Joanne L.	110A	5271
Matthis, Karen	5315	380A	Cyprus Minerals Company	Tax/Property Management	481	Matthis, Karen R.	380A	5315
May, Janice L. †	5322	300A	Cyprus Minerals Company	Accounts Payable	510	Martin, Marcia J.	316A	5262
McCabe, Jon M.	5815	134B	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
McCain, Cynthia	5210	5120	Cyprus Industrial Minerals	Sales - Paper	112	McCain, Cynthia	5120	5210
McCoy, George C. †	5790	5154	Cyprus Industrial Minerals	Controller-Accounting	181		5223	5841
McDonald, Kerry A.	5356	244A	Cyprus Metals Company	V.P.-Business Development	449	Schillinger, Maxine L.	241A	5282
McFerrin, Mildred J.	5658	212A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
McHugh, Larry F.	5477	218A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
McKeenan, J. *	5295	224A	Cyprus Metals Company	Marketing	451	Blish, Susan A.	219A	5139
McLaughlin, Mary †	5327	300A	Cyprus Minerals Company	Accounts Payable	510	Born, Charolette E.	300A	5097
McLaughlin, Mike*	5352	5253	Cyprus Industrial Minerals	International	190		5245	5439
McQuarrie, Marie C.	5101	156B	Cyprus Coal Company	Sales & Customer Service	380	McQuarrie, Marie C.	156B	5101
Meier, Robert H.	5809	318A	Cyprus Minerals Company		511	Martin, Marcia J.	316A	5262
Mercier, John M.	5127	204B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe, Carolyn L.	225B	5176
Metcalf, Del	5736	5126	Cyprus Industrial Minerals	Sales	111	Wielenga, Sylvia J.	5127	5486
Middleton, Mary Lou	5166	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Middleton, Mary Lou	333A	5166
Miera, LeRoy	5724	214B	Cyprus Coal Company	Equipment & Maintenance	374	Radcliffe, Carolyn L.	225B	5176
Miley, Karen	5455	104B	Cyprus Minerals Company	Law	435	Landrum, Debra A.	111C	5029
Miller, Donald O.	5252	202C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Miller, Pamela A.	5012	119C	Cyprus Minerals Company	Law	435	Locks, Jocelyn J.	280B	5669
Miller, Ric *†	5492	317A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Milliken, Frank R.	5382	264A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Mills, Richard O. (Dick)	5001	154B	Cyprus Coal Company	Sales & Customer Service	380	McQuarrie, Marie C.	156B	5101
Monheit, Patricia E.	5312	320A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Monkus, Gail A.	5748	331A	Cyprus Minerals Company	Consolidation & Ext. Rpt.	511	Martin, Marcia J.	316A	5262
Mooney, Ruthann C.	5055	307C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Mooney, F. Steve	5289	217A	Cyprus Metals Company	Sr. V.P. Operations	445	Bottorff, Mary Lou	216A	5221
Morley, Susan	5040	362A	Cyprus Minerals Company	Tax	576	Matthis, Karen R.	380A	5315
Morris, James R.	5228	221C	Cyprus Minerals Company	Business Development	547	Kitchell, Carole T.	218C	5178

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Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Morse. Louis H.	5461	326C	Cyprus Minerals Company	Market Strategy-CIM & Coal	595	Schultz. Anna M.	300C	5061
Moser. Janice G.	5347	214C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner. Jean E.	218C	5259
Mulryan. M. T. (Joe)	5153	330C	Cyprus Minerals Company	Sr. V.P.-Corp. Admin.	589	Schultz. Anna M.	300C	5061
Murino, Louis O.	5619	S260	Cyprus Industrial Minerals	International	190		S245	5439
Nace. R. H. (Dick)	5077	144B	Cyprus Minerals Company	System Development	532	Harp. Julie K.	173A	5820
Nagan. Nancy J.	5670	333A	Cyprus Minerals Company	Office Services	585	Nagan. Nancy J.	333A	5670
Nalven. James G.	5745	275B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe. Carolyn L.	225B	5176
Nichols. Carl W.	5693	S252	Cyprus Industrial Minerals	Operations	140	Felger. Joanne S.	S249	5476
Nied. B.	5425	S106	Cyprus Industrial Minerals	Traffic	120	Everitt. Nicki	S137	5487
Noel. Sharon K. †	5033	204A	Cyprus Metals Company	Controller	503	Gaylord. Laurie M.	216A	5226
Norrell. Gerald B.	5354	168B	Cyprus Coal Company	Contract Administration	383	Jann. Jenny M.	177B	5678
Notheisen. Betty A.	5621	112A	Cyprus Gold Company	Executive Vice President	457	Notheisen. Betty A.	112A	5621
Olsen. Karen O.	5410	S102	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Padden. Roger M.	5433	S146	Cyprus Industrial Minerals	Sales-Cosmetic.Pharm..Food	114			
Peluso. Thomas F.	5076	206C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Peppard. Gerard	5041	201C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Pereira. M. W.	5636	202A	Cyprus Metals Company	Controller	503	Gaylord. Laurie M.	216A	5226
Pergrem. Dwayne W.	5148	259A	Cyprus Metals Company	Human Resources	525	Glau. Linda L.	210A	5162
Perkins. Diana K.	5482	S148	Cyprus Industrial Minerals	Controller-Budgets & Reporting	182		S223	5841
Phillips. Key L.	5470	S204	Cyprus Industrial Minerals	Human Resources-Safety&Ind.Hyg.	171	Bauer. Linda L.	S200	5134
Phinpraphat. Jeannine †	5320	300A	Cyprus Minerals Company	Accounts Payable	510	Born. Charolette E.	300A	5097
Phoenix. Steve *†	5394	322A	Price Waterhouse		000	Martin. Marcia J.	316A	5262
Pierce. Nedra A. †	5043	106C	Cyprus Minerals Company	Computer Operations	533	Evans. Alice L.	128A	5302
Pine. Julie A. †	5257	360A	Cyprus Minerals Company	Payroll	506	Matthis. Karen R.	380A	5315
Pittenger. Mark †	5279	166B	Cyprus Minerals Company	Auditing & Procedures	574	Martin. Dianne L.	315C	5058
Piwowarski. Anthony J.	5192	176A	Cyprus Minerals Company	System Development	532	Harp. Julie K.	173A	5820
Poganski. Gregory L.	5311	209C	Cyprus Minerals Company	Human Resources-Benefits Plans	592	Wagoner. Jean E.	218C	5259
Popish. Marilyn F. †	5069	374A	Cyprus Minerals Company	Accounts Payable	510	Martin. Marcia J.	316A	5262
Pratt. Will *	5826	S138	Cyprus Industrial Minerals	Marketing	122	Everitt. Nicki	S137	5487
Priddy. Kathy M.	5030	115C	Cyprus Minerals Company	Law	435	Priddy. Kathy M.	115C	5030
Purswell. Robert L.	5185	230B	Cyprus Coal Company	Technical Services	370	Radcliffe. Carolyn L.	225B	5176
Quinn. Kevin	5360	215C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner. Jean E.	218C	5259
Quinn. Sheryl D. †	5330	238C	Cyprus Minerals Company	Treasurer - Credit & Collection	509	Williams. Patricia O.	200C	5206
Radcliffe. Carolyn L.	5176	225B	Cyprus Coal Company	Technical Services	370	Radcliffe. Carolyn L.	225B	5176
Radies. Jr.. Ernest A. †	5338	120A	Cyprus Gold Company	Controller	457	Notheisen. Betty A.	112A	5621
Radies. Mary J.	5494	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt. Nicki	S137	5487
Ratcliff. Deborah S.	5116	235C	Cyprus Minerals Company	Treasurer	509	Williams. Patricia O.	200C	5206
Ratcliff. Donald B.	5238	320C	Cyprus Minerals Company	Financial Analysis	434	Skeens. Janie M.	338C	5491
Reeves. James	5126	250A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Rhodes. Tom C.	5802	S228	Cyprus Industrial Minerals	Controller	180		S223	5841
Ricardo. Mary L. †	5771	S155	Cyprus Industrial Minerals	Controller-Accounts Payable	181		S223	5841
Richards. William O.	5135	162B	Cyprus Coal Company	President	340	Gengler. Darlene H.	160B	5039
Roberts. Sheri L.	5047	4C	Cyprus Minerals Company	Office Services-Rec. Retention	586	Roberts. Sheri L.	4C	5047
Robinette. Patty *	5408	203C	Cyprus Minerals Company	Human Resources	581	Strub. Rosemary S.	200C	5213
Robinson. Rick *†	5823	349A	Price Waterhouse		000	Martin. Marcia J.	316A	5262
Rodine. Phyllis *	5027	108C	Cyprus Minerals Company	Law	435	Landrum. Debra A.	111C	5029
Roe. Matt S.	5022	5C	Cyprus Minerals Company	Office Services-Reprographics	585	Roe. Matt S.	5C	5022
Roeder. Robert E.	5842	S122	Cyprus Industrial Minerals	Sales - Paper	112	McCain. Cynthia	S120	5210

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME

PLEASE SEND ANY CHANGES TO THIS LIST TO M. J. NAGAN, MAIL CODE 333A.

Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Rounds, Michael	5186	306C	Cyprus Minerals Company	Public & Gov't Affairs	572	Martin, Dianne L.	315C	5058
Ryckman, Jeffrey S.	5370	132A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Sabatoni, Maria S.	5738	S255	Cyprus Industrial Minerals	International-Export Sales	191		S245	5439
Sackett, Sallie K. †	5217	173B	Cyprus Minerals Company	Auditing & Procedures	574	Martin, Dianne L.	315C	5058
Schaumburg, Erica F.	5384	243C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Schillinger, Maxine	5282	241A	Cyprus Metals Company	Technology	449	Schillinger, Maxine L.	241A	5282
Schmutz, Dale J.	5836	S162	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Schneider, Jr., Robert H.	5242	251B	Cyprus Coal Company	Controller-Accounting	351	Landres, Leigh	255B	5008
Schofield, Donald W.	5728	224C	Cyprus Minerals Company	Business Development	547	Kitchell, Carole T.	218C	5178
Schulte, J. M. †	5070	313A	Cyprus Minerals Company	Capital Investment	510	Martin, Marcia J.	316A	5262
Schultz, Anna M.	5061	300C	Cyprus Minerals Company	Sr. V.P.-Corp. Admin.	589	Schultz, Anna M.	300C	5061
Schwing, Lee	5828	177A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	178A	5820
Sedillos, Sherry	5052	S102	Cyprus Industrial Minerals	Transportation	118	Everitt, Nicki	S137	5487
Sessom, Fernando †	5053	S114	Cyprus Industrial Minerals	Sales Service	118	Everitt, Nicki	SL37	5487
Sevy, W.	5431	S142	Cyprus Industrial Minerals	Marketing	122	Everitt, Nicki	S137	5487
Shellhaas, S. Scott	5016	284B	Cyprus Minerals Company	Law	435	Locks, Jocelyn J.	280B	5669
Sheppard, Alan L. †	5309	361A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Sheremeta, Frank	5236	242C	Cyprus Minerals Company	Human Resources-Benefits Admn	592	Wagoner, Jean E.	218C	5259
Sherman, Sherrill A.	5085	121C	Cyprus Minerals Company	Law	435	Anderson, Debbie K.	125C	5010
Simmons, Jill K. *	5154	305A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Sims, Paula F. †	5078	351A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Skaggs, Gary L.	5175	266A	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Skeens, Janie	5491	338C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Smart, Harriott W. †	5365	107C	Cyprus Minerals Company	Library/Information Center	587			
Smith, Julie H.	5742	325C	Cyprus Minerals Company	Market Strategy-Coal	595	Schultz, Anna M.	300C	5061
Snow, Stuart R.	5237	226B	Cyprus Coal Company	Technical Services	370	Radcliffe, Carolyn L.	225B	5176
Spenner, Kathleen M.	5788	236A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Spiecha, John J.	5652	242B	Cyprus Coal Company	V.P. - Operations	340	Gunnare, Susan M.	234B	5130
Steckley, Robert C.	5172	317C	Cyprus Minerals Company	Market Strategy-Metals	596	Schultz, Anna M.	300C	5061
Stone, Jr., Chester B.	5057	314C	Cyprus Minerals Company	Chief Financial Officer	454	Martin, Dianne L.	315C	5058
Strain, Robert D. †	5333	231C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia D.	200C	5206
Strandford, Mark C.	5036	178A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Strub, Rosemary S.	5213	200C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Studer, Leslie R. †	5203	228C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia D.	200C	5206
Studer, Stephen †	5346	171B	Cyprus Minerals Company	Auditing & Procedures	574	Martin, Dianne L.	315C	5058
Sturgess, Janie	5782	237A	Cyprus Metals Company	Environmental Affairs	449	Schillinger, Maxine L.	241A	5282
Sutterer, Tom *†	5823	349A	Price Waterhouse		000	Martin, Marcia J.	316A	5262
Taraba, John	5245	313C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Thienes, Katharine S.	5137	366A	Cyprus Minerals Company	Tax	576	Matthis, Karen R.	380A	5315
Thomas, Julie K.	5398	261B	Cyprus Coal Company	Controller	350	Thomas, Julie K.	261B	5398
Thomas, Steve	5219	117A	Cyprus Gold Company	Acquisitions & Development	457	Dolan, Joanne L.	110A	5271
Thornton, C. M.	5489	S128	Cyprus Industrial Minerals	Sales	111	Wielenga, Sylvia J.	S127	5486
Thorpe, J. Tim	5480	S112	Cyprus Industrial Minerals	Sales-Administration	121	Everitt, Nicki	S137	5487
Tiffin, O. Steve	5388	180A	Cyprus Minerals Company	Health Services-Medical	580	Fujita, Peggy	183A	5319
Tiritas, E. P. (Manos)	5844	S250	Cyprus Industrial Minerals	Chief Engineer	142	Felger, Joanne S.	S249	5476
Tomasino, Tera	5152	3C	Cyprus Minerals Company	Office Services-Telephone/Records	586	Tomasino, Tera	3C	5152
Trabits, George A.	5103	212B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Tuffield, Michael	5772	S156	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Turner, Susan *	5758	S149	Cyprus Industrial Minerals	Controller-Accounting	181		S223	5841
Tyszkiewicz, Kenneth A.	5002	116A	Cyprus Gold Company	Human Resources	457	Mothelsen, Betty A.	112A	5621

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME

PLEASE SEND ANY CHANGES TO THIS LIST TO M. J. HAGAN, MAIL CODE 333A.

Name	Ext.	Mail Code	Company	Department	Acct Code	Administrative Support	Mail Code	Ext.
Unutmaz, Orhan Z.	5113	216B	Cyprus Coal Company	Technical Services-Engr.&Land	372	Radcliffe, Carolyn L.	225B	5176
Vogel, Craig G.	5239	187B	Cyprus Coal Company	Transportation	384	MacMillan, Janice L.	177B	5827
Vogels, Robert	5810	365A	Cyprus Minerals Company	Tax	576	Matthis, Karen R.	380A	5315
Von Rentzell, Sandy K.	5675	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Von Rentzell, Sandy	333A	5675
Vruwink, Oot B.	5146	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Vruwink, Oot B.	333A	5146
Wagoner, Jean E.	5259	218C	Cyprus Minerals Company	Human Resources-Benefits	592	Wagoner, Jean E.	218C	5259
Wahrman, Jeanette M.	5673	333A	Cyprus Minerals Company	Office Services-Word Processing	585	Wahrman, Jeanette M.	333A	5673
Wambolt, Larry O.	5784	S224	Cyprus Industrial Minerals	Controller-Budgets & Reporting	182		S223	5841
Ward, Sandra S. †	5655	348A	Cyprus Minerals Company	Controller-Project Group	517	Martin, Marcia J.	316A	5262
Warnaars, Fred	5833	106A	Cyprus Gold Exploration Co.	Exploration	457	Golan, Joanne L.	110A	5271
Watt, Gina L.	5268	371A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Weeks, Richard L.	5355	S215	Cyprus Industrial Minerals	Resource Development	143	Folger, Joanne S.	S249	5476
Wegher, Linda	5208	230C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Wells, Robert	5348	223C	Cyprus Minerals Company	Business Development	547	Kitchell, Carole T.	218C	5178
West, Arnold J.	5006	130A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Whelpdale, David	5393	171A	Cyprus Minerals Company	System Development	532	Harp, Julie K.	173A	5820
Whigham, Edward G. †	5042	264B	Cyprus Minerals Company	Computer Operations	533			
Wielenga, Sylvia J.	5486	S127	Cyprus Industrial Minerals	Sales	111	Wielenga, Sylvia J.	S127	5486
Willcox, John S.	5328	208C	Cyprus Minerals Company	Human Resources	581	Strub, Rosemary S.	200C	5213
Williams, Gary R.	5830	S118	Cyprus Industrial Minerals	Sales - Paper	112	McCain, Cynthia	S120	5210
Williams, Patricia O.	5206	200C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Wilson, Bruce	5368	3C	Cyprus Minerals Company	Office Services-Supplies	586	Wilson, Bruce	3C	5368
Wilson, Linda G. †	5187	236C	Cyprus Minerals Company	Treasurer	509	Williams, Patricia O.	200C	5206
Wilson, Mark A.	5361	312C	Cyprus Minerals Company	Financial Analysis	434	Skeens, Janie M.	338C	5491
Wilson, Sue *	5822	207B	Cyprus Coal Company	Technical Services-Geology	371	Radcliffe, Carolyn L.	225B	5176
Windholz, Joyce L. †	5088	S219	Cyprus Industrial Minerals	Controller-Accounts Receivable	181		S223	5841
Wisdom, Cheryl A.	5023	324C	Cyprus Minerals Company	Office Services	586	Schultz, Anna M.	300C	5061
Wittrig, Meredeth A. †	5385	355A	Cyprus Minerals Company	Payroll	506	Matthis, Karen R.	380A	5315
Wolf, Philip C.	5084	S238	Cyprus Industrial Minerals	President	100	Longhofer, Deborah K.	S237	5138
Woods, Julie F.	5447	S109	Cyprus Industrial Minerals	Customer Service	119	Everitt, Nicki	S137	5487
Work, James R.	5038	234A	Cyprus Metals Company	Marketing	451	DeMier, Patty L.	219A	5261
Yaros, Mary †	5628	102A	Cyprus Minerals Company	Information Services	531	Evans, Alice L.	128A	5302
Yoshida, Alan S.	5017	368A	Cyprus Minerals Company	Property Management	481	Matthis, Karen R.	380A	5315
Young, Darrell E.	5465	S144	Cyprus Industrial Minerals	Marketing	122	Everitt, Nicki	S137	5487
Zang, Daniel G.	5244	203A	Cyprus Metals Company	Controller	503	Gaylord, Laurie M.	216A	5226
Zazenski, Richard J.	5484	S244	Cyprus Industrial Minerals	Quality Assurance/Prod. Safety	160	Cloud, Mary S.	S245	5720

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Abarca. Sergio	5718	252S	309-Cyprus Industrial Minerals	International	81716	Chandler. Barbara A.	234S	5091
Abercrombie. Gail A.	5216	418S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	417S	5825
Adams. Susan E. †	5276	257M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary lou	231M	5820
Adcock. J. M.	5108	339M	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337M	5226
Anderson. Debbie K.	5212	139S	587-Cyprus Minerals Company	law	890	Erickson. Joyce P.	131S	5010
Anderson. Debora l.	5380	358M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Anderson. Todd	5808	477S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	5491
Andrews. C. R. †	5340	460S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Armbrister. Michael L. †	5031	413S	587-Cyprus Minerals Company	Treasurer - Credit & Collection	870	Williams. Patricia O.	408S	5206
Aydt. Greg O.	5249	461S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Baker. Melodie J.	5442	361M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Ball. lola A.	5375	424S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	426S	5058
Barr. Kenneth J.	5050	439S	587-Cyprus Minerals Company	Executive Office	805	Frank. V. Florence	437S	5051
Barrett. Thomas R.	5371	353M	587-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	365M	5213
Bartenhagen. Cathy L.	5306	301M	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324M	5082
Bauer. Herman l.	5270	114	726-Expl..Dev.& Min.Res.	Administration	380	Hoffman. Liz	154	5755
Bauer. Linda l.	5134	231S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	5134
Baughn. Bruce E.	5314	357S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn l.	300S	5176
Baum. John E.	5608	338S	389-Cyprus Coal Company	Controller	840	Thomas. Julie K.	337S	5398
Beall. Stewart l.	5463	274S	309-Cyprus Industrial Minerals	Sales/Marketing	91310	Wielenga. Sylvia J.	275S	5486
Behm. David W.	5383	262M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary lou	231M	5820
Bell. Robert M.	5225	311M	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316M	5018
Bellum. Donald P.	5131	430S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Schultz. Anna M.	431S	5061
Bellum. Greig O.	5287	238M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary lou	231M	5820
Bensing. J. J.	5090	108S	726-Expl..Dev.& Min.Res.	land Management	970	Matthis. Karen R.	116S	5315
Beyl. François	5667	230S	309-Cyprus Industrial Minerals	U.S. Sales & Operations	81500	Longhofer. Deborah K.	240S	5138
Bhappu. Ross R..	5839	475S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	5491
Bihr. Hans	5207	131	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	5315
Bird. James H.	5335	139	726-Expl..Dev.& Min.Res.	land Management	970	Matthis. Karen R.	138	5315
Blair. Robert G.	5369	136	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman. liz	154	5755
Blish. Susan A.	5621	129	726-Expl..Dev.& Min.Res.	Administration	380	Blish. Susan A.	129	5621
Boehlke. John W. *	5260	274M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary lou	231M	5820
Bolger. James J. †	5765	106M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice l.	232M	5302
Bondch. Sue E.	5672	300M	587-Cyprus Minerals Company	Office Services-Word Processing	946	Bondch. Sue E.	300M	5672
Born. Charolette E. †	5097	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Bornhofen. Richard G.	5232	332S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Borowicz. Ginnie †	5067	250S	309-Cyprus Industrial Minerals	Controller	84000	longhofer. Deborah K.	240S	5138
Borrelli. Mary A. †	5364	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486
Bott. Rick J. †	5467	481S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Bottorff. Mary lou	5221	428S	587-Cyprus Minerals Company	Executive Office	805	Bottorff. Mary lou	428S	5221
Bowen. Sally E.	5079	126S	587-Cyprus Minerals Company	law	890	Bowen. Sally E.	126S	5079
Bradley. Carol M.	5307	248S	309-Cyprus Industrial Minerals	Controller	84000	longhofer. Deborah K.	240S	5138
Brady. Patricia J.	5188	136	726-Expl..Dev.& Min.Res.	land Management	970	Matthis. Karen R.	138	5315
Bragassa. Reany (Ray)	5569	LAB	309-Cyprus Industrial Minerals	lab Facility	81705	Poersch. Karen M.	LAB	5562
Brosley. C. Corwin (Cory)	5838	117S	587-Cyprus Minerals Company	law	890	Mueller. Karen A.	116S	5616
Brost. Joyce Y.	5296	322M	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316M	5018
Brotzman. Michael F.	5308	141	726-Expl..Dev.& Min.Res.	land Management	970	Matthis. Karen R.	138	5315
Brotzman. Victoria l.	5685	107	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger. Maxine l.	117	5386
Brown. D. P.	5846	345S	389-Cyprus Coal Company	President	804	Gunnare. Sue M.	344S	5130
Brown. Rose l. †	5334	401S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia O.	408S	5206
Buckley. Leonard J.	5430	269M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary lou	231M	5820
Buettner. R. J. (Jack)	5472	229S	309-Cyprus Industrial Minerals	Production	81510	Bauer. Linda l.	231S	5134

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Bulford, Jennifer L. †	5042	121M	S87-Cyprus Minerals Company	Information Services	877	Evans, Alice L.	232M	S302
Burton, William O.	S272	159	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman, Liz	1S4	S7S5
Bury, Julie L.	S320	423M	S87-Cyprus Minerals Company	Accounts Payable	84S	Born, Charolette E.	423M	S097
Byrne, Vicki P.	5160	341M	S8S-Cyprus Copper Company	Controller	842	Hanchey, Barbara J.	337M	S226
CaHow, Kenneth R., Jr.	S211	423M	S87-Cyprus Minerals Company	Accounts Payable	84S	Born, Charolette E.	42SM	S097
Caffarelli, Jr., J.	5009	339S	389-Cyprus Coal Company	Controller	840	Thomas, Julie K.	337S	S398
Caldwell, Steven W.	S218	307M	S8S-Cyprus Copper Company	Marketing	913	Male, Susan	316M	S018
Canter, Thomas C.	S114	31SS	389-Cyprus Coal Company	Transportation	91S	MacMillan, Janice L.	3t9S	5827
Capobianco, Debra *†	S342	102S	S87-Cyprus Minerals Company	Library/Information Center	948			
Cardamone, Frank A.	5693	254M	S87-Cyprus Minerals Company	Information Services	878	Middleton, Mary Lou	231M	S820
Carfrae, Marilyn A.	S70S	290M	S87-Cyprus Minerals Company	Information Services	878	Middleton, Mary Lou	231M	S820
Carlson, Eric	5056	150	726-Expl..Dev.& Min.Res.	Administration	373	Blish, Susan A.	129	S621
Cavanagh, Will A.	SS72	LAB	309-Cyprus Industrial Minerals	Lab Facility	8170S	Poersch, Karen M.	LAB	SS62
Caylor, John R.	S104	331S	389-Cyprus Coal Company	Human Resources	920	Walker, Pat A.	329S	S142
Ceranowicz, Jo †	5003	320M	S8S-Cyprus Copper Company	Marketing	913	Male, Susan	3l6M	S018
Chandler, Barbara A.	5091	234S	309-Cyprus Industrial Minerals	International Sales	81716	Chandler, Barbara A.	234S	S091
Chittenden, John	S180	340S	389-Cyprus Coal Company	Planning & Analysis	846	Thomas, Julie K.	337S	S398
Clark, Mike	SS74	LAB	309-Cyprus Industrial Minerals	Lab Facility	8170S	Poersch, Karen M.	LAB	SS62
Cohen, Rolanda M.	5806	418M	S87-Cyprus Minerals Company	Corporate Accounting	84S	Martin, Marcia J.	414M	S262
Colley, G. Lynn	S125	360S	389-Cyprus Coal Company	Resource Development	961	Radcliffe, Carolyn L.	300S	S176
Collings, Jimmie O.	5379	2S2M	S87-Cyprus Minerals Company	Information Services	879	Middleton, Mary Lou	231M	S820
Colville, Pat	SS66	LAB	309-Cyprus Industrial Minerals	Lab facility	8170S	Poersch, Karen M.	LAB	SS62
Compton, J. C.	S263	429S	S87-Cyprus Minerals Company	Executive Office	80S	Bottorff, Mary Lou	428S	S221
Cornette, Daniel J.	S629	474S	S87-Cyprus Minerals Company	Financial Analysis	884	Harp, Julie K.	472S	S491
Cox, Victor L.	S734	3S4S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe, Carolyn L.	300S	S176
Coyner, J. Michael	5650	104	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine L.	1L7	S386
Craig, Stella B. †	S413	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	27SS	S486
Crosby, Terry	5042	121M	S87-Cyprus Minerals Company	Information Services	877	Evans, Alice L.	232M	S302
Crowl, Chris L.	S253	346M	S87-Cyprus Minerals Company	Human Resources	920	Greenwood, Melissa M.	36SM	S213
Dalton, Glenn A.	S267	276M	S87-Cyprus Minerals Company	Information Services	879	Middleton, Mary Lou	231M	S820
Davey, Maybelle S. †	S321	422M	S87-Cyprus Minerals Company	Accounts Payable	84S	Born, Charolette E.	423M	S097
Davidson, Janna L.	S118	443S	S87-Cyprus Minerals Company	Market Strategy	911	Davidson, Janna L.	443S	S118
DeCesare, Richard S.	S230	32SM	S8S-Cyprus Copper Company	Marketing	913	DeMier, Patty L.	327M	S261
DeMier, Patty L.	S261	327M	S8S-Cyprus Copper Company	President	808	DeMier, Patty L.	327M	S261
Deal, Larry M.	S812	316S	389-Cyprus Coal Company	Contract Administration	91S	MacMillan, Janice L.	3t9S	S827
Dechant, Joyce L. †	5088	260S	309-Cyprus Industrial Minerals	Controller	84000	Everitt, Micki	2S3S	S487
Deimling, Don J.	S329	423M	S87-Cyprus Minerals Company	Accounts Payable	84S	Born, Charolette E.	423M	5097
Disbury, Brian	S295	310M	S8S-Cyprus Copper Company	Marketing	913	Male, Susan	316M	S018
Dolan, Joanne	S756	483S	S87-Cyprus Minerals Company	Utility Services	90S	Dolan, Joanne B.	483S	S7SS
Doster, E. Elizabeth	5089	426M	S87-Cyprus Minerals Company	Consolidated Accounting	84S	Martin, Marcia J.	414M	S262
Dowell, Billie S. †	S381	218S	S87-Cyprus Minerals Company	Payroll	844	Gaylord, Laurie M.	216S	S282
Drabant, Donald J.	S769	447S	389-Cyprus Coal Company	Sales	910	McQuarrie, Marie C.	3t9S	5101
Driscoll, Veronica †	5317	217S	S87-Cyprus Minerals Company	Payroll	844	Gaylord, Laurie M.	216S	S282
Droppelman, James W. †	S27S	104M	S87-Cyprus Minerals Company	Information Services	877	Evans, Alice L.	232M	S302
Dube, Michael R.	S424	363S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare, Sue M.	344S	S130
Dulmaine, Jean Paul	S189	308S	S8S-Cyprus Copper Company	Controller	842	Manchey, Barbara J.	337M	S226
Dunn, Richard D.	S478	278M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	27SS	S486
Duwe, Scott A.	S796	27SM	S87-Cyprus Minerals Company	Information Services	879	Middleton, Mary Lou	231M	S820

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Ctr	Administrative Support	Mail Code	Ext.
Earle. Carol E.	5358	313N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Eckstein. Donald A.	5016	1115	587-Cyprus Minerals Company	Law	890	Mueller. Karen A.	1165	5616
Erickson. Joyce P.	5010	1315	587-Cyprus Minerals Company	Law	890	Erickson. Joyce P.	1315	5010
Esterline. Steven C.	5235	336S	389-Cyprus Coal Company	Planning & Analysis	846	Thomas. Julie K.	337S	5398
Evans. Alice L.	5302	232N	587-Cyprus Minerals Company	Information Services	875	Evans. Alice L.	232N	5302
Everitt. Nicki N.	5487	253S	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	253S	5487
Faris. Katherine M.	5081	102S	587-Cyprus Minerals Company	Library/Information Center	948			
Farrell. t. Lori	5751	259N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Felger. Charles T.	5158	106S	587-Cyprus Minerals Company	Law	890	Landrum. Debra A.	116S	5029
Felton. Diane A.	5128	354N	587-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	365N	5213
Fickle. Robin L. †	5601	225S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	5134
Fisher. Gregory A. †	5243	224S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Fitzsimmons. Nancy *	5635	137	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	5315
Flemming. J. O. (David)	5193	207S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Frank. V. Florence	5051	137S	587-Cyprus Minerals Company	Executive Office	805	Frank. V. Florence	437S	505L
Frank. Vince	5019	118N	587-Cyprus Minerals Company	Office Services-Mail Room	947	Frank. Vince	118N	5019
Fraser. Michael J.	5477	321N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Frederick. *Diana* *	5043	264N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
French. Claudene †	5078	209S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Friedman. Deborah J.	5657	129S	587-Cyprus Minerals Company	Law	890	Locks. Jocelyn L.	128S	5669
Fritz. Kimberly *	5758	262S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	5487
Fujita. Peggy	5319	205N	587-Cyprus Minerals Company	Health Services-Medical	930	Fujita. Peggy	205N	5319
Fulgham. William N.	5309	223S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Gallagher. Leslie A.	5027	133S	587-Cyprus Minerals Company	Law	890	Moody. JoAnn A.	137S	5266
Garceau. George H. †	5801	263S	309-Cyprus Industrial Minerals	Controller-Accounting	84000	Everitt. Nicki	253S	5487
Gardiner. Craig A.	5013	134S	587-Cyprus Minerals Company	Law	890	Moody. JoAnn A.	137S	5266
Garner. Andrietta C.	5331	267N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Gaskins. Lee *T.*	5087	135	*726-Expl..Dev.& Min.Res.*	*Land Management*	970	Matthis. Karen R.	138	5315
Gaul. Dennis M.	5829	234N	587-Cyprus Minerals Company	Information Services	875	Evans. Alice L.	232N	5302
Gaylord. Joy G.	5202	409N	587-Cyprus Minerals Company	Controller	841	Hill. T. Kathy	411N	5026
Gaylord. Laurie M.	5282	216S	587-Cyprus Minerals Company	Tax/Payroll	848	Gaylord. Laurie M.	216S	5282
Gayner. Trudy *†	5343	101S	587-Cyprus Minerals Company	Library/Information Center	948			
Genereaux. Bruce M.	5256	470S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	5491
Gill. Gordon	5182	258S	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	253S	5487
Glau. Linda L.	5247	362N	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Gleason. Terry J.	5141	329N	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330N	5162
Godell. Ralph W.	5014	130S	587-Cyprus Minerals Company	Law	890	Erickson. Joyce P.	1315	5010
Gonzales. Bethann R.	5000	123N	587-Cyprus Minerals Company	Office Services-Reception	946	Gonzales. Bethann	123N	5000
Gonzales. Marta G. †	5333	402S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia O.	408S	5206
Gormley. Kathleen J.	5824	125S	587-Cyprus Minerals Company	Law	890	Bowen. Sally E.	126S	5079
Graber. Larry	5677	405N	587-Cyprus Minerals Company	Utility Services	905	Dolan. Joanne B.	483S	575S
Graham. Vickie	5760	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	5487
Graves. Thomas C.	5403	269S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486
Graybill. Ron	5194	416S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia O.	408S	5206
Greenwood. Melissa M.	5213	365N	587-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa	365N	5213
Grotegut. Don	5439	108N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Gunnare. Sue M.	5130	344S	389-Cyprus Coal Company	President	804	Gunnare. Sue M.	344S	5130
Hager. Samuel E.	5176	300S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn L.	300S	5176
Hagman. R. H. (Dick)	5362	420S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	426S	5058
Hake. James	5140	323S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142

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LEHMAN 00705

ADMINISTRATIVE SUPPORT LIST SORTED BY NAME
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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Hakimi, Farokh S.	5106	414S	587-Cyprus Minerals Company	Treasurer	870	Williams, Patricia O.	408S	5206
Hale, Susan	5018	316M	585-Cyprus Copper Company	Marketing	913	Hale, Susan	316M	5018
Hamilton, Bradley W.	5404	407M	587-Cyprus Minerals Company	Budgets & Reporting	845	Hill, T. Kathy	411M	5026
Hanchey, Barbara J.	5226	337M	585-Cyprus Copper Company	Controller	842	Hanchey, Barbara J.	337M	5226
Hand, John S.	5792	364S	389-CyPrus Coal Company	Process & Construction	979	Radcliffe, Carolyn L.	300S	5176
Harlan, Howard M.	5191	130	726-Expl. Dev.& Min.Res.	Evaluations - Development	330	Bilsh, Susan A.	129	5621
Harp, Julie K.	5491	472S	587-Cyprus Minerals Company	Financial Analysis	884	Harp, Julie K.	472S	5491
Harris, Ken	5575	LAB	309-CyPrus Industrial Minerals	Lab Facility	81705	Poersch, Karen M.	LAB	5562
Hart, Wm. Mark	5426	349S	389-CyPrus Coal Company	Maintenance Resources	980	Gunnare, Sue M.	344S	5130
Haselhoff, William H.	5654	335S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas, Julie K.	337S	5398
Haugh, O. C.	5025	409S	587-Cyprus Minerals Company	Treasurer	870	Williams, Patricia O.	408S	5206
Hauser, Virginia	5240	306M	585-Cyprus Copper Company	Marketing	913	Wachsmann, Kathy M.	324M	5082
Hegner, Frank (Bruno)	5632	123S	587-CyPrus Minerals Company	Law	890	Wertz, Bonnie L.	121S	5030
Hesketh, James K. B.	5437	459S	587-CyPrus Minerals Company	HQ Spec. Metals & Ind. Minerals	812		448S	5178
Higgins, G. A.	5434	378S	587-CyPrus Minerals Company	Human Resources-Benefits Admn	924	Kinser, Sharon M.	379S	5259
Hill, Gail M. †	5241	417M	587-Cyprus Minerals Company	Corporate Accounting	845	Martin, Marcia J.	414M	5262
Hill, T. Kathy	5026	411M	587-CyPrus Minerals Company	Controller	841	Hill, T. Kathy	411M	5026
Hillburn, Stacy L.	5432	113M	587-CyPrus Minerals Company	Office Services-Records Center	947	Hillburn, Stacy L.	113M	5432
Hinze, Daniel C.	5459	317S	389-CyPrus Coal Company	Controller-Accounting	843	Thomas, Julie K.	337S	5398
Hoffer, Richard J.	5121	370S	389-CyPrus Coal Company	Resource Development-Tech.Support	961	Radcliffe, Carolyn L.	300S	5176
Hoffman, Elizabeth (Liz)	5755	154	726-Expl. Dev.& Min.Res.	Administration	381	Hoffman, Liz	154	5755
Hopkins Darlene H.	5039	350S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Horne, Stephen	5085	249S	309-CyPrus Industrial Minerals	Controller	84000	Everitt, Micki	253S	5487
Horton, Peggy J. †	5204	302M	585-CyPrus Copper Company	Controller	842	Hanchey, Barbara J.	337M	5226
Horton, Richard L.	5366	347M	587-Cyprus Minerals Company	Human Resources	920	Greenwood, Melissa M.	365M	5213
Huesman, Lisa R.	5083	479S	587-CyPrus Minerals Company	Consolidated Accounting	845	Martin, Marcia J.	414M	5262
Huffman, Dale E.	5155	115S	587-CyPrus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Hunt, Gregory L.	5071	365S	389-CyPrus Coal Company	Resource Development	961	Radcliffe, Carolyn L.	300S	5176
Hunt, Reuel J.	5378	335M	585-Cyprus Copper Company	Human Resources	922	Priddy, Kathy M.	330M	5162
Irr, Thomas J.	5811	320S	389-Cyprus Coal Company	Transportation	915	MacMillan, Janice L.	319S	5827
Isaacs, Terry C.	5022	119M	587-Cyprus Minerals Company	Office Services-Reprographics	946	Isaacs, Terry C.	119M	5022
Jaap, Michael	5305	301M	585-CyPrus Copper Company	Marketing	913	Wachsmann, Kathy M.	324M	5082
Jackson, Karen M. †	5445	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	275S	5486
Jackson, Paul R.	5805	325S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas, Julie K.	337S	5398
James, Van †	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans, Alice L.	232M	5302
Jaquez, Joe R.	5444	253M	309-CyPrus Industrial Minerals	Sales Service	91310	Wielenga, Sylvia J.	275S	5486
Jefferies, Robert A. †	5716	224M	587-Cyprus Minerals Company	Information Services	876	Middleton, Mary Lou	231M	5820
Jerez, Rodrigo	5795	237M	587-CyPrus Minerals Company	Information Services	879	Middleton, Mary Lou	231M	5820
Johnson, Leland R.	5828	229M	587-CyPrus Minerals Company	Information Services	876	Middleton, Mary Lou	231M	5820
Judy, Robert O.	5462	332M	585-Cyprus Copper Company	Environmental Affairs	808	Wachsmann, Kathy M.	324M	5082
Kear, Stephany †	5845	208S	587-CyPrus Minerals Company	Payroll	844	Gaylord, Laurie M.	216S	5282
Keenan, John C.	5169	301M	585-CyPrus Copper Company	Marketing	913	Hale, Susan	316M	5018
Kelly, William S.	5229	455S	587-CyPrus Minerals Company	Market Strategy-CIM & Coal	911	Davidson, Janna L.	443S	5118
Kent, Vicky B.	5651	406M	587-CyPrus Minerals Company	Budgets & Reporting	845	Hill, T. Kathy	411M	5026
Keown, L. Eric	5174	268M	587-CyPrus Minerals Company	Information Services	878	Middleton, Mary Lou	231M	5820
King, Carolyn †	5412	271S	309-CyPrus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	275S	5486
King, David	5053	240M	587-CyPrus Minerals Company	Information Services	876	Middleton, Mary Lou	231M	5820
Kinser, Sharon M.	5259	379S	587-CyPrus Minerals Company	Human Resources-Benefits Admn	924	Kinser, Sharon M.	379S	5259
Kirchhoff, Bruce C.	5402	138S	587-CyPrus Minerals Company	Law	890	Sherman, Pam H.	137S	5011
Kitchell, Carole T.	5284	352M	587-CyPrus Minerals Company	Human Resources	920	Greenwood, Melissa M.	365M	5213

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Kling. Mark A.	5255	113S	587-Cyprus Minerals Company	Law	890	Taets. Lynn M.	119S	5428
Kluck. Clarence J.. M.D.	5387	206M	587-Cyprus Minerals Company	Health Services-Medical	930	Fujita. Peggy	205M	5319
Knoll. Kevin F. †	5096	255M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Knope. Paul T.	5603	463M	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Kounovsky. Bart W.	5070	421M	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Kraft. Penny A.	5166	300M	587-Cyprus Minerals Company	Office Services-Word Processing	946	Kraft. Penny A.	300M	5166
Krivanek. Julie A.	5190	330S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Krommenhoek. Robert L.	5274	303M	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337M	5226
Krueger. Don C. †	5094	103M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Lampard. William J.	5265	116	581-Cyprus Gold Company	President	380	Schillinger. Maxine L.	117	5386
Landolt. Brenda R.	5446	275S	309-Cyprus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	275S	5446
Landres. Ted B.	5803	247M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Landres. Vernalee K.	5008	334S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Landrum. Debra A.	5029	116S	587-Cyprus Minerals Company	Law	890	Landrum. Debra A.	116S	5029
Lantz. Darlene C.	5161	310S	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337M	5226
LeBlanc. Thomas J.	5288	359M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	375S	5259
Leland. Stanley S. †	5637	150	726-Expl..Dev.& Min.Res.	Administration	330	Blish. Susan A.	129	5621
Leo. K. Paige	5407	204S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Lessner. George D.	5460	235S	309-Cyprus Industrial Minerals	International Sales	81716	Chandler. Barbara A.	234S	5091
Locks. Jocelyn J.	5669	128S	587-Cyprus Minerals Company	Law	890	Locks. Jocelyn J.	128S	5669
Lodenkamper, John	5721	318M	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319M	5139
Loew. George R.	5034	110M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Loewen. Robert J.	5209	312M	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324M	5082
Loken. Bruce G.	5659	301M	585-Cyprus Copper Company	Marketing	913	Hale. Susan A.	316M	5018
Longhofer. Deborah K.	5138	240S	309-Cyprus Industrial Minerals	President	80400	Longhofer. Deborah K.	240S	5138
Longo. Richard	5197	246M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Loose. Rocky A. *	5607	285M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Loughrey. Kevin	5062	132S	587-Cyprus Minerals Company	Law	890	Erickson. Joyce P.	131S	5010
Louis. Patt A. †	5171	206S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Luevane. Marsha *†	5342	102S	587-Cyprus Minerals Company	Library/Information Center	948			
Luxley, L. Bruce	5793	235M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Lutrey. Tom *	5201	132	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	5315
MacMillan. Janice L.	5827	319S	389-Cyprus Coal Company	Transportation	915	MacMillan. Janice L.	319S	5827
Magnuson. Wm. S.	5613	109M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Maher. Henry E. (Hank)	5797	256M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Maier. David C. †	5684	230M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Malys. Gerald J.	5060	440S	587-Cyprus Minerals Company	Executive Office	805	Frank. V. Florence	437S	5051
Mansfield. Nancy	5149	350M	587-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	385M	5213
Mares. Julie M. †	5086	323M	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319M	5139
Martin. Dianne L.	5046	422S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	426S	5058
Martin. Marcia J.	5262	414M	587-Cyprus Minerals Company	Corporate & Consolidated Acctg	845	Martin. Marcia J.	414M	5262
Martin. Michael O.	5177	128	726-Expl..Dev.& Min.Res.	Sr. Vice President-ED&HR	380	Blish. Susan A.	129	5621
Mason. M. Chellie	5098	260M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Mateer. Raymond G.	5124	306S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	5176
Matthis. Karen R.	5315	138	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	5315
McCabe. Jon M.	5815	248M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
McCain. Cynthia	5105	324S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
McCarthy. E. F.	5563	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
McCutchan. Mel E.	5146	300M	587-Cyprus Minerals Company	Office Services-Word Processing	946	McCutchan. Mel E.	300M	5146
McDonald. Kerry A.	5356	446S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Davidson. Janna L.	443S	5118
McFerrin. Mildred J.	5658	309S	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337M	5226

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ADMINISTRATIVE SUPPORT LIST SORTED BY NAME
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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
McKelvy, Jean L.	5773	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt, Nicki	253S	5487
McLaughlin, Mary †	5327	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born, Charolette E.	423M	5097
McQuarrie, Marie C.	5101	319S	389-Cyprus Coal Company	Sales & Customer Service	910	McQuarrie, Marie C.	319S	5101
Meadows, W. O.	5564	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch, Karen M.	LAB	5562
Meier, Robert H.	5809	413M	587-Cyprus Minerals Company	Policies & Procedures	845	Martin, Marcia J.	414M	5262
Melaragno, Tom *	5489	274M	587-Cyprus Minerals Company	Information Services	878	Middleton, Mary Lou	231M	5820
Mercier, John M.	5127	361S	389-Cyprus Coal Company	Resource Development	961	Radcliffe, Carolyn L.	300S	5176
Middleton, Mary Lou	5820	231M	587-Cyprus Minerals Company	Information Services	875	Middleton, Mary Lou	231M	5820
Miera, LeRoy	5724	351S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare, Sue M.	344S	5130
Miley, Karen	5455	112S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Miller, Donald O.	5252	380S	587-Cyprus Minerals Company	Human Resources	923	Greenwood, Melissa M.	365M	5213
Millet, Paul R.	5336	245S	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt, Nicki	253S	5487
Milliken, Frank R.	5382	369S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe, Carolyn L.	300S	5176
Monheit, Patricia E.	5312	420M	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin, Marcia J.	414M	5262
Monkus, Gail A.	5345	375S	587-Cyprus Minerals Company	Human Resources-Benefit Admn	924	Kinser, Sharon M.	379S	5259
Moody, JoAnn	5266	137S	587-Cyprus Minerals Company	Law	890	Moody, JoAnn	137S	5266
Mooney, Ruthann C.	5055	404S	587-Cyprus Minerals Company	Treasury	870	Williams, Patricia D.	408S	5206
Mooney, F. Steven	5289	328M	585-Cyprus Copper Company	President	808	DeMier, Patty L.	327M	5261
Morin, Kristine K.	5020	109S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Morley, Susan	5040	213S	587-Cyprus Minerals Company	Tax	848	Gaylord, Laurie M.	216S	5282
Morris, James R.	5228	342S	389-Cyprus Coal Company			Gunnare, Sue M.	344S	5130
Morse, Louis H.	5461	473S	587-Cyprus Minerals Company	Financial Analysis	884	Harp, Julie K.	472S	5491
Moser, Janice G.	5347	363M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser, Sharon M.	379S	5259
Muehleip, Mary P.	5231	338M	585-Cyprus Copper Company	Controller	842	Hanchey, Barbara J.	337M	5226
Mueller, Karen A.	5616	116S	587-Cyprus Minerals Company	Law	890	Mueller, Karen A.	116S	5616
Mulryan, H. T. (Joe)	5153	421S	587-Cyprus Minerals Company	Consultant	815	Schultz, Anna M.	431S	5061
Murino, Louis D.	5619	243S	309-Cyprus Industrial Minerals	International	81716	Chandler, Barbara A.	234S	5091
Murray, Don	5802	241S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer, Deborah K.	240S	5138
Nace, R. H. (Dick)	5077	227M	587-Cyprus Minerals Company	Information Services	875	Middleton, Mary Lou	231M	5820
Nagan, Nancy J.	5670	345M	587-Cyprus Minerals Company	Office Services-Supervisor	946	Nagan, Nancy J.	345M	5670
Nalven, James G.	5745	373S	389-Cyprus Coal Company	Technical Services-Env.&Mine Eng.	963	Radcliffe, Carolyn L.	300S	5176
Nelson, Donna L.	5139	319M	585-Cyprus Copper Company	Marketing	913	Nelson, Donna L.	319M	5139
Nerger, Lawrence	5454	226M	587-Cyprus Minerals Company	Information Services	876	Middleton, Mary Lou	231M	5820
Nied, Bruce	5425	268S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	275S	5486
Noel, Oscar F. III	5570	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch, Karen M.	LAB	5562
Noel, Sharon K. †	5033	334M	585-Cyprus Copper Company	Controller	842	Hanchey, Barbara J.	337M	5226
Norrell, Gerald B.	5354	321S	389-Cyprus Coal Company	Contract Administration	915	MacMillan, Janice L.	319S	5827
Notheisen, Betty A.	5577	364M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser, Sharon M.	379S	5259
Ola, Susan O.	5611	122S	587-Cyprus Minerals Company	Law	890	Wertz, Bonnie L.	121S	5030
Orendorf, Mickey	5154	366M	587-Cyprus Minerals Company	Human Resources	923	Greenwood, Melissa M.	365M	5213
PW-Auditors †	5640	480S	Price Waterhouse	Auditors	000			
PW-Auditors †	5709	480S	Price Waterhouse	Auditors	000			
PW-Managers †	5028	482S	Price Waterhouse	Managers	000			
Padden, Roger M.	5433	276S	309-Cyprus Industrial Minerals	Sales - Industrial	81702	Wielenga, Sylvia J.	275S	5486
Park, Frederick B.	5646	158	726-Expl..Dev.& Min.Res.	VP Exploration-Metals	381	Hoffman, Liz	154	5755
Patrick, M. Craig	5609	328S	389-Cyprus Coal Company	Human Resources	920	Walker, Pat A.	329S	5142
Peelish, Michael R.	5234	120S	587-Cyprus Minerals Company	Law	890	Taets, Lynn M.	119S	5428
Peluso, Thomas F.	5076	351M	587-Cyprus Minerals Company	Human Resources	923	Greenwood, Melissa M.	365M	5213
Peppard, Gerard	5041	421S	587-Cyprus Minerals Company	Human Resources	920	Bottorff, Mary Lou	428S	5221

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Pereira. M. W.	5636	344N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337M	5226
Pergrem. Dwayne W.	5148	333M	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330M	5162
Petersburg. Shawn A.	5144	478S	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Phelps. Catherine S.	5723	416M	587-Cyprus Minerals Company	Corporate & Consolidated Acctg	845	Martin. Marcia J.	414M	5262
Phillips. Jeffrey	5389	341S	389-Cyprus Coal Company	Planning & Analysis	846	Thomas. Julie K.	337S	5398
Phillips. Key L.	5470	227S	309-Cyprus Industrial Minerals	Human Resources-Safety&Ind.Hyg.	92000	Bauer. Linda L.	231S	5134
Phinpraphat. Jeannine †	5044	211S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Pine. Julie A. †	5257	219S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Pittenger. Mark †	5279	464S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Placka. Michael F.	5744	356S	389-Cyprus Coal Company			Radcliffe. Carolyn L.	300S	5176
Poersch. Karen M.	5562	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Poganski. Gregory L.	5311	355M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Popish. Diana K.	5482	259S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Micki	253S	5487
Popish. Marilyn F. †	5069	249M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Powell. Debbie *	5018	316M	585-Cyprus Copper Company	Marketing	913	Powell. Debbie	316M	5018
Pratt. Will	5826	251S	309-Cyprus Industrial Minerals	Sales	81702	Wielenga. Sylvia J.	275S	5486
Priddy. Kathy M.	5162	330M	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330M	5162
Puckett. Kristen P.	5711	284M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Pugh. Chuck	5568	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Purswell. Robert L.	5185	367S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe. Carolyn L.	300S	5176
Putnam. Craig	5179	273M	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Quinn. Sheryl O. †	5330	412S	587-Cyprus Minerals Company	Treasurer - Credit & Collection	870	Williams. Patricia O.	408S	5206
Radcliffe. Carolyn L.	5176	300S	389-Cyprus Coal Company	Technical Resources	960	Radcliffe. Carolyn L.	300S	5176
Radies. Jr.. Ernest A. †	5338	108	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger. Maxine I.	117	5386
Radies. Mary J. †	5227	279M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486
Ratcliff. Deborah S.	5116	406S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia O.	408S	5206
Ratcliff. Donald B.	5238	456S	587-Cyprus Minerals Company	Market Strategy	911	Davidson. Janna L.	443S	5118
Reigan. Marine *	5837	247S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Micki	253S	5487
Revitte. Robert F.	5653	348M	587-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	365M	5213
Ricardo. Mary L. †	5771	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Micki	253S	5487
Richards. William O.	5135	347S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Rist. Hank	5351	362S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Roberts. Sheri L.	5047	116M	587-Cyprus Minerals Company	Office Services-Rec. Retention	947	Roberts. Sheri L.	116M	5047
Roe. Matt S.	5022	119M	587-Cyprus Minerals Company	Office Services-Reprographics	946	Roe. Matt S.	119M	5022
Roeder. Robert E.	5842	288M	309-Cyprus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	275S	5447
Rounds. Michael	5186	419S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	417S	5825
Ryckman. Jeffrey S.	5370	228M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Sabatoni. Maria S.	5738	284M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486
Sackett. Sallie K. †	5217	458S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Schaumburg. Erica F.	5384	377S	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Schillinger. Maxine	5386	117	581-Cyprus Gold Company	President	380	Schillinger. Maxine I.	117	5386
Schissler. Andrew P.	5054	371S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe. Carolyn L.	300S	5176
Schmidt. Warren W.	5681	270M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Schnutz. Dale J.	5836	244S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer. Deborah K.	240S	5138
Schneider. Jr.. Robert H.	5242	326S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Schulte. J. H.	5196	202S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Schultz. Anna M.	5061	431S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Schultz. Anna M.	431S	5061
Scott. Randall J.	5469	469S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	5491
Sebenik. Roger F.	5578	LAB	585-Cyprus Copper Company	Marketing - Moly Development	913	Poersch. Karen M.	LAB	5562
Sessom. Fernando C.†	5021	273S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Sevy. W.	5431	277S	309-Cyprus Industrial Minerals	Sales - Products	81702	Wielenga. Sylvia J.	275S	5486
Shank. Robert S.	5449	245N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Sheldon. William C.	5754	251M	587-CyPrus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Shereneta. Frank	5236	356M	587-CyPrus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	5259
Sherman. Pam H.	5011	137S	587-Cyprus Minerals Company	Law	890	Sherman. Pam H.	137S	5011
Sherman. Sherrill A.	5085	136S	587-Cyprus Minerals Company	Law	890	Sherman. Pam H.	137S	5011
Shimbel. Lee F. *	5195	250N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Shonk. Lowell A.	5349	105	726-ExPl..Dev.& Min.Res.	Controller	840	Schillinger. Maxine I.	105	5386
Simi. Ruth	5630	111M	587-CyPrus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Simmons. Jill *	5438	210S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Skeens. Janie M.	5322	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Smart. Marriott W. †	5365	104S	587-CyPrus Minerals Company	Library/Information Center	948			
Smith. Brian *	5644	274M	587-CyPrus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	5820
Smith. John P. *	5644	283M	587-CyPrus Minerals Company	Information Services	879	Middleton. Mary Lou	231M	5820
Smith, Julie M.	5742	452S	587-Cyprus Minerals Company	Market Strategy-Coal	911	Davidson. Janna L.	443S	5118
Smith. Tom	5006	236N	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Snow. Stuart R.	5237	308S	389-Cyprus Coal Company	Technical Resources	960	Radcliffe. Carolyn L.	300S	5176
Solly. Pamela A.	5012	110S	587-Cyprus Minerals Company	Law	890	Bowen. Sally E.	126S	5079
Spenner. Kathleen M.	5788	317M	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Spiecha. John J.	5652	327S	389-Cyprus Coal Company	V.P. - Operations	804	Radcliffe. Carolyn L.	300S	5176
Spielman. Susan L.	5748	427N	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Steen. Bill	5565	LAB	309-CyPrus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Stolina. Nelly	5569	LAB	309-CyPrus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Stone. Jr.. Chester B.	5057	436S	587-Cyprus Minerals Company	HQ Coal and Iron Ore	810	Frank. V. Florence	437S	5051
Strain. Robert O. †	5304	404N	587-Cyprus Minerals Company	Budgets & Reporting	845	Hill. T. Kathy	411M	5026
Strandjord. Mark C.	5036	233M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Strub. Rosemary S.	5408	360N	587-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	365M	5213
Studer. Leslie R. †	5203	410S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia O.	408S	5206
Studer. Stephen †	5346	453S	587-CyPrus Minerals Company	Auditing & Procedures	882	Dolan. Joanne B.	483S	5271
Sturgess. Jamie	5782	331M	585-CyPrus Copper Company	Environmental Affairs	808	Wachsmann. Kathy M.	324M	5082
Such. Curtis L.	5567	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Sulesk. David P.	5626	465S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	5491
Swanson. Theresa O.	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Sypersma. Daniel	5126	370S	389-CyPrus Coal Company	Technical Services-Resource Dev.	961	Radcliffe. Carolyn L.	300S	5176
Taets. Lynn M.	5428	119S	587-Cyprus Minerals Company	Law	890	Taets. Lynn M.	119S	5428
Tafoya. Alex	5042	121M	587-CyPrus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Taraba. John	5245	408M	587-Cyprus Minerals Company	Controller	841	Hill. T. Kathy	411M	5026
Thiemes. Katharine S.	5137	214S	587-CyPrus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Thomas. Julie K.	5398	337S	389-CyPrus Coal Company	Controller	840	Thomas. Julie K.	337S	5398
Thomas. Stephen W.	5219	467S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Davidson. Janna L.	443S	5118
Thorpe. J. Tim	5480	281N	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486
Tiffin. O. Steve	5388	202N	587-CyPrus Minerals Company	Health Services-Medical	930	Fujita. Peggy	205M	5319
Tiritas. E. P. (Manos)	5844	236S	309-CyPrus Industrial Minerals	Technical Services	81704	Everitt. Nicki	253S	5487
Tomasino. Tera	5152	115N	587-Cyprus Minerals Company	Office Services-Telephone/Records	947	Tomasino. Tera	115M	5152
Trabert. Kathy M.	5825	417S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	417S	5825
Trabits. George A.	5103	366S	389-CyPrus Coal Company	Technical Services-Env.&Mine Eng.	963	Radcliffe. Carolyn L.	300S	5176
Tuffield. Michael	5772	246S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	5487
Turner. Robert C. (Nick)	5264	353S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	344S	5130
Tyszkiewicz. Kenneth A.	5002	127	726-ExPl..Dev.& Min.Res.	Human Resources	380	Blish. Susan A.	129	5621
Ussery. Jerri R.	494	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	5486

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Valdez. Connie	561S	242N	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	S820
Varga. Virginia *	5832	142	726-ExPl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	S31S
Villiard. A. Lynn	540S	312S	58S-CyPrus CopPer Company	Controller	842	Hanchey. Barbara J.	337M	S226
Viren. Edward A.. III	5473	352S	389-CyPrus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	S130	344S
Vogel. Craig G.	5239	313S	389-CyPrus Coal Company	Transportation	91S	McQuarrie. Marie C.	319S	S101
Vogels. Robert	5810	205S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	S282
Von Rentzell. Sandy K.	567S	300M	587-CyPrus Minerals Company	Office Services-Word Processing	946	Von Rentzell. Sandy	300M	S67S
Wachsmann. Kathy M.	5082	324M	58S-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324M	S082
Wagoner. Jean E.	5058	426S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	426S	S058
Wahrman. Jeanette M.	5673	300M	587-Cyprus Minerals Company	Office Services-Word Processing	946	Wahrman. Jeanette M.	300M	S673
Walker. Greg A.	S21S	124S	587-Cyprus Minerals Company	Law	890	Locks. Jocelyn L.	128S	S669
Walker. Pat A.	S142	329S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	S142
Wallack. Lynda W.	5093	357M	587-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S259
Wambolt. Larry D.	S784	106	726-ExPl..Dev.& Min.Res.	Controller	840	Schillinger. Maxine I.	117	S386
Warnaars. Fred	5833	148	726-ExPl..Dev.& Min.Res.	Administration	381	Hoffman. Liz	1S4	S75S
Warnick. S.	S339	228S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	S114
Watt. Gina L.	5268	146	726-ExPl..Dev.& Min.Res.	Land Management	970	Matthis. Karen R.	138	S31S
Wegner. Linda	S208	41SS	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	S206
Wells. Robert	S348	457S	587-Cyprus Minerals Company	HQ Coal and Iron Ore	810		448S	S178
Wertz. Bonnie L.	5030	121S	587-Cyprus Minerals Company	Law	890	Wertz. Bonnie L.	121S	S030
Whelpdale. David	S393	258M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231M	S820
Whigham. Edward G. †	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	S302
Wicks. V. J. (Pete)	5001	314S	389-CyPrus Coal Company	Sales & Customer Service	910	McQuarrie. Marie C.	319S	S101
Wielenga. Sylvia J.	S486	275S	309-Cyprus Industrial Minerals	Sales - Paper	81701	Wielenga. Sylvia J.	27SS	S486
Willcox. John S.	5328	349M	587-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SM	S213
Williams. Gary R.	5830	287M	309-CyPrus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	27SS	S447
Williams. John	S488	105M	587-CyPrus Minerals Company	Information Services	877	Evans. Alice L.	232M	S302
Williams. Patricia D.	S206	408S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	S206
Williams. T. A.	S3S3	425S	587-Cyprus Minerals Company	HQ Spec. Metals & Ind. Minerals	812	Bottorff. Mary Lou	428S	S221
Williamson. Kemal	5483	466S	587-Cyprus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	S491
Wilson. Bruce	S368	117M	587-Cyprus Minerals Company	Office Services-Supplies	947	Wilson. Bruce	117M	S368
Wilson. Laurie	S648	401M	587-Cyprus Minerals Company	Budgets & Reporting	84S	Hill. T. Kathy	411M	S026
Wilson. Linda G. †	S187	403M	587-CyPrus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	S206
Wilson. Mark A.	S361	471S	587-CyPrus Minerals Company	Financial Analysis	884	Harp. Julie K.	472S	S491
Wilson. Peggy S.†	S703	114S	587-Cyprus Minerals Company	Law	890	Landrum. Debra A.	116S	S029
Wilson. Sue *	5804	372S	389-CyPrus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Wisdom. Cheryl A.	5023	445S	587-CyPrus Minerals Company	Office Services-Manager	947	Schultz. Anna M.	431S	S051
Wittrig. Meredeth A. †	S38S	215S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	S282
Wolf. Philip C.	5084	242S	309-Cyprus Industrial Minerals	President	80400	Longhofer. Deborah K.	240S	S138
Woods. Julie F. †	S447	271S	309-CyPrus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	27SS	S486
Wright. Bruce R.	S1S1	449S	587-Cyprus Minerals Company	HQ SPec. Metals & Ind. Minerals	812		448S	S178

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Yaros, Mary †	5628	101N	587-Cyprus Minerals Company	Information Services	877	Evans, Alice L.	232N	5302
Yoshida, Alan S.	5017	147	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Young, Darrell E.	5465	2705	309-Cyprus Industrial Minerals	Sales - Industrial	81702	Wielenga, Sylvia J.	2755	5486
Yungmeyer, Harold	5736	4685	587-Cyprus Minerals Company	Financial Analysis	884	Harp, Julie K.	4725	5491
Zang, Daniel G.	5244	336N	585-Cyprus Copper Company	Controller	842	Hanchey, Barbara J.	337N	5226
Zazenski, Richard J.	5484	2575	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt, Nicki	2535	5487
Zegob, Susan	5107	3765	587-Cyprus Minerals Company	Human Resources-Benefits Adm	924	Kinser, Sharon M.	3795	5259
Zeisler, Sherry †	5052	282N	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	2755	5486
Zinge, Tom	5571	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch, Karen M.	LAB	5562
Zust, Patricia L. *	5326	2505	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga, Sylvia J.	2755	5486

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Admn. Support _____
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Company _____

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Longhofer. Deborah K.	5138	2405	309-Cyprus Industrial Minerals	President	80400	Longhofer. Deborah K.	2405	5138
Wolf. Philip C.	5084	2425	309-Cyprus Industrial Minerals	President	80400	Longhofer. Deborah K.	2405	5138
Beyl. François	5667	2305	309-Cyprus Industrial Minerals	U.S. Sales & Operations	81500	Longhofer. Deborah K.	2405	5138
Buettner. R. J. (Jack)	5472	2295	309-Cyprus Industrial Minerals	Production	81510	Bauer. Linda L.	2315	5134
Landolt. Brenda R.	5446	2755	309-Cyprus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	2755	5446
Roeder. Robert E.	5842	288N	309-Cyprus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	2755	5447
Wielenga. Sylvia J.	5486	2755	309-Cyprus Industrial Minerals	Sales - Paper	81701	Wielenga. Sylvia J.	2755	5486
Williams. Gary R.	5830	287N	309-Cyprus Industrial Minerals	Sales - Paper	81701	Landolt. Brenda R.	2755	5447
Padden. Roger M.	5433	2765	309-Cyprus Industrial Minerals	Sales - Industrial	81702	Wielenga. Sylvia J.	2755	5486
Pratt. Will	5826	2515	309-Cyprus Industrial Minerals	Sales	81702	Wielenga. Sylvia J.	2755	5486
Sevy. W.	5431	2775	309-Cyprus Industrial Minerals	Sales - Products	81702	Wielenga. Sylvia J.	2755	5486
Young. Darrell E.	5465	2705	309-Cyprus Industrial Minerals	Sales - Industrial	81702	Wielenga. Sylvia J.	2755	5486
Everitt. Nicki N.	5487	2535	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	2535	5487
Gill. Gordon	5182	2585	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	2535	5487
Millet. Paul R.	5336	2455	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	2535	5487
Tiritas. E. P. (Nanos)	5844	2365	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	2535	5487
Zazenski. Richard J.	5484	2575	309-Cyprus Industrial Minerals	Technical Services	81704	Everitt. Nicki	2535	5487
Bragassa. Reamy (Ray)	5569	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Cavanagh. Will A.	5572	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Clark. Mike	5574	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Colville. Pat	5566	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Harris. Ken	5575	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
McCarthy. E. F.	5563	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Meadows. W. D.	5564	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Noel. Oscar F. III	5570	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Poersch. Karen M.	5562	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Pugh. Chuck	5568	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Steen. Bill	5565	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Stolina. Nelly	5569	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Such. Curtis L.	5567	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Zinge. Tom	5571	LAB	309-Cyprus Industrial Minerals	Lab Facility	81705	Poersch. Karen M.	LAB	5562
Abarca. Sergio	5718	2525	309-Cyprus Industrial Minerals	International	81716	Chandler. Barbara A.	2345	5091
Chandler. Barbara A.	5091	2345	309-Cyprus Industrial Minerals	International Sales	81716	Chandler. Barbara A.	2345	5091
Lessner. George D.	5460	2355	309-Cyprus Industrial Minerals	International Sales	81716	Chandler. Barbara A.	2345	5091
Murino. Louis D.	5619	2435	309-Cyprus Industrial Minerals	International	81716	Chandler. Barbara A.	2345	5091

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
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Name	Ext.	Mail Code	Company	Department	Cost Ctr	Administrative Support	Mail Code	Ext.
Borowicz. Ginnie †	5067	250S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer. Deborah K.	240S	S138
Bradley. Carol M.	S307	248S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer. Deborah K.	240S	S138
Dechant. Joyce L. †	5088	260S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Fritz. Kimberly *	5758	262S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Garceau. George H. †	5801	263S	309-Cyprus Industrial Minerals	Controller-Accounting	84000	Everitt. Nicki	253S	S487
Graham. Vickie	S760	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Horne. Stephen	5065	249S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
McKelvy. Jean L.	S773	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Murray. Don	5802	241S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer. Deborah K.	240S	S138
Popish. Diana K.	S482	259S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Reigan. Norine *	5837	247S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Ricardo. Mary L. †	S771	250S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Schmutz. Dale J.	5836	244S	309-Cyprus Industrial Minerals	Controller	84000	Longhofer. Deborah K.	240S	S138
Tuffield. Michael	S772	246S	309-Cyprus Industrial Minerals	Controller	84000	Everitt. Nicki	253S	S487
Beall. Stewart L.	5463	274S	309-Cyprus Industrial Minerals	Sales/Marketing	91310	Wielenga. Sylvia J.	275S	S486
Borrelli. Mary A. †	S364	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Craig. Stella B. †	S413	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Dunn. Richard D.	5478	278M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Graves. Thomas C.	S403	269S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Jackson. Karen M. †	S445	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Jaquez. Joe R.	S444	253M	309-Cyprus Industrial Minerals	Sales Service	91310	Wielenga. Sylvia J.	275S	S486
King. Carolyn †	S412	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Nied. Bruce	S425	268S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Radies. Mary J. †	S227	279M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Sabatoni. Maria S.	S738	284M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Sessom. Fernando C.†	5021	273S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Thorpe. J. Tim	5480	281M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Ussery. Jerri R.	494	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Woods. Julie F. †	S447	271S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Zeisler. Sherry †	5052	282M	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Zust. Patricia L. *	S326	250S	309-Cyprus Industrial Minerals	Sales Services	91310	Wielenga. Sylvia J.	275S	S486
Bauer. Linda L.	S134	231S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	S134
Fickle. Robin L. †	S601	225S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	S134
Phillips. Key L.	S470	227S	309-Cyprus Industrial Minerals	Human Resources-Safety&Ind.Hyg.	92000	Bauer. Linda L.	231S	S134
Warnick. S.	S339	228S	309-Cyprus Industrial Minerals	Human Resources	92000	Bauer. Linda L.	231S	S134

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Morris. James R.	5228	342S	389-CyPrus Coal Company			Gunnare. Sue M.	344S	5130
Placha. Michael F.	5744	356S	389-Cyprus Coal Company			Radcliffe. Carolyn L.	300S	5176
Brown. D. P.	5846	345S	389-Cyprus Coal Company	President	804	Gunnare. Sue M.	344S	5130
Gunnare. Sue M.	5130	344S	389-Cyprus Coal Company	President	804	Gunnare. Sue M.	344S	5130
Spiecha. John J.	5652	327S	389-CyPrus Coal Company	V.P. - Operations	804	Radcliffe. Carolyn L.	300S	5176
Hopkins Darlene H.	5039	350S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Richards. William D.	5135	347S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Rist. Hank	5351	362S	389-Cyprus Coal Company	Materials Management	805	Secretary	343S	5373
Baum. John E.	5608	338S	389-Cyprus Coal Company	Controller	840	Thomas. Julie K.	337S	5398
Caffarelli. Jr.. J.	5609	339S	389-Cyprus Coal Company	Controller	840	Thomas. Julie K.	337S	5398
Thomas. Julie K.	5398	337S	389-CyPrus Coal Company	Controller	840	Thomas. Julie K.	337S	5398
Bornhofen. Richard G.	5232	332S	389-CyPrus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Haselhoff. William H.	5654	335S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Hinze. Daniel C.	5459	317S	389-CyPrus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Jackson. Paul R.	5805	325S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Landres. Vernalee K.	5008	334S	389-Cyprus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Schneider. Jr.. Robert H.	5242	326S	389-CyPrus Coal Company	Controller-Accounting	843	Thomas. Julie K.	337S	5398
Chittenden. John	5180	340S	389-Cyprus Coal Company	Planning & Analysis	846	Thomas. Julie K.	337S	5398
Esterline. Steven C.	5235	336S	389-Cyprus Coal Company	Planning & Analysis	846	Thomas. Julie K.	337S	5398
Phillips. Jaffrey	5389	341S	389-CyPrus Coal Company	Planning & Analysis	846	Thomas. Julie K.	337S	5398
McQuarrie. Marie C.	5101	319S	389-CyPrus Coal Company	Sales & Customer Service	910	McQuarrie. Marie C.	319S	5101
Wicks. V. J. (Pete)	5001	314S	389-Cyprus Coal Company	Sales & Customer Service	910	McQuarrie. Marie C.	319S	5101
Orabant. Donald J.	5769	447S	389-CyPrus Coal Company	Sales	910	McQuarrie. Marie C.	319S	5101
Canter. Thomas C.	5114	315S	389-CyPrus Coal Company	Transportation	915	MacMillan. Janice L.	319S	5827
Deal. Larry N.	5812	316S	389-CyPrus Coal Company	Contract Administration	915	MacMillan. Janice L.	319S	5827
Irr. Thomas J.	5811	320S	389-CyPrus Coal Company	Transportation	915	MacMillan. Janice L.	319S	5827
MacMillan. Janice L.	5827	319S	389-Cyprus Coal Company	Transportation	915	MacMillan. Janice L.	319S	5827
Norrell. Gerald B.	5354	321S	389-CyPrus Coal Company	Contract Administration	915	MacMillan. Janice L.	319S	5827
Vogel. Craig G.	5239	313S	389-Cyprus Coal Company	Transportation	915	McQuarrie. Marie C.	319S	5101
Caylor. John R.	5104	331S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Hake. James	5140	323S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Krivanek. Julie A.	5190	330S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
McCain. Cynthia	5105	324S	389-CyPrus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Patrick. N. Craig	5609	328S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Walker. Pat A.	5142	329S	389-Cyprus Coal Company	Human Resources	920	Walker. Pat A.	329S	5142
Radcliffe. Carolyn L.	5176	300S	389-CyPrus Coal Company	Technical Resources	960	Radcliffe. Carolyn L.	300S	5176
Snow. Stuart R.	5237	308S	389-Cyprus Coal Company	Technical Resources	960	Radcliffe. Carolyn L.	300S	5176

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Name	Ext.	Mail Code	Company	Department	Cost Ctr	Administrative Support	Mail Code	Ext.
Colley. G. Lynn	S125	360S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Hoffer. Richard J.	S121	370S	389-Cyprus Coal Company	Resource Development-Tech. Support	961	Radcliffe. Carolyn L.	300S	S176
Hunt. Gregory L.	5071	365S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Mateer. Raymond G.	S124	306S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Mercier. John M.	S127	361S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Sypersma. Daniel	S126	370S	389-Cyprus Coal Company	Technical Services-Resource Dev.	961	Radcliffe. Carolyn L.	300S	S176
Wilson. Sue *	5804	372S	389-Cyprus Coal Company	Resource Development	961	Radcliffe. Carolyn L.	300S	S176
Milliken. Frank R.	S382	369S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe. Carolyn L.	300S	S176
Nalven. James G.	S745	373S	389-Cyprus Coal Company	Technical Services-Env.&Mine Eng.	963	Radcliffe. Carolyn L.	300S	S176
Purswell. Robert L.	SI8S	367S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe. Carolyn L.	300S	S176
Schissler. Andrew P.	50S4	371S	389-Cyprus Coal Company	Environmental & Mine Engineering	963	Radcliffe. Carolyn L.	300S	S176
Trabits. George A.	S103	366S	389-Cyprus Coal Company	Technical Services-Env.&Mine Eng.	963	Radcliffe. Carolyn L.	300S	S176
Baughn. Bruce E.	S314	3S7S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn L.	300S	S176
Cox. Victor L.	S734	3S4S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn L.	300S	S176
Hager. Samuel E.	S176	300S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn L.	300S	S176
Hamd. John S.	S792	364S	389-Cyprus Coal Company	Process & Construction	979	Radcliffe. Carolyn L.	300S	S176
Dube. Michael R.	S424	363S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	344S	S130
Hart. Wm. Mark	S426	349S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	344S	S130
Hiera. LeRoy	S724	3S1S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	344S	S130
Turner. Robert C. (Nick)	S264	3S3S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	344S	S130
viren. Edward A., III	S473	3S2S	389-Cyprus Coal Company	Maintenance Resources	980	Gunnare. Sue M.	S130	344S

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Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
DeMier. Patty L.	5261	327N	585-Cyprus Copper Company	President	808	DeMier. Patty L.	327N	5261
Judy. Robert D.	5462	332N	585-Cyprus Copper Company	Environmental Affairs	808	Wachsmann. Kathy M.	324N	5082
Mooney. F. Steven	5289	328N	585-CyPrus Copper Company	President	808	DeMier. Patty L.	327N	5261
Sturgess. Jamie	5782	331N	585-Cyprus Copper Company	Environmental Affairs	808	Wachsmann. Kathy M.	324N	5082
Adcock. J. M.	5108	339N	585-Cyprus Copper ComPany	Controller	842	Hanchey. Barbara J.	337N	5226
Byrne. Vicki P.	5160	341N	585-CyPrus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Dulmaine. Jean Paul	5189	308S	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Hanchey. Barbara J.	5226	337N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Horton. Peggy J. †	5204	302N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Krommenhoek. Robert L.	5274	303N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Lantz. Darlene C.	5161	310S	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
McFerrin. Mildred J.	5658	309S	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Nuehleip. Mary P.	5231	338N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Noel. Sharon K. †	5033	334N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Pereira. M. W.	5636	344N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Villiard. A. Lynn	5405	312S	585-CyPrus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Zang. Daniel G.	5244	336N	585-Cyprus Copper Company	Controller	842	Hanchey. Barbara J.	337N	5226
Bartenhagen. Cathy L.	5306	301N	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324N	5082
Bell. Robert N.	5225	311N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Brost. Joyce Y.	5296	322N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Caldwell. Steven W.	5218	307N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Ceranowicz. Jo †	5003	320N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
DeCesare. Richard S.	5230	325N	585-Cyprus Copper Company	Marketing	913	DeMier. Patty L.	327N	5261
Disbury. Brian	5295	310N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Earle. Carol E.	5358	313N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Fraser. Michael J.	5477	321N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Hale. Susan	5018	316N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Hauser. Virginia	5240	306N	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324N	5082
Jaap. Michael	5305	301N	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324N	5082
Keenan. John C.	5169	301N	585-Cyprus Copper Company	Marketing	913	Hale. Susan	316N	5018
Lodenkamper. John	5721	318N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Loewen. Robert J.	5209	312N	585-CyPrus Copper Company	Marketing	913	Wachsmann. Kathy M.	324N	5082
Loken. Bruce G.	5659	301N	585-CyPrus Copper Company	Marketing	913	Hale. Susan A.	316N	5018
Mares. Julie M. †	5086	323N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Nelson. Donna L.	5139	319N	585-Cyprus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Powell. Debbie *	5018	316N	585-Cyprus Copper Company	Marketing	913	Powell. Debbie	316N	5018
Sebenik. Roger F.	5578	LAB	585-Cyprus Copper Company	Marketing - Moly Development	913	Poersch. Karen M.	LAB	5562
Spenner. Kathleen M.	5788	317N	585-CyPrus Copper Company	Marketing	913	Nelson. Donna L.	319N	5139
Wachsmann. Kathy M.	5082	324N	585-Cyprus Copper Company	Marketing	913	Wachsmann. Kathy M.	324N	5082
Gleason. Terry J.	5141	329N	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330N	5162
Hunt. Reuel J.	5378	335N	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330N	5162
Pergrem. Dwayne W.	5148	333N	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330N	5162
Priddy. Kathy M.	5162	330N	585-Cyprus Copper Company	Human Resources	922	Priddy. Kathy M.	330N	5162

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†Call directly regarding work. not administrative support.

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Ctr	Administrative Support	Mail Code	Ext.
Lampard, William J.	5265	116	581-Cyprus Gold Company	President	380	Schillinger, Maxine I.	117	5386
Schillinger, Maxine	5386	117	581-Cyprus Gold Company	President	380	Schillinger, Maxine I.	117	5386
Harlan, Howard M.	5191	130	726-Expl..Dev.& Min.Res.	Evaluations - Development	330	Blish, Susan A.	129	5621
Leland, Stanley S. †	5637	150	726-Expl..Dev.& Min.Res.	Administration	330	Blish, Susan A.	129	5621
Carlson, Eric	5056	150	726-Expl..Dev.& Min.Res.	Administration	373	Blish, Susan A.	129	5621
Bauer, Herman L.	5270	114	726-Expl..Dev.& Min.Res.	Administration	380	Hoffman, Liz	154	5755
Blish, Susan A.	5621	129	726-Expl..Dev.& Min.Res.	Administration	380	Blish, Susan A.	129	5621
Martin, Michael D.	5177	128	726-Expl..Dev.& Min.Res.	Sr. Vice President-EO&MR	380	Blish, Susan A.	129	5621
Tyszkiewicz, Kenneth A.	5002	127	726-Expl..Dev.& Min.Res.	Human Resources	380	Blish, Susan A.	129	5621
Blair, Robert G.	5369	136	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman, Liz	154	5755
Burton, William O.	5272	159	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman, Liz	154	5755
Hoffman, Elizabeth (Liz)	5755	154	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman, Liz	154	5755
Park, Frederick B.	5646	158	726-Expl..Dev.& Min.Res.	VP Exploration-Metals	381	Hoffman, Liz	154	5755
Warnaars, Fred	5833	148	726-Expl..Dev.& Min.Res.	Administration	381	Hoffman, Liz	154	5755
Brotzman, Victoria L.	5685	107	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine I.	117	5386
Coyner, J. Michael	5650	104	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine I.	117	5386
Radies, Jr., Ernest A. †	5338	108	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine I.	117	5386
Shonk, Lowell A.	5349	105	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine I.	105	5386
Wambolt, Larry D.	5784	106	726-Expl..Dev.& Min.Res.	Controller	840	Schillinger, Maxine I.	117	5386
Bensing, J. J.	5090	1085	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	1165	5315
Bihr, Hans	5207	131	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Bird, James H.	5335	139	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Brady, Patricia J.	5188	136	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Brotzman, Michael F.	5308	141	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Fitzsimmons, Nancy *	5635	137	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Gaskins, Lee T.	5087	135	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Lutrey, Tom *	5201	132	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Matthis, Karen R.	5315	138	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Varga, Virginia *	5832	142	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Watt, Gina L.	5268	146	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315
Yoshida, Alan S.	5017	147	726-Expl..Dev.& Min.Res.	Land Management	970	Matthis, Karen R.	138	5315

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Barr. Kenneth J.	5050	439S	587-Cyprus Minerals Company	Executive Office	805	Frank. V. Florence	437S	5051
Bottorff. Mary Lou	5221	428S	587-Cyprus Minerals Company	Executive Office	805	Bottorff. Mary Lou	428S	5221
Compton. J. C.	5263	429S	587-CyPrus Minerals Company	Executive Office	805	Bottorff. Mary Lou	428S	5221
Frank. V. Florence	5051	137S	587-CyPrus Minerals ComPany	Executive Office	805	Frank. V. Florence	437S	5051
Nalys. Gerald J.	5060	440S	587-Cyprus Minerals Company	Executive Office	805	Frank. V. Florence	437S	5051
Stone. Jr.. Chester B.	5057	436S	587-CyPrus Minerals Company	HQ Coal and Iron Ore	810	Frank. V. Florence	437S	5051
Wells. Robert	5348	457S	587-CyPrus Minerals ComPany	HQ Coal and Iron Ore	810		448S	5178
Bellum. Donald P.	5131	430S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Schultz. Anna M.	431S	5061
McDonald. Kerry A.	5356	446S	587-Cyprus Minerals Company	HQ CoPPer and Gold	811	Davidson. Janna L.	443S	5118
Schultz. Anna M.	5061	431S	587-CyPrus Minerals Company	HQ Copper and Gold	811	Schultz. Anna M.	431S	5061
Thomas. Stephen W.	5219	467S	587-Cyprus Minerals Company	HQ Copper and Gold	811	Davidson. Janna L.	443S	5118
Hesketh. James K. B.	5437	459S	587-Cyprus Minerals Company	HQ Spec. Metals & Ind. Minerals	812		448S	5178
Williams. T. A.	5353	425S	587-Cyprus Minerals Company	HQ SPec. Metals & Ind. Minerals	812	Bottorff. Mary Lou	428S	5221
Wright. Bruce R.	5151	449S	587-CyPrus Minerals ComPany	HQ SPec. Metals & Ind. Minerals	812		448S	5178
Mulryan. M. T. (Joe)	5153	421S	587-Cyprus Minerals ComPany	Consultant	815	Schultz. Anna M.	431S	5061
Gaylord. Joy G.	5202	409M	587-CyPrus Minerals Company	Controller	841	Hill. T. Kathy	411M	5026
Hill. T. Kathy	5026	411M	587-Cyprus Minerals Company	Controller	841	Hill. T. Kathy	411M	5026
Taraba. John	5245	408M	587-CyPrus Minerals ComPany	Controller	841	Hill. T. Kathy	411M	5026
Dowell. Billie S. †	5381	218S	587-Cyprus Minerals ComPany	Payroll	844	Gaylord. Laurie M.	216S	5282
Driscoll. Veronica †	5317	217S	587-CyPrus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Fisher. Gregory A. †	5243	224S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
French. Claudene †	5078	209S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Fulgham. William M.	5309	223S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Kear. StePhany †	5845	208S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Louis. Patt A. †	5171	206S	587-CyPrus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
PhinpraPhat. Jeannine †	5044	211S	587-Cyprus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Pine. Julie A. †	5257	219S	587-CyPrus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Wittrig. Meredeth A. †	5385	215S	587-CyPrus Minerals Company	Payroll	844	Gaylord. Laurie M.	216S	5282
Born. Charolette E. †	5097	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Bury. Julie L.	5320	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
CaHow. Kenneth R.. Jr.	5211	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	425M	5097
Cohen. Rolanda M.	5806	418M	587-CyPrus Minerals Company	CorPorate Accounting	845	Martin. Marcia J.	414M	5262
Davey. Naybelle S. †	5321	422M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Deinling. Don J.	5329	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Ooster. E. Elizabeth	5089	426M	587-CyPrus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Hamilton. Bradley W.	5404	407M	587-CyPrus Minerals Company	Budgets & RePorting	845	Hill. T. Kathy	411M	5026
Hill. Gail M. †	5241	417M	587-Cyprus Minerals ComPany	CorPorate Accounting	845	Martin. Marcia J.	414M	5262
Huesman. Lisa R.	5083	479S	587-CyPrus Minerals CoMpany	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Kent. Vicky B.	5651	406M	587-Cyprus Minerals CoMpany	Budgets & RePorting	845	Hill. T. Kathy	411M	5026
Kounovsky. Bart W.	5070	421M	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Martin. Marcia J.	5262	414M	587-CyPrus Minerals Company	CorPorate & Consolidated Acctg	845	Martin. Marcia J.	414M	5262
McLaughlin. Mary †	5327	423M	587-Cyprus Minerals ComPany	Accounts Payable	845	Born. Charolette E.	423M	5097
Meier. Robert M.	5809	413M	587-Cyprus Minerals Company	Policies & Procedures	845	Martin. Marcia J.	414M	5262
Monheit. Patricia E.	5312	420M	587-Cyprus Minerals ComPany	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Petersburg. Shawn A.	5144	478S	587-CyPrus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Phelps. Catherine S.	5723	416M	587-CyPrus Minerals CoMpany	Corporate & Consolidated Acctg	845	Martin. Marcia J.	414M	5262

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Skeens. Janie M.	5322	423M	587-Cyprus Minerals Company	Accounts Payable	845	Born. Charolette E.	423M	5097
Spielman. Susan L.	5748	427M	587-Cyprus Minerals Company	Consolidated Accounting	845	Martin. Marcia J.	414M	5262
Strain. Robert D. †	5304	404M	587-Cyprus Minerals Company	Budgets & Reporting	845	Hill. T. Kathy	411M	5026
Wilson. Laurie	5648	401M	587-Cyprus Minerals Company	Budgets & Reporting	845	Hill. T. Kathy	411M	5026
Flemming. J. D. (David)	5193	207S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Gaylord. Laurie M.	5282	216S	587-Cyprus Minerals Company	Tax/Payroll	848	Gaylord. Laurie M.	216S	5282
Leo. K. Paige	5407	204S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Morley. Susan	5040	213S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Schulte. J. M.	5196	202S	587-Cyprus Minerals Company	Tax.	848	Gaylord. Laurie M.	216S	5282
Simmons. Jill *	5438	210S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Thiemes. Katharine S.	5137	214S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Vogels. Robert	5810	205S	587-Cyprus Minerals Company	Tax	848	Gaylord. Laurie M.	216S	5282
Armbrister. Michael L. †	5031	413S	587-Cyprus Minerals Company	Treasurer - Credit & Collection	870	Williams. Patricia D..	408S	5206
Brown. Rose L. †	5334	401S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Gonzales. Marta G. †	5333	402S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Graybill. Ron	5194	416S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Hakimi. Farokh S.	5106	414S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Haugh. D. C.	5025	409S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Mooney. Ruthann C.	5055	404S	587-Cyprus Minerals Company	Treasury	870	Williams. Patricia D.	408S	5206
Quinn. Sheryl D. †	5330	412S	587-Cyprus Minerals Company	Treasurer - Credit & Collection	870	Williams. Patricia D.	408S	5206
Ratcliff. Deborah S.	5116	406S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Studer. Leslie R. †	5203	410S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Wegher. Linda	5208	415S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Williams. Patricia D.	5206	408S	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Wilson. Linda G. †	5187	403M	587-Cyprus Minerals Company	Treasurer	870	Williams. Patricia D.	408S	5206
Evans. Alice L.	5302	232M	587-Cyprus Minerals Company	Information Services	875	Evans. Alice L.	232M	5302
Gaul. Dennis M.	5829	234M	587-Cyprus Minerals Company	Information Services	875	Evans. Alice L.	232M	5302
Middleton. Mary Lou	5820	231M	587-Cyprus Minerals Company	Information Services	875	Middleton. Mary Lou	231M	5820
Mace. R. H. (Dick)	5077	227M	587-Cyprus Minerals Company	Information Services	875	Middleton. Mary Lou	231M	5820
Jefferies. Robert A. †	5716	224M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Johnson. Leland R.	5828	229M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
King, David	5053	240M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Merger. Lawrence	5454	226M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Ryckman. Jeffrey S.	5370	228M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Smith. Tom	5006	236M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Strandjord. Mark C.	5036	233M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Valdez. Connie	5615	242M	587-Cyprus Minerals Company	Information Services	876	Middleton. Mary Lou	231M	5820
Bolger. James J. †	5765	106M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Bulford. Jennifer L. †	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Crosby. Terry	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Droppelman. James W. †	5275	104M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Frederick. Diana *	5043	264M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Grotegut. Don	5439	108M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
James. Van †	5042	121M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Krueger. Don C. †	5094	103M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Loew. George R.	5034	110M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Magnuson. Wm. S.	5613	109M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302
Simi. Ruth	5630	111M	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232M	5302

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ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Swanson. Theresa D.	5042	121N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Tafoya. Alex	5042	121N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Whigham. Edward G. †	5042	121N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Williams. John	5488	105N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Yaros. Mary †	5628	101N	587-Cyprus Minerals Company	Information Services	877	Evans. Alice L.	232N	5302
Adams. Susan E. †	5276	257M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Behm. David W.	5383	262N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Boehlke. John W. *	5260	274M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Buckley. Leonard J.	5430	269M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Cardamone. Frank A.	5693	254M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Carfrae. Marilyn A.	5705	290M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Farrell. M. Lori	5751	259N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Garner. Andrietta C.	5331	267M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Keown. L. Eric	5174	268N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Knoll. Kevin F. †	5096	255N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Maher. Henry E. (Hank)	5797	256N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Mason. M. Chellie	5098	260M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Melaragno. Ida *	5489	274M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Popish. Marilyn F. †	5069	249M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Puckett. Kristen P.	5711	284M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Schmidt. Warren W.	5681	270M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Smith. Brian *	5644	274M	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Wheipdale. David	5393	258N	587-Cyprus Minerals Company	Information Services	878	Middleton. Mary Lou	231N	5820
Bellum. Greig D.	5287	238N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Collings. Jimmie D.	5379	252N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Dalton. Glenn A.	5267	276N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Dawe. Scott A.	5796	275N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Jarez. Rodrigo	5795	237N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Landres. Ted B.	5803	247N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Longo. Richard	5197	246N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Loose. Rocky A. *	5607	285N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Lumley. L. Bruce	5793	235N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Maier. David C. †	5684	230N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
McCabe. Jon M.	5815	248N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Putnam. Craig	5179	273N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Shank. Robert S.	5449	245N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Sheldon. William C.	5754	251N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Shimbel. Lee F. *	5195	250N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Smith. John P. *	5644	283N	587-Cyprus Minerals Company	Information Services	879	Middleton. Mary Lou	231N	5820
Abercrombie. Gail A.	5216	418S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	4175	5825
Ball. Lola A.	5375	4245	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	426S	5058
Hagman. R. M. (Dick)	5362	420S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	4265	5058
Martin. Dianne L.	5046	422S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	4265	5058
Rounds. Michael	5186	4195	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	4175	5825
Trabert. Kathy M.	5825	4175	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Trabert. Kathy M.	4175	5825
Wagoner. Jean E.	5058	426S	587-Cyprus Minerals Company	Public. Govt & Investor Relations	880	Wagoner. Jean E.	4265	5058

*Consultant/Temporary

†Call directly regarding work. not administrative support.

LEHMAN 00722

ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT.
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Andrews, C. R. †	S340	460S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Aydt, Greg D.	S249	461S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Bott, Rick J. †	S467	481S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Knope, Paul T.	S603	463N	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Pittenger, Mark †	5279	464S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Sackett, Sallie K. †	S217	458S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Studer, Stephen †	S346	453S	587-Cyprus Minerals Company	Auditing & Procedures	882	Dolan, Joanne B.	483S	S271
Anderson, Todd	S808	477S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Bhappu, Ross R.	S839	475S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Cornette, Daniel J.	S629	474S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Genereaux, Bruce M.	S256	470S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Harp, Julie K.	S491	472S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Horse, Louis M.	S461	473S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Scott, Randall J.	S469	469S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Suleski, David P.	562S	465S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Williamson, Kemal	S483	466S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Wilson, Mark A.	S361	471S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Yungmeyer, Harold	S736	468S	587-Cyprus Minerals Company	Financial Analysis	884	Marp, Julie K.	472S	S491
Anderson, Debbie K.	S212	139S	587-Cyprus Minerals Company	Law	890	Erickson, Joyce P.	131S	S010
Bowen, Sally E.	5079	126S	587-Cyprus Minerals Company	Law	890	Bowen, Sally E.	126S	5079
Bromley, C. Corwin (Cory)	S838	117S	587-Cyprus Minerals Company	Law	890	Mueller, Karen A.	116S	S616
Eckstein, Donald A.	5016	111S	587-Cyprus Minerals Company	Law	890	Mueller, Karen A.	116S	S616
Erickson, Joyce P.	5010	131S	587-Cyprus Minerals Company	Law	890	Erickson, Joyce P.	131S	5010
Felger, Charles T.	S158	106S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Friedman, Deborah J.	S657	129S	587-Cyprus Minerals Company	Law	890	Locks, Jocelyn L.	128S	S669
Gallagher, Leslie A.	S027	133S	587-Cyprus Minerals Company	Law	890	Moody, JoAnn A.	137S	S266
Gardiner, Craig A.	S013	134S	587-Cyprus Minerals Company	Law	890	Moody, JoAnn A.	137S	S266
Godell, Ralph W.	5014	130S	587-Cyprus Minerals Company	Law	890	Erickson, Joyce P.	131S	5010
Gormley, Kathleen J.	S824	125S	587-Cyprus Minerals Company	Law	890	Bowen, Sally E.	126S	5079
Hegner, Frank (Bruno)	S632	123S	587-Cyprus Minerals Company	Law	890	Wertz, Bonnie L.	121S	5030
Huffman, Dale E.	S155	115S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Kirchhoff, Bruce C.	S402	118S	587-Cyprus Minerals Company	Law	890	Sherman, Pam M.	137S	5011
Kling, Mark A.	S255	113S	587-Cyprus Minerals Company	Law	890	Taets, Lynn M.	119S	S428
Landrum, Debra A.	5029	116S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Locks, Jocelyn J.	S669	128S	587-Cyprus Minerals Company	Law	890	Locks, Jocelyn J.	128S	S669
Loughrey, Kevin	5062	132S	587-Cyprus Minerals Company	Law	890	Erickson, Joyce P.	131S	*5010*
Miley, Karen	S455	112S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Moody, JoAnn	S266	137S	587-Cyprus Minerals Company	Law	890	Moody, JoAnn	137S	S266
Morin, Kristine K.	5020	109S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029
Mueller, Karen A.	S616	116S	587-Cyprus Minerals Company	Law	890	Mueller, Karen A.	116S	S616
Oja, Susan D.	S611	122S	587-Cyprus Minerals Company	Law	890	Wertz, Bonnie L.	121S	5030
Peelish, Michael R.	S234	120S	587-Cyprus Minerals Company	Law	890	Taets, Lynn M.	119S	S428
Sherman, Pam M.	5011	137S	587-Cyprus Minerals Company	Law	890	Sherman, Pam M.	137S	5011
Sherman, Sherrill A.	508S	136S	587-Cyprus Minerals Company	Law	890	Sherman, Pam M.	137S	5011
Solly, Pamela A.	5012	110S	587-Cyprus Minerals Company	Law	890	Bowen, Sally E.	126S	5079
Taets, Lynn M.	S428	119S	587-Cyprus Minerals Company	Law	890	Taets, Lynn M.	119S	S428
Walker, Greg A.	S21S	124S	587-Cyprus Minerals Company	Law	890	Locks, Jocelyn L.	128S	S669
Wertz, Bonnie L.	5030	121S	587-Cyprus Minerals Company	Law	890	Wertz, Bonnie L.	121S	5030
Wilson, Peggy S.†	S703	114S	587-Cyprus Minerals Company	Law	890	Landrum, Debra A.	116S	5029

*Consultant/Temporary

†Call directly regarding work, not administrative support.

LEHMAN 00723

ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Dolan. Joanne	S7SS	483S	S87-Cyprus Minerals Company	Utility Services	90S	Dolan. Joanne B.	483S	S7SS
Graber. Larry	S677	40SN	S87-Cyprus Minerals Company	Utility Services	90S	Dolan. Joanne B.	483S	S7SS
Davidson. Janna L.	S118	443S	S87-Cyprus Minerals Company	Market Strategy	911	Davidson. Janna L.	443S	S118
Kelly. William S.	S229	4SSS	S87-Cyprus Minerals Company	Market Strategy-CIN & Coal	911	Davidson. Janna L.	443S	S118
Ratcliff. Donald B.	S238	4S6S	S87-Cyprus Minerals Company	Market Strategy	911	Davidson. Janna L.	443S	S118
Smith. Julie M.	S742	4S2S	S87-Cyprus Minerals Company	Market Strategy-Coal	911	Davidson. Janna L.	443S	S118
Crowl. Chris L.	S2S3	346N	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SN	S213
Greenwood. Melissa M.	S213	36SN	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa	36SN	S213
Horton. Richard L.	S366	347N	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SN	S213
Kitchell. Carole T.	S284	3S2N	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SN	S213
Peppard. Gerard	5041	421S	S87-Cyprus Minerals Company	Human Resources	920	Bottorff. Mary Lou	428S	S221
Strub. Rosemary S.	S408	360N	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SN	S213
Willcox. John S.	S328	349N	S87-Cyprus Minerals Company	Human Resources	920	Greenwood. Melissa M.	36SN	S213
Barrett. Thomas R.	S371	3S3N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Felton. Diane A.	S328	354N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Mansfield. Nancy	S149	350N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Miller. Donald O.	S2S2	380S	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Orendorf. Mickey	S1S4	366N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Peluso. Thomas F.	S076	3S1N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Revitte. Robert F.	S653	348N	S87-Cyprus Minerals Company	Human Resources	923	Greenwood. Melissa M.	36SN	S213
Anderson. Debora L.	S380	358N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Baker. Melodie J.	S442	361N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Glau. Linda L.	S247	362N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Higgins. G. A.	S434	378S	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Kinser. Sharon M.	S2S9	379S	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
LeBlanc. Thomas J.	S288	3S9N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	37SS	S2S9
Monkus. Gail A.	S34S	37SS	S87-Cyprus Minerals Company	Human Resources-Benefit Admn	924	Kinser. Sharon M.	379S	S2S9
Moser. Janice G.	S347	363N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Motheisen. Betty A.	SS77	364N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Poganski. Gregory L.	S311	3SSN	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Schaumburg. Erica F.	S384	377S	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Sheremeta. Frank	S236	3S6N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Wallack. Lynda W.	5093	3S7N	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Zegob. Susan	S107	376S	S87-Cyprus Minerals Company	Human Resources-Benefits Admn	924	Kinser. Sharon M.	379S	S2S9
Fujita. Peggy	S319	20SN	S87-Cyprus Minerals Company	Health Services-Medical	930	Fujita. Peggy	20SN	S319
Kluck. Clarence J., M.D.	S387	206N	S87-Cyprus Minerals Company	Health Services-Medical	930	Fujita. Peggy	20SN	S319
Tiffin. D. Steve	5388	202N	S87-Cyprus Minerals Company	Health Services-Medical	930	Fujita. Peggy	20SN	S319
Bondch. Sue E.	S672	300N	S87-Cyprus Minerals Company	Office Services-Word Processing	946	Bondch. Sue E.	300N	S672
Gonzales. Bethann R.	S000	123N	S87-Cyprus Minerals Company	Office Services-Reception	946	Gonzales. Bethann	123N	S000
Isaacs. Terry C.	S022	119N	S87-Cyprus Minerals Company	Office Services-Reprographics	946	Isaacs. Terry C.	119N	S022
Kraft. Penny A.	S166	300N	S87-Cyprus Minerals Company	Office Services-Word Processing	946	Kraft. Penny A.	300N	S166
McCutchan. Mel E.	S146	300N	S87-Cyprus Minerals Company	Office Services-Word Processing	946	McCutchan. Mel E.	300N	S146
Nagan. Nancy J.	S670	345N	S87-Cyprus Minerals Company	Office Services-Supervisor	946	Nagan. Nancy J.	345N	S670
Roe. Matt S.	S022	119N	S87-Cyprus Minerals Company	Office Services-Reprographics	946	Roe. Matt S.	119N	S022
Von Rentzell. Sandy K.	S675	300N	S87-Cyprus Minerals Company	Office Services-Word Processing	946	Von Rentzell. Sandy	300N	S675
Wahrman. Jeanette M.	S673	300N	S87-Cyprus Minerals Company	Office Services-Word Processing	946	Wahrman. Jeanette M.	300N	S673

*Consultant/Temporary

†Call directly regarding work, not administrative support.

LEHMAN 00724

ADMINISTRATIVE SUPPORT LIST SORTED BY COMPANY/DEPARTMENT
PLEASE SEND ANY CHANGES TO THIS LIST TO N. J. NAGAN, MAIL CODE 345N.

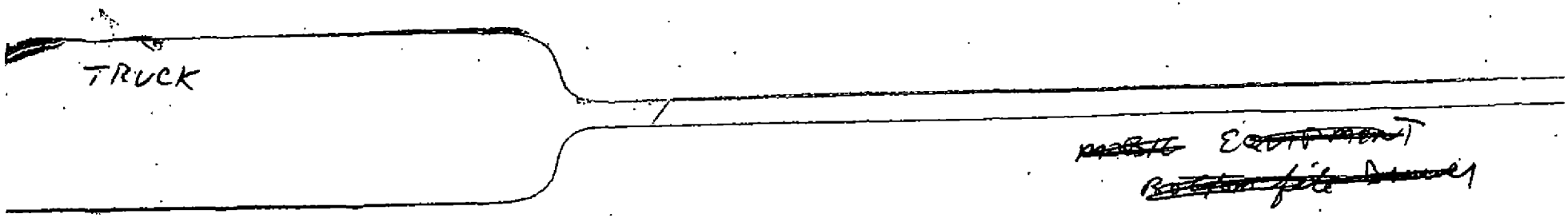
Name	Ext.	Mail Code	Company	Department	Cost Cntr	Administrative Support	Mail Code	Ext.
Frank. Vince	5019	118N	587-Cyprus Minerals Company	Office Services-Mail Room	947	Frank. Vince	118N	5019
Millburn. Stacy L.	5432	113N	587-Cyprus Minerals Company	Office Services-Records Center	947	Millburn. Stacy L.	113N	5432
Roberts. Sheri L.	5047	116N	587-Cyprus Minerals Company	Office Services-Rec. Retention	947	Roberts. Sheri L.	116N	5047
Tomasino. Tera	5152	115N	587-CyPrus Minerals Company	Office Services-TelePhone/Records	947	Tomasino. Tera	115N	5152
Wilson. Bruce	5368	117N	587-CyPrus Minerals Company	Office Services-Supplies	947	Wilson. Bruce	117N	5368
Wisdom. Cheryl A.	5023	445S	587-CyPrus Minerals Company	Office Services-Manager	947	Schultz. Anna M.	431S	5061
Capobianco. Debra *†	5342	102S	587-CyPrus Minerals Company	Library/Information Center	948			
Faris. Katherine M.	5081	102S	587-Cyprus Minerals Company	Library/Information Center	948			
Gayner. Trudy *†	5343	101S	587-Cyprus Minerals Company	Library/Information Center	948			
Luevane. Marsha *†	5342	102S	587-CyPrus Minerals Company	Library/Information Center	948			
Smart. Marriott W. †	5365	104S	587-CyPrus Minerals Company	Library/Information Center	948			
PW-Auditors †	5640	480S	Price Waterhouse	Auditors	000			
PW-Auditors †	5709	480S	Price Waterhouse	Auditors	000			
PW-Managers †	5028	482S	Price Waterhouse	Managers	000			

*Consultant/Temporary

†Call directly regarding work. not administrative support.

CNC:00-CO (11/20/89)

LEHMAN 00725



LEHMAN 00726

Dodge P/U 1980

February 14, 1985

V. P. Byrne
Mail Code 374A

Attached is check #475242 from Peterson, Howell and Heather, Inc., in the amount of $1,826.65, the realization on the sale of one used vehicle at Cyprus Industrial Minerals, South Plainfield, New Jersey. The vehicle is a 1980 Dodge Sweplin Pickup, Serial No. D14ANAS108536.

N. W. Templin
Mail Code N216

NWT/acm

Attachment

K. B. Lehman, CIM, S. Plainfield, NJ

475242

CHECK NO. 475242

DEALER NUMBER	OWNER NUMBER	SERIAL NUMBER	DELIVERY DATE	TOTAL	NET USED CAR PRICE	AMOUNT OUR DEALER
2488	33061					

PROCEEDS FROM SALE OF 1 UNIT
33061-1,826.65

FEB 12 1985

PETERSON, HOWELL & HEATHER, INC.
P.O. Box 2174, Baltimore, Maryland 21203

1,826.65

A PHH GROUP COMPANY

PETERSON, HOWELL & HEATHER, INC. 475242
P.O. BOX 2174, BALTIMORE, MARYLAND 21203

50-817
213

DATE		
MO	DAY	YR
02	07	85

CITIBANK (NEW YORK STATE), N.A.
NORTH AMERICAN BANKING GROUP

AMOUNT	
DOLLARS	CENTS
******1,826	65*

NOT GOOD AFTER 6 MONTHS

PAY THE SUM OF ******1,826 DOLLARS *65*CENTS

TO THE ORDER OF
STANDARD OIL COMPANY
7000 S. YOSEMITE ST.
ENGLEWOOD, CO 80112
ATTN: N. W. TEMPLIN

⑈475242⑈ ⑆021308176⑆ 30994106⑈

Amoco Minerals Company
7000 South Yosemite Street
Post Office Box 3299
Englewood, Colorado 80155
303-740-5201

Norman W. Templin
Manager
Purchasing Coordination

November 16, 1984

Mr. Pat Norris
Peterson, Howell & Heather, Inc.
P. O. Box 2174
Baltimore, Maryland 21203

Dear Mr. Norris:

Enclosed is one completed and signed PHH To Sell Notice form and Certificate of Title for the vehicle to be picked up by your representative at:

Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, NJ 07080

Contact: K. B. Lehman
Phone: (201) 754-4880.

Please direct the PH&H check for this vehicle to my attention.

Sincerely,

N. W. Templin/gkc

NWT/acm

Attachments

K. B. Lehman - After vehicle has been picked up, please send me a copy of PHH Vehicle Condition Report. NWT.

PHH TO SELL

CLIENT NAME	SERIAL NUMBER	CLIENT NO.	SUB	UNIT NO.
Amoco Minerals Company	D14ANAS100536	2490	07	33001

VEHICLE DESCRIPTION

THE ODOMETER READING BELOW, AS REQUIRED BY FEDERAL REGULATION P L 92-513 IS CORRECT TO THE BEST OF MY KNOWLEDGE AS OF THIS DATE

YEAR · MAKE · CYL · SERIES · DOORS · BODY STYLE	EQUIPMENT A/T	R	P/S	P/B	A/C	VINYL TOP	TINTED GLASS	ODOMETER READING
1980 Dodge Pickup SHEPLN	☐	☐	☐	☐	☐	☐	☐	56,144

DEALER ADDRESS (TO BE COMPLETED BY PHH)

LOCATION OF UNIT

NAME: Cyprus Industrial Minerals Company
ADDRESS: 651 Ketuchen Road
CITY/STATE PROV/ZIP: South Plainfield, NJ 07080
PHONE: (201) 754-4880
CONTACT: Keith B. Lehman

TYPE OF SALE

☐ S/S ☒ SURPLUS ☐ WRECK ☐ VEHICLE INOPERABLE

DAMAGED ESTIMATES $

PLEASE ATTACH ALL ESTIMATES & BIDS

ATTACHMENTS & SIGNATURE

TITLE NO. ENCLOSED	FROM STATE OF	☐ REGISTRATION ATTACHED	REGISTRATION NO.	FROM STATE OF
5262992	NJ			

NO ACTION POSSIBLE AT PHH WITHOUT OWNERSHIP DOCUMENTS.

SIGNATURE [signature] DATE 11/16/84

SPECIAL INSTRUCTIONS FROM CLIENT

Please send check to: Amoco Minerals Company
P. O. Box 3299
Englewood, Colorado 80155
Attention: H. H. Templin

UC 26 REO (REV. 7/84) 40M

PETERSON, HOWELL & HEATHER, INC.
P.O. BOX 2174 • BALTIMORE, MARYLAND 21203
2 ROBERT SPECK PARKWAY • MISSISSAUGA, ONTARIO L 4Z IN7

PRINTED IN U.S.A.

CLIENT FILE COPY

CONTROL NUMBER

5862992

NEW JERSEY DIVISION OF MOTOR VEHICLES

CERTIFICATE OF OWNERSHIP OF A MOTOR VEHICLE

LIEN INFORMATION

SECURED PARTY AND ADDRESS

NONE

TITLE

PLATE NO. XTJ25U

PREFIX

VEHICLE IDEN. NO. D14ANAS108536

NAME

CYPRUS INDUSTRIAL MINERALS CO*

DATE OF ISSUE 12 6 79

MILEAGE

STREET 151 METUCHEN RD

CITY AND STATE SO PLAINFLD NJ

AGENCY I.D. MER

DEALER I.D. 42553

C. OF O. FEE A4

MAKE DOD

YEAR 80

VEH. TYPE PUKUP

WC/GW/RP 5000

COLOR/AXLES CODE 2 11

MODEL SWEPLN

$ 6795.00

IN WITNESS WHEREOF I HAVE SET MY HAND AND OFFICIAL SEAL ON THE DATE SHOWN HEREON

I, the Director of Motor Vehicles, Department of Law and Public Safety of the State of New Jersey, do hereby certify that evidence of purchase of ownership, in compliance with the provision of R. S. Title 39, Chapter 10, as amended, of the above described motor vehicle, has been recorded and filed with me, and I do hereby issue this Certificate of Ownership to the above subject to security agreement or lien, if any, as stated above.

[redacted]

DIRECTOR

DIVISION OF MOTOR VEHICLES

BUREAU OF

January 31, 1986

DISTRIBUTION

Employee Personal Use of Company Owned Automobiles - Automotive Equipment Time Report

Effective immediately, the Automotive Equipment Time Report (Form 32-1008) should not be used and use of company autos should be recorded on Form 27-185 (Time Report - Weekly/Bi-Weekly Exception to Regular Work Schedule or Positive Time). As a result of this new procedure, Form 32-1008 may be used by employees for record keeping, however, Form 27-185 is the form to be submitted to payroll. The automobile use can be added to the regular exception report; that is, there is no need for an additional form.

The amount for each round-trip commute is $3.00 per employee, with a time/rate code of 98-40 (see attached example). The reporting period should be monthly or at least on a quarterly basis. Also, please note that inclusive dates may not be reported beyond the reporting period date for salaried employees.

If you have any questions, please call your payroll representative or myself.

Jan - Mar. 53 R.T.
#159.

James P. Daniel
235A

JF/sjw

Attachment

J. Furlong
M.J. Lorang
R.B. Rickard
E.P. Tiritas

Time Report — Weekly/Bi-Weekly
Exceptions to Regular Work Schedule or Positive Time
77 185 18 841

- Complete this form in ink.
- Time to be paid at different rates must be shown on separate lines.
- Report may be submitted weekly or bi-weekly according to Pay Period.
- When report is completed, send to Personnel Records Center (or transmit information).
- If Sickness and Disability, report separate and non-continuous absences on separate lines.
- For one day absences, complete "from" side only of inclusive dates of absence.

Reporting Period ▶	From (Date)							Through (Date)						
Name	Daily Time													
Last Initial	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Doe, John L.														

Time Report : ☐ Bi-Weekly Paid ☐ Weekly Paid

Company: ABC Company

Location or Department: Englewood

Reporting Period ▶ From (Date): February 1, 1986 Through (Date): February 28, 1986

Content Data (Leave Blank)

I.D. No.	Page No.	Batch No.	Pay Pd.
69 70 71 72	73 74	75 76 77	78 80

● Time Codes (Cols. 20-21) *Shading indicates codes most often used*			
00	Straight Time	37	Holiday Worked
01	New Hire	38	Commission
02	Return From Leave of Absence	39	Stand-by or Special Travel Pay
03	Return From Lay-off	40	Rate Differential
20	Terminated-Retired (Termination Reason Req'd.)	41	Vacation Allowance
21	Terminated-Resigned "	50	Vacation
22	Terminated-Deceased "	51	Excused Absence (Family)
23	Terminated-Discharged "	52	Excused Absence (Other)
24	Terminated-Other "	54	Holiday Allowance
25	Transferred Out (Another Co.) "	60	S & D Benefits
30	Additional Straight Time	61	Occupational Injury or Illness
31	Overtime	91	Shift Differential
32	Absence Without Pay-Subject To Benefit Plan Makeup (½ day or more)	98	Driver's Miles
33	Absence Without Pay-Not Subject To Benefit Plan Makeup (Less than ½ day)		
34	Adjustment		
35	Call Out		

* When these Time Codes are Used, the Rate Code will always be 20.

● Rates Codes (Cols. 22-23)		
10	Morning	Straight Time
11	"	One and One-Half Time
12	"	One-Half Time
13	"	Double Time
14	"	Two and One-Half Time
20	Day	Straight Time
21	"	One and One-Half Time
22	"	One-Half Time
23	"	Double Time
24	"	Two and One-Half Time
30	Evening	Straight Time
31	"	One and One-Half Time
32	"	One-Half Time
33	"	Double Time
34	"	Two and One-Half Time
99	Identification rate code to override and used in lieu of normal pay period earnings for employees on an exception reporting basis. (Salaried or Hourly employees-off payroll).	

● Conversion of Minutes to Tenths of an Hour		
Minutes	S & D Vac. Etc. (Abs.)	Shift & Rate Differential Etc. (Worked)
1 – 6	.0	.1
7 – 12	.1	.2
13 – 18	.2	.3
19 – 24	.3	.4
25 – 30	.4	.5
31 – 36	.5	.6
37 – 42	.6	.7
43 – 48	.7	.8
49 – 54	.8	.9
55 – 59	.9	1.0

Social Security Number (Important – Verify!)	Change Cd	Card No.	Time Code	Rate Code	Hours or Miles	Tenths	Sign	Rate of Pay Decimal For: Hourly	Salaried	Dollar Amount Decimal	Sign	Inclusive Dates of Absence From Yr.	Mo.	Da.	Through Yr.	Mo.	Da.	O.I. & I. Case No.	Termination Reason
1 2 3 4 5 6 7 8 9 10	11	12 13 14	15 16	17 18	19 20 21 22	23	24	25 26 27 28	29	30 31 32 33 34 35 36 37	38	39 40 41 42 43 44 45	46	47 48	49 50	51	52 53	54 55	56 57	58 59 60 61	62 63
0 123456789		900	98	40						6900		86 02 01			86 02 28				
0		900																	
0		900																	
0		900																	
0		900																	
0		900																	
0		900								23 hundredths	%								
0		900																	
0		900								$3.00 per employee									
0		900																	
0		900																	
0		900																	

Remarks:

Prepared By (Please Print) | Phone/Extension | Approved By

LEHMAN 00733

cc: MRM
TDL
GRMD
KBL

Please comply as appropriate for your location and vehicle.

Mike

December 10, 1985

R.J. Buettner
M/C 261A

M.J. Lorang
M/C 260A

L.H. Morse
M/C 244A

R.B. Rickard
Ennis, MT

Employee Personal Use of Company Owned Automobiles.

Attached is a memo on the new IRS regulations and Cyprus policy of personal use of company vehicles. Please distribute to the relevant locations and inform them of the new procedrues. Also note that the company, effective December 1, 1985, reimburses 21¢ per mile for company use of personal vehicles.

James P. Daniel

J.P. Daniel

JPD/jld

December 6, 1985

See Attached List

Employee Personal Use Of Company Owned Automobiles

The IRS has finally issued final regulations on personal use of company owned automobiles. Effective January 1, 1985, the company is required to include the value of personal use of company automobiles in the employee's income and to withhold taxes on the amount included in income. Personal use shall be valued at $3.00 per round trip from the employee's home to his or her work location, regardless of distance.

The regulations require that to be eligible for the above handling, company policy must permit personal use from the employee's home to his or her work location only. No other personal use of company vehicles is permitted. Company policy has been changed as reflected in the attached memo from Personnel and Salary Committee. Non-compliance with the policy will require that the total value of the vehicle will have to be included in the employee's income unless he can substitute by adequate records, the portion of the use that is business use.

A new form 32-1008, Automotive Equipment Time Report, has been authorized for use in reporting the personal use of company owned automobiles. Attached is a blank form and an example of a properly completed form for reporting personal use. Form 32-1008 should be transmitted to Englewood along with the regular payroll. Form 64-1000 (formerly AM4), Automotive Equipment Report, will no longer be required for reporting personal versus business mileage as long as company policy is being followed.

The amount submitted on Form 32-1008 will be included in the employee's gross income for tax purposes, but not in his pay. Income and FICA taxes will be withheld. It is suggested that current year-to-date information be included in the payroll calculation as soon as possible so that any problems can be worked out by year-end. Subsequent reporting will be made in the last payroll period in March, June, September, and December.

Payroll problems should be handled with the appropriate payroll contact. If you should have any other questions, please call Bob Meier, extension 5809.

R. H. Meier

RHM/sk

ATTACHMENT

The following provisions of the IRS regulations (section 1.274-67 (a)(3)) must be complied with by Cyprus Minerals Company and its employees.

1. The vehicles are owned by the employer and are provided to the employees for use in connection with the employer's business and are used in the employer's business.

2. For bona fide noncompensatory business reasons, the employer requires the employee to commute to and/or from work in the vehicle.

3. The employer has established a written policy under which neither the employee, nor any individual whose use would be taxable to the employee, may use the vehicles for personal purposes, other than for commuting or de minimis personal use (such as a stop for a personal errand on the way between a business delivery and the employee's home).

4. The employer reasonably believes that, except for de minimis personal use, neither the employee, nor any individual whose use would be taxable to the employee, uses the vehicle for any personal purpose other than commuting.

5. The employee required to use the vehicle for commuting is not a "control" employee. A "control" employee is a Board or shareholder-appointed, confirmed, or elected officer of the employer, or a director of the employer, or an employee who owns a one-percent or greater equity, capital or profits interest in the employer.

6. The employer accounts for the commuting use by including in the employee's gross income the commuting value of $1.50 per one-way commute. Thus, the amount includible for each round-trip commute is $3.00 per employee.

AUTOMOTIVE EQUIPMENT
TIME REPORT

☐ Weekly ☐ Bi-Weekly

Company	Location or Department	Reporting Period	From (Date)	Through (Date)
ABC COMPANY	ENGLEWOOD	OCTOBER, 1985	10/1/85	10/31/85

Name Last, First, Initial	Total Round Trips From Home to Work Location	Social Security Number (Important - Verify) 1 12 13 14 15 16 17 18 19 10	Card No. 11 12 13	Time Code 14 15	Rate Code 16 17	Dollar Amount Decimal 18 19 20 21 22 23 24
JOHN DOE	23	0 7 6 3 9 4 1 2 0 1	9 1 0 1 0	9 8	4 1	6 9 0 0
		0	9 1 0 1 0	1	1	

Signature of Car Custodian John Doe

Note: Your signature indicates that you are in compliance with Company policy which allows commuting to and from work as the only personal use of Company automobiles.

Remarks:

Prepared By (Please Print)	Phone/Ext.	Approved By
J DOE	2964	

Form 32 1008 (11-85)

LEHMAN 00737

AUTOMOTIVE EQUIPMENT
TIME REPORT

☐ Weekly ☐ Bi-Weekly

Company	Location or Department	Reporting Period	From (Date)	Through (Date)

Name Last, First, Initial	Total Round Trips From Home to Work Location	Social Security Number (Important - Verify). 1 12 13 14 15 16 17 18 19 10	Card No. 11 12 13	Time Code 14 15	Rate Code 16 17	Dollar Amount Decimal 18 19 20 21 22 23 24
		0	9 0 0			
		0	9 0 0			

Signature of Car Custodian _____

Note: Your signature indicates that you are in compliance with Company policy which allows commuting to and from work as the only personal use of Company automobiles.

Remarks:

Prepared By (Please Print)	Phone/Ext.	Approved By

Form 52-1008 (11-85)

LEHMAN 00738

CYPRUS MINERALS COMPANY

PERSONNEL & SALARY COMMITTEE

Memorandum of Action

December 5, 1985

Policy Change - Personal use of company vehicles

In order to comply with item 3 of the attached provisions of the IRS regulations (section 1.274-6T(a)(3)) regarding use of company vehicles, the following policy change will be implemented immediately.

> Employees of Cyprus Minerals Company are prohibited from using company vehicles for personal purposes other than commuting to and from work.

Also,

> Effective December 1, 1985, the Company reimbursement rate for business use of an employee's personal automobile will increase from 20.5 cents per mile to 21 cents per mile.

Roger A. Kaufmann
Secretary
Personnel & Salary Committee

/csm

P. J. Longstreet
H. M. Mann
G. J. Malys
A. L. Sheppard

November 21, 1985

R. A. Kaufmann
316C

Company Vehicles Used for Commuting

On November 1, the IRS issued proposed and temporary regulations that require taxpayers to maintain detailed records of business and personal use of company cars. Because Cyprus plans to permit certain employees to use company owned vehicles for commuting between home and the job site, you have asked what changes must be made to company rules to comply with the new regulations.

For vehicles not used for personal purposes other than commuting, Cyprus must comply with the following provisions:

1. The vehicles are owned by the employer and are provided to the employees for use in connection with the employer's business and are used in the employer's business.

2. For bona fide noncompensatory business reasons, the employer requires the employee to commute to and/or from work in the vehicle.

3. The employer has established a written policy under which neither the employee, nor any individual whose use would be taxable to the employee, may use the vehicles for personal purposes, other than for commuting or de minimis personal use (such as a stop for a personal errand on the way between a business delivery and the employee's home).

4. The employer reasonably believes that, except for de minimis personal use, neither the employee, nor any individual whose use would be taxable to the employee, uses the vehicle for any personal purpose other than commuting.

5. The employee required to use the vehicle for commuting is not a "control" employee. A "control" employee is a Board or shareholder-appointed, confirmed, or elected officer of the employer, or a director of the employer, or an employee who owns a one-percent or greater equity, capital or profits interest in the employer.

6. The employer accounts for the commuting use by including in the employee's gross income the commuting value of $1.50 per one-way commute. Thus, the amount includible for each round-trip commute is $3.00 per employee.

In addition to the distribution of these provisions to all field locations and affected employees, the proposed regulations require the employer and affected employees to maintain written evidence that will enable the IRS to determine whether the use of the vehicle met the preceding six conditions. Presumably, this evidence will include verification from the affected employee that he or she has complied with these rules and periodic reports from the field offices showing the names of affected employees and the commuting value to be included in the income of those employees. I understand that such reports from the field offices will be submitted through the Corporate Controllers Department during the last payroll period in March, June, September and December of each year.

You should be aware of the fact that a failure to comply with the six conditions set forth above will require much more detailed records substantiating the commuting use of company vehicles and may result in a greater amount of income attributed to the affected employee.

J. David Flemming
364A

JDF/jmg

December 13, 1985

K. B. Lehman

Company Truck

With the new IRS ruling, you have permission to use the company vehicle for trips to and from home. This, of course, will have to be reported as income.

If you choose, you may prefer to allow one of your subordinates to use this vehicle as appropriate to the smooth operation of the plant.

Michael J. Lorang

MJL:jsf

1988 Ford F250

State of New Jersey

DEPARTMENT OF THE TREASURY

50 BARRACK STREET
CN-269
TRENTON, NEW JERSEY 08646

DIVISION OF TAXATION

May 23, 1985

IN REPLY REFER TO
Wayne E. Dirlam
(609) 292-7979

Cyprus Industrial Miner
651 Metuchen Rd.
So. Plainfield NJ

RE: File No. A60-485
Vehicle 82 Ford
Ser. # PA19481
Reg, Date 5-22-84

Dear Taxpayer:

Reference is made to your correspondence of a recent date regarding the above motor vehicle transaction and the amount of New Jersey Sales or Use Tax due thereon.

N.J.S.A. 54:32B-2(e) excludes the following corporate transactions from the definition of a taxable retail sale:

"(B) The transfer of tangible personal property to a corporation, solely in consideration for the issuance of its stock, pursuant to a merger or consolidation effected under the law of New Jersey or any other jurisdiction.

(C) The distribution of property by a corporation to its stockholders as a liquidating dividend.

(E) The transfer of property to a corporation upon its organization in consideration for the issuance of its stock."

N.J.S.A. 54:32B(f) defines a sale, in relevant part, as any transfer of title, possession or both for a consideration. Consideration is the price paid for taxable tangible property, valued in money, whether paid in money or otherwise. (N.J.S.A. 54:32B-2(d).

N.J.S.A. 54:32B-19 of the New Jersey Sales and Use Tax provides that where a return is filed which shows insufficient consideration for the transfer of taxable, tangible property (a car) this division may determine the correct amount of tax due on the transaction.

N.J.A.C. 18:24-7.6 provides the following: "Where because of affiliation of interest between the seller and purchaser or for any other reason, the purchase price stated for a motor vehicle is not indicative of the

true value of the property, the Director may, at his discretion, utilize external indices to establish the basis upon which tax shall be paid."

After consideration of all available information concerning this transaction, it has been determined that you are liable for the following deficiency:

Purchase Price per National Autombile Dealers Used Car Guide (NADA):	$6300.00
6% Tax Rate in Effect and Tax Due on Date of Registration:	$378.00
New Jersey Sales Tax Paid at Registration:	$-0-
Balance of New Jersey Sales or Use Tax Due:	$378.00

Should you disagree with this average retail value, you may obtain a dealer's appraisal of your vehicle and remit 6% of that impartial figure less the amount of tax paid at registration. (Copy of Dealer Appraisal must accompany reply).

Remittance of $378.00 is due within fifteen (15) days of the date hereof. Failure to comply with this request will result in further action by this division.

Sincerely,

Wayne E. Dirlam

Wayne E. Dirlam, Investigator II
Motor Vehicle Casual Sales
Division of Taxation

WED:maw

Cyprus Pima Mining Company

Post Office Box 7187
Tucson, Arizona 85725

Pima Mine Road
Telephone (602) 791-2870

MAY 10, 1984
INVOICE # 5-34
TERMS NET CASH

CYPRUS INDUSTRIAL MINERALS TALC DIVISION
651 METUCHEN ROAD
P.O. BOX 405
SOUTH PLAINFIELD, NJ 07080

1 ea.	1982 FORD F-250 PICKUP TRUCK s/n 1FTHF25Z3CPA19481	$3,580.00
	CYPRUS PIMA EQUIPMENT # PU-250	
	PREPARATION EXPENSES INVOICE # R041216	445.12
		$4,025.12

TOTAL AMOUNT DUE $4,025.12

NOTE: Shipping notice and title enclosed with this invoice.

CYPRUS

SHIPPING NOTICE

42710

P. O. BOX 7187 TUCSON, ARIZONA

CYPRUS PIMA MINING COMPANY

DATE Feb. 23, 1984

TO Cyprus Industrial Minerals

c/o Amoco Minerals

ROUTE: AAA CON

RETURNED FOR Sale REF Sale #014-84 CHG 8-30

QUANTITY	UNIT	DESCRIPTION	
		REF: Amoco Minerals PO #IR83-01	
1	Ea	1982 Ford F-250 Pickup Truck	$3,580.00
		S/N 1FTHF 2523C PA 19481	
		Cyprus Pima Mining Co. Equipment #PU-250	
		Note: Spare Tire and Jack in truck	
		Truck picked up by AAACON Auto Transport, Inc. on 2-23-84 By [signature]	
		and to be delivered to ~~Louisiana~~ N.Y.	
		~~Aggregates, INC., Baton Rouge, Louisiana~~	

FORM P-17-3

VENDOR COPY

LEHMAN 00746

AAACON AUTO TRANSPORT, INC.

TRUCK # 250

CONDITION REPORT AND CONTRACT TERMS

DATE DISPATCHED	ESTIMATED DUE DATE
/ /	/ /

SPLIT OFFICE #:

SAVE ORDER ☐ TRANS SHIP ☐

RP 30885

CAR AVAILABLE FROM:
Cyprus Pima Mining Company
Tucson, AZ
602-791-2870

(NEAREST PICK-UP POINT:_____ MILES FROM OFFICE)

CONSIGNEE:
Louisiana Limestone Aggregates, Inc.
1175 Nicholson Drive
Baton Rouge, Louisiana 70821
504-387-3560

DRIVER MUST CHECK LICENSE PLATE, MAKE, MODEL & COLOR OF CAR WITH THIS FORM.

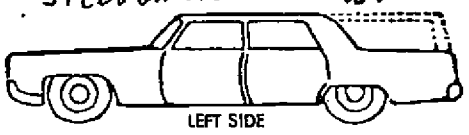
REGISTERED CAR OWNER (SHIPPER)	*Cyprus Pima Mining Company*	LICENSE PLATE NO. & STATE *FF9029 6T*	SERIAL NO. *1FHPF25Z3CPA19487*		
REGISTERED ADDRESS	*P.O. Box 7187*	VEHICLE MAKE *1982 Ford*	TYPE *pick-up*	MODEL *F350*	COLOR *white*
CITY & STATE	*Tucson, Arizona 85725*	☐ AUTOMATIC TRANSMISSION ☐ POWER BRAKES	☒ GASOLINE ☐ DIESEL	☒ POWER STEERING NO. OF DOORS_____	

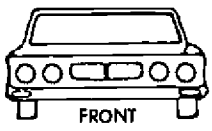
CONDITION REPORT — T TORN · F FAIR · B BROKEN · C CRACKED · D DENTED · S SCRATCHED · P PITTED · X MISSING · G GRIME · W WORN

DRIVER MUST FILL OUT CONDITION REPORT PRIOR TO TRANSPORT OR FORFEIT DEPOSIT.

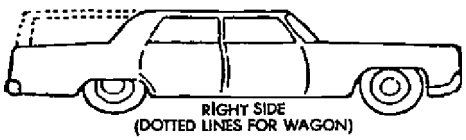
ILLUSTRATE DAMAGE ON APPROPRIATE PICTURES BELOW AND SPECIFY CONDITION IN BOXES TO RIGHT.

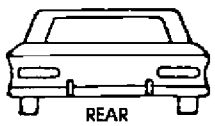
Speedometer Not Working





L/F TIRE L/R TIRE



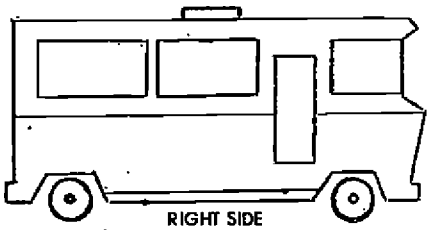


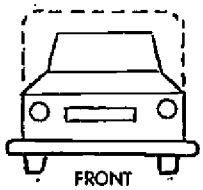
R/R TIRE R/F TIRE

	CODE				
L.F. Door		Rear Bumper		L.F. Window	
L.F. Fender		Rear Bpr. Guards		L.R. Window	
Windshield		R.F. Window		Mirrors	
Hood & Cowl		R.R. Window		Roof Rack	
Head Lts. & Rims		Roof-Conv. Top		Radio/Stereo	
Name Plates		Trunk Lid		Keys	
Grilles		Spare Wheel		Sun Visor	
F. Bumper Guard		Spare Tire		Upholstery: Front Seat	
Front Bumper		Hub Caps		Upholstery: Rear Seat	
Front Splash Pan		Jack & Wrench		Upholstery: Door Panel	
R.F. Fender		Toll Lts. & Rims		Upholstery: Headlining	
R.F. Door		L.R. Fender	X	Inside Trim	
R. Rear Door		L.R. Door		Floor Mats	
R. Rocker Panel	X	L. Rocker Panel		Heater	
R. Rear Door		Molding-Gen.		Air Cond.	
R. Rear Fender		Tires			

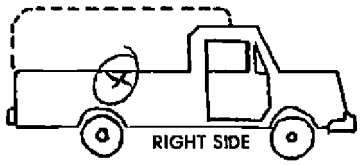
MILEAGE AT START 9/98

MILEAGE AT FINISH

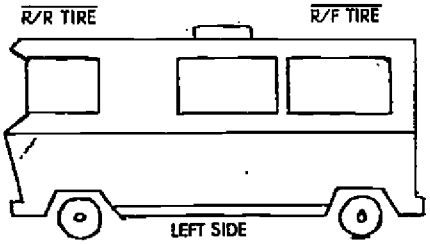




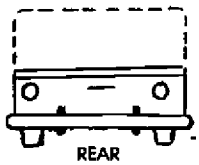
R/R TIRE R/F TIRE

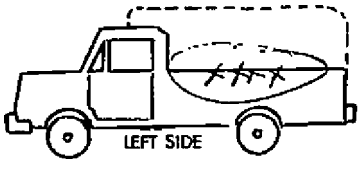


R/R TIRE R/F TIRE



L/F TIRE L/R TIRE





L/F TIRE L/R TIRE

LIST LUGGAGE AND CONTENTS. PLACE IN TRUNK ONLY. SEE CONTRACT TERMS FOR LIMITS OF LIABILITY ON VEHICLE VALUE. RENTALS. MECHANICAL DAMAGE AND VEHICLE CONTENTS.

THIS VEHICLE IS ACCEPTED WITH MINOR NICKS. DENTS AND SCRATCHES FOUND ON ANY VEHICLE.

I HAVE READ, UNDERSTAND AND AGREE TO THE TERMS OF THE CONTRACT SET FORTH ON THE REVERSE SIDE HEREOF:

SHIPPER OR SHIPPER'S AGENT X *Bob Spoon* 2-23-84

DRIVER *[signature]* DATE: 2/23/84

DELIVERED IN THE ABOVE CONDITION EXCEPT AS NOTED

CONSIGNEE (SHIPPER'S AGENT) X

DRIVER RECEIVED FULL PAYMENT DATE:

PAYMENT DUE AT DESTINATION $ RWD IN CASH TO DRIVER, ONLY WHEN CAR IS DELIVERED SATISFACTORILY. BY CHECK OR CASH IF DELIVERED TO AAACON OFFICE.

DRIVER SHALL PURCHASE PERMITS IN ARIZONA, NEW MEXICO, NEVADA AND WHERE REQUIRED BY LAW.

CAR OWNERS COPY

7. Vehicles - Once all the current vehicles are replaced in accordance with the policy not to keep vehicles beyond three years or 60,000 miles, we will handle replacement when required by ourselves. It will be the responsibility of the location managers to insure that vehicles are replaced on a timely basis.

8. MOR - Specific questions relating to location costs as shown on the MOR will be directed to the location manager for explanations. Better and more accurate reporting is needed from the locations to show what production costs really are. Location managers will be held accountable for mistakes or inaccurate reporting.

9. AFE's - Projects/items over $10,000 must be approved in accordance with the Delegations of Authority. Any expenditure over $100,000 requires a formal presentation to the CIM Management Committee. An expenditure of over $1,000,000 requires a formal presentation to both the CIM Management Committee and the Amoco Minerals Management Committee. After the AFE has been approved, the necessary work orders, contracts, purchase orders, etc. still must be approved in accordance with the Delegations of Authority. Detailed expenditures are only those items/projects included in the approved Capital Expenditure Control Budget. These include the "Less than $50M Projects/Items" and "Health and Safety" categories. Any item/project not in the Control Budget is undetailed and requires approval at a different level.

10. Safety-The primary goal of the Operations Department as it relates to safety is to run safe, clean, and efficient mines and mills. Employee training and the proper attitudes are seen as essential to accomplish this goal. Implementation is the responsibility of line managers who will be held accountable for any problems which may arise. Follow-up in the form of reprimands and disciplinary actions will be taken for employees who do not comply with this directive.

OPERATIONS DEPARTMENT MEETINGS -
JANUARY 31-FEBRUARY 2, 1984

In attendance full time were:

R. J. Buettner
T. E. Cook
J. S. Felger
M. J. Lorang
K. L. Phillips
R. B. Rickard

In attendance part time were:

H. M. Harlan
S. K. Hays
G. T. Rhyne
J. Vigil
R. Wiist

1. Organization - RJB discussed the organization of the Operations Department including the recent addition of the Exploration group. An updated organizational chart will be requested from Employee Relations.

2. Monthly Reports - Monthly reports must be submitted on a timely basis. RJB's report is due to GDL by the tenth day of the month. Consequently, reports from TEC, HMH, MJL, KLP, and RBR must be submitted to him no later than the eighth day of the month. Status reports on 1984 performance goals are to be submitted along with the appropriate monthly reports for all employees Class 10 or above. The goal itself should be stated along with a short

KBL

October 10, 1983

Mine and Mill Superintendents

Amoco Operating Policy - Automobiles and Pickups

The Talc Division will follow the Amoco Operating Policy on automobiles and pickups. This is Policy #1 in the light brown Policy Manual. Each location manager should read and familiarize himself with the policy. Everyone will be expected to be in compliance with all aspects of the policy. There will be no exceptions unless they are in writing from the Vice President, Operations or General Manager of the Talc Division. GDL

Each location manager will be required to monitor pickups at his location to ensure timely disposition when mileage or age limits are reached.

This is a major change from our treatment of pickups in the past and has good economic and safety values. Location compliance with the policy will be periodically audited.

All locations were recently requested to furnish information on pickups. That information has been reviewed, and Norm Templin will be placing orders for new pickups to be delivered to the various locations. A standard pickup will be ordered for mine and mill locations. When it is time to replace these pickups, you will order the same standard model as a replacement. At locations with several pickups, managers should rotate or reassign vehicles as far as practicable to avoid extremely low mileage at the time of disposition. In other words, avoid having one with 60,000 miles at the end of two years and one with 20,000 miles at the end of three years.

Disposition of old pickups is to be handled according to Company procedures.

Please call if you have any questions.

R J Buettner

R. J. Buettner

RJB:jsf

T. E. Cook
G. D. Lessner
M. J. Lorang
K. L. Phillips
R. B. Rickard
J. Vigil

EXCEPTIONS ONLY

IMPORTANT **IMPORTANT**

Codes 31,51.52	Insert your County Agriculture Number in the appropriate space on the back of the application. Well digger does not require agriculture number.
Codes 23.56	We require a certificate of insurance for property damage, personal and accident liability. This certificate must contain a 10 day cancellation clause during which time the insurance company can notify the Division of any change, cancellation or non-renewal of the policy. The certificate shall be valid up to the expiration date on the insurance certificate. We will reject any applications for Codes 23 and 56 without the insurance certificate and without the certified check or money order. The required coverage amounts for these codes are as follows: Code 23 - $100,000/property damage. $15,000/per person. $30,000/per accident Code 56 - $ 5,000/property damage, $15,000/per person, $30,000/per accident
Code 13	Include a Municipal Certificate for vehicles of 1 to 9 passengers with the applications. If the vehicle is for 10 passengers or more, include an EQ-68 certificate issued by the N.J. Dept. of Transportation (201-648-6137-6138) with the renewal application.
Code 39	You must include a copy of the Certificate of Convenience and Necessity prepared by the Board of Public Utility Commissioners with the renewal application.
Code 54	You must include a Dept. of Transportation Authorization Certificate (EQ-68) with the Application (201-648-6137-6138). If you wish to renew for the $10.00 fee, include a letter issued by the Dept. of Transportation with the renewal application. Also list your P.U. number.
Codes 20 & 21	The optional four-year commercial trailer fee is $74. If you prefer the four-year registration, please correct the fee on your application, and return it with your check for $74. Any full year or years of unused registration for codes 20 & 21 is refundable when the license plates and registration are turned in to the Division of Motor Vehicles.

Additionally, those vehicles covered by the self-inspection regulation (trucks over 10,001 pounds gross weight, trailers and vehicles under I.C.C. Regulations) do not require inspection, but must provide their I.C.C. number in the appropriate space on the application.

MI-23 (R3/84)

NEW JERSEY DIVISION OF MOTOR VEHICLES
Instructions For Renewal of all Commercial Registrations

IMPORTANT **IMPORTANT**

Please read this flyer carefully and completely. Items 1 through 5 apply to all commercial registration renewals. Special instructions (exceptions) for specific codes are included on the reverse side. To prevent delays in the processing of your renewal application (s), please follow these instructions.

1. Check the information on the enclosed application. If there are any mistakes, print the corrections in the space provided. Read and answer all questions on the reverse side of the application.

2. Your vehicle must be covered by liability insurance. Write the full name and policy number of your insurance company (not the insurance agent) in the appropriate space on the form.

3. Sign your name in ink in the spaces provided. If the vehicle is owned by a company or corporation, an authorized officer must sign, stating his or her title in the company.

4. Send a check or money order to cover any number of renewals with the same code (1 check for all code 11's, 1 check for all code 21's, etc.). However, if you are renewing more than 1 type of commercial vehicle, write separate checks for each code.

   Note: Personal checks are not accepted for codes 23, 39, 41 and 56. A CERTIFIED CHECK OR MONEY ORDER IS REQUIRED. If the check is not certified or contains renewals for different codes, all applications will be rejected.

5. To Renew By Mail - Send the completed application, fee and any other required document in the envelope provided to: Division of Motor Vehicles, Bureau of Mail Renewals, CN 008, Trenton, N.J. 08625.
   To Renew In Person - Present the document (s) and fee to any Motor Vehicle Agency. Please note codes 23 and 56 can only be presented to the Central Office, Quakerbridge Road, Quakerbridge Plaza, Bldg. 5, Hamilton Township, New Jersey 08619.

SEE REVERSE SIDE

RR/11/XE96ZE/////////0700000073000007600S

NEW JERSEY VEHICLE REGISTRATION RENEWAL APPLICATION

PLATE NO.	EXP. DATE	VIN IDENTIFICATION NO.	YEAR	MAKE	REG.CODE
XE96ZE	APR 30 88	THF25Z3CPA19481	82	FOR	11

VEH.TYPE	AXLES/COLOR	MODEL	DRIVER LIC.NO. / CORPCOD
PKUP			24946257307080

CYPRUS INDUSTRIAL MINER
651 METUCHEN RD
SO PLAINFLD NJ 07080

WC/GW/NP	REG EQUITY	TYPE
7000	7000	RENEWAL

FILED
FEB 07 87

CO-OWNER(S)

PAY THIS AMOUNT $73.00

INSTRUCTIONS: Complete the reverse side and return this application with the amount due the return envelope. Make check or money order payable to "N.J. Division of Motor Vehicle NO CASH PLEASE. For a Family Duplicate check here ☐ and add $3.00 to renewal fee.

IF ANY ENTRY ABOVE IS INCORRECT, CROSS IT OUT AND ENTER THE CORRECT INFORMATION.
MAIL APPLICATION WITH CHANGES AS EARLY AS POSSIBLE. CHANGES TAKE LONGER TO PROCESS.

CYPRUS INDUSTRIAL MINERALS COMPANY
WORKING FUND ACCOUNT
651 METUCHEN ROAD
SOUTH PLAINFIELD, N.J. 07080

XE96ZE 582

March 24 1987 55-726/212

PAY TO THE ORDER OF NJ Division of Motor Vehicles $ 73.00

Seventy-three and NO/100 DOLLARS

First National State
First National State Bank — Edison
Maple Avenue Office
So. Plainfield, N.J. 07080

FOR 95-60

Kurt B. Johnson

⑆021207264⑆ 506 004573 ⑈

RR/11/XE96ZE/////////0700000073000007600S

NEW JERSEY VEHICLE REGISTRATION RENEWAL APPLICATION

PLATE NO.	EXP. DATE	VIN IDENTIFICATION NO.	YEAR	MAKE	REG.CODE
XE96ZE	APR 30 88	THF25Z3CPA19481	82	FOR	11

VEH.TYPE	AXLES/COLOR	MODEL	DRIVER LIC.NO. / CORPCODE
PKUP			249462573070800

CYPRUS INDUSTRIAL MINER
651 METUCHEN RD
SO PLAINFLD NJ 07080

WC/GW/NP	REG EQUITY	TYPE
7000	7000	RENEWAL

FILED
FEB 07 87

CO-OWNER(S)

PAY THIS AMOUNT $73.00

INSTRUCTIONS: Complete the reverse side and return this application with the amount due in the return envelope. Make check or money order payable to "N.J. Division of Motor Vehicles." NO CASH PLEASE. For a Family Duplicate check here ☐ and add $3.00 to renewal fee.

IF ANY ENTRY ABOVE IS INCORRECT, CROSS IT OUT AND ENTER THE CORRECT INFORMATION.
MAIL APPLICATION WITH CHANGES AS EARLY AS POSSIBLE. CHANGES TAKE LONGER TO PROCESS.

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D. C. 20554

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

LEHMAN 00754

HELP US FIND
TIAHEASE JACKSON
FROM: STATEN ISLAND, NY
MISSING: 8-14-88 D.O.B. 10-5-72
EYES: BLACK HAIR: BLACK
If you have information, please call:
1-800-843-5678
NATIONAL CENTER FOR MISSING AND EXPLOITED CHILDREN

FCC

POSTAGE AND FEES PAID
FEDERAL COMMUNICATIONS
COMMISSION
FCC 015

Cyprus
P.O. Box 405
South Plainfield, N.J.
07080

PUBLIC NOTICE

FEDERAL COMMUNICATIONS COMMISSION
1919 M STREET N.W.
WASHINGTON, D.C. 20554

2317

News media information 202/254-7674. Recorded listing of releases and texts 202/632-0002.

March 16, 1987

PART 90 FREQUENCY COORDINATION.

On April 15, 1986, the Commission released a Report and Order which adopted rules and procedures for private land mobile frequency coordination. The Report and Order certified coordinators for most radio services or specialized group of frequencies listed in Part 90 of the Commission's Rules. Information regarding frequency coordination procedures and services can be obtained from the certified coordinators listed below.

Automobile Emergency Road Service
American Automobile Association, Inc. (AAA)
Attn: Rick Williamson, Jay Howarth
8111 Gatehouse Road
Falls Church, VA 22047
703-222-6229

Business Radio Service
(Central Station Protection only)
Central Station Electrical Protection Association (CSEPA)
Attn: Stan Iott
1120 Nineteenth St., NW
Suite LL20
Washington, DC 20036
202-296-9595

Business Radio Service
National Association of Business and Educational Radio, Inc. (NABER)
Attn: Frequency Coord. Dept.
1501 Duke Street, Suite 200
Alexandria, VA 22314
703-739-0303

Fire Radio Service
International Municipal Signal Association (IMSA)
Attn: Al Mello
PO Box 1513
Providence, RI 02901
401-738-2220

Forestry Conservation Radio Service
Forestry Conservation Communications Association (FCCA)
Hall of the States
444 N. Capitol Street, NW
Suite 526
Washington, DC 20001
202-624-5416

Forest Products Radio Service
Forest Industries Telecommunications (FIT)
Attn: James Baker
PO Box 5446
3025 Hillyard Street
Eugene, OR 97405
503-485-8441

Highway Maintenance Radio Service
American Association of State Highway and Transportation Officials (AASHTO)
Attn: Jack Stanton
444 N. Capitol Street, NW
Suite 225
Washington, DC 20001
202-624-5800/5448

Local Government and Police Radio Service
Association of Public Safety Communication Officers (APCO)
Attn: Frequency Coord. Dept.
PO Box 280
New Smyrna Beach, FL 32070
904-423-3629
Admin. 800-654-4951

Manufacturers Radio Service
Manufacturers Radio Frequency
Advisory Committee, Inc. (MARFAC)
Attn: Michele Willison
6269 Leesburg Pike
Suite B1
Falls Church, VA 22044
703-532-7459

Motion Picture Radio Service
Alliance of Motion Picture and
Television Producers (AMPTP)
c/o SIRSA
Attn: Andre Cote
Suite 910
1700 N. Moore Street
Rosslyn, VA 22209
703-528-5115

Motor Carrier Radio Service
American Trucking Association, Inc. (ATA)
Attn: Gus Gyllenhoff
2200 Mill Road
Alexandria, VA 22314
703-838-1730/1731

Petroleum Radio Service
Petroleum Frequency Coordinating
Committee
Attn: Marie Hawkins
c/o SMS
1700 N. Moore Street
Suite 910
Rosslyn, VA 22209
703-528-5115

Power Radio Service
Utilities Telecommunications Council (UTC)
Attn: Carole Harris
1150 17th Street, NW
Suite 1000
Washington, DC 20036
202-956-5636

Railroad Radio Service
Association of American Railroads (AAR)
Communications & Signal Section
Attn: Chris Allman
50 F Street, NW
Washington, DC 20001
202-639-2217

Special Emergency Frequency Coord. Committee
c/o NABER/IMSA/IAFC
1501 Duke Street
Suite 200
Alexandria, VA 22314
703-739-0303

Relay Press Radio Service
American Newspaper Publishers Association
(ANPA)
c/o SMS
Attn: Andre Cote
Suite 910, 1700 N. Moore Street
Rosslyn, VA 22209
703-528-5115

Special Industrial Radio Service
Special Industrial Radio Service
Association, Inc. (SIRSA)
Attn: Frequency Coord. Dept.
Suite 910
1700 N. Moore Street
Rosslyn, VA 22209
703-528-5115

Taxicab Radio Service
International Taxicab Association (ITA)
Attn: Debbie Devault
3849 Farragut Avenue
Kensington, MD 20895
301-946-5700

Telephone Maintenance Radio Service
Telephone Maintenance Frequency Advisory
Committee (TELFAC)
Attn: Frequency Coord. Dept.
Suite 910
1700 N. Moore Street
Rosslyn, VA 22209
703-528-5115

800 MHz Business and 900 MHz Paging
National Association of Business and
Educational Radio, Inc. (NABER)
Attn: Frequency Coord. Dept.
1501 Duke Street, Suite 200
Alexandria, VA 22314
703-739-0303

800 MHz Industrial/Land Transportation
Special Industrial Radio Service
Association, Inc. (SIRSA)
Attn: Frequency Coord. Dept.
Suite 910, 1700 N. Moores Street
Rosslyn, VA 22209
703-528-5115

800 MHz Public Safety
Association of Public Safety Communication
Officers
PO Box 280
New Smyrna Beach, FL 32070
904-423-3629

APPLICATION FOR RADIO STATION AUTHORIZATION IN THE PRIVATE RADIO SERVICES
(Industrial, Land Transportation, Public Safety, Radio Location, Special Emergency and General Mobile)

Approved by OMB 3060-0128 Expires 9/30/87

Refer to "Instructions for Completion of FCC Form 574 (June 1985)" and FCC Rules for requested service.

FCC Form 574 - November 1986

Federal Communications Commission
Gettysburg, PA 17325

Commission File Copy

Page No. of

	1. Frequencies (MHz)	2. Station Class	3. No. of Units	4. Emission Designator	5. Output Power	6. E.R.P.	7. A.A.T.	8. Ground Elevation	9. Ant. Hgt. To Tip	10. Antenna Latitude	11. Antenna Longitude
A											

12. Number of Mobiles By Category:

Vehicular_____
Portable_____
Aircraft_____
Marine_____
Pagers_____

13. Area of Operation for Mobiles, Temporary, or Itinerant Stations

Is _____ miles radius of station A.

or is _____ miles radius of coordinates:

Lat_____
Long_____

If not, please check one:

☐ Countywide
☐ Statewide
☐ Nationwide
☐ Other (Specify below)

	14a. Station Address or Geographic Location	15. City	16. County	17. State
A				
B				
C				
D				
E				
F				

18. Location of Primary Control Point (include Telephone Number), and location of all Radio Control Stations with antennas under 20 Ft.

19. Freq. Advisory Comm. No:

20. Radio Service:

DO NOT WRITE IN THIS BLOCK.

21. Applicant / Licensee Name (See Instructions):

22. Mailing Address (Number & Street, P.O. Box or Rt. No.):

23. City

24. State

25. ZIP Code

If the Stations authorized herein are not placed in operation within eight months this authorization becomes invalid and must be returned to the Commission for cancellation unless an extension of completion date has been authorized. (Exception being 800 MHz TRUNKED Stations which have one year to complete construction.)

	26. Will antenna be mounted on an existing antenna structure? If yes, give call sign and radio service of existing user.				27. Will antenna exceed 20 Ft. above ground or any man-made structure? If yes, give total height of the structure (less proposed antenna) and the type of structure.			
	No	Yes	Call Sign	Radio Service	No	Yes	Height of Structure	Type of Structure
A								
B								
C								
D								
E								
F								

	28. If Item 27 was "yes", give the name of the nearest aircraft landing area, and the distance and direction to the nearest runway.		
	Aircraft Landing Area Name	Distance	Direction
A			
B			
C			
D			
E			
F			

29. If Item 27 was "yes", has notice of construction or alteration been filed with the FAA? If yes, give the date filed, the name under which filed, and the FAA office where filed.

	No	Yes	Date Filed	Name Under Which Filed	FAA Office Where Filed
A					
B					
C					
D					
E					
F					

30. Applicant Classification: ☐ Individual ☐ Partnership ☐ Association ☐ Corporation ☐ Govt. Entity

31. Eligibility (Describe Activity):

32. Application is for (check one): ☐ New Station ☐ Modification ☐ Assignment ☐ Reinstatement ☐ Renewal

33. Is applicant requesting a System License? ☐ Yes ☐ No

Give Rule Section

34. Would grant of this application be a "Major Action" per Rule Section 1.1305? ☐ Yes ☐ No
If yes, submit the required statement per Rule Section 1.1311.

35. Specification of item(s) modified, if applicable:

36. List previous call sign(s), if any:

37. Individual completing this application (print):

Telephone No. ( )

DO NOT WRITE IN THIS BLOCK

READ CAREFULLY BEFORE SIGNING

1) If application is for a Land Mobile Service license, applicant certifies that a current copy of the requested radio service's rules will be obtained.
2) Applicant waives any claim to the use of any particular frequency regardless of prior use by license or otherwise.
3) Applicant will have unlimited access to the radio equipment and will control access to exclude unauthorized persons.
4) Neither applicant nor any member thereof is a foreign government or representative thereof.
5) Applicant certifies that all statements made in this application and attachments are true, complete, correct and made in good faith.

Willful false statements made on this form are punishable by fine and/or imprisonment. U.S. Code Title 18, Section 1001.

See reverse of this form for Privacy Act Notice, additional authorization provisions, and space for additional information.

Typed Signer Name:

Telephone No: ( )

Signature:

Date:

☐ AUTHORIZED EMPLOYEE OF APPLICANT CORPORATION ☐ MEMBER OF APPLICANT PARTNERSHIP ☐ INDIVIDUAL APPLICANT ☐ OFFICER WHO IS ALSO A MEMBER OF THE APPLICANT ASSOCIATION ☐ OFFICIAL OF GOVERNMENTAL ENTITY

CONDITIONS OF GRANT

A. Subject to the provisions of the Communications Act of 1934, as amended, subsequent acts, treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this authorization the licensee or permittee hereof is authorized to use and operate the radio transmitting facilities herein described. This authorization shall not vest in the licensee or permittee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein.

B. Neither this authorization nor the right granted herein shall be assigned or otherwise transferred to any person, firm, company, or corporation except by specific authorization of the Commission.

C. This authorization is issued on the licensee's representation that the statements contained in licensee's application are true and that the undertakings therein contained, so far as they are consistent herewith, will be carried out in good faith. The licensee shall, during the term of this license, render such service as will serve public interest, convenience, or necessity to the full extent of the privileges herein conferred.

D. This authorization is subject to the right of use or control by the Government of the United States conferred by Section 606 of the Communications Act of 1934, as amended.

NOTICE TO INDIVIDUALS REQUIRED BY PRIVACY ACT OF 1974 AND THE PAPERWORK REDUCTION ACT OF 1980

Sections 301, 303, and 308 of the Communications Act of 1934, as amended (licensing powers) authorized the FCC to request the information on this application. The purpose of the information is to determine your eligibility for a license. The information will be used by FCC staff to evaluate the application, to determine station location, to provide information for enforcement and rulemaking proceedings and to maintain a current inventory of licensees. No license can be granted unless all information requested is provided. Your response is required to obtain this authorization.

For FCC Use Only

Use this space for additional information or remarks:

LEHMAN 00758

Federal Communications Commission

Private Radio Services Fee Filing Guide

for

- Marine Coast Stations
- Operational Fixed Microwave Stations
- Aviation Ground Stations
- Land Mobile Radio Licenses

PRIVATE RADIO SERVICES

The Private Radio services provide for the communications needs of businesses, individuals, non-profit organizations and non-federal government agencies.

MARINE COAST STATIONS

Marine Coast Stations are used to provide radio communications and navigation and location information for maritime operations. The marine services to which fees will be applied include the following specific types of stations:

Public coast stations, private coast stations, marine-utility stations, shore radiolocation stations, shore radionavigation stations, marine support stations, operational fixed stations, Alaska-public fixed stations and Alaska-private fixed stations.

OPERATIONAL FIXED MICROWAVE STATIONS

The Operational fixed microwave services are comprised of fixed stations licensed under Part 94 of the Commission's rules to entities eligible under Parts 80, 87, or 90 of the Commission's rules for the operation of their own radiotelecommunication facilities or to provide communications service to other private service eligibles on a commercial basis.

AVIATION GROUND STATIONS

Aviation ground stations are used to provide radio communications and navigation facilities to aircraft operators and various aeronautical enterprises eligible to be licensed under Part 87 of our rules. The aeronautical services to which fees will be applied include the following specific types of stations:

Aeronautical advisory stations, aeronautical multicom stations, aeronautical enroute stations, flight test stations, aviation instruction stations, airdome control stations, aeronautical utility mobile stations, aeronautical search and rescue stations, operational stations, radionavigation land stations, radionavigation land test stations and automatic weather observation stations. Civil Air Patrol stations qualify as "governmental entities" and, therefore, are exempt from fees.

LEHMAN 00760

LAND MOBILE RADIO STATIONS

The land mobile radio service is used to satisfy the needs of commercial and industrial activities, state and local governments, transportation systems, and religious, philanthropic, and educational endeavors for mobile communication systems. Licensees are regulated under Part 90 of our rules to operate private communications systems in the following radio services: the industrial radio services, which consist of the power, petroleum, forest products, motion picture, relay press, special industrial, business, manufacturers, and telephone maintenance radio services; the land transportation radio services, which consist of the interurban passenger and property, urban passenger and property, railroad, taxicab, and automobile emergency radio services; the radiolocation radio service; the public safety radio services, which consist of the local government, police, fire, highway maintenance and forestry-conservation radio services; the special emergency radio service which includes such subservices as medical, disaster relief, school bus, and beach patrol; the 900 MHz paging service; and the 800 MHz and 900 MHz radio services. Additionally, licensees operating private systems in the general mobile radio service (GMRS) are regulated under Part 95 of our rules. GMRS systems provide for short-distance personal and business land mobile communications.

LEHMAN 00761

17. FCC rules designate frequencies that correspond to each channel in the DEMS service. Therefore, each time an applicant requests an additional frequency it is in effect requesting an additional channel for which a fee of $135 is charged.

This is an unofficial compilation of the radio services and requests for FCC actions that are subject to fees. The public should consult the Commission's Rules as set out at Title 47 of the Code of Federal Regulations (CFR) for application and filing requirements. Further information on fees may be obtained at Part 1, Subpart G of the CFR or in the Commission's official decision implementing the Congressional Schedule of Charges (See Report and Order on the Establishment of a Fee Collection Program to Implement the Provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985, General Docket Number 86-285, FCC 86-562, adopted December 23, 1986. This decision is published in the *FCC Record* or may be purchased from the Commission's copy contractor, International Transcription Service, (202) 857-3800, 2100 M Street, NW, Suite 140, Washington, DC 20037).

Federal Communications Commission
Washington, D.C.
March 1987

LEHMAN 00762

FEDERAL COMMUNICATIONS COMMISSION
QUICK REFERENCE CHART

FILING APPLICATIONS and PAYMENT OF FEES
for
PRIVATE RADIO SERVICES

ALL APPLICATIONS REQUIRING A FEE SHOULD BE MAILED TO THE FEDERAL COMMUNICATIONS COMMISSION AT A SPECIFIC P.O. BOX ADDRESS IN PITTSBURGH, PENNSYLVANIA. THE SPECIFIC ADDRESS DEPENDS UPON THE SERVICE REQUESTED AND IS LISTED ON THE FOLLOWING PAGES.

APPLICATIONS MAY BE FILED IN PERSON. (Provided the application is enclosed in a sealed envelope with the appropriate P.O. Box address clearly marked on the outside. Applications must be enclosed in a separate envelope for each different P.O. Box address. The P.O. Box addresses are listed under each radio service category.) Applications may be delivered between 9:00 AM and 3:00 PM, Monday through Friday, at the following address:

FEDERAL COMMUNICATIONS COMMISSION
c/o MELLON BANK
THREE MELLON BANK CENTER
525 WILLIAM PENN WAY
27th FLOOR, ROOM 153-2713
PITTSBURGH, PA 15259
(ATTN: WHOLESALE LOCKBOX SHIFT SUPERVISOR)

FEE EXEMPTIONS

Eligibles in the Public Safety and Special Emergency Radio Services, Civil Air Patrol and governmental entities are exempt. Requests for Special Temporary Authority (STAs), duplicate licenses and transfers of control are also exempt.

All applications in these exempt categories should be mailed to:

Federal Communications Commission
Gettysburg, PA 17326

NOTE: ALL CHECKS SHOULD BE MADE PAYABLE TO THE FCC. DO NOT SEND CASH.

A single check may be submitted to cover the fees required for multiple applications if the applications are filed simultaneously on behalf of the same legal applicant, in the same radio service, for the same action on the same FCC form.

FOR ASSISTANCE CALL: 717/337-1212

Footnotes To Quick Reference Chart

1. No fee is required when FCC Form 405-A or a letter is used to inform the FCC of a change in mailing address; licensee name without changes in ownership, control or corporate structure; vessel name; or that the station is no longer in service. These notifications should be mailed to the Federal Communications Commission, Gettysburg, PA 17326.

2. Each 503 application requesting both a license modification and renewal will be subject to a single fee of $60.00 per station.

MARINE COAST STATIONS:

TYPE OF APPLICATION	FORM #	FEE AMOUNT	PER UNIT	MAILING ADDRESS
NEW AUTHORIZATION	FCC 503	$ 60.00	Station	Federal Communications Commission Marine Coast Service P.O. Box 371706M Pittsburgh, PA 15251-7706
MODIFICATION[1]	FCC 503	$ 60.00	Station	
ASSIGNMENT[2]	FCC 503	$ 60.00	Call Sign	
RENEWAL WITH MODIFICATION[3]	FCC 503	$ 60.00	Station	
RENEWAL	FCC 405A	$ 60.00	Station	Federal Communications Commission 405A Station Renewal P.O. Box 360703M Pittsburgh, PA 15251-6703

OPERATIONAL FIXED MICROWAVE STATIONS:

TYPE OF APPLICATION	FORM #	FEE AMOUNT	PER UNIT	MAILING ADDRESS
NEW AUTHORIZATION	FCC 402	$135.00	Station	Federal Communications Commission Microwave Service P.O. Box 360850M Pittsburgh, PA 15251-6850
MODIFICATION[1]	FCC 402	$135.00	Station	
ASSIGNMENT[2]	FCC 402	$135.00	Call Sign	
RENEWAL WITH MODIFICATION	FCC 402	$135.00	Station	
RENEWAL	FCC 402R	$135.00	Station	Federal Communications Commission Microwave Service Renewal P.O. Box 371147M Pittsburgh, PA 15251-7147

AVIATION GROUND STATIONS:

TYPE OF APPLICATION	FORM #	FEE AMOUNT	PER UNIT	MAILING ADDRESS
NEW AUTHORIZATION	FCC 406	$ 60.00	Station	Federal Communications Commission Aviation Ground Service P.O. Box 371632M Pittsburgh, PA 15251-7632
MODIFICATION[1]	FCC 406	$ 60.00	Station	
ASSIGNMENT[2]	FCC 406	$ 60.00	Call Sign	
RENEWAL WITH MODIFICATION[3]	FCC 406	$ 60.00	Station	
RENEWAL	FCC 405A	$ 60.00	Station	Federal Communications Commission 405A Station Renewal P.O. Box 360703M Pittsburgh, PA 15251-6703

3. Each 406 application requesting both a license modification and renewal will be subject to a single fee of $60.00 per station.

4. Applicants may apply to operate at different permanent locations, provided that the different locations are an integral part of a single system. Each group of six permanent locations constitutes a station to which a separate call sign is assigned. If there are more than six permanent locations, a fee of $30.00 will be required for each increment of six different locations or part thereof.

LAND MO

APPLICA
PROPRIA
SECTION

MAILING

For Land T

For Busine

For Other

For Genera

For 800 Me
900 Mega

For 900 Me

TYPE OF

NEW AUT
MODIFICA
ASSIGNME
REINSTAT

MAILING

TYPE OF

RENEWAL

RENEWAL

5. No fee
in license
in owners
location o
470 MHz
90.119(a)
radiolocat
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LEHMAN 00764

LAND MOBILE RADIO STATIONS:

APPLICATIONS REQUIRING FREQUENCY COORDINATION MUST BE SUBMITTED TO THE APPROPRIATE FREQUENCY COORDINATOR AND NOT TO THE ADDRESSES LISTED BELOW (SEE SECTION 90.175 OF THE COMMISSION'S RULES).

MAILING ADDRESSES (applies only to those actions filed on FCC Form 574):

For Land Transportation Radio Service	Federal Communications Commission Land Transportation Service P.O. Box 360200M Pittsburgh, PA 15251-6200
For Business Radio Service	Federal Communications Commission Business Radio Service P.O. Box 360291M Pittsburgh, PA 15251-6291
For Other Industrial Radio Services	Federal Communications Commission Other Industrial Service P.O. Box 360354M Pittsburgh, PA 15251-6354
For General Mobile Radio Service	Federal Communications Commission General Mobile Service P.O. Box 360373M Pittsburgh, PA 15251-6373
For 800 Megahertz Radio Service and 900 Megahertz Paging Radio Service	Federal Communications Commission 800 Megahertz Service P.O. Box 360416M Pittsburgh, PA 15251-6416
For 900 Megahertz Radio Service	Federal Communications Commission 900 Megahertz Service P.O. Box 360497M Pittsburgh, PA 15251-6497

TYPE OF APPLICATION	FORM #	FEE AMOUNT	PER UNIT
NEW AUTHORIZATION[4]	FCC 574	$ 30.00	Six (6) Fixed Stations
MODIFICATION[4,5]	FCC 574	$ 30.00	Six (6) Fixed Stations
ASSIGNMENT[4,6]	FCC 574	$ 30.00	Six (6) Fixed Stations
REINSTATEMENT[4]	FCC 574	$ 30.00	Six (6) Fixed Stations

MAILING ADDRESSES (applies only to those actions filed on FCC Form 574R or FCC 405A)

TYPE OF APPLICATION	FORM #	FEE AMOUNT	PER UNIT	MAILING ADDRESS
RENEWALS	FCC 574R	$ 30.00	Call Sign	Federal Communications Commission 574R Land Mobile Renewal P.O. Box 360559M Pittsburgh, PA 15251-6559
RENEWALS	FCC 405A	$ 30.00	Call Sign	Federal Communications Commission 405A Station Renewal P.O. Box 360703M Pittsburgh, PA 15251-6703

5. No fee will be required when the Commission is informed of a change in licensee mailing address; change in licensee name, without changes in ownership, control or corporate structure; change in the number and location of station control points or of control stations operating below 470 MHz or above 800 MHz meeting the requirements of section 90.119(a)(2)(ii); a change in the number of mobile units operated by radiolocation service licensees; or a notice that the station is no longer in service (these notifications are made on FCC Form 405-A or by letter).

6. An FCC Form 1046 must accompany the application(s) for station(s) being assigned.

HEALTH AND SAFETY G.O. INDEX

The following G.O.'s reference health and safety specifically or effect health and safety in one way or another.

Construction Projects	55
Contractor Safety and Health	61
Authorizing Use of Contractors	62
Major and Minor Purchases	307
Contractors Services	314
Personal Protective Equipment	601
Safety Meetings	611
Surface Mobile Equipment Checklist	612
Industrial and Public Liability, Injuries and Illnesses	613
Fire Prevention and Control	614
Reporting Vehicle Accidents	620
Mine Safety and Health Act	801
Toxic Substances Control Act	825

Proposed:

Industrial Hygiene Monitoring	603
Respiratory Protection	635
Hearing Conservation	641

January 16, 1985

R. P. Arellanez
A. B. Cooper
G. M. Dugan
G. C. Jeske
R. W. Johnson
T. D. Landels
K. B. Lehman
M. R. McCune

High Voltage Power Lines

The Yellowstone mine experienced its third incident in several years involving overhead high voltage power lines in January 1985. As in the previous two incidents, this accident resulted in property damage and lost production but fortunately did not result in injuries to the contractor employee operating the crane. The potential for serious injury and death however was extremely high.

In addition to the two previous incidents that occurred at the Yellowstone, we have had equipment contact power lines at the Three Forks and South Plainfield mills.

ANOTHER INCIDENT OF THIS TYPE MUST NOT OCCUR AT OUR LOCATIONS.

Effective immediately the directive below will be followed at all Talc Division locations:

- All contractors will be provided with a copy of the Health and Safety Guidelines (attached) including a summary of our safety rules prior to the bid process.
- Prior to commencing work, the superintendent and/or project engineer will review with the contractor our safety requirements and specific hazards associated with that job such as overhead power lines.
- A responsible company employee will escort all contractor equipment (except pickups) onto the property and job site to point out specific hazards.

- Contractor accidents are to be reported to the project engineer if available or to the operation's foreman or superintendent as soon as possible if not immediately.

- All crane and drill operators must provide proof of training and certification in safe operation before being allowed to operate on our property.

- Contractors and their subcontractors will be required to comply completely with the safe work practices outlined in the Health and Safety Guidelines.

Responsibilities:

- superintendents are ultimately responsible for insuring that contracted projects are completed on time and safely. Failure to insure that contractors follow company guidelines regarding safe work practices will result in disciplinary action for the superintendent and the involved foreman.

- Project Engineer/Manager is responsible to insure that a project is completed to specifications, on time, and within budget whenever possible and to provide assistance to operations personnel as necessary regarding the project.

- Foremen (as well as other company officials) have the responsibility to ensure that a construction project does not adversely affect our ability to operate or threaten the safety of our employees or those of the contractor. It is the responsibility of the foreman to insist on safe operating practices and use of personal protective equipment by contractor employees. (For example, if a contractor employee is not wearing eye protection or fall protection, it is the foreman's responsibility to take corrective action immediately and not wait to tell the project engineer or safety representative.)

A memo to me with a copy to your supervisor indicating your understanding of these instructions and a statement that you have discussed this matter with your foremen should be on my desk no later than March 1, 1985.

R. J. Buettner

RJB:jsf

Attachment

T. E. Cook
T. W. Flink
H. M. Harlan
G. D. Lessner
M. J. Lorang
K. L. Phillips
R. B. Rickard

INDEPENDENT CONTRACTOR SAFETY & HEALTH PROVISIONS

It is Cyprus Industrial Minerals Company's firm belief that accident prevention efforts by all independent contractors working on Cyprus property will not only reduce the potential for injury producing accidents to contractor and Company employees but will result in fewer unexpected costs, greater efficiency, and project completion on time and within specifications.

All independent contractors are expected to conduct their work activities in a safe and healthful manner in compliance with Company safety rules as well as federal, state, and local safety and health regulations, laws, and ordinances. Failure to adhere to the guidelines detailed in the following pages, as well as good business practices, may result in the termination of the contract. The safety and health of all employees working on Cyprus properties is a prime concern of Cyprus management and must receive appropriate attention from all contractors.

Company Safety and Health Rules

All contractors and contractor employees (including subcontractor employees) are required to be familiar and to comply with Company safety and health rules applicable to the work being performed. A condensed list of the most important of these rules is provided in the Appendix. All contractor employees are required to wear and use appropriate personal protective equipment including, but not limited to, hard hats, industrial strength safety glasses, steel-toed shoes, fall protection (safety lines and belts), hearing protection, respiratory protection, and protective clothing. All persons are required to wear hard hats, industrial strength safety glasses, and steel-toed work boots at all times while working on Cyprus property. Contractors and/or their employees will be responsible for the purchase of protective equipment.

Federal, State, and Local Laws, Regulations, and Codes

Cyprus Industrial Minerals Company is involved in the mining and processing of talc and is therefore, regulated by the Mine Safety

and Health Administration (MSHA) which provides for specific standards and regulations affecting employee safety and health. The MSHA Act also requires all independent contractors working on mining or milling projects to comply with the standards and provisions of the MSHA Act including specific safety and health standards, accident reporting, and employee training requirements, as well as the general intent of the MSHA Act. Copies of the MSHA standards and requirements are available from the regional MSHA offices. (A list is provided in the Appendix.) In addition, all independent contractors will be required to secure MSHA identification numbers and provide the Company with a copy.

Because the MSHA Act is a mine safety & health act, much of the work contractors perform is not addressed in MSHA standards. When the MSHA Act is silent, contractors are expected to comply with other applicable federal, state, and local standards. Regulations such as the OSHA standards, the National Electric Code, the Associated General Contractors Accident Prevention Manual, and state and local safety and health rules and regulations must be reviewed and followed where appropriate. If a contractor is uncertain about a working condition or practice that may affect employees' safety and health, the Company location superintendent or project engineer should be consulted.

Accident Reporting

All independent contractors working on Cyprus property are required to report all injuries requiring medical treatment to the Company location superintendent and/or the project engineer as soon as possible. MSHA requires contractors to submit a specific accident reporting form (7000-1) within ten (10) days of the injury producing accident that required medical treatment as well as immediate notification for certain serious accidents. The contractor is required to furnish the Company with a copy of the Workers' Compensation first report of injury and illness form and a copy of

the MSHA 7001 form on all reportable injuries requiring medical attention; however, submission of more detailed accident investigation reports are encouraged and must be made available upon request in the event of a serious accident.

In addition to accidents resulting in injury to employees, accidents causing substantial property damage to Company property or contractor equipment must also be reported to the location superintendent and/or a project engineer as soon as possible.

Accident Investigation

In addition to the expected contractor's investigation, the Company reserves the right to investigate all contractor accidents and "near misses" and to take steps necessary to prevent recurrence of similar accidents.

Emergency Procedures

All contractors will be expected to make arrangements to provide emergency medical care for their employees who may be injured while on the job. This may include notification of Company or community paramedics or rescue teams and providing on-site trained employees. It is understood that small contractors may by necessity have to rely on Company and local support; however, regardless of contractor size, it is contractor management's responsibility to insure adequate emergency care for their employees including sub-contractor's employees. A summary of the provisions that have been made should be provided in your bid.

Safety Inspections

A Company representative will monitor contractor performance, including safety and health violations, and will seek corrective action through contractor supervision. The Company reserves the right to conduct periodic inspections with emphasis on safety and health. This will be accomplished jointly with contractor supervision. Contractors are required to take prompt and

appropriate action to correct unsafe conditions and/or work practices.

The Company also reserves the right to halt all or any specific work performed at a construction site or area until employee practices have been changed or physical hazards corrected.

Personal and Environmental Exposure Monitoring - Medical Examinations

Contractors will conduct industrial hygiene monitoring for their employees when such monitoring is required by law or dictated by the job and/or conditions. The Company will advise contractors of known conditions on its premises for which monitoring of contractor employee exposures will be required. Additional monitoring may be required as the contract work progresses and unexpected hazards become apparent.

Medical examinations and monitoring may also be required as a part of an industrial hygiene monitoring program as well as a prerequisite for certain types of work such as that which requires work in hazardous atmospheres requiring air supplied breathing apparatus, work that involves particular environmental stresses such as heat or severe cold, confined areas, etc. Contractors will be responsible for providing those physicals when required.

Training

Contractors are responsible for providing safety and health training for their employees. Weekly toolbox safety meetings are encouraged. Safety meetings should cover facility and job hazards, accidents and "near misses", the safety and health rules, applicable policies, and procedures. Further training may be required if insufficient or lack of training seriously affects the contractor's ability to perform its work safely.

Workers' Compensation

All contractors are expected to be registered with the appropriate State Workers' Compensation board or commission and are expected to comply with all requirements of the compensation laws of the state in which the contract work is to be conducted.

Accident Costs

All costs associated with accidents that occur under the control of an independent contractor and its subcontractors are to be borne by the contractor and not passed on to the Company. These costs may include but are not limited to: compensation costs, medical treatment costs, state and/or federal government penalties for safety and health violations, law suits against the contractor or the Company for injury or damage as a result of the contractor accident, and liquidated damage agreements against the contractor for failure to complete a project on schedule as a result of an accident.

Contractors agree to hold the Company harmless from all liability resulting from injuries and property damage arising out of contractors' activities.

Furnish Equipment

Contractors shall furnish where appropriate all equipment, materials, tools, and personal protective equipment necessary to perform their work in a safe, healthful, and efficient manner. If equipment is provided by the Company for contractor use, contractor shall inspect such equipment and verify in writing its safe condition and ability to operate safely.

Summary

As a condition of the contract agreement, the contractor accepts and assumes the responsibility for complying with the letter and the implied intent of the above to provide a safe and healthful work place for its employees.

Failure of individual contractor and subcontractor employees to abide by safe work practices as noted by Company personnel will be reported to contractor supervision for correction. Failure of contractor supervision and management to assure compliance with contract provisions involving employee safety and health may result in suspension of individual contractor's employees and/or supervisors as well as possible suspension of the work or termination of the contract. Removal of a contractor's name from the approved bidding list may result from a contract suspension. Under no circumstances should Company involvement with the contractor's safety and health provisions be construed as an assumption of the contractor's safety and health responsibilities.

CONTRACTOR SAFETY AND HEALTH PROVISIONS

Items to be completed and included with bids:

1) Completed copy of "Contractor Safety and Health" questionnaire.

2) Copy of contractor's safety and health program and/or rule book.

3) Copy of contractor's program to provide industrial hygiene monitoring when warranted.

4) Copy of contractor's program to provide personal protective equipment necessary to perform job in a safe and healthful manner. This includes, but not limited to, hard hats, industrial strength safety glasses, steel-toed work boots, fall protection, etc.

Appendix A

CONDENSED LIST OF CYPRUS SAFETY RULES

This is only a condensed list of Cyprus' Safety Rules; the complete list will be given during the pre-bid or pre-job orientation.

- Hard hats, industrial strength glasses, and steel-toed work boots are required by all personnel on Cyprus property. Other personal protective equipment such as (but not limited to) respirators and hearing protection shall be used when needed.

- Safety belts and lines shall be worn when personnel work where there is a danger of falling. If safety belts and lanyards are not suitable for the type of work performed, safety nets, scaffolds, retractable fall protection devices, or other suitable means shall be provided. A lanyard shall not permit a fall of more than six (6) vertical feet.

- Protective clothing or equipment and face shields or goggles shall be worn when welding, cutting, grinding, or working with molten metal.

- A competent person designated by the contractor shall examine each working area at least once each shift, preferably before work proceeds, for conditions which may adversely affect safety and health of employees. Noted conditions will be corrected promptly.

- Selected personnel shall be trained in first aid and/or arrangments made in advance for obtaining emergency medical assistance and transportation for injured persons.

- Adequate first aid materials, including stretchers and blankets shall be provided at places convenient to all working areas.

- All projects and work areas within shall be kept clean and orderly. Housekeeping should be maintained on a day-to-day basis.

- Illegal or illicit drugs will not be permitted or used on Company property. Persons under the influence of, or who's work is impaired as a result of the use of alcohol or drugs will be suspended from working on Cyprus property.

- Compressed and liquid gas cylinders shall be secured in an upright position when in use, transit, and storage. Valves on compressed gas cylinders shall be protected by covers when being transported and stored.

- Each contractor shall have available suitable fire fighting equipment adequate for the size of the project and/or arrangments made in advance for obtaining a local fire department in case of fires.

- Whenever self-propelled mobile equipment is used, such equipment shall be provided with a suitable fire extinguisher readily accessible to the equipment operator.

- All mobile construction or mining equipment shall be equipped with seat belts and rollover protection. The seat belts must be worn when operating such equipment.

- Equipment defects affecting safety shall be corrected before the equipment is used.

- Scaffolds and working platforms shall be of substantial construction and provided with handrails, and maintained in good condition. Floor boards shall be laid properly and the scaffold and working platforms shall be provided when necessary.

- Ladders shall be provided with suitable bases, anchored securely, and project at least three feet above landings, or substantial hand holds shall be provided above the landings.

- Circuits shall be protected against excessive overload by fuses or circuit breaker of the correct type and capacity. Ground fault circuit interrupters shall be used where appropriate.

- Power circuits shall be de-energized before work is done on such circuits or equipment. Switches shall be locked out to prevent the power circuit from being energized while work is being performed. Such locks shall be removed only by the person who installed them or by authorized personnel.

- Personnel shall not touch or handle overhead electrical power lines and shall not allow equipment or tools to come in contact with them. Crane operators will be specifically advised of overhead power line locations.

- Gears, sprockets, chains, drive, head, tail and takeup pulleys; flywheels, coupling, shafts, saw blades, fan inlets, and similar exposed moving machinery parts which may be contacted by persons, and which may cause injury to persons, shall be guarded.

- Hand-held power tools shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

- Tools and equipment shall not be used beyond the design capacity intended by the manufacturer where such use may create a hazard to personnel.

All contractors shall obtain a legal identity number through the local MSHA office as described in the MSHA standards, Part 41, Notification of Legal Identity.

Each contractor shall maintain a supply of MSHA Mine Accident, Injury, and Illness Report Form 7000-1. Each reportable

accident/injury will be reported on this form and sent to MSHA within ten (10) days (see MSHA regulation 50.20).

All independent contractors are required to report all injuries requiring treatment to the Company location superintendent and/or project engineer as soon as possible. Accidents causing substantial property or equipment damage must also be reported.

APPENDIX I

Contractor Safety and Health Questionnaire

1. List your firm's Worker's Compensation Experience Modification Rates for the last three years:

19__	19__	19__

2. List your firm's OSHA or MSHA incidence rates for the last three years for the following categories. (Use your OSHA Form No. 200 or MSHA Form 7000-2 and the formula

$$\frac{\text{No. of incidents or days} \times 200{,}000 \text{ hours}}{\text{No. of hours worked}}$$

	19__	19__	19__
Fatalities			
Injuries and illnesses with lost workdays			
Injuries and illnesses with restricted workdays			
Days away from work			

3. Do you have a written safety program? Yes _____ No _____

4. Do you have one or more full time:
   a. Physicians? Yes _____ No _____
   b. Safety professionals? Yes _____ No _____
   c. Industrial hygienists? Yes _____ No _____

5. Do you have a new employee orientations program? Yes _____ No _____

   Does it include instructions on the following?

	Yes	No		Yes	No		Yes	No
a) Company safety policy	___	___	f) Hazard reporting	___	___	k) Housekeeping	___	___
b) Company safety rules	___	___	g) Injury reporting	___	___	l) Toxic substances	___	___
c) Safety meeting attendance	___	___	h) Personal protective equipment	___	___	m) Electrical safety	___	___
d) Company safety record	___	___	i) Respiratory protection	___	___	n) Safety belts and lifelines	___	___
e) Hazard recognition	___	___	j) Fire protection	___	___	o) First aid	___	___
						p) Driving safety	___	___

6. Do you have a training program for newly hired or promoted first line supervisors?

	Yes	No		Yes	No		Yes	No
a) Hazard recognition	___	___	d) New employee orientation	___	___	g) Emergency procedures	___	___
b) Safe work practices	___	___	e) Tailgate/toolbox safety meetings	___	___	h) Incident reporting	___	___
c) Safety supervision	___	___	f) First aid procedures	___	___	i) Accident investigation	___	___

7. Do you hold periodic safety meetings for your employees? Yes _____ No _____

   a) Weekly _____ b) Biweekly _____ c) Monthly _____ d) Less often, as needed _____

8. Do you conduct field safety inspections of work in progress? Yes _____ No _____

   a) If yes, who conducts the inspection (title)? _____
   b) How often? _____

9. Are accident reports circulated to your management? Yes _____ No _____

10. Is safety a criteria in evaluating the performances of:

    a. Foremen? Yes _____ No _____
    b. Supervisors? Yes _____ No _____
    c. Management? Yes _____ No _____

* * *

LEHMAN 00780

APPENDIX II

Contractor Safety Orientation

Date: _____

Company: _____

If Subcontractor, Indicate Prime Contractor: _____

Address: _____

_____

Phone: (Office) _____

(Plant) _____

Company Job Representative: _____ Phone: _____

Work Location: _____

No. of Employees/Shift: _____ Estimated Start of Work _____

Estimated Completion Date: _____

Work Schedule:

Hours: _____ To _____

Monday-Friday_____ Saturday_____ Sunday_____

Hospital To Use In Case Of An Emergency: _____

Contractor Safety Representative: _____

Title: _____

Contractor Job Superintendent: _____

Contractor Foremen: (1) _____ (3) _____

(2) _____ (4) _____

X — Indicate If Job Will Require This Type of Work

____ Excavation	____ Handling Asbestos Bearing Materials	____ Hydroblasting
____ Hot Work	____ Lifting/Rigging	____ Respiratory Protection Respirators, Fresh Air Breathing Equipment)
____ Blasting	____ Electrical	
____ Catalyst Handling	____ Work Inside Vessels	____ X-Ray Equipment
____ Tank Cleaning, Tank Firewall	____ Hot Tap/Stopples	____ Disposal of Toxic Materials
____ Hearing Protection	____ Radioactive Materials	

I have received a copy of the Company's safety and health rules for contract work and aeeept the reponsibility of informing all subcontractors and employees working for me of those rules. I understand the safety rules and regulations which our employees and subcontractors will have to comply with while working at the Company. The Company has reviewed with me its procedures and requirements with respect to the items checked above.

_____ _____

_____ _____

_____ _____

Safety Orientation Given By: _____

APPENDIX III

Contractor Safety and Health Performance Evaluation

Date: _____

Contractor: _____

Project Description: _____

Estimated Cost: _____

Length: From _____ To _____

Manhours Worked: _____

Contractor Job Representatives: _____

	YES	NO
1. Did the contractor adhere to Company safety and health rules?	____	____
2. Did the contractor hold periodic safety meetings?	____	____
3. Did the contractor promptly report accidents and furnish reports?	____	____
4. Did the contractor promptly correct safety problems brought to his attention?	____	____
5. Injury Experience*		
a. Fatalities	____	____
b. Injuries and illnesses with lost workdays	____	____
c. Injuries and illnesses without lost or restricted workdays	____	____

* Information should be obtained from contractor's completed OSHA 200 log or MSHA Form 7000-2.

Comments: _____

_____

_____

Company Job Representatives: _____

* * *

Cyprus Industrial Minerals Company

651 Metuchen Road
South Plainfield, N.J. 07080
Telephone (201) 754-4880

TWX 710-997-9528

CYPRUS

U. S. Department of Labor

Mine Safety and Health Administration
P O Box 1874
Albany, New York 12201 -1874

April 17, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed supplemental report completes a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on May 2, 1984. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	0					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Harold L. Thompson

Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

Mineral Fiber
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Type of Sample	
28-00959	5/2/84	☐ Screening	☒ Personal Exposure

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Industrial Minerals Company	651 Metuchen Road South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Time of Sample	Sampling Time (min)	Occupancy Time (min)	Sample Concentration (fibers/cm3)	SWA or TWA* (fibers/cm3)	Exposure Limit (fibers/cm3)	Comments
Jorge Aguilar	Bagger - Mill	T-155	0704-0805	61		.292			
		T-151	0805-0902	57		.086			
		T-160	0902-1002	60		.346			
		T-158	1002-1102	60		.512*			
		T-156	1102-1202	60		.214			
		T-163	1202-1309	67		.429			
		T-164	1309-1405	56		.283			
		T-166	1405-1500	55		.036			
			FULL SHIFT		480	---	.28	2.00	

*Sample identified, no asbestos found - all other samples were not identified due to low concentration.

Form 4000-25,Oct. 81 (revised)

*Circle calculation method used

LEHMAN 00785

Mineral Fiber
Sampling Results

U.S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Type of Sample	
28-00959	5/2/84	☐ Screening	☒ Personal Exposure

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Industrial Minerals Company	651 Metuchen Road South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Time of Sample	Sampling Time (min)	Occupancy Time (min)	Sample Concentration (fibers/cm^3)	SWA or TWA* (fibers/cm^3)	Exposure Limit (fibers/cm^3)	Comments
Miguel Contreras	Stacker - Mill	T-154	0705-0804	59		.084			
		T-152	0804-0903	59		.336			
		T-159	0903-1000	57		.156			
		T-157	1000-1103	57		.295			
		T-161	1103-1203	60		.165			
		T-162	1203-1308	65		.152			
		T-165	1308-1405	57		.104			
		T-167	1405-1500	55		.126			
			FULL SHIFT		480	---	.17*	2.00	

*Samples were not identified due to low concentrations.

Form 4000-25,Oct. 81 (revised)

*Circle calculation method used

LEHMAN 00786

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

October 11, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed supplemental report completes a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on August 7 and 8, 1985. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	0					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Harold L. Thompson

Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

Crystalline Silica Dust Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Type of Sample		Contaminant		
28-00959	8/8/85	☐ Total	☒ Respirable	☒ Quartz	☐ Cristobalite	☐ Tridymite

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Industrial Minerals Co.	651 Metuchen Road South Plainfield, New Jersey 07080

Name and Social Security Number	Occupation and Location	Sample Number	Sampling Time (min)	Sample Weight (mg)	SiO_2 Weight (mg)	% SiO_2	SWA (mg/m^3)	TLV (mg/m^3)	Comments
George Aguilar	Bagger Plant	5K-091	480	1.268	.046	3.63	1.55	1.78	In compliance
Miguel Contreras	Laborer Mill	5K-092	480	.194	0	0	.24	*3.3	In compliance
	* Equivalent TLV for nonasbestosiform talc with less than 1% SiO_2								

MSHA Form 4000-24,Oct. 81 (revised)

*Circle calculation method used

LEHMAN 00788

U. S. Department of Labor
Mine Safety and Health Administration

MARCH 1980

MSHA Policy Memorandums

LEHMAN 00789

U. S. Department of Labor

Mine Safety and Health Administration
4015 Wilson Boulevard
Arlington, Virginia 22203

March 13, 1980

MSHA MANAGEMENT LETTER NO. 80-32

SUBJECT: Informal Review Under Section 103(g)

Section 103(g) of the Act provides to the representative of miners (or a miner if there is no representative of miners) the right to notify MSHA of a violation or imminent danger that he believes to exist in the mine. If the MSHA investigator thereafter refuses to issue a citation or order, MSHA is obligated to provide an opportunity for an informal review of the matter. The procedure for this informal review is stated in Subpart C of 30 CFP Part 43.

MSHA is currently involved in litigation of a claim by the Council of Southern Mountains, Inc. that our inspectors should have issued 104(d) citations and orders in many instances where 104(a) citations were issued. In connection with this litigation, we have included the following statement as part of our brief to the court:

> The Secretary has never applied the procedures found in Part 43 to an instance where the miners complain about a failure to issue a Section 104(d) citation or order instead of a Section 104(a) citation. However, to the best of the Secretary's knowledge, no attempt has ever been made to so utilize this procedure. Nevertheless, since the Act is remedial in nature and should be broadly construed, the Secretary asserts that miners complaining of the failure of an inspector to issue an "unwarrantable" citation or order may utilize the Part 43 procedures to obtain MSHA review of the inspector's actions.

Having stated this position in court, we should anticipate that miners and representatives of miners will begin filing complaints for failure to issue a 104(d) citation or order, although a 104(a)

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citation was issued. Any such complaint should be processed in accordance with the procedures set forth in Subpart B of 30 CFR Part 43. As with any other Section 103(g) complaint, if it is determined that no citation or order should be issued, the miner or representative of miners may request an informal review under Subpart C of 30 CFR Part 43. Following the informal review, the District Manager's determination in the matter shall be final.

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U. S. Department of Labor

Mine Safety and Health Administration
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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-36

SUBJECT: PROGRAM DIRECTIVE: Standard 57.4-57
Flame-Resistant Trailing Cables

This document provides guidance for enforcement personnel in the application of new mandatory standard 57.4-57. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 57.4-57 requires that, effective November 12, 1980, trailing cables shall be flame-resistant in accordance with 30 CFR 18.64.

Attached is a list of cable manufacturers and approval numbers. Upon inspection of trailing cables, MSHA enforcement personnel are to consult the list to determine whether the numerical figure which appears on the cable is included on the list. An approved number will be followed by an indication as to which governmental division granted the approval -- MSHA, MESA or BM (Bureau of Mines). If the number appears on the list, and MSHA, MESA, or BM is indicated, the cable is to be considered an approved one.

Upon locating a trailing cable with a number that does not appear on the list (regardless of whether MSHA, MESA, or BM is indicated), MSHA personnel are advised to call MSHA's Approval and Certification Center for assistance before the issuance of a citation.

MSHA personnel may also locate trailing cables that bear approval numbers which are preceded by a "P" (e.g., P123 MSHA). The prefix "P" indicates acceptance by the Pennsylvania Bureau of Mines. These cables are to be considered approved so long as the number is followed by an MSHA, MESA, or BM notation. If such a notation is not included (e.g., "P109), MSHA personnel are advised to call the Approval and Certification Center for Assistance.

Contact: Frank Delimba, Chief, Safety Division, Arlington, Va., FTS 8-235-8647

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The following is a summary of MSHA's guidelines for approved trailing cables:

Numerical Figure	Action
1. Number appears on list; MSHA, MESA, or BM notation (e.g., 104-MSHA)	No citation
2. Number does not appear on list regardless of MSHA, MESA, or BM notation (e.g., 109-MSHA)	Further Inquiry Required
3. Prefix "P"; number appears on list; MSHA, MESA, or BM notation (e.g., P123-MSHA	No citation
4. Prefix "P"; any number; no quotation of MSHA, MESA, or BM (e.g., P108)	Further Inquiry Required

MSHA personnel may locate trailing cables with an additional numerical figure between the approval number and the MSHA, MESA, or BM notation (e.g., P123-35-MSHA). The number between the two dashes can be disregarded. It is merely the "test number."

Inquiries regarding the approval of trailing cables, and requests for updated lists of cable manufacturers and approval numbers should be addressed to Jerry Taylor or Robert Boring, Approval and Certification Center, Triadelphia, West Virginia (304-547-0400).

Thomas J. Shepich
Administrator for Metal and
Nonmetal Mine Safety and Health

Attachment to Program
Directive - Standard 57.4-57

CABLES - MASTER (Revised December, 1979)

Manufacturers of Cables with
MSHA Acceptance Numbers

Company	MSHA Acceptance Number
Simplex Wire and Cable Company P.O. Box 397 North Berwick, ME 03906	101-MSHA
Anaconda Wire and Cable Company Marion, IN 46952	102-MSHA
Kaiser Aluminum and Chemical Corporation 500 Wood Street Bristol, RI 02809	103-MSHA
The Okonite Company P.O. Box 340 Ramsey, NJ 07446	104-MSHA
Rome Cable Company 421 Ridge Street Rome, NY 13440	105-MSHA
Collyer Insulated Wire Company, Inc. 100 Higginson Avenue Lincoln, RI 02865	107-MSHA
General Electric Company 1285 Boston Avenue Bridgeport, CT 06602	108-MSHA
General Cable Corporation Cornish Wire Products 800 Rahway Avenue Union, NJ 07083	110-MSHA
Reynolds Metals Company Front and Lloyd Streets Chester, PA 19013	111-MSHA
Crescent Insulated Wire and Cable Company, Inc. Trenton, NJ 08605	112-MSHA
Phelps Dodge Cable and Wire Company P.O. Box 391 Yonkers, NY 10702	114-MSHA

Company	MSHA Acceptance Number
Cerro Wire and Cable Company 5500 Maspeth Avenue Maspeth, NY 11378	115-MSHA
Teledyne Western Wire and Cable Company 2425 East 30 Street Los Angeles, CA 90058	116-MSHA
General Cable Corporation Cornish Wire Products 101 Water Street Williamstown, MA 01267	117-MSHA
Whitney-Blake Company P.O. Box K New Haven, CT 06514	118-MSHA
Continental Copper and Steel Industries, Inc. CCS Hatfield 360 Hurst Street Linden, NJ 07036	120-MSHA
Diamond Wire and Cable Company Sycamore, IL 60178	121-MSHA
ITT Wire and Cable Division 95 Grand Avenue Pawtucket, RI 02862	122-MSHA
Carol Cable Company 249 Roosevelt Avenue Pawtucket, RI 02860	123-MSHA
Plastic Wire and Cable Corporation P.O. Box 486 Jewett City, CT 06351	124-MSHA
Essex International, Inc. Power Conductor Division 2601 South Adams Street Marion, IN 46952	125-MSHA
Bell Northern Research Wire and Cable Laboratory P.O. Box 6122 Montreal, Canada	126-MSHA

Company	MSHA Acceptance Number
Chester Cable Corporation Chester, NY 10918	127-MSHA
The Rockbestos Company 1910 Cochran Road Pittsburgh, PA 15220	128-MSHA
Narrangansett Wire Company 1125 Main Street Pawtucket, RI 02860	129-MSHA
ITT Wire and Cable Division Clinton, MA 01510	131-MSHA
Packard Electric P.O. Box 431 Warren, OH 44482	132-MSHA
Silec 22, Rue Du General Foy Paris (8e) France	133-MSHA
Hackethal - Draht - und Kable - Werke A.G. Hanover West Germany	134-MSHA
Eastern Electric Wire and Cable Company Interstate Industrial Park Bellmawr, NJ 08030	135-MSHA
American Insulated Wire Corporation Central Avenue and Freeman Street Pawtucket, RU 02862	136-MSHA
Boston Insulated Wire and Cable Company 55 Bay Street Boston, MA 02125	138-MSHA
Calco Electric Wire and Cable Corporation 21 Haverford Station Road Haverford, PA 19041	145-MSHA
Industrija Kablova Svetozarevo, Yugoslavia	152-MSHA
Manhattan Electric Cable Company Station Plaza Rye, NY 10580	155-MSHA

Company	MSHA Acceptance Number
ExCel Wire and Cable Company 108 Elm Avenue P.O. Box D Tiffin, OH 44883	159-MSHA
Corona Insulated Wire Company, Inc. 101 Central Avenue Farmingdale, NY 11735	162-MSHA
Felten and Guilleaume Post Fach 805001 5000 Koln 80	164-MSHA
Hendrix Wire and Cable Corporation Milford, NH 03055	165-MSHA
Electrical Conductors, Inc. 2500 Commonwealth Avenue North Chicago, IL 60064	166-MSHA
Southwire Company Carrollton, GA 30117	168-MSHA
BICC General Cables Limited Leigh Works, Leigh Lancashire WN7 4HB England	177-MSHA
The Rochester Corporation Culpepper, VA 22701	178-MSHA
Trexon Products Company P.O. Box 3880 Oak Park, MI 48237	179-MSHA
Communication and Control Engineering Company, Ltd. 66 Dalaire Crescent Richmond, Ontario, Canada K0A2Z0	181-MSHA
Belden Corporation 2000 South Bataira Avenue Geneva, IL 60134	182-MSHA
Canada Wire 147 Laird Drive Toronto, Ontario M4G 3W1	183-MSHA

Company	MSHA Acceptance Number
Amercable El Dorado Industrial Park 1200 Bailey Road P.O. Box 1552 El Dorado, AR 71730	184-MSHA
The Kerite Company 49 Day Street Seymour, CT 06483	186-MSHA
Sumitomo Electric Industries, Ltd. 606 South Olive Street Los Angeles, CA 90014	187-MSHA
Phillips Cables, Ltd. King Street West Brockville, Ontario Canada KGV 5W4	188-MSHA

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March 25,. 1980

MSHA MANAGEMENT LETTER NO. 80-37

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.6-140
Protecting Blasting Circuits and Electric Blasting Caps from Extraneous Electricity

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.6-140. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.6-140 requires that all blasting circuits and electric blasting caps, which may be initiated by conventional power sources, be protected from sources of extraneous electricity. For the purpose of this standard, sources of extraneous electricity include stray currents and static electricity. Potential conductors of stray current and static electricity are tracks (particularly those that may be used as an electrical return), pipelines, airlines, power lines, telephone lines, and water. In addition, other possible sources of extraneous electricity are two-way radios and lightning.

The methods for protecting blasting circuits and electric blasting caps from the potential sources of extraneous electricity are isolation, insulation, location and shunting.

Further inquiries regarding this standard shall be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-38

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.4-47
Safety Switches for Belt Conveyors

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.4-47. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.4-47 requires that belt conveyors shall be equipped with a safety switch capable of automatically stopping the drive pulley in the event of excessive slippage of the belt, where ignition of the belt could create a hazard to personnel. The safety switches required by this standard are available currently on an over-the-counter basis from several manufacturers.

For surface operations, those areas that could create a hazard to personnel include the following:

1. Surge tunnels.

2. Conveyor belts located in areas where other combustible or flammable materials are stored within 25 feet. This is to prevent a conveyor belt fire from spreading and becoming a larger and more serious fire and is consistent with distances used as safeguards in the electrical and explosives standards.

3. Any restricted area where a conveyor belt fire could hinder the escape of personnel who normally work in that area.

Further inquiries regarding safety switches shall be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-39

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.14-3
Guarding of Moving Machine Parts

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.14-3. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

New mandatory standard 55/56/57.14-3 requires that the guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from accidentally reaching behind the guard and becoming caught between the belt and the pulley. This standard is to be cited when there is a guard at such locations, but it does not extend a distance sufficient to prevent persons from accidentally reaching behind the guard and becoming caught.

The new standard is to be distinguished from standard 55/56/57.14-1 which requires guarding of certain moving machine parts (such as drive, head, tail and takeup pulleys) which may be contacted by, and cause injury to, persons. Standard 55/56/57.14-1 is to be cited in those instances when there is no guard at the conveyor-drive, conveyor-head, or conveyor-tail pulleys.

Further inquiries regarding this standard shall be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-40

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.9-1
Inspection of Self-Propelled Equipment

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.9-1. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.9-1 requires equipment operators to inspect self-propelled equipment that is to be used during a shift before placing the equipment into operation. Equipment defects affecting safety must be reported to the mine operator.

The standard applies to all off-road and on-road self-propelled equipment used on mine property during a shift for loading, hauling or dumping materials, or transporting persons. The standard applies to vehicles such as vans, suburbans, and pick-up trucks which are used at mine sites and remain on mine property. It does not apply to vehicles used to transport persons between locations not on mine property and mine gates. However, if such vehicles transport personnel on mine property (e.g., from the gate to various sites at the mine), then such equipment must be inspected "by the equipment operator before being placed in operation." As stated in the preamble of the published final rule, the inspection should consist of a visual and operational check of the various primary operating systems affecting safety, such as brakes, lights, tires, steering, and related items.

Further inquiries regarding this standard may be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia 22203, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-41

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.19-39
Drum and Sheave Tread Diameters

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.19-39. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.19-39 establishes specific drum and sheave diameters for personnel hoists installed after November 15, 1979. As used in the standard, a personnel hoist means any hoist that is used in a mine for lowering or raising persons, or persons and materials.

The standard contains two exemptions. The first applies to emergency escape hoists, and the second applies to slow speed hoists. The second exemption permits the use of smaller diameter drums and sheaves provided the rope speed is 200 feet per minute or less, and is intended to include shaft sinking or other construction projects when hoist speeds are 200 feet per minute or less.

As stated in the preamble statement to the final rule (44 FR 48490, August 17, 1979) "the standard allows the continued use of present equipment, but requires that all future installations meet the ANSI D/d Ratios for drums and sheaves...". Therefore, compliance with the new D/d Ratios in this standard is not mandatory if, before November 15, 1979: (1) hoists are or have been used in mining operations; (2) hoists are manufactured and available for use in mining operations; or (3) hoists are being manufactured under a specific order by a mine operator and component parts are completed and available for assembly. In allowing the continued use of present equipment as indicated above, MSHA inspectors shall assure that such hoists comply with appropriate hoisting standards in Section 19 of 30 CFR Parts 55, 56 and 57.

In those situations where a personnel hoist is being manufactured and the components had not been fabricated or were not ready for assembly prior to November 15, 1979, the hoist must comply with the new D/d Ratios. However, the mine operator may file a petition to modify the application of standard 55/56/57.19-39 under section 101(c) of the Federal Mine Safety and Health Act of 1977.

Further inquiries regarding this standard may be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia 22203, FTS 8-235-8647.

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should not be allowed unless no other travelway is available. However, if persons do travel by stationary electrical equipment, standard 55/56/57.11-1 requires that a safe means of access be provided.

Further inquiries regarding this standard may be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-42

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.12-19
Suitable Clearance Around Stationary Electrical Equipment

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.12-19. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.12-19 requires that where access is necessary, suitable clearance shall be provided at stationary electrical equipment or switch gear. The intention of this standard is to provide sufficient access and working space around such electrical equipment to insure worker safety and to avoid contact by persons with electrical components.

The standard is intended to apply to the many and varied situations that do or will exist on mine property. Among the general factors to be considered in determining "suitable clearance" are voltages and conductors (including size), insulation, guards, existing passage or working space, direction of access to electrical components, potential exposure to live or exposed electrical parts, and the grounding of live parts.

The current editions of the National Electrical Code and the National Electrical Safety Code may be used as guidance in determining "suitable clearance." The provisions of the National Electrical Code for safe work clearances around electrical equipment can be found in Article 110 ("Requirements for Electrical Installations") and Article 710 ("Over 600 Volts, Nominal, General"). Part 1 of the National Electrical Safety Code contains two sections that may be of assistance: Section 11 ("Protective Arrangements in Electrical Supply Stations") and Section 12 ("Protective Arrangements of Equipment"). The National Electrical Code may be obtained from the National Fire Protection Association, 470 Atlantic Avenue, Boston, Massachusetts 02210. The National Electrical Safety Code (also referred to as ANSI-C2) may be obtained from the Institute of Electrical and Electronics Engineers, Inc., National Bureau of Standards, 345 East 47th Street, New York, New York 10017.

Areas around stationary electrical equipment or switch gear should be restricted to authorized persons. Normal travel by or through such equipment

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-43

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.4-41
Exits from Buildings or Structures

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.4-41. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.4-41 requires that every building or structure where persons normally work shall be provided with exits sufficient to permit the prompt escape of persons in case of fire. The standard applies to every building or structure where "persons normally work."

Excluded from the requirements of this standard are those areas where persons work infrequently, e.g., change rooms, surge tunnels, toilet facilities, cafeterias. "Exits" may be doorways, passageways, windows or other openings that lead out of the building or structure. While the standard uses the word "exits", a single exit may be acceptable where it permits the prompt escape of persons in case of fire.

When considering what constitutes sufficient exits, the following factors should be considered: (1) the size of the exit(s); (2) the height of the exit(s) from the ground; (3) the size of the building; (4) the number of persons who normally work in the area serviced by the exit(s); (5) the nature of the operations; (6) the presence of potential fire hazards; (7) the type of materials of which the building is constructed, e.g., wood, brick, block, stone, metal, concrete; (8) the presence of fire suppression devices or the availability of fire extinguishers.

Further inquiries regarding this standard may be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-235-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-44

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.16-16
Operating Fork Lift and Similar Type Lift Trucks

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.16-16. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.16-16 provides that fork and other similar type lift trucks must be operated: (a) with the uprights tilted back; (b) with the load in the upgrade position when traveling on grades steeper than 10 percent; (c) with the load not raised or lowered during travel, except for minor adjustments; and (d) if unloaded, with the load-engaging mechanism downgrade.

This standard is intended to insure that safe lift truck operating procedures will be used at all times.

The requirement that load engaging devices be placed in a downgrade position when traveling on all grades reflects the accepted safety practice of traveling or tramming with the load-engaging mechanism as low as possible. This practice is set forth in Chapter 22, Powered Industrial Trucks, Industrial Safety, published by the National Safety Council and is also a requirement of the Occupational Safety and Health Administration, standard 29 CFR 1910.178(n)(i), (ii), and (iii). In most situations when tramming without a load, the load-engaging mechanism should be kept as close to the ground as safety permits. However, in situations where adjustments will be necessary to facilitate safe operation of the vehicle (e.g., when traveling on inclines, declines or over rough terrain), the load-engaging mechanism may be adjusted enroute.

Further inquiries regarding this standard shall be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia, FTS 8-236-8647.

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March 25, 1980

MSHA MANAGEMENT LETTER NO. 80-45

SUBJECT: PROGRAM DIRECTIVE: Standard 55/56/57.4-27
Fire Extinguishers for Self-Propelled Mobile Equipment

This document provides guidance for enforcement personnel in the application of new mandatory standard 55/56/57.4-27. The information in this document is intended to clarify and explain certain portions of the standard, and may be used as a basis for responding to public inquiries regarding the standard.

Standard 55/56/57.4-27 requires that whenever self-propelled mobile equipment is used, it shall be provided with a suitable fire extinguisher readily accessible to the equipment operator.

The preamble statement for standard 55/56/57.4-27 indicated that the standard does not require fire extinguishers to be placed inside "staff automobiles." The phrase "staff automobiles" means passenger cars owned, operated or leased by the mine operator and used to transport persons to and from the mine using public or private highways and roadways and which remain in parking areas while at the mine. The standard also is not intended to apply to vans, suburbans, or similar vehicles used in the same manner as "staff automobiles" above. These vehicles need not be provided with fire extinguishers even though they may be used infrequently for travel at the mine site. However, company owned or operated vehicles that are often used at the mine site for mining purposes (e.g., to haul equipment, supplies, explosives, repair or replacement parts; or, to transport persons from one location to another on the mine property) must have a suitable fire extinguisher accessible to the driver.

Further inquiries regarding this standard may be addressed to Frank Delimba, Chief, Division of Safety, Arlington, Virginia 22203, FTS 8-235-8647.

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LOSS-CONTROL INSPECTION

This list is intended only as a reminder. Look for other unsafe acts and conditions, and report them so that corrective action can be taken.

	OK	Not OK	Comments
Machinery			
Point of operation guards			
Belts, pulleys, gears, shafts, etc.			
Grinding wheels			
Air line safety chains			
Maintenance & oil leakage			
Oiling, cleaning & adjusting			
Emergency stops operational			
Electrical			
Lockout			
Cover plates			
Doors closed			
Label disconnects			
Conduit			
Insulating mats			
Danger signs			
Ground fault protection			
Emergency lighting/operational			
Lights guarded			
Tools double-insulated			
Extension cords			
Machinery grounded, continuity tests			
Gas Cylinders & Welding			
Cylinders secured upright			
Caps in place			
Gases stored separately			
Cylinders marked empty/full			
Valves closed			
Flashback present			
Fire extinguisher at site			
Undamaged welding lead			
Cylinders & hose good condition			
Welding screens present			
Exhaust ventilation present			
Cylinders free of grease/oil			
Personal Protective Equipment			
Glasses			
Hard hat			
Safety shoes			
Hearing protection			
Goggles			
Face shields			
Respirators			
Gloves			
Fall Protection			
Protective clothing			

Fire Protection	OK	Not OK	Comments
Sprinkler systems			
Fire hoses & nozzles			
Extinguisher on mobile equipment/accessible			
Extinguisher in accessible locals			
Extinguisher on welding machine			
Extinguisher on oxy-acetylene carts			
Extinguisher charged & sealed			
Flammable liquid storage			
Oil & grease storage			
"No Smoking" signs			
Safety cans - labeled			
Drip pans			
Containers for oil waste & rags			
Bonding wires/clamps			
Housekeeping			
Fire exits marked/signs			
Emergency lighting/operational			
Housekeeping			
Storage			
Floors			
Aisles			
Materials stacked adequately			
Stairs			
Walkways			
Spillage			
Clear access to safety equipment			
Vacuum systems adequate			
Break areas/lunch rooms			
Bathroom facilities			
Disposal of waste			
First Aid Equipment			
First aid kits/replenished			
Stretcher/oxygen			
Blankets			
Emergency showers/eye washes			
Emergency procedures/ambulance transport			
Tools			
Powered tools			
Double insulated			
Grounded			
Guards			
Tool rests/tongue guards			
Shields			
Stored properly			
Finger pressure controls			
Hand tools			
Heads mushroomed			
Worn			
Modified			

Mobile Equipment	OK	Not OK	Comments
Tires			
Brakes			
Backup alarm			
Lights			
Horn			
R.O.P.S.			
Fire Extinguisher			
Seat belts			
Windows			
Housekeeping			
Qualified Operators			
Berms on Roads			
Material Handling			
Cables, hoist			
Slings			
Manlifts			
Ropes			
Chains			
Come-a-longs			
Emergency stops on conveyors			
Overhead cranes			
Load limits			
Ladders, Platforms, Walkways			
Tread			
Handrails			
Mid-rails			
Toeboards			
Tripping hazards			
Stairs			
Chain handrails			
Ladder rungs			
Ladder rails			
Properly secured			
Safe access			
Safety Practices			
Personal protective equipment used			
- hearing protection			
- respirators			
- eye protection			
- goggles (grinding, chemicals, cutting)			
- fall protection			
- seat belts			
- gloves (chemicals, welding cutting)			
- protective clothing			

Safety Practices (Cont'd)	OK	Not OK	Comments
Material Handling			
- proper lifting techniques used			
- equipment operation			
- mobile equipment operated at speeds appropriate to conditions (weather, congestion, etc.)			
- pallets stacked evenly			
- are chock blocks used			
- vehicles off when unattended			
- vehicles parked out of traffic areas			
- dock plates secured properly			
- open loading docks secured w/rail			
- safe door opening/closing procedures observed			
- blue flag procedures observed			
- chains, hoists, slings used properly			
- load limits determined			
Electricity			
GFCI used			
Equipment locked out properly			
Unauthorized repair of electrical equipment			
Clearance observed at overhead power lines			
Disconnects used properly			
Fire Protection			
No Smoking areas observed			
Fire extinguisher use understood			
Improper use of gasoline/storage			
Housekeeping rules observed			
Fire drill/escape procedures understood			
Fire extinguisher present during cutting/welding			
Miscellaneous			
Horseplay/practical jokes			
Does employee understand job assignment/qualified?			
Taking shortcuts			
Ignoring safety signs			
Working under a load			
Work area inspections performed			
Pre-shift inspections performed			
Cleanup performed during shift			

U.S. Department of Labor

Mine Safety and Health Administration
4015 Wilson Boulevard
Arlington, Virginia 22203

April 07, 1986

MSHA PROGRAM INFORMATION BULLETIN NO. 86-2M

SUBJECT: Hazard Communication

This document provides guidance concerning the impact of the OSHA hazard communication standard, 29 CFR 1910.1200 (48 FR 53340, November 25, 1983) and various State right-to-know laws on the mining industry. It may also be used as the basis for responding to public inquiries on the subject. For the reasons discussed below, operators should be advised that the OSHA hazard communication rule is not applicable to mining activities within MSHA's jurisdiction.

The OSHA standard requires chemical manufacturers listed within SIC Codes 20 through 39 (Division D, Standard Industrial Classification Manual) and importers to determine if chemicals produced in their workplaces or imported by them are hazardous, and label each hazardous chemical leaving their workplace. 1/ Chemical manufacturers and importers must develop material safety data sheets for each hazardous chemical they produce or import. In addition, covered employers 2/ must develop a written hazard communication program and provide training for their employees.

INQUIRIES: Marvin Nichols, Chief, Division of Health,
Metal and Nonmetal Mine Safety and Health,
on (703) 235-8307

DISTRIBUTION: All Mine Operators
District Managers for Metal and Nonmetal
Mine Safety and Health
Principal Officials, Headquarters
Superintendent, National Academy

1/ OSHA has proposed to extend coverage of the hazard communication rule to general industry (See 50 FR 48794, November 27, 1985).

2/ (Defined as "Persons engaged in a business within SIC Codes 20 through 39 where chemicals are either used, or are produced for use or distribution.")

The OSHA standard specifically exempts the coal mining industry. While a few metal and nonmetal operations appear to fall within the designated SIC Codes, the OSHA rule is silent as its applicability to the mining industry as a whole.

The Federal Mine Safety and Health Act of 1977, 30 U.S.C. §802 (1982), (Mine Act) defines a "coal or other mine" in extremely broad terms and court cases have sustained the full scope of this jurisdiction. Additionally, section 3(h)(1) of the Mine Act directs the Secretary of Labor, in determining what constitutes mineral milling, to give due consideration to the convenience of administration resulting from the delegation to one Assistant Secretary of all authority with respect to the health and safety of miners employed at one physical establishment.

The legislative history of the Mine Act explains MSHA's authority by stating that the term "mine" was to be given the "broadest possible interpretation and that [jurisdictional] doubts were to be resolved in favor of inclusion of a facility within the coverage of the [Mine] Act." Congress specifically distinguished the mining industry from manufacturing and intended that one agency, MSHA, enforce uniform safety and health standards and provisions ensuring miners' rights.

Relevant to determining the respective coverage of MSHA and OSHA standards are the guidelines contained in the Interagency Agreement, 44 FR 22827, April 17, 1979. This agreement states the general principle that MSHA will exercise jurisdiction over unsafe and unhealthful working conditions on mine sites and milling operations. Accordingly, MSHA has promulgated standards requiring miners to be trained in hazard recognition and avoidance including the hazards of handling chemical products. Moreover, warning and labeling requirements for metal and nonmetal mines specifically require that hazardous areas be posted in order to warn miners and that toxic substances be labeled, both in a manner which identifies the hazard involved. In advising operators, applicable MSHA standards are attached for your information.

Regarding the effect of State "right-to-know" laws at mining operations, section 506 of the Mine Act permits application of State laws that do not conflict with its provisions or regulations. State laws that are more stringent than MSHA standards, or cover health and safety in mines where MSHA has no such standards, are still applicable to mines. In general, State right-to-know laws address the threat to public health caused

by workplace hazardous substances in the environment and they may require employers to label hazardous chemicals in their workplaces and inform community residents of the potential hazards and associated exposure. Education and training of employees may also be required under State laws.

Roy L. Bernard
Administrator for
Metal and Nonmetal

Attachment

Attachment

30 CFR 56/57.16004 Containers for hazardous materials.

30 CFR 56/57.20011 Barricades and warning signs.

30 CFR 56/57.20012 Labeling of toxic materials.

30 CFR 48.5 Training of new miners; minimum course of instruction; hours of instruction.

30 CFR 48.6 Training of newly employed experienced miners; minimum courses of instruction.

30 CFR 48.7 Training of miners assigned to a task in which they have no previous experience; minimum courses of instruction.

30 CFR 48.8 Annual refresher training of miners; minimum courses of instruction; hours of instruction.

30 CFR 48.25 Training of new miners; minimum courses of instruction; hours of instruction.*

30 CFR 48.26 Training of newly employed experienced miners minimum courses of instruction.*

30 CFR 48.27 Training of miners assigned to a task in which they have no previous experience; minimum courses of instruction.*

30 CFR 48.28 Annual refresher training of miners; minimum courses of instruction; hours of instruction.*

*Note: See Department of Labor, Health and Human Services, and Education and Related Agencies Appropriation Act, 1986, Pub. L. No. 99-178, 99 Stat. 1107 (1985), providing funding for fiscal year ending September 30, 1986, which restricts funding for enforcement of any training requirement pursuant to sections 115 and 104(g)(1) of the Mine Act with respect to shell dredging, or with respect to any sand, gravel, surface stone, surface clay, colloidal phosphate, or surface limestone mine.

GPO 922-861

U.S. Department of Labor

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Permit Number G-59

Mine Safety and Health Administration
4015 Wilson Boulevard
Arlington, Virginia 22203

Official Business
Penalty for Private Use, $300

2800959 CNTY% MIDDLESEX
SOUTH PLAINFIELD MILL
CYPRUS MINES CORPORATION
65L METUCHEN ROAD
S. PLAINFIELD NJ 07080

Copy for US

Copy To Reverts & Lorang

Copy Last page For JK INFO.

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

July 30, 1986

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Mines Corporation
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on June 2-3, 1986. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:				1		
Orders:						

Sincerely yours,

Stan Mitchell (for)
Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the first quarter of 1986 were 3,646. There were no reportable accidents. The incidence rate and severity measure were zero.

Safety was discussed with two employees. Topics were forklift safety, housekeeping, and fatal accidents.

A review of records indicated the operator was in compliance with Part 50 reporting requirements outlined in Part 50.10, .20 and .30.

Miscellaneous Contaminants
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Contaminant			
28-00959	6/3/86	☐ Gas	☐ Vapor	☐ Mist	☒ Other (specify) SLM Readings

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Mines Corporation	651 Metuchen Rd. South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Sampling Time (min)	Contaminant Name	Contaminant Concentration (dBA)**	SWA or TWA* ( )**	TLV ( )** dBA	Comments
	Mill operator - mill		Instant	Noise exposure	74		90	
	Bagger - mill		Instant	Noise exposure	80		90	

MSHA Form 4000-22,Oct. 81 (revised)

*Circle calculation method used

**Specify Concentration Units

LEHMAN 00822

Crystalline Silica Dust
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Type of Sample		Contaminant		
28-00959	6/2&3/86	☐ Total	☒ Respirable	☒ Quartz	☐ Cristobalite	☐ Tridymite

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Mines Corporation	651 Metuchen Road, South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Sampling Time (min)	Sample Weight (mg)	SiO_2 Weight (mg)	% SiO_2	SWA (mg/m^3)	TLV (mg/m^3)	Comments
Daniel Damen	Mill operator Mill	5-X-060	480	.662	0	0	.81	5.00	In compliance
Miguel Contreras	Bagger Mill	5-X-061	480	.544	0	0	.68	5.00	In compliance

MSHA Form 4000-24,Oct. 81 (revised)

*Circle calculation method used

LEHMAN 00823

Mine Citation/Order Continuation

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Subsequent Action/Continuation Data

1. Subsequent Action ☐	1a. Continuation ☐	2. Dated (Original Issue) Mo 11 Da 13 Yr 85	3. Citation/Order Number 2627514-2

4. Served To	5. Operator
KEITH B. LEHMAN - MILL SUPT.	CYPRUS INDUSTRIAL MINERALS COMPANY
6. Mine SOUTH PLAINFIELD MILL	7. Mine ID 28-00959- (Contractor)

Section II—Justification for Action

THIS CITATION IS HEREBY EXTENDED, UNTIL PITTSBURG TECH SUPPORT, ADVISES THE COMPANY OF THEIR DECISION ON THE PROCEEDURES FOR A GROUNDING SYSTEMS CHECK, OF THIS PARTICULAR TYPE OF ELECTRICAL SYSTEM.

See Continuation Form ☐

Section III—Subsequent Action Taken

8. Extended To A. Date Mo 07 Da 02 Yr 86 B. Time (24 Hr. Clock) 1200 C. Vacated ☐ D. Terminated ☐ E. Modified ☐

Section IV—Inspection Data

9. Type of Inspection 001 10. Event Number 15079

11. Signature Charles A. Rentz AR Number 935 12. Date Mo 06 Da 02 Yr 86 13. Time (24 Hr. Clock) 2339

MSHA Form 7000-3a, Mar 85 (revised)

STATE OF NEW JERSEY
DEPARTMENT OF LABOR
DIVISION OF PLANNING AND RESEARCH
C N 383
TRENTON, NEW JERSEY 08625-0383

CHARLES SERRAINO
Commissioner

OFFICE OF THE DIRECTOR
(609) 292-1857

Dear Employer:

The United States Department of Labor and the New Jersey Department of Labor are currently in need of vital information regarding the occupational structure of New Jersey's work force. This information is of great importance for the following reasons:

It allows educational and vocational planners to structure programs that will best meet industry's future labor needs.

It provides factual data which are needed for a more efficient allocaton of public tax dollars to educational and vocational programs.

It establishes a basis upon which individuals can make intelligent career decisions and thus train for jobs that will be demanded by industry.

It provides an inventory of local, state, national manpower resources.

We are asking you to cooperate with us in our attempt to spend the public's tax dollars wisely and to assist our citizens in finding meaningful employment.

You can make a valuable contribution to our effort by completing the enclosed questionnaire and returning it within two weeks. The purpose of the questionnaire is to obtain your firm's employment by occupation. While completing it, you may wish to refer to the "Hints for Filling Out an OES Form" which we have enclosed.

The confidentiality of all respondents is guaranteed by law. Data are published by industry group without revealing the identity of individual participating employers. Copies of reports will be made available to participants upon request. Past experience has indicated to us that many employers regard these reports as valuable additions to their own data resources.

Thank you for your cooperation.

Sincerely,

Shirly Goetz, Assistant Director
Office of Demographic & Economic Analysis

Enc.

New Jersey Is An Equal Opportunity Employer

RP-36 (R•1•87)

HELPFUL HINTS FOR OES SURVEY

Directions- Read the directions before beginning. This form is much simpler than it looks.

Match Descriptions, Not Titles- When placing employees in our categories, match job descriptions, not titles. If some of your categories do not fit into any of ours, list them (along with a brief job description and number in that category) in Section V at the end of the form.

Multiple Job Duties- Employees with multiple job duties should be listed in only one category- the one with the highest skill level. If they do several jobs at the same skill level, put them in the one they spend the most time.

Owners- If you are an owner, count yourself only if your company is incorporated and you are a salaried employee.

Managers and Supervisors- Direct supervisors (or in small firms, owner/managers who handle both supervisory and administrative functions) should go in one of the First Line Supervisor & Manager-Supervisor categories: which one depends on the type of workers they supervise.

Top-Management categories (those with an office code beginning with a 1) should only include management personnel who are higher than First Line Supervisor & Manager-Supervisor in the company hierarchy.

Employees with a management title who manage a function (as opposed to managing a department of employees) should be placed in the appropriate professional category (one with an Office Code beginning with a 2 or 3).

Research and Development- For a definition of what R&D employees are, see the inside cover of the form (Section III).

To code R&D occupations, put the total number of employees in the category in the white area. Beneath that, in the shaded area, put down how many are R&D.

KEEP A COPY of the form in case we have any questions.

If you should need any further assistance with this form feel free to call the OES staff COLLECT at 609-292-1857.

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LEHMAN 00827

EMPLOYMENT BY OCCUPATION

Occupations	Number of Employees	Office Code
TRUCK DRIVERS, HEAVY OR TRACTOR TRAILER: Drive tractor-trailer combination or truck with a capacity of at least 3 tons to transport and deliver goods, livestock, or materials in liquid, loose or packaged form. May be required to unload truck.		971023
TRUCK DRIVERS, LIGHT- INCLUDE DELIVERY AND ROUTE WORKERS: Drive truck, van, or automobile with a capacity under 3 tons. May drive light truck to deliver or pick-up merchandise and load and unload truck.		971053
EXCAVATING AND LOADING MACHINE OPERATORS: Operate or tend machinery, except dredges or draglines, equipped with scoops, shovels, or buckets to excavate and load loose materials.		979233
DRAGLINE OPERATORS: Operate power driven crane equipment with dragline bucket to excavate or move sand, gravel, mud, or other materials.		979263
DREDGE OPERATORS AND DIPPER TENDERS: Operate power driven dredge or dipper stick of dredge to mine sand, gravel, or other materials from lakes, rivers, or streams.		979283
LOADING MACHINE OPERATORS, UNDERGROUND MINING: Operate underground loading machine to load coal, ore, or rock into shuttle or mine car or onto conveyors. Loading equipment may include any of various types, such as power shovel, hoisting engine equipped with cable drawn scraper or scoop, or machine equipped with gathering arms and conveyor.		979323
INDUSTRIAL TRUCK AND TRACTOR OPERATORS (FRONT-END LOADER OPERATORS; ETC.): Operate gasoline or electric powered industrial trucks or tractors equipped with fork lift, elevated platform, or trailer hitch to move materials in an establishment, warehouse, storage yard, factory, or at a construction site. *Exclude* Logging Tractor Operators.	1	979473
CONVEYOR OPERATORS AND TENDERS: Control or tend conveyors or conveyor systems that move materials or products to and from stockpiles, processing stations, departments, vehicles, and underground workings. May control speed and routing of materials or products.		979513
OPERATING ENGINEERS: Operate several types of power construction equipment, such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers, or motor graders to excavate, move and grade earth, erect structures, or pour concrete or other hard surface paving. May repair and maintain equipment in addition to other duties. *Exclude* workers who specialize in operation of a single type of heavy equipment such as a bulldozer or crane.		979563
CONSTRUCTION TRADES AND EXTRACTIVE WORKER HELPERS: Help workers in the construction trades, such as Brickmasons, Carpenters, Electricians, Painters, Plumbers, and Surveyors. Perform duties such as furnishing tools, materials, and supplies to other workers; cleaning work areas, machines, and tools; and holding materials or tools for other workers.		983003
FREIGHT, STOCK, AND MATERIAL MOVERS, HAND: Include workers who move materials manually. Freight, stock and material movers (hand) work in a variety of settings such as warehouses, production areas, stockrooms, or shipping departments.	2	987003

Subtotal of Section IV
(Sum of non-shaded boxes)

LEHMAN 00828

EMPLOYMENT BY OCCUPATION

Occupations	Number of Employees	Office Code
MACHINERY MAINTENANCE WORKERS (BELT REPAIRERS; STRIPPING SHOVEL OILERS; ETC.): Perform routine maintenance of machinery, such as changing of parts and lubrication of machinery. *Exclude* workers who repair machinery.		851283
MAINTENANCE REPAIRERS, GENERAL UTILITY: Perform work involving two or more maintenance skills to keep the machines, mechanical equipment, and/or structure of an establishment in repair. This occupation is generally found in a small establishment where specialization in maintenance work is impractical. Duties may involve pipefitting, boilermaking, insulating, welding, machining, machine and equipment repairing, carpentry, and electrical work, as well as planning and laying out of work relating to repairs; repairing electrical and/or mechanical equipment; installing, aligning and balancing new equipment; and repairing buildings, floors, or stairs.		851323
BUS AND TRUCK MECHANICS, AND DIESEL ENGINE SPECIALISTS: Repair and maintain the operating condition of trucks, buses, and all types of diesel engines. Also include those mechanics working primarily with automobile diesel engines.		853113
MOBILE HEAVY EQUIPMENT MECHANICS, EXCEPT ENGINES (CONSTRUCTION EQUIPMENT MECHANICS; ETC.): Repair and maintain mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and surface mining. *Exclude* Rail Car Repairers and Diesel Engine Specialists.		853143
EARTH DRILLERS, EXCEPT OIL AND GAS (CORE DRILL OPERATORS; ROCK DRILL OPERATORS; ETC.): Operate a variety of drills to tap sub-surface water and salt deposits, to remove core samples during mineral exploration or soil testing, and to facilitate the use of explosives in mining or construction. Include workers such as Core, Well, and Foundation Drill Operators and Horizontal and Earth Boring Machine Operators. *Exclude* Oil Well Drillers.		879023
BLASTERS AND EXPLOSIVES WORKERS: Place explosives in holes or other spots and detonate the explosives to loosen, remove, or displace earth, rock, or other materials, or to demolish structures. Include such occupations as Tier-Detonator Blasters, Perforator Operators, and Seismograph Shooters.		879053
ROCK SPLITTERS, QUARRY: Separate blocks of rough dimension stone from quarry mass using jackhammer, wedges, and feathers.		879083
FURNACE, KILN, OVEN, DRIER, OR KETTLE OPERATORS AND TENDERS: Operate or tend heating equipment other than basic metal or plastic processing equipment. *Oven Operators or Tenders*: Perform such operations as baking fiberglass or painted products, fusing glass or enamel to metal products, carbonizing coal, or curing rubber or other products. *Furnace Operators or Tenders*: Perform such operations as annealing glass, roasting sulfur, converting chemicals, or processing petroleum. *Kettle Operators and Tenders*: Perform such operations as boiling soap or melting antimony or asphalt materials. *Drier Operators and Tenders*: Perform such operations as removing moisture from paper, chemicals, ore, clay products, or slurry. *Kiln Operators and Tenders*: Perform such operations as heating minerals, drying lumber, firing greenware, annealing glassware, or baking clay products.		929233
CRUSHING, GRINDING, MIXING, AND BLENDING MACHINE OPERATORS AND TENDERS (PULVERIZER MILL OPERATORS; TUMBLER OPERATORS; GRINDING MILL OPERATORS; ETC.): *Crushing, Grinding, and Polishing Machine Operators and Tenders*: Operate or tend machines to crush or grind any of a wide variety of materials, such as coal, glass, plastic, dried fruit, grain, stone, chemicals, food, or rubber, or operate or tend machines that buff and polish materials or products, such as stone, glass, slate, plastic or metal trim, bowling balls, or eyeglasses. *Mixing and Blending Machine Operators and Tenders*: Operate or tend machines to mix or blend any of a wide variety of materials such as spices, dough batter, tobacco, fruit juices, chemicals, livestock feed, food products, color pigments, or explosive ingredients.		929653
WELDERS AND CUTTERS (ARC-CUTTERS; ETC.): Use hand welding and flamecutting equipment, such as arc welders, gas welders, and gas torches, to weld together metal components of such products as pipelines, automobiles, boilers, and ships, or join together components of fabricated sheet metal assemblies, or cut, trim, or scarf metal objects to dimensions as specified by layout, work orders, or blueprints.		939143

LEHMAN 00829

EMPLOYMENT BY OCCUPATION

Occupations	Number of Employees	Office Code
GEOLOGISTS, GEOPHYSICISTS, AND OCEANOGRAPHERS (PETROLOGISTS; ETC.): *Geologists*: Study composition, structure, and history of the earth's crust; examine rocks, minerals, and fossil remains to identify and determine the sequence of processes affecting the development of the earth; apply knowledge of chemistry, physics, biology, and mathematics to explain these phenomena and to help locate mineral and petroleum deposits and underground water resources; prepare geologic reports and maps, interpret research data, and recommend further study or action. *Geophysicists*: Study physical aspects of the earth, including the atmosphere and hydrosphere; investigate and measure seismic, gravitational, electrical, thermal, and magnetic forces affecting the earth utilizing principles of physics, mathematics, and chemistry. *Oceanographers*: Study topographical features and rock and sediment of the ocean bottom in addition to the physical aspects of oceans, such as density, temperature, and sound. *Exclude* Geodesists and report them under Surveying and Mapping Scientists.	R&D + Non R&D = R&D Only	241113 241115
FIRST LINE SUPERVISORS AND MANAGER/SUPERVISORS- SALES AND RELATED OCCUPATIONS: Directly supervise and coordinate activities of marketing, sales, and related workers. In addition to their supervisory duties, may perform management functions, such as budgeting, accounting, marketing, and personnel work.		410023
SECRETARIES: Relieve officials of clerical work and minor administrative and business detail by scheduling appointments, giving information to callers, taking dictation, composing and typing routine correspondence (using typewriter or word processor), reading and routing incoming mail, and filing correspondence and other records. May perform various other assigned clerical duties.		551003
BOOKKEEPING, ACCOUNTING, AND AUDITING CLERKS: Compute, classify, and record numerical data to keep sets of financial records complete. Perform any combination of routine calculating, posting, and verifying duties to obtain primary financial data for use in maintaining accounting records. May also check the accuracy of figures, calculations, and postings pertaining to business transactions recorded by other workers. Workers whose primary duty is operation of special office machines are classified as Billing, Posting, and Calculating Machine Operators.		553383
GENERAL OFFICE CLERKS: Workers should be classified as General Clerks *only* if their duties are too varied and diverse to be classified in any specific office clerical occupation. Clerical duties may be assigned in accordance with the office procedures of individual establishments and may include a combination of bookkeeping, typing, stenography, office machine operation, and filing.		553473
WEIGHERS, MEASURERS, CHECKERS, AND SAMPLERS- RECORDKEEPING (COUNTERS-WEIGHERS; ETC.): Duties are primarily clerical in nature and involve weighing, measuring, and checking materials, supplies, and equipment for the purpose of keeping relevant records. Also include workers who collect and keep record of samples of products or materials. *Exclude* Production Samplers and Weighers.		580173
GUARDS AND WATCH GUARDS: Stand guard at entrance gate or walk about premises of business or industrial establishment to prevent theft, violence, or infractions of rules; guard property against fire, theft, vandalism, and illegal entry; direct patrons or employees and answer questions relative to services of establishment; control traffic to and from buildings and grounds. Include workers who perform these functions using a car patrol.		630473
FIRST LINE SUPERVISORS AND MANAGER/SUPERVISORS- CONSTRUCTION TRADES AND EXTRACTIVE WORKERS: Directly supervise and coordinate activities of construction or extractive workers. Manager/Supervisors are generally found in smaller establishments where they perform both supervisory and management functions, such as accounting, marketing, and personnel work. In addition, Manager/Supervisors may also engage, in part, in the same construction work as the workers they supervise. *Exclude* [illegible] leaders who spend 20% or more of their time at tasks similar to those of employees under their supervision and report them in the occupations which are most closely related to their specific work duties.		810053
UNDERGROUND MINE MACHINERY MECHANICS: Repair, adjust, and maintain underground mining machinery, such as drilling and cutting machines, continuous mining machines, and underground conveyor systems. *Exclude* Mine Car Repairers.		351173

LEHMAN 00830

EMPLOYMENT BY OCCUPATION

Occupations NOTE: The following is an abbreviated list of occupations in your industry. If you have different or additional occupations, please list them in Section V.	Number of Employees	Office Code
FINANCIAL MANAGERS (TREASURERS; CONTROLLERS;): Plan, organize, direct, control, or coordinate the financial activities of an organization. Include managers in banks or similar financial institutions who advise on credit and investment policy or negotiate general policy with financial or other institutions.		130023
MINING, QUARRYING, AND OIL AND GAS WELL DRILLING MANAGERS: Plan, organize, direct, control, or coordinate, usually through subordinate supervisory personnel, the operations of mines, quarries, oil or gas wells, or other similar operations that extract natural deposits.		150213
GENERAL MANAGERS AND TOP EXECUTIVES (INDUSTRIAL ORGANIZATION MANAGERS, PLANT MANAGERS; ETC.): Include both top and mid-level managers whose duties and responsibilities are too diverse and general in nature to be classified in any functional or line area of management and administration. These managers generally work through departmental or subordinate executives.		190053
ACCOUNTANTS AND AUDITORS: Examine, analyze, and interpret accounting records for the purpose of giving advice or preparing statements and installing or advising on systems of recording costs or other financial and budgetary data.		211143
METALLURGISTS AND METALLURGICAL, CERAMIC, AND MATERIALS ENGINEERS (EXTRACTIVE OR PHYSICAL METALLURGISTS; ETC.): *Metallurgists and Metallurgical Engineers*: Investigate properties of metals and develop methods to produce new alloys, usages, and processes of extracting metals from their ores. Include Physical and Extractive Metallurgists. *Ceramic Engineers*: Conduct research, design machinery, and develop processing techniques related to the manufacturing of ceramic products. *Materials Engineers*: Evaluate, plan, and implement processes to develop new materials to meet product specifications, performance standards, and costs. *Exclude* Sales Engineers and report them with the Sales Workers.	R&D + Non R&D = R&D Only	221053 221055
MINING ENGINEERS, INCLUDING MINE SAFETY (MINE EQUIPMENT DESIGN ENGINEERS; ETC.): Determine the location and plan the extraction of coal, metallic ores, nonmetallic minerals, and building materials, such as stone and gravel. Work involves: Conducting preliminary surveys of deposits or undeveloped mines and planning their development; examining deposits or mines to determine whether they can be worked at a profit, making geological and topographical surveys; evolving methods of mining best suited to character, type, and size of deposits; and supervising mining operations. Exclude Sales Engineers and report them with Sales Workers.	R&D + Non R&D = R&D Only	221083 221085
SURVEYORS AND MAPPING SCIENTISTS (CARTOGRAPHERS; GEODESISTS; ETC.): Use surveying, engineering and scientific data to determine and identify fixed points or boundaries, prepare maps for legal and design purposes and provide data relevant to the shape, contour, gravitation, location, or dimension of land or land features for construction, mining, or land evaluation and other purposes.	R&D + Non R&D = R&D Only	223113 223115
DRAFTERS: Prepare clear, complete, and accurate working plans and detail drawings from rough or detailed sketches or notes for engineering or manufacturing purposes according to specified dimensions. Utilize knowledge of various machines, engineering practices, mathematics, building materials, and other physical sciences to complete drawings.	R&D + Non R&D = R&D Only	225143 225145

LEHMAN 00831

SECTION II: UNIT(S) STATUS

a. **TYPE OF OWNERSHIP** *(Please check one of the following)*

☑ Corporation ☐ Partnership ☐ Sole Proprietorship ☐ Other *(explain)* _____

b. **AUXILIARY STATUS** Is the Unit *primarily* engaged in performing services for other units of your company? ☑ Yes ☐ No If yes, please check block below:

☐ Central administrative office ☐ Research, development, or testing lab ☑ Storage (warehouse) ☑ Other *(specify, e.g., powerplant)* MILLING

c. **RESEARCH AND DEVELOPMENT EMPLOYMENT** If this unit(s) has any employees engaged in research and development as defined below, enter total number of employees engaged in R&D. —

SECTION III: DEFINITIONS AND SPECIAL INSTRUCTIONS

Report multiple job holders only once: Report an employee who performs work in two or more of the listed occupations in the job that you believe requires the *highest level of skill*. If there is no measureable difference in skill requirements, report the employee in the occupation in which he spends most of his time.

Report employees in the occupation in which they are working, not in an occupation for which they may have been trained, if that is different. For example, an employee trained as an Engineer but working as a Drafter, should be reported as a Drafter.

Report part-time workers, learners, and apprentices in the occupation in which they ordinarily perform their work.

Research and Development: Include in this function employees who spend the greatest proportion of their time performing, managing, or administering basic and applied research in engineering, mathematics, physical, life (including medicine), and other sciences; and in the design and development of prototypes and processes. For purposes of this study, research and development *includes* the following types of activities: (a) Pursuit of planned research of new knowledge, whether or not the *research has reference to a specific application*. (b) Application of existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses. (c) Application of existing knowledge to problems involved in the improvement of an existing product or process.

SECTION IV AND V: REPORT EMPLOYMENT BY OCCUPATION

Report covered employees in one of the listed occupations in Section IV. For occupations not covered, list in Section V and include a descriptive job title, the main duties, and the corresponding number of employees.

Research and Development workers, in addition to being included in the unshaded area, should be separately reported in the shaded area provided.

Please classify workers according to the definitions provided rather than by title alone.

LEHMAN 00832

New Jersey Department of Labor
Division of Planning and Research
CN383 - OES Unit
Trenton, NJ 08625

Occupational Report 710-1 in Cooperation with the U.S. Department of Labor

The information contained on this form is in the Bureau of Labor Statistics and the State agency cooperating in its statistical programs will be held in confidence and will be used for statistical purposes only.

This report is authorized by law, 29 U.S.C. (2). Your voluntary cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

Form Approved
O.M.B. No. 1220-0042
Approval expires: 6-30-88

OCCUPATIONAL EMPLOYMENT SURVEY OF THE NONMETALLIC MINERALS AND METAL MINING INDUSTRIES

INSTRUCTIONS—PLEASE COMPLETE SECTIONS I thru V—This form requests information on the number of workers you employ by occupation—NO WAGE OR FINANCIAL INFORMATION IS REQUIRED.

SECTION I—COVERAGE

a. PRODUCT OR SERVICE: According to our records, your products or services are related to those listed on the label below.

If this list is not generally appropriate, please specify below and continue to item b.

710 149 71000048-7
UNITS PRIMARILY ENGAGED IN MINING, QUARRYING, MILLING OR OTHERWISE PREPARING GYPSUM, MICA, NATIVE ASPHALT AND BITUMENS, PUMICE AND PUMICITE, TALC, SOAPSTONE, & PYROPHYLLITE, NATURAL ABRASIVES (EXCEPT SAND), PEAT, ASBESTOS, ETC.

b. UNIT(S) COVERED

Please report only for the unit(s) identified by the words "report for," on the label below. Our estimate of the unit(s) employment is in the lower right corner of the label. If this employment represents more than one location, how many? _____

Some employers may receive more than one form and are asked to report separately for each unit(s) covered by the individual forms.

71000048-7 0019133700 0 1496 710-1
CYPRUS INDUSTRIAL MINERALS CO
651 METUCHEN RD
S PLAINFIELD NJ 07080

REPORT FOR UNIT AT:
S.PLAINFIELD NJ NJ

1.67 287 34 00 022 0 13
(Please change address if incorrect) (Employment)

Office Use Only
Status
Auxiliary

c. SURVEY PERIOD: Pay period including May 12, 1987.

Please report for the pay period which includes this date. If, because of *unusual* operational problems, this period is not typical, choose a period that approximates the norm and specify _____
Seasonal and general economic changes in employment should *not* be considered an unusual operational problem.

If the unit(s) did not operate under your management during the survey period for one of the following reasons, please indicate.
☐ Out-of-Business ☐ Sold or Merged. New name & address _____

d. UNIT EMPLOYMENT: Include the total number of all covered employees, as defined below. 8 Office Code 999999

COVERED EMPLOYEES: Full or part-time paid workers; Workers on *paid* vacations or other types of leave; Workers on *unpaid* short-term absences (i.e., illness, bad weather, temporary layoff, jury duty); Salaried officers, executives and staff of incorporated firms; Employees temporarily assigned to other units; Employees for whom this unit is their permanent (home) duty station, regardless of whether this unit prepares their pay check.

NON-COVERED EMPLOYEES: Proprietors, owners and partners of unincorporated firms; Unpaid family workers; Workers on extended leave (i.e., pensioners and members of the armed forces) and workers on long term layoff.

e. IF QUESTIONS ARISE CONCERNING YOUR REPORT, WHOM SHOULD WE CONTACT?

Name	Title	City & State	Area Code	Telephone	Date
KEITH B. LEHMAN	MANAGER	S. PLAINFIELD NJ	201	754	4881

BLS-2377 710-1

LEHMAN 00833

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

October 3, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on August 7 and 8, 1985. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Industrial hygiene samples, collected during this inspection, require laboratory analysis. You will receive a supplement to this inspection report upon completion of the analysis.

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	0					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Harold L. Thompson/ms
Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the first half of 1985 were 6,728. There were no reportable accidents, therefore, the incidence rate and severity measure were zero.

Safety was discussed with four employees. Topics were forklift safety, housekeeping, and fatal accidents.

Pending the results of dust samples sent to the Denver laboratory for analysis, a supplemental report will follow.

Miscellaneous Contaminants
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Contaminant			
28-00959	8/7-8/85	☐ Gas	☐ Vapor	☐ Mist	X☒ Other (specify) SOUND LEVEL METER READINGS

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Industrial Minerals Company	South Plainfield, Middlesex, New Jersey

Name	Occupation and Location	Sample Number	Sampling Time (min)	Contaminant Name	Contaminant Concentration (dba)**	SWA or TWA* ( )**	TLV ( )** dba	Comments
	Bagger Mill		Instant	Noise Exp.	to 82		115	Bagging area
	Laborer Mill		Instant	Noies Exp.	to 81		115	Pallet stacking area

MSHA Form 4000-22,Oct. 81 (revised) *Circle calculation method used **Specify Concentration Units

LEHMAN 00836

U.S. Department of Labor

Mine Safety and Health Administration
P O Box 1894
Albany, New York 12201

February 13, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on January 16-17, 1985. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Industrial hygiene samples, collected during this inspection, require laboratory analysis. You will receive a supplement to this inspection report upon completion of the analysis.

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	0					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Steve Mitchell (for)
Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the last three quarters of 1984 were 9,697. There were no reportable accidents, therefore, the incidence rate and severity measure were zero.

Safety was discussed with four employees. Topics were forklift safety, housekeeping, and fatal accidents.

Pending the results of dust samples sent to the Denver laboratory for analysis, a supplemental report will follow.

U. S. Department of Labor

Mine Safety and Health Administration
P O Box 1874
Albany, New York 12201 -1874

April 12, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed supplemental report completes a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on January 16-17, 1985. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	0					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Steve Mitchell (for)
Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

Crystalline Silica Dust
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Type of Sample		Contaminant		
28-00959	1/17/85	☐ Total	☒ Respirable	☒ Quartz	☐ Cristobalite	☐ Tridymite

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Industrial Minerals Company	651 Metuchen Road South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Sampling Time (min)	Sample Weight (mg)	SiO_2 Weight (mg)	% SiO_2	SWA (mg/m^3)	TLV (mg/m^3)	Comments
Joe Giacobbe	Mill Operator Mill	5C-010	480	.354	.007	1.98	.43	2.51	In compliance

MSHA Form 4000-24, Oct. 81 (revised)

*Circle calculation method used

LEHMAN 00840

U.S. Department of Labor
Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

November 26, 1985

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Mines Corporation
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on November 12-13, 1985. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Industrial hygiene samples, collected during this inspection, require laboratory analysis. You will receive a supplement to this inspection report upon completion of the analysis.

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	1					
Orders:	0					

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the third quarter of 1985 were 3,856. There were no reportable accidents. The incidence rate and severity measure were zero.

Safety was discussed with four employees. Topics were forklift safety, wearing respirators, housekeeping, fatal accidents, electrical, bin entry, and loading procedures, and use of safety belt and line.

Pending the results of dust samples being analyzed in our laboratory, a supplemental report will follow.

Miscellaneous Contaminants
Sampling Results

U. S. Department of Labor
Mine Safety and Health Administration

Mine ID Number	Date of Sample(s)	Contaminant				
28-00959	11/13/85	☐ Gas	☐ Vapor	☐ Mist	☒ Other (specify)	Sound Level Meter Readings

Mine Name	Company Name	Address
South Plainfield Mill	Cyprus Mines Corporation	651 Metuchen Road South Plainfield, NJ 07080

Name and Social Security Number	Occupation and Location	Sample Number	Sampling Time (min)	Contaminant Name	Contaminant Concentration (dBA)**	SWA or TWA* ( )**	TLV ( )** dBA	Comments
	Bagger Mill		Instant	Noise Exposure	to 82		115	
	Laborer Mill		Instant	Noise Exposure	to 81		115	

MSHA Form 4000-22 (Oct. 81 Revised)

*Circle calculation method used

**Specify Concentration Units

LEHMAN 00843

Mine Citation/Order

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Violation Data

1. Date	Mo	Da	Yr	2. Time (24 Hr. Clock)		3. Citation/Order Number	
	11	13	85	1130			2627514

4. Served To: KEITH B. LEHMAN - MILL SUPT.

5. Operator: CYPRUS INDUSTRIAL MINERALS COMPANY

6. Mine: SOUTH PLAINFIELD MILL

7. Mine ID: 28-00959 (Contractor)

8. Condition or Practice — 8a. Written Notice (103g) ☐

UPDATED RECORDS OF ELECTRICAL CONTINUITY AND RESISTANCE OF GROUNDING SYSTEMS WERE NOT AVAILABLE FOR INSPECTION.

See Continuation Form (MSHA Form 7000-3a) ☐

9. Violation: A. Health ☐ Safety ☑ Other ☐ — B. Section of Act: — — C. Part/Section of Title 30 CFR: 56.12028

Section II—Inspector's Evaluation

10. Gravity:

A. Injury or Illness (has) (is): No Likelihood ☐ Unlikely ☒ Reasonably Likely ☐ Highly Likely ☐ Occurred ☐

B. Injury or Illness could reasonably be expected to be: No Lost Workdays ☒ Lost Workdays or Restricted Duty ☐ Permanently Disabling ☐ Fatal ☐

C. Significant and Substantial (See Reverse): Yes ☐ No ☒ — D. Number of Persons Affected: 1

11. Negligence (check one): A. None ☐ B. Low ☐ C. Moderate ☐ D. High ☐ E. Reckless Disregard ☐

12. Type of Action: — — , — —

13. Type of Issuance (check one): Citation ☐ Order ☐ Safeguard ☐

14. Initial Action: A. Citation ☐ B. Order ☐ C. Safeguard ☐ D. Written Notice ☐ — E. Citation/Order Number: — F. Dated: Mo Da Yr

15. Area or Equipment

16. Termination Due: A. Date: Mo 11 Da 20 Yr 85 — B. Time (24 Hr. Clock): 1130

Section III—Termination Action

17. Action to Terminate

18. Terminated: A. Date: Mo Da Yr — B. Time (24 Hr. Clock):

Section IV—Automated System Data

19. Type of Inspection (activity code): 001 — 20. Event Number: 108187 — 21. Primary or Mill: M

22. Signature: Charles A. Raisla — 23. AR Number: 935

MSHA Form 7000-3, Mar 85 (Revised)

LEHMAN 00844

Mine Citation/Order Continuation

U.S. Department of Labor
Mine Safety and Health Administration

1. Dated (original issue)	11 Mo. 13 Da. 85 Yr.	2. Citation/Order Number	2627514-
3. Subsequent Action ☒ Continuation ☐	4. Date 12 Mo. 20 Da. 85 Yr.	5. Time (24 hr. clock)	0840
6. Served To	[illegible]		
7. Operator	Mine	8. Mine ID	28-00959-11 (Contractor)

Justification For Action

THIS CITATION IS HEREBY EXTENDED TO ALLOW AN MSHA ELECTRICAL SPECIALIST TO INSPECT THE MILL ELECTRICAL SYSTEM ON JANUARY 7, 1986 AS PER MR. LEHMANS PHONE CONVERSATION WITH MR THOMPSON SUB DISTRICT MGR.

9. Extended To: ☒	9a. Date 01 Mo. 10 Da. 86 Yr.	9b. Time (24 hr. clock) 1600	10. Vacated ☐ Terminated ☐ Modified ☐
11. See Continuation Form ☐	12. Type of Inspection 003	13. Event Number 108177	
14. Signature [illegible]		AR Number 733	

MSHA Form 7000-3a., Apr 82 (revised)

LEHMAN 00845

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

December 10, 1987

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Mines Corporation
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on November 23-24, 1987. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Industrial hygiene samples, collected during this inspection, require laboratory analysis. You will receive a supplement to this inspection report upon completion of the analysis.

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	1	1	1			
Orders:						

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

William A. Conway
for

Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the third quarter of 1987 were 3,488. There were no reportable accidents. The incidence rate and severity measure were zero.

Safety was discussed with two employees. Topics were dust, noise, and electrical safety. The plant was in very good condition. The superintendent was very cooperative and safety conscious. This was a well handled operation.

A review of records indicated the operator was in compliance with Part 50 reporting requirements outlined in Part 50.10, .20 and .30.

Pending the results of dust samples being analyzed in our laboratory, a supplemental report will follow.

Mine Citation/Order

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Violation Data

1. Date	Mo	Da	Yr	2. Time (24 Hr. Clock)	3. Citation/Order Number
	11	23	87	1100	2629987

4. Served To: KEITH B. LEHMAN, MILL SUPT.
5. Operator: CYPRUS MINES CORPORATION
6. Mine: SOUTH PLAINFIELD MILL
7. Mine ID: 28-00959 (Contractor)

8. Condition or Practice — 8a. Written Notice (103g) ☐

COPIES OF TRAINING CERTIFICATES WERE NOT AVAILABLE FOR REVIEW. A BOOK OF MSHA FORMS 5000-23 WERE GIVEN TO THE INSTRUCTOR TO BE UPDATED.

See Continuation Form (MSHA Form 7000-3a) ☐

9. Violation: A. Health ☐ Safety ☐ Other ☒ — B. Section of Act: 103-d — C. Part/Section of Title 30 CFR: 56.48.29(a)(c)

Section II—Inspector's Evaluation

10. Gravity:
A. Injury or Illness (has) (is): No Likelihood ☐ Unlikely ☒ Reasonably Likely ☐ Highly Likely ☐ Occurred ☐
B. Injury or Illness could reasonably be expected to be: No Lost Workdays ☒ Lost Workdays or Restricted Duty ☐ Permanently Disabling ☐ Fatal ☐
C. Significant and Substantial (See Reverse): Yes ☐ No ☒ — D. Number of Persons Affected: 1

11. Negligence (check one): A. None ☐ B. Low ☒ C. Moderate ☐ D. High ☐ E. Reckless Disregard ☐

12. Type of Action: 104-(a)- , - -
13. Type of Issuance (check one): Citation ☒ Order ☐ Safeguard ☐

14. Initial Action: A. Citation ☐ B. Order ☐ C. Safeguard ☐ D. Written Notice ☐ — E. Citation/Order Number: — F. Dated: Mo Da Yr

15. Area or Equipment

16. Termination Due: A. Date: Mo 11 Da 24 Yr 87 — B. Time (24 Hr. Clock): 1600

Section III—Termination Action

17. Action to Terminate

THE FORMS WERE UPDATED AND MADE AVAILABLE FOR REVIEW.

18. Terminated: A. Date: Mo 11 Da 23 Yr 87 — B. Time (24 Hr. Clock): 1300

Section IV—Automated System Data

19. Type of Inspection (activity code): 001 — 20. Event Number: 183654 — 21. Primary or Mill: M

22. Signature: Charles J. Rawson — 23. AR Number: 935

MSHA Form 7000-3, Mar 85 (Revised)

Mine Citation/Order Continuation

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Subsequent Action/Continuation Data

1. Subsequent Action	1a. Continuation	2. Dated (Original Issue) Mo	Da	Yr	3. Citation/Order Number
X	☐	11	23	87	2629887-

4. Served To: KEITH B. LEHMAN, MILL SUPT.

5. Operator: CYPRUS MINES CORPORATION

6. Mine: SOUTH PLAINFIELD MILL

7. Mine ID: 28-00959- (Contractor)

Section II—Justification for Action

SECTION 1 - VIOLATION DATA, LINE 9. VIOLATION, BLOCK C.

PART/SECTION OF TITLE 30 CFR, IS HEREBY MODIFIED TO READ

48.29(A)(C).

See Continuation Form ☐

Section III—Subsequent Action Taken

8. Extended To	A. Date Mo	Da	Yr	B. Time (24 Hr. Clock)	C. Vacated ☐	D. Terminated ☐	E. Modified X

Section IV—Inspection Data

9. Type of Inspection	10. Event Number
001	183654

11. Signature	AR Number	12. Date Mo	Da	Yr	13. Time (24 Hr. Clock)
Charles Q. Rawls	933	11	23	87	1105

MSHA Form 7000-3a. Mar 85 (revised)

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

October 30, 1987

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Mines Corporation
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed supplemental report completes a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on July 20-22, 1987. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	1	1				
Orders:						

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Steve Mitchell (for)
Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

Personal Exposure Data Summary
Metal/Nonmetal

U.S. Department of Labor
Mine Safety and Health Administration

Delete [ ] Office Code 2841 Mine ID 28 - 00959 - [ ] Event Number 183715

AR Number 923 Date Month 10 Day 19 Year 87

Location Code	Job Code	Sample Type	Contaminant Code	Concentration	Exposure Limit	Short Term	Prot.	Action
83	879	03	541	4.39	3.30		Y	N

Name of Employee: Daniel Pineda — Occupation: Bagger — Contaminant: Talc

Name of Employee — Occupation — Contaminant

Name of Employee — Occupation — Contaminant

Name of Employee — Occupation — Contaminant

Name of Employee — Occupation — Contaminant

Name of Employee — Occupation — Contaminant

Name of Employee — Occupation — Contaminant

Name of Person Completing Form

resurvey will be conducted in the near future.

David Anspach

LEHMAN 00851

MSHA Form 4000-43, Dec 85 (Revised)

Copy 2 — Operator

U.S. Department of Labor

Mine Safety and Health Administration
4015 Wilson Boulevard
Arlington, VA 22203-1984

August 31, 1987

MSHA PROGRAM INFORMATION BULLETIN NO. 87-4C and 87-2M

SUBJECT: Reporting Occupational Illnesses to MSHA

The purpose of this Bulletin is to clarify operator compliance responsiblities for reporting occupational illnesses under the Federal Mine Safety and Health Act of 1977.

Title 30, Code of Federal Regulations, Part 50 requires mine operators to report occupational illnesses of miners. A miner is defined as "any individual working in a mine," and occupational illness is defined as "an illness or disease which may have resulted from work at a mine or for which an award of compensation is made." Illnesses that are reportable include noise-induced hearing loss, silicosis, coal worker's pneumoconiosis (black lung), poisoning by toxic materials, and cancer. Part 50 further requires that the operator mail a completed Form 7000-1 to the Mine Safety and Health Administration (MSHA) within 10 working days after a miner is diagnosed as having an occupational illness.

Industry reporting activity for occupational illness suggests there is operator uncertainty about the relationship between Part 50 reporting obligations and the information provided to the operator through Federal and State occupational illness compensation programs.

In order to ensure that data reported by mine operators reflects the incidence of occupational illnesses associated with the mining industry, the reporting requirements of Part 50 apply when compensation programs provide an operator notice that an individual has been awarded compensation for or is diagnosed as having an occupational illness resulting from employment in a mine, regardless of whether the individual is currently working as a miner. Thus, within 10 days of becoming aware of any such compensation award or diagnosis, the operator must report the occurrence by completing and mailing a Form 7000-1 to MSHA.

INQUIRIES: William H. Sutherland, Chief, Division of Health, Coal Mine Safety and Health, (703) 235-1358

Marvin W. Nichols, Jr., Chief, Division of Health, Metal and Nonmetal Mine Safety and Health (703) 235-8307

DISTRIBUTION: All Mine Operators, Coal and Metal and Nonmetal
Coal District Managers, Mine Safety and Health,
Metal and Nonmetal District Managers, Mine Safety and Health
Principal Officials, Headquarters
Superintendent, National Academy

Accordingly, effective 30 days after the issuance date of this Bulletin, MSHA will require that operators report occupational illnesses consistent with the Part 50 regulations and the clarification provided by this bulletin. MSHA's district and subdistrict offices will be pleased to provide additional guidance or assistance regarding the reporting of occupational illnesses and the proper completion of the Form 7000-1.

Roy L. Bernard
Administrator
for Metal and Nonmetal Mine Safety and Health

Jerry L. Spicer
Administrator
for Coal Mine Safety and Health

U.S. Department of Labor

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Metal/Nonmetal - Surface Fatalities First Half - 1985

U.S. Department of Labor
Mine Safety and Health Administration

ABSTRACTS WITH ILLUSTRATIONS

ANALYSIS AND SUGGESTED USES

LEHMAN 00855

INTRODUCTION

The 1985 Fatal Illustration Program is divided into four large categories or subject areas. These categories are underground coal mining; surface coal mining; underground metal/nonmetal mining; and surface metal/nonmetal mining. Fatalities in each category are grouped by accident type.

The materials in this unit include illustrated abstracts (summaries) of all chargeable surface metal/nonmetal mining fatalities for the first six months of 1985 accompanied by 35mm slides, and a statistical analysis of the accidents in that category.

The statistical analysis examines accident location, classification, and the number of supervisory and nonsupervisory fatalities. The analysis includes additional tables of supervisory and nonsupervisory fatalities by experience, supervisory fatalities by activity, and blasting, electrical, powered and nonpowered haulage fatalities by occupation. A final table lists fatalities by occupation and age. This program, through its abstracts, slides, and statistical analysis, is a dramatic and effective training tool for all involved in mining.

HOW COMPANIES USE THE FATAL ILLUSTRATION PROGRAM

Many mining companies use the Fatal Illustration Program to train supervisory and nonsupervisory personnel. The abstracts, slides, and statistics readily lend themselves to group safety training and special emphasis programs including, annual refresher training, new miner training, and task training.

Following are quotations from various mining companies that use this material in their safety training programs:

"Excellent! The slides show miners exactly what can happen to cause fatalities. Glad you made them available."
Pacific Clay Products, Inc.

"The material on past accidents is very helpful for annual refresher training."
Lone star Cement, Inc.

"Very relevant - we've shown these slides to new miners and have used them in safety meetings, too. The illustrations help employees relate accidents to their own operations and equipment."
Granite Mountain Quarries

"Educational and informative program - especially on mobile equipment."
Wedron Silica Co.

"Excellent training aid."
Lehigh Cement Co.

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

LOCATION OF ACCIDENT

Location	Fatalities
Open-Pit	11
Mill	9
Dredge	1

ACCIDENT CLASSIFICATION - SUPERVISORY FATALITIES

Accident Classification	Fatalities
Blasting	-
Electrical	-
Explosions and Fires	1
Fall of Highwall	-
Materials Handling	-
Powered Haulage	2
Nonpowered Haulage	-
Machinery	1
Slips and Falls of Persons	-
Other	-

ACCIDENT CLASSIFICATION - NONSUPERVISORY FATALITIES

Accident Classification	Fatalities
Blasting	-
Electrical	3
Explosions and Fires	-
Fall of Highwall	2
Materials Handling	3
Powered Haulage	7
Nonpowered Haulage	-
Machinery	-
Slips and Falls of Persons	1
Other (Handtools)	1
TOTAL FATALITIES - SUPERVISORY	4
TOTAL FATALITIES - NONSUPERVISORY	17

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

SUPERVISORY FATALITIES BY EXPERIENCE

Total Mining Experience (Years)	Total Experience This Mine (Years)	Total Experience This Job (Years)
25	1 month	n/a
20	4 months	4 months
15	2 days	2 days
10	10	10

NONSUPERVISORY FATALITIES BY EXPERIENCE

Total Mining Experience (Years)	Total Experience This Mine (Years)	Total Experience This Job (Years)
45	45	9 1/2
37	n/a	37
21	3	3
16	16	8
15	1 week	1 week
14	14	14
14	14	14
12	1	1
11	11	10 1/2
10	1 day	1 day
8	8	8
3	3	3
n/a	1	1
n/a	1	1
n/a	1	1
1 week	1 week	1 week
n/a	n/a	n/a

NOTE: n/a means information not available.

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

SUPERVISORY FATALITIES BY ACTIVITY

Activity	Performing Supervisory Duties When Fatality Occurred? (Yes or No)
Checking vibrating screen for leakage	No
Caught in explosion	No
Operating bulldozer	No
Operating front end loader	No

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

BLASTING FATALITIES BY OCCUPATION

Occupation	Fatalities
Blaster	-
Bulldozer/Mobile Equipment Operator	-
Dragline/Crane/Shovel Operator	-
Drill Operator	-
Electrician	-
Front End Loader Operator	-
Laborer	-
Mechanic/Maintenance	-
Supervisor/Foreman	-
Truck Driver	-
Welder/Machinist	-
Other	-

ELECTRICAL FATALITIES BY OCCUPATION

Occupation	Fatalities
Blaster	-
Bulldozer/Mobile Equipment Operator	-
Dragline/Crane/Shovel Operator	-
Drill Operator	-
Electrician	1
Front End Loader Operator	-
Laborer	1
Mechanic/Maintenance	1
Supervisor/Foreman	-
Truck Driver	-
Welder/Machinist	-
Other	-

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

POWERED HAULAGE FATALITIES BY OCCUPATION

Occupation	Fatalities
Blaster	-
Bulldozer/Mobile Equipment Operator	1
Dragline/Crane/Shovel Operator	-
Drill Operator	-
Electrician	-
Front End Loader Operator	1
Laborer	2
Mechanic/Maintenance	-
Supervisor/Foreman	2
Truck Driver	3
Welder/Machinist	-
Other	-

NONPOWERED HAULAGE FATALITIES BY OCCUPATION

Occupation	Fatalities
Blaster	-
Bulldozer/Mobile Equipment Operator	-
Dragline/Crane/Shovel Operator	-
Drill Operator	-
Electrician	-
Front End Loader Operator	-
Laborer	-
Mechanic/Maintenance	-
Supervisor/Foreman	-
Truck Driver	-
Welder/Machinist	-
Other	-

STATISTICAL ANALYSIS

Metal/Nonmetal - Surface Fatalities First Half - 1985

FATALITIES BY OCCUPATION AND AGE

Occupation	Fatalities	Age
Blaster	-	-
Bulldozer/Mobile Equipment Operator	1	65
Dragline/Crane/Shovel Operator	1	49
Drill Operator	-	-
Electrician	1	27
Front End Loader Operator	1	51
Laborer	3	64, 60, 19
Mechanic/Maintenance	1	37
Supervisor/Foreman	4	58, 53, 46, 38
Truck Driver	4	55, 52, 36, 34
Welder/Machinist	-	-
Other (Crusher Operator)	1	39
Other (Driller Helper)	1	26
Other (Ironworker)	1	43
Other (Plant Operator)	2	39, 20

SLIDE INDEX

Metal/Nonmetal - Surface - Fatalities First Half - 1985

ACCIDENT CLASSIFICATION	SLIDE NUMBER	FATAL CASE NUMBER
Powered Haulage	1	7
Powered Haulage	2	8
Powered Haulage	3	9
Powered Haulage	4	10
Powered Haulage	5	15
Powered Haulage	6	16
Powered Haulage	7	25
Powered Haulage	8	26
Powered Haulage	9	27
Electrical	10	22
Electrical	11	24
Electrical	12	28
Materials Handling	13	5 and 6
Materials Handling	14	23
Fall of Highwall	15	12
Fall of Highwall	16	20
Explosions and Fires	17	2
Machinery	18	17
Slips and Falls of Persons	19	3
Other (Handtools)	20	4

NOTE: Slide Numbers refer to the numerical sequence of fatalities that are grouped by specific Accident Classification.

Fatal Case Numbers are based on chronological order.

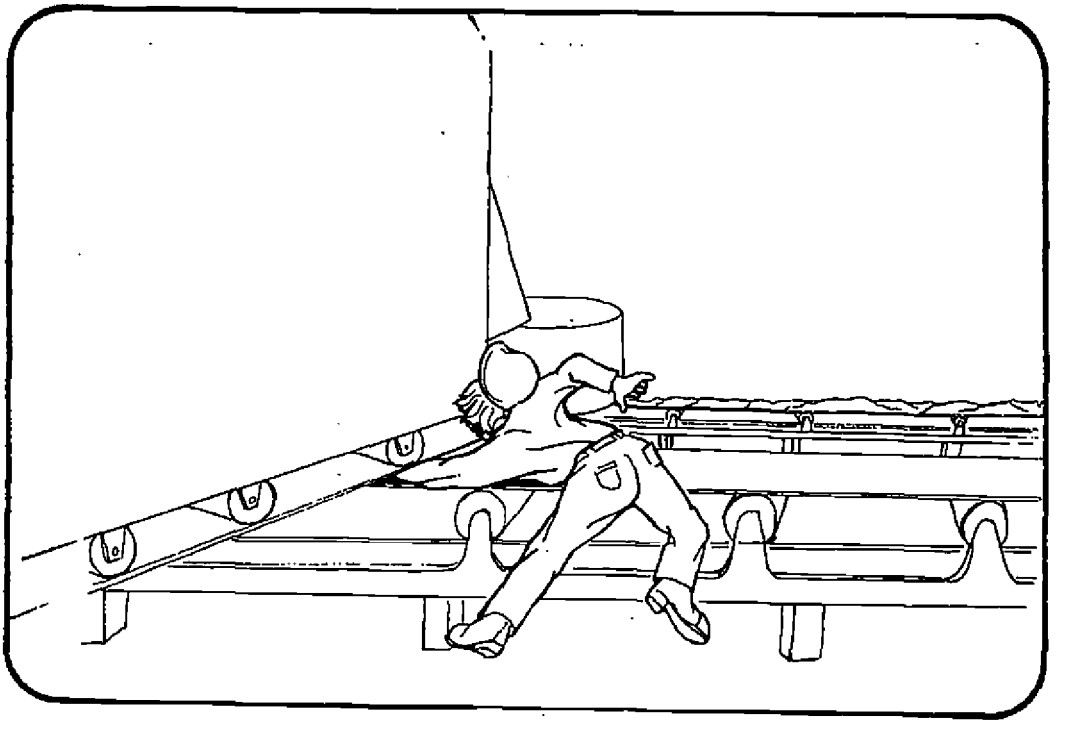
ABSTRACT OF INVESTIGATION

Date: February 19, 1985

Slide Number: 1 (Fatal Case Number: 7)
Accident Classification: Powered Haulage
Type of Mine: Crushed Stone - Surface
Location: New Mexico

Age of Victim: 58
Total Mining Experience: Not Available
Total Experience this Mine: 14 years
Total Experience this Job: 14 years
Number Employed at Mine: 12
Number Working at Time of Accident: 6
Time of Accident: 4:00 p.m.

A crushing plant foreman was fatally injured when he was caught between the top side of a belt conveyor and the steel frame members of a portable crushing/screening plant. The victim and another foreman were trying to locate the source of oversize rock that was entering the final product from the primary vibrating screen. The victim hand signaled the plant operator to start the final product conveyor to remove some crushed stone that was blocking his view. The plant operator walked to the control trailer and started the conveyor. When the conveyor started the victim became caught between the belt and steel framing.



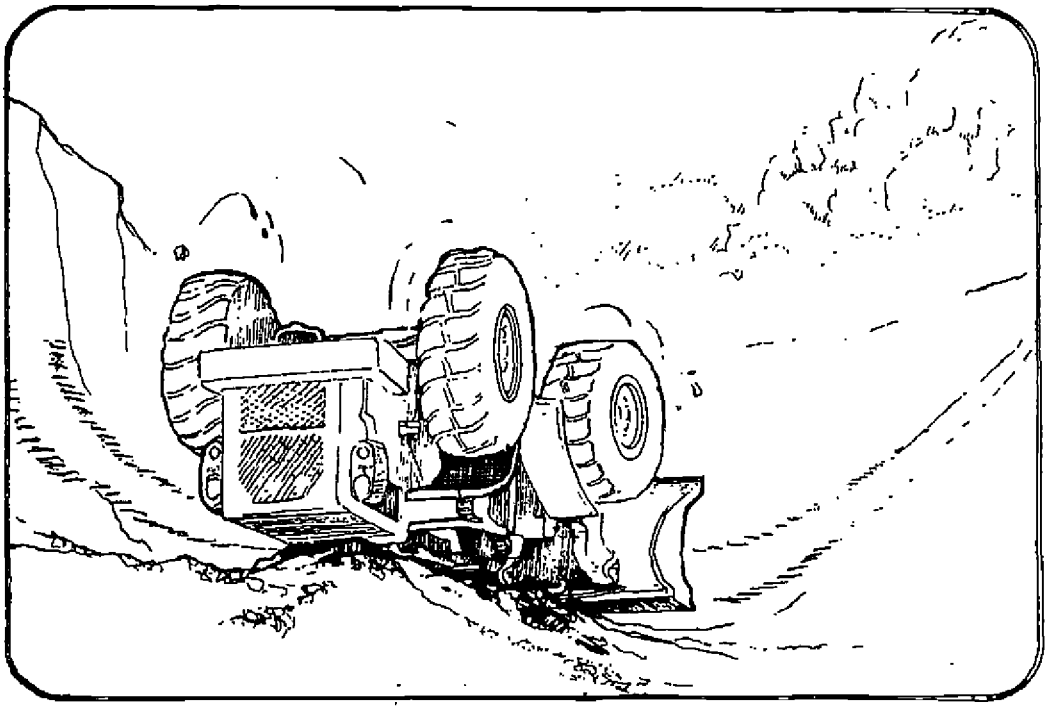
ABSTRACT OF INVESTIGATION

Date: February 21, 1985

Slide Number: 2 (Fatal Case Number: 8)
Accident Classification: Powered Haulage
Type of Mine: Sand & Gravel - Surface
Location: Idaho

Age of Victim: 65
Total Mining Experience: 15 years
Total Experience this Mine: 4 months
Total Experience this Job: 1 week
Number Employed at Mine: 6
Number Working at Time of Accident: 4
Time of Accident: 3:50 p.m.

A dozer operator was fatally injured when the front-end loader he was operating rolled over and pinned him beneath it. The loader was a 1964 model with a fiberglass cab and no rollover protective structure. The victim was feeding pit run material to the crusher. A witness saw the loader backing down the haul ramp at a fast rate of speed with the bucket elevated above the ground. After reaching the bottom of the 90-foot ramp it traveled another 88 feet to an embankment. The left side of the loader climbed the bank and the loader rolled over on its top. It was not determined why the victim could not maintain control of the loader.



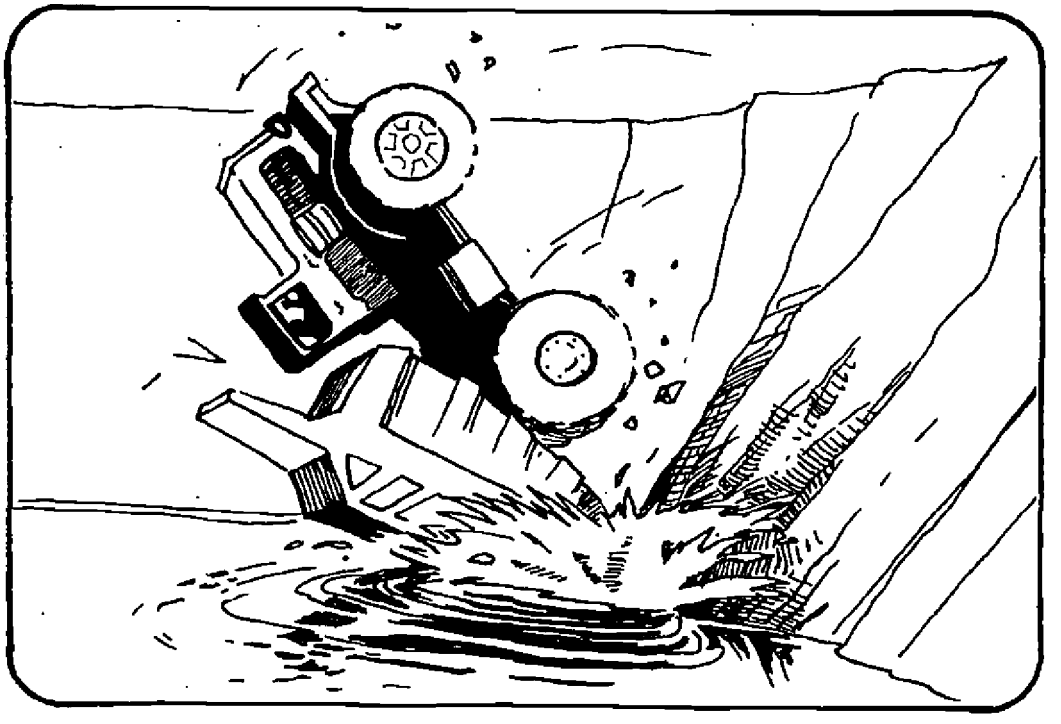
ABSTRACT OF INVESTIGATION

Date: February 24, 1985

Slide Number: 3 (Fatal Case Number: 9)
Accident Classification: Powered Haulage
Type of Mine: Cement Plant & Quarry - Surface
Location: Iowa

Age of Victim: 64
Total Mining Experience: 16 years
Total Experience this Mine: 16 years
Total Experience this Job: 8 years
Number Employed at Mine: 33
Number Working at Time of Accident: Not Available
Time of Accident: 3:00 p.m.

A plant dust truckdriver was fatally injured when he backed a haultruck over the edge of an old dump. The truck turned upside down and the victim was drowned when the cab became submerged in water. At the beginning of the shift the victim's supervisor reviewed with him a new procedure for dumping waste dust into the center of a dry pond. The victim was told that if he experienced any difficulty with the new dumping procedure he was to notify his foreman. He had not reported any problems during the shift; however, none of the 9 loads he had hauled were dumped at the assigned location. Use of the dump site where the accident occurred had been discontinued several months earlier for environmental reasons. This old dump was about 200 yards away from the dry pond where he had been told to dump. The primary cause of this accident was attributed to impairment of judgement and driving abilities due to the consumption of alcohol. An autopsy revealed that the victim had 0.2 percent blood alcohol content when he expired.



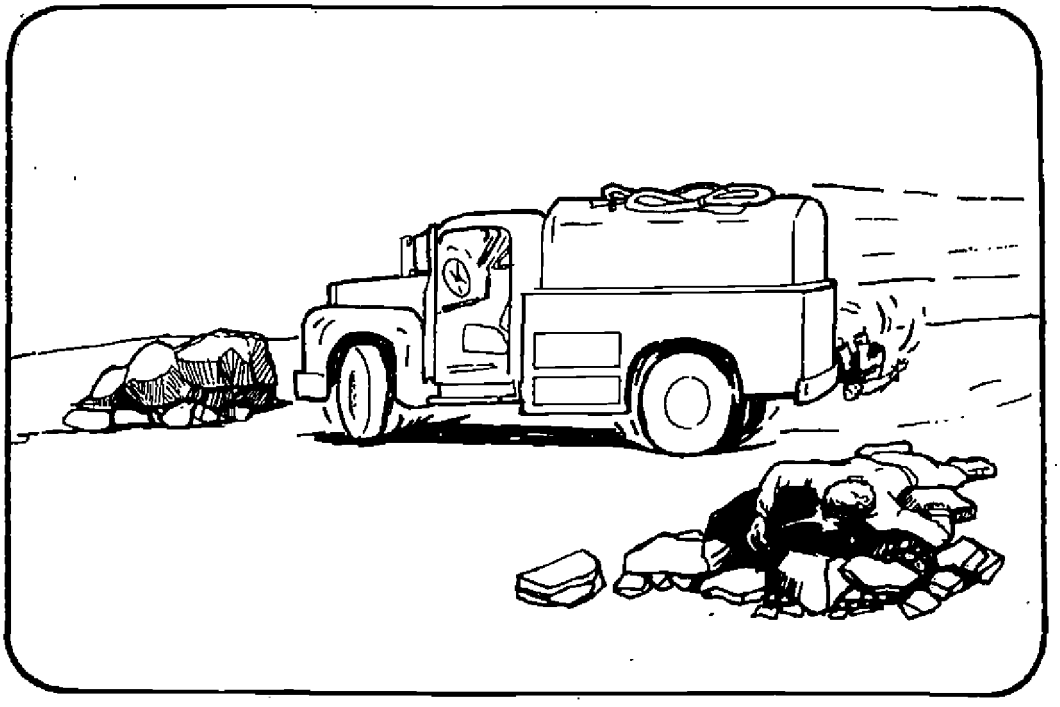
ABSTRACT OF INVESTIGATION

Date: February 24, 1985

Slide Number: 4 (Fatal Case Number: 10)
Accident Classification: Powered Haulage
Type of Mine: Feldspar - Surface
Location: North Carolina

Age of Victim: 55
Total Mining Experience: 5 years
Total Experience this Mine: 2 years
Total Experience this Job: 2 years
Number Employed at Mine: 5
Number Working at Time of Accident: 2
Time of Accident: 12:05 p.m.

A truckdriver was fatally injured when he jumped from the fuel truck he was operating. He was attempting to change gears and was unable to engage the transmission into low range before reaching a steep decline. As the truck gained speed the victim and a passenger in the truck decided to jump. When the victim hit the roadway he rolled into a small rock berm and struck his head. The passenger was not seriously injured. The truck continued along the roadway for approximately 300 feet and struck a large boulder used for a berm along the elevated side of the roadway. After striking the berm, the truck flipped around and turned over on the passenger side with the front of the truck facing uphill. Although the front wheels and axle were completely torn off, the cab was only slightly damaged.



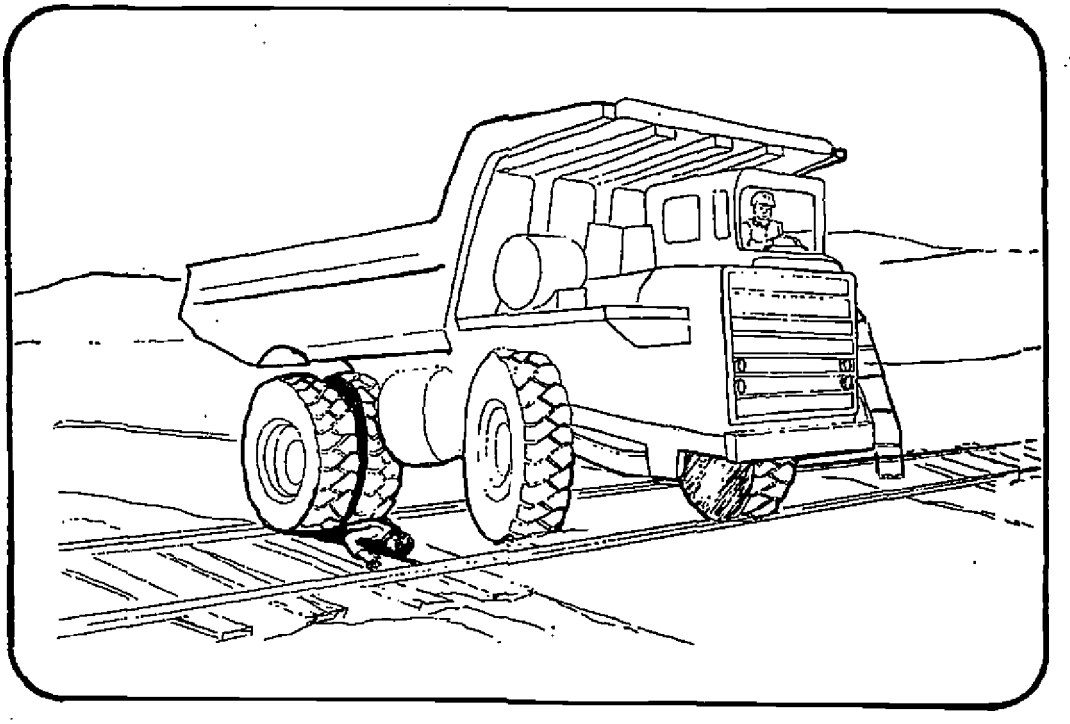
ABSTRACT OF INVESTIGATION

Date: April 4, 1985

Slide Number: 5 (Fatal Case Number: 15)
Accident Classification: Powered Haulage
Type of Mine: Crushed Stone - Surface
Location: South Carolina

Age of Victim: 60
Total Mining Experience: 38 years
Total Experience this Mine: 38 years
Total Experience this Job: 38 years
Number Employed at Mine: 52
Number Working at Time of Accident: 48
Time of Accident: 7:10 a.m.

A loadout person was fatally injured when he was run over by a haultruck. The accident occurred on a roadway located at the loadout area which at times had heavy traffic congestion. The victim had worked in the loadout area for his entire tenure at this operation. The victim had left the loadout control house to unlock the door of the testing laboratory. He was walking directly toward the testing lab to the right of a 50-ton haultruck. As the truck pulled out from its parked position it made an arcing right turn toward a stockpile area. The victim fell between the front wheels and tried to roll out from under the truck but was run over by the inside right rear wheel. The driver of the truck never saw the victim as the victim remained within the driver's blind area throughout the distance traveled.



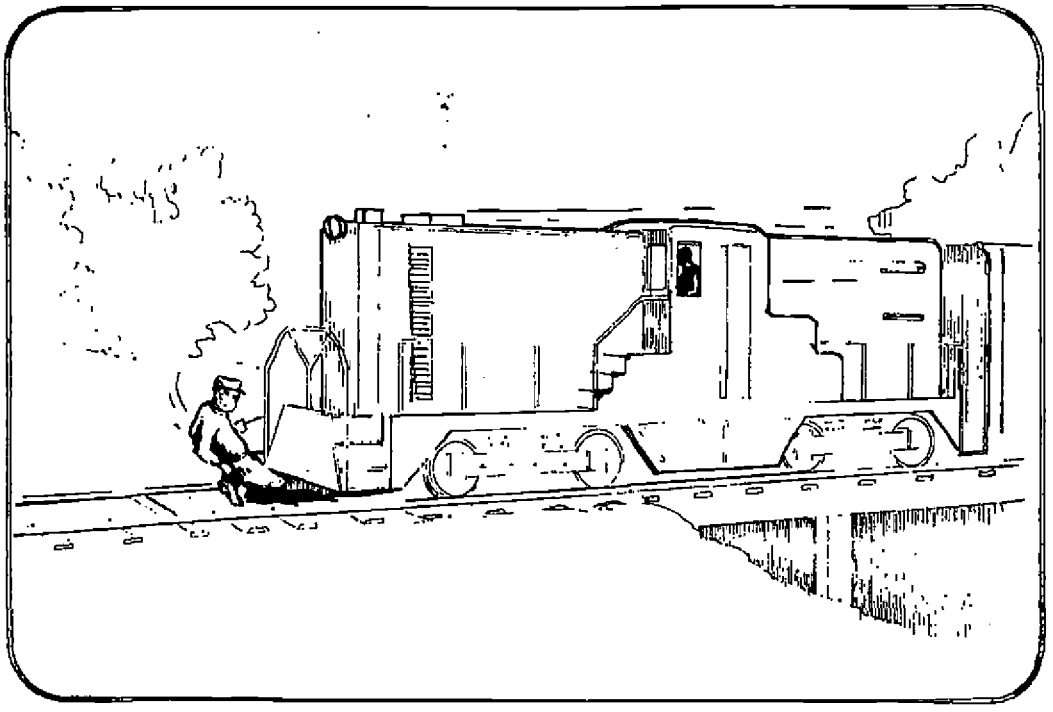
ABSTRACT OF INVESTIGATION

Date: April 11, 1985

Slide Number: 6 (Fatal Case Number: 16)
Accident Classification: Powered Haulage
Type of Mine: Crushed Marble - Surface
Location: Alabama

Age of Victim: 64
Total Mining Experience: 45 years
Total Experience this Mine: 45 years
Total Experience this Job: 9 1/2 years
Number Employed at Mine: 165
Number Working at Time of Accident: Not Available
Time of Accident: 7:30 a.m.

A mill operator was fatally injured when he was run over by a company-owned locomotive that was moving railcars in the plant yard. The area where the accident occurred was an open, level yard between two of the product plants. The train was moving slowly through the open yard pulling four railcars from one track to another. It appeared as though the victim simply walked into the path of the oncoming train while talking into or listening to his walkie-talkie and did not see or hear the train. The right front corner of the locomotive struck the victim and he fell across the tracks.



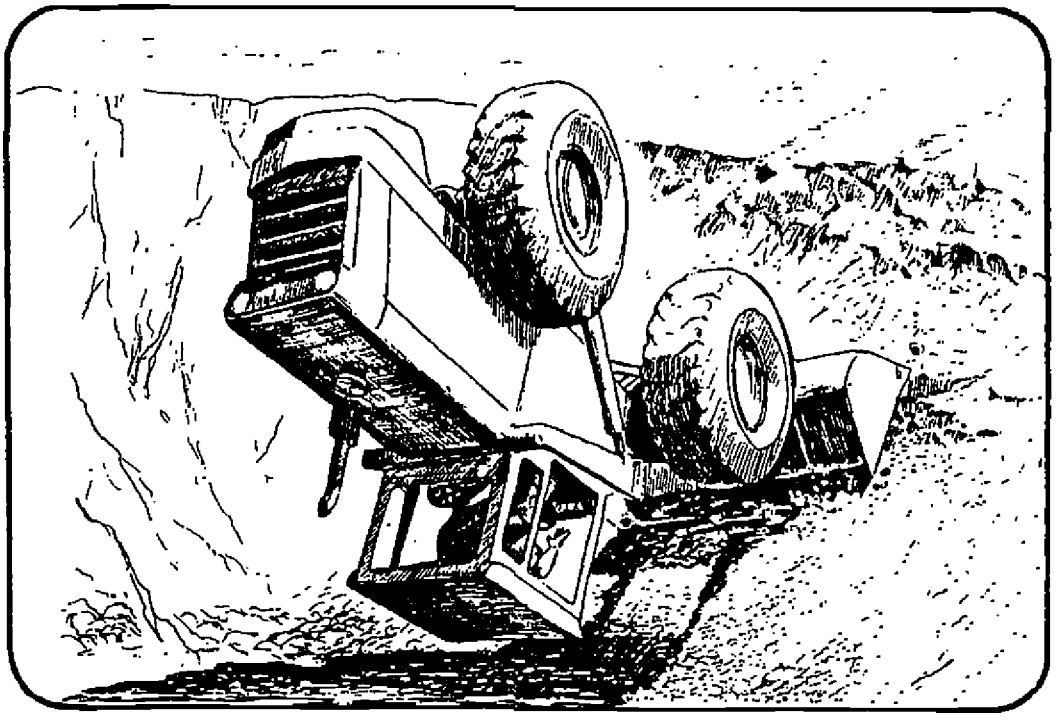
ABSTRACT OF INVESTIGATION

Date: May 20, 1985

Slide Number: 7 (Fatal Case Number: 25)
Accident Classification: Powered Haulage
Type of Mine: Mica - Surface
Location: South Dakota

Age of Victim: 38
Total Mining Experience: 15 years
Total Experience this Mine: 2 days
Total Experience this Job: 2 days
Number Employed at Mine: 2
Number Working at Time of Accident: 2
Time of Accident: 11:00 a.m.

A loader operator was fatally injured when the front-end loader he was operating went over the edge of a 12-foot bank. The loader was being used to push loose material over the bank to the pit floor below. As the loader was approaching the edge it appeared as though the bucket struck a solid object and deflected upward. The loader lurched forward over the edge and slipped over on its roof. The victim was crushed in the cab. The loader did not have a rollover protective structure and the braking system was defective.



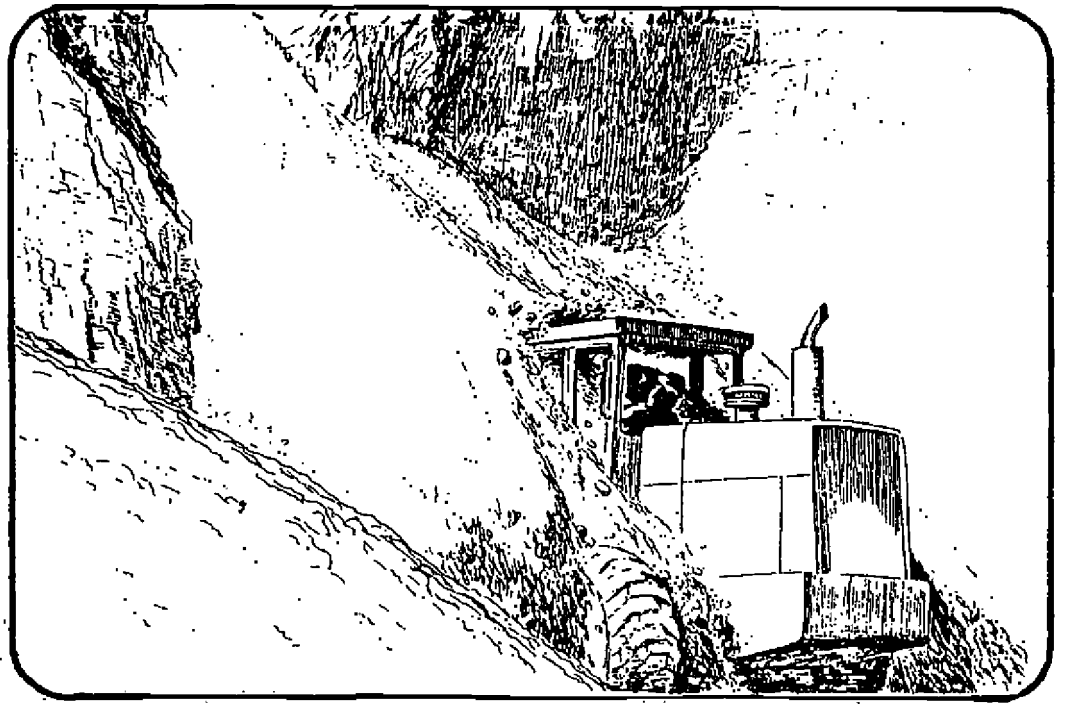
ABSTRACT OF INVESTIGATION

Date: June 24, 1985

Slide Number: 8 (Fatal Case Number: 26)
Accident Classification: Powered Haulage
Type of Mine: Sand & Gravel - Surface
Location: Colorado

Age of Victim: 51
Total Mining Experience: 14 years
Total Experience this Mine: 14 years
Total Experience this Job: 14 years
Number Employed at Mine: 1
Number Working at Time of Accident: 1
Time of Accident: 2:45 p.m.

An equipment operator was fatally injured when material sloughed off a highwall face and engulfed him in the cab of a front-end loader. The front-end loader was used by the victim to dig the highwall face to a point where a pocket had developed in the 40 to 50 foot highwall. The loader was effectively surrounded on three sides by dangerous overhanging banks when the accident occurred. The sand and gravel material inundated the loader, broke through the windshield and almost completely filled the cab. The victim had been assigned to work alone in the pit and was not discovered until it was time for him to be picked up near the end of this shift. The accident was discovered at 2:45 p.m.; however, due to continued unstable ground conditions he was not removed from the loader until 8:00 p.m.



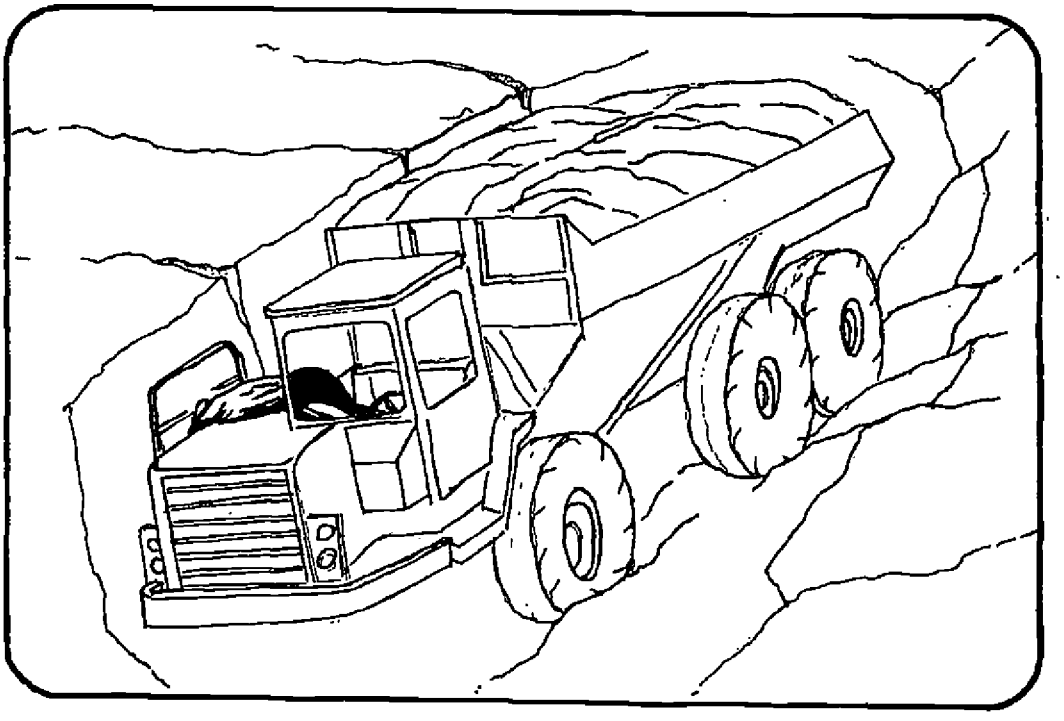
ABSTRACT OF INVESTIGATION

Date: June 22, 1985

Slide Number: 9 (Fatal Case Number: 27)
Accident Classification: Powered Haulage
Type of Mine: Limestone - Surface
Location: California

Age of Victim: 52
Total Mining Experience: 28 years
Total Experience this Mine: 28 years
Total Experience this Job: Not Available
Number Employed at Mine: 15
Number Working at Time of Accident: Not Available
Time of Accident: 12:30 p.m.

A truckdriver was fatally injured after loosing control of the truck he was driving. He was traveling from the quarry to the crusher when the truck suddenly veered to the left and climbed an embankment. The truck then veered to the right and went off the road. It came to rest in a ditch about 1600 feet from where it left the roadway. The victim was not wearing his seat belt and was violently thrown about the interior of the cab. After the truck stopped he was found lying on the platform just outside the cab. The truck was found to be in good mechanical condition.



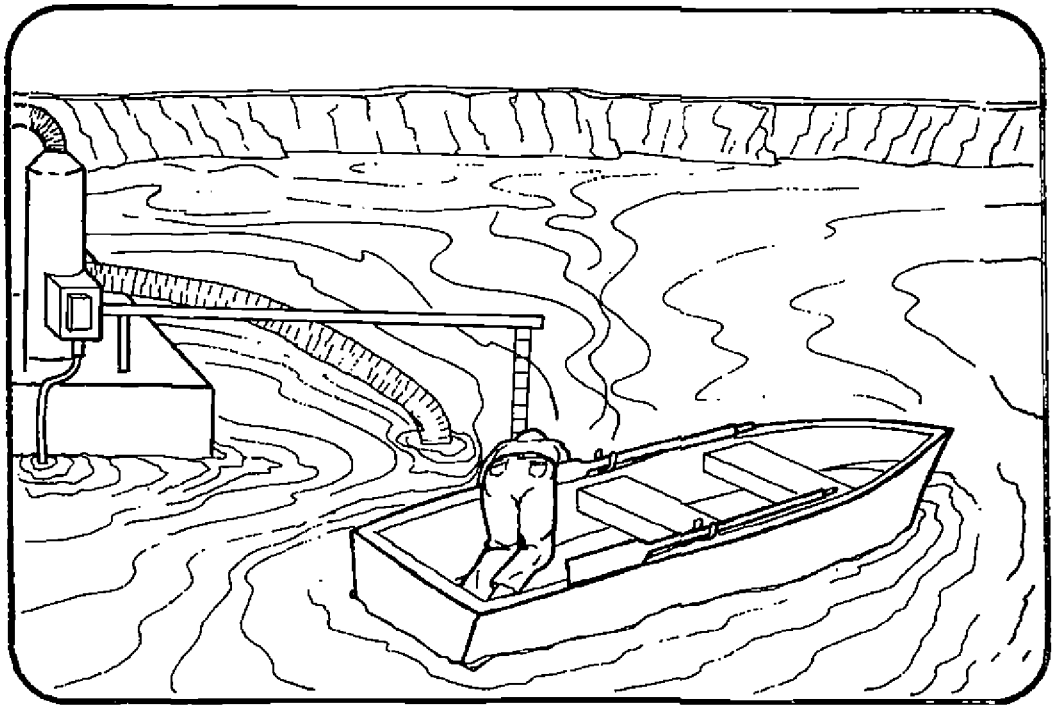
ABSTRACT OF INVESTIGATION

Date: April 29, 1985

Slide Number: 10 (Fatal Case Number: 22)
Accident Classification: Electrical
Type of Mine: Sand & Gravel - Surface Dredge
Location: Ohio

Age of Victim: 37
Total Mining Experience: 14 years
Total Experience this Mine: 14 years
Total Experience this Job: 14 years
Number Employed at Mine: 3
Number Working at Time of Accident: 2
Time of Accident: 3:30 p.m.

A mechanic was fatally injured when an electrical fault occurred in a junction box. The victim was standing in an aluminum boat adjacent to a pontoon support water pump attempting to get the pump primped and running. He was holding the foot valve closed with a metal welding rod while another worker was priming the pump with water. When the pump motor was energized a phase-to-ground fault occurred in the electrical junction box located on shore. Fault current flowed through an aluminum anchor cable from the metal support on which the junction box was mounted to the intake pipe of the water pump. The victim was in direct contact with the water pump and received an electrical shock of approximately 220-volts. He slumped down in the boat and his upper body draped over the edge into the water. His co-worker jumped into the water to render aid and also received a severe electrical shock but managed to make it to shore.



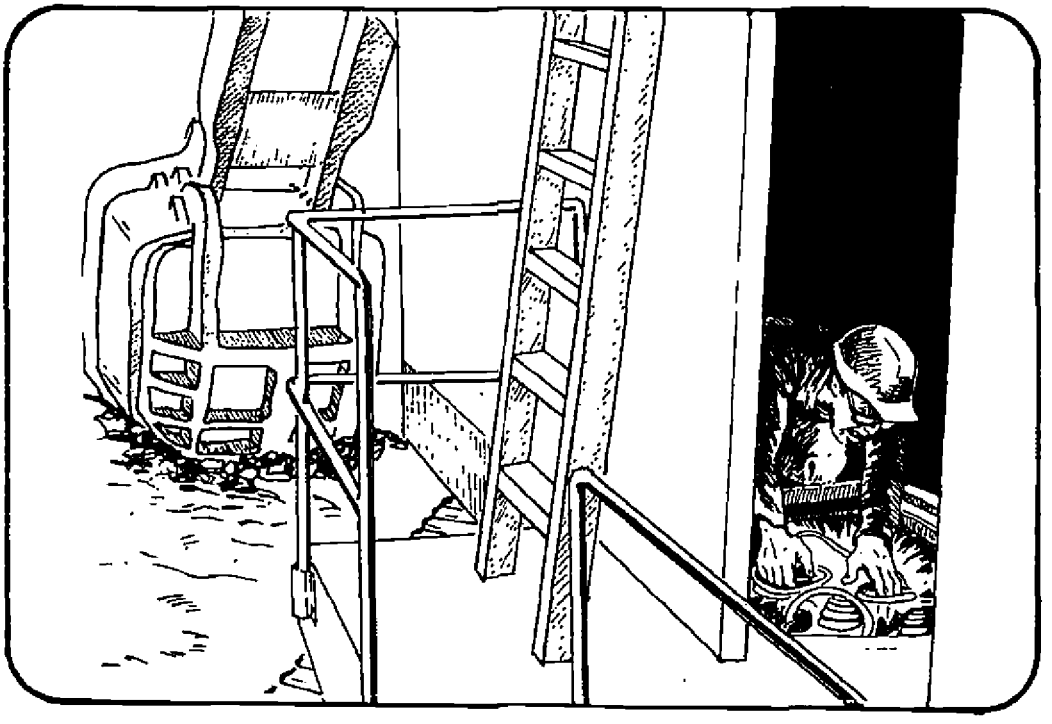
ABSTRACT OF INVESTIGATION

Date: May 24, 1985

Slide Number: 11 (Fatal Case Number: 24)
Accident Classification: Electrical
Type of Mine: Uranium - Surface
Location: Wyoming

Age of Victim: 27
Total Mining Experience: 8 years
Total Experience this Mine: 8 years
Total Experience this Job: 8 years
Number Employed at Mine: 181
Number Working at Time of Accident: 60
Time of Accident: 8:50 p.m.

An electrician was fatally injured when he contacted an energized 4160-volt bushing while troubleshooting an electric malfunction in a power shovel. The victim was attempting to check the 480-volt ac contacts located inside an oil switch container. He apparently lost his balance while kneeling and leaning forward to test the terminals. His right hand contacted the 4160-volt bushing and his left hand contacted the load bushing which allowed current to flow across his body. He received about 2400-volts ac phase-to-load which proved fatal. The ground fault interrupter failed to trip due to the fact that the victim was kneeling on top of an insulated cover plate while working on the circuit.



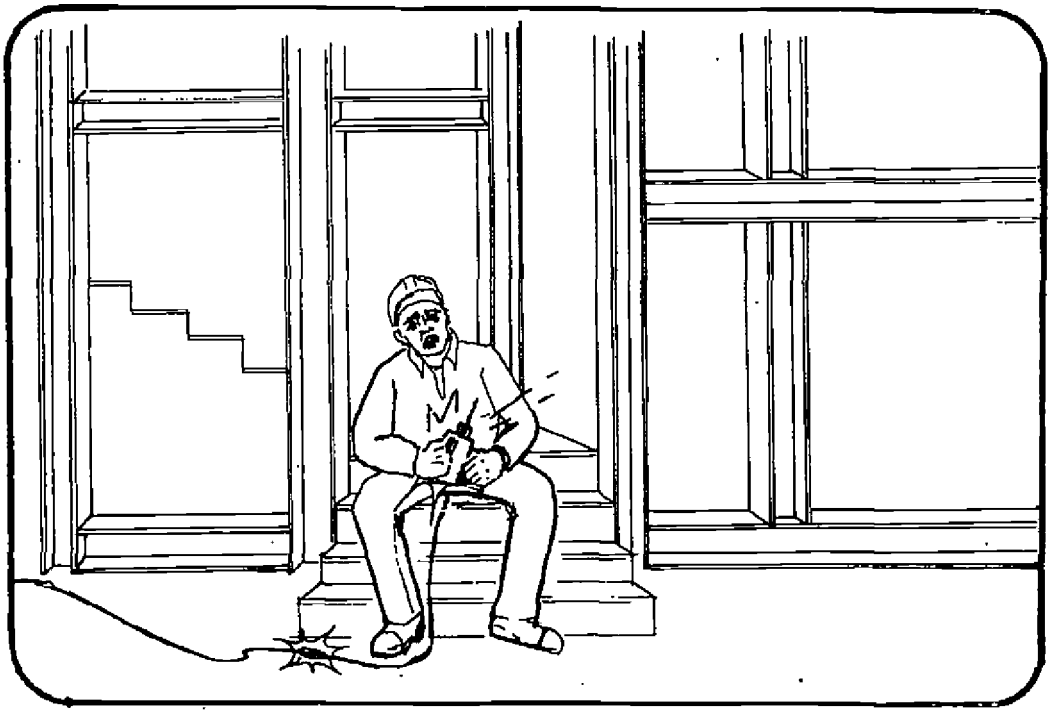
ABSTRACT OF INVESTIGATION

Date: June 6, 1985

Slide Number: 12 (Fatal Case Number: 28)
Accident Classification: Electrical
Type of Mine: Cement Plant - Surface (Contractor)
Location: Alabama

Age of Victim: 19
Total Mining Experience: 1 week
Total Experience this Mine: 1 week
Total Experience this Job: 1 week
Number Employed at Mine: 18
Number Working at Time of Accident: 2
Time of Accident: 2:20 p.m.

A laborer was fatally injured when he contacted the energized chuck of a hand-held drill. The building where the accident occurred was under construction and was not yet provided with electricity. A 150-foot extension cable, reportedly made at the job-site, was used to provide electricity to the hand-held drill. The ground circuit in the extension cable was disconnected in three places and a phase-to-ground fault was found approximately 45 feet from the end of the cable. The ground circuit in the cable was continuous from the fault to the drill. The victim was sitting on a set of metal steps which were grounded to earth through the metal structure of the building. When the victim contacted the drill chuck, fault current passed through his hand and body to the grounded metal steps.



ABSTRACT OF INVESTIGATION

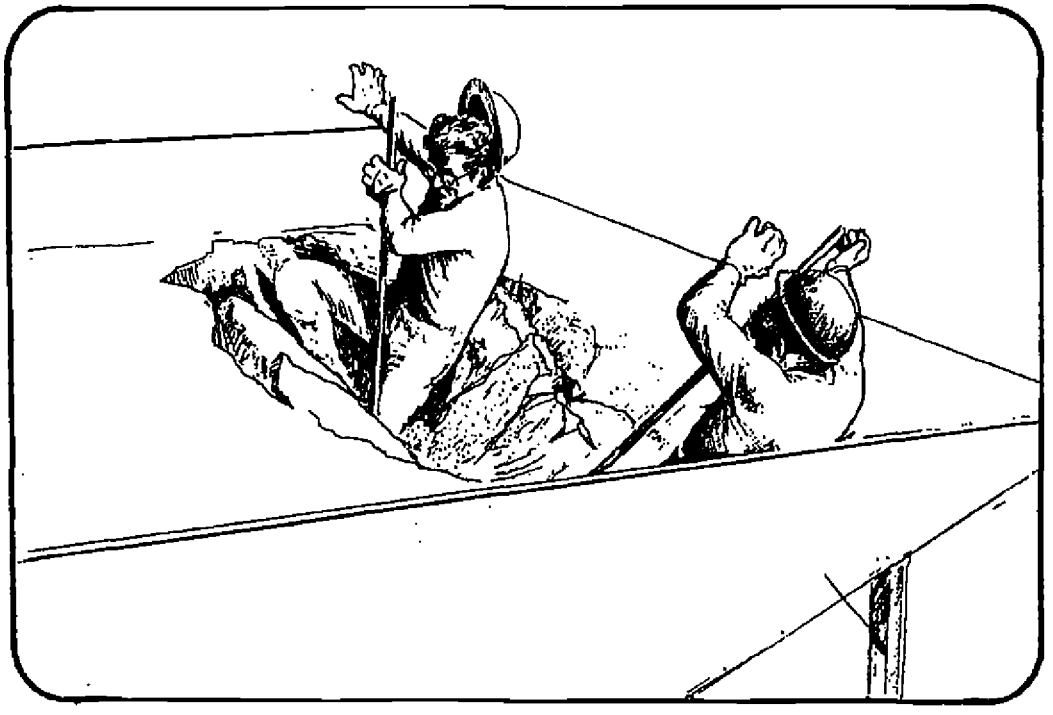
Date: February 15, 1985

Slide Number: 13 (Fatal Case Number: 5 and 6)
Accident Classification: Handling Material
Type of Mine: Limestone - Surface
Location: Ohio

	Victim (1):	Victim (2):
Age of Victim	36	39
Total Mining Experience	12 years	Unknown
Total Experience this Mine	1 year, 4 mos.	1 year, 4 mos.
Total Experience this Job	1 year, 4 mos.	1 year, 4 mos.

Number Employed at Mine: 13
Number Working at Time of Accident: 5
Time of Accident: 1:30 p.m.

Two men, one a 36 year old truckdriver and the other a 39 year old crusher operator, were fatally injured when they entered a limestone storage bin from the top to dislodge a hang-up of bridged stone. Snow and freezing temperatures were causing material flow problems at the truck loadout bins. The minus 1-inch material was hanging up above the loadout chute. One of the two victims was warned that the material was undermined and not to enter the bin from the top. The warning went unheeded and without being noticed the victims entered the bin with a steel bar to try to get material flowing again. A truckdriver, while loading his truck, noticed a hard hat liner drop through the chute. He and another employee went to the top of the bin and saw that the bridged material had broken free. They went back down below the bin and observed a hand protruding out of the material in the loadout chute. During recovery operations it was discovered that two men had been engulfed when the material caved in.



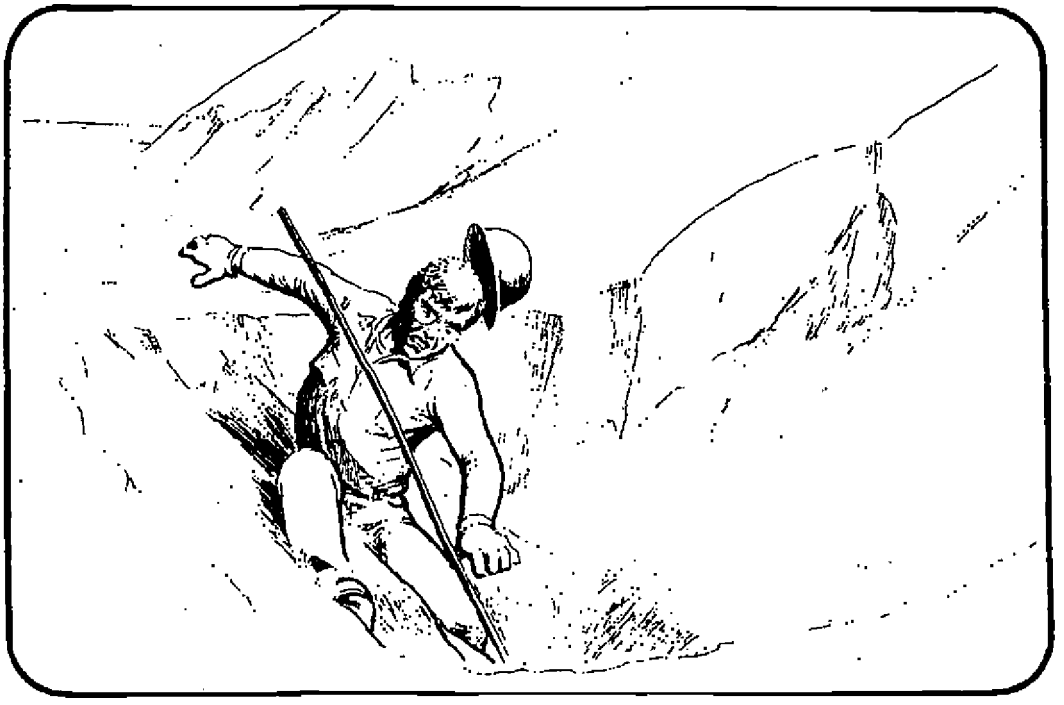
ABSTRACT OF INVESTIGATION

Date: May 15, 1985

Slide Number: 14 (Fatal Case Number: 23)
Accident Classification: Falling/Sliding Material
Type of Mine: Sand & Gravel - Surface
Location: Wisconsin

Age of Victim: 39
Total Mining Experience: 21 years
Total Experience this Mine: 3 years
Total Experience this Job: 3 years
Number Employed at Mine: 2
Number Working at Time of Accident: 2
Time of Accident: 9:15 a.m.

A plant operator was fatally injured when the sides of a surgepile drawhole sloughed in and buried him with material. The accident occurred at the drawpoint (grizzly level) of the surgepile which was about 18 feet below the top of the drawhole. Large stones had collected on the grizzly which prevented material from passing through at a normal flow rate. The victim had been instructed to push material into the drawhole with a front-end loader until he reached the grizzly level and then clean off the stones; however, he felt this would take too long. Contrary to instructions, he decided to slide down into the drawhole to remove the stones. He was wearing a safety belt and lifeline, but when the sides sloughed in on him he was covered with 10 to 12 feet of material and could not be pulled free.



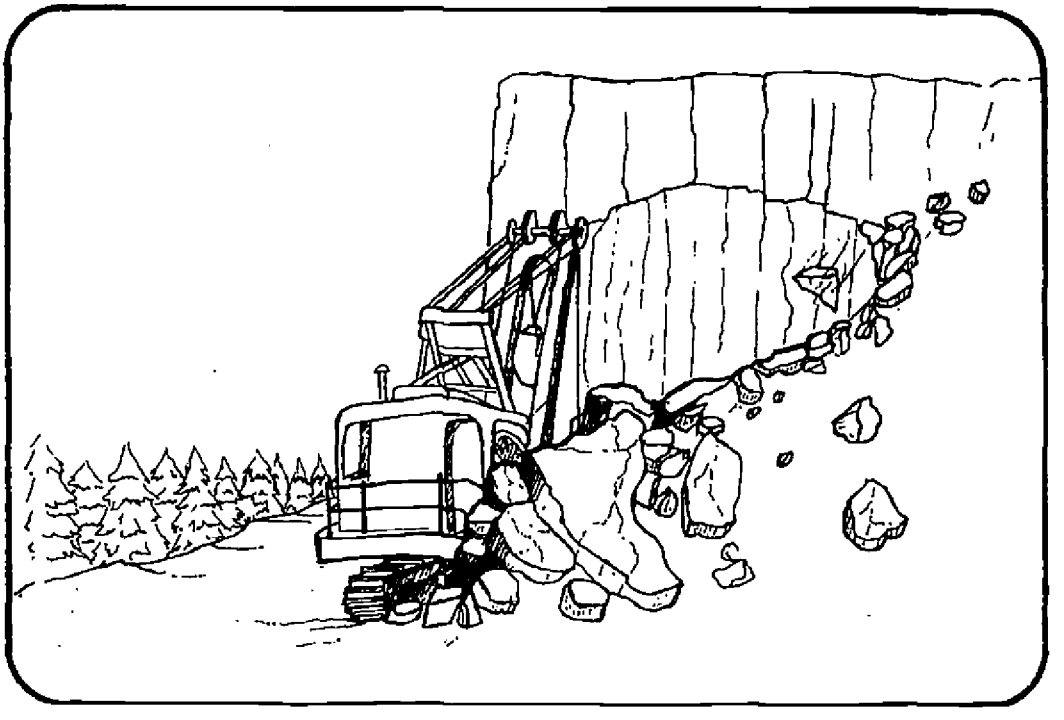
ABSTRACT OF INVESTIGATION

Date: March 25, 1985

Slide Number: 15 (Fatal Case Number: 12)
Accident Classification: Fall of Highwall
Type of Mine: Crushed Stone - Surface
Location: Florida

Age of Victim: 49
Total Mining Experience: 11 years
Total Experience this Mine: 11 years
Total Experience this Job: 10 1/2 years
Number Employed at Mine: 221
Number Working at Time of Accident: Not Available
Time of Accident: 9:05 a.m.

A shovel operator was fatally injured when a highwall adjacent to where he was working collapsed. A section of pit wall about 60 feet high, 50 feet long and 3 to 4 feet thick fell onto the shovel and crushed the operator's cab. The victim was loading a truck near a corner of the pit when he stopped digging and moved the shovel backward about 20 feet. The wall that collapsed was on his right side and the shovel was about 40 feet out from the toe. The highwall was not benched and heavy rainfall had occurred several days prior to the accident.



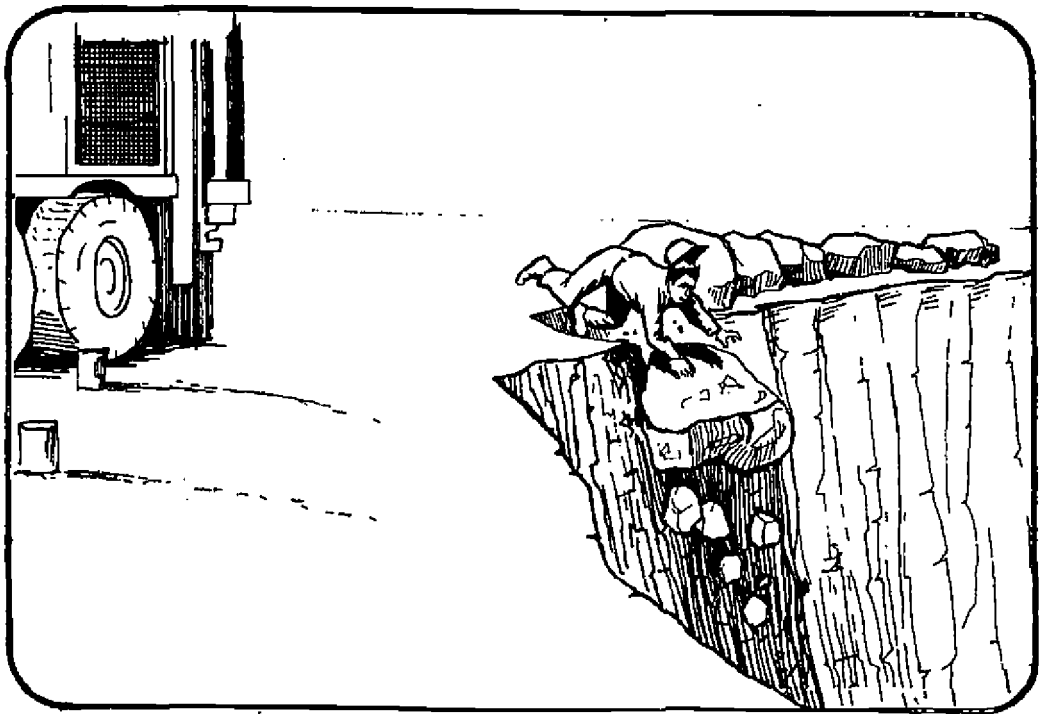
ABSTRACT OF INVESTIGATION

Date: April 25, 1985

Slide Number: 16 (Fatal Case Number: 20)
Accident Classification: Fall of Highwall
Type of Mine: Crushed Stone - Surface
Location: Maryland

Age of Victim: 26
Total Mining Experience: 3 years
Total Experience this Mine: Not Available
Total Experience this Job: 3 years
Number Employed at Mine: 25
Number Working at Time of Accident: 25
Time of Accident: 4:15 p.m.

A driller helper was fatally injured when a section of highwall failed and he fell 72 feet to the bench below. The victim was an employee of an independent drilling contractor and had worked at this mine on prior occasions. The drill rig was set up near the rim of a 72-foot highwall and the drill crew was starting to drill their 9th hole. When the hole was about 10 feet deep the victim walked over to a boulder on the highwall rim to see if any material was falling away from beneath the drill rig. As he was leaning on the boulder a section of the rim about 9 feet long by 5 feet deep gave way and both he and the boulder fell to the bench below. The top 15 feet of the highwall was highly fractured and there was a parallel tension crack about 5 feet back from the rim.



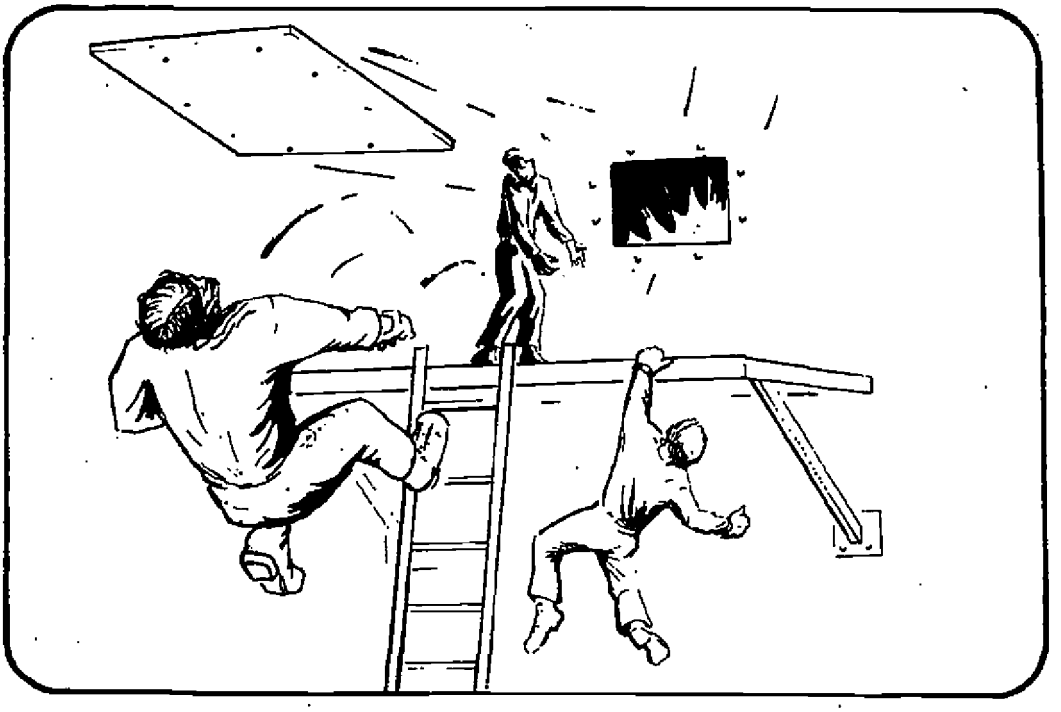
ABSTRACT OF INVESTIGATION

Date: January 23, 1985

Slide Number: 17 (Fatal Case Number: 2)
Accident Classification: Ignition/Explosion of Gas/Dust
Type of Mine: Cement Plant - Surface
Location: New York

Age of Victim: 53
Total Mining Experience: 21 years
Total Experience this Mine: 21 years
Total Experience this Job: 10 years
Number Employed at Mine: 389
Number Working at Time of Accident: 240
Time of Accident: 10:30 a.m.

A maintenance supervisor was fatally injured when he was thrown from a work platform as a result of an explosion in a coal pulverizer bowl mill. On the day of the accident it had been decided to conduct a routine bowl mill shutdown due to abnormalities reported by the previous shift. The victim and two other men were on a work platform removing nuts from an inspection door on the mill. Seven of eight nuts were removed when one of the workmen pried the door with a screwdriver to break the seal. An explosion occurred and two of the three men were blown off the work platform to the floor 10 feet below. The victim sustained brain contusions and died following surgery five days later. In pulverized fuel systems, experience has shown that explosions are most likely to occur during start-up or shutdown operations and during interruptions or lack of control of raw fuel supplies.



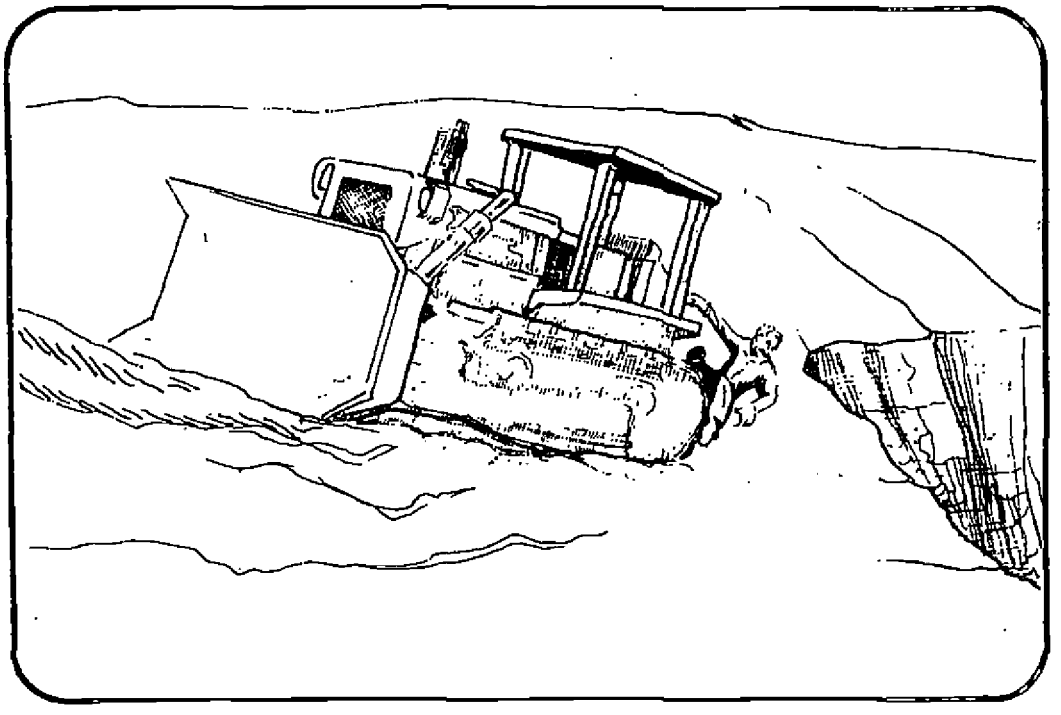
ABSTRACT OF INVESTIGATION

Date: April 18, 1985

Slide Number: 18 (Fatal Case Number: 17)
Accident Classification: Machinery
Type of Mine: Limestone - Surface (Contractor)
Location: Missouri

Age of Victim: 46
Total Mining Experience: Not Available
Total Experience this Mine: 7 weeks
Total Experience this Job: 7 weeks
Number Employed at Mine: 9
Number Working at Time of Accident: 15 (6 contractors)
Time of Accident: 12:45 p.m.

A bulldozer operator was fatally injured when he attempted to jump from the bulldozer he was operating. He had completed pushing material up a 2:1 slope when the dozer started to freewheel backwards. He dropped the dozer blade to the ground but was still unable to control the dozer's descent or direction of travel. Since the dozer was approaching a 90 foot vertical drop-off into the quarry he attempted to jump clear. He apparently slipped while making his exit and landed on the left track. The motion of the track threw him behind the dozer. The dozer came to a stop about 8 feet from the edge of the vertical drop-off with the rear of the left track pinning him to the ground.



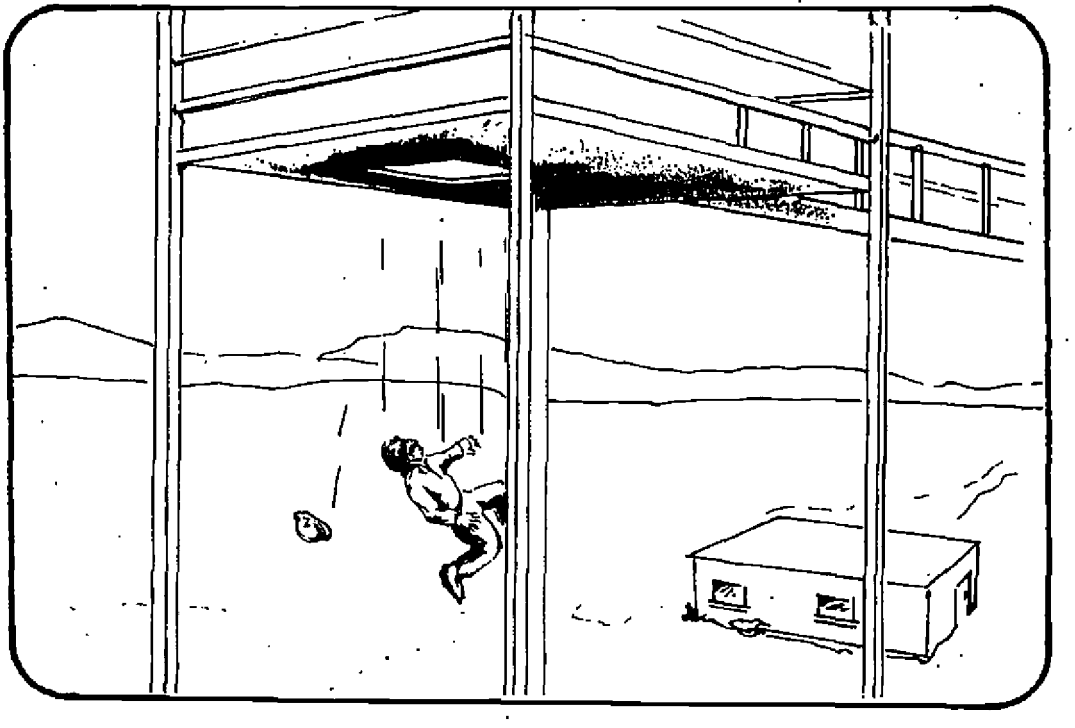
ABSTRACT OF INVESTIGATION

Date: January 28, 1985

Slide Number: 19 (Fatal Case Number: 3)
Accident Classification: Slip or Fall of Person
Type of Mine: Limestone Plant - Surface (Contractor)
Location: Ohio

Age of Victim: 43
Total Mining Experience: 10 years
Total Experience this Mine: 2 1/2 years
Total Experience this Job: 1 day
Number Employed at Mine: 140
Number Working at Time of Accident: 2
Time of Accident: 2:05 p.m.

An ironworker was fatally injured when he fell from an elevated work platform to a metal floor 30 feet below. The project involved the removal of abandoned metal exhaust tubing in a multi-level building at a limestone plant. The victim and his supervisor/co-worker were working from an elevated work platform through which the old exhaust tubing extended. After an eight foot long section of tubing was removed, a 4 by 4 foot hole was left in the floor of the platform. While the supervisor was lowering the tube section to the floor the victim, for an unknown reason, moved toward the hole and fell through. The victim had been assigned to monitor the area below the platform while the tubing was being lowered. This assignment did not require him to be in the vicinity of the platform hole.



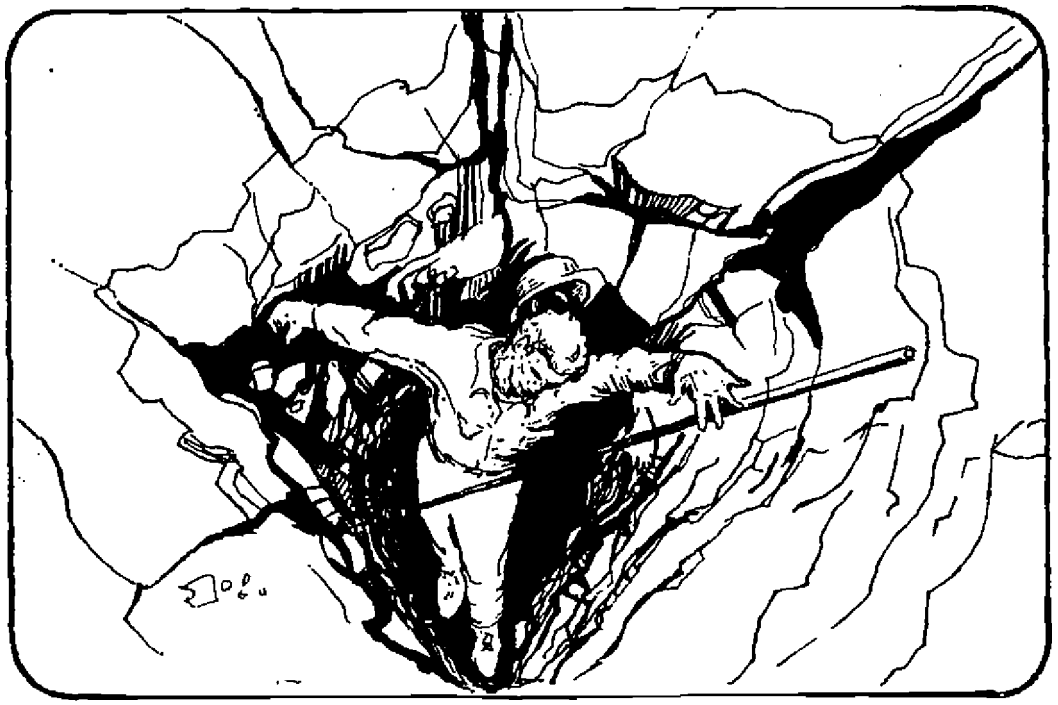
ABSTRACT OF INVESTIGATION

Date: January 31, 1985

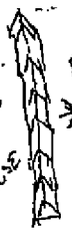
Slide Number: 20 (Fatal Case Number: 4)
Accident Classification: Handtools
Type of Mine: Sand & Gravel - Surface
Location: California

Age of Victim: 20
Total Mining Experience: Unknown
Total Experience this Mine: 1 year
Total Experience this Job: 1 year
Number Employed at Mine: 9
Number Working at Time of Accident: 8
Time of Accident: 4:30 p.m.

A front-end loader operator was fatally injured when he was drawn down into a feeder chute located under a surgepile. Material was gravity fed through a chute onto a belt feeder located in a tunnel beneath a sand surgepile. The damp sand had bridged over the chute and stopped flowing onto the feeder. The victim was standing on the surgepile using a piece of rebar in an effort to break the material loose. Two other employees were in the surge tunnel also trying to get material flowing. No one saw the victim disappear into the drawhole, but when material started flowing again the two men returned to their normal duties. When the feed slowed again one man went back into the surge tunnel and discovered the victim in the feeder chute.



10 FIBERS
200 FIBERS
WOOD CELLULOSE



Returns → 100% grab samples

3 ↗

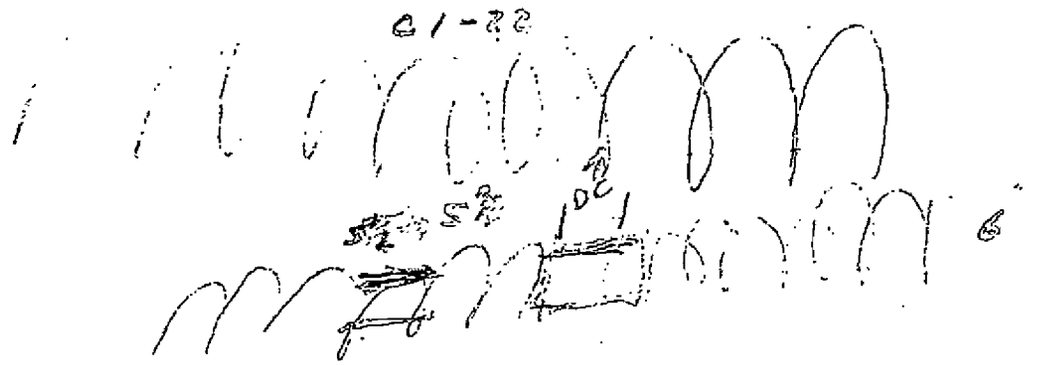
ordered 4/11/86
Bonar Bill Hogins

45" with 36" Duffle 8oz. white
Lift loops standings
DOC. pocket
Bottom 8oz. white velcro closures (stitch around)
B1 - B22
Cim 4 SIDES 4"
2000# MAX PRODUCT LSA 1 SIDE 2" or 3"

DOC. pocket
Bag # 4 Handling inst. same side of bag

20 Dart
13 EF
20

94" HIGH tie of sprint
60+ 34" sprint
C1-22



FRI

TRANSAC, INC.
7951 Industrial Highway
P.O. Box 10196
Macon, Georgia 31297
(912) 784-9040
1-800-841-4982
FAX 912-788-3920

December 15, 1987

Cyprus Industrial Mineral
615 Metuchen Road
S. Plainfield, N J 07080

Dear Purchasing

On December 14, 1987 Bowater Industries plc of London, England acquired the assets and business of Bonar Industries Inc., Macon, Georgia from Bonar Inc. of Canada.

Our new name is Transac Inc. The business will operate in the same location with all management and employees remaining in place. We will continue to offer our customers a wide range of Flexible Intermediate Bulk Containers including the patented *Mulox* design.

The future looks bright and exciting. By working closely with the European group we intend to introduce new ideas and concepts to the American market. It is our goal to make Transac Inc. the largest producer of Flexible Intermediate Bulk Containers in North America.

We look forward to your continued support.

Sincerely,

William R Hodgins

W.R. Hodgins
Sales Manager

LEHMAN 00887

INVOICE TRANMITTAL

APPROVED FOR PAYMENT BY

DATE

CONT.	MAIN	[illegible]	SEC	SP ANAL.	COST CENTER	SPEC CODES	AMOUNT
329							

13,986.38

300

13986.38

25

2

2

2

10/1/86

Approved - Unsecured

Mary Ricardo Bills

BOFAM INC. T/A

RENT-RITE

RENTAL CONTRACT No.

R 125667

☐ 571 ROUTE 27
ISELIN, N.J. 08830
(201) 283-2200

☑ STELTON ROAD AND
WASHINGTON AVENUE
PISCATAWAY, N.J. 08854
(201) 752-6400

CUST. P.O. NO. AND/OR JOB NO.

Rented To: Cyprus Ind Minerals

SHIP TO:
Or Place where equipment will be used

Street

City, State & Zip

Phone No.

Phone No.

CUSTOMER ACCT. NO. 03890

MONTHLY

INVOICE

TIME IN

OUT

DRIVER'S LICENSE NO. STATE

OTHER IDENTIFICATION

EMPLOYED BY

ALL REMITTANCES TO:
P.O. BOX 4158
DUNELLEN, N.J. 08812
(201) 752-9344

PRECEDES

TOTAL

AUTO LICENSE NO.

CONTRACTOR
COMMERCIAL ☐ OR HOMEOWNER ☑

DATE & TIME DUE IN

☐ OUR DELIVERY ☑ CUSTOMER P. U.

TERMS	CHGE	C.O.O.	CASH	PAY UPON RETURN	ORDERED BY
	✓				

CODE	QTY.	DESCRIPTION	MIN.	HR.	DAY	WEEK	MONTH	EST. RENT
	1	2" Elec Sub Pump. Stk # 24-1321			293			
	1	2" Discharge Hose						

CODE	MERCHANDISE AND SUPPLIES	UNIT	PRICE	QTY. OUT	CHARGE	QTY. IN	REFUND

CHARGES		ADDITIONAL
Rent		
Del 23C		
PU 23D		
Cleaning 23E		
Tool Steel 23F		
Damage Waiver 23G		
Merchandise 23A		
Fuel 23B		
TOTAL		
Tax		
TOTAL		
DEPOSIT		
REFUND		

I have read and I agree to the contract terms on the back of this writing, which constitutes our entire agreement. There are no oral or other representations not included herein. I acknowledge receipt of a copy of this contract.

Signature of Lessee

DAMAGE WAIVER: By his initials hereon or by separate written confirmation in consideration of an additional charge of 7% of the gross rental charges, Lessor agrees to waive certain claims for damage to rental item(s), as specified on the back of this contract.

Accepts _____ Initial Declines _____ Initial

PICK UP — RETURN RECEIPT

We Charge For Time Out NOT Time Used Including Weekends and Holidays. Return Items Promptly To Avoid Late Charges. All Balances Over 60 Days Subject to 1½% Per Month Charge.

BOFAM INC. T/A

RENT-RITE

RENTAL CONTRACT No.

R 125667

☐ 571 ROUTE 27
ISELIN, N.J. 08830
(201) 283-2200

☑ STELTON ROAD AND
WASHINGTON AVENUE
PISCATAWAY, N.J. 08854
(201) 752-6400

CUST. P.O. NO. AND/OR JOB NO.

Rented To: Cyprus Ind Minerals

SHIP TO:
Or Place where equipment will be used

Street

City, State & Zip

Phone No.

Phone No.

CUSTOMER ACCT. NO. 03890

DRIVER'S LICENSE NO. STATE

OTHER IDENTIFICATION EMPLOYED BY

AUTO LICENSE NO. CONTRACTOR COMMERCIAL ☑ OR HOMEOWNER ☑

ALL REMITTANCES TO:
P.O. BOX 4168
DUNELLEN, N.J. 08812
(201) 752-9344

MONTHLY: INVOICE / PRECEDES

TIME: IN / OUT / TOTAL

DATE & TIME DUE IN

☐ OUR DELIVERY ☑ CUSTOMER P. U.

TERMS	CHGE.	C.O.D.	CASH	PAY UPON RETURN	ORDERED BY
	✓				

CODE	QTY.	DESCRIPTION	MIN.	HR.	DAY	WEEK	MONTH	EST. RENT
	1	2" LLC Sub Pump			29.50			
		Stk# 24-1321						
	1	2" Discharge Hose						

CHARGES			ADDITIONAL
Rent			
Del	23C		
PU	23D		
Cleaning	23E		
Tool Steel	23F		
Damage Waiver	23G		
Merchandise	23A		
Fuel	23B		
TOTAL			
Tax			
TOTAL			
DEPOSIT			
REFUND			

CODE	MERCHANDISE AND SUPPLIES	UNIT	PRICE	QTY. OUT	CHARGE	QTY. IN	REFUND

I have read and I agree to the contract terms on the back of this writing, which constitutes our entire agreement. There are no oral or other representations not included herein. I acknowledge receipt of a copy of this contract.

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Signature of Lessee

Accepts _____ Initial Declines _____ Initial

PICK UP –
RETURN RECEIPT

We Charge For Time Out NOT Time Used Including Weekends and Holidays. Return Items Promptly To Avoid Late Charges. All Balances Over 60 Days Subject to 1½% Per Month Charge.

United Parcel Service

Date OCTOBER 13, 1988

Dear Customer:

Enclosed is our check for $ 150 . 00, which represents the balance in your account.

Consolidated Payment Amount (received 06/12/87)	$	150 .00
Less:	$	0 .
Net Amount:	$	150 .00

If you have any questions, please call us.

Very truly yours,

#081296

UNITED PARCEL SERVICE

District Controller

CYPRUS INDUSTRIAL MINERALS CO.
651 METUCHEN ROAD
SOUTH PLAINFIELD, NJ 07080

U7254 (15.2M 1-86)

O. A. NEWTON AND SON COMPANY, P.O. BOX 397 BRIDGEVILLE, DELAWARE 19933 (302) 337-8211

DATE	REFERENCE #	INVOICE AMT.	DISCOUNT/DEDUCT.	NET AMOUNT
9/26/86	7059	61.52		61.52

CREDIT BALANCE

VEND. #	CK. #			
19852	1114	TOTALS 61.52		61.52

REMITTANCE STATEMENT - PLEASE DETACH BEFORE DEPOSITING

National Brand 45-604 Eye-Ease® 45-704 20/20 Buff Made in USA

		1	2	3	4
1	ABSOLUTE	1 26984460	9275		
2	ACETYLENE	1 26616774	9275	010 0080	010 0069
3	AIM	1 28499381	"		
4	ALLEN & B.	1 27898877			
5	AM. OPT.	1 26620229			
6	AM. STD				
7	AMOCO	1 26451110		010 080	
8	ARA	1 28191655			
9	ARGO	1 26582275			
10	ARRANT				
11	ATLANTIC	1 26619863			
12	AUTOMATED	1 26616588		010 0069	
13	BELL LEASING	1 28169144		095 0069	
14	BLACHER				
15	BROWNELL				
16	BRY-RITE	1 26670777			
17					
18	CARLIN	1 28530162			
19	C-E	1 26778944			
20	CENTRAL JERSEY	1 26616666		095 0072	
21	CENTURY	1 28499907			
22	CONCUX	1 26849957			
23	COUNTY	1 27015877			
24	CUTLER				
25					
26	DANFORD	1 29045277			
27	DAY	1 08226744			
28	DODGE	1 26671777			
29					
30					
31	FAITOUTE	1 28795258			
32	FLEXICO				
33	FOLEY	127 074571			
34	FRASSE				
35	FROMM	1 27077469			
36	FULLER	1 26779205			
37	GAUZE	1 26932144			
38	GARDEN	1 26671355			
39	G+G	1 26615276			
40	GENERAL	1 26819611			
	G. A. MATHESON	1 26785044			

National Band 45-604 Eye-Ease® 45-704 20/20 Buff Made in USA

		1	2	3	4
1	GRAPHIC	1 2695862			
2					
3	HADLEY	1 2901179			
4					
5	INDUSTRIAL	1 2660791			
6	K-PRODUCTS	1 0988920		010 0024	
7	KADESH				
8	KNAPP	1 2374930			
9	LINK BROS.	1 2942090			
10	LORICON	1 2770319			
11					
12	MCARTHUR	1 2937108	LUBE	010 0081	
13	MICHAELS	1 2673982			
14	MILLER KNAPP	1 2696928			
15					
16	NJ BELL	1 2699163			
17	NORTHERN	1 2902078			
18	NUODEX				
19	PARKWAY	1 2788208	309-9480	116-665	SAMPLE COST
20	PSEYE	1 2682472	ELECT.	010 0067	010 0068
21	PEN BOY	1 2691416			
22	PETRO				
23	PIONEER	1 2808150			
24	PREMIER				
25					
26	RARITAN	1 2695896		010 0080	
27	ROBBINS	1 2697249			
28	RELIABLE (Houston)	1 28 387 85	336 3539	300 0002	34288015
29	SATELLITE	1 2677381		010 0036	
30	SOL ZEMEL	1 2681953			
31	SOMERSET	1 2677373			
32	STD TUBE	1 2743928			
33	SOS	1 2680294		010 0036	010 0024
34	STAR LUMBER	1 2701595			
35	STARR	1 2804969			
36	STD REG.	1 1980935			
37	SQUIRE	1 2846648			
38					
39	THUL	1 2830014			
40					
	UPS	1 2677407		095 0088	

National Brand 45-604 Eye-Ease®
45-704 20/20 Buff
Made in USA

	1	2	3	4
VALLEY DIST.	124 012 78			
VAIL	1267739			
VIBRATEC				
VIKING	1267547			
VWR				
WEB				
WEBER	1266823			
WILLIAMS	1241980			

FOLEY
FOLEY TOWLIFT INC.

STATEMENT

CATERPILLAR

833 CENTENNIAL AVE., PISCATAWAY, NJ 08855
PISCATAWAY: (201) 885-1300 SADDLE BROOK (201) 546-7070

FOR PARTS: (201) 885-3100
FOR SERVICE: (201) 885-3130

PLEASE REMIT TO: P.O. BOX 17092, NEWARK, N.J. 07194

CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SO PLAINFIELD NJ 07080

CUSTOMER NUMBER	DATE
245700	09 29 88

INVOICE DATE MO.	DAY	YR.	INVOICE NUMBER	REFERENCE	CHARGES	CREDITS	BALANCE
PLEASE REMIT PAYMENT TO P.O. BOX 17092. NEWARK. NJ 07194							(FTL)
07	18	88	R62301		566.30		566.30
07	18	88	R62302		376.30		942.60
07	26	88	R62303		84.80		1027.40
				**	RENTALS	SUBTOTAL **	1027.40

PLEASE REMIT TO: P.O. BOX 17092, NEWARK, N.J. 07194

PAY THIS AMOUNT → 1027.40

MONTHLY AGING OF UNPAID INVOICES

CURRENT	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	5 MONTHS	6/OVER MONTHS
		1027.40				

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

AUG 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	50.0	ON-PEAK	9.140000			457.00
		INTERMED				
	14.0	OFF-PEAK	1.030000			14.42
					SUB-TOTAL	471.42
		ON-PEAK 2800	.087570			245.20
		INTERMED				
		OFF-PEAK 2000	.058480			116.96
		ENERGY ADJUSTMENT				-97.44
					SUB-TOTAL	736.14
		SERVICE CHARGE				389.00

TOT KWH 4800 TOTAL $1,125.14

KW CONSTANT 200.000

95-3191

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

SEP 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	12.0 ON-PEAK		9.140000			109.68
	INTERMED					
	10.0 OFF-PEAK		1.030000			10.30
					SUB-TOTAL	119.98
	ON-PEAK	1200	.087570			105.08
	INTERMED					
	OFF-PEAK	600	.058480			35.09
	ENERGY ADJUSTMENT					-36.54
					SUB-TOTAL	223.61
	SERVICE CHARGE					389.00

TOT KWH 1800 TOTAL $612.61

KW CONSTANT 200.000

95-3391

FOLEY
FOLEY TOWLIFT INC.

833 CENTENNIAL AVE., PISCATAWAY, NJ 08855
PISCATAWAY: (201) 885-1300 SADDLE BROOK (201) 546-7070

STATEMENT

CATERPILLAR

FOR PARTS: (201) 885-3100
FOR SERVICE: (201) 885-3130

PLEASE REMIT TO: P.O. BOX 17092, NEWARK, N.J. 07194

CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SO PLAINFIELD NJ 07080

CUSTOMER NUMBER	DATE
245700	08 30 88

INVOICE DATE MO	DAY	YR	INVOICE NUMBER	REFERENCE	CHARGES	CREDITS	BALANCE
PLEASE			REMIT PAYMENT	TO P.O. BOX 17092. NEWARK. NJ 07194			(FTL)
07	16	88	R62301		565.30		566.30
07	18	88	R62302		376.30		942.60
07	26	88	R62303		84.80		1027.40
				**	RENTALS	SUBTOTAL **	1027.40

PLEASE REMIT TO: P.O. BOX 17092, NEWARK, N.J. 07194

PAY THIS AMOUNT → 1027.40

MONTHLY AGING OF UNPAID INVOICES

CURRENT	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	5 MONTHS	6/OVER MONTHS
	1027.40					

STATEMENT

ACETYLENE SUPPLY COMPANY

WOODBRIDGE, N.J. (201) 634-7500 BRONX, N.Y. (212) 325-7690

PLEASE REMIT TO: P. O. BOX 417, WOODBRIDGE, NJ 07095

CYPRUS INDUST. MINERALS
METUCHEN & HAMICH ROAD
SOUTH PLAINFIELD, N. J.
07080

PLEASE DETACH THIS STUB AT PERFORATION AND ENCLOSE WITH YOUR REMITTANCE.

ACCOUNT NO.	DATE	TERMS	PAGE
111600	08/31/88	NET	1

INVOICE NO.	DATE	CHARGES	CREDITS	REFERENCE	BALANCE
131449	07/07/88	45.72	45.72		.00
133425	08/05/88	8.00			8.00
512938R	06/30/88	21.20	21.20		8.00
513094R	07/31/88	21.20			29.20

30 DAYS	60 DAYS	90 DAYS	CURRENT	NET DUE
.00	.00	21.20	8.00	29.20

THANK YOU FOR YOUR PAYMENT - PAYMENT RECEIVED AFTER MONTH END WILL APPEAR ON NEXT STATEMENT.

ACCOUNT NO.	DATE
111600	08/31/88

INVOICE NO.	AMOUNT
133425	8.00
513094R	21.20
NET DUE	29.20

PLEASE PAY THIS AMOUNT

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 75
Effective 6/1/87

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Mill Expense-Paga-Cont'd	9274							
Equipment-Repair Parts			36				36	
Miscellaneous Repairs			37					
Employee Special Benefits			38					
Railroad Car Rental			40					
Educational Assistance Program			41					
Small Tools			46					
Travel			62				7	
Travel Meals				1				
All Other Travel Costs				2				
Business Meals and Entertainment			64				7	
Fuel-Propane			65					
Fuel-Drying			66					
Electric Power			67					
Supplies-Bags			71					
Supplies-Packaging Materials			72					
Supplies-Pallets			73					
Supplies-Chemical Reagents			74					
Supplies-Boards			75					
Supplies-Other			76					
Supplies-Grinding Media			77					
Gasoline			78					
Diesel Fuel			79					
Lubricants			81					
Publications			84					
Expenses Charged In			86					
Other Direct Charges			95					

Form 26-1000 (6-85)

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 75
Effective 6/1/87

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Mill Expense-CIM Talc & Clay	9275				SLIC Fac			
Milling		10						
Crude-Used		*	5					
Labor-Milling Operations			10				35	
Labor-Quality Assurance			11				35	
Labor-Travel Time			13				35	
Labor-Maintenance & Repairs			14				35	
Benefit Plans and Payroll Taxes			15					
Bonuses and Incentive Comp.			17					
Miscellaneous Freight			20					
Safety and Health Expense-Labor			21				35	
Safety and Health Expense-Education Labor			22				35	
Safety and Health Expense-Other			24				35	
Sample Analysis-Outside			34					
Maintenance and Repairs-Outside			35				35	
Repair Parts			36				35	
Employee Special Benefits			38					
Small Tools			46					
Permits and Licenses			60					
Demurrage			65					
Electric Power			67					
Fuel & Water			68					
Equipment Rentals			69					
Short-term				1				
Long-term				2				
Supplies-Bags			71					
Supplies-Packing Materials			72					
Supplies-Chemicals			74					
Supplies-Laboratory			75					
Supplies-Other			76					
Equipment-Fuel			80				35	
Equipment-Lubrication			81				35	
Other Direct Charges			95					
Charges from Other Operations			97					
Loaned Employees								
Labor-Milling Operations				10				
Benefit Plans and Payroll Taxes				15				
Educational Assistance				18				
Travel				62				
Business Meals and Entertainment				64				
Other				95				

Form 26-1000 (6-85)

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Milling Expense-CIM Talc & Clay-Cont'd	9275				SLIC Fac			
Other Direct Charges			95					
Charges from Other Companies			97					
Loaned Employees								
Labor-Salaried				10				
Benefit Plans & Payroll Taxes				15				
Travel				62				
Business Meals and Entertainment				64				
Other				95				
Charges to Other Companies			98					
*The following Primary Subaccounts are authorized for use by the Clay Division:								
#1 Mill		12						
#2 Mill		14						
#3 Mill		16						
Bagging Facility		18						
Bulk Loading Facility		20						
Mine Overhead Summary-Coal Operations	9276				SLIC Mine			
Clearings from Memorandum Account			100					

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 75
Effective 6/1/87

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Milling Exp.-CIM Talc & Clay-Cont'd	9275				SLIC Fac			
Charges to Other Operations			98					
General Milling (Fixed Costs)		95						
Labor-Salaried			10					
Benefit Plans and Payroll Taxes			15					
Educational Assistance			18					
Telecomm.-Radio/Microwave			30					
Telecommunications-Voice			32					
Telecommunications-Data			33					
Consultants Fees			50				2	
Other				1				
Ex-Employees				2				
Consultants Reimbursable Exp.			52				2	
Outside Services-Other			55					
Agency Fees				5				
Other				10				
Permits and Licenses			60					
Employee Expense-Travel			62				7	
Travel Meals				1				
All Other Travel Costs				2				
Employee Expense-Business Meals and Entertainment			64				7	
Office Equipment Rent			69					
Short-term				1				
Long-term				2				
Rent-Premises			70					
Short-term				1				
Long-term				2				
Vehicle Lease Expense			71					
Short-term				1				
Long-term				2				
Office Supplies			72					
Contributions			82				2,4	
Community Service				1				
Youth				2				
Health				3				
Education				4				
Culture and Art				5				
Civic and Community				6				
Other				9				
Memberships and Dues-								
Individual Employees			83				2,3,4	
Industry-Related Organizations				1				
Professional Organizations				3				
Training and Development			87					
Freight			88					

Form 26-1000 (6-85)

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

JUL 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	40.0	ON-PEAK	9.140000			365.60
		INTERMED				
	34.0	OFF-PEAK	1.030000			35.02
					SUB-TOTAL	400.62
		ON-PEAK 2400	.087570			210.17
		INTERMED				
		OFF-PEAK 600	.058480			35.09
		ENERGY ADJUSTMENT				-60.90
					SUB-TOTAL	584.98
		SERVICE CHARGE				389.00

TOT KWH 3000 TOTAL $973.98

KW CONSTANT 200.000

95-3391

STATEMENT

FROM

BUY-RITE AUTO PARTS
230 HAMILTON BLVD.
SO. PLFD. N.J. 07080
201-756-7698

AS OF: 07/01/88

PAGE 1

TO

CYPRUS IND. MINERALS CO.
651 METUCHEN RD.
SO. PLAINFIELD N.J. 07080

ACCOUNT NO. C2100

REFERENCE	CUSTOMER REFERENCE	REFERENCE DATE	CODE	DEBIT	CREDIT
**********	**********	**********	**********	**********	**********
* PLEASE DIRECT ALL BILLING INQUIRIES TO ACCOUNTS RECEIVABLE *					
* AT 756-7778 *					
**********	**********	**********	**********	**********	**********
	PREVIOUS BALANCE			122.95	
2864	THANK YOU	06/17/88	P		84.09
209386		06/30/88	I	25.69	

* YOUR ACCOUNT IS OVER 30 DAYS PAST DUE
THERE WILL BE A 1-1/2% SERVICE CHARGE

CODE: A — Adjustment; C — Credit Memo; D — Discount; F — Dated Billing; I — Invoice; P — Payment

TERMS	NEW BALANCE
2% 10 DAYS/NET 30	64.55

CURRENT	31-60		
25.69	38.86		

BUY-RITE AUTO PART

AS OF: 07/01/88

CYPRUS IND. MINERALS CO

ACCOUNT NO. C2100

REFERENCE	AMOUNT
-PRE.BAL-	122.95
2864	-84.09
209386	25.69

PLEASE SUBMIT THIS STUB WITH YOUR REMITTANCE

NEW BALANCE 64.55

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE _____ Page _____ of _____

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____

AMC-DENVER, CO.

LEHMAN 00906

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 7/14/88

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		6/88	PSEG	JUN88	1,013.42		10-67 10-68
		7/88	BELL ATLANTIC	JULY88	117.53		95-69
		6/30/88	ACETYLENE 5729381	~~6/30/88~~	81.20		10-80
		7/1/88	A+S	367	79.50		10-69
		6/30/88	BUY RITE	209386	25.65		10-36
		6/28/88	AMOCO	JUN 88	117.95		10-80
		7/9/88	UPS	070988	3.75		95-88
		7/2/88	UPS	070288	9.28		95-88
		6/25/88	UPS	072588	3.75		95-88
		6/18/88	UPS	061888	3.75		95-88
		6/4/88	UNIL	7599	10.43		10-36
		7/7/88	ACETYLENE	131449	45.72		60-80
		7/8/88	RELIABLE	11805	$1,790.00		
		7/8/88	RELIABLE	11810	$1,790.00		
		3/31/88	SOS	597221M	36.25		10-36

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00907

Batch Number 07-001 | Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by 7632 | Date 7/14/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
1	1	//	//	329	1 1	0	07	8	1	1		5,068,22		1 1 1 1

Number of Invoices 15

07-001 #5,068-22

Form 12-1003 (1-87)

1013.420+
117.530+
21.200+
79.500+
25.690+
117.950+
3.750+
9.280+
3.750+
3.750+
10.430+
45.720+
1790.000+
1790.000+
36.250+
5068.220*

0.*
0.*
0.*

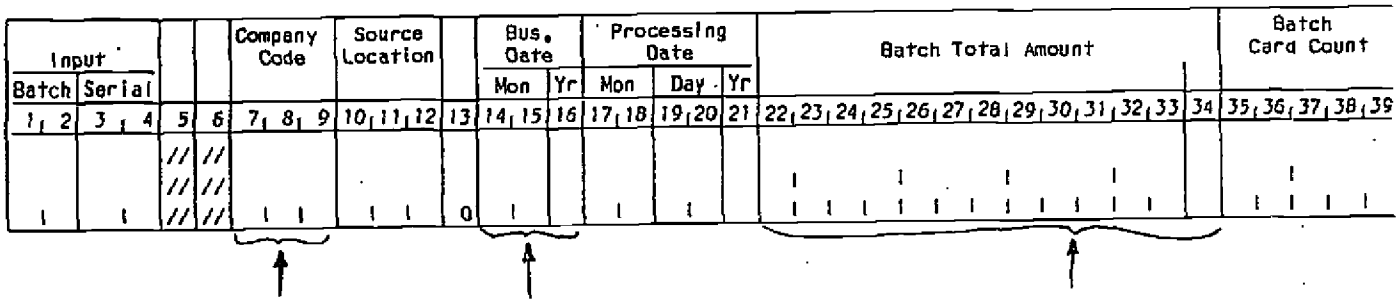
Batch Number

Location

Prepared by

Date

CAPS - Batch Header Record (80 Column Card Record)



Number of Invoices

Form 12-1003 (1-87)

Batch Number

Location

CAPS - Batch Header Record (80 Column Card Record)

Prepared by

Date

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
		//	//			0								

Number of Invoices

Form 12-1003 (1-87)

Batch Number

Location

Prepared by

Date

CAPS - Batch Header Record (80 Column Card Record)

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
		//	//			0								

Number of Invoices

Form 12-1003 (1-87)

SOS

STATEMENT

GABES INC. 1100 HARRISON AVE, KEARNY, N.J. 07029 • (201) 998-7800/114 EGEL AVE, MIDDLESEX, N.J. 08846 • (201) 468-3515

PLEASE REMIT TO 1100 HARRISON AVE., KEARNY, N.J. 07029

TO CYPRUS MINERALS CO
651 METUCHEN RD *
SOUTH PLAINFIELD
N J 07080-4820

ACCOUNT NO. MC600 STATEMENT DATE 05/31/88

PAYMENTS RECEIVED AFTER THIS DATE
WILL APPEAR ON YOUR NEXT STATEMENT

DATE	REFERENCE	CHARGES	CREDITS
03/31/88	597221 R	36.25	
04/30/88	600803 R	32.22	
05/10/88	601178	7.00	
05/31/88	604438 R	13.14	

CURRENT	30 DAYS PAST DUE	60 DAYS PAST DUE	90 DAYS PAST DUE	120 DAYS & OVER	TOTAL AMOUNT DUE
20.14	32.22	36.25			88.61

STATEMENT

ACETYLENE SUPPLY COMPANY

WOODBRIDGE, N.J. (201) 634-7580 BRONX, N.Y. (212) 325-7690

PLEASE REMIT TO: P. O. BOX 417, WOODBRIDGE, NJ 07095

PLEASE DETACH THIS STUB AT PERFORATION AND ENCLOSE WITH YOUR REMITTANCE.

CYPRUS INDUST. MINERALS
METUCHEN & HAMICH ROAD
SOUTH PLAINFIELD, N. J.
07080

ACCOUNT NO.	DATE	TERMS	PAGE
111600	06/30/88	NET	1

ACCOUNT NO.	DATE
111600	06/30/88

INVOICE NO.	DATE	CHARGES	CREDITS	REFERENCE	BALANCE
125346	04/27/88	26.76	26.76		.00
126852	05/19/88	59.76	59.76		.00
512626R	04/30/88	21.20	21.20		.00
512782R	05/31/88	21.20			21.20
512938R	06/30/88	21.20			42.40

INVOICE NO.	AMOUNT
512782R	21.20
512938R	21.20

PLEASE PAY THIS AMOUNT

00 DAYS	60 DAYS	90 DAYS	CURRENT	NET DUE	NET DUE
.00	.00	.00	42.40	42.40	42.40

THANK YOU FOR YOUR PAYMENT - PAYMENT RECEIVED AFTER MONTH END WILL APPEAR ON NEXT STATEMENT.

P

STATEMENT

MAKE CHECK PAYABLE TO:

VAIL HARDWARE
189 FRONT ST.
S PLAINFIELD NJ 07080

CYPRUS INDUSTRIAL CO.
651 METUCHEN ROAD
SOUTH PLAINFIELD NJ 07080

PAGE 1

BILLING DATE 06/26/88

C95000
ACCOUNT NO.

AMOUNT OF PAYMENT

TO INSURE PROPER CREDIT RETURN THIS PORTION WITH YOUR PAYMENT $ _____

PREVIOUS BALANCE ▶ $ 107.87

DATE	REFERENCE	CHARGES	PAYMENTS	CREDITS
5/27/88			33.79	
6/04/88	7599	10.43		

FINANCE CHARGE COMPUTED ON $ FINANCE CHARGE ▶ $

ACCOUNT NUMBER C95000 BILLING DATE 06/26/88 NEW BALANCE ▶ $ 84.51

CURRENT	30 DAYS	60 DAYS	90+ DAYS	ACCUM. FIN. CHG.
10.43	74.08			

A FINANCE CHARGE *is computed at the periodic rate of* 1.50 % per month which is an ANNUAL PERCENTAGE RATE OF 18.0 % on the first $ 500.00 . 1 % per month, which is an ANNUAL PERCENTAGE RATE OF 12.0 % will be charged on that portion of the balance in excess of $ 500.00 . A minimum FINANCE CHARGE of .50 c will be applied on past due balances of less than $ 33.34 . C

The **FINANCE CHARGE** is computed on the basis of explanation **(A)** Not Applicable No finance charge has been computed. **(B)** Adjusted Balance The previous balance is adjusted by subtracting payments and credits. **(C)** Average Daily Balance The previous balance is adjusted on a daily basis by subtracting payments and credits after excluding unpaid finance charges. The sum of these daily balances divided by the number of days in the billing period is the Average Daily Balance. To avoid additional **FINANCE CHARGES**, pay the **"NEW BALANCE"** before the billing date next month.

VAIL HARDWARE S PLAINFIELD NJ 07080

NOTICE:
See reverse side for important information.

CHARGES, RETURNS AND PAYMENTS PROCESSED AFTER THE BILLING DATE WILL APPEAR ON YOUR NEXT STATEMENT.

STATEMENT

ACETYLENE SUPPLY COMPANY

WOODBRIDGE, N.J. (201) 634-7500 BRONX, N.Y. (212) 325-7690

PLEASE REMIT TO: P. O. BOX 417, WOODBRIDGE, NJ 07095

PLEASE DETACH THIS STUB AT PERFORATION AND ENCLOSE WITH YOUR REMITTANCE.

CYPRUS INDUST. MINERALS
METUCHEN & HAMICH ROAD
SOUTH PLAINFIELD, N. J.
07080

ACCOUNT NO.	DATE	TERMS	PAGE
111600	05/31/88	NET	1

ACCOUNT NO.	DATE
111600	05/31/88

INVOICE NO.	DATE	CHARGES	CREDITS	REFERENCE	BALANCE	INVOICE NO.	AMOUNT
123444	04/07/88	20.04	20.04		.00		
125346	04/27/88	26.76			26.76	125346	26.76
126852	05/19/88	59.76			86.52	126852	59.76
512468R	03/31/88	21.20	21.20		86.52		
512626R	04/30/88	21.20			107.72	512626R	21.20
512782R	05/31/88	21.20			128.92	512782R	21.20

PLEASE PAY THIS AMOUNT

30 DAYS	60 DAYS	90 DAYS	CURRENT	NET DUE	NET DUE
.00	.00	47.96	80.96	128.92	128.92

THANK YOU FOR YOUR PAYMENT - PAYMENT RECEIVED AFTER MONTH END WILL APPEAR ON NEXT STATEMENT.

P

Batch Number 06-002

Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by [illegible]

Date 6/21/88

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
		//	//	329		0	06	8				27221 14		

Number of Invoices 7

272.14

LOG:

06-001 1,291.21

06-002 272.14

1,563.35 Total

Form 12-1003 (1-87)

0.*

13.140+

76.720+

3.750+

74.080+

21.20+

3.750+

79.500+

272.140*

0.*

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 6/21/88

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		6/1/88	Automated	334	79.50		10-69
		6/11/88	UPS	061188	3.75		95.88
		5/31/88	Acetylene	5127828	21.20		10.69
		5/31/88	Vail	6920	74.08		10.36
		6/4/88	UPS	060488	3.75		95.88
		5/27/88	Amoco	May 88	76.72		10-80
		5/31/88	SOS	6044381	13.14		10-69

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00917

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 6/01/88

Page 1 of 1

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		5/88	PSE&G	MAY 88	997.82		898.69 0067 122.18 0068
		5/24/88	GRANZZI	X11438	10.55		10-36
		5/14/88	UPS	051488	3.75		95-88
		5/28/88	UPS	052888	12.25		95-88
		5/19/88	BUYRITE	203067	72.09		10-36
		5/31/88	BUYRITE	203777	12.00		10-36
		5/21/88	UPS	052188	5.46		95-88
		6/88	BELL ATLANTIC	06/88	117.53		95-72
		5/19/88	ACETYLENE	126852	59.76		10-80

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried

AMC-DENVER, CO.

LEHMAN 00918

Batch Number 06-001

Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by [illegible]

Date 6/01/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
		//	//	329		0	08	8				1291.21		

Number of Invoices 9

$1,291.21

Form 12-1003 (1-87)

997.820+
10.550+
3.750+
12.250+
72.090+
12.000+
5.460+
117.530+
59.760+
1291.210*
0.*

STATEMENT

MAKE CHECK PAYABLE TO:

VAIL HARDWARE
189 FRONT ST.
S PLAINFIELD NJ 07080

CYPRUS INDUSTRIAL CO. PAGE 1
651 METUCHEN ROAD
SOUTH PLAINFIELD NJ 07080

BILLING DATE 05/26/88

C95000
ACCOUNT NO.

AMOUNT OF PAYMENT

TO INSURE PROPER CREDIT RETURN THIS PORTION WITH YOUR PAYMENT $ _____

PREVIOUS BALANCE ▶ $ 101.07

DATE	REFERENCE	CHARGES	PAYMENTS	CREDITS
5/03/88	6920	74.08		
5/05/88			67.28	

FINANCE CHARGE COMPUTED ON $ FINANCE CHARGE ▶ $

ACCOUNT NUMBER C95000 BILLING DATE 05/26/88 **NEW BALANCE** ▶ $ 107.87

CURRENT	30 DAYS	60 DAYS	90+ DAYS	ACCUM. FIN. CHG.
74.08	33.79			

A FINANCE CHARGE is computed at the periodic rate of 1.50 % per month which is an **ANNUAL PERCENTAGE RATE OF** 18.0 % on the first $ 500.00 . 1 % per month, which is an **ANNUAL PERCENTAGE RATE OF** 12.0 % will be charged on that portion of the balance in excess of $ 500.00 .
A minimum **FINANCE CHARGE** of .50 c will be applied on past due balances of less than $ 33.34 . C

The **FINANCE CHARGE** is computed on the basis of explanation (A) Not Applicable No finance charge has been computed. (B) Adjusted Balance The previous balance is adjusted by subtracting payments and credits. (C) Average Daily Balance The previous balance is adjusted on a daily basis by subtracting payments and credits after excluding unpaid finance charges. The sum of these daily balances divided by the number of days in the billing period is the Average Daily Balance. To avoid additional **FINANCE CHARGES**, pay the **"NEW BALANCE"** before the billing date next month.

VAIL HARDWARE S PLAINFIELD NJ 07080

NOTICE:
See reverse side for important information.

CHARGES, RETURNS AND PAYMENTS PROCESSED AFTER THE BILLING DATE WILL APPEAR ON YOUR NEXT STATEMENT.

STATEMENT

FROM

BUY-RITE AUTO PARTS
230 HAMILTON BLVD.
SO. PLFD. N.J. 07080
201-756-7698

AS OF: 06/01/88

PAGE 1

TO

CYPRUS IND. MINERALS CO.
651 METUCHEN RD.
SO. PLAINFIELD N.J. 07080

ACCOUNT NO. C2100

REFERENCE	CUSTOMER REFERENCE	REFERENCE DATE	CODE	DEBIT	CREDIT
	PREVIOUS BALANCE			38.29	
203067		05/19/88	I	72.09	
203777		05/24/88	I	12.00	
	SERVICE CHARGE *			.57	

* YOUR ACCOUNT IS OVER 60 DAYS PAST DUE
THERE WILL BE A 1-1/2% SERVICE CHARGE

CODE: A — Adjustment, C — Credit Memo, D — Discount, F — Dated Billing, I — Invoice, P — Payment

TERMS	NEW BALANCE
2% 10 DAYS/NET 30	122.95

CURRENT	31-60	61-90	
84.66	.00	38.29	

BUY-RITE AUTO PART

AS OF: 06/01/88

CYPRUS IND. MINERALS CO

ACCOUNT NO. C2100

REFERENCE	AMOUNT
-PRE.BAL-	38.29
203067	72.09
203777	12.00
SER.CHG.	.57

PLEASE SUBMIT THIS STUB WITH YOUR REMITTANCE

NEW BALANCE
122.95

STATEMENT

MAKE CHECK PAYABLE TO:

VAIL HARDWARE
189 FRONT ST.
S PLAINFIELD NJ 07080

CYPRUS INDUSTRIAL CO.
651 METUCHEN ROAD
SOUTH PLAINFIELD NJ 07080

PAGE 1

BILLING DATE 04/26/88

C95000
ACCOUNT NO.

AMOUNT OF PAYMENT

TO INSURE PROPER CREDIT RETURN THIS PORTION WITH YOUR PAYMENT $ _____

PREVIOUS BALANCE ▶ $ 277.83

DATE	REFERENCE	CHARGES	PAYMENTS	CREDITS
3/29/88	3977	33.79		
4/11/88			210.55	

FINANCE CHARGE COMPUTED ON $ FINANCE CHARGE ▶ $

ACCOUNT NUMBER C95000 BILLING DATE 04/26/88 NEW BALANCE ▶ $ 101.07

CURRENT	30 DAYS	60 DAYS	90+ DAYS	ACCUM. FIN. CHG.
33.79	67.28			

A FINANCE CHARGE is computed at the periodic rate of 1.50 % per month which is an **ANNUAL PERCENTAGE RATE OF** 18.0 % on the first $ 500.00 . 1 % per month, which is an **ANNUAL PERCENTAGE RATE OF** 12.0 % will be charged on that portion of the balance in excess of $ 500.00 .
A minimum **FINANCE CHARGE** of .50 c will be applied on past due balances of less than $ 33.34 . C

The **FINANCE CHARGE** is computed on the basis of explanation **(A)** Not Applicable No finance charge has been computed. **(B)** Adjusted Balance The previous balance is adjusted by subtracting payments and credits. **(C)** Average Daily Balance The previous balance is adjusted on a daily basis by subtracting payments and credits after excluding unpaid finance charges. The sum of these daily balances divided by the number of days in the billing period is the Average Daily Balance. To avoid additional **FINANCE CHARGES,** pay the **"NEW BALANCE"** before the billing date next month.

VAIL HARDWARE S PLAINFIELD NJ 07080

NOTICE:
See reverse side for important information.

CHARGES, RETURNS AND PAYMENTS PROCESSED AFTER THE BILLING DATE WILL APPEAR ON YOUR NEXT STATEMENT.

STATEMENT

ACETYLENE SUPPLY COMPANY

WOODBRIDGE, N.J. (201) 634-7500 BRONX, N.Y. (212) 325-7690

PLEASE REMIT TO: P. O. BOX 417, WOODBRIDGE, NJ 07095

ASCO

PLEASE DETACH THIS STUB AT PERFORATION AND ENCLOSE WITH YOUR REMITTANCE.

CYPRUS INDUST. MINERALS
METUCHEN & HAMICH ROAD
SOUTH PLAINFIELD, N. J.
07080

ACCOUNT NO.	DATE	TERMS	PAGE
111600	04/30/88	NET	1

INVOICE NO.	DATE	CHARGES	CREDITS	REFERENCE	BALANCE
119275	03/03/88	17.54	17.54		.00
122042	03/16/88	33.50	33.50		.00
123444	04/07/88	20.04			20.04
125346	04/27/88	26.76			46.80
512304R	02/29/88	21.20	21.20		46.80
512468R	03/31/88	21.20			68.00
512626R	04/30/88	21.20			89.20

60 DAYS	30 DAYS	20 DAYS	CURRENT	NET DUE
.00	.00	.00	89.20	89.20

ACCOUNT NO. 111600 DATE 04/30/88

INVOICE NO.	AMOUNT
123444	20.04
125346	26.76
512468R	21.20
512626R	21.20

PLEASE PAY THIS AMOUNT

89.20

THANK YOU FOR YOUR PAYMENT - PAYMENT RECEIVED AFTER MONTH END WILL APPEAR ON NEXT STATEMENT.

STATEMENT

FROM

BUY-RITE AUTO PARTS
230 HAMILTON BLVD.
SO. PLFD. N.J. 07080
201-756-7698

AS OF: 05/02/88

PAGE 1

TO

CYPRUS IND. MINERALS CO.
651 METUCHEN RD.
SO. PLAINFIELD N.J. 07080

ACCOUNT NO. C2100

REFERENCE	CUSTOMER REFERENCE	REFERENCE DATE	CODE	DEBIT	CREDIT
**********	**********	**********		**********	**********
* TAKE ADVANTAGE OF OUR PROMPT PAYMENT DISCOUNT. PAY THE *					
* CURRENT BALANCE WITHIN 10 DAYS OF RECEIPT OF STATEMENT AND *					
* TAKE 2% OFF THE CURRENT BALANCE WHEN PAYING. PLEASE DIRECT *					
* ANY QUESTIONS TO ACCOUNTS RECEIVABLE, 756-7698. *					
**********	**********	**********		**********	**********
	PREVIOUS BALANCE			417.82	
2359	THANK YOU	04/08/88	P		379.53

* YOUR ACCOUNT IS OVER 30 DAYS PAST DUE
THERE WILL BE A 1-1/2% SERVICE CHARGE

CODE: A — Adjustment; C — Credit Memo; D — Discount; F — Dated Billing; I — Invoice; P — Payment

TERMS	NEW BALANCE
2% 10 DAYS/NET 30	38.29

CURRENT	31-60		
.00	38.29		

BUY-RITE AUTO PART

AS OF: 05/02/88

CYPRUS IND. MINERALS CO

ACCOUNT NO. C2100

REFERENCE	AMOUNT
-PRE.BAL-	417.82
2359	-379.53

PLEASE SUBMIT THIS STUB
WITH YOUR REMITTANCE

NEW BALANCE: 38.29

Danford's Office Supply Company

476 MAIN STREET
METUCHEN, NJ 08840

Tel (201) 549-6898
Tel (201) 549-6913
ID# 221-551-415/000

[illegible] US INDUSTRIAL MINERALS CO Customer 0657 Apr 27 1988 Page 1
691 METUCHEN ROAD
SO PLAINFIELD, N.J. 07080

PLEASE RETURN THIS COPY WITH YOUR REMITTANCE

DATE	TYPE	REFERENCE	STATUS	DEBIT	CREDIT	BALANCE
02.08.88	Invoice	20476		27.50		
02.17.88	Invoice	G 50913		106.34		

Refund 9,4 T+Thurs

5/10/88

STATEMENT

OVER 90 DAYS	OVER 60 DAYS	OVER 30 DAYS	CURRENT	TOTAL DUE
.00	133.84	.00	.00	

PLEASE RETURN DUPLICATED WITH PAYMENT. THANK YOU

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 5/16/88

Page 1 of ____

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		5/10/88	Satellite	65788	8.11		10-36
		4/28/88	Amoco	APR. 88	61.79		10-80
		4/1/88	Michaels	10985	596.70		95-95
		5/1/88	AES	298	79.50		10-69
		4/27/88	Acetylene	125346	76.76		10-80
		4/30/88	UPS	043088	36.81		95-88
		4/30/88	Acetylene	512626R	21.20		10-69
		3/29/88	Vail	3977	33.79		10-36
		5/7/88	UPS	050788	84.75		95-88
		5/10/88	SOS	60178	7.00		10-36
		4/30/88	SOS	600803R	32.22		10-69

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00926

Batch Number 05-001

Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by KBC

Date 5/16/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//	329		0	05	8				938.63		
1	1	//	//						1	1				

Number of Invoices 11

938.63

Form 12-1003 (1-87)

0.00*
0.00*
0.00*
0.00*
8.110+
61.750+
595.700+
79.510+
26.760+
35.810+
21.200+
33.790+
54.750+
7.000+
32.220+
938.630*

Batch Number 04-001

Location 325

CAPS - Batch Header Record (80 Column Card Record)

Prepared by CBL

Date 4/28/88

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//	325			04	88				2577.64		
		//	//			0								

Number of Invoices 14

APRIL TOTAL

$ 2,577.64

Form 12-1003 (1-87)

79.500+
76.220+
16.900+
99.590+
205.200+
67.280+
54.790+
3.750+
21.200+
20.040+
5.810+
117.530+
1541.650+
268.200+
2577.640*

1.*

1.*

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 4/28/88

Page 1 of 1

	* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
1			3/29/88	AMOCO	MAR 88	99.59		010.0080
2			4/1/88	AUTOmated	270	79.50		010.0065
3			4/2/88	UPS	040288	16.90		095.0088
4			3/26/88	UPS	032688	76.21		095.0088
5			4/5/88	RARITAN	98628	205.20		010.0080
6			2/18/88	Vail	3133	67.28		010-036
7			4/9/88	UPS	040988	54.79		095.088
8			4/16/88	UPS	041688	3.75		095.088
9			3/31/88	Acetylene	512468R	21.20		010.065
10			4/7/88	Acetylene	123444	20.04		010.080
11			4/23/88	UPS	042388	5.80		095.088
12			5/9/88	BECC LEASE	05/88	117.53		095.065
13			4/88	PSE+G	APR.88	1,541.65		010.067 1,164.20 010.068 373.45
14			4/19/88	CAVAZZI	675681	268.20		010.036
15								

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____

AMC-DENVER, CO.

LEHMAN 00929

Cyprus Minerals Company

Phone or Routing Memo
18-150 (6-84)

Date of Memo 5/20/88 | Reply by Date (if reqd.)

To (print all names legibly)	MC/Room	Location (if not local)	Company/Facility
Keith Lehman	CiM	So. Plainfield, NJ	

Time	Person Calling			☐ Telephoned You ☐ Wants To See You ☐ Please Call ☐ Will Call Back ☐ Returned Your Call ☐ Stopped By
☐ Urgent	Representing			
	Area Code	Telephone No.	Ext.	

For Your
☐ Information
☐ Signature
☐ Comments
☐ Approval

Please
☐ Handle
☐ Note & Return
☐ Approve & Return
☐ See or Phone Me
☐ Prepare Signature
☐ Per Our Conv.
☐ Per Your Req.
☐ File
☐ Mail
☐ Circulate
☐ Make _____ Copies/Ea.

Message: Vendor must be mistaken. See attached copy.

☐ Continued on back

From Mary | MC/Room | Location (if not local) | Extension

Cyprus Industrial Minerals Company

651 Metuchen Road
South Plainfield, N.J. 07080
Telephone (201) 754-4880

TWX 710-997-9528

DANFORD'S
OFFICE SUPPLY CO.
476 Main Street
METUCHEN, NEW JERSEY 08840
Phone 549-6898

CUSTOMER Cyprus Industrial Minerals INVOICE NO. G 50913
ADDRESS 651 Met Road So Plfd
MODEL OR SERIAL NO. Selectric EX66 PHONE 754-4881 DATE RECEIVED 2-8-88
TROUBLE REPORTED PROMISED DELIVERED 2/17

DESCRIPTION OF MATERIAL USED	AMOUNT	
Cleaned + Lubricated		
Adjusted Homing - Rotate - Tilt		
Replaced Paper Release Lever	5	85
Replaced Right Margin Stop	4	75
Picked up Feb. 23-88 TOTAL MATERIALS		
LABOR	85	00
TAX	5	74
TOTAL	101	34

RECEIVED BY [signature]

C5-11

Thank You! CASH ON COMPLETION OF WORK →

Payable on Receipt

APPROVED FOR PAYMENT BY [signature]
DATE 2/22/88 129 048 27

COMPANY CODE	MAIN	PRIM	SEC	SP ANAL.	COST CENTER	SPEC CODES	AMOUNT
329	9275	010	0035		38920029		$101.34

Post-it™ routing request pad 7664

ROUTING - REQUEST

Please
- [ ] READ
- [ ] HANDLE
- [ ] APPROVE

and
- [ ] FORWARD
- [ ] RETURN
- [ ] KEEP OR DISCARD
- [ ] REVIEW WITH ME

To Please see if there were paid. They were submitted. DANFORD 20476, & G 50913.

Date 5/16/88 From [signature]

FEB 25 1988
NOTE PAYABLE

CYPRUS

LEHMAN 00931

Batch Number 03-001

Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by ICBL

Date 3/25/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
1	1	//	//	3 1 2 9	1 1	0	0 1 3	8	1	1		1 1 1 1 1 5 1 7 1 4 8 1 5 1		1 1 1 1

Number of Invoices 26

Form 12-1003 (1-87)

March Total

$5,748.51

1.*
10.680+
77.230+
182.460+
288.430+
20.000+
24.770+
72.270+
64.40+
14.720+
5.30+
13.850+
105.220+
21.210+
36.250+
206.530+
4.020+
314.950+
36.250+
40.280+
17.540+
7.750+
117.530+
32.270+
20.000+
33.500+
3981.090+
5748.510*

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 3/25/88

Page 1 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		3/4/88	BUY RITE	197180	10.68		10.36
		3/4/88	BUY RITE	191458	77.23		10.36
		3/7/88	BUY RITE	191927	182.46		10.36
		3/88	BELL ATLANTIC	C000098-2	288.43		95.69
		11/23/87	MSHA	02629887	20.00		95.60
		3/4/88	BUY RITE	191548	24.77		10.36
		3/4/88	CENTURY	040045	72.27		95.72
		3/15/88	Buy Rite	193194	64.80		10.36
		3/15/88	BUY RITE	188847	14.72		10.36
		2/15/88	"	188884	5.32		10.36
		3/5/88	UPS	030588	13.85		95.88
		2/29/88	Amoco	2	105.22		10.80
		2/29/88	Acetylene	512304R	21.20		10.69
		2/29/88	SOS	593148R	36.25		10.36
		1/20/88	VNIC	2666	206.53		10.36

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried
AMC-DENVER, CO.

LEHMAN 00933

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 3/25/88

Page 2 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
		2/15/88	Vail	3062	4.02		10.36
		3/2/88	K-Products	59183	314.95		10.17
		12/31/87	SOS	585869R	36.25		10.36
		11/30/87	SOS	582177R	40.28		10.36
		3/3/88	Acetylene	119275	17.54		10.80
		3/12/88	UPS	031288	7.75		95.58
		4/9/88	Bell Atlantic	4/88	117.53		95.69
		3/19/88	UPS	031988	32.27		95.58
		3/24/88	Barry Lerner	032488	20.		10.24
		3/16/88	Acetylene	122042	33.50		10.80
		3/88	PSE&G	3/88	398.09		10.67 2825.99 10.68 1155.10

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried

AMC-DENVER, CO.

LEHMAN 00934

Batch Number 02-002

Locations 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by KBL

Date 2/29/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount	Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33 34	35 36 37 38 39
1	1	//	//	3 2 9		0	0 2	8	1	1		6 2 3 3 1 1	

Number of Invoices 9

LOG FEB. '88

Form 12-1003 (1-87)

02-001 = $1,678.40

02-002 = 6,233.11

$7,911.51 TOTAL

0.00
0.00
1568.030+
4080.090+
37.560+
113.820+
30.750+
17.640+
79.510+
33.250+
272.500+
6233.110=

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 2/29/88

	* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
1			2/24/88	Valley	A68189	1568		1610-003 1772.48 9271-464 204.48
2			2/18/88	PSE&G	FEB 88	2433.09 1,647.00		10-67 10-68
3			2/24/88	ARA	242298	37.56		95-72
4			2/13/88	BELL LEASING	3/88	113.82		95-69
5			2/27/88	UPS	022788	30.75		95-88
6			2/25/88	ACETYLENE	118706	17.64		95-80
7			3/1/88	AYS	234	79.50		10-69
8			2/26/88	DODGE	344394	33.25		10-36
9			2/29/88	GENERAL PALLET	561	272.50		1610-003 312.50 9271-464 (-40)
					TOTAL	$6,233.11		

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____

AMC-DENVER, CO.

LEHMAN 00936

Batch Number 02 - 001

Location 329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by KBL

Date 2/22/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
1	1	//	//	3 7 9		0	0 2	8	1	1		1 6 7 8 4 0		1

Number of Invoices 25

$1678.40

27.500+
31.490+
241.150+
4.590+
23.210+
27.510+
97.950+
57.830+
19.100+
15.900+
34.360+
167.240+
36.250+
42.310+
54.060+
6.990+
78.550+
17.450+
38.000+
326.840+
101.340+
17.750+
117.530+
84.450+
8.570+
1,678.400*

100-20

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 2/22/88

	* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
1			2/8/88	DANFORDS	20476	27.50		95-72
			1/28/88	DAYTIMERS	8020 23481	31.45		95-72
			1/27/88	SOS	587763	24.15		10-36
			2/3/88	BUY RITE	187176	4.59		10-36
			1/30/88	UPS	013088	23.21		95-88
			1/29/88	ACETYLENE SUPPLY	116468	27.51		10-80
			1/29/88	AMOCO	FEB-88	97.95		10-80
			2/6/88	UPS	020688	57.83		95-88
			1/30/88	Satellite	56827	19.10		10-36
			1/30/88	Acetylene	512-147R	15.90		10-69
			1/18/88	Vail	56.94	34.86		10-36
			12/28/88	Vail	5036	167.24		10-36
			1/31/88	SOS	589549R	36.25		10-69
			2/15/88	DAYTIMERS	85422555	42.31		95-87
15			2/5/88	central Jersey	05819	54.06		10-36

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried

AMC-DENVER, CO.

LEHMAN 00938

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 2/22/88

Page 2 of 2

	* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number
16			2/13/88	UPS	024388	6.99		95-88
17			2/4/88	VIKING	132853	78.55		95-72
18			2/11/88	Acetylene	117581	17.43		10-80
19			2/10/88	Loicon	23313	38.00		10-34
20			11/02/87	Parkway Plastics	033619	326.84		309.9480 116.665
21			2/17/88	Danfords	50913	101.34		10-35
22			2/18/88	Acetylene	118010	17.75		10-80
23			3/4/88	Bell Leasing	03/88	117.53		95-69
24			2/24/88	Burgate	190211	84.45		10-36
25			2/26/88	UPS	022088	8.57		95-88

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00939

Statement

Loricon Testing Service, Inc.
55 State Highway 36
Keyport, N.J. 07735
Telephone (201) 787-4131

Cypress

Open Invoices Shipped over for payment.

DATE	INVOICE NO.	CHARGES	CREDITS	BALANCE
		PREVIOUS BALANCE		
1987				
10/27	22627 Allpoint	9 50	—	
11/25	22851 Hg.	9 50	copy	
12/22	23011 Hg.	161 50	pl.	
3/8/88	23374 Allpoint	19 —	—	
		BALANCE DUE		199 50

Statement

Loricon Testing Service, Inc.
55 State Highway 36
Keyport, N.J. 07735
Telephone (201) 787-4131

Cygnus
15
Upon Invoices Mailed over
for Payment.

DATE	INVOICE NO.	CHARGES	CREDITS	BALANCE
1967			PREVIOUS BALANCE	
10/27	22627 Allyene	9 50		
11/25	22851 "	9 50		
12/28	23011 "	161 50		
3/18/68	23574 Allyene	15 —		
			BALANCE DUE	199 50

MONTHLY INVOICE

RECD FEB 25 1988

AT&T

RECEIVED

FEB 29 1988

ACCTS PAYABLE

AT&T
CENTRAL, NJ (AT&T) 00518
120 CENTENNIAL AVE. FLR 1
PISCATAWAY, NJ. 08854

Account Number: 0010-20643-42
Invoice Number: 8090421826

CYPRUS IND MINERALS CO
DIV-CYPRUS MINES CORP
P O BOX 3299
ENGLEWOOD CO 80155

Invoice Date: 02-04-88

For billing inquiries: (800)624-3450
To place an order: (800)247-7000

New Charges

Lease and Rentals 02-04 through 03-03:	$79.74	
Purchases:	$ 0.00	
One-Time and Partial Charges/Credits:	$ 0.00	
Total New Charges:		$79.74
Federal Excise Tax:	$ 1.09	
State and Local Taxes:	$ 0.00	
Total Taxes on New Charges:		$ 1.09
Total New Charges and Taxes:		$80.83

Balance Brought Forward

Balance as of Last Monthly Invoice:	$80.83	
Additional Billing 01-05 through 02-03:	$ 0.00	
Payments Received:	$80.83CR	
Date: 01-19 Amount: $80.83		
Net Adjustments:	$ 0.00	
Balance Brought Forward:		$ 0.00

Remittance Amount

Total Payable Upon Receipt: $80.83

So. Plainfield

329 APPROVED FOR PAYMENT BY _____ 12817425

DATE _____

COMPANY CODE	MAIN	PRIM	SEC	ANAL	COSTCENTER	SUBSIDIES	AMOUNT
329	9275	95	32		32920029		

To insure proper credit, please detach this portion and return with remittance.

Remittance Document

CYPRUS IND MINERALS CO
DIV-CYPRUS MINES CORP
P O BOX 3299
ENGLEWOOD CO 80155

Branch Office: GBEABNX1
Telephone Number: (800)624-3450
Account Number: 0010-20643-42
Invoice Number: 8090421826

Invoice Date: 02-04-88

Address Correction:

Please remit payments to:
AT&T
P.O. BOX 210
NEWARK, NJ 07101-0210

Amount Due: $80.83

Amount Enclosed:

00000000 00102064342 8090421826 880305 0000008083

SOS

STATEMENT

GASES INC. 1100 HARRISON AVE, KEARNY, N.J. 07029 • (201) 998-7800/114 EGEL AVE, MIDDLESEX, N.J. 08846 • (201) 469-3515

PLEASE REMIT TO 1100 HARRISON AVE., KEARNY, N.J. 07029

TO

CYPRUS MINERALS CO
651 METUCHEN RD *
SO PLAINFIELD
N J 07080

ACCOUNT NO. MC600 STATEMENT DATE 01/31/88

PAYMENTS RECEIVED AFTER THIS DATE WILL APPEAR ON YOUR NEXT STATEMENT

DATE	REFERENCE	CHARGES	CREDITS
11/24/87	580719	115.52	P
11/24/87	580795	45.69	P
11/30/87	582177 R	40.28	
12/23/87	584097	22.72	
12/23/87	584212	30.18	
12/31/87	585868 R	36.25	
01/13/88	586497	26.45	
01/18/88	586728	16.20	
01/27/88	587763	241.15	
01/31/88	589549 R	36.25	
01/04/88	7906		161.21- P

not paid

pd. 3/1/88 ck #165114

Keith:
Please ask for copy of originals; code; approve + submit to me.

RECEIVED
FEB 25 1988
ACCTS PAYABLE

CURRENT	30 DAYS PAST DUE	60 DAYS PAST DUE	90 DAYS PAST DUE	120 DAYS & OVER	TOTAL AMOUNT DUE
320.05	89.15	40.28			449.48

BELL ATLANTIC TRICON LEASING CORPORATION

95 N ROUTE 17 SOUTH
PARAMUS, NJ 07652

February 16, 1988

Cyprus Indust Minerals
651 Metuchen Rd
South Plainfield, NJ 07080

Attention: Accounts Payable

Re: Equipment Lease #: 2006038

Gentlemen:

The key to having credit available is a good payment record. We would like to remind you the terms of our Lease contract call for payments to be received by us on the due date.

Your check in the amount of $117.53 covering our invoice due 02/09/88 has not been received. Action is required today, please send your check in the amount of $117.53 .

Very truly yours,

Nina Lindsey

Credit and Collections Department
201-599-9520
Extension 539

pd 2/9/88 ck# 155882

FEB 25 1988
ACCTS. PAYABLE

$242.73 → 2 invoices:

117.53
+ 125.20
242.73

Please make sure these highlighted Bills have been paid.

Thanks
Bob

ACTIONGRAM

INVOICE NO. 1984-85

Loricon Testing Service, Inc.

55 State Highway 36
Keyport, N.J. 07735
Telephone (201) 787-4131

CLIENT: Cyprus

DATE:

ATTN.:

DATE	TEST No.	NO. OF SAMPLES	TEST	AMOUNT
				$
Invoices				
	Skipped over			
			ck# 155879	
			pd 2/9/88 ~~ck#~~	
12/16/87	22569		ck. Tot. $256.50	114-
12/22/87	23011		pd 1/4/88 ck#140111	161.50
			ck. Tot. $237.50	
				$275.50
	Sent			
			Received	
			FEB 25 1988	
			ACCTS. PAYABLE	
			TOTAL CHARGES DUE	$

ALL PAYMENTS ARE DUE UPON RECEIPT OF INVOICE
THANK YOU

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

MAR 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	108.0	ON-PEAK	8.170000			882.36
		INTERMED				
	344.0	OFF-PEAK	1.060000			364.64
					SUB-TOTAL	1,247.00
		ON-PEAK 4800	.090090			432.43
		INTERMED				
		OFF-PEAK 30000	.058480			1,754.40
		ENERGY ADJUSTMENT				-1,007.84
					SUB-TOTAL	2,425.99
		SERVICE CHARGE				400.00
		TOT KWH 34800			TOTAL	$2,825.99
		KW CONSTANT 200.000				

95-2391

PSE&G
The Energy People

STATEMENT

651 METUCHEN RD
S PLAINFIELD NJ 07080

52 518 950 9 7 IND COPY

CYPRUS IND MINERALS
ATTN ACCTS PAY
P O BOX 405
S PLAINFIELD NJ 07080

MAR 88 RATE LPLT RATE PLAINFIELD DISTRICT

DATE	KILOWATTS	KILOWATT HRS	BLOCK	THERMS	BLOCK	AMOUNT
	108.0	ON-PEAK	8.170000			882.36
		INTERMED				
	344.0	OFF-PEAK	1.060000			364.64
					SUB-TOTAL	1,247.00
		ON-PEAK 4800	.090090			432.43
		INTERMED				
		OFF-PEAK 30000	.058480			1,754.40
		ENERGY ADJUSTMENT				-1,007.84
					SUB-TOTAL	2,425.99
		SERVICE CHARGE				400.00

TOT KWH 34800 TOTAL $2,825.99

KW CONSTANT 200.000

95-3391

Batch Number

Location

CAPS - Batch Header Record (80 Column Card Record)

Prepared by

Date

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
		//	//											
		//	//											
		//	//			0								

Number of Invoices

Form 12-1003 (1-87)

Batch Number	Location
01-001	329

CAPS - Batch Header Record (80 Column Card Record)

Prepared by	Date
KBL	1/18/88

Input				Company Code	Source Location		Bus. Date		Processing Date			Batch Total Amount		Batch Card Count
Batch	Serial						Mon	Yr	Mon	Day	Yr			
1 2	3 4	5	6	7 8 9	10 11 12	13	14 15	16	17 18	19 20	21	22 23 24 25 26 27 28 29 30 31 32 33	34	35 36 37 38 39
1	1	//	//	329		0	01	8				7182.82		
		//	//											
		//	//											

Number of Invoices
32

#7,182.82

Form 12-1003 (1-87)

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 1/18/88

Page 1 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	~~B.A.~~ Number
	01-001	1/11/88	Lonican	23059	294.50		10-34
		1/9/88	UPS	010988	171.03		309-9480-114
		12/16/87	VAIL	4606	18.10		10-36
		12/21/87	VAIL	4706	8.44		10-36
		11/17/87	VAIL	2363	154.76		10-36
		1/7/88	G+G	59344	19.64		10-36
		1/14/88	G.A. Mathewson	128234	46.08		10-36
		1/7/88	KNAPP	503830	77.95		10-24
		1/8/88	KNAPP	504661	72.95		10-24
		11/18/87	AIRBORNE	220580864	35.00		309 9480 114
		9/22/87	ABF	044401991	121.74		309 9480 116 665
		1/6/88	DODGE	343197	4171.99		35393 329 87087 00002
		1/11/88	LINK BROS.	013	492.90		10-345
		1/7/88	BUYRITE	183033	17.54		10-36
		1/6/88	BUYRITE	182859	54.86		10-36
		1/14/88	BUYRITE	184049	16.24		10-36

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried
AMC-DENVER, CO.

~~7069~~ 7182.82

LEHMAN 00950

COMPANY Cyprus Industrial Minerals

LOCATION #29 South Plainfield, N.J.

INVOICE TRANSMITTAL

DATE 1/18/88

Page 1 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	~~B.A.~~ Number
	01-001	12/23/87	ARA COLY	235661	28.45		95-72
		12/14/88	Buy RITE	184134	152.84	87-167	10-36
		12/23/87	Graphic PRINT	66706	26.95	87-165	95-72
		12/28/87	KADESH Travel	0024981	575.00	—	1322-001-329-1287 158443319
		1/2/88	UNITED PARCEL	010288	31.22	—	95-88
		1/1/88	Automated EQUIP	168	79.50	—	10-69
		12/30/87	Robbins Cont.	L77466	133.05	87-165	10-76
		1/1/88	~~Zeller~~ Atlantic leasing	1-88	113.82		95-69
		12/23/87	SOS GAS	584097	22.72		10-36
		12/30/87	Amoco oil	12/30/87	70.10		10-80
		12/30/87	ACETYLENE SUPPLY	511992R	15.90		10-69
		12/28/87	Acetylene Supply	113716	17.54		10-80
		12/23/87	SOS	584212	30.18		10-36
		12/16/87	SATTELLITE	53241	65.53		10-36
		1/6/88	ACETYLENE	114395	25.10		10-80
		12/21/87	DAY TIMERS	78441520 0	21.40		95-72

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00951

APPROVED FOR PAYMENT BY _____

DATE _____

MAIN PRIM SEC. SF ANAL. COST CENTER SPEC. CODES AMT

Batch Number 01 - 002

Location 307

CAPS - Batch Header Record (80 Column Card Record)

Prepared by KBL

Date 1/29/88

Input Batch	Input Serial			Company Code	Source Location		Bus. Date Mon	Bus. Date Yr	Processing Date Mon	Processing Date Day	Processing Date Yr	Batch Total Amount		Batch Card Count
1, 2	3, 4	5	6	7, 8, 9	10, 11, 12	13	14, 15	16	17, 18	19, 20	21	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33	34	35, 36, 37, 38, 39
		//	//											
		//	//											
1	1	//	//	3,2,9	1 1	0	0,1	8	1	1		7,7,8,3,7,3		1 1 1 1

Number of Invoices 18

$7,783.73

Form 12-1003 (1-87)

01 - 001 7,182.82

01 - 002 7,783.73

Month Total: 14,966.55

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 1/29/88

Page 1 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	~~B.A.~~ Account Number
		1/14/88	ACETYLENE SUPPLY	115243	35.18		10-81
		1/16/88	UPS	011688	177.97		95-88
		2/4/88	Bell Atlantic Leasing	02/88	117.53		95-69
	accrue	1/14/88	General Pallet	541	1090.		003-1250 464-160
		1/13/88	SOS	586497	26.45		10-36
		1/15/88	Central Jersey	05377	180.20		95-72
		1/19/88	Raritan oil	59647	275.13		10-81
		1/18/88	SOS	586728	16.20		10-36
		1/20/88	LORICON	23103	142.50		10-34
		1/15/88	RARITAN oil	99865	88.76		10-81
		1/23/88	UPS	012388	70.16		95-88
		1/27/88	ARA	239122	28.45		95-72
		2/13/88	BELL ATLANTIC lease	02/88	125.20		95-69
	Accrue	1/88	PSE&G	JAN 88	3554.37 1410.54		10-67 10-68
		1/21/88	ACETYLENE SUPPLY	115846	26.99		10-81

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

15

Received and Inventoried _____
AMC-DENVER, CO.

LEHMAN 00953

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE 1/29/88

Page 2 of 2

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	~~B.A.~~ Account Number
		2/1/88	A+S	806	79.50		10-69
		1/28/88	Somerset	8860	224.30	88-07	10-36
		12/16/87	Lonicon	22969	114		10-34

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

$7,783.73

Received and Inventoried

AMC-DENVER, CO.

3

LEHMAN 00954

30550010 von F.
30550008 Ross L.

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 50
Effective 5/1/85

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Mill Expense-CIM Talc & Clay	9275				SLIC Fac			
Milling		10						
Crude-Used		*	5					
Labor-Milling Operations			10				35	
Labor-Quality Assurance			11				35	
Labor-Travel Time			13				35	
Labor-Maintenance & Repairs			14				35	
Benefit Plans and Payroll Taxes			15					
Bonuses and Incentive Comp.			17					
Miscellaneous Freight			20					
Safety and Health Expense-Labor			21				35	
Safety and Health Expense-Education Labor			22				35	
Safety and Health Expense-Other			24				35	
Sample Analysis-Outside			34					
Maintenance and Repairs-Outside			35				35	
Repair Parts			36				35	
Employee Special Benefits			38					
Small Tools			46					
Permits and Licenses			60					
Demurrage			65					
Electric Power			67					
Fuel & Water			68					
Equipment Rentals			69					
Short-term				1				
Long-term				2				
Supplies-Bags			71					
Supplies-Packing Materials			72					
Supplies-Chemicals			74					
Supplies-Laboratory			75					
Supplies-Other			76					
Equipment-Fuel			80				35	
Equipment-Lubrication			81				35	
Other Direct Charges			95					
Charges from Other Operations			97					
Loaned Employees								
Labor-Milling Operations				10				
Benefit Plans and Payroll Taxes				15				
Educational Assistance				18				
Travel				62				
Entertainment				64				
Other				95				

Form 26-000 (4-85)

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 71
Effective 2/1/87

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Pri.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Milling Expense-CIM Talc & Clay-Cont'd	9275				SLIC Fac			
Travel				62				
Entertainment				64				
Other				95				
Charges to Other Companies			98					
*The following Primary Subaccounts are authorized for use by the Clay Division:								
#1 Mill		12						
#2 Mill		14						
#3 Mill		16						
Bagging Facility		18						
Bulk Loading Facility		20						
Mine Overhead Summary-Coal Operations	9276				SLIC Mine			
Clearings from Memorandum Account			100					

Form 26-1000 (6-85)

Cyprus Minerals Company
and Subsidiary Companies

Bulletin No. 71
Effective 2/1/87

Chart of Accounts

COST OF SALES	Coding Requirements							
	Main Acct.	Sub Account Prl.	Sub Account Sec.	Spec. Anal.	Cost Center Ident.	Qty	Special Codes Required	Special Codes Opt.
Milling Exp.-CIM Talc & Clay-Cont'd	9275				SLIC Fac			
Charges to Other Operations			98					
General Milling (Fixed Costs)		95						
Labor-Salaried			10					
Benefit Plans and Payroll Taxes			15					
Educational Assistance			18					
Telecomm.-Radio/Microwave			30					
Telecommunications-Voice			32					
Telecommunications-Data			33					
Consultants Fees			50				2	
Other				1				
Ex-Employees				2				
Consultants Reimbursable Exp.			52				2	
Outside Services-Other			55					
Agency Fees				5				
Other				10				
Permits and Licenses			60					
Employee Expense-Travel			62				7	
Travel Meals				1				
All Other Travel Costs				2				
Employee Expense-Entertainment			64				7	
Office Equipment Rent			69					
Short-term				1				
Long-term				2				
Rent-Premises			70					
Short-term				1				
Long-term				2				
Office Supplies			72					
Contributions			82				2,4	
Community Service				1				
Youth				2				
Health				3				
Education				4				
Culture and Art				5				
Civic and Community				6				
Other				9				
Memberships and Dues-								
Individual Employees			83				2,3,4	
Industry-Related Organizations				1				
Professional Organizations				3				
Training and Development			87					
Freight			88					
Other Direct Charges			95					
Charges from Other Companies			97					
Loaned Employees								
Labor-Salaried				10				
Benefit Plans & Payroll Taxes				15				

Form 26-1000 (6-85)

Form **W-9**
(October 1983)
Department of the Treasury
Internal Revenue Service

Payer's Request for Taxpayer Identification Number

Please print or type

Name as shown on account (if joint account, also give joint owner's name)

Address

City, State, and ZIP code

List account number(s) here (See instructions) ▶

PART I.—Taxpayer Identification Number

Enter the taxpayer identification number in the appropriate box. For most individual taxpayers, this is the social security number.

Note: *If the account is in more than one name, see the chart on page 2 for guidelines on which number to give the payer.*

Social security number

OR

Employer identification number

PART II.—Backup Withholding On Accounts Opened After 12/31/83

Check the box if you are NOT subject to backup withholding under the provisions of section 3406(a)(1)(C) of the Internal Revenue Code ▶ ☐

(See Highlight below.)

Certification.—Under the penalties of perjury, I certify that the information provided on this form is true, correct, and complete.

Signature ▶ Date ▶

Instructions *(Section references are to the Internal Revenue Code.)*

Highlight for Interest or Dividend Accounts Opened After 12/31/83—Backup Withholding

You may be notified that you are subject to backup withholding under section 3406(a)(1)(C) because you have underreported interest or dividends or you were required to but failed to file a return which would have included a reportable interest or dividend payment. If you have NOT been so notified, check the box in PART II. **Note:** Backup withholding may apply to existing accounts as well as accounts opened after December 31, 1983.

Caution: There are other situations where you may be subject to backup withholding. Please read the instructions below carefully.

Purpose of Form

Use this form to report the taxpayer identification number (TIN) of the record owner of the account to the payer (or broker).

Beginning January 1, 1984, payers must generally withhold 20% of taxable interest, dividend, and certain other payments if you fail to furnish payers with the correct taxpayer identification number (this is referred to as backup withholding). For most individual taxpayers, the taxpayer identification number is the social security number.

To prevent backup withholding on these payments, be sure to notify payers of the correct taxpayer identification number and, for accounts you open after December 31, 1983, properly certify that you are not subject to backup withholding under section 3406(a)(1)(C).

You may use this form to certify that the taxpayer identification number you are giving the payer is correct and, for accounts opened after December 31, 1983, that you are not subject to backup withholding.

If the payer provides a different form than Form W-9 to request the taxpayer identification number, please use it.

Backup Withholding

You are subject to backup withholding if:

(1) You fail to furnish your taxpayer identification number to the payer, OR

(2) The Internal Revenue Service notifies the payer that you furnished an incorrect taxpayer identification number, OR

(3) You are notified that you are subject to backup withholding (under section 3406(a)(1)(C)), OR

(4) For an interest or dividend account opened after December 31, 1983, you fail to certify to the payer that you are not subject to backup withholding under (3) above, or fail to certify your taxpayer identification number.

For payments other than interest or dividends, you are subject to backup withholding only if (1) or (2) above applies.

(See the section on the back titled "Payees Exempt from Backup Withholding.")

Payments of Interest, Dividends, and Patronage Dividends

Accounts Opened Before January 1, 1984

To certify that the taxpayer identification number is correct for accounts opened before January 1, 1984, fill out your name and address, enter your account number(s) (if applicable), complete Part I, sign and date the form and return it to the payer.

Accounts Opened After December 31, 1983

To certify that the taxpayer identification number is correct and that you are not subject to backup withholding under section 3406(a)(1)(C) for accounts opened after December 31, 1983, fill out your name and address, enter your account number(s) (if applicable), complete Parts I and II, sign and date the form and return it to the payer.

If you are subject to backup withholding and are merely providing your correct taxpayer identification number to the payer, fill out your name, address, enter your account number(s) (if applicable), and complete Part I.

Other Payments

If you are merely providing your correct taxpayer identification number to the payer for payments other than interest, dividends, and patronage dividends, you need not sign this form. Fill out your name and address, enter your account number(s) (if applicable), complete Part I and return the form to the payer.

Account Numbers

If you have more than one account with the same payer (for example, a savings account and a certificate of deposit at the same bank), the payer may request a separate Form W-9 for each account depending on how the payer's records are kept.

What Number to Give the Payer

Give the payer the social security number or employer identification number of the record owner of the account. If the account belongs to you as an individual, give your social security number. If the account is in more than one name or is not in the name of the actual owner, see the chart on page 2 for guidelines on which number to report.

Obtaining a Number

If you don't have a taxpayer identification number or you don't know your number, obtain **Form SS-5**, Application for a Social Security Number Card, or **Form SS-4**, Application for Employer Identification Number, at the local office of the Social Security Administration or the Internal Revenue Service and apply for a number. Write "applied for" in Part I in place of your number. When you get a number, submit a new Form W-9 to the payer.

(Give this form to the payer, not to the Internal Revenue Service)

Form W-9 (10-83)

WORKSHEET

		SLIC	MINE or FACILITY
Bags	- 1610-001	9271-461	
Pallets	- 1610-003	9271-464	
Boards	- 1610-005	9271-464	
Reagents	- 1610-007	9271-462	
Fuel	- 1610-072	9271-463	

Quantity Purchased		1984 Standard Cost			Charge To:
_____	X	_____	=	$ _____	1610-XXX

Less Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

Cyprus Industrial Minerals Company
Division of Cyprus Minerals Company

March 9, 1987

Pat Bramlett, Cartersville, GA
Phyllis Brantley, Sandersville, GA
Gail Butler, Sylacauga, AL
Beverly Dauzat, Baton Rouge, LA
Paula Davis, Cartersville, GA
Carol Downey, South Plainfield, NJ
Jack Ferrell, Waterville, ME
Pat Jones, Three Forks, MT
Janelle LaFavor, Alder, MT
Linda Lawrence, Gleason, TN
Jane Littlejohn, Smithland, KY
Flora Meester, Grand Island, NE
Nora Reeves, Alpine, AL
Terri Wilkins, Yellowstone, MT
Desiree Williams, Los Angeles, CA
Brenda Young, Aiken, SC

Correct Procedure for Submitting Invoices to Denver for Payment

Coding:

1. The stamp provided by Denver must be used.
2. Write the codes directly under the proper account headings, i.e.

BA # 112233

Company Code	Main	Prim	Sec	Sp Analysis	Cost Center	Spec Codes	Amount
333	9275	010	0036	-	31025300	-	$17.34

3. Be sure to get the correct signature for authorization.
4. Always include the BA#, or the BA# request if coding an invoice for a new vendor.

BA#s:

1. Use correct BA#.
2. If no BA#, call the vendor for Federal Tax ID# or SS# and include this information with the invoice sent to Denver. This is the responsibility of the location, not Denver.

Invoices:

1. Highlight - Invoice #
   Due date or terms
   Amount due before taxes
   Tax amount (Total)

AC-SubmInv

CYPRUS

Freight amount
Total Invoice amount
Remit to address and note if there are any changes

2. Staple small invoices to 8-1/2 x 11" paper. (One invoice only per page).

Send to Denver:

1. Alphabetize each batch.
2. Batches are to be sent at least three times/week. DO NOT HOLD INVOICES.

Accrual of invoices at month end -

Any unpaid invoice of $500.00 or more at month end must be accrued. This would include:

1. Any invoice still in the possession of the location on the fifth workday for an expense incurred in the prior month, and
2. Any invoice in transit to Denver on the fifth workday.

If a location has in their possession, or knows of an in-transit, on the fifth workday, any invoice over $500.00 for the previous month, the location must advise CAPS in Denver of the accrual, including proper coding, BA# and amount.

You have been doing a great job. Thank you for your cooperation. Let us know if you have any questions or suggestions.

S.K. Noel

S.K. Noel
Mail Code S160

SKN/btb

C.R. Andrews, Mail Code S162
R.J. Buettner, Mail Code S246

AC-SubmInv

February 16, 1988

DISTRIBUTION

Accounts Payable

The first of December, I distributed a procedure relating to the transmittal of accounts payable batches to Denver. For the most part this is working fine with the following exceptions:

1. Point 4 of the procedure referenced the sending of a copy of the monthly batch log, kept by the location, with the last batch of the month. For compliance to Internal Audit findings and recommendations this item is required.

2. Since the Batch Header Record requires a batch total, an adding machine tape should be included in the batch. This will provide for faster troubleshooting if batch totals and computer totals don't agree. If you don't have an adding machine with a tape, please get one to use.

Fine tuning procedures is an on going process. Your continued cooperation is greatly appreciated in establishing and maintaining proper controls. If you have any questions, please contact me.

C. R. Andrews

C.R. Andrews, S218

CRA/fjz

M.D. Aydt, 321C
R.J. Buettner, S246
J.P. Close, Grand Island, NE
T.F. Deems, Cartersville, GA
G.R.M. Dugan, Three Forks, MT
F.F. Hutchison, Sylacauga, AL
J.M. Hooks, Sandersville, GA
G.C. Jeske, Yellowstone, MT
C.W. King, S160
T.D. Landels, Gleason, TN
M.J. Lorang, S250
J.W. Massari, Aiken, SC
G.R. McCloskey, Smithland, KY
R.G. Morris, Cartersville, GA
T.C. Rhodes, S228
C. Ross, Cartersville, GA
M.B. Toelle, Alder, MT
O.P. Wren, Baton Rouge, LA

BA-Memo:31

DISTRIBUTION

K. Benson, Baton Rouge, LA
P. Brantley, Sandersville, GA
J. Ceranowicz, S155
R. Cole, S159
N. Davis, Alpine, AL
C. Downey, S. Plainfield, NJ
J. Felger, S249
N. Johnson, Sylacauga, AL
P. Jones, Three Forks, MT
J. LaFaver, Alder, MT
L. Lawrence, Gleason, TN
J. Littlejohn, Smithland, KY
M. Miller, Cartersville, GA
F. Meester, Grand Island, NE
M. Ricardo, S155
C. Schwetz, S149
L. Smith, Smithland, KY
A. Thompson, Waterville, ME
T. Wilkins, Cameron, MT
B. Young, Aiken, SC

LEHMAN 00963

December 1, 1987

DISTRIBUTION

Accounts Payable Procedure

In response to an internal audit point relating to the control of invoice batches, a new procedure will be effective for December 1987 business. This procedure is necessary to insure receipt of all invoice batches by the Denver accounting staff.

Currently, certain locations include a "Batch Header Record" and/or an "Invoice Transmittal" with the invoices which are sent to Denver for processing. Starting with December's business, use the following guidelines:

1. With each group of invoices include a "Batch Header Record" only. An invoice transmittal is not needed.

2. Using the attached form, fill out the fields indicated by the arrows. Leave the other fields blank.

3. Maintain a sequentially numbered batch log. The batch number should consist of a two (2) digit business month and a three (3) digit batch number. Some examples of this numbering system would be:

3rd batch of February	02-003
15th batch of October	10-015

   Each location can maintain their batch numbering logs independent of other locations.

4. At month-end, send a copy of the batch log with the last batch of invoices to be included in that business month.

5. Maintain the current procedure for accruals of invoices received after the last batch has been sent but prior to the close of the business month.

If you have any questions or comments regarding this procedure, please feel free to call me at extension 5340.

C.R. Andrews

C.R. Andrews fb

M.D. Aydt, 321C
R.J. Buettner, S246
J.P. Close, Grand Island, NE
T.F. Deems, Cartersville, GA
G.R.M. Dugan, Three Forks, MT
F.F. Hutchison, Sylacauga, AL
J.M. Hooks, Sandersville, GA
G.C. Jeske, Yellowstone, MT
T.D. Landels, Gleason, TN
M.J. Lorang, S250
J.W. Massari, Aiken, SC
G.R. McCloskey, Smithland, KY
R.G. Morris, Cartersville, GA
T.C. Rhodes, S228
M.B. Toelle, Alder, MT
O.P. Wren, Baton Rouge, LA

FB-ActPay:1

COMPANY _____

LOCATION # 29 South Plainfield, N.J.

BATCH _____

CYPRUS INDUSTRIAL MINERALS

Invoice Transmittal

DATE _____

Page _____ of _____

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	Business Associate Number

* These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC-DENVER, CO

LEHMAN 00965

1986

CYPRUS INDUSTRIAL MINERALS COMPANY

PACKAGING SUPPLIES

MONTH ENDING _____

LOC. # 29 South Plainfield

1	2	3	4	5	6	7	8	9	10
Description	Opening Balance	Purchases	Transfers In (Out)	Loc.#	Usage	Ending Balance	Std.	Value Usage	Value Ending Balance
Wood Pallets					6.07		5.76 ea		
Cardboard					.57		.54 ea		
Adhesive					.36		.341/ lb		
Stretch Wrap - 50"					89.52		85.35/ roll		
Stretch Wrap - 60"					107.55		102.43/ roll		
TOTALS									

1986

CYPRUS INDUSTRIAL MINERALS

BAG USAGE REPORT

MONTH ENDED _____

Location 29 South Plainfield

1987 Std

1	2	3	4	5	6	7	8	9	10	11
DESCRIPTION	SPEC. NO.	OPENING BALANCE	PURCHASES	TRANSFERS IN (OUT)	TRANSFERS LOC. NO.	USAGE	ENDING BALANCE	STD. PER M	VALUE USAGE	VALUE ENDING BALANCE
Roller Mill	0501					180.10		172.34		
Vertical Mill	1002					225.75		235.89		
Semi-Bulk	-					29.7¼		29.76/ ea		
TOTALS										

1986

CYPRUS INDUSTRIAL MINERALS COMPANY

CHEMICALS

MONTH ENDING _____

LOC. # 29 South Plainfield

1987 std.

1	2	3	4	5	6	7	8	9	10
Description	Opening Balance	Purchases	Transfers In/ (Out)	Loc.#	Usage	Ending Balance	Std.	Value Usage	Value Ending Balance
Zinc Stearate					1.34 lb.		1.34/lb		

Date 1-14-87

Telecommunication
Form 16-188 (1-76)

Call Number or Cable Code

To:

Company, City and Street Address

Message Number (If Applicable)

For (Name of Recipient)
Keith

1987 inventory standards are attached.

New stds. are handwritten. Typewritten

copies to follow.

Joanne

Company		Approved By	
Initiated By	Typed By	Phone Number	Mail Code

Special Instructions:

WORKSHEET

		SLIC	MINE OR FACILITY
BAGS	1610-001	9271-461	
PALLETS	1610-003	9271-464	
BOARDS	1610-005	9271-464	
REAGENTS	1610-007	9271-462	
FUEL	1610-072	9271-463	

QUANITY PURCHASED		1987 STANDARD COST		CHANGE TO:
_____	X	_____	$_____	1610-XXX

LESS ACTUAL INVOICE AMOUNT (Including Frieght) _____

$_____ 9271-XXX

PURCHASE PRICE VARIANCE

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greaterthan standard, a debit to 9271-XXX is necessary.

WORKSHEET

		ELEC	MINE or FACILITY
Bags	- 1610-001	9271-461	
Pallets	- 1610-003	9271-464	
Boards	- 1610-005	9271-464	
Reagents	- 1610-007	9271-462	
Fuel	- 1610-072	9271-463	

Quantity Purchased		1984 Standard Cost		Charge To:
_____	X	_____	= $ _____	1610-XXX

Less: Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

WORKSHEET

		SLOC	NAME OF FACILITY
Bags	- 1610-001	9271-461	
Pallets	- 1610-003	9271-464	
Boards	- 1610-005	9271-466	
Reagents	- 1610-007	9271-462	
Fuel	- 1610-072	9271-463	

Quantity Purchased | 1984 Standard Cost | Charge To

_____ X _____ = $ _____ 1610-XXX

Less: Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

WORKSHEET

		SLIC	MINE OR FACILITY
Bags	- 1610-001	9271-461	
Pallets	- 1610-003	9271-464	
Boards	- 1610-005	9271-464	
Reagents	- 1610-007	9271-462	
Fuel	- 1610-072	9271-463	

Quantity Purchased	1984 Standard Cost		Charge To
_____	X _____	= $ _____	1610-XXX

Less Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

LEHMAN 00973

WORKSHEET

		PLIC	NTHE CT FACILITY
Bags	- 1610-001	9271-461	
Pallets	- 1610-003	9271-464	
Boards	- 1610-005	9271-464	
Reagents	- 1610-007	9271-462	
Fuel	- 1610-072	9271-463	

Quantity Purchased		1984 Standard Cost		Charge To:
_____	X	_____	= $ _____	1610-XXX

Less: Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

WORKSHEET

			ELIC	MINE or FACILITY
Bags	- 1610-001	9271-461		
Pallets	- 1610-003	9271-464		
Boards	- 1610-005	9271-464		
Reagents	- 1610-007	9271-462		
Fuel	- 1610-072	9271-463		

Quantity Purchased		1984 Standard Cost			Charge To:
_____	X	_____	=	$ _____	1610-XXX

Less Actual Invoice Amount (Including Freight) _____

Purchase Price Variance $ _____ 9271-XXX

If the actual invoice amount is less than standard, a credit to 9271-XXX is necessary.

If the actual invoice amount is greater than standard, a debit to 9271-XXX is necessary.

Technical Service Laboratory Request

Requested K.B.LEHMAN Company (customer) DARTCO MFG.

Location #29 SO.PLAINFIELD, N.J. Date:

Approved by: Completion date

1. Description of problem and assistance required.

BULK SUPRA CUSTOMER REQUIRES ACID SOLUBLES & LOI IN ADDITON TO NORMAL QUALITY CONTROL TESTING.

2. Samples and identification.

SUPRA BULK
LOT#
ACFX

3. Expected benefits to be gained ($, annual tonnage, etc)

Type of request

__customer complaint __Competitive product analysis

__Customer trial __Quality check

__Customer assistance __Other

Sample disposition

__Retain 3 month __Discard after testing __Keep for referance

Project number: Lab sample number:

Project Manager: Key word (s):

Approved by: urgent / 1 wk / 2 wks / 3 wks / 4 wks

DATE:

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE _____ Page _____ of _____

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____
AMC--DENVER, CO.

LEHMAN 00977

COMPANY Cyprus Industrial Minerals

INVOICE TRANSMITTAL

LOCATION #29 South Plainfield, N.J.

DATE _____ Page _____ of _____

* Date Accepted	* Batch Number	Invoice Date	Vendor	Invoice Number	Invoice Amount	P.O. Number	B.A. Number

*These columns are to be used by Corporate Headquarters and Accounts Payable Teleprocessing Locations Only.

Received and Inventoried _____

AMC-DENVER, CO.

LEHMAN 00978

FORM LETTERS

LEHMAN 00979

Your street address
Your city, state, zip
Current date

Mr. Joseph Brown, President
Apex Line Corporation
2111 South Street
South Amboy, NJ 08879

Dear Mr. Brown:

At this time, I would like to thank you for the warm reception I received during my interview at your office last Thursday.

It was a pleasure speaking with you about the many operations of your company and the specific tasks involved in the position you are presently inverviewing for.

I look forward to hearing from you in regard to your decision on the applicant chosen to fill the vacancy. If you should desire any further information, you may reach me at the above address or by telephoning (201) xxx-xxxx anytime after 6:00 p.m. Monday through Friday.

Thank you once again for a most delightful visit.

Sincerely yours,

(Miss) Kathy Brown

2110 Forrest Drive
Oconomowoc, WI 53916
November 28, 1978

Mr. Samuel S. Sawyer
Personnel Director
Bentura Enterprises
1012 Kewanee Street
Racine, WI 53916

Dear Mr. Sawyer:

Will you please consider me an applicant for the position of secretary to your Vice President of Marketing and Research. Dr. William St. Croix suggested that I write you, for he believes I have the necessary qualifications for the position.

On April 9, I shall be graduated from Waukesha Community College with an Associate in Business degree with a major in administration secretarial science. My grade point average has been 3.6 or higher, and I have developed to a superior level the stenographic skills necessary for an administration secretarial position.

I am presently employed on a part-time basis as assistant to Mrs. Sara Allen, secretary to the president of Dyer Motors, Inc. This position has provided excellent experience in using my shorthand and transcription skills.

You will find my personal data sheet, which will give you more complete information about my background and qualifications, enclosed with this letter. At your convenience, I shall be glad to come to your office to discuss the position and the reasons for my interest in a career with Bentura Enterprises.

Sincerely yours,

Dale C. Bennett

Enclosure

safety-kleen.

Sample form

ATTENTION: PERSONNEL ADMINISTRATOR

RE: Jesse Mannon

SOC. SEC. #: 135 -40-5685

The applicant referenced herein is being considered for employment as a _____.
As indicated below, the applicant has authorized all previous employers to furnish any information concerning personal character and employment records.

Only through a frank exchange of information concerning applicants are we able to reduce turnover; given sufficient knowledge of prospective employees' weaknesses, we are able to develop the employee more readily and prevent his failing in his new work.

If you will kindly complete the reverse side of this form in the same manner you would expect us to complete it for you, it will be greatly appreciated. Please be assured that we will be most happy to supply you with similar information upon request.

Very truly yours,

Vicky Moon

Personnel Representative

AUTHORIZATION: I hereby authorize any of my former employers to furnish Safety-Kleen Corp. with any information they may have concerning me whether on record or not, and do hereby release such employers and Safety-Kleen Corp. from all liability for any damage whatsoever for issuing such information.

DATE: 6/8/83 SIGNATURE: Jesse C. Mannon

655 BIG TIMBER ROAD ELGIN, ILLINOIS 60120 PHONE 312/697-8460

TO BE COMPLETED BY FORMER EMPLOYER:

1. Dates of employment: from _____ to _____

2. Title or position: _____

3. Salary: _____ per hour _____ per week _____ per month

4. Reason for separation: _____

_____

_____

5. Eligible for rehire: _____ yes _____ no.

If no, please explain: _____

_____

_____

_____

6. Please comment on the following:

DEMONSTRATED ABILITY:	_____ GOOD	_____ FAIR	_____ POOR
ATTITUDE:	_____ GOOD	_____ FAIR	_____ POOR
ATTENDANCE:	_____ GOOD	_____ FAIR	_____ POOR
PUNCTUALITY:	_____ GOOD	_____ FAIR	_____ POOR
GENERAL CHARACTER & CONDUCT:	_____ GOOD	_____ FAIR	_____ POOR

7. Any additional comments you might have that would assist us with the proper placement of this applicant:

_____

_____

_____

_____

DATE: _____ POSITION: _____

SIGNATURE: _____

ASSEMBLING AND INSERTING A CARBON PACK

Place the sheet on which the carbon (file) copy is to be made flat on the desk; then place a sheet of carbon paper, carbon side down, on top of the paper. Finally, place the sheet for the original on top of the carbon paper.

Pick up the papers and tap them lightly on the desk. Insert the pack into the machine, carbon side toward you as you insert the papers. Roll the pack in far enough for the feed rolls to grip the papers; then operate the paper-release lever to eliminate possible wrinkles.

Scotch® 7664 "Post-it" Routing-Request Pad

ROUTING - REQUEST

Please

- ☐ READ
- ☐ HANDLE
- ☐ APPROVE

and

- ☐ FORWARD
- ☐ RETURN
- ☐ KEEP OR DISCARD
- ☐ REVIEW WITH ME

To MODEL LETTER for Employment VERIFICATION

Date _____ From _____

PERSONAL DATA SHEET

NAME: Mary R. Jones

AGE: 18

ADDRESS: 747 Marion Street
Palo Alto, California 94303

OCCUPATION: Student

TELEPHONE: 415 323 8126

HEALTH: Excellent

MARITAL STATUS: Single

HEIGHT: 5' 6"

WEIGHT: 125 lbs.

TYPE OF WORK DESIRED: General office work and typing

SCHOOLS ATTENDED: Van Auken Elementary School
Palo Alto, California

Jordan Junior High School
Palo Alto, California

Palo Alto High School
Palo Alto, California

SUBJECTS: Typewriting, two years
Filing, one semester
Office Machines, one semester
Business English, one semester
Business Mathematics, one semester
General high school requirements for graduation in June

EXPERIENCE: In-school work experience, one semester
Worked in counselor's office typing record cards and filing them
Typed student reports made by counselor

Attended work experience program at Shell Data Center, Menlo Park, California. This program gave me one semester of office work including billing, filing, typing statistical reports, and typing general correspondence.

ACTIVITIES: Vice President of Palo High School Business Club
Member of California Youth Symphony
Tennis

REFERENCES: (by permission)

Mr. John Jackson, Counselor, Jordan Junior High School
Mr. James Dickinson, Personnel Director, Shell Data Center
Mrs. Olive Smith, Business Teacher, Palo Alto High School

19 x 28 1/4 x 4 1/4
FITS 40 x 46 5 [illegible]

RM

19 x 22 3/4 x 3 3/4
FIT GMA 40 x 48

19 x 23 x 3 1/2 [illegible]

Oxford Pendaflex

STOCK No. 752 1/3

MADE IN U.S.A.

FORM 01-10-68 R

ST REGIS PAPER COMPANY

BAG PACKAGING DIVISION

150 East 42nd Street, New York, N.Y. 10017

INVOICE

PROD. DATA

OUR ORDER NO. (1)	ITEM (2)	CUSTOMER ORDER NO. (3)	INVOICE NO.	INVOICE DATE	PAGE
NYK-3145	0 F	3019	12-132-324	7 2 7%	0 F

SALES CODE (7)	SHIP FROM (8)	DATE SHIPPED	SHIPPED PART	SHIPPED COMP.	SHIPPED VIA
32796-01	NAZARETH, PA.	6 28 7%		C	WALLS FAST MOTOR FRT.

SOLD TO (13)
METROPOLITAN TALC CO., INC.
MERCHEN & HARMON BDS.
S. PLAINFIELD, N.J. 07080

SHIP TO (SAME AS SOLD TO UNLESS SHOWN) (16)

BILL OF LADING NO. 9609

CAR INITIAL AND NO.

IF CONVENIENT PLEASE REMIT TO
St. Regis Paper Co.
P. O. Box 8079
Church Street Station
New York, N. Y. 10008

TERMS (17)	FREIGHT (18) PPD.	FREIGHT (18) COLL.	F. O. B. (19)
2-10-30		X	CRAWFORD CPA

DESCRIPTION	QUANT. SHIPPED	PRICE PER M	PRICE PER UNIT	NO. OF UNITS	AMOUNT
16½ x 24½ FUEL FLAP WKM BGS 25-54-30-27	522	135.60	$ Mls.	Mo. ALL.	77.76 (1.19) 76.57
FRT. ALLOWANCE ON 29# = 1.19					

86.14

dis taken in error

AUG 9 1971

IF REMITTANCE MADE IN 10 DAYS, DISCOUNT 1 % ON $ 76.57 = $ .77 DISCOUNT

"ST.REGIS PAPER COMPANY, THE MANUFACTURERS OF THE GOODS DESCRIBED IN THIS INVOICE, HEREBY CERTIFY THAT THESE GOODS WERE PRODUCED IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF SECTIONS 6, 7 AND 12 OF THE FAIR LABOR STANDARDS ACT, AS AMENDED, AND OF REGULATIONS AND ORDERS OF THE UNITED STATES DEPARTMENT OF LABOR ISSUED UNDER SECTION 14 THEREOF."

2—DUPLICATE

UNION CAMP CORPORATION
P.O. BOX J, NEW HOPE, PA 18938

SALES ORDER

(REPRINT** VERSION = 2)
MFR & SHIP W/O APRIL 18

OUR ORDER NO.	ORDER DATE	CUST. ORDER NO. & DATE	DEST	BR.	AGT.	CUST.	SOR	S'MAN	WEEK
33 44356 01 01 09	03 24 83	45085	289073	000		229940	1144	07	JB

SOLD TO
CYRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SOUTH PLAINFIELD NJ 07080

SHIP TO (SAME AS SOLD TO UNLESS OTHERWISE SHOWN)
SAME
METUCHEN AVE & HARWICK RD
SOUTH PLAINFIELD NJ 07080

1% 10 DAYS, NET 30 ON SALES VALUE LESS FRT
FOB NEW HOPE T/L FRT ALLD TO 1.25 CWT

CASH DISC. TERMS
DELIVERY TERMS

DESCRIPTION	SIZE CODE	PRODUCT CODE	QUANTITY ORDERED	PRICE
N-1076-00 ROLLER MILL II	PVDO	173199	100.00 M	$.00 M
N10760 ROLLER MILL II				
19 X 22-1/4 T&B 4-1/4				-- -
PALLETS MW				8.25 E
CARTON TOPS				4.10 E

-BLUE
BLUE INK, PRT LOGO, CO. NAME & ADDRES & WT MARK ON EDGE OF BAG. PRT VLV ARROW & FCS. *NOTE: PRT TO BE S/A VERTICAL MILL BAG.(ZIP CODE ON BAG TO BE 80112

L 050 1041-0000 MWK
L 050 1041-0000 MWK
D 050 6210-0000 WHITE MWK REG.

4-1/4 URHV;3-1/2 REDUCED PE TUBULAR REINF INS INSERT EXT 8" FROM EDGE OF BAG;AOPHP;VVH: 06 X 06;UNITIE;
INSERT TO EXTEND 2" BEYOND LIP OF VALVE.
**********WATCH VVH. LARGE HOLES WILL RESULT IN COMPLAINT**********

40 X 40 (GMA)

MAIL INVOICES IN TRIPLICATE TO: P.O. BOX 3419
ENGLEWOOD COLORADO 80155
ATTN: JOANNE FELGER, RM 254-A

CUST NOTE:
THIS ORDER SUBJECT TO PRICE PREVAILING AT TIME OF SHIPMENT
S/A 33551-1 EXCEPT PRT & CONST
100 M 36900#
2 COPIES OF INV NO SPECIAL HANDLING

PRINT-DATE = 03/24/83 TIME : HOUR = 15 MINS : 42 SECS : (6)

THANK YOU FOR THIS ORDER — If this exact copy of our instructions to the factory does not conform with your understanding please correct us promptly. In writing, please refer to OUR ORDER NO. This order is accepted subject to the conditions printed on the back hereof.

X-89(

CUSTOMER'S COPY

Yours very truly,
UNION CAMP CORPORATION
P.O. BOX J, NEW HOPE, PA 18938

THIS ADDRESS FOR REMITTANCE ONLY

UNION CAMP CORPORATION
P.O. BOX 17002
NEWARK, N.J. 07194

NOTE NEW ADDRESS

Union Camp CORPORATION
D-U-N-S 130-6935

ORIGINAL INVOICE

RECEIVED MAY 04 1983

SPECIAL INSTRUCTIONS

PLT.	CUST. #	DIV.	ST.	CT.	AGT.	SOR SALESMAN	F.O.B.	FREIGHT	SHIPPED VIA	INVOICE DATE	INVOICE/BT #
09	229940	73	28	90	00	11440	7000	FULL FRT ALLD	OUR TRUCK	04 26 83	09-03738-01

TERMS: 1% 10 DAYS NET 30 ON SALES VALUE LESS FRT

SOLD TO: CYPRUS INDUSTRIAL MINERAL
651 METUCHEN ROAD

SOUTH PLAINFIELD NJ
07080

SHIP TO: SAME
METUCHEN AVE & HARWICK RD

SOUTH PLAINFIELD NJ
07080

(SAME AS SOLD TO UNLESS OTHERWISE INDICATED)

PRODUCT CODE	U.C. REF. # F	U.C. REF. # D	C OR P	*	CUST. ARTICLE/OR DESCRIPTION	CUST. ORDER NO.	UNIT	QUANTITY BILLED & SHIPPED PRICE	QUANTITY BILLED & SHIPPED UNITS	AMOUNT $
					33-44356-01-70 45085					
1731991	076			1	N 00 ROLLER MILL II	TW 38735	44	159.55	104975	16748.76
					19 X 22-1/4 T&B 4-1/4					
				5	PALLETS MW			8.25	44	363.00
				5	CARTON TOPS			4.10	44	180.40
					L 050 1041 0000 MWK					
					L 050 1041 0000 MWK					
					O 050 6210 0000 WHITE MWK REG.					
					PRINT ROLLER MILL II					
					ORDER TOTAL		44		104975	17292.16
			C		PREPAID FREIGHT	80.00			44659	
					172.12 ALLOWED IF PAID BY 05/06/83					17292.16

P/S take

APPROVED FOR PAYMENT BY: R J Buettner

DATE: 5-10-83

COMPANY CODE	MAIN	PRIM	SEC	SP ANAL	COST CENTER	SPEC CODES	AMOUNT
329	9271	466			32920029		17,292.16

* PRICED IN
0. N/C
1. M.
2. MSF
3. M & SU
4. MSF & SU
5. OTHER
6. LBS.
7. GALS.
8. TON
9. CWT.
A. LTN.
B. MTN.
C. LOT
D. ROLL
E. ADJ.

MAIL ALL REMITTANCES TO P. O. BOX ABOVE. INTEREST ON PAST-DUE INDEBTEDNESS WILL BE CHARGED AT 2% ABOVE PRIME RATE CHARGED BY NEW YORK CITY BANKS, BUT IN NO EVENT GREATER THAN THE MAXIMUM RATE PERMISSIBLE UNDER APPLICABLE LAW. "WE HEREBY CERTIFY THAT THESE GOODS WERE PRODUCED IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF SECTIONS 6, 7 AND 12 OF THE FAIR LABOR STANDARDS ACT AS AMENDED AND OF REGULATIONS AND ORDERS OF THE U. S. DEPT. OF LABOR ISSUED UNDER SECT. 14 THEREOF."

PLEASE PAY LAST AMOUNT IN THIS COLUMN

021

01

LEHMAN 00989

Union Camp CORPORATION

SALES ORDER

PLANT	SHIP	FACTORY DATE
NEW HOPE	MFR & SHIP W/O JULY 19	

OUR ORDER NO.	S.I.	ORDER DATE	CUST. ORDER NO. & DATE	CODES	SOR	S'MAN
32 | 33552 | 01 | 02		06 25 82	44985	28-90-00-000-229940	114	407

SOLD TO

CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
S. PLAINFIELD NJ 07080

SHIP TO (SAME AS SOLD TO UNLESS OTHERWISE SHOWN)

SAME
METUCHEN AVE & HARWICK RD
S. PLAINFIELD NJ 07080

1-10-30 ON SALES VALUE LESS FRT ← CASH DISCOUNT
FOB FACT T/L FRT ALLW TO 1.25 CWT DELIVERY TERMS

DESCRIPTION	PRODUCT CODE	Ms ORDERED
PVDO 22 X 25-1/2 B-4-1/2 4-1/2 INCH URHV	173199	38M

MADE FROM

L 40 MWK 1041
L 50 MWK 1041
O 50 FB WHITE

BRAND: VERTICAL MILL

PRINT

BLUE INK. PRT LOGO, COMPANY NAME & ADDRESS & WT MARK ON EDGES OF BAG PER SAMPLE IN OUR POSSESSION. PRT VALVE LOCATION ARROW & PCS.

MFG INSTR

EXTRA HEAVY UNITIE. 3-1/2" REDUCED PE TUBULAR INSERT. DEPTH OF INSERT 8" FROM EDGE OF BAG. INSERT TO EXTEND 2" BEYOND LIP OF VALVE. NO VVH. ADPHP ALL PLIES. PALLETIZE GMA REUSABLE PALLET, 40 X 48. CARTONS.

33552-01	CYPRUS IND.	PVDO 22 X 25-1/2 4-1/2	38M		VERTICAL MILL

FINISHING OUTURN OTHER

EST WT.
18012#
t

PRICE PREVAILING AT TIME OF SHIPMENT

CUST INV

MAILING

MAIL INVOICES IN TRIPLICATE TO:
P. O. BOX 3419
ENGLEWOOD CA 80155
ATTN: JOANNE HELGER, RM 254-A

CARTONS	$226.15/MA
GMA PALLETS	4.10 EA
	8.25 EA

THANK YOU FOR THIS ORDER — If this exact copy of our instructions to the factory does not conform with your understanding please correct us promptly. In writing, please refer to OUR ORDER NO. This order is accepted subject to the conditions printed on the back hereof.

Yours very truly,
UNION CAMP CORPORATION

FORM X-950

CUSTOMER'S COPY

BAG SPECIFICATIONS - South Plainfield, New Jersey

A. 19 x 22¼ x 4¼ Stepped End
2 40/NK - 1 50/FBW anti-skid
3½" Valve - poly sleeve
I.D. Printing Only
(19 x 29 Tube)

B. 21 x 24 x 5½ Stepped End
1 40/NK - 1 50/NK - 1 50/FBW
3½" Valve - poly sleeve
I.D. Printing Only
(21 x 32 Tube)

BAG SPECIFICATIONS - Alpine, Alabama

A. 18½ x 23 x 3½ Stepped End
2 40/NK - 1/50 FBW anti-skid
3½" Valve - poly sleeve
I.D. Printing Only
(18½ x 28½ Tube)

B. 19 x 22¼ x 4¼ Stepped End
2 40/NK - 1/50 FBW anti-skid
3½" Valve poly sleeve
I.D. printing Only
(19 x 29 tube)

C. 20½ x 25 x 3½ Stepped End
2 40/NK - 1/50 FBW anti-skid
3½" Valve - poly sleeve
I.D. Printing Only
(20½ x 30½ Tube)

D. 23½ x 29 x 3½ Stepped End
2 40/NK - 1 50/FBW anti-skid
3½" Valve - poly sleeve
I.D. Printing Only
(Tube - 23½ x 34½)

Amoco Location Bag Spec Number (Product Packaged)	Estimated 1982 Usage	Bag Type	Bag Size *Finished Length/* Top & Bottom Butt
Los Angeles (Continued)			
21-1001 (Vertical Mill--Domestic)	299,000	PVSE	20-1/2" x 25" 5-1/2"
21-1002 (Vertical Mill--Export)	11,000	PVSE	20-1/2" x 25" 5-1/2"
Sandersville			
53-0601-1 (Trademark)	105,000	PVSE	19" x 24-1/2"
53-0801-1 (Plain)	330,000	PVSE	20" x 25" 3-1/2"
53-0801-2 (Trademark)	525,000	PVSE	20" x 25" 3-1/2"
53-0803-1 (Export)	230,000	PVSE	20" x 25" 3-1/2"
53-0807-1 (White Trademark)	25,000	PVSE	20" x 25" 3-1/2"
53-0809-1 (Export)	25,000	PVSE	20" x 25" 3-1/2"
South Plainfield			
CYS-1 (29-0501) (Roller Mill)	375,000	PVSE	19" x 22-1/4" 4-1/4"
CYS-2 (29-1001) (Vertical Mill)	35,000	PVSE	21" x 24" 5-1/2"
CYS-3 (29-1002) (Vertical Mill)	N/A	PVSE	22" x 25" 4-1/2"
CYS-4 (29-1003) (Vertical Mill)	N/A	PVSE	21" x 23" 6-1/2"

LEHMAN 00993

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
5-1/2"--Crepe (Tuck-In)	3/50# Basis NK	Identification Printing
5-1/2"--Crepe (Tuck-In)	3/50# Basis NK 1/60# Basis NK	Identification Printing (+ Export Markings)
3-1/2"--Paper	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/2"--Paper	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/2"--Paper	4/50# Basis NK	Identification Printing
3-1/4"--Paper (White)	3/50# Basis Beater (All Plies White)	Identification Printing
3-1/4"--Paper (White)	4/50# Basis Beater (All Plies White)	Identification Printing
3-1/2"--Poly	2/40# Basis NK 1/50# Basis FBW	Identification Printing Ludox
3-1/2"--Poly	1/40# Basis NK 1/50# Basis NK 1/50# Basis FBW	Identification Printing Ludox
3-1/2"--Poly	1/40# Basis NK 1/50# Basis NK 1/50# Basis FBW	Identification Printing Ludox
3-1/2"--Poly	1/40# Basis NK 1/50# Basis NK 1/50# Basis FBW	Identification Printing Ludox

BEMIS COMPANY, INC.

January 28, 1986 LPM/hm

INDUSTRIAL BAG DIVISION
NORTHEAST SALES REGION
P.O. BOX 1380, CHAPEL PLACE
PEPPERELL, MA 01463-1380
TELEPHONE: (617) 433-8911
TELEX: 92-8425

Cypruss Industrial Minerals
Metuchen Road
South Plainfield, NJ 07080

Attn.: Mr. Keith Lehman

Dear Mr. Lehman:

Due to announced increases in the cost of paper and other materials, effective February 1st, it is necessary that we increase our multiwall prices approximately 7 percent, and small papers 4 percent, depending on the construction. These increases will be effective with shipments on and after March 1, 1986.

It has been over two years since we have had an increase. Your support at this time is very important if we are to remain a viable supplier.

Sincerely,

BEMIS COMPANY, INC.

Ludi P. Mayer
Manager
Northeast Sales Region

April 19, 1985

G. M. Dugan
R. Estrada
T. D. Landels
K. B. Lehman
M. R. McCune

Revised Bag Pricing

Attached are revised bag prices for your operation which became effective April 1, 1985. The lower prices resulted from a reduction in paper costs.

Joanne

J. S. Felger

jsf

Attachment

R. J. Buettner
M. J. Lorang

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
29-0501 Roller Mill 19 x 22 1/4 x 4 1/4	2/40 NK, 1/50 FBW	3 1/2" poly.
29-1002 Vertical Mill 22 x 25 1/2 x 4 1/2	1/40 NK, 1/50 NK, 1/50 FBW	3 1/2" poly.

NOTE: All of the above prices include anti-skid coating.

LEHMAN 00996

Effective: 04/01/85

LOCATION South Plainfield, N.J.

COST/M CARLOAD QUOTATION

PRINTING	Bemis	Union Camp		
ID.	$ 161.60	$ 147.35		
ID.	211.35	212.70		

Union Camp Corporation

SALES ORDER

PLANT: NEW HOPE | SHIP: MFR & SHIP W/O JULY 19 | FACTORY DATE:

OUR ORDER NO.	S.I.	ORDER DATE	CUST. ORDER NO. & DATE	CODES	SOR	SMAN
32 | 33552 | 02 | 02		06 25 82	44985	28-90-00-000-229940	114	407

SOLD TO

CYPRUSS INDUSTRIAL MINERALS
651 METUCHEN ROAD
S. PLAINFIELD NJ 07080

SHIP TO (SAME AS SOLD TO UNLESS OTHERWISE SHOWN)

SAME
METUCHEN AVE & HARWICK RD
S. PLAINFIELD NJ 07080

1-10-30 ON SALES VALUE LESS FRT ← CASH DISCOUNT
FOB FACT T/L FRT ALLD TO 1.25 CWT ← DELIVERY TERMS

DESCRIPTION	PRODUCT CODE	Ms ORDERED
PVDO 22 X 25-1/2 B-4-1/2 4-1/2 INCH URHV	173199	2M

MADE FROM
L 40 MNK 1041
L 50 MNK 1041
O 50 FB WHITE

BRAND: VERTICAL MILL

PRINT
BLUE INK. PRT LOGO, COMPANY NAME & ADDRESS & WT MARK ON EDGE OF BAG PER SAMPLE IN YOUR POSSESSION. PRT VALVE LOCATION ARROW & FCS.

MFG INSTR
EXTRA HEAVY UNITIE. 3-1/2" REDUCED PE TUBULAR INSERT. DEPTH OF INSERT 8" FROM EDGE OF BAG. INSERT TO EXTEND 2" BEYOND LIP OF VALVE. 6 X 6 VVH SMALL PIN (.040). AOPHP ALL PLIES. PALLETIZE GMA REUSABLE PALLET, 40 X 48. CARTONS.

NOTE: WATCH VVH PERFS. LARGE HOLES WILL RESULT IN COMPLAINT.

33552-02	CYPRUSS IND	PVDO 22 X 25-1/2 4-1/2	2M			VERTICAL MILL

FINISHING OUTTURN OTHER
EST WT.
948#
t

PRICE PREVAILING AT TIME OF SHIPMENT

CUST INV MAILING
MAIL INVOICES IN TRIPLICATE TO:
P. O. BOX 3419
ENGLEWOOD (CA) 80155
ATTN: JOANNE FELGER, RM 254-A

CARTONS	$226.75/M
GMA PALLETS	4.10 EA
	8.25 EA

THANK YOU FOR THIS ORDER — If this exact copy of our instructions to the factory does not conform with your understanding please correct us promptly. In writing, please refer to OUR ORDER NO. This order is accepted subject to the conditions printed on the back hereof.

Yours very truly,
UNION CAMP CORPORATION

FORM X-950

CUSTOMER'S COPY

GREAT PLAINS BAG CORPORATION
SUBSIDIARY OF CONTINENTAL CAN COMPANY, INC.
Reiser Ave. C.I.C. • Industrial Park
New Philadelphia, Ohio 44663 • 216/339-3311

PRODUCTION ORDER NO.—1:

SOLD TO	SHIP TO	CUSTOMER ORDER NO.—2
CYPRUS INDUSTRIAL MINERALS 651 METUCHEN ROAD SO. PLAINFIELD, N.J 07080	SAME DEL HRS. 7:00 AM - 3:00 PM CALL: 201-754-4880 IN ADVANCE	DATE RECEIVED—3 SHIPPING DATE—4

QUAN. ORDERED—7	PRICE—8	INV. INSTRUCTIONS—9	TERMS 1% 10 DAYS NET 30—10	SHIP VIA—11
				TRUCK ONLY

TERR 12	SMN. 13	CUST. NO. 14	S.A. 15	L.C. 16	ST. 17	O FR. 18	MF. 19	BC. T. 20	PCI 21	P.C.C. 22	WT/M-PA. 23	WT/M-PL. 24	C.P. BAC NO. 25	D.P. NO—26
04	14	C-795				1	3	36	30	803	0456	000.0	C-795-003-00-000	33356

DESC.

TYPE BAG—27	CONSTRUCTION—28
PVSE	2/50NK, 1/50FB

FACE WIDTH—29	GUSSET—30	FIN. LENGTH—31	PRINT LENGTH—32	TOP SIZE—33	BOTTOM SIZE—34	VALVE SIZE & LOC.—35	TYPE BOTTOM—36
21		23	30½	6½	6½	3½ URH	SIFTPROOF

PRINTING

BRAND NAME—37: 29-2123
BRAND NO.—38: C-795-3

COLOR AND INK NO.—39	FACE	EDG/CUS	BACK	TOP	BTM	FCS	INSTRUCTIONS:—40
BLUE GP 539	·	X	ID			BACK	PRINT VALVE ARROW. PRINT ABOVE FCS: 29-2124 (½" LETTERS) DATE, CUSTOMER PO#, 3/140, GP ORDER#. ID PRINT BELOW FCS.

PAK'G. & SHIP

QUAN./UNIT (SPECIFY TYPE UNIT)—41	HALF WRAP—42	FULL WRAP—43
2200/44 x 56 PALLET		

INSTRUCTIONS:—44

BOARDS _____ SHRINK WRAP X LABELS _____
BANDS _____ PAPER WRAP _____
BOX _____ STRING TIED _____ BALES WRAPPED _____
PICTURE FRAME UNDER SHRINK LOADED LOOSE _____ BALES UNWRAPPED _____

TUBING

WALL	WIDTH & BASIS WEIGHT - TYPE OF PAPER—45	WT/M	POUNDS USED
1 INSIDE	43 x 50 NK	152	
2	43 x 50 NK	152	
3	43 x 50 FB	152	
4			
5			
6			

SUBSTITUTIONS:—46
S— 800/.0639
K— 1350/.0379

TUBING: W & N— 8,988 S—
BOTTOM: W & H— 6100 S— 4400
SEWING:

ADHESIVE—47	GUSSET - STAGGER—48	SCORE—49
MP		

GRIP FAST—50	SPOT PASTING—51	SV NOTCH—52
MED	STD	

THUMB CUT. LOC.—53	PERF.—54	FRT. CLASS—55
	*SEE BELOW	

INSTRUCTIONS:—56
*ALL OVER 3/32" PIN HOLE PERFORATIONS ON 1" CENTERS ON INNER WALLS. OUTER WALL 3/32" PINS ON 1½" CENTERS.

CLOSING

TAPE SIZE—57	TAPE TYPE—58	TAPE COLOR—59	LOOPER THREAD—60	NEEDLE THREAD—61	FILLER CORD—62	TOS—63	SLEEVE TYPE—64
							POLYLOK

INSTRUCTIONS:—65
BAGS TO BE AS SIFTPROOF AS POSSIBLE

FOLD VTF-BTF

OTHER

SPECIAL INSTRUCTIONS:—66

#503

We have shipped today merchandise as described below. In case of damage or shortage, notify the carrier and have him note condition on the freight bill. Return this notice with freight bill, seal record and your tally to our New Hope Office so we may take the proper action for your protection.

MAY 19 Rec'd

UNION CAMP CORP.

Date: 5/19/82

Car No.

Routing: OUR TRUCK

Seal Nos.

Total Bales: Pallets: 33

Total No. of Bags: 102,255 Total Weight: 38,793

CONSIGNEE: CYPRUS INDUSTRIAL MINERALS
METUCHEN AVE. & HARNICK ROAD
S. PLAINFIELD N.J.

(ATTN. MR. VERN ALTUS)

ITEM NO.	1					2					3				
CUSTOMER ORDER NO.	45000					45000									
OUR ORDER NO.	33281-1					33281-1									
STYLE AND SIZE	PVDO 19 x 22-¼ B-4-¼ 4-¼ UHHV					PVDO 19 x 22-¼ B-4-¼ 4-¼ UHHV									
BRAND	PLAIN					PLAIN (DOUBLE TRAP)									
	NO. PALLETS OR BALES	WEIGHT	BAGS PER UNIT	TOTAL BAGS		NO. PALLETS OR BALES	WEIGHT	BAGS PER UNIT	TOTAL BAGS		NO. PALLETS OR BALES	WEIGHT	BAGS PER UNIT	TOTAL BAGS	
LOADED	30	1214	3200	96	000	1	1214	3200	3	200					
	1	750		1	975	1	409		1	080					
TOTALS	31	37,170		97	975	2	1,623		4	280					

PALLETS BOXES T & B

CUSTOMER

LEHMAN 00999

[redacted]

Amoco Minerals Company

October 16, 1981

V. W. Alltus
R. P. Arellanez
P. W. Hangas
T. D. Landels
M. R. McCune
P. E. Vierk

Multi-Wall Bag Purchases

The attached listing by specification shows current carload pricing by supplier for your respective plants. In accordance with supplier agreements negotiated by Standard Oil, revised pricing will be effective on January 1 or July 1 of each year. You will be notified of any price increases and the effective date of the increase as soon as we receive this information from Chicago.

The majority of your bags should be purchased from the low-priced supplier (highlighted on the attachment). The alternate supplier(s) should be used as a second source. All suppliers have committed to delivery within 45 days after placement of orders.

Letters have been sent to all suppliers requesting that invoices be sent to the attention of Joanne Felger in the Englewood office. In order to expedite payment of invoices, please be sure that you send her a copy of the purchase order when it is issued and that the "bill to" indicates that the invoice should be sent to her attention. When the bags are received, a TWX should be sent to Joanne indicating the date received, vendor, purchase order number, bag specification number and the quantity received. Locations not having TWX machines should communicate this information by telephone. After the invoices have been approved for payment, a copy will be sent to you for your files.

Please contact me if there are any questions regarding the above.

R. J. Buettner

RJB:jsf
Attachment

J. S. Felger
W. W. Gaskins

OCT 20 Rec'd

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
27-1106 Mistron Domestic-Wh. 22 x 35½ x 4	2/50,1/60 Beater White (water-soluble adhesive OR 3/50 Beater White	Full wrap-around beater white insert. with unpasted seam.
27-1201 Mistron ZSC 22 x 37 x 4½	2/50, 1/60 NK	Full wrap-around paper insert with unpasted seam.
27-1401-1 Mistron Dens./Class. 22 x 25½ x 4½	3/50 Beater White (water-soluble adhesive)	Full wrap-around beater white paper insert w/unpasted seam.
27-1401-2 Mistron Dens./Class. 22 x 25½ x 4½	3/50 NK (water-soluble adhesive)	Full wrap-around paper insert with unpasted seam.

LEHMAN 01001

03/17/82

LOCATION Grand Island, Nebraska (Page 2)

COST/M CARLOAD QUOTATION

PRINTING	Bemis	Union Camp		
ID (water-soluble ink).	$ N/A	$ 353.80		
	346.95	339.70		
ID.	*	248.00		
ID (water-soluble ink).	281.40	275.00		
ID (water soluble ink).	188.60	185.55		

* Price not provided.

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
27-0501 Roller Mill-Domestic 19 x 22¼ x 4¼	2/40, 1/50 NK	Poly seal.
27-0502P Roller Mill-Export 19 x 22¼ x 4¼	2/50, 1/60 NK inner plies; 1/50 white kraft outer ply	Full wrap-around white kraft insert with unpasted seam.
27-0505 USP/USP Dense 19 x 22¼ x 4¼	2/50, 1/60 NK inner plies; 1/50 white kraft outer ply	Full wrap-around white kraft insert with unpasted seam.
27-0506 Olympic 19 x 22¼ x 4¼	2/50, 1/60 NK inner plies; 1/50 white kraft outer ply	Full wrap-around white kraft insert with unpasted seam.
27-1102 Mistron Export 22 x 35½ x 4	2/50, 2/60 NK	Full wrap-around ext. paper insert with unpasted seam.
27-1104 Mistron Domestic-Brn. 22 x 35½ x 4	2/50, 1/60 NK (water-soluble adhesive)	Full wrap-around paper insert with unpasted seam.

LEHMAN 01002

03/17/82

LOCATION Grand Island, Nebraska

COST/M CARLOAD QUOTATION

PRINTING	Bemis	Union Camp		
ID.	$ 140.10	$ 142.95		
Export markings only.	209.10	213.80		
One side, one color.	214.45	217.45		
One side, one color.	214.45	217.45		
ID and export markings.	*	299.70		
ID (water-soluble ink).	243.05	238.45		

* Price not provided.

Cyprus Industrial Minerals Company

Purchase Order

555 South Flower Street
Los Angeles, California 90071
Telephone (213) 489-3700

Ship To:
Acknowledgement Requested

CYPRUS INDUSTRIAL MINERALS CO.
651 METUCHEN ROAD
SO. PLAINFIELD, N. J. 07080

Invoice in triplicate

Vendor

GREAT PLAINS BAG CORPORATION
~~48 SOUTH FRANKLIN TURNPIKE~~
~~HERITAGE III OFFICE CENTER~~
~~RAMSEY, NEW JERSEY 07446~~
~~ATTN: WILLIAM PETERS~~

To: →

To:
CYPRUS INDUSTRIAL MINERALS CO.
P.O. BOX 3419
ENGLEWOOD, COLORADO 80155

ATTN: JOANNE FELGER
M/C 254A

Date	Ship Via	Date Required	Terms
1/14/82	PREPAID	2/8/82	

Quantity Ordered	Quantity Received	Description	Unit Price	Total
40 PALLETS 100,000	BAGS	19 x 22-1/4		

Hi!! Joanne
For your info -
800 Commerce Drive
Oak Brook, Illinois 60521
Att: Dave McClintock
Have a fantastic 1982!
Dave McClintock

GREAT PLAINS BAG CO.

CODE 29-461

Approved

44852

Above order number must appear on all papers and packages relative to this order.

CYPRUS

GREAT PLAINS BAG CORPORATION
SUBSIDIARY OF CONTINENTAL CAN COMPANY, INC.
Reiser Ave. C.I.C. - Industrial Park
New Philadelphia Ohio 44663 - 216/339-3311

PRODUCTION ORDER NO.—1

CUSTOMER ORDER NO.—2

DATE RECEIVED—3

SHIPPING DATE—4

SOLD TO
CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SO. PLAINFIELD, N.J 07080

SHIP TO
SAME

DEL HRS. 7:00 AM - 3:00PM
CALL: 201-754-4880 IN ADVANCE

QUAN. ORDERED—7	PRICE—8	INV. INSTRUCTIONS—9	TERMS 1% 10 DAYS NET 30—10	SHIP VIA—11
				TRUCK ONLY

TERR	SMN.	CUST. NO.	S.A.	L.C.	ST. D	PR. MF.	BC. T.	PCI	P.C.C.	WT/M-PA.	WT/M-PL.	C.P. BAG NO.	O.P. NO—26
12 04	13 14	14 C-795	15	16	17	18 1	19 3	20 36	21 30	22 803	23 0322	24 000.0	25 C-795-002-00-000	33178

DESC.

TYPE BAG—27	CONSTRUCTION—28
PVSE	2/40NK, 1/50FB

FACE WIDTH—29	GUSSET—30	FIN. LENGTH—31	PRINT LENGTH—32	TOP SIZE—33	BOTTOM SIZE—34	VALVE SIZE & LOC.—35	TYPE BOTTOM—36
19		22½	27½	4¼	4¼	3½ URH	SIFTPROOF

PRINTING

BRAND NAME—37: 29-1922

BRAND NO.—38: C-795-2

COLOR AND INK NO.—39	FACE	EDG/GUS	BACK	TOP	BTM	FCS
BLUE GP 539		X	ID			BACK

INSTRUCTIONS:—40
PRINT VALVE ARROW.
PRINT ABOVE FCS:
29-1922 (½" LETTERS)
DATE, CUSTOMER PO#,
3/140, GP ORDER #.
ID PRINT BELOW FCS.

PAKG. & SHIP

QUAN./UNIT (SPECIFY TYPE UNIT)—41	HALF WRAP—42	FULL WRAP—43
2500/44 x 56 PALLET		

INSTRUCTIONS:—44

BOARDS ____ SHRINK WRAP X ____ LABELS ____
BANDS ____ PAPER WRAP ____ BALES WRAPPED ____
BOX ____ STRING TIED ____
PICTURE FRAME UNDER SHRINK LOADED LOOSE ____ BALES UNWRAPPED ____

TUBING

WALL	WIDTH & BASIS WEIGHT • TYPE OF PAPER—45	WT/M	POUNDS USED
1 INSIDE	39 x 40 NK	99	
2	39 x 40 NK	99	
3	39 x 50 FB	124	
4			
5			
6			

SUBSTITUTIONS:—46
S— 800/.0576
K— 1350/.0341
W & H— 6100
S— 4400

TUBING: W & H— 9576 S—

BOTTOM

SEWING

ADHESIVE—47	GUSSET • STAGGER—48	SCORE—49
MP		

GRIP FAST—50	SPOT PASTING—51	SV-NOTCH—52
MED	STD	

THUMB CUT. LOC.—53	PERF.—54	FRT. CLASS—55
	*SEE BELOW	

INSTRUCTIONS:—56
ALL OVER 3/32" PINHOLE PERFORATIONS ON 1" CENTERS ON INNER WALLS.
OUTER WALL 3/32" PINS ON 1½" CENTERS.

REDUCED

CLOSING

TAPE SIZE—57	TAPE TYPE—58	TAPE COLOR—59	LOOPER THREAD—60	NEEDLE THREAD—61	FILLER CORD—62	TOS—63	SLEEVE TYPE—64
							POLYLOK

INSTRUCTIONS:—65
BAGS TO BE AS SIFTPROOF AS POSSIBLE.
FOLD V F-BTF

OTHER

SPECIAL INSTRUCTIONS:—66

503

LEHMAN 01004

GREAT PLAINS BAG CORPORATION
SUBSIDIARY OF CONTINENTAL CAN COMPANY, INC.
Reiser Ave. C.I.C. - Industrial Park
New Philadelphia, Ohio 44663 - 216/339-3311

PRODUCTION ORDER NO.—1:

SOLD TO	SHIP TO	CUSTOMER ORDER NO.—2
CYPRUS INDUSTRIAL MINERALS 651 METUCHEN ROAD SO. PLAINFIELD, N.J 07080	SAME DEL HRS. 7:00 AM - 3:00PM CALL: 201-754-4880 IN ADVANCE	DATE RECEIVED—3 SHIPPING DATE—4

QUAN. ORDERED—7	PRICE—8	INV. INSTRUCTIONS—9	TERMS 1% 10 DAYS NET 30—10	SHIP VIA—11
				TRUCK ONLY

TERR 12	SMN. 13	CUST. NO. 14	S.A. 15	L.C. 16	ST. O PR. MF. 17 18 19	BC. T. 20	%CI 21	P.C.C. 22	WT/M.PA. 23	WT/M-PL. 24	C.P. BAG NO. 25	O.P. NO—26
04	14	C-795			1 3	36	30	803	0425	000.0	C-795-001-00-000	33177

DESC.

TYPE BAG—27	CONSTRUCTION—28
PVSE	1/4ONK,1/5ONK,1/5OFB

FACE WIDTH—29	GUSSET—30	FIN. LENGTH—31	PRINT LENGTH—32	TOP SIZE—33	BOTTOM SIZE—34	VALVE SIZE & LOC.—35	TYPE BOTTOM—36
21		24	30½	5½	5½	3½ URH	SIFTPROOF

PRINTING

BRAND NAME—37	BRAND NO.—38
29-2124	C-795-1

COLOR AND INK NO.—39	FACE	EDG/GUS	BACK	TOP	BTM	FCS	INSTRUCTIONS:—40
BLUE GP 539		X	ID			BACK	PRINT VALVE ARROW. PRINT ABOVE FCS: 29-2124 (½" LETTERS) DATE, CUSTOMER PO#, 3/140, GP ORDER #. ID PRINT BELOW FCS.

PAKG.&SHIP

QUAN./UNIT (SPECIFY TYPE UNIT)—41	HALF WRAP—42	FULL WRAP—43
2200/44 x 56 PALLET		

INSTRUCTIONS:—44

BOARDS _____ SHRINK WRAP X LABELS _____
BANDS _____ PAPER WRAP _____
BOX _____ STRING TIED _____ BALES WRAPPED _____
PICTURE FRAME UNDER SHRINK LOADED LOOSE _____ BALES UNWRAPPED _____

TUBING

	WALL	WIDTH & BASIS WEIGHT • TYPE OF PAPER—45	WT/M	POUNDS USED
1	INSIDE	43 x 40 NK	121	
2		43 x 50 NK	152	
3		43 x 50FB	152	
4				
5				
6				

SUBSTITUTIONS:—48
S— 800/.0639
K— 1350/.0379
W & H— 6100 BOTTOM
S— 4400

TUBING: W & H— 8988 S—

SEWING:

ADHESIVE—47	CUSSET • STAGGER—48	SCORE—49
MP		

GRIP FAST—50	SPOT PASTING—51	SV NOTCH—52
MED	STD	

THUMB CUT. LOC.—53	PERF.—54	FRT. CLASS—55
	*SEE BELOW	

INSTRUCTIONS:—56 ALL OVER 3/32" PINHOLE PERFORATIONS ON 1" CENTERS ON INNER WALLS.
OUTER WALL 3/32" PINS ON 1½" CENTERS.

REDUCED

CLOSING

TAPE SIZE—57	TAPE TYPE—58	TAPE COLOR—59	LOOPER THREAD—60	NEEDLE THREAD—61	FILLER CORD—62	TOS—63	SLEEVE TYPE—64
							POLYLOK

INSTRUCTIONS:—65

BAGS TO BE AS SIFTPROOF AS POSSIBLE.

FOLD V F-BTF

OTHER

SPECIAL INSTRUCTIONS:—66

#503

GREAT PLAINS BAG CORPORATION
SUBSIDIARY OF CONTINENTAL CAN COMPANY, INC.
Reiser Ave. C.I.C. • Industrial Park
New Philadelphia Ohio 44663 - 216/339-3311

PRODUCTION ORDER NO.—1

SOLD TO	SHIP TO	CUSTOMER ORDER NO.—2
CYPRUS INDUSTRIAL MINERALS 651 METUCHEN ROAD SO. PLAINFIELD, N.J 07080	SAME DEL HRS. 7:00 AM - 3:00 PM CALL: 201-754-4880 IN ADVANCE	DATE RECEIVED—3 SHIPPING DATE—4

QUAN. ORDERED—7	PRICE—8	INV. INSTRUCTIONS—9	TERMS 1% 10 DAYS NET 30—10	SHIP VIA—11
				TRUCK ONLY

TERR 12	SMN. 13	CUST. NO. 14	S.A. 15	L.C. 16	ST. D 17	PR. 18	MF. 19	BG. T. 20	PCI 21	P.C.C. 22	WT/M-PA. 23	WT/M-PL. 24	G.P. BAG NO. 25	O.P. NO—26
04	14	C-795				1	3	36	30	803	0456	000.0	C-795-003-00-000	33356

DESC.

TYPE BAG—27	CONSTRUCTION—28
PVSE	2/50NK, 1/50FB

FACE WIDTH—29	GUSSET—30	FIN. LENGTH—31	PRINT LENGTH—32	TOP SIZE—33	BOTTOM SIZE—34	VALVE SIZE & LOC.—35	TYPE BOTTOM—36
21		23	30½	6½	6½	3½ URH	SIFTPROOF

PRINTING

BRAND NAME—37: 29-2123
BRAND NO.—38: C-795-3

COLOR AND INK NO.—39	FACE	EOG/GUS	BACK	TOP	BTM	FCS	INSTRUCTIONS:—40
BLUE GP 539		X	ID			BACK	PRINT VALVE ARROW. PRINT ABOVE FCS: 29-2124 (¼" LETTERS) DATE, CUSTOMER PO#, 3/140, GP ORDER#. ID PRINT BELOW FCS.

PAK'G. & SHIP

QUAN./UNIT (SPECIFY TYPE UNIT)—41	HALF WRAP—42	FULL WRAP—43
2200/44 x 56 PALLET		

INSTRUCTIONS:—44

BOARDS _____ SHRINK WRAP X LABELS _____
BANDS _____ PAPER WRAP _____
BOX _____ STRING TIED _____ BALES WRAPPED _____
PICTURE FRAME UNDER SHRINK LOADED LOOSE _____ BALES UNWRAPPED _____

TUBING

WALL	WIDTH & BASIS WEIGHT • TYPE OF PAPER—45	WT/M	POUNDS USED
1 INSIDE	43 x 50 NK	152	
2	43 x 50 NK	152	
3	43 x 50 FB	152	
4			
5			
6			

SUBSTITUTIONS:—46
S— 800/.0639
K— 1350/.0379

TUBING W & H— 8,988 S—

BOTTOM W & H— 6100 S— 4400

SEWING

ADHESIVE—47	GUSSET • STAGGER—48	SCORE—49
MP		

GRIP FAST—50	SPOT PASTING—51	SV NOTCH—52
MED	STD	

THUMB CUT. LOC.—53	PERF.—54	FRT. CLASS—55
	*SEE BELOW	

INSTRUCTIONS:—56
*ALL OVER 3/32" PIN HOLE PERFORATIONS ON 1" CENTERS ON INNER WALLS. OUTER WALL 3/32" PINS ON 1½" CENTERS.

CLOSING

TAPE SIZE—57	TAPE TYPE—58	TAPE COLOR—59	LOOPER THREAD—60	NEEDLE THREAD—61	FILLER CORD—62	TOS—63	SLEEVE TYPE—64
							POLYLOK

INSTRUCTIONS:—65
BAGS TO BE AS SIFTPROOF AS POSSIBLE

FOLD VTF-BTF

OTHER

SPECIAL INSTRUCTIONS:—66

#503

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
29-0501 Roller Mill 19 x 22½ x 4½	2/40 NK, 1/50 FBW	3½" poly.
29-1002 Vertical Mill 22 x 25½ x 4½	1/40 NK, 1/50 NK, 1/50 FBW	3½" poly.

NOTE: All of the above prices include anti-skid coating.

LEHMAN 01007

4/1/

07/01/82

LOCATION South Plainfield, N.J.

COST/M CARLOAD QUOTATION

159.55

PRINTING	Great Plains	Union Camp		
ID.	$ 153.15 / 155.85	$ 152.35 / 159.55 / 152.35		
ID.	214.45	205.90 / 236.25		

September 24, 1986

G. R. M. Dugan
T. D. Landels
K. B. Lehman
M. R. McCune

Bag Price Increases

Attached are revised bag price lists for your respective plants. Reflected in these lists are price increases as follows:

1. Stone Container Corporation - 5% increase effective 10/1/86.

2. Westvaco Corporation - 6.3% increase effective 9/1/86.

As of this date, we have not been advised by any of our other suppliers of a price increase.

Joanne

J. S. Felger

jsf

Attachment

M. J. Lorang

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING
29-0501 Roller Mill 19 x 22-1/4 x 4-1/4	2/40 NK, 1/50 FBW	3-1/2" poly.	ID.
29-1002 Vertical Mill 22 x 25-1/2 x 4-1/2	1/40 NK, 1/50 NK, 1/50 FBW.	3-1/2" poly.	ID.

Note: All of the above prices include anti-skid coating.

LEHMAN 01009

Effective: 10/1/86

LOCATION: South Plainfield, New Jersey

COST/M CARLOAD QUOTATION

Westvaco
$ 162.95
204.30

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
29-0501 Roller Mill 19 x 22-1/4 x 4-1/4 22 3/4 x 3 3/4	2/40 NK, 1/50 FBW	3-1/2" poly.
29-1002 Vertical Mill 22 x 25-1/2 x 4-1/2	1/40 NK, 1/50 NK, 1/50 FBW.	3-1/2" poly.

Note: All of the above prices include anti-skid coating.

LEHMAN 01010

Effective: 7/1/86

LOCATION: South Plainfield, New Jersey

COST/M CARLOAD QUOTATION

PRINTING	Westvaco
ID.	$ 153.30
ID.	192.20

BEMIS

BEMIS CO INC
P O BOX 1380
PEPPERELL MA 01463
— attn: John Howard —

CUSTOMER ORDER NO. 45278

MC ENTEER J E
OUR ORDER NO. 215-PV-53491

UNIVERSAL PRODUCT CODE	SALES ORDER NO.	SALESMAN	EXP	FC	G	FILE NO./PLANT REPR.	CORRESPONDENT	DATE ENTERED	SCHEDULED SHIP DATE
	G532695	862				FL 22921	MJW	05/03/85	N/E 05/24/85

215-PV-53491 TERMS NET 30 TAX EXEMPT NO:

SPEC. ACK. INSTR.

SOLD TO
CYPRUS INDUSTRIAL MINERALS CO
ATTN: JOANNE FELGER RM 254A
P O BOX 3419
ENGLEWOOD CO 80155

SHIP TO
CYPRUS INDUSTRIAL MINERALS CO
651 METUCHEN
SOUTH PLAINFIELD NJ 07080

COLLECT PREPAID X CHARGE ALLOW X VIA:

SHIP. INSTR.

PKG. INSTR. 2500/TOTE BOX 40X48 GMA PALLET- EXPENDABLE 4 WAY PALLET - COUNT TO BE 2500
KEEP TOP FLAT FOR PALLET STACKING

DESCRIPTION (BRAND)	QUANTITY	UNIT	PRICE	U/M
50# CYPRUS (SPEC0501 DOES NOT PRT) 19 X 22-1/4 PVSE 2/40 1/50WHT	110,000 PRICE IN EFFECT AT TIME OF SHIPMENT 231.60 (ENTRY PRICE)	BAG		M
GMA PALLET		EA	8.25	E
TOTE BOX		EA	4.50	E

ACKNOWLEDGEMENT

117,766
- 10,000 N/C
107,766 @ 161.60
$ 17,834.10 after Disc. 1%

ALL INVOICES MUST BE PAID WITHIN TERMS QUOTED. LATE PAYMENT PENALTY OF 1-1/2% PER MONTH (18% PER ANNUM) SHALL BE CHARGED ON OVERDUE ACCOUNTS.

E

YOUR ORDER IS ACCEPTED ON THE TERMS AND CONDITIONS SET FORTH ON THE REVERSE SIDE HEREOF, INCLUDING LIMITING WARRANTIES

FORM NO. 740125-04 3-83

LEHMAN 01011

December 26, 1985

G. R. M. Dugan
R. Estrada
T. D. Landels
K. B. Lehman
M. R. McCune

1986 Bag Prices

Attached are bag prices for your locations which will be effective on January 1, 1986. Bids were solicited from the various vendors, and the lowest priced supplier(s) were selected. The vendors have been notified and requested to have a saleman call on each of you in the near future. At that time you should submit a sample of each bag to them. Please be sure that the sample you submit has one of the HMIS hazard communication labels attached so that it can be incorporated in all future printing. Attach the label where you would like it to appear on the bag.

If at all possible, please cancel any outstanding orders you may have with other vendors and re-order through the vendors listed for your location.

Non-delivered prices have not been included for some of the vendors. Please call Joanne if you would like us to obtain these prices for you.

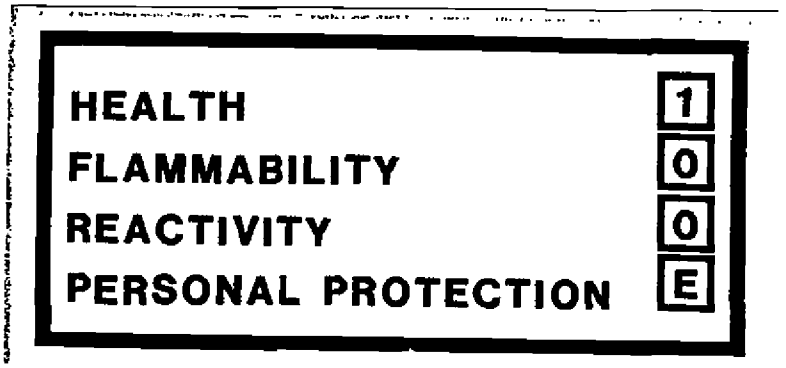
Michael J. Lorang/jsf

Michael J. Lorang

MJL:jsf

Attachment

R. J. Buettner



GREAT PLAINS BAG CORPORATION
SUBSIDIARY OF CONTINENTAL CAN COMPANY, INC.
Reiser Ave. C.I.C. - Industrial Park
New Philadelphia, Ohio 44663 • 216/339-3311

PRODUCTION ORDER NO.—1

SOLD TO
CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SO. PLAINFIELD, N.J 07080

SHIP TO
SAME
DEL HRS. 7:00 AM - 3:00 PM
CALL: 201-754-4880 IN ADVANCE

CUSTOMER ORDER NO.—2
DATE RECEIVED—3
SHIPPING DATE—4

QUAN. ORDERED—7	PRICE—8	INV. INSTRUCTIONS—9	TERMS 1% 10 DAYS NET 30—10	SHIP VIA—11
				TRUCK ONLY

TERR 12	SMN. 13	CUST. NO. 14	S.A. 15	L.C. 16	ST. D 17	PR. MF. 18	BG. T. 19	PCI 20	P.C.C. 21	WT/M-PA. 22	WT/M-PL. 23	G.P. BAG NO. 24	25	D.P. NO—26
04	14	C-795				1	3	36	30	803	0456	000.0	C-795-003-00-000	33356

DESC.

TYPE BAG—27	CONSTRUCTION—28
PVSE	2/50NK,1/50FB

FACE WIDTH—29	GUSSET—30	FIN. LENGTH—31	PRINT LENGTH—32	TOP SIZE—33	BOTTOM SIZE—34	VALVE SIZE & LOC.—35	TYPE BOTTOM—36
21		23	30½	6½	6½	3½ URH	SIFTPROOF

BRAND NAME—37	BRAND NO.—38
29-2123	C-795-3

PRINTING

COLOR AND INK NO.—39	FACE	EDG/GUS	BACK	TOP	BTM	FCS
BLUE GP 539		X	ID			BACK

INSTRUCTIONS:—40
PRINT VALVE ARROW.
PRINT ABOVE FCS:
29-2124 (½" LETTERS)
DATE, CUSTOMER PO#,
3/140, GP ORDER#.
ID PRINT BELOW FCS.

PAK.&SHIP

QUAN./UNIT (SPECIFY TYPE UNIT)—41	HALF WRAP—42	FULL WRAP—43
2200/44 x 56 PALLET		

INSTRUCTIONS:—44
BOARDS _____ SHRINK WRAP X LABELS _____
BANDS _____ PAPER WRAP _____
BOX _____ STRING TIED _____ BALES WRAPPED _____
PICTURE FRAME UNDER SHRINK LOADED LOOSE _____ BALES UNWRAPPED _____

TUBING

WALL	WIDTH & BASIS WEIGHT - TYPE OF PAPER—45	WT/M	POUNDS USED
1 INSIDE	43 x 50 NK	152	
2	43 x 50 NK	152	
3	43 x 50 FB	152	
4			
5			
6			

SUBSTITUTIONS:—46
S— 800/.0639
K— 1350/.0379
W & H— 6100 BOTTOM
S— 4400

TUBING W & H— 8,988 S—
SEWING

ADHESIVE—47	CUSSET - STAGGER—48	SCORE—49
MP		

GRIP FAST—50	SPOT PASTING—51	BV NOTCH—52
MED	STD	

THUMB CUT. LOC.—53	PERF.—54	FRT. CLASS—55
	*SEE BELOW	

INSTRUCTIONS:—56
*ALL OVER 3/32" PIN HOLE PERFORATIONS ON 1" CENTERS ON INNER WALLS. OUTER WALL 3/32" PINS ON 1½" CENTERS.

CLOSING

TAPE SIZE—57	TAPE TYPE—58	TAPE COLOR—59	LOOPER THREAD—60	NEEDLE THREAD—61	FILLER CORD—62	TOS—63	SLEEVE TYPE—64
							POLYLOK

INSTRUCTIONS:—65
BAGS TO BE AS SIFTPROOF AS POSSIBLE

FOLD VTF-BTF

OTHER

SPECIAL INSTRUCTIONS:—66

#503

LEHMAN 01013

NATIONAL 42-383

19 x 23 x 3½ — 3¾ UMHV

Required 1035 3/30

1 Ton 1615

Benn

St

6/30/76	20x24	30,000	6/23/76	18½ x 23¾	Chalk 3/22	800 4609
8/19/77	19x22¼	120,000			3/27 EARN 3/30	1633
9/16/77	20x24	20,000				
8/19/77	20x24	20,000			835 Cathy	3/19-3/21
6/16/76	20x24	10,000			836	3/22
6/16/78	20x24	30,000			837	3/27
9/22/77	19x22¼	144,100			838	3/27
7/6/78	20x24	20,025			939	3/28
6/2/78	19x22¼	62,300			939	3/28
8/18/78	19x22¼	160,000	7/5/78	19x22¼ x 4¼	939	3/29
6/30	20x24	20,000	8/1/78	19x22¼ x 4¼	940	3/29
5/5/78	19x22¼	80,000	11/30/77	19x22¼ x 4¼	941	3/30
1/9/76 →	19x23 x 3½"	80,100	11/7/77	19x22¼ x 4¼		52275
9/24/75	19x23x3½"	30,050	1/24/77	19x22¼ x 4¼		51,100
						5,600
						99772
						54,000

Benn was 19x23 - 3½" Bottom 3¾ UMHV insert

Dead 19x22¼ - 4¼ " 4¼ UMHV reduced to 3¾ Idea

1050 — Kemp [illegible] — dil 3/29

AVM 1031 3/22

Thru

BANCROFT BAG, INC.

BANCROFT BAG, INC.

POST OFFICE BOX 307
WEST MONROE, LOUISIANA 71291
TELEPHONE 318/387-2550

INVOICE

Nº 17196

D-U-N-S NO. 00-847-3498

SOLD TO: American Talc Company
Alphine, Alabama 35014

DATE January 15, 1979
See below TERMS: ~~1% 10 DAYS, NET 30 DAYS~~
CUSTOMER ORDER NO. 217
CAR NO. B 102
ROUTING Bancroft Bag Truck

SHIPPED TO: SAME

Item No.	Quantity	Bag Code	Type Bag	Size – Construction – Closures	Price	Amount
				Our Order No. SE 8-2264 1/3-30 days - 1/3-60 days 1/3-90 days		
1	12,800	~~XXXX~~	PVSE	18½ x 23 x 3½ TUBE 18½ x 28½ 2 40/NK - 50 FBW Banskid 1S, 1C Product of American Talc A-063-005	$ 146.25	1,872.00
2	39,400	--	PVSE	23½ x 29 x 3½ TUBE 23½ x 34½ 2 40/NK - 50 FBW BS Black ID A-063-003	$ 210.36	8,288.18
				20 Boxes @ $9.00/Unit		180.00

127-114 –
19½ x 23½ 2-40/NK · 150 white
price -

5500
1-19-79
M.R.M.

Note - Set up 3 Cks
1/3 1/15
+ 1/3 1/16

Ck 1828 FEB 16 (5856.57)
Ck 1829 MAR 23 PAID
Ck 1830 APR 25 PAID 3446.72

Shipped under our ticket No. 20702
dated January 13, 1979

10340.18

827-A-323

sh

TOTAL $ 10,340.18

LEHMAN 01015

March 23, 1987

G. R. M. Dugan
T. D. Landels
K. B. Lehman
M. R. McCune

Revised Bag Pricing

Attached is a revised bag price list for your location. Revised pricing is effective April 1, 1987.

All prices have increased by 4½ percent. Union Camp and Gilman prices are exact since new price lists were supplied. Stone and Georgia-Pacific prices have been calculated based on the above percentage; therefore, actual prices on invoices may vary by a few cents per thousand because of rounding.

Joanne

J. S. Felger

jsf

Attachment

M. J. Lorang

STANDARD OIL COMPANY (INDIANA)

Multiwall Bag Specifications (Not For Manufacturing Purpose), June 6, 1984
(* = Indicates Change From Previous List Dated March 19, 1984)

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt	Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
Aiken							
47-0901-1 (Trademark)	220,000		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing
47-0905-1 (Export)	170,000		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	4/50# Basis NK	Identification Printing
47-0909-2 (Windsor Clay)	200,000		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	4/50# Basis NK	1 Side, 1C Printing
47-0910-2 (Windsor Clay)	130,000		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing
47-0911-1 (Export)	15,000		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	2/40# Basis NK 1/50# Basis NK	Identification Printing
47-0914-1	N/A		PVSE	20-1/2" x 25-3/4" 3-1/2"	3" --Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1 Color Printing Water Soluble Adhesive Water Soluble Ink
Alpine							
CYA-1 (23-0501) (Roller Mill)	138,000		PVSE	18-1/2" x 23" 3-1/2"	3-1/2"--Poly	2/40# Basis NK 1/50# Basis FBW	Identification Printing Ludox
CYA-2 (23-1001) (Vertical Mill)	44,000		PVSE	20-1/2" x 25" 3-1/2"	3-1/2"--Poly	2/40# Basis NK 1/50# Basis FBW	Identification Printing Ludox
CYA-4 (23-1003) (Vertical Mill)	83,000		PVSE	22" x 25-1/2" 4-1/2"	3-1/2"--Poly	2/40# Basis NK 1/50# Basis FBW	1 Side, 1C Printing Ludox
Cartersville/Sylacauga							
CTW-1 (#1 White)	560,000		PVSE	16" x 20-1/4" 3-1/2"	3-1/2"--Paper	2/60# Basis NK	Identification Printing Ludox
CTW-2 (Atomite)	N/A		PVSE	18" x 21" 5-1/2"	3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
CTW-3 (Atomite)	180,000		PVSE	18-1/2" x 23-1/2" 3-1/2"	3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	Ludox

LEHMAN 01017

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Cartersville/Sylacauga (Continued)				
CTW-4 (Atomite)	2,800,000		PVSE	18-1/2" x 23-1/2" 3-1/2"
CTW-5 (Atomite)	2,000		PVSE	18-1/2" x 23-1/2" 3-1/2"
CTW-6 (Barimite)	120,000		PVSE	15" x 20-1/4" 3-1/4"
CTW-7 (Barimite XF)	375,000		PVSE	15" x 20-1/4" 3-1/4"
CTW-8 (Barytes #22)	80,000		PVSE	14" x 16-3/4" 3"
CTW-9 (Barytes #22)	700,000		PVSE	14" x 16-3/4" 3"
CTW-10 (Chemcarb #11)	15,000		PVSE	18-1/2" x 23-1/2" 3-1/2"
CTW-11 (Chemcarb #22)	20,000		PVSE	17-3/4" x 21" 3-1/2"
CTW-12 (Chemcarb #33)	20,000		PVSE	17" x 20-1/4" 3-1/2"
CTW-13 (Drikalite)	430,000		PVSE	17-3/4" x 21" 3-1/2"
CTW-14 (Dry 50's)	250,000		PVSE	16" x 20-1/4" 3-1/2"
CTW-15 (Duramite)	800,000		PVSE	17" x 20-1/4" 3-1/2"
CTW-16 (Kotamite)	300,000		PVSE	17-1/2" x 19-3/4" 4-1/2"
CTW-17 (Snowflake)	250,000		PVSE	17-3/4" x 21" 3-1/2"
CTW-18 (Snowflake)	1,000,000		PVSE	17-3/4" x 21" 3-1/2"

LEHMAN 01018

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	4/60# Basis NK	Ludox
3-1/4"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/4"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3" --Paper	1/60# Basis NK 1/70# Basis NK	Ludox
3" --Paper	1/60# Basis NK 1/70# Basis NK	Identification Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	Identification Printing Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	Ludox
3-1/2"--Paper	1/60# Basis NK 1/70# Basis NK	1 Side, 1C Printing Ludox

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Cartersville/Sylacauga (Continued)				
CTW-19 (Supercoat)	120,000		PVSE	20-3/4" x 24-1/2" 3-1/2"
CTW-20 (Supermite)	160,000		PVSE	20-3/4" x 24-1/2" 3-1/2"
CTW-21 (Supermite)	30,000		PVSE	20-3/4" x 24-1/2" 3-1/2"
Chocolate Bayou				
CB-1 (HD Polyethylene)	620,000		PVSE	20" x 24" 5-1/2"
CB-1A (HD Polyethylene)	0		PVSE	20" x 24" 5-1/2"
CB-1 (Special) (HD Polyethylene)	160,000		PVSE	20" x 24" 5-1/2"
CB-2 (Polypropylene)	950,000		PVSE	21" x 24" 5-3/4"
CB-2A (Polypropylene)	24,000		PVSE	21" x 24" 5-3/4"

LEHMAN 01019

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
3-1/2"--Paper	2/60# Basis NK	Identification Printing Ludox
3-1/2"--Paper	2/60# Basis NK	Identification Printing Ludox
3-1/2"--Paper	2/60# Basis NK	Ludox
5-1/4"--Poly	1/2-1/2# P.E. per Ream 50# Basis NK 3/50# Basis NK 1/60# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies
5-1/4"--Poly	1/2-1/2# P.E. per Ream 50# Basis NK 3/50# Basis NK 1/60# Basis NK	Export ID Marking Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies
5-1/4"--Poly	1/1-1/2 Poly Ply 5/50# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies
5-1/2"--Poly	1/2-1/2# P.E. per Ream 50# Basis NK 3/50# Basis NK 1/60# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies
5-1/2"--Poly	1/2-1/2# P.E. per Ream 50# Basis NK 3/50# Basis NK 1/60# Basis NK	Export ID Marking Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Chocolate Bayou (Continued)				
CB-2 (Special) (Polypropylene)	280,000		PVSE	21" x 24" 5-3/4"
CB-3 (Polypropylene)	100,000		PVSE	21" x 24" 5-3/4"
CB-3A (Polypropylene)	24,000		PVSE	21" x 24" 5-3/4"
CB-4 (HD Polyethylene)	132,000		PVSE	20" x 24" 5-1/2"
CB-4A (HD Polyethylene)	36,000		PVSE	20" x 24" 5-1/2"
Fernley				
K-8 (Diatomite)	N/A		PVSE	22" x 35" 4-1/2"
N-81 (Diatomite)	N/A		PVSE	23" x 35-1/2" 7"
Gleason				
60-0402-1 (Trademark)	190,000		PVSE	18-1/2" x 23-1/2" 3-1/4"
60-0403-1 (Export)	60,000		PVSE	18-1/2" x 23-1/2" 3-1/4"

*Note: Sleeve must be reduced hinged tuck-in with thumb slot.

LEHMAN 01020

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
5-1/2"--Poly	1/1-1/2 Poly Ply 5/50# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies
5-1/2"--Poly	1/2-1/2# P.E. per Ream 60# Basis NK 2/60# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st ply only
5-1/2"--Poly	3/60# Basis NK	Ludox
5-1/4"--Poly	1/2-1/2# P.E. per Ream 60# Basis NK 2/60# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st ply only
5-1/4"--Poly	3/60# Basis NK	Ludox
*4-1/2"--Crepe	3/50# Basis NK	Identification Printing
*4-1/2"--Crepe	3/50# Basis NK	Identification Printing
3-1/4"--Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing
3-1/4"--Paper	4/50# Basis NK	Identification Printing

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Grand Island				
27-0501 (Roller Mill--Domestic)	335,000		PVSE	19" x 22-1/4" 4-3/4"
27-0505 (USP/USP Dense)	100,000		PVSE	19" x 22-1/4" 4-3/4"
27-0506 (Olympic)	396,000		PVSE	19" x 22-1/4" 4-3/4"
27-1102 (Mistron--Export)	0		PVSE	22" x 35-1/2" 4"
27-1104 (Mistron--Domestic, Brown)	132,000		PVSE	22" x 35-1/2" 4"
27-1106 (Mistron--Domestic, White)	178,000		PVSE	22" x 35-1/2" 4"
27-1301 (Mistron--Domestic, Brown)	54,000		PVSE	25" x 29-1/2" 5"
27-1401-1 (Mistron--Dens/Class)	192,000		PVSE	22" x 25-1/2" 4-1/2"
27-1401-2 (Mistron--Dens/Class)	118,000		PVSE	22" x 25-1/2" 4-1/2"

LEHMAN 01021

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
3-1/2"--Poly	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/2"--FBW	2/50# Basis NK 1/60# Basis NK 1/50# Basis FBW	1 Side, 1C Printing
3-1/2"--FBW	2/50# Basis NK 1/60# Basis NK 1/50# Basis FBW	1 Side, 1C Printing
3-1/2"--Paper	2/50# Basis NK 2/60# Basis NK	Identification Printing (+ Export Markings)
3-1/2"--Paper	2/50# Basis NK 1/60# Basis NK	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/2"--Beater (White)	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/2"--Paper	3/50# Basis NK	Identification Printing
3-1/2"--Beater (White)	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/2"--Paper	3/50# Basis NK	Identification Printing Water Soluble Adhesive Water Soluble Ink

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Hutchinson				
H-1 (Zyest)	0		PBOM	18" x 4" x 31"
H-2 (Zyest-FM)	85,000		PBOM	18" x 4" x 31"
H-3 (Zyest-FM Oil Coated)	57,000		PBOM	18" x 4" x 31"
H-4 (Torutein)	26,000		PBOM	18" x 4" x 31"
H-5 (Plain White)	24,000		PBOM	18" x 4" x 31"
H-6 (Plain Brown)	27,000		PBOM	18" x 4" x 31"
H-7 (Plain White)	5,000		PBOM	18" x 6" x 31"
H-8 (Plain White)	20,000		PBOM	13" x 4" x 24"

LEHMAN 01022

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis FBW	2 Sides, 1C Printing
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50 # Basis FBW	2 Sides, 1C Printing
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis FBW	2 Sides, 1C Printing
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis FBW	2 Sides, 2C Printing
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis FBW	Plain
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis NK Brown	Plain
N/A	.002 LDPE Laminated 2/50# Basis NK 1/50# Basis FBW	Plain
N/A	.002 LDPE Sheeting Hot Melt Stripe Laminated 1/50# Basis NK 1/50# Basis FBW Longitudinal Poly Seam on Number One Ply, Heat Sealed With Hot Melt (Poly-to-Poly Seal), Poly Sealed at Bottom of Bag (Poly-to-Poly Heat Seal)	Plain

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Joliet/Willow Springs				
J-1AB (Polystyrene)	183,000		PVSE	20" x 24-1/2" 5-1/2"
J-1B (Polystyrene)	240,000		PVSE	20" x 24-1/2" 5-1/2"
J-1B (E) (Polystyrene)	0		PVSE	20" x 24-1/2" 5-1/2"
J-2B (TMA)	420,000		PBOM	15" x 4-1/2" x 30"
J-2B (2C) (TMA)	300,000		PBOM	15" x 4-1/2" x 30"
J-4B (Isophthalic Acid)	0		PVSE	18-1/2" x 23-1/4" 3-3/4"
J-8B (Isophthalic Acid)	360,000		PVSE	18-1/2" x 23-1/4" 3-3/4"
J-9B (Isothalic Acid)	70,000		PVSE	18-1/2" x 23-1/4" 3-3/4"
J-11B (Terephthalic Acid)	60,000		PVSE	18-1/2" x 23-1/4" 3-3/4"
Los Angeles				
21-0501 (Roller Mill--Domestic)	457,000		PVSE	18-1/2" x 24-1/2" 3-1/4"
21-0502 (Roller Mill--Export)	46,000		PVSE	18-1/2" x 24-1/2" 3-1/4"

LEHMAN 01023

Sleeve Size--Type	Bag Consttuction (Beginning with Inner Ply)	Requires
5-1/2"--Poly	3/60# Basis NK	Identification Printing Ludox Siftproof ("Double Trap")
5-1/2"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox Siftproof ("Double Trap")
5-1/2"--Poly	1/2-1/2# P.B. per Ream 50# Basis NK 3/50# Basis NK 1/60# Basis NK	1 Side, 1C Printing Ludox 3/32" Perforations On 1-1/2" centers on 1st and 2nd plies Siftproof ("Double Trap")
N/A	1/4.0 Mil Valeron (Anti-Static) 2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing Ludox
N/A	1/4.0 Mil Valeron (Anti-Static) 2/40# Basis NK 1/50# Basis NK	1 Side, 2C Printing Ludox
3-3/4"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox Siftproof ("Double Trap")
3-3/4"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox Siftproof ("Double Trap")
3-3/4"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox Siftproof ("Double Trap")
3-3/4"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox Siftproof ("Double Trap")
3-1/4"--Poly	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/4"--Poly	3/50# Basis NK 1/60# Basis NK	Identification Printing (+ Export Markings)

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Los Angeles (Continued)				
21-1001 (Vertical Mill--Domestic)	274,000	*	PVSE	20-1/2" x 25" 5-1/2"
21-1002 (Vertical Mill--Export)	26,000	*	PVSE	20-1/2" x 25" 5-1/2"
Sandersville				
53-0601-1 (Small Trademark)	145,000		PVSE	19" x 24-1/2" 3-1/2"
53-0801-1 (Plain)	360,000	*	PVSE	20" x 25" 3-1/2"
53-0802-1 (Large Trademark)	320,000	*	PVSE	20" x 25" 3-1/2"
53-0803-1 (Export)	320,000		PVSE	20" x 25" 3-1/2"
53-0807-1 (Beater White Trademark)	25,000		PVSE	20" x 25" 3-1/2"
53-0809-1 (Beater White Export)	0		PVSE	20" x 25" 3-1/2"
53-0810-1	N/A		PVSE	20-1/2" x 26-3/4" 3-1/2"
South Plainfield				
CYS-1 (29-0501) (Roller Mill)	334,000		PVSE	19" x 22-1/4" 4-1/4"
CYS-3 (29-1002) (Vertical Mill)	47,000		PVSE	22" x 25-1/2" 4-1/2"

LEHMAN 01024

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
3-1/2"--Crepe (Tuck-In)	3/50# Basis NK	Identification Printing
3-1/2"--Crepe (Tuck-In)	3/50# Basis NK 1/60# Basis NK	Identification Printing
3" --Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing
3" --Paper	3/50# Basis BW	1 Side, 1C Printing
3" --Paper	3/50# Basis BW	1 Side, 1C Printing
3" --Paper	4/50# Basis NK	Identification Printing
3" --Paper (White)	2/50# Basis Beater 1/60# Basis Beater (All Plies White)	1 Side, 1C Printing Water Soluble Adhesive Water Soluble Ink
3" --Paper (White)	4/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/4"--Paper	4/50# Basis NK	Identification Printing
3-1/2"--Poly	2/40# Basis NK 1/50# Basis FBW	Identification Printing Ludox
3-1/2"--Poly	1/40# Basis NK 1/50# Basis NK 1/50# Basis FBW	Identification Printing Ludox

Amoco Location Bag Spec Number (Product Packaged)	Estimated Annual Usage--1983	*	Bag Type	Bag Size Finished Length/ Top & Bottom Butt
Texas City				
TC-1 (Resin 18-210)	80,000		PVSE	20" x 22-1/2" 5-1/2"
TC-2 (Resin 18-240)	15,000		PVSE	20-1/2" x 23" 5-1/2"
TC-3 (Resin 18-290)	145,000		PVSE	20-1/2" x 23" 5-1/2"
Three Forks				
25-0101 (Compacted--Brown)	352,000		PVSE	18" x 21" 4-1/2"
25-0102 (Compacted--White)	469,000		PVSE	18" x 21" 4-1/2"
25-0104 (Compacted--Export)	17,000		PVSE	18" x 21" 4-1/2"
25-0501 (Roller Mill--Domestic)	317,000		PVSE	19" x 22-1/4" 4-1/4"
25-0511 (Roller Mill White-- Domestic)	N/A	*	PVSE	19" x 22-1/4" 4-1/4"
25-0601 (Roller Mill--325 Mesh)	56,000		PVSE	19" x 22-1/4" 4-3/4"
25-0602 (Roller Mill--Export)	36,000		PVSE	19" x 22-1/4" 4-1/4"
25-1101 (Mistron--Export)	42,000	*	PVSE	22" x 35-1/2" 4-3/4"
25-1103 (Mistron--Domestic, Brown)	146,000	*	PVSE	22" x 35-1/2" 4-3/4"
25-1105 (Mistron--Domestic, White)	57,000	*	PVSE	22" x 35-1/2" 4-3/4"

LEHMAN 01025

Sleeve Size--Type	Bag Construction (Beginning with Inner Ply)	Requires
5-1/2"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox
5-1/2"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox
5-1/2"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludux
4-1/2"--Paper	3/50# Basis NK	Identification Printing Water Soluble Adhesive Water Soluble Ink
4-1/2"--Beater (White)	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
4-1/2"--Paper	4/50# Basis NK	Identification Printing
3-1/2"--Poly	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/2"--Beater (White) Full Wrap Around Unpasted Seam	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/2"--Poly	2/40# Basis NK 1/50# Basis NK	Identification Printing
3-1/2"--Poly	3/50# Basis NK 1/60# Basis NK	Identification Printing (+ Export Markings)
3-3/4"--Paper	2/50# Basis NK 2/60# Basis NK	Identification Printing (+ Export Markings)
3-3/4"--Paper	3/50# Basis NK	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-3/4"--Beater (White)	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink

Amoco Location Bag Spec Number	Estimated Annual		Bag	Bag Size Finished Length/
Three Forks (Continued)				
25-1301 (Mistron--Domestic, Brown)	28,000	*	PVSE	25" x 29-1/2" 5"
25-1302 (Mistron--Domestic, White)	56,000	*	PVSE	25" x 29-1/2" 5"
Torrance				
T-1 (Polystyrene)	20,000		PVSE	20" x 24-1/2" 5-1/2"
T-1A (Polystyrene)	10,000		PVSE	20" x 24-1/2" 5-1/2"
White Marsh				
62-0201-1 (Trademark)	140,000		PVSE	18-1/2" x 22" 3-1/4"
62-0403-1 (Export)	3,000		PVSE	18-1/2" x 23-1/2" 3-1/4"

LEHMAN 01026

Sleeve	Bag Construction (Product Packaged) Usage--1983 * Type Top & Bottom Butt Size--Type (Beginning with Inner Ply) Requires	
3-1/2"--Paper	3/50# Basis NK	Identification Printing Water Soluble Adhesive Water Soluble Ink
3-1/2"--Beater (White)	3/50# Basis Beater (All Plies White)	Identification Printing Water Soluble Adhesive Water Soluble Ink
5-1/2"--Poly	3/60# Basis NK	1 Side, 1C Printing Ludox
5-1/2"--Poly	3/60# Basis NK	Ludox
3" --Paper	2/40# Basis NK 1/50# Basis NK	1 Side, 1C Printing
3" --Paper	4/50# Basis NK	Identification Printing

BAG DIVISION 58 WEST BRIDGE STREET, NEW HOPE, PA 18938 TELEPHONE (215) 862-2086

June 28, 1982

Mr. Keith Lehman
Cyprus Industrial Minerals Company
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Keith:

This will confirm our conversations and action on bags for South Plainfield.

1. Roller Mill Bags

We will replace the defective (valve leakage) bags recently shipped to your plant. When the defective bags are returned, we will perforate the edge of some bags to see if by relieving the pressure in the bag we can eliminate the excessive spillage from the valve. If successful, you agree to accept the return of the bags.

The replacement roller mill bags will be constructed with a longer P. E. valve insert and will have under valve perforations made with small pins. The print copy will be changed per your instructions.

2. Vertical Mill Bags

We have entered your order No. 44985 covering 40M vertical mill bags. The specifications for these are as follows:

Size - 22 x 25½ - 4½ top and bottom
Constructed - 1/40 NK 1/50 NK 1/50 white
3½ reduced P.E. insert
Printed - one side one color (blue)
Extra heavy anti skid treated

Our current price in 40M quantity is $226.15 per M.

We will manufacture 38M without under valve perforations. Two thousand will be manufactured with under valve perforations for testing. All of the bags will be printed per your instructions.

-continued-

Cyprus Minerals Company

Phone or Routing Memo

16-1160 (6-84)

Date of Memo 12/1 | Reply by Date (if reqd.)

To (print all names legibly)	MC/Room	Location (if not local)	Company/Facility
K. B. Lehman		So. Plainfield, NJ	C/M

Time	Person Calling			☐ Telephoned You ☐ Wants To See You ☐ Please Call ☐ Will Call Back ☐ Returned Your Call ☐ Stopped By
	Representing			
☐ Urgent	Area Code	Telephone No.	Ext	

For Your
- ☐ Information
- ☐ Signature
- ☐ Comments
- ☐ Approval

Please
- ☐ Handle
- ☐ Note & Return
- ☐ Approve & Return
- ☐ See or Phone Me
- ☐ Prepare Reply, My Signature
- ☐ Per Our Conversation
- ☐ Per Your Request
- ☐ File
- ☐ Mail
- ☐ Circulate
- ☐ Make _____ Copies/Ea.

Message

☐ Continued on back

From	MC/Room	Location (if not local)	Extension
Kem	5225		

mjl

cc: KBL
MRM
JPC
GRMD

FYI and use.

MJL

November 23, 1987

M. J. Lorang
R. G. Morris

Bags

Per our discussions on November 20 and 23, a decision has been made that Georgia-Pacific Corporation would be our primary supplier and Union Camp Corporation and Stone Container Corporation would be our secondary suppliers. Approximate volumes are 52%, 34%, and 14% for Georgia-Pacific, Union Camp, and Stone respectively. This is based on a 50/50 split at all locations except South Plainfield and Alpine between the two lowest-priced suppliers. See attached list for suppliers at each location. All three companies have been verbally notified of our decisions, and appointments are being scheduled for their representatives to meet with Jack and me to review the details.

As per MJL's suggestion, worksheets have been prepared for each location where gross dollars have been used to calculate the "best deal" on a percentage basis. These worksheets are attached for your information. The intent of this exercise is not to dictate which bags should be purchased from each supplier. They are provided only for guideline purposes.

I will prepare price lists which include specifications in the near future which will be updated as necessary when price increases are announced. In the interim, pricing by location for the vendors selected is attached for use by the Superintendents/Managers.

Joanne

Joanne S. Felger

jsf

Attachments

R. J. Buettner

11/20/87

			$M	Qty	
Stone	50%	Sandersville	130	643	
		Three Forks	180	778	
		Grand Island	153	650	
			463	2.071	14%
Georgia Pacific	50%	Cartersville	291	2.195	
		Sylacauga	282	1.979	
		Wilcox	59	348	
		Albion	79	385	
		Sandersville	125	643	
		Three Forks	190	778	
		Grand Island	151	650	
	100%				
		Alpine	66	385	
		So. Plainfield	36	165	
			1,279	7,478	52%
Union Camp	50%				
		Cartersville	297	2,195	
		Sylacauga	272	1,979	
		Wilcox	54	348	
		Albion	73	385	
			696	4,907	34%
	Totals		2,438	14,456	100%

* = GP

Canterville

		1	2 Ye. Pacific	4	5 Union Camp	7	%
		#Bags	$M		$M		
1	CTW-2	830	125.5		123.7		101.5
2	3	7	1.1		1.1		—
3	6 ✓	100	11.4		12.6	*	90.5
4	7 ✓	290	33.1		36.4	*	90.9
5	8 ✓	70	7.0		7.1	*	98.6
6	9 ✓	695	69.1		70.8	*	97.6
7	16	290	40.3		40.0		100.8
8	17	44	6.0		6.1	*	98.4
9	19	224	32.7		34.5	*	94.8
10	20	217	35.2		36.4	*	96.7
11	21	—	—		—		
12	22	476	62.3		66.0	*	94.4
13	24	1,147	157.6		159.1		99.1
14							
15		4,390	581.3		593.9		
16							
17							
18							
19	* = 2.116 =	48.2%					
20							
21							
22							
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29							
30							
31							

22-207 EFFICIENCY® LINE AMPAD

Sylacauga

* = GP

		1	2 Ga. Pacific	3	4	5 Union Camp	6	7	
		#Boas		$M			$M		%
1	CTW-1	476		59.7			56.3		106.0
2	2	1,646		252.5			245.4	½*	102.9
3	3	121		18.0			18.0		—
4	5	25		6.0			5.9	*	101.7
5	13	444		61.5			61.6	*	99.8
6	14	459		55.6			53.3		104.3
7	17	81		10.9			11.1	*	98.2
8	18	477		66.1			66.2	*	99.8
9	23	229		34.1			26.6		128.2
10									
11		3,958		564.4			544.4		
12									
13									
14									
15									
16	* = 1850 =	46.7							
17									
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27									
28									
29									
30									
31									

22-207 EFFICIENCY® LINE AMPAD

Mason

		1	2 Ga-Pacific	4	5 Union Camp	7	
		#2205	$M	—	$M		%
1	60-0402	605	98.6		90.7		108.7
2	-0403	90	19.1		17.8		107.3
3							
4		695	117.7		108.5		
5							
6							
7							
8							
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30							
31							

Aiken

		1	2 Ga. Pacific	3	4	5 Union Camp	6	7
		#Sacs		$M		$M		¢/#
1	47-0901	240		47.1		42.6		110.6
2	0905	30		7.4		7.3		101.-
3	0909	125		30.3		29.4		103.1
4	0910	375		73.6		66.5		110.7
5								
6		770		158.4		145.8		
7								
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31								

EFFICIENCY, LINE 22 207

Sandersville

		1	2 Up Pacific	4	5 Stone	7	
		#Cars	PM		PM		%
1	53-0801	550	102.2		106.7		95.8
2	0802	660	122.7		128.0		95.9
3	0803	15	3.5		3.6		97.2
4	0809	60	20.7		21.3		97.2
5	0810	—					
6							
7		1,285	249.1		259.6		
8							
9							
10							
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31							

EFFICIENCY LINE 22 207

* = GF

Three Forks

		1	2 Ya. Pacific		4	5 Stone	6	7	
		# Bags	Bags	$M		Bags	$M		%
1	25-0101	220		36.0			34.1		105.6
2	0102	205		48.9			44.6		109.6
3	0104	25		5.2			5.0		104.0
4	0501	90		15.4			14.9	*	103.4
5	0503	105		18.0			17.3	*	104.0
6	0505	80		13.7			13.2	*	103.8
7	0601	40		7.0			6.7	*	104.5
8	0602	55		12.9			12.3	*	104.9
9	0603	125		21.7			20.8	*	104.3
10	1101	95		35.5			33.8		105.0
11	1103	160		44.3			42.9	*	103.3
12	1105	15		8.1			7.2		112.5
13	1401-1	180		74.0			67.9		109.0
14	1401-2	145		35.2			35.0	*	100.6
15	1401-E	15		4.5			4.3		104.7
16									
17		1,555		380.4			360.0		5.7
18									
19									
20									
21									
22	* = 51.4 d/o								
23	All RM bags								
24	+ 1103 + 1401-2								
25									
26									
27									
28									
29									
30									
31									

*GP

Grand Island

EFFICIENCY LINE 22 207

		1	2 Ga. Pacific	4	5 Stone	6	7	
		#cogg	#M			#M		%
1	27-0501	325	56.3			54.8		102.7
2	0502	20	3.5			3.4		102.9
3	0503	25	4.3			4.2		102.-
4	0504	20	3.5			3.4		102.9
5	0505	248	59.7			62.6	*	95.-
6	0507	20	5.1			5.4	*	94.-
7	1104	325	88.2			89.3		98.8
8	1106	61	23.6			21.1		111.8
9	1301	78	20.2			21.1	*	95.7
10	1401-1	18	5.6			5.8	*	96.6
11	1401-2	160	32.5			34.5	*	94.2
12		1,300	302.5			305.6		
13								
14								
15								
16								
17								
18								
19	* = 524							
20								
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29								
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31								

Recd. 10/27

Georgia-Pacific Corporation
133 Peachtree Street, N.E. (30303)
P.O. Box 105605
Atlanta, Georgia 30348-5605
Telephone (404) 521-4000

October 23, 1987

Mr. R. J. Beuttner
Sr. V. P., Operations
Cyprus Industrial Minerals Co.
7000 South Yosemite Street
Englewood, CO 80155

Dear Jack,

In response to your request for quotation, we at Georgia-Pacific are very pleased to submit the attached bid package on your multiwall bag requirements for the following locations:

Cartersville, GA
Sylacauga, AL
Gleason, TN
Aiken, SC
Sandersville, GA
Three Forks, MT
Grand Island, NE
Alpine, AL
S. Plainfield, NJ

Georgia-Pacific, being the largest totally integrated forest products company and a large supplier of kraft, white and extensible grade papers, is very proud of our capabilities, ranging from forest lands through converted products.

Addressing the points stated in your letter dated September 15, 1987, Georgia-Pacific is prepared to propose the following:

1. Multi-Year Contract - As discussed in our previous meeting in Englewood, Georgia-Pacific is very interested in a multi-year contract that is beneficial to both our companies provided we are chosen as a major supplier. At such time as this decision is made, we would request a personal meeting with you and the Georgia-Pacific Multiwall Management team to determine specifics in the best interest of both Cyprus and Georgia-Pacific.

2. Price Escalation - We would offer inventory control programs based on forecasted requirements by plant location. This would be in the form of printed roll stock or finished bags as would be determined by manufacturing locations. A program of this type will have to be developed between Cyprus and Georgia-Pacific for maximum benefits to both our companies.

Prices quoted herein are firm through March 31, 1988. Price increases/decreases will be reviewed on a quarterly basis and will be dependent upon the changes in published prices of kraft paper, other raw materials, increase/decreases and ongoing market conditions. All increases/decreases will be negotiated with at least 30 days prior written notification.

3. Print Differential Charges - The attached prices already include the print upcharge for each and every item, however, we will combine all orders of the same size and construction to insure Cyprus the best possible manufacturing cost. Attached, per your request, is a copy of our print upcharges. This for you information only, please.

4. Techinical Support - Georgia-Pacific is very fortunate to have the services of a Packaging Engineer capable of performing plant surveys with the objective of reducing costs and maximizing operating efficiencies. Frankly, we offer the finest engineering services in the industry at no cost to the customer.

5. Our terms are 1%, 10, net 30 days. Applicable finishing charges to apply per attached.

We at Georgia-Pacific are very proud of our people, our products and our two manufacturing plants located in Pine Bluff, AR and Hamlet, NC. We extend to you and your personnel an open invitation to visit our plants and meet our people.

We are very pleased by the confidence expressed in our company to join with Cyprus as a "partner" for the future.

After reviewing our attached quotation, should you have any questions, please contact me. Thank you again for this opportunity to be of service.

Sincerely,

Bob Webb/sbm

R. E. (Bob) Webb
National Accounts Representative
Multiwall Packaging Division

REW:sbm

Attachments

cc: Joanne Felger
Roy Donnell
Tony Joyce
Sales Service - Hamlet
Sales Service - Pine Bluff

PRICING SUMMARY

CYPRUS LOCATION: Three Forks, Montana

SUPPLIER: Georgia-Pacific Corp.

SHIPPING LOCATION: Pine Bluff, AR

Spec. No.	Delivered Price 80M	40M	20M
25-0101	$163.54	$165.02	$172.30
25-0102	$238.75	$239.90	$247.55
25-0104	$200.75	$202.25	$209.55
25-0501	$171.35	$172.85	$180.85
25-0503	$171.35	$172.85	$180.85
25-0505	$171.35	$172.85	$180.85
25-0601	$173.30	$174.75	$182.80
25-0602	$232.50	$233.95	$242.00
25-0603	$173.30	$174.75	$182.80
25-1101	$374.05	$375.55	$382.80
25-1103	$276.70	$$278.20	$285.45
25-1105	$532.45	$533.90	$541.20
* 25-1401-1	410.95 ~~$216.30~~	412.40 ~~$217.80~~	419.70 ~~$225.10~~
25-1401-2	$242.60	$244.10	$251.40
25-1401-E	$290.30	$291.80	$299.10

* Corrected 11/6/87

PRICING SUMMARY

CYPRUS LOCATION: Grand Island, Nebraska

SUPPLIER: Georgia-Pacific Corp.

SHIPPING LOCATION: Pine Bluff, AR

	Delivered Price		
Spec. No.	80M	40M	20M
27-0501	$173.15	$175.03	$182.30
27-0502	$173.15	$175.03	$182.30
27-0503	$173.15	$175.03	$182.30
27-0504	$173.15	$175.03	$182.30
27-0505	$240.85	$242.75	$249.35
27-0507	$245.40	$247.30	$253.90
27-1104	$271.30	$273.15	$280.45
27-1106	$385.15	$387.05	$394.30
27-1301	$258.90	$260.80	$268.05
27-1401-1	$300.35	$302.20	$308.80
27-1401-2	$203.00	$204.85	$211.48

PRICING SUMMARY

CYPRUS LOCATION: Alpine, Alabama

SUPPLIER: Georgia-Pacific Corp.

SHIPPING LOCATION: Pine Bluff; AR

	Delivered Price		
Spec. No.	80M	40M	20M
23-0501	$189.38	$191.31	$198.80
23-1001	$215.81	$217.73	$225.22
23-1003	$234.71	$236.63	$244.12

PRICING SUMMARY

CYPRUS LOCATION: South Plainfield, New Jersey

SUPPLIER: Georgia-Pacific Corp.

SHIPPING LOCATION: Hamlet, NC

	Delivered Price		
Spec. No.	80M	40M	20M
29-0501	$205.50	$207.46	$215.05
29-1002	$250.94	$252.90	$260.49

MULTI-WALL BAG UPCHARGES PER M BAGS*

(1)	Printing:			
	(a) Identification (ID).			$1.85
	(b) One-side, one-color.			$8.05
(2)	Anti-skid coating.			$1.00/M
(3)	Tuck-in sleeves:			
	(a) Crepe.			$12.00
	(b) Natural Kraft - Brown.			Same
	(c) Crepe FBW.			$13.50
	(d) FBW.			$13.50
(4)	Inserts:			
	(a) Crepe.			
	(b) Natural Kraft - Brown.	Half Full		N/C $1.00
	(c) Natural Kraft - White.		Half	.80
	(c) Poly.		Full	2.50 7.50

*Carload quantities.

Supplier: Georgia-Pacific Corp.

(5) Finishing charges (per unit):

(a)	Pallets - Disposable.	$6.00
(b)	Pallets - GMA	$8.00
(c)	Picture Frame Top.	$4.00
(d)	Outside Storage Preparation. (Pallet, Box, Picture Framd & Black PE Shroud)	$18.00
(e)	Corrugated Pallet Box.	$5.00
(f)	Stretch Wrap.	$3.00

Stone Container Corporation

Mountain Region

Bag Division

2357 South 900 West
Salt Lake City, Utah 84119

801 972-8100

October 26, 1987

QUALITY PROBLEMS

Mr. R. J. Beuttner
Cyprus Industrial Minerals
P.O. Box 3419
Englewood, Colorado 80155

Dear Mr. Beuttner,

Stone Container Corporation is pleased to quote on your Multiwall bag requirements at all nine Cyprus Industrial Minerals locations for 1988.

Stone Container is the worlds largest producer of Kraft paper, with 12 paper mills and the largest producer of paper bags, with 18 plants. This enables Stone Container to ensure our customer we will meet their normal demands, regardless of market conditions. Our mills have the capacity to supply 100% of our bag plant needs while meeting our existing commitments to outside Kraft customers.

The following quoted prices are quaranteed by Stone Container through March 31, 1988. After that time we ask for an escalator of 1.75% for every $10.00 a ton increase in Multiwall grade Kraft, should there be an industry wide increase.

Should you have any questions concerning any part of this quote, please do not hesitate to call. We have enjoyed serving you in the years past and look forward to continuing our relationship.

Yours truly,

Tom R. Johnson

Tom R. Johnson
Sales Representative

MULTI-WALL BAG UPCHARGES PER M BAGS*

(1)	Printing:	
	(a) Identification (ID).	1.85
	(b) One-side, one-color.	8.05
(2)	Anti-skid coating.	.75
(3)	Tuck-in sleeves:	
	(a) Crepe.	11.15
	(b) Natural Kraft - Brown.	11.15
	(c) Crepe FBW.	12.65
	(d) FBW.	.85
(4)	Inserts:	
	(a) Crepe.	2.30
	(b) Natural Kraft - Brown.	0
	(c) Natural Kraft - White.	.85
	(c) Poly.	8.05

*Carload quantities.

Supplier: Stone Container Corporation

(5) Finishing charges (per unit):

(a) Pallets - Disposable.	7.00
(b) Pallets - GMA	9.50
(c) Picture Frame Top.	3.25
(d) Outside Storage Preparation.	2.25
(e) Corrugated Pallet Box.	5.50
(f) Stretch Wrap.	3.00

PRICING SUMMARY

CYPRUS LOCATION: Three Forks, Montana

SUPPLIER: Stone Container Corp.

SHIPPING LOCATION: Salt Lake City, Utah

	Delivered Price		
Spec. No.	80M	40M	20M
25-0101	154.85	155.75	161.30
25-0102	217.50	218.35	223.60
25-0104	192.50	193.40	199.00
25-0501	165.15	166.05	176.05
25-0503	165.15	166.05	176.05
25-0505	165.15	166.05	176.05
25-0601	167.40	168.30	178.80
25-0602	222.40	223.30	229.75
25-0603	166.15	167.35	173.80
25-1101	355.55	356.45	362.05
25-1103	268.00	268.90	274.45
25-1105	475.20	476.05	481.30
25-1401-1	377.00	377.85	383.10
25-1401-2	241.45	242.45	248.80
25-1401-E	282.45	283.35	288.95

PRICING SUMMARY

CYPRUS LOCATION: Grand Island, Nebraska

SUPPLIER: Stone Container Corp.

SHIPPING LOCATION: Des Moines, Iowa

	Delivered Price		
Spec. No.	80M	40M	20M
27-0501	168.70	169.95	176.00
27-0502	168.70	169.95	176.00
27-0503	168.70	169.95	176.00
27-0504	168.70	169.95	176.00
27-0505	252.30	253.65	259.25
27-0507	260.50	261.90	267.50
27-1104	274.70	276.00	282.45
27-1106	345.30	346.50	351.35
27-1301	270.75	272.05	278.20
27-1401-1	317.35	318.70	324.15
27-1401-2	215.55	216.90	222.40

8300 VALCOUR AVE., AFFTON, MO. 63123 TEL: (314) 832-1201

Ms. Joanne Felger
Cyprus Minerals Co.
7000 S. Yosemite St.
P.O. Box 3299
Englewood,CO. 80155

October 30,1987

Dear Joanne,

As per our conversation the otherday regarding adjustments to pricing on bag constructions for Aiken,SC. & Gleason Tennessee. I have attached the original construction and pricing accordingly for amendment to our proposal.

	80M	40M	20M
Location: Gleason,Tennessee			
Spec. #60-0402			
Construction-2/40NK,1/50NK	149.84	152.02	158.72
Location:Aiken,South Carolina			
Spec.#47-0901			
Construction-3/50NK	177.32	179.51	186.70
Spec.#47-0909			
Construction-4/50NK	234.96	237.26	242.31
Spec.#0910			
Construction-3/50NK	177.32	179.51	186.70

These appear to be the only bag items that we have changed construction from the original proposal.If you have any questions or if I can be of any further assistance please don't hesitate to call.

Sincerely,

G M Buffo
National Accounts Manager
Union Camp Corporation
Multiwall Packaging Group
(314) 832-1201

cc-D. Devries-Wayne
M. Pineau-Wayne
P. Holland-Tifton

8300 VALCOUR AVE., AFFTON, MO. 63123 TEL: (314) 832-1201

October 26,1987

Mr. R.J. Buettner
Senior Vice-President,Operations
Cyprus Industrial Minerals Co.
7000 S. Yosemite St.
P.O. Box 3299
Englewood, CO.80155

Dear Jack,

Union Camp is pleased to quote on your annual multiwall bag requirements for 1988. We have supplied Cyprus Minerals with many of their multiwall bag needs, and we are anxious to maintain that relationship.

The following information outlines conditions of sale,terms of payment ,paper tonnage escalators,etc.

1. Cash Terms: 1% 10 days Net 30 Days

2. Attached prices are based on delivered to Cyprus plants.

3. First year of contract will run from January 1,1988 thru December 31,1988. Any extension of the contract may be mutually agreed upon by Union Camp and Cyprus Minerals upon sixty (60) days advance written notice from Cyprus Minerals to Union Camp.

4. General Price will be firm from January 1,1988 thru March 31,1988. Pricing adjustments are to amended up or down based on multiwall paper cost at 1.6% of every $10/Ton increase or decrease. This will apply to natural kraft as well as bleached kraft.

5. Pricing-Non-Tonnage-If converting(Non-Tonnage) costs increase substantially during the agreement period,such increases will be subject to negotiation on a annual basis.Non-tonnage increases will be limited to 3% annually.

6. Pricing-Effective date-Adjustments- All pricing increases will become effective 30 days after written notice to Cyprus.

UNION CAMP CORPORATION

CONDITIONS OF SALE

7. All Artwork and new print copy changes will be supplied by Cyprus Minerals to Union Camp in the form of half-size film positives or negatives depicting graphic layout of each Cyprus bag. The releasing locations will furnish Union Camp with sample bags depicitng the graphic layout and printing requirements.

8. Union Camp will supply bag technical assistance utilizing our Bag Technical personnel at our Savannah paper mill. Whenever a question of bag sizing,bag filling,palletization or any bag technical question arrises Union Camp will supply this service at No Charge to Cyprus Minerals.

9. Specific Union Camp plant sales representatives will be directly responsible for the Cyprus Minerals plant requirments. Any particulars regarding bag needs will be directed thru these individual sales representatives.

We appreciate this opportunity to quotc Cyprus Minerals bag requirements. Our relationship with Cyprus has been a fine one over the years and we at Union Camp want to continue this relationship. If you have any questions or if I can be of any further assistance, please do not hesitate to call.

Sincerely,

G. M. Buffo
National Accounts Manager
Union Camp Corporation
Multiwall Packaging Group
(314) 832-1201

cc-D. Devries-Wayne
M. Pineau-Wayne
J. Newell-St. Louis
P. Holland-Tifton
J. Morris-New Hope

CUSTOMER COPY

GILMAN PAPER COMPANY / KRAFT BAG DIVISION

TIME & LIFE BUILDING / ROCKEFELLER CENTER / 111 WEST 50th STREET / NEW YORK, N.Y. 10020

WE THANK YOU FOR THIS ORDER, WHICH WE HAVE ENTERED FOR MANUFACTURE AS INDICATED.

PLEASE CHECK ADVISE IF NOT CORRECT

ORDER #	PG #	# PGS	CHG #	MASTER #	REL #	CUSTOMER ORDER #	ORDER DATE	SHIP DATE	SHIP WITH
103846	1	2	1			SP 87-146	08 14 87	09 14 87	

MILL	SALESMAN	RGN	CUST #	BILL	STATE	ROUTING
MW	52 MC KEOWN	1	3328	03	30	TP1

SOLD: CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
S PLAINFIELD, NJ 07080

SHIP: CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
S PLAINFIELD, NJ 07080

GENERAL INFORMATION

WE RESERVE THE RIGHT TO SHIP THIS ORDER AT THE PRICE PREVAILING AT TIME OF SHIPMENT.

FOB	DISCOUNT TERMS	PALLETS	SLUG	COLOR CHG	FINISH / M	PRICE / M		FRT. ALLOW.	PER	FIXED
ST. MARY'S, GA.	1/10 N/30	14.50				168.75				

BAG IDENTIFICATION

BAG TYPE	BRAND NAME	B. S. #	REV #	VERSION	COMM.
PVSE	NET WT 50 LBS 22.68 KG CYPRUS TALC VALVE ARROW (ROLLER MILL)	T-147-5007	00	NEW	-73-

SIZE

WIDTH	FACE	GUSSET	FIN. LENGTH	TUBE LENGTH	TOP BUTT	BOTT. BUTT	VALVE SIZE	LOC.
39	19		22-3/4	27-1/2	3-3/4	3-3/4	3-1/2	URF

WEIGHT TOT S/W	WEIGHT PAGE WEIGHT	QUANTITY
140	36290	95000

CONSTRUCTION

		WGT/M	PLY WGT	OVERALL	PERFS	PIN SZ
1	40 NK	109	10378	1	1	3/32
2	50 NK	137	12971	1	1	3/32
3	50 BLEACH	137	12971	1	2	1/16
4						
5						
6						
7						

SPECIAL INSTRUCTIONS - TUBING: WATCH PERFORATION SIZE

PLYS	ANTI-SKID	HOT M.S.	VAL. PERF	PIN SZ.	PAGE	ACROSS	DOWN	SPOT PST	OFFSET GE	STIFF GE	THUMB CUT	SOM SLIT
3	HVY SYTON		YES	3/32	230	00	00					

ENDING

	METH.	LOC.	THREAD	LOOPER	CORD	TAPE	EZ OPEN	H/S	CREASE	HANDLES
SEWING										

	VALVE TYPE	EXTERNAL	INTERNAL	THB CUT	SLIT
VALVE	POLY				

	GUILLOTINE	K. B. CLOSE	FLD OV SEAM	HEAT SEAL	CUST H/S	PULL STRING
TFT						

SPECIAL INSTRUCTIONS - ENDING: BAGS PACKED FACE UP

PRINTING

	COLOR	INK #	FA	GE	BK	BT	FCS
1	BLUE			X	ID		BK
2							
3							
4							
5							
6							
7							
8							

FCS & CODING: P.O.#, DTE OF MFG BELOW FCS

PRT PER SAMPLE BAG RECD ON 8-10-87 FROM MAK

SPECIAL INSTRUCTIONS - PRINTING

CAUTION	SIDES	COLORS
	1	1

FINISHING

BDL/WRP	BAGS/BDL	STRETCH	CONT.	CHAFE L	PALLETS	2W/4W	TOP & BOT	PICT FRAM	MAX HGT	BAGS / PER	OUTSIDE STORAGE
			YES		48X40 GMA	4W				2500	NONE

SHIPPING NOTICE: TRUCKER MUST CALL 24 HOURS PRIOR TO DELIVERY. FOR APPT 201-754-4881

SPECIAL MARKINGS

SPECIAL INSTRUCTIONS - SHIPPING

CHANGES

SPECIFICATION & PAGE CHANGES

ORDER CHANGES: 1 SHIP TO CHG

SUBJECT TO ALL TERMS AND CONDITIONS PRINTED UPON BACK HEREOF WHICH ARE PART OF THIS ACKNOWLEDGEMENT.

CUSTOMER COPY

GILMAN PAPER COMPANY / KRAFT BAG DIVISION

TIME & LIFE BUILDING / ROCKEFELLER CENTER / 111 WEST 50th STREET / NEW YORK, N.Y. 10020

WE THANK YOU FOR THIS ORDER, WHICH WE HAVE ENTERED FOR MANUFACTURE AS INDICATED.

PLEASE CHECK ADVISE IF NOT CORRECT

ORDER #	PG #	# PGS	CHG #	MASTER #	REL #	CUSTOMER ORDER #	ORDER DATE	SHIP DATE	SHIP WITH
103846	2	2	1			SP 87-146	08 14 87	09 14 87	

MILL	SALESMAN	RGN	CUST #	BILL	STATE	ROUTING
MW	52 MC KEOWN	1	3328	03	30	TP1

SOLD	SHIP
CYPRUS INDUSTRIAL MINERALS	CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD	651 METUCHEN ROAD
S PLAINFIELD, NJ 07080	S PLAINFIELD, NJ 07080

GENERAL INFORMATION

WE RESERVE THE RIGHT TO SHIP THIS ORDER AT THE PRICE PREVAILING AT TIME OF SHIPMENT.

FOB	DISCOUNT TERMS	PALLETS	SLUG	COLOR CHG	FINISH / M	PRICE / M	FRT. ALLOW.	PER	FIXED
ST. MARY'S, GA.	1/10 N/30	14.50				168.75			

BAG IDENTIFICATION

BAG TYPE	BRAND NAME	B. S. #	REV #	VERSION	COMM.
PVSE	CYPRUS TALC VALVE ARROW (NO WT MARK) (ROLLER MILL)	T-147-5008	00	NEW	-73

SIZE

WIDTH	FACE	GUSSET	FIN. LENGTH	TUBE LENGTH	TOP BUTT	BOTT. BUTT	VALVE SIZE	LOC.
39	19		22-3/4	27-1/2	3-3/4	3-3/4	3-1/2	URF

WEIGHT TOT B/W	WEIGHT PAGE WEIGHT	QUANTITY
140	1910	5000

CONSTRUCTION

		WGT/M	PLY WGT	OVERALL	PERFS	PIN SZ	SPECIAL INSTRUCTIONS - TUBING
1	40 NK	109	546	1	1	3/32	WATCH PERFORATION SIZE
2	50 NK	137	683	1	1	3/32	
3	50 BLEACH	137	683	1	2	1/16	
4							
5							
6							
7							

PLYS	ANTI-SKID	HOT M.S.	VAL. PERF	PIN SZ.	PAGE	ACROSS	DOWN	SPOT PST	OFFSET GE	STIFF GE	THUMB CUT	SOM SLIT
3	HVY SYTON	YES	3/32	230	00	00						

ENDING

	METH.	LOC.	THREAD	LOOPER	CORD	TAPE	EZ OPEN	H/S	CREASE	HANDLES
SEWING										

	VALVE TYPE	EXTERNAL	INTERNAL	THB CUT	SLIT	
VALVE	POLY					BAGS PACKED FACE UP

	GUILLOTINE	X. B. CLOSE	FLD OV SEAM	HEAT SEAL	CUST H/S	PULL STRING	SPECIAL INSTRUCTIONS - ENDING
TFT							

PRINTING

	COLOR	INK #	FA	GE	BK	BT	FCS	FCS & CODING
1	BLUE			X	ID		BK	P.O.#, DTE OF MFG BELOW FCS
2								
3								PRT PER SAMPLE BAG RECD ON
4								8-10-87 FROM MAK
5								
6								
7								SPECIAL INSTRUCTIONS - PRINTING
8								CAUTION / SIDES 1 / COLORS 1

FINISHING

BDL/WRP	BAGS/BDL	STRETCH		CHAFE L	PALLETS		TOP & BOT	PICT FRAM	MAX HGT	BAGS / PER	OUTSIDE STORAGE
			YES CONT.		48X40 GMA	4W 2W/4W				2500	NONE

SHIPPING NOTICE

TRUCKER MUST CALL 24 HOURS PRIOR TO DELIVERY FOR APPT 201-754-4881

SPECIAL MARKINGS

SPECIAL INSTRUCTIONS - SHIPPING

CHANGES

SPECIFICATION & PAGE CHANGES

ORDER CHANGES

1 SHIP TO CHG

SUBJECT TO ALL TERMS AND CONDITIONS PRINTED UPON BACK HEREOF WHICH ARE PART OF THIS ACKNOWLEDGEMENT.

LEHMAN 01055

CUSTOMER COPY

GILMAN PAPER COMPANY / KRAFT BAG DIVISION

TIME & LIFE BUILDING / ROCKEFELLER CENTER / 111 WEST 50th STREET / NEW YORK, N.Y. 10020

WE THANK YOU FOR THIS ORDER, WHICH WE HAVE ENTERED FOR MANUFACTURE AS INDICATED.

PLEASE CHECK ADVISE IF NOT CORRECT

ORDER #	PG #	# PGS	CHG #	MASTER #	REL #	CUSTOMER ORDER #	ORDER DATE	SHIP DATE	SHIP WITH
103398	1	1				SP 87-127	06 02 87	06 22 87	

MILL	SALESMAN	RGN	CUST #	BILL	STATE	ROUTING
MU	52 MC KEOWN	1	3328	03	32	TP1 SHIP WITH TONNAGE TO AREA

SOLD TO: CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SOUTH PLAINFIELD, N07080

SHIP: SAME

GENERAL INFORMATION

WE RESERVE THE RIGHT TO SHIP THIS ORDER AT THE PRICE PREVAILING AT TIME OF SHIPMENT.

FOB	DISCOUNT TERMS	PALLETS	SLUG	COLOR CHG	FINISH / M	PRICE / M		FRT. ALLOW.	PER	FIXED
ST. MARY'S, GA.	1/10 N/30	14.50				237.10				

BAG IDENTIFICATION

BAG TYPE	BRAND NAME	B. S. #	REV #	VERSION	COMM.
PVSE	(VERTICAL MILL) NET WT. 50LBS 22.68KG CYPRUS TALC	T-147-5004	00	NEW	-73-

SIZE

WIDTH	FACE	GUSSET	FIN. LENGTH	TUBE LENGTH	TOP BUTT	BOTT. BUTT	VALVE SIZE	LOC.
45	22		25-1/2	31-	4-1/2	4-1/2	3-1/2	URF

WEIGHT TOT B/W	WEIGHT PAGE WEIGHT	QUANTITY
140	24850	50000

CONSTRUCTION

		WGT/M	PLY WGT	OVERALL	PERFS	PIN SZ
1	40 NK	142	7104	3/4	3/4	1/16
2	50 NK	178	8880	3/4	3/4	1/16
3	50 BLEACH	178	8880	1-1/2	1-1/2	1/16
4						
5						
6						
7						

SPECIAL INSTRUCTIONS - TUBING:

PLYS	ANTI-SKID	HOT M.S.	VAL. PERF	PIN SZ.	PAGE	ACROSS	DOWN	SPOT PST	OFFSET GE	STIFF GE	THUMB CUT	SOM SLIT
3	HVY SYTON		YES	1/16	231	00	00					

ENDING

	METH.	LOC.	THREAD	LOOPER	CORD	TAPE	EZ OPEN	H/S	CREASE	HANDLES
SEWING										

	VALVE TYPE	EXTERNAL	INTERNAL	THB CUT	SLIT
VALVE	POLY				

	GUILLOTINE	K. B. CLOSE	FLD OV SEAM	HEAT SEAL	CUST H/S	PULL STRING
TFT						

SPECIAL INSTRUCTIONS - ENDING:

PRINTING

	COLOR	INK #	FA	GE	BK	BT	FCS
1	BLUE			X	ID	X	8K
2							
3							
4							
5							
6							
7							
8							

FCS & CODING:

PRT PER SAMPLE BAG MAILED ON

5/26/87

SPECIAL INSTRUCTIONS - PRINTING

CAUTION	SIDES	COLORS
	1	1

FINISHING

BDL/WRP	BAGS/BDL	STRETCH	CONT.	CHAFE L.	PALLETS	2W/4W	TOP & BOT	PICT FRAM	MAX HGT	BAGS / PER	OUTSIDE STORAGE
			YES		48X40 GMA					2000	NONE

SHIPPING NOTICE:
TRUCKER MUST CALL 24 HOURS PRIOR TO DELIVERY FOR APPT 201-754-4881

SPECIAL MARKINGS:

SPECIAL INSTRUCTIONS - SHIPPING:

CHANGES

SPECIFICATION & PAGE CHANGES

ORDER CHANGES

SUBJECT TO ALL TERMS AND CONDITIONS PRINTED UPON BACK HEREOF WHICH ARE PART OF THIS ACKNOWLEDGEMENT.

LEHMAN 01056

Requested by	Date	Appropriation No.	Serial No.	Material Description
	5/29/87	Inventory		Bags

▼Show this number on all invoices, packages, shipping papers, and correspondence.

Purchase Order No. SP87-127

Dates ▶	Ordered	P.O. Issued	Material Required
	5/18/87	5/18/87	W.O. 7/1/87

▼ Send shipment to--

▼ Vendor

Gilman Paper Company
One Blue Hill Plaza
Pearl River, N.Y. 10965

Ship Via	F.O.B.	Freight Terms	Payment Terms:	Sales Tax
P.P. ☐ U.P.S. Air ☐ R.R. ☐ Truck ☐	Origin ☐ Destination ☐	Collect ☐ Prepay ☒ Prepay & Add. ☐	discount % within days	Exempt ☐ Taxable ☐

Item No.	Quantity Ordered	Quantity Received	Unit	Symbol No.	Description	Price
1	50M		Each		29-1002 Vertical Mill bags 22x25 1/2 x 4 1/2 w/3 1/2 poly insert Dupliote sample Bag for perfs. & Printing Package in tote boxes on GMA Pallet. 2,000 bags per box.	$237.10/M

Account Number	Business Assoc. No.	Commodity Code

Company ~~1610-001~~

By ~~Cyprus Industrial Minerals~~ Title

Direct Inquiries regarding this order to-- Phone

201 754-4881

▼ Send invoice in triplicate to--

- Advise if not able to ship by date material required.
- Transportation charges must be accompanied by original freight bill.

The Terms and Conditions set forth on the reverse side hereof are incorporated herein by this reference and made a part hereof. They shall govern any contract between us resulting therefrom, not withstanding any inconsistency with any terms and conditions contained in your acceptance, acknowledgment, and/or confirmation unless we specifically hereinafter agree in writing to any such inconsistent terms and conditions submitted by you.

Form 23-301-AM (5-82)

PURCHASING

Requested by	Date	Appropriation No.	Serial No.	Material Description
	5/29/87	Inventory		Bags

▼Show this number on all invoices, packages, shipping papers, and correspondence.

Purchase Order No. SP87-127

Dates ▶	Ordered	P.O. Issued	Material Required
	5/18/87	5/18/87	W.O. 7/1/87

▼ Send shipment to--

▼ Vendor

Gilman Paper Company
One Blue Hill Plaza
Pearl River, N.Y. 10965

Ship Via	F.O.B.	Freight Terms	Payment Terms:	Sales Tax
P.P. ☐ U.P.S. ☐ Air ☐ R.R. ☐ Truck ☒	Origin ☐ Destination ☒	Collect ☐ Prepay ☒ Prepay & Add. ☐	discount % within days	Exempt ☒ Taxable ☐

Item No.	Quantity Ordered	Quantity Received	Unit	Symbol No.	Description	Price
1	50M		Each		29-1002 Vertical Mill bags 22x25 1/2 x 4 1/2 w/3 1/2 poly insert Duplicate sample bag for perfs. & Printing Package in tote boxes on GMA Pallet 2,000 bags per box.	$237.10/M

Account Number	Business Assoc. No.	Commodity Code

Company ~~1610-001~~

By ~~Cyprus Industrial Minerals~~ Title

Keith B. Lehman

Direct inquiries regarding this order to-- Phone

201 754-4881

▼ Send invoice in triplicate to--

- Advise if not able to ship by date material required.
- Transportation charges must be accompanied by original freight bill.

The Terms and Conditions set forth on the reverse side hereof are incorporated herein by this reference and made a part hereof. They shall govern any contract between us resulting herefrom, not withstanding any inconsistency with any terms and conditions contained in your acceptance, acknowledgment, and/or confirmation unless we specifically hereinafter agree in writing to any such inconsistent terms and conditions submitted by you.

Form 23-301-AM (5-82)

PURCHASING

FACSIMILE TRANSMISSION

DATE:

TO	FROM
Name: ATTN: MAUREEN	Name: KEITH LEHMAN
Company Gilman Paper Company	Company CIM So. Plainfield
City/State Pearl River, N.Y.	Telephone - 1 201 754-4881
Facsimile Tel.# 914 735-3999	Facsimile Tel.# 201 754-0083

This Transmision Consists of: 3 pages (Including this page)

Cyprus Industrial Minerals
Phone: 1 201 754-4881

Facsimile Machine:
1 201 754-0083

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
29-0501 Roller Mill ~~19 x 22-1/4 x 4-1/4~~ 19 x 22 3/4 x 3 3/4	2/40 NK, 1/50 FBW	3-1/2" poly.
~~29-1004 Vertical Mill 22 x 25-1/2 x 4-1/2~~	~~1/40 NK, 1/50 NK, 1/50 FBW.~~	3-1/2" poly.

Note: All of the above prices include anti-skid coating.

LEHMAN 01060

Effective: 4/1/87

LOCATION: South Plainfield, New Jersey

COST/M CARLOAD QUOTATION

PRINTING	Gilman
ID.	$ 168.75
ID.	~~487.10~~

December 16, 1986

G. R. M. Dugan
T. D. Landels
K. B. Lehman
M. R. McCune

Bag Prices

After review of the quotations submitted by nine multi-wall paper bag vendors, a decision has been made regarding the suppliers we will be using in 1987 as follows:

Three Forks

50%	Stone Container Corporation
20-25%	Gilman Paper Company
20-25%	Union Camp Corporation

Grand Island

50%	Georgia-Pacific Corporation
20-25%	Stone Container Corporation
20-25%	Gilman Paper Company

Alpine and South Plainfield

The majority of your bags should be purchased through Gilman Paper Company. Georgia-Pacific Corporation has been advised that they may receive some of your business.

All percentages above are approximate.

Revised price lists are attached.

Please call me if you have any questions.

Michael J. Lorang/jsf

Michael J. Lorang

MJL:jsf

Attachments

Effective: 1/1/87

4.25

LOCATION: South Plainfield, New Jersey

COST/M CARLOAD QUOTATION

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING	Gilman	Georgia Pacific
29-0501 Roller Mill 19 x 22-1/4 x 4-1/4 22 1/4 x 3 1/4	2/40 NK, 1/50 FBW 1 1/2	3-1/2" poly.	ID.	$ 161.50	$ 169.65
29-1002 Vertical Mill 22 x 25-1/2 x 4-1/2	1/40 NK, 1/50 NK, 1/50 FBW.	3-1/2" poly.	ID.	226.90	223.28

Note: All of the above prices include anti-skid coating.

19 x 22 1/4 x 4 3/4 G.I. # 0505
works o.k packs 3 or 4 sec. faster than on 19 x 22 3/4 x 3 3/4

LEHMAN 01062

Cyprus Industrial Minerals Company
Division of Cyprus Minerals Company

7200 South Alton Way
Post Office Box 3299
Englewood, Colorado 80155
(303) 740-5000

December 15, 1986

Mr. Woody Evans
Gilman Paper Company
950 Lee Street
Des Plaines, Illinois 60016

Dear Mr. Evans:

Gilman Paper Company has been selected as a multi-wall bag supplier for approximately 20 to 25% of our 1987 requirements at Three Forks, Montana, approximately 20 to 25% at Grand Island, Nebraska, and the majority of our bags at Alpine, Alabama and South Plainfield, New Jersey based on your quotation of November 7, 1986. Orders will be placed as needed by our plant superintendents, Mike Dugan, Tom Landels, Marvin McCune, and Keith Lehman. Your prices which become effective January 1, 1987 will be forwarded to them in the near future.

Price increase notifications as outlined in your November 7 letter should be sent to my attention at the above address.

Please call me or Joanne Felger if you have any questions.

Very truly yours,

Michael J. Lorang/jsf

Michael J. Lorang
Manager-Mills, Talc Division

MJL:jsf

G. R. M. Dugan
T. D. Landels
K. B. Lehman
M. R. McCune

CYPRUS

September 2, 1987

G. R. M. Dugan
T. D. Landels
K. B. Lehman
M. R. McCune

Bag Price Increases

Attached is a revised bag price list for each of your respective locations. Stone Container Corporation has announced a 4.5% increase effective 9/9/87, and Gilman Paper Company has announced a 5% increase effective 9/14/87 for Alpine and South Plainfield and 7% for Three Forks and Grand Island. I have received calls from Union Camp and Georgia-Pacific regarding their increases but as yet have not received written notification of the percentage or effective dates. Will advise you as soon as we receive this information.

Note to G. R. M. Dugan and T. D. Landels: I have not included the new bags specs. for your locations. This information will be shown in future price lists.

Joanne

J. S. Felger

jsf

Attachment

M. J. Lorang

2/50
1/60
1/50

22

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT
29-0501 Roller Mill 19 x 22-3/4 x 3-3/4	3/ 2/40 NK, 1/50 White Kraft	3-1/2" poly.
29-1002 Vertical Mill 22 x 25-1/2 x 4-1/2	1/40 NK, 1/50 NK, 1/50 White Kraft.	3-1/2" poly.

Note: All of the above prices include anti-skid coating.

LEHMAN 01065

Revised 9/2/87

LOCATION: South Plainfield, New Jersey

COST/M CARLOAD QUOTATION

PRINTING	Gilman	Georgia Pacific
ID.	$ 177.20	$ 177.28
ID.	249.00	233.33

December 7, 1987

KRM
pls copy attached & memo & send to: GPM.D JPC KBL MRM
thanx

M. J. Lorang
R. G. Morris

Bag Pricing Effective January 1, 1988

Attached are price lists including specifications for the locations reporting to you. This information needs to be forwarded to your Superintendents/ Managers by you. As we discussed, all locations with the exception of Alpine and South Plainfield will be a 50/50 split between the two lowest-priced vendors as shown on the price lists. Prices for all suppliers are firm through March 31, 1987. We are in the process of meeting with all three suppliers to discuss the proposed agreement. A copy of these agreements will be sent to you when finalized.

We have indicated to all three suppliers that we would be monitoring purchases. I would therefore like to request that your plant Superintendents/ Managers forward a copy of all bag invoices as well as a copy of their month-end bag inventory reports to me for this purpose.

Please let me know if I can be of further assistance.

Joanne

J. S. Felger

jsf

Attachments

R. J. Buettner

COST/M PRICING EFFECTIVE 1/1/88
LOCATION: Three Forks, Montana

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING	Georgia-Pacific 80M	Georgia-Pacific 40M	Georgia-Pacific 20M	Stone 80M	Stone 40M	Stone 20M
25-0101 Compacted-Brown 18 x 21 x 4-1/2	3/50 NK (water-soluble adhesive)	4-1/2" full wrap-around paper insert with unpasted seam.	IO (water-soluble ink).	$163.54	$165.02	$172.30	$154.85	$155.75	$161.30
25-0102 Compacted-White 18 x 21 x 4-1/2	3/50 FBW (water-soluble adhesive)	4-1/2" full wrap-around beater white paper insert with unpasted seam.	ID (water-soluble ink).	238.75	239.90	247.55	217.50	218.35	223.60
25-0104 Compacted-Export 18 x 21 x 4-1/2	4/50 NK (water-soluble adhesive)	4-1/2" full wrap-around paper insert with unpasted seam.	IO and export markings (water-ink).	200.75	202.25	209.55	192.50	193.40	199.00
25-0501 Roller Mill-200 Mesh 19 x 22-1/4 x 4-1/4	2/40, 1/50 NK (water-soluble adhesive)	3-1/2" poly.	IO (water-soluble ink).	171.35	172.85	180.85	165.15	166.05	176.05
25-0503 200 Mesh - OSHA Label 19 x 22-1/4 x 4-1/4	2/40, 1/50 NK (water-soluble adhesive)	3-1/2" poly.	ID (water-soluble ink).	171.35	172.85	180.85	165.15	166.05	176.05
25-0505 Chlorite - OSHA Label 19 x 22-1/4 x 4-1/4	2/40, 1/50 NK (water-soluble adhesive)	3-1/2" poly.	ID (water-soluble ink).	171.35	172.85	180.85	165.15	166.05	176.05
25-0601 Roller Mill-325 Mesh 19 x 22-1/4 x 4-3/4	2/40, 1/50 NK (water-soluble adhesive)	3-1/2" poly.	ID (water-soluble ink).	173.30	174.75	182.80	167.40	168.30	178.80
25-0602 Roller Mill-Export 19 x 22-1/4 x 4-1/2	3/50, 1/60 NK (water-soluble adhesive)	3-1/2" poly.	ID and export markings (water-soluble ink).	232.50	233.95	242.00	222.40	223.30	229.75
25-0603 325 Mesh - OSHA Label 19 x 22-1/4 x 4-3/4	2/40, 1/50 NK (water-soluble adhesive)	3-1/2" poly.	ID (water-soluble ink).	173.30	174.75	182.80	166.15	167.35	173.80
25-1101 Mistron Export 22 x 35-1/2 x 4-3/4	2/50, 2/60 NK (water-soluble adhesive)	3-3/4" full wrap-around paper insert with unpasted seam.	IO and export markings (water-soluble ink).	374.05	375.55	382.80	355.55	356.45	362.05
25-1103 Mistron Domestic-Brown 22 x 35-1/2 x 4-3/4	3/50 NK (water-soluble adhesive)	3-3/4" full wrap-around paper insert with unpasted seam.	ID (water-soluble ink).	276.70	278.20	285.45	268.00	268.90	274.45
25-1105 Mistron Domestic-White 22 x 35-1/2 x 4-3/4	4/50 F8W (water-soluble adhesive)	3-3/4" full wrap-around beater white paper insert with unpasted seam.	IO (water-soluble ink).	532.45	533.90	541.20	475.20	476.05	481.30

LEHMAN 01067

COST/M PRICING EFFECTIVE 1/1/88

LOCATION: Three Forks, Montana

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING
25-1401-1 ACM-White 22 x 25-1/2 x 4-1/2	4/50 FBW (water-soluble adhesive)	3-1/2" full wrap-around beater white paper insert with unpasted seam.	ID (water-soluble ink).
25-1401-2 ACM-Brown 22 x 25-1/2 x 4-1/2	3/50 extensible (water-soluble adhesive) OR 3/50 NK (water-soluble adhesive)	3-1/2" full wrap-around paper insert with unpasted seam.	ID (water-soluble ink).
25-1401-E ACM-Export 22 x 25-1/2 x 4-1/2	2/50, 2/60 NK (water-soluble adhesive)	3-1/2" full wrap-around paper insert with unpasted seam.	ID and export markings (water-soluble ink).

Note: The above prices do not include anti-skid coating.

LEHMAN 01068

Georgia-Pacific			Stone		
80M	40M	20M	80M	40M	20M
$410.95	$412.40	$419.70	$377.00	$377.85	$383.10
242.60	244.10	251.40	241.45	242.45	248.80
290.30	291.80	299.10	282.45	283.35	288.95

COST/M PRICING EFFECTIVE 1/1/88

LOCATION: Grand Island, Nebraska

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING	Georgia-Pacific			Stone		
				80M	40M	20M	80M	40M	20M
27-0501 Roller Mill-Domestic 19 x 22-1/4 x 4-3/4	3/50 NK	3-1/2" poly seal.	One-side, one-color.	$173.15	$175.03	182.30	$168.70	$169.95	$176.00
27-0502 Roller Mill-Plain 19 x 22-1/4 x 4-3/4	3/50 NK	3-1/2" poly seal.	One-side, one-color.	173.15	175.03	182.30	168.70	169.95	176.00
27-0503 Roller Mill-Chlorite-Brown 19 x 22-1/4 x 4-3/4	3/50 NK	3-1/2" poly seal.	One-side, one-color.	173.15	175.03	182.30	168.70	169.95	176.00
27-0504 Roller Mill-Glacier 19 x 22-1/4 x 4-3/4	3/50 NK	3-1/2" poly seal.	One-side, one-color.	173.15	175.03	182.30	168.70	169.95	176.00
27-0505 Roller Mill-Cosmetic 19 x 22-1/4 x 4-3/4	2/50, 1/60 NK inner plies; 1/50 white kraft outer ply	3-1/2" full wrap-around white kraft insert with unpasted seam.	One side, one color.	240.85	242.75	249.35	252.30	253.65	259.25
27-0507 Roller Mill-Chlorite-White 19 x 22-1/4 x 4-3/4	3/50 FBW (water-adhesive).	3-1/2" full wrap-around beater white insert with unpasted seam.	One-side, one-color (water-soluble ink).	245.40	247.30	253.90	260.50	261.90	267.50
27-1104 Mistron Domestic-Brown 22 x 35-1/2 x 4	2/50, 1/60 NK (water-soluble adhesive)	3-1/2" crepe tuck-in sleeve.	One-side, one-color (water-soluble ink).	271.30	273.15	280.45	274.70	276.00	282.45
27-1106 Mistron Domestic-White 22 x 35-1/2 x 4	3/50 FBW (water-soluble adhesive)	3-1/2" FBW crepe tuck-in sleeve.	One-side, one-color (water-soluble ink).	385.15	387.05	394.30	345.30	346.50	351.35
27-1301 Mistron Domestic-Brown 25 x 29-1/2 x 5	3/50 NK (water-soluble adhesive)	3-1/2" crepe tuck-in sleeve.	One-side, one-color (water-soluble ink).	258.90	260.80	268.05	270.75	272.05	278.20
27-1401-1 Mistron Dens./Class.-White 22 x 25-1/2 x 4-1/2	3/50 FBW (water-soluble adhesive)	3-1/2" full wrap-around beater white paper insert with unpasted seam.	One-side, one-color (water-soluble ink).	300.35	302.20	308.80	317.35	318.70	324.15
27-1401-2 Mistron Dens./Class.-Brown 22 x 25-1/2 x 4-1/2	3/50 NK (water-soluble adhesive)	3-1/2" full wrap-around paper insert with unpasted seam.	One-side, one-color (water-soluble ink).	203.00	204.85	211.48	215.55	216.90	222.40

Note: The above prices do not include anti-skid coating.

LEHMAN 01069

it out Speak with Maureen

1-800-336-3606

ATTN:

Jeffrey P. McKeown

P.O. 1577

Sales Manager
Eastern Region
Converted Products

Gilman Paper Company
One Blue Hill Plaza
Pearl River, N.Y. 10965
914-735-2320

5052176

COST/M PRICING EFFECTIVE 1/1/88

LOCATION: Alpine, Alabama

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING	Georgia-Pacific 80M	40M	20M
23-0501 Roller Mill 18-1/2 x 23 x 3-1/2	2/40 NK (inner plies), 1/50 white kraft outer ply)	3-1/2" poly.	One-side, one color.	$189.38	$191.31	$198.80
23-1101 Vertical Mill 20-1/2 x 25 x 3-1/2	2/40 NK (inner plies), 1/50 white kraft outer ply)	3-1/2" poly.	One-side, one-color.	215.81	217.73	225.22
23-1103 Vertical Mill 22 x 25-1/2 x 4-1/2	2/40 NK (inner plies), 1/50 white kraft outer ply)	3-1/2" poly.	One-side, one-color.	234.71	236.63	244.12

Note: The above prices include anti-skid coating.

LEHMAN 01072

COST/M PRICING EFFECTIVE 1/1/88
LOCATION: South Plainfield, NJ

SPEC. NO./ DESCRIPTION/ SIZE	CONSTRUCTION	INSERT	PRINTING	Georgia-Pacific 80M	40M	20M
29-0501 Roller Mill 19 x 22-3/4 x 3-3/4	2/40 NK (inner plies), 1/50 white kraft (outer ply)	3-1/2" poly.	One-side, one-color.	$205.50	$207.46	$215.05
29-1002 Vertical Mill 22 x 25-1/2 x 4-1/2	2/50 NK (inner plies), 1/50 white kraft (outer ply)	3-1/2" poly.	One-side, one-color.	250.94	252.90	260.49

Note: The above prices include anti-skid coating.

LEHMAN 01073

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ENERGY SURVEY MAY 1983

[redacted]

GAS USE

6.3

AIGNER FORM NO. 84016 Page 4
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Date/Product	Start	Stop	Total	Temp	Feed Bin Number	Tons Produced	CF/hour	CF/TON	TON/Hour Brued	Lot #
1/22 IT	931903	935209		250°	RMF II					
Gate # 9	4782.1	4791.0								
1/23 4.S.	935214			200°	VMF II					
Gate # 9	4791.0	4799.6								
1/24 Korean	935420			330°	RMF I					
Gate # 9	4799.6	4812.3								
1/28/85 IT										
Gate # 9	4812.3									
1/31/86 YS 25C	936575			250°	VMF II					
Gate # 9	4828.3	4835.4								
2/01/86 IT				250°	RMF II					
Gate # 9	4835.4	947.9								
2/20/86 YS Bow 3/4	947.9									
Gate 10 21 scoops	940,194									
2/25/86 KN,	930596			330°	RMF II					
Gate 10 20 scoops	4957.5									
3/3 S. Cos.	942,882			330°	RMF I					
Gate 7	5009.7									
4/2 Korean										
Gate 7 67 scoops	BOBCAT		.46 Tons/scoop							

DATE / Product	START	STOP	TOTAL	TEMP	Feed BIN Number	TONS Produced	CF/HOUR	CF./TON	TON/HOUR Dryed	Lot #
	1	2	3	4	5	6	7	8	9	10
12/18 IT.	930698	930865	167	250°	RMFII					
GATE #9	2 4681.7	4688.1	6.4							
	3									
12/19 IT	4 931926	931041	885	250°	RMFII					
GATE # 9	5 4688.1	4692.0	3.9							
	6									
12/27 IT	7 931455	931555	100	250°	RMFII					
GATE #9	8 4692.0	4695.6	3.6							
	9									
12/31 BVR	10 931782	932263	481	250°	RMFI	52.71				
GATE #9 SWISS	11 4696.6	4707.1	10.5							
	12									
01/4 IT.	13 932263			330°	RMFI	48			4.6	501096
GATE # 7	14 4707.1	4717.5	10.4							501106 501116
	15									
01/9 IT	16			250°	RMFII					59796
GATE #9	17 47175	4728.4								Bertea
SCOOPS = 22	18									
Dry	19									
01/11/86 IT	20 933164			330°	RMFI	44			4.85	01116
GATE #7	21 4728.4	4738.5	10.61							01146
SCOOPS 20	22 2.2 Ton per Scoop									
50 w/ 50% Dry	23									
	24									
1/14/86 IT	25 933575	933762	187	250°	RMFII					
GATE #9	26 4739.2	4746.5	7.3							
	27									
1/17/86 50/50	28 933839			330°	RMFI					
GATE # 24 SCOOPS	29 4746.5									
WET	30									
1/16/86 2SC. Y.S.	31									
Gate 9 200°	32			200°	V2					
15 Scoops	33	4766								
	34									
1/20/86 IT/CO.	35 932626									
Gate 7 330°	36 4766	7821		330°	RMFI					01176
20 SCOOPS WET	37									2-07216
Done 50										

AIGNER FORM NO. 84016
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Date/Product	Start	Stop	Total	Temp	Feed Bin Number	Tons Produced	CF/Hour	C.F./Ton	Ton/Hour Day	
11/20 BVR. (For Dry.)	927,760	927,939	179	330°	RMFI	37	22.09	4.83	4.56	
Gate #9	4596.2	[illegible]1.3	8.1							
19 Scoops	1.94 Ton per Scoop									
11/21 IT Dart	[illegible]	928,203	264	250°	[illegible]		40.6			
[illegible]	[illegible]3	4610.8	6.5							
11/25 IT. (cosmetic)	928,203	928,377	174	330°	RMFI	37		4.72	(6.49)	11275 11055
Gate # 9	4610.8	4616.5	5.7				30.52			
11/27 IT Dart	928,484	928,843	359	250°	RMFII		40.79			
Gate # 9	4616.5	4625.3	8.8							
12/3 IT Cosm	928,843	929,049	206	330°	RMFI	39	29.01	5.28	(5.49)	12055 (12075)
Gate # 7	4625.3	4632.4	7.1							
12/5 IT Dart	929,126	929,246	120	250°	RMFII		27.90			
Gate # 9	4632.4	4636.7	4.3							
12/6 IT Dart	929,289	929,433	144	250°	RMFII		26.66			
Gate #9	4636.7	4642.1	5.4							
	4642.1	4645.2	3.1	> 8.5 hrs total			71.6	(mont 4 [illegible])		
	929433	929655	222							
12/9 #50/50	929655	929827	172	330°	RMFI	28.15	18.29	6.11	2.9	12105F
Gate #7	4645.2	4654.6	9.4							
7K/6I [illegible]										
2.16T/Scoop										
12/10 YS (ZSC)	929827	929965	138	175°	VMF2	29	20.9	4.75	4.39	
Gate #9	4654.6	4661.2	6.6							
15 Scoops	1.9 Tons per Scoop									
12/11 Monoblend	930080			330°	RMFI	24				
Gate #7	4661.2	4694	6.2						3.87	
12 Scoops	2 Tons per Scoop									
12/17 IT.				330°	RMFI					
Gate #7	4694.1									

AIGNER FORM NO. 84016
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Page 1

Date / Product	Start	Stop	Total	Temp	Feed Bin Number	Tons Produced	CF/Hour	CF/Ton		TPH
10/31 - Supra Cosmetic	924393	924472	79	330°	RMI					
11/01 - Supra (Dart co)	924472	[illegible]	413	250°	RMII					
CAR #										
11/4 V2	924885	925054	169	250	V2	37.05		4.59	ACTUAL	
11/4 S. COS. 330-6	925054	925253	199	330°	RMF 1		20.51			
Dryer Feed	4480.5	4490.2	9.7				EST.	5.12	[illegible]	[illegible] at 4
Gate 6										
11/6 SUPRA DART	925253	925434	181	[illegible]	RMF 2		16.45			
[illegible] Dryer FEED	4490.2	4501.0	11	(240° actual)			EST.	4.11	44 [illegible] at 4	
Gate 6										
11/6 BVR.	925434	925636	202	275°	VMF 2	15/19/3	16.29	[illegible]		
Dryer FEED	4501.0	513.4	12.4	(300° actual)		57.22	[illegible]	[illegible]		3.0
GATE #7										
11/7 IT Supra Dart	925636	925846	210	250°	RMF 2		26.25			
Dryer Feed	513.4	521.4	8							
Gate 7										
[illegible]	95.25 +									
11/8 [illegible]	925846	926081	[illegible]	330° set	RMF 1		27.32	[illegible]	34.1 [illegible]	[illegible]
Dryer	521.4	[illegible]	[illegible]	(315 [illegible])						
GATE 9		Dover 50								
11/10 S.F. V2	[illegible]	926282	201	330° set V2			28.3			
Supra Feed	530.0	537.1	7.1							
Gate 6										
11/12 Silosmi RMF II	926282	926456	174	330° set RMF II		Dover 50				
Dryer Feed	537.1	543.4	6.3				27.61			
Gate 6										
11/13 Dart co	926456	925[illegible]	133	250° set RMF I			27.14			
Gate 9 Dryer	543.4	548.3	4.9				23.3 ave			
926589 - 926871	282	548.3 - 561.2	12.9				21.86			
11/14 Korean	926871	927,439	568							
Gate 9 Dryer	561.2	583.9	22.7	330°	RMF I	67	25.02	8.48		2.9
11/19 IT	927,439	927,760	329	250°	RMF II					
GATE 9 Dryer	583.9	596.2	12.3							

ENERGY USAGE REPORT 1987

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Total (dryed)	391	502	534	536	487	458	496	489	408	214			
Roller Mill	356	437	403	445	358	397	395	394	296	180			
Vertical Mill	35	65	131	91	129	61	101	95	112	34			
ELECTRIC													
DEMAND COST	1,105	1,330	1,439	1,460	1,419	1,498	1.442	1,748	1,531	1,428			
KW-Demand	410.	604.	518.	502.	506.	518.	466.	518.	510.				
KWH	45,800	55,800	70,200	55,800	61,400	50,600	58,600	58,400	47,200	35,400			539,200
KWH/Ton	117.44	111.16	131.46	104.1	126.08	110.48	118.15	119.43	115.69	2,844			34,030
Cost Estimated	3,423	3,476	3,800	3,467	3,057	3,258	3,287	3,943	3,475				
Cost/Ton	8.78	6.92	7.11	6.47	6.28	7.11	6.63	8.06	8.52				
MID MONTH BILL	3,412	3,958	4,092	4,140	3,695	3,879	3,359	4,604	3,786	3650			38,575
NATURAL GAS													
MCF	316.6	389.9	342	223.3	234	162.5	181.3	151.5	120.				
MCF/Ton	.812	.777	.640	.417	.480	.355	.366	.310	.294				
Cost Estimated	1,715	2,012	1,856	1,228	1,257	860	959	822	658				
Cost/Ton	4.39	4.01	3.48	2.29	2.58	1.88	1.93	1.68	1.61				
MID MONTH BILL	1,702	2,012	1,979	1,493	1,212	1,016	823	1,067	817	925			12,846
No 2 DIESEL FUEL	(LOADERS ONLY)												
Gallons	134	110	120	111	135	69	65	100	62			906	
Gallons/Ton	.343	.219	.225	.206	.277	.151	.131	.204	.152				
Cost	102	84	85	79	90	49	46	72	45				
Cost/Ton	.261	.167	.159	.147	.185	.107	.093	.147	.110				
PROPANE (FORK LIFTS ONLY)													
Gallons	82	65	105	97	128	68	86	93	87				
Gallons/Ton	.210	.129	.197	.181	.283	.143	.173	.190	.213				
Cost	86	68	111	102	100	106	91	98	91				
Cost/Ton	.220	.135	.208	.190	.205	.231	.183	.200	.223				
GASOLINE (NOT USED IN PRODUCTION)													
Cost	110	774	86	88	109	52	101	92	64				

LEHMAN 01080

ENERGY USAGE REPORT 1983

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Total (dryed)	391	502	534	536	487	458	496	489	408				
Roller Mill	356	437	403	445	358	397	395	394	296				
Vertical Mill	35	65	131	91	129	61	101	95	112				
ELECTRIC													
DEMAND COST	1,105	1,330	1,439	1,460	1,419	1,498	1.442	1,748	1,531				
KW-Demand	410.	604.	518.	502.	506.	518.	466.	518.	510.				
KWH	45,800	55,800	70,200	55,800	61,400	50,600	58,600	58,400	47,200				
KWH/Ton	117.44	111.16	131.46	104.1	126.08	110.48	118.15	119.43	115.69				
Cost Estimated	3,423	3,476	3,800	3,467	3,057	3,258	3,287	3,943	3,475				
Cost/Ton	8.78	6.92	7.11	6.47	6.28	7.11	6.63	8.06	8.52				
MID MONTH BILL	3,412	3,958	4,092	4,140	3,695	3,879	3,359	4,604	3,786				
NATURAL GAS													
MCF	316.6	389.9	342	223.3	234	162.5	181.3	151.5	120.				
MCF/Ton	.812	.777	.640	.417	.480	.355	.366	.310	.294				
Cost Estimated	1,715	2,012	1,856	1,228	1,257	860	959	822	658				
Cost/Ton	4.39	4.01	3.48	2.29	2.58	1.88	1.93	1.68	1.61				
MID MONTH BILL	1,702	2,012	1,979	1,493	1,212	1,016	823	1,067	817				
NO 2 DIESEL FUEL (LOADERS ONLY)													
Gallons	134	110	120	111	135	69	65	100	62				
Gallons/Ton	.343	.219	.225	.206	.277	.151	.131	.204	.152				
Cost	102	84	85	79	90	49	46	72	45				
Cost/Ton	.261	.167	.159	.147	.185	.107	.093	.147	.110				
PROPANE (FORK LIFTS ONLY)													
Gallons	82	65	105	97	128	68	86	93	87				
Gallons/Ton	.210	.129	.197	.181	.283	.143	.173	.190	.213				
Cost	86	68	111	102	100	106	91	98	91				
Cost/Ton	.220	.135	.208	.190	.205	.231	.183	.200	.223				
GASOLINE (NOT USED IN PRODUCTION)													
Cost	110	774	86	88	109	52	101	92	64				

LEHMAN 041081

ENERGY USAGE REPORT 1987

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Total (dryed)	391	502	534	536	487	458	496	489	408				
Roller Mill	356	437	403	445	358	397	395	394	296				
Vertical Mill	35	65	131	91	129	61	101	95	112				
ELECTRIC													
DEMAND COST	1,105	1,330	1,439	1,460	1,419	1,498	1,442	1748	1531				
KW-Demand	410.	604.	518.	502.	506.	518.	466.	518.	510.				
KWH	45,800	55,800	70,200	55,800	61,400	50,600	58,600	58,400	47,200				
KWH/Ton	117.44	111.16	131.46	104.1	126.08	110.48	118.15	119.43	115.69				
Cost Estimated	3,423	3,476	3,800	3,467	3,057	3,258	3,287	3,943	3,475				
Cost/Ton	8.78	6.92	7.11	6.47	6.28	7.11	6.63	8.06	8.52				
MID MONTH BILL	3,412	3,958	4,092	4,140	3,695	3,879	3,359	4,604	3,786				
NATURAL GAS													
MCF	316.6	389.9	342	223.3	234	162.5	181.3	151.5	120.				
MCF/Ton	.812	.777	.640	.417	.480	.355	.366	.310	.294				
Cost Estimated	1,715	2,012	1,856	1,228	1,257	860	959	822	658				
Cost/Ton	4.39	4.01	3.48	2.29	2.58	1.88	1.93	1.68	1.61				
MID MONTH BILL	1,702	2,012	1,979	1,493	1,212	1,016	823	1,067	817				
NO 2 DIESEL FUEL (LOADERS ONLY)													
Gallons	134	110	120	111	135	69	65	100	62				
Gallons/Ton	.343	.219	.225	.206	.277	.151	.131	.204	.152				
Cost	102	84	85	79	90	49	46	72	45				
Cost/Ton	.261	.167	.159	.147	.185	.107	.093	.147	.110				
PROPANE (FORK LIFTS ONLY)													
Gallons	82	65	105	97	128	68	86	93	87				
Gallons/Ton	.210	.129	.197	.181	.283	.143	.173	.190	.213				
Cost	86	68	111	102	100	106	91	98	91				
Cost/Ton	.220	.135	.208	.190	.205	.231	.183	.200	.223				
GASOLINE (NOT USED IN PRODUCTION)													
Cost	110	774	86	88	109	52	101	92	64				

LEHMAN 01082

ENERGY USAGE REPORT 198

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
- Total (dryed)													
Roller Mill													
Vertical Mill													
ELECTRIC													
KW-Demand													
KWH													
KWH/Ton													
Cost													
Cost/Ton													
DEMAND COST													
NATURAL GAS													
MCF													
MCF/Ton													
Cost													
Cost/Ton													
No 2 DIESEL FUEL (LOADERS ONLY)													
Gallons													
Gallons/Ton													
Cost													
Cost/Ton													
PROPANE (FORK LIFTS ONLY)													
Gallons													
Gallons/Ton													
Cost													
Cost/Ton													
GASOLINE (NOT USED IN PRODUCTION)													
Cost													

LEHMAN 01083

ENERGY USAGE REPORT 198[illegible]

Location So. Plainfield, N. J.

TONS PRODUCED	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Total (dryed)													
Roller Mill													
Vertical Mill													
ELECTRIC													
KW-Demand													
KWH													
KWH/Ton													
Cost													
Cost/Ton													
DEMAND COST													
NATURAL GAS													
MCF													
MCF/Ton													
Cost													
Cost/Ton													
No 2 DIESEL FUEL (LOADERS ONLY)													
Gallons													
Gallons/Ton													
Cost													
Cost/Ton													
PROPANE (FORK LIFTS ONLY)													
Gallons													
Gallons/Ton													
Cost													
Cost/Ton													
GASOLINE (NOT USED IN PRODUCTION)													
Cost													

LEHMAN 01084

ELECTRICAL SYSTEM PREVENTATIVE MAINTENANCE

1.0. INTRODUCTION.

1.1. Electric power distribution systems are very tolerant of neglect and somewhat less tolerant of abuse. Failures, when they occur, vary from those that are minor annoyances to those that are catastropic. Failures can be minimized by the employment of some simple preventative maintenance procedures and housekeeping.

2.0. SCOPE.

2.1. The provisions of this document cover suggested acceptable methods of preventative maintenance of electrical power system components but do not include control circuits, power operated circuit breakers or final control elements. Definitions of terms shall be in accordance with the current revision of the National Electrical Code.

3.0. PREVENTATIVE MAINTENANCE.

3.1. SWITCHBOARDS.

WARNING

POWER MUST BE TURNED "OFF" TO THE SWITCHBOARD BEFORE ANY OF THE FOLLOWING MAINTENANCE OPERATIONS ARE PERFORMED. USE A VOLT METER TO POSITIVELY CHECK THE INCOMING LINE TERMINALS TO BE CERTAIN THAT THE SWITCHBOARD IS TOTALLY DE-ENERGIZED.

OBSERVE ALL WARNING AND INSTRUCTION LABELS.

Periodic maintenance on the switchboard includes cleaning, lubrication and the exercising of component parts. The interval between maintenance checks can vary, depend- upon the amount of usage and the environmental conditions of each installation. The maximum inspection period shall not exceed one year. Always inspect the switchboard after a fault.

3.1.1. GENERAL INSPECTION.

3.1.1.1. Vacuum the switchboard interior to remove deposits of dust, dirt and other extraneous material. Do not use pressurized air as this may blow dirt into the operating mechanism or onto contact surfaces. This condition can result in local overheating and failure due to either arcing or high contact resistance.

3.1.1.2. Check the interior of the switchboard for indications of moisture. Moisture can cause insulation breakdown and rapid oxidation of current carrying parts. Take any necessary measures to eliminate moisture and seal leaks.

3.1.1.3. Check for signs of rodent nesting and if necessary use a good exterminating technique in the area of the switchboard. Do not use bait type exterminants inside the switchboard.

3.1.1.4. Inspect all devices for excessively worn out, cracked or missing parts and replace as required.

3.1.1.5. Manually open and close switches and circuit breakers several times to check operation.

3.1.1.6. Check to ascertain that all interlocks and key locks function properly.

3.1.2. BUS BAR JOINTS AND LUG TERMINATIONS.

WARNING

POWER TO THE SWITCHBOARD MUST BE "OFF" BEFORE SERVICING BUS BARS AND LUG TERMINATIONS.

3.1.2.1. Check torque on bolts and nuts at bus bar joints to manufacturers specifications.

3.1.2.2. Check all bus bar joints and lugs for any pitting, corrosion or discoloration resulting from high temperatures or subject to a fault condition. If such damage has occurred, the affected part should be cleaned or replaced. If cleaning is required, use a non-abrasive cleaner.

CAUTION: DO NOT SAND OR REMOVE THE PLATING ON ANY ALUMINUM PART.

ANY DAMAGED ALUMINUM PART SHOULD BE REPLACED.

3.1.2.3. Check the rigidity of all bus bar bracing and tighten where necessary.

3.1.2.4. Check all main line side lugs and ALL load side lugs on circuit breakers and switches for proper torque in accordance with the manufacturers specifications. Where compression type lugs are used, check the torque on the bolts which fasten the lugs to the bus bar or phase connector.

3.1.2.5. Re-tighten all control wiring terminations at relays, meters, terminal blocks, etc.

3.1.3. CIRCUIT BREAKERS.

3.1.3.1. Where applicable check to see that all bolts are tightened to proper torque values.

3.1.3.2. Vacuum or wipe clean.

3.1.3.3. Test the circuit breaker trip.

3.1.4. GROUND FAULT PROTECTION SYSTEMS.

3.1.4.1. Check all terminations for tightness and corrosion. Test GFI in accordance with the manufacturers instructions.

3.2. PANEL BOARDS AND LOAD CENTERS.

WARNING

POWER MUST BE TURNED "OFF" TO PANEL BOARDS AND LOAD CENTERS BEFORE ANY MAINTENANCE OPERATIONS ARE PERFORMED.

3.2.1. Panel boards and load centers should be vacuumed out and terminations checked for tightness and evidence of corrosion annually. More frequent inspection maybe required in locations where high levels of vibration and/or extremely dusty conditions prevail.

3.3. CONDUIT AND OTHER WIREWAYS.

3.3.1. Large quantities of product dust may accumulate in conduits and on the horizontal surfaces of rectangular wireways or ducts as a result of dry grinding and milling operations. These accumulations insulate circuit conductor runs thermally and can contribute to

accelerated degradation of the electrical insulation of the conductor. Accumulations of dust should be removed periodically as individual plant operations require.

3.4. SHORT CIRCUITS.

3.4.1. Normally, the overcurrent protective device in a circuit will prevent electrical damage except at the point where the short occurred. The short circuit current may cause damamge to conductors due to mechanical and/or thermal stress.

The intense heat generated during a short will destroy the conductor electrial insulation in the affected area and may cause carbonized material deposits in electrical equipment.

The affected equipment should be cleaned following the equipment manufacturers recommended procedure. Following cleaning the equipment should be meggered following the manufacturers procedure and minimum megohm values.

3.5 PERIODIC INSULATION BREAKDOWN TESTS.

3.5.1. Though not required, it is recommended that megger tests be performed on all main service, feeder and branch equipment and conductors at least every five years or more frequently as individual locations may require due to environmental or operating extreme conditions.

REL/fjm

Cyprus Minerals Company

APPROPRIATION

Page ___ of ___

COMPANY (Owner) CIMC - Talc LOC/DEPT S. Plainfield Mill APPROPRIATION NO. 86-39
COMPANY (User) CIMC - Talc LOC/DEPT S. Plainfield Mill SUPPLEMENT NO. ___

BRIEF DESCRIPTION OF PROJECT

Restore and upgrade electrical power main service and feeder distribution system.

TO BE COMMENCED 8-17-86 (DATE) TO BE COMPLETED 9-26-86 (DATE) COMPANY OWNERSHIP % 100 ESTIMATED GROSS COST $88,235.1

Property Classification, Sub Description and General Description of item(s), or Work, as Appropriate	Estimated Net Cost
3526 Electrical service, distribution, metering and main breaker equipment, installation & building modification.	

REMARKS

TOTAL THIS AUTHORIZATION ___
BUDGET ESTIMATE ___
PREVIOUSLY AUTHORIZED ___
TOTAL PREVIOUSLY AUTHORIZED PLUS THIS SUPPLEMENT ___

☐ AUTHORIZED ☐ RECOMMENDED ☐ REJECTED

SUPERVISOR ___ DATE ___

TITLE ___

REVIEWED BY

DEPARTMENT ___ INITIALS ___ DATE ___

DEPARTMENT ___ INITIALS ___ DATE ___

ACTION BY MANAGEMENT COMMITTEE (IF REQUIRED) ___ DATE ___

Form 20-1000 (6-85)

AUTHORIZATION FOR EXPENDITURE
CYPRUS INDUSTRIAL MINERALS COMPANY
TALC DIVISION

Location	South Plainfield, N.J.	AFE No.	
Location No.	32620029	Class	3526
Asset Life	20 Years	Date	10-7-86

TITLE:

PROJECT MANAGER: R. E. Leonard

ESTIMATED COST: $88,235.19

FINANCIAL JUSTIFICATION: See Attached

ESTIMATED COMPLETION DATE: 9-26-86

APPROVAL:		DATE
Cyprus Minerals President		
Cyprus Minerals Exec. Vice President and Chief Financial Officer		
CIM President		
CIM Senior Vice President		
TALC DIV. V.P. & General Manager		
TALC DIV. V.P., Operations		
TALC DIV. V.P., Marketing		
TALC DIV. European General Manager		
TALC DIV. Technical Services Manager		
TALC DIV. Manager - Mills		
TALC DIV. Manager - Mines		
TALC DIV. Chief Engineer		
TALC DIV. Location Supervisor		
TALC DIV. Administrative Manager		
TALC DIV. Safety Department		
TALC DIV. Quality Control Manager		

02/13/86

1.0. TITLE.

1.1. Restore and upgrade electrical power main service and feeder distribution systems.

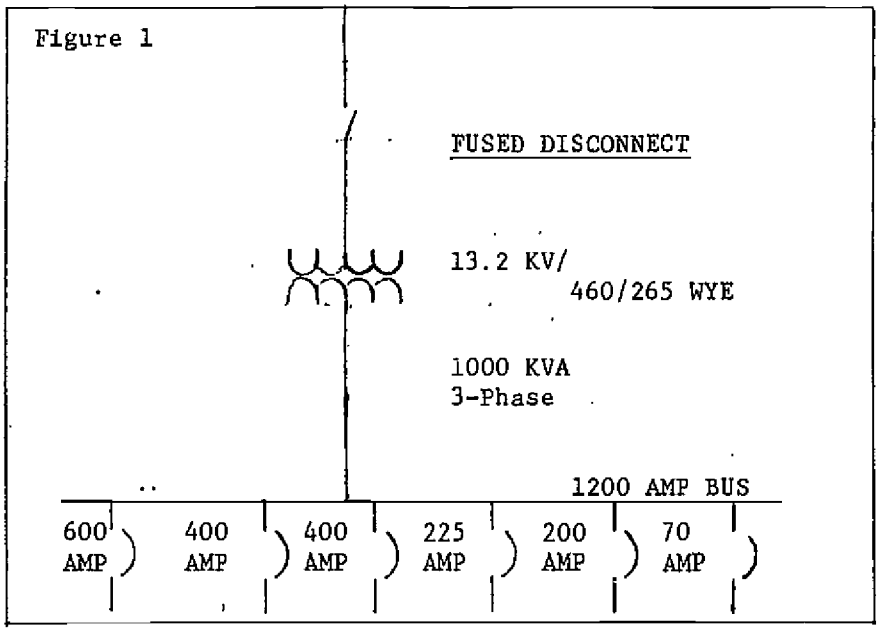
2.0. DESCRIPTION.

2.1. Purchase and install equipment necessary to restore electric service to the South Plainfield plant and upgrade the service from 1200 ampere, 460 volts, three phase AC to 2000 ampere, 460 volts, three phase AC. The additional capacity is needed to meet the present full load requirements as well as to allow for future additional load requirements.

3.0. PROBLEMS.

3.1. PRIMARY PROBLEM.

3.1.1. The main electric service to the plant was destroyed by a short circuit and electrical fire on 8-15-86. At the time no main service disconnecting device existed on the plant side of the public power utility's step down transformer. The feeder circuit breakers were connected directly to the transformer secondary through a four conductor bus bar system. (Figure 1)



The 600 amp breaker failed to trip on overload. This allowed current to be drawn until the utility company's pole mounted fuse links dropped.

3.2. SECONDARY PROBLEMS.

3.2.1. LOCATION.

3.2.1.1. The location of the main breaker panel on the second level of the building stretches the requirement of ready accessibility specified by the NEC.

3.2.2. SYSTEM LOAD.

3.2.2.1. The 1200 amp system was maximally loaded.

4.0. SOLUTION.

4.1. Provide restored service consisting of:
a) 2000 amp main service.
b) 2000 amp main service disconnect.
c) feeder distribution breakers.
d) CT metering section.
e) deal front switchborads.
f) ground floor location.
g) replace damaged conductor.

5.0. COSTS.

5.1. Purchased items:

a) switchboard consisting of: 2 - dead front switchboard sections. 1 - CT section. 1 - 2000 amp, 3 pole, main C/B with GFI. 1 - 600 amp, 3 pole C/B, type MHL. 4 - 400 amp, 3 pole C/B type IL. 7 - 200 amp, 3 pole C/B type IK. 1 - 100 amp, 3 pole C/B type IF. all copper bus square D company drawing #47-34699-00	$33,400.00
b) freight (dedicated truck) Tollie Freight Lines	2,609.44
c) air conditioner for the electrical equipment room Grainer Stock #314251, Schneider Electric (Labor & material)	626.90
d) welder/generator	2,283.75
e) galvanized sheet metal roof covering	403.10
f) lighting fixtures	200.00
SUB TOTAL	$39,523.19

5.2. Contracted Services:

a) contract with Albert Romano, Inc. for expansion of existing storage room to house electrical equipment, trenching and finishing underground electric servics entrance.	$12,212.00
b) contract with Schneider Electric, Inc. for labor and materials to restore electric service and to install company supplied electrical equipment.	35,000.00
SUB TOTAL	$47,212.00
Contingency	1,500.00
TOTAL	$88,235.19

6.0. EQUIPMENT AND MATERIALS DESTROYED OR OTHERWISE UNUSABLE AS A RESULT OF SHORT CIRCUIT AND ELECTRICAL FIRE.

6.1. EQUIPMENT.

6.1.1. a) CT section.

b) bus bar system - internal, copper, ¼ in. X 2½ in. X 30 ft., 4 conductor, 3 phase.

c) bus bar system, external, copper, ¼ in.X 2½ in.X 45 ft, 4 conductor, 3 phase.

d) 1 - 600 amp., 3 pole C/B.
2 - 400 amp., 3 pole C/B.
1 - 225 amp., 3 pole C/B.
1 - 200 amp., 3 pole C/B.
1 - 70 amp., 3 pole C/B.

6.2. MATERIALS.

6.2.1. Conductors:

SIZE	INSULATION	QUANTITY (APPROXIMATELY)
350 MCM	THW	2250 ft
300 MCM	THW	2100 ft
0000 AWG	THW	1000 ft
4 AWG	THW	1800 ft

6.2.2. Fittings;

8 in. sq. wire duct 20 ft.
3 in. conduit, steel 40 ft.
3 in. LB 4 each.

6.3. All the items in para. 6.1 and 6.2 were purchased and installed in 1965 and 1966.

REL/fjm

PAGE 1

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 5251895089
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

ELECTRIC RATE	BILLING MONTH	ON PEAK MEASURED KW	ON PEAK BILLED KW	INTERMED BILLED KW	OFF PEAK BILLED KW	ON PEAK KWH
LPL	JAN 86	.0	155.2	16.0	369.6	9,280
	FEB 86	.0	174.4	20.8	520.0	14,080
	MAR 86	.0	302.4	8.0	467.2	49,760
	APR 86	.0	177.6	41.6	512.0	11,680
	MAY 86	.0	340.8	126.4	481.6	49,600
	JUN 86	.0	88.0	6.4	465.6	9,600
	JUL 86	.0	94.4	9.6	536.0	9,920

END OF REPORT

MORE =>

INTERMED. KWH	OFF PEAK KWH	TOTAL KWH	MONTHLY BILL ELECTRIC $	SPECIAL BILL CONDITION
320	43,680	53,280.00	$4,446.78	
640	69,920	84,640.00	$6,199.09	
320	47,200	97,280.00	$8,866.60	
320	56,800	68,800.00	$5,490.72	
1,280	49,280	100,160.00	$9,410.86	
160	55,680	65,440.00	$4,631.62	
480	53,760	64,160.00	$4,719.47	

END OF REPORT

<= MORE

PAGE 1

SERVICE USE HISTORY FOR THE FOLLOWING
ACCOUNT NUMBER 52518950
CUSTOMER NAME CYPRUS IND MINERALS
SERVICE ADDRESS 651 METUCHEN AVE

SOUTH PLAINFIELD
07080

GAS RATE	BILLING MONTH	THERMS	MONTHLY BILL GAS $	SPECIAL BILL CONDITION
LVG	JAN 86	3,861.0	$2,344.88	
	FEB 86	5,280.0	$3,167.40	
	MAR 86	5,441.0	$3,260.83	
	APR 86	3,300.0	$2,019.65	
	MAY 86	5,263.0	$3,157.94	
	JUN 86	3,369.0	$2,059.86	
	JUL 86	2,652.0	$1,644.17	

END OF REPORT

SERVICE USE RECORD 52-518-950-89

NAME CYPRUS IND MINERALS ACCT. NO. S 17-1-5 % HEATING

ADDRESS 651 Metuchen Rd., So. Plainfield RATES: ELECTRIC LPL GAS LVG

FACILITIES CHARGE Interruptible Service 1000 KVA HEATING DEMAND CREDIT KW

	MO.	ELECTRIC TOTAL KWHR	NIGHT KWHR	MEASURED KW	DAY KW	ELECTRIC REVENUE	GAS THERMS ~~OR CCF~~	GAS REVENUE
1981	J	70880	14776	486.4	21%	6181.05	6241	3079.62
	F	98240	27921	529.3		7757.56	7721	3788.54
	M	83200	25098	399.7		6070.22	7040	3462.71
	A	127520	31808	608.5	25%	9720.06	6410	3160.23
	M	104000	25941	509.0	22%	8087.98	4856	2416.13
	J	90720	20340	547.0	22%	9106.54	5221	2591.05
	J	128800	34456	618.9	27%	11565.07	5847	2890.54
	A	95200	23840	576.0	25%	9945.26	4907	2409.16
	S	58240	15700	446.4	26%	7113.91	3117	1583.13
6/7	O	89760	22240	569.6	25%	9538.53	4679	1955.33
	N	97440	24960	654.4		10165.72	7221	3610.43
	D	39680	5920	601.6		6523.75	2058	1052.14
1982	J	59360	5760	588.8		7666.70	4441	2597.34
	F	67040	16800	592.0		7853.96	6905	3883.61
	M	69440	18960	334.0		7692.22	6084	3644.25
	A	94720	22720	604.8		11491.67	6368	3809.58
	M	60480	20160	467.2		7845.82	2997	1843.91
6/7-8/7	J	65440	19840	518.4		8779.74	4106	2491.01
	J	106400	36320	422.4		14007.62	2958	1821.97
✓	A						2911	1793.95
	S	63680	17120	457.6		872.46	2915	1796.34
	O	71200	31520	497.6	4352	8160.19	2811	1801.94
✓	N							
✓	D					3503.79	2048	1372.12
1983	J	43360	35200	484.8	150.4	4360.07	2470	1635.12
	F	42720	35520	492.8	102.2	4083.29	3154	2060.75
	M	63200	54560	512.0	110.4	4996.75	3273	2135.07
	A	56640	20480	448.0	390.4	6470.97	3622	2352.32
	M	79680	11840	633.6		9653.44	3229	2107.75
	J	62400	8000	489.6		8052.97	2625	1762.80
	J	44000	5280	456.0		6253.61	1877	1265.39
	A	62240	12000	502.4	489.6	8019.76	2062	1381.01
✓	S	58400	6080	518.4		8098.15	2078	1390.54
✓	O	38560	4800	466.8	Night 356.8	6560.77	1023.06	705.30
Estim	N	40480	4960	320.0		5100.12	2511	1543.22
Estim	D	29120	3040	320.0		4479.41	2384	1464.78
Estim 1984	J	49280	5600	371.2		6058.42	3804	2287.74
Estim	F	80640	9520	476.8	366.4	8653.48	4693	2800.13
Estim	M	45920	6080	385.6		5978.39	3231	1958.08
	A							
	M							
	J							
	J							
	A							
	S							
	O							
	N							
	D							

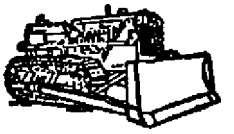
90-1027 2M 2-80

INTERSTATE GENERAL CONTRACTING, CO.

HEAVY EQUIPMENT MOVING
ALL TYPES OF EXCAVATING

• SEWERS •

SAND • STONE • FILL DIRT



OFFICE: 356-9838
RESIDENCE: 356-0931

744 LINCOLN BOULEVARD
MIDDLESEX, NEW JERSEY

To: Metropoliatan Talc Co.
Front Street
South Plainfield, N.J.

Agreement between Interstate General Contractors and Metropolitan Talc Co. concerning the installation of one complete septic system with:

1) Concrete septic tank-1000 gal. capacity
2) Distribution box
3) three one hundred foot laterals; 2' wide and 3' deep with
4) 12 inches of 1½" stone, 4" clay pipe, and salthey

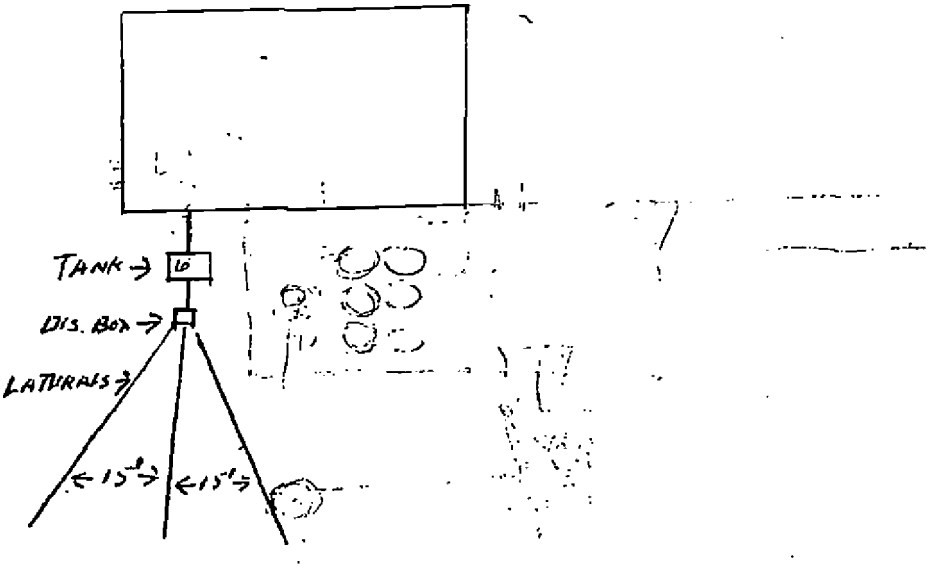
All work done according to Board of Health standards. All permits to be paid by Metropolitan Talc. Co.

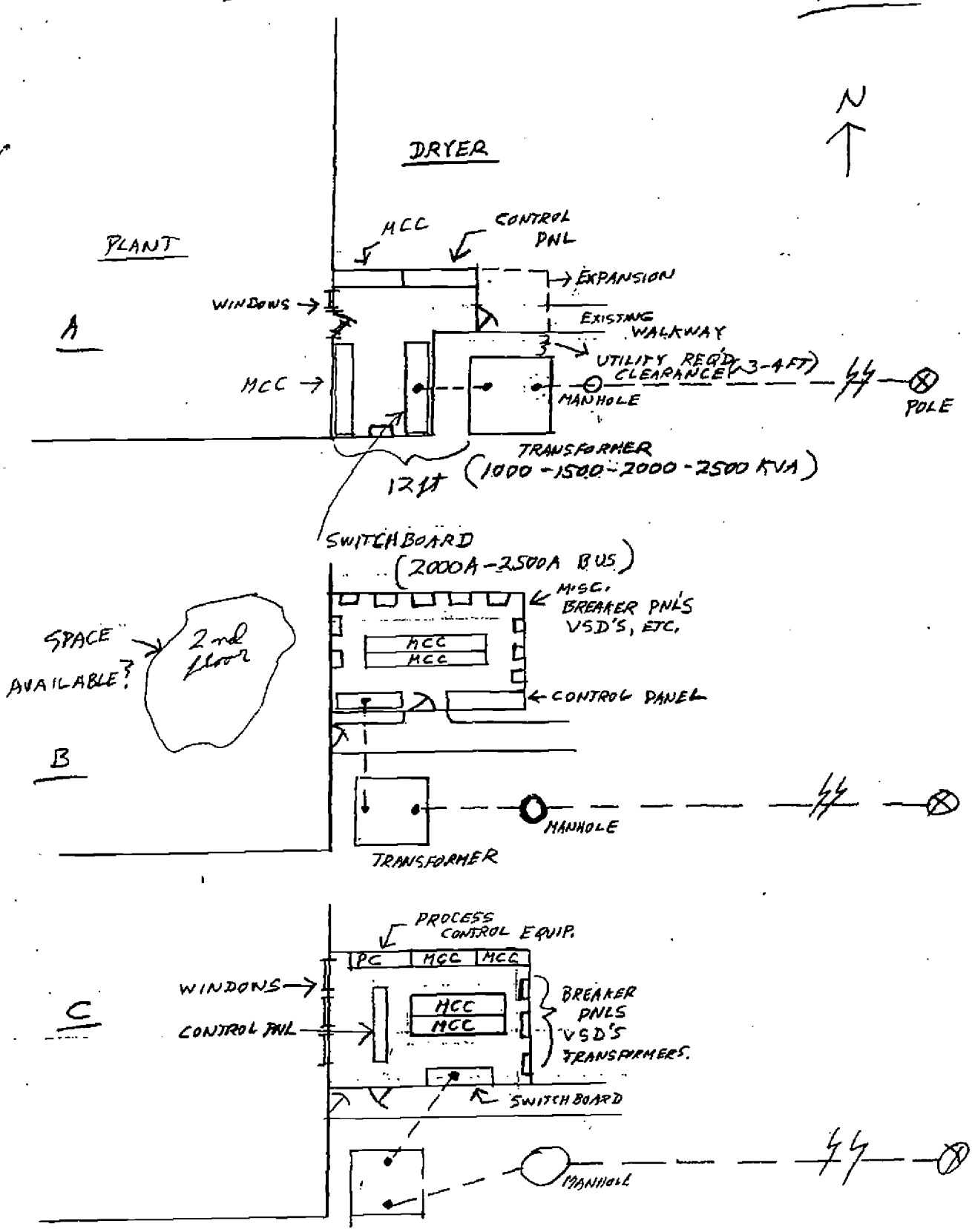
Labor and material: $1000.oo

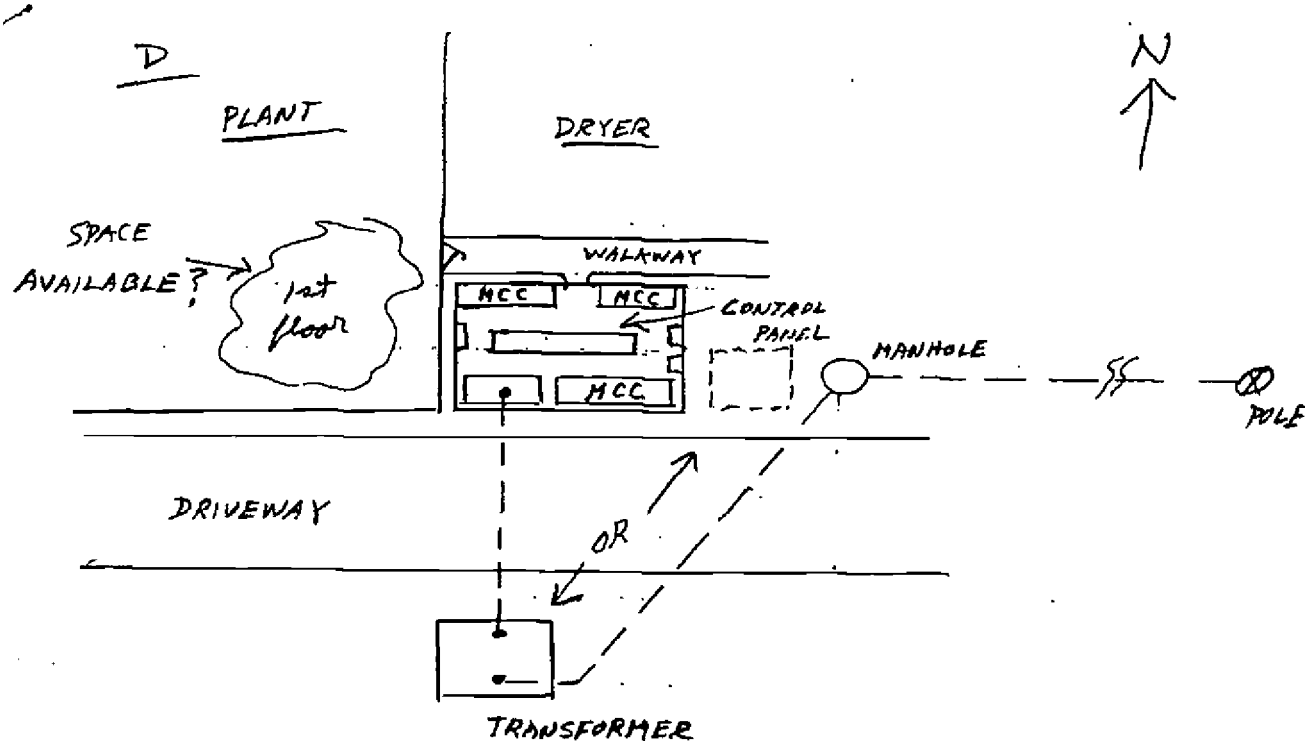
FOR METROPOLITAN TALC CO

Signature _____

Signature _____




N
DRYER
PLANT
MCC
CONTROL PNL
EXPANSION
WINDOWS
EXISTING WALKWAY
A
UTILITY REQ'D CLEARANCE (3-4 FT)
MCC
MANHOLE
POLE
TRANSFORMER
(1000 - 1500 - 2000 - 2500 KVA)
12ft
SWITCHBOARD
(2000A - 2500A BUS)
MISC. BREAKER PNLS VSD'S, ETC.
SPACE AVAILABLE?
2nd floor
MCC
MCC
CONTROL PANEL
B
MANHOLE
TRANSFORMER
PROCESS CONTROL EQUIP.
PC
MCC
MCC
WINDOWS
CONTROL PNL
MCC
MCC
BREAKER PNLS
VSD'S
TRANSFORMERS.
C
SWITCH BOARD
MANHOLE



NOTES:

1.) IF POSSIBLE, PUT CONTROL PANEL IN OWN ROOM, INSIDE PLANT, W/WINDOWS.

2.) MANHOLE ALLOWS PERMANENT RACEWAY TO POLE REGARDLESS OF FUTURE PLAN.

3.) REQUIRES CAREFUL PLANNING. CONSIDER HIRING AN ENGINEERING FIRM.

4.) PLACE MANHOLE ≈ 25FT. EAST OF BUILDING.

5.) USE CABLE TRAY IN ROOM.

7.) PLANS A & C SEGREGATE OPERATOR FROM SWITCHBOARD AND MCC'S (SAFETY MEASURE)

SOUTH PLAINFIELD ELECTRICAL ROOM.

Jim Chilton
4/12/89
Revision 1

METROPOLITAN GAS USAGE

JUNE, 1974 - MAY, 1975

	USE	THERMS	AMOUNT
June-July, 1974	6,316	6,442,320	$ 998.95
July-Aug., 1974	6,920	7,058,400	1,087.37
Aug.-Sept.,1974	7,370	7,517,400	1,153.25
Sept.-Oct., 1974	7,526	7,676,520	1,465.36
Oct.-Nov., 1974	6,010	6,130,200	1,157.70
Nov.-Dec., 1974	7,362	7,509,240	1,443.60
Dec.-Jan., 1975	7,570	7,721,400	1,386.79
Jan.-Feb., 1975	5,436	5,544,720	1,017.77
Feb.-Mar., 1975	5,234	5,338,680	982.84
Mar.-Apr., 1975	5,690	5,803,800	1,155.78
Apr.-May, 1975	5,846	5,962,920	1,185.54
11 Month Average	6,480	6,609,600	$1,184.99

4662 VT

NOV 1976

NATIONAL 42-383

	1060762	1061162	360665	1062862 "A"	1062862 "B"	1062862 "C"	1062862 "D"		550 4615	Aug 1975 4615	1974 4665	
40	99	98.5	99.5	99	99	97	96		100	100	99	-1
30	97	95	98	97	97	95	91		99	99	97	-2
20	90	84	90	90	90	87	82		98	98	91	-7
15	80	75	80	78	80	78	75		96	96	84	-12
10	62	55	64	60	60	66	60		87	87	70	-3
5	36	30	35	34	35	40	40		56	56	40	-16
4	30	23	28	28	30	34	35		42	42	35	-7
3	22	18	20	22	22	26	28		34	34	24	-10
2	14	10.5	12	13	14	20	21		18	18	15	-3
1	8	5	6	7	7	10	12		8	8	4	-4

SERVICE USE RECORD

NAME Metropolitan Talc Company ACCT. NO. S17-1-5 TEL.

ADDRESS Metuchen Road, So. Plfd. RATE: ELECTRIC LPL GAS LVG

	MO.	ELECTRIC TOTAL KWHR	ELECTRIC NIGHT KWHR	ELECTRIC DEMAND KW	ELECTRIC REVENUE	GAS THERMS	GAS REVENUE
19	J	121800	55320	633.6		7976.4	2092.95
1	F	165960	92520	638.4	7097.32	7633.7	2003.98
	M						
	A						
	M						
	J						
	J						
	A						
	S						
	O						
	N						
	D						
19	J						
	F						
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	D						
19	J						
	F						
	M						
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	J						
	J						
	A						
	S						
	O						
	N						
	D						

330hrs. **SERVICE USE RECORD** DF [illegible] 15%

NAME Metropolitan Talc Co. ACCT. NO. S17-1-5 TEL. 754-4880

ADDRESS Metuchen Road, So. Plfd. RATES: ELECTRIC LPL GAS LVG

	MO.	ELECTRIC TOTAL KWHR	ELECTRIC NIGHT KWHR	ELECTRIC DEMAND KW		ELECTRIC REVENUE	GAS THERMS	GAS REVENUE
1973	J	131940	63540	401.[illegible]		2[illegible]09.95	10057.2	1266.30
	F	212850	97380	[illegible]		[illegible]	12621.4	1526.40
	M	180180	84420	[illegible]		[illegible]	9108.6	1153.00
	A	174780	79200	[illegible]		[illegible].30	8486.4	1083.53
	M	148950	79200	[illegible]		[illegible]	6758.5	876.15
	J	164610	79470	[illegible]		[illegible]79.72	8351.7	1095.87
	J	149330	74[illegible]30	[illegible]		[illegible]	6681.0	908.16
	A	123660	57600	[illegible]		[illegible]	6062.8	832.43
	S	122850	54760	[illegible]		[illegible]	5426.4	760.49
	O	97290	38560	[illegible]		[illegible]	4396.2	711.16
	N	113220	49950	461		3014.07	8184.4	1264.63
	D	[illegible]	[illegible]	[illegible]		[illegible]	9700.2	1486.06
		[illegible]	[illegible]	[illegible]			[illegible]	[illegible]4.18
1974	J	131850	66530	473.[illegible]		3541.21	10,381.5	1487.43
	F	193590	92070	452.[illegible]		5137.02	11260.8	1578.40
	M	169740	81000	457		[illegible]	9265.6	1394.62
	A	184500	85860	[illegible]		[illegible].16	9900.1	1556.36
	M	203670	104310	[illegible]		[illegible].72	8331.3	1321.52
	J	217530	110520	573		[illegible]	7,778.5	1156.90
	J	209700	103140	[illegible]		[illegible]	6,442.3	998.95
	A	[illegible]	[illegible]	[illegible]		[illegible]	7,058.4	1087.37
	S	199080	90090	[illegible]		[illegible]	7,517.4	1153.25
	O	176290	98370	[illegible]		[illegible]	7676.5	1465.36
	N	144920	41400	[illegible]		[illegible]	6130.2	1157.70
	D	123480	41760	[illegible]		[illegible]	7509.2	1443.60
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible].46
[illegible]	[illegible]	105,030	33480	[illegible]		4595.92	7,721.4	1,386.79
	[illegible]	[illegible],670	28350	[illegible]		[illegible]	5544.7	1017.77
	[illegible]	[illegible],930	29250	[illegible]		[illegible].31	5338.6	982.84
	A	[illegible]	46530	[illegible]		[illegible].22	5803.8	1155.98
	[illegible]	[illegible]	69570	[illegible]		[illegible].92	5962.9	1185.54
	[illegible]	141570	67140	[illegible]		[illegible]	5220.3	1049.66
	[illegible]	154080	72630	[illegible]		[illegible]	5285.6	1132.76
	A	149040	73350	[illegible]		[illegible]	4488.0	973.94
	S	[illegible]	97380	[illegible]		[illegible]	5722.2	1219.68
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	6338.2	1372.09
	N	214470	102690	[illegible]		[illegible]	7313.4	1602.54
	D	[illegible]	[illegible]	[illegible]		[illegible]	7676.9	1737.70
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
1975	J	236970	112140	[illegible]		10[illegible]9.94	12,876.4	3310.12
	F	226170	115560	[illegible]		8958.61	12786.7	3287.65
	M	264150	128340	[illegible]		10770.15	12450.1	3203.36
	A	239280	112480	[illegible]		9628.46	11,436.2	2558.85
	M	217080	101520	[illegible]		8694.17	7,558.2	1,978.49
	J	242160	118560	[illegible]		9605.71	7223.6	1894.72
	J	164760	80400	[illegible]		7656.56	6774.8	1782.35
	A	133800	65520	[illegible]		5843.11	4355.4	1176.56
	S	119520	59760	[illegible]		5724.07	4655.2	1251.64
	O	143280	73680	[illegible]		5841.75	7672.4	1960.79
	N	95520	28920	628.8		5608.43	5875.2	1561.47
	D	105720	30720	633.6		5933.77	5818.0	1551.55
		[illegible]	[illegible]	[illegible]		94275.33	[illegible]	5517.55

RATE SCHEDULE LVG
LARGE VOLUME SERVICE

APPLICABLE TO USE OF SERVICE FOR:

General purposes.

CHARACTER OF SERVICE:

Continuous.

RATE:

Commodity Charge:

$170.90	for the first ... or less used in each month	500 therms
20.97¢	per therm for the next ... used in each month	1,000 therms
19.23¢	per therm in excess of ... used in each month	1,500 therms

Raw Materials Adjustment:

A charge or credit will be made when the estimated October through September twelve-month net average cost to Public Service of production raw materials used is above or below 90.0¢ per million Btu of gas sent out. Immediately prior to October of each year, the estimated average cost will be determined for the succeeding twelve-month period. Any charge or credit will apply to all therms billed each month of the succeeding twelve-month period. In the event that a major change in the cost of production raw materials occurs during the twelve-month period, a revised estimated average cost will be calculated for the remainder of the period. The adjustment factor for each 0.1¢ variation above or below 90.0¢ per million Btu of gas sent out is 0.01207¢ per therm.

Other Charges:

See SPECIAL PROVISIONS (a) Seasonal Use and (b) Off-Peak Use.

MINIMUM CHARGE:

The monthly minimum charge shall be $170.90.

DETERMINATION OF THERMS:

The number of therms used shall be determined by multiplying the number of hundred cubic feet used by the "therm multiplier" expressed in therms per hundred cubic feet which appears on every bill.

TERMS OF PAYMENT:

Bills are due on presentation.

TERM:

One year and thereafter until terminated by five days' notice.

SPECIAL PROVISIONS:

(a) **Seasonal Use:** When the use of gas in any of the months of November through April exceeds (1) 4,000 therms and also exceeds (2) the sum of the therms actually used in the preceding months of June through September, or as estimated by Public Service for new customers and for customers who install additional gas-burning equipment, the Commodity Charge for the therms used in such months of November through April in excess of the higher of (1) or (2) shall be 22.18¢ per therm.

(b) **Off-Peak Use:** Where separately metered gas service (1) is used for building cooling or dehumidification or (2) is to boilers, used in whole or in part to supply the requirements of absorption air-conditioning equipment of 100 tons or more nominal capacity, the rate during the off-peak period shall be 14.50¢ per therm. However, such off-peak rate shall not be applicable until the initial block of the Commodity Charge has been billed.

The off-peak period shall commence and end with the regularly scheduled meter readings in the months of April and October, respectively, but Public Service may change such period depending upon load conditions on its system.

(c) **Resale:** Service under this Rate Schedule is not available for resale.

LEHMAN 01106

(d) **Large Volume Gas Service—Interruptible:** Gas service may be made available under this special provision to customers presently served under Rate Schedule ISG—Interruptible Gas Service for process, feedstock, or plant protection gas, as defined by the Board of Public Utility Commissioners, provided:

(d-1) Public Service has available capacity to provide such service.

(d-2) The customer signs an application for Large Volume Gas Service—Interruptible use.

(d-3) The customer agrees to discontinue the use of gas until further notice upon advance notice of eight hours or more from any hour of any day given to customer by Public Service by telephone, telegram, or otherwise; customer shall designate personnel who will accept such notification at any hour of any day.

(d-4) That the Commodity Charge for all gas used during such discontinuance shall be $1.80 per therm. Public Service has no obligation to supply gas at any time following notice and may discontinue all deliveries of gas under this provision during the period of interruption.

(d-5) Gas use under this provision shall be metered separately and shall not be combined with use under any other provision of this Rate Schedule or under any other Rate Schedule for billing purposes.

(d-6) That metering shall include a recording device, furnished by Public Service and customer shall furnish an electrical supply for the operation of the recording device.

(d-7) That the customer shall be responsible for any and all costs in connection with the installation of facilities required to accept service under this provision with the exception of those associated with the metering installation.

(d-8) Load accepted for service under this provision shall not be transferred to any other rate schedule for billing purposes.

STANDARD TERMS AND CONDITIONS:

This Rate Schedule is subject to the Standard Terms and Conditions of the Tariff for Gas Service. (See separate booklet.)

05.7515 (FORM NO. G 289)

Public Service Electric and Gas Company

Gas

Rate Schedule LVG

Large Volume Service

Effective October 21, 1976

General Offices
80 Park Place
Newark, N. J. 07101

330Hrs. SERVICE USE RECORD 159

NAME Metropolitan Talc Co, ACCT. NO. S17-1-5 TEL. 754-4880

ADDRESS Metuchen Road, So. Plfd. RATES: ELECTRIC LPL GAS LVG

		ELECTRIC				GAS	
	MO.	TOTAL KWHR	NIGHT KWHR	DEMAND KW	REVENUE	THERMS	REVENUE
1973	J	131940	63540	401.4	2809.95	10057.2	1266.30
	F	212850	97380	475.2	3991.49	12624.4	1526.40
	M	180180	84420	433.8	3655.20	9108.6	1153.00
	A	174780	79200	408.6	3599.30	8486.4	1083.53
	M	148950	79200	430.2	3186.10	6758.5	876.15
	J	164610	79470	449.4	3519.72	8351.7	1095.87
	J	147330	74430	543.6	3343.05	6681.0	868.16
	A	173660	57600	411.6	3036.87	6062.8	782.43
	S	172850	54760	411.6	2820.40	5726.4	745.92
	O	97290	38560	411.6	2697.39	4296.2	561.16
	N	113220	51050	411.6	3019.07	8184.4	1064.63
	D	124410	56430	411.6	3234.96	8171.0	1062.84
1974	J	131850	61830	411.6	3541.21	10391.5	1351.12
	F	193590	91070	411.6	5137.02	11760.2	1528.82
	M	169740	81000	411.6	4843.58	9[illegible]	[illegible]
	A	124500	60000	411.6	3828.16	9[illegible]	[illegible]
	M	203670	104310	511.2	7325.72	8331.3	1083.07
	J	217530	110550	511.2	7877.95	7772.5	1010.43
	J	209700	103140	511.2	7414.66	6[illegible]	[illegible]
	A	188510	[illegible]	[illegible]	6862.93	7058.3	917.58
	S	199040	[illegible]	511.2	7213.00	7[illegible]	[illegible]
	O	196790	[illegible]	511.2	7134.86	7624.5	991.18
	N	174470	[illegible]	511.2	6060.38	6122.2	796.09
	D	123480	[illegible]	511.2	5621.80	7507.[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1975	J	105,020	[illegible]	[illegible]	4595.92	7721.4	1384.79
	F	104610	[illegible]	[illegible]	4585.20	5394.2	967.27
	M	96,510	[illegible]	[illegible]	4178.31	5322.6	954.47
	A	115,620	[illegible]	[illegible]	4992.22	3803.8	682.08
	M	141,630	69570	[illegible]	5301.92	5762.9	1033.54
	J	141570	69510	[illegible]	5269.13	5220.3	1049.66
	J	156060	77430	[illegible]	6218.06	5225.6	1132.76
	A	149040	73350	[illegible]	6203.85	4420	923.94
	S	131540	[illegible]	[illegible]	5436.41	4[illegible]	[illegible]
	O	172620	[illegible]	[illegible]	7209.07	6[illegible]	[illegible]
	N	211470	[illegible]	[illegible]	8756.46	7313.4	1307.54
	D	188[illegible]	[illegible]	[illegible]	8[illegible]	7[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	J	236970	[illegible]	[illegible]	10009.[illegible]	13016.4	3310.17
	F	226170	[illegible]	[illegible]	8926.61	12786.7	3287.65
	M	210150	[illegible]	[illegible]	8170.65	12450.1	3223.36
	A	[illegible]	[illegible]	[illegible]	9623.46	11436.2	2957.85
	M	211080	[illegible]	[illegible]	8609.17	7538.2	1928.49
	J	145160	[illegible]	[illegible]	6105.71	7243.6	1891.72
	J	164760	[illegible]	[illegible]	7056.56	6774.8	1778.35
	A	153800	[illegible]	[illegible]	6543.71	4355.4	1176.56
	S	119520	59160	[illegible]	5724.07	4655.2	1251.64
	O	143280	73680	[illegible]	6841.75	7672.4	1960.79
	N	95520	48720	[illegible]	5608.43	5875.2	1561.87
	D	105720	54720	63[illegible]	5933.77	5818.0	1551.55
		2,188,416	1078[illegible]	[illegible]	74275.36	[illegible]	25511.55

SERVICE USE RECORD

[illegible]politan Talc Company ACCT. NO. S17-1-5 TEL.

[illegible] Hutchen Road, So. Plfd. [illegible] ELECTRIC LPL GAS LVG

ELECTRIC			GAS		
[illegible]	NIGHT KWHR	DEMAND KW	REVENUE	THERMS	REVENUE
[illegible]	55320	633.1	[illegible]	7976.4	2092.95

[illegible]

LEHMAN 01109

NOV 15 Rec'd

November 9, 1982

ALAN STANLEY

FEASIBILITY OF ALTERNATE FUEL

Analysis by Allis-Chalmers Corp. showed that a saving of 40% over No. 6 fuel oil in industrial boilers can be achieved using a coal/water fuel mixture. The analysis is based on a 75:24 coal/water slurry with 1% additive (trade name: Fluidcarbon) of $3.33/MMBTU vs. that of No. 6 fuel oil at $5.56/MMBTU, delivered price.

The coal/water slurries will be available next year. Fluidcarbon will be sold on the basis of BTU content. It takes 1.5 gallons of Fluidcarbon to equal one gallon of No. 6 fuel oil on a BTU basis.

Capital investments and boiler modifications will be required on the existing boilers. It will be more expensive to modify gas-fired boilers rather than oil-burning boilers for use of Fluidcarbon.

New advances have been made in the area of coal/methanol which, though now commercially available, shows more promise than the other coal mixtures. The methanol might penetrate the coal particles and they, in turn, would be fractured by rapid methanol vaporization in combustion leading to greater carbon conversion for slurries. In the case of coal/water slurries, the air has to be preheated and also energy has to be supplied to evaporate the water in the slurries. In the case of coal/oil slurries, there is additional ash and particulate problems.

The economics, based on a different set of baseline data, are detailed as follows:

	NO. 6 FUEL OIL	COAL/OIL SLURRIES 45:55	COAL/METHANOL SLURRIES-60:40*	COAL/WATER SLURRIES-70:29**
COST/MMBTU	$4.5	$3.3	$2.5	$2.1
SAVINGS		$1.2	$2.0	$2.4

*"Methanol" is in 1:2 methanol/water ratio
**1% additive

It seems that coal mixtures might soon become economically feasible as compared to natural gas, although modifications of boilers and new accessory equipment would be required to harness this different form of energy.

Y. Y. Kwan

YYK:pc

Attachments

Energy Coordinators
P.E. Staff

Coal/oil, coal/water slurries . . . Now it's coal/methanol

Coal/oil is commercial, coal/water is a few years away. Coal/methanol shows exciting possibilities, and coal/water/methanol may be even better

By Richard P Ruskan, DM International Inc

Coal slurries with water or with methanol offer a method of completely replacing oil, yet they retain many of the beneficial properties of a liquid fuel. Unlike coal/oil mixtures, slurries with water or methanol have good rheological properties and can be transported by pipeline (the cheapest method) in concentrations of up to 50% coal. In particular, coal/methanol mixtures offer the greatest promise for low-cost transportation, since a given volume of this slurry contains 50-60% more energy than a similar coal/water slurry. At even higher coal concentrations, say 60%, the slurry viscosity with water or methanol is still suitable for firing. The maximum coal loading in coal/oil mixtures is much less.

Water has the advantage of low cost, but it substantially detracts from the fuel's combustion properties. On the other hand, methanol is an excellent but expensive fuel. Actually, a coal slurry with a blend of water and methanol appears to provide the best compromise of performance and economics.

Compare slurry characteristics

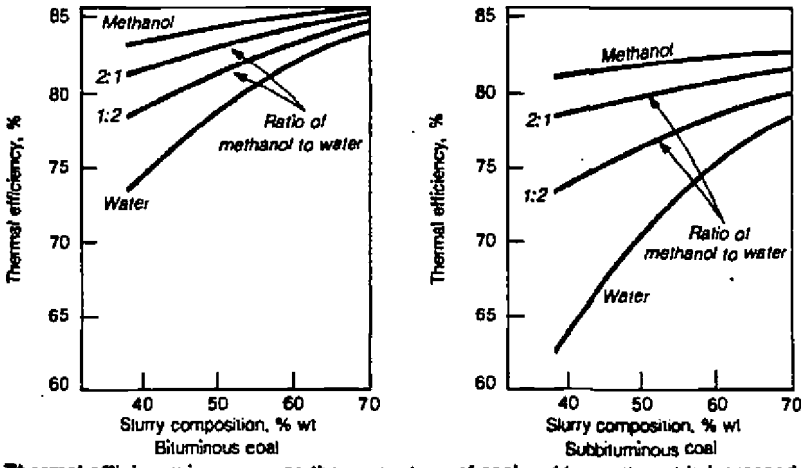
A slurry with only water burns cool since a portion of the available heat is used in evaporation. This effect is compounded if the coal has a high inherent moisture content. Three methods are used to bring a coal/water slurry up to an acceptable performance level. First, coal loading is maximized, typically at 60% by weight, or up to 70%, with the addition of small amounts of a surfactant to provide a reasonable viscosity. In the second approach, air is preheated to 300-600F to help maintain combustion that might otherwise self-extinguish. The third method is the concurrent firing of a conventional liquid or gaseous fuel.

When methanol replaces some of the water, several beneficial effects appear. Water, which requires 1040 Btu/lb for vaporization, is replaced with a fuel with a respectable 9760-Btu/lb higher heating value. The theoretical air required for slurry combustion is also reduced, since methanol is an oxygenated compound. The adiabatic flame temperature increases for these reasons.

Actually, methanol has a much more pronounced effect on combustion characteristics than indicated by the adiabatic flame temperature. Methanol vaporizes rapidly and then mixes easily with combustion air. This aids efficient combustion. Moreover, methanol is known to penetrate and to swell coal particles. It is postulated that such coal particles, either puffed and porous, or fractured by rapid methanol vaporization, burn more efficiently than conventionally fired particles. These factors apparently account for the greater carbon conversion for slurries with methanol than for slurries without methanol.

Work at DOE's Pittsburgh Energy Technology Center demonstrates methanol's contribution to slurry combustion. The combustion of a 60% coal and 40% water slurry in a 100-hp firetube boiler gives 85% carbon conversion with 530F preheated air (235F air is required to sustain combustion) and with 3% oxygen in the flue gas. This is substantially below the performance of a coal/oil mixture in the same service. But if the slurry water is replaced with a methanol/water mixture in a 1:1.5 ratio, no air preheat is required, and the carbon utilization goes up to 90%.

The substitution of methanol for a portion of the water in a slurry also increases thermal efficiency. The figure gives some typical thermal efficiencies for slurry combustion, assuming 100% carbon conversion, 10% excess air, a 3% unaccounted heat loss, and a 320F flue-



Thermal efficiency increases as the percentage of coal and/or methanol is increased.

LEHMAN 01111

gas temperature. The improvement in efficiency is almost entirely due to a reduction of moisture, which consumes usable heat through evaporation.

Other methanol benefits

Although flue-gas scrubbing is the primary method applied for removing SO_2 from boiler flue gas, precombustion treatment of the coal can also be used to partially meet EPA's new-source performance standards or to totally satisfy the less restrictive standards on existing plants.

Coal beneficiation is a precombustion-treatment process often specified to remove pyritic sulfur, and such facilities are most often located near the mine site to dispose of refuse easily. Fine-grind processes liberate more pyritic sulfur than coarse-grind processes, but these have limited application since dry, fine coal is difficult to transport. However, the more efficient fine-grind processes can be used prior to slurry preparation, since fine coal is not only acceptable, but desirable, in a slurry fuel.

The fuel's sulfur content is further reduced by dilution with methanol, a sulfur-free fuel. The combination of a low-sulfur coal, an efficient coal-cleaning process, and methanol to form the slurry, can substantially reduce or eliminate flue-gas scrubbing.

A fuel's ash content is also of concern to users for at least two reasons:

1. Capital and operating costs are incurred in ash removal and disposal.

2. Ash deposition on surfaces reduces heat-absorption rates—a major factor in derating units designed for oil but converted to coal.

The combination of an efficient coal-cleaning process and methanol addition also lowers the fuel's ash concentration. Perhaps as much as 50-70% of the ash can be eliminated. The use of this fuel would not meet stringent particulate-emission restrictions on new plants without other control devices, but would go a long way toward minimizing ash deposition on boiler tubes, minimizing the size of dust collectors, etc. The lower ash content would be significant in the conversion of oil-fired units, most of which have limited ash-handling capability.

How economics compare

Comparative costs of fuels that can be used for steam raising or power generation must be factored into your evaluation. No. 6 fuel oil has the advantage of low ash content, but it is the most expensive at $28/bbl or $4.50/million Btu.

A mixture of 45% West Virginia bituminous coal at $30/ton and 55% No. 6 fuel oil costs about $3.30/million Btu. Although the $1.20 saving over fuel oil might appear to be large, the cost of accommodating the additional ash is also substantial.

Methanol, at $0.70/gal or $10.90/million Btu, is a premium-priced fuel. Although methanol-production facilities using inexpensive, remote natural gas or domestic coal as feedstock may bring the real cost down in the future, it is highly unlikely that methanol will become economically attractive as a stand-alone boiler fuel. But just a bit of methanol goes a long way in improving the combustion characteristics of a coal slurry. A slurry with 60% coal and the balance methanol/water in a 1:2 ratio costs $2.50/million Btu—a $2.00 advantage over oil.

The slurry's price is highly sensitive to methanol content. For example, the same slurry with methanol/water in a 1:4 ratio would cost $2.00/million Btu.

Coal is the least expensive alternative at $30/ton or $1.20/million Btu. A coal/water slurry can have the identical cost since water is essentially free. However, an additive is usually included to obtain reasonable coal loading; the additive typically costs $0.90/lb. So a 70% coal/water slurry with 1% additive would cost about $2.10/million Btu. The cost, of course, could vary significantly with changes in additive price and concentration. **Edited by John Reason**

Coal/Water Mix Said to be 40% Cheaper Than No. 6 Oil

MILWAUKEE—Allis-Chalmers Corp. will offer a coal/water fuel mixture next year that can replace No. 6 oil in industrial boilers for 60 percent of the oil's cost on a Btu basis, according to a company spokesman.

The "Fluidcarbon" mixture consists of 75 percent coal, 24 percent water, and a one percent chemical additive that will allow the mixture to flow more easily,according to Robert Faulkner, the director for Chalmer's Advanced Technology Center here.

The coal will most likely be pulverized and premixed with the water and additive at a processing station, and then shipped to users nationwide on barges and railroad tank cars. Users can store the fuel in the storage tanks they already use for oil, Faulkner said.

Allis-Chalmers plans to set up a nationwide network of coal/water plants that will allow the company to deliver the fuel to most locations.

According to another Allis-Chalmers spokesman, the estimated cost of Fluidcarbon will be about $3.33 per million Btu. (mmBtu), including delivery costs, compared to about $5.56 per mmBtu for No. 6 oil at $35 a barrel, delivered—a price difference of 40.1 percent.

Users will need about 1.5 gallons of Fluidcarbon to get the same heat content as one gallon of No. 6, the spokesman said. However, the company expects to sell Fluidcarbon by mmBtu rather than by the gallon, he added.

The spokesman said that Fluidcarbon will cost less than No. 6 oil or natural gas, but will be slightly higher than dry coal. However, he added that the company expects its market to be the replacement of residual oil.

Users with oil-burning and coal-burning boilers will be able to use the fuel, although some capital investments and boiler modifications would be required, Faulkner said. Users will still be able to switch back to residual fuel despite the changes, he added.

Fluidcarbon retrofit items will most likely include a regulating pump, a new burner, higher horsepower fans, and ash-handling and particulate collection equipment, Faulkner said.

New burners would be required to burn off the extra moisture in the coal, while the upgraded fan is required to blow coal soot off boiler tubes, he said.

Users can switch back to using No. 6 oil by switching pumps and valves to stop the flow of Fluidcarbon and begin the flow of the oil, the spokesman said. He added that the process could be compared to flipping a switch.

Although he could not estimate what the retrofit cost would be, a spokesman for Amax Coal Co., a coal supplier in Indianapolis, Ind., said that it would be "substantially less" than retrofitting an oil-burning boiler to use regular, or dry, coal.

"Since the fuel is in liquid form you won't have to buy the coal-handling equipment and storage bins that are required for dry coal. I would say that it would cost users 25 percent or less to retrofit a boiler for use with this type of fuel than to retrofit to dry coal," said George Land, director of technology assessment with Amax.

Although Fluidcarbon could be employed by users with gas-fired boilers, the retrofit costs will be higher because they would need to install the proper storage tanks, Land explained.

Because the coal is mixed with water, users will see a one to two percent decrease in boiler efficiency, a potential hidden cost users should consider before using the fuel, Land explained. A user may have to spend an extra 7 cents per mmBtu to make up for the lack in efficiency, he said.

Users may have slightly increased maintenance costs to take care of the soot-blowing fans and the particulate removal equipment, Land said. Despite this, however, he feels that fuels like Fluidcarbon will be a bona fide alternative for users who now use oil.

"There is a replacement market to replace heavy fuel oil, but it's about three to four years away from total acceptance in the marketplace," Land said.

The address of the Advance Technology Center of Allis-Chalmers Corp. is Box 512, Zone GC, Milwaukee, Wis. 53201.

ENERGY USER NEWS
October 18, 1982

PRICE WATCH

No. 2 oil for November delivery rose by 2.30 cents to 102.80 per gallon on the Mercantile Exchange. Latest week's range: 100.20 to 103.25 Previous week's: 100.00 to 101.50.

No. 6 oil's posted price rose by 28 cents per barrel to $29.00. (1% sulfur).

Free-market traders, selling crude oil at prices close to official levels, set their spot prices at 99.4% of producer-country postings, down from the previous week's 99.9%.

No. 2 Oil (Nov. deliv.)
Per Gallon.....102.80 cents

No. 6 Oil (1%S, at terminal)
Per Barrel.....$29.00

Natural Gas (Midw., lg. vol.)
Est. Per Thou. Cu. Ft..$4.22

Steam Coal (To TVA in Aug.)
Per Ton.....$41.41

"Price Watch" sources: N. Y. Mercantile Exchange for No. 2 oil, four seller firms for No. 6 oil, EUN for natural gas, Tenn. Valley Authority for coal.

ENERGY USER NEWS
October 25, 1982

Vertical Efficiency Motors Introduced

MILFORD, Conn.—U.S. Electrical Motors, a division of Emerson Electric Co., has introduced a line of improved-performance vertical motors that the company claims will increase efficiency of the line 2 to 7 percent, depending on the size of the motor.

The firm's line of "Premium Efficiency Vertical Motors" are produced in sizes ranging from 3- to 250-horsepower (hp) at 900-, 1,200- and 1,800-rpm, according to Richard Beach, product manager. The high efficiency motors cost 15 to 20 percent more than standard efficiency vertical units, but the additional cost is usually returned in less than 2 years, Beach said.

Efficiency is improved through the use of high silicon content steel in the stator and rotor, increased copper on the stator winder and more aluminum on the rotor bars, Beach said. The use of these high grade metals in the motors improves efficiency by decreasing electrical losses that occur in standard motors through absorbtion and magnetization, Beach said.

A standard efficiency motor of 50 hp will cost a user about $2,175, some $435 less than an identical model of the premium efficiency line, Beach said.

The standard unit has a rated efficiency of 89 percent, about 2.7 points less than the high efficiency motors, Beach explained.

With an electrical cost of 7 cents a kwh, the improved-efficiency motor will return the $435 price premium in the first 5,550 hours of operation, he said. If the motor is operated 8,000 hours a year, the cost premium will be returned in slightly more than 8 months, Beach added.

The motors, sold with both hollow and solid shafts, are used primarily for industrial, agricultural and municipal pumping operations, Beach said.

U.S. Electrical Motors is located at 125 Old Gate Lane, Milford, Conn. 06460.

ENERGY USER NEWS
October 25, 1982

Canada Urged to Cut Price of Costly Gas

WASHINGTON—The chairman of the Federal Energy Regulatory Commission (FERC) lastweek urged Canada to lower the price of natural gas it sends to the United States, saying the move would attract more U.S. industrial customers.

The present border price for Canadian gas is $4.94 per thousand cubic feet and once delivered to U.S. users may reach $7 per mcf, a price much higher than the U.S. average delivered price of $3.42 per mcf.

C. Michael Butler III, the FERC chairman, spoke last week in Calgary, Canada, to a group of gas marketers. He noted industrial boiler owners are not likely to pay more than $3.50 to $4 per mcf for natural gas, because that is the equivalent price of residual oil, the competing boiler fuel.

Butler acknowledged that U.S. consumers are buying some Canadian gas now because the high price is rolled in with price-controlled gas.

But he said that if Congress discards the price controls of the Natural Gas Policy Act and gas prices in the U.S. stay below the $4 level, then Canadian gas could not compete.

Even if U.S. gas prices are not decontrolled, he said, Canada will not be able to increase its penetration of the U.S. gas market, "so long as gas cannot compete in the boiler fuel market."

"An aggressive pricing policy could, even under these circumstances, provide a means for acquiring substantial new markets," Butler said. "That is an approach which I hope you will explore in either case."

A "discussion paper" circulated recently by Canadian gas marketers said that Canadians need to be flexible about prices and contract terms to increase their U.S. sales, but did not specifically call for a price reduction.

New Teflon Heat Exchanger Ready

WILMINGTON, Del.—The Du Pont Co. has begun marketing a line of improved-efficiency teflon heat exchangers for highly corrosive industrial processes, according to Ray Parker, national sales manager.

The unit can cut annual steam costs by about 15 percent, company officials claim.

The heat exchanger is used to heat chemicals and acid baths with steam without losing the condensate that can occur when steam is directly injected into a bath, Parker said.

The firm's Q series heat exchanger, constructed of a fluorocarbon resin, can withstand nearly twice the temperature and pressure limits of earlier teflon models, Parker said. The unit is highly resistant to corrosive conditions and can be directly immersed in acidic pickling baths used in the metals and chemical industries, he noted.

Made in both immersion-coil and shell-and-tube designs, the heat exchanger comes in sizes ranging from 6 to 16 feet at 2-foot increments and has effective heat transfer surface areas ranging from 85 to 225 square feet, Parker said.

The unit ranges in price from $6,000 to $7,000 and installation costs can be expected to roughly triple the price, Parker explained.

In the past, acid baths for the pickling process were heated by injecting live steam directly into the acid, causing the loss of both steam condensate and acid that was diluted by the steam, Parker explained.

Under the teflon system, heat from the steam is transferred directly to the acid bath, and condensate is exhausted on the other side of the process and returned to the boiler, he added.

While payback on the heat exchanger will vary widely depending upon the process operation and application, the system can save about $7,500 annually per ton of steel processed each day, Parker said.

With a pickling bath handling 200 tons of steel daily, a system composed of 10 heat exchangers at a rough cost of $250,000 can save $1.5 million each year in steam and acid costs, he said.

The units would pay for themselves in 3 months under these conditions, he said.

Du Pont Co. is located at 1007 Market St., Wilmington, Del. 19898.

Energy Managers to Push for Gas Decontrol Legislation

WASHINGTON—Industrial energy managers at the Council of Industrial Boiler Owners (CIBO) annual meeting last week said they will push next year for natural gas decontrol legislation, despite warnings from congressional aides that the legislation will not pass.

"There is a window of opportunity in 1983—not 1984 because it is an election year—so we've got to take advantage of that window," said Lawrence L. Saphier, energy conservation manager for Dow Chemical U.S.A., Midland, Mich.

Saphier and other energy managers at the CIBO meeting here were somewhat optimistic Congress will respond to their pleas to completely decontrol natural gas prices and discard the scheme of price controls in the Natural Gas Policy Act (NGPA).

The industrial managers fear the NGPA will cause spot shortages and sharp price hikes if left alone.

"The problems with the NGPA are being recognized by members of Congress," said James D. Beatty, energy conservation manager for Procter & Gamble Co., Cincinnati, adding he is hopeful Congress will tackle the issue next year.

Robert W. Kiernan, energy director for the National Association of Manufacturers, said, "I was taken aback by the fervor" of industrial user support for decontrol at the group's recent energy meeting in Houston, Tex. (SeeSept. 20 EUN, page 27.)

The key element to the decontrol effort is for President Reagan to push hard for the legislation, the energy managers said. The White House is expected to decide by December or January whether it will press for such legislation.

Robert C. Odle Jr., the Energy Department's top lobbyist for decontrol legislation said he expects Reagan to offer the legislation early in 1983.

But House and Senate energy committee aides predicted Congress will debate natural gas policy next year, but probably not pass legislation.

The congressional aides said Congress will have little time for gas policy because it will be preoccupied with the budget and raising revenues to reduce the deficit. They also said Congress is reluctant to press the issue until there is a consensus in the gas industry on how to fix the troubled gas market.

ENERGY USER NEWS
October 25, 1982

Reagan Report Urges 12% Elec. Rate Hikes

MITCH BETTS

WASHINGTON—Electricity rates must increase an average 12.5 percent to improve the financial health of electric utilities, according to a report prepared for the Reagan administration's Electricity Policy Project.

The rate increase would "restore utility earnings to competitive levels," and thus help utilities finance powerplant construction so they can provide reliable service in the future, according to the report by the Booz, Allen & Hamilton Inc. consulting firm.

The report is one of 24 being prepared for the Reagan task force on electricitypolicy, which is considering new regulatory schemes for the utility industry. (See Sept. 27 EUN, page 16.)

The guiding theory for the task force has been that state regulators have held electricity rates too low, causing financial problems for utilities that prevent them from building new coal and nuclear powerplants needed for future supply. (See Aug. 23 EUN, page 4.)

The administration cannot order state utility commissions to raise their retail rates, but it clearly would like to see rate increases that help utilities finance new powerplants.

The administration is considering drafting a model regulatory code that stresses long-term supply considerations over short-term prices, and then pressing states to accept it.

The new Booz-Allen report, prepared under contract for the U.S. Department of Energy and power rates are needed now so that power supplies will be adequate in the future.

"A deterioration in utility financial health has constrained the industry's access to the capital markets," the report, "The Financial Health of the Electric Utility Industry," said.

The litany of financial problems, Booz-Allen said, include downgraded bond ratings, stocks sold below book-value and low return on equity.

If changes such as rate relief are not made, the consultant said, the results will be:

- Electricity prices will increase rapidly and unnecessarily because utilities will rely on expensive oil- and gas-fired generation rather than coal or nuclear power;
- Service reliability will suffer as the limited power supply fails to keep up with increased demand, especially if there is a strong economic recovery; and,
- Utilities will lose their customers to other fuels due to reliability problems, even though competing fuels may be less efficient and more costly.

New Axial-Flow Burners Marketed

SAN FRANCISCO—Ray Burner Co. has added 100 and 150 boiler horsepower models to its line of 200-500 bhp axial-flow fuel burners, according to Robert Winskill, national sales manager.

Axial-flow designs place the burner fan in a straight line with the other components of the burner unit to achieve better air control, less pressure drop, and ability to fire against higher back pressures, said Winskill. Traditional designs attach the fan to the top or bottom of the burner assembly, he said.

The units are designed to be retrofit to existing boilers. The price ranges from $2,100 to $4,500 depending on application, since the two basic units can include different controls, Winskil said.

The burners are used in boilers and furnaces both for space heating and for industrial processes.

According to Winskill, energy consumption has been cut by up to 25 percent by replacing older, original-equipment burners with current designs. The larger units sold by the companies usually pay back within 2 years, he said.

Ray Burner Co. is located at 1201 San Jose Ave., San Francisco, Calif. 94112.

PRICE WATCH

No. 2 oil for December delivery rose by 1.10 cents to 101.60 per gallon on the Mercantile Exchange. Latest week's range: 100.10 to 105.25 Previous week's: 100.20 to 103.25.

No. 6 oil's posted price rose by 84 cents per barrel to $29.93 (1% sulfur).

Free-market traders, selling crude oil at prices close to official levels, set their spot prices at 100.1% of producer-country postings, up from the previous week's 99.4%.

No. 2 Oil (Dec. deliv.)
Per Gallon.....101.60 cents

No. 6 Oil (1%S, at terminal)
Per Barrel.....$29.93

Natural Gas (Midw., lg. vol.)
Est. Per Thou. Cu. Ft..$4.22

Steam Coal (To TVA in Sep.)
Per Ton.....$41.19

"Price Watch" sources: N. Y. Mercantile Exchange for No. 2 oil, four seller firms for No. 6 oil, EUN for natural gas, Tenn. Valley Authority for coal.

FIGURING ON ENERGY

ENERGY USER NEWS
October 25, 1982

Whose High-Cost Gas?

By PAUL SCHAFFER
Statistics Editor

NEW YORK—The sudden unwillingness of gas pipelines to pay $8 at the wellhead for unregulated gas is documented in great detail by a new report from the Department of Energy that looks at individual pipelines.

The market couldn't sustain such a price level, at least during a recession, sothe price of "high-cost" gas fell.

These price figures, in dollars per thousand cubic feet, relate to domestic gas purchased by pipelines at the wellhead that isn't subject to federal price ceilings.

At the start of 1982, the most expensive averages were $8.93 for Texas Gas Transmission Corp., $8.80 for Southern Natural Gas Co., and $8.43 for Tennessee Gas Pipeline Co.

By the middle of the year, Texas Gas and Tennessee Gas had dropped out of the $8 league. Southern Natural Gas, though still above that threshhold, was down to $8.09. Mid-1982 details are shown below, adapted by the department's researchers from pipelines' filings at the Federal Energy Regulatory Commission (FERC) related to purchased-gas adjustments.

To fulfill its analytical purposes, the researchers converted all prices to constant-value, January 1982 dollars. Those adjusted figures are used below. To put the prices back into mid-1982 dollars, one can multiply everything by 1.024.

The quantity of high-cost gas covered in the table is 0.66 trillion cubic feet per year. Companies are listed in rank order, from highest average price to lowest.

"Cumulative quantity in percent" tells what proportion of the high-cost gas was bought by pipelines paying the stated price or higher. Asterisk means a price decline from early 1982, by 10 cents or more per mcf.

Average Price	Pipeline	Cumulative Quantity In Pct.
8.09....	* Southern Natural Gas Co.	6.3
7.98....	* Texas Gas Transmission Corp.	13.0
7.93....	Trunkline Gas Co.	20.3
7.86....	* Tenneco Inc.	29.5
7.63....	* Columbia Gas Transmission	38.7
7.57....	Michigan-Wisconsin Pipe Line	45.9
7.40....	Panhandle Eastern Pipeline	47.0
7.35....	Transcontinental Gas Pipe	61.0
7.34....	Colorado Interstate Corp.	66.3
6.90....	El Paso Natural Gas Co.	80.0
6.72....	* United Gas Pipeline Co.	85.1
6.21....	* Kansas-Nebraska Natural Gas	85.5
6.01....	Cities Service Gas Co.	87.8
5.98....	Transwestern Pipeline Co.	94.7
5.87....	Texas Eastern Transmission	95.2
5.82....	Florida Gas Transmission Co.	96.5
5.35....	Northwest Pipeline Corp.	97.4
5.15....	Northern Natural Gas Co.	99.4
4.76....	Natural Gas P. Co. of Amer.	100.0

In relation to company size, the pipelines most dependent on free-market, "high-cost" gas are Transwestern, Colorado Interstate, Transcontinental, Columbia, and Texas Gas. They get 10 to 15 percent of their wellhead purchases in transactions exempt from federal price ceilings.

For the 19 firms above, plus Consolidated Gas Supply Corp., the mid-1982 picture for all wellhead gas shows "old gas" providing 56.1 percent of the total at a $1.29 average, "new gas" providing 36.9 percent at $3.09, "high-cost" free-market gas providing 6.4 percent at $7.24.

The remaining, miscellaneous 0.6 percent averaged $2.87. (Consolidated was omitted above for lack of "high-cost" buys.)

The study team, headed by Richard O'Neill, ran some statistical correlations to test some theories. Is "old" gas turning into "new" gas through abuse of the rules? Was the $8 price of free-market gas due to exhorbitant bidding by the companies enjoying the largest quantities of cheap, "old" gas?

Both questions are answered in the negative.

Widespread bypassing of pre-1977 wells by extracting gas through unnecessary post-1977 wells might show up indirectly in the FERC filings, the report says. The symptom would be "old" gas fading fast while Section 103 purchases increase rapidly.

The actual tendency is slightly the reverse. Large buyers of Section 103 gas show below-average drops in purchases of "old" gas.

The "cushion" hypothesis, pushed by decontrol advocates, foresees the highest bids for free-market gas coming from the largest holders of "old" gas. Not evident, says the report.

"Companies with substantial supplies of old gas appear not to have engaged in aggressive acquisition programs for high-cost gas."

Purchasing information on "An Analysis of Post-NGPA Interstate Pipeline Wellhead Purchases," not yet printed, will be available by calling 202-252-8800 and asking about item 0357.

AMOCO

Cyprus Industrial Minerals Company

TO: All Plant and Department Heads

FROM: Alan Stanley

DATE: May 28, 1981

SUBJECT: Energy

Attached are articles of interest on power costs. Please let us know if we can help you.

Alan Stanley

AS/ss

cc: H.T. Mulryan
T.G. Gressett
Y.Y. Kwan

Squeeze the most out of power rates

Figure out how you can work with the utility to improve its load factor. You'll cut your power bill at the same time

By John Reason, Assistant Editor

Most industrial managers are aware that their electric bills are a combination of two basic components: (1) the demand charge, which is measured in kilowatts; and (2) the energy charge, which is measured in kilowatt-hours. Thus, to cut your electric-power costs, you can either: (1) alter the magnitude and/or timing of your peak demand; or (2) minimize the amount of electric energy you buy from the utility.

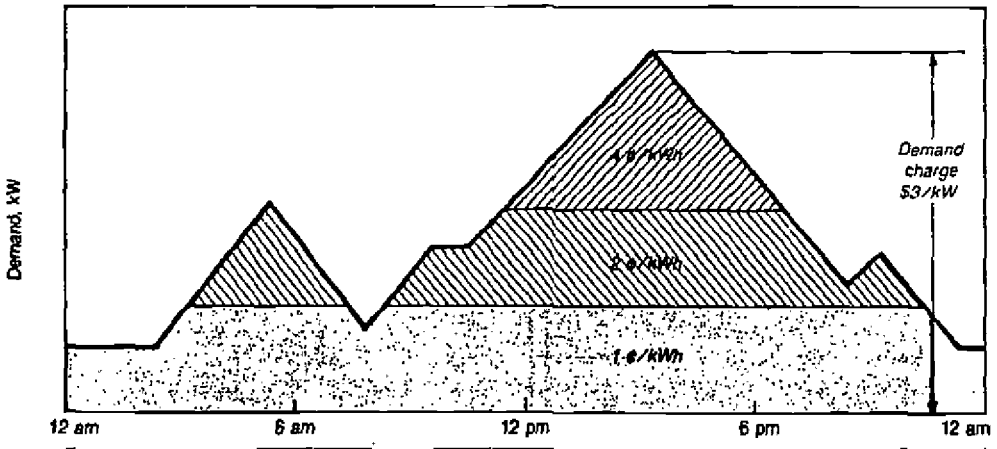
Almost everyone today is working to reduce energy use by cutting out waste and improving the efficiency of production machinery. But there's a limit to how far you can go in reducing kilowatt-hours without affecting production. On the other hand, there may be a lot you can do, in cooperation with your utility, to manipulate peak demand in ways that will benefit both you and the utility.

(One method of reducing purchased kilowatt-hours that is rapidly gaining favor is the use of in-plant generation, and particularly cogeneration. For a report on this trend, see the story that starts on page 59.)

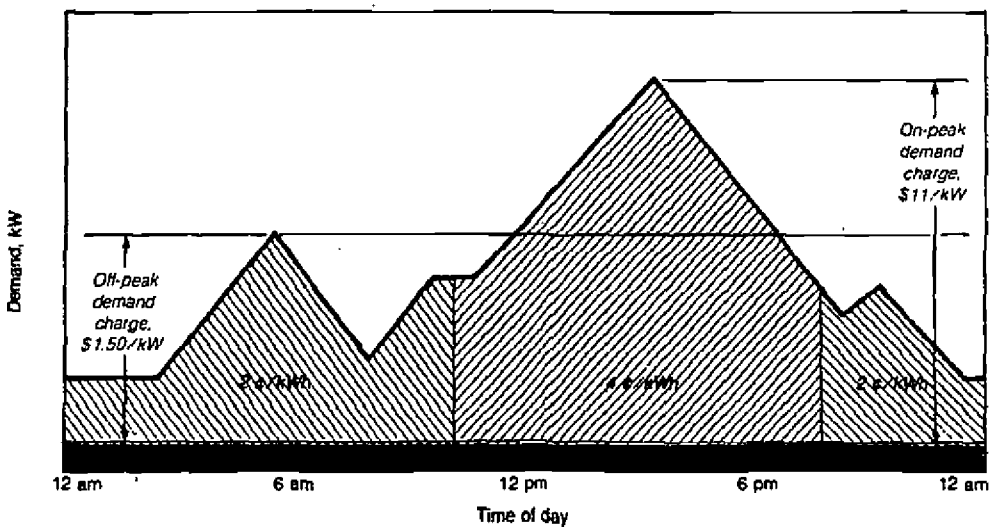
Electric rates have never been simple. Today, as utilities respond to complex state and federal regulations aimed at improving the nation's overall energy situation, the electric bill has become a complex document that demands a full understanding.

Ratemaking in transition

The only certainty is continual change; most of the new rates are experimental. They are subject to changes in the economy as a whole, to customer response, and to continuing uncertainties about future regulatory dictates. New technology,



1. Declining-block rate structure lowers energy charge as more energy is used, and has been criticized for subsidizing large users of energy



2. Time-of-day rates charge substantially more for both demand and energy during peak period. Length of peak period depends on utility's load-makeup

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such as remote metering and ripple control of customer loads, will also affect the types of rates that can be put into effect. An understanding of the pressures that motivate a utility to charge as it does may go a long way toward keeping your power bill down and making better use of the kilowatt-hours you buy.

Before 1974, when the energy crisis got into full swing, utility rates were figured almost universally on what is generally known as the declining-block method (Fig 1). Under this tariff, the demand charge is made in dollars per kilowatt for the maximum load drawn by the customer at any time during the billing month. Usually this load is averaged over 15- or 30-min intervals to determine the demand charge. The energy charge, in cents per kilowatt-hour, is then applied at a declining rate—for example: 4¢/kWh for the first million kWh, 3¢/kWh for the next million kWh and 2¢/kWh for any remaining energy used. Rates for kilowatt-hours consumed in the third block were often extremely low. Ontario Hydro at one time strongly promoted the concept of night electric heating (by leaving lights on, for instance) as being cheaper than virtually any other heating fuel.

As energy became more costly and less abundant, public utility comissions came under pressure to end rates that favored large users of electricity, because they appeared to be partially subsidized by residential rates. This pressure has now been formalized in the Public Utility Regulatory Policy Act (Purpa) of 1978, which, among other things, requires PUCs to set electric rates that reflect the actual cost of providing service to each group of users.

The principal effect of this regulation has been the introduction of time-of-day (TOD) rates over the past few years. According to a survey conducted by the Edison Electric Institute at the end of 1979, 103 investor-owned electric utilities now offer TOD rates; some are mandated by the PUC for certain user groups, others are optional. Some 37 PUCs have either approved or ordered some form of TOD rates, and all PUCs and publicly owned utilities have held or have scheduled hearings on the Purpa demands.

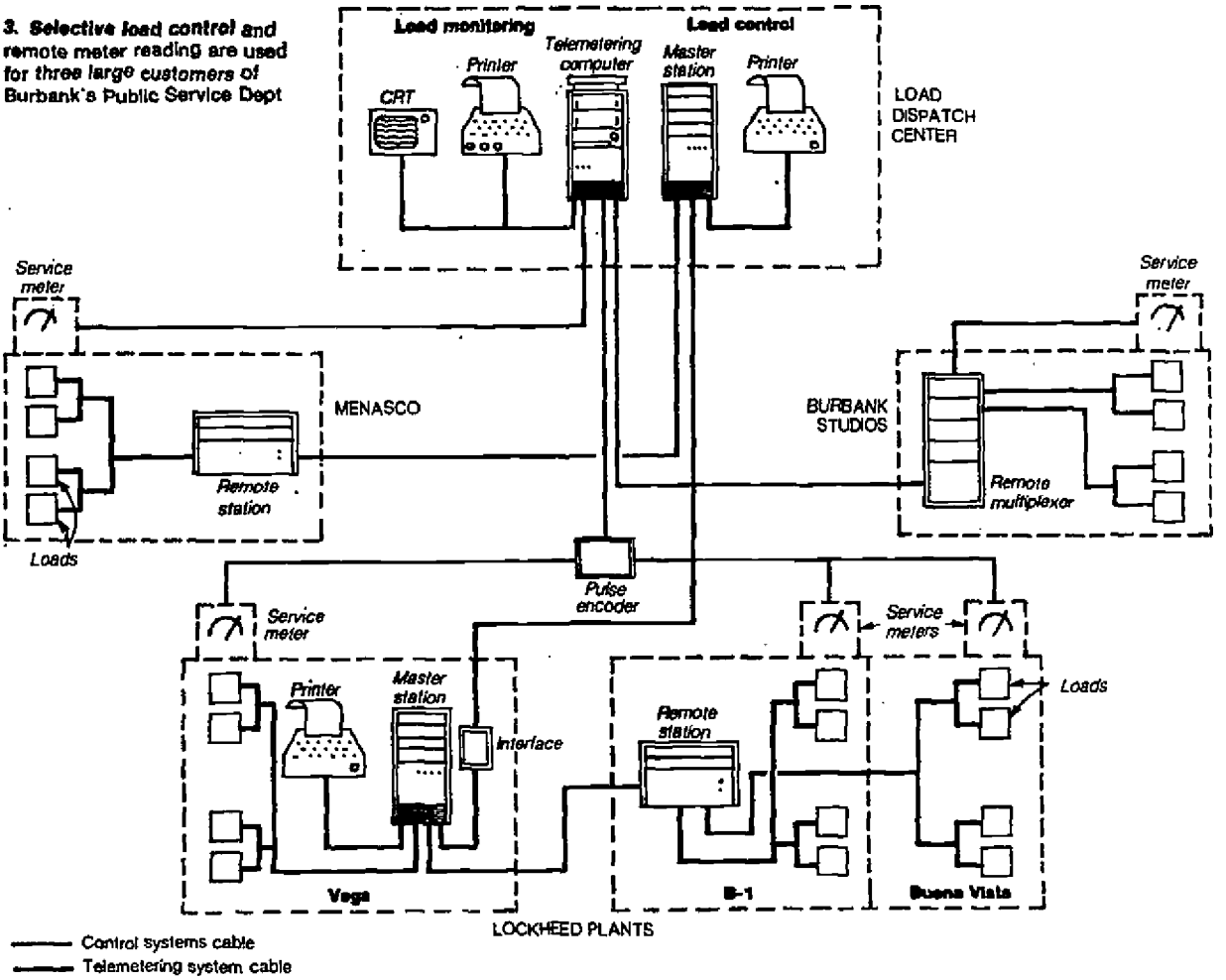
In many cases, TOD rates have gone into effect accompanied by rapid increases in electric-energy costs. This has led some users to equate TOD rates with higher charges—which, in fact, were inevitable anyway. TOD rates are an attempt to allocate costs more equitably, and to encourage uses to adopt better usage patterns.

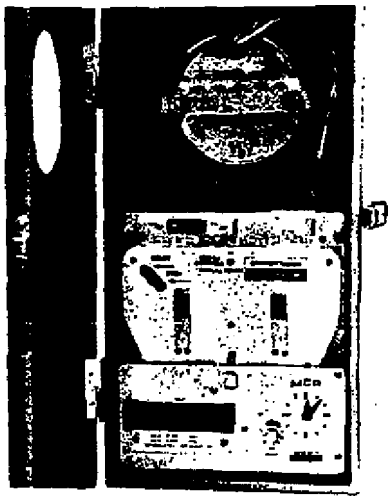
How TOD rates work

Conventional TOD rates divide the 24-hr day into a peak period (say 10 a.m. to 6 p.m.) and an off-peak period for the rest of the day (Fig 2). Some TOD rates divide the day into three periods—peak, intermediate peak, and off-peak. Maximum demand during the peak period is charged at a much higher rate than during the off-peak period. And kilowatt-hours used during the peak period are charged at a much higher rate than those used during the off-peak period. In addition, kilowatt and kilowatt-hour charges are usually different during summer and winter months.

Nonconventional TOD rates are those in which only the demand charge varies between peak and off-peak periods, or where off-peak service is separately

3. Selective load control and remote meter reading are used for three large customers of Burbank's Public Service Dept





4. Time-of-use watt-hour meter has removable tape cassette for billing

metered. Sometimes TOD rates apply only to certain groups of users, such as those with electric space heating or energy storage. Many of these rates are experimental.

The actual structure of an individual utility's TOD rate varies widely with its geographical location, its customer makeup, the type and availability of the fuels it uses, and its level of reserve generating capacity. Utilities in the South have summer peaks, due to air-conditioning loads, and therefore charge higher rates in the summer. Utilities in the Upper Midwest do the opposite. Utilities with large residential loads usually have peak periods that extend further into the evening than those whose load is largely commercial or industrial. Companies that supply gas as well as electricity may have less of a residential peak heating load, because much of the heating is done with gas.

Some utilities that are capacity-short have introduced a ratchet demand charge—that is, a high demand that is incurred in one month is applied not only to that month but at 90% to each of the succeeding 12 months, even though the demand in those months may be far lower.

All of the above rates are different for customers supplied at high voltage or at utilization voltage. The demand charge may be divided into charges for transmission and for primary and secondary distribution, and a different peak period may apply to each charge. There are also a fuel-adjustment clause, power-factor penalty, taxes, and other charges. The total bill for the month is the sum of all the separate charges.

How effective is TOD?

The ultimate effect of TOD rates on the nation's bottom line—barrels of imported oil—is still largely unknown, though it seems certain that this or some other time-oriented rate structure is here to stay. TOD rates are designed to influence peak demand, and have little influence on overall energy consumption. This may seem contradictory, since it is energy costs that have risen sharply, and regulators could be expected to pay more attention to the energy component of the electric bill. But as William Hopkins, vice president of Stone & Webster Inc. Boston, Mass, points out, the closer the electric load supplied by a utility gets to its total installed generating capacity, the lower is the efficiency of the equipment that the load dispatcher must use. Although his base load may be generated by cheaply fired coal boilers, heavy short-term loads need the responsiveness of oil or gas, and extreme peaks may force the starting of diesel or turbine-driven peaking units.

That's why big urban utilities with a large proportion of oil-fired plants, such as Consolidated Edison Co or Southern California Edison Co, have embraced TOD rates. Rapidly rising capital costs and the extensive delays involved in building new plants are an even greater spur to holding down peak demand.

Many smaller utilities, especially those with mostly coal-fired plants, see far less benefit in TOD rates, according to Hopkins. Often they just don't have the data on customer loads to be able to evaluate the effect of TOD rates. As a result, the TOD rates that are set may be overly cautious and relatively ineffective.

The fuel-adjustment clause is another factor that is obscuring the effectiveness of TOD rates. The clause has the effect of leveling out kilowatt-hour rates, but now, according to Hopkins, it has become such a large component of the total bill that potential TOD benefits cannot be clearly seen.

But customers do respond to TOD rates in direct relation to the ratio of peak-to-off-peak charges, and in inverse relation to the length of the peak period. This is shown in a study conducted in 1979 by Detroit Edison Co. The results underscore the need for realistic load data, from which the utility can design TOD rates that the customer can respond to. However, the study concluded that there were insufficient data available to estimate the effectiveness of the rates. In general, the study found that residential customers respond more to TOD rates in the short term than do industrial and commercial customers. The latter, locked into established work schedules, may need more time to show an effective response. The results may also be a reflection on the fact that these larger customers already offer the utility a better demand cure than do residential customers.

However, most mandatory TOD rates are being applied to large customers. This is because the potential return on the investment in new billing equipment is greater for large power users. At present, TOD billing requires a meter that records the time of usage, as well as the peak demand and the total number of kilowatt-hours. This usage profile is recorded on magnetic tape that must be collected each month by the utility. Various alternative methods of remote billing over telephone lines or even over the power lines themselves are being investigated.

Once installed, the magnetic tape meter offers great flexibility in the type of rate structures that can be applied. The taped data can be fed directly into the utility's billing computer, and any rate structure, however complex, can be automatically applied to each customer's usage pattern.

How to cut demand

The user's ability to cut peak demand or to move his peak out of the peak billing period depends largely on the nature of this production process. According to William Hughes, vice president of Charles River Associates, Boston, Mass, the companies that can reap maximum benefit from controlling load are those for which power costs constitute a significant proportion of total production costs. Labor-intensive industries must normally consume the bulk of their power during established work shifts. Only in extreme cases is it advantageous to operate night or split shifts to reduce power costs.

Several of the larger utilities are now offering customer seminars on techniques for saving energy. Seminars are organized to appeal to such varied groups of customers as manufacturers, commercial buildings, hotels and motels, etc. Frequently, manufacturers of energy-management systems and energy-saving equipment are invited to these seminars, providing a comprehensive picture of energy-saving techniques.

The demand controller is one piece of equipment that has been in use long before the introduction of TOD rates. This controller measures the total kilowatt load drawn by a user at any time. When this load approaches a predetermined maximum, the controller either sounds an alarm or automatically sheds nonessential loads to prevent the maximum demand level from being exceeded. There are three different techniques for automatic demand control—ideal-, predictive-, and instantaneous rate (POWER, June 1976 p 19).

A user with large heating or refrigeration loads, which can be interrupted for relatively long intervals without adverse affect, can make maximum use of a demand controller, but many users need the additional sophistication of a computerized energy-management system.

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Such a system looks at the total building or manufacturing process needs, schedules loads or alternates them in a predetermined pattern, taking into account both the needs of the user and the utility's rate schedule. The programmable nature of energy-management systems enables them to be tailored to to individual situations (POWER, September 1979, p 103).

Interruptible-power contracts provide the utility with an opportunity to shed certain loads during periods of excessive demand. In most cases to date, this has been done on a rather informal basis. Ratepayers notify the utility of their ability to shed a certain number of kilowatts and the length of time for which they can be shed. When the utility's load becomes excessive, the load dispatchers telephone these customers and ask them to shed loads. The advantage of this approach is that it is directly related to the utilities load and does not depend on the averaging effect of a rate structure. Utilities that have such agreements with customers report that customers are only rarely called on to shed loads.

The economic advantage to the customer is that he is billed for the contracted demand—the number of kilowatts the utility agrees to supply on a firm basis. His actual demand may rise well above the contracted demand on most days without incurring extra charges.

Cooperative load control is a concept that was first tried in California, and is now being promoted by DOE under the name Operation Powerplay. The first energy cooperative was organized by the Engineering Supervision Co. (ESCO), Newport Beach, Calif. for 11 buildings in downtown Los Angeles. A terminal in each of these buildings is connected by a dedicated telephone line to a computer in ESCO's headquarters. The computer monitors the demand of each building and the outside temperature, and compares these with historical data, enabling it to predict energy demand over 5-min intervals for 15 min into the future. When total demand approaches the predetermined peak, the computer tells building operators which loads to shed.

During a test period, the system obtained peak-demand reductions as high as 12%. Because the load shedding is alternated among the 11 buildings, this peak reduction can be obtained without undue hardship on any one member of the group. The system also enables users who are normally too small to qualify for an interruptible tariff to take advantage of this method of reducing their electricity bills. A second cooperative, organized in the service area of Southern California Edison, has successfully reduced peak demand by up to 25%. Information on forming energy cooperatives in your area can be obtained from Program Manager, Conservation & Solar Energy, DOE, Washington, DC 20585.

Hot- or cold-water storage, which has been in use for many years in some buildings, is another way to cut peak demand. With the advent of TOD rates, storage equipment has an added advantage, because it can move the heating or cooling load out of the peak period. At the same time, recording-type kilowatthour meters automatically record the time of day that the heating load was used. Without the recording meter, the utility must rely on timers to ensure that heating loads are switched on during non-peak periods. The customer is given a credit for the use of heat-storage equipment, but the utility doesn't have a guarantee that the heating load will be switched off during peak hours.

Direct load control is best

Load-control techniques available to a utility range from rate design on the one hand, all the way to the direct control of customer loads on the other. Hughes, of Charles River, points out that rates are a very indirect method of controlling demand. They must be designed to average out the influence on a wide range of customer groups and, before being approved, must be hammered out at lengthy rate hearings. Thus, the influence of a new rate design on peak demand is slow to take effect, and is inconclusive at best. Any method of control that tends toward the other extreme is likely to be more effective. Hughes says the sophisticated techniques now used at a utility dispatch center and the electronic energy-management system used by large power consumers will eventually be extended to include hardwired control between customer and utility.

Hughes cites the case of an ideal client for this type of arrangement. The process involved is production of chlorine and caustic soda by electrolytic processes. During a typical year, the plant operates at about 60% of capacity, but while it is operating the load factor is about 90%. The electrolytic process can be operated at an almost infinitely variable production rate, the only restriction being total monthly production needs of the plant.

Hughes recommends that this load, which is about 100 MW—as large as many utility generating units—should be connected directly to the utility's load-dispatch center and treated as a "negative generating unit." The dispatch computer would then control this load at a minimum peak periods and at a variable rate at other times, to keep the utility's generators as full loaded as possible, within the production restrictions of the customer's plant. Because of other constraints, this system has not yet been implemented, but it represents the type of customer/utility cooperation that is possible.

Although utility control of residential loads has been practiced extensively by Southern California Edison, there is only one known instance to date of utility-controlled industrial loads—the Burbank Public Service Dept, Burbank, Calif. where a few large industrial customers make up a large proportion of the load. Three of these customers, Menasco, Burbank Studios, and two plants belonging to Lockheed-California Co. are connected over existing utility control lines to a computer-based load-control system at the dispatch center (Fig 3).

Each of the three customers has its own load-management system, which enables it to select the number and types of loads that are placed under utility control, as well as the manner in which they are controlled. The hardware used for both the utility load control and the customers' energy-management systems is the Lockheed Electronics Co LEC 7600.

This system consists of a computerized master station communicating with remote stations that control the actual loads. By operating through the customers' load-management systems, rather than by directly interrupting customer loads, the utility maintains good customer relations and avoids the possibility of liability. A final report on the effectiveness of this experimental system is due shortly from the California Energy Commission.

Don't wait for a rate decision

Systems such as Burbank's are in their infancy. At the same time, utilities all over the country are designing and filing new rates. Purpa mandates that all utilities present studies of the feasibility of TOD rates in their service area by October 1981, after which rate increases cannot be considered without a TOD study.

If your company could benefit from a particular type of rate, or could offer the utility direct control of part of your load, the time to make the suggestion is now. Says Hughes, "Most utilities are looking for ideas, and will listen to anything that might save them capital investment. Look for situations where both you and the utility could benefit, and then make sure the utility knows about them before it files a new rate."

Once a new rate has been through the lengthy processes of hearings and has finally been approved by the PUC, it's much harder to make changes. "The utility rate manager knows," says Hughes, "that once he goes back to the PUC he'll open up the whole rate case to intervenors from all competing interests—something he's not about to do in a hurry." ■

LEHMAN 01121

New economic incentives for in-plant generation

Potential benefits in efficiency and flexibility of inplant generation are recognized in regulations that were published this year

The most significant recent developments in electric rates are related to in-plant power generation. Over the next few years, these developments will give many industrial users far greater control over their electric bills than they have now. Until a year or two ago, many utilities actively discouraged in-plant electric generation by their customers. Most forbade customers to operate generating plants in parallel with the utility network, and the idea of a utility purchasing excess electric power from one of its customers was almost unheard of.

Today all that has changed. Many utilities are in urgent need of the additional capacity that is available from small generating plants. Even those that until recently balked at this type of cooperative venture have been forced to accommodate the customer who finds it economical to generate part or even all of his own power.

There are actually very few instances in which a customer can generate prime power more cheaply than a utility. But there are many instances in which the user can cogenerate heat and electric power on site at a better heat rate. (It is necessary here to define cogeneration as the simultaneous production of electric power and heat energy. Although cogeneration is the secret of economic in-plant generation, the word should not be used to describe the cooperative generation of electric power by customer and utility.)

The user who cogenerates makes maximum use of his fuel because he optimizes the production of energy at all quality levels and uses it on the spot. Electricity can generally be considered as the highest form of energy, heat at successively lower temperatures is lower and lower-quality energy.

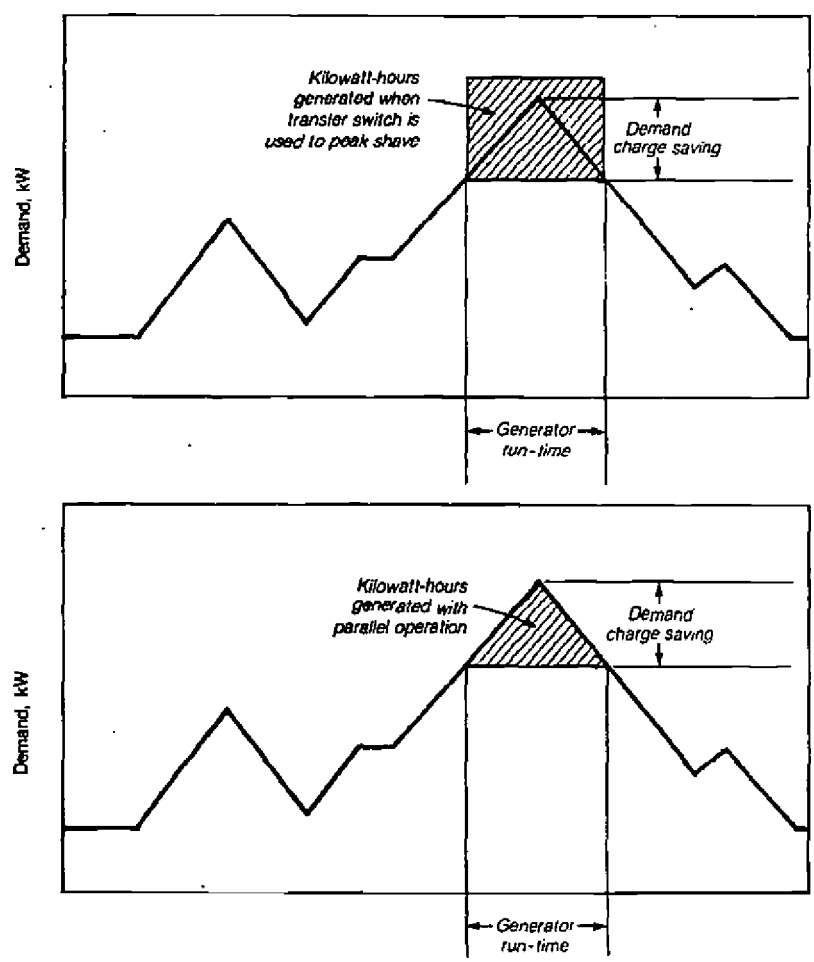
By comparison, few utilities can use the economies of cogeneration. According to Tom Casten, president of Cogeneration Development Corp, New York, NY, even utilities with district-heating systems generate most of their district-heating steam with low-pressure boilers, and use condensing turbines to generate their electricity. They have been forced into this position because of environmental restrictions on building new generating plants in downtown areas. Because steam heat cannot be transmitted more than a few miles, a utility can only reap the benefits of cogeneration if there is an industrial customer close by who can purchase large quantities of steam.

Purpa's dictates and the Federal Energy Regulatory Commission (FERC) rulings established under authority recognize this energy anomaly, and provide economic incentives that should go a long way toward correcting it.

What the law says

Basically, the FERC regulations require all utilities to buy electricity generated by qualified cogenerators at the utility's avoided cost. At the same time, the utility must provide supplementary and backup power at rates that are "just and reasonable."

A **qualified cogenerator** is one that meets certain standards of efficiency and ownership as set out by FERC in the *Federal Register* for March 20, 1980, p 17973. Basically, the cogeneration plant must be less than 50% owned by the utility and must attain a minimum efficiency level based on both electricity and heat production. The efficiency level required depends on the fuel used, the size of the cogeneration plant, and the



1. Secret of economical peak-shaving is to minimize engine running time. The transfer-switch method of reducing utility load may be cheaper to install, but it offers less flexibility and less economy of operation than parallel peak-shaving

LEHMAN 01122

heat cycle. These conditions prevent the utility from obtaining tax credits and Fuel Use Act exemptions that are designed to encourage customers to cogenerate. They also release the utility from the need to purchase power that has been inefficiently generated.

Avoided cost may be thought of as similar to marginal cost. It represents the utility's cost (without profit add-on) to provide additional power over and above what it is presently supplying. Operating avoided cost varies from hour to hour as the load on the utility's system fluctuates. It is also influenced from year to year by the so-called capital avoided cost, which represents the cost of building new generating plant to meet additional loads. The utility saves the avoided cost of each unit of additional power that is generated by a customer.

The avoided cost may very well be higher than the rate at which you buy electric power, because existing rates, as filed with your state's PUC, are designed to provide a return on the utility's embedded cost in all existing plant and equipment. Much of this is old plant, built at a lower cost and burning the cheapest fuel.

The calculation of avoided cost is a complex mathematical procedure involving a large number of factors, which are of great interest to the utility, but until recently were of little interest to the power user. Now, however, it is of considerable interest to the prospective cogenerator who needs to figure out his return on investment.

To facilitate the calculation, FERC requires that all utilities must publish their avoided cost in cents per kilowatt-hour for peak and off-peak periods, both daily and annual, as projected over the next five years, and must update these projections every two years. Large utilities (over 500-million kWh) should have already published this information. Small utilities have until May 31, 1982 (see *Federal Register*, Feb 25, 1980, for complete regulations).

If the utility belongs to a power pool from which it purchases power over and above what it can economically generate, the published power-pool rate effectively equals the utility's avoided cost. This is because the utility will add on its own generating units as the load increases until the avoided cost is equal to the power-pool cost. It will then purchase additional power.

Philadelphia Electric Co. for instance, which has about 30 customer generating systems paralleled with its network, buys extra power from the Pennsylvania-New Jersey-Maryland interconnection pool. The cost to the utility for PJM power varies hourly, and is recorded on tape. Thus, to credit a customer with the avoided cost of power purchased, the PJM tape is computer-matched with the customers' meter tape.

Nailing down the ROI

The potential cogenerator now has at least some basic data with which to estimate the return on investment (ROI) for a cogeneration plant. A company that already cogenerates stands to gain substantially by applying for cogeneration status, tying into the utility's network through an approved meter, and meeting all the utility's requirements for protection of the system.

The utility is required to provide the necessary interconnection within 90 days of the qualification of cogeneration status. Even though the net flow of power may be from utility to customer, the customer is paid at the avoided cost for power flowing into the utility network, and charged at the current retail rate for power flowing from the utility into his system. In a few existing installations, a single meter has been used. Customer-generated power merely runs this meter backwards. But now that the avoided-cost buy-back rate is formalized, two meters will normally be required.

Note that the utility can set its own prices and terms on the buy-back of electricity from a customer (subject to the approval of the state PUC) and can set its own standards for reliability and network protection. However, it must offer a price that is not less than the published avoided cost, it must allow the customer to parallel with its network (otherwise buy-back is impossible), and it must agree to provide supplementary maintenance and backup power at rates that are "just and reasonable."

These provisions ensure that the utility loses nothing. The avoided-cost provision ensures that it does not have to buy power om a cogenerator at a rate greater than it could buy it for elsewhere. If the customer needs the utility to provide all the equipment for full backup power, but purchases very few kilowatt-hours of supplementary power, then the utility can set a rate per kilowatt of installed capacity that provides a fair return on the equipment that it must maintain.

However, despite the fact that FERC regulations quite clearly mandate all utilities to buy back cogenerated power, the matter is by no means completely settled in all areas. The economic situation of utilities across the country varies widely, and it is probable that FERC rules will be tested in court in some states. Utilities that serve an expanding area and are already capacity-short should welcome the additional capacity provided by cogeneration. Utilities that are cash-short and need the revenue will resist the reduction in kilowatt-hour sales. Likewise, if customer generation cuts into a utility's base load, it will adversely affect both the return on investment and the utility's heat rate. PUCs are required to have specific interconnection rules and rates in place by March 1981, after which the situation may become clearer.

Whether or not cogeneration is right for your plant depends on the extent to which you can lower your overall heat rate, and on the buy-back rate and interconnection conditions you can negotiate with the utility. Casten, of Cogeneration Development, recommends that a cogeneration plant be sized to meet your basic heat-energy needs. Whatever electricity is generated as a result can then be used to offset the amount of power you buy from the utility. This way you are taking maximum advantage of cogeneration potential without attempting to compete with the utility in the generation of power.

However, Casten considers that the minimum viable size for a cogeneration plant using high-pressure boilers is about 15 MW. At that size, a full-time maintenance crew is required and economically justified. Smaller cogeneration systems would usually involve prime movers. As size gets down to 3MW, it's hard to justify a full-time maintenance crew. Problems of maintenance and unattended operation are likely to fall on management personnel, so that the cogeneration installation becomes more of a headache than an economic asset. This situation should change as PUCs establish interconnection rules and utility backup is ensured. Casten also notes that plants burning diesel oil do not qualify for cogeneration status, though it appears that they eventually will.

Sherif Fam, energy studies manager of Thermo Electron Corp, Waltham, Mass, points out that a cogeneration plant normally requires an after-tax return on investment of at least 25%, or a simple pretax payback of about three years, compared with the normal utility ROI of 11-15%. In the case of cogeneration, uncertainties in the marketplace are compounded by uncertainties in the field of regulation. These uncertainties shorten the payback time that can prudently be allowed on the investment.

Fam considers that small steam-driven cogeneration plants, down to 2 MW, are economically viable now, particularly for back-pressure turbines producing steam at moderate pressures of 150 psig or less. If excess boiler capacity already exists, there is virtually no limit to the economic size. Each company's situation is different, and the capital investment it must make needs to be examined individually. Boilers in particular are very costly, and excess capacity may turn the balance in favor of cogeneration. In regions where at least some oil or gas is used to gener-

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ate power, and purchased electricity is 5¢/kWh or more, the use of diesel cogeneration plants burning residual fuel makes good economic sense in sizes of 5 MW or more.

A common situation may be found where pressure-reducing valves are used to reduce high-pressure steam for process applications. These valves represent energy wastage. They can be replaced by steam turbine/generators that convert the wasted energy into electric power. In such ways, investment in a cogeneration plant may be a relatively small addition to capital investments that are made for other purposes.

Peak-shaving possibilities

The new TOD rates, and particularly the ratchet clause (see story, page 55), may provide substantial incentive to use in-plant generation to shave peak-demand charges. But it's important to note that peak-shaving represents an entirely different approach to reducing purchased-power costs than the approach used with cogeneration. As such, it must be evaluated on entirely different premises.

Whereas a cogeneration plant should be operated for the longest periods possible, to take advantage of its superior heat rate, the key to peak-shaving is to minimize generator run time. The peak-shaving generator is invariably driven by a prime mover, with no waste-heat recovery. This means that the cost of the electricity it generates is high, possibly several times more expensive than the kilowatt-hours purchased from the utility. It does not qualify as a cogenerator, and is therefore not subject to any of the cogeneration incentives provided by FERC. However, if it can be used to cut demand charges substantially while running only a few hours a month, it will provide a satisfactory ROI.

The economics of a peak-shaving generator depend on:

- The utility's demand charge.
- The shape of the user's load profile.
- The capital cost of the generating and switching equipment.
- The method of operation—transfer switches or parallel connection.

Demand charges are rising rapidly and show no sign of leveling off. John Shields of Cummins Engine Co, Columbus, Ind, suggests that if your demand charge has reached $5/kW, you should at least take a look at peak shaving.

Consider the load factor

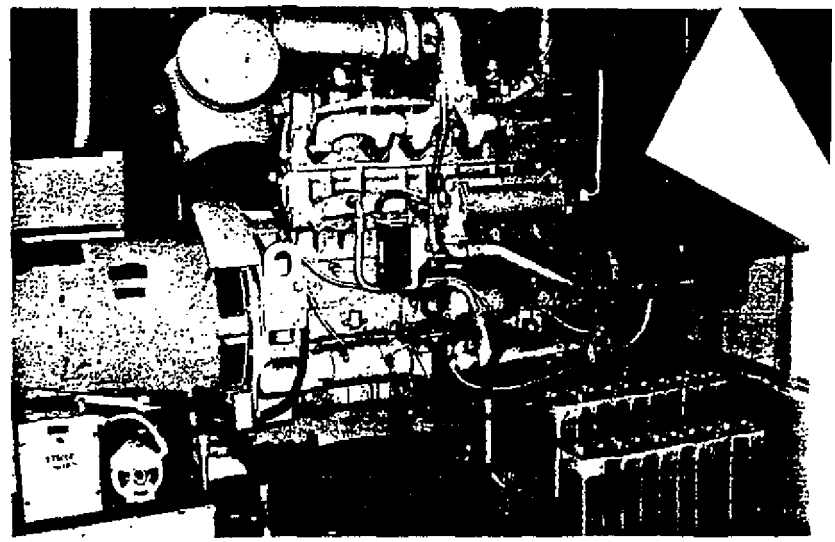
The load factor affects the number of hours the peak-shaving generator will have to run to reduce demand charges substantially. Load factor can be simply expressed as the average kilowatt demand divided by the peak demand. If the demand charge is $5/kW, you normally need a load factor of less than 50% to make peak-shaving economical. Higher demand charges make peak-shaving attractive at higher load factors.

The capital cost of a peak-shaving generator is high, anywhere between $150 and $300/kW. Only users with high short-term peaks that cannot be moved out of the peak-demand period can normally justify the use of a generator set purely for peak-shaving. But 95% of the peak-shaving generators installed today double as emergency generators, according to Shields. At today's demand charges, all installed emergency generators should be considered for their additional potential as peak-shaving generators.

The cost of hooking up an emergency generator for peak-shaving can be quite low, depending on the plant system and the loads served. If the emergency load itself can be used for shaving, the cost is almost negligible, since it is only necessary to transfer this load to the emergency generator to shave peaks. Unfortunately, the emergency load is not often suitable for this purpose. Either its size is wrong for economical shaving or its nature is such that the switching transients cannot be tolerated. Even more important, it may not be operating at the time peak-shaving is needed.

Usually it's necessary to install a separate transfer switch to automatically transfer a more suitable load to the generator for peak-shaving. Additional control is needed to drop the peak-shaving load and switch in the emergency load in the event of a power failure. Controls and switchgear to do this may cost anywhere from $5,000 to $10,000.

The key to success here is the right combination of load profile and size of emergency generator set. It's not economical to shave more than a minimum number of kilowatts from peak demand, because of the high cost of running the generator. Usually this means less than 10% of the peak and less than 40 hours' running time per month. For users with demand charges of less than 2000 kW, the smallest emergency generator available may be too big for peak-shaving.



2. One of five emergency diesel generators installed in a New York City building, which could supply up to 1 MW of peak-shaving capacity with suitable switching

Paralleling the generator with the utility supply usually provides better operating economies than a system using transfer switches. This is because the generator produces only the minimum number of kilowatt-hours necessary to reduce the peak demand (Fig 1). The cost of automatic paralleling equipment, however, may be as high as $30,000 to $50,000 for a 500-kW generator. The circuit breaker required by the utility alone costs about $10,000. Depending on the layout of the plant and the loads used for peak shaving, however, the cost of the paralleling equipment may be offset by the savings in rewiring the various loads through transfer switches.

Note, however, that the peak-shaving generator does not qualify as cogeneration equipment, and the utility is not required to allow parallel connection. But Stephen Bureh, of On-Site Power Consultants, Nashville, Ind, notes that, because of the increased experience with the paralleling of cogeneration system, utility resistance to interconnecting customer systems is lessening.

In fact, some utilities are welcoming peak-shaving equipment as a way of obtaining additional peaking capacity. Some are even offering a special rate to customers who will agree to operate their generators during peak utility loads. The agreement is similar to that used for customers who offer to interrupt loads. The utility dispatcher phones cooperating customers and asks them to start their generators when needed. Considering the enormous installed capacity of emergency generators around the country, this is another cooperative approach that is sure to be expanded.

Compiled by John Reason

LEHMAN 01124

NOV 2 Rec'd

September 30, 1982

A. Stanley
Mail Code S160

Breakeven Point for the Feasibility of Alternate Fuel for Natural Gas

As the price of natural gas continues to escalate at a much faster rate than that of the other fuels, and phased-in decontrol of "old" gas is expected from 1983 to 1990, the idea of using alternate fuel such as propane or light oil no. 2 becomes apparent. CIM clay operation at Aiken, South Carolina, has just experienced a price increase of natural gas in the amount of $1.01817 per MCF, and the same level of increase is expected at the other locations. (Colorado expects a 44% increase in gas utility bills next year.) These factors make the concept of alternate fuel much more attractive.

Based on an article "Propane Seen As Standby Fuel for Higher-Priced Gas" in the Energy User News of September 13, 1982, by Lisa Tucker, it seems that we have come to the breakeven point of propane for natural gas. Since "only propane prices are expected to go down in the future," the substitution of propane for gas should be implemented immediately. Our analysis, however, did not support the figures as given in the article.

The price figures as given in the article on the basis of heat content are:

Propane	Natural Gas	Oil
$5.3/MMBTU	$5.27/MMBTU	$4.8/MMBTU

which translates to a price on a unit basis of:

$.49/gal.	$5.43/MCF	$.67/gal.

The prices of propane and oil, however, are not realistic at the current price level, which shows at least $.75/gal. for propane and $1/gal. for oil.

If we use the unit price of natural gas as the base for calculation to compute the breakeven point for the corresponding unit prices of both propane and fuel oil no. 2, we have the following table:

Breakeven Cost For Fuel*

Propane ($/gal.)	Natural Gas ($/MCF)	Fuel Oil No. 2 ($/gal.)
.267	3	.405
.311	3.5	.472
.356	4	.540
.400	4.5	.607
.445	5	.675
.489	5.5	.742
.534	6	.810
.578	6.5	.877
.623	7	.945
.667	7.5	1.01
.711	8	1.08 ←
.756	8.5	1.15
.800	9	1.21
.845	9.5	1.28
.889	10	1.35

* The unit prices per MM BTU of propane and fuel oil no. 2 are equated to that of the gas, and the unit cost is then computed.

$$\frac{\$x/\text{gal.}}{.0916\ \text{MMBTU/gal.}} = \frac{\text{price of gas (\$/MCF)}}{1.03\ \text{MMBTU/MCF}} = \frac{\$y/\text{gal.}}{.139\ \text{MMBTU/gal.}}$$

The table indicates that at the current price level of propane and fuel oil no. 2, the price of natural gas has to be at least $8/MCF to make the idea of using alternate fuel for gas feasible. However, we should continue to investigate the concept of alternate fuel.

Information on the past ten-year energy trends, price watch, etc., are also enclosed for your perusal.

Y. Yi Kwan

YYK/mkh

Attachments

Propane Seen as Standby Fuel for Higher-Priced Gas

By LIZA TUCKER

NEW YORK--Liquid propane gas is being held in reserve as a backup fuel when natural gas is not available by users throughout the country, and some may switch to the fuel permanently because of higher natural gas prices, according to users interviewed by Energy User News.

At present, propane prices remain volatile, according to sources, because production is down. Propane is a byproduct of oil and gas production, and since domestic production of oil and gas are down, propane production is also suffering, according to Robert Myers, spokesman for Petrolane, a Los Angeles propane distributor.

"The production of natural gas and oil is down, so domestic propane production is down also," Myers said. "But inventories are at a high level, and supplies of propane will be unloaded over the next 6 months," he said.

The influx of propane into the market over the next 6 months may lower prices which have gone up 6 to 7 cents over the previous 6 months. Liquid propane now costs 60 to 65 cents a gallon on the average, he said.

One liquid gallon of propane generates 91,000 Btus, a source said. Currently, propane averages $5.30 per million Btus (mmBtu). Natural gas averages $5.27 per mmBtu, while oil averages $4.80 per mmBtu. However, of the three fuels, only propane prices are expected to go down in the near future, he said.

"People who haven't been using their standby propane supplies are doing so now because there is a growing concern about natural gas rates," he said. "If local and state regulatory commissions continue to approve natural gas rate increases, we may see a trend towards the use of propane on a regular basis," Myers added.

Some companies such as Nabisco, East Hanover, N.J., have backup propane systems for those instances when natural gas is not available. If the price of the fuel were right, a company spokesman said, they would switch to propane on a regular basis.

"Good business dictates that a user use the less expensive fuel. If propane were available and cheaper, we would certainly use it on a regular basis," a Nabisco source said. Nabisco currently has ten bakeries around the country, seven of which have propane backup systems, he said.

The volatility of prices has caused some industries, such as a Northeastern glassware plant, to reconsider switching from natural gas to propane. "It would have cost us $200,000 to $300,000 to switch from natural gas to propane," said a company spokesman. "We were going to make the investment but then the price went up."

To burn propane, one part propane must be mixed with 23.86 parts air, and must be burned with at 3,595 degrees F., the same temperature required to burn gasoline, according to Reginald Wintrell, president of Dual Fuels, a propane conversion company in Orem, Utah. Propane must be compressed to a liquid form for storage, he added.

"A broad spectrum of users who need a clean fuel use propane, in heat treating processes, for example, when natural gas is not obtainable," Myers of Petrolane said. Propane is also used in commercial businesses such as hotels and restaurants for heating purposes where natural gas is scarce and electricity expensive, as well as the converting of vehicle fleets, he said.

Propane contains 2 to 3 times the Btus of natural gas, he said.

All contracts for propane are on a "take or pay" basis, according to David Lessley, spokesman for Mapco, a propane distributor in Janesville, Wis. The user must pay for the propane, even though he may not need it when it is eventually delivered, he said. Propane can also be bought on a spot basis when a user's supplies are low, he said.

In addition, distributors may help users do all the necessary converting to propane if the user wishes, a Petrolane spokesman said. Petrolane will design, install and operate pipelines for the user, he added.

Pressure vessels used to store and distribute propane can range in size from 30,000- to 90,000-gallon capacity.

To install a propane backup system using a propane pressure vessel, a user must first get a construction permit in his own name as well as an electrical permit, he said. Once these permits are secured, insurance rates are not affected, he said.

Equipment used must meet National Fire Prevention Agency and Underwriters Laboratories requirements as well, he said.

Propane is volatile and may ignite if it leaks, but with the safety precautions utilized in the construction of pressure vessel tanks, leakage can be averted, he said.

The disadvantages of using propane are in its storage, according to Bill Burk, vice president of purchasing, Jim Walter Co., a building material manufacturer in Tampa, Fla. "There is an inventory investment in the storage of propane which must be taken into account," he said. "If you burn propane, you must pay for the tanks as well as the conversion equipment. When gas is readily available, it would be at an economic disadvantage to burn propane."

The company has over 75 facilities that manufacture gypsum wall board, bathroom fixtures, plumbing fixtures, and ceramics.

The gypsum wall board plant must use propane because the product requires a clean fuel, he said. The local gas company will not pump in natural gas because there is not enough industry in the area to justify it, he added.

Other disadvantages include regulatory and space considerations. "In some instances regulatory personnel have not granted permits for the storage of large quantities of propane in industrial sectors because they are not familiar with its properties," according to Petrolane's Myers.

Spacing between tanks and between tanks and facilities must also meet many safety regulations, be said.

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TEN-YEAR ENERGY TRENDS

Trends in U.S. production, imports, consumption and prices are shown below, with the latest monthly figure followed by the corresponding monthly figures for one year back, 5 years back and 10 years back.

The table shows trends rather than values, since index numbers are substituted for the physical quantities. The base year is 1978, with 100 representing that year's 12-month average. That means seasonal tendencies will be reflected in the figures, affecting all entries on a given line.

		Latest Month	12 Mos. Prior	5 Yrs. Prior	10 Yrs. Prior
PRODUCTION (1978 = 100.0):					
Natural Gas.....	Jun.	96.9	100.9	100.4	109.5
All Crude Oil.....	Jul.	99.9	97.6	93.1	109.1
Non-Alaska Oil...	Jul.	93.3	92.2	103.4	124.3
Coal.....	Jun.	132.6	113.2	115.5	91.9
Nuclear Power...	May	92.2	84.0	91.6	12.3
NEW WELLS COMPLETED (1978 = 100.0):					
Finding Oil.....	Jul.	217.7	184.8	86.4	55.2
Finding Gas.....	Jul.	153.7	100.6	65.3	30.2
PETROLEUM IMPORTS (1978 = 100.0):					
Total.....	Jul.	63.8	69.0	106.8	52.6
From OPEC.....	Jun.	36.1	50.8	115.3	35.9*
Fr. Arab OPEC.	Jun.	27.0	57.5	114.7	17.9*
CONSUMPTION (1978 = 100.0):					
Gas To Industry.	Jun.	102.6	133.5	107.7	140.3
Industrial Elec...	May	90.9	100.0	95.2	77.5
All U.S. Energy.	May	83.7	86.8	88.5	n.a.
PRICES TO REFINERIES (per barrel):					
Imported Oil.....	Jun.	$33.88	$37.03	$14.63	$3.22*
All Crude Oil.....	Jun.	$31.76	$35.03	$11.98	$3.58*
PRICES TO INDUSTRY (per mill. British thermal units):					
Natural Gas.....	1Q-82	$3.85	$3.22	$1.61	$0.48
Electricity.....	May	$14.51	$12.19	$7.18	$3.40*
No. 2 Oil.....	May	$7.37	$7.89	$2.78	$0.75*
Steam Coal.....	1Q-82	$1.64	$1.48	n.a.	n.a.
PRICES TO ELEC. UTILS. (per mill. Brit. thermal units):					
Natural Gas.....	May	$3.32	$2.83	$1.26	$0.31*
Residual Oil.....	May	$4.92	$5.57	$2.25	$0.62*
Steam Coal.....	May	$1.65	$1.47	$0.92	$0.38*

Sources: "Ten-Year Energy Trends" is adapted from data published by government agencies and utility trade associations. In several cases, indicated by an asterisk, the 10-years-back figure is derived from annual rather than monthly data.

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PRICE WATCH

No. 2 oil for October delivery fell by 0.05 cents to 94.95 per gallon on the Mercantile Exchange. Latest week's range: 94.80 to 96.80. Previous week's: 92.30 to 95.10.

No. 6 oil's posted price rose by 34 cents to $27.91 per barrel (1% sulfur, average posting of Exxon, Hess, Marathon, Amoco).

No. 2 Oil (Oct. deliv.)
Per Gallon.....94.95 cents

No. 6 Oil (1%S. at terminal)
Per Barrel.....$27.91

Natural Gas (Midw., lg. vol.)
Est. Per Thou. Cu. Ft..$4.20

Steam Coal (To TVA in July)
Per Ton.....$38.55

Sources for "Price Watch": New York Mercantile Exchange for No. 2 oil, seller firms for No. 6 oil (see "Refiners' Fuel Prices," page 4), EUN for natural gas, Tennessee Valley Authority for coal.

EFFICIENCY WATCH

EUN calculates that during the 12 months ended May 1982, energy use per unit of activity or output, in comparison with 1979, has been:

INDUSTRIAL:	Cut 11.1%
COMMERCIAL:	Cut 5.1%
RESIDENTIAL:	Cut 7.6%

Further information on "Efficiency Watch" is given on page 33.

INVENTORY WATCH

Petroleum inventories at refineries and bulk terminals are shown below using index numbers. "Trouble point" is an EUN estimate of how low stocks could get at this time of year without a risk of supply problems. For each item, 100 is the average 1977 inventory.

Distillate Fuel Oil
Latest week.....Up 1 to 83
Trouble point.....84

Residual Fuel Oil
Latest week.....Up 2 to 70
Trouble point.....74

Gasoline
Latest week.....Up 1 to 91
Trouble point.....84

Crude Oil
Latest week.....Off 2 to 108
Trouble point.....77

Sources for "Inventory Watch": American Petroleum Institute and EUN.

Energy User News
September 20, 1982

WHAT COAL COSTS

Representative steam-coal price is shown in dollars per ton, with August the latest month. The figures are derived from price indexes and freight rate indexes issued by the Bureau of Labor Statistics.

	Latest Month	Prior Month	12 Mos. Earlier	12-Mo. % Chg.
Price at mine.....	$32.67	$32.62	$30.23	+8
Rail freight.....	10.57	10.57	9.73	+9
Delivered Price....	43.24	43.19	39.96	+8

Source: "What Coal Costs" is adapted from Bureau of Labor Statistics indexes and Department of Energy price data. The table is anchored to a 1981 delivered price of $39.49 (Sept. 6, 1982, EUN, page 22), of which $9.53 is assumed (by EUN) to be the shipping cost.

FIGURING ON ENERGY

Gas: Who'd Pay Whom?

By PAUL SCHAFFER
Statistics Editor

NEW YORK—The Consumer Federation of America, which opposes gas price decontrol, has worked up a company-level portrait of decontrol's financial impact.

CFA foresees 15 gas pipelines paying $56.9 billion extra to 20 major gas producers from 1983 to 1990 under phased-in decontrol of "old" gas. That's in addition to the payments likely under current law, using estimates based on records at the Federal Energy Regulatory Commission (FERC).

CFA says decontrol would force non-residential users to cut capital spending to pay for their gas.

The organization acknowledges current problems of unequal competition between interstate and single-state pipelines, and of producers going after hard-to-produce gas before easy-to-get gas because of federal regulations. But CFA wants the price rules changed, not abolished.

"The larger market-ordering problem is the underconsumption and underinvestment in the non-energy sectors of the economy that could well result from the transfer of large amounts of money from consumers and industrial users to producers," CFA argues. CFA's backers include labor unions and the American Public Power Association.

CFA used Energy Information Administration assumptions about how fast old gas will wane, combined with individual pipelines' semiannual regulatory filings.

To put the $56.9 billion in perspective, keep in mind that it is spread over 8 years. The same 15 pipelines had 1980 gas revenues totaling $28 billion. All U.S. gas producers in 1981 received $40.3 billion at the wellhead.

The figures below are in billions of dollars.

Whose customers would pay the $56.9 billion?:

Tenneco Inc.	8.7
El Paso Natural Gas Co.	6.9
Natural Gas P. Co. of Amer.	6.3
Texas Eastern Transmission	5.2
Northern Natural Gas Co.	4.5
Michigan-Wisconsin Pipe Line	3.6
Trunkline Gas Co.	3.5
Texas Gas Transmission Corp.	3.2
United Gas Pipeline Co.	3.2
Transcontinental Gas Pipe	2.5
Southern Natural Gas Co.	2.5
Columbia Gas Transmission	2.3
Cities Service Gas Co.	1.9
Panhandle Eastern Pipeline	1.8
Colorado Interstate Corp.	0.8
Total	56.9

Who would get the $56.9 billion?:

Gulf	5.7
Mobil	5.2
Texaco	5.0
Exxon	4.8
Shell	4.2
Standard of Indiana	3.9
Tenneco	3.4
Standard of California	3.1
Phillips	3.1
Atlantic Richfield	2.7
Cities Service	2.6
Getty	2.4
Union	1.9
Superior	1.9
Sun	1.7
El Paso	1.7
Conoco	1.4
Pennzoil	0.9
Marathon	0.7
Columbia	0.5
Total	56.9

Four of the pipelines are affiliated with companies on the producer list. These firms account for $19.8 billion of the payments and $8.2 billion of the receipts.

The summary report, "The Powerful Twenty and Old Gas," costs $5 from CFA, 1314 14th St., N.W., Washington, D.C. 20005. The detailed tables cost $250.

In arguing that certain producers will benefit disproportionately from decontrol, CFA says these 20 firms account for 51 percent of U.S. gas production but for 72 percent of old-vintage interstate gas that would get the major price hikes under decontrol.

Even without a windfall from gas decontrol, the major producers seem bound to boost their gas role. They are the key players in undersea wells, which provided 27 percent of domestic gas in 1981 up from 22 percent in 1976.

The Department of Energy has a list of big energy producers similar to CFA's. The majors' natural gas role in 1979, DOE says, was 49 percent of U.S. production, 51 percent of onshore reserves and 65 percent of offshore reserves.

Energy User News
September 27, 1982

Gas Prices 10% Below Oil's in 2000: AGA

By JERRY SLAFF

ARLINGTON, Va.—Natural gas prices will stay at least 10 percent below residual oil's through the year 2000, except for 1985 when full gas decontrol takes effect, according to a study prepared for the American Gas Association (AGA), here.

However, other industry sources are saying that the price advantage of gas over oil will not be as stable or rigid as the AGA report predicts, but will "flip back and forth" between the two fuels.

The report, using 1982-value dollars, puts the current price for natural gas at $3.62 per million Btus (mmBtu), with residual oil priced at $4.65 per mmBtu, showing gas as being 22 percent cheaper than resid.

By 1984 gas prices will increase 7.75 percent to $3.90 per mmBtu, the report says, while oil prices will decrease 2 percent to $4.56 per mmBtu. Gas's price advantage would narrow to 14.5 percent under those conditions, according to the study.

Full gas price deregulation in 1985 would send gas prices up 26.4 percent from 1984 prices to $4.93 per mmBtu. The increase would make oil, at $4.74 per mmBtu, about 4 percent less expensive than gas, the report speculates.

The AGA report views oil's 1985 price advantage as temporary. After 1985, gas would quickly recover some of its price advantage over oil, in reponse to market conditions. In 1986, gas would be priced at $4.87 per mmBtu, 7 cents less than oil's $4.94 per mmBtu, giving gas an advantage of about 1 percent.

After 1986, gas prices would rise more slowly than oil prices due to declining increases of wellhead gas prices, the report predicts. Through 2000, according to the AGA scenario, gas would maintain a price advantage of about 10 percent over oil.

The point, however, is disputed by Mark Decker, vice president for heating fuel policy of the National Oil Jobbers Council, a Washington-based federation of state and regional petroleum marketers.

While Decker said he agrees with the AGA price predictions up to 1985, he does not see a clear return to gas's price advantage over oil through the end of the century.

The 1985 increase in gas prices will not be temporary, but will continue, Decker said. "It's not an upward 'blip' in a downward graph, but a continuousupward trend," he said. "I definitely don't see a gas advantage over oil of 10 percent through 2000."

The fuel market is easily disrupted, and any number of events could change the price of either gas or oil dramatically, Decker said.

"We may have shortages or curtailments in gas," he said. "Of course, if there's another oil embargo in the Middle East, oil [prices] would shoot up. It's going to be nip-and-tuck between oil and gas through 2000."

The AGA predictions indicate the possibility of a shift of industrial users from oil to gas. An AGA spokesman said there would be ample supplies for users switching to gas.

"In the event of a mass switch, we could cover a 50 percent rise in gas demand," the AGA spokesman said. The extra gas would come from domestic sources, as well as imported gas from Canada and Mexico, he said. Little price difference between domestic and imported gas is expected after full deregulation in 1985, he added, although imported gas would still be "slightly" higher.

The AGA did not take into account any possible global emergencies, such as Middle East wars, the spokesman said, and assumed a 6 percent global economic recovery in 1982, using as a reference point a 1981 economic study made by the Wharton School of Business, Philadelphia.

The average sulfur content of the residual oil used in the study was 1.1 percent, he said.

The September 1982 report, "Historical and Projected Natural Gas Prices," was prepared by the AGA in conjunction with the Total Energy Resource Analysis Advisory Committee, a gas industry consulting firm. The study is available from AGA at 1515 Wilson Blvd., Arlington, Va. 22209.

Energy User News
September 20, 1982

Southern Natural Gas Company
Post Office Box 2563
Birmingham AL 35202 2563
205 325 7410

SOUTHERN NATURAL GAS

RECEIVED
1982
PRICES DEPARTMENT

September 24, 1982

Cyprus Industrial Minerals Company
P. O. Box 898
Aiken, SC 29801

Attention: Mr. Joe Lubner, Operations Manager

Gentlemen:

We refer to the agreement between you and us for the purchase and sale of natural gas. Said agreement provides, inter alia, that the initial price(s) stated therein shall be adjusted to reflect changes in the price payable for all gas subject to Seller's Rate Schedule when calculated at a load factor of 100% (the "Unit Price") from such price in effect on May 1, 1981(the "Base Unit Price").

On August 31, 1982, we filed with the Federal Energy Regulatory Commission (FERC) adjustments to Seller's Rate Schedule to be effective October 1, 1982. Upon acceptance by the FERC, such adjustments will result in changes to the Unit Price as shown below:

Price under "Rate Schedule" Effective 10/1/82	
Demand Charge = $6.302/Mcf x 12 Months	$ 75.6240
Commodity Charge = $3.56555 Mcf x 365 Days	= 1301.4258
	$ 1377.0498
Unit Price/Mcf	$ 3.77274
Base Unit Price/Mcf	$ 2.75457
Change: Increase	$ 1.01817

Accordingly, effective October 1, 1982, the initial price(s) payable for gas delivered to you under our agreement will be increased by $1.01817 per Mcf.

Yours very truly,

K. M. Adkins

K. H. Adkins, Manager
Industrial Sales & Market Research

KHA/jga
cc: Cyprus Industrial Minerals Company ✓
7000 South Yosemite
Englewood, CO 80112
Attention: Ms. Marta Gonzales

A SOUTHERN COMPANY

Southern Natural Gas Company
Post Office Box 2563
Birmingham AL 35202 2563
205 325 7410

RECEIVER
AUG 02 1982
PROCESS ENGINEERING

SOUTHERN NATURAL GAS

July 30, 1982

To All Resale and Direct Sale Customers
of Southern Natural Gas Company

Gentlemen:

Enclosed is a copy of Federal Energy Regulatory Commission (FERC) Order No. 55-C, issued June 29, 1982. The effect of this order is to affirm the FERC's determination that residual fuel oil and coal are economically practicable and reasonably available alternative fuels for essential agricultural users. The FERC declined to exercise its discretion to determine No. 2 fuel oil and propane to be economically practicable alternative fuels.

Yours very truly,

K. H. Adkins

K. H. Adkins, Manager
Industrial Sales & Market Research

KHA/eks

Enclosures

LEHMAN 01133

19 FERC ¶ 61,314

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: C. M. Butler III, Chairman; Georgiana Sheldon, J. David Hughes and A. G. Sousa.

Determination of Alternative Fuels for Essential Agricultural Users	)	Docket No. RM79-40-000 -002 -003 -004 -005 -006 -007 -008 -009 -010 -011 -012

ORDER NO. 55-C
ORDER DENYING REHEARING

(Issued June 29, 1982)

I. INTRODUCTION

Curtailment plans of interstate natural gas pipelines establish priority-of-service categories that are used during periods of natural gas shortages. In times of shortage, the users of natural gas which are placed in lower priorities are the first to be curtailed and those in higher categories are curtailed last.

Section 401(a) of the Natural Gas Policy Act of 1978 (15 U.S.C. §§ 3301-3432) (NGPA) provides that, in the curtailment plans of interstate natural gas pipelines, essential agricultural uses must be given a high priority status second only to certain other enumerated priority uses. In other words, in the event of a shortage of natural gas in the system, the pipeline must curtail service to all other classified users,

LEHMAN 01134

PROCESS ENGINEERING 1982

except high priority users, before curtailing service to essential agricultural users. Inclusion in the priority afforded under section 401(a) is restricted by section 401(b) however. The curtailment priority status which section 401(a) provides essential agricultural uses is inapplicable if the Federal Energy Regulatory Commission (Commission), in consultation with the Secretary of Agriculture, determines that there is an alternative fuel that is economically practicable and reasonably available (the alternative fuel test). An essential agricultural use which is determined to have an alternative fuel that is economically practicable and reasonably available is placed in the lower curtailment priority that the use occupied prior to a certification by the Secretary of Agriculture that the use is an essential agricultural use.

On August 11, 1980, the Commission issued a final rule to implement section 401(b) of the NGPA (Order No. 55-B, 45 Fed. Reg. 54733, August 18, 1980). Like the interim rule promulgated for the 1978-79 winter heating season (44 Fed. Reg. 62484, October 31, 1979), the final rule provides that residual fuel oil 1/ and coal are economically practicable

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1/ Residual fuel oil means "Nos. 5 and 6 oil, Bunker C, and Navy Special as defined in the standard specification for fuel oils published by the American Society for Testing and Materials, ASTM, D396." 18 C.F.R. § 281.303(n).

and reasonably available alternative fuels for essential agricultural users which have fuel requirements in excess of 300 Mcf per day and which have the installed ability to use these alternative fuels. The Commission declined to exercise its discretion to determine No. 2 fuel oil and propane to be economically practicable alternative fuels.

11. APPLICATIONS FOR REHEARING AND RECONSIDERATION

The Commission received timely applications for rehearing of the final rule from the American Bakers Association, The Brooklyn Union Gas Company, Distilled Spirits Council of the United States, The Fertilizer Institute, The Great Western Sugar Company, National Renderers Association, Inc., Petrochemical Energy Group, The Process Gas Consumers Group and the Georgia Industrial Group (filing jointly), and United Gas Pipeline Co.

On September 11, 1980, Mare, Inc. (Mare) filed a petition for reconsideration and The National Council of Farmer Cooperatives (NCFC) submitted a late application for rehearing. In this order, the Commission treats the late-filed application of NCFC as a petition for reconsideration and considers both petitions for reconsideration on the merits.

On October 8, 1980, the Commission granted rehearing of the final rule in this docket solely for the purpose of further consideration.

LEHMAN 01135

III. DISCUSSION

A. Economic Practicability

Based on the record in this proceeding and the relevant legislative history, the Commission determined, in the final rule, that residual fuel oil and coal are reasonably available and economically practicable as alternative fuels under the terms of section 401(b) of the NGPA. The Commission, however, did not find that No. 2 fuel oil or propane were economically practicable alternatives for essential agricultural uses of natural gas.

In the final rule, the Commission considered and rejected a suggestion submitted in response to the Notice of Proposed Rulemaking (45 Fed. Reg. 39283, June 10, 1980) that an alternative fuel should be determined to be economically practicable only if that fuel would cost the same as, or less than, natural gas. The Commission stated that such an economic practicability standard would render section 401(b) of the NGPA virtually meaningless, because, based on data in the record that showed all liquid fuels exceed natural gas in price, there would be no liquid fuels that would qualify as alternative fuels. In other words, the consequence of limiting economic practicability to price equivalency would be that no essential agricultural user that could use liquid fuels would be required to accept a priority lower than priority 2 when natural gas is less expensive than liquid fuels. The Commission believes that it may be appropriate under section 401(b) of the NGPA

for some essential agricultural uses not to receive priority 2 status, even if curtailment leads to the consumption of fuels which cost more than natural gas. In the final rule, the Commission noted that reliance solely on a price comparison test would ignore other factors that affect the cost of food, 2/ such as the number of days a user would be curtailed in times of a shortage.

Several applicants for rehearing allege, as they have previously, that the Commission erred in determining that residual fuel oil is economically practicable and in failing to use a simple comparison of fuel prices as a test for economic practicability. These applicants argue that the Congress, in 1978, anticipated that certain fuels would be declared economically practicable because the Congress expected natural gas prices to equal or exceed those of liquid fuels as a result of increased ceiling prices for first sale gas and the deregulation of some natural gas pricing categories after 1985. However, in 1979, OPEC increased the price of crude oil and, as a result, residual fuel oil now costs significantly more than gas. The applicants argue that the OPEC increase was unexpected and that the Congress did not anticipate the result. The Commission's rule is, therefore, viewed as inconsistent with congressional intent.

2/ As noted in the preamble to the final rule, the Conference Report states that the special priority for essential agricultural uses was established to "prevent unnecessary increases in the cost of food in this country." H.R. Rep. No. 95-1752, 95th Cong., 2d Sess. 114.

LEHMAN 01136

The Commission is not persuaded by this argument. The applicants provide no evidence that, in enacting section 401(b), the Congress assumed that oil prices would not increase faster than the price of natural gas. The contention that the Congress expected natural gas to exceed liquid fuels in cost and therefore intended the alternative fuel test to be based on a simple comparison of prices is unsupported. The Congress was certainly aware, in 1978, that the OPEC cartel had the capability to increase oil prices and had done so on prior occasions. There is no compelling reason to assume that the Congress enacted section 401(b) of the NGPA on the assumption that further oil price increases would not occur.

Some applicants also challenge the Commission's use of average annual fuel oil prices for 1979 as a basis for its decision to view residual fuel oil as an economically practicable alternative fuel. They argue that the use of average prices obscured the dramatic increase in fuel oil prices in that year which was evidenced by monthly increases in imported crude oil prices in 1979 and, especially, in January 1980. The applicants imply that such price increases made residual fuel oil economically impracticable as an alternative fuel. One applicant further notes

that monthly increases in imported crude oil prices continued through June 1980.

The Commission has reviewed its use of average annual prices, including those for 1979. The use of average annual figures instead of the most recent monthly prices provides a better assessment of the likely economic results of finding residual fuel oil to be an economically practicable alternative, because average annual prices provide a more complete picture of long term trends than do monthly prices which may vary due to seasonal and other short-term price variability. For example, Form 423 data published by DOE for the first six months of 1980 (the time period noted by one applicant) indicate that No. 6 fuel oil prices tended to fluctuate and in June 1980 were 8 percent lower than in January 1980. 3/ This confirms the Commission's original opinion that a decision on whether residual fuel oil is an economically practicable alternative need not be based on monthly data.

Applicants further criticize the Commission's analysis in the final rule insofar as the Commission relies on a comparison of the price of No. 6 fuel oil to the price of No. 2 fuel oil to demonstrate the economic practicability of No. 6 fuel oil. They argue that a determination that No. 6 fuel oil is an economi-

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3/ See Appendix B to this order.

LEHMAN 01137

cally practicable alternative to natural gas could not have been made if the Commission had compared the price of No. 6 fuel oil to the price of natural gas, rather than that of No. 2 fuel oil.

It is inaccurate to imply that the Commission ignored all factors and price differentials other than the difference between the price of No. 2 fuel oil, the most expensive of the alternative liquid fuels, and No. 6 fuel oil. Appendix A to the final rule sets forth a comparison of prices and price differentials for gas and all the fuel alternatives considered by the Commission. As noted above and in the preamble to the final rule, the Commission considers that a comparison of natural gas and oil prices is not the only relevant factor upon which the Commission should make the alternative fuel determination under section 401 of the NGPA. By considering the relative prices of No. 6 and No. 2 fuel oils, 4/ the likely rate of increase in their relative prices, 5/ and projected levels of curtailment, 6/ the Commission developed a picture of the economic consequences of using various alternative fuels that is more complete than an analysis that is predicated only on the relative proximity of natural gas and fuel oil prices.

4/ 45 Fed. Reg. at 54736.

5/ Id.

6/ Id.

Several applicants object to the Commission's decision that No. 2 fuel oil is not an economically practicable alternative to natural gas. They allege that there is no rational basis for not finding No. 2 fuel oil to be economically practicable, especially in view of the Commission's determination that low sulfur No. 6 fuel oil, a fuel which they claim costs about the same as No. 2 fuel oil, is economically practicable. In support of this argument, one applicant refers to the "unchallenged expert evidence" of its witness that the absolute price differential between No. 2 and low sulfur No. 6 fuel oils will be generally no greater than 15 percent in constant dollars.

The Commission believes that there is some uncertainty inherent in predicting future price differentials and that any analysis of future fuel oil prices is bound to be somewhat speculative. The testimony relied upon by the applicant does not, in the Commission's opinion, provide a sufficient basis for finding that No. 2 fuel oil is economically practicable. In addition, recent Form 423 data show that, for 1981, the absolute price differential between No. 2 and low sulfur No. 6 fuel oils was 22.5 percent. 7/

After analysis of the record, the relevant market factors, and the trends in reliable data, the Commission, in its discre-

7/ See Appendix A to this order.

LEHMAN 01138

tion, made a policy decision that it continues to believe will fulfill the statutory purpose of section 401 of the NGPA to provide for orderly curtailment of natural gas service without unnecessarily increasing the cost of food or requiring essential agricultural users to switch to high cost alternative fuels. The applications for rehearing present no new facts or issues of law that warrant a change in the Commission's determination that residual fuel oil and coal are the only economically practicable alternative fuels to natural gas under section 401(b) of the NGPA.

B. Reasonable Availability

Several applicants challenge the determination in the final rule that residual fuel oil is reasonably available. In particular, one applicant challenges the determination by claiming that DOE predicts that oil supplies will continue to decline as prices escalate. Another applicant argues that residual fuel oil is not reasonably available because there has been a decline in residual fuel oil stocks.

From June 1980 through May 1981 residual fuel oil stocks were in the range considered normal by DOE. Although the residual fuel oil stocks declined from June 1981 through December 1981, they have nevertheless remained above the level considered to be a minimum operating inventory. 8/ Therefore, the Commission

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8/ See Appendix C to this order.

is not persuaded to alter its determination in the final rule that residual fuel oil is, for the present, reasonably available to essential agricultural users with the capability to use it. As noted in the final rule, however, the Commission intends to reconsider that rule as circumstances require.

One applicant argues that the Commission's finding that residual fuel oil is reasonably available is inconsistent with Order No. 30-D 9/ which extended the fuel oil displacement program. That program authorizes the transportation of natural gas for the purpose of encouraging large users to displace fuel oil with natural gas. In support of its argument, the applicant states that one result of finding residual fuel oil to be reasonably available is to foster the use of residual fuel oil in situations where natural gas otherwise would be used.

This argument misapprehends both the purpose of the fuel oil displacement program and the final rule. The final rule is part of a larger program to determine, in times of a shortage of natural gas supplies, which users will receive the limited supplies and which will be required to switch to alternative fuels. During such times, lower priority industrial and utility uses will be curtailed before higher priority uses, such as essential agricultural uses. On the other hand, the fuel oil displacement

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9/ Order No. 30-D, Docket No. RM79-34 (issued August 15, 1980), 45 Fed. Reg. 56046 (August 22, 1980).

LEHMAN 01139

program is intended to displace fuel oil used by lower priority industrial and utility users with surplus supplies of natural gas, and interstate pipeline systems which are experiencing curtailments of natural gas will probably not be selling gas under the Order No. 30 program. As stated in Order No. 30-E, "it is unlikely that Order No. 30 sales will be made by systems experiencing a serious threat of curtailment." 10/ The determination that residual fuel oil is reasonably available as an alternative to natural gas when natural gas is curtailed is not, therefore, inconsistent with the Commission's efforts to displace fuel oil in another context.

C. Installed Capability

The final regulations apply only to those facilities that have the installed capability to use the fuels determined by the Commission to be economically practicable and reasonably available. 11/ Thus, there is no requirement that an essential agricultural user would be compelled by curtailment to rely on an alternative fuel if the user's facility did not have the capability to use that fuel. In other words, the final rule

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10/ Order No. 30-E, Docket No. RM79-34 (issued September 26, 1980), 45 Fed. Reg. 66784, 66785 (October 8, 1980).

11/ New boilers, i.e. those boilers put into service for the first time after August 29, 1979, that have a capacity in excess of 300 Mcf of natural gas per day, are presumed to have installed alternative fuel capability. This presumption does not apply to diesel engines or turbines designed to use distillate fuels as the only substitute for natural gas. 18 C.F.R. § 281.304(b).

does not require that an essential agricultural user incur any conversion costs.

Some applicants, however, argue that an alternative fuel test should be based on a user's ability to convert its facilities to use fuels other than gas. Citing Opinion No. 92, 12/ one applicant points out that the Commission has often recognized that, for larger volume fuel users, the cost of conversion to alternative fuels is relatively low.

The Commission has, in the context of establishing curtailment plans, concluded that it is relatively less expensive for large users to convert to alternative fuels than it is for small users to do so. However, the relative cost of conversion is irrelevant to the determination of what fuels are economically practicable within the meaning of section 401(b) of the NGPA. Under that section, the relevant consideration is whether an essential agricultural user should be required to bear the costs of conversion to an alternative fuel, thereby losing its priority 2 status. In the final rule, the Commission took the position that the cost of conversion, in fact, contributes to the cost of using an alternative fuel and stated that "imposition of conversion costs could cause unnecessary increases in food costs . . . ." 13/ It remains the Commission's view that requiring

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12/ Docket No. RM78-4, et al. (Issued August 4, 1980), 12 FERC ¶ 61,129.

13/ 45 Fed. Reg. at 54736.

LEHMAN 01140

any essential agricultural user, whose facilities can burn only gas, to convert those facilities so they can burn fuels other than natural gas would therefore be inconsistent with the Congress' mandate that the alternative fuel test under section 401(b) may not include a requirement to switch to high cost alternatives. 14/ Therefore, the Commission will continue its existing policy which does not require essential agricultural users to install alternative fuel capability.

D. Small Customer Exemption

The final rule exempts small users from application of an alternative fuel test. Small users are defined in § 281.302(a)(2) as users that have requested 300 Mcf per day or less in priority 2 entitlements. One applicant objects to the 300 Mcf per day cut-off for the exemption because it is said to apply in a manner that unfairly penalizes agricultural users that combine a number of natural gas end-uses in one facility. The applicant suggests that, as an alternative, the exemption limit should be 300 Mcf per day for each type of end-use within a facility.

The Commission declines to adopt the applicant's proposal. The Commission adopted the small customer exemption because it would have been administratively burdensome and impracticable to gather data on all essential agricultural users which request 300 Mcf or less per day in priority 2 entitlements. The 300 Mcf

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14/ Conference Report, supra note 2, at 114.

limitation per user was chosen by the Commission because it is consistent with the threshold for small users in many Commission curtailment plans. 15/ The fact that some users fail to qualify does not make the exemption unfair. The applicant has furnished no data or information to support either its allegation of unfairness or its proposal for a different application of the 300 Mcf limit for the small customer exemption. The Commission therefore will continue to apply the exemption limit to entire facilities.

B. Other Issues

Additional issues are raised in the applications for rehearing and the petitions for reconsideration. These issues were adequately considered by the Commission when it promulgated the final rule. The Commission believes reconsideration of these issues in this order is therefore unnecessary.

IV. CONCLUSION

The applications for rehearing and petitions for reconsideration raise no issues and present no data that were not fully considered by the Commission during development of the final rule or which, now having been considered, warrant

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15/ See e.g., Opinion No. 98, Lehigh Portland Cement Co. v. Florida Gas Transmission Co., Docket No. RP75-79 (Phase II), October 10, 1980, at 21, appeal pending sub. nom. Cities of Lakeland, et al., v. FERC, No. 81-5208, at al. (5th Cir.).

LEHMAN 01141

modification of the final rule on rehearing. The Commission believes that the alternative fuel test established in the final rule is the product of an informed use of Commission discretion to determine the appropriate criteria for the operation of natural gas curtailments under Title IV of the NGPA. Accordingly, for the reasons discussed above, the Commission denies rehearing and reconsideration of the final rule.

The Commission Orders:

The applications for rehearing and petitions for reconsideration are denied.

By the Commission.

(S E A L)

Kenneth F. Plumb,
Secretary.

DOCKET NO. RM79-40-000, et al.

COMPARISON OF SELECTED PRICE DATA
FPC FORM NO. 423 V. MONTHLY ENERGY REVIEW
1976 - 1981

APPENDIX A

Type of Fuel	FPC Form No. 423 Price Data 1/						Monthly Energy Review Price Data 1/					
	1976	1977	1978	1979	1980	1981 3/	1976	1977	1978	1979	1980	1981 3/
	($/BBtu)											
Fuel Oil												
No. 2	235.1	264.5	271.9	402.1	560.9	706.5	226.4	252.5	268.2	403.1	526.8	716.0
Low Sulfur No. 6	207.1	229.1	225.1	320.2	464.5	576.4	195.6	221.5	216.8	322.4	467.8	582.6
High Sulfur No. 6	168.2	189.8	186.2	264.7	359.5	457.1	165.9	195.2	186.1	261.5	351.7	457.5
All No. 6	195.9	220.6	212.5	299.2	428.1	529.0	192.8	218.4	207.2	297.0	416.8	516.8
Coal												
All Grades	84.8	94.2	111.6	122.4	155.1	155.5	84.8	94.2	111.6	122.4	155.1	155.5
Natural Gas	183.4	130.8	143.8	175.4	221.4	282.8	97.2	131.0	154.1	201.8	242.6 2/	316.5 2/
	Actual Price Difference (Fuel Oil and Coal v. Natural Gas)											
Fuel Oil												
No. 2	151.2	134.5	128.1	226.7	548.5	625.5	129.2	125.4	114.2	201.5	329.8	399.5
Low Sulfur No. 6	103.7	99.1	81.5	144.8	242.8	295.6	96.4	89.4	62.2	120.6	219.2	266.1
High Sulfur No. 6	65.5	69.1	42.9	88.5	132.9	174.5	68.7	64.5	32.0	59.2	103.9	140.8
All No. 6	92.5	90.4	68.5	124.7	206.7	246.2	95.6	78.5	48.6	95.2	167.2	202.5
Coal												
All Grades	(98.6)	(35.5)	(32.2)	(53.0)	(66.5)	(128.5)	(12.4)	(32.2)	(42.5)	(79.4)	(113.7)	(161.2)
	Price Difference Ratio 4/ (Fuel Oil and Coal) v. Natural Gas)											
	Ratio											
Fuel Oil												
No. 2	1.224	1.035	.891	1.292	1.376	1.498	1.329	.931	.740	.998	1.378	1.262
Low Sulfur No. 6	1.003	.262	.565	.826	1.097	1.038	.992	.678	.402	.598	.885	.841
High Sulfur No. 6	.633	.538	.298	.509	.623	.616	.702	.435	.208	.294	.419	.445
All No. 6	.895	.695	.476	.709	.934	.821	.881	.595	.313	.472	.623	.639
Coal												
All Grades	(.180)	(.272)	(.224)	(.302)	(.330)	(.458)	(.128)	(.282)	(.276)	(.393)	(.453)	(.510)

1/ As reported in DOE/EIA Energy Data Report entitled Cost and Quality of Fuels for Electric Utility Plants (Annual summary data 1976 - 1980) and Monthly Reports for January through December 1981. Note: All prices are delivered prices to steam electric plants. Prices paid for No. 6 fuel oil include prices paid for minor amounts of No. 4 and No. 5 fuel oil, crude and topped crude. Note: Low sulfur No. 6 has 1 percent sulfur content or less.

2/ Fuel oil prices are reported on FEA Form P302-M-1, "Petroleum Industry Monthly Report for Product Prices." Natural Gas Prices are those paid by industrial customers of major interstate pipeline companies as reported on FPC Form No. 11, "Natural Gas Pipeline Company Monthly Statement" from 1976 through 1979. Note: Gas prices paid by industrial customers to interstate pipeline companies are no longer reported in EIA's MER. The 1980 natural gas price was taken from the EIA report entitled Emerging Natural Gas Sales to Industrial Users, 1980 (December 1981); the 1981 gas price is based on the percentage increase in natural gas prices paid by steam electric plants from 1980 to 1981.

3/ Preliminary estimate based on Monthly Form 423 and Monthly Energy Review data.

4/ Mathematically the price difference ratio is $\frac{P_2 - P_1}{P_1}$; Where P_2 = the price of fuel oil or coal and P_1 = the price of natural gas. The ratio indicates the percent difference between natural gas and alternate fuel prices. For example, during 1981, electric utilities reported (in FPC Form 423) that they paid 1.498 times more (149.8 percent) for No. 2 fuel oil than they paid for natural gas.

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Docket No. RM79-40-000, et al.

APPENDIX B

MONTHLY PRICES PAID BY STEAM ELECTRIC PLANTS
FOR SELECTED FUELS DURING 1980

Type of Fuel	Average 1979 Prices	1980 Jan.	Feb.	Mar.	April	May	June
	Actual Delivered Prices Paid ($/MMBtu)						
Fuel Oil No. 2	402.0	364.4	573.1	584.0	372.3	553.7	552.5
Low Sulfur No. 6	320.3	433.3	466.1	454.4	433.3	444.3	440.5
High Sulfur No. 6	264.7	381.4	358.6	324.6	201.3	311.1	309.5
All No. 6	299.7	413.5	429.7	411.0	394.9	403.1	392.7
Coal (All Grades)	122.4	128.7	129.9	130.1	133.0	135.3	133.1
Natural Gas	175.4	184.0	205.9	207.9	204.0	212.0	200.3
	Actual Price Differential (Fuel Oil and Coal Less Natural Gas)						
Fuel Oil No. 2	726.6	359.6	360.4	377.0	368.3	341.7	343.0
Low Sulfur No. 6	144.0	239.3	262.2	246.5	231.3	232.3	231.2
High Sulfur No. 6	89.3	196.6	154.7	116.5	87.3	99.1	100.2
All No. 6	124.3	229.7	223.8	203.1	189.9	191.1	183.4
Coal (All Grades)	(53.0)	(46.1)	(74.0)	(77.0)	(74.2)	(78.7)	(74.2)
	Price Difference Ratio 1/ (Fuel Oil and Coal v. Natural Gas)						
Fuel Oil No. 2	1.292	1.897	1.812	1.813	1.805	1.612	1.659
Low Sulfur No. 6	.826	1.377	1.286	1.186	1.133	1.096	1.105
High Sulfur No. 6	.509	.853	.759	.560	.428	.467	.479
All No. 6	.709	1.174	1.107	.977	.936	.901	.876
Coal (All Grades)	(.302)	(.339)	(.243)	(.374)	(.344)	(.371)	(.355)

Source: FPC Form No. 423 as reported in DOE/EIA Energy Data Report entitled Cost and Quality of Fuels for Electric Utility Plants - Annual Summary Reports 1979 and 1980 and Monthly Reports for January through December 1980. Note: All prices are actual delivered prices to steam-electric plants. Prices paid for No. 6 fuel oil may include prices paid for minor amounts of No. 4 and No. 5 fuel oil, crude and topped crude.

1/ Mathematically the price difference ratio is $\frac{P_2 - P_1}{P_1}$; where P_2 = the price of fuel oil or coal and P_1 the price of natural gas.

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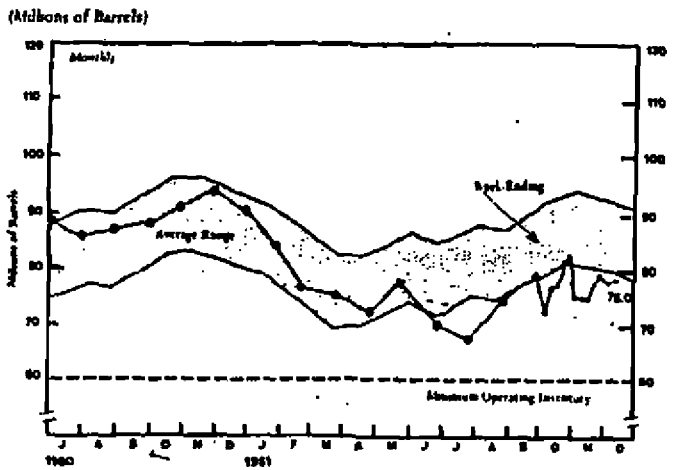
APPENDIX C

STOCKS OF RESIDUAL FUEL OIL, U. S. TOTAL



SOURCE: DOE/EIA Weekly Petroleum Status Report, December 18, 1981, at 13. "Minimum Operating Inventory" is defined by the National Petroleum Council as the minimum level required for routine operation. By their definition, runouts and shortages would occur if inventory levels fall below that level.

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Please Return to Plant

AUG 1 [illegible]

.2097/therm for next 6,000 therms

.1925 [illegible] in excess of 1500

Therms Of Gas

	1973	1974	1975	1976	1977	1978
J	10,057.2	10,381.5	7,721.4	12,876.4	7976.4	
F	12,621.4	11,260.8	5,544.7	12,786.7	[illegible]	
M	9,108.6	9,265.6	5,338.6	12,450.1	6226.1	
Σ 1st Q	31,787.2	30,907.9	18,604.7	38,113.2	21,836.2	
Av./mo	10,595.7	10,302.6	6,201.5	12,704.4	7278.7	
		[illegible]		+40.6%	-42.7%	
A	8,486.4	9900.1	5803.8	11,436.2	6096	
M	6,758.5	8331.3	5962.9	7,558.2	3,812.76	
J	8,351.7	7,778.5	5220.3	7,223.6	6046.56	
Σ 2nd Q	23,596.6	26,009.9	16987.0	26,218.0	15,955.32	
Av/mo	7865.5	8,669.9	5662.3	8,739.3	5,318.74	
		7849.2		+18.1%		
J	6,681.0	7,778.5	5,285.6	6774.8	5216.28	
A	6,062.8	6,442.3	4,488.0	4355.4		
S	5,426.4	7,058.4	5,722.2	4655.2		
Σ 3rd Q	18,170.2	21,279.2	15,495.8	15785.4		
Av/mo	6,056.7	7,093.1	5,165.3	5,261.8		
		[illegible]		-13.8%		
O	4,396.2	7,517.4	6338.2	7672.4		
N	8,184.4	7,676.5	7313.4	5875.2		
D	9,700.2	6,130.2	7696.9	5818.0		
Σ 4th	22,280.8	21,324.1	21,348.5	19,365.6		
Av/mo	7,426.9	7,108.0	7,116.2	6,455.2		
		72[illegible]		-10.6%		
Σ 12 Mo	95834.8	99,821.1	72,436.0	99,482.2		
Av/mo	7986.2	8,318.4	6,036.3	8,290.2		
		7447.0		+11.3%		

3 phase

$\frac{1.73 \times 444 \times 800 A.}{PF} = KW$

FULL LOAD HRS.

$T \cdot \frac{KWHR}{KW\ Demand} = FULL\ LOAD\ HRS.$

$A \times V \times 1.73 = KVA \times PF = KW$

85%

INSTALL Demand meter

KWHR ÷ HR = KW

KW — Demand

349
135
484

1 3

3 484 × 160 KWHR

4 349 D KWHR prior

6 135 N KWHR

7 5.50 D Demand × 160 KW

8 5.26 N Demand KW

1/4 of Rate 8-8pm $4000

$6 200 500 KW Day $3000

$1.50 900 600 NITE 150

6 × .125 × 100 8-8

$80 Wed - 3 hrs. Rock Ave - gym shop

7-10 35 people 12 WKS. 9/22

SERVICE USE RECORD

NAME Cyprus Ind Minerals ACCT. NO. S 17-1-5 % HEATING

ADDRESS RATES: ELECTRIC LPL GAS LVG

FACILITIES CHARGE HEATING DEMAND CREDIT KW

500 KW x 2.65

		ELECTRIC				GAS		
	MO.	TOTAL KWHR	NIGHT KWHR	MEASURED KW DEMAND	DAY KW	REVENUE	THERMS ~~OR CCF~~	REVENUE
1981	J	70880	14776	486.4	21%	6181.05	6241	3079.62
	F	98240	27921	529.3		7757.56	7721	3783.54
	M	83200	25098	399.7		6070.22	7040	3462.71
	A	127520	31808	608.5	25%	9720.06	6410	3160.23
	M	104000	25941	509.0	25%	8087.98	4856	2416.13
	J	90720	20340	547.0	22%	9106.54	5221	2591.05
	J	128800	34456	618.3	27%	11565.07	5847	2840.54
	A	95200	23840	576.0	25%	9925.26	4867	2009.16
	S	58240	15720	446.4	26%	7113.91	3117	1583.13
CP	O	89760	22240	569.6	25%	9538.53	4679	1755.33
	N	97440	24960	554.4		10165.72	7221	3610.43
	D	39680	5920	601.6		6523.75	2052	1052.14
					% NMR			
1982	J	59360	5760	588.8		7665.70	4441	2597.34
	F	67040	16800	592.0		7953.96	6905	3883.61
	M	69440	12960	334.0		7692.22	6084	3644.25
	A	94720	22720	604.8		11491.67	6368	3829.58
	M	60480	20160	446.72		7845.82	2997	1843.91
	J			518.4				
	J							
	A							
	S							
	O							
	N							
	D							
19	J							
	F							
	M							
	A							
	M							
	J							
	J							
	A							
	S							
	O							
	N							
	D							
19	J							
	F							
	M							
	A							
	M							
	J							
	J							
	A							
	S							
	O							
	N							
	D							

BILLED DEMAND - INTERRUPT. FIRM

N/T 565 KW

[redacted]

CONTRACT FAILURE

What Can Contact Failures Teach You?

KLOCKNER-MOELLER

LEHMAN 01149

What can contact failures teach you?

by Dr. G. F. R. GALLE, manager, testing department, Klockner-Moeller

Seventeen specific causes of contact failure are illustrated in this exclusive article. Accurate colour reproductions show normal characteristics of each; and ways are suggested to avoid the same trouble in the future.

The life of contactors is essentially dependent on the behaviour of the contacts. Pure silver as contact material has proved highly satisfactory due to many outstanding properties. The shape of the contacts is chosen to guarantee that all required properties (resistance to welding, breaking capacity, continuous current rating, etc.) are maintained. For satisfactory service life, the contacts are designed as butt contacts thus avoiding friction. Contacts in modern control are designed for a relatively long service life and specifications are based on specific current duty diagrams indicating definite service conditions and maximum values for frequency of operations and continuous current. If one of these factors is neglected, a shorter service life or breakdown will result.

A critical examination of the appearance of the contact surfaces will yield many valuable hints as to the nature of the service conditions under which the contacts operated, especially during the most recent period of operation. It is then often possible to make the necessary corrections in order to obtain the utmost economy. Such an examination will also indicate whether or not the contact is nearing the end of its useful life. In the case of breakdown, careful scrutiny of the surfaces often reveals the cause of the trouble.

It is a common occurrence to have users complain about the appearance of contacts, assuming that they are no longer fit for service and that in consequence the unit has not completed the promised service life. In examining these complaints we often find that either the equipment has not nearly reached the end of its useful life or that some incorrect application has caused an excessive load on the apparatus. Often valuable material—sometimes entire contactors which would have given satisfactory performance for many more years—is spoiled. Also, it is often exceedingly difficult to convince the user that his conclusions were incorrect. A convincing explanation of the cause of these defects must be given immediately to the user, since complaints of this nature may prove harmful to the good reputation of control equipment and shake the confidence of the customers in the validity of the equipment life guarantees. The user will be saved further considerable material losses in most cases by a clear presentation of the facts.

At what point has the life of the apparatus ended? The life of an airbreak contactor has come to an end when the over-travel of the contacts has gone down to .5 mm (.02″). Overtravel of the contact assembly is that part of the stroke which the moving contacts would cover after touching the fixed contacts — propelled by the actuating device— if they were not blocked in their movement by the latter. The remaining over-travel of a contactor can be measured by actuating the control mechanism by hand and by determining the distance which the actuating device will cover, applied to the contacts, after the contacts have touched. Measuring the over-travel is the only means of determining whether or not the contacts are approaching the end of their useful life. This procedure is of the utmost importance. It is by no means true that the pure silver used as contact material can be allowed to wear to the last trace for contact making.

These explanations are, however, not meant to invite the making of tests from time to time on our contactors to see whether the end of their service life has been reached. The life of the apparatus can readily be determined in advance by careful selection of suitable control based on life expectancies as given in our catalogues. Testing should only be necessary after the specified life term has expired, and then only for the purpose of determining whether, due to special circumstances (for example light load conditions) the apparatus may yield a longer service life than indicated in the catalog.

Endurance tests, continuously carried out in our test

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laboratories, plus the experience gained in actual service confirm with a high degree of probability that equipment used at rated loads will reach the specified life span.
If it is found on checking that the end of the service life has been reached before the apparatus has performed that total number of operations it is rated for, the cause can only be due to a too heavy load or a defect. It is a fortunate fact, however, that contacts of control in normal service or under overload conditions or under the effects of a fault, assume specific appearances, thereby indicating clearly one of these causes.
Most users lack the opportunity of becoming familiar with these characteristics of contacts. For this reason, we pass on the experience gained by a large number of critical examinations performed on airbreak contactors. To do this, we have selected some typical cases where the appearance of the contacts permits definite conclusions regarding the duty to which the contactors were subjected during their useful life. We trust, however, that before beginning our task, a few words concerning the appearance of pure silver butt contacts of airbreak contactors under normal duty, will be allowed.
The appearance of pure silver contacts, even under normal service conditions is a surprise to many users accustomed to copper contacts. The surface of pure silver contacts constantly changes in colour under normal duty, starting from a light blue hue at the beginning, to a dark colouring toward the end of their useful life.
Many users from the appearance of the contact surfaces, are led to believe that the apparatus will not work reliably and is consequently useless. Our comments on these objections are as follows: The colour changes in the pure silver contact surfaces is a natural phenomenon. It is a very thin film of silver oxide and silver carbonates produced by the effects of arcing. This colouring has no harmful effects whatsoever on the performance of the equipment. It may be said on the contrary that the making capacity of the contactor is considerably increased by the film. We will show later that this film has originally a blue tinge, changing to a deep brown with progressive operative life. No single case has so far come to our knowledge where the discolouration of the contacts has had a harmful effect on the properties of the contactor. Above all, we have found no instance where the current carrying capacity of the contact assembly was in the least diminished through this film.

The following examples are divided into four groups, each group illustrated and each discussed in the following paragraphs.

The first group represents contacts of apparatus having been operated within the permissible ranges of switching capacity, frequency of operations and continuous current rating. The control voltage was kept constant between 90 to 100 per cent of the rated value. These examples will illustrate to the reader the appearance of contacts of equipment, as they should look under ideal service conditions. It must, at the same time be clearly understood that contacts used mainly for making duty look different from those working chiefly under breaking duty. For contactors controlling heavily inductive circuits, the breaking operation represents the higher stress if the starting current remains below the contact welding value or as long as it is not essentially higher than the breaking current. In nearly all induction free or capacitive circuits, the making stress is generally greater than the breaking stress. Moreover, if the starting current is considerably higher than the breaking current, as is the case for example with contactors for condenser control without damping devices, the result will be a pure making stress effect on the contact surfaces.

The second group of examples is representative of contactors working under conditions outside the permissible range without causing definite failures. Conditions of this kind are very undesirable since they are the cause of considerable reduction of the service life of the apparatus. This will jeopardize one of the most valuable properties of our contactors and this is why it is important that these cases be rapidly recognized and remedied.

The third group illustrates those cases where excessive stress on the contact assembly resulted in a rapid development of a defect and failure of the unit. It may be suitable at this stage to review the chief causes of overstress on contactors and to examine their origin and effects.

(*a*) Exceeding the switching capacity of a contactor.

Exceeding the making capacity of a contactor will produce welded contacts, while exceeding the breaking capacity means—in addition to welded contacts—prolonged arcing. The most common causes for exceeding the breaking capacity of a contactor are:

1. Motors with abnormally high current peak.
2. Transformers with an extremely high flux density.
3. Short time voltage failures with running motor.
4. High proportion of harmonic waves in the mains or connection on opposed phases with condenser contactors.

Under the above specified conditions the breaking capacity is normally indirectly exceeded by exceedingly heavy inching or reversing duty, or through short circuits with a relatively high resistance in the load circuit.

(*b*) Exceeding the continuous rating of a contactor.

This type of overstress will entail excessive temperature rise of the current path and of the contacts. If this overstress is extremely severe, it may cause direct harm to the contacts as well as indirect injury to other parts of the apparatus. This includes all cases where the allowable ambient temperature is considerably surpassed. The effects of an unduly high ambient are, naturally, similar to those of excessively heated contacts as a consequence of a high current rise with an ambient temperature within permissible limits. The continuous current rating is often impaired by accumulation of dirt on the contact surfaces. Suitable enclosures are therefore of utmost importance.

(*c*) Variations in control voltage.

Too low a control voltage is of frequent occurrence and of special importance in tracing the causes of defects. It is not sufficient in this case to check as to whether the voltage on the contactor coil is within the permissible range. Often only a temporary drop of the control voltage can be observed, due to the starting current, especially with motors of large outputs. If the control voltage is

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permanently too low, the result will be a lower making capacity.

An increased control voltage may considerably interfere with the behaviour of the contactor regarding rebound. Contact burning may increase and there is danger of the service life of the contactor being shortened. In extreme cases which occur where a contactor coil for a lower voltage is installed, this may lead to broken parts in the contactor.

The cause for too low a control voltage may in most cases be looked for in excessive resistance of the circuit. The voltage drop in power-and-control transformers, circuits including the control circuits, must not exceed 10 per cent of the rated voltage. It must be considered that the voltage drop in the main and control circuits depends, during the starting of the motor, on its starting current; and during the making response of the contactor, on the latter's inrush current. Neglecting this fact has often been the cause of failures. Unstable control voltage may furthermore be the result of failures in the control circuit as a consequence of accumulated dirt or vibrating control devices.

The fourth group is composed of two examples showing the contacts of two units which carried a short circuit current. This extreme load forcibly produces a considerable deformation of the contact surfaces. Welded contacts will normally result. Up to this day, however, we have not heard of one single case where a flash-over occurred in one of our contactors due to a short-circuit. Neither have we experienced one single flash-over during the tests in our laboratories where our contactors were subjected to short-circuits with and without fuses.
It is, however, advisable to replace a contactor through which a short-circuit current has passed.

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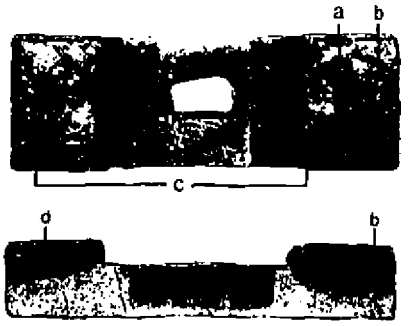
Photos Nos. 1 and 2
Breaking stress, beginning of service life

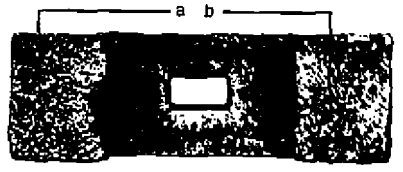


Characteristics:
(*a*) Blue colouring, uniform contact surface
(*b*) Preserved geometrical shape
(*c*) Smooth corners and edges
(*d*) Only tiny silver beads

Photo No. 3
Breaking duty, end of service life

Characteristics:
(*a*) Dark brown colouring

Photo No. 4
Making stress



Characteristics:
(*a*) Silvery colouring
(*b*) Surface shows chiselled effect.

Photographs Nos. 1 and 2
show the contacts of a DIL 4 which has interrupted a current corresponding to the maximum normal rating. The contactor is at the beginning of its service life. The contact surfaces, consequently, show the typical blue colouring resulting from breaking duty. The surface is smooth and uniform in shape. The geometrical form of the contacts has remained practically unchanged, except that the outer corners are slightly rounded and very small silver beads which hardly project over the outer edges of the contacts have formed on the sides.
This picture is typical of silver contacts showing the effects of normal breaking duty.
No harmful effect from this coloured film due to starting could be ascertained in spite of many careful tests. It was, on the other hand, established beyond doubt that the formation of the contact surfaces resulting from the effects of the arc-base being exposed to the outer atmosphere, has an advantageous influence on the welding limit of the contacts.

Photograph No. 3
shows a contact of a DIL 4 at the end of its useful life. This picture clearly shows that the blue colouring of the contact surface vanished gradually toward the end of the service life and that the silver hue has clearly changed to brown or dark brown.
It becomes apparent from the picture that the geometrical shape remains unchanged, provided that the load is kept within admissible limits with regard to intensity, voltage and frequency of operation—this applies particularly to the outer edges of the contact. This brown colouring which may vary to a very dark brown hue has also in this case no harmful effect on the properties of the contact. All required qualities remain fully effective up to the end of the useful life of the contact.

Photograph No. 4
shows the contact of a DIL 4 contactor having undergone making tests with the maximum allowable current at unity power factor.
By comparison with the preceding photos it becomes quite evident that the appearance of the contacts of a contactor used exclusively for making duty is fundamentally different from that of contactors working under making and breaking duty, or solely under breaking duty. The blue colouring of the contact surface typical for breaking duty is not apparent in this instance. The surface, on the contrary, has a silvery white appearance as of pure metal and gives the effect of a finely chiselled surface with a pattern as if applied by light blows.
This pattern is produced by a gradual material transfer taking place at every contact making at the first point of contact, causing tiny rough spots on the contact surface. Due to the fact that the first point of contact varies at each switching operation, the tiny rough spots are distributed over the entire contact surface, producing this chiselled effect.

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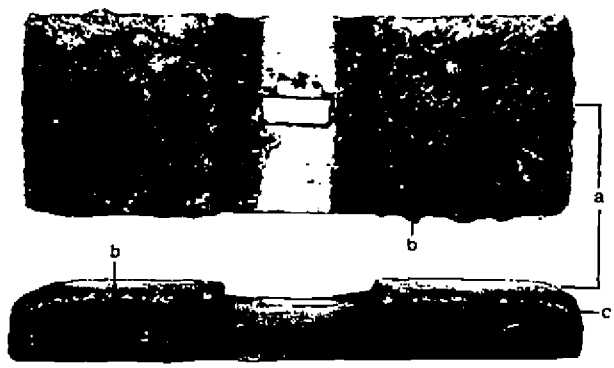
It is surprising to observe that this metallic surface does not corrode in spite of the marked affinity of silver for the hydrogen sulfide gas in the air. This form of surface shows also no trace of corrosion nor change of colouring even after a prolonged idle period without switching operations. The contacts will retain their geometrical form under exclusive making duty, provided the breaking capacity is not exceeded. The original form maintained during the service period, is evidence of normal load within permissible limits; with proof to the contrary, if the shape shows marked deformation.

Photographs 5 and 6
show the contacts of a DIL 8 contactor. The load has remained within permissible limits. The contactor is in the first half of its service life.
Here, too, the typical blue colouring of breaking duty, the formation of a smooth and uniform film on the surface, and the preservation of the original form, especially of the outer edges, are clearly visible. The silver beads on the edges are somewhat larger than those observed in the case of the DIL 4, since the magnitude of the current is correspondingly greater. The corners and edges are more rounded off than those of the DIL 4 contact. The lateral view of the contact shows that no spikes have formed and that the beads developed only directly along the edges of the contact. The contact wear allowance is therefore fully maintained for the switching operations. The contacts will thus attain the promised service life. These pictures also show clearly the characteristic appearance of contacts working within permissible load limits.

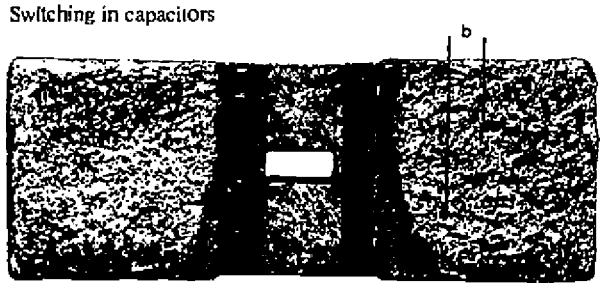
Photographs Nos. 7 and 8
These two photos of DIL 8 contacts show a comparison of contacts from two different contactors used for condenser control.
The upper picture illustrates the surface of the contacts from a contactor used for condenser control, working under making duty only. Here again we observe the typical appearance of a contact surface exclusively under making duty.
The lower picture shows a contact from a contactor used for condenser control, after a switching capacity test, consisting of making as well as breaking operations. The light brown tinge is a sign of breaking duty. The large proportion of light spots with a metallic gleam is explained by the fact that with a condenser contactor the making duty is considerably more severe than the breaking duty. Upon closer scrutiny, a great number of minute welded spots will be observed, spreading over the area where contact making occurred. These, however, were broken up again.
For this reason the photo of a contact after a test of 100 making operations was chosen because the fine welding spots will be covered by subsequent contact blows in prolonged switching duty, as can be seen by comparison with the upper photo.

Photos Nos. 5 and 6



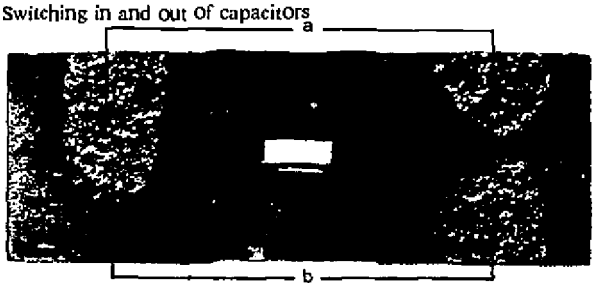
Characteristics:
(*a*) Blue colouring
(*b*) Maintained geometrical shape
(*c*) Only beads, no spikes
(*d*) Only slightly rounded off edges

Photo No. 7
Switching in capacitors



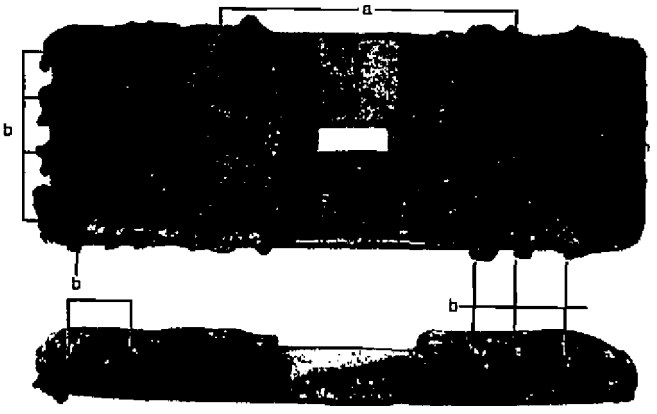
Characteristics:
(*a*) Silvery colouring
(*b*) Precisely chiselled surface

Photo No. 8
Switching in and out of capacitors



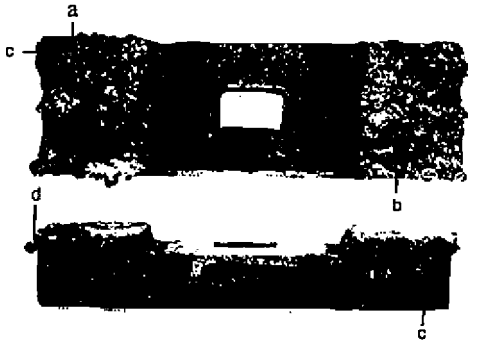
Characteristics:
(*a*) Light brown colouring
(*b*) Torn up welded spots

Photos Nos. 9 and 10
Excessively high breaking current together with unduly high load



Characteristics:
(*a*) Blue up to dark brown colouring
(*b*) Large silver beads and spikes

Photos Nos. 11 and 12
Exceeded continuous rating together with high frequency of operation



Characteristics:
(*a*) Welded spots
(*b*) Light brown colouring
(*c*) Extended surface
(*d*) Silver beads, no spikes

Second Group: Service under Overload. Common Characteristic: deformed contours.

Photographs Nos. 9 and 10

Contrary to the photos shown so far, these pictures of contacts of a DIL 8 contactor show marked deformations of the geometrical form. Very large silver beads and spikes have formed on the edges of the contacts which have partly bent downward. The contact surface remained smooth and has the typical blue colouring of breaking duty. No white metallic spots can be found on the contact surface.

The contacts were taken from a DIL 8 contactor which was subjected to a heavy test of 160 per cent rated load. The switching capacity of the contactor was not exceeded by this test, so that no immediate disturbances occurred. This excessive load leads, however, to undue wear of the contacts, for the silver material accumulating in the form of beads and spikes can no longer be used for further contact making. This, and the increased burning of the material will considerably decrease the life of the contacts.

This kind of excessive load is, as can be seen, very easily recognized and the specified features of the contact shape are reliable indications that the rated load of the contactor has been exceeded by an unduly high breaking current.

Photographs Nos. 11 and 12

These two photos of a DIL 4 contact show positive indications of excessive thermal stress.

This example shows the effects of exceeding the continuous current rating, bringing about an undue temperature rise at the contact gap. Although the temperature did not rise to the point of fusion, a temperature near the softening point was reached. In conjunction with a high frequency of operation, the impact energy of the contacts was strong enough to produce permanent deformation of the contact surface.

The load remained within tolerable limits, which becomes evident by the silver beads formed along the edges and corners of the contacts, but the spikes, the characteristic sign of too high a current, are absent.

Overstress of this nature on the contacts will ultimately produce contact welding.

On the left side of the contact small welded spots are clearly visible as well as the large welded area near the left edge, which finally led to the failure of the contactor.

Photograph No. 13

This contact also shows uneven outlines as well as an irregular surface. The colouring is also unequal, showing positive blue areas alternating with silvery bright spots with a chipped surface.

The deformation of the geometrical shape and the formation of spikes, pits and furrows on the surface suggest an excessive current. The formation of silver beads on the surface as well as the irregular colouring indicate special load conditions.

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The contact is, in fact, the result of the same heavy load test applied to the contacts shown in photos Nos. 9 and 10. A condenser was, however, connected in parallel in this instance for individual power compensation. The apparent power decreased correspondingly, the spikes and points are no longer as marked as in photos Nos. 9 and 10. The blue tinge indicative of a severe breaking stress, while the silvery, chipped areas clearly indicate heavy making stresses, customary in condenser control. This contact is a good example of how the nature of the load is clearly reflected in the appearance of the contact surface.
Although the amount of burnt contact material is reduced by connecting the capacitor in parallel, the load on the contact is still unduly high.

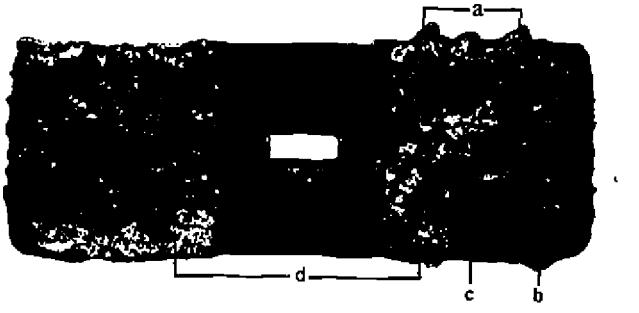
Photographs Nos. 14 and 15

These two photos of a DIL 4 contact are again typical of a very specific case. It is obvious at first sight that the controlled current remained within permissible limits, for the edges are free from silver beads and spikes. The surface shows the typical blue colouring (however of a considerably darker hue) indicating breaking duty. The contours have undergone a change of a nature which justifies the conclusion that small silver particles have been continuously transferred to the edge of the contact in a very liquid state, from which they have flowed down. These features develop if the motor power controlled by the contactor remains in the lower half of the permissible current range and, at the same time, the frequency of operations is unduly high.
Although no welding nor excessive temperature rise of the contact surface is produced, the spots where the arc stands for a longer period are severely heated up, if the liquid silver material in this place has not sufficiently cooled down before the formation of the next arc. It may happen that the silver material, pushed by the base of the arc toward the edge of the contact in a liquid state, remains in this state, flowing down the sides. This interpretation is supported by the intensive colouring.
It is obvious that this kind of load will also reduce the contact wear allowance since part of the contact material is transferred to unsuitable places.

Photograph No. 16

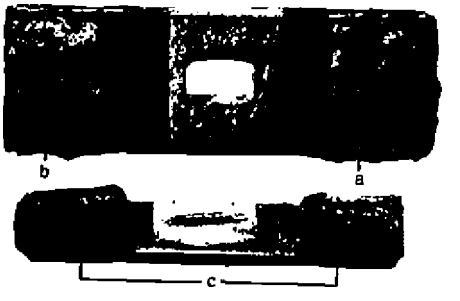
This contact of a DIL 4 contactor was taken from a contactor used for making a current for above the rated capacity.
This excessive load will inevitably cause welded contacts and as a consequence immediate failure of the contactor. This example was intentionally chosen to illustrate the characteristic appearance of a genuinely welded area.
In the centre we see the core of liquified silver, smooth and shining, enclosed by the roughened halo, which is caused partly by the breaking apart of the contact. If the rated value is only slightly exceeded, the welded spot is so small that it can only be observed if considerably magnified.

Photo No. 13
Rated breaking current exceeded. Capacitor connected in parallel.



Characteristics:
(*a*) Large spikes
(*b*) Blue colouring
(c) Furrows and beads on the surface
(*d*) Silvery spots

Photos Nos. 14 and 15
Unduly high frequency of operations



Characteristics:
(*a*) Deep blue colouring
(*b*) Smooth surface
(c) Flow of silver material at the edges

Photo No. 16
Excessively high making current

Characteristics:
(*a*) Welded spot

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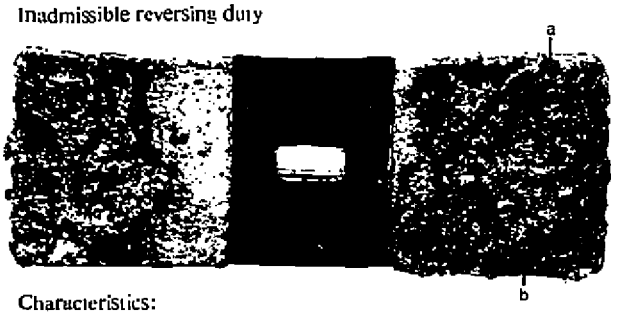
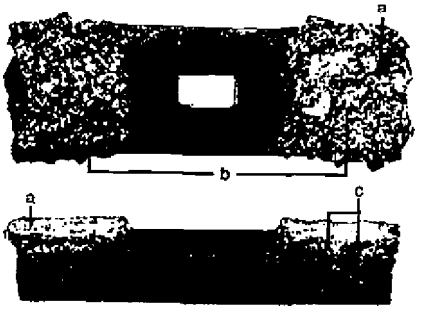
Photo No. 17
Inadmissible reversing duty



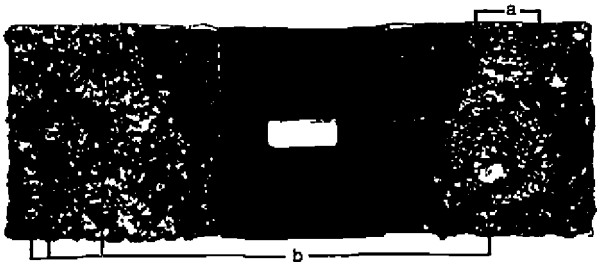
Characteristics:
(*a*) Blue-brown colouring
(*b*) Many welded spots
(*c*) Nor spikes nor prongs

Photos Nos. 18 and 19
Inadmissible Inching (jogging) duty



Characteristics:
(*a*) Strongly deformed contact surface
(*b*) Mostly silvery colouring, more rarely brown
(*c*) Spikes and prongs on the edges, in most cases not welded, only sticking contacts

Photo No. 20
Collapsing control voltage in the moment of making



Characteristics:
(*a*) Silvery colouring with dark spots
(*b*) Very extended welded spots with pronounced liquification of silver

Photograph No. 17
This contact of a DIL 8a2 contactor shows the characteristic blue-brown colouring of breaking duty. No spikes have formed. a proof that the breaking current was not too high. Many welded spots can be observed. which are spread over the entire contact face. Although somewhat levelled out by the arcs of subsequent breaking operations they have entirely changed the smooth appearance of the surface under normal conditions. In two spots the silver became liquified to a greater depth.
This contact shows evidence of the effects of unduly heavy reversing duty. The severe starting load was too heavy and caused the formation of a chipped contact surface by a large number of torn apart welded spots. These conditions continued until full liquification of the contact surface occurred in two places which almost caused the welding of this contactor.
Contacts which are submitted to repeated short-time failures of the control voltage show the same features.

Photographs Nos. 18 and 19
As opposed to the contacts shown in photo No. 17, these contacts of DIL 4a2 contactor shows strongly developed spikes as well as an entirely white, silvery appearance of the contact surface. The contact surface proper is flattened out by pressure, changing the original form, and is probably more intensely chipped than the surface of the contact shown in picture No. 17.
The formation of points and spikes suggests above all an excessive breaking current which the white silvery appearance of the contact surface seems to contradict. When we take into consideration the exceedingly high temperature over the entire surface, existing during the process of deformation of the contact during which the silver turned viscous, suppressing the thin blue coloured layer, this seeming contradiction is explained.
This contact was taken from a contactor used for inching duty for which it was not designed. The high making and breaking currents—due to the very short intervals customary in inching duty—heated up the contact surface to an excessive degree beyond the fusion temperature of the silver.
It is only natural that this fusing of the entire contact surface will inevitably produce sticking contacts.
It must be observed that the contact surface does not show any welded spots, a sign that although the switching capacity of the contactor was not exceeded, the inching duty was beyond the rated performance of the unit.
These extreme service conditions are, unfortunately, very frequent. For this reason the proper evaluation of the signs in order to eliminate the causes of possible faults is of the utmost importance.

Photograph No. 20
This contact shows no spikes and only a very slight brown colouring. The silvery spots, predominant over the

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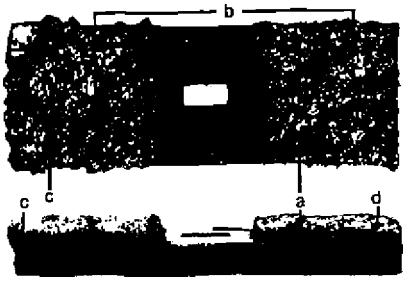
entire surface, are an indication that no excessive breaking stress is involved here, but that the trouble is due to *failure of the unit in making*. A very extensive welded area has formed on the right half of the contact, indicative of the contactor working with undervoltage.
These marks occur relatively frequently if motors with high output are controlled. In this particular case the control voltage broke down under the effects of the high starting current, producing first a chipped contact surface and finally completely welded contacts.

Photographs Nos. 21 and 22
These contacts also operated under insufficient control voltage. As opposed to the contact shown in Photo No. 20, the control voltage was permanently too low. Thus not only many and extended welded areas were produced, but also excessive heating of the entire contact surface and, consequently, complete deformation.
It might be advisable to underline at this stage that the nature of the colouring of the contact surfaces is essentially influenced by the relation between making and breaking currents and the ratio of undervoltage. All gradations of colouring between photos Nos. 17 and 21 may develop in cases of this kind.
A distinction between the cases of inadmissible inching duty, reversing service and undervoltage is not always easy to make and is only possible after minute examination of these photos.

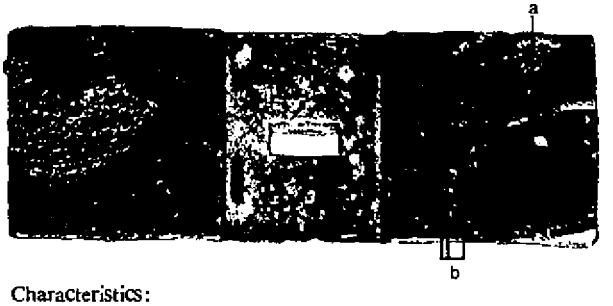
Photographs Nos. 23 and 24
These photos of two DIL 8 contacts are a particularly clear illustration of the effects of a very high current (short circuit current) which passed through them. It can be observed in photo No. 23 that a large part of the right hand section of the contact surface was heated to a state of slight plasticity. The upper left hand section was liquified to a state where the dynamic forces of the current succeeded in blowing the silver outwards. The contact material was carried away in this case over the middle of the silver coat. It is therefore discernible that the contactor was in the closed position when the surge current developed and remained thus, for the surface of the crescent shaped shallow crater is smooth and looks polished. Moreover, small welded spots are clearly visible on the left half of the contact. In this case three welded spots can be clearly located.
On the right half of the contact shown in photo No. 24, it may be observed that the surface of the shallow crater is no longer smooth but chipped. These marks develop when the contactor opens a short-circuit current and an arc base moves across the liquified silver layer. This is produced by the control voltage breaking down under the effects of the short circuit current, so that the contactor drops out.
These marks constitute an absolute proof that the short-circuit current passed through the contactor has reached a multiple of the permissible continuous current rating.

Photos Nos. 21 and 22
Control voltage too low



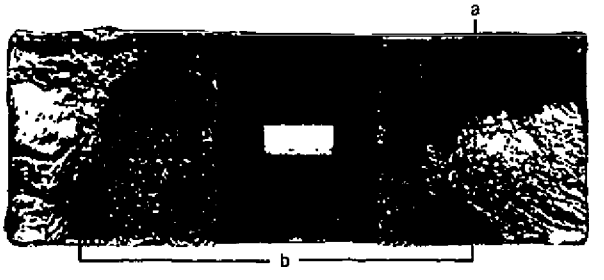
Characteristics:
(*a*) Silvery up to brown colouring
(*b*) Pronounced welded spots
(*c*) Strongly deformed contact surface
(*d*) Silver beads, but no spikes nor prongs

Photo No. 23
Short circuit in closed position



Characteristics:
(*a*) Crescent shaped shallow smooth bright craters
(*b*) Welded spots

Photo No. 24
Short-circuit with interruption



Characteristics:
(*a*) Craters as shown in Photo No. 23, yet grooved
(*b*) Pronounced accumulation of soot

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KLOCKNER-MOELLER

CONRAIL (SWITCH LIST)

LEHMAN 01160

To Be Done in December

ITEM NO.	NUMBER EACH ITEM
	John FurBush CR

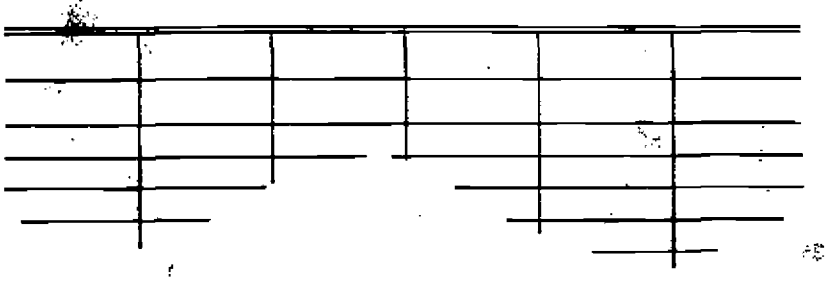
ITEM NO.	NUMBER EACH ITEM
	oak ISLAND 800-247-7099
	Transportation Dept.
	LCS Right
	JOE DECAPUA - Term. Supt. Crews + Service
	Gary Spiegel ASSIST. SUPT.
	Norman Rotheock - Trainmaster
	STATIONS Dept.
	MIKE Galbagen - Area Manager (clerks)
	Terry Moore - FIELD Term Supv.
	RICCITELLI, SNIEDER. SUPV. Transportation Reporting
	Bob Shetzle - head Clerk
	Ray Mantay - ASSIST. Supt. Stations
	2ND SHIFT - Don Felix Cindy Donna
	CUST. SERVICES - Wallace George 212-578-4229 SERVICE M, W, & F 2:30 PM
	DIRECTIONS TO OAK ISLAND
	EXIT 14 NJTP RT1 N. UP Ramp on BRIDGE Delaney ST. 1ST EXIT RIGHT, RED STOP TO END THRU GATE S CURVE UNDER BRIDGE MAKE LEFT - Gray Building 2ND FLOOR
	SEALS.
	MCTVCHEN - JIM BERGEN MT or Charlie Fri
	SRS AGENT AUGUSTA, GA. 404-722-6607
	Sales Dept 1-404-722-7387

1984 DECEMBER 1984

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
A.M.				100	42x33½ 46x44 Remar	100
NOON						
P.M. 30	31			100	150	1
EVE.						
A.M.			MONTHLY'S			
NOON						
P.M. 2	3	4	5	6	7	8
EVE.						
A.M.						
NOON						
P.M. 9	10	11	12	13	14	15
EVE.						
A.M.						
NOON						
P.M. 16	17	18	19 HANUKKAH	20	21	22
EVE.						
A.M.						
NOON						
P.M. 23	24	25 CHRISTMAS	26	27	28	29
EVE.						

#7 Dock by Bumper - (Out)
Empties going out - Door 1 or 2.

CAR Reports



EFFICIENCY® LINE

DATA NOTEBOOK

11 x 8½
50 Sheets
Data Ruled
No. 3636

Name RAIL TRAFFIC Project 4/80

APRIL 22/80 - MAY 22

INITIALS	NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG./DEST.	ROUTE	COMMOD/WT
4/22/80	#74829 WCKD 3:30 PM	(D-D CHEMICAL) CR, SSW, SP ORDERED 50' BULKHEAD					NORTHRIDGE, CA. CAR ASAP FROM JIM BERGEN			
4/24/80	#74946 2 PM	C.I.M. LA., CA. CONRAIL, STRATTON, ILL., ATSF DEL ORDERED 50' BULKHEAD CAR ASAP JIM BERGEN								
SP #74829 WCKD	693991	—	ASAP	4/25 P7 FRI.	4/26/80 SAT:	GARY AUSTIN	4/28 MON. P7	NORTHRIDGE CA.	CR, SSW, SP	1615 40 TON
ATSF-DF	52878	Wed 4/30	ASAP	Thru 5/1	5/6 TUES	GARY AUSTIN	5/8 P7 THURS.	C.I.M. LA.	CR, STR. ATSF DEL.	1705/1706
SSW, DF BLACK IC 40?	25616	5/5 I.H. (?)	ASAP 138,200	5/5 P7 MON.	5/6 TUES	"	"	G.I.	CR, BN, UP DEL.	IT.CRD 69.4T.
RBOX KC	36960 32' 8 CAT	5/5 (154)	ASAP 122,700	5/6 P7 MON.	5/6 TUES .5T/SC.	"	"	G.I.	"	IT.CRD 61.35
SP KC	234080 32' HOP	(147)	ASAP 98,400	5/8 P7 THURS.	5/9 FRI. 1.3T/HOP	"	5/11 SUN. 8 PM	G.I.	"	" 49.2
T.P. KC	366567 40 HOP 12 WC	(154) (110)	" 112,100	" .97T/SC.	" 1.47/HOP	"	"	"	"	" 56.05
SOU BLACK IC	522679 30 BC	(110)	" 135,100	"	"	"	"	"	"	" 67.55
R BOX KC	32997	(154)	" 147,700	"	" 1.64/SC.	"	"	"	"	" 73.85
RBOX BLACK IC	18873 40 I.H.	(154)	" 138,100	"	" 1.72/SC.	"	"	"	"	" 69.05
RBOX	15529	5/9 FRI.	"	5/11 SUN. 8 PM	DIRTY CAR -		5/13 REJECTED	"	"	"
EGEX GEO.	28193 32 I.H.	"(110)	" 121,700	"	5/14 WED 4PM	JIM 1.99/SC.	5/20 P7 TUES.	"	"	" 60.85
SCL	27140	"	"	"	DIRTY CAR -		5/13 REJECTED	"	"	"
RBOX	14642	5/16	"	5/17 SAT.	CANCELED #60 demurrage			"	"	"
RBOX	11262	5/16	"	5/24 SAT.	CANCELED #60 dem.			"	"	"
UP	110778 32 I.H.	5/16 (110) BLACK IC	ASAP 137,300	5/19 P7 MON.	5/22 THURS.	2.57T/SC.	5/23 P7 FRI.	G.I.	"	" 68.65
UP	171133 30 I.H.	" BLACK IC	" 135,600	"	5/21 4PM WED.	JIM 2.26T/SC.	5/22 P7 THURS.	G.I.	"	" 67.8

MAY 19/80 - SEPT. 19/80

INITIALS	NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG./DEST	ROUTE	COMMOD/WT
SCL	24767	5/19 MON.	~~5/21~~ WED.	6/22 P7 THURS.	5/22	JIM	5/22 P7 FRI.	C.I.M. ALPINE	CR,	PENNTAC 66.95 T.
CONFIRMED (5/19)	2 ALPINE CARS PENNTACC, 1 DF w/ SIDE FILLERS FOR CA NO MORE C.I. CARS									4
ATSF	524333		ASAP	5/24 SAT.						
~~ATSF~~ CBQ	~~520499~~ 41893	6/20 FRI.	6/20	6/24 P7 TUES.	6/27 FRI.	JIM	6/27 FRI.	ALDER		BVR
BN	217338	6/23 MON.	6/23	6/24 P7 TUES.	6/26 THURS.	JIM	6/27 FRI.	ALDER		BVR
BN	189473	6/25	ASAP	6/27 FRI.	6/30 MON.	JIM	7/2	ALDER		BVR
SHOPPED 6/24 AT ALLEN.										
BN	187332	7/9 WED.	ASAP	7/10 P7 THURS.	7/11 FRI.	JIM		ALDER		BVR
7/14/80		REQUESTED		D&D EMPTY	CHEMICAL BULKHEAD 50'			NORTHRIDGE CA.	CR, SSW, SP DEL.	1615 1600 BGS
SP	697130	TUES. 7/15	7/16	7/17 P7 THURS.	7/18 12PM FRI.	ACOY		"	"	" 40 TON
BN	189208	8/25 MON.	8/25	8/26 P7 TUE	8/27 WED.	PAT	8/29	ALDER		YS
BN	189145	8/25 MON.	8/25	8/27 P7 WED	8/28 THRS.	JIM	"	ALDER		YS
BN	189299	8-2 TUES.	9-2 TUES	9/4 P7 THRS	9/4 THURS.	JIM	9/8 MON. P7	ALDER		~~BVR~~ YS
BN	217025	WED. 9/3	9/3	"	9/5 FRI. 11:45	JIM	"	ALDER	-	~~YS~~ BVR
BN	189405	THURS. 9/4	9/~~8~~	9/5 FRI. P7	9/8 MON.	MARNY	9/9 TUES	ALDER		YS
SHOPPED 9/3 ALLENTOWN										
BN	217093	MON. 9/15 10AM	9/15 MON.	9/16 P7 TUES.	9/16 2PM TUES.	JIM	FRI. 9/19 P7	"		~~YS~~ BVR
BN	217009	"	~~9/16~~ "	9/16 TUES P7	"	JIM	9/19 FRI. P7	"		YS
BN	18719	"	~~9/16~~ "	"	9/19 1:15	BRUCE		"		BVR
COULD NOT UNLOAD UNTIL ABOVE CARS DRAINED OUT										
BN	217266	"	"	"	" FRI.	BRUCE		"		YS
COULD NOT UNLOAD UNTIL ABOVE CARS DRAINED OUT										

SEPT. 22/80 – NOV. 6 (1580)

INITIALS	N.D.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG/DEST	ROUTE	COMMOD/WT.
BN	217369	9/22 MON.	ASAP	9/30 P7 TUES.	9/30 2:30PM	JIM BERGEN	10/1 P7 WED.	ALDER	BN CHIC. CR	YS
BN	189679	"	"	"	"	"	"	"	"	BVR
BN	217322	9/29 C.P. MON.	~~ASAP~~ 10/30	10/1 P7 WED.	10/1 WED. 10:30 AM	JIM	10/6 P7 MON.	"	"	YS
BN	217235	10/6 MON.	ASAP	10/7 P7 TUES.	10/7 TUES. 1:30 PM	JIM	10/8 P7 WED	"	"	BVR
10/2/80		ORDERED BULK HEAD CAR FOR CR, CHIC, 60' IF POSSIBLE					10/10 SNW, UP LA, SP DEL.	WC&D FREEMONT,	NORTHR CR, SSW, SP DEL.	IDGE
BN	217058	10/13 MON.	ASAP	10/14 P7 TUES.	10/15 10AM WED.	JIM		ALDER	BN CHIC. CR	YS
NP	8694	10/13 CP	10/14 3PM TUES	10/15 P7 WED	10/15 11AM WED.	JIM		"		BVR
NP	3850	10/13 MON.	ASAP	10/14 P7 TUES.	10/14 3PM	JIM	10/15 P7 WED.	"		YS
UP	3850	10/10	ASAP	10/10 FRI. 2PM	10/13 3PM MON.	JIM	10/14 P7 TUES.	NORTHRIDGE CA.	CR CHIC. SNW FREEMONT, UP LA, SP DEL.	307 KIS
60 ft BULKHEAD										
PACKED w/GLUE ON 4 WAY SIDEWAYS 30 PALLETS					PALLETS USED		40 BGS PER. – LOADED 40 OLD PALLETS FOR DUNNAGE.			
BN	189293	10/17 11AM FRI.	ASAP	10/17 3PM FRI.	10/21 TUES 11:30 AM	JIM	10/23 P7 THURS.	ADDER	BN CHIC. CR	BVR
GN	37254	10/20 3PM MON	ASAP		"	"	"	"	"	BVR.
BN	217218	10/21 11:30 TUES.	ASAP	10/23 P7 THURS.	10/23 THURS. 3PM	JIM BERGEN		"	"	YS
ACFX	4463	10/31	ASAP	11/3 SAT. P7	11/12	JIM	11/12 3PM	N. BERGEN	CR.	GLACIER 200
BN	217137	"		"	11/3 MON.	JIM	11/4 P7 TUES.	ADDER		BVR BUNKER 4
BN	189394	"		"	11/3 MON.	JIM	"	"		YS
GN	13136	11/3 C.P. MON 9AM	11/4	11/4 P7 TUES	11/5 3PM WED	JIM		"		BVR 34
BN	189794	1030AM WED. 11/5	11/6	11/12 WED 3PM	11/14 FRI. 830PM	JIM	11/18 TUES P7	"		YS

1580 MADE OUT - CAR NOT DRIVED UNTIL 11/12

NOV. 10/80 –

INITIALS	CAR NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG/DEST	ROUTE	COMMOD/WT
BN	189145	11/10 MON 11:35	11/12 WED	11/12 WED 3PM	11/13 THURS. 3PM	JIM	11/13 THUR. 4PM	ALDER		YS
NP	9218	"	"	"	"	"	"	"	"	BVR
BN	89413	11/17 MON 10AM	ASAP	11/18 TUES PT	11/18 3:30 PM	JIM	11/19 3PM	"		YS
BN	189406	11/19 WED 8AM	ASAP	11/20 PT THURS.	11/20 3PM THURS.	JIM	"	"		BVR
BN	217048	12/1 MON 11:30AM	ASAP	12-2 PT TUES.	RICHIE WED.	[illegible]	[illegible]	"		BVR
BN	189261	12/15	ASAP	12/15 3PM MON.	12/16 3PM	JIM	12/18	"		BVR
BN	244469	"	ASAP	12/18 3PM	"	"		"		"
GN	39527	"	C.P. 12/16 3PM	12/18 12 Noon	12/18 3.30	JIM JIM	12/19	"		"
BN	217366	12/15 THURS 11 AM	12/19	330 12/18	12/19 FRI	BOB ADCOX		"		"
BN	217095	12/15 THURS 11 AM.	12/19	330 12/18	12/19 FRI. 4PM	BOB ADCOX		"		"
BN	217322	12/22	12/22	12/22	12/26 FRI	JIM	12/30 8AM TUES	"		"
GN	189794	" C.P.	12/24	12/24	12/26 FRI.	JIM	"	"		"
BN	287097	" C.P.	"	"	12/30	JIM	12/30 TUES	"		"
BN	246117	" CP	"	"	12/29 MON.	JIM	12/30	"		"
BN	217024	" CP	"	"	12/30	JIM	12/31 8AM TUES	"		"
BN	36810	" CP.	FOR 12/26	"	12/30 TUE. 3PM	BOB HANSEN	12/31 WED.	"		"
GN	36984	" CP.	FOR 12/26	"	12/31 WED. 1PM	JIM	1/3	"		"
BN	189080	12/29	12/29	12/30	1/1 THURS.	JIM	1/3	"		"

INITIALS	NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG./DEST.	ROUTE	COMMOD/WT
BN	246074	12/29 CP.	12/30 [illegible]	12/31 WED. 12PM	1/1 THURS	JIM	1/3	ALDER		BVR
GN	319373	12/29 CP	12/30 [illegible]	12/31	12/31 WED 3:45 PM	JIM	1/3	"		BVR
GN	319421	1/2 FRI	ASAP	1/3 SAT.	1/8 THURS	JIM				
BN	217058				1/6 TUES.	KEN				
BN	245701				1/7 WED. 4PM.	JIM				
BN	189064				1/6 TUES. 1PM	KEN				
BN	245794				1/8 THURS	JIM				
NTW	4485		1/30	1/30 FRI	1/30	JIM		NORTHRIDGE CAL.	CR. SSW SP	1615 30T.
RBOX	18844	NOT	ASAP	3/5 P7 THURS.	3/6 2PM FRI.	KEN		NORTHRIDGE CAL.	D&D CR. SSW, SP	Chemical 1615 30T.
SLSF	18791	4/6 MON	ASAP	4/5 PM MON.	4/8 WED.	JIM		ALDER		BVR.
BN	217338	4/16	4/16	4/16 FRI.	4/20 1130AM	MARY BETH		ALDER		BVR.
RBOX	20037	[illegible]	FOR 4/20	4/13	PULLED	4/14				
BN	247232	4/23/81	4/23/81	4/23/81	[illegible]	Hoggy		NORTHRIDGE CAL.	CR. SSW UP	1615 30T.
GN	39645	4/27/81	4/27/81	4/28/81	4/28/81	MARNEY		ALDER		BVR.
BN	246141	4/28/81	4/28/81	4/28/81	4/29/81	Jim 3Pm.				
BN	246032	5/4/81	5/4/81	5/5/81 [illegible]	[illegible] 3:30	Marney				
USLX	17049	5/4/81	5/4/81	5/4/81 4 [illegible]	5-8-81 [illegible]	Marney				
SLSF	19183	5/11/81 11:30 AM	5/11/81 MARNEY	5/11/81	5/12/81 [illegible]	~~[illegible]~~ Mary Beth				
BN	189429	5/18/81 1:20 PM	5/18/81 Mary Beth	5/18 PM.	5/19/81 ~~6/[illegible]~~	Jack				
BN	217286	6/2/81 10:00	6/2/81 KEN	6/2/81	2:20 PM 6/3/81	Ken				

INITIALS	NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG/DEST	ROUTE	Comm. W.T.
BN	189782	8-3-81	8-3-81	8-3-81	11:55 AM 8-5-81	UNI				
	212266	UAI	1:45 PM	PM.	UNI					
BN	[redacted]	8-4-81	8-4-81	8-5-81	8-6-81	John				
		UNI	11 AM	1 PM.	2 10 PM					
SLSF	19186	8-6-81	8-6-81	8-7-81	8-10-81	John				
		2:45 PM John	2:45	315	1:30 PM					
SLSF	19523	8-10-81	8-10-81	8-10-81	8-12-81	John				
	John	1:30 PM [redacted]	1:30 PM	PM	2:45 PM					
CB&Q	40043	8-10-81	8-10-81	8-10-81	8-12-81	John				
	John	1:30 PM	1:30 PM	PM.	2 45 PM					
SLSF	19422	10:30 AM 8-20-81	8-20-81 10:30 AM	8/21 FRI.	8/24 (MON) 5:30 PM	FRANK FREE		Gross 155570 Tare 49500		BVR.
	John						RETURNED 8/27 FOR REPAIRS			
GN	38187	8/24 MON. 11:30 AM	8/24 MON.	8/25 PM	8/26 4:30 PM	FRANK FREE	8/27 PM	ALDER	released again 8/28 to Kan	BVR.
GN	36359	8/24	"	8/25 PM	8/25 3 PM	JOHN KENNEDY	"	8/28 to Kan		BVR
BN	19957	"	"	8/26 P.7AM	8/27 7PM	FRANK FREE		"		BVR
BN	217114	8-31	8-31	1:30 PM	9/3/81 3 PM.	—	John			
	John	11:30 AM		Pulled 9-1-81 5 PM.	By Conrail that Evening ?			Pulled to John Did Not Know Car was Removed.		
	Car Returned									
BN	189293	9-2	9-2	9-2 PM	9-4	John				
	John	10:30	10:30	9-9	10:15					
SLSF	42389	9-8	9-8	9-9	9-11	John				
	John.	1:30 PM	1:30 PM	1 PM	3:00 PM.					
SLSF	18805	9-9	9-9	Weekend	9-16-81 8:45 AM	John	unloaded Night before			
	Journal.	10 AM	10 AM							
SLSF	19695	9-11	9-11	Weekend	9-16-81 8:45 AM	John				
	John	10 AM	10 AM							
CBQ	40068	9-15	9-16	9-16 PM	9-17 5:15 PM.	John				
	John	2 PM	8:45 AM							
SLSF	27519	10:30 AM 9-18	9-18	Weekend	9-22 3:62 PM	John				
		9-18	10:30 AM							

INITIALS	No.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG/DEST.	ROUTE	COMM. W.T.
UP	465117	6/8/81 9:15-	6/8/81 9:15 AL	6/9/81	6-9-81 1 P.M.	Ken Weber.				
BN	189141	6/18/81 11:30 am	6/18/ Willow	6-19-81 1 P.M.	6/23/81 8:45	VAL				
BN	189265	845 AM	6-24-81 VAL	6-24-81	1:50 PM 6-25-81	Jim				
BN	217136	6-30-81 8:30	6:30-81 Ed Called John	6-30-81 Late PM 7-2-81	7-2-81 8:AM Allen 1230 7-3-81					
GN	138465	[illegible]				EEO	weight - 149200			(1 ton) 74.60
BN	189293	915 AM 7-6-81	7-6-81 VAL	7-6-81 P.M.	7-7-81 1:50 PM	E.S. Ernie	was called to close doors on car. · told would be done Tmed.			
BN	217238	930 AM 7-10-81	7-10-81	7-10-81 PM	7/13/81 3 P.M.	Bob.				
SLSF	19093	930 AM 7-10-81	7-10-81	7-10-81 PM	7/13/81 3 P.M.	Bob.				
Southern	47880			7-10-81 PM.	7/13/81 No useable for Calif. - Notified Rail - 7-13-81 (Bob.)					
SLSF	43177	7/13/81 Bob.	7/13/81 3 P.M.	7/17 P7	7/22 330 PM	JOHN K.		ALDER		BVR
~~[illegible]~~	~~[illegible]~~									
SOU	47880	7/13/81 2 PM	BOB O.K. SAID FOR CAL.	~~[illegible]~~ Not Pulled	7/14/81 2 P.M.	Rich.	(WCD)			
BN	217065	7/17/81 930 DAY.	7/17/81 930.	7/20 P7	7/22 3:30 PM	JOHN K.		ALDER		BVR
SLSF	27836	7-26 11:30 VAL	7-26 ~~[illegible]~~	7/26	7-28 330 PM	John		X		
BN	217322	7-26 11:30 VAL	7-26 ~~[illegible]~~	7-26	7-28 330 PM	John		X		

Trade	No	Notified	Ordered	Placed	Refused	To
LSF	18519	[illegible]	—	9-21-81	9-22 5:52 PM	John
BN	245837	10-1-81	10-1-81	weekend 10-3-81 10-5-81	3:26 PM	Garry
	John					

1982

Initial	No	Notified	ordered	Placed	Relieved	to.	weight		
SLSF	24003	3-31-82	3-31-82	12:30PM 3-31-82	4-1-82 2:00PM	SNider			
BN	217047 Benny.	4-5-82	4-5-82	4-7-82	4-8-82 2 P.M.	Monday Matthey			
BN	217238 Benny	4-12	4-12	4-13 1 P.M.	4-14 11:45 AM	Benny			
BN	217075 Richard 7:59 am.	4-16	4-16	Week end	4-19 11:12 AM	Benny.	Drugged		
BN	217065 Benny	4-20	4-20 9:13	4-21 7:30 AM	4-21 1:00 P	Benny			
BN	189699 Benny.	4-27	4-27 9:30 AM	4-27 Noon	7-28 1:50 P.M.				
SLSF	19156 Benny	4-28- 9:15 AM	1:50 PM 4-28	4-28 8 AM	4-28 2:30 PM	Benny			
BN	217114		5/5	5/5	5/5	Bernie			

1982

~~756-0038~~
526-4559 BARBARA
722-0387

DAY + TIME / time / time — 1:30 PM MA31 - DRILL

Initials	CAR NO	Notified	ordered	Placed	Released	To	Pulled	Orig/Dest.	Route	Comm./W.
BN	217010	5/10/82	5/10	5/10	5/11	FRANK	.	ALDER	.	BVR.
BN	217065	5/17/82	5/17/82	5/19 10AM	5/19 11:25	Bennie	5/20 8:00 AM	Alder		BVR
LN	217058	5/28/	5/28	5/28 AM	5/28 11AM	RICH	6/3 6/13/82	ALDER		BVR
BN	18979S	6/10/82	6/10	6/10 2PM	6/11 5:45PM	FRANK		ALDER		BVR.
SLSF	42361	6/22/82	6/22 (9:30)	6/22 1PM empty	6/24 8:30AM 6/23 PM	PAT		ALDER		BVR.
BN	217322 PAT	6/29/82 8:30AM	6/29 TUES.	6/29	6/30 10:30AM	FRANK	7/1 10:15AM	ALDER		BVR.
SLSF	47010 AL W.	7/7/82 9AM	7/7 WED.	7/8	7/9 8:15PM	PAT		ALDER		BVR.
BN	189534	7/12/82 9AM	7/12/82 MONDAY	7/12/82	7/13 10:45AM	PAT	7/13 1:30PM	ALDER		BVR.
SLSF	27393	7/20/82 1 10 PM	7/20/82 TUESDAY	7/21/82 AM.	7/21/82 2 P.M.	FRANK	7/22	ALDER		BVR.
SLSF	47208	7/27/82 9 A.M.	7/27/82 TUESDAY	7/28/82 1:30PM	7/29/82 10:30AM	FRANK	7/30 8:00AM	ALDER		BVR.
BN	189574	8/2/82 9A.M.	MONDAY 8/2/82	8/2/82 P.M.	8/3/82 1:15PM	FRANK	8/4 10:30AM	ALDER		BVR.
BN	214989	8/10/82 9A.M.	8/10/82 TUESDAY	8/11/82 A.M.	8/11/82 2:20PM	FRANK	8/12	ALDER		BVR.
BN	199485	8/11/82 CP 7:30AM	8/11/82 WEDNESDAY	8/12/82 A.M.	8/13/82 8.55AM	FRANK		ALDER		BVR.
BN	217322	8/30/82 2:30 PM	8/30/82 MONDAY	8/31/82 P.M.	9/1/82 11:20AM	FRANK	9/1/82 PM	ALDer		BVR.
SLSF	47164	8/23/82 9:45AM	8/23/82 MONDAY	8/23/82	8/24/82 10:05AM	RITCHIE	8/26/82 PM	ALDER		BVR.
BN	199988	9/7/82 3:30PM	9/7/82 TUESDAY	9/9/82 PM	9/13/82 11:15AM	FRANK	PRIOR SAT. 9/18	ALDER		BVR
BN	217114	9/13/82 11:15AM	9/13/82 MONDAY	9/15/82 PM	9/17/82	RITCHIE AUGDAN	PRIOR SAT 9/18	ALDER		BVR.
BN	245837 *CP	9/16/82 10:30AM	9/20/82 MONDAY	9/22/82 WED. P.M.	9/23/82 1 PM	JOE V.	9/23/82 P.M.	ALDER		BVR.
SLSF	47196 CP	9/20/82 10 AM	9/20/82 A.M	9/22/82 WED. P.M.	9/23/82 12:40PM	JOE V.	9/23/82 P.M.	ALDER		BVR.

* KBL SPOKE WITH RITCHIE AUGDAN ON 9/22/82 AM. FRANK ON VACATION. AUGDAN SAID CAR 245837 WOULD NOT BE CP BECAUSE WE HAD ATTEMPTED TO CONTACT CR AT 756-0038 on 9/17/82. WE WERE NOT NOTIFIED OF MOVE TO MANVILLE

CHARLIE KELTON - YARDMASTER [redacted] ~~715-5979~~
558-2467

AL WARREN 465-7043 7:30 - 4:30 12:30 - 1:30 OUT LUNCH

9/20 10AM KBL REQUESTED DRILL FOR 9/20 BN 245837 WHILE SCSF 47196 ON CP. DRILL NOT PERFORMED ON 9/20, THEREFORE ALLOWANCE SHOULD BE MADE FOR SCSF 47196 ON CP.

9/21 AGAIN NO DRILL PERFORMED AS REQUESTED

9/22 PM DRILL PERFORMED BUT NOT AS REQUESTED; SCSF 47196 & BN 245837 WERE BROUGHT IN TOGETHER. ONLY BN 245837 HAD BEEN ORDERED BY KBL TO BARBARA AT MANVILLE ON 9/20. THERE SHOULD BE NO DEMURRAGE ON EITHER CAR.

INITIALS	CAR NO.	NOTIFIED	ORDERED	PLACED	RELEASED	TO	PULLED	ORIG./DEST.	ROUTE	COMM.
BN	217166	10/4/82 11:30AM	10/4/82 MONDAY	10/5/82 TUES. P.M.	10/7/82 THURS.	FRANK 2:15	10/8/82 P.M.	ALDER		BVR.
SLSF	24004	10/8/82 10:15AM	10/8/82* FRIDAY	10/8/82 P.M.	10/12/82 TUES.	BENNY 4:20	10/12/82 P.M.	ALDER		BVR.
BN	217843	10/8/82 10:15AM	10/8/82* FRIDAY	10/8/82 P.M.	10/11/82 MONDAY	BARBARA 1:40P	P.M. 10/12/82	ALDER		BVR.
BN	217025	10/25/82 10:00AM	10/25/82 MONDAY	11/28/82 P.M.	10/29/82 FRIDAY	BARBARA 3:10P.M.	10/10/82 P.M.	ALDER		BVR.
SOU	528200	12/28/82 1:PM	12/28 TUES.	12/28 [redacted]	12/29 JOE [redacted] WED.	JOE 3:30	1/2/83	ALPINE	CR, SOU	VT 60T
SCSF	47208	1/3/83	1/3/83 MON.	1/5/83 WED.	1/5/83 WED.	BARBARA 3 PM		ALDER		BY SOU
BN	217843	1/3/83	1/3/83 MON.	1/5/83 WED.	1/6/83 THURS.	6:30 PM JOE JOERZKI		ALDER		BY SOU
BN	189261	1/11/83	1/11/83 TUES	1/12/83 WED.	1/12/83 WED.	2: PM BARBARA		ALDER		BY SOU
BN	217043	5/5/83	5/5/83	5/4/83 WED.	5/5/83 THURS.	3 PM BARB.		ALDER		BY SOU
	DOOR DAMAGED/RICHIE CUT OFF									
SLSF	47083	6/16/83	6/16/83 THURS.	6/17/83 FRI.	6/20/83 MON.	12:45 PM		ALDER		BY SOU

10/8/82 *BARBARA, CONRAIL, SAID THERE WOULD BE NO DEMURRAGE ON EITHER CAR WHEN PLACED AT ONE TIME. Helen.

523-4065 (800)-247-7099

465 ~~702~~

Initials	Car No.	Notified	Ordered	Placed	Released	to	Pulled	on/best	Route	Comm
BN	245837	7/7/83	7/7/83	7/8/83	7-12-83	Pat				By 80 (W)
SLSF	47066	7/25/83		7/26/83	7-27-83	Phil				CHLORITE
SLSF	47239	8/9/83	8/9/83	8/10/83	8-15-83	WARREN	Released 2PM		MON.	BVR(W)
SLSF	47154	8/9/83	8/9/83	8/10/83	8-11-83	FELIX				BVR(W)
SLSF	47186	8/22/83	8/22/83	8/24/83 PM	8/25/83 7:20 PM	DANNY				BVR(W)
BN	217122	9/12/83	9/12/83	9/13/83 AM	9/14/83 2PM WED	AL WARREN	TO BE RELOADED FOR MEXICO			BVR(W)
BN	217122	—	9/15/83	9/15/83				CIM MEXICO	CR/ST. LOUIS MP/LAREDO	KOREAN CRUDE
BN	199485	11-1-83	11-1 TUES.	11-1-83 TUE. 3PM	11-2-83 WED.	BILL 9PM			ENNIS MT.	By 80
SLSF	42248	11-1-83	11-1	11-1-83 TUES 3PM	11-2-83 WED.	BILL 9PM			ENNIS	By 80
~~SLSF~~	~~24004~~								~~ENNIS~~	~~By 80~~
~~SLSF~~	~~47243~~								~~ENNIS~~	~~By 80~~
SLSF	24004	11-7-83		11/9/83 8:7AM	11/10/83 5PM THURS.	FELIX			ENNIS	By 80
SLSF	47243	11-8-83		11/9/83 8:7AM	11/10/83 5PM	~~FELIX~~			ENNIS	By 80
BN	217392	1-16-84		P7am FRI 1/20/84	1-23-84 3PM MON	Kelly			ENNIS	BRANER
BN	217186	1-18-84		1/19/84 8.7AM	1-20-84 2:30	Bobby			ENNIS	BRANER
SLSF	47245	2-10-84	2-22-84	2-23-84	2-27-84	Bobby				Beaucheal
SLSF	47083	2-10-84	222-84	2-23-84	2-27-84	Bobby			Ennis	Beaucheal
BN	217335			3-13-84	1:35 3-15-84	Hugh			Ennis	Beaucheal
BN	329312			3-13-84	1:35 3-15-84	Hugh			Ennis	Beaucheal

550 ~~0353~~ 465-7038 3 DAYS

CR/ 611 DELANCEY ST.
NEWARK, NJ 07105
ATTN. JUDY SOCHA

550 ... NEWARK ... TRAINMASTER 558-2473 4 ... CHAR. KELTON

Initials	Car No	Notified	Ordered	Placed	Released	to	Pulled	~~Orig~~/Dest.	Route	Comm
BN	217047	3/19/84 MONDAY	3/19/84	3/20/84	3-22-84	Bobby			Ennis	By-80
BN	245799	4/29/84 DANNY	5/17/84		5-31-84 Danny		6-6-84		Ennis	Beaverhead
SLSF	42306	4/31/84 Danny	5/17/84		WALT. SNIEDER 6/1/84	6PM			Ennis	Beaverhead
BN	217054	6/29/84	6/29/84	Holiday 7/4/83 @ 7AM	7/5/84 3:30 PM	FELIX			ALDER	Y.S. By-80
BN	36987	8/15/84	8/16/84	8/17/84 @ 7AM	8/17/84 4PM	FELIX				BVR.
SLSF	44290		9/10/84	9/[illegible]	9/12/84 10AM					By80
ACFX	59794									
	59795									
25 ① ACFX →	59796	9/12/84	9/12/84	9/12/84	11/5/84 10AM	TEE	11/6/84	AUGUSTA GA.	CR/POT SRS	SUPRA DART 96.75
* ② ACFX	59797	9/12/84	9/12/84	9/12/84 3PM	9/14/84 2:25 PM	DANNY (CONFIRMED By DON 4:50PM)		AUGUSTA GA.	CR/POT SRS	97. SUPRA DARTCO
— ③	59798	11/5/84	11/5/84	11/6/84	10:35AM 11/12/84	RICHIE	20th 11/23/84	AUGUSTA	CR/POT SRS 93.65	DARTCO SI-FULL
— ④	59799	11/5/84	11/5/84	11/6/84	11/6/84	JUDY	11/6/84	AUGUSTA GA	CR/POT/S	DARTCO
SLSF	44124	9/10/84		9-19-84						By 80
BN MT	217554	10/15/84 3:45 PM	10/15/84	10/16/84 3PM	10/17/84 6:27 PM	ROGER			Alder	By-80
BN	217388	10/15/84 3:45 PM	10/15/84 CP 10/17/84	10/22/84 9:30 A.M					Alder	By-80

ordered in ASAP OTHER CP

DON

1 TRACK in 1st
2 - BOXES IN
2 - DD CAMS at land end

- BILL M

BOB
WIL

[redacted] yardmaster - Charlie Ketton Joe DeCapua Term. Supt.

ANDY, [redacted]
TRAINMASTER NORMAN ROTHROCK
558-2454
405 DIVISION ST. ELMIRA PORT

OAK ISLAND TERMINAL SUPT. JOE DECAPUA 465-7048-9

Ray Mccarthy Terry Moore

192,200 CAPY

GARY SPIGEL - ASSIST. SUPT. 215-999-4000 → ECRR 558-2361-2

PETE DEE

Initials	Car No.	Notified	Ordered	Placed	Released	Released To	Pulled	Origin / Destination	Route	Comm
BN 318658	318658	11-12-84 Hugh Good	11-12-84	11-13-84 NOT PLACED RIGHT RE-DRILL N/A	11-15-84 THURS.	DANNY		ALDER 10-3		By-80
BN	217167	11-12-84	11-12-84	"	11-15-84 THURS.	DANNY	11-15-84	ALDER 11-1		By-80
BN	217137	11-19-84 Hugh Good	11-19-84	11-20		DANNY		ALDER 11-3B		BVR
BN	217169	11-19-84 Hugh Good	11-19-84	11-20	11-21	DANNY		ALDER 11-2B		BVR
BN	217554 - 21	12-4-84	12-4-84	12-4-84	12-5-84	Hugh	12/6	ALDER		By-80
SLSF	42271	12-4-84	12-4-84	12-4-84	12-5-84	Hugh	12/6	ALDER 11-4		BVR.
ACFX	59797 70,700 71,600	12-10-84 4:28 PM	12-10-84	12-14-84 3PM	12-17-84 4PM	FELIX		AUGUSTA	CR/POTY SRS	DART
ACFX	59796	1/7/85 70,700	1/7/85	1/7/85	1/9/85	CINDY 5:30PM	1/9/85	AUGUSTA	CR/POTY SRS	DART
GN	39640	1/16/85	1/16	1/18/85	1/21/85 5PM	BILL				BVR-HI-GRITE
SLSF	42274	1/28	1/28	1-29-85 12:30PM	1/29/85 5PM	[redacted] Don	2/1/85 AFTER 5:30PM	DERAILED 1/24 BY CR.		BVR. NIKEL BITE
SLSF	42279 OFF DERAILMENT.	1-29	1-29-85 DUE TO CR	1-29-85	2-1-85 5:30PM GEORGE	LORINA 7:30 PM 2-1-85 TERRY MOORE	2/1/85			BVR 80
BN	281773 OFF DERAILMENT	1-29	1-29-85 DUE TO CR	1-29-85	2/4/85	STEVE 9AM				By 80
SLSF	47048	1-31 DON CR	2-1-85 LORINA 5:30 PM	2/1/85	2/4/85 2PM	GEORGE		752-9853		By 80
SLSF	44124	2/11	2/11	2/13	2/14 8:30 AM	KRIS				BVR HIGH
SLSF	47154	2/19/85 STEVE 9AM	2/19	2/20 WED	2/28 4:30PM	BRUCE				BVR HIGH
ACFX	59798 70,800	2/4/85 STEVE	2/4/85	2/7	2/14	KRIS				Dart 98.05
ACFX TARE	59799 70,800 70,600	2/19/85 steve 9 AM	2/19	2/20	2/28	DON				DART 109.7

KRIS TERRY MOORE 465-7063 PETE RI AUGDAO

705 7-5 Before 9 AM tom

Tracing

CFX	59796	Dartt	4/19
	59797	Newark on	4/10
	59798	IN Rt.	4/17
	59799	Dworcs	4/17

OVER

OAK ISLAND

800-247-7099

DENISE

800-535-5700

465-9145 = SUPRA

800 523 4065 TRACING

Initial	CAR #	Notified	Ordered	Placed	Released	Released To	Pulled	origen / Distinction	Route	Comm
ACFX LTWT	59797 71,600	3/4 Steve	3/4 12:30	3/7	3/22/84	JOE MCFADEN	3/25/85	Dartco	CR Poty SRS	SUPRA
ACFX LTWT	59796 70,700	3/13	3/13	3/15	3/18/84	BOB RICATELLI	3/20/85	DARTCO	CR POTY SRS	SUPRA
ACFX	59796	3/25 Steve	3/25		HUGH 3/26/85	Car was returned by mistake!	3/26/85	& Reshipped		
SLSF	42361	4-4/48 Steve		4/8	4/9 5:45	DENISE				BVR LITE
SLSF	47257	4-4/48 Steve		4/8	4/9 5:45	DENISE				BVR Dark
BN	318771	4-4/48 Steve		4/8	4/10 6:15	FELIX				BVR DARK
ACFX LTWT	59798 70,800	4/2/48 4-10 Steve	4/2	4/12	4/13 Sat. 5:20	DENISE	4/15		CR POTY SRS	SUPRA 85.95
ACFX	59797	4/10/85	4/13/85 ordered in Don after 6	4/19	4/22 8AM	DENISE	4/23 12AM			Dart 86.70
SLSF	42352	4/22/85 Dennis	4/22/85	4/23 12AM	4/23 8:35AM	JUDY	MISSED 2 DRILLS	ALDER	RECEIVED AGAIN TO GEO. 4/29 9AM	BVR Lite
ACFX	59799	4/23 9AM	4/23 DENNIS	4/24 3:30PM	4/24 5:25PM	Danny	4/26		CR POTY SRS	Dartco 93 Ton
BN	217137	5/6	5/6	5/7 5AM	5/7 3:30 PM	Denise				BY 80
SLSF	47186	5/6	5/6	5/7 5AM	5/7 3:30 PM	Denise				BY 80
ACFX	59796	5-2	5-2 Kevin		5/9	DENNIS	5/10		FULL SI	Dartco 95.43
SLSF	47227	5/13 KEVIN 12AM	5/13		5/14	Richie	5/16 230 PM			BVR LITE
GN	39504	5/13 12PM	5/13		~~5/18~~ 5/14	JOE Richie		RE-DRILLED on 5/16 230PM		BVR LITE
					could not unhood on [illegible]					
ACFX	59798	KEVIN 5/13 12AM	5/13		5/23 9:45	DANNY	5/28/85 3PM	Drilled		DARTCO 86.45
ACFX	59797	5/20		5/22	5/28/85 3PM	NICK		[illegible]		Dartco 94.93
ACFX	59799	6/3 Danny	6/3	6/3 2AM	6/6/85 4:15PM	FELIX	[illegible]	[illegible]	#32477	Dartco 91.95

Cars 770/month

Norman Rothrock call by 10:30
465-7115
465-7048 *
465-7049
NOT IN (465-7052) -

Gary Spiegel
Supt. NJ District
Conally

CAR #	CAP'Y	LD LMT	CL. WT.
ACFX 59798	192,000	192,200	70,800
ACFX 59797	191,000	191,400	70,800
59796	192,000	192,300	70,700
59799	192,000	192,400	70,600
ICFX 59991			71,800
9CFX 59994			71,500
95			71,200
96		—	71,500
97			71,500
98			71,800
99			71,100
59794	191,000	191,900	71,100
59795			70900 ?
51232	191,000	191,900	71,100

JOHN FAHEMAN
ADRIAN
WAYNE

SLSF 700105

1-800-247-7099 paul

TUES/THURS JOE CARR 7115 7065

CT 100 IS SHIPPING PAPER

INITIAL	CAR	NOTIFIED	ORDERED IN	PLACED	RELEASED ON	RELEASED TO	PULLED OUT	ORIGIN/ DESTINATION	ROUTING	COMMODITY WT.
ACFX	59796	6/14/85	6/10	6/11 2PM	6/11 5:30PM	DON	6/13	DARTCO AUGUSTA	CR/PAT SRS	SUPRA 95.4
ACFX S1	59991 5.1 MI/LOADING	6/17	6/17	6/19 PM	6/20 2:10PM	JUDY WT. OAKES.	6/20	DARTCO 32480	"	SUPRA 93.55
ACFX VMP'S	59994 DIRECT	6/17	6/17	6/19 PM	6/19 7:PM	DON WT. OAKES.	6/20	DARTCO 32479	CR/PAT SRS	SUPRA 87.67
ACFX	59998 (REJECTS out)	6/21	6/21 FRI.	6/21 PM	6/24 (DRILL ON DEMAND)	DANNY	6/24	DARTCO 32481	RM "DIRECT 252 lbs.	" 95.52
USLX	11267	7/8	7/8	7/9 PM	8/14 4:30	DON		G.I. 34553		OLY. 60T.
ACFX	59799	7/10	7/10	7/11 5PM	7/17 3:30PM	STEVEN	7/17 11:55PM	DARTCO 32482	"	SUPRA 95.02
ACFX	59991	7/23	7/23	7/23	7/29	TEE		DART 32483	"	SUPRA 96.05
ALFX	59798	7/26	7/26	7/26 5PM	8/2 9AM	HUGH		DART 32484	" -4 7/25	SUPRA 89.6
SLSF	7702	JUDY 7/6	8/6	11AM 8/7	3:30PM 8/8	Z. CARTER		ALDER		RY 80 54.85
SLSF	44236 (BAD ordered at chicago 7/85)							ALDER		BX80 51.65
SLSF X	42325	8/12/85 830 AM	8/12/85 JUDY		8.20.85 Judy			ALDER		BVR Lite 64.75
BN	217054	8-20-85 7:30	8-21-85	8.28.85	8.29.85	Richie		ALDER		BVR Lite 54.68
ACFX	59795	8/12/85 830 AM	8/12 JUDY		8/23		8.27.85	34[illegible] DARTCO	34556	94.13
ACFX	59796	8/12/85 830 AM	8/12 JUDY		8/14/85 4:30	DON	9/[illegible]	[illegible]	34365	SUPRA 92.80
ACFX	59799 REQUEST	8:[illegible]	Judy	9-19-85 11AM	9-5-85	[illegible] DANNY	9/5/85	[illegible] 35787		SUPRA 95.3
AC[illegible]	[illegible]		9-26-85	8-27-[illegible]	8-28-85		8-29-85	DARTCO 34387		SUPRA 88.1
ACFX	59798	9-3-85	9-3-85 Judy	9/5/85 THURS.	9/6/85 FRI.	BRUCE	9/10/85 2PM	DARTCO 35788	CR/SUT SRS	SUPRA 95.3
ACFX	59999 (CLE)	9-9-85	9-9 Judy	9/10/85 2PM	9-11-85 3PM	Bruce		DART 35789	"	SUPRA 97.02

796,97 4 4

778,

eim 96,97

10/29

799 -NC lost

997

996

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795

794 o.l.

796 o.l.

999 S.P.

51232

CT 100 IS C.R. SHIPPING PAPER | 1-800-247-7099

C.P. = CONSTRUCTIVE PLACEMENT JOE CARR | DATE DAYS TUES. & THURS

DRILL ON DEMAND CALL ~~NORMAN~~ ~~[illegible]~~ K, | 35790

A JOE CARR 465-7050, 7065, 7115.

INITIAL	CAR NO	DATE NOTIFIED	DATE ORDERED IN FOR	DATE PLACED CIM	DATE RELEASED TO C.R.	PERSON RELEASED TO	DATE FUELED FROM CIM	SHIPPER # ORIGIN/DESTINATION	ROUTING	COMMOD. & WT.
ACFX	59796	9/17/85	9/17	9/19/85	9/26/85	LARRY	9/27 1PM	35790 DART		SUPRA 88.42
ACFX	[illegible]	9/23		9/26	9:29 [illegible]	Jim	10/1	35791 DART		SUPRA 94.64
ACFX	59997	9/30 JUDY	9/30	10/1	10/11 1:30	PETE FRI.	10/15 5:30PM	35793 DART	[illegible] NO Rejects	SUPRA 88.78
SLSF	44236	9/25 8AM	9/25	9/26 12:30PM	[illegible] 7:00	Jim	10/1	ALDER		BY 80
ACFX	59795	9/20	9/20	10/1	10/2 10AM	PERRY		35792 DART	CR/POTY SRS	SUPRA 92.87
ACFX	59996	10/9 RICHIE	10/9	10/9	10/12/85 3:30PM	PAUL SAT.	10/15 5:30PM	35794 DART	[illegible] Rejects	SUPRA 90.59
ACFX	59799	10/9	10/9	10/9	10/21 9:30PM	DON	11/22	35796 Dart	Rejects	Supra 90.62
ACFX	59793	10-7 [illegible]	10-3	10/9	10/16 10:15PM	JIM		35795 DART	Rejects	SUPRA 93.11
[illegible]	[illegible]	[illegible]	[illegible]	10/22 5PM	10/29 1:40PM	RICH	11/1 (10/31)	36068 DART	Rejects	Supra 84.33
				10/29	11/7 4:50PM	BILL	11/7 4:30PM	36069 Dart	Rejects	Supra 95.25
ACFX	59794	10/29 RICH	10/29	10/29	11/13 12:45PM	JIM		36070 Dart	Rejects	Supra
ACFX	59995	11-4 Rich	11-4	11/7 4:30PM	11/15 1:45	Charlie	11/[illegible] 3:30PM	36071 DART	Rejects	94.80 Supra
ACFX	[illegible]	11-18	11-18	11/19 3:30PM	[illegible] 10:20	[illegible]	12-3	36072 DART		93.15
11/19 11/27	ENGINE DERAIL AT 3.30PM ~ 6.30PM Track in SERVICE						Track Spread			
ACFX	59794	12/16/85 RICH	12/16	12/17	12/30 10:30	Pete	1/2/86 THURS.	DART 37288		SUPRA 88.03
ACFX	59798	12/16 RICH	12/16	12/17	12/18/85 9:25PM	PETE		DART 37287		SUPRA 94.05
BN	245855	12/27 JUDY	12/27	1/2/86	1/3/86	CAROLYN	1/7/86			YS BY
BN	221067	12/27 JUDY	12/27	1/2/86	1/3/86	CAROLYN	1/7/86			YS BY

465-7038 RELEASES

Dayton
Note ITEM 2400
Tariff # CR3003D

21 Dark 82

BVR 20 84-85

1-800-247-7099

DRILL TUES./THURS.

or 465-7038

INITIAL	NO.	DATE NOTIFIED	DATE ORDERED IN FOT	DATE PLACED	DATE RELEASED	PERSON RELEASED TO	DATE PULLED FROM LIM	SHIPPER # ETC. DEST.	ROUTING	COMMODT. & WT. HQ
BN	245965	1/2/86 Richard	1/2/86 FELIX	[illegible]	1/8/86 9:15 AM	JIM	1/9/86			BVR. 53.81
BN	245799	1/3/86 JUDY	1/3/86 JUDY	1/7/86 4:30 PM	1/8/86 9:15 AM	JIM	1/9/86		110.2 Ton	BVR HQ 56.39
ACFX	59796	1/8/86 Richard	1/8/86 Richard	1/9/86 4 PM	8:12 PM 1/15/86	BILL	THURS. 1/16/86	37289	CR/POTY/SRS 51 FULL + 1 HZ.	DART 93.93
ACFX	59795	1/22/86 Richard	1/22/86 Richard	1/28/86 4 PM	1-29-85 7:10 AM	Richie	1/31/86 8 PM	37290		DART
ACFX	51230	2-4-86	2/4/86	2/7 3:30 AM	2/11 12:05 AM	LOU	2/11/86	37292	[illegible]	DART 88.17
ACFX	59798	2-3-86 Rich	2/3/86	2/4/86 3 PM	2/6/86 10 AM	DENIS	2/6/86	37291	No rejects NEW IT.	DART (95)
ACFX	59794	2/10/86 RICH.	2/10/86	2/11/86 3 PM	2/17/86 8:30 AM	BOBBY	2/18	37293	Some Rejects NEW IT.	DART 90.30
ACFX	59796			2/18/86 3 PM	2/19/86 10:33 PM	PETE	2/20/86 3 PM	37294	rejects out NEW	Dart 97.41
ACFX	59795	2/24/86 Richard	2/24/86	2/25/86 4 PM	2/26/86 830 PM	ELEANOR	2/27/86 4 PM	37295	Rejects #10 NEW constant	Dart 92.75
ACFX	59798	RICH 3-4	3-4-86	3/6/86 2 PM	3/6/86 830 PM	DON	3/11 11 AM	37296	Rejects 6 HZ. old + NEW	Dart
SLSF	47204	3/10 JUDY	3/10	3/11 11 AM	3/11 5 PM	FELIX	3/13	—		BY 80 55.05
BN	245775	3/10	3/10	3/11 11 AM	3/11 5 PM	FELIX	3/13			By 80 55.45
ACFX	59799	3/10 Judy	3/10	3/11 11 AM	3/12 12:37 AM	DENISE	3/13	37505	[illegible]	DART
ACFX	59794	3/21	3/21	3/25/86	3/26/86 3 PM	PETE	3/27 THURS.	37506	6 HZ. [illegible]	Dart 95.15
ACFX	59796	3/31 MON	3/31 RICH	4/1/86	4/2/86 8 PM	JIM	4/3/86	37507	OLD + NEW 6 HZ.	Dart 95.66
ACFX	59799	4/9/86 RICH	4/9/86 GARY	4/10/86	4/14/86 9:50 AM	GEO.	4/15/86 3 PM	37508	OLD + NEW WT + DAY 6 HZ.	DART
ACFX	51232	4/8/86 RICH	4/8/86	4/8/86 TUES.	4/23/86 WED.	BILL	4/24/86 1 PM	37510	OLD REAR S. BUNK 7 HZ	Dart

5/1 DINSMORE

798 + TUES.
5/2/70

FAX 465-7039 2040

578-4039 ED

FAX 4040

7023 FAX

1-800-247-7099

DRILL TUES./THURS.

OR 465-7038

INITIAL	NO.	DATE NOTIFIED	DATE RECEIVED IN FOR	DATE PLACED	DATE RELEASED	PERSON RELEASED TO:	DATE PULLED FROM IN	SHIPPER # ETC. DELT.	PUMPING	COMP. PT.
ACFX	59795	4-14-86 Richard	4-14-86	4/15/86 3 pm	4/18/86 3:45 pm	PETE	4/22/86 TUES.	37509 25 TON 40 LOAD TEST	10 DAYS 83 85 NEW, OLD & WET REJECT 6-15 HZ	DAN 99
ACFX	59798	4/21/86 RICH	4/21/86	4/22/86 TUES.	4/28/86 1 PM	RICH	4/28/86	37511	wet DRY .2D, NEW 1%	Dan 96.
BN	318755	4/22/86 RICH	4/22/86	4/23/86 TUES.	4/23/86	BILL	4/24/86 1 PM		58.9	SENIER 29 < 29
ACFX	59794	RICH 4/28/86	4/28/86		5/5/86 3:45 PM	PETE		37517 1%	1 new 1 wet 7 HZ	DAN TC 96.38
ACFX	59796	5/6/86 RICH	5/6/86	5/8/86	5/12/86 mon.	EDDIE		37513 ~1-8%	14 HZ	Dan TC 93.84
SLSF	42274	5/20 2 PM	5/20/86	5/20	5/21/86					BY 80 52.24
BN	318747	5/27/86 RICH	5/27/86		5/28/86 wed	FAX	5/31 SAT.			BYRO 52.25
ACFX	51270	5/12/86 EDDIE	5/12/86	5/15/86	5/19/86 12 pm	FAX		37514 < ½%	all wet HZ 14	Dan TC 98.25
ACFX	59799	5/19/86 RICH	5/19/86		5/26/86	FAX		1%	all wet HZ 14	Dan 95.91
BN	245368	5/13/86	5/13/86		5/19/86 12 PM	FAX				BVR 52.28
BN	245938	5/13/86	5/13/86		5/19/86 12 PM	FAX				BVR 51.14
ACFX	59795	5/27/86 RICH	5/27/86		5/28/86 wed.	FAX	5/31 SAT.	1% +	all wet HZ 14	Dan 98.58
AC FX	51232	GARY 6/5/86	6/5/86	6/5/86		FAX	6/20	10145 .6 AVE.	all wet HZ 20	Dan 96.05
ACFX	59798	6/12/86	6/12/86	6/12/86		FAX	6/20	10146 .5%	all wet 20 HZ	Dan 100.1
ACFX	59794	6/23 Gary	6/23	6/27	7/2/86	FAX	7/3/86	10147	wet 20 HZ	Dan 99.65
ACFX	59796	7/8/86 Gary	7/8/86		7/14/86	BEN		10148	wet 20 HZ	Dan 95.87

ORD. -SDS CA

T & THURS.

796 796 795 S.V.

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11382

P.O. Same

DINSMORE

Ordered empties Bill Sharky Car Management 800-523-4108

OAKISLAND SHOP 578-4143 (Somers)

INITIAL	NO.	Date NOTIFIED	ORDERED FOR	Date PLACED	Date Released	PERSON RELEASED TO:	Date PULLED FROM CIM	SHIPPER # ER.	Routing	Commodity + WT.
RBOX	40475			3-28-86	3-29-86	Joe	9	Rate Item 2400		
RBOX	35566			" "	" "	"		Tarriff	CR3003D	
ACFX	59795	10/6/86 RICH	10/7/86							
BN	247915	10/20	10/21	10/21					By 80	49
SLSF	42189	10/20	10/21	10/21					By 80	5
ACFX	59799				11/			old + powder 20 HZ	90.48	S1030
ACFX	59794	11/11/86	11/11/86			12/1/86	—	10151 90	12/86	12 86
ACFX	59796			2ND request 3rd request	12/11/86 12/17/ 12/19	FAX FAX RICHIE	12/23	10152 90	(1/87)	S120 87.
ACFX	59798	—	—	12/18/86		1/7	1/13/87	10805 90	EST. NOT WTD	88 (1/3
ACFX	59795			12/23/86	1/14/87	BarBara	1/16	10806 2/87 75	88.42	S0107 est.
ACFX	59799	1/11	1/13	1/16	1/27	Richie DINSMORE	→	10807 75	94.67 75 1/87	S01167 +19.67 5/87
ACFX	59796		1/28		2-18	Jim	2-24	10808 85	88.05 2/87	S02037
ACFX	59794		1/28		2-11-87	Don	Released TO Hamburg SUB-LEASE			
BN	248368	2-18	2-19	2-24						
BN	248679	2-25	2-26		3-2	Sompoia	534.32	534	NQ	BVR.
BN	232162	3-16	3-17	3/17	3/18/87 5:25 PM	Jim		85 S1	#2075 47.4	By 80
ACFX	59798	3-27-87	3-27		4/2/87 9AM	Geo.	4/6/87	13415	89.55	S02187
BN	248838	4/7/87	4/7/87	4/9/87 5PM	4/10/87 2:30 PM	JUDY			48.95	By 80
BN	243057	Door Broken EXTRA TIME		4/21	4/27	Geo.		4-28H19	60.8	BVR 19
BN	247223			4/21	4/21/87	GEO.			47.06	By 80

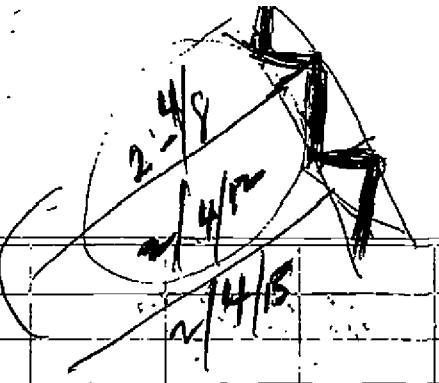
SOU 19091

30th/65000# 2/5th 65000#

BILL SHAPKIE 800-222-2103 Can DIST RIB: 50, class C

800-247-7099 RICHIE DINSMORE 1580

	CAR NO.	Date NOTIFIED	Ordered For	Date Placed	Date Release	Person Released To	Date Pulled Cin	SH/PBER # TEL.	Route	Comment. # WT.
BN	242623	4/28/87	4/28/87	4/30	4/30	SIMCA		4-48H1		BRH 1 58.35
BN	747803			5/19/87	5/20/87	Bill Hall		5-2-By80		By80 43.55
BN ✓	747081	5/20/87 Frank	5/20/87 SHOPPED	For Brakes	C-2	Jim 2pk Blank	5/21	5-38y80		By80 43.8
ACFX	59796	5/21/87	5/21/87	5/26 TUES	6-2			13416	V	91.2
~~BN~~ ✓ SCSF	42195	6/15/87	6/15/87	6/16	3:58PM 6/17	JIM		6-1-UGFK		BN #819 56.87
				6/18	6/19	4:15PM DOUG		13417	Last 4	90.87 (EST.)
BNV	331877	6/25 Frank	6/25		6-29	Jim 3:30PM		6-2 DART		BH #1 55.25
BN	331254	6/25 Frank	6/25		6-29	Jim		6-3 By80		By80 50.67
RUSX	5633 7 Days	7/17	7/17	7/24/87	7/28/87	JIM 8:25PM		7-1		By80 94.2
ACFX	59798	Frank 7/21	7/22		7/31	Frank 12PM		13418		DART 96.5
CABX	430	Frank 7/31	7/31	8/3/87 SAT.	8/12 Wed.	[redacted] SAD			Ship 7/22	98.2 By80
ACFX	59796	Frank 8/6	8/6		NICK 8/23/87	FAXED 8/24 + AS+N	8/25	13419		DART 94.4
ACFX	59799		8/24 Can IN	11/24? Busy Holiday	12/18 11:45A	Joe Boss				DART
ACFX	59798			12/4	12/14	George	12/16/87 4:30PM			Dart
BN	461105	2/12/88	2/16/88	8/16/88 4:30PM	7/18/88 12:40PM	?	7/22/88 1:30PM			By80
BN	458722			2/15/88 4:30PM	2/3 1:20					
SOU	52400 3		3/29	2/28 4PM	3/29 4PM	CATHY	3/30	IT-01	76.85	32 IT. 153,700
SOU	524433 Return one	3/29		3/28 4PM	3/29 4PM	CATHY	3/30	IT-02		32 IT.


2-4/9
4/15
4/15

SERVICE DATES SU M T W TH F S _____

INDUSTRY SWITCH LIST SEQ. NUMBER - ___ ___

INDUSTRY NAME- _____ ZONE- ___
LOCATION- _____

WORK COMPL DATE/TIME _____

DATE/TIME ORDER REC- __ __ __ ____
DATE ORDERED FOR- __ __ __ ____ CONDUCTOR _____
ORDER RECEIVED FROM- _____
ORDER RECEIVED BY- _____ JOB NO. _____ ENGINE _____

****

REASON FOR ENGINE DELAY IF ANY	TIME OF DELAY BEGIN	END

****

INIT	NUMBER	L/E	KD	FROM TRACK	FROM SPOT	TO TRACK	TO SPOT	REMARKS

car management 800-222-2103 FAX # 578-4031 4074

CAR	#	Date notify	Date ordered for	Date placed	Date release	Person release	Date pulled	Shipper #	Rattle	Comm.
SOU	19091		3/30	3/31	4/4	John	4/5	IT-03	64.85	IT 27
order	650002		1 class C for 3/30					Bill Sharkie		
	650003		2 class C for 4/5					50		
~~SOU~~	~~526034~~									
SOU	19102	- 650002 4/5		4/5	4/6	Jim	4/7 4pm	IT-04	57.8	115,600
SOU	19842	- 650003 4/5		4/5	4/6	Jim	4/7 4pm	IT-05	62.75	125,500
?	19926	- 650003 4/5								
SOU	526430	4/6		4/7 4pm	4/9	4/13		IT 07		67,800 IT
order #	650004		2 class C for 4/8/88				526430, 14144			
	650005		2 " " " 4/12/88						←(10 total)	
SOU	14144	4/6		4/7 4pm	4/9	4/13		IT 06		63,60 IT
SOU	15065	4/11 harry	4/11	4/13	4/14	Harry	4/18	IT-08		58,800 IT
SOU	523911	4/11 "	4/11	4/13	4/15	?	4/18	IT-10		
SOU	530129	4/11 "	4/11	4/13	4/14	Harry	4/18	IT-09		66,100 IT
SOU ✓	523752	4/14 harry	4/15	4/18	4/19	Jim	4/20	IT-12		
SOU ✓	531649	4/14 harry	4/15	4/18	4/19	Jim	4/20	IT-11		
SOU	525153	harry 4/18	4/19							
SOU	524133			4/18	4/19	Jim	4/20	IT-02		
	overnight return									
SOU	19926		4/21	4/21	4/22	Don	4/26	IT-13		
SOU	525153		4/20	4/20	4/22	Don	4/26	K-14		
SOU	19172				4/27/88	Bernie	4/	K-IT-15		
							800-247-7099			

201-578-4029, 4030

Gini

CONRAIL

NOTICE

CHANGE OF ADDRESS

(EFFECTIVE 6/15/88)

Dear Customer:

Conrail is relocating our Newark Transportation Center to new offices located at 1 Liberty Place, Philadelphia, PA. We will start the business day there on Wednesday, June 15, 1988 with no interruption of your service.

Our new facility will be equipped with a state-of-the-art telephone system to give you prompt access to our services, and with the latest in data-processing systems to give you the best, most direct service.

Customer Service representatives will be available for all of your transportation needs twenty-four (24) hours a day, seven days a week.

Just call our new, toll-free number when you need to order or ship a car, if you have a problem with car placement or a stuck door - or for any transportation need. Our new facilities have been designed to improve all of our existing services to enable us to achieve our ultimate goal: to provide our customers with premium service.

Telephone Number	1-800-456-3019
Panafax Number	1-800-456-4019

Payments for freight and miscellaneous charges will continue to be mailed to the P. O. Box number indicated on your Statement.

Should you have any unique need or requirement, our Supervisor can be reached at (215) 851-7169.

Yours truly,

R. V. McCarthy
Assistant Superintendent - Stations

Room 1300
One Liberty Place
1650 Market Street
Philadelphia, PA 19103

(215) 851-7181

CONSOLIDATED RAIL CORPORATION

Dutco

10 cms = 900 T. '87

- AVG. 24
- JULY 31
- JUNE 19
- JUNE 2
- ~~MARCH~~
- Apr. 6
- Feb. 11
- Feb. 18
- JAN. 27
- JAN. 16
- JAN. 13

FAX 11/19

515 + Food +

CONRAIL CONTACTS

For Cyprus Industries
(Customer)

ZTS No. 10/766

Phone Numbers

Transportation Center 800-247-7099

Call to:

- Order Cars for Loading/Unloading
- Release Cars
- Arrange Switching
- Furnish Shipping Instructions
- Billing and Service Problems

Car Ordering Center ***(800) 222-2103***

Call to:

- Forecast Car Requirements

Customer Information Center **(800) 523-4065**

Call to:

- Trace Cars, Trailers, and Containers
- Arrange for Diversions and Reconsignments

Sales Office 212-578-4207

Call to Discuss:

- Rates
- New Business Opportunities
- Conrail Services
- All Other

Trainmaster Chuck Mooney 201-578-4065
(Name)

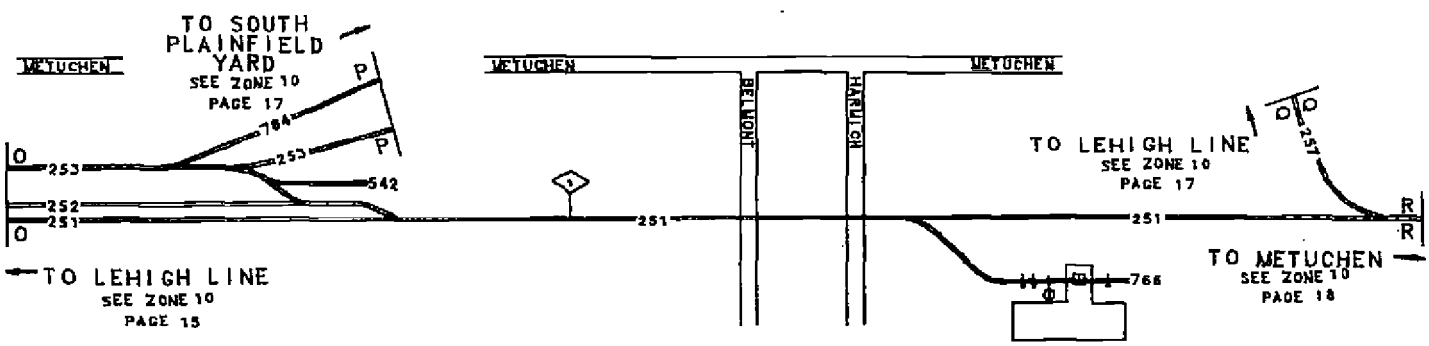
Call to Discuss:

- Unresolved Local Service Problems

LEHMAN 01198

SOUTH PLAINFIELD NJ

(PERTH AMBOY RUNNING TRACK)



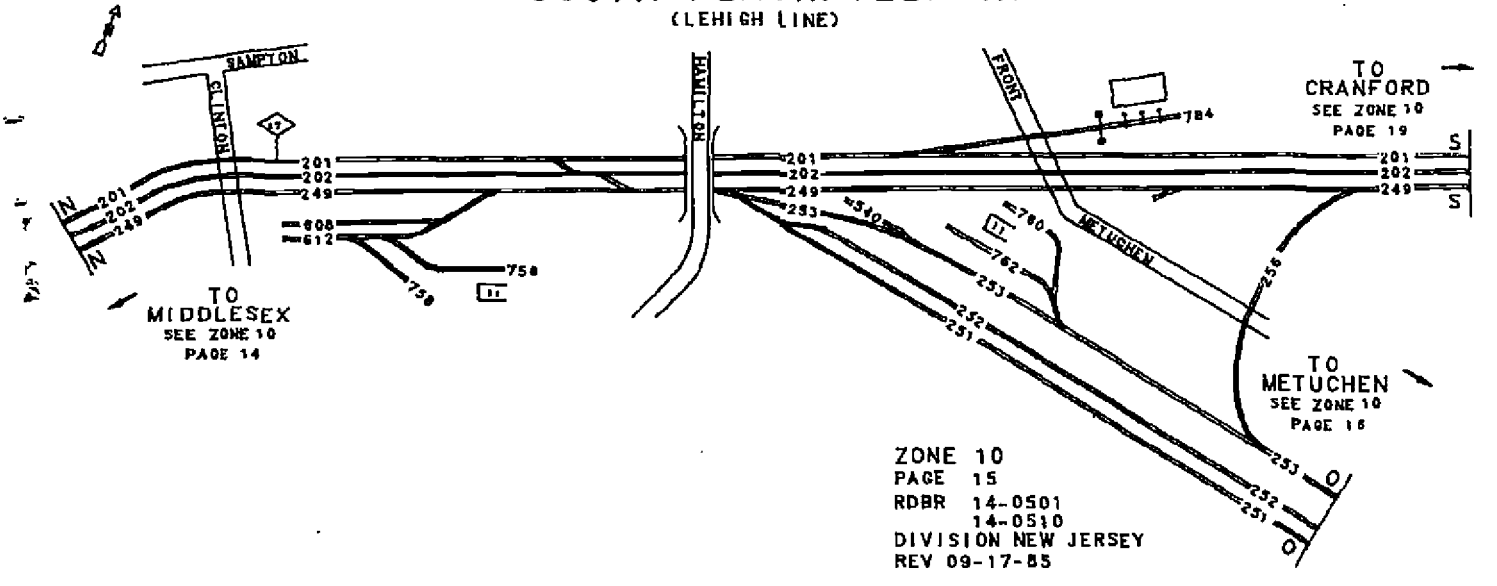
ZONE 10
PAGE 16
RDBR 14-0510

DIVISION NEW JERSEY
REV 09-17-85

10 253 00 00 PA-S/South Plainfield Yard Lead
10 257 00 00 Long Leg Wye
10 263 00 00 Industry Lead
10 621 00 00 South Plainfield Yard
10 622 00 00 South Plainfield Yard
10 623 00 00 South Plainfield Yard
10 624 00 00 South Plainfield Yard
10 625 00 00 South Plainfield Yard
10 626 00 00 South Plainfield Yard
10 627 00 00 South Plainfield Yard
10 628 00 00 South Plainfield Yard
10 629 00 00 South Plainfield Yard
10 630 00 00 South Plainfield Yard
10 631 00 00 South Plainfield Yard
10 764 99 99 Smith Steel & Aluminum
10 792 99 99 Modulume
10 792 99 99 American Steel Erector
10 794 01 02 Squire
10 796 01 06 Chevron Chemical
10 798 01 02 Hummel Croten

SOUTH PLAINFIELD NJ

(LEHIGH LINE)



ZONE 10
PAGE 15
RDBR 14-0501
14-0510
DIVISION NEW JERSEY
REV 09-17-85

10 251 00 00 Perth Amboy Running Track
10 252 00 00 PA-1
10 253 00 00 PA-5/South Plainfield Yard Lead
10 257 00 00 Long Leg Wye
10 542 00 00 South Plainfield - Stub
10 764 99 99 Smith Steel & Aluminum
10 766 01 05 Cyprus Industries

ACF INDUSTRIES

SHIPPERS CAR LINE

3301 RIDER TRAIL SOUTH, EARTH CITY, MISSOURI 63045-1393
TELEPHONE: (314) 344-4800 • TELEX 44-7691

Cecil Lehman
RS Info
Gary
4/29/86

April 22, 1986

Mr. Gary Evans
Traffic Supervisor
Cyprus Mines Corp.
P. O. Box 3299
Englewood, CO 80155

Re: Contract 5-3884

Dear Gary:

The five (5) cars covered by the above contract and recently delivered to you have the following capacity information.

ACFX	CAPACITY	LOAD LIMIT	LIGHT WEIGHT
51230	191,000#	191,700#	71,300#
51231	191,000#	191,600#	71,400#
51232	191,000#	191,900#	71,100#
51233	191,000#	191,600#	71,400#
51234	191,000#	191,400#	71,600#

Very truly yours,

Wilma J. Foren
Office Manager-District Sales

WJF

LEHMAN 01203

CONRAIL

CONSOLIDATED RAIL
CORPORATION
1542 SIX PENN CENTER PLAZA
PHILADELPHIA PA 19103 2959

TELE (800) 932 4292

CAROL L. YUPCO
SALES REPRESENTATIVE

CONRAIL

G. M. WILLIAMS, JR.
VICE PRESIDENT SALES

December 18, 1986

Mr. Keith Lehman
Traffic Manager
Cyprus Industrial Mineral
651 Metuchen Road
S. Plainfield, N.J. 07080

Dear Mr. Lehman:

First, I want to extend my personal thanks to you for giving us the opportunity of doing business with Cyprus Industrial Mineral.

Because we place a high value on our continued association with you, we at Conrail are pleased to tell you of a major innovation in the way we plan to service your needs through the creation of an inside sales office located at our Philadelphia headquarters. We are convinced this new procedure will enable us to serve you better than ever. Once you see it in operation, I think you will agree.

Here's how it will work. We have assigned Carol Yupco the sales responsibility for your account. She will be responsible for developing initiatives that respond to your company's needs. Sometime after January 5th, 1987, Carol will phone to introduce herself. She will be prepared to discuss your transportation requirements and how Conrail might best assist you in filling them. Carol will provide you with the latest information on Conrail's special programs, including TOFC, Bulk Distribution facilities, etc. as well as addressing any concerns you may have with existing movements.

In addition, she will handle your requests with other departments within Conrail, such as Stations, Transportation or Credit. In short, Carol will be the salesperson responsible for setting in motion whatever is required in our organization to serve you best.

No doubt you see how this new approach gives you the opportunity to plan for your transportation requirements more closely, giving you a regular contact, readily available for working through your questions and comments. This will inevitably give us a better picture of your needs.

We are always striving to find ways to serve you better. I think you will agree this new, regularly scheduled phone procedure is a step in the right direction. If you have any questions, please do not hesitate to call.

Sincerely,

G. M. Williams, Jr.

G. M. Williams, Jr.
Vice President-Sales

1-800-932-9292

P.S. Hope you enjoy the enclosed gift.

DON'T FORGET: "WHEN YOU WHISTLE - CONRAIL LISTENS!!"

CC: Mr. R. W. Bridges
Regional Sales Manager
Consolidated Rail Corp.
New York, N. Y.

BULK BAGS + FULL Bulk + ALL FLOW

LEHMAN 01207

12/9 - 3 (2) 12/18 (3)

11/22 13 (2) NOV

10/25 10/15 (2) oct.

9/30 9/25 9/10 Sept. 9/3 (4)

8/9 8/5 (2) AUG.

7/23 (1) JULY

6/27 18 10 (3)

5/28 24 10 7 (4)

SAVE
202
5 months

4/29 24 14 11 1

3 (6)

3/25 18 4 (3)

2/22 6 8 (3)

1/28 23 15 4 (4)

37 Loads 740 TON

6 TRIPS / LOAD / HR.

TRANSTORE™

TRANSPORTABLE STORAGE SYSTEMS

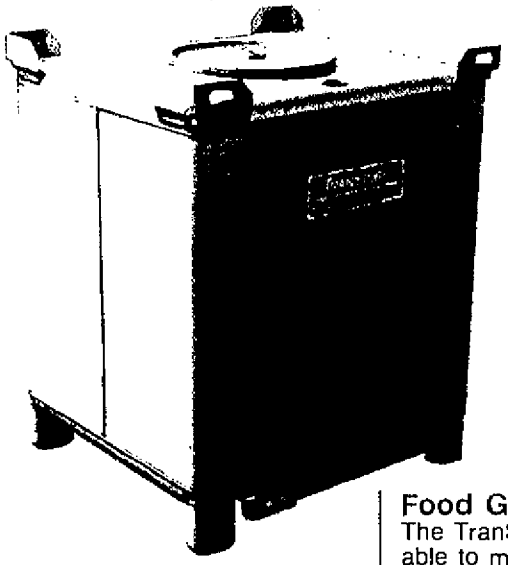
By

Custom METALCRAFT

A complete line of space saving, mobile storage containers and accessories.

TRANSTORE™...

Custom Metalcraft combines their engineering expertise, craftsmanship and years of experience in manufacturing a broad spectrum of fabricated equipment and tankage to offer you this precision made, high quality storage system. TranStore containers come in a wide variety of designs each combining the duties of storage and transportation, thus providing the most efficient movement of product. The TranStore line is available in carbon steel, aluminum and the most widely used stainless steels, including 304, 304L, 316 and 316L product contact. Custom Metalcraft can complement the TranStore Transportable Storage Systems with other high quality, standard and custom made equipment designed and produced to handle the filling, blending processing and discharge of various products in the simplest, safest and most efficient manner.



• 44" x 52", 42" x 48" or 42" x 42" standard base dimensions with other sizes available. • Steel, 304/316 Stainless Steel and Aluminum construction. • All corners have a 2" radius for strength and easy cleaning. • Available tested and tagged per D.O.T. specification 56 for dry material; D.O.T. specification 57 for liquid material. • Heavy Duty Combination Lifting Lugs and Leg Positioners for stacking. • One piece bottom available with sump for complete drainage. • Variety of closures and valves available. • 22" drum cover on Tanks and Hopper Bottom Bins provides easy access for cleaning and inspection. • Stackable for compact and efficient storage. • Variety of capacities to fit your requirements.

Department of Transportation (D.O.T.) APPROVED

The TranStore line is designed and tested to comply with D.O.T. specifications 56 and 57. Thus the units are designed to meet all lifting, stacking, impact, welding and pressure testing requirements as critically outlined for D.O.T. approved tanks.

Passing the criteria of D.O.T. may qualify these units for use by other government and private agencies. The line is offered in Aluminum, Carbon or Stainless Steel in standard capacities.

Food Grade

The TranStore line is also available to meet various food grade requirements. Never has such a complete line been offered to meet the sanitary requirements that must be incorporated in FDA and USDA approved equipment.

Material finishes available range from a 2B finish to highly polished #4 finish with optional weld finishes that include glass beading, wire brushing or grinding and polishing to sanitary standards.

Please contact Custom Metalcraft and discuss your sanitary requirements for portable vessels. Our years of experience in fabrication of sanitary equipment can work for you.

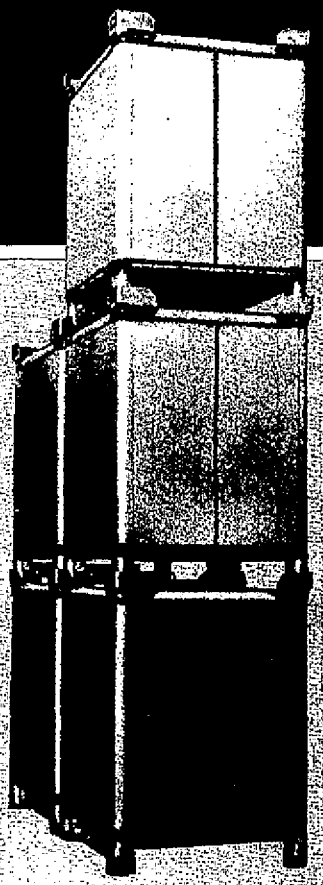
Industrial Grade

TranStore line is available in a heavy duty portable unit fabricated complete with a 2B finish with welds glass bead finished or wire brushed.

These units are designed for heavy duty operation to give you years of service. The units may be stacked for storage indoors or outdoors as they are totally sealed, minimizing the danger of leakage or contamination.

Please contact our sales agents to discuss your exact industrial application.

transporting, handling, blending, discharging



TranStore offers many features which include:

SPACE SAVING: Shipping or warehousing requires about ½ the space used by some other containers.

REDUCED RISK OF PRODUCT CONTAMINATION: Bins and tanks are sealed to protect contents against weather and to minimize loss resulting from broken bags, boxes and rodents.

BUILT IN PALLETS: Eliminate the high cost of pallets with the units designed to be lifted by standard fork trucks.

SAVINGS IN FREIGHT COSTS: Ship by standard flat beds or closed equipment thereby eliminating specialized container shipment. Many railroads pass along certain bulk shipping savings.

CONVENIENCE IN LOADING: 20-22 containers can be loaded in a standard truck and 26-28 containers can be loaded in a standard box car.

FAST PAYBACK: TranStore reuseable bins and tanks replace costly disposable containers, often paying back the investment in one year or less.

LABOR SAVINGS: One bin replaces several smaller containers and requires less handling. Loading and unloading time is minimal. TranStore bins may be double or triple stacked or moved directly to the process area.

TranStore is available in many designs:

COMPATABILITY: TranStore tanks and bins are designed to interface with most existing systems and equipment.

VISCOUS PRODUCTS: Liner and special pumps are available for transporting and handling viscous materials with poor flow characteristics.

PATENTABLE DOUBLE DOOR HOPPER BOTTOM: TranStore bins offer a patented bottom designed for discharging of dry products with poor flow characteristics, literally letting the entire bottom of the hopper open for immediate discharge.

BLENDING: The TranStore complementary equipment converts to a blender, accomplishing mixing and blending of the product without removal from the TranStore bin or tank.

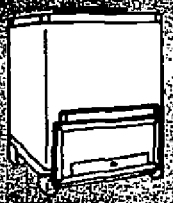
WASH STATION: A variety of washing systems are available for automatic washing and drying the bins or tanks.

ACCESS OPENINGS: Bins are available with a wide variety of openings, including side door, top door, hopper bottom and cone top discharge.

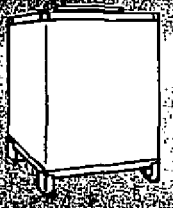
TRANSTORE By Custom METALCRAFT

LEHMAN 01212

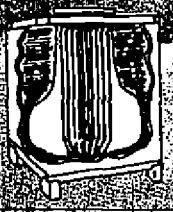
TRANSTORE



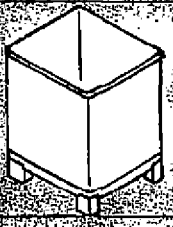
Side door bin for dry materials. Available in stainless steel, steel or aluminum construction. Standard or DOT 56 capacities to meet most requirements.



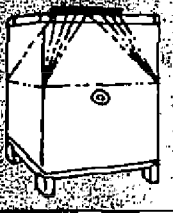
Tank for liquid materials. Available in stainless steel, steel or aluminum construction. Standard or DOT 57 capacities to meet most requirements.



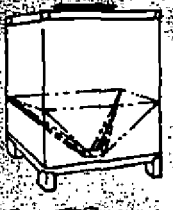
Tank for viscous liquids such as grease or ink. Differential pressure promotes the discharge of a high percentage of hard-to-empty materials.



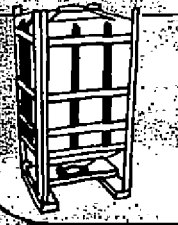
Open top container for dry or liquid materials. Available with sidedoor, hopper bottom or valve for liquids.



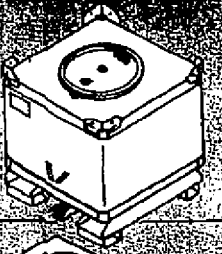
Enclosed Cone Top bin available with adapter to control flow when bin is inverted to discharge. Inverter available with hydraulic, electric or pneumatic drive. Excellent for dry materials with poor flow characteristics.



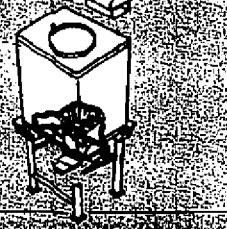
Enclosed cone hopper bottom bin available with a variety of valves or closures for flow control when discharged. Used for dry materials with good flow characteristics.



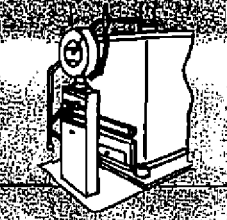
Poly bin with 45° hopper bottom in metal support frame. Stackable. Used for certain corrosive dry materials.



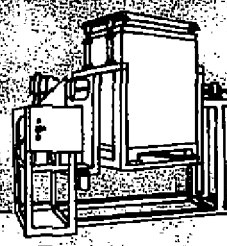
Tank for chemicals. Available in top or bottom discharge. Lookable for required security. DOT 57 with pump mounting V-bracket on front side of tank. Fork channels for 4 way entry.



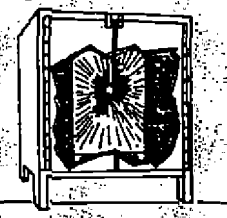
Hopper bottom discharge station shown with bin in place. Available in standard or automatic operation with gravity or conveyor discharge.



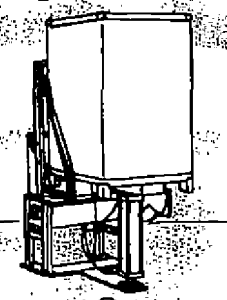
Weigh in or discharge, manually or automatically, for accuracy, labor saving operation. Divider spout available for dual filling station.



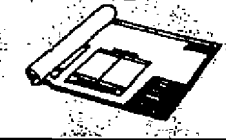
Blending in bins for dry materials or tanks for liquids. Labor saving concept virtually eliminates risk of contamination and labor intensive cleaning required by other blending methods. Fully automatic or manually controlled operation.



Wash station for all types of containers. From a simple lid washer to a completely automatic cabinet with provisions for drying. Single or multi cabinet units available.



Dump station tilts bin 45° for complete discharge shown with bin in place. Manual or automatic operation with gravity or conveyor discharge. Subtract weighing into process available.

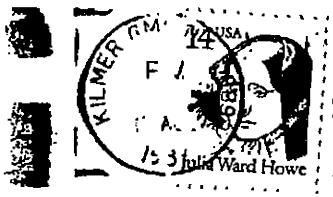


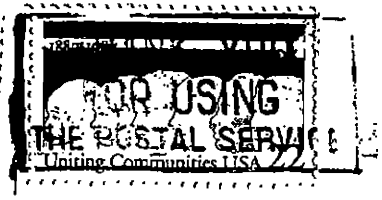
Engineering & design capabilities to assist in developing your portable bulk handling system.

REPRESENTED IN YOUR AREA BY:

Custom METALCRAFT INC.
2332 EAST DIVISION, P.O. BOX 10587 G.S., SPRINGFIELD, MO 65808
(417) 862-0707

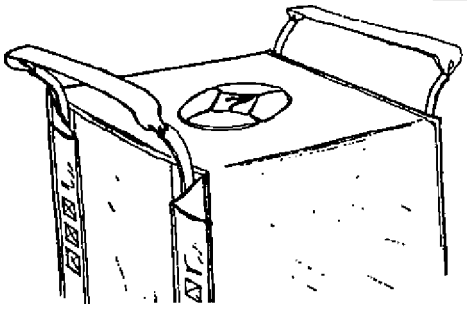
William G. Pierson Sr
634 Springfield Avenue
Summit, N.J. 07901





Mr. Keith B. Lehman
Mill Superintendent Gale Division
Cyprus Industrial Minerals
651- Metuchen Road
South Plainfield, N.J.
07080

Walpole Whopper
Option Chart



1 STAND-AWAY LIFTING LOOPS

Has two lifting loops

Loop Caddies hold loops up and away from container allowing easy fork lift entry

Curvature of Loop Caddies allows containers to be stacked one on another

---

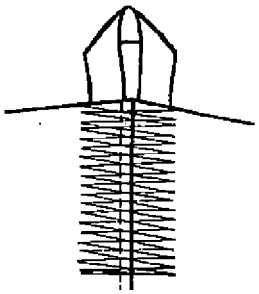
2 CONVENTIONAL LIFTING LOOPS*

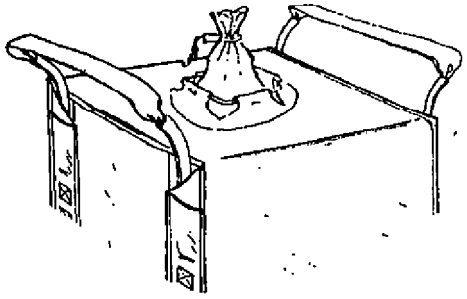
Four corner loops for lifting

Standard loops extend 10" above container

Can be extended to allow for one-hook pick-up

Mr. William G. Pierson
834 Springfield Avenue
Summit, New Jersey 07901





3 FILLING SPOUT*

Standard size 16" diameter x 18" long

Has Double Flap Protectors

Secures with Non-slip slide fasteners

No knot tying or untying required

Will Custom Size to Customer's specifications

---

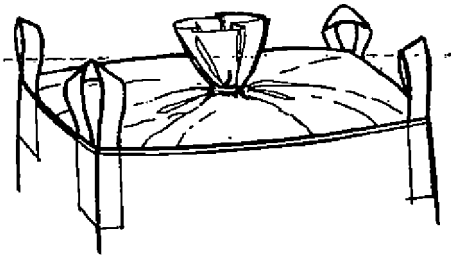
4 DUFFLE TOP CLOSURE*

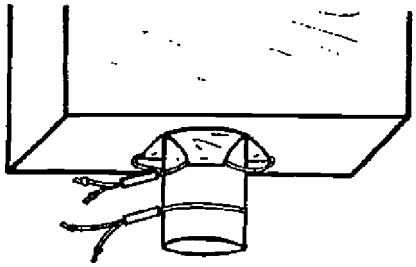
Opens to full circumference of container

Closes to give 100% Protection

Secures with Non-slip slide fasteners

No knot tying or untying required





5 DISCHARGE SPOUT*

Standard Size 16" diameter x 18" long

Has Double Flap Protectors

Secures with Non-slip slide fasteners

No knot tying or untying required

Will custom-size to customer's specifications

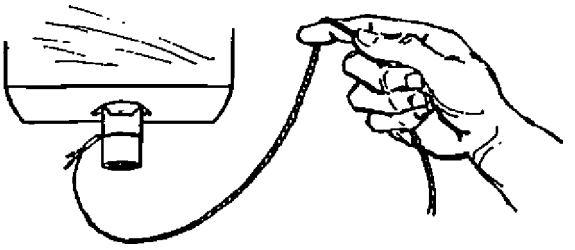
*No Additional Charge

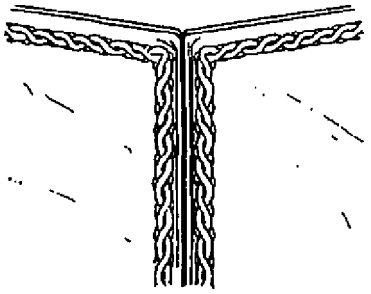
6 REMOTE RELEASE DEVICE

Allows operator to stand several feet away when discharging product

Easy to resecure and re-use

No knot-tying or untying required





7 SIFT GUARD & MOISTURE BARRIER SEAMS

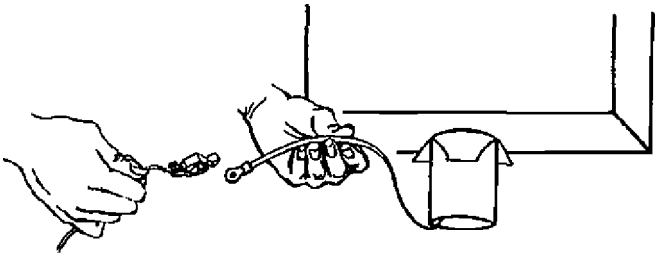
Keeps fine mesh particles from migrating through needle holes and seams

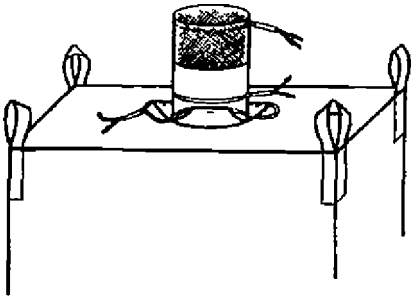
Inhibits moisture from penetrating at seam points

8 STATIC ELECTRICITY DISSIPATOR

Allows for grounding during loading and discharge procedures

Terminal Point is easily attached and detached from ground wire





9 AIR SCREEN FILLING SPOUT

Traps airborne particles during loading

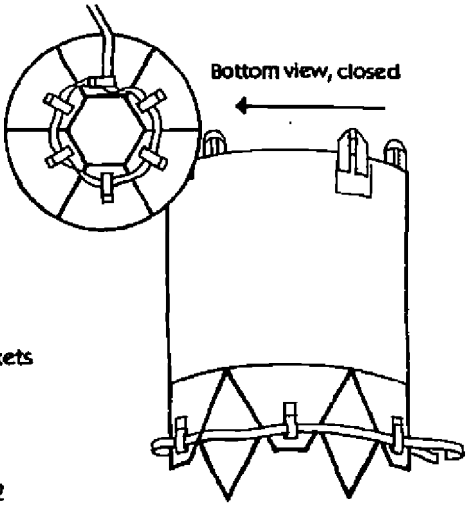
Snugs up to feed pipe with Non-Slip Slide Fasteners (pat. pending)

Lower Slide Fastener secures spout when loading is completed

10 FULL BOTTOM OPENING

For products that tend to cake or bridge

Opens to full circumference of container

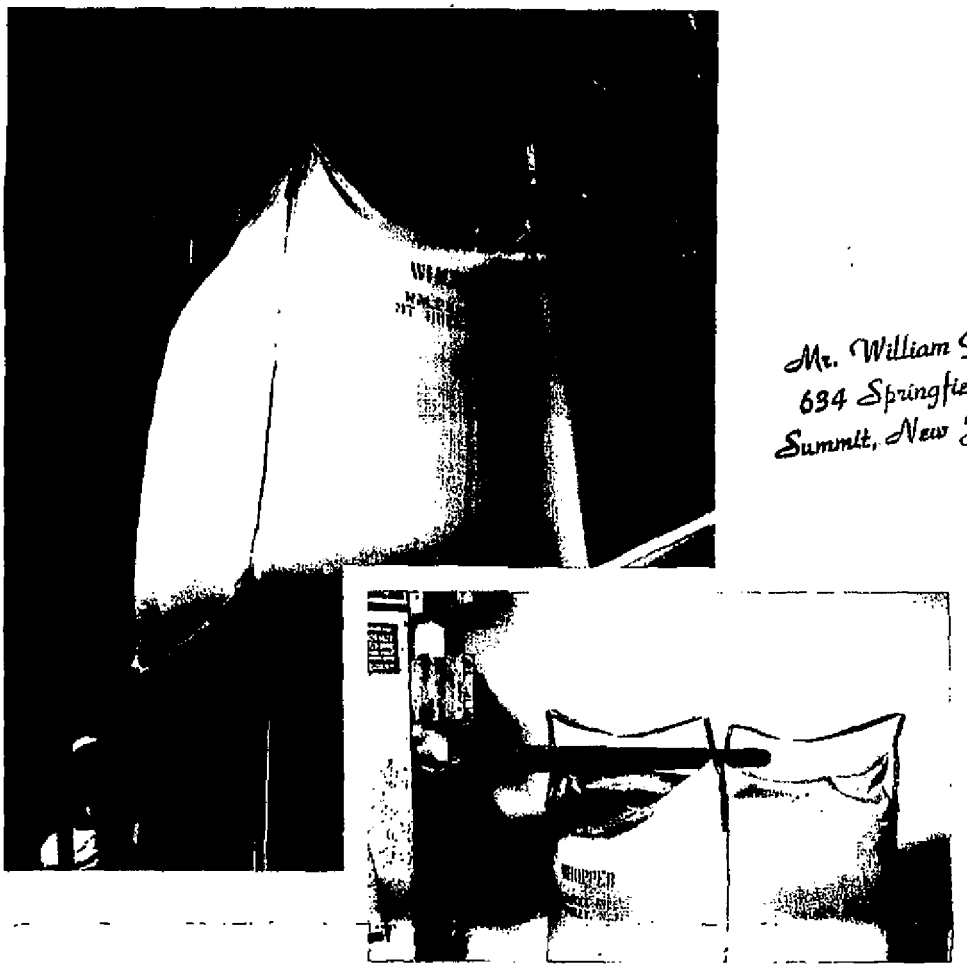


Other Options:

- Breathable or non-breathable fabric
- U.V. treated or FDA approved fabric
- Polyethylene liners
- Document Pockets
- Stenciling
- Silk Screening

WALPOLE, INC., P.O. Box 55, Mt. Holly, NJ 08060 • 609-261-5552

YOUR FORK LIFT OPERATOR'S BEST FRIEND IS A WHOPPER®!



Mr. William G. Pierson
634 Springfield Avenue
Summit, New Jersey 07901

The WHOPPER® Semi-Bulk Container
By Walpole, Incorporated

The finest in semi-bulk containers
for the storage and transportation
of dry flowable products, including:

Chemicals • Minerals • Grains • Fertilizers • Foodstuffs
Pharmaceuticals • Resins • Plastics • Dyestuffs • Clay

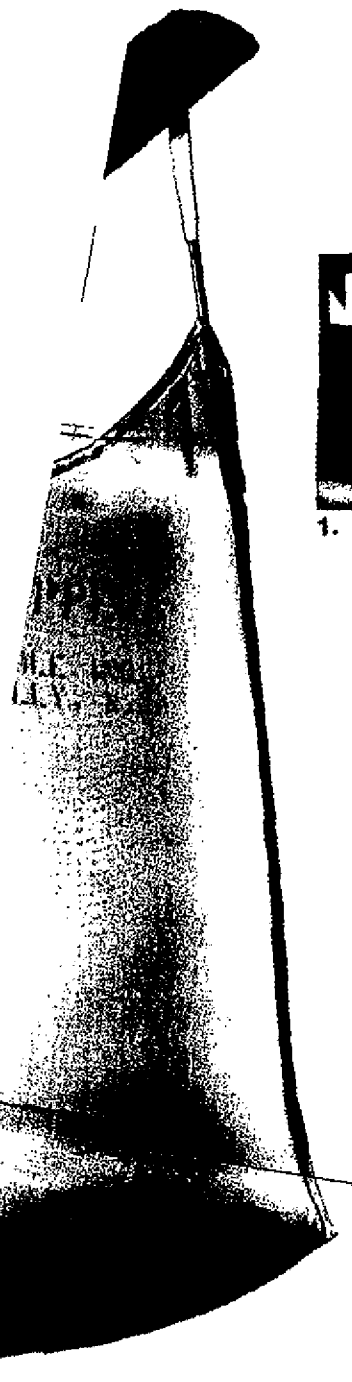
10 REASONS YOUR COMPANY SHOULD USE SEMI-BULK CONTAINERS

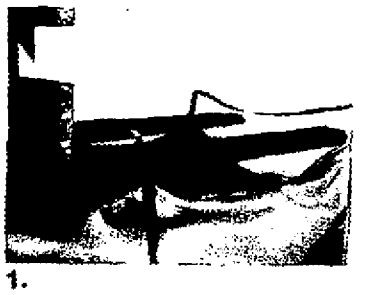
You...

1. ...significantly improve your labor force efficiency.
2. ...eliminate the need to handle, slit and dispose of 50 lb. and 100-lb bags.
3. ...end the pre-assembly work – which is required with most rigid and corrugated containers.
4. ...avoid wood pallet usage.
5. ...discharge your product with no dust or air contamination.
6. ...save storage space, because semi-bulk containers are totally collapsible.
7. ...cut costs, because semi-bulk containers are the least expensive means of packaging and transporting your product.
8. ...reduce your cost-per-unit use, because most semi-bulk containers can be used more than once.
9. ...protect your product and insure its safe storage and shipping. The tough industrial fabrics used in semi-bulk containers give better security than multi-wall paper bags, corrugateds and most other rigid containers.
10. ...do away with special handling equipment. Your forklift does all the work!

WHO
WALP
MT HO

LEHMAN 01218





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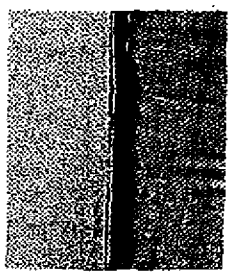

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4., 5., 6

10 REASONS
YOUR COMPANY SHOULD USE
WALPOLE WHOPPER®
SEMI-BULK CONTAINERS!

1. Our unique lifting Loop Caddies (Patent Pending) allow your fork lift driver to pick up and drop off a Whopper just as easily as he does a pallet. (Most other semi-bulk containers require someone, in addition to the driver, to dress the lifting loops onto the blades.)
2. Whoppers can be stacked one on another with no deformation to the Loop Caddies or the webbing they support.
3. Whoppers are sewn with heavy industrial twine, rather than thread, for greater strength and no needle hole leakage.
4. All load and discharge spouts are secured with rope rather than webbing, for greater security and ease of handling.
5. Nonslip slide fasteners are used to facilitate opening and closing the load and discharge spouts. (Many other manufacturers require that spouts be secured with hand knobs which then have to be untied or cut.)
6. Both spouts on the Whopper have two, not one, protective flaps to insure against outside contamination of any sort.
7. The Loop Caddies and both spouts are standard on the Whopper. No extra charge.
8. Walpole Whoppers can be completely custom-sized to meet your specific requirements.
9. The clean, classic design of the Whopper allows it to remain relatively square after loading, for more efficient utilization of warehouse and transportation space.
10. No other semi-bulk container with comparable features sells for as little as the Walpole WHOPPER!

GO WITH THE WALPOLE WHOPPER!

The Walpole WHOPPER® represents a significant advancement in the design of semi-bulk containers. It combines durability with design integrity, economy with practicality.

Our Company's Principal has been a leader in the semi-bulk container industry since its inception in the United States.

He saw the exciting new dimensions semi-bulk containers offered in packaging, storing and shipping, and has now combined these with major new improvements in their function and performance.

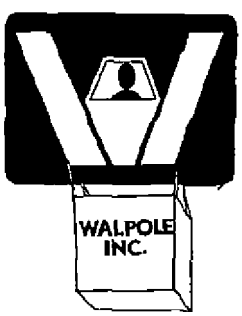
- **The standard Whopper, with one-cubic-meter capacity, is rated for 1½ metric tons (3,306 lbs.), based on a safety factor of five-to-one.**
- **Whoppers can be made to any size you require, and can be produced to contain safely up to 10,000 lbs.**
- **Whoppers are available with either spout or duffle tops. They are also available with total bottom discharge openings for products that tend to cake or bridge.**

Our objective and commitment is to supply you with a container that totally fits your needs, with delivery as promised, and at a price you will recognize as an outstanding value.

With our line of semi-bulk containers, you can package, store and ship your product quickly, economically and safely.

A unique feature of the Whopper's Loop Caddies (patent pending) is their curvature away from the container, allowing "nesting" of Whoppers without deformation to the Loop Caddies themselves.

WALPOLE, INCORPORATED
Mount Holly Industrial Commons
Post Office Box 55
Mount Holly, New Jersey 08060
(609) 261-5552



AND REMEMBER, IF YOUR FORKLIFT DRIVERS WERE DOING THE PURCHASING, WE'D BE SELLING YOU WHOPPERS NOW!

Walpole, Inc.

Free Sample on Request

Effective Jan. 1, 1986

WALPOLE WHOPPER

PRICE LIST

Prices can be Negotiated

SIZE CU.FT.	LOADED DIMENSIONS	QUANTITY PRICES				
		1-9	10-49	50-99	100-499	500-+
7.5	23"diam.X31"high	$18.50	$16.50	$15.50	$14.50	$13.50
15	34" " X28" "	20.50	18.50	17.50	16.50	15.50
20	43" " X26" "	21.25	19.25	18.25	17.25	16.25
25	44" " X29" "	22.00	20.00	19.00	18.00	17.00
30	44" " X35" "	22.75	20.75	19.75	18.75	17.75
35*	44" " X41" "	23.50	21.50	20.50	19.50	18.50
40	44" " X46" "	24.25	22.25	21.25	20.25	19.25
45	44" " X51" "	25.00	23.00	22.00	21.00	20.00
50*	44" " X57" "	25.75	23.75	22.75	21.75	20.75
55	44" " X63" "	26.50	24.50	23.50	22.50	21.50
60	44" " X68" "	27.25	25.25	24.25	23.25	22.25

Most commonly used sizes are shown with asterisks.

Whoppers can also be made to YOUR special size and design requirements.

Terms are Net 30 days. Prices are FOB Mt. Holly, N.J.

(Please see reverse side for option information)

Dear Keith - These Bags are Made in N.J.
Designed Either as one way - or (as many as 20-30 Re Use - Round Trips) being used by Talc & Kayolin Clay industry now - Phone the Co. Owner - Walter Polette for any additional Info

P.O. Box 55 • Mt. Holly, New Jersey 08060 • (609) 261-5552

Plant is in Mt. Holly - May be visited

LEHMAN 01221

OPTION INFORMATION

NO CHARGE OPTIONS

Conventional Lifting Loops

Loading and/or Discharge Spouts

Duffle Top Closures

Ultra Violet treated and FDA approved fabric

ADDITIONAL CHARGE OPTIONS

Stand-away Lifting Loops	$ 2.00
Remote Release Device	1.00
Sift Guard & Moisture Barrier Seams	.75
Full Bottom Opening	10.00
Static Electricity Dissipator	4.00
Air Filter Loading Spout	2.00
Document Pockets	1.00
"Stop Flo" Discharge Spout	1.00

OTHER OPTIONS

Polyethylene Liners

Stenciling

Silk Screening

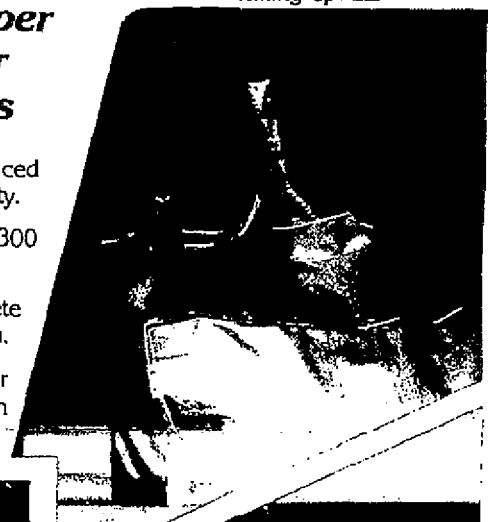
(See separate Option Chart supplied)

THE WHOPPER® By Walpole, Inc.

"Your Flexible Bulk Container Specialist"

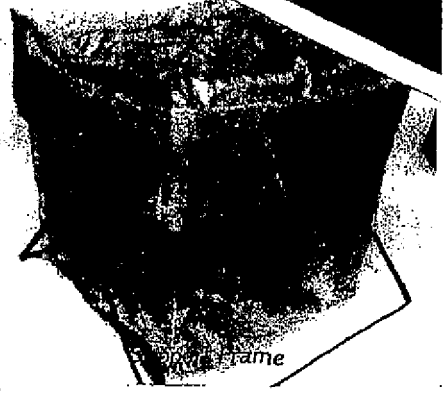
Static Electricity Dissipator

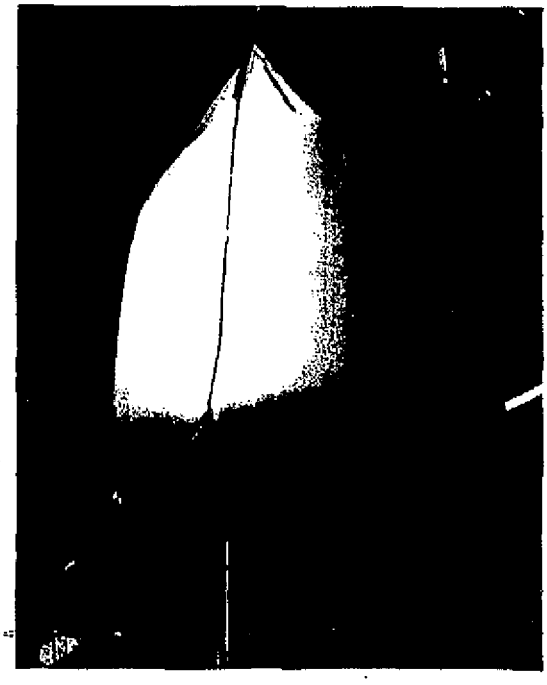
Loading Spouts

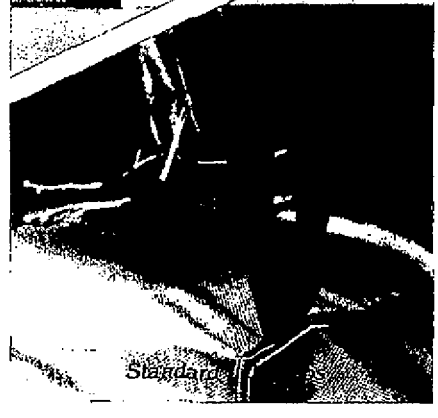


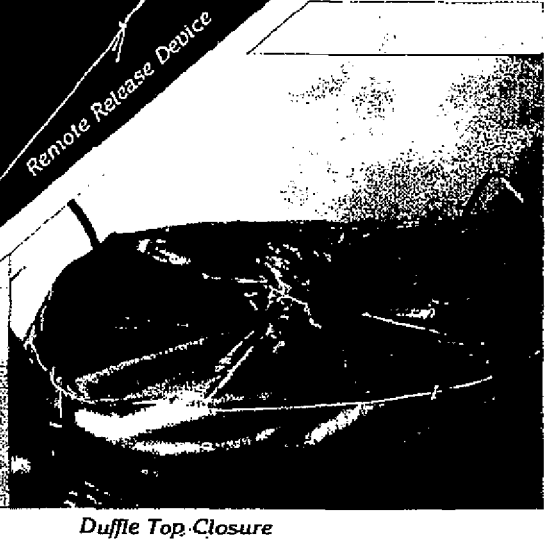
Walpole provides the Whopper container that meets your precise plant requirements

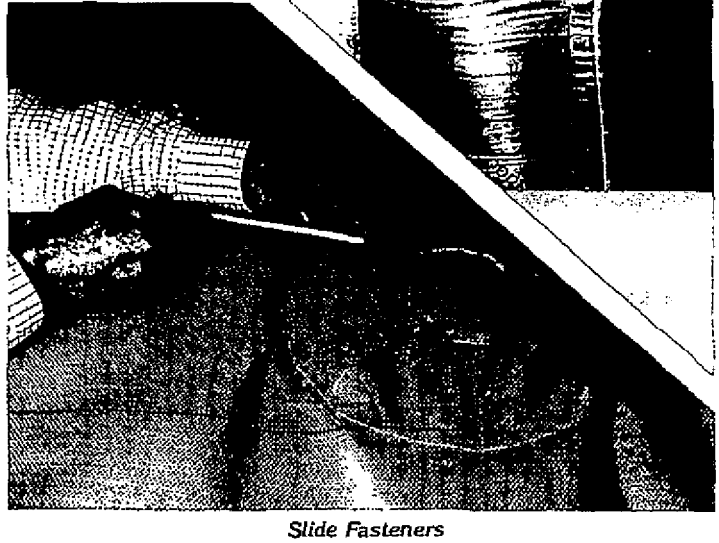
- Flexible bulk containers designed and produced precisely to your requirements--that's our specialty.
- We have designed and produced more than 300 different type and size containers.
- This custom service is in addition to the complete range of standard stock sizes available to you.
- Let us know your special needs. See for yourself how quickly--and affordably--we can meet them!











Duffle Top Closure

Slide Fasteners

Air Screen Fill Spout

Why Flexible Bulk Containers

- Significantly improve labor force efficiency.
- Eliminate need to handle, slit and dispose of 50-lb. and 100-lb. bags.
- End pre-assembly work required with most rigid and corrugated containers.
- Avoid wood pallet usage.
- Discharge product with no dust or air contamination.
- Save storage space. Semi-bulk containers are totally collapsible.
- Cut costs. Flexible bulk containers are one of the least expensive means of packaging and transporting your product safely and securely.
- Reduce cost-per-unit use. Most semi-bulk containers are reusable.
- Do away with special handling equipment. Your forklift does the work!

Quality is First!

Full Range of Sizes

Why Walpole Whopper® Flexible Bulk Containers

- Nonslip slide fasteners (pat. pending) facilitate opening and closing fill and discharge spouts. No knot tying, untying required.
- All spouts are secured with rope rather than webbing, for greater security.
- Whoppers are sewn with heavy industrial twine, rather than thread, for greater strength.
- Spouts on the Whopper have two protective flaps to insure against contamination.
- Our patented lifting loop caddy option allows your forklift driver to transport a Whopper as easily as a pallet.
- Conventional lifting loops or lifting sleeves also available.
- Remote Release Devices, Static Electricity Dissipators, Air Filter Loading Spouts are just a few of the very important, unique options we offer.
- Bottoms of containers are not sewn on. They are an integral part of the Whopper. It makes for stronger, safer handling.
- Whoppers are from 1 cu. ft. to 100 cu. ft. capacities and all sizes in between.
- No other semi-bulk containers with comparable qualities and features sell for as little as the Walpole WHOPPER!

Write or call us. In just a few minutes we can determine the best size and features your company will require. We'll also give you prices and can get a sample Whopper off to you immediately.

Walpole Inc. P.O. Box 55, Mt. Holly, NJ 08060 (609) 261-5552

LEHMAN 01224

D.O.T. + I.C.C. Approved Title CE 49

Motor Freight Classification Specifications

RULES NMF 100 F

* ITEM 203

DEFINITION AND SPECIFICATIONS FOR PLASTIC SLING LIFT SEMI-BULK BAGS

Sec. 1. Application— Where 'bags,' 'multiple-wall bags,' or 'paper bags' are provided for in separate descriptions of articles as outer shipping containers, bags, meeting the requirements of this rule may be used for dry commodities only. Dry commodities are those which are not liquid or which do not contain any free liquid.

Sec. 2. Construction— Bags may be constructed of polyethylene, polybutylene, polypropylene, polyvinyl chloride, polyester or neoprene, of sheet, film, woven or coated fabric construction, of a thickness or of a combination of laminates or liners or of a denier, with body heat sealed, sewn or adhered to meet the performance requirements specified within Section 3.

Bags must be equipped with attached ropes or webbed straps to provide loops for use as sling lifting devices to facilitate handling by mechanical equipment. Ropes or straps used as slings must harness, encircle or be attached to the bag body.

Bags must be constructed with spouts for discharging purposes. Top and bottom filling or discharging openings must be secured with coated wire ties or other means which will provide a sift-proof closure.

Containers may be used again in transportation only when they are in such condition that they will protect contents as efficiently as new containers.

Bags meeting the provisions of this item may be used as shipping containers for Less-Than-Truckload (LTL) movement only when tendered for transportation on pallets.

Sec. 3. Performance— Container, filled with product or other material to simulate actual net weight to be contained must be capable of withstanding without damage or loss of product a free drop of four feet onto a solid concrete surface.

Slings and method of harnessing or attachment to bag must be capable of providing a 5:1 safety factor tested by simulating a load of two times the actual weight apportioned each loop used for lifting purposes without failure. For example, if the total net weight of container is equal to 1,000 pounds and the container is outfitted with four loops for vertical lifting purposes, each loop must be capable of lifting a weight of 500 pounds. Testing may be accomplished by filling the container to a weight of 1,000 pounds and lifting by use of two opposing loops or by filling the container to a weight of 2,000 pounds and lifting by use of all four loops.

ITEM 430-A

COLLECT-ON DELIVERY (COD) SHIPMENTS

Unless otherwise provided in carriers' tariffs, collect on delivery shipments (COD) will be accepted subject to the following provisions and charges:

Sec. 1. Shipments must be tendered on 'Uniform Straight', 'Straight Bill of Lading—Short Form', or 'Straight' bill of lading forms as shown on pages 20 through 25 of Supplement 1.

The letters 'COD' must be stamped, typed or written on all such bills of lading and shipping orders immediately before name of consignee; OR, 'COD' in red letters at least one (1) inch in height with thickness of stroke ¼ inch thick or greater must be stamped or printed across the face of all bills of lading and shipping orders. Only one COD amount may be shown and may not be subject to change dependent upon time or conditions of payment. The name and street and post office address of consignor and consignee must be shown on bill of lading and shipping order. On Straight Bills of Lading—Short Form there must be shown in the space provided for this purpose or in the lower left hand corner of space provided for 'description of articles, special marks and exceptions,' the following information:

Collect on Delivery, $ _____ and remit to:
_____ Street
_____ City
_____ State
C.O.D. Charge to be paid by:

Shipper ☐ Consignee ☐

Sec. 2. Each package must be plainly marked, labeled, or tagged by consignor showing letters COD, and the name and address of consignor and consignee in accordance with Item 580 of the classification.

Sec. 3. COD packages will not be accepted on the same bill of lading with packages other than COD and only packages covered by one COD bill may be tendered on one bill of lading.

Sec. 4. If consignor desires to forward invoice or collection papers, they must be securely attached to the shipping order copy of the bill of lading and the shipping order must show the following information:

'Attached invoice (or invoices) to accompany shipment to destination.'

Sec. 5. COD shipments will not be accepted or receipted for when billed to one firm or person, with instructions to collect charges from another firm or person.

Sec. 6. COD shipments will not be accepted for transportation subject to inspection or trial by consignee, or when bearing instructions to make partial delivery. Carriers are responsible to deliver the shipment in accordance with the bill of lading contract. If, for any reason, upon presentation for delivery, C.O.D. payment is refused by the consignee, carriers are responsible for the disposition of the shipment only in accordance with the bill of lading contract and tariff provisions as applicable. Carriers are not responsible, in such circumstances, to seek or remit the C.O.D. amount to the consignor or owner of goods.

Sec. 7. Intoxicating beverages may be handled COD only under the provisions provided by State Laws of the State in which the point of destination is located. (See Section 389 of Title 18 of the United States Code Annotated.)

Sec. 8. The amount of COD bills for COD shipments must be collected at the time such shipments are delivered to the consignee.

Sec. 9. Only the following forms of payment will be accepted in payment of COD amounts: (1) cash, up to a maximum of $250.00; (2) bank cashier's check; (3) bank certified check; (4) money order; or (5) personal check of the consignee when so vized in writing or by endorsement on the bill of lading and shipping order by the consignor. All checks and money orders to be made payable to the consignor. The carrier will accept checks and money orders only as the agent of the consignor and

January 22, 1986

R. M. Padden

Semi-Bulk Unloading of Cosmetic Talcs

Two basic systems are proposed for unloading cosmetic talcs. Sketches are attached to illustrate each system. The first system is a low cost transfer system that would be used by customers with their own weight control feeding or who use our talcs in one ton increments. The alternative system allows weight control feeding for partial ton usage.

The weight control option utilizes a sterile tote bin to hold the product for feeding. The tote bin permits the user to store talc between their batch operations and maintain its sterility. The proposed tote bin feeding system is manually operated. An automatic weight cutoff controller could be added to the scale for about $1,500. More advanced loss in weight feeders are available for metering our talcs at a cost of about $20,000.

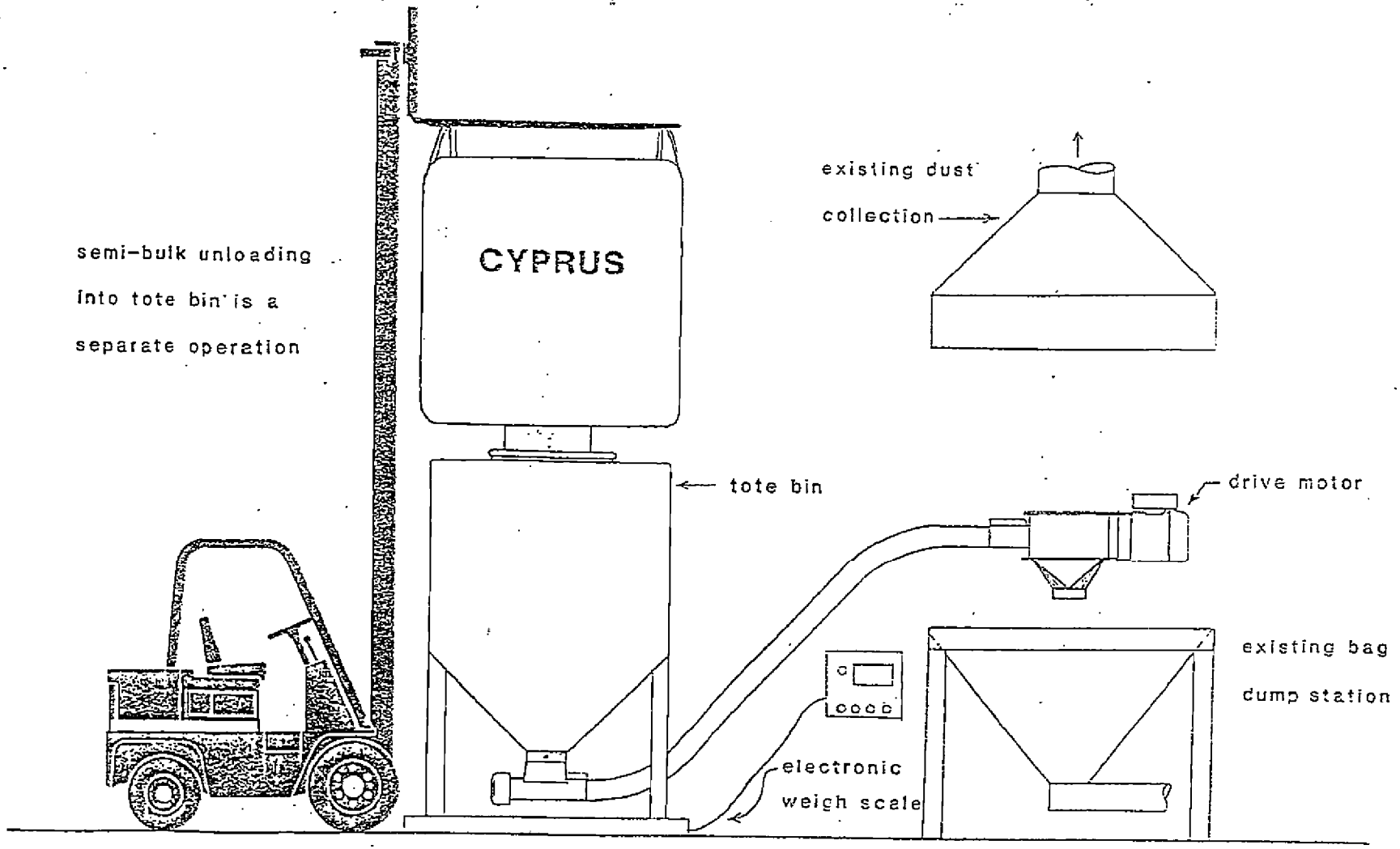
The flexible screws can be obtained in lengths up to 40 feet. The conveyor length can be adjusted down with a hacksaw. Every installation will require some adjustments in the proposed design.

I am available to provide any additional information that you may need for specific installations.

C. W. Nichols

CWN:jsf

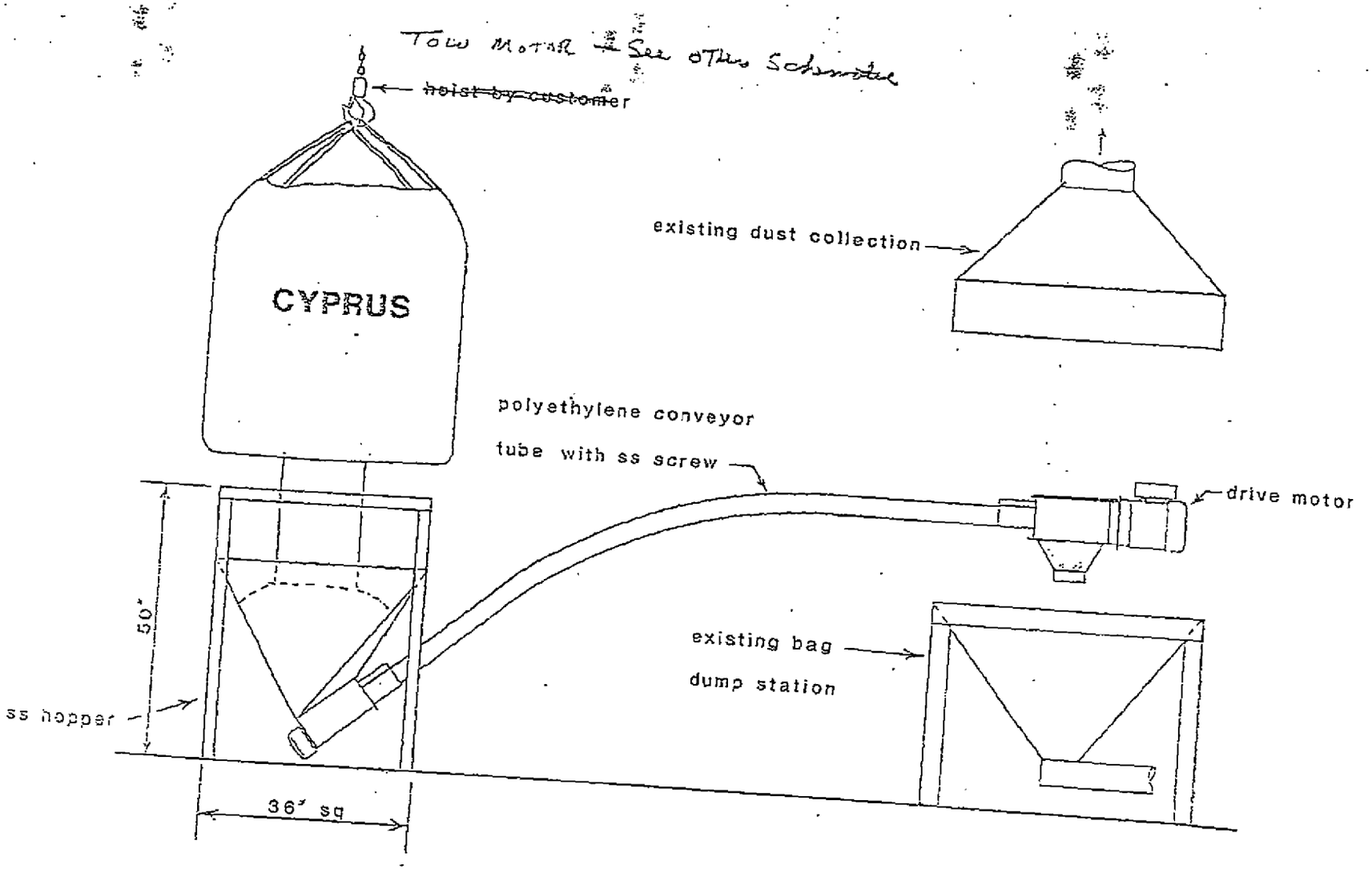
E. P. Tiritas



SEMI-BULK UNLOADING STATION

(WEIGHT CONTROL OPTION)

LEHMAN 01227



SEMI-BULK UNLOADING STATION

LEHMAN 01228

SEMI-BULK UNLOADING SYSTEM PRICING

Basic Unit :

36" ss hopper 10' long conveyor tube 3 hp drive appx 150 cu ft/hr motor starter not included	$3,125

Options :

hopper vibrator	$ 400
mast support for drive	275
high level switch for discharge hopper	250
reversing motor starter	575
variable speed control	1900

weight control	
deduct from basic	(375)
60" scale	3500
tote bin	
al	1350
ss	1900
high reach forklift adapter	475

Bonar Industries, Inc.
7951 Industrial Highway
P.O. Box 10196
Macon, Georgia 31297
(912) 784-9040
Telex 80-4505

January 8, 1986

Cyprus Industrial Minerals Co.
615 Metuchen Road
South Plainfield, N.J. 07080

Attention: Mr. K. Lehman

Dear Keith,

Here are the details which you requested covering the specifications on all materials used in the manufacture of Mulox bags. I have also provided a copy N.E.L. test certificate number 3882 which shows the container has a safe working load factor of 8.4 to 1. This rating is well above the accepted national standard of 5 to 1.

I trust this information is what you are seeking. Should you need anything else please let me know. I look forward to handling your future bulk bag requirements.

Sincerely,

W. R. Hodgins
Sales Manager

Enclosures:

WRH/lb

MULOX SERIES 3300

Bag Capacity-	45 cubic feet, square configuration
Bag Dimensions-	35" X 35" X 52" high. These are unfilled measurements.
Body Fabric-	8 oz/sq.yd. woven polypropylene with 8 polyester reinforcing bands woven into the fabric for added tensile strength. The material is U.V. stabilized.
Tensile-	BS 2576 388 X 470
Burst-	ASTM D-751 600
Color-	Blue
Base Fabric-	8 oz/sq.yd woven polypropylene which is U.V. stabilized.
Tensile-	ASTM D-1682 400 X 400
Burst-	ASTM D-751 750
Color-	Blue
Bottom Discharge Spout-	Same specification as the base fabric.
Top and Fill Spout-	3.5 ozs./sq. yd woven polypropylene coated on the inner surface with 1.5 mils of polypropylene.
Tensile-	ASTM D-1682 100 X 90
Burst-	ASTM D-751 225
Color-	White
Lift Loops-	Four independent loops manufactured from 2" wide polyester webbing having a minimum tensile strength of 5000 pounds. These loops are affixed to the reinforcing band area of the body.
Sewn Seams-	Side seams as well as seams around the top and bottom of the container are sewn with polyester thread having an average tensile strength of 60 pounds.

Serial No: 274:83

TRADE &
DEPARTMENT OF INDUSTRY

NATIONAL ENGINEERING LABORATORY
East Kilbride, Glasgow

SERIES 3300 TEST RE

Certificate of Test

Certificate No.	3882	Component tested including maker's or other serial or type numbers	FIBC MIF929 125-A TX09296
Date of Test	30/11/83		
Tester's Name	D S Thomson	NOTE:	Serial No. 125 is container made by Bonar Industries, Inc., Macon, GA Corrected certificates requested
Tested on behalf of	Mulox IBC plc	Maker	Mulox IBC plc, 14 Aylmer Parade, Lond N2 OPF
Constructional details of component	89^2 x 150 cm flexible intermediate bulk container of woven polymer lifted on four webbing loops sewn to interwoven reinforcing bands.		
Type of Test	Repeat loading followed by: Tensile to destruction - performance test to BS 6382 : Part 1 : Appendix		
Test conditions	Top restraint - 30 cycles of loading to 2 x s.w.l.	Test machine used	400 kN A frame
Test results	No visible damage noted after 30 cycles of loading from 7.0 to 19.45 kN (2000 k On 31st cycle to destruction at 82.41 kN (8405 kgf) side panel warp tapes parte below loop attachment. 18533 pounds		
Conclusions and recommendations if any	TEST LOAD WEIGHT OF 22051bs S.W.L. RATING 8.4 TO 1 ON THIS LOAD		

N. Paton

.....

For Director, National Engineering Laboratory.

The above component was tested using the apparatus stated and under the conditions given it is certified that the performance of the component was as shown.

LEHMAN 01232

BULK LIFT
INTERNATIONAL INCORPORATED
455 Maple Avenue
Carpentersville, IL 60110
312/428-6059 Telex 282565

Jan. 3, 1986

Mr. Keith Lehman
Cyprus Industrial Minerals
651 Metuchen Rd.
So. Plainfield, New Jersey 07080

Dear Mr. Lehman:

Pursuant to our conversation, I am attaching data pertaining to our bulk bags.

I hope this is what your customer requested. If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

Harry Wilke
BULK LIFT INTERNATIONAL, INC.
Regional Sales Manager

HW:lg
enc.

BULK LIFT
INTERNATIONAL INCORPORATED
455 Maple Avenue
Carpentersville, IL 60110
312/428-6059 Telex 282565

BL 2000-2 BAG SPECIFICATIONS

FABRIC	6.25 oz per square yard
CONSTRUCTION	12 X 11 tapes per square inch
TENSILE	275# per square inch. UV protected for 1200 hours retaining 70% of original strength (fabric will steadily weaken after 1200 hours).
LOOPS	4 X 6000# X 2" wide nylon webbing
SAFETY BAND	1 X 2500# X 1½" wide nylon or polyester webbing
THREAD	207 nylon stabilized - 35# breaking strength
TWINE	No. 12 polyester, glazed - 65# breaking strength
BOX BAG CONSTRUCTION	One body and two sides. Bottom edge of sides hemmed 1". All edges to be folded in 3½" and chain stitched.
OUTLET	10 - 14" in diameter to be made out of lightweight uncoated fabric.
INLET SKIRT	As above
LOAD	2240#
SAFETY FACTOR	5 to 1 maximum
COATING	Optional (polypropylene)

This bag must not be subjected to drop tests when fully loaded i.e., 2240 lbs.

File No: HITE 01
Serial No: 281;81

DEPARTMENT OF INDUSTRY

NATIONAL ENGINEERING LABORATORY
East Kilbride, Glasgow

Certificate of Test

Certificate No. 2771

Date of Test . 19 January 1982

Tester's Name . D S Thomson

Component tested including maker's or other serial or type numbers . FIBC HIN 104 Test No 3

Tested on behalf of . Transac IBC Ltd

Maker . Bulk Lift International Inc USA

Constructional details of component . 85^2 x 112 cm flexible intermediate bulk container of woven polymer lifted on 4 webbing loops sewn to top of double thick corner seam. 8 ounce Amoco fabric.

Type of Test . Tensile to destruction - performance test to Appendix 'A' draft BS Specification

Test conditions . Top restraint

Test machine used . 400 kN A frame

Test results . Warp tapes below loop attachment parted at a force of 70.79 kN (7220 kgf)

15,920 pounds -- 5:1 safety factor +

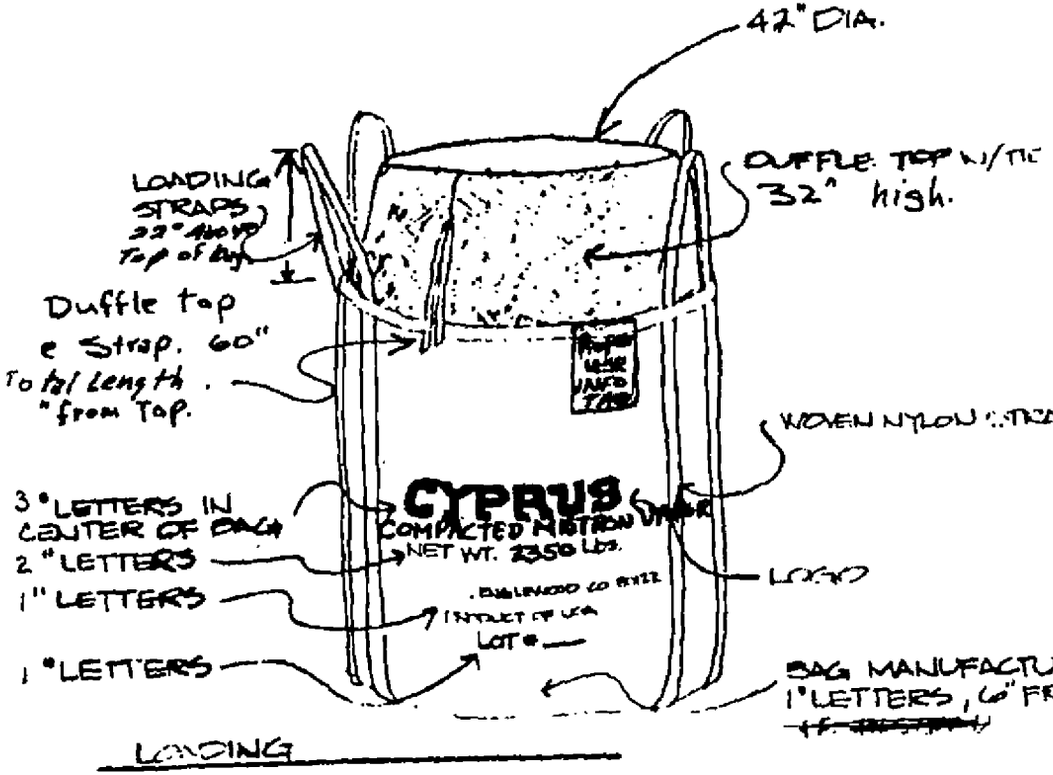
Conclusions and recommendations if any .

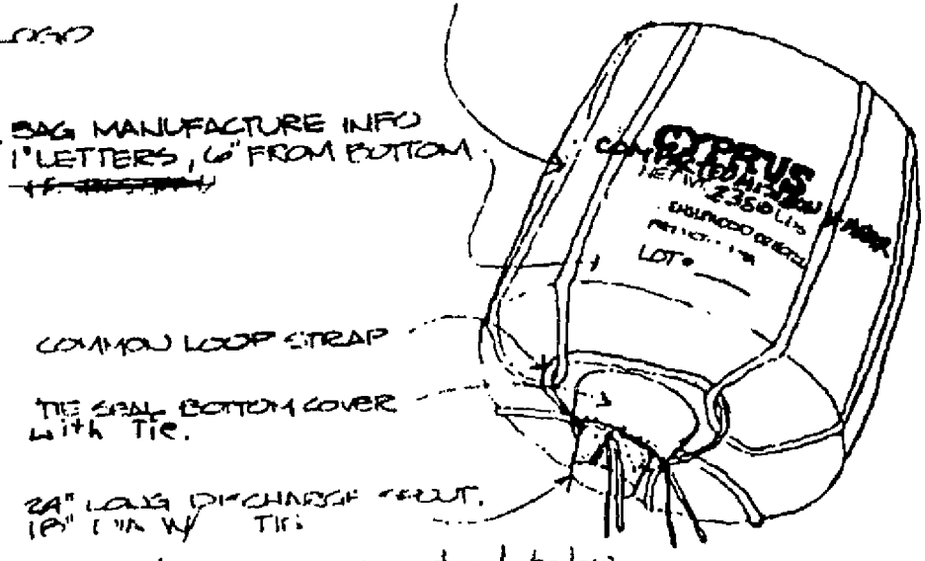
N. Paton

ATTACHMENT

Empty diameter - 42 inches - approximately
Empty height - 42 inches - approximately
Empty weight - 7 pounds - average

Filled diameter - 44 inches
Filled height - 44 inches
Filled weight - 2350 pounds





LEHMAN 01236

BULK BAG SPECIFICATIONS

CYPRUS INDUSTRIAL MINERALS COMPANY

1. Bag: See Attachment No. 1

a.	Material:	5½ ounce coated polypropylene
b.	Color:	Grey
c.	Supplier:	Amoco Fabric Company
d.	Capacity:	38 cubic feet, 2,350 pounds
e.	Diameter, Empty:	Approximately 42 inches
f.	Diameter, Filled:	44 inches
g.	Height, Empty:	Approximately 42 inches
h.	Height, Filled:	44 inches
i.	Weight, Empty:	7 pounds average
j.	Weight, Filled:	2,350 pounds
k.	Seams:	Double fabric thickness and lock stitched for maximum strength
l.	Top Lip:	Must be a double seam with a minimum 1½ inch wide strap attached for top of bag seam strength to attach lifting straps to for stabilization during transit
m.	Fabric Cuts:	Must be heat cut to prevent unraveling

2. Lifting Straps: See Attachment No. 1

a.	Number per Bag:	Four (4)
b.	Color:	White
c.	Material:	(Automobile seat belt) or equivalent material having sufficient strength to carry loaded bag with a safe margin
d.	Lifting Loop:	Must extend 22 inches above top horizontal seam for easy center point lifting

pc: D.C. Schantz
3-9-84

3. Duffle Top: See Attachment No. 1

a.	Material:	3½ ounce coated (.15 mil) woven polypropylene
b.	Color:	Translucent
c.	Texture:	Soft
d.	Diameter:	Approximately 42 inches
e.	Height:	32 inches
f.	Tie Strap:	60 inches long, midpoint of tie strap is attached 8 inches below top edge of duffle top

4. Discharge Spout: See Attachment No. 1

a.	Material:	3½ ounce coated (.15 mil) woven polypropylene
b.	Color:	Translucent
c.	Texture:	Soft
d.	Diameter:	18 inches
e.	Length:	24 inches
f.	Tie Strap:	Midpoint of strap must be securely attached to discharge spout. NOTE: Loose tie strap must not extend below the extended discharge spout when untied. Tie strap must be bow tied for easy untieing.

5. Bottom Seal: See Attachment No. 1

a.	Material:	5½ ounce coated polypropylene
b.	Color:	Grey
c.	Tie Strap:	Midpoint of tie strap must be securely attached to bottom seal and tied in bow. NOTE: Loose tie strap must not extend below the extended discharge spout.

LEHMAN 01238

6. Bag Printing: See Attachment No. 2

   a. Ink Color: Black

	TEXT	LETTER SIZE
b.	CYPRUS	3 inch letters in center of bag
c.	COMPACTED MISTRON VAPOR	2 inch letters
d.	NET WEIGHT 2,350 POUNDS	2 inch letters
e.	ENGLEWOOD, CO 80112	2 inch letters
f.	PRODUCT OF USA	1 inch letters
g.	LOT #	1 inch letters

7. Instructions Sheets: See Attachment No. 2

   a. Material: Tynec

   b. Color: White

   c. Dimensions: 7 x 8 inches

   d. Ink Color: Red and Black

   e. Number of Sheets: Two Sheets, (1. Handling Instructions and 2. Storage Instructions)

   f. Placement of Sheets: Instructions sheets are stitched to the top lip of bag.

8. General: All excess material from stitching and fabrics must be removed from bag. All staples used in fabrication must be removed from bag and straps.

9. Packing and Shipping Instructions

   a. One hundred (100) empty bags wrapped in plastic sheet and secured by ~~steel~~ strapping per pallet.

   b. Carrier and routing to be provided by Cyprus Industrial Minerals Company.

   c. Destination: Cyprus Industrial Minerals Company
   Willow Creek Highway
   Three Forks, Montana 59752

Bonar Industries, Inc.

Bonar Industries, Inc
7951 Industrial Highway
P.O. Box 10196
Macon, Georgia 31297
(912) 784-9040
Telex 80-4505

MULOX SPECIFICATIONS

SQUARE CONTAINER

CODE	APPROXIMATE VOLUMETRIC CAPACITY CUBIC FEET	APPROXIMATE FILLED DIMENSIONS DIAM. BY HT.
S15	15	44x18
S20	20	44x23
S25	25	44x29
S30	30	44x34
S35	35	44x40
S40	40	44x46
S45	45	44x52
S50	50	44x57
S55	55	44x63
S60	60	44x69
S65	65	44x74
Base Dimension	35"x35"	44" Diameter

RECTANGULAR CONTAINER

CODE	APPROXIMATE VOLUMETRIC CAPACITY CUBIC FEET	APPROXIMATE FILLED DIMENSIONS WIDTH BY LENGTH BY HT.
R30	30	44x52x28
R35	35	44x52x32
R40	40	44x52x36
R45	45	44x52x40
R50	50	44x52x45
R55	55	44x52x50
R60	60	44x52x54
R65	65	44x52x59
R70	70	44x52x63
R75	75	44x52x68
R80	80	44x52x73
R85	85	44x52x78
Base Dimension	35"x45"	49"Diameter

STANDARD SPOUT DIMENSIONS - TOP FILLER OR BOTTOM DISCHARGE

Diameter by length

12"x18"
14"x18"
18"x24"

*NOTE: Custom sizes are available at your request.

MATERIAL: 100% polypropylene. Has a minimum tensile strength of 300 lbs. per square inch in both directions. Material Weight is 6.5 ozs. per square yard.

COATING: 1.5 Mil polypropylene on inside of MULOX, if desired.

REINFORCING: Nylon cord woven in place to provide an additional 2500 lbs. of tensile strength.

U.V. STABILITY: 70% strength retention after 1200 hours of direct exposure. (FEDERAL TEST METHOD STANDARD NO. 191 METHOD 5304)

Bonar Industries, Inc.

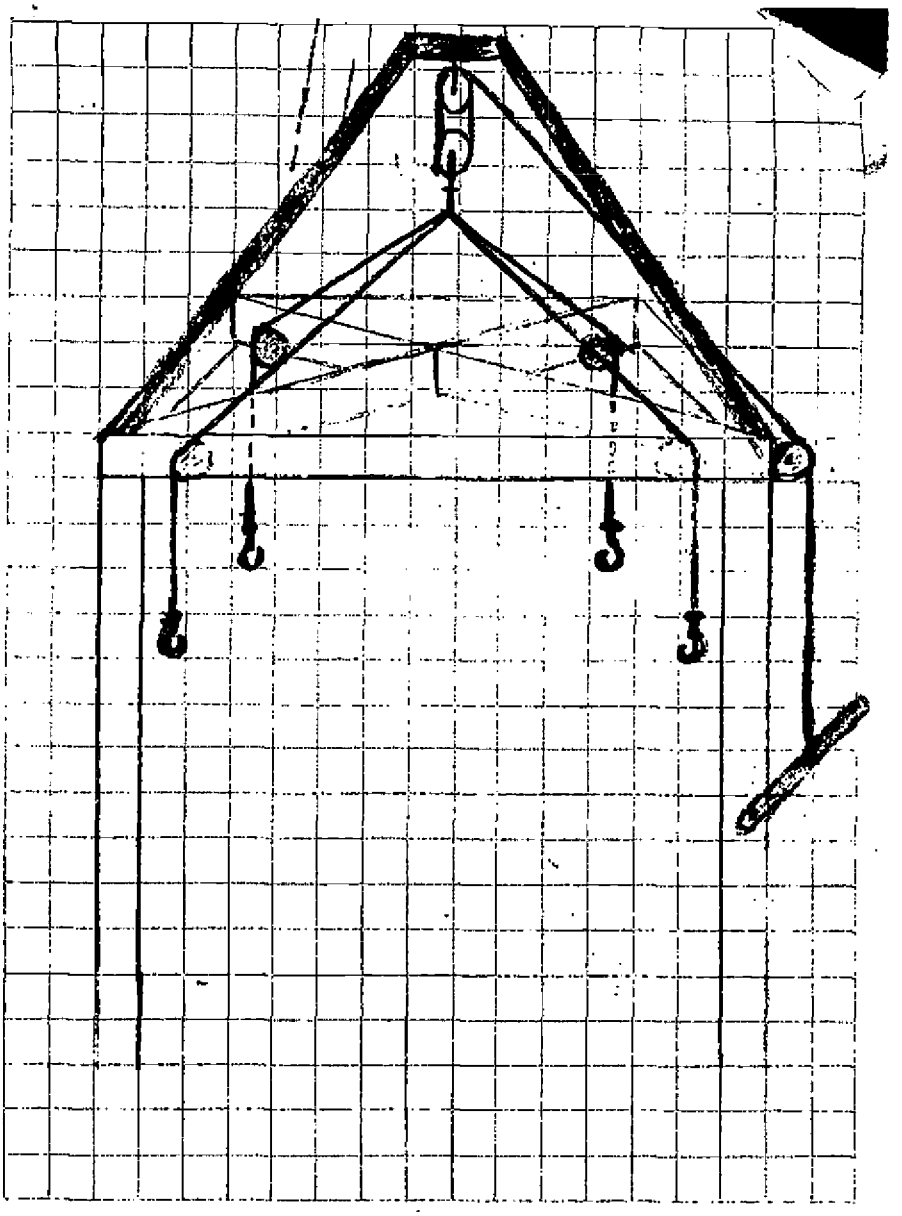
Bonar Industries, Inc.
7951 Industrial Highway
P.O. Box 10196
Macon, Georgia 31297
(912) 784-9040
Telex 80-4505

July 30, 1982

PATENT APPLICATION NUMBER - U.S.A. 1S64850

MATERIAL:	BASE FABRIC 100% POLYPROPYLENE
REINFORCING BANDS:	100% NYLON TIRE CORD WOVEN IN PLACE TO PROVIDE AN ADDITIONAL 2500 LBS. TENSILE PER REINFORCING BAND IN EXCESS TO THAT OF THE BODY MATERIAL ITSELF.
WEAVE:	STANDARD
COUNT:	WARP - 18 ENDS X 1150 DENIER WEFT - 13 ENDS X 2000 DENIER
TENSILE:	300 LBS./IN. EITHER DIRECTION
TEAR:	(WHERE APPLICABLE) 60 LBS. EITHER DIRECTION
BURST:	600 LBS.
COATING:	(WHERE APPLICABLE) 1.5 MIL POLYPROPYLENE
U.V. STABILITY:	70% STRENGTH RETENTION AFTER 1200 HOURS OF DIRECT EXPOSURE.
CHEMICAL RESISTANCE:	INERT TO MOST CHEMICALS. CHECK WITH BONAR PACKAGING LTD. REPRESENTATIVE ON ANY APPLICATION IN QUESTION.
TEMPERATURE RESISTANCE:	OPERATING TEMPERATURES -50°F TO 200°F (-46°C TO 93°C)

* Mulox is the registered U.S.A. Trademark of Bonar Industries, Inc., Macon, Ga.



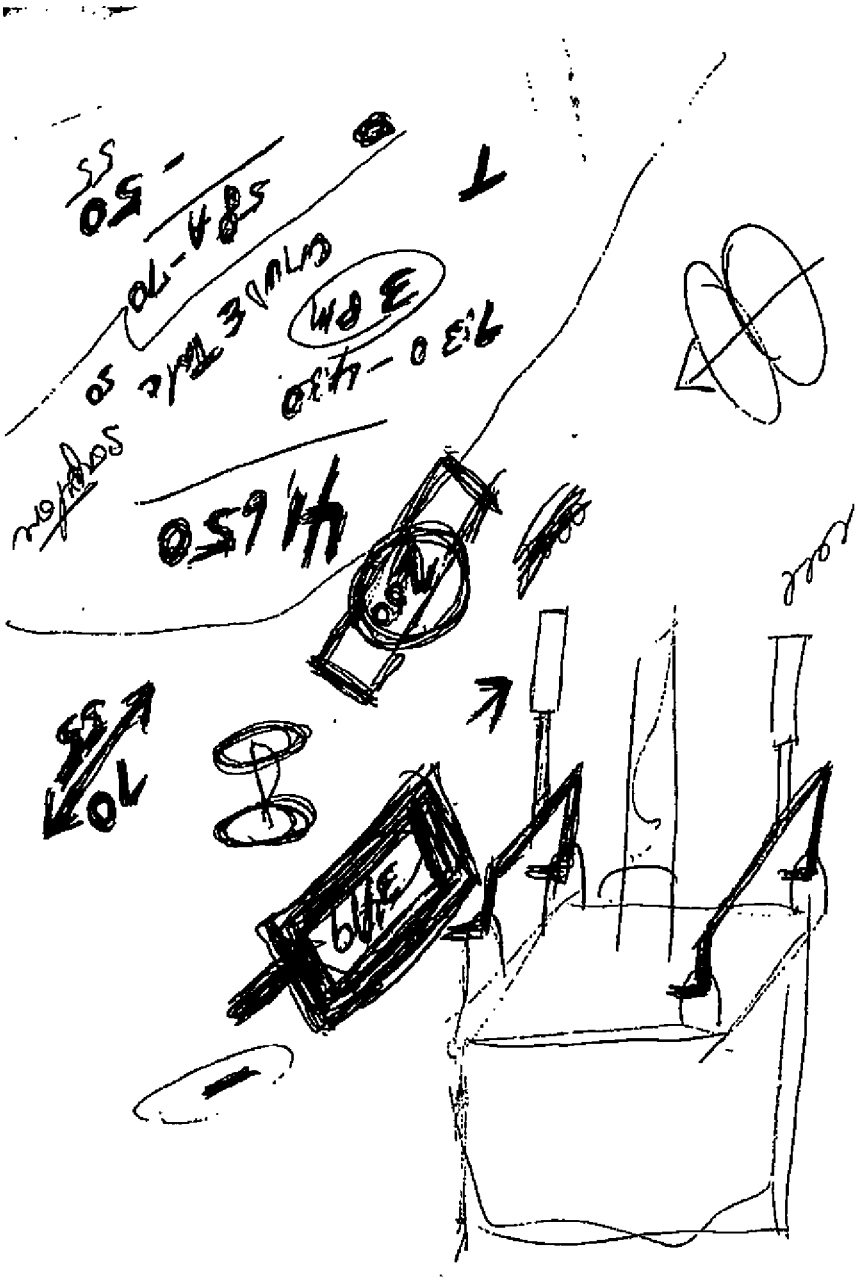
BENEDICT-MILLER, INC.

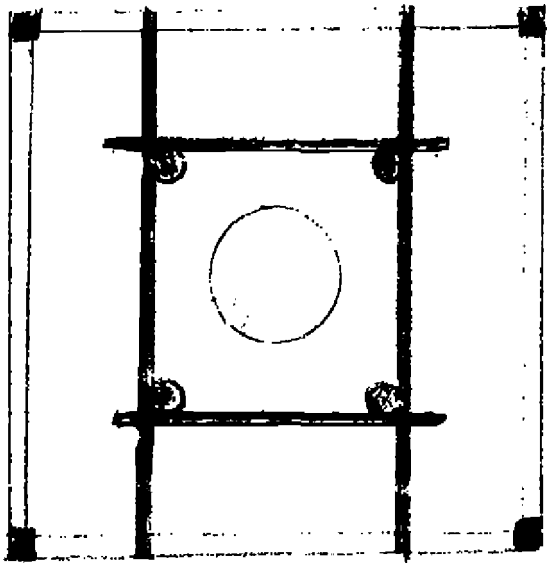
"KUSTOM KUT" — SAW CUT ALLOY,
CARBON, TOOL STEEL, FLATS.

MARIN AVE. AND ORIENT WAY P.O. BOX 912 / LYNDHURST, N.J. 07071
NEW JERSEY (201) 438-3000 / 623-6400 • N.Y. (212) 564-5206

FOUNDED 1940

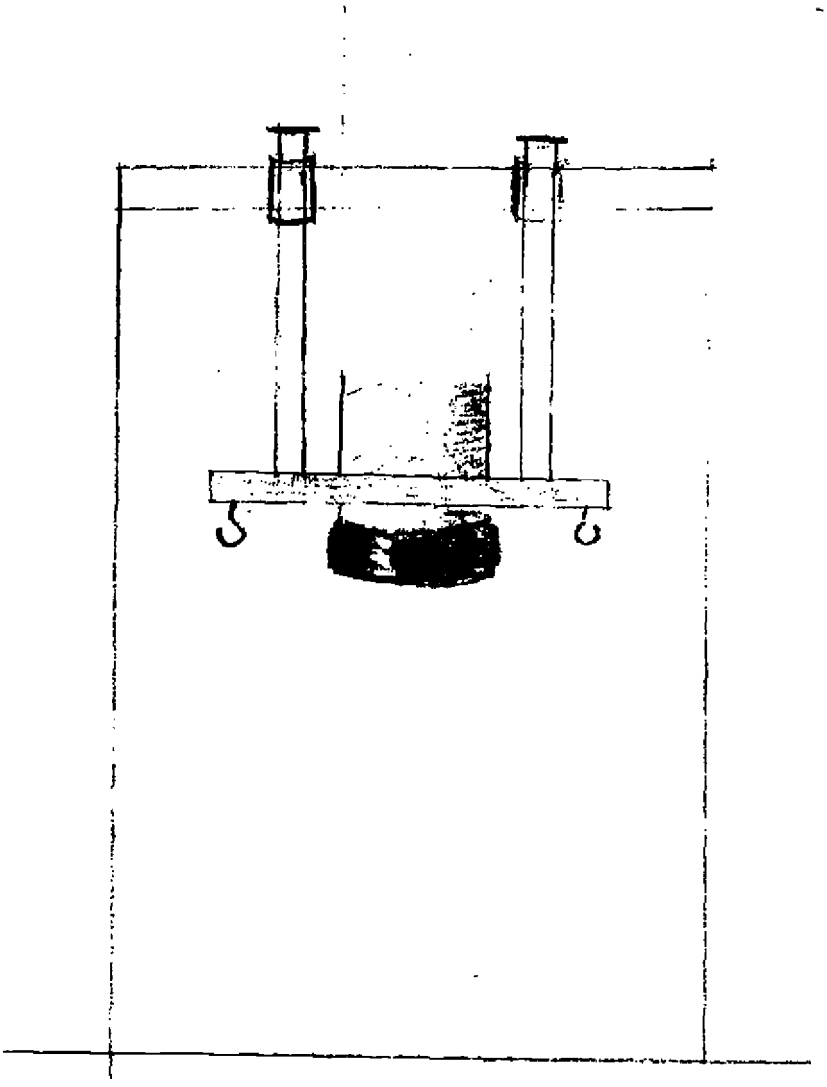
YOUR SERVICE CENTER FOR STEEL AND HEAT TREATING





FAITOUTE STEEL COMPANY, INC.

182 FRELINGHUYSEN AVE. • NEWARK, N. J. 07114
Hot Rolled Bars • Cold Finished Bars • Bar Shapes • Structural Shapes
Carbon & Code Plates • Diamond Plates • Carbon Sheets • Expanded Metals
Drill Rods • Flat Ground Stock • Alloys • Flexangle
"Complete Processing Facilities"
Newark, N.J. (201) 242-1000 • New York and Pennsylvania 1-800-524-1203



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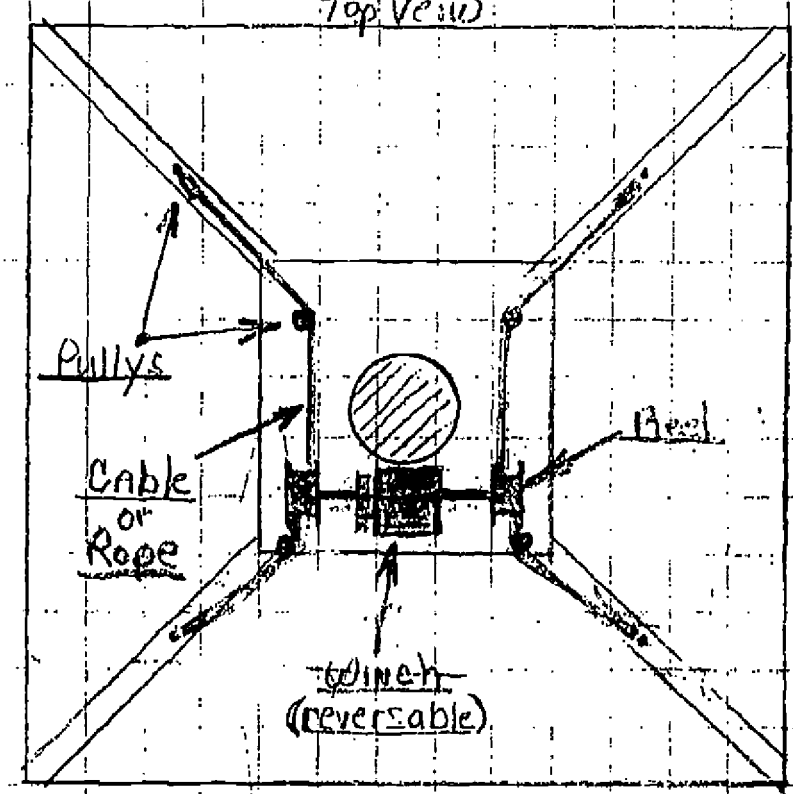
Bulk Machine



12/27/84

BENEDICT-MILLER, INC.

"KUSTOM KUT" — SAW CUT ALLOY,
CARBON, TOOL STEEL, FLATS.

MARIN AVE. AND ORIENT WAY P.O. BOX 912 / LYNDHURST, N.J. 07071
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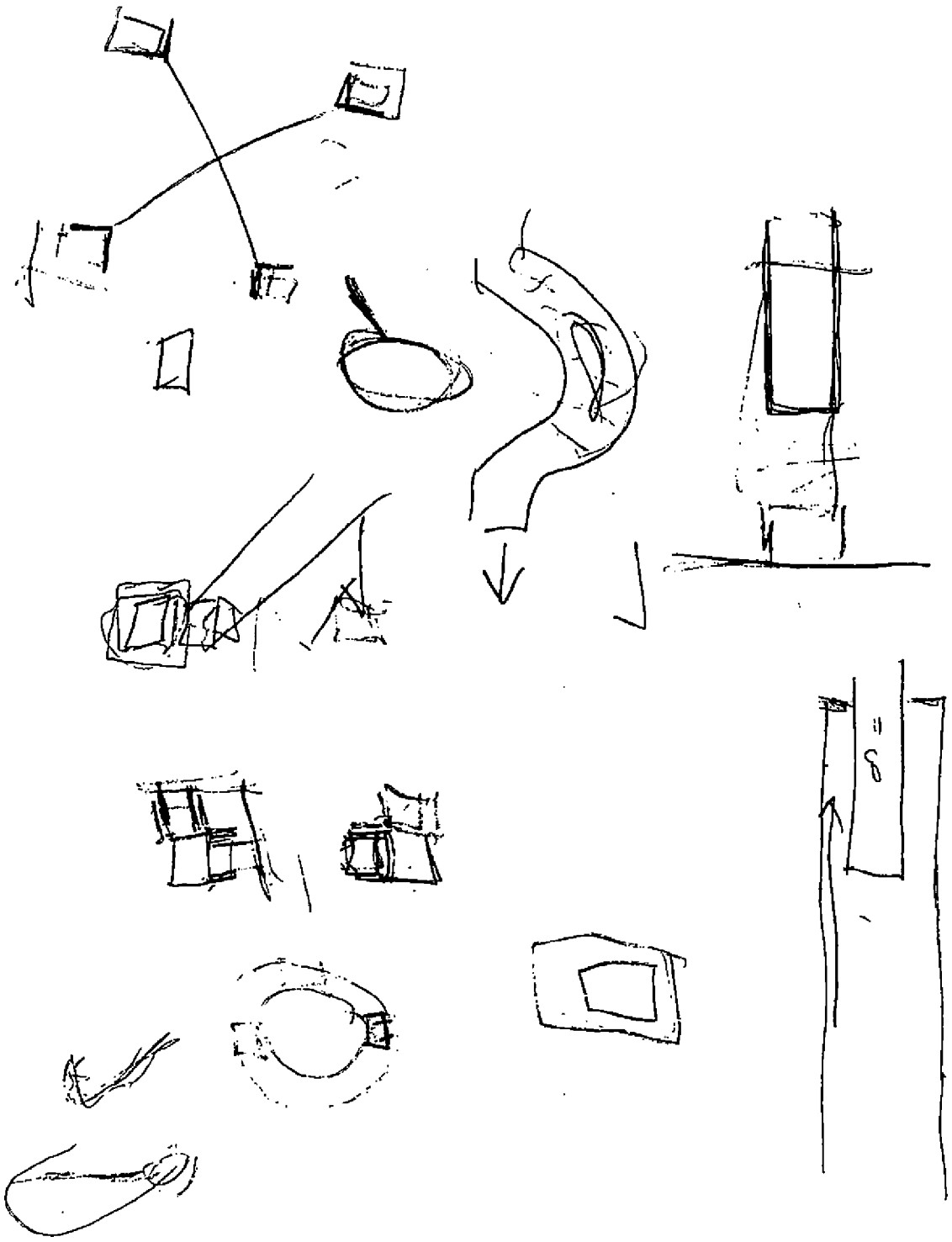


F. D. A. Approved

The ALL-FLOW® Bulk Transportation System

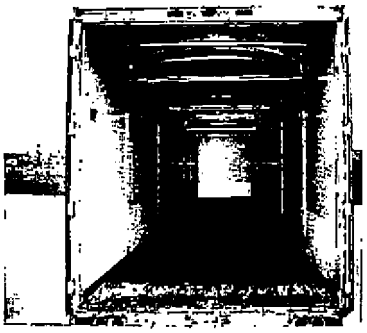
The All Flow® Bulk Transportation System:

After three years of research, development and testing, the revolutionary All-Flow® Bulk Handling and Storage System - proven effective in numerous industrial applications - is now being adapted for a multitude of transportation modes - including truck, rail, barge or shipboard.

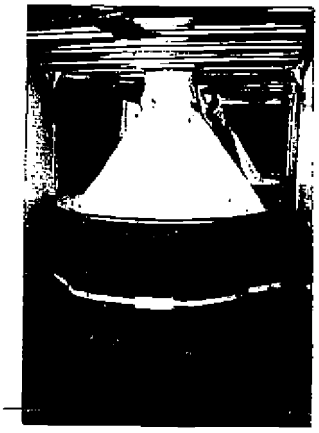
The All-Flow® Bulk Transportation System, when installed in a conventional dry van, gives it the capability to handle both dry bulk and piece good cargoes, or both simultaneously.

The patented All-Flow® System features an inflatable membrane, supported by a frame, engineered to act as a retractable storage unit. When there is a demand for product discharge, the membrane inflates under very low pressure, pushing the product past its angle of repose, gently pushing and rolling it to the discharge opening. The All-Flow System is controlled through a single self-contained panel. The only required utilities are 115V single phase, 60 Hertz. DC power optional.

Now, the All-Flow® Bulk Transportation System extends the many advantages and ease of operation of the basic storage and handling system to meet the needs of bulk goods transporters. Already in use, the transportation system, easily installed, gives you unheard of flexibility in hauling bulk cargo.



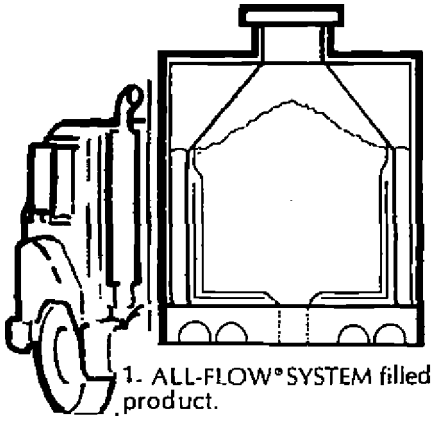
1. When not in use, the system, which adds approximately 1500 pounds in weight to the trailer, occupies less than 8 inches of the trailer ceiling.



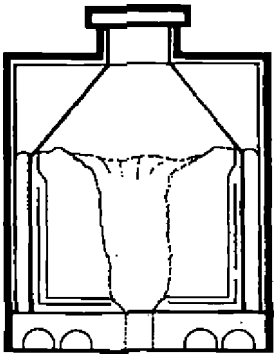
2. The All-Flow® Bulk Transportation System is automatically lowered from the ceiling in an operation usually requiring less than 15 minutes. (front unit shown.)

3. After converting the trailer from conventional to bulk configuration, the All-Flow® storage units are top-loaded.

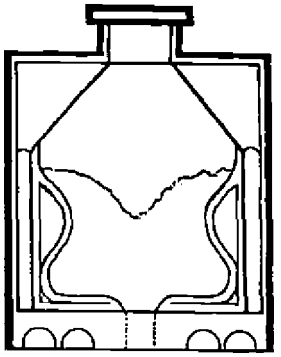
4. Weathertight floor module is opened and discharge spout is extended for hookup with conveyor.



1. ALL-FLOW® SYSTEM filled with product.



2. During initial product discharge, a rat-hole forms creating a potential interruption in product flow.



3. Inflation of the membrane results in the collapse of the rat-hole and continued product flow.

The All-Flow® Syste

For many companies, delivering piece goods on a palletized load usually means an expensive empty return trip. If only a carrier were able to return with a load of raw materials, transportation costs could effectively be cut in half.

Now, there's a practical, economically sound solution to this age-old dilemma - the All Flow® Bulk Transportation System.

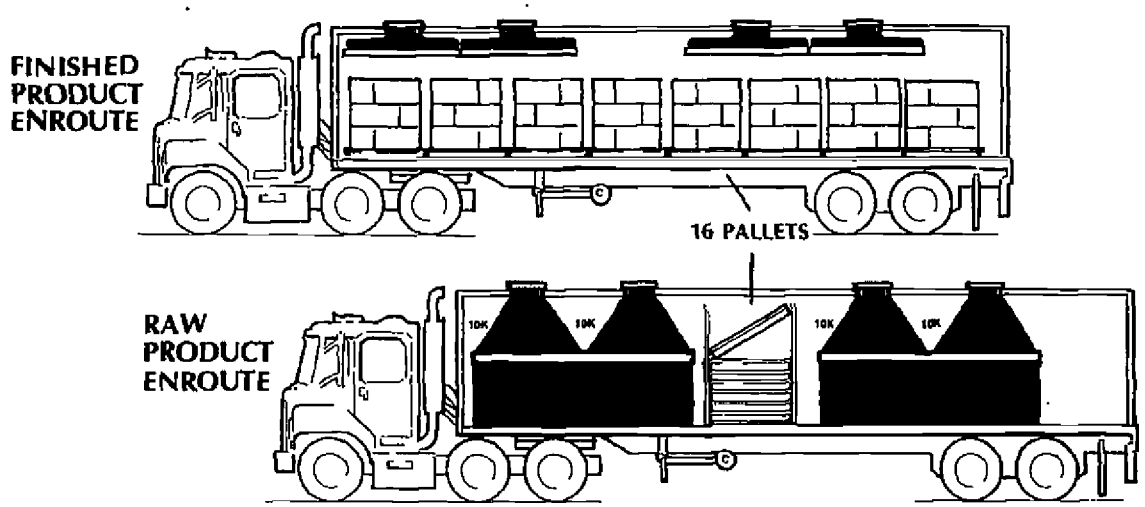
The system is as simple to install as it is to use. Once installed, you can change your conventionally-configured van trailer to a bulk configuration in about 15 minutes.

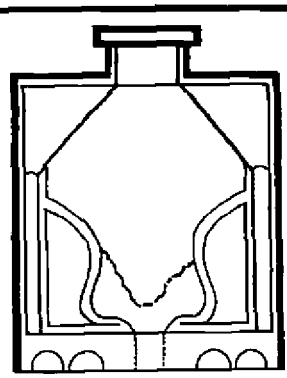
And, with 4 All Flow® bulk storage units, you can haul up to 4 different materials. Or, use only two storage units, and combine a bulk and piece goods load - unprecedented versatility!

ADVANTAGES OF THE ALL-FLOW® BULK TRANSPORTATION SYSTEM:

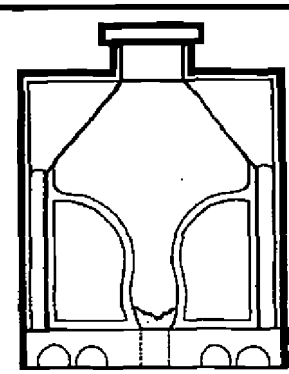
- Provides capability to handle both bulk and piece good cargoes with the same trailer - even simultaneously.
- Increases backhaul potential, and allows one trailer to handle up to four different bulk cargoes.
- Converts from bulk mode to piece good mode, and back again, quickly and easily, using only one person, and is easily cleaned and maintained.
- Standard system weighs approximately 1500 pounds, and is specially engineered for toughness and durability. (Lightweight systems available.)
- Utilizes approximately 6" of the ceiling area of a van trailer.
- Installs in both new and used conventional van trailers, and can be removed and reinstalled in another van trailer.
- Provides storage space for exchange pallets when bulk configuration is in use. (System occupies approximately 2/3 of available space.)
- Handles almost all dry bulk materials, including polyester flake, poultry meal, cake mix, dextrose, salt, plastics, etc.
- Discharge rate is governed by the capacity of your pneumatic or mechanical conveyor; discharge hookup is easily interfaced with standard pneumatic and mechanical conveying equipment.
- Unloading process does not add heat or moisture to the bulk material as in standard pressurized bulk tankers.
- Provides greater control over incoming bulk materials.
- Trailer itself can be used as a portable bulk storage supply.
- Factory or on-site installation available.

TYPICAL VEHICLE APPLICATION

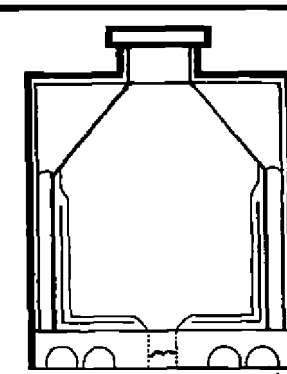




4. Membrane inflates as required, continually rolling and lifting product towards the discharge opening.



5. Product is completely discharged, membrane will now automatically deflate.



6. ALL-FLOW SYSTEM ready to be collapsed and retracted back to the ceiling position.

n : How it works

ALL-FLOW, Inc.

All-Flow Inc.'s full-scale test facility, located in suburban Buffalo, New York, is available for your inspection.

The All-Flow® Bulk Transportation System provides the ultimate in flexibility to shippers who must transport bulk and piece good cargoes. You can see that the system is easily operated, and that it will soon pay for itself in eliminated empty backhauls alone. If you are making even one empty backhaul of 500 miles or more every other week, you can't afford to be without the All-Flow® Bulk Transportation System.

To fully appreciate the uniqueness of the system, we urge you to spend a day at our full-scale test and demonstration facility. You'll be amazed at the utility and effectiveness of the All-Flow® Bulk Transportation System. A videotape demonstration is also available.

COLEMAN
EQUIPMENT, INC.
525 CHANCELLOR AVE
IRVINGTON, N.J. 07111
TEL. 201-375-6000

materials handling equipment · processing equipment · conveying systems

© All-Flow Inc., 1984. patents pending

50%

(OK) 1 Hole B 1/3 3x3
(OK) 2 SLICE 30" long [illegible] OK
(OK) 3 5x3 B 1/3
4 TOP SEAMS RIPPED [illegible]
(OK) 5 + 3x3 [illegible]
(OK) 5 OK
(OK) 6 TOP TORN
(OK) 7 OK
(OK) 8 OK
(OK) 9 3x3 B 1/3
(OK) 10 2x2 B 1/3
(OK) 11
(OK) 12
(OK) 13
(OK) 14
(OK) 15
(OK) 16
(OK) 17 TOP RIPS 5 PLACES + CORNER TOP
18 TOP RIPPED (corner) need patch
(OK) 19
(OK) 20

66 Tube
42
42

BULK LIFT

INTERNATIONAL INCORPORATED

455 Maple Avenue • Carpentersville, IL 60110
312/428-6069 Telex 282-566

INVOICE NO 5- 4926

INVOICE DATE 5/11/84

P.O. NUMBER	SHIP VIA	SHIP DATE	B/L NUMBER
45199	McLean Trucking	5/8/84	L 03595

SOLD TO

Cyprus Industrial Minerals
651 Metuchen Rd.
So. Plainfield, New Jersey 07080

Attn: Keith Lehman

SHIP TO

TERMS: NET 30 DAYS UNLESS OTHERWISE SPECIFIED.

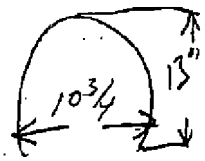
QUANTITY	DESCRIPTION	PRICE	TOTAL AMOUNT
42	Bulk Lift semi-bulk containers (coated) Style BL-2000, Size 35 X 35 X 76	$22.35 ea.	$938.70
		Freight chgs.	61.50
			$1,000.20

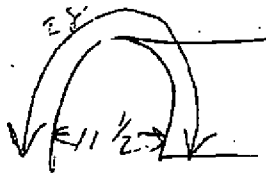
SELLER REPRESENTS THAT WITH RESPECT TO THE PRODUCTION OF THE ARTICLE & THE PERFORMANCES OF THE SERVICES COVERED BY THIS INVOICE, IT HAS FULLY COMPLIED WITH SECTION 12(A) OF THE FAIR LABOR STANDARD ACT OF 1938, AS AMENDED.

PAY LAST AMOUNT

LEHMAN 01253

yellow = 10"

10 3/4 = 

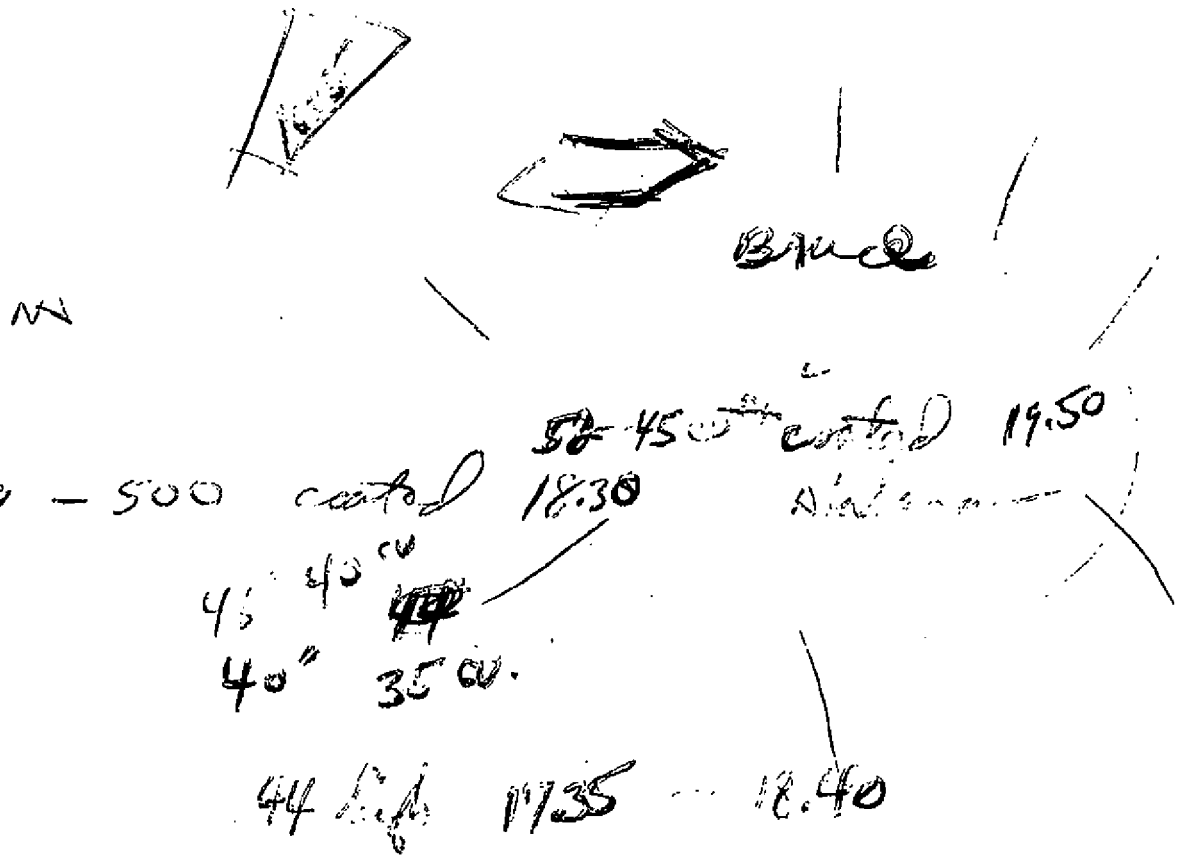


#2 Blue
4" stitch

13" between stripes

35

Label samples



Bruce

NN

52 - 45 cu coated 19.50

99 - 500 coated 18.30 [illegible]

45 40 cu ~~44~~

40" 35 cu.

44 high 17.35 - 18.40

6.5 - 7 oz. SQ. YRD

[illegible] - 40 Trips

8 oz. 44 20.40

52 21.65

[illegible] DS [illegible] 2" [illegible] Spout

Fabric [illegible]

18 .50 Not spout cover

14" spout

~~10 [illegible]~~

(5) 12/30

2" Webbing

20 —

1. 14 sprout 18 W/ Felcro
No cover —
8 oz. BLUE —
WHITE 4" 4 SIDE
9X6 stitched —
(14") TOP WHITE 14 DIA. 20 tie cord

57" 19.55
2.50
.25
.15
22.55

DE-AIRATER EUROPE
2 MV
82 coat
72

8 LKS.

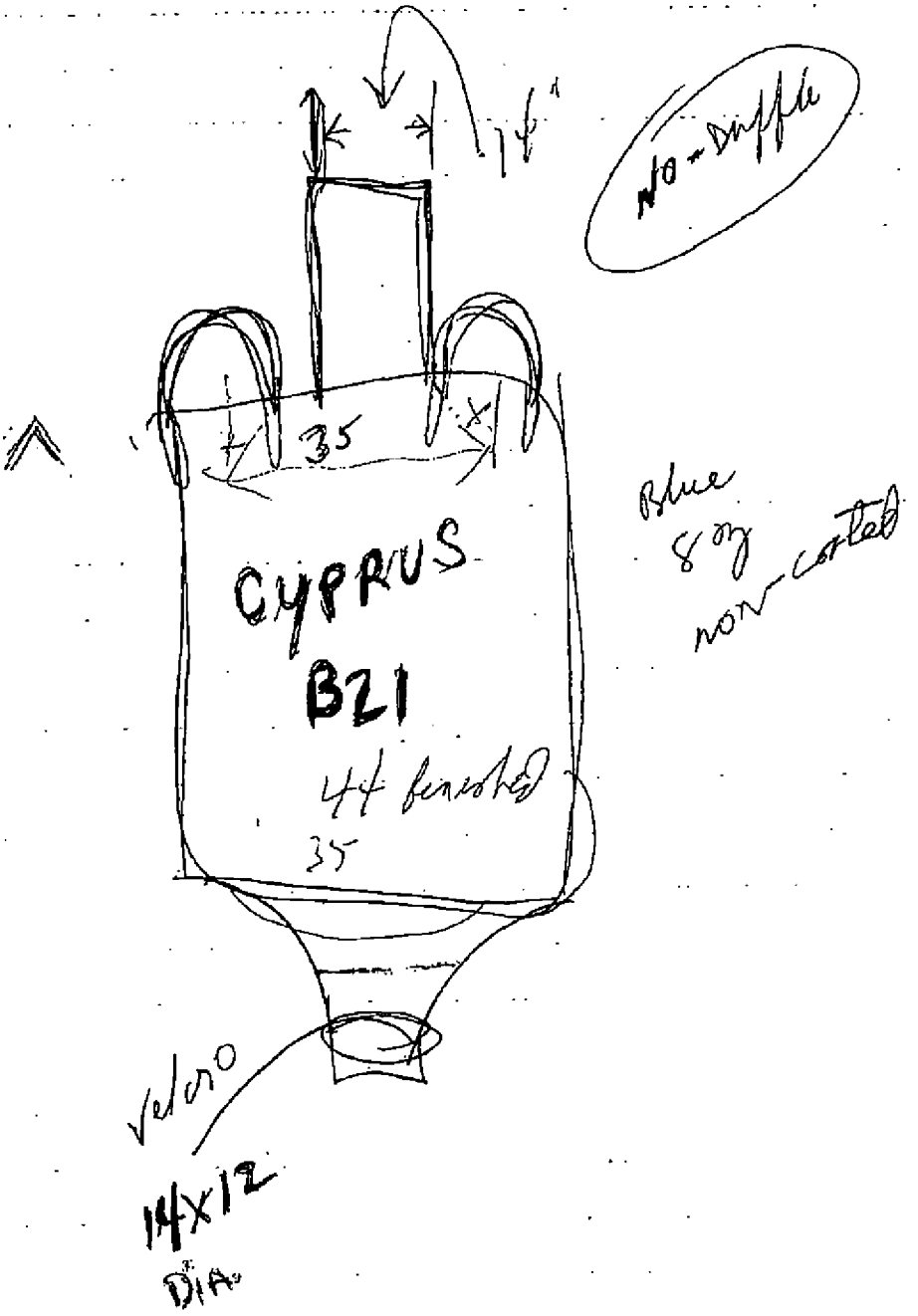
.1

Add 2000# Act stencil
Doc [illegible] + Fil 4 X 3¼
Trip #
Add → product of USA coated
1 SIDE stencil [illegible]

→ Duffle Tops?
→ 44 X 57 → all with [illegible]

20 LINER

STACKING FORK HEIGHT


14"
No - Duffle
35
CYPRUS
B21
44 finished
35
Blue
8 oz
non-coated
velcro
14X12
DIA.

BULK LIFT
INTERNATIONAL INCORPORATED
455 Maple Ave. • Carpentersville, IL 60110 • (312) 428-6059
Telex: 282-565

April 16, 1984

PLASTIC DOCUMENT pockets 9x6 28 in from TOP

J. P. Stevens Co.
Patrick Plant Highway 5E
Stuart, Va. 24171

Attn: Mr. Durand Hines

Dear Mr. Hines:

Pursuant to our recent discussion, I am enclosing information pertaining to the rope lock which would be available to be attached to the outlet spout on the bag that you are using. I am also sending a copy to Cyprus Industrial Minerals so that they are aware of your desires.

If we can be of any further assistance to you, please do not hesitate to contact me.

LINER IS PULLED THRU BOTTOM 18" THEN BOTTOM TIED. TO OPEN CUT OFF 18" OF BAG AND UNTIE

TIER RACKS 2-PARTS

SANDY DAHN

Sincerely,

Harry Wilke

Harry Wilke
BULK LIFT INTERNATIONAL INC.
Regional Sales Manager

HW:lg
enc.

Send samples Rope-Lock TY
SAME SIZE AS present Rope?
ANY SIZE
BAG LEAKS ?
HOLE PATCHES
PRINTING LOGO
POLY PROP W - WATER RESISTANT
SEW
GRIFFOLYN TAPE
COATED

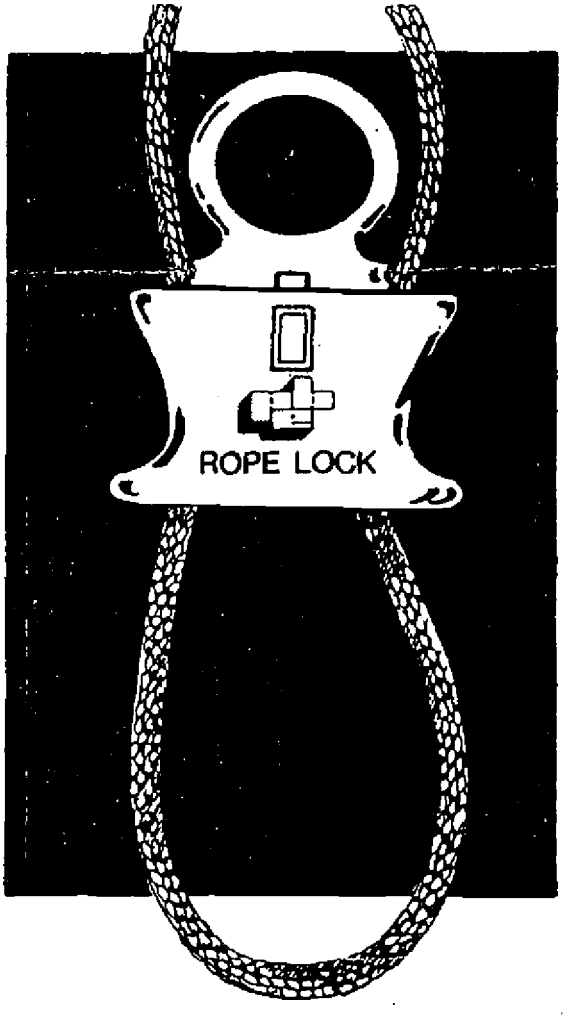
ANTI-SIV WEBING IN SEAMS

STENCIL .50/ WT. BY MANUFACTURER

35x35x96 = 65

ROPE LOCK

The Ropelock offers:



RUGGED DEPENDABILITY

.heat resistant
.chemical resistant
.able to withstand the extreme pressures of extractors and hydraxtors

ASSURANCE

."sure-bite" lock on rope holds fast -- no slipping
.self-locking -- doesn't let go until the ring is pulled

EASY AND EFFICIENT HANDLING

.easy to thread
.rope releases quickly by pulling on ring

LOW COST

.minimal investment for long-life product

The PBE ROPELOCK is designed for #6 rope.

PRODUCT NUMBER	DESCRIPTION	PRICE
8071	Heavy Duty Yellow Celcon Plastic For Use with #6 Rope	$1.50
8072	Heavy Duty #6 Rope (1000 Foot Spool)	$125.60

Also available from Principle Business Enterprises is a high quality #6 rope -- ideal for use with the R-1 Ropelock.
Minimum Order: 1000 ft. spool

A Product of

PRINCIPLE BUSINESS ENTERPRISES, INC.
Pine Lake Industrial Park•Dunbridge, Ohio 43414•419-352-1551

Distributed by:

Bonar Industries, Inc.

Bonar Industries, Inc
7951 Industrial Highway
P.O. Box 10196
Macon, Georgia 31297
(912) 784-9040
Telex 80-4505
Outside Georgia
1-800-841-4982

May 6, 1985

Cyprus Industrial Minerals Company
Talc Division
651 Metuchen Rd.
South Plainfield, NJ 07080

Attention: Mr. Keith B. Lehman

Dear Mr. Lehman:

Thank you for your phone call of Friday 3rd. and for the trial order you placed with us.

The price of the Mulox bags will be $23.60 with the stand-up straps and $21.60 each for the 15 bags without the stand-up straps. I have included a 9"x6" clear pocket that will be attached to the top seam, and we will stencil "CYPRUS" in 4 inch letters on all 4 sides in white ink.

If this blue material tends to sift too much for you, please let me know and we will arrange to have material made and coated for you. We do know that the coated fabric is satisfactory as your Three Forks operations have used this type of bags for many years.

As promised, enclosed is a copy of the new label Three Forks will be using on their bags. If you can utilize the same label it will help us with our order quantities. The drawing of the fork lift truck attachment will help you with your handling of the bags. If you want one made up to try, please let me know and I will gladly arrange for one to be made.

After we rang off I thought of a piece of equipment that is available from Europe that deaerates cement, and considered it may be of interest to you provided it will work with talc. It is the Falkenburg Horizontal/Vertical Screw Deaerating filling system. Apparantly it deaerates cement at the rate of 2 metric tonnes per minute, but the cost is quite high at about $25,000 per unit. You already have the fill/weigh station and the deaerator would work in line with your station. I believe our machinery division has a V.C.R. tape showing

the unit in use and I can try to obtain this for you if it is of any interest.

I hope the details passed onto you are of interest and helpful to you. Please call if we can be of any further help.

Sincerely yours,

Bruce Cuthbertson

Bruce Cuthbertson
President and General Manager

Enclosures

BC/je

Keith
FYI
CWN

BULK LIFT
INTERNATIONAL INCORPORATED
455 Maple Avenue
Carpentersville, IL 60110
312/428-6059 Telex 282565

April 16, 1985

Mr. Carl Nichols
Amoco Minerals Co.
RE: Cyprus Thompson Creek
7000 S. Yosemite St.
P.O. Box 3299
Englewood, Co. 80155

Dear Carl:

Attached is the confirmation of the quotation on the various bags we discussed today. Bruce Vernon is on vacation and asked that I get these out to you right away.

You mentioned getting some small trial orders out to the various plants so they could familiarize themselves with the bag. I think this is an excellent idea and we would be happy to send these out as soon as you give us the go ahead.

Please let me know if you have any questions Carl. Thank you for giving us this opportunity.

Sincerely,

Joseph L. Offenburger
Vice President - Sales

JLO:lg
enc.
cc: B. Vernon
B. Hopkins
H. Wilke

BULK LIFT
INTERNATIONAL INCORPORATED
455 Maple Avenue
Carpentersville, IL 60110
312/428-6059 Telex 282565

QUOTATION

Customer Amoco Minerals Co.
Re: Cyprus Thompson Creek
7000 S. Yosemite St.
P.O. Box 3299
Englewood, Co. 80155

Date April 16, 1985

Attention Carl Nichols

Container Capacity 45 Cu. Ft., 55 Cu. Ft., 65 Cu. Ft.
35 cuft. 35x35x41

Container Size
45 Cu. Ft. -- 35" X 35" X 51"
55 Cu. Ft. -- 35" X 35" X 61"
65 Cu. Ft. -- 35" X 35" X 71" — yours is 76" so it must be a 70 oz 7

Container Features
BL-2000, bags manufactured from 6.25 oz. white woven polypropylene
BL-3000, bags manufactured from 8 oz white woven polypropylene

Includes: four lifting loops, one safety band, one 14" X 18" inlet top, one 14" X 18" 'C' discharge outlet. Liner optional.

Order Quantity / Price

		BL-2000		BL-3000	
45 Cu.Ft.	50	$16.55	50	$17.80	
	100	$16.05	100	$17.30	
55 Cu. Ft.	50	$17.35	50	$18.85	
	100	$16.85	100	$18.30	
65 Cu. Ft.	50	$18.45	50	$20.10	
	100	$17.90	100	$19.50	(note: add $1.15 for inserted liner)

Delivery Allow 2 - 3 weeks lead time

F.O.B. Our plant, Carpentersville, Il.

Terms Net 30 Days

Respectfully submitted,

Joseph L. Offenburger

KARLA SHATZER
Administrative Assistant

1150 B. DAVIS RD.
ELGIN, IL 60120

(312) 742-6600

ATLAS BAG COMPANY INCORPORATED

(312) 742-6800

1150 B DAVIS RD.
ELGIN, IL 60120

Keith Lehman
Cyprus Minerals
651 Metuchen
South Plainfield, N.J. 07080

January 21, 1986.

Dear Keith;

Thank you very much for taking the time to speak with me on the telephone earlier today. From the information you gave me, I was able to figure the enclosed price quotation for your semi-bulk, polypropylene bags. I have ordered your sample bag which you should receive early next week. I feel this is a very strong bag, and should hold up very well to your recycling . The bag does not have your stencil on it, however I have included it in your price quotation. I have also enclosed my business card, and if you have any questions or comments, please do not hesitate to call.
Thank you for your time and consideration.

Sincerely;

Karla Shatzer

Karla Shatzer
Administrative Assistant

ks
enclosures

ATLAS BAG COMPANY, INC.

Quotation Form

Date: January 20th, 1986.

Company: Cyprus Minerals - New Jersey

Attention: Keith Lehman

We are pleased to submit our price quotation for your bulk bag specifications. It would be appreciated if you would compare the quotation with your requirements as any discrepencies can affect the price.

Bag dimensions: 35" x 35" x 60"

Fabric data: 8oz. woven polypropylene, laminated coating

Inlet: 14" diameter x 30", 8oz. coated fabric

Outlet: 14" diameter x 18", 8oz. coated fabric, Velcro strap release

Lifting loops: stand up loops, at four corners

Liner data: no liner

Stencil: Cyprus four sides, in 4" block letters, also on one side Net Weight... Product of USA

Other features: Sift proof seams
Instruction label sewn under safety band

Price: 1 - 100 bags $23.80 each
over 100 - 500 bags $23.65 each; over 500 - 1000 bags $23.50

Delivery: 10 - 14 days after receipt of order

Respectfully Submitted;

Karla Shatzer

SALESMAN: HW

WORK ORDER #: S-4926 5/11/84

COMMISSION:

OBRARA / LL TO — ~ BULKLIFT PLANT ORDER ~

ENTREGARA / SHIP TO

FECHA / DATE: 4-13-84

CONTACTO / CONTACT	Keith Lehman	CONTACTO / CONTACT	
CLIENTE / CUSTOMER	Cyprus Industrial Minerals	CLIENTE / CUSTOMER	
DIRECCION / ADDRESS	651 Metuchen Road	DIRECCION / ADDRESS	Same
	So. Plainfield, N.J. 07080		
NUMERO DE TELEFONO / PHONE No.	201/754-4880	NUMERO DE TELEFONO / PHONE No.	
		NUMERO DE ORDEN CLIENTE / CUSTOMER ORDER No.	45199

MEDIDA DE LA BOLSA / SIZE OF BAG: 35 X 35 X 76 70 cu.ft.

QUANTITY: 42

MODELO / MODEL: BL-2000

DESCRIPCION DE LA BOLSA / DESCRIPTION OF BAG: Coated fabric

PARTES / PARTS	CONSTRUCCION / CONSTRUCTION
CINTAS / LOOPS 4	36 x 2
FALDA / SKIRT OR INLET SPOUT	DIA. 14 x 18
CINTAS / TIES	TOP HAT TH + outlet
Gorro a lo Redondo / OUTLET DIAMETER & LENGTH	14 x 18 ("C") → OUTLET Spout w/ cover
IMPRENTA / PRINTING	——— CYPRUS
Banda de Seguridad / SAFETY BAND	150 x 1½
Medida de la Linea Plastica / POLYLINE SIZE	———

9x6 document pouch located in center of bag

INVOICE INFORMATION

1 Bundle @ 42 Bags

260 #

~~Truck~~ McLean Trucking

FECHA SOLICITADA / PROMISED SHIP DATE: 4-23-84	FECHA DE ENTEGRA / DATE SHIPPED
FECHA TERMINACION / OATE COMPLETED	TRANSPORTACION / CARRIER: McLean
CONTIDAD MANDADA / QUANTITY SHIPPED	PRECIO / PRICE
BALANCE	

NOTE: Ship prepaid and add

LEHMAN 01267

Sherman Andrus

Large Bulk Bags:

91.1 oz material
$22.18 each per 100 Bags
50 Bags 25¢ more.

35 x 35 x 52
6.5 oz material
$17.31 each per 100 Bags
50 Bags 25¢ more

35 x 35 x 52
9.1 oz material
$19.46 per 100 Bags
50 Bags - 25¢ more

Self Stand up straps
+ 1.50 per bag.

SHIPPING SYSTEMS/BULK-PACK, INC.

POST OFFICE BOX 2371
WEST MONROE, LOUISIANA 71294-2371
1-800-643-1568

TO	Cyprus Industrial Minerals Co. 651 Metuchen Road South Plainfield, NJ 07080 Attn: Keith Lehman, Mill Superintendent	DATE: Dec. 10, 1985 YOUR INQUIRY DATED: PROPOSED SHIPPING DATE: Your request SALESMAN: Sherm Andres	Please indicate this number when ordering TERMS: 1% 10, Net 30 days TO BE SHIPPED VIA: Truck F.O.B.: Denison, TX	PDD.	COL.: XX

HERE IS OUR QUOTATION ON THE GOODS NAMED, SUBJECT TO THE CONDITIONS NOTED:

CONDITIONS: The prices and terms on this quotation are not subject to verbal changes or other agreements unless approved in writing by the Home Office of the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and all other causes beyond our control. Prices are based on costs and conditions existing on date of quotation and are subject to change by the Seller before final acceptance.

Typographical and stenographic errors subject to correction. Purchaser agrees to accept either overage or shortage not in excess of ten percent to be charged for pro-rata. Purchaser assumes liability for patent and copyright infringement when goods are made to Purchaser's specifications. When quotation specifies material to be furnished by the purchaser, ample allowance must be made for reasonable spoilage and material must be of suitable quality to facilitate efficient production.

Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein which may appear on Purchaser's formal order will not be binding on the Seller.

QUANTITY	DESCRIPTION	PRICE	AMOUNT
	Woven Polypropylene Semi-Bulk Bags SBP-35x35x76/C-14x18/BPF/S14x18/ 6.5 oz/sq yd polycoated fabric for main body of bag; 14" diameter by 18" long fill and discharge chutes with bottom protection flap; 10" carrying loops		
50		$20.17 ea	
100		$19.92 ea	

THANK YOU FOR ALLOWING US TO QUOTE ON YOUR BUSINESS

CUSTOMER COPY

BULK-PACK, INC.

P. O. BOX 2371
WEST MONROE, LA 71294-2371
Sales and Marketing Offices: (318) 387-2550 • Toll Free 1-800-643-1568
Plant Facility: HIGHWAY 75-A • DENISON, TEXAS

December 10, 1985

Mr. Keith Lehman, Mill Superintendent
Cyprus Industrial Minerals Co.
651 Metuchen Road
South Plainfield, NJ 07080

Dear Mr. Lehman:

At the request of our representative in your area, Mr. Sherm Andres, we are pleased to submit the enclosed competitive prices for your semi-bulk bag requirements.

In order to give our customers better service and shorter lead times, we have recently opened an expanded manufacturing facility in Denison, Texas. This, together with a responsive sales service office and a national network of representatives, has allowed us become even more sensitive to our customers' needs.

After you have reviewed the enclosed pricing, we will be happy to supply you with sample bags for testing and examination. If I can be of further help to you, please give me a call. We would welcome the opportunity to work with you.

Sincerely yours,
BULK-PACK, INC.

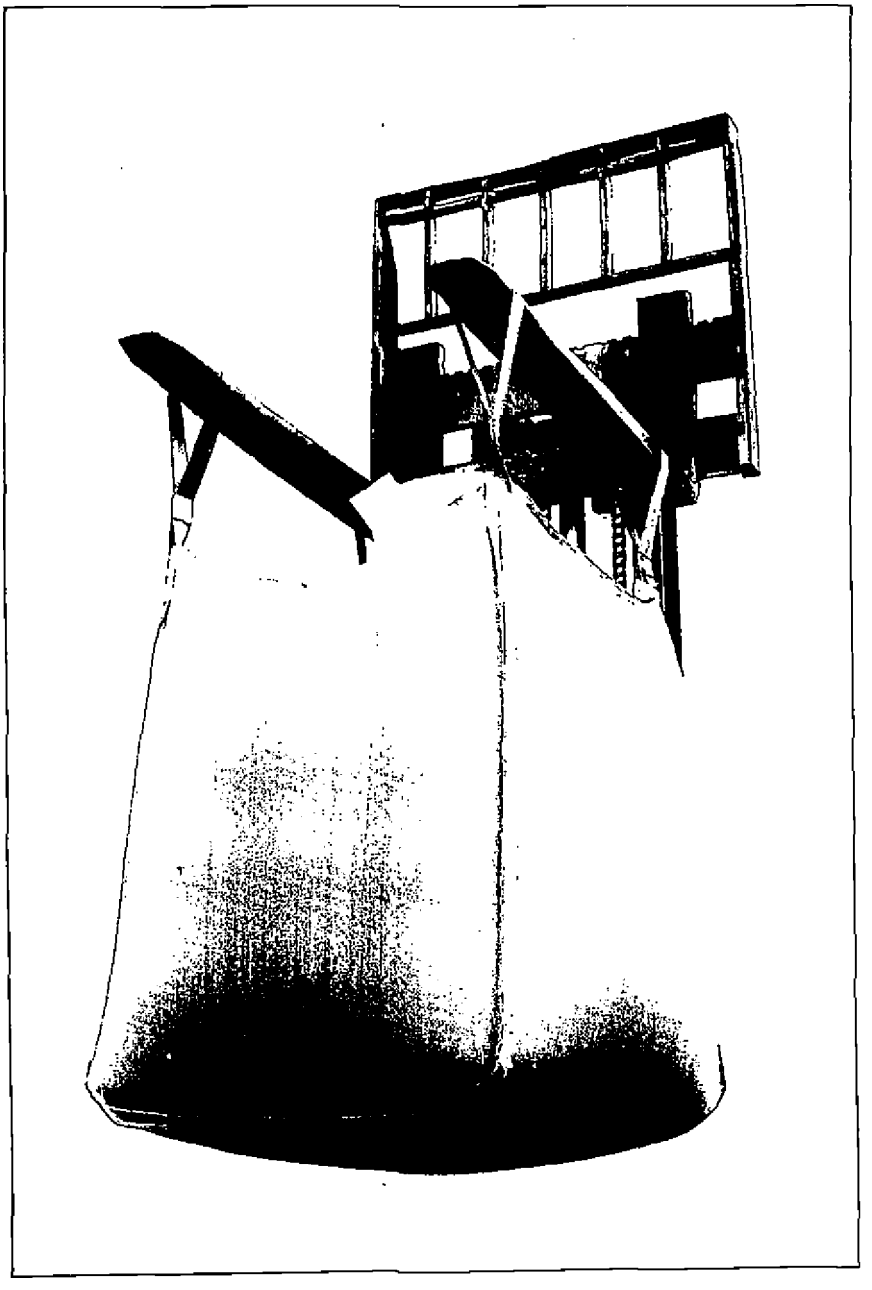
Peter J. Anderson
National Sales Manager

cc: Sherm Andres

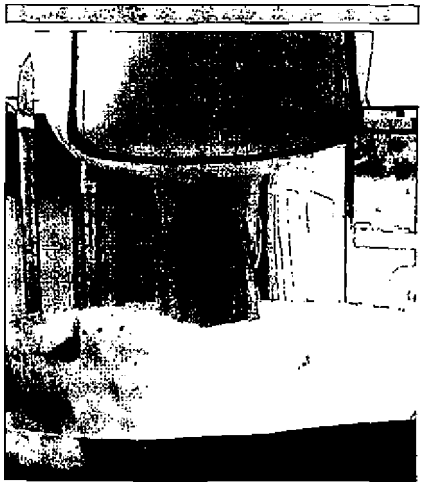
Encl.

Bulk-Pack Inc.

INTERMEDIATE BULK CONTAINERS



The Industry



INTERMEDIATE BULK CONTAINER

Discharging contents in less than one minute.

In response to the constant search for packages which will reduce cost and upgrade productivity, Bulk-Pack, Inc. is pleased to introduce you to the most exciting package to hit U.S. industry in years. . . . intermediate bulk containers (IBC's). IBC's are large woven bags which have the capability of holding up to 4,000 pounds of a dry, free flowing product. IBC's are handled efficiently with conventional equipment and are shipped by most modes of transportation. They are also priced competitively with other industrial packages which means that productivity savings go directly to where you need them the most — the bottom line.

So please take a few minutes to read our manual. The manual describes why IBC's have revolutionized the handling of bulk products throughout the world. I can assure you that your organization will benefit from the experience.

CORPORATE OFFICES:
1851 Avenue of America
Suite 18
Monroe, Louisiana
800-643-1568, 318-322-7713
MAILING ADDRESS:
P. O. Box 2371
West Monroe, LA 71294-2371
PLANT FACILITY:
Denison, Texas

Bulk-Pack, Inc.

Andrew Lee Mintz

Andrew Lee Mintz
President

The Company

Bulk-Pack was formed in May 1980 to meet the growing demands of the IBC industry. However, our roots date back over six decades to 1924 when Bancroft Bag, Inc. manufactured a sift proof multiwall bag for the carbon black industry. Today Bancroft Bag has grown into one of the largest privately held companies in the multiwall bag industry and is recognized as one of the leaders in its field.

Bulk-Pack is proud to carry on the tradition established by Bancroft by offering the IBC concept to those shippers seeking a more efficient packaging method. Bulk-Pack has and continues to be dedicated to quality and service, and to the establishment of long term, mutually beneficial relationships with our customers. We possess a modern, well equipped manufacturing facility, an experienced management team, and a well trained efficient work force who can produce a high quality product. But enough about us. Let us show you how the IBC system can benefit your organization.

Bulk-Pack
Denison, Texas
Manufacturing Complex and Demonstration Laboratory

Benefits of an IBC System

The primary reason for using IBC's is the benefits that accrue to the user. The advantages are numerous:

LABOR COSTS CAN BE DRAMATICALLY REDUCED

IBC's can be filled and discharged in a fraction of the time it takes for smaller, conventional packages.

CAPITAL COST OF DEVELOPING AN IBC SYSTEM IS MINIMAL

Filling equipment with high precision accuracies can be purchased for a relatively low price. Many companies simply modify their existing equipment, further reducing initial costs.

CONVENTIONAL EQUIPMENT CAN BE USED TO HANDLE THE IBC

The standard handling device for an IBC is the fork lift truck.

IBC's CAN BE STACKED UP TO THREE HIGH IN A PYRAMID CONFIGURATION

They can be stored outside, adding to their versatility.

IBC's CAN BE SHIPPED BY ALL MODES OF TRANSPORTATION

There is no need to use pallets unless overhead lifting is restricted.

IMPROVED WASTE AND DUST CONTROL IS POSSIBLE WITH THE USE OF IBC's

Working conditions are further improved because of the lack of physical handling of the IBC by personnel.

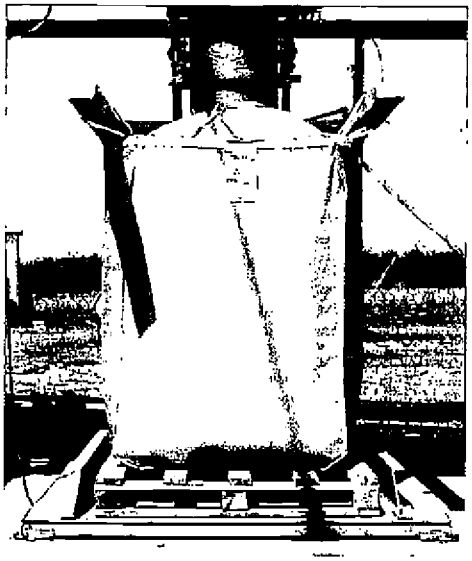
IBC's CAN BE REUSED

This is a major advantage for companies that have a system in which bags can be returned by customers. They can also be reused internally for batch mixing of products.

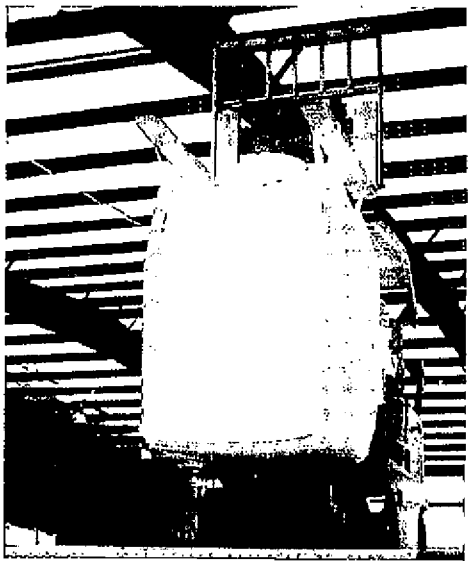
IBC's ARE ECONOMICAL

They are priced competitively with other industrial packages and your savings go to the bottom line.

FILLING



HANDLING



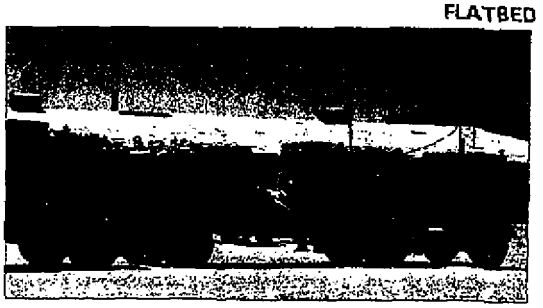
STORAGE

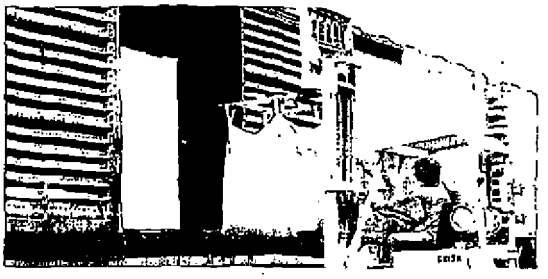
In The IBC

TRANSPORTATION

EXPORT CONTAINER, TRUCK

FLATBED

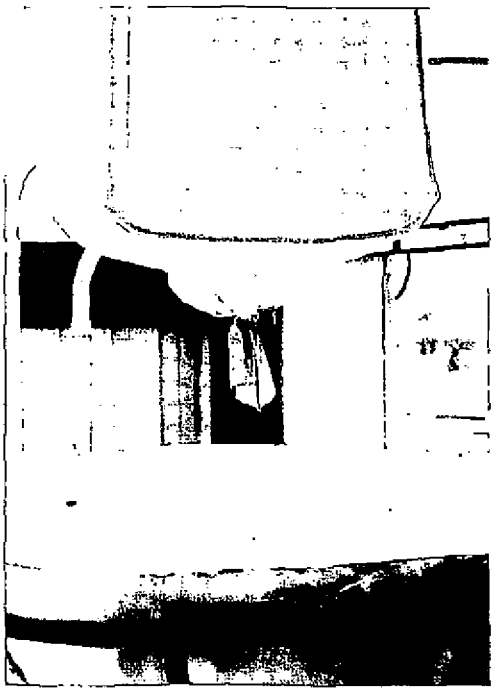




RAILCAR

BREAK BULK IN VESSEL

DISCHARGING

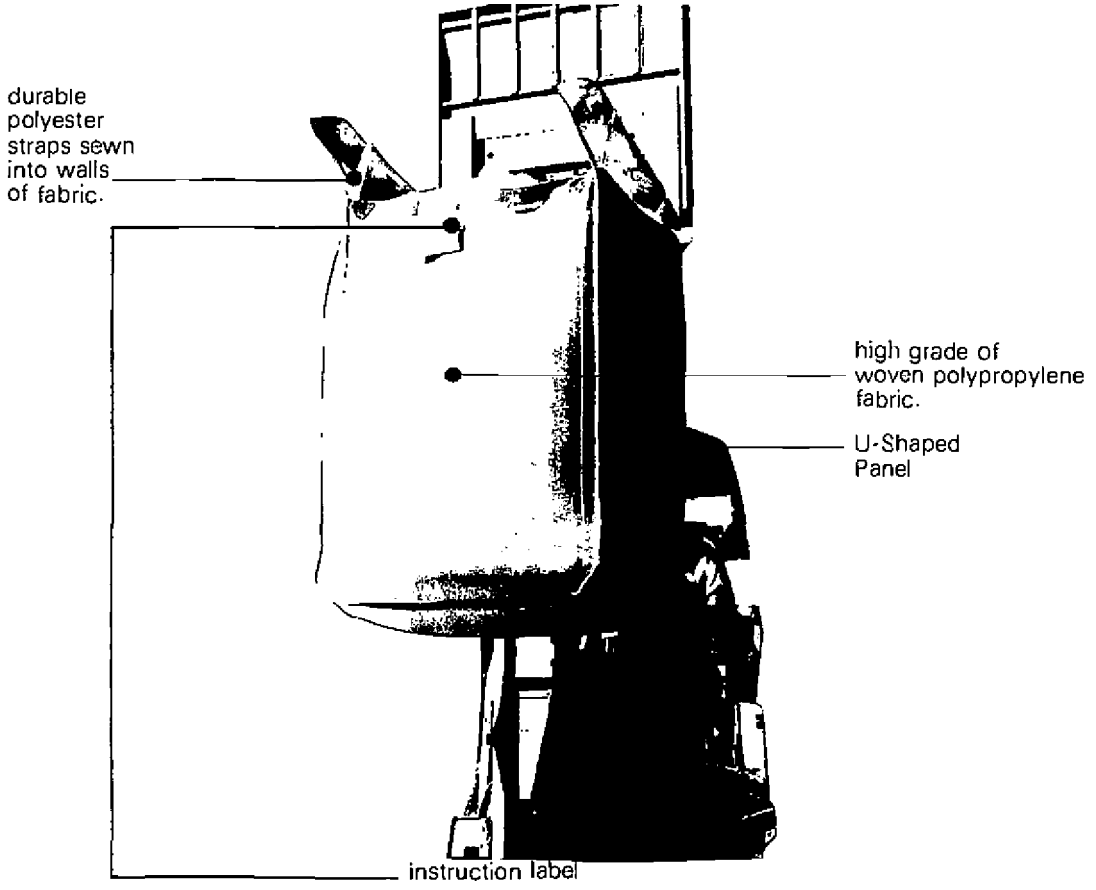


Bulk-Pack IBC Construction and Design

Manufacturing an IBC which will hold up to two tons of product is an awesome responsibility for any manufacturer. Bulk-Pack's IBC was designed and engineered for safety in handling. Our design incorporates the use of carrying loops and a primary U-shaped panel which gives the bag a tremendous amount of lifting capability. The loops are sewn into walls of fabric at the corners of the bag and are therefore an integral part of the package. The U-shaped panel acts as the primary panel for lifting purposes and distributes the weight of the load more evenly throughout the entire fabric.

The construction and design of the Bulk-Pack IBC is clearly illustrated below:

BULK-PACK's IBC IS ATTRACTIVE AND SAFE TO USE.



Instructions for proper usage . . .

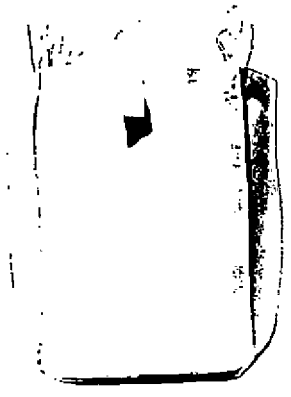
1. Make sure fork prongs and hooks are dulled or protected at all times to prevent tearing of loops.
2. Always lift the bag by using the four carrying straps. For a single point pickup, use extra long straps or Bulk-Pack's crane lift feature.
3. It is the shipper's responsibility for bracing IBC's in transportation vehicles. If voids exist, IBC's must be braced carefully to prevent in transit damage.
4. Do not exceed maximum weight capacity of container.

Bulk-Pack Styles

Bulk-Pack manufactures one way and reusable IBC's in three styles:

BAG STYLE	PURPOSE	MAXIMUM LOAD CAPACITY
•Commodity Bulk-Pack	•One way only	•3,000 pounds
•Standard Bulk-Pack	•One way or multiple use	•3,300 pounds
•Heavy weight Bulk-Pack	•One way or multiple use	•4,000 pounds

COMMODITY BULK-PACK



STANDARD BULK-PACK

Same fabric as Commodity Bulk-Pack but uses perimeter belt around the top of the bag.

HEAVY WEIGHT BULK-PACK

Same as standard but utilizes a heavier fabric.

Features Available In Bulk-Pack Styles

All three Bulk-Pack styles come with optional tops and bottoms. All IBC's are loaded through the top portion of the bag and discharged through the bottom by gravity flow.

IBC TOPS

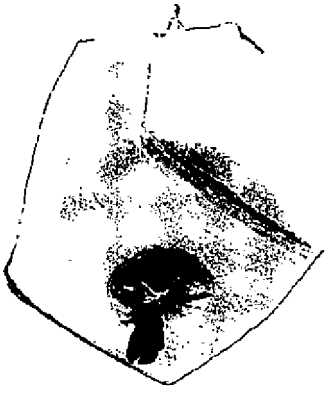
FILL SPOUT TOP

DUFFLE TOP

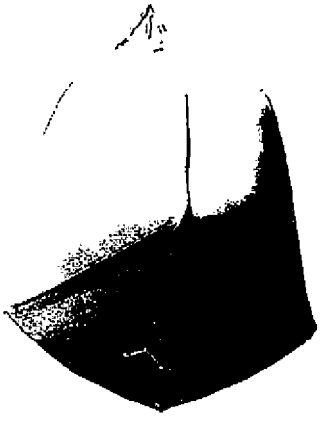
OPEN TOP

STANDARD DIAMETERS FOR FILL SPOUT TOPS ARE 12, 14, 16 and 18 INCHES.

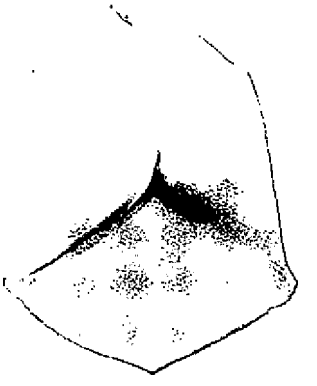
IBC BOTTOMS



DISCHARGE CHUTE BOTTOM



DISCHARGE CHUTE BOTTOM WITH BOTTOM PROTECTION FLAP



FULL BOTTOM

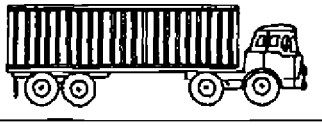
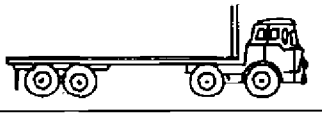
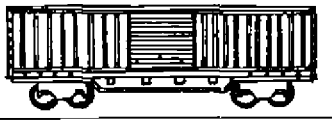
STANDARD DIAMETERS FOR DISCHARGE CHUTES ARE SAME AS FOR FILL SPOUTS.

OTHER AVAILABLE FEATURES:

- Crane lift feature or extra long lifting loops. For single point pickup.
- Stand up loops. For easy entry by fork lift.
- Carrying sleeves. Sleeves made of fabric in lieu of carrying loops.
- UV treated fabric. To protect the IBC from sunlight.
- Poly coated fabric. Coating placed on fabric for water resistance or added durability.
- P. E. liners inserted. Liner placed inside IBC to prevent contamination or moisture from getting to product.
- Bottom protection flap. Pictured above, to prevent discharge chute from being torn while in use.
- Stenciling or silk screening. Corporate logos and pertinent information can be imprinted upon request.

Size Dimensions of Bulk-Pack IBC's

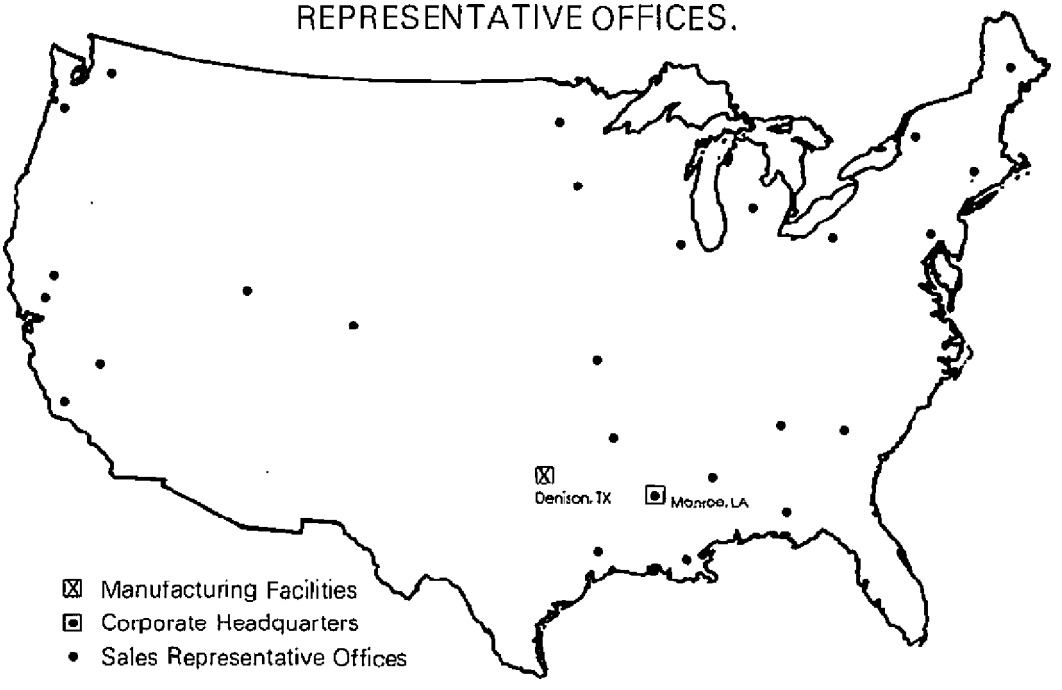
The standard width and lengths for Bulk-Pack IBC's are as follows:

Mode of Transportation	Unfilled Dimensions Width x Length	Filled Approximate Dimensions Width x Length
EXPORT CONTAINER	35" x 35"	44" x 44"
TRUCK 	35" x 35"	44" x 44"
FLAT BED 	35" x 35"	44" x 44"
RAIL CAR 	41" x 41"	51" x 51"

Heights for Bulk-Pack IBC's are based upon how much product needs to be placed into the bag. Heights range from 20 inches up to 88 inches.

Bulk-Pack's sales and sales service department will gladly assist you in determining the right size bag and features for your specific application. Let Bulk-Pack, Inc. put over six decades of packaging experience to work for your company.

SERVING OUR CUSTOMERS'
IBC NEEDS FROM A STRATEGICALLY
LOCATED PLANT FACILITY AND SALES
REPRESENTATIVE OFFICES.



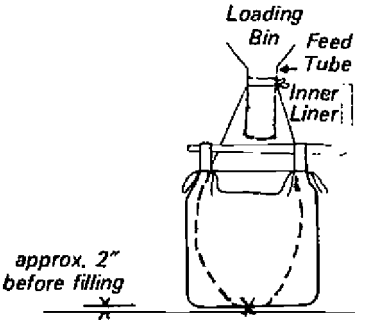
BULK-PACK, INC.
P. O. Box 2371, West Monroe, LA 71294-2371
Telephone (318) 322-7713—Toll Free 800-643-1568

BULK LIFT

SEMI-BULK CONTAINERS

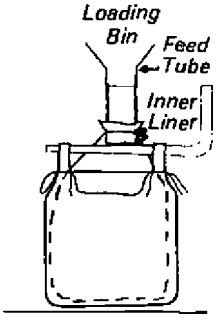
Standard filling and discharge procedure

1.



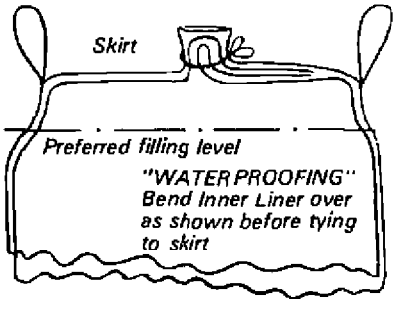
By using elastic retainer secure inner PE liner to feed pipe making sure liner is free from twists. See illus. As filling starts, the liner will move down pipe and stop when bag has filled.

2.



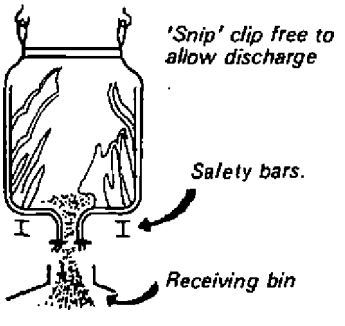
Liner has slipped down and is ready to be tied.

3.



After air has dispersed, liner is folded over as shown and tied into top closure skirt. This tie-off prohibits the liner from slipping into the base outlet and blocking discharge.

4.

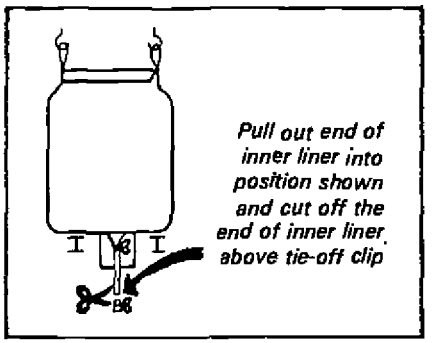


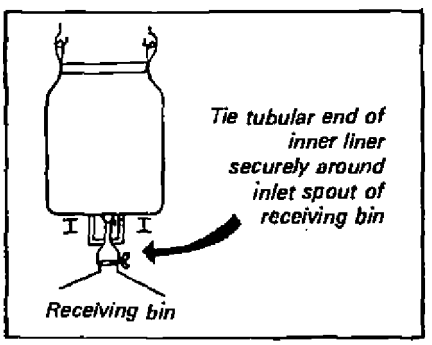
Raise bag to necessary height. Place safety bars in position under bag and open discharge outlet to release contents, during discharge, it may be necessary to raise bag 12 to 18" to completely empty contents.

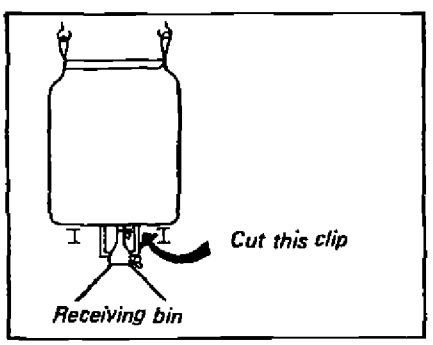
SEE OTHER SIDE FOR SPECIAL DUST FREE DISCHARGE OUTLET

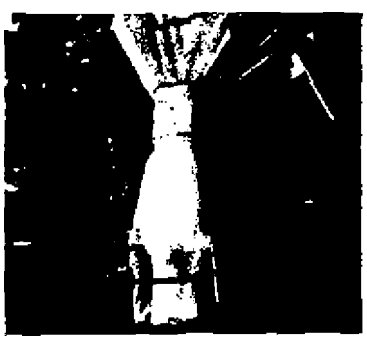
Bulk Lift International Inc. • 455 Maple Ave., Carpentersville, IL 60110 • (312) 428-6059 • Telex 282-565

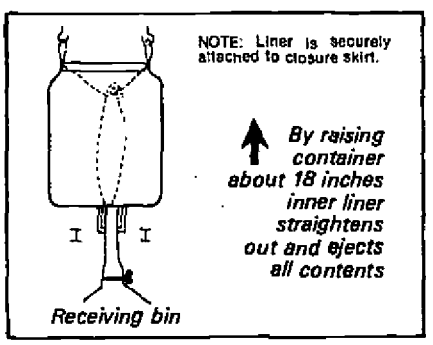
Bulk Lift Bag with Special Dust Free Discharge Outlet







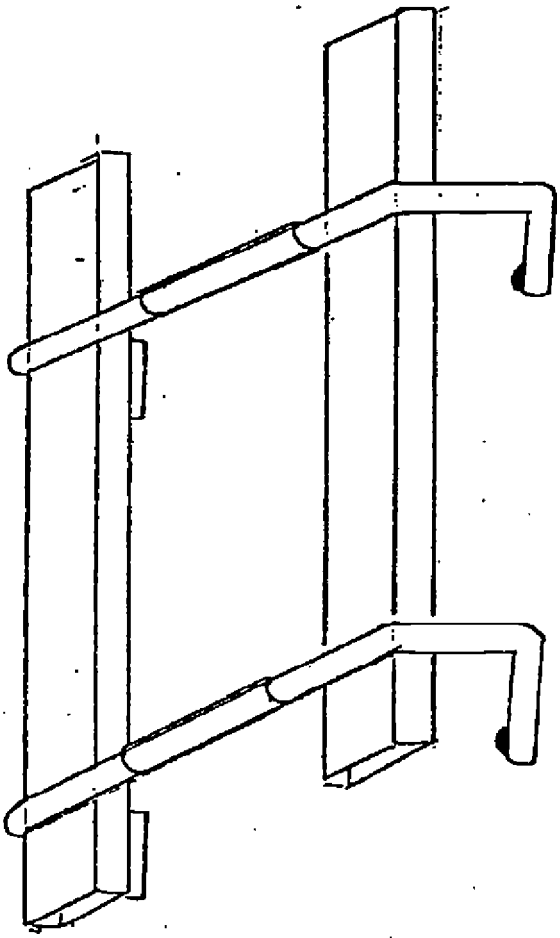


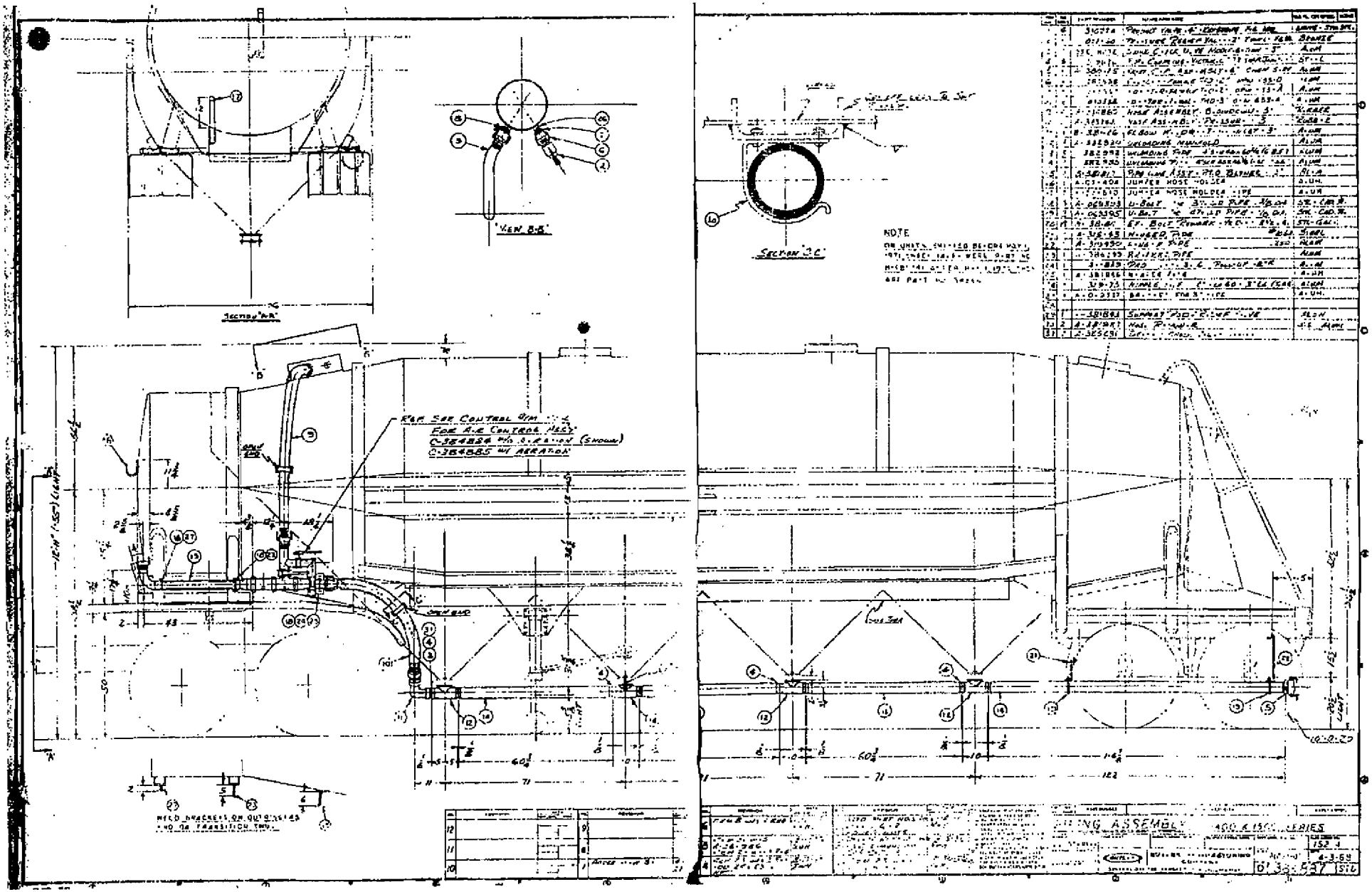


Bulk Lift Containers can usually be filled and discharged at extremely fast rates. Bulk Lift SBC should be able to be filled with the simplest of filling devices. **Expensive equipment is not necessary.** On occasion customers may have to convert existing equipment to fill SBC, but this is usually a relatively simple conversion. If customers do require sophisticated filling equipment, several methods are available and can be recommended upon request.

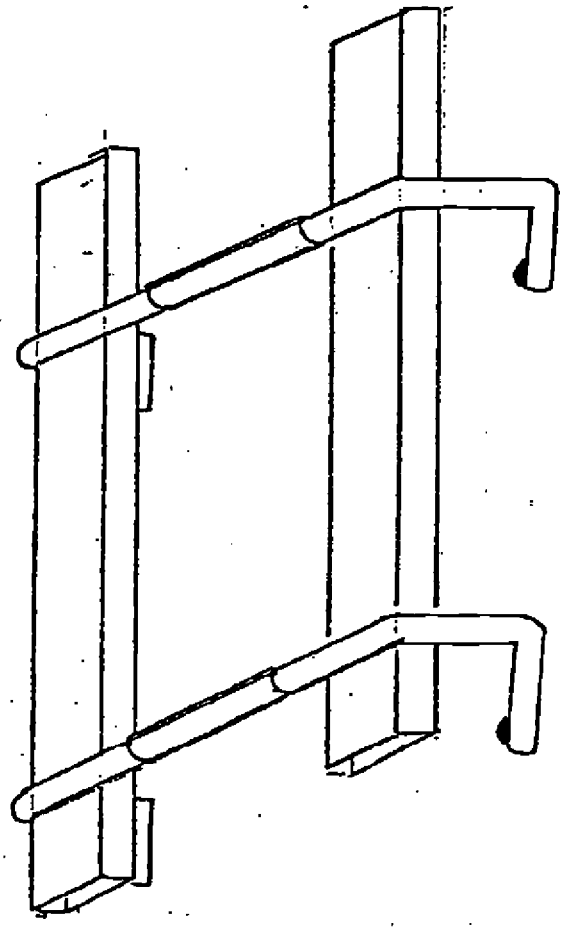
BULK LIFT

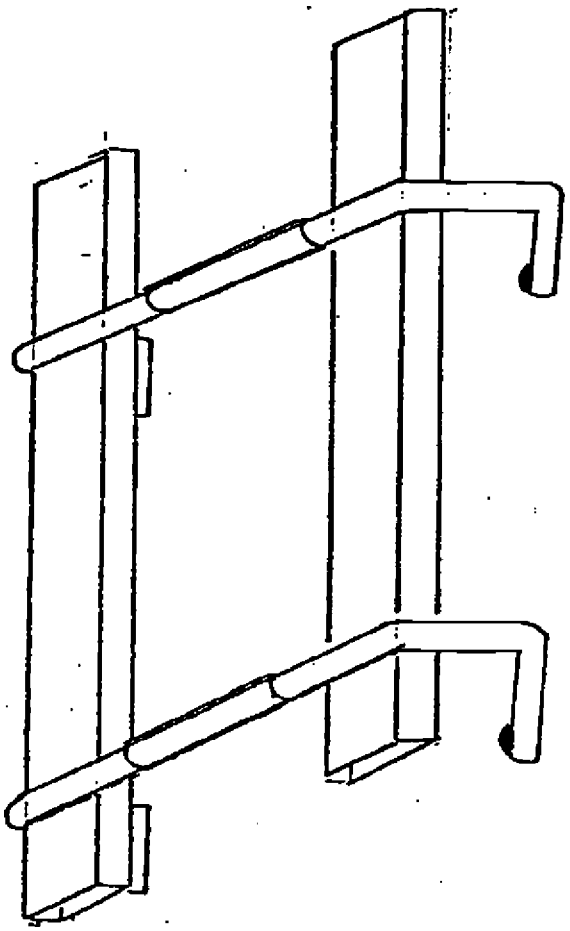
455 Maple Avenue, Carpentersville, IL 60110
(312) 428-6059 • Telex 282-565

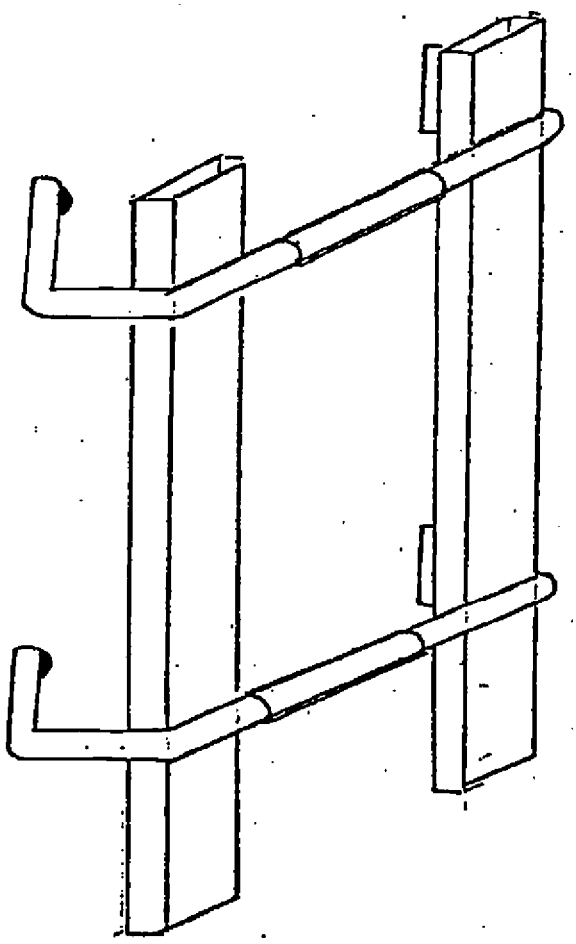


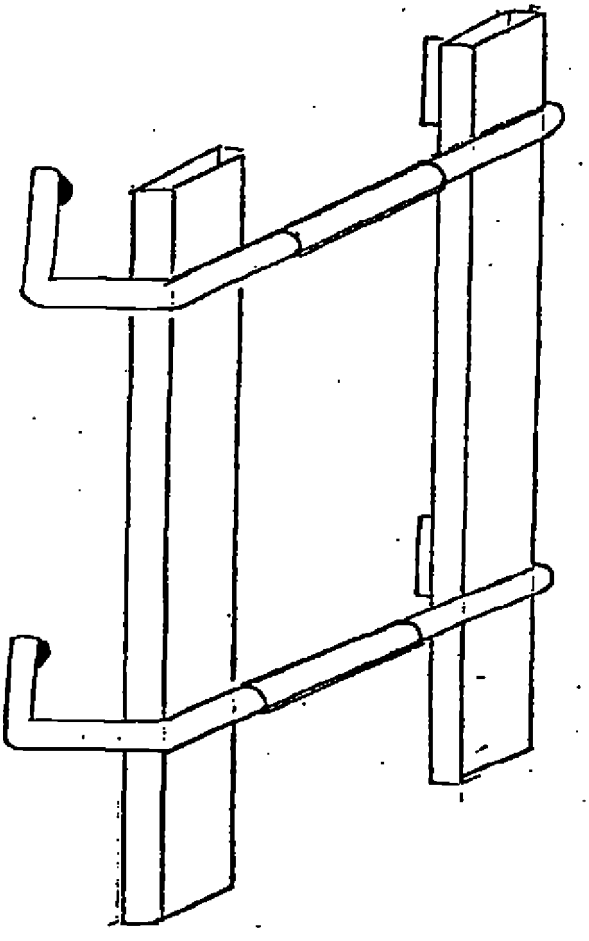


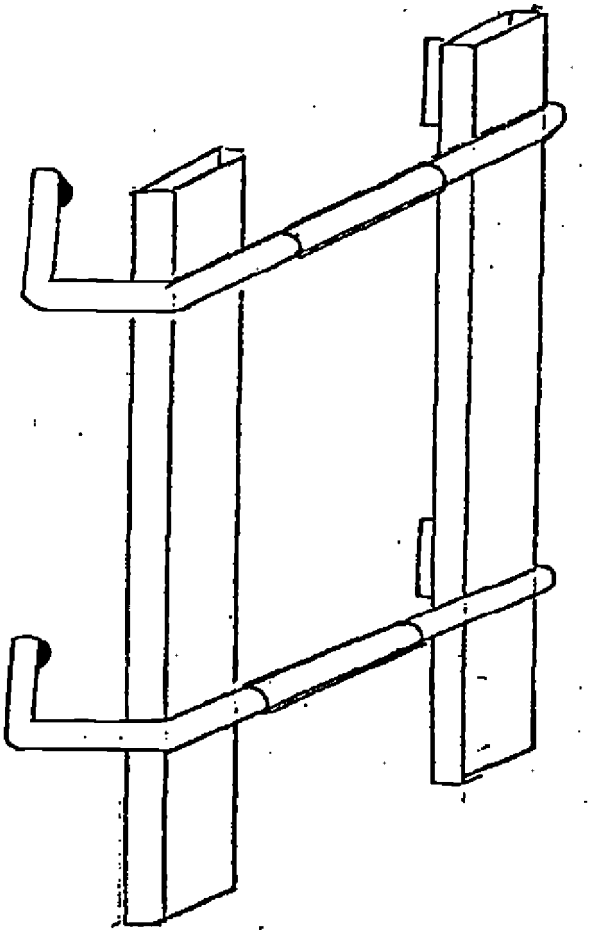
LEHMAN 01285











RED

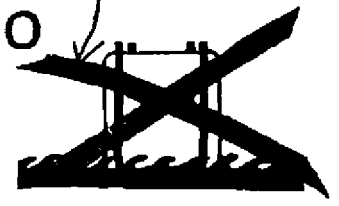
RED

STORAGE INSTRUCTION SHEET

NO

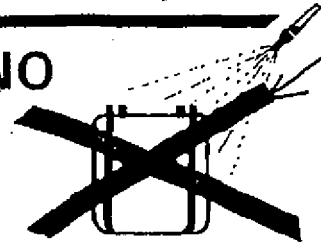
RAIN

NO



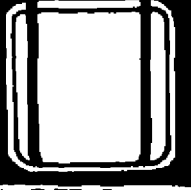
FLOODING

NO



WASH DOWN

YES

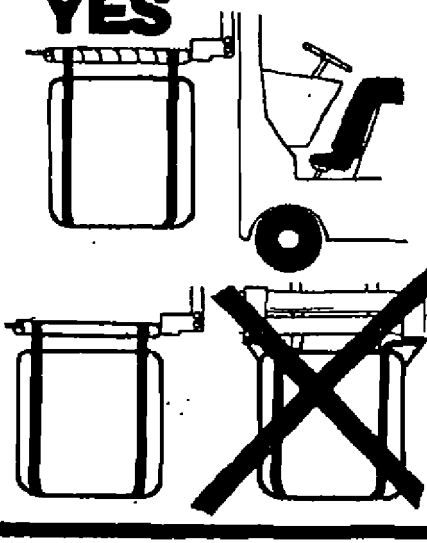


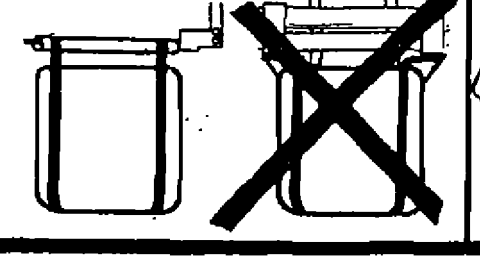
DRY STORAGE

IMPORTANT NOTICE: ALWAYS LIFT VERTICALLY USING ALL FOUR LIFT STRAPS.

FORK LIFT

YES

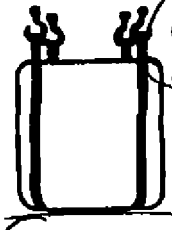




CRANE

NO

YES



FOR ONE POINT CRANE LIFT- Red LONGER LIFT STRAPS ARE NEEDED

YES

DO NOT EXCEED RECOMMENDED WORKING LOADS LIMIT! Red

Solid letters →

TALC

Hydrous Magnesium Silicate

CAS#14807-96-6

HANDLING SUGGESTIONS

- NIOSH respirators
- exhaust ventilation

This product is:

- NON-flammable
- NON-explosive
- NON-toxic

Entire Label in Blue

Solid letters →

CYPRUS

Englewood, CO. 80155
(303) 740-5440

LEHMAN 01291

April 25, 1985

G. M. Dugan
R. Estrada
T. D. Landels
K. B. Lehman
M. R. McCune

Bag Logo

The Englewood office has two zip codes - 80155 for mailing and 80112 for shipping. When the new bag logo was designed, it contained the street address along with the mailing zip code. It was decided that eliminating the street address would be the easiest way to correct the logo. The revised logo has been sent to your multi-wall bag suppliers, and a copy is attached for your information.

Joanne

J. S. Felger

jsf

Attachment

TALC

Hydrous
Magnesium
Silicate

CAS#14807-96-6

HANDLING SUGGESTIONS

- NIOSH respirators
- exhaust ventilation

This product is:

- NON-flammable
- NON-explosive
- NON-toxic

CYPRUS

Englewood, CO 80155
(303) 740-5440

LEHMAN 01293

Bonar Industries, Inc.

5

INVOICE NUMBER
5369

PLEASE REMIT TO: P.O. BOX 10196, MACON, GA. 31297 PHONE (912) 784-9040

SOLD TO:
[illegible]
[illegible]
[illegible]

5-23-85

SHIP TO:
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

Prepaid

FOB	INVOICE DATE	SALESMAN	BONAR ORDER NO.	SHIP VIA	CUSTOMER ORDER NO.
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]

QUANTITY ORDERED	DESCRIPTION	QUANTITY SHIPPED	BALANCE	UNIT PRICE	TOTAL
20	[illegible]	20	-0-		

5 Ship 1st Day Air
With 5 Liners

GOODS RETURNED WITHOUT OUR AUTHORITY WILL NOT BE ACCEPTED. GOODS DAMAGED IN TRANSIT ARE RESPONSIBILITY OF CARRIER. IF SHIPMENT ARRIVES IN DAMAGED CONDITION, SECURE PROPER NOTATION ON FREIGHT BILL AND FILE CLAIM WITH CARRIER. TERMS: NET 30 DAYS: 1½% PER MONTH (18% PER ANNUM) WILL BE CHARGED ON OVERDUE ACCOUNTS.

PACKING SLIP

SEMI-BULK BAGS FOR ALL POWDERED PRODUCTS

- ACCEPTS BAGS UP TO 46" DIAMETER AND FROM 41" TO 76" HIGH.

- CAPABLE OF FILLING TO 2,000 POUNDS MINIMUM WEIGHT WITH ALL PRODUCTS.

- INITIAL INSTALLATIONS WOULD BE LIMITED TO 4 TONS PER HOUR FILLING RATE.

- WITH EXPANSION UNIT CAN BE INSTALLED WITH A HOPPER OR SILO FOR FILLING RATES COMPARABLE TO THREE FORKS.

- INSTALLED COST WILL BE APPROXIMATELY $25,000.

- WITH SOME ADDITIONAL EQUIPMENT, HEAT TREATED TALCS IN GRAND ISLAND CAN ALSO BE PACKAGED IN SEMI BULK. INSTALLED COST OF UNIT WILL BE APPROXIMATELY $35,000.

COLEMAN
EQUIPMENT, INC.

525 CHANCELLOR AVE • IRVINGTON, N.J. 07111 • TEL. 201-375-6000

materials handling equipment
processing equipment
conveying systems

December 18, 1984

Mr. Keith Lehman
Cyprus Industrial
Metuchen Road
South Plainfield, NJ 07080

Re: All Flow Bulk
Transportation System

Dear Mr. Lehman:

Many Chemical, plastic and food processing plants receive raw materials in hopper cars and bulk trucks and ship out finished goods in drums, palletized bags or cases in a conventional van. Using two different trucks for raw bulk goods and finished piece goods usually means an expensive empty return trip.

Now one van equipped with the All Flow Bulk Handling Storage System can eliminate "dead heading". Transportation costs can be cut in half. The equipment can be installed in new or used vans either at our plant in Buffalo, N.Y. or on site.

If interested in additional information or a video tape demonstration please call George A. Jonas, 201-375-6000, or if you prefer, fill in the enclosed reply card. We will respond promptly.

Sincerely,

COLEMAN EQUIPMENT, INC.

George A. Jonas

George A. Jonas

GAJ:ve
enc.

Polypropylene bags of purified terephthalic acid (PTA) are inspected at our Cooper River, S.C., plant by Gene Rakar, shipping supervisor, left, and Adella Dickerson, foreman. Operating at capacity, the facility is designed to produce a billion pounds of PTA annually.

reserves purchased in corporate acquisitions. However, rarely is an attempt made to characterize the nature of the reserves: Are they new or old? Long- or short-lived? Under primary recovery or waterflood? Heavy oil or condensate? Is there any upside potential? A multitude of other factors also can affect their present value. These are considerations that have to be scrutinized in evaluating potential purchases.

Our analyses also show that the cost of finding and developing can exceed the cost of purchasing by 50 to 70 percent and still provide the same return. This is because of both tax treatment of expenditures and the lower crude oil excise tax rates on new reserves compared with old production.

We firmly believe that any acquisition we make must yield returns that are competitive with our internal investment criteria. We also believe that our exploration and production programs are contributing to our earnings objectives, and that we can continue to achieve satisfactory results.

We will continue to evaluate purchase opportunities as they are identified. We have a long history of making attractive acquisitions, many of which are still contributing to our production and earnings.

We are not willing, however, to make acquisitions that will simply add reserves without helping to meet our earnings growth objectives and creating value for our shareholders.

Because of our confidence in our ability to find and develop new reserves, the exploration and production segment of Standard's business will continue to get a major share of capital allocations. In 1984, for example, 78 percent of the $5.1 billion budget is scheduled for exploration/production projects. We believe our major technical strengths and demonstrated superior record justify

LEHMAN 01297

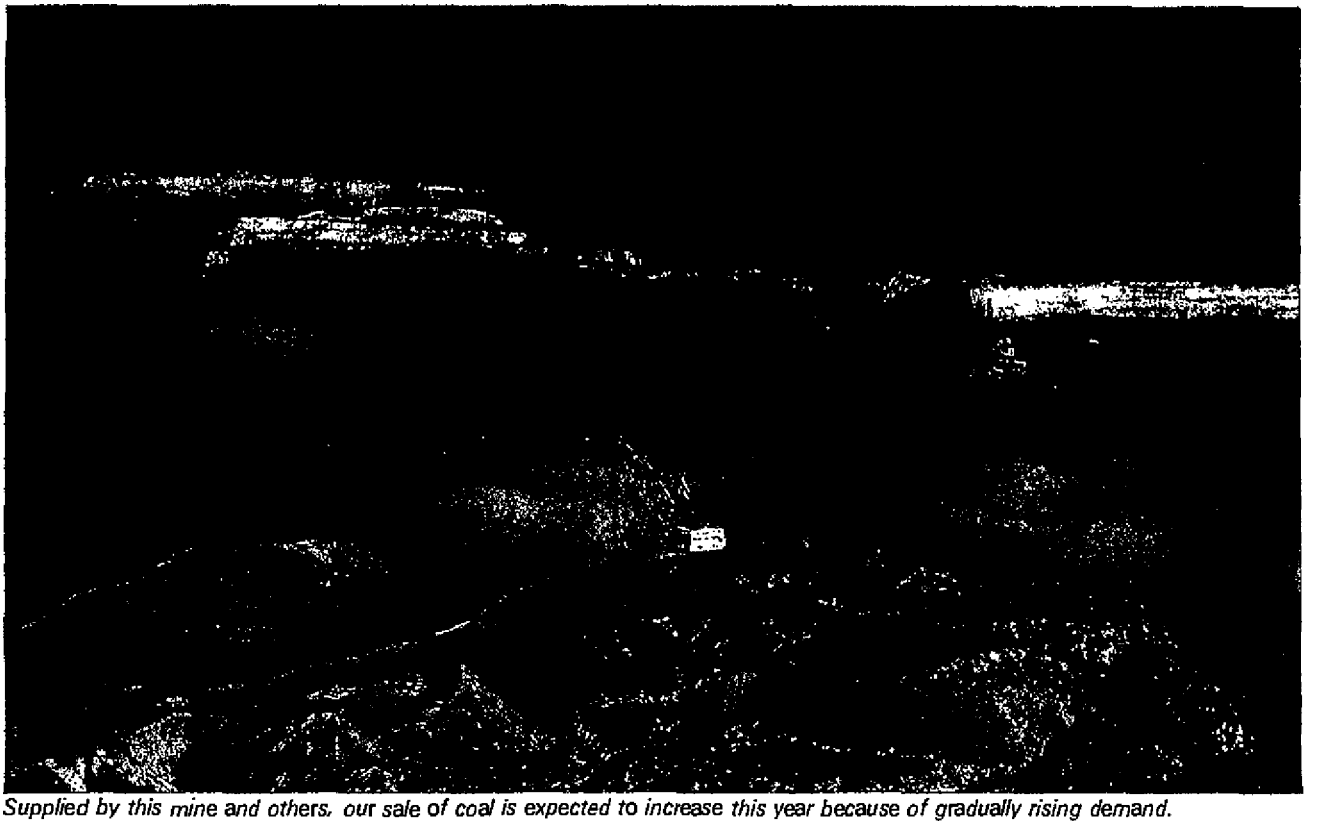
our continuing to direct the bulk of available funds to the upstream area.

We expect that oil and gas prices will be adequate to provide attractive rates of return for successful exploration companies. Our unrivaled position in domestic lease holdings affords ample opportunities to test prospects with excellent potential. Our expanded acreage position in the Gulf of Mexico is a prime example. Thus far, since we tripled our Gulf holdings in 1983, eight of 14 exploratory wells we have drilled have encountered hydrocarbons. Granted, their commercial viability must yet be determined by additional drilling, but we are encouraged by initial results. We expect to have as many as 16 company-operated rigs running in the Gulf in 1984, and to drill as many as 50 additional exploratory wells during the year.

Apart from our strengths in exploration and production, we are also concentrating on improving other aspects of our business. We have downsized our refining system and modernized our remaining plants. We are continuing to enhance the efficiency of our petroleum products marketing and transportation systems. We enjoy a very competitive position in those parts of the petrochemical industry in which we participate—a business that should benefit from improving economic conditions and higher rates of capacity utilization. We have sound positions in coal and nonferrous metals, again operations that should respond to a reviving economy. And our interests in several high-tech enterprises enable us to stay abreast of new technological developments that could impact any or all of our basic businesses.

In summary, we have a broad exposure to opportunities around the world. We have the financial resources and staying power to absorb large risks. We are at the frontedge of technological innovation with competent and experienced personnel. And, finally, we have what we believe is an enviable track record.

With all of these attributes working in our favor, we have every confidence that the future is a bright one for the shareholders of Standard Oil Company (Indiana).



Supplied by this mine and others, our sale of coal is expected to increase this year because of gradually rising demand.

LEHMAN 01298

SEMI-BUCK MACHINE SET-UP

LEHMAN 01299

SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14_____ seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
8. Lift____ seconds.
9. Vibrate_____seconds.
10.
11.
12. Delay fill valve stage 1____seconds (see #3).
13. Delay fill valve stage 1_____seconds. (see #5).
14. Dust collector valve delay on_____seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing____seconds (after bag full).
16. ____ seconds delay set point react after blower goes off. (Eliminates false signal).

SEMI-BULK MACHINE RELAYS

1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
4. 2ND SET POINT.
5. 3RD SET POINT.
6. 4TH SET POINT.
7. EMERGENCY STOP.
8. NOT IN USE.
9. CUFF INFLATOR.
10. DUST COLLECTOR VALVE.
11. 1ST STAGE FILL.
12. 2ND STAGE FILL.
13. TABLE LIFT.
14. VIBRATION.
15. BLOWER.
16. NOT USED.

07/Send
Hold for
Copies
(revise)

Cyprus Industrial Minerals Company

651 Metuchen Road
South Plainfield, N.J. 07080
Telephone (201) 754-4880

TWX 710-997-9528

CYPRUS

SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14=____ seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
8. Lift____ seconds.
9. Vibrate_____seconds.
10. RESTART DELAY 10 SECONDS after Emergency STOP activated
11. 2 SECOND Delay after Blower cycle to BLOCK SET POINTS from STRAY signals
12. Delay fill valve stage 1____seconds (see #3).
13. Delay fill valve stage 1_____seconds. (see #5).
14. Dust collector valve delay on_____seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing____seconds (after bag full).
16. 2 seconds delay set point react after blower goes off. (Eliminates false signal).
    DE-ENERGIZES Coil on D.C. valve

SEMI-BULK MACHINE RELAYS

1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
4. 2ND SET POINT.
5. 3RD SET POINT.
6. 4TH SET POINT.
7. EMERGENCY STOP.
8. NOT IN USE.
9. CUFF INFLATOR.
10. DUST COLLECTOR VALVE.
11. 1ST STAGE FILL.
12. 2ND STAGE FILL.
13. TABLE LIFT.
14. VIBRATION.
15. BLOWER.
16. NOT USED.

Control Panel: EPTAK 210 Controller

1	NL 110L1	120 Volt Input Module	$ 50.00
1	NL 120L1	120 Volt Output Module	$ 75.00
1	CP 2040A6	Data Access/Disp. Module (DAD/m)	$ 325.00
1	CP 2001V1	Programmed EEprom Memory Module (Chip)	$ 150.00

UMC2010 AACA Weight Indicator:

1	KNW 1924-1	Display Assembly	$ 192.00
1	KBE 7182	Keyboard	$ 40.00
1	KBT 8924-1	Keyboard Display Assembly	$ 108.00
1	KBR 8924-1	Keyboard I/O Assembly	$ 367.00
1	KL 2900-2	Set Point Relay Assembly	$ 165.00
1	KAL 1921-1-1	Programmed EEProm	$ 50.00
1	KFM 1918 AM	Micro Processor	$ 17.00
1	KW 116-6	A/D Converter Assembly	$ 365.00
1	KW 116-33	CPU Assembly	$ 599.00

NOTE: Above prices as of 8/1/85. Subject to change without notice!.

Darenth Americas

The Complete Weighing Technology

U.S. Route 13 • P.O. Box 397
Bridgeville, Delaware 19933
(302) 337-3051

RECOMMENDED SPARE PARTS

1500 mm T.B.C. Filler

for

Cyprus Industrial Minerals

	Qty.	Part No.	Description	Price Each
Scale Assembly:				
	2	Size Per Customer	Inflatable Fill Spout Cuff	$ 36.00
	2	Size Per Customer	Flexible Sleeve Fill Valve Supply	$ 36.00
	1	SSM 250	Load Cell (250#)	$ 459.00

O. A. NEWTON & SON COMPANY
P. O BOX 397 - ROUTE 13
BRIDGEVILLE, DELAWARE 19933
302-337-8211

INTERMEDIATE BULK CONTAINER (I.B.C.) FILLER WITH VIBRATION TABLE

Operating Sequence and Instructions for Cyprus Minerals South Plainfield New Jersey.

The Vibration Control design provides three (3) automatic adjustable vibration weight set points with adjustable vibration times prior to final weight set point and a final manual jog/vibration and/or fill after final weight set point fill cut off.

1). Select and enter intermediate weight set points, three (3), for vibration and final weight set point, using weight indicator key pad.

2). Hang bag straps from rope locks (Item #20).

3). Place bag fill spout over unit fill spout and inflatable cuff. (Item #10)

4). Activate cuff inflation pushbutton. Solenoid valve automatically provides air to inflate cuff and seal bag onto spout.

5). Activate the control panel cycle start button and automatic fill, vibration, and weighing will occur as follows:

   (a) Blower will activate to inflate bag for an adjustable preset time period and bag inflation indicating light will come on.

   (b) At time out; blower will shut off, bag inflation light goes out, fill valve opens and filling cycle commences. After adjustable preset time desired air tee valve is activated for dust extraction provision.

   (c) At first vibration weight set point the fill valve closes and timed vibration cycle will commence after vibrator lifts. At time out, fill valve fully opens and filling continues.

   (d) At second and third vibration weight set points Sequence "(c)" repeats.

   (e) At end of third vibration set point, the fill valve opens to dribble fill position only.

(6) At final set weight, fill valve closes, cuff inflation continues and operator has three choices:

(a) Activate jog vibrate for final extra vibration.

- and/or -

(b) Activate jog fill for extra material to be added beyond set weight limit.

- then -

(c) Activate cuff deflate to release bag fill spout seal for bag removal.

NOTE: Dust extraction remains open for adjustable preset time period.

(7) Seal bag fill spout and remove bag. Unit is ready for next bag filling.

(8) Emergency Stop - In "Auto" Position activation of emergency stop will stop cycle in whatever portion of cycle is occuring. De-activation of emergency stop will allow cycle to resume from stop point after á ten second delay. Emergency stop does not function in "System" or "Hand" Selector Switch Positions.

GENERAL NOTES:

1). Vibration cycle is isolated from weighing and filling cycle and they do not occur at the same instant in order to prevent incorrect weight indications and damage to weight system.

2). For Conveyor/Vibration Systems the vibration table is of grid type with grids raising between conveyor rollers to lift pallet and bag for vibration cycle and lowering after cycle to transfer bag weight to conveyor and weigh platform for accurate weighing.

3). Jog vibrate and jog fill are only activated after final set point weight.

(a) Jog Fill - Selector Switch on "System".

(b) Jog Vibrator - Selector Switch on "Hand" Fibrator will lift (Approx. 7 seconds) after which jog will vibrate will function when depressed.

4). Each intermediate point cycle contains a separate timer to allow for individual different vibration times for each cycle.

5). If all three (3) intermediate vibration set points are not desired, the second and third set points can be set at the same point as the first or identically to allow for one, two or three (maximum) vibration cycles prior to final set weight.

To Set Timer

To change time periods use the timer key pad inside Control Panel.

1). Push number pad and up or down arrow pads until timer position number is reached as indicated on display. Timer positions are as follows:

#1 - Blower (Bag Inflate) Time
#3 - First Weigh Set Point Vibration Time
#5 - Second Weigh Set Point Vibration Time
#7 - Third Weigh Set Point Vibration Time
#14 - Dust Extraction Provision Time Delay After Fill Valve Opens
#15 - Dust Extraction Provision Time Delay After Fill Valve Closes

Timer position numbers 2, 4, and 6 are vibration lift delay times, factory set for seven (7) seconds.

2). Push "Ent" (enter) pad to readout existing time.

3). Push "Set" pad to enable programming.

4). Push up and down arrow pads to program time period.

5). Push "Ent" pad to enter new time period.

Vibrator Adjustments

1). Do not vibrate with vibrator in lowered rest position or without a weight load.

2). For best results vibrate with 1500 lb. minimum load. At lower weights vibration may be excessive.

3). To set vibrator lift height adjust vibrator lift air regulator in Control Panel. Heavier loads require more pressure. Use only enough pressure to lift vibrator 1/4" - 3/8" above scale or conveyor. Do Not Exceed 90 psi.

Revised 11/28/85

76" Bag

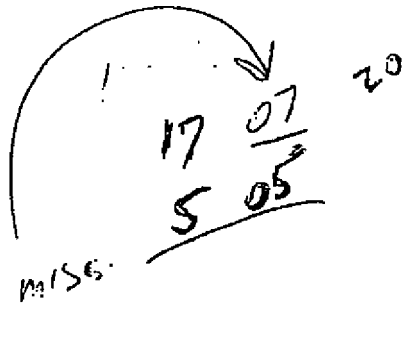
1 Blower 55 ← DC VALVE DELAY #14 0
FILL Stage 1 1100 / VALVE AIRLOCK 1250
2 LIFT 07
3 V.B. 45 15 SEC Delay #12 45
FILL Stage 1 1100 - 1500 1250-1650
4 LIFT 07
5 [illegible] 85 SEC. Delay 15 SEC #13 80
FILL Stage 1 1500 - 1800 1650-1800
6 LIFT 07
7 V.B. 65 SEC. NO VALVE Delay 70
8 FILL STAGE 2 (TRICKLE) 1800 - 1990 AIR LOCK
8 LIFT 0 (can be 07) 1800 - 2000 20 PRE
9 V.B. 0
10 10 SEC. ?
[illegible] ?
12 Delay FILL VALVE 15 SEC. 20
13 Delay FILL VALVE 15 SEC. 20
14 DC VALVE DELAY ON 10 SEC. 15
15 DC VALVE DELAY OFF AFTER SAC FULL 240 SEC. 12
16 10 SEC. ?

Duffle 5
5/23

52" Bag Blue

1 [illegible] DC [illegible] DELAY #14 10 SEC.
FILL STAGE 1 1250 # / VALVE [illegible]
2. [illegible] 07 SEC.
3. VIB. 120 SEC. DELAY [illegible] 15 SEC. #12
FILL [illegible] 1250 # - 1650 #
4. [illegible] 07 SEC.
5. VIB. 125 SEC. DELAY [illegible] 15 [illegible]
FILL STAGE 1 1650 # TO 1820 #
6. [illegible] 07 SEC.
7. VIB. 85 [illegible]
[illegible] STAGE 1 [illegible] / AIRLOCK SWITCH
[illegible]
1820# TO 2000 #
8. [illegible] 07 SEC.
9. VIB. 120 SEC.
10. 10 SEC. ?
11. 10 SEC.
12. DELAY [illegible] VALVE STAGE 1 - 15 SEC. (SEE #5)
13. DELAY [illegible] VALVE STAGE 1 15 SEC. (SEE #5)
14. DC VALVE DELAY ON 15 SEC. (BLOWER OPENED + DC CLOSED)
15. DC VALVE DELAY OFF 20 SEC. (AFTER BAG FULL)
16. 10 SEC. ?

17 07 20
5 05
3 MISS.



52" Bag Blue

[illegible] DELAY #14 10 SEC.
FILL STAGE [illegible] # 1 VALVE + AIRLOCK
LIFT 07 SEC.
VIB. 180 SEC. DELAY FILL 15 SEC. #12
FILL STAGE 1 1150 # - 1400 #
4. LIFT 07 SEC.
5. VIB. 260 SEC. DELAY FILL 15 SEC. #13
FILL STAGE 1 1400 # TO 1650 #
6. LIFT 07 SEC.
7 VIB. 125 SEC. NO [illegible] DELAY
FILL STAGE 2 [illegible] AIRLOCK [illegible]
on SLOW POSITION, VALVE OPEN on FAST POSITION
1650 # TO 1850 # [illegible]
8. LIFT 07 SEC.
9. VIB. 180 SEC.
10. 10 SEC. ?
11. 10 SEC. ? 0
12. DELAY FILL VALVE STAGE 1 15 SEC. (SEE #3)
13. DELAY FILL VALVE STAGE 1 15 SEC. (SEE #4)
14. DC VALVE DELAY [illegible] SEC. (BLOWER OPENED + D.C. CLOSED)
15. DC VALVE DELAY [illegible] 240 SEC. (AFTER BAG FULL)
16. [illegible] SEC. # delay / set point meant after blower

fill TO 1,850 TRICKLE MANUAL 50#

9 cuff
10 [illegible] VALVE D.C.
11 1st Stage
12 2ND
13 VIB LIFT
14 VIB.
15 Blower
16 NOT USED

1 INPUT cuff
2 CYCLE START
3 kgf
4 inf Set points
5 ?
6 ft
7 EMERG. STOP
8 NOT USED

SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

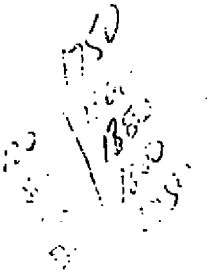
52" BLUE BAGS 2000#

TIMER SETTING NUMBERS.

1. Blower 0 seconds on. Dust collector valve delay #14 10 seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point 1250 lbs.
2. Table lift 7 seconds.
3. Vibrate 120 seconds. Fill delay 15 seconds #12. Fill stage 1 continues 1250 lbs. to 1650 lbs.
4. Table lift 7 seconds.
5. Vibrate 125 seconds. Fill delay 15 seconds #13. Fill stage 1 continues 1650 lbs. to 1820 lbs.
6. Lift 7 seconds.
7. Vibrate 85 seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point 1820 lbs. to 2000 lbs. minus 12 lbs. pre-act.
8. Lift 7 seconds.
9. Vibrate 120 seconds.
10.
11.
12. Delay fill valve stage 1 15 seconds (see #3).
13. Delay fill valve stage 1 75 seconds. (see #5).
14. Dust collector valve delay on 10 seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing 160 seconds (after bag full).
16. 10 seconds delay set point react after blower goes off. (Eliminates false signal).

SEMI-BULK MACHINE RELAYS

1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
4. 2ND SET POINT.
5. 3RD SET POINT.
6. 4TH SET POINT.
7. EMERGENCY STOP.
8. NOT IN USE.
9. CUFF INFLATOR.
10. DUST COLLECTOR VALVE.
11. 1ST STAGE FILL.
12. 2ND STAGE FILL.
13. TABLE LIFT.
14. VIBRATION.
15. BLOWER.
16. NOT USED.



SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
2. Put empty pallet and bags to be "TARED" onto scale.
3. Press "AUTO ZERO". Scale should read zero.
4. Remove empty pallet & bags. Scale will read a negative tare wt.
5. Set full pallet on scale. Scale will show exact net wt. each time a full pallet is placed on it, until the "AUTO ZERO" is pressed again.

SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

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SEMI-BULK MACHINE

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5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

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SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
2. Put empty pallet and bags to be "TARED" onto scale.
3. Press "AUTO ZERO". Scale should read zero.
4. Remove empty pallet & bags. Scale will read a negative tare wt.
5. Set full pallet on scale. Scale will show exact net wt. each time a full pallet is placed on it, until the "AUTO ZERO" is pressed again.

SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
2. Put empty pallet and bags to be "TARED" onto scale.
3. Press "AUTO ZERO". Scale should read zero.
4. Remove empty pallet & bags. Scale will read a negative tare wt.
5. Set full pallet on scale. Scale will show exact net wt. each time a full pallet is placed on it, until the "AUTO ZERO" is pressed again.

SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
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3. Press "AUTO ZERO". Scale should read zero.
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5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
2. Put empty pallet and bags to be "TARED" onto scale.
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SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14=____ seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
8. Lift____ seconds.
9. Vibrate_____seconds.
10.
11.
12. Delay fill valve stage 1____seconds (see #3).
13. Delay fill valve stage 1_____seconds. (see #5).
14. Dust collector valve delay on_____seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing____seconds (after bag full).
16. ____ seconds delay set point react after blower goes off. (Eliminates false signal).

SEMI-BULK MACHINE RELAYS

1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
4. 2ND SET POINT.
5. 3RD SET POINT.
6. 4TH SET POINT.
7. EMERGENCY STOP.
8. NOT IN USE.
9. CUFF INFLATOR.
10. DUST COLLECTOR VALVE.
11. 1ST STAGE FILL.
12. 2ND STAGE FILL.
13. TABLE LIFT.
14. VIBRATION.
15. BLOWER.
16. NOT USED.

SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14=____ seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
8. Lift____ seconds.
9. Vibrate_____seconds.
10.
11.
12. Delay fill valve stage 1____seconds (see #3).
13. Delay fill valve stage 1_____seconds. (see #5).
14. Dust collector valve delay on_____seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing____seconds (after bag full).
16. ____ seconds delay set point react after blower goes off. (Eliminates false signal).

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1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
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15. BLOWER.
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SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14_____ seconds. Fill stage 1 starts, valve and airlock operate. bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
8. Lift____ seconds.
9. Vibrate_____seconds.
10.
11.
12. Delay fill valve stage 1____seconds (see #3).
13. Delay fill valve stage 1_____seconds. (see #5).
14. Dust collector valve delay on_____seconds. (Blower valve opened and dust collector closed).
15. Dust collector valve delay closing____seconds (after bag full).
16. ____ seconds delay set point react after blower goes off. (Eliminates false signal).

SEMI-BULK MACHINE RELAYS

1. INPUT CUFF INFLATE.
2. CYCLE START.
3. 1ST SET POINT.
4. 2ND SET POINT.
5. 3RD SET POINT.
6. 4TH SET POINT.
7. EMERGENCY STOP.
8. NOT IN USE.
9. CUFF INFLATOR.
10. DUST COLLECTOR VALVE.
11. 1ST STAGE FILL.
12. 2ND STAGE FILL.
13. TABLE LIFT.
14. VIBRATION.
15. BLOWER.
16. NOT USED.

SEMI-BULK MACHINE SEQUENCE AND SET POINTS.

TIMER SETTING NUMBERS.

1. Blower_____ seconds on. Dust collector valve delay #14_____ seconds. Fill stage 1 starts, valve and airlock operate, bag fills to 1st set point_____lbs.

2. Table lift_____seconds.
3. Vibrate____ seconds. Fill delay_____seconds #12. Fill stage 1 continues_____lbs. to_____ lbs.
4. Table lift____seconds.
5. Vibrate_____seconds. Fill delay____seconds #13. Fill stage 1 continues____lbs. to____lbs.
6. Lift_____seconds.
7. Vibrate____ seconds. No fill delay.
   Fill stage 2 trickle flow via rotary aerlock feeder (switch in "slow fill" position).
   Main valve opens when switch in "fast fill" position. (Activated by 2nd stage air).
   Bag fills to final set point_____lbs. to____lbs. minus____lbs. pre-act.
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SEMI-BULK FILLING INSTRUCTIONS

1. Turn on power and air supply.
2. Set machine to net mode by depressing "NET/GROSS" selector button.
3. Set selector switch to "AUTOMATIC" position and make sure red stop button is not depressed.
4. Set plywood on scale.
5. Hang bag.
6. Place spout over cuff and switch on "CUFF INFLATOR'' switch.
7. Hang safety bag.
8. Set dust collector discharge to proper bin and turn on dust collector.
9. Depress "AUTO TARE" button. Scale should read ZERO.
10. Enter wt. set points and timer settings.
11. Push "CYCLE START". You will hear relays engage. If not, repeat above proceedure.

"EMERGENCY STOP" button should be used if a bag falls off or overfills. This will interrupt the cycle, but not cancel it. When ready, pull out button and cycle will automatically continue after a 10 second delay. (Provided you did not cancel cycle by: killing power at "main breaker" or "control power" button or cuff inflator" switch).

If you need to re-position fill spout during cycle, do not switch off cuff inflator. Deflate cuff manually by opening air petcock. That way you don't cancel the cycle.

If cycle is canceled, you have to start new cycle by depressing cycle start. Machine will go through all vibrations and set points again.

If bag floods during fill stage 1, partially close main fill valve by decreasing air at stage 1 regulator (turn counter clockwise, clockwise will increase pressure and open main valve more).

If bag floods during fill stage 2 (trickle cycle), main valve is open. Close valve by decreasing air at stage 2 regulator (turn all the way counterclockwise). Only the rotary feeder should operate during fill stage 2.

TO FINISH PARTIALLY FILLED BAG

1. Set scale to "NET" mode.
2. Zero "TARE" wt.
3. Place bag on a pallet and lift in place with forklift.
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13: = 20.4"

14= DIA = 22"

15= DIA = 23.5

DIA x 3.1416 = CIRCUMFERENCE ÷ 2 =

FAITOUTE STEEL COMPANY, INC.

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SEMI-BULK MACHINE

MANUAL OPERATION

1. Set machine to "NET" mode.
2. Set selector switch to "MANUAL" position.
3. Set bag in place.
4. Switch on "CUFF INFLATOR SWITCH".
5. Depress "AUTO TARE" button.
6. Set jog fill switch to "FAST FILL" positon. (This activates 2nd stage relay and opens main valve. Adjust 2nd stage air regulator so that main valve fully opens).
7. Press "JOG FILL" button and hold until desired wt. reached.
8. Move selector switch to "LIFT" positon and wait 7 seconds for table to raise before turning on vibrator.
9. Vibrate for desired time then shut off vibrator and switch back to "MANUAL FILL" and repeat filling and vibrating.
10. Trickle fill last 100 lbs. by setting jog fill switch to "SLOW FILL" position. (This runs rotary aerlock feeder only. Main valve remains closed). Push "JOG" button and trickle to final wt.

CHECK WEIGHING

1. Set scale to "GROSS" mode.
2. Put empty pallet and bags to be "TARED" onto scale.
3. Press "AUTO ZERO". Scale should read zero.
4. Remove empty pallet & bags. Scale will read a negative tare wt.
5. Set full pallet on scale. Scale will show exact net wt. each time a full pallet is placed on it, until the "AUTO ZERO" is pressed again.

TO ENTER WT. SET POINTS:

1. Push "set" button.
2. Push "stp" button for step; red light indicates set point. There is a set point and pre-act for each step. Blinking red light indicates pre-act.
3. Press desired wt. number and then "E" for enter. Repeat for each step. Push "CE" to clear a mistake.
4. When all set points are entered, push "OPR" for operate.

NOTE: Set points cannot be changed during fill cycle without disrupting cycle.

TO SET TIMER:

To change time periods use the timer key pad inside Control Panel.

1). Push number pad and up or down arrow pads until timer position number is reached as idicated on display. Timer positions are as follows:
   1. Blower (Bag Inflate) time.
   3. First Weigh Set Point Vibration time.
   5. Second Weigh Set Point Vibration Time.
   7. Third Weigh Set Point VIbration Time.
  14. Dust Extraction Provision Time Delay After Fill Valve Opens.
  15. Dust Extraction Provision Time Delay After Fill Valve Closes.

   Timer position numbers 2,4, and 6 are vibration lift delay times, factory set for seven (7) seconds.

2). Push "Ent" (enter) pad to readout existing time.
3). Push "Set" pad to enable programming.
4). Push up and down arrow pads to program time period.
5). Push "Ent" pad to enter new time period.

NOTE: Timer settings cannot be altered during fill cycle.

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Date JANUARY 5, 1983

From R. B. RICKARD

R. B. Rickard

Subject PERSONNEL CHANGE AT ALDER PLANT

Effective January 9, 1984, Mr. A. B. "Bud" Cooper, Special Assignments, is taking on the additional responsibilities of the Alder Plant. Any inquiries involving the Alder Plant should be made to him either at Alder or the Ennis office. Mr. Cooper will continue to report directly to me.

DISTRIBUTION LIST:

G. D. Lessner	J. Vigil	K. Phillips	M. R. McCune
L. D. Murino	C. T. Felger	J. S. Felger	T. Landels
R. J. Buettner	T. E. Cook	G. M. Dugan	R. P. Arellanez
G. T. Rhyne	M. J. Lorang	K. B. Lehman	E. J. Panisko

Lab Results:

D50 Tap .85

SIMILAR

SF 50 hey.

12.43 loose

5.9 microns

.85

83 76.5

47 43.5

17 17

8 8.5

CYPRUS

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
1-11-84	1st	TG/KL	50 DOVER CLASS	501113

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	ANAL. TAP	MAG.	GATE	CLASS RPM	SPINNER RPM
930	22	84			200	98.		15	/	/	639
1030	23	15	89.	0	200	98.4		15	/	/	627
1100	START		CLASSIFIER		-		OIL COLD				
1110	25	40	85.	0	200	98.2	.816	15	1/2	1300	622
FINES	12	30	88.	0	325	99.7	/	"	"	"	"
1130	25	27			200	98.4		"	"	1230	622
FINE	12	30			325	99.8	/	"	"	"	"
1230	26	33	85.	0	200	97.8	.816	"	"	1070	610
FINE	13	42	88.	0	325	99.9	/	(oil	158°)	"	"
150	26	65	85.	0	200	97.9	.833	(oil	190°)	1013	618
FINE	14	04	88.	0	325	99.8	/			"	"
235	26	33	85	0	200	98.6		"	"	952	639
FINE	14	35	88	0	325	99.8	/	"	"	"	"
255	27	46	85	0	200	98.6	.833	"	"	860	639
FINE	15	10	88.	0	325	99.8	/	"	"	"	"

Down Time - Cause - Production Notes:

CK. INIT.

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
1-11-84	1st	TG/KL	DOVER 50 CLASS	501113

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER R.P.M.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES

TIME	Loose BULK ~~TEST~~	Loose BULK READ	~~COLOR~~ METER	~~COLOR~~ ~~VISUAL~~	SCREEN No.	SCREEN %	~~ANAL.~~ TAP	MAG.	GATE	CLASS RPM	SPINNER RPM
930	22	84			200	98		15	/	/	639
1030	03	15	87.	0	200	98.4		15	/	/	627
1100	START		CLASSIFIER		-		OIL COLD				
1110	25	40	85.	0	200	98.2	.816	15	1/2	1300	622
FINES	12	30	88.	0	325	99.7	/	"	"	"	"
1130	25	27			200	98.4		"	"	1230	622
FINE	12	30			325	99.8	/	"	"	"	"
1230	26	33	85.	0	200	97.8	.816	"	"	1070	610
FINE	13	42	88.	0	325	99.9	/	(OIL	158°)	"	"
150	26	65	85.	0	200	97.9	.833	(OIL	190°)	1013	618
FINE	14	04	88.	0	325	99.8	/			"	"
235	26	33	85	0	200	98.6		"	"	952	639
FINE	14	35	88	0	325	99.8	/	"	"	"	"
255	27	46	85.	0	200	98.6	.833	"	"	860	639
FINE	15	10	88.	0	325	99.8	/	"	"	"	"

Down Time - Cause - Production Notes:

CK. INIT.

ROLLER MILL REPORT

1/84

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
			DOV 50	

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	ANAL. TAP	SPINNER RPM	DC FAN	GATE	RPM CLASS.
MILL	2307		87.0		98.	4					
MILL	2402		86.0					580			
MILL	2321										
120	2365		87.0							1/4	1000
125	2440		87.0							1/2	1000
130	2440		87.0						1/2	FULL	1000
1-40	2708		86	—	*97.4				FULL	FULL	1000
300	2652		87	—	*97.6			610	FULL	1/2	900
310	2765							625	FULL	1/2	1100
TAP	.769										
325	2765							633	FULL	1/2	1000
TAP	.784										
400	2839			200	*98.00			636	FULL	3/3	80
FINES	1810			200	*99.8					"	"
425	2652		87.	200	*98.	6	.853	636	FULL	"	850
FINE	1448		89.	325	99.	8%					
"				200	100%						

Down Time - Cause - Production Notes:

CK. INIT.

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	ANAL. TAP	SPIN RPM	DC FAN	DC GATE	RPM CLASS
455	27	64						636	[illegible]	1/2	
500	27	96			200	R98.2	.851	636	[illegible]	1/2	875
FINES	14	79			325	99.8		"	"	"	"
"	"				200			"	"	"	"
555	27	64	87		200	98.4	.851			"	"
600	27	83	87-		200	98.4	.86	636	"	"	875
FINES	14	98	87	HEL. 7.5	325	99.8		"	"	"	"
BUCKETS ↑								"	"	"	"
640	27	14						"	"	"	980
710	26	83					.851	636	"	"	1100
FINES	13	67						"	"	"	

Down Time - Cause - Production Notes:

METER 10399.5 [illegible] 1 HR. TO Bins

10400.5 25% Fines P.4 1,541

75% [illegible] P2 4,625

CK. INIT.

Cyprus Industrial Minerals Company

Interoffice Correspondence

To
Mary Cloud

Date
January 5, 1984

From Keith B. Lehman

#29 SO. PLAINFIELD, N.J.

Subject Urgent Analysis Requested;

DOVER COURSE:

1. Particle size distribution to compare to Beacon Talc.

98.4 2. 200 mesh screen.

87 3. GEB

28.52 4. Loose bulk density

.851 5. 50 tap bulk density

DOVER FINES:

1. Particle size distribution to compare to Suprafino Talc.

99.8% 2. 325 mesh screen

89.0 3. GEB

14.98 4. Loose bulk density

2.5 5. Hegman

Keith B. Lehman

Keith B. Lehman
Mill Supertendent

KbL/alk

CYPRUS

ROLLER MILL REPORT Agate via Transfer Bin #4

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
		5/85	D-50	

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES
								Feed Speed 8 is MAX

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	ANAL TAP	TAP	FEEDER		RPM
730							.869				
	11.	85									> 1000
945	28.	70					.869		8		7960
	11.	67									
1140	30	58			200	98.0			7		
	12	25			325					>	945
	28	39			200						995

Down Time - Cause - Production Notes:

85.8, 87.6, 85.4

86.3, 85.5

CK. INIT.

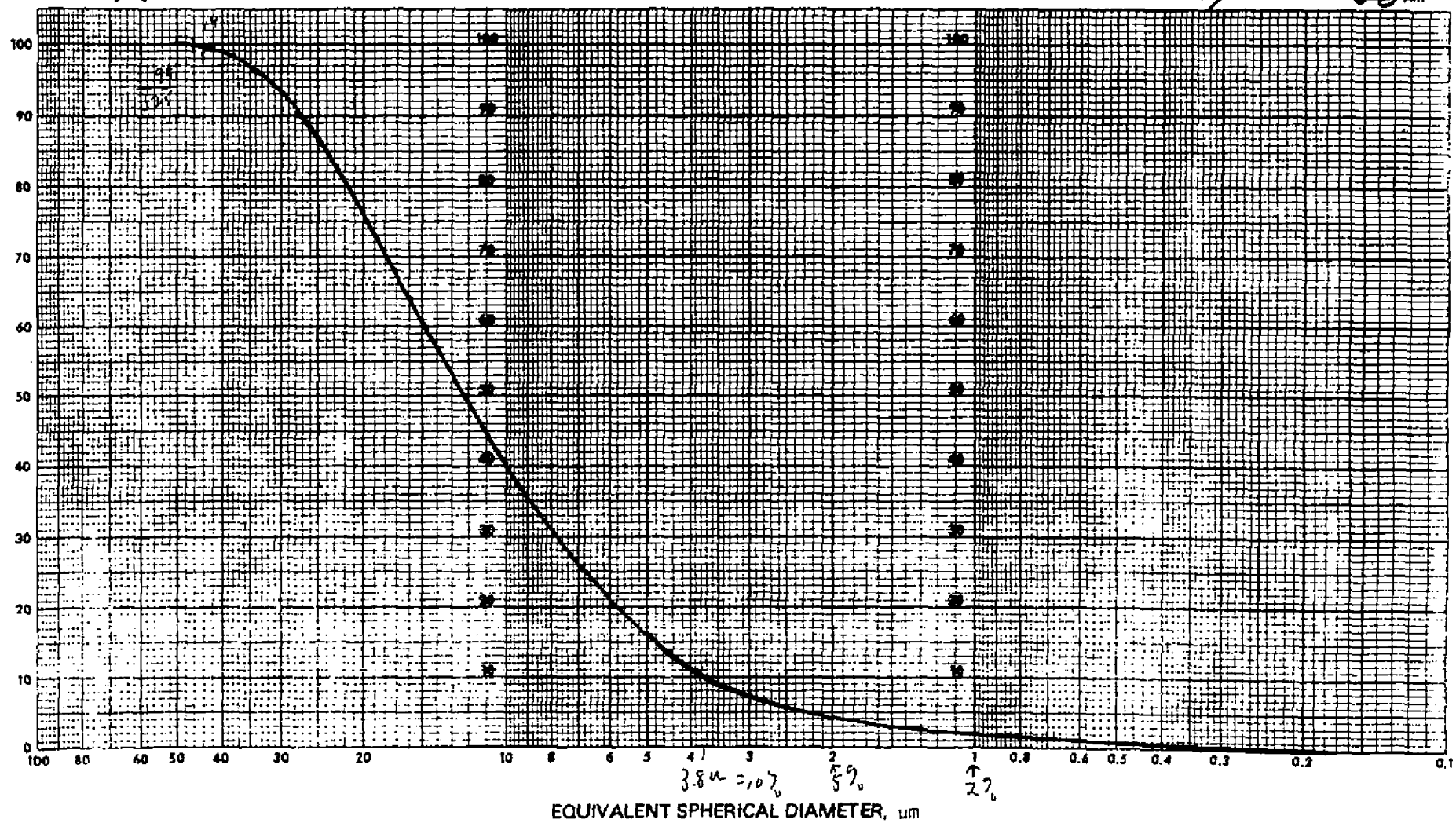
PARTICLE SIZE DISTRIBUTION

SAMPLE IDENTIFICATION Beacon Tak 82-225 DATE 4/18/82

Density 2.75 g/cc LIQUID H2O Density ____ g/cc Viscosity ____ cp BY ME

Preparation S-178 TEMPERATURE 33 °C

RATE 4/4 START DIA. 50 µm



micromeritics® instrument corporation

LEHMAN 01347

Form 500/42701

ROLLER MILL REPORT

DATE	SHIFT	OPERATOR	PRODUCT	LOT No.
1/16/84	1st.	Joe	Supra	

TIME	MILL AMPS	FAN AMPS	MAG	SPINNER r.p.m.	SPINNER AMPS	DAMPER	D.C.	PRODUCTION - NOTES

TIME	BULK TEST	BULK READ	COLOR METER	COLOR VISUAL	SCREEN No.	SCREEN %	ANAL.	MAG. off	CLASS. R.P.M.	TAR	R.P.M.
7:20	22	90	87	.0	98	.0	%				630
8:20	23	09	87	.0	98	.6	%				638
10:25	29	95	85	.0	200	98.1	%	14.5	778		634
10:40	16	04	88	.0	325	99.4	%	14.5	771		635
11:10	29	58	85	.0	200	98.2	%	14.5	827	.885	636
11:10	15	60	88	.0	325	99.6	%	14.5	827		636
12:35	29	27	85	.0	200	98.3	%	14.5	840		640
12:35	14	98	88	.0	325	99.8	%	"	840		640
1:55	28	83	85	.0	200	98.6	%	14.5	839		642
1:55	14	85	88	.0	325	99.9	%	"	839	.869	642
2:55								1.7 FLOW		158°	
4:30	27	96	85	.5	200	98.6			866	.851	633
4:30	13	85	87	.5	325	99.9	DC	FULL			

Down Time - Cause - Production Notes:

CK. IN

LEHMAN 01348

HEALTH AND SAFETY TRAINING REFERENCE MANUAL

CYPRUS INDUSTRIAL MINERALS COMPANY

TALC DIVISION

7200 S. Alton Way
Englewood, Colorado 80155
(303) 740-5470

HEALTH AND SAFETY TRAINING REFERENCE

GENERAL INDEX

- Introduction and Instructions for Use
- Cyprus Industrial Minerals Videotape Programs
- Standard Oil Health and Safety Film List
  - Indexes
    - Alphabetical
    - Subject
  - Program Descriptions
  - Ordering Information
- MSHA Safety and Health Training Plan
  - Recommended Plan, Approval Process
  - MSHA Audio Visual Programs
- Maintenance Skills Training
  - Foreward
  - duPont Courses
  - Tel-a-Train, Inc. Courses
  - ICS Intext Courses

HEALTH AND SAFETY TRAINING REFERENCE MANUAL

INTRODUCTION AND INSTRUCTIONS FOR USE

This training reference manual was designed to assist Talc Division operations in their health and safety related training efforts. It contains indexed references and summaries of audio-visual based training programs that cover a wide range of topics in health and safety, environmental, general interest, and maintenance and operator skills training.

The Cyprus Industrial Minerals videotape programs are available through the Talc Division Safety Department offices at 303-740-5470 or 406-285-3271.

The Standard Oil programs are available through SOCO's Media Resources Center. Instructions are provided for ordering in that section.

Required Mine Safety and Health training is also covered with a sample training plan, a summary of the approval process, and an MSHA audio-visual program list.

Finally, a reference section on maintenance and operator skills training is provided. Examples of commercially available training programs on a multitude of topics are provided.

Any questions or clarification of materials or information should be directed to the Talc Division Safety Department offices at 303-740-5470 or 406-285-3271.

Issued 12/84

CIM FILM LIST

CYPRUS INDUSTRIAL MINERALS FILM LIST

The following videotapes are available through the Talc Division Safety Department offices. Order by calling either (303) 740-5470 or (406) 285-3271.

LOCKOUT PROCEDURES
Detailed guidelines on lockout procedures for electrical, pneumatic/hydraulic, fluids and gases and mechanical actuated equipment. Covers the six basic steps of a lock and tag procedure. Also covers start up procedures. Recommended for all maintenance and operations personnel.

½" VHS Videotape

GRINDING WHEEL SAFETY - PART 1 & 2
Thoroughly covers all aspects of safe use of grinding wheels. Covers ring testing, mounting, dressing wheels, guards and general precautions. Recommended for all maintenance personnel.

½" VHS Videotape Part I (22:18) Part II (19:40)

COLOR OF DANGER/THE WINNERS, THE LOSERS
Catepillar films on safe forklift operation. Excellent film recommended for all mill employees.

½" VHS Videotape Available in Spanish

MULTIPLE CHOICE/SHAKE HANDS WITH DANGER
Catepillar films on heavy equipment operation and maintenance. Excellent films. Recommended for viewing by all mine employees, mill maintenance and mill loader operators.

½" VHS Videotape

PROPANE GAS AND FORKLIFTS
Reviews the benefits and precautions needed with propane fueled lift trucks. Covers fueling procedures, basic maintenance, general precautions. Recommended for viewing by all mill employees and mine employees who work with or operate propane powered vehicles.

½" VHS Videotape

WIRE ROPE AND SLINGS
Five segments on one tape covering wire rope construction, use and inspections and wire rope slings - how they are made, how they work and how to use safely and correctly. A sixth segment covers web slings. Recommended for all maintenance employees.

OXY/ACETYLENE WELDING - SAFE PRACTICES
Excellent tape from Victor Welding on set up and use of oxy/acetylene welding systems. Covers and stresses safety aspects such as preventing flash back, tip selection, flame size, etc. Recommended for all maintenance employees.

½" VHS Videotape

SCAFFOLDING
Proper erection of all types of scaffolding. Recommended for any employee who must use scaffolding. Available for review with contractors working on our property with scaffolding.

½" VHS Videotape

LOVE YOUR BACK
Safe lifting program adapted to our mill locations. Shows G.I. employees lifting bags, twisting, etc. Back exercises covered. Recommended for viewing by all employees.

½" VHS Videotape

DUPONT FORKLIFT TRAINING SERIES
A series of four tapes, employee workbooks and final quiz that covers safe operation of forklifts in an industrial environment. Course can be taken on an individual study basis or on a lecture/group basis. Recommended for all forklift operators. Should be required for all new lift operators.

½" VHS Videotape

PREVIEW OF TALC DIVISION OPERATIONS
Videotape preview of Talc Division locations (not narrated). Good for showing employees who we are and what we do.

½" VHS Videotape Approximately 30"

FALL PROTECTION
Basic guidelines on fall protection, safety belt and lanyard selection, inspection and use. Rose Manufacturing presentation. Shots of specialized fall protection devices such as the SALA safety block and bulk loading fall protection/access systems at Three Forks. Recommended for viewing by all employees.

½" VHS Videotape

THREE FORKS ROLLER MILL OVERHAUL
Tape of 54" roller mill overhaul in mid 1984.

½" VHS Videotape

BATTERY CHARGING PROCEDURES

Short film on proper steps required to safely jump start or charge a vehicle's battery. Stresses the explosion hazards associated with battery charging. Warning stickers detailing jump start procedures (see below) are also available. Recommended for all employees.

½" VHS Videotape

Use CAUTION and SAFETY EYEWEAR when jump-starting vehicle.

Place in glove compartment or other clean, dry location.

WARNING
BATTERIES PRODUCE EXPLOSIVE GASES

Keep sparks, flames and cigarettes away from batteries at all times. Wear eye protection. Don't lean over batteries during jump-starting. See owner's manual for instructions.

JUMP-START INSTRUCTIONS

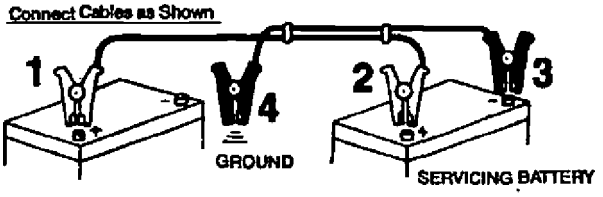
Be sure: vent caps are tight and level...damp cloth, if available, is placed over vent caps...vehicles are not touching...both electrical systems are the same voltage. **Don't Jump-Start If Fluid Is Frozen!**

ATTACHING THE CABLES

(Do in order listed):

1. Clamp one jumper cable to positive (+) terminal of discharged battery wired to starter or solenoid. Do not allow positive cable clamps to touch any metal other than battery terminals.
2. Connect other end of positive (+) cable to positive (+) terminal of booster battery.
3. Connect one end of the second cable [negative (−)] to other terminal [negative (−)] of booster battery.
4. Make final connection on engine block of stalled engine (not to negative post) away from battery, carburetor, fuel line, any tubing or moving parts.

Connect Cables as Shown



5. Stand back from both vehicles. Start car with good battery—then start the disabled car.
6. Remove cables in reverse order of connections beginning by first removing cable from engine block or metallic ground.

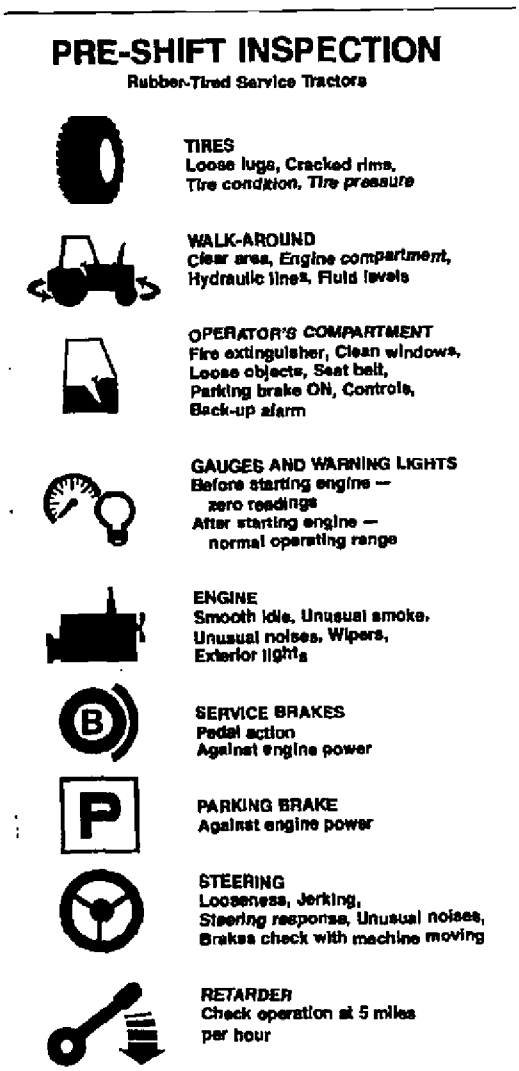
NATIONAL SOCIETY TO PREVENT BLINDNESS
79 MADISON AVENUE, NEW YORK, NY 10016

Copyright 1984 by National Society to Prevent Blindness

PRE-SHIFT INSPECTIONS

Covers the actual pre-operation inspection of small front end loader/backhoe at a Cyprus mining location but can be used to explain the purpose and need for pre-shift inspections for all types of equipment. Explains the safety and good operating practices enhanced by a thorough inspection of a vehicle before operating. Inspection checklists for forklifts (available in Spanish), haul trucks, service tractors, and other heavy equipment are available. Recommended for all employees particularly new employees.

½" VHS Videotpae — Approximately 15 Minutes



[redacted]

VISUAL PRE-USE CHECKLIST (BEFORE START-UP)

1. Fire Extinguisher - Present & charged.
2. Engine Oil Level.
3. Fuel Level.
4. Evidence of ANY damage; missing or loose bolts; nuts, Guards, chains, hydraulic hose reel.
5. Wheels/Tires - Tire tread ok, tires round.
6. Forks - Positioning latches in working condition; carriage teeth not broken, chipped, or worn.
7. Anchor Pins on Chains - Pins not worn, loose, or bent.
8. Fluid Leaks - Damp spots or drips of fluid that may indicate a leak.
9. Battery - Cables (no exposed wires).
10. Hoses - Held securely, not loose or rubbing.

FORKLIFT PRE-SHIFT INSPECTION FORMS

EXAMEN VISUAL ANTES DE PRENDER LA MÁQUINA

1. Extinquidor de Fuego-Presente y cargado.
2. Nivel de Aceite del Motor.
3. Nivel de Combustible.
4. Señales de cualquier daño: tuercas sueltas, protecciones, cadenas, carrete de la manga hidráulica.
5. Ruedas/Llantas-En buenas condiciones.
6. Cuchillas del Montacarga-Funcionamiento del cerrojo para posicionar las cuchillas.
7. Pasadores de las Cadenas-que no esten gastados, sueltos, o doblados.
8. Goteos, Filtraciones de Fluidos-manchas o areas húmedas que indiquen goteos.
9. Batería-Cables, que no hayan alambres expuestos.
10. Mangas-Seguras y firmes. Que no esten friccionando.

OPERATIONAL PRE-USE CHECKLIST (AFTER START-UP)

1. Seat Belt - Good condition - Use Them!
2. Horn.
3. Lights - Head and warning.
4. Foot Brake - Pedal holds. unit stops smoothly.
5. Parking Brake - Should hold against slight acceleration.
6. Clutch and Gearshift - Smooth shifting. no jumping or jerking.
7. Noises.
8. Dash control panel - All gauges operational.
9. Steering - Smooth movement.
10. Lift mechanism - Moves smoothly. holds.
    Raise forks to maximum height.
    Lower forks completely.
11. Tilt mechanism - Moves smoothly. holds.
    Tilt mast all the way forward.
    Tilt mast all the way backward.
12. Side shifter - Moves smoothly. holds.
    Shift all the way to the right.
    Shift all the way to the left.
13. Leaks - Check cylinders and hoses for leaks after above checks.

FORKLIFT PRE-SHIFT INSPECTION FORMS

EXAMEN OPERACIONAL DESPUES DE PRENDER LA MÁQUINA

1. Cinturón de Seguridad-En Buena Condición ¡Utilízelo!
2. Bocina.
3. Luces-Delanteras y Señales
4. Freno de Pie-que el pedal agarre y se detenga el camión suavemente.
5. Freno de Emergencia o para estacionar-debe aguantar una aceleración leve.
6. Embrague y Palanca de Cambios-cambios suaves sin brincos o jaléos.
7. Ruidos raros.
8. Tablero de Controles-indicadores en buen funcionamiento.
9. Manejo-Movimiento suave.
10. Mecanismo Para Elevar-movimiento suave, y que agarre. Alze las cuchillas a la altura máxima y bájelas completamente.
11. Mecanismo para Inclinar-movimiento suave,y que agarre. Incline mástil hacia delante y hacia atras.
12. Mecanismo para mover carga de lado a lado movimiento suave, y que agarre. Mover hacia la izquierda y hacia la derecha.
13. Gotéos-Examinar cilindros y mangas después de todas las verificaciones anteriores.

duPont Take Two Safety Meeting Series

The Take Two videotape series is a series of 13 videotapes, each 7-10 minutes long, designed to reduce accidents and injuries by encouraging positive safety attitudes and awareness. Take Two refers to the theme stressed throughout the series that encourages employees and supervisors to think through a job before and during the work.

The series' real value lies in its ease in use and ability to encourage discussion about attitudes and specific practices in our locations.

In addition to the thirteen individual units, the series also provdes a "Meeting Guide for Leaders" and a printed outline for each unit which helps supervisors conduct successful, interactive meetings.

Below are summaries of each unit:

#1 WHY TAKE TWO (7:30)
Is an introductory tape that explains the Take Two series. It stresses that just talking about safety won't prevent injuries. Thinking through a job before acting is important.

#2 A MATTER OF HABIT (7:25)
Stresses the need to establish safe work practices. Working safely (or unsafely) can become a habit.

#3 THE "NO MAN" (8:00)
Negative attitudes toward safe work practices are dramatized and discussed.

#4 WHO'S TO BLAME (8:15)
Accident and injury reports are important tools designed to prevent recurrence of incidents. This tape shows what can happen when incident reports are ignored.

#5 OVER AND OVER AGAIN (8:50)
Repetitious, monotonous jobs often lead employees into a false sense of security. Thinking through a job, regardless of how many times you have performed it, can prevent accidents.

#6 NO EXCEPTIONS (8:30)
Supervisors are expected to set examples and follow safe work practices.

#7 **THE WHAT IF GAME (10:00)**
Confined area entry procedures and the consequences of not following those procedures are dramatized to emphasize the need to follow procedures, to communicate and think through jobs.

#8 **MAKING DO...WON'T DO (8:30)**
The right tools and equipment are essential to completing a job safely, productively, and efficiently.

#9 **THE COUNTDOWN (9:15)**
Failure to follow lockout procedures is used to show that safety on the job is rarely an isolated situation and is often the result of a series of actions of many people. STRONGLY RECOMMENDED.

#10 **DON'T HIDE AN INJURY (8:00)**
Reporting all injuries (and accidents) is important - even reporting minor injuries can prevent complications and help prevent major accidents.

#11 **MAKE POUNDS...BUT SAFELY (9:00)**
Safe production is cost effective and efficient. Accidents or injuries result in significant losses to the employee, the company, and the supervisor.

#12 **TAKE TWO WHEN YOU'RE THROUGH (10:00)**
Stresses the need to bring up suggestions that can lead to safe, more efficient ways to do a job.

#13 **THAT MAKES ME MAD (9:00)**
Anger and frustration can often lead to inattention and accidents. This tape encourages employees to recognize anger as a potential hazard and to stop and Take Two or three minutes to calm down.

MEETING LEADER'S GUIDE (20:00)
A guide to help supervisors conduct successful, interactive meetings. Provides practical suggestions on how to improve safety meeting efforts.

STANDARD OIL COMPANY HEALTH AND SAFETY FILM LIST

This list of audio-visual programs has been extracted from the General Catalog of Media Resources and subsequent supplements provided by Standard Oil Company. The 16 mm motion picture films, 35 mm slide/tape programs, and videotape programs are intended to improve the quality of health, safety, and environmental training at our locations. Films should be ordered directly from the Media Center in Chicago. Instructions for ordering are provided after the program descriptions. Both subject and alphabetical indexes have been provided.

To insure arrival of the appropriate film on time, you are encouraged to order at least one month in advance. It is also possible to order several films in advance so that a different film will arrive during successive months.

Requests for films should be directed to:

Standard Oil Company (Indiana)
Media Center, Mail Code 2601
200 East Randolph Drive
Chicago, Illinois 60601
(312) 856-4343

STANDARD OIL COMPANY HEALTH AND SAFETY FILM LIST

ALPHABETICAL TITLE INDEX

	Page
Accidents Made Easy	1
Accident Report	1
American Roulette	1
Backfire	1
Be A Pro	1
Bend Your Knees	2
B L E V E	2
Choice Is Ours, The	2
Closed Containers and Fire	2
Cold Can Kill	2
Convincer, The	3
Corporate Safety Belt Program	3
Cranes and Hoists	3
Crane Contacts With Overhead Power Lines	3
Danger Zone: Your Back	3
Danger Zone: Your Head	4
Decide To Be Safe	4
Driving Drunk	4
Drum Handling Safety	4
Electrical Lockout	4
Electrical Safety	5
Electricity - Parts 1 and 2	5
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ACCIDENTS MADE EASY
Employee attitudes toward safety are uncovered as a result of a series of recent accidents that could have and should have been avoided.
Restricted - Standard Oil Company and Affiliates only
1000986MP6PC

16mm	Optical Sound	Color	10 Min.	1975

ACCIDENT REPORT
Program stresses the importance of personal responsibility while driving. Shows how "the attitude factor" can cause and cure accidents. Positive ideas are provided to develop safe attitudes.
Restricted - Standard Oil Company and Affiliates only.
1001064MP6PC

16mm	Optical Sound	Color	15 Min.	1982

AMERICAN ROULETTE
Program describes safety hazards of grinding wheels. Covers maintenance procedures and safety procedures for air portable grinders and bench and plate mounted grinding wheels. Sates importance of safety glasses and proper methods for installing or changing grinding wheels.
Restricted - Standard Oil Company and Affiliates only.
2020583VAIC

VT	Sound	Color	30 Min	1974
01 Videotape Program				

BACKFIRE
One out of three people in the workforce will injure their back within the next 12 months--it is industry's most common injury. This program attempts to cut those odds.
Restricted - Standard Oil Company and Affiliates only.
1001083MP6PC

16mm	Optical Sound	Color	15 Min.	1977

BE A PRO
Stresses the fact that just as professional athletes protect themselves with good equipment and attitudes. Workers too should develop a professional attitude toward their work. Spectacular sport scenes make the film entertaining as well as educational.
Restricted - Standard Oil Company and Affiliates only.
1000627MP6PC

16mm	Optical Sound	Color	15 Min.	1969

BEND YOUR KNEES
Anyone who picks up as much as a piece of paper from the floor needs to see this film. Len Ring one of the world's greatest safety communicators, puts forth his knowledge and sharp wit to show how insidious back injuries really are and shows an easy method to prevent them.
Restricted - Standard Oil Company and Affiliates only
1001029MP6PC

16mm	Optical Sound	Color	18 Min.	1974

B L E V E
The film on boiling liquid expanding vapor explosions. Spectacular fire ground footage shows how these explosions can cause widespread death and destruction. Offers guidance on decisions affecting attack or evacuation. Uses animation to clarify explanations. Essential for fire fighters, tank fleet operators, flammable liquid transportation and gas company personnel.
1000983MP6PC

16mm	Optical Sound	Color	19 Min.	1978

CHOICE IS OURS, THE
Program discusses methods to avoid vehicle accidents by applying the four-second rule while driving. Examples are reviewed in several road scenes.
Restricted - Standard Oil Company and Affiliates only.
2021771VA9C

VT	Sound	Color	15 Min.	1983

CLOSED CONTAINERS AND FIRE
Demonstrated are the effects of extreme heat on closed containers: rupture or explosion. If we recognize clues, we will have a better chance of dealing with fires involving containers
Restricted - Standard Oil Company and Affiliates only.
1001056MP6PC

16mm	Optical Sound	Color	20Min.	1981

COLD CAN KILL
The dangers of hypothermia are presented, and proper preventive measures are demonstrated.
Restricted - Standard Oil Company and Affiliates only.
1001062MP6PC

16mm	Optical Sound	Color	28 Min.	1980

CONVINCER, THE
Each year over 2 million employees suffer severe diabling injuries at work. Over 90 percent of them were caused by someone, usually the injured employee, performing an unsafe act. Slides in this program are of actual injuries, and those who may become ill should be excused.
Restricted - Standard Oil Company and Affiliates only.
3021622SL2CC

SLAC	Sound	Color	12 Min.	1979

CORPORATE SAFETY BELT PROGRAM
Program is designed to aid in establishing and supporting an on-going safety belt campaign.
Restricted - Standard Oil Company and Affiliates only.
8021782MPSL

SLAC	Optical Sound	Color	30 Min.	1983

CRANES AND HOISTS
Safety principles in accordance with OSHA Standards are presented in this program. Supplementary materials are available. Videotape version order No. 2021649.
Restricted - Standard Oil Company and Affiliates only.
1001091MP6PC

16mm	Optical Sound	Color	26 Min.	1982

CRANE CONTACTS WITH OVERHEAD POWER LINES
Stresses the Safety precaustions a crane operator must take while moving various types of loads near overhead power lines. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020534SL2SC

SL	Silent	Color		1974

DANGER ZONE: YOUR BACK
Program attempts to motivate emplyees to use safe guidelines before attempting to lift, push or pull. Restricted - Standard Oil Company and affiliates only.
1000955MP6PC

16mm	Sound	Color	19 Min.	1976

DANGER ZONE: YOUR HEAD
An injury to the head is one of the most potentially debilitating types of injuries. If the brain is damaged, the damage is permanent. In several cases workers who were required to wear hats did not understand why, did not inspect and maintain their hats, and even abused them. This program instructs and emphasizes the importance of good head protection.
Restricted - Standard Oil Company and Affiliates only.
1001101MP6PC

16mm	Optical Sound	Color	16 Min.	1983

DECIDE TO BE SAFE
Proves safety comes with decision. Points up the need for sincere determination to work safely.
1000137MP6PB

16mm	Optical Sound	Black & White	15 Min.	1970

DRIVING DRUNK
A cocktail party is the setting in which myths concerning effects of alcohol on individuals are deflated. These include "some drinks are less intoxicating than others." "It's O.K. to drive as long as you have some hot coffee to sober you up." "It's easy to spot someone impaired by alcohol." Alternatives to "driving drunk" are offered also. A "know your limits" chart for blood-alcohol percentage is explained.
Restricted - Standard Oil Company and Affiliates only.
2021770VA8C

VT	Sound	Color	28 Min.	1984

DRUM HANDLING SAFETY
Discussed in this program are proper methods for palletizing drums, rolling drums, dumping drums, breaking drums, and safety equipment.
Restricted - Standard Oil Company and Affiliates only.
3021605SL2CC

SLAC	Sound	Color	15 Min.	1974

ELECTRICAL LOCKOUT
Improper or careless lockout/tagout procedures result in an alarming number of needless injuries. This program points out how they happen and how to avoid them. Available in half inch VHS videotape format only.
Restricted - Standard Oil Company and Affiliates only.
2021676VA9C

VT	Sound	Color	27 Min.	1983

ELECTRICAL SAFETY
A program for anyone who works around electric current. Hazards of electric shock are explained and safe practices are demonstrated. Importance of staying alert and taking nothing for granted is stressed. Available in half inch VHS videotape format only.
Restricted - Standard Oil Company and Affiliates only.
2021675VA9C

VT	Sound	Color	28 Min.	1983

ELECTRICITY - PARTS 1 AND 2
Topics viewed in this program include nature and measurement of electricity, dangers of electricity, insulation, protection devices in accorance with OSHA Standards. Supplementary materials available. Videotape version may be ordered under No. 21642.
Restricted - Standard Oil Company and Affiliates only.
1001084MP6PC

16mm	Optical Sound	Color	31 Min.	1982

EMERGENCY RESPONSE FOR OPERATORS
Being prepared for an emergency is what this operator program is all about. Decision making and action to be taken are needed to minimize personal injury, property, and environmental loss.
Restricted - Standard Oil Company and Affiliates only.
2021683VA8C

VT	Sound	Color	45 Min.	1983

EVERYTHING TO LOSE
This program shows the terrible consequences of ignoring shop safety rules, of taking foolish chances when there is everything to lose. The message is loud and clear for all who work around machine tools and material handling equipment.
Restricted - Standard Oil Company and Affliates only.
2021324VA8C

VT	Sound	Color	21 Min.

01 Videotape Program

FIRE EXTINGUISHERS
Vital information about classes of fires and types of extinguishers suitable for each. Program discusses proper use of extinguishers.
Restricted - Standard Oil Company and Affiliates only.
3021615SL2CC

SLAC	Sound	Color	10 Min.	1975

FIRE FIGHTING/FIRE AND OIL SPILLS
Topics covered in this program include: 1) characteristics of flammable materials; 2) flammable liquid spills on water; 3) flammable liquid spills on land; 4) other fire hazards.
Restricted - Standard Oil Company and Affiliates only.
2021749VA8C

VT	Sound	Color	40 Min.	1978

FIRST STEP, THE: AN INVITATION TO FALL
Slips and falls on stairs are a major health and safety problem. Each year there are over 31 million minor accidents, over 2.5 million disabling injuries, over 500,000 accidents requiring hospital treatment, and over 5,000 deaths. You are most likely to fall when you are: 1) hurrying, 2) carrying something, or 3) distracted. The title of the film emphasizes the importance of making the first step a good one. It shows why all stairs are a potential hazard and the four key principles for avoiding falls on stairs: 1) recognize the hazard, 2) watch that first step, 3) slow down the stairs, and 4) give a hand to the rail.
Restricted - Standard Oil Company and Affiliates only.
1000996MP6PC

16mm	Optical Sound	Color	15 Min.	1980

FIRST TWO MINUTES, THE
A demonstration on the proper use of hand portable fire extinguishers in a variety of actual fire situations. Scenes show proper technique for flammable liquid spill fires, fuel in-depth and multi-level fires, flammable liquid and gas pressure fires, and wood and paper fires. Also shown in the proper technique for "blow-down" of the fire extinguisher.
Restricted - Standard Oil Company and Affiliates only.
1001107MP6PC

16mm	Optical Sound	Color	10 Min.	1979

FIRST STEP TO SAFETY: HAZARD RECOGNITION
Illustrated are simple but effective ways to control or eliminate safety hazards - an almost foolproof method every supervisor and worker can use.
Restricted - Standard Oil Company and Affiliates only.
1001108MP6PC

16mm	Sound	Color	10 Min.	1980

FLAMMABLE LIQUIDS - PARTS 1-2-3
The dangers associated with flammable liquids is covered in this OSHA safety program. Topics discussed include characteristics and classification. Supplementary materials available. Videotape version may be ordered under No. 2021643.
Restricted - Standard Oil Company and Affiliates only.
1001085MP6PC

16mm	Optical Sound	Color	50 Min.	1982

FOOLS RUSH IN-CONFINED SPACES
Program alerts all in the hazards inherent with confined space entry. Instruction in correct procedure and motivation to follow these procedures at all times is given. Slide version of program available under No. 3021686SL2CC.
Restricted - Standard Oil Company and Affiliates only.
2021686VA8C

VT	Sound	Color	18 Min.	1983

FORESIGHT NOT HINDSIGHT
Film shows that foresight - eliminating hazards before they can cause accidents - is the difference between real safety supervision and just a good try.
Restricted - Standard Oil Company and Affiliates only.
1000199MP6PB

16mm	Optical Sound	Black & White	10 Min.	1967

FUTURE IS IN YOUR HANDS, THE
A hand and finger safety program in which an actual accident is reenacted. Key points leading to accidents of this type are covered.
Restricted - Standard Oil Company and Affiliates only.
1001082MP6PC

16MM	Optical Sound	Color	17 Min.	1982

GOLDEN TOE, THE
A motivational foot safety program featuring Jim Bakken, St. Louis football star, to buy and wear safety shoes.
Restricted - Standard Oil Company and Affiliates only.
2021659VA8C

VT	Sound	Color	12 Min.	1982

GUARD YOUR HANDS
This program is designed to show how to protect workers hands on the job. It stresses four points: (1) Know the machinery you operate, and be sure all guards are on. Don't wear gloves or jewelry when working with machines. (2) Use the right rool, and make sure it's in good condition. (3) When handling materials, check for hazards and watch out for pinch points. (4) With any injury, get first aid right away.
Restricted - Standard Oil Company and Affiliates only.
3021325SL2SC

SL	With Script	Color	10 Min.	1967

HANDS OFF DANGER
A film featuring one of the biggest problems in nearly every occupational environment - the hand injury. As tools for living, our hands can be considered the fundamental vehicle of human thought - a partner with the brain. Demonstrated are how hands are utilized as tools of learning, working and communicating.
Restricted - Standard Oil Company and Affiliates only.
1001057MP6PC

16mm	Optical Sound	Color	17 Min.	1978

HAND TOOLS
Describes basics for care and use of hand tools. Safety aspects are highlighted. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020525SL2SC

SL	Silent	Color		1974

HAZARDS OF ELECTRICITY
Electricity is a powerful and beneficial helper to industry. Utilized incorrectly in a refinery, however, it can be highly dangerous. Due to the presence of vapors and gases at a refinery, control of sparks, and arcs is required. Safety factors are covered in this program.
Restricted - Standard Oil Company and Affiliates only.
2021669VA8C

VT	Sound	Color	17 Min.	1982

HAZARDS OF WAREHOUSE JOBS
Hazards connected with our warehouse equipment such as the conveyors, bag flatteners, bagging machines and tote bin inspection.
Restricted - Standard Oil Company and Affiliates only.
2020711VA1B

VT	Sound	Black & White	25 Min.	1973

01 Videotape Program

HAZARDOUS SUBSTANCES
Program covers toxic, flammable, and radioactive dangers and effects of exposure to hazardous substances at the workplace and on the job. Identification, precaution, prevention procedures, and protective equipment relating to chlorine, acids, caustics, gasoline fuels, and liquids, paints, dusts and gasses, and metallic substances are highlighted.
Restricted - Standard Oil Company and Affiliates only.
2021773VA8C

VT	Sound	Color	60 Min.	1978

HAZARDOUS WASTE - LABELS AND MARKINGS
In the transport of hazardous wastes - proper labels and markings are required by the EPA and the Department of Transportation. Proper procedures are explained in this program so as to comply.
Restricted - Standard Oil Company and Affiliates only.
2021690VA8C

VT	Sound	Color	20 Min.	1979

HEAT STRESS
Heat illness on the job is everyone's responsibility. Being able to recognize the difference between heat stroke and heat exhaustion and corrective action to be taken are of the utmost importance.
Restricted - Standard Oil Company and Affiliates only.
3021672SL2CC

SLAC	Sound	Color	30 Min.	1983

HOUSEKEEPING MEANS SAFEKEEPING
Dramatization of the painful consequences of poor industrial housekeeping.
Restricted - Standard Oil Company and Affiliates only.
1000931MP6PC

16mm	Optical Sound	Color	9 Min.	1970

HOW TO PREVENT FALLS
Program designed to help teach employees how to spot the hazards that cause falls - the second most frequent cause of fatal accidents - and how to correct the fall hazards on the job and at home. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020530SL2SC

SL	Silent	Color		1974

HOW YOU LIFT MAKES A DIFFERENCE
Program objective is to teach employees how to avoid painful strain and sprain injuries by lifting properly.
Restricted - Standard Oil Company and Affiliates only.
3021588SL2CC

SLAC	Sound	Color	30 Min.	1980

INJURIES AND CHEMICAL BURNS TO THE EYE
A talk given by D. Jack Kilian, M.D., about the human eye and industry related accidents of the eye.
Restricted - Standard Oil Company and Affiliates only.
3021265SL2CC

SLAC	Sound	Color	55 Min.	1979

INTRODUCTION TO HAZARD RECOGNITION
In 1970, the U.S. Congress passed into law the Occupational Safety and Health Act to assure as far as possible--every working man and woman in the nation--safe and healthful working conditions. This program outlines major work place hazards through individual units. For videotape version order No. 2021652.
Restricted - Standard Oil Company and Affiliates only.
1001094MP6PC

16mm	Optical Sound	Color	20 Min.	1982

IRON GRAVEYARD, THE
"The Iron Graveyard" is a film about city driving, its dangers and challenges. Produced specifically for the professional driver, the film examines a variety of driving situations demanding the clear thinking and skillful handling expected of a pro. The film dramatically analyzes the safe ways to deal with such potentially hazardous driving maneuvers as: exiting from expressways, changing lanes, parking, approaching intersections and four way stops, making left and right turns. The film also touches on a number of other subjects, including pedestrian safety, anticipating the moves of parallel and angle parkers, maintaining following distance, and moving with the flow of traffic.
Restricted - Standard Oil Company and Affiliates only.
1000907MP6PC

16mm	Optical Sound	Color	10 Min.	1977

IT'S YOUR HEARING
Explains how long exposure to excessive noise can harm hearing. Program advises machine operators and others who work in high noise areas to get good ear protection and describes a number of types of ear protectors. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020529SL2SC

SL	Silent	Color		1974

JOB ORIENTATION: THE SUPERVISORS ROLE IN TRAINING NEW EMPLOYEES
Work habits, good or bad, for the new employee are established in the first 90 days. Critical areas such as attitudes, productivity, attendance, are determined at that time. Proper job orientation should help in reducing turnover, improving quality, and in cutting costs.
Restricted - Standard Oil Company and Affiliates only.
1001061MP6PC

16mm	Optical Sound	Color	15 Min.	1979

KEEP YOUR DISTANCE
Designed for professional drivers. The program explains how to gauge breaking distance, and proper following distance, and other ways to prevent collisions.
Restricted - Standard Oil Company and Affiliates only.
3020524SL2SC

SL	Silent	Color		1974

KNOW YOUR SAFETY MANUAL - SAFETY TRAINING SERIES - PROGRAM 2 - "HOUSEKEEPING"
Program covers the importance of housekeeping for safe operations. Good and bad examples at Amoco Pipeline Company are viewed. Available in slide program format also.
Restricted - Standard Oil Company and Affiliates only.
2021600VA8C

VT	Sound	Color	10 Min.	1982

LADDERS
Safety program deals with OSHA Safety Standards on Ladders. Supplementary materials available. Also, program is available in videotape under No. 2021644.
Restricted - Standard Oil Company and Affiliates only.
1001086MP6PC

16mm	Optical Sound	Color	10 Min.	1982

LET GEORGE DO IT
Shows sequence of events that lead to work injuries because of the assumption that "The Other Guy" did his part of the job safely. Teaches employees to check for safety before starting to work. The film also conveys how it feels to be "George" - knowing that an oversight contributed to the painful injury of a co-worker.
Restricted - Standard Oil Company and Affiliates only.
1000963MP6PC

16mm	Optical Sound	Color	10 Min.	1978

LOCKOUT
"Lockout" is another part of machine guarding-protection for employees who are required to get into the works of a machine.
Restricted - Standard Oil Company and Affiliates only.
3021526SL2CC

SLAC	Sound	Color	10 Min.	1978

LOW VOLTAGE SAFETY
Program is for employees who work with 660 volts or less. Some of the points covered include: what determines severity of low voltage accidents; physical reactions; arcs; shock; thermal and arc burns; protective clothing and equipment; electrical power tools; grounding and lockouts; extension cords; and work environment. Available in 3/4" video format.
Restricted - Standard Oil Company and Affiliates only.
2021775fVA8C

VT	Sound	Color	14 Min.	1983

MANUAL HANDLING AND LIFTING
Fundamentals of correct handling methods. Tells proper way to lift and handle a variety of materials. Stresses importance of intelligent reading. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020519SL2SC

SL	Silent	Color		1974

MATERIAL HANDLING VEHICLES
Safety precautions for all material handling vehicles in accordance with OSHA Standards. Supplementary materials are available. For videotape version order No. 2021654.
Restricted - Standard Oil Company and Affiliates only.
1001096MP6PC

16mm	Optical Sound	Color	16 Min.	1982

MATERIAL HANDLING SAFETY PRINCIPLES
A variety of hazards in material handling are covered, including strains, sprains, fractures, bruises. OSHA Standards are covered. Supplementary materials are available. Videotape version order No. 2021648.
Restricted - Standard Oil Company and Affiliates only.
1001090MP6PC

16mm	Optical Sound	Color	31 Min.	1982

MECHANICAL SAFEGUARDING
Wherever it is possible for a worker to be struck by moving parts of a machine, safeguarding is required. Standards established by OSHA are explained. Supplementary materials are available. Videotape version order No. 2021647.
Restricted - Standard Oil Company and Affiliates only.
1001089MP6PC

16mm	Optical Sound	Color	18 Min.	1982

MINI-SEMINAR ON THE PROPER CARE AND USE OF THE MODEL 2A EXPLOSIMETER INDICATOR
This program explains the sampling procedure with the explosimeter in a step by step fashion. In addition, calibration inspection and routine maintenance are discussed.
Restricted - Standard Oil Company and Affiliates only.
3021663SL2CC

SLAC	Sound	Color	24 Min.	1978

MINI-SEMINAR ON THE PROPER CARE AND USE OF THE MODEL 260 COMBUSTIBLE GAS AND OLYGEN ALARM
This program covers the set up, operation calibration check, and simple maintenance of the Model 260. The viewer learns the importance of detecting combusible gases and vapors or oxygen deficiency in different work environments including confined space.
Restricted - Standard Oil Company and Affiliates only.
3021664SL2CC

SLAC	Sound	Color	24 Min.	1980

MUST WE FALL
Every hour 19 people are injured or killed in a serious fall. Slips, trips, and falls are one of the largest causes of injuries. Outlined is a three-step porcess which we can use to avoid slips, trips, and falls.
Restricted - Standard Oil Company and Affiliates only.
1001065MP6PC

16mm	Optical Sound	Color	17 Min.	1982

NEW SAFETY EQUIPMENT
In order to detect and protect personnel, Amoco Pipline Company videoaped this safety seminar. Discussed are combusitble, oxygen deficient, and toxic atmospheres. In addition safety equipment such as MX241 (combination combustible and oxygen deficiency monitor) SP200 (sampling pump) Scott self contained breathing apparatus are demonstrated.
Restricted - Standard Oil Company and Affiliates only.
2021757VA8C

VT	Sound	Color	110 Min.	1983

NOISE DESTROYS
Program examines the nature of sound, explains the effect of over exposure to loud noise upon hearing ability, discusses the consequence of a permanent loss of hearing, and outlines the elements of a hearing conservation program.
Available as a slide/audio program under No. 24040.
Restricted - Sandard Oil Company and Affiliates only.
2021769VA9C

VT	Sound	Color	12 Min.	1983

NOT BY ACCIDENT - A LOGICAL LOOK AT ACCIDENT INVESTIGATION
With the Occurrence of two plant accidents, a plant foreman is instructed to investicate and prepare a report for his supervisor. In attempting to accomplish the job he turns to the corporate computer for information. In the process, a dialog develops between the foreman and the computer on how to investigate, corrective actions required and a summary report upon conclusion.
Restricted - Standard Oil Company and Affiliates only.
2021446VA8C

VT	Sound	Color	20 Min.	1980

OFFICE SAFETY: THE THRILL SEEKERS
It's a familiar axiom that 20 percent of the workers account for 80 percent of the accidents. Doubly unfortunate is that in an office the accident-prone are as liable to injure others as themselves. Many office hazards cause only minor injuries--but custs, bruises, and sprained backs add substanitally to the costs of absenteeism, compensation, and lawsuits. In an entertaining manner, this presentation alerts viewers to many common dangers and practices.
Restricted--Standard Oil Company and Affiliates only.
1001105MP6PC

16mm	Optical Sound	Color	10 Min.	1983

OIL SPILL CONTINGENCY PLANNING
Topics include: Fate of oil on land and water, Facility survey, Boom and recovery site selection.
Restricted--Standard Oil Company and Affiliates only.
2021630VA8C

VT	Sound	Color	2 Hr.	1978

03 Videotape Program

ON EVERY HAND
Describes dangers to hands and advises workers to respect guards on all machinery, disconnect power when clearing or adjusting machine, learn when and where not to wear gloves and to get treatment for any hand injury immediately.
Restricted - Standard Oil Company and Affiliates only.
1000763MP6PC

16mm	Optical Sound	Color	10 Min.	1970

OTHER HALF OF THE SAFETY TEAM, THE
The film is designed to supplement a new employee orientation program. Emphasizes employee attitudes toward safety policies of the company. Supplementary materials available.
Restricted - Standard Oil Company and Affiliates only.
1001120MP6PC

16mm	Optical Sound	Color	10 Min.	1977

PERSONAL PROTECTIVE EQUIPMENT
While engineering and administrative controls for hazards are preferred, situations continue to exist which call for the use of personal protection equipment. This OSHA program coveres the use and maintenance of the equipment. Supplementary materials are available. For videotape version order No. 2021658.
Restricted - Standard Oil Company and Affiliates only.
1001100MP6PC

16mm	Optical Sound	Color	21 Min.	1982

PERSONNEL SAFETY
Different safety devices and practices are illustrated to train personnel in avoiding job hazards.
Restricted - Standard Oil Company and Affiliates only.
2021772VA8C

VT	Sound	Color	30 Min.	1978

PREVENTING CUTTING AND WELDING FIRES
Points out the hazards of cutting and welding fires and illustrates the precaustions that must be taken to prevent fires from sparks and globules of molten metal. Depicts the cutting-welding permit system and the role of the fire watcher in preventing fires.
Restricted - Standard Oil Company and Affiliates only
1000919MP6PC

16mm	Optical Sound	Color	13 Min.	1971

PORTABLE FIRE EXINGUISHERS: SELECTION, PLACEMENT, USE
Program information on the four types of extinguishers: Class A--ordinary combustibles; Class B--flammable or combustible liquids; Class C--energized electrical equipment; and Class D--combustible metals. Knowing when and how to use each can save lives and minimize the damage.
Restricted - Standard Oil Company and Affiliates only.
3021768SL2CC

SLAC	Sound	Color	60 Min.	1979

R.C.R.A. - FACILITY PERSONNEL TRAINING
Helps meet the training requirements for hazardous waste treatment, storage and/or disposal facility personnel.
Restricted - Standard Oil Company and Affiliates only.
3021755SL2CC

SLAC	Sound	Color	20 Min.	1981

R.C.R.A. - RESOURCE CONSERVATION RECOVERY ACT
Designed to introduce middle and upper management personnel to the hazardous waste requirements of the R.C.R.A. of 1976 as amended in 1980.
Restricted - Standard Oil Company and Affiliates only.
3021756SL2CC

SLAC	Sound	Color	23 Min.	1981

REASON TO LIVE
Common sense and good judgement are two things that dissolve quickly when mixed with alcohol, and a person's reason to live can take a back seat to the temporary exhilaration of drinking. Sergeant Jack Ware cites startling statistics about the body's tolerance to alcohol and what you, as a friend or host, can do to prevent a potential tragedy.
Restricted - Standard Oil Company and Affiliates only.
1001034M96PC

16mm	Optical Sound	Color	25 Min.	1981

RESCUE TRAINING
This production is intended for use in reviewing rescue techniques found in "The International Manual of Basic Rescue Methods," by Dawson Nethercutt. The program covers ropes and knots, casualty handling, rescue from upper stories, block and tackle and davit lashing, and field practice. The program can be viewed in sections with practice in between. Supplementary materials available through Dawson Nethercutt, Route 4, Box 203A, Chapel Hill, North Carolina 27514. Mr. Nethercutt's phone is (919) 942-3886.
Restricted - Standard Oil Company and Affiliates only.
2021591VA8C

VT	Sound	Color	95 Min.	1981
02 Videotape Program				

RESPIRATORY PROTECTION TRAINING
Different respiratory equipment is available for on the job protection. How to inspect, test, and use this equipment is explained.
Restricted - Standard Oil Company and Affiliates only.
2021682VA8C

VT	Sound	Color	32 Min.	1979

RIGGING WIRE ROPE SLINGS
Program presents safe recommended methods for securing maximum use for wire rope slings. The skills required to select and properly use slings are portrayed in careful detail.
Restricted - Standard Oil Company and Affiliates only.
2020375VA1C

VT	Sound	Color	18 Min.	1974

ROOM TO LIVE
Sgt. Jack Ware, a Michigan State Trooper, narrates this program on why automobile seat belts should be used.
Restricted - Standard Oil Company and Affiliates only.
1000987MP6PC

16mm	Optical Sound	Color	27 Min.	1979

ROOM TO LIVE II
Emphasizing that seatbelts are still the most effective protection against injury or death in automobile accidents, Sgt. Jack Ware delivers poignant accounts of people who heard his words but failed to heed his message-buckle up and live.
Restricted - Standard Oil Company and Affiliates only.
1001102MP6PC

16mm	Optical Sound	Color	28 Min.	1982

SAFE FORKLIFT OPERATION
This program illustrates dangers that are encountered when a forklift truck is not properly operated. Numerous simulated accidents are viewed. At the end of the program is a summary of safety points including cartoon slides and narration.
Restricted - Standard Oil Company and Affiliates only.
2020709VA1C

VT	Sound	Color	25 Min.	1973

01 Videotape Program

SAFE PRACTICES OF LOADING AND UNLOADING HOPPER CARS
Safe work procedures involved while loading and unloading hopper cars.
Restricted - Standard Oil Company and Affiliates only.
2020713VA1B

VT	Sound	Bl. & Wt.	32 Min.	1973

01 Videotape Program

SAFE PROCEDURE FOR LIGHTING GAS FIRED VESSELS
The purpose of this presentation is to discuss basic operating practices for the safe lighting of gas fired vessels. Available as a slide program under No. 24057
Restricted - Standard Oil Company and Affiliates only.
2021783VA8C

VT	Sound	Color	20 Min.	1980

SAFE TANK CLEANING
Program is intended as a guide for cleaning a stationary storage tank from initial planning stages through the completed job. Program designed for the person who will have all (or part) of the responsibility of supervising the cleaning and doing it safely. Upon completion, viewer should be able to describe planning steps, considerations prior to opening a tank, various ventilation methods, and the importance of flammable range, threshold limit value, oxygen deficiency, and permit procedures. Viewers should be able to also list most common hazards associated with tank cleaning. Supplemental materials available from Howell Training Company, 5201 Langfield Road, Houston, Texas 77040.
Restricted - Standard Oil Company and Affiliates only.
3021604SL2CC

SLAC	Sound	Color	100 Min.	1981

SAFER BELT, A
Having and utilizing proper fall protection equipment is viewed. Belts, lanyards, snap hooks are covered in this basic safety program.
Restricted - Standard Oil Company and Affiliates only.
2021666VA8C

VT	Sound	Color	30 Min.	1982

SAFETY AT THE SPILL SCENE PARTS 1 and 2
Part 1 deals with employee and employer responsibility at the spill scene whether gaseous or liquid. Working safely at the spill scene is discussed. Part 2 deals with spill fires. Confined spaces and handling small boats. Methods employed to extinguish fires along with equipment requirements are explained for each segment.
Restricted - Standard Oil Company and Affiliates only.
2021764VA8C

VT	Sound	Color	50 Min.	1980

SAFETY, ISN'T IT WORTH IT
Program gives us a dramatic, intensive look at potential hazards and the appropriate safety precautions in any lab. It's an ideal accident prevention aid for medical, clinical, educational, and industrial lab facilities.
Restricted - Standard Oil Company and Affiliates only.
1001050MP6PC

16mm	Optical Sound	Color	15 Min.	1981

SAFETY PROCEDURES - EQUIPMENT LOCKOUT AND RESPIRATORY EQUIPMENT
Program is in two parts. In the first, procedures for tagging equipment prior to performing maintenance or repairs are explained. In the second part, an explanation of selecting, use and care of repirators in the realistic setting of a chemical plant is seen.
Restricted - Standard Oil Company and Affiliates only.
2021481VA9C

VT	Sound	Color	25 Min.	1981

SCAFFOLDS
Hazardous characteristics of scaffolds are covered in this OSHA Safety program. Supplementary materials available. For videotape version order No. 2021650.
Restricted - Standard Oil Company and Affiliates only.
1001092MP6PC

16mm	Optical Sound	Color	14 Min.	1982

SECONDS TO LIVE
Defensive driving is more than just a catch phrase. It's that extra second you take to make a complete stop at a red flasher. It's the moment you spend dropping back to a safe distance when following another vehicle, and it's not taking for granted that the other driver knows the rules of the road.
Restricted - Standard Oil Company and Affiliates only.
1001036MP6PC

16mm	Optical Sound	Color	32 Min.	1981

SEE A PIN
Designed to carry the fire prevention story to the average family in the home. Smoking, playing with matches, bad housekeeping, electrical circuits and improper fusing are the main causes of home fires, and they are the topics on which the plot revolves.
Restricted - Standard Oil Company and Affiliates only.
1000473MP6PC

16mm	Optical Sound	Color	14 Min.	1968

SLIPS AND FALLS
In the U.S.A., over 200,000 workers are injured every year on the job as a result of slip and falls. Over half of these accidents happen on a level surface. *This program* explains how to minimize the chances of a fall and the techniques designed to prevent this type of recurring accident on the job.
Restricted - Standard Oil Company and Affiliates only.
1001115MP6PC.

16mm	Optical Sound	Color	26 Min.	1984

SOUND OF SOUND
Program presents the argument for the use of hearing protection effectively by relating the problem of hearing loss in personal terms. Workers candidly explain how they have difficulty speaking with their families, talking over the phone, or keeping up with group conversations because they cannot hear clearly. Available in videotape under number 2021461VABC.
Restricted - Standard Oil Company and Affiliates only.
1000941MP6PC

16mm	Sound	Color	15 Min.	1979

STATIC ELECTRICITY GENERATION ACCUMULATION AND CONTROL
This program takes the trainee from a basic understanding of the presence and nature of static electricity to detailed explanations of techniques for eliminating the fire and explosion hazards of static charges. Explained in the build up of charges, conductance in solids and liquids, charge generation in liquids through turbulence, and agitation.
Restricted - Standard Oil Company and Affiliates only.
3021754SL2CC

SLAC	Sound	Color	30 Min.	1978

STEP RIGHT UP
With a lightbulb in one hand and a ladder perched precariously on a wooden crate, Ernie does a swan dive when the ladder breakes through the crate. This is just one mishap on ladder safety, which handles this serious topic with a light touch.
Restricted - Standard Oil Company and Affilates only.
1001053MP6PC

16mm	Optical Sound	Color	19 Min.	1977

STICK IT IN YOUR EAR
A series of comic skits explains the inconvenience and hazards of hearing loss. Included are: Difficulties in socially dealing with people, inability to perform some jobs and hear warnings. Ear plugs or muffs are advocated as solutions to filter out damaging high-frequency noise.
Restricted - Standard Oil Company and Affiliates only.
1000950MP6PC

16mm	Optical Sound	Color	10 Min.	1978

SURVIVING WINTER DRIVING
Produced especially for drivers of commercial vehicles, the film is based on the National Safety Council's annual driving research. Safety information on load factors, skidding, winter handling of vans, and smaller vehicles is included.
Restricted - Standard Oil Company and Affiliates only.
1000976MP6PC

16mm	Optical Sound	Color	10 Min.	1979

TESTING FOR HAZARDOUS ATMOSPHERES
Detection of flammable toxic liquids and vapors with proper test equipment is explained. In addition the "hot work" procedure is covered for welding, grinding, and wessel entry situations.
Restricted - Standard Oil Company and Affiliates only.
2021681VA8C

VT	Sound	Color	27 Min.	1982

THAT FEELING OF FALLING
Describes falls from stairs or near glass doors, how they happen, and how to prevent them. Prevention measures shown in the program include installation of handrails and slip-resistant material on stairs, and the use of colorful decals to make glass more visible.
Restricted - Standard Oil Company and Affiliates only.
2021373VA8C

VT	Sound	Color	12 Min.	1980
01 Videotape Program				

THAT'S THE RULE PARTS 1 AND 2
Program covers the enforcement of safety rules and practices by first line supervisors and other middle level managers. Supplementary materials available.
Restricted - Standard Oil Company and Affiliates only.
1001119MP6PC

16mm	Optical Sound	Color	30 Min.	1983

THINK BEFORE YOU REACH
That's the best advice you can get to avoid a serious hand injury. Sounds easy enough to follow - our hands are such remarkable tools that they do their task so well, but we seldom give them much thought - until after they're injured. The slides in this program are of actual injruies, and thos who may become ill should be excused.
Restricted - Standard Oil Company and Affiliates only.
3021613SL2CC

SLAC	Sound	Color	15 Min.	1981

TO LAST A LIFETIME
This film is designed to prevent the most frustrating and costly accidents plaguing industry - the back injury. This film deals with a person's attitude, which is the primary cause of all the on-the-job accidents.
Restricted - Standard Oil Company and Affiliates only.
1001052MP6PC

16mm	Optical Sound	Color	16 Min.	1978

TO YOUR HEALTH
This training program provides an overview of the potential effects of hazardous materials in the workplace and instruction in the use of personal protective equipment and control techniques.
Restricted - Standard Oil Company and Affiliates only.
3021673SL2CC

SLAC	Sound	Color	45 Min.	1983

TOOLS
What hazards may be involved in selecting the wrong tool for your job are explained in this OSHA program. Supplementary materials are available. For videotape version order No. 2021656.
Restricted - Standard Oil Company and Affiliates only.
1001098MP6PC

16mm	Optical Suond	Color	18 Min.	1982

TRENCHING
What dangers are associated with trenching. Unguarded contact with utility lines and cave-ins or ground slides are a few points covered in this OSHA program. Supplementary materials are available. For videotape version order No. 2021657.
Restricted - Standard Oil Company and Affiliates only.
1001099MP6PC

16mm	Optical Sound	Color	19 Min.	1982

TWO BREATHES TO
Safety program relating to oxygen deficient areas.
Restricted - Standard Oil Company and Affiliates only.
2021597VA8C

VT	Sound	Color	6 Min.	1980

USE AND CARE OF BASIC TOOLS
This program is very basic in its treatment of tools, their use and care. Do's and Don't's are stressed for the safety of the individual and the protection of tools. The discussion ranges from screwdrivers to electrical - and air-operated tools. This is a slide-booklet program.
Restricted - Standard Oil Company and Affiliates only.
3020809SL2CC

SLAC	Sound	Color	25 Min.	1975

USING HEARING PROTECTION DEVICES
Program explains the proper use and care of the most commonly used hearing protection devices. Available as a slide program under No. 2021570.
Restricted - Standard Oil Company and Affiliates only.
2021569VA8C

VT	Sound	Color	10 Min.	1982

WALKING AND WORKING SURFACES
The work place itself is hazardous if a worker cannot walk through it safely and leave it quickly and easily. Workers need to know safety principles for floors, stairways, other walking and working surfaces, exits. OSHA Standards are covered. Supplementary materials available. Videotape version available under No. 2021645.
Restricted - Standard Oil Company and Affiliates only.
1001087MP6PC

16mm	Optical Sound	Color	15 Min.	1982

WATCH THE WIRES
An educational film which illustrates the hazards of operating heavy equipment near high voltage wires. Stresses the fact that construction equipment can operate near electric lines safely if proper precautions - such as the minimum distance between equipment and wires - are observed. The film vidly portrays the results of crane and live wire contact.
Restricted - Standard Oil Company and Affiliates only.
1000588MP6PC

16mm	Optical Sound	Color	12 Min.	1965

Available in Videotape

WELDING - CUTTING - BRAZING
Fires, explosions, gases, eye damage are but a few areas covered in this OSHA Safety program. Supplementary materials are available. Videotape version order No. 2021646.
Restricted - Standard Oil Company and Affiliates only.
1001088MP6PC

16mm	Optical Sound	Color	27 Min.	1982

WORKERS EYE, THE
The importance of eye protection and safety for workers is stressed in this program. This critical task is best undertaken by the "Occupational Health Team." Who these people are and what is involved is explained.
Restricted - Standard Oil Company and Affiliates only.
3021617SL2SC

SL	Silent	Color	15 Min.	1981

YOUR CUSHION FOR SAFETY
A concise overview showing how to put the five keys to space cushion driving into practice. Program combines a summary of each key with a graphic on-road demonstration of the most important driving skills and habits associated with that key.
Restricted - Standard Oil Company and Affiliates only.
1001097MP6PC

16mm	Optical Sound	Color	17 Min.	1982

August 1, 1982

To All Users of Media Resources

The attached General Catalog of Media Resources describes a collection of programs covering a wide range of interests and knowledge available on a loan basis from the General Office Media Center. It represents a consolidation of predecessor catalogs, supplements, and addenda through December, 1981.

As additional programs are produced or acquired, we shall continue to publish addenda, supplements, or updated versions of the catalog. We anticipate that the detail and scope of the collection will continue to broaden, and hopefully, its value to you, the user, will increase.

It is our hope that this new catalog will prove useful to you. We would be pleased to hear from you if you have any questions or suggestions which would enable us to improve the catalog in concept, content, or format.

Request for or questions relevant to programs in the Media Center collection should be referred directly to:

Standard Oil Company (Indiana)
Media Center, Mail Code 2601
200 East Randolph Drive
Chicago, Illinois 60601

Your interest is appreciated.

W. H. Smorowski

Walter H. Smorowski
Manager, Meeting Facilities and Services
Mail Code 2601

WHS/jh

Attachment

Ordering Information

Instructions for Use

This Catalog is organized to make the task of finding a specific Media Resource as easy as possible. All material of a broad subject area are segregated under a MAJOR subject heading. These broad or MAJOR subject headings are further broken down into Sub-headings or subjects within the MAJOR headings. The program descriptive details are arranged herein alphabetically by MAJOR Subject and alphabetically by sub-headings within the MAJOR areas.

Each title in this catalog includes:

Major Subject → **Marketing**

Sub Heading → MARKETING-SELLING

Program Title → BETTGER STORY *

Synopsis → STORY OF FRANK BETTGER WHO WENT FROM FAILURE TO SUCCESS IN SELLING. HIGHLIGHTED ARE HIS BECOMING AWARE OF THOSE THINGS THAT HE WAS DOING WRONG, WHICH CAUSED HIM TO LOSE SALES, AND HIS ASSUMING A MORE CONFIDENT SALES PERSONALITY.

Supplementary Material Available → RESTRICTED - STANDARD OIL COMPANY AND AFFILIATES ONLY

Title Number → 1000058MP6PB

Media Format, Black & White or Color, Length in Running Time, Year of Production, Sound/Silent → 16MM OPTICAL SOUND BLACK AND WHITE 25MIN 1969

Key to Format → 16MM Motion Picture; VT Videotape; SL Slides; AC Audiocassette; SLAC Slide Audiocassette; FSAC Film Strip Audiocassette

Media/Format Data

Recognition of the equipment you have available for presentation of a program is extremely important. In programs involving the video media it is essential that the make and model playback equipment are carefully checked and precisely specified in the order to assure receipt of the program package in a format compatible to your playback system.

How to Order

To order a program, complete the Request Form which is included at the rear of this Catalog. Phone orders in emergency situations are acceptable. Four order forms are furnished with each catalog. An additional form will be furnished upon confirmation of each incoming order. To expedite shipment a separate form should be utilized for each program ordered.

Normal delivery of your program requires a minimum of 7 to 10 days from receipt of your order at the Media Center. Please be guided accordingly in scheduling your programs. All motion picture film and videotape should be returned prepaid.

Completed order forms should be mailed to:
Standard Oil Co. (Indiana)
Meeting and Program
Distribution Services Dept.
P.O. Box 5910A
Chicago, Ill. 60680

Phone inquiries may be directed to:
Chet Dybowski
Area Code (312) 856-4343

LEHMAN 01396

Program Order

Send Order To: Standard Oil Company (Indiana) M/C 2601
P. O. Box 5910A
Chicago, Illinois 60680

Ship Program To: _____

_____

_____

_____ Zip _____

Title of Program _____

Program Number _____

Date: Required _____, ___; Date to be Returned _____, ___

Supplementary Material Required: ☐ Yes. ☐ No. Total Number _____

Playback Equipment for Program (Check Boxes and Fill in Blank Lines):

Projectors

☐ Motion Picture.
_____ Make _____ Model _____ Film Size
Sound: ☐ Optical ☐ Magnetic ☐ None

☐ Slide.
_____ Make _____ Model _____ Slide Size
☐ Automated Slide Advance (Tone). ☐ Manual Slide Advance Only (Button).

☐ Other (Describe). _____

Videotape Player

☐ Reel to Reel.
_____ Make _____ Model _____ Tape Width

☐ Cassette.
_____ Make _____ Model _____

Audio-Tape Player

☐ Reel to Reel.
_____ Make _____ Model _____
☐ Monaural ☐ Stereo _____ Playback Speed

☐ Cassette.
_____ Make _____ Model _____
☐ Monaural ☐ Stereo _____ Playback Speed

LEHMAN 01397

Send Order To: Standard Oil Company (Indiana) M/C 2601
P. O. Box 5910A
Chicago, Illinois 60680

Ship Program To: _____

_____

_____

_____ Zip_____

Title of Program _____

Program Number _____

Date: Required _____. ___; Date to be Returned_____. ___

Supplementary Material Required: ☐ Yes. ☐ No. Total Number_____

Playback Equipment for Program (Check Boxes and Fill in Blank Lines):

Projectors

☐ Motion Picture.
_____ Make_____ Model_____ Film Size
Sound: ☐ Optical ☐ Magnetic ☐ None

☐ Slide.
_____ Make_____ Model_____ Slide Size
☐ Automated Slide Advance (Tone). ☐ Manual Slide Advance Only (Button).

☐ Other (Describe). _____

Videotape Player

☐ Reel to Reel.
_____ Make_____ Model_____ Tape Width

☐ Cassette.
_____ Make_____ Model_____

Audio-Tape Player

☐ Reel to Reel.
_____ Make_____ Model_____
☐ Monaural ☐ Stereo _____ Playback Speed

☐ Cassette.
_____ Make_____ Model_____
☐ Monaural ☐ Stereo _____ Playback Speed

MSHA TRAINING

LEHMAN 01398

MSHA REQUIRED TRAINING

The Mine Safety and Health Act in Subchapter H, Part 48.28, Training and Retraining Miner's - Annual Refresher Training, requires that all production employees of mines and mills receive a minimum of eight hours of "annual refresher" training. The refresher training must include as a minimum the subjects listed on the attached pages. This training can be accomplished by either holding an eight-hour training class (typically for all employees) at one time and location and covering all of the required subjects, or by covering one or two topics every month in a 45-minute to one-hour safety and training meeting.

Regardless of the method, employee attendance and the topics covered must be documented and maintained on file. Upon completion of all required refresher training each year, an MSHA 5000-23 form must be completed for each employee and a copy provided to the employees. (A sample of the 5000-23 form is attached. Please note item 6 on the form.)

If you choose to incorporate your annual refresher training in your monthly safety meetings (which is recommended), documentation can be achieved in one of two ways. The simplest means is to pass around the meeting a sheet of paper with the subjects to be discussed at the top of the page along with the date, time and place, for each employee's signature. (An example page has been attached.) The other method is to have each employee initial and date the subject(s) under 5B of the 5000-23 form that have been completed. Keep the training documentation in your training file from month-to-month.

After all of the topics have been covered, the 5000-23 should be completed and each employee asked to sign. The white copy should be given to the employee and the pink copy maintained on file for two years. If all of the training is provided in one eight-hour class, the 5000-23 should be completed, signed by the instructor and employee and presented to the employees at the end of the training day.

New employee training is also required, and details of the training are provided in the attached training plan example. Please note that the requirements of the law can be met by using a variety of resources including the SOCO and CIM film lists as well as other sources of training materials available from vendors, equipment manufacturers, and from MSHA's training facilities in Arlington, Virginia and Beckley, West Virginia. An MSHA film list and ordering information have been provided.

It is important to note that these topics are subjects that should be discussed with employees whether there is a mandatory training law in effect or not. Operations mangement down to the first line supervisors should be regularly communicating with their employees. Safety and training meetings provide the additional opportunity for operations employees to take time out from regular work schedules to discuss their work, correct procedures, etc.

Cyprus Industrial Minerals

Location _____

SAFETY MEETING

Topic(s) _____ Date _____

Shift(s) _____ Time of Meeting _____ a.m. To _____ p.m.

The topic(s) discussed during this meeting may be used to comply with MSHA annual refresher training requirements. A list of topics required for annual refresher training as well as a copy of the complete training plan is available at the office for review. Please sign below indicating you attended this meeting.

MSHA TRAINING PROGRAMS

The following programs have been selected from the Mine Safety and Health Administration's catalog titled "MSHA Products and Programs for the Mining Industry - 1985:. The complete catalog is available from:

National Mine Health and Safety Academy
P. O. Box 1166
Beckley, West Virginia 25802-1166
(304) 256-3207

The programs listed below are considered the most relevant to our operations. Videotapes are available for purchase only through the Academy. Sixteen millimeter motion picture films and slide tape programs are available on a free loan basis from:

U. S. Bureau of Mines
Motion Picture Film Library
4800 Forbes Avenue
Pittsburgh, Pennsylvania 15213
(412) 621-4500, Ext. 326

Ordering instructions are provided on the following page or contact the Talc Division Safety offices for assistance.

MSHA TRAINING FILMS

Address all requests for loans of films or for descriptive catalogs to Motion Pictures, MSHA, 4800 Forbes Avenue, Pittsburgh, PA 15213. Give your official connection with the group before whom the films will be shown. Films are shipped from Pittsburgh by prepaid parcel post only. Films are LOANED FREE of any cost to the borrower—EXCEPT that the borrower must PAY RETURN POSTAGE AND FOR ALL LOSS OR DAMAGE TO FILM.

Only adults who indicate that they are responsible persons or officials of a responsible organization and who agree to comply fully with the "Film Borrower's Agreement" may borrow films. Because of divided responsibility, requests for the loan of films on behalf of another person cannot be granted. The demand in the United States for MSHA films is so great that loans cannot be made for more than a maximum of 10 days nor to persons or organizations in foreign countries. However, unless you specify that the film is needed for a period of 10 days (or a period not to exceed 10 days), it will be scheduled for one day only.

Make one or more alternate choices of film subject and designate the dates of showing. If a period is given within which the film can be shown on a definite date to be selected by us, or if alternate choices of dates are stated, the chances of finding a vacancy in the film schedule will be greatly increased. Please do not ask when certain films will be available, for films cannot be reserved until a positive request is received giving a date or period within which the film can be shown. If feasible, have your requests reach MSHA at least two weeks before the showing. Many films are booked six months to a year in advance. MSHA endeavors to book films so the shipments will arrive at their destinations the day before the showing date.

When planning return of films, the following rate information will be helpful to you. Educational institutions and certain other nonprofit organizations are eligible under the parcel post "library book rate." Coal companies, commercial establishments, individuals, etc., may use the "book rate." Please contact your local Post Office for exact rate information.

Should you wish to purchase any of these films, send requests to the National Mine Health & Safety Academy, P.O. Box 1166, Beckley, WV 25801. Purchase requests must be in writing (preferably on purchase order forms). No verbal requests are accepted. By purchasing MSHA produced films, you agree that such films will be exhibited in their entirety, will not be shown for profit or commercial purposes, will not be used as parts of other motion pictures, will not be resold, and will not be electronically reproduced.

NO MONEY ORDER, CHECKS, OR STAMPS ARE TO BE SENT TO MSHA. OUTGOING POSTAGE COSTS ARE BORNE BY MSHA.

Should you wish to present these films on television, you must obtain clearance from MSHA. To do so, you may contact the National Mine Health & Safety Academy, P.O. Box 1166, Beckley, WV 25801.

REMINDER:

Borrower pays return postage only.

If films are not returned promptly, your borrowing privileges will be withdrawn. Borrower must agree to all conditions on "Film Borrower's Agreement."

COMPLETE THE FOLLOWING INFORMATION: PLEASE PRINT

School or organization _____

Name and Title _____

Mailing Address _____
(Street) (City) (State) (Zip)

Phone No. _____

MSHA MOTION PICTURE LOAN ORDER FORM

Select the 16mm-sound color film(s) you want from listing below. Insert your preferred showing date, and an alternate in the spaces provided. Complete information requested below, and mail to: MOTION PICTURES, BUREAU OF MINES, ROOM 359, 4800 FORBES AVENUE, PITTSBURGH, PA 15213

Showing date	Alternate date	Film Title
		805. Fighting Coal-Mine Fires, 31 min.
		807. Rock Bolting Safety, 27 min.
		808. Roof Bolting in Coal Mines (revised), 19 min.
		809. The Magic of Fire, 23 min.
		810. Oh! My Aching Back, 21 min.
		811. Causes and Prevention of Mine Fires and Explosions, 27 min.
		812. Color for Safety, 22 min.
		813. Orientation and Indoctrination of Safe Workmen, 27 min.
		814. The Care and Use of a Permissible Flame Safety Lamp, 18 min.
		816. Open-Pit Mining Hazards, 17 min.
		817. Set the Pace, 18 min.
		818. Investigation--A Tool for Accident Prevention, 7 min.
		819. Truck Safety, 13 min.
		820. Roll Safety, 10 min.
		821. Safety--A Way of Life, 21 min.
		822. Men and His Habits, 13 min.
		823. Man's Shortcomings, 13 min.
		824. Safety Consciousness, 10 min.
		825. Motivation--A Means to Accident Prevention, 11 min.
		826. Protection Against Radioactivity in Uranium Mines, 27 min.
		827. Fire Fighting in the Mineral Industry, 14 min.
		828. Coal Miner--Today (revised), 14 min.
		829. Coal Dust: Hazards and Controls, 14 min.
		833. Mine Rescue Concept Training, 25 min.
		836. Conveyor Belts--Be Careful, 13 min.
		838. Safety in Surface Coal Mining, 22 min.
		839. Haulage Safety in Low-Coal Mines, 13 min.
		840. Safety Practices in Low-Coal Mining, 12 min.
		841. The Air We Breathe in Industrial Environments, 15 min.
		842. Management's Role in Health and Safety, 13 min.
		843. Emergency Investigation of Coal-Waste Embankments, 16 min.
		844. Mining Noise Hazards, 21 min.
		845. Breathe and Live: Ventilation in Metal and Nonmetal Mines, 21 min.
		846. Artificial Respiration (Revised), 9 min.
		847. Control of Bleeding (Revised), 13 min.
		848. Shock (Revised), 7 min.
		849. Open and Closed Wounds (Revised), 11 min.
		850. Burns and Scalds (Revised), 7 min.
		851. Fractures and Dislocations (Revised), 11 min.
		852. Transportation (Revised), 8 min.
		853. Cardiopulmonary Resuscitation (Revised), 22 min.

Showing date	Alternate date	Film Title
		854. Cabs and Canopies for Your Safety, 18 min.
		855. Rubber-Tired Haulage, 14 min.
		856. Underground Coal Mine Blasting, 19 min.
		857. Electrical Hazards in Underground Coal Mining, 13 min.
		858. Mine Emergency Operations (MEO), 17 min.
		859. Accuse Nothing, 21 min.
		860. In Search of the Facts, 26 min.
		861. Safety on the Move, 16 min.
		862. Front-End Loader Safety, 14 min.
		863. Accident Prevention Through Equipment Guarding, 11 min.
		864. Electrical Lock-Out Procedures, 11 min.
		865. Safety in Longwall Mining, 19 min.
		866. Face Ventilation in Underground Coal Mines, 16 min.
		867. Twenty-Five Feet From The Face, 17 min.
		868. Hazards Around Mine and Haulage, 16 min.
		869. Safety Practices in Dredging Operations, 16 min.
		870. Slope Stability of Waste Banks and Embankments, 28 min.
		871. Illumination in Underground Coal Mines, 13 min.
		872. Underground Blasting in Metal and Nonmetal Mines, 17 min.
		873. Surface Blasting in Metal and Nonmetal Mines, 18 min.
		874. Why Roof Control Plans, 14 min.
		875. Underground Haulage Hazards, 12 min.
		876. Hydraulics of Mine Impoundments, 15 min.
		TRAINING MODULE FILMS:
		890. Ground Control in Surface Coal Mining, 8 min.
		891. Hazard Recognition and Avoidance in Surface Coal Mining, 9 min.
		892. Transportation and Communication in Underground Coal Mines, 9 min.
		893. Hazard Recognition and Avoidance in Underground Coal Mines, 11 min.

(OVER)

MSHA TRAINING PROGRAMS

ACCIDENT PREVENTION THROUGH EQUIPMENT GUARDING (COAL/MNM)
Draws attention to need for proper safety guards on industrial equipment (including conveyors, drive units, motor shafts and other machinery with exposed gears, pulleys, belts and hazardous moving parts). Shows various types of safety guarding devices. Emphasizes proper installation, maintenance and repair. Concludes by stressing advantages of a well-planned safety guarding program (aimed at getting workers directly involved in a company's equipment guarding program).

MESA Sep 1976 11 min.
Cat No.: F863 or VC863
Price: F863 ($62.60) or VC863 ($26.50)

AIR WE BREATHE IN INDUSTRIAL ENVIRONMENTS, THE (COAL/MNM)
Discusses composition and importance of air in relation to various working environments. Describes industrial health (breathing) hazards encountered. Explains need for evaluation of working conditions, for observation of safety precautions and for protection of workers from noxious gases and oxygen deficiency by using protective equipment and proper ventilation.

BuM Apr 1972 16 min.
Cat No: F841 or VC841
Price: F841 ($91.00) or VC841 ($26.50)

BREATHE AND LIVE: VENTILATION IN METAL AND NONMETAL MINES (MNM)
Focuses of why mine ventilation systems are an underground miner's personal lifeline. Shows components of mine ventilation systems (including main and booster fans, air curtains, ventilation tubes, doors and regulators). Emphasizes importance of good maintenance. Recreates several fatal accidents caused by contaminated air, inadequate ventilation or failure to warn workers away from unventilated "dead end" zones. Stresses importance of frequent safety checks with instruments which measure quality and quantity of ventilating air (a responsibility of mine management).

BuM Aug 1973 21 min.
Cat No: F845 or VC845
Price: F845 ($119.45) or VC845 ($26.50)

CONVEYOR BELTS - BE CAREFUL (MNM)
Depicts five of the most common accidents that can occur around belt conveyors in the mineral industry. Outlines recommendations for prevention. Describes safe working procedures for all workers. Stresses need for safe mining equipment and facilities.

BuM Mar 1969 15 min.
Cat No: F836 or VC836
Price: F836 ($85.30) or VC836 ($26.50)

ELECTRICAL LOCK-OUT PROCEDURES (COAL/MNM)
Accidental starting of equipment or the energizing of electrical power circuits has caused many injuries and fatalities in the mining and milling industry. Recreates some of these accidents and points out potential hazards connected with specific jobs. Emphasizes need for immediate and thorough training in proper lock-out procedures for all personnel who work with or around electrical installations (including personnel who operate electric-powered machinery and equipment).

MESA Nov 1976 11 min.
Cat No: F864 or VC864
Price: F864 ($62.60) or VC864 ($26.50)

FIRE FIGHTING IN THE MINERAL INDUSTRY (MNM)
Concerns techniques of fire fighting in noncoal mining and related industries. Shows the classifications of fires (A, B, and C). Provides instruction on proper use of various types of extinguishers. Demonstrates how to control fires by "sealing them off" with foam, asphalt and other chemical sealants.

BuM Jul 1970 16 min.
Cat No: F827 or VC827
Price: F827 ($91.00) or VC827 ($26.50)

FRONT-END LOADER SAFETY (COAL/MNM)
Based upon records of actual mining accidents, describes some of the fatalities and injuries that can occur in the use (and misuse) of front-end loaders (particularly if the operator is inattentive, careless, disobeys safety rules and/or takes unnecessary chances). Analyzes these accidents and explains causes and preventive measures. Presents safe operating procedures for various work assignments. Designed to motivate front-end loader operators to adopt safe driving and operating habits and to develop a positive attitude toward mine haulage safety in general.

MESA Jun 1976 14 min.
Cat No: F862 or VC862
Price: F862 ($79.65) or VC862 ($26.50)

GROUND CONTROL IN SURFACE MINING (COAL)
One of the most prevalent dangers facing new or inexperienced surface coal miners is falling ground (or slope failure) involving highwalls and spoil banks. Presents overview of ground control problems. Describes danger signs and visible indicators that warn of impending earth/rock slides. Emphasizes need for miners to learn how to recognize these conditions. Outlines safety precautions and safe working practices miners must follow to avoid accidents.

MSHA Apr 1980 8 min.
Cat No: F890 or VC890
Price: F890 ($45.50) or VC890 ($26.50)

HAZARD RECOGNITION AND AVOIDANCE IN SURFACE COAL MINING (COAL)
Miners who are inexperienced and unfamiliar with the working environment, equipment and mining procedures are often exposed to potential safety hazards for which they are largely unprepared. Describes some of the more common dangers encountered (including failure of highwalls and spoil banks, slips and falls, drilling and blasting and not wearing or using proper safety clothing or equipment). Addresses machinery/vehicle, mechanical/electrical, welding/cutting (and other maintenance/repair) hazards. Gives examples of danger signs and warnings which usually precede a hazard. Outlines safety precautions needed to avoid the hazard. Emphasizes miners must learn how to recognize and avoid unsafe conditions and situations by staying alert, obeying company safety rules and following safe working practices at all times.

MSHA May 1980 9 min.
Cat No: F891 or VC891
Price: F891 ($51.20) or VC891 ($26.50)

HAZARDS AROUND BINS AND HOPPERS (COAL/MNM)
Stresses need for greater employee safety training (along with job and skill training). Emphasizes that those who work around bins and hoppers must become acquainted with the potential hazards of entering these and other material storage areas. Encourages workers to follow safe and correct operating procedures to avoid being buried alive and suffocating from a cave-in or loose material (particularly when barring down or loosening hung-up and bridged materials inside of bulk storage facilities).

MSHA Oct 1978 16 min.
Cat No: F868 or VC868
Price: F868 ($91.00) or VC868 ($26.50)

MAGIC OF FIRE, THE (COAL/MNM)
Deals with fire, its composition, uses and control. Tabletop displays and laboratory demonstrations illustrate how fires and explosions occur. Describes the safe use and control of commonly used gases and flammable liquids. Shows various industrial fires (and fire hazards in the home) and gives instructions on fire prevention.

BuM Jan 1965 23 min.
Cat No: F809 or VC809
Price: F809 ($130.80) or VC809 ($26.50)

OPEN-PIT MINING HAZARDS (MNM)
Moving machinery and moving earth supply the basic ingredients for a variety of possible hazards in mining ore from open pits. Uses staged accidents (involving dump trucks, power shovels, front-end loaders, rail haulage and highwall blasting) to show what happens as the result of workers' carelessness, overlooked safety precautions and/or unsafe machinery and mining methods. Explains why the accidents happened and stresses the correct and safe way to perform various mining jobs to prevent future accidents.

BuM Aug 1967 17 min.
Cat No: F816 or VC816
Price: F816 ($96.70) or VC816 ($26.50)

ORIENTATION AND INDOCTRINATION OF SAFE WORKMEN (MNM)
Follows a group of new employees through preemployment testing, hiring and actual working situations. The industry is a gypsum products manufacturing plant, but the orientation and indoctrination policies and procedures may easily be applied to other mining or manufacturing organizations. Takes viewers on a tour of the plant and follows new employees through interviews, physical examinations, classroom instruction and on-the-job training sessions. Stresses job safety as an integral part of the production. Highlights the value of accident prevention training for all employees.

BuM Jun 1966 17 min.
Cat No: F813 or VC813
Price: F813 ($153.60) or VC813 ($26.50)

SAFETY - A WAY OF LIFE (COAL/MNM)
Dramatizes importance of developing safety habits and attitudes at work and on the highway. Uses simulated accidents and "near accidents" to highlight the importance of "living" safety.

BuM July 1968 21 min.
Cat No: F821 or VC821
Price: F821 ($119.45) or VC821 ($26.50)

SAFETY ON THE MOVE: TRUCK HAULAGE SAFETY (COARL/MNM)
The camera conveys atmosphere and movement around an open-pit mining operation. Shows huge haulage trucks in action. Depicts how truck operators encounter difficult, dangerous, emergency driving situations while performing assigned duties. Points out existing and potential hazards of truck haulage by reenactment of some of the most frequently-occurring accidents. Explains causes of these accidents and outlines corrective steps necessary to prevent their reoccurrence. Stresses on-the-job safety training and a truck driver's personal safety responsibility throughout.

MESA Jun 1976 16 min.
Cat No: F861 or VC861
Price: F861 ($91.00) or VC861 ($26.50)

SURFACE BLASTING IN METAL AND NONMETAL MINES (MNM)
Examines some of the most common hazards that may be encountered in surface blasting operations (including ineffectively guarded blast sites, insufficient warning systems, failure to take adequate cover, improper drilling, loading, detonation and post-examination procedures). Uses a documentary style (shot on location) to depict actual workers in real mining situations. Recreates a blasting accident. Underlines various unsafe conditions and work practices. Emphasizes need for greater safety precautions in the use of explosives. Demonstrates proper and safe blasting procedures. Affirms need for worker awareness and cooperation as the principal means of avoiding the majority of blasting related accidents.

MSHA Oct 1980 18 min.
Cat No: F873 or VC873
Price: F873 ($102.40) or VC873 ($26.50)

UNDERGROUND BLASTING: SAFE BLASTING PROCEDURES IN METAL AND NONMETAL UNDERGROUND MINES (MNM)
Deals with the use of explosives in underground blasting operations. Begins with a dramatic reenactment of a serious blasting accident and continues on to analyze the direct causes and extenuating circumstances of the accident. Outlines appropriate safety procedures and protective measures needed to prevent recurrence of this accident (and similar accidents). Follows a blasting crew through various stages of underground blasting (drilling, loading, detonation and the handling of misfires). Describes specific safety practices that must be followed during each step. Stresses importance of strict compliance with company and Federal explosive safety regulations in all blasting operations.

MSHA Feb 1980 17 min.
Cat No: F872 or VC872
Price: F872 ($96.70) or VC872 ($26.50)

UNDERGROUND HAULAGE HAZARDS (MAM)
Presents a broad overview of some of the more common factors which cause (or contribute to) accidents involving both track and off-track haulage. Points out need for sufficient safety and task training, staying alert, learning to recognize specific job hazards, correcting or reporting all dangerous conditions, following safe haulage practices and obeying company safety rules and regulations. Uses simulated haulage accidents (based on actual occurrences) which realistically reenact haulage accidents.

MSHA Feb 1983 12 min.
Cat No: F875 or VC875
Price: F875 ($68.30) or VC875 ($26.50)

EQUIPMENT OPERATOR TRAINING PROGRAMS

CRANE TRAINING SYSTEM
Woodward Associates
1984
BuM Contract H0318009
Tape, slides, workbooks.

DIESEL-MECHANICAL HAUL TRUCK TRAINING SYSTEM
Woodward Associates
1983
BuM Contract J0387221
Tapes, slides, tailoring guide, instruction guide, wookbooks.

FRONT-END LOADER TRAINING SYSTEM
Woodward Associates
1983
BuM Contract J0308034
Tapes, slides, tailoring guide, instructor guide, OJT instructor guide, trainee guide, performance evaluation forms, performance tests, proficiency demonstration sheet.

MOTOR GRADER TRAINING SYSTEM
Woodward Associates
1984
BuM Contract H0318009
Tapes, slides, instructor guide, study guide, operator guide, performance evaluation form, proficiency demonstration sheets, progress tests.

RUBBER-TIRE DOZER TRAINING SYSTEM
Woodward Associates
1984
BuM Contract H0138009
Tapes, slides, instructor guide, study guide, basic operator form, progress tests.

SCRAPER TRAINING SYSTEM
Woodward Associates
1984
BuM Contract H0318009
Tailoring guide, instructor guide, proficiency demonstration sheet, progress test, answer sheet.

TRACKED DOZER TRAINING SYSTEM
Woodward Associates
1984
BuM Contract H031009
Note: The Academy's Publications Distribution Center is awaiting receipt of materials for this product.

This is a copy of a revised MSHA training plan. Please review. If you have any comments, suggested changes or questions, please call either Tom Flink or myself. If not, provide a copy to the union steward or employee representative. If an employee representative has not been designated you must post on an accessible bulletin board for at least two weeks. Call if there are any employee comments or questions.

If your operation does not have at least two MSHA approved instructors, call my office. Approval can be made based on experience. The revised plan will then be submitted to MSHA for approval for the entire division.

Cyprus Industrial Minerals Company
ENGINEERING DEPARTMENT

Willow Creek Highway
Three Forks, Montana 59752
Telephone 406) 285-3271

Post Office Box 977
TWX 910) 963-2480

EXAMPLE

Today's date

William C. Gardner
District Manager
P O Box 25367
Denver, CO 80225

Dear Mr. Gardner:

Enclosed are resumes for IS instructor certification and a copy of the training plan for your approval. Training materials are available through our Corporate Safety Department for conducting the required training.

Certification of instructors for MSHA training is needed in order to proceed with the current training requirements. Thank you for your help in this matter.

Sincerely,

Joe Supervisor

JS/mwc

CYPRUS

EXAMPLE

Name: Joe Supervisor

Occupation: Mill Foreman

SS #: 999-99-9999

Certification Requesting: IS

Experience: 5 years milling experience
2 years supervising

Schooling: High School - Jefferson High
Pine River, AZ

College - 2 years, Lancaster Jr. College

Teaching: instructors aid in several safety meeting subjects.

SAFETY TRAINING PROGRAM
FOR SURFACE MINERS

Company name CYPRUS INDUSTRIAL MINERALS CO.

Mine/mill name GRAND ISLAND MSHA ID# 26-0012

Address _____

Person responsible for health and safety training at the mine:

Name MINE/MILL MANAGER

Position MANAGER Phone number (707) 373-6666

MSHA approved instructor(s):

Name	Courses qualified to teach
SUPERVISORS	

Location(s) where training will be given:

_____

The approximate number of miners employed: _____

Training periods: Each new miner will receive 24 hours of training in the subjects listed; the annual refresher training for experienced miners will total eight hours per year. New miner training may be divided into 8 and 16 hours segments. The first 8 hours will include the mandatory preassignment training with the remaining 16 hours being administered within 60 days. Annual refresher training will be conducted at monthly safety meetings or once per year, at management's discretion.

Qualification of trainers: All formal courses will be conducted by MSHA-approved instructors; new task safety training will be conducted by qualified persons.

ADDRESSES FOR REQUESTING MSHA INSTRUCTOR CERTIFICATION

ROCKY MOUNTAIN DISTRICT

William C. Gardner
District Manager
P O Box 25367
Denver, CO 80225

MONTANA

NORTH EASTERN DISTRICT

Michael P. Trainor
District Manager
4800 Forbes Avenue
Pittsburgh, PA 15213

NEW JERSEY

SOUTH EASTERN DISTRICT

Horst S. Gottschalk
District Manager
228 West Valley Ave.
Room 102
Birmingham, AL 35209

ALABAMA

SOUTH CENTRAL DISTRICT

Wayne D. Kanack
District Manager
1100 Commerce St.
Room 4c50
Dallas, TX 75242

NEBRASKA

WESTERN DISTRICT

Thomas C. Lukins
District Manager
Alameda Federal Center
620 Central Ave.
Building 7
Alameda, CA 94501

CALIFORNIA/NEVADA

SAFETY TRAINING PROGRAM
FOR SURFACE MINERS

Company name _____

Mine/mill name _____ MSHA ID# _____

Address _____

_____

Person responsible for health and safety training at the mine:

Name _____

Position _____ Phone number _____

MSHA approved instructor(s):

Name	Courses qualified to teach
_____	_____
_____	_____
_____	_____
_____	_____

Location(s) where training will be given:

_____

The approximate number of miners employed: _____

Training periods: Each new miner will receive 24 hours of training in the subjects listed; the annual refresher training for experienced miners will total eight hours per year. New miner training may be divided into 8 and 16 hours segments. The first 8 hours will include the mandatory preassignment training with the remaining 16 hours being administered within 60 days. Annual refresher training will be conducted at monthly safety meetings or once per year, at management's discretion.

Qualification of trainers: All formal courses will be conducted by MSHA-approved instructors; new task safety training will be conducted by qualified persons.

TRAINING PLAN: ANNUAL REFRESHER

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Electrical hazards	Instruction on the hazards involved when working with, near or around any machine or equipment powered by electricity and proper procedures to avoid them.	Lecture discussion demonstration or slide-tape program	Company safety rulebook; dummy switch box, fuses, safety clamp, lock, key	Quick Check Test
First aid	Instruction on the most common conditions requiring first aid treatment: shock, bleeding, fainting. Location of first aid supplies.	Lecture and discussion demonstration slide-tape program	Splints, bandages	Quick Check Test
How to recognize and avoid hazards	Identification of hazards common to the mine/mill. Instruction on safe work procedures.	Lecture and discussion or slide-tape program. Demonstration	Company safety rulebook, list of unsafe acts and conditions. Boxes	Quick Check Test
Mandatory health and safety standards	Instruction on Federal standards pertinent to miners' tasks; Explanation of Company safety rules	Lecture and discussion	Company safety rules, Federal standards	Oral response
Prevention of accidents	Instruction on accident prevention, causes & accident review.	Lecture and discussion	Safety record Slide-tape show	Oral response

LEHMAN 01420

TRAINING PLAN: ANNUAL REFRESHER

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Authority and responsibility of supervisors and the rights of miners	Instruction on the authority and responsibility of supervisors; the statutory rights of miners; explanation of safety rules and procedures for reporting hazards.	Lecture and discussion or slide-tape program	Company safety rulebook	Quick Check Test
Dust control and the use of respirators	Instruction on the dangers involved in dust hazards and how they can be controlled; the approved methods of protecting personal respiratory system; use and care of respirator.	Lecture and discussion or slide-tape program Demonstration	Company safety rulebook. Respirator(s) used on property.	Quick Check Test. Demonstration evaluation.
Transportation controls and communication systems	Instruction on the hazards involved in mine/mill transportation; safe procedures for working around mobile equipment; communication systems at work.	Lecture and discussion or slide-tape program	Company safety rulebook	Quick Check Test
Fighting fires	Instruction on fire prevention procedures; types of fires and fire extinguishers; use of fire extinguishers; location of fire extinguishers and first aid supplies; site evacuation plan.	Lecture and discussion, demonstration, slide-tape program	Company safety rulebook	Quick Check Test
Protecting your hearing	Instruction on dangers of noise hazards; how hazards are identified; different controls available to protect hearing.	Lecture and discussion or slide-tape program	Company safety rulebook. Approved hearing protection devices used on property.	Quick Check Test

LEHMAN 01421

TRAINING PLAN: NEW MINER

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Authority and responsibility of supervisors and the rights of miners	Instruction on the authority and responsibility of supervisors; the statutory rights of miners; explanation of safety rules and procedures for reporting hazards.	Lecture and discussion or slide-tape program	Company safety rulebook	Quick Check Test
Dust control and the use of respirators	Instruction on the dangers involved in dust hazards and how they can be controlled; the approved methods of protecting personal respiratory system; use and care of respirator.	Lecture and discussion or slide-tape program Demonstration	Company safety rulebook. Respirator(s) used on property	Quick Check Test. Demonstration evaluation.
Transportation controls and communication systems	Instruction on the hazards involved in mine/mill transportation; safe procedures for working around mobile equipment; communication systems at work.	Lecture and discussion or slide-tape program	Company safety rulebook	Quick Check Test
Fighting fires	Instruction on fire prevention procedures; types of fires and fire extinguishers; use of fire extinguishers; location of fire extinguishers and first aid supplies; site evacuation plan.	Lecture and discussion, demonstration, slide-tape program	Company safety rulebook	Quick Check Test
Ground control	Instruction on basic ground control terms; description of basic slope failures and visual indications of potential hazards.	Lecture and discussion or slide-tape program		Quick Check Test
Protecting your hearing	Instruction on dangers of noise hazards; how hazards are identified; different controls available to protect hearing.	Lecture and discussion or slide-tape program	Company safety rulebook. Approved hearing protection devices used on property	Quick Check Test

LEHMAN 01422

TRAINING PLAN: NEW MINER

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Electrical hazards	Instruction on the hazards involved when working with, near or around any machine or equipment powered by electricity and proper procedures to avoid them.	Lecture discussion demonstration or slide-tape program	Company safety rulebook; dummy switch box, fuses, safety clamp, lock, key	Quick Check Test
First aid	Instruction on the most common conditions requiring first aid treatment: shock, bleeding, fainting. Location of first aid supplies.	Lecture and discussion demonstration slide-tape program	Splints, bandages	Quick Check Test
Explosives	Instruction on hazards related to explosives, identification of blasting agents, accessories, storage and transportation of explosives	Lecture and discussion or slide-tape program	Handouts and simulated versions of permissable blasting materials.	Quick Check Test
**How to recognize and avoid hazards	Identification of hazards common to the mine/mill. Instruction on safe work procedures.	Lecture and discussion or slide-tape program. Demonstration	Company safety rulebook, list of unsafe acts and conditions. Boxes	Quick Check Test
**Introduction to the work environment	Familiarize new employee with workplace; method of mining and milling observed and explained; work rules and company policies explained.	Lecture discussion and tour of mine/mill	Company safety rulebook, personal protective equipment	
**Health and safety aspects of assigned tasks	Familiarize new employee to he health and safety standards; explain work procedures, instruction on common accident causes.	Tour of work site	Company safety rulebook, personal protective equipment	

** Mandatory preassignment training

LEHMAN 01423

TRAINING PLAN: NEWLY-EMPLOYED EXPERIENCED MINER

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Mandatory health and safety standards	Instruction on Federal standards pertinent to mine/mill tasks; explanation of company safety rules	Lecture discussion	Company safety rulebook, Federal metal/ nonmetal standards	Oral response
Introduction to work environment	Same as New Miner program	Lecture discussion slide-tape show	Same as New Miner program	
Transportation & communication	Same as New Miner program	Lecture Slide-tape show	Same as New Miner program	Quick Check Test
Authority and responsibility of supervisors and miners' representatives	Same as New Miner program	Lecture discussion Slide-tape show	Same as New Miner program	Quick Check Test
Fighting fires	Same as New Miner program	Lecture Slide-tape show	Same as New Miner program	Quick Check Test
Ground controls	Same as New Miner program	Lecture Slide-tape show	Same as New Miner program	Quick Check Test
Hazard recognition	Same as New Miner program	Lecture Slide-tape show	Same as New Miner program	Quick Check Test

LEHMAN 01424

TRAINING PLAN: ANNUAL REFRESHER FOR EXPERIENCED MINERS

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Mandatory health and safety standards	Instruction on Federal standards pertinent to miners' tasks; Explanation of company safety rules	Lecture and discussion	Company safety rules, Federal standards	Oral response
Transportation and communication	Same as New Miner program	Lecture Slide-tape show	Same as New Miner program	Quick Check Test
Fighting fires	Same as New Miner program	Slide-tape show	See New Miner	Quick Check Test
Ground control	Same as New Miner program	Slide-tape show	See New Miner	Quick Check Test
First aid	Same as New Miner program	Slide-tape show Lecture and discussion	Same as New Miner program	Quick Check Test
Electrical hazards	Same as New Miner program	Slide-tape show Lecture	Same as New Miner program	Quick Check Test
Prevention of accidents	Instruction on accident prevention, causes & accident review.	Lecture discussion	Safety record Slide-tape show	Oral response
Protecting your hearing	Same as New Miner program	Slide-tape show	Same as New Miner program	Quick Check Test
Explosives	Same as New Miner program	Slide-tape show or lecture	Same as New Miner program	Quick Check Test
Dust control & use of respirators	Same as New Miner program	Slide-tape show Lecture and demonstration	Same as New Miner program	Demonstration check, Quick Check Test

LEHMAN 01425

TRAINING PLAN: NEW TASKS

The training process outlined below is for miners assigned to a task in which they have had no previous experience. The process is a result of job classifications at the mine/mill and an analysis of the hazards involved.

The matrix on Page 7 identifies the task safety training needed for each job classification.

The period of instruction required will vary due to the different learning levels, skills and abilities of the individuals and the difference in complexity of different tasks and pieces of equipment.

SUBJECT	OBJECTIVES	TRAINING METHODS	COURSE MATERIAL	METHOD OF EVALUATION
Health and safety aspects and safe operating procedures for work tasks equip., machinery	Provide instruction in the health and safety standards associated with job assignments	On site w/qualified instructor	Equipment related to task assignment. Operating manual, checklist	Verbal response on Company rules. Demonstrate ability to perform safely
Supervised practice during non-production	Provide instruction and practice in the safe operating procedures and health aspects on the equipment associated with the job assignment.	Coaching by a qualified instructor	Machinery or equipment related to task assignment. Checklist.	On site observation. Demonstrate ability to perform safely.
Supervised operation during production	Provide coaching and supervision on safe operating procedures and health aspects of the equipment associated with the job assigned.	On-the-job with qualified supervisor	Operating manual, Company safety rules Machinery or equipment	On the job observation. Demonstrate proficiency
New or modified machines and equipment	Provide instruction in the safe operating procedures applicable to new or modified wquipemtn and machinery	On site demonstration and discussion on new, different procedures	Operating manual on new, modified equipment, checklist	Answer questions correctly and demonstrate proficiency

LEHMAN 01426

TASK TRAINING MATRIX

TASK / DUTIES	PACKER	ORE HANDLER	LABORATORY PERSONNEL	WAREHOUSEMAN	MAINTENANCE PERSONNEL	MILL OPERATOR		
	JOB							
Clean-up	X	X	X	X	X	X		
Manual Handling of Equipment	X	X	X	X	X	X		
Operate Front-end Loader		X			X	X		
Operate Forklift	X	X		X	X	X		
Operate Power Sweeper		X			X			
Inspect Equipment	X	X		X	X	X		
Repair Equipment and Machinery					X	X		
Welding					X			
Install Parts and Equipment					X	X		
Machining of Parts								
Lubrication		X			X			
Calibration					X	X		
Equipment Lock-out					X	X		
Maintain Equipment and Machinery					X			
Operate Plant Control Panels					X	X		
Inventory Material	X	X	X	X	X	X		

LEHMAN 01427

TRAINING PLAN: HAZARD RECOGNITION

Before entering the operations and maintenance areas, office workers, scientific workers, delivery persons and visitors will be advised of the dangers present in surface mining.

These persons will read and certify that they understand a printed "Hazard Recognition Checklist" before entering these areas. A signed copy of the document will be kept on file by the Company.

OUTLINE OF TRAINING PROCEDURE
NEW TASK TRAINING

TITLE: Forklift Operator

DUTIES: Operate forklift
Inspect forklift
Lubricate forklift

MATERIALS NEEDED: Company policy and rulebook
Hand tools
Lubrication tools and lubricants
Training manual for forklift pallet

WHAT THE INSTRUCTOR WILL DO:

1. Discuss company policy and rulebook
2. Discuss traffic rules
3. Equipment orientation
4. Explain parts, controls, safety devices, and gauges
5. Explain and demonstrate pre-operational check
6. Explain and demonstrate lubrication
   a. Points
   b. Levels
   c. Tools
   d. Procedure
   e. Lubricant types
7. Explain and demonstrate start-up, operation, and shutdown
   a. Removing pallets from palletizer
   b. Placing and stacking full and empty pallets for storage
   c. Loading and unloading pallets from trucks
8. Explain hazards associated with operation

WHAT THE STUDENT WILL DO:

1. Read company policy and rulebook
2. Review traffic rules
3. Read all forklift training
4. Conduct pre-operational equipment check
5. Simulate lubrication
6. Simulate operation
7. Operate under non-production conditions using an empty pallet

EVALUATION:

1. Student gives verbal response to all questions
2. Student explains all parts, gauges, and safety devices on forklift
3. Student demonstrates pre-operation check
4. Student simulates lubrication procedure
5. Student demonstrates start-up, operation, and shutdown

Routine cycle steps shall be performed without error for five cycles

Retrain if trainee cannot complete two series of five error-free cycles

Observation by experienced operator and/or supervisor during first day of operation

OUTLINE OF TRAINING PROCEDURE
NEW TASK TRAINING

TITLE: Sacker-Trucker-Tableman

DUTIES: Operates trackmobile to spot R.R. cars
Clean-up
Operates forklift
Operates packer

MATERIALS NEEDED: Company policy and rulebook
Clean-up tools
Cement sacks/pallets
Forklift/trackmobile
Training manuals

WHAT THE INSTRUCTOR WILL DO:

1. Discuss company policy and rulebook
2. Explain and demonstrate clean-up procedure and associated tools
3. Explain and demonstrate operation of packer
   a. Bag placement near packer
   b. Placement of bag on packer
   c. Activation of packer
   d. Hazards associated with operation
   e. Use of protective equipment
4. Discuss company policy and traffic rules for forklift and trackmobile operation
   a. Equipment orientation
   b. Explanation of parts, controls, and safety devices
   c. Explain and demonstrate start-up, operation, and equipment shutdown
   d. Explain and demonstrate
      1. pre-operation inspection
      2. lubricant/fuel levels
      3. lubrication process/types
   e. Indicate hazards and correct response to hazards associated with each equipment function

WHAT THE STUDENT WILL DO:

1. Read company policy and rulebook
2. Review traffic rules
3. Simulate clean-up procedure and use of tools
4. Simulate use of packer
5. Read forklift training manual
   a. Conduct pre-operational check
   b. Simulate operation
   c. Operate under non-production conditions using empty pallets
6. Read trackmobile training manual
   a. Conduct pre-operational check
   b. Simulate operation
   c. Ride with experienced operator for one day
   d. Operate with experienced operator for one day.

TITLE: Sacker-Trucker-Tableman (Cont'd)

EVALUATION:
1. Student gives verbal response to all questions
2. Student demonstrates proper use of packer
3. Student demonstrates proper clean-up procedures and use of associated hand tools.
4. Explain parts, gauges, and safety devices on forklift and trackmobile
5. Give verbal response to parts nomenclature on forklift and trackmobile
6. Demonstrate pre-operational check on forklift and trackmobile

ON FORKLIFT AND TRACKMOBILE: Routine cycle steps shall be performed without error for five cycles

Retrain if trainee cannot accomplish two series of five error-free cycles

Observation by experienced operator and/or supervisor during first day of operation

TITLE OF PERSONNEL CONDUCTING TRAINING:

OUTLINE OF TRAINING PROCEDURE
NEW TASK TRAINING

TITLE: Finish Miller

DUTIES: Assist finish mill operator
Regulate feed to mills
Inspect mill equipment
Control conveyor material flow
Complete equipment reports
Mixes Admix for special cements
Equipment repair
Clean-up
Electrical Lockout
Clear material stoppages

MATERIALS NEEDED: Company policy and rulebook
Safety lock and hasp
Hand tools for clean-up and repair
Layout/diagrams of mill room and associated equipment (screw conveyors, etc.)

WHAT THE INSTRUCTOR WILL DO:

1. Discuss company policies and rules
2. Explain and demonstrate the regulation of feed to compartment mills
3. Explain and demonstrate mill equipment inspection
4. Explain and demonstrate proper sequence of mill equipment startup and shutdown procedures
5. Explain and demonstrate Admix procedure
   a. Type of cement
   b. Type of Admix
   c. Proportion of Admix needed
6. Explain and demonstrate use of hand tools in equipment repair
7. Explain clean-up procedures and use of hand tools
8. Explain electrical lockout
   a. When
   b. Where
   c. How
   d. Communication with central control
9. Explain proper clearing of material stoppages when blinker signal lights activates on
   a. Screw conveyors
   b. Elevators
   c. Etc.

WHAT THE STUDENT WILL DO:

1. Read company policy and rulebook
2. Study all layouts and diagrams
3. Listen to and watch all explanations and demonstrations respectively
4. Walk through mill area and familiarize himself with
   a. Equipment layout
   b. Control panels

TITLE: Finish Miller (Cont'd)

c. Lube points
d. Disconnect points

5. Simulate use of
   a. Hand tools for clean-up and repair
   b. Lubrication tools
   c. Electrical lockout

EVALUATION: 1. Student gives verbal response to all questions
2. Student demonstrates the ability to perform
   a. Feed regulation to mills
   b. Sequential start up and shut down of mill equipment
   c. Equipment inspection
   d. Use correct Admix for various cements
   e. Equipment repair
   f. Lockout
   g. Clean-up
   h. Clearing material stoppages

TITLE OF PERSON CONDUCTING TRAINING:

OUTLINE OF TRAINING PROCEDURE
NEW TASK TRAINING

TITLE: Sack and Load Utilityman

DUTIES: Uses hand/air tools
Makes equipment repairs
Electrical lockout
Lubricates equipment
Torch cutting and welding

MATERIALS NEEDED: Company policy and rulebook
Safety lock and hasp
Hand/air tools
Lubrication tools; lubricants
Torch cutting and welding equipment
Blueprints/drawings/sketches

WHAT THE INSTRUCTOR WILL DO:

1. Discuss company policy and rulebook
2. Explain sack and load equipment layout via blueprints, diagrams etc.
   a. Equipment location
   b. Disconnect points
   c. Inspection points
   d. Lubrication points
3. Explain and demonstrate use of hand/air tools in equipment repair
4. Explain and demonstrate electrical lockout
   a. Where
   b. When
   c. How
   d. Communication with central control
5. Explain and demonstrate lubrication
   a. Points of
   b. Tools used
   c. Lubricants used
   d. Maintenance schedule
6. Explain and demonstrate the use of torch cutting and welding equipment
   a. Transportation of
   b. Storage of
   c. Use of
   d. Maintenance of
   e. Safety equipment used

WHAT THE STUDENT WILL DO:

1. Read company policy and rulebook
2. Review all blueprints, diagrams, and sketches
3. Attentively listen to and watch all explanations and demonstrations respectively
4. Simulate
   a. Use of all tools
   b. Use of welding equipment
   c. Inspection procedure
   d. Lubrication procedure
   e. Electrical lockout

TITLE: Sack and Load Utilityman (Cont'd)

EVALUATION:
1. Student gives verbal response to all questions
2. Student explains and demonstrates
   a. Use of all tools
   b. Use of welding equipment
   c. Inspection procedure
   d. Lubrication procedure
   e. Electrical lockout

TITLES OF PERSONNEL CONDUCTING TRAINING:

SKILLS TRAINING

MAINTENANCE SKILLS TRAINING

The following maintenance and plant operations training programs are representative of the types of programs commercially available. The majority of the courses are self study programs designed to assist the employee in understanding a process or maintenance skill through workbooks and often videotape instruction. The vast majority of these courses stress safe work practices integrated into the training.

All maintenance employees should be encouraged to augment their knowledge and abilities through skills training programs. The duPont programs are fairly basic and should be understood by most employees with average reading ability. Assistance with ordering the duPont programs is available through the Talc Division Safety Department. Most of the programs can be ordered for preview.

DU PONT TRAINING MATERIALS

Introduction

The wide variety of training courses offered in this catalog was originally developed for use at Du Pont Company sites to train new employees and to maintain and upgrade existing employees' safety, maintenance, and plant operations skills.

These training programs were created to combat steadily rising training and operating costs, cope with the increased complexity of today's plants and their multitude of safety and operating problems, improve productivity, and overcome a shortage of skilled workers.

The self-study programmed instruction courses and videotapes, developed by teams of practical, on-the-job specialists, were field tested for effectiveness and then placed into plant and site use. Thus they were created by experienced industrial trainers for use in "real world" work environments.

As examples of the diverse "real world" work environments for which these training courses were developed, the 170 facilities operated worldwide by Du Pont include not only chemical plants and refineries but also facilities to produce electronic connectors, plastic pipe, medical diagnostic instruments, fishing line, pharmaceuticals, and heat exchangers. In support of this large business, we operate and maintain warehouses, fleets of transportation equipment, surface mines, chemical and engineering laboratories, power generating equipment, and sales offices.

The practical, diverse, "real world" training experience gained by Du Pont in a wide variety of industries has encouraged thousands of companies to use our training programs to train their employees.

Du Pont offers self-study training programs in three different areas:

1. *Safety.*
2. *Forklift Truck Operation.*
3. *Maintenance and Plant Operations Skills.*

The *safety training programs* teach supervisory and non-supervisory personnel how to develop safety observation techniques for eliminating unsafe acts, how to build a positive safety attitude, and how to perform routine jobs safely.

Experience has shown that such training, when properly implemented, results in:

- Reduced injuries.
- Greater productivity.
- Improved labor relations.
- Lower workers' compensation payments.
- Better public relations.
- Improved management skills.

Safety pays not only in these areas but also significantly impacts the bottom line. Good safety management is good business. At Du Pont, effective safety training has helped us become the recognized leader in reducing injuries and their costs to the lowest levels. It can provide your organization with similar benefits.

The *forklift truck operator training program* ties the visual impact of videotape into a self-study programmed instruction course to maximize the training experience for forklift truck operators. It stresses the proper and safe operation of powered lift trucks and prevention of injuries.

The *maintenance and plant operations training programs* cover subjects from pipe fitting, welding, gears and gearing, pumps, and steam traps to plant mathematics, distillation, boiler operation, and flow measurement. The courses vary from those covering broad subjects, such as the Plant Operator Series or Reading Engineering Drawings, to specific areas of interest, such as scaffolding, mechanical seals, or thermal insulation. The emphasis is on general maintenance and instrument mechanics training as well as plant operations training.

If you need more information after reading this catalog, please contact us at one of the offices listed at the back of the catalog.

Training Methods

Effective training methods involve interaction of the trainee with an instructor or materials. Programmed instruction courses provide interactive training and are inexpensive methods to teach safety, maintenance, and plant operations skills. Du Pont programmed instruction courses are now used by over 10,000 organizations throughout the world.

Programmed Instruction

What Is Programmed Instruction?

Programmed instruction, or P.I., is a well-established self-study training method. Using a workbook and proceeding at his own pace, the trainee reads a block of information and then gives an active response; for example, he may fill in a blank. He immediately confirms or corrects his reponse by referring to an answer sheet. Important concepts are reinforced by repetition. At the end of the course, a test measures how well the trainee has retained the material.

What Are the Benefits of P.I.?

- *Trainees learn more in less time with better retention.*
  Validation tests involving more than 1,000 employees in Du Pont plants demonstrated these benefits. Two groups of trainees received the same course material: the first group by P.I., the second by conventional teaching methods. The P.I. group covered the material in 25% less time and scored 10% higher on the same comprehensive test.

- *P.I. is more cost-effective than conventional teaching methods.*
  Since P.I. takes 25% less time, trainees spend less time in the training room and more time in productive on-the-job activities. Also, the courses themselves are reasonably priced, averaging approximately $2.50 per training hour. In addition, there is no need to hire outside instructors or take supervisors away from their jobs to act as trainers.

- *P.I. can fit into any work schedule.*
  Because the P.I. courses do not require formally scheduled classrooms and instructors, training can be carried out to fit demanding work schedules. A single training room can be used for many different courses at the same time. Most important, the trainee can move ahead at his own pace.

- *Overtraining is eliminated.*
  Individual courses can be selected to fulfill specific training needs, no more and no less.

- *Virtually all employees can be trained with P.I. courses.*
  Du Pont P.I. courses were written so that only very basic reading and computational skills are required. They are not limited to high school or college graduates.

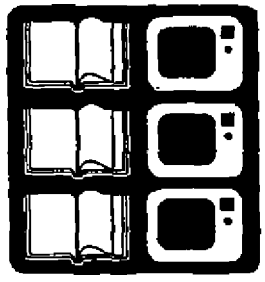
Videotapes

What Is the Purpose of the Videotapes?

Videotapes are being added to Du Pont's training materials product line to reinforce the effectiveness of the printed P.I. training courses. These videotapes currently include topics such as safe forklift truck operation, plant safety and security, and maintenance training. Before being approved for use in on-the-job training, the videotapes were developed and tested by experienced Du Pont trainers using workers at actual plant locations.

Du Pont's first videotape, "Behind the Mast: An Operator's Guide to Lift Truck Safety," covers the safe operation of forklift trucks. This comprehensive 70-minute videotape enhances the new four-unit P.I. course, "Forklift Truck Operator Training," to form a powerful training package. See page 25 for more details.

Dozens of videotapes will soon be introduced. Watch for new product announcements and special introductory offers.



Maintenance and Plant Operations Training

Du Pont, a leader in industrial crafts training, has developed one of the largest curricula of general maintenance and instrument mechanics training as well as plant operations training courses available today. A total of 120 programmed instruction courses and one easy-reference handbook address a wide variety of training needs. Two management training courses, developed and used within Du Pont, are also available.

The self-study P.I. courses and handbook are designed for any employee with basic reading ability and computational skills. Like other programmed instruction courses, these training programs reinforce what the trainee has learned.

The wide variety of course offerings allows a flexible training approach so that a course or set of courses can be specifically tailored to a particular need. Courses have been grouped into training areas as shown below:

Maintenance Training
- Carpentry
- Electrical Work
- Instrumentation
- Insulating
- Machine Shop
- Millwrighting
- Pipe Fitting
- Rigging
- Sheet Metal Work
- Welding

Operations Training
- Chemical Operation
- Powerhouse Operation
- Service Operation

Management Training
- Supervisory Problems
- Venture Analysis

Specific units can be selected for an introduction to a craft, a review of a problem area for an experienced worker, or progressive mastery of the craft.

Thousands of organizations have successfully used Du Pont P.I. courses to meet their vocational training needs. Here are just a few examples:

- *Colorado Interstate Gas Co., Colorado Springs, CO*

With operations in six states and a work force that would lose 40% of its members to retirement by 1988, Colorado Interstate Gas needed a training program that would ensure a high level of competency for new employees, increased skills for current employees, and maintenance of skills for workers who often lack direct supervision. The old training program just was not meeting these goals, so Colorado Interstate restructured its whole approach to training: now 50 Du Pont P.I. courses in materials handling, pipe fitting, and other basic skills keep a far-flung work force functioning at a high level of competence and help employees obtain skills needed to replace retiring co-workers. Colorado Interstate is also impressed that the courses are free of "cultural bias" and are useful to all workers.

Course List and Training Area Cross Reference

The foldout chart entitled "Course List and Training Area Cross Reference" shows each course and the training areas to which it applies. Courses are listed alphabetically.

Numerical Index

This section contains a listing of course titles arranged by course number. Refer to the course descriptions (pages 34 to 70) for more information about each course.

Course Number	Title
	Maintenance and Operations Training
3	Measurements for Installation and Construction
4	Measuring Tools—Calipers
5	Measuring Tools—Verniers
6	Palin Bearings
7	Anti-Friction Bearings
8	Pipe Fitting—Pipe & Fitting Identification
9	Pipe Fitting—Measurement & Layout
10	Pipe Fitting—Simple & Rolling Offsets
11	Welding—Oxyacetylene
12	Positive Displacement Pumps
13	Sheet Metal—Layout Patterns
14	Thermal Insulation—Pipe & Fittings
15	Thermal Insulation—Equipment
16	Drills—Selection, Checking & Inspection
17	Drills—Regrinding & Modification
18	Solid Hand Reamers
19	Expansion Hand Reamers
20	Single Stage Steam Jet Vacuum Pumps—Operation
21	Single Stage Steam Jet Vacuum Pumps—Trouble Shooting
22	Material Handling—Crane & Hoist Signals
23	Material Handling—Wire Rope Identification & Fittings
25	"Lightnin" Mixers
26	Gears and Gearing—Spur Gears
27	Field Sketching
28	Coupling Alignment (Shafts)
29	Plant Mathematics—Whole Numbers
30	Plant Mathematics—Fractions
31	Pressure and Its Measurement—Basic Principles
32	Pressure and Its Measurement—Bourdon Tube & Other Gages
33	Level Measurement—Gage Glasses & Floats
34	Level Measurement—Buoyancy Displacers
35	Level Measurement—Differential Pressure
36	Level Measurement—Electrical Devices
37	Flow Measurement—Basic Principles
38	Temperature Measurement—Basic Physics and Terms
39	Temperature Measurement—Scales and Conversion
40	Temperature Measurement—Thermometers
41	Water Treatment—Boiler Feedwater
47	Introduction to Chromatography
48	Colorimeter Operation
49	Plant Operator Series—Fundamentals
50	Filtration—Plate and Frame Filter Presses
51	Titration and Its Glassware
53	Principles of Combustion
54	Using a Pitot Tube
55	Chains and Sprockets—Roller Chains
57	Multistage Steam Jet Vacuum Pumps—Operation
58	Plant Operator Series—Basic Chemistry
59	Plant Operator Series—Equipment
60	Plant Mathematics—Decimals & Percents
61	Gears and Gearing—Gear Ratios
62	Sheet Metal—Edging, Notching & Seams
63	Plant Operator Series—Operating Procedures
64	Pipe Fitting—Layout Practices
66	Gears and Gearing—Gearing Installation
67	Temperature Measurement—Filled Thermal Systems
68	Valves—Operation and Maintenance
69	Inorganic Chemistry for Plant Operators
71	Gears and Gearing—Helical Gears
72	Flow Measurement—Primary Elements
73	Plant Mathematics—Area & Volume of Common Figures

Course Number	*Title*
74	Plant Mathematics—Numerical Prefix & Powers of Ten
75	Multistage Steam Jet Vacuum Pumps—Trouble Shooting
76	Gears and Gearing—Bevel Gears
77	Adjustable Hand Reamers
78	Reading & Preparing Simple Graphs
79	Mechanical Seals
80	Material Handling—Chain Hoists
81	Material Handling—Wire Rope Slings
82	Plant Mathematics—Positive & Negative Numbers
83	Plant Mathematics—Simple Algebra
84	Plant Mathematics—Ratio & Proportion
85	Calibration Adjustments—Zero, Span and Linearity
86	Control of Static Electricity
87	Steam and the Steam Generating Unit
88	Steam Traps—Testing Practices
89	Material Handling—Knots
90	Water Treatment—Water Chemistry
91	Steam Traps—Installation
92	Flow Measurement—Measuring Elements
93	Flow Measurement—Integration
94	Level Measurement—Electronic Devices
96	Boiler Operation—Monitoring Boiler Conditions
97	Scaffolds
98	Gears and Gearing—Worms and Worm Gears
99	Plant Mathematics—Square and Square Root Tables
100	Temperature Measurement—Standards & Calibration
102	Steam Traps—Trouble Shooting
103	Modes of Instrument Control
104	Disc Steam Traps
105	Thermostatic Steam Traps
106	Float-Thermostatic Steam Traps
107	Inverted Bucket Steam Traps
108	Boiler Operation—Boiler Efficiency
109	Reading Engineering Drawings
110	Temperature Measurement—Thermocouple Theory
111	Impulse Steam Traps
112	Chains and Sprockets—Sprockets and Drives
114	Plant Mathematics—Right Angle Trigonometry
115	Pedestal and Bench Grinders
116	Principles of Distillation
117	Water Treatment—Water Testing
119	Centrifugal Pumps
120	Internal Combustion Engines
121	Boiler Operation—Shutdown Procedures
122	Welding—Tungsten Inert Gas (TIG)
123	Pipe Fitting—Manually Cutting & Reaming Pipe
124	Dowtherm® Heating
126	Distillation—Practical Distillation
127	Reading Electrical Schematic Diagrams
128	Boiler Operation—Start-Up Procedures
129	Compressed Air Systems—Fundamentals
130	Valves—Introduction
131	Steam Traps—Introduction
132	Compressed Air Systems—Centrifugal Compressors
133	Compressed Air Systems—Reciprocating Compressors
137	Cost Stewardship—Unit 1
138	Cost Stewardship—Unit 2
139	Cost Stewardship—Unit 3
	Management Training
140	Supervisory Problems
141	Venture Analysis
	Reference Handbook
162	Rigging Handbook

Course List and Training Area Cross Reference

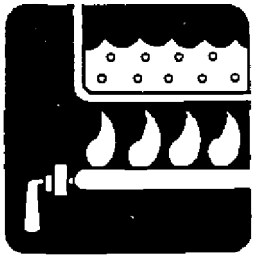
Order Code	Course Title	Avg. Time (hrs.)	Abstract Page	Training Area Use												
				Maintenance Training										Operations Training		
				Carpentry	Electrical Work	Instrumentation	Insulating	Machine Shop	Millwrighting	Pipefitting	Rigging	Sheet Metal Work	Welding	Chemical Operation	Power House Operation	Service Operation
07	Bearings—Anti-Friction	10	34		X			X	X							
06	Bearings—Plain	8	54		X			X	X							
96	Boiler Operation—Monitoring Boiler Conditions	6	35											X		
108	Boiler Operation—Boiler Efficiency	7	34											X		
128	Boiler Operation—Start-Up Procedures	13	35											X		
121	Boiler Operation—Shutdown Procedures	6½	35											X		
85	Calibration Adjustments—Zero, Span and Linearity	8½	36			X										
55	Chains and Sprockets—Roller Chains	7	36					X	X							
112	Chains and Sprockets—Sprockets and Drives	12	37					X	X							
69	Chemistry, Inorganic—for Plant Operators	10	46											X		
47	Chromatography, Introduction to	16	46											X		
48	Colorimeter Operation	16	37											X		
53	Combustion, Principles of	14	61												X	
129	Compressed Air Systems—Fundamentals	2½	38											X	X	X
132	Compressed Air Systems—Centrifugal Compressors	5	38											X	X	X
133	Compressed Air Systems—Reciprocating Compressors	5	38											X	X	X
137	Cost Stewardship—Unit 1	2½	39	X	X	X	X	X	X	X	X	X	X	X	X	X
138	Cost Stewardship—Unit 2	5	39	X	X	X	X	X	X	X	X	X	X	X	X	X
139	Cost Stewardship—Unit 3	3	39	X	X	X	X	X	X	X	X	X	X	X	X	X
28	Coupling Alignment (Shafts)	14	40					X	X							
116	Distillation—Principles of Distillation	6	61											X		
126	Distillation—Practical Distillation	8	40											X		
124	Dowtherm® Heating	4	40		X	X	X						X	X	X	X
109	Drawings—Reading Engineering Drawings	12	62	X	X	X	X	X	X	X		X	X			
16	Drills—Selection, Checking & Inspection	4½	41	X	X	X	X	X	X	X		X				
17	Drills—Regrinding & Modification	3½	40					X		X		X				
86	Electricity—Control of Static Electricity	4	39		X					X			X	X	X	
127	Electrical—Reading Electrical Schematic Diagrams	7	62		X	X	X	X		X				X	X	
50	Filtration—Plate and Frame Filter Presses	13½	41							X				X		
37	Flow Measurement—Basic Principles	8	42			X				X				X	X	
72	Flow Measurement—Primary Elements	3	43			X							X			
92	Flow Measurement—Measuring Elements	3	43			X							X			
93	Flow Measurement—Integration	2	42			X							X			
26	Gears and Gearing—Spur Gears	8	45					X	X							
61	Gears and Gearing—Gear Ratios	11	44					X	X							
66	Gears and Gearing—Gear Installation	9	44					X	X							
71	Gears and Gearing—Helical Gears	4½	45					X	X							
76	Gears and Gearing—Bevel Gears	6½	43					X	X							
98	Gears and Gearing—Worms and Worm Gears	9½	45					X	X							
78	Graphs—Reading & Preparing Simple Graphs	14	62											X		
115	Grinders, Pedestal and Bench	4½	53	X	X	X	X	X	X	X	X	X	X			
18	Hand Reamers—Solid Hand Reamers	5	64					X	X			X				
19	Hand Reamers—Expansion Hand Reamers	2½	41					X	X			X				
77	Hand Reamers—Adjustable Hand Reamers	5	34					X	X			X				
103	Instrument Control, Modes of	11	51			X								X		
14	Insulation, Thermal—Pipe & Fittings	25	68				X			X						
15	Insulation, Thermal—Equipment	25	68				X			X						

Course List and Training Area Cross Reference

Order Code	Course Title	Avg. Time (hrs.)	Abstract Page	Training Area Use												
				Maintenance Training										Operations Training		
				Carpentry	Electrical Work	Instrumentation	Insulating	Machine Shop	Millwrighting	Pipefitting	Rigging	Sheet Metal Work	Welding	Chemical Operation	Power House Operation	Service Operation
120	Internal Combustion Engines	2	46					X	X						X	X
33	Level Measurement—Gage Glasses & Floats	2½	49			X								X	X	
34	Level Measurement—Buoyancy Displacers	5	47			X								X		
35	Level Measurement—Differential Pressure	8½	48			X								X		
36	Level Measurement—Electrical Devices	3½	48			X								X		
94	Level Measurement—Electrical Devices	9½	49			X								X		
80	Material Handling—Chain Hoists	2	49	X	X	X	X	X	X	X	X	X	X	X		X
22	Material Handling—Crane & Hoist Signals	1	50	X					X	X	X	X				X
89	Material Handling—Knots	3	50	X			X	X	X	X	X	X	X	X		X
23	Material Handling—Wire Rope Identification & Fittings	3	50	X					X	X	X					
81	Material Handling—Wire Rope Slings	2	51	X					X	X	X					
29	Mathematics, Plant—Whole Numbers	14	59	X	X	X	X	X	X	X	X	X	X	X	X	X
30	Mathematics, Plant—Fractions	19	56	X	X	X	X	X	X	X	X	X	X	X	X	X
60	Mathematics, Plant—Decimals & Percents	25	55	X	X	X	X	X	X	X	X	X	X	X	X	X
82	Mathematics, Plant—Positive & Negative Numbers	4	57	X	X	X	X	X	X	X	X	X	X	X	X	
83	Mathematics, Plant—Simple Algebra	10	58	X	X	X	X	X	X	X	X	X	X	X	X	
84	Mathematics, Plant—Ratio and Proportion	10	57	X	X	X	X	X	X	X	X	X	X	X	X	
73	Mathematics, Plant—Area & Volume of Common Figures	5	55	X	X		X	X	X		X	X				
74	Mathematics, Plant—Numerical Prefix & Powers of Ten	5	56		X	X										
99	Mathematics, Plant—Squares and Square Root Tables	4	58					X	X	X		X				
114	Mathematics, Plant—Right Angle Trigonometry	8	58	X	X	X	X	X	X	X	X	X	X	X	X	
03	Measurements for Installation and Construction	10	51	X	X	X	X	X	X	X	X	X	X			
04	Measuring Tools—Calipers	3	51	X	X	X	X	X	X	X		X				
05	Measuring Tools—Verniers	1½	51			X	X	X	X	X		X				
79	Mechanical Seals	14	51					X	X							
25	Mixers, "Lightnin"	7	49					X	X					X		
08	Pipefitting—Pipe & Fitting Identification	14	54				X	X	X	X				X	X	
09	Pipefitting—Measurement & Layout	36	53					X	X	X						
10	Pipefitting—Simple & Rolling Offsets	20	54							X						
64	Pipefitting—Layout Practices	7½	53					X	X	X						
123	Pipefitting—Manually Cutting & Reaming Pipe	4½	53					X	X	X						
54	Pitot Tube, Using a	2	69			X								X	X	
49	Plant Operator Series—Fundamentals	16	60											X	X	
58	Plant Operator Series—Basic Chemistry	12	59											X	X	
59	Plant Operator Series—Equipment	13	59											X	X	
63	Plant Operator Series—Operating Procedures	22	60											X	X	
31	Pressure and Its Measurement—Basic Principles	15	61			X								X	X	
32	Pressure and Its Measurement—Bourdon Tube & Other Gages	8	61			X								X		
119	Pumps—Centrifugal Pumps	9	36			X		X	X	X				X	X	
12	Pumps—Positive Displacement Pumps	5½	60			X		X	X					X		
20	Pumps—Single Stage Steam Jet Vacuum Pumps—Operation	2	63							X				X	X	
21	Pumps-Single Stage Steam Jet Vacuum Pumps-Trouble Shooting	5	63							X						
57	Pumps—Multistage Steam Jet Vacuum Pumps—Operation	6	52							X				X	X	
75	Pumps-Multistage Steam Jet Vacuum Pumps-Trouble Shooting	11	52							X						
162	Rigging Handbook	—	62	X	X		X	X	X	X	X	X			X	
97	Scaffolds	1	62	X	X		X		X	X	X	X	X			
13	Sheet Metal—Layout Patterns	18	63									X				

Course List and Training Area Cross Reference

Order Code	Course Title	Avg. Time (hrs.)	Abstract Page	Training Area Use: Maintenance Training: Carpentry	Electrical Work	Instrumentation	Insulating	Machine Shop	Millwrighting	Pipefitting	Rigging	Sheet Metal Work	Welding	Operations Training: Chemical Operation	Power House Operation	Service Operation
62	Sheet Metal—Edgings, Notching & Seams	12½	63					X	X			X				
27	Sketching, Field	16	41	X		X	X	X	X	X		X	X			
87	Steam and the Steam Generating Unit	4½	64												X	
131	Steam Traps—Introduction	2	65					X	X	X				X	X	
88	Steam Traps—Testing Practices	4½	65					X	X	X				X	X	
91	Steam Traps—Installation	3	64					X	X	X					X	
102	Steam Traps—Trouble Shooting	2	65					X	X	X					X	
104	Steam Traps—Disc Steam Traps	2	40					X	X	X					X	
105	Steam Traps—Thermostatic Steam Traps	2	68					X	X	X					X	
106	Steam Traps—Float—Thermostatic Steam Traps	1	42					X	X	X					X	
107	Steam Traps—Inverted Bucket Steam Traps	1½	47					X	X	X					X	
111	Steam Traps—Impulse Steam Traps	2½	46					X	X	X					X	
38	Temperature Measurement—Basic Physics and Terms	6	66			X								X	X	
39	Temperature Measurement—Scales and Conversion	4	66			X								X		
40	Temperature Measurement—Thermometers	3	67			X								X		
67	Temperature Measurement—Filled Thermal Systems	4	66			X								X		
100	Temperature Measurement—Standards & Calibration	4	67			X								X		
110	Temperature Measurement—Thermocouple Theory	14	67			X								X		
51	Titration and Its Glassware	3	69											X		
130	Valves—Introduction	1	69			X		X	X	X				X	X	
68	Valves—Operation and Maintenance	12	69			X		X	X	X				X	X	
90	Water Treatment—Water Chemistry	2½	70												X	
41	Water Treatment—Boiler Feedwater	6	69												X	
117	Water Treatment—Water Testing	2½	70												X	
11	Welding—Oxyacetylene Cutting & Tacking	4	70					X	X	X			X			
122	Welding—Tungsten Inert Gas (TIG)	13	70					X	X	X			X			
Management Training																
140	Supervisory Problems—Workshop & Reference Manual	—	66													
141	Venture Analysis	—	69													



Boiler Operation—Monitoring Boiler Conditions Course No. 96 6 hours

Identification of normal furnace and boiler conditions by observation of flame appearance and instruments: determination of normal and abnormal excess air by appearance of flame and by observation of O_2, CO_2 meters, or steam flow-air flow meter; variations, if any, of boiler conditions with load changes such as: boiler exit gas temperature, feedwater flow, feedwater temperature, CO_2 and O_2, steam flow-air flow, furnace draft, boiler outlet draft, and windbox or undergrate air pressure, boiler water level, etc.

Related Instruction: Other courses on boiler operation are:
Course No. 108, *Boiler Efficiency*
Course No. 121, *Shutdown Procedures*
Course No. 128, *Start-Up Procedures*

Boiler Operation—Shutdown Procedures Course No. 121 6½ hours

General procedures involved in boiler load reduction; taking a boiler off the line; allowable cooling rate; boiler shutdown and draining of boiler; effect of cooling rate on boiler water level; and identification of boiler parts such as chemical feed valve, drum vent valve, etc.

Related Instruction: Other courses on boiler operation are:
Course No. 96, *Monitoring Boiler Conditions*
Course No. 108, *Boiler Efficiency*
Course No. 128, *Start-Up Procedures*

Boiler Operation—Start-Up Procedures Course No. 128 13 hours

General procedures involved in boiler load increases; putting a boiler on the line; allowable warm-up rate; boiler start-up; filling a boiler with water; establishing a minimum stable flame; and identification of parts, such as pilot burner, manholes and handholes, etc.

Related Instruction: Other courses on boiler operation are:
Course No. 96, *Monitoring Boiler Conditions*
Course No. 108, *Boiler Efficiency*
Course No. 121, *Shutdown Procedures*

Compressed Air Systems—Centrifugal Compressors Course No. 132 5 hours

Identification of the basic types of rotary compressors: positive displacement and velocity head; purpose of and flow through the principal centrifugal compressor parts; impeller, diffuser, and volute; multistage centrifugal compressor operation at both constant and variable speeds; the cause and correction for the operating condition of surge; control systems to provide compressor load control and surge control by variable discharge venting, variable discharge venting with variable inlet throttling, full inlet throttling, and full discharge venting; compressor start-up procedure; operating observations; and compressor shutdown procedure.

Related Instruction: Other courses on compressed air systems are:
Course No. 129, *Fundamentals*
Course No. 133, *Reciprocating Compressors*

Compressed Air Systems—Fundamentals Course No. 129 2½ hours

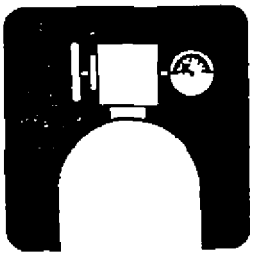
Fundamentals of compressed air systems: the air mixture of nitrogen, oxygen, and water vapor; the interrelationship of air pressure, temperature, volume, water vapor, and dew point; uses of compressed air, and the purposes and flow sequence of filter, compressor first stage, intercooler, compressor second stage, aftercooler, aftercooler separator, after-aftercooler, after-aftercooler separator, receiver, and dryer.

Related Instruction: Other courses on compressed air systems are:
Course No. 132, *Centrifugal Compressors*
Course No. 133, *Reciprocating Compressors*

Compressed Air Systems—Reciprocating Compressors Course No. 133 5 hours

Identification and operating sequence of the basic parts of a reciprocating compressor; name, purpose, and airflow in each piece of equipment of a reciprocating compressor system; lubricated and nonlubricated compressors; drain traps; regulation of compressor capacity by inlet valve lifters and cylinder clearance pockets; compressor start-up procedure; operating observations; and compressor shutdown procedure.

Related Instruction: Other courses on compressed air systems are:
Course No. 129, *Fundamentals*
Course No. 132, *Centrifugal Compressors*



Level Measurement—Electronic Devices Course No. 94 9½ hours

Measuring and detecting the level of liquids and solids with electronic devices: the principles of operation, applications and points of interest in the maintenance of level devices; using light source and phototube; utilizing ultrasonic vibrational waves; detecting level using gamma-ray absorption; change in capacitance between a probe and a vessel caused by changing the dielectric constant.

Related Instruction: Other level measurement courses are:
Course No. 33, *Gage Glasses & Floats*
Course No. 34, *Buoyancy Displacers*
Course No. 36, *Electrical Devices*

Level Measurement—Gage Glasses & Floats Course No. 33 2½ hours

Basic physics, terms, and operation of level sight and float instruments.

Related Instruction: Other level measurement courses are:
Course No. 34, *Buoyancy Displacers*
Course No. 35, *Differential Pressure*
Course No. 36, *Electrical Devices*
Course No. 94, *Electronic Devices*

"Lightnin" Mixers Course No. 25 7 hours

Highlights of the course include identifying "Lightnin" portable-type mixers (Models ND, NC, NS, and NM) and their major parts; identifying, measuring, and selecting standard propellers; preparing the mixer shaft and installing the propellers on the shaft; adjusting the mixer position; lifting and handling the mixer for installation or removal; identifying data needed for replacement of defective motor and mixer; using the "Operating Instructions" manual for disassembly, inspection, repair and reassembly of the mixer; and identifying the safety factors in performing these jobs.

Material Handling—Chain Hoists Course No. 80 2 hours

Identification of the four basic types of chain hoists; identification of various parts of all hoists; recognition of proper hook opening for various size hoists; inspection of hoists; storage; proper hanging of a hoist; and precautions.

Related Instruction: Other material handling courses are:
Course No. 22, *Crane & Hoist Signals*
Course No. 23, *Wire Rope Identification & Fittings*
Course No. 81, *Wire Rope Slings*
Course No. 89, *Knots*

Material Handling—Crane & Hoist Signals Course No. 22 1 hour

Giving and taking hand signals for: raise the load, lower the load, stop, raise the boom, lower the boom, "dog everything," lower the load slowly, raise the load slowly, swing the load, and move crane forward or back.

Related Instruction: Other material handling courses are:
Course No. 23, *Wire Rope Identification & Fittings*
Course No. 80, *Chain Hoists*
Course No. 81, *Wire Rope Slings*
Course No. 89, *Knots*

Material Handling—Knots Course No. 89 3 hours

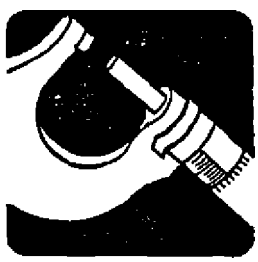
Identification, use, and tying of knots in fiber rope: identification of the parts of a rope; identification, use, and tying of overhand loop, overhand knot, square knot, granny knot, thief knot, bowline, bowline on a post, sheet bend, bowline on a bight, two half hitches, reverse hitches, buntline hitch, clove hitch, timber hitch, and barrel hitch; discrimination among binding knots, bends, and hitches.

Related Instruction: Other material handling courses are:
Course No. 22, *Crane & Hoist Signals*
Course No. 23, *Wire Rope Identification & Fittings*
Course No. 80, *Chain Hoists*
Course No. 81, *Wire Rope Slings*

Material Handling—Wire Rope Identification & Fittings Course No. 23 3 hours

Identifying the more commonly used wire rope fittings including: thimbles, clips, open and closed sockets, wedge-type open sockets, anchor shackles, hooks, and pear links; fabricating an eye made with a thimble and clips; proper assembling of wedge-type socket; and identifying three commonly used loops or eyes.

Related Instruction: Other material handling courses are:
Course No. 22, *Crane & Hoist Signals*
Course No. 80, *Chain Hoists*
Course No. 81, *Wire Rope Slings*
Course No. 89, *Knots*



Material Handling—Wire Rope Slings Course No. 81 2 hours

Identification of slings using one piece of wire rope; identification of multi-leg slings; application of various slings and hitches; safe working loads of slings; and 18 rules for guidance in the use of wire rope slings.

Related Instruction: Other material handling courses are:
Course No. 22, *Crane & Hoist Signals*
Course No. 23, *Wire Rope Identification & Fittings*
Course No. 80, *Chain Hoists*
Course No. 89, *Knots*

Measurements for Installation and Construction Course No. 3 10 hours

Use angles and straight lines.

Reading the scale on a steel rule to an accuracy of 1/64"; reading the scale on a micrometer to an accuracy of 0.001"; reading the scale on a protractor to an accuracy of 30 minutes; specific techniques for correct placement and use of the measuring tools; and instruction in the use of a micrometer with a ratchet drive.

Measuring Tools—Calipers Course No. 4 3 hours

Identifying the six commonly used calipers; reading scales to an accuracy of 1/64" or 0.01"; and identifying the parts and use of: outside firm joint calipers, inside firm joint calipers, outside lock joint calipers, inside lock joint calipers, outside bow spring calipers, and inside bow spring calipers.

Related Instruction: Course No. 5, *Measuring Tools—Verniers*

Measuring Tools—Verniers Course No. 5 1½ hours

Reading verniers on vernier calipers and micrometers.

Related Instruction: Course No. 4, *Measuring Tools—Calipers*

Mechanical Seals Course No. 79 14 hours

Parts and their functions, types, and installation of mechanical seals: balanced and unbalanced seals; inside, outside, and sleeve-mounted seals; seal flushing arrangements; key points in care and maintenance; materials used for various parts; and requirements and techniques involved in mechanical seal installation.

Modes of Instrument Control Course No. 103 11 hours

Elements, signals, and terminology of certain basic automatic control systems as applied in demonstrations of open and closed loops: on-off, proportional, proportional plus reset, proportional plus derivative, and proportional plus reset plus derivative.

Pedestal and Bench Grinders Course No. 115 4½ hours

Identification of the types of grinders and their parts; inspection of grinder guards, work rest, and grinding wheel; safety precautions; disassembly and assembly of grinding wheel; and checkout of grinder.

Pipe Fitting—Layout Practices Course No. 64 7½ hours

How to locate and mark pipe and fitting centerlines using common shop tools and handbook tables, with particular emphasis on butt welding fitting centerlines.

Related Instruction: Other pipe fitting courses are:
Course No. 8, *Pipe & Fitting Identification*
Course No. 9, *Measurement & Layout*
Course No. 10, *Simple & Rolling Offsets*
Course No. 123, *Manually Cutting & Reaming Pipe*

Pipe Fitting—Manually Cutting & Reaming Pipe Course No. 123 4½ hours

The use of common pipe shop tools in manually cutting and reaming pipe: operation of pipe vises, and pipe cutters, and hand pipe reamers to fabricate cut lengths of pipe free of irregularities at the pipe cut; use of proper personal protective equipment; demonstration of skills in a practical exercise.

Related Instruction: Other courses on pipe fitting are:
Course No. 8, *Pipe & Fitting Identification*
Course No. 9, *Measurement & Layout*
Course No. 10, *Simple & Rolling Offsets*
Course No. 64, *Layout Practices*

Pipe Fitting—Measurement & Layout Course No. 9 A=10 hours
B=10 hours
C=16 hours

Section A: Interpretation of orthographic and isometric single-line piping drawings. Use of pipe and fitting symbols for threaded, flanged, and welded piping systems. Use of dimensions to locate pipe and fittings on drawings.

Section B: Calculation of the cut lengths of threaded pipe required to fabricate systems made with screwed fittings and flanges. Use of pipe fitting handbook tables to determine screwed fitting and flange allowances.

Section C: Calculation of the cut lengths of pipe necessary to make piping arrangements made with butt-and-socket welding fittings and weld neck, slip-on, and lap-joint or Van Stone flanges. Use of pipe fitting handbook tables to determine butt-and-socket weld allowances and welding fitting and flange allowances.

Related Instruction: Other pipe fitting courses are:
Course No. 8, *Pipe & Fitting Identification*
Course No. 10, *Simple & Rolling Offsets*
Course No. 64, *Layout Practices*
Course No. 123, *Manually Cutting & Reaming Pipe*

Plant Operator Series—Fundamentals Course No. 49 16 hours

Basic principles of physics with which all new plant operators should be familiar: concepts of weight, form, volume, temperature, pressure, density, specific gravity, condensates, and vapors; conversion of "psi" to "feet of water" and "inches of mercury" and vice versa; absolute, gauge, and atmospheric pressure, and vacuum; effects of temperature and pressure on gas volumes (Ideal Gas Laws); compression and expansion; and the effects of temperature and pressure on liquids, vapors, and condensates.

Related Instruction: Other courses in plant operator series are:
Course No. 58, *Basic Chemistry*
Course No. 59, *Equipment*
Course No. 63, *Operating Procedures*

Plant Operator Series—Operating Procedures Course No. 63 22 hours

Identification and general operating principles of some of the instruments used to measure and control plant processes, and how they function in an instrument loop.

The instruments discussed are: totalizing meters, rotameters, manometers, transmitters and receivers, diaphragm motor valves, temperature and pressure controllers, and liquid level controllers.

Related Instruction: Other courses in the plant operator series are:
Course No. 49, *Fundamentals*
Course No. 58, *Basic Chemistry*
Course No. 59, *Equipment*

Positive Displacement Pumps Course No. 12 5½ hours

The identification of *reciprocating* positive displacement pumps by type of power end, displacing solid, number of pumping units, type of pumping unit, and valve gear; and the identification of the common types of *rotary* positive displacement pumps by type of displacing solid. The operating principles of both types of pumps are applied to elementary troubleshooting.

Related Instruction: Other pump courses are:
Course No. 20, *Single Stage Steam Jet Vacuum Pumps—Operation*
Course No. 21, *Single Stage Steam Jet Vacuum Pumps—Trouble Shooting*
Course No. 57, *Multistage Steam Jet Vacuum Pumps—Operation*
Course No. 75, *Multistage Steam Jet Vacuum Pumps—Trouble Shooting*
Course No. 119, *Centrifugal Pumps*

Titration and its Glassware Course No. 51 3 hours

An introduction to common types of laboratory glassware and units of volumetric measurement and the steps in titrating a sample.

Using a Pitot Tube Course No. 54 2 hours

Measuring static, velocity, and total pressures with a Pitot tube and manometers.

Valves—Introduction Course No. 130 1 hour

The identification and operation of manual valves commonly used in the process industries: the gate valve, the globe valve, the check valve, and the plug cock; rising stem and nonrising stem; use of the globe valve for regulating flow; use of the gate valve as a shutoff valve; and flow through a check valve.

Related Instruction: Course No. 68, *Valves—Operation and Maintenance*

Valves—Operation and Maintenance Course No. 68 12 hours

The identification, function, construction, operation, and maintenance of the various types of valves in general use in piping systems; detailed coverage of the general appearance, construction, and function of gate, globe, and check valves; general coverage of plug, diaphragm, pinch, butterfly, three-way-flow, safety, pressure-regulating, control, multiport, and other less common valves; and general coverage of valve operation, installation, and maintenance.

Related Instruction: Course No. 130, *Valves—Introduction*

Venture Analysis Course No. 141

A systematic approach to business decisions, featuring interrelationships of markets, marketing strategy, costs and investment, economic criteria, and methods of venture analysis.

Water Treatment—Boiler Feedwater Course No. 41 6 hours

The "why" and "how" of boiler feedwater treatment; the causes and effects of deposits, corrosion, and carryover; specific conductance; blowdown; internal chemical treatment including sulfite, phosphate, and chelates; deaerating heaters; and sodium cation exchangers.

Related Instruction: Other water treatment courses are:
Course No. 90, *Water Chemistry*
Course No. 117, *Water Testing*

Water Treatment—Water Chemistry Course No. 90 2½ hours

The basic chemistry needed to understand the "how" and "why" of water treatment: sources of water; water quality; dissolved and suspended impurities in water; ions; attraction between anions and cations; hardness; pH and the pH scale; alkalinity; and specific conductance.

Related Instruction: Other water treatment courses are:
Course No. 41, *Boiler Feedwater*
Course No. 117, *Water Testing*

Water Treatment—Water Testing Course No. 117 2½ hours

Types of test procedures used for control of water treatment operations: titration-type tests, including test equipment, reading liquid levels, indicators, standard test solution, endpoint, test factors, and the five steps in a typical titration; colorimetric tests, including special reagents, comparison with color standards, and recognition of equipment used; tests requiring special instruments, including specific conductance and pH, recognition of the equipment used and the five steps in a typical specific conductance test on boiler water; sampling for representative test samples. Importance of cleanliness and good housekeeping.

Related Instruction: Other courses on water treatment are:
Course No. 41, *Boiler Feedwater*
Course No. 90, *Water Chemistry*

Welding—Oxyacetylene Cutting & Tacking Course No. 11 4 hours

Types of oxyacetylene flames; equipment, including welding torch, tips, hoses, and pressure regulators; gas cylinders; cylinder and working pressures; and operating procedures such as opening cylinders, adjusting working pressures, lighting a torch, adjusting the flame, and shutting off the torch.

A practical performance test to measure the ability of the trainee, and a checklist for the examiner, are included.

Oxyacetylene equipment and supplies are hazardous. Serious injury, fire, and explosion can result from unsafe conditions or improper use. This is a course for self-instruction; *however,* a trainee must not handle *any* oxyacetylene equipment without specific direction and control by his supervisors.

Related Instruction: Course No. 122, *Welding—Tungsten Inert Gas (TIG)*

Welding—Tungsten Inert Gas (TIG) Course No. 122 13 hours

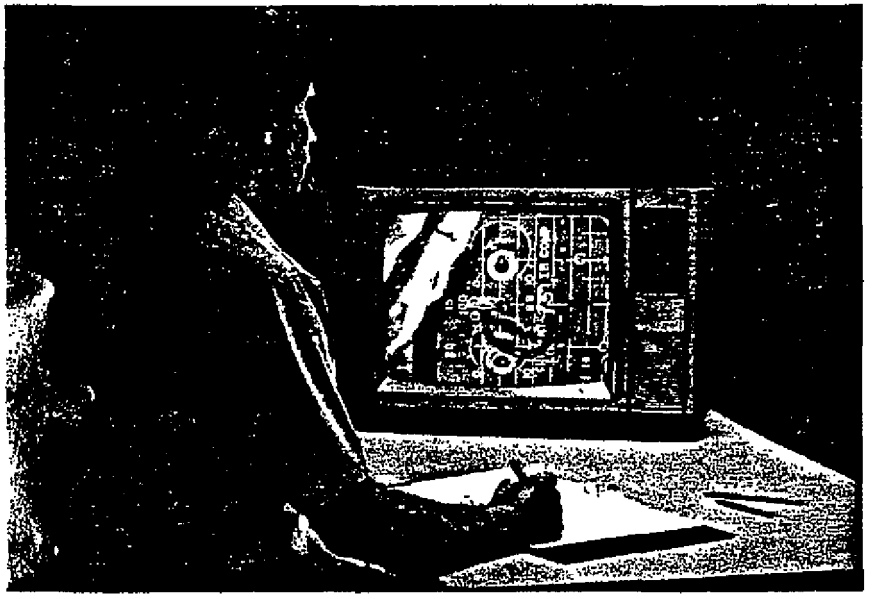
The operation of a tungsten inert gas welding torch: detailed description of preparation of a TIG torch: setting the power supply unit and the inert gas flow, protective equipment, striking and holding a TIG arc, forming a weld puddle and moving it a short distance, shutting down the equipment. Practical exercises are included for each section of the course.

Related Instruction: Course No. 11, *Oxyacetylene Cutting & Tacking*

Technical Training with Videotapes and Films.

TEL-A-TRAIN

To Evaluate Programs of Interest Call Toll-Free: 1(800) 251-6018



Tel-A-Train offers a comprehensive line of training videotapes and films that addresses the needs of today's technical employee — from basic courses to advanced training.

Our programs train new employees on the job in proper technical procedures. Transferred or new trainees are instructed with minimal supervision, while experienced personnel can update and augment their skills.

Our program topics include both basic skills training in Mechanical, Electrical, and Arc Welding fields, as well as more complex subjects, such as Hydraulic and Pneumatic technology and Solid State Electronics. Our Safety Training programs offer invaluable information on safety hazards and prevention of injury.

Ideal for Industry, Military, Technical and Vocational Schools, Tel-A-Train's training programs can cut training time in half, with minimum time required from an experienced supervisor.

Whether training the new employee or student, or staying abreast of today's technological advances, Tel-A-Train's tapes and films impart the knowledge and techniques required for the edge in today's technical work environment.

TEL-A-TRAIN
309 North Market Street
P.O. Box 4752
Chattanooga, Tennessee
37405
615·624·2628

Programs in Videotape or Film from Tel-A-Train.

HYDRAULIC TECHNOLOGY
The Physical World of a Machine
Hydraulic Transmission of Force & Energy
Operation at the Suction Side of a Pump
Hydraulic Actuators
Control of Hydraulic Energy
Check Valves, Accumulators, & Cylinders
Flow Control Valves
Directional Control Valves
Pressure Control Valves
Pilot Operated Pressure Control Valves
Hydraulic Pumps
Hydraulic Motors
Fluids, Reservoirs, Coolers & Filters

PNEUMATIC TECHNOLOGY
Force Transmission through a Fluid
Energy Transmission Using a Pneumatic System
Control of Pneumatic Energy
Compressors
Aftercoolers, Driers, Receivers — Air Distribution System
Check Valve, Cylinders, & Motors I
Check Valve, Cylinders, & Motors II
Directional Control Valves I
Directional Control Valves II
Flow Control Valves, Silencers, & Quick Exhausts
Regulators, Excess Flow Valves, Boosters, Sequence Valves
Air Preparation

MECHANICAL TRAINING
Basic Terms of Maintenance
Bearings
Brakes and Clutches
Chain Other Than Roller Chain
Conveyor Components
Couplings
Aligning Couplings I (with feeler gages)
Aligning Couplings II (with dial indicator)
Gearing
Reducers and Gearmotors
Roller Chain
Timing Belts and Flat Belts
V-Belts
Valves
Centrifugal Pumps I
Centrifugal Pumps II

HANDS-ON MECHANICAL TRAINING BENCH

ELECTRICAL TRAINING
Basic Electricity I
Basic Electricity II
Motors I
Motors II

SOLID STATE ELECTRONICS:
Solid State Electronic Theory
Transistors, Semiconductor Diodes, Half Wave Rectifiers
Full Wave Rectifiers, Heat Sinks, Filters, Special Purpose Diodes
Transistor Amplifiers
Amplifier Applications
Oscillators, Modulators, Demodulators
Special Purpose Semiconductors

TROUBLE SHOOTING SCR MOTOR CONTROLS

ELECTRIC ARC WELDING
Introduction to Shielded Metal Arc Welding
Arc Welding Safety
Striking Arcs With E-6010/Cellulose Electrodes
Striking Arcs With E-7018/Low Hydrogen Electrodes
Stringer Beads With E-6010
Stringer Beads With E-7018
Weave Beads
Restarts of Beads
Welding Tips & Techniques
Groove Weld, Square, Flat Position
Fillet Joint, Horizontal
Groove Weld, Horizontal, With Back
Air Carbon Arc

ADVANCED WELDING
Maintenance Welding (a series)
Welding of Stainless Steel Pipe
Gas Tungsten and Gas Metal Arc Short Circuiting (MIG & TIG)
Welding of Carbon Steel Pipe
Welding of Low Alloy Steel Pipe

SAFETY
Electrical Lockout/Tagout
Electrical Safety
Slips and Falls
Minimizing Back Injury
Oxyacetylene Safety
Arc Welding Safety
Grinding Wheel Safety I
Grinding Wheel Safety II

To Evaluate Programs of Interest Call Toll-Free:
1-800-251-6018 (In Tennessee, Alaska & Hawaii Call Collect 615-624-2628)

Conveyor Components

LENGTH: 20 minutes

Four common **conveyors** are shown in operation. They are: **Belt, Screw, Bucket elevators,** and **Roller.**

Belt conveyors are shown and each component is discussed individually.

1. Belt
2. Head Pulley
   A. Crowned
   B. Lagged
3. Tail Pulleys
   A. Solid
   B. Winged
4. Load Idlers
   A. Straight
   B. Troughing
5. Return Idlers
6. Training Idlers
7. Drive
8. Take-Ups
9. Housing
10. Frame

Speed of travel, degree of inclination and **angle of repose** are explained.

An **assembly cutaway** is shown of a **screw conveyor,** and then each part is covered as follows:

1. Screw
2. Coupling
3. Trough
4. Trough ends with bearings
5. Hangers
6. Loading and discharge spouts
7. Drive

Bucket elevators are covered as listed by types: Centrifugal, Continuous, and Gravity discharge.

Components of **elevators** are discussed including both **belt** and **chain** types.

Roller and **skate wheel conveyors** are shown in actual service, and their use and limitations are discussed. Construction of both types are explained.

Mention is made of **slider bed, over-head chain,** and **drag chain conveyors** and their use.

Couplings

LENGTH: 20 minutes

First, the **basic function of a coupling** is discussed. The **rigid type coupling** is illustrated and its particular uses are outlined.

The types of rigid couplings covered are:

1. Sleeve couplings
2. Split sleeve couplings
3. Flange type couplings

Then comes a brief discussion of the types of **misalignment** which will be encountered by a normal flexible coupling. The following flexible couplings are discussed:

1. The roller chain coupling
2. The silent chain coupling
3. The delrin coupling
4. The gear coupling

At this point, a brief explanation is given for an **interference fit.** How a coupling is installed with an interference fit.

5. The rubber biscuit coupling
6. The flexible center disc with rubber member insert
7. The rubber tire coupling
8. The metal disc coupling
9. The leaf design coupling
10. The steel grid coupling

This program available in Spanish.

Basic Electricity Part I

LENGTH: 20 minutes

An explanation is given of a **flow of electricity** and how it is one form of energy.

Matter is defined and an explanation given of how it is made up of atoms. and how atoms are extremely small and are basically composed of a nucleus and one or more electrons.

How electricity **moves along a conductor** by shifting electrons from one atom to another is illustrated and how massive numbers of electrons flow for even a small amount of useful energy to be transmitted.

Ohm's Law is discussed and a simple explanation given of its use.

The **Power Law** is explained and illustrated with a "pie" chart and an example given of its use.

Static electricity is discussed along with how it is generated.

Mechanical electricity is reviewed. but first a magnet and its uses are explained and how movement of a loop of wire through a field causes an EMF.

Chemically generated electricity is illustrated and its uses shown.

Direction of electron flow is explained.

Electricity from a photo cell is demonstrated.

An **EMF from a thermocouple** is explained and its use indicated.

Piezoelectric or **electricity from pressure** on a crystal is pictured.

This program available in Spanish.

Basic Electricity Part II

LENGTH: 22 minutes

AC current is explained along with an illustration of a cycle and a sine wave curve.

Hertz and **cycle** are discussed.

A **simple transformer** is explained and how its use makes possible the transmission of power over long distances. **Ohm's Law** is tied in with the explanation.

An **analogy** is given between flow in a water pipe and flow of electricity through a wire.

Single phase current is discussed. and **series** and **parallel circuits** demonstrated.

Three phase current is discussed and explanation is given of its use in industry.

The **National Electrical Code** and its use is covered.

Fuses and **circuit breakers** and their uses are explained.

Wire sizes and their numbering systems are shown.

Solenoid or **"suck" coils** are discussed and use in solenoid valves and relays demonstrated.

Resistance heat is explained along with their use in home and industry.

Summary is made of major points covered in both "Basic Electricity I" and "Basic Electricity II".

This program available in Spanish.

LEHMAN 01463

Full Wave Rectifiers, Heat Sinks, Filters, Special Purpose Diodes

Chapter 3

A continuation of **rectification**.

The **full wave** and **bridge rectifiers** are explained and their uses and limitations are discussed.

The requirements for **heat sinks** are presented.

Different types of **filters** for "smoothing" the rectified DC are explained.

Special purpose diodes and their applications are discussed. These include (1) the zener diode as a regulator (2) metallic oxide diodes as rectifiers (3) light sensitive diodes (4) solar cells (5) light emitting diodes (LED).

Transistor Amplifiers

Chapter 4

The **three basic transistor amplifier configurations** (common base, common emitter, common collector) are developed.

Some **basic terms** used in electronics (input resistance, output resistance, voltage gain, current gain, power gain) are defined.

Proper bias methods using two batteries are developed. The characteristics and some uses of the different amplifiers are presented. Bias is summarized.

Amplifier Applications

Chapter 5

Bias methods using one battery are developed along with the **use of power supplies** to supply the bias voltage.

Some domestic and industrial **applications of the transistor amplifier** are discussed.

Small signal amplifiers and **large signal** amplifiers are defined and some of their uses given.

Class A, B, and C amplifiers are defined and explained.

Oscillators, Modulators, Demodulators

Chapter 6

The oscillator develops an **AC signal with only DC applied**.

The method by which this is accomplished is developed.

The use of **positive and negative feedback** is explained.

Different types of **oscillator circuits** (Colpitts, Hartly, crystal) are covered.

Modulation and **demodulation** are defined and explained.

Amplitude modulation (AM) is defined and the methods of **obtaining AM** by using amplifiers and oscillators are covered.

Frequency modulation is briefly discussed.

Price List

JANUARY 1, 1984

	IN VIDEOTAPE:
Complete set of 78 programs	$23,545.00

HYDRAULICS	**VIDEOTAPE**	**16 MM FILM**
Series price (13 Separate programs)	3,900.00	4,900.00
Individual program	385.00	435.00
Student text available ($15.00)		
Instructor's Guide furnished		
Transparencies available ($328)		
PNEUMATICS		
Series price (12 Separate programs)	3,600.00	4,500.00
Individual program	385.00	435.00
Student text available ($15.00)		
Instructor's Guide furnished		
Transparencies available ($398)		
MECHANICAL		
*Basic Terms of Maintenance	385.00	435.00
*Bearings	385.00	435.00
Brakes & Clutches	385.00	435.00
*Centrifugal Pumps Part 1	385.00	435.00
Centrifugal Pumps Part 2	385.00	435.00
Chain other than Roller Chain	385.00	435.00
Conveyor Components	385.00	435.00
*Couplings	385.00	435.00
*Coupling Alignment Part 1	385.00	435.00
Coupling Alignment Part 2	385.00	435.00
Gearing	385.00	435.00
*Reducers & Gearmotors	385.00	435.00
Roller Chain	385.00	435.00
Timing Belts & Flat Belts	385.00	435.00
*V-Belts	385.00	435.00
*Valves	385.00	435.00
Industrial Mechanical Training Bench	7,175.00	
NOTE: A 20% discount will apply to the Bench with the purchase of 10 or more Mechanical Videotapes.		
ELECTRICAL		
*Basic Electricity Part 1	385.00	435.00
*Basic Electricity Part 2	385.00	435.00
*Motors Part 1	385.00	435.00
*Motors Part 2	385.00	435.00
ELECTRONICS		
*Solid State Electronics (7 separate programs)	2,500.00	3,100.00
Student Text available ($8.00)		
Troubleshooting SCR Motor Controls	385.00	435.00

Price List

WELDING	VIDEOTAPE	16 MM FILM
Arc Welding		
Series price (13 Separate programs)	2,850.00	N/A
Welding for Carbon Steel Pipe	450.00	N/A
Welding of Low Alloy Pipe	450.00	N/A
Gas Tungsten & Gas Metal Arc		
Short Circuiting	450.00	N/A
Welding of Stainless Steel Pipe	450.00	N/A
SAFETY		
*Electrical Safety	385.00	435.00
*Electrical Lockout/Tagout	385.00	435.00
*Oxyacetylene Safety	385.00	435.00
Arc Welding Safety	385.00	435.00
*Grinding Wheel Safety Part 1	385.00	435.00
*Grinding Wheel Safety Part 2	385.00	435.00
Slips and Falls	385.00	435.00
Minimizing Back Strain on the Job	385.00	435.00
WORKBOOKS		
Basic Terms of Maintenance Handbook	3.50 ea.	
Solid State Electronics Student Text	8.00 ea.	
Industrial Hydraulic Student Text	15.00 ea.	
Instructor's Guide	25.00 ea.	
Industrial Pneumatic Student Text	15.00 ea.	
Instructor's Guide	25.00 ea.	
Arc Welding Student Text	18.50 ea.	

TERMS: Net 30 .

F.O.B. Chattanooga, TN

All programs are copyrighted and are protected by applicable law.

Multiple set discounts and License to Duplicate contracts are available — ask your representative for details.

*Available in Spanish

½" or ¾" videotape (NTSC 60 cycle)	$400.00 ea.
PAL or SECAM Spanish	435.00 ea.

PROGRAMS AVAILABLE FOR PREVIEW AT NO-CHARGE

LEHMAN 01466

Rental Prices

JANUARY 1, 1984

SPECIAL NOTE: Scheduling of rental programs must be confirmed to TEL-A-TRAIN prior to submitting order.

		Videotape	16MM Film
I.	Any Individual program	$100.00	$125.00
II.	Series Pricing:		
	(a) **Hydraulics** (13 programs) Student Text — $15.00 each Rental period is 13 weeks	$1365.00	$1920.00
	(b) **Pneumatics** (12 programs) Student Text — $15.00 each Rental period is 13 weeks	$1365.00	$1920.00
	(c) **Solid State Electronics** (7 programs) Student Text — $8.00 each Rental period is 8 weeks	$ 875.00	$1490.00
	(d) **Arc Welding** (13 programs) Student Text — $18.50 each Rental period is 13 weeks	$1250.00	N/A
	(e) **Safety** (8 programs) Rental period is 8 weeks	$ 680.00	$ 850.00
	Basic Terms of Maintenance Handbook		3.50 ea.
	Solid State Electronics Text		8.00 ea.
	Industrial Hydraulic Student Text		15.00 ea.
	Instructor's Guide		25.00 ea.
	Industrial Pneumatic Text		15.00 ea.
	Instructor's Guide		25.00 ea.
	Arc Welding Student Text		18.50 ea.

TERMS: Net 30
F.O.B. Chattanooga, TN

All programs are copyrighted and are protected by applicable law.

PROGRAMS AVAILABLE FOR PREVIEW AT NO-CHARGE

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ICS-Intext offers industrial training materials and programs in the following areas:

- Basic Industrial Skills
- Business Management and Sales Skills
- Diesel and Automotive Technologies
- Electrical Technologies
- *Electronic Technologies*
- Industrial Maintenance and Construction Trades
- Machine Technologies

315 Post Road West
Westport, Connecticut
(203) 227-0891
a division of
NATIONAL EDUCATION CORPORATION

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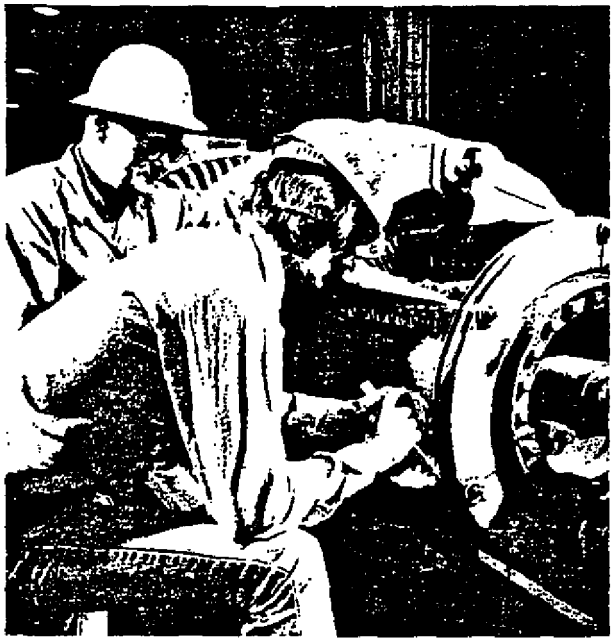
WHO IS ICS-INTEXT?



Contemporary Industrial Training Backed by A Century of Experience

ICS-Intext is America's oldest and most respected skills training organization. Since our founding in 1890, nearly nine million workers have acquired and improved upon skills through our training programs.

At ICS-Intext, we are committed to serving American Industry through training programs created to increase the productivity of the labor force. We've developed the most comprehensive performance-based programs available today. We provide total training services from complete training programs to testing services. We can help companies administer programs for one worker or for a total workforce. We can maintain records of enrolled trainees and award Continuing Education Units (CEU's). We can even give participants the opportunity to earn an Associate Degree through our fully accredited Center for Degree Studies.

ICS-Intext products and services are backed by National Education Corporation, the world's largest training organization with over $100 million in annual sales. NEC's support means that we have the ability to invest vast resources into new product development, a highly professional training staff and a nationwide support organization.

No other training organization offers such a wide range of services supporting the finest training programs available. That's the ICS-Intext Commitment. That's the way it's been for ninety years and nine million American workers.

- **All ICS-Intext training materials are produced with your workers in mind**—Our materials are presented at the "right level", easy to understand, yet challenging enough to maintain interest.
- **Skills-based programs**—We teach what your workers need to know to "get the job done."
- **More skill areas**—We offer training in all major areas, including the most up-to-date electronics and machine technologies, and business and sales skills.
- **"State-of-the-Art"**—We use the latest training techniques and materials available including videotapes to make our programs effective and interesting.
- **Programs at all levels**—From entry-level to management . . . including programs that meet the "related study" standards set by the Department of Labor, Bureau of Apprenticeship and Training.
- **Self-paced individualized instruction**—Our instructional materials are designed to make sure each trainee understands what is being taught . . . trainees move on to the next step when **they** are ready.
- **Flexible program design**—Everyone's training needs vary, so we offer a wide range of program types . . . from Mini Programs to full Career and Apprentice Programs. We can even **custom-assemble** programs to suit your special needs.
- **Flexible scheduling**—Your company can train employees as needed. You set your own schedule . . . start courses when you want to. There's no waiting for the next session to begin.
- **In-plant or at-home training**—ICS-Intext programs can be used either way. Both ways are far better than campus-based training programs, where you incur the expense of travel and time off.
- **You can administer your own programs**—We'll show you how easy it is to run your own training programs with ICS-Intext. We provide specially designed materials for "in-house" program administration.
- **ICS-Intext can administer your program**—We offer complete services, including test correction and record keeping.
- **Toll-Free Help when your trainees need it!**—ICS-Intext offers training assistance and service information to your eligible trainees via toll-free telephone.
- **Our representative is near you**—We have a highly-trained Account Manager in your area who can help you select the right programs and help monitor your company's training progress.

ICS-Intext wants to be your training company

Contact us at:
ICS-Intext
315 Post Road West
Westport, Ct. 06880
(203) 227-0891

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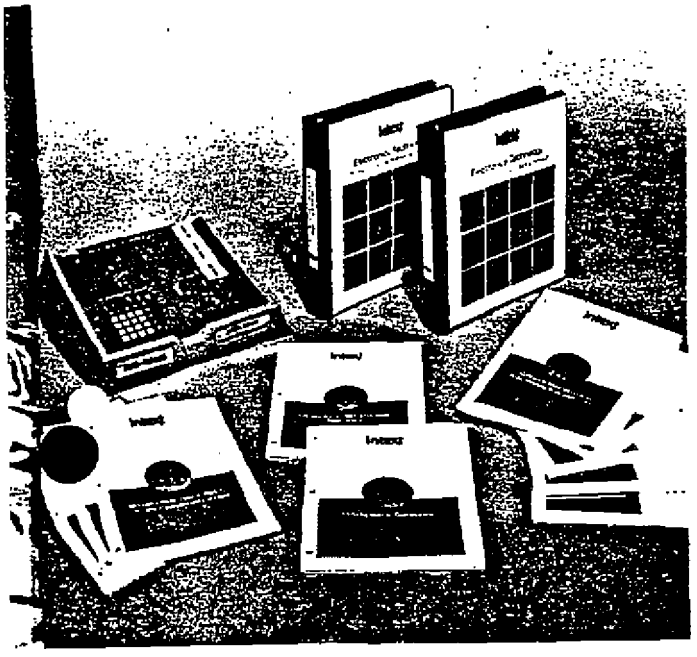


Blocks

Some skill areas require trainees to build up knowledge in order to master tasks. For these ICS-Intext has created instructional blocks.

Blocks consist of a group of short lessons attractively presented to trainees in a three-ring binder. Blocks vary in length, depending on the complexity of the skill area. There can be from four to twelve lessons within an instructional block. A trainee can usually complete an average lesson in five hours. Most training programs would thus expect trainees to complete four lessons in a month. ICS-Intext Blocks start with basic concepts and use practice exercises, experiments and self-evaluation quizzes to insure competency before moving on to more complex areas. Progress examinations are also included.

Videotapes

In the age of the electronic media, many training professionals have recognized the value of videotapes as a learning tool. ICS-Intext offers a growing line of videotapes and video programs that you can incorporate into many of our training programs. The main feature of these tapes is that trainees learn by seeing actual demonstrations of the principles being discussed. Trainees get to see on-the-job applications of the skills they are learning on these full-color learning tapes. Many ICS-Intext videotapes have accompanying videotexts to supplement the skills instruction.

For a complete description of the videotape programs available from ICS-Intext, see the videotape section of this Catalog beginning on page 119.

Training Aids

"Hands-on" training is invaluable in learning specialized skills. ICS-Intext offers a variety of Training Aids to enhance the learning process of our programs. In some instances, Training Aids are required and in other cases, they are optional, making the training program even more effective.

For a complete list and description of all ICS-Intext Training Aids, see the Training Aids section of this Catalog beginning on page 129.

LEHMAN 01471

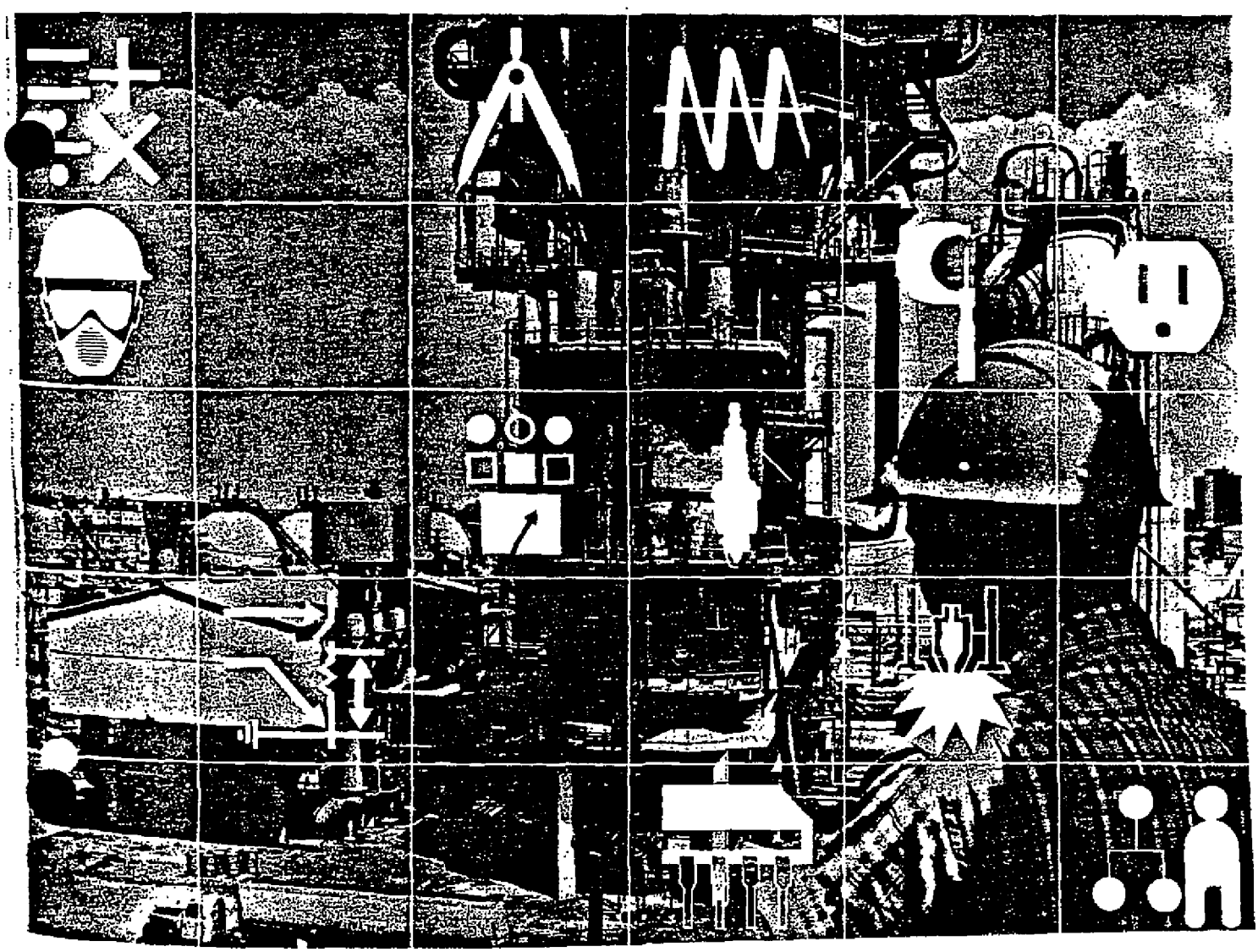
STANDARD PROGRAMS

Contemporary Industrial Training Programs in these trade areas:

Industrial Maintenance and Construction Trades
Electrical Technologies
Electronics Technologies
Machine Technologies
Diesel and Automotive Technologies
Basic Industrial Skills
Business Management and Sales Skills

This section of the Catalog lists the Standard Programs available in each of the trade areas. A short description of each program is followed by both program objectives and the program outline. The program outline lists the serial number and title for each text or block required to complete the program. In addition, the serial numbers for optional videotapes to supplement the program are also listed.

If you would like a complete synopsis for each text, block or videotape within a program, refer to the ICS-Intext **Directory of Training Materials and Programs.**



Serial Numbers And Titles: Texts

This section presents a list of all texts, according to their serial numbers.

If you know the number of a text, look it up in this list to get its title. Then turn to the *Text Synopses* section of this Directory, to find a complete description.

Serial Number	Title
1066A-B	The Steel Square
1830	Limes, Cements, and Mortars
1832	Face Brickwork
1842A-C	Reading Architects' Blueprints
1949A-C	Practical Projection
2001	Introduction to Electronics
2002A-D	Electronics
2007A-C	Solid-State Circuits
2008A-B	Advanced Solid-State Circuits
2010	Vacuum-Tube Fundamentals
2019	Plastering
2020	Basic Electronic Components and Schematic Symbols
2021	Understanding and Using Electronic Diagrams
2028A-B	Servomechanisms
2036	Acoustics and Audio Amplifiers
2080	Industrial Electron Tubes
2090	Automatic Testing of Electronic Devices
2096	Audio Consoles
2130A-B	Number Systems and Logic
2131A-B	Digital Methods and Components
2132	Organization of Digital Computers
2133	Analog Systems
2162	Fundamental Transmitter Systems
2166	AM Broadcast Transmitters
2167	FM Transmitters
2170	Propagation of Electromagnetic Waves
2173	Transmitter Tests and Measurements
2175A-B	Specification Writing
2176	Sheet Metal Work
2177C	Estimating Building Costs
2179	Millwork
2180	Woodworking Tools
2184A	Estimating Building Costs
2185	Building Unit Construction
2186	Architectural Metalwork
2187A-B	Floors, Walls, and Ceilings
2190	Operations Preliminary to Building
2192A-B	National Standard Plumbing Code
2213	Turret Lathe Tools and Setups
2217	Milling-Machine Practice
2218	Milling-Machine Indexing and Spiral Work
2222	Shapers, Slotters, and Keyseaters
2243	Gear Calculations
2246A-B	Erecting
2301	Compound Angles
2309A-B	Plane Trigonometry with Trigonometric Tables/ 5515
2310A-F	Plane Geometry
2311A-D	Solid Geometry
2400A-H	Reading Improvement
2430A-F	Practical English
2431A-D	Business English
2442	How to Read Graphs and Maps
2443	Going Metric
2444	Basic Geometry
2446	Gearing
2452	High-Pressure Pipe Fitting
2453	SI Metric
2468	Formulas
2469A-E	Algebra
2505	Types of Steam Turbines
2506	Steam Turbine Management and Governing
2507	Steam Turbine Calculations
2508	OSHA: Occupational Safety and Health Act
2509A-E	Industrial Safety
2511A-E	Vibration Analysis and Control
2512	Materials Handling
2514	Power Plant Economy
2518A-B	Time Study
2520A-D	Manufacturing Processes
2521A-E	Statistical Quality Control
2522	Incentive Wage Systems
2523A-C	Steam Engines and Their Management
2525	Principles of the I-C Engine
2526	I-C Engine Fuels and Combustion
2527	I-C Engine Testing
2530A-B	Pumps
2531A-B	Lubrication
2536A-C	Engineering Materials
2539A-E	Hydraulic and Pneumatic Power Transmissons
2540A-C	Toolmaking
2542	Fasteners
2543	Fluid Amplifiers
2545	Heat Transfer
2549	Engineering Economy
2552A-B	Operation Analysis
2555A-B	Plant Layout
2560A-D	Engineering Mechanics
2564	Theory of Architectural Design
2569	Stair Building
2580	Production Planning and Control
2582A-B	Heat
2585	Steam Generator Accessories
2587	Steam Generator Settings, Ducts, and Stacks
2588	Pressure Parts for Steam Generators
2589	Steam Generator Supporting Steel Structures
2590	Quality Control of Manufactured Product
2592	Oil and Gas Firing for Steam Generation
2596A-C	Automatic Combustion Control
2598A-B	Steam Generator Design
2600	Control of Materials
2602	Bearings and Seals
2603	Link Mechanisms
2604	Gear Trains
2605	Cams
2606	Mechanical Power Transmission
2607A-B	Belt Power Transmission

Serial numbers and titles: texts

Serial Number	Title
2608A-B	*Mechanical Testing of Materials*
2620	Steam
2626A-B	Air Compressors
2650	*Boiler Installation and the Construction* Boilermaker
2660A-H	Machine Design
2720A-C	*Design of D-C Machines*
2727A-C	Design of Alternating-Current Machines
2750A-F	Practical Arithmetic
2750X-Y	*Special Arithmetic Examination*
2766	Loads in Buildings
2773A-B	Hard Pavements
2897	Heat Treatment of *Nonferrous Metals*
2945	Duct and Piping Design for Air Conditioning
3028	Automobile Paint Shop
3037A-F	Automobile Body Rebuilding
3038	Spray Painting
3039A-C	Automotive Refinishing
3048	Sanitary Bacteriology
3074A-B	Roofing
3194	Tool Dressing
3195	Hardening and Tempering
3306	Resonant Circuits
3307	Transformers in Radio and Electronics
3395A-C	Water Supply
3500A-B	Measuring Instruments
3501	Layout
3503	Vacuum-Tube Amplifiers
3508	Cathode-Ray Tubes
3517	Tuned Circuits
3520A-E	Lathes
3521A-B	Drilling
3522A-C	Milling Machines
3525A	Turret Lathes
3530A-B	Automatic Screw Machines
3535A-G	Fundamentals of Tool Design
3536A-B	Arc Welding Techniques
3541A-D	Heat Treatment
3560A-B	Cylindrical Grinding
3569	Introduction to Comfort Control
3570A	Glossary of Technical Terms
3572A-S	Modern Refrigeration and Air Conditioning
3600	Introduction to Automotive Mechanics
3601	Engine Operation and Construction
3602	*Automotive Shop Practices*
3603	Automobile Cooling System
3604	Automobile Fuel System
3605	*Automobile Lubrication*
3606	Automobile Exhaust Systems
3607	Automobile Storage Batteries
3608	*Automobile Starting System*
3609	Automobile Charging Systems
3610	Automobile Ignition System
3611	*Automobile Electronic Ignition Systems*
3612	Automobile Emission Control Systems
3613	Automobile Engine Tune-Up
3614	*Automobile Lighting System and Instruments*
3615	Automobile Clutches and Universal Joints
3616	Automobile Manual-Shift Transmissions
3617	*Automobile Automatic Transmissions*
3618	Automobile Rear Axles and Differentials
3619	Automobile Wheels, Tires, Springs, and Shock Absorbers
3620	Automobile Drum Brakes
3621	Automobile Disc Brakes
3622	Automobile Front-End Alignment
3623	Automobile Manual Steering Systems
3624	Automobile Power Steering Systems
3625	Engine Disassembly and Inspection Procedures
3626	Engine Valves and Valve Mechanisms
3627	Engine Pistons, Piston Rings, and Connecting Rods
3628	Engine Bearings, Camshafts, and Crankshafts
3629	Engine Assembly and Testing Procedures
3631	Engine Tune-Up Manual
4010A-C	Electricity and Magnetism
4018A-D	Principles of A-C Circuits
4019A-B	Electric Power Measurements
4030A-B	D-C Machines
4031	*Alternators*
4032	Alternating-Current Motors
4033	Fractional-Horsepower Motors
4034	*Repairing Fractional-Horsepower Motors*
4040	Transformers
4041	Transformer Operation
4042	*Distribution and Power Transformers*
4048	Telemetering
4060	Graphic Presentation
4101A-B	*Engineering Orientation*
4146A-C	Electrical Measuring Instruments
4210A-C	Electricity
4220A-B	*Repairing D-C Motors and Generators*
4278	Automobile Radio and Tape Equipment
4300A-C	Electrical Wiring
4305	Lighting Control
4310	Electric Heating
4312	Electric Space Heating
4341	Industrial Motor Applications
4342	Efficiency Tests
4343	Storage Batteries
4358	Transmission Lines
4368	Voltage Regulators for Generators
4370	Voltage Regulation of Distribution Systems
4400	Working Safely with Electricity
4401	Electricians' Tools
4402A-B	Conduit and Conductors
4403A-B	Electrical Equipment
4404A-B	Wiring Electrical Components
4410	Getting Started as an Electrician
4411A-E	Tools & Testing
4414	Rapid Electrical Estimating
4415	Design of Transformers
4420A-B	Electric Furnaces
4500B	Servicing Gas Appliances
4501A-C	National Building Code
4502	Drainage Systems
4503	Hot-Water Heating
4507	Steam Heating Systems
4512A-B	Concrete Construction
4515A-B	Sanitary Plumbing Fixtures
4516	Plumbing Plans, Specifications, and Inspection
4544	Excavations and Foundations
5001	Plastic Adhesives and Coatings
5002	Plastics: Films, Sheets, Foams,and Laminates
5003	Pulping Processes and Stock Preparation
5004A-C	Bench Work
5005A-D	*Inorganic Chemistry*
5008A-F	Inorganic Chemicals and Processes
5011	Elements of Chemistry
5012	*Engineering Chemistry*
5013A-D	Physical Chemistry
5017A-B	Basic Organic Chemistry
5018	*Material and Energy Balances*
5019	Fluid Flow
5021A	Fundamentals of Metal Cutting
5023	*Fundamentals of Grinding*
5030A-F	Rigging
5030X	Dictionary of Rigging Terms
5031A-I	*Principles of Forging*
5041	Numerical Control for Machining
5042	Numerical Control Milling and Drilling
5043	Numerical Control Turning
5045	Tertiary Wastewater Treatment
5046A-C	Operation of Wastewater-Treatment Plants
5054A-F	Economics
5055A-D	Marketing Research

Serial numbers and titles: texts

Serial Number	Title
6338A-B	Liquid-Level Measuring and Control Instruments
6346	Warm-Air Heating
6396A-E	Fundamentals of Computer Programming
6397A-E	FORTRAN IV Programming
6403A-B	Low-Cost Road Surfaces
6421A-B	Builders' Hardware
6426A-B	Principles of Mechanics
6447A-B	Principles of Heating, Ventilating, and Air Conditioning
6463	Plumbing and Pipe-Fitting Tools
6465	Radiators, Convectors and Unit Heaters
6472	Testing Solid and Liquid Boiler Fuels
6473	Solid and Pulverized Fuel Burning
6487	Construction Safety
6491	Radio-Electronic Telemetry
6513A-D	Elements of Photogrammetry
6515	Radio-Frequency Circuits
6519	Electronic Power-Supply Design
6520A-B	Ultrasonics
6525	Fundamentals of Electronic Instrumentation and Control
6526	Electronic Instrumentation Methods and Circuits
6531A-B	Electronic Test Instruments
6533A-B	Electronic Testing and Measuring Techniques
6536A-B	Managing Physical Distribution
6538A-B	Protective Relaying
6553	Condensers
6556	Digital Computer Maintenance and Troubleshooting
6561A-B	Analytical Geometry
6563	Radio and TV Receiving Antennas
6569A-B	Transfer Devices for Machine Tools
6580	Electronic Control Circuits and Applications
6582	Design of Prestressed Concrete
6584A-B	Industrial Electronic Heating
6585	Reconnecting Induction Motors
6586A-D	Instrumental Laboratory Analysis
6589A-B	Electric Power Generating Stations
6590A-B	Electric-Power Substations
6593	National Fuel Gas Code
6598	Batteries and Electronic Power Supplies
6601	Theory of RL, RC, and RLC Circuits
6605	Electronic Detectors
6606	How Our Economic System Works
6613	Switchgear
6615	Electronic Oscillators
6617	Inductance and Capacitance
6618A-D	Calculus: Function and Use
6623	Pneumatics
6631A-B	A-C Motor Repair
6632	Types of Steam Generators
6634A-B	Electrical Schematic Diagrams
6635	Electrical Blueprint Reading
6636	Controls for Air Conditioning
6646	Illumination Principles
6649A-B	Job Analysis, Job Evaluation, and Personnel Rating
6651	Introduction to Accounting
6655A-M	Accounting
6660	Radio Communications Fundamentals
6670	Linear Surveying
6671	Leveling
6682A-B	Electric Lamps
6683	Principles and Uses of Nuclear Energy
6686	Local Distribution of Electric Power
6687	D-C Generators and Motors
6688A-B	Reading Highway Blueprints
6689	Introduction to Systems and Procedures
6691	Pressure Vessel and Tank Print Reading
6695A-B	Electrical Drafting
6698	A-C Motors, Generators, and Rectifiers
6699A-C	Industrial Motor Control
6705	Reading Construction Prints
6709	AM and FM Radio Receiving Systems
6710A-D	Qualitative Analysis
6711	Qualitative Analysis Laboratory Manual
6712A-B	Sheet Metal Hand Processes
6716	Sheet Metal Machine Processes
6718A-C	Hydraulic Turbines
6719A-B	Elements of Print Reading
6720A-B	Reading Shop Prints
6722	Stone Masonry
6727	Feedwater Treatment and Equipment
6728	Symmetrical Components
6732	Reading Piping Prints
6734	Steam Boiler Operation and Maintenance
6737A-E	Templet Development for the Pipe Trades
6793	Instrument Transformers
6794A-C	Sewerage
6797	Lithium Bromide Absorption System
6802	Steam Generator Testing
6810	Flue Gas Analysis
6812A-B	Highway Curves
6814	Insulation for Pipefitting
6818A-C	City Surveying
6835A-C	Management by Objectives
6836A-B	Problem Analysis for Decision Making
ETK3	Basic Transistors
ETK9	Logic Trainer
TK1	Electronic Measurements
TK2	Assembly of VOM

DIESEL MECHANICS: COMPREHENSIVE TRAINING BLOCKS

BLOCK A—DIESEL MECHANICS (25 Units)

00A1	Introduction
00A2	Work Habits and Practices, Part 1
00A3	Work Habits and Practices, Part 2
00A4	Diesel Engine Parts, Part 1
00A5	Diesel Engine Parts, Part 2
00A6	Fuel Systems, Part 1
00A7	Fuel Systems, Part 2
00A8	Lubricating Systems
00A9	Cooling, Air Intake, and Exhaust Systems
0A10	Electrical Systems
0A11	Diesel Engine Operation, Part 1
0A12	Diesel Engine Operation, Part 2
0A13	Welding
0A14	Shop and Hand Tools
0A15	Arithmetic for Mechanics
0A16	Drawing and Sketching for the Mechanic
0A17	Reading Micrometers, Dial Gauges, and Other Measuring Instruments
0A18	Engine and Allied Equipment Service Manuals
0A19	Troubleshooting Diesel Engines
0A20	Failure Analysis
0A21	Maintenance of Lubricating and Fuel Systems
0A22	Maintenance of Air Intake, Exhaust, and Cooling Systems
0A23	Maintenance of Electrical Systems
0A24	In-Frame Overhaul, Part 1
0A25	In-Frame Overhaul, Part 2

BLOCK B—GASOLINE ENGINE MECHANICS (25 Units)

0081	Introduction
0082	Work Habits and Practices
0083	Gasoline Engine Parts, Part 1
0084	Gasoline Engine Parts, Part 2
0085	Fuel Systems, Part 1
0086	Fuel Systems, Part 2
0087	Fuel Systems, Part 3
0088	Electrical Systems

Serial numbers and titles: texts

Serial Number	Title
5056A-D	Essentials of Business Enterprise
5057A-B	Principles of Marketing
5058A-C	Public Relations
5059A-H	Industrial Psychology
5060A-C	Sales Management
5065A-C	Personnel Management
5070A-C	*Business Statistics*
5074A-B	Introduction to Business Finance
5080A-B	Business Law: The Law of Business Organization
5081A-C	Business Law: The Law of Business Transactions
5098	Gage Making
5099	Jigs and Fixtures
5100	Jig and Fixture Making
5101A-B	*Dies and Die Making*
5110	Metallurgy of Iron
5111	Metallurgy of Steel
5121A-D	Labor Relations
5127C	Principles of Refrigeration
5140	Insulation for Refrigeration
5160	Inspection and Testing of Welds
5177	*National Electrical Code*
5178	Unit Operations and Equipment
5207	Heat Transmission Through Buildings
5249A-B	Arc Welding of Low-Carbon Steel
5250	Arc Welding of Alloy Steels and Iron
5251	Arc Welding of Nonferrous Metals and Overlaying
5254	Logarithms
5282A-C	Mechanics of Materials
5287	*Structural Tables*
5289	Flat-Slab Design
5290	Design of Spread Footings
5294A-D	Sewage Treatment
5298	Contracts for Building Operations
5301A-B	Purification of Water
5302A-D	Operation of Water-Treatment Plants
5337	*Metallurgy of Nonferrous Metals*
5338A-B	Metallography
5340	Fuels
5348	Grinding Practice
5349	Tool Grinding
5352A-B	Traffic Control and Operations
5353A-C	Highway Location and Design
5359	*Highway Embankments and Subgrades*
5374	Highway Drainage
5383	*Refrigeration in Air Conditioning*
5384	Cold-Water Supply
5385	Hot-Water Supply
5386	Pipework
5389	Tanks and Pumps
5390	Domestic and Institutional Water Supply
5399	Development of Surfaces
5434	*Elementary Mechanical Drawing*
5440A-C	Design of Steel Building Frames
5450A-C	Reinforced-Concrete Design
5451	Structural Design of Pipe Culverts
5459A-C	Fluid Mechanics
5460A-C	Transit Surveying
5461A-B	Topographic Surveying
5462A-B	Mapping
5463	Fundamentals of Law for Surveyors
5465	Determination of True Meridian
5466A-B	United States Land Surveys
5468	Earthwork
5469A-C	Production of Concrete
5470A-C	Structural Steel Drawing
5471A-B	Reading Structural Steel Drawings
5481	Plate Girders for Buildings
5501	*Sanitary Chemistry*
5513	Exterior Lighting Practice
5515	Trigonometric Tables
5532A-B	Gear Making
5544A-B	Geometrical Drawing
5545	Drafting as a Language
5551A-B	Sheet Metal Drafting
5565A-B	*Business Mathematics*
5567	Practical Geometry and Trigonometry
5591	*Pipe-Fitting Practice*
5602A-F	Carpentry
5636A	Boring Mills
5649	Elements of Projection Drawing
5739	Mechanical Drawing
5797	Estimating Plumbing Installations
5801	Antennas & Radiation
5807	*Machine Sketching*
5809B	Measuring Instruments
5810	Field Sketching
5850A-B	Physics
5878	Filtration
5886	Pipes and Fittings
5887	Properties of Materials
5891	*Fireproofing of Buildings*
5893A-C	Elementary Architectural Drawing
5959A-B	*Underground Power Systems*
5961	Nondestructive Testing of Castings
5962	Inspection of Shop Products
5976	Drying
5983A-B	Practical Geometry
5998	Sales Records and Reports
6026	Surface Protection of Metals
6041	*Distillation*
6048	Evaporation and Crystallization
6063A-B	Report Writing
6078	Sound
6084A-B	Air Conditioning Systems
6091	Broaching
6105	Size Reduction
6106	*Size Separation*
6116	Planers
6141X and A-D	Intermediate and Advanced Algebra
6151	Fundamentals of Welding
6152A-B	Practical Metallurgy for Welders
6153	Process Systems and Components
6154	*Safety in Welding and Cutting*
6161	Gas Tungsten-Arc Welding
6162	Gas Metal-Arc Welding
6184	Forms of Business Organization
6208	Solvent Extraction
6209	Mixing
6211	Plumbing Drawing
6219	*Selling Your Ideas*
6227A-C	Painting
6232A-E	*Plane Trigonometry, with Trigonometric Tables* 5515
6235A-C	Inventory Control
6238A-B	Industrial Accident Prevention
6255A-B	Light
6256	Power-Line Calculations
6272A-B	Gas Welding Equipment
6274A-C	Arc Welding Equipment
6275A-B	Gas Cutting
6276A-C	Gas Welding Techniques
6278A-B	*Fabrication of Pipe by Welding*
6290	Common Brickwork
6305A-B	Principles of Automatic Process Control Instruments
6306A-B	Temperature Measuring and Control Instruments
6307	*Automatic Process Control Valves*
6308A-B	Fluid-Flow Measuring and Control Instruments
6309A-B	*Process-Pressure Measuring and Control* Instruments
6319A-F	Modern Management
6330A-B	Field Methods in Concrete Construction
6333	Heating Plans and Specifications

Serial numbers and titles: texts

Serial Number	Title
00B9	Ignition Systems
0B10	Lubricating Systems
0B11	Cooling, Air Intake, and Exhaust Systems
0B12	Arithmetic for Mechanics
0B13	Reading Micrometers, Dial Gauges, and Other Precision Instruments
0B14	Shop and Hand Tools. Part 1
0B15	Shop and Hand Tools. Part 2
0B16	Tune-Up of Gasoline Engines (Diagnostics). Part 1
0B17	Tune-Up of Gasoline Engines (Diagnostics). Part 2
0B18	Failure Analysis
0B19	Engine Maintenance-Lubricating, Air Intake, Exhaust, and Cooling Systems
0B20	Engine Maintenance-Fuel System Maintenance and Overhaul
0B21	Engine Maintenance-Ignition System Component Maintenance and Overhaul
0B22	Engine Maintenance-Electrical System
0B23	Engine Overhaul. Part 1
0B24	Engine Overhaul. Part 2
0B25	Engine Overhaul. Part 3
BLOCK C—MACK DIESEL ENGINES (15 Units)	
00C1	Introduction
00C2	Engine Disassembly
00C3	Cylinder Block and Components. Part 1
00C4	Cylinder Block and Components. Part 2
00C5	Cylinder Block and Components. Part 3
00C6	Cylinder Head Assemblies and Valve Operating Mechanisms
00C7	Fuel Systems, Part 1
00C8	Fuel Systems. Part 2
00C9	Air Intake and Exhaust Systems
0C10	Cooling and Lubricating Systems
0C11	Accessory Equipment
0C12	Engine Assembly. Part 1
0C13	Engine Assembly. Part 2
0C14	Engine Testing and Run-In
0C15	Mack V8 Diesel Engines
BLOCK D—DETROIT DIESEL ENGINES (17 Units)	
00D1	Introduction
00D2	Engine Disassembly
00D3	Cylinder Block and Components. Part 1
00D4	Cylinder Block and Components. Part 2
00D5	Cylinder Block and Components. Part 3
00D6	Cylinder Block and Components. Part 4
00D7	Cylinder Heads, Cylinder Head Components and Valve Operating Mechanism
00D8	Fuel Systems
00D9	Governors
0D10	Intake Systems; Exhaust Systems
0D11	Cooling and Lubricating Systems
0D12	Accessory Equipment
0D13	Engine Assembly. Part 1
0D14	Engine Assembly. Part 2
0D15	Engine Tune-Up and Run-In
0D16	Supplement Detroit Diesel 8V-71 and 8V-71T Engines
0D17	Series 92 Engine
BLOCK E—CATERPILLAR DIESEL ENGINES (2 Units)	
00E1	Introduction
00E2	Engine Disassembly

Serial Number	Title
BLOCK H—CUMMINS ENGINES (15 Units)	
00H1	Introduction
00H2	Introduction to Engine Rebuilding
00H3	Rebuild Shop Practices. Part 1
00H4	Rebuild Shop Practices. Part 2
00H5	Engine Disassembly
00H6	Cylinder Block Group. Part 1
00H7	Cylinder Block Group. Part 2
00H8	Cylinder Heads, Cam Followers, Tappets and Rocker Levers
00H9	Cummins PT Fuel System
0H10	Lubricating and Cooling Systems
0H11	Drive Units, Intake and Exhaust Systems
0H12	Accessory Equipment and Adaptations
0H13	Engine Assembly
0H14	Engine Testing and Run-in
0H15	Applications and Installation of Cummins Engines
BLOCK J—HYDRAULIC CIRCUITRY (3 Units)	
00J1	Hydraulic Fundamentals
00J2	Hydraulic System Components
00J3	Hydraulic System Maintenance
BLOCK K—ON-HIGHWAY TRUCK AND TRACTOR COMPONENTS (13 Units)	
0KK1	Fundamentals of Braking Systems
0KK2	Air Brake Systems. Part 1
0KK3	Air Brake Systems. Part 2
0KK4	Retarders and Oil Seals
0KK5	Clutches and Propeller Shaft Assemblies
0KK6	Transmissions and Controls
0KK7	Rebuilding Manual Transmissions
0KK8	Rebuilding Automatic Transmissions
0K10	Cab Air Conditioning
0K12	Maintenance and Repair of Drive Axles
0K13	Front Axles,Steering, and Suspensions
0K14	Fifth Wheels, Wheels, and Tires
00K5	Refrigeration Systems
BLOCK L—POWER SHIFT TRANSMISSIONS (2 Units)	
00L1	Description and Operating Principles
00L2	Operating Principles and Troubleshooting
BLOCK M—FUEL INJECTION (6 Units)	
00C7	(See Block C—Mack Diesel Engines)
00C8	(See Block C—Mack Diesel Engines)
00H9	(See Block H—Cummins Engines)
00D8	(See Block D—Detroit Diesel Engines)
00D9	(See Block D—Detroit Diesel Engines)
00M6	Roosa Master Fuel Injection System
BLOCK P—HEAVY EQUIPMENT (8 Units)	
00P1	Scrapers
00P5	Caterpillar D7,D8 and D9 Tractors,Part 1
00P6	Caterpillar D7,D8 and D9 Tractors,Part 2
00P7	Caterpillar D7,D8 and D9 Tractors,Part 3
00P8	Caterpillar D7,D8 and D9 Tractors,Part 4
0P10	Motor Graders
0P11	Michigan Mobile Shovel-Crane; Marion Shovel, Dragline, Clamshell and Crane
0P12	Link-Belt Speeder Shovels

Serial Numbers And Titles: Blocks

This section presents a list of all blocks, according to their serial numbers.

Blocks of instruction are available in these areas:

Electrical Technologies

Block A01 D-C Principles
Block A02 A-C Principles and Components
Block A03 Electrical Measurements and Instruments
Block A04 Electrical Equipment
Block A05 Basic Wiring Practice

Electronic Technologies

Block B01 Electronic Measurements and Instruments
Block B02 *Reactive Circuits*
Block B03 Electronic Components
Block B04 Basic Electronic Circuits
Block B05 Electronic Systems
Block B06 Troubleshooting Electronic Equipment and Systems
Block B07 Pulse Circuits
Block B08 Logic Circuits
Block B09 Linear and Digital Integrated Circuits
Block B10 Basic Industrial Computer Systems
Block B11 Introduction to Microprocessors
Block B12 Microprocessor Applications
Block B13 Electronic Instrumentation and Control
Block B14 Industrial Electronic Circuit Applications
Block B15 Basic Industrial Electronic System Applications
Block B16 Advanced Troubleshooting Techniques

Industrial Maintenance and Construction Trades

Block D10 Industrial Plumbing and Pipefitting

Basic Industrial Skills

Block X01 Practical Math and Measurements
Block X02 Introduction to Algebra, Geometry and Trigonometry
Block X03 Industrial Safety
Block X04 Hand and Power Tools
Block X05 Reading Prints and Schematics
Block X06 Industrial Materials and Components
Block X07 Maintenance and Troubleshooting

As you can see, each block is identified by three digits. Within a block, each lesson is identified by an additional two digits. For example, Block X01 is *Practical Math and Measurements*. And within this block is lesson X0109, titled *Fluid Measurement*.

If you know the serial number of a lesson, look it up in this list to find its title and the title of the block it is part of.

Then turn to the *Block Synopses* section of this Directory for a description of the complete Block and of that specific lesson.

Serial number and titles: blocks

Serial Number	Title
BLOCK A01	**D-C PRINCIPLES**
A0101	Nature of Electricity
A0102	Preventive Maintenance
A0103	Electric Cells and Batteries
A0104	Electrical Components and Ohm's Law
A0105	Basic Circuit Arrangements
A0106	Electrical Language and Hardware
A0107	Magnetism and Electromagnetism
A0108	D-C Generators
A0120	Progress Examination Booklet
BLOCK A02	**A-C PRINCIPLES AND COMPONENTS**
A0201	Alternating Current
A0202	Alternators
A0203	Transformers
A0204	Inductance and Capacitance
A0205	A-C Circuits
A0206	Rectification and Electronic Devices
A0207	Electric Energy Distribution
A0208	Types of Electric Circuits
A0220	Progress Examination Booklet
BLOCK A03	**ELECTRICAL MEASUREMENTS AND INSTRUMENTS**
A0301	Checking Simple Circuits
A0302	Troubleshooting with Basic Meters
A0303	How a Voltmeter Works
A0304	How an Ammeter Works
A0305	A-C Measuring Instruments
A0306	Miscellaneous Electrical Measuring Instruments
A0320	Progress Examination Booklet
BLOCK A04	**ELECTRICAL EQUIPMENT**
A0401	Electrical Equipment Applications and Symbols
A0402	Outlet Boxes
A0403	Industrial Boxes, Panels and Raceways *Progress Examination*
A0404	Conductor Properties and Installations
A0405	Conduit Characteristics and Installations
A0406	Electrical Fittings and Bending Conduit *Progress Examination*
A0407	Switches and Their Operation
A0408	Automatic Controls and Control Circuits
A0409	Fuses
A0410	Circuit Breaker Operation and Maintenance *Progress Examination*
A0411	Plugs, Receptacles and Lampholders
A0412	Electrical Loads *Progress Examination*
A0420	Progress Examination Booklet
BLOCK A05	**BASIC WIRING PRACTICE**
A0501	Installation of Cable and Outlet Boxes
A0502	Wiring Commonly Used Devices
A0503	Wiring Lighting Equipment and Miscellaneous Loads *Progress Examination*
A0504	Wiring Branch Circuits
A0505	Wiring the Service Entrance
A0506	Electrical System Calculations *Progress Examination*
A0520	Progress Examination Booklet
BLOCK B01	**ELECTRONIC MEASUREMENTS AND INSTRUMENTS**
B0101	Electronic Quantities and Testing Principles
B0102	Multi Purpose Test Instruments
B0103	Bridge-Type Instruments
B0104	Oscilloscopes
B0105	Component Testers
B0106	Digital Test Equipment
B0120	Progress Examination Booklet
BLOCK B02	**REACTIVE CIRCUITS**
B0201	Resistance, Capacitance and Inductance
B0202	Reactance and Impedance
B0203	Resonant Circuits
B0204	Applications of Resonant Circuits
B0120	Progress Examination Booklet
BLOCK B03	**ELECTRONIC COMPONENTS**
B0301	Resistive, Capacitive, and Inductive Components
B0302	Basic Semiconductor Components
B0303	Semiconductor Switching Devices
B0304	Special Semiconductor Devices
B0305	Rectifiers and Electron Tubes
B0306	Switching and Connection Devices
B0320	Progress Examination Booklet
BLOCK B04	**BASIC ELECTRONIC CIRCUITS**
B0401	Rectifiers and Power Supplies
B0402	Amplifiers
B0403	Oscillators
B0404	Modulation and Detection Circuits
B0405	Switching Circuits
B0406	Logic Circuits
B0407	Gating and Counting Circuits
B0408	Pulse and Digital Circuits
B0420	Progress Examination Booklet
BLOCK B05	**ELECTRONIC SYSTEMS**
B0501	Electronic Devices and Amplification
B0502	Audio and R-F Circuits
B0503	Oscillators, Feedback, and Waveform Generators
B0504	Electronic Power Supply Systems
B0505	Industrial Receivers, Transmitters, and Video Systems
B0506	Servo and Control Systems
B0507	Pulse and Logic Circuits
B0508	Programmable Controllers and Microprocessors
B0520	Progress Examination Booklet
BLOCK B06	**TROUBLESHOOTING ELECTRONIC EQUIPMENT AND SYSTEMS**
B0601	Logical Troubleshooting Methods
B0602	Instrument Selection
B0603	Measuring Techniques
B0604	Interpreting Data and Results
B0605	Use of Manufacturers' Instructions
B0606	Test Instruments Maintenance
B0620	Progress Examination Booklet
BLOCK B07	**PULSE CIRCUITS**
B0701	Pulse Techniques
B0702	Pulse Generators
B0703	Waveshaping Circuits
B0704	Timing and Synchronization
B0705	Pulse Circuit Applications
B0706	Troubleshooting Pulse Circuits
B0720	Progress Examination Booklet
BLOCK B08	**LOGIC CIRCUITS**
B0801	Logic Circuit Fundamentals
B0802	Introduction to Number Systems
B0803	Logic Devices and Diagrams
B0804	Logic Families
B0805	Applications of Logic Circuits
B0806	Troubleshooting Logic Circuits
B0820	Progress Examination Booklet

Serial number and titles: blocks

Serial Number	Title
BLOCK B09	**LINEAR AND DIGITAL INTEGRATED CIRCUITS**
B0901	Linear and Digital Circuit Principles
B0902	Integrated Circuit Techniques
B0903	Linear Integrated Circuits
B0904	Digital Integrated Circuits
B0905	Integrated Circuit Logic Systems
B0906	Troubleshooting Integrated Circuit Systems
B0920	Progress Examination Booklet
BLOCK B10	**BASIC INDUSTRIAL COMPUTER SYSTEMS**
B1001	Computer Fundamentals
B1002	Digital and Analog Systems
B1003	Software and Programming
B1004	Computer-Aided Control Systems
B1005	Interfacing Principles
B1020	Progress Examination Booklet
BLOCK B11	**INTRODUCTION TO MICROPROCESSORS**
B1101	Introduction to Computers
B1102	Introduction to Microprocessor Applications
B1103	Microprocessor Basics, Part 1
B1104	Microprocessor Basics, Part 2
B1120	Progress Examination Booklet
BLOCK B12	**MICROPROCESSOR APPLICATIONS**
B1201	Working with an Uncomplicated Microprocessor, The *MC6802*, Part 1
B1202	Microprocessor Programming Principles, Part 1
B1203	Working with an Uncomplicated Microprocessor, The MC6802, Part 2
B1204	Microprocessor Programming Principles, Part 2
B1205	Interfacing Through Serial and Parallel Ports
B1206	Troubleshooting Microprocessor Equipment, Part 1
B1207	Troubleshooting Microprocessor Equipment, Part 2
B1208	Other Families of Microprocessors
B1220	Progress Examination Booklet
BLOCK B13	**ELECTRONIC INSTRUMENTATION AND CONTROL**
B1301	Physical Properties and Their Measurement, Part 1
B1302	Physical Properties and Their Measurement, Part 2
B1303	Measuring Instruments and Signal Processing
B1304	Transducers
B1321	Progress Examination
B1305	Introduction to Control Systems
B1306	Controllers
B1307	Control System Methods
B1308	Data Logging, Transmission, and Display
B1309	Control Systems Applications, Maintenance and Troubleshooting
B1320	Progress Examination Booklet
BLOCK B14	**INDUSTRIAL ELECTRONIC CIRCUIT APPLICATIONS**
B1401	Interfacing Process Variables
B1402	Motor Control and Servo Systems
B1403	Numerical Control Systems
B1404	Programmable Controllers
B1405	Industrial Robots
B1420	Progress Examination Booklet
BLOCK B15	**BASIC INDUSTRIAL ELECTRONIC SYSTEM APPLICATIONS**
B1501	Voltage and Frequency Controllers
B1502	Nondestructive Test Equipment
B1503	Resistance Welding Equipment
B1504	Dielectric and Induction Heating
B1505	Cranes, Scales, and Materials Handling
B1520	Progress Examination Booklet

Serial Number	Title
BLOCK B16	**ADVANCED TROUBLESHOOTING TECHNIQUES**
B1601	Approach to Troubleshooting
B1602	Analysis of Systems
B1603	Test Equipment Applications
B1604	Safe Troubleshooting Practices
B1605	Troubleshooting Typical Industrial Systems, Part 1
B1606	Troubleshooting Typical Industrial Systems, Part 2
B1620	Progress Examination Booklet
BLOCK D10:	**INDUSTRIAL PLUMBING AND PIPEFITTING**
D1001	The Trades of Plumbing and Pipefitting
D1002	Pipes, Fittings, and Valves
D1003	Plumbing and Pipefitting Tools
D1004	Joining and Assembling Pipes
D1005	Supportuning, Installing, and Testin Pipes
D1006	Plumbing Fixtures and Appliances
D1007	Tanks, Pumps, and Boilers
D1020	Progress Examination Booklet
BLOCK X01	**PRACTICAL MATH AND MEASUREMENTS**
X0120-X	Pretest Examination Booklet
X0101	Addition and Subtraction
X0102	Multiplication and Division
X0103	Fractions and Decimals
X0104	SI Metric
X0105	Measuring Lengths and Distances
X0106	Bulk Measurement
X0107	Temperature Measurement
X0108	Energy, Force, and Power
X0109	Fluid Measurement
X0110	Formulas
X0111	Equations
X0120	Progress Examination Booklet
BLOCK X02	**INTRODUCTION TO ALGEBRA, GEOMETRY AND TRIGONOMETRY**
X0220-X	Pretest Examination Booklet
X0201	Algebra: Monomials and Polynomials
X0202	Algebra: Factoring
X0203	Algebra: Addition and Subtraction of Fractions
X0204	Alegbra: Multiplication and Division of Fractions
X0205	Algebra: Linear Equations
X0206	Algebra: Simultaneous Linear Equations
X0207	Algebra: Determinants
X0208	Algebra: Quadratic Equations
X0209	Algebra: Exponents
X0210	Algebra: Radicals and Imaginary Numbers
X0211	Applied Geometry
X0212	Practical Trigonometry
X0220	Progress Examination Booklet
BLOCK X03	**INDUSTRIAL SAFETY**
X0301	Personal Safety, Part 1
X0302	Personal Safety, Part 2
X0303	Safe Use of Hand Tools
X0304	Materials Handling
X0305	General Industrial Safety
X0320	Progress Examination Booklet
BLOCK X04	**HAND AND POWER TOOLS**
X0401	Common Hand Tools
X0402	Metal-Cutting Tools
X0403	Measuring Instruments
X0404	Woodworking Hand Tools
X0405	Plumbing Hand Tools
X0406	*Electric Drills and Hammers*
X0407	Electric Power Saws
X0408	Routers, Power Planers, and Sanders
X0409	Pneumatic Tools
X0410	Grinding Equipment
X0411	Tool Grinding and Sharpening
X0412	Jacks, Hoists, and Pullers
X0420	Progress Examination Booklet

Serial number and titles: blocks

Serial Number	Title
BLOCK X05	**READING PRINTS AND SCHEMATICS**
X0501	Introduction to Print Reading
X0502	Dimensioning
X0503	Tolerancing and Symbols
X0504	*Sectional Views and Simplified Drafting*
X0505	Building Drawings
X0506	Electical Drawings and Circuits
X0507	Electronic Drawings
X0508	Hydraulic and Pneumatic Drawings
X0509	Piping: Drawings, Materials and Parts
X0510	Welding Symbols
X0511	Sheet Metal Basics
X0512	Sketching
X0520	Progress Examination Booklet
BLOCK X06	**INDUSTRIAL MATERIALS AND COMPONENTS**
X0601	Metal Processing
X0602	Ferrous Metals
X0603	*Nonferrous Metals* *Progress Examination*
X0604	Identification of Metals
X0605	Nonmetallic Materials
X0606	Plastics, Elastomers, and Composite Materials
X0607	Wood Products
X0608	Paints and Adhesives *Progress Examination*
X0609	Fasteners
X0610	Introduction to Pumps and Compressors
X0611	Introduction to Bearings and Seals
X0612	Introduction to Power Transmission *Progress Examination*
X0620	Progress Examination Booklet
BLOCK X07	**MAINTENANCE AND TROUBLESHOOTING**
X0701	Getting Ready for Troubleshooting
X0702	Troubleshooting Aids and Tools
X0703	Scheduled Downtime
X0704	Emergency Downtime *Progress Examination*
X0705	Mechanical Maintenance
X0706	Electrical Maintenance
X0707	Preventive Maintenance *Progress Examination*
X0720	Progress Examination Booklet

Serial Numbers And Titles: Videotapes And Videotexts

This section presents a list of all videotapes, videotape programs, and videotexts according to their serial numbers.

Videotapes and videotexts that relate to the same videotape program are grouped together, and arranged according to the videotape serial numbers.

If you know the number of a videotape or videotape program, you can look it up here to get the title of the tape or program.

If you know the number of a videotext, look it up under the serial number of the related videotape, to find its title.

Serial numbers for videotapes begin with the letter V. Serial numbers for videotexts begin with the letter T.

Otherwise, the serial numbers for videotapes and videotexts are identical. For example:

VN1104 is a videotape titled *Coordinate Measurement Systems.*
TN1104 is a videotext, with the same title.

Once you have found the title of the videotape or the videotape program, turn to the *Videotape Synopses* section of this Directory for a description of the tape, text or videotape program.

Videotape	Videotext	
VB1100	**TB1100**	**BLUEPRINT READING (3 Videotapes)**
VB1101		Pulley Bar (12 minutes)
VB1102		Wheel Puller (14 minutes)
VB1103		Toolmaker's Vise (16 minutes)
VC1100	**TC1100**	**SOFTWARE MANAGEMENT FOR SMALL COMPUTERS (14 Videotapes)**
VC1101		Computer Hardware and Software Jargon (40 minutes)
VC1102		Computer Hardware Features (40 minutes)
VC1103		The Impact of Technology (37 minutes)
VC1104		Contemporary Microcomputer Architecture (41 minutes)
VC1105		Selecting a Computer and Setting Up Shop (33 minutes)
VC1106		The Software Management Team (38 minutes)
VC1107		Software Selection (39 minutes)
VC1108		Designing Reliable Software (43 minutes)
VC1109		Defensive Programming (26 minutes)
VC1110		The Testing Process (35 minutes)
VC1111		Troubleshooting Aids (42 minutes)
VC1112		Programming Style and Documentation (37 minutes)
VC1113		Fault Tolerant Software (31 minutes)
VC1114		Monitoring Your Progress (34 minutes)
	TC1101	SOFTWARE RELIABILITY: PRINCIPLES AND PRACTICE
	TC1102	THE MYTHICAL MAN-MONTH

Videotape	Videotext	
VE1100	**TE1100**	**ELEMENTS OF METALLURGY (15 Videotapes)**
VE1101		Atoms and Molecules (40 minutes)
VE1102		The Elements of Physics (42 minutes)
VE1103		The Elements of Chemistry (35 minutes)
VE1104		Chemical Equilibrium, Heat and Temperature (43 minutes)
VE1105		Oxidation and Reduction (41 minutes)
VE1106		Smelting and Refractories (35 minutes)
VE1107		Thermal Metal Refining (36 minutes)
VE1108		Electricity, Electrochemistry, and Electrolytic Processes (43 minutes)
VE1109		Solidification of Metals (53 minutes)
VE1110		Solid Solutions (35 minutes)
VE1111		Heat Treatment of Steel (50 minutes)
VE1112		Precipitation Hardening (28 minutes)
VE1113		Diffusion and Surface Treatments (48 minutes)
VE1114		Methods of Forming Metals (47 minutes)
VE1115		Mechanical Testing of Metals (56 minutes)
	TE1101	READING MODULE—ELEMENTS OF METALLURGY
	TE1102	METALS HANDBOOK
VF1100	**TF1100**	**MICROPROCESSORS: FUNDAMENTAL CONCEPTS AND APPLICATIONS (20 Videotapes)**
VF1101		Introduction (32 minutes)

Serial numbers and titles: videotapes and videotexts

Videotape	Videotext	
VF1102		Fundamental Computer Concepts I (37 minutes)
VF1103		Fundamental Computer Concepts II (37 minutes)
VF1104		Characteristics of the Intel 8080 Microprocessor (51 minutes)
VF1105		A Simple Programming Example (46 minutes)
VF1106		Algorithms, Flow Charts, Program Planning (47 minutes)
VF1107		Debugging and Use of the MMD-1 (42 minutes)
VF1108		Stack Architecture, Subroutines (44 minutes)
VF1109		Microprocessor CPU Hardware Concepts and Signals (41 minutes)
VF1110		Hardware Configuration of a Typical Microcomputer System (46 minutes)
VF1111		Microcomputer Bus Timing (50 minutes)
VF1112		A Microcomputer Executive Program (50 minutes)
VF1113		Arithmetic Subroutines (47 minutes)
VF1114		Interrupts (44 minutes)
VF1115		Real-Time Microcomputer Applications I: Computer Tone Generation (40 minutes)
VF1116		I/O Interfacing I (47 minutes)
VF1117		I/O Interfacing II (46 minutes)
VF1118		Real-Time Microcomputer Applications II: Character Generation (51 minutes)
VF1119		Real-Time Microcomputer Applications III: Computer-Controlled Sampling Scope (49 minutes)
VF1120		Comparative Evaluation of Microprocessors, Advanced Systems (55 minutes)
	TF1122	**MCS-80 MICROCOMPUTER USERS' MANUAL**
	TF1123	**8080 ASSEMBLY LANGUAGE PROGRAMMING MANUAL**
Required Equipment:		
	XF1100	**MMD-1 MICROCOMPUTER TRAINER (SALE)**
	XF1200	**MMD-1 MICROCOMPUTER TRAINER (RENT)**
VI1100	**TI1100**	**MICROPROCESSOR INTERFACING (12 Videotapes)**
VI1101		Grounding and Shielding, Part 1 (33 minutes)
VI1102		Grounding and Shielding, Part 2 (46 minutes)
VI1103		Busing, Part 1 (43 minutes)
VI1104		Busing, Part 2 (33 minutes)
VI1105		Serial Interfacing, Part 1 (43 minutes)
VI1106		Serial Interfacing, Part 2 (41 minutes)
VI1107		Parallel Interfacing, Part 1 (42 minutes)
VI1108		Parallel Interfacing, Part 2 (44 minutes)
VI1109		Magnetic Tape Interfacing, Part 1 (45 minutes)
VI1110		Magnetic Tape Interfacing, Part 2 (45 minutes)

Videotape	Videotext	
VI1111		Magnetic Disk Interfacing, Part 1 (48 minutes)
VI1112		Magnetic Disk Interfacing, Part 2 (44 minutes)
VM1200	**TM1200**	**INTRODUCTION TO MACHINE TECHNOLOGY (16 Videotapes/ 16 Videotexts in 2 binders)**
VM1300	**TM1300**	**INTRODUCTION TO MACHINE TECHNOLOGY, PART 1 (8 Videotapes/8 Videotexts in a binder)**
VM1201	TM1201	Introduction to the Machine Shop (15 minutes)
VM1202	TM1202	Hand Tools (12 minutes)
VM1203	TM1203	Measuring Tools (13 minutes)
VM1204	TM1204	Precision Measurement Tools (16 minutes)
VM1217	TM1217	Semiprecision and Precision Layout (15 minutes)
VM1205	TM1205	Basic Power Tools (15 minutes)
VM1206	TM1206	Drill Presses (17 minutes)
VM1207	TM1207	Operating Drill Presses (13 minutes)
VM1400	**TM1400**	**INTRODUCTION TO MACHINE TECHNOLOGY, PART 2 (8 Videotapes/8 Videotexts in a binder)**
VM1208	TM1208	Engine Lathes (16 minutes)
VM1209	TM1209	Lathe Tools (11 minutes)
VM1210	TM1210	Cutting Speeds and Feeds (16 minutes)
VM1211	TM1211	Mounting, Facing and Turning (20 minutes)
VM1212	TM1212	Turning Between Centers (18 minutes)
VM1213	TM1213	Milling Machines (16 minutes)
VM1214	TM1214	Milling Cutters and Accessories (18 minutes)
VM1215	TM1215	Fundamentals of Grinding (12 minutes)
VN1100	**TN1100**	**NUMERICAL CONTROL/ COMPUTERIZED NUMERICAL CONTROL (20 Videotapes/ 20 Videotexts in 2 binders)**
VN1200	**TN1200**	**NUMERICAL CONTROL/ COMPUTERIZED NUMERICAL CONTROL, PART 1: FUNDAMENTALS (12 Videotapes/ 12 Videotexts in a binder)**
VN1101	TN1101	Introduction to NC and CNC (15 minutes)
VN1102	TN1102	Machine Set-up and Safety (14 minutes)
VN1103	TN1103	Program Preparation (16 minutes)
VN1104	TN1104	Coordinate Measurement Systems (17 minutes)
VN1105	TN1105	One-and Two-Axis Linear Milling (18 minutes)
VN1106	TN1106	Three-Axis Linear Milling (18 minutes)
VN1107	TN1107	Circular Milling (19 minutes)
VN1108	TN1108	Completed Milling Programs (16 minutes)
VN1109	TN1109	Basic Drilling (16 minutes)
VN1110	TN1110	Drilling, Boring and Spot Facing (19 minutes)
VN1111	TN1111	Manual Data Input (17 minutes)
VN1114	TN1114	Punching and Editing (16 minutes)

Serial numbers and titles: videotapes and videotexts

Videotape	Videotext	
VN1300	**TN1300**	**NUMERICAL CONTROL/ COMPUTERIZED NUMERICAL CONTROL, PART 2: ADVANCED PROGRAMMING (8 Videotapes/ 8 Videotexts in a binder)**
VN1112	TN1112	Subroutines (18 minutes)
VN1113	TN1113	Loopings (16 minutes)
VN1115	TN1115	Special Cycles (17 minutes)
VN1116	TN1116	Translations (18 minutes)
VN1117	TN1117	Polar Coordinate Program (19 minutes)
VN1118	TN1118	Rotation (18 minutes)
VN1119	TN1119	Scaling (16 minutes)
VN1120	TN1120	Cutter Radius Compensation (18 minutes)
V0300	**X03**	**INDUSTRIAL SAFETY (5 Videotapes)**
V03001	X0301	Personal Safety, Part 1 (15 minutes)
V03002	X0302	Personal Safety, Part 2 (20 minutes)
V03003	X0303	Safe Use of Hand Tools (18 minutes)
V03004	X0304	Materials Handling (16 minutes)
V03005	X0305	General Industrial Safety (16 minutes)
VP1100	**TP1100**	**ENERGY CONSERVATION IN INDUSTRIAL PLANTS (10 Videotapes)**
VP1101		How to Get a Program Started (47 minutes)
VP1102		How to Justify Energy Conservation Expenditures (32 minutes)
VP1103		Understanding the Importance of Electrical Systems (45 minutes)
VP1104		Utility and Process System Optimization (39 minutes)
VP1105		Reducing Equipment and Piping Losses (33 minutes)
VP1106		Building Considerations for Energy Utilization (32 minutes)
VP1107		Heating, Cooling and Utility Requirements (40 minutes)
VP1108		Industrial Solar Applications (32 minutes)
VP1109		Improving Plant Maintenance for Energy Savings (40 minutes)
VP1110		Energy Audits and Managing an Energy Conservation Program (42 minutes)
VS1100	**TS1100**	**BASIC SHOP MATH (4 Videotapes)**
VS1101		Whole Numbers and Fractions (12 minutes)
VS1102		Decimals and Tolerances (15 minutes)
VS1103		Algebra (13 minutes)
VS1104		Trigonometry (12 minutes)
VT1100	**TT1100**	**MANAGEMENT OF MICROPROCESSOR TECHNOLOGY (10 Videotapes)**
VT1101		Introduction (57 minutes)
VT1102		Microprocessor Architecture I (50 minutes)
VT1103		Microprocessor Architecture II (49 minutes)
VT1104		Basic Software for Product Development (48 minutes)
VT1105		Real Time Systems (57 minutes)
VT1106		Strategic Impact of Technology (44 minutes)
VT1107		Microprocessor-Based Product Opportunities (56 minutes)
VT1108		Advanced Software (53 minutes)
VT1109		Developing Microprocessor -Based Product (58 minutes)
VT1110		Planning for the Future: New Microprocessor Trends (56 minutes)
VU1100		**WRITING: BUSINESS AND TECHNICAL (15 Videotapes)**
VU1101		Identifying Needs and Planning Writing (26 minutes)
VU1102		Adapting Tone, Language and Structure (32 minutes)
VU1103		Writing Business Correspondence (42 minutes)
VU1104		Descriptions and Instructions (30 minutes)
VU1105		Using Graphs, Charts, and Illustrations (20 minutes)
VW1100		**WELDING (42 Videotapes)**
VW1200	**TW1200**	**OXY-ACETYLENE WELDING (14 Videotapes)**
VW1201		Welding Equipment, Accessories and Shop Safety (14 minutes)
VW1202		Set-Up and Shut Down of Oxy-Acetylene Welding Equipment (14 minutes)
VW1203		The Three Types of Oxy-Acetylene Flames: Neutral, Oxidizing, Carburizing (10 minutes)
VW1204		Joint Design and Welding Terms (12 minutes)
VW1205		Puddling and Running Beads with Oxy-Acetylene (11 minutes)
VW1206		Flat and Horizontal Butt Welds with Filler Rod (11 minutes)
VW1207		Vertical and Overhead Butt Welds with Filler Rod (12 minutes)
VW1208		Cutting Metal with the Combustion Torch (11 minutes)
VW1209		Piercing, Cutting Holes and Cutting 45 Degree Bevels with the Cutting Torch (11 minutes)
VW1210		Oxy-Acetylene Welding T Joints, Lap Joints, Corner Joints and Edge Joints (12 minutes)
VW1211		Bronze Welding in Flat and Horizontal Positions (12 minutes)
VW1212		Silver Brazing and Soft Soldering (11 minutes)
VW1213		Brazing and Fusion Welding on Gray Cast Iron (13 minutes)
VW1214		Automatic Flame Cutting with Oxy-Acetylene (14 minutes)
VW1300	**TW1300**	**SHIELDED METAL-ARC WELDING (14 Videotapes)**
VW1301		Electric-Arc Power Sources and Minor Maintenance (8 minutes)
VW1302		Safety in Electric-Arc Welding and Terms (8 minutes)
VW1303		Selection of Electrodes for Shielded Metal-Arc Welding (10 minutes)
VW1304		Striking an Arc, Restarting the Arc and Running A Continuous Bead in the Flat Position (13 minutes)

Serial numbers and titles: videotapes and videotexts

Videotape	Videotext	
VW1305		Running Continuous Bead in Horizontal and Vertical Down Position (10 minutes)
VW1306		Running Continuous Beads in Vertical Up and Overhead Position (10 minutes)
VW1307		Electric-Arc Welding in Flat, Horizontal, Vertical and Overhead Butt Welds (13 minutes)
VW1308		T Joint, Lap Joint, Outside Corner Joint in Flat Position (9 minutes)
VW1309		T Joint, Lap Joint, Outside Corner Joint in a Horizontal Position with SMAW (12 minutes)
VW1310		T Joint, Lap Joint, Outside Corner Joint in a Vertical Up Position with SMAW (9 minutes)
VW1311		T Joint, Lap Joint, Outside Corner Joint in an Overhead Position (8 minutes)
VW1312		Welding Cast Iron in Flat Position with Electric-Arc, Hard Facing Surfaces with Electric-Arc (8 minutes)
VW1313		Carbon-Arc Cutting (8 minutes)
VW1314		Multi pass Electric-Arc Welding (12 minutes)
VW1400		**M.I.G. AND T.I.G. WELDING (14 Videotapes)**
VW1401		Safety and Equipment for Gas-Shielded Arc-Welding (11 minutes)
VW1402		Setting Up and Padding of the Inert-Gas-Shielded Metal-Arc Welding (12 minutes)
VW1403		Butt-Joint, T-Joint, Lap Joint and Outside Corner Joints in the Flat and Horizontal Position with M.I.G. (11 minutes)
VW1404		Butt-Joint, T-Joint, Lap Joint and Outside Corner Joints in the Vertical and Overhead Position with M.I.G. (10 minutes)
VW1405		Setting Up Flux-Cored Wire and Running Continuous Beads (8 minutes)
VW1406		Butt-Joint, T-Joint and Lap Joint with Dual Shielded (9 minutes)
VW1407		Multi Pass Welding with Dual Shielded (12 minutes)
VW1408		Setting Up Aluminum Wire Feed and Running Butt-,T-,and Lap Joints (16 minutes)
VW1409		Safety in Gas Tungsten Arc Welding (8 minutes)
VW1410		Selection of Electrode, Gas, Cups, and Filler Rod for Inert-Gas-Tungsten Arc Welding (T.I.G.) (16 minutes)
VW1411		Welding Aluminum with Inert-Gas-Tungsten Arc (16 minutes)
VW1412		Welding Mild Steel with Inert-Gas-Tungsten Arc (11 minutes)
VW1413		Welding Stainless Steel with Inert Gas Tungsten Arc (13 minutes)
VW1414		Submerged Arc Welding (14 minutes)
VX1100		**MACHINE TECHNOLOGY (56 Videotapes)**
VX1200	**TX1200**	**MACHINE TECHNOLOGY I, BASIC MACHINE TECHNOLOGY (14 Videotapes)**
VX1201		Safety Procedures and Guidelines for Machine Technology (10 minutes)
VX1202		Hand Tools and Their Use in Machine Technology (17 minutes)
VX1203		The Use of Measuring Tools in Machine Technology (11 minutes)
VX1204		Micrometer (Telescope Gages, Caliper, Hole Gages) (13 minutes)
VX1205		Vernier Scale and Vernier Caliper (13 minutes)
VX1206		The Use of Layout Tools in Machine Technology (17 minutes)
VX1207		The Pedestal Grinder (9 minutes)
VX1208		Sharpening Drill Bits By Hand and Machine (12 minutes)
VX1209		Drill Presses (Sensitive and Radial) (8 minutes)
VX1210		Operations Frequently Performed on the Drill Press (12 minutes)
VX1211		Hand Hacksaw and Filing Procedures (14 minutes)
VX1212		Vertical Bandsaws—Parts and Accessories (10 minutes)
VX1213		Butt Welding Saw Blades (10 minutes)
VX1214		Setting the Bandsaws Up for Sawing and Use of the Accessories (14 minutes)
VX1300	**TX1300**	**MACHINE TECHNOLOGY II, BASIC ENGINE LATHE (14 Videotapes)**
VX1301		Identification of Parts and Care of the Engine Lathe (13 minutes)
VX1302		Engine Lathe Accessories (13 minutes)
VX1303		Cutting Speeds and Feeds for Engine Lathe-Ferrous, Nonferrous and Plastics (13 minutes)
VX1304		Grinding a Right-Hand Roughing Tool (13 minutes)
VX1305		Grinding a Round Nose Finishing Tool (11 minutes)
VX1306		Mounting and Truing Work in the 4-Jaw Independent Chuck (14 minutes)
VX1307		Three Methods of Facing Work to Length (20 minutes)
VX1308		Straight Turning Work of Two Diameters (16 minutes)
VX1309		Straight Turning Between Centers (17 minutes)
VX1310		Drilling, Boring and Reaming Work Held in a Lathe Chuck (20 minutes)
VX1311		Turning and Radius (16 minutes)
VX1312		Taper Turning on the Lathe (13 minutes)
VX1313		Filing and Polishing on the Engine Lathe (13 minutes)
VX1314		Knurling on the Lathe (16 minutes)
VX1400	**TX1400**	**MACHINE TECHNOLOGY III, INTERMEDIATE ENGINE LATHE OPERATION (14 Videotapes)**
VX1401		Grinding Forming Tools and Machining Forms (20 minutes)
VX1402		Machining Shoulders and Corners on the Lathe (16 minutes)
VX1403		Using the Cutoff Tool on the Lathe (12 minutes)
VX1404		Measuring External and Internal Threads (16 minutes)
VX1405		Tap and Die Threading on the Lathe (14 minutes)

Serial numbers and titles: videotapes and videotexts

Videotape	Videotext	
VX1406		Chasing External Threads and Finishing with a Die (12 minutes)
VX1407		Roughing and Finishing External Threads on the Lathe (15 minutes)
VX1408		Cutting Internal Threads on the Lathe (13 minutes)
VX1409		Cutting Acme Threads (15 minutes)
VX1410		Chasing Tapered Pipe Threads on the Lathe (10 minutes)
VX1411		Machining Offset Holes—Face Plate and 4-Jaw Chuck (18 minutes)
VX1412		Using the Toolpost Grinder on the Lathe (11 minutes)
VX1413		Using the Steady Rest and Follower Rest to Machine on the Lathe (9 minutes)
VX1414		Spring Winding on the Lathe (8 minutes)
VX1500	**TX1500**	**MACHINE TECHNOLOGY IV, MILLING AND TOOL SHARPENING (14 Videotapes)**
VX1501		Identification of Parts and Operation of the Vertical Milling Machine (12 minutes)
VX1502		Cutters and Machining Operations for the Vertical Milling Machine (14 minutes)
VX1503		Use of Dividing Head and Rotary Table (11 minutes)
VX1504		Machining Keyways on the Vertical Milling Machine (Straight and Woodruff) (13 minutes)
VX1505		Use of Plain and Side Milling Cutters on the Horizontal Milling Machine (12 minutes)
VX1506		Identification of Parts and Operation of the Horizontal Milling Machine (9 minutes)
VX1507		Setup for Holding Work to be Milled (7 minutes)
VX1508		Use of the Face Milling Cutter on the Horizontal Mill (13 minutes)
VX1509		Sharpening the Periphery of End Mills (14 minutes)
VX1510		Sharpening Ends of End Mills (12 minutes)
VX1511		Gouging of Two- and Four-Flute End Mills (11 minutes)
VX1512		Reamer Sharpening Between Centers (10 minutes)
VX1513		Sharpening the Periphery of Plain Milling Cutters and Side Mills (19 minutes)
VX1514		Sharpening Brazed Carbide Lathe Tools Using a Universal Vise (13 minutes)
VZ1100	**TZ1100**	**MAKING MORE EFFECTIVE TECHNICAL PRESENTATIONS (10 Videotapes)**
VZ1101		The Basics (35 minutes)
VZ1102		The Audience as Listeners (29 minutes)
VZ1103		Audience Characteristics (33 minutes)
VZ1104		Audience Analysis (36 minutes)
VZ1105		Presentation Design (32 minutes)
VZ1106		Graphics: Why and What (36 minutes)
VZ1107		Graphics: The Tools, Part I (37 minutes)
VZ1108		Graphics: The Tools, Part II (36 minutes)
VZ1109		Making the Presentation (35 minutes)
VZ1110		Fielding Questions (29 minutes)

Provide your employees with training in the essential skills they will need to keep your plant and equipment operating at peak efficiency. Whether you want to train entry-level employees, or crosstrain or retrain your present employees, ICS-Intext has an Industrial Maintenance and Construction Trades Program to fit your company's needs.

***Also available*—Technical Trades Programs in the areas of Wastewater Management, Surveying, and Highway Construction and Maintenance.**

INDUSTRIAL MAINTENANCE AND CONSTRUCTION TRADES

Basic Skills Programs

Basic Skills For Building Trades
Maintenance Helper

Career Programs

- Pipefitter
- Mason
- Refrigeration and Air Conditioning Mechanic
- Carpenter
- Building Maintenance and Repair Mechanic
- Painter
- Plumber
- Basic Plant Maintenance

Basic Skills for Technical Trades

Career Programs

- Waste Water Management
- Surveyor
- Highway Construction and Maintenance

Mini Programs

- Pipefitting
- Masonry
- Refrigeration
- Air Conditioning
- Carpentry
- Plumbing
- Surveying

Apprentice Programs

- Pipefitter Apprentice
- Mason Apprentice
- Refrigeration and Air Conditioning Mechanic Apprentice
- Carpenter Apprentice
- Plumber Apprentice

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Basic Skills for Building Trades

This entry-level program provides trainees with the related study required to prepare them for any one of the numerous opportunities in the field of Industrial Maintenance and Construction. When combined with on-the-job training, the program will give trainees a comprehensive foundation in the basic skills and knowledge they will need to perform in these trade areas. In addition, the *Basic Skills for Building Trades Program* will qualify your trainees for the position of Maintenance Helper.

Upon completion of the program, trainees should be able to:

- Select proper protective clothing, eye protection and so forth for a particular task.
- Demonstrate safe practices when using common hand and power tools
- Perform basic arithmetic functions
- Distinguish between the various physical principles such as energy, force and power.
- Identify and select the proper hand and power tools for a specific task
- Understand basic concepts for reading drawings used in the fields of maintenance and construction.
- Discuss troubleshooting techniques, how to handle down-time, and maintenance procedures.
- Read and interpret architect's drawings and construction specifications.

Basic Skills Assessment Test: Building Trades

A Basic Skills Assessment Test is available from ICS-Intext covering the topics included in the **Basic Skills for Building Trades Program.** This test can be used on an optional basis to evaluate the need for the Basic Skills Program prior to enrollment in any one of the Standard Industrial Maintenance and Construction Career Programs

Program Outline:

SERIAL NO.	TITLE	OPTIONAL VIDEOTAPES
BLOCK X03	INDUSTRIAL SAFETY	
X0301	Personal Safety, Part 1	V03001
X0302	Personal Safety, Part 2	V03002
X0303	Safe Use of Hand Tools	V03003
X0304	Materials Handling	V03004
X0305	General Industrial Safety	V03005
X0101	Addition and Subtraction	VS1101
X0102	Multiplication and Division	VS1102
X0103	Fractions and Decimals	
X0104	SI Metric	
X0105	Measuring Lengths and Distances	
X0106	Bulk Measurement	
X0107	Temperature Measurement	
X0108	Energy, Force, and Power	
X0109	Fluid Measurement	
BLOCK X04	HAND AND POWER TOOLS	
X0401	Common Hand Tools	VM1202
X0402	Metal-Cutting Tools	
X0403	Measuring Instruments	VM1203 VM1204
X0404	Woodworking Hand Tools	VM1202
X0405	Plumbing Hand Tools	
X0406	Electric Drills and Hammers	VM1205
X0407	Electric Power Saws	
X0408	Routers, Power Planers and Sanders	
X0409	Pneumatic Tools	
X0410	Grinding Equipment	VM1215
X0411	Tool Grinding and Sharpening	
X0412	Jacks, Hoists and Pullers	
X0701	Getting Ready for Troubleshooting	
X0702	Troubleshooting Aids and Tools	
X0703	Scheduled Downtime	
X0704	Emergency Downtime	
X0705	Mechanical Maintenance	
X0501	Introduction to Print Reading	
X0502	Dimensioning	
X0504	Sectional Views and Simplified Drafting	
X0505	Building Drawings	
1842A	Reading Architects Blueprints, Part 1	
1842C	Reading Architects Blueprints, Part 3	
2175A	Specification Writing, Part 1	

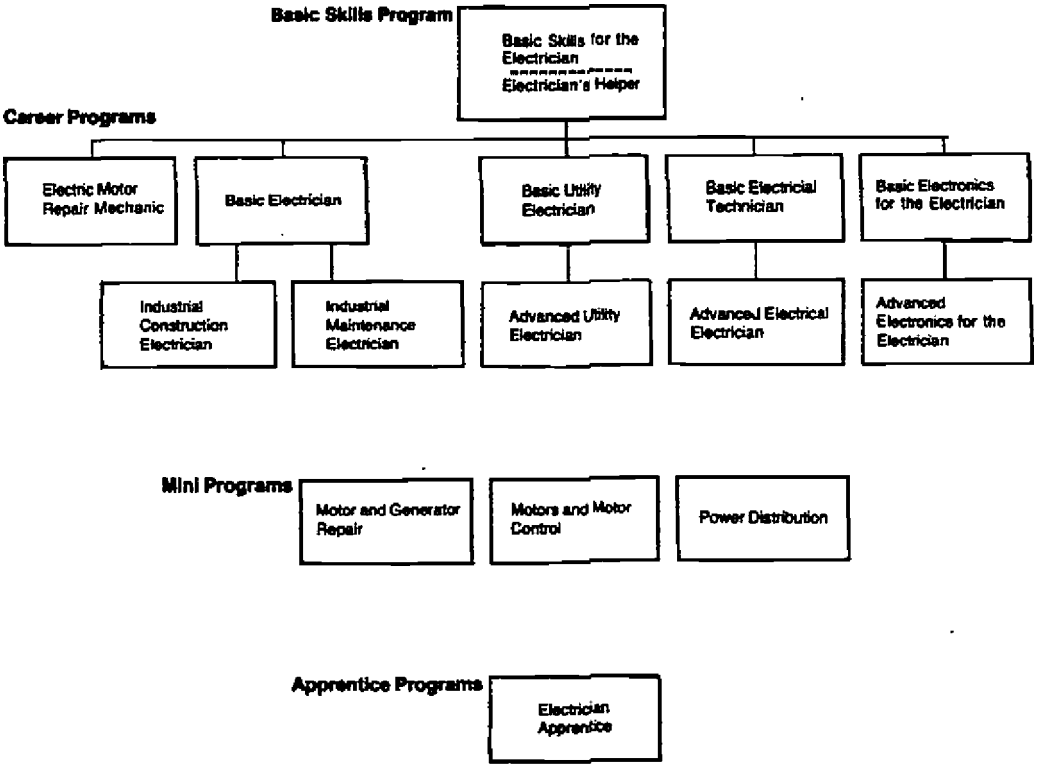
Exams, 12

Estimated Average Completion Time: 28 weeks

LEHMAN 01488

The electrical technologies come into focus with ICS-Intext training programs. We combine the proven method of guided-independent study and hands-on experiments with your on-the-job training to turn your employees—entry-level or members of your current workforce—into skilled electricians.

ELECTRICAL TECHNOLOGIES



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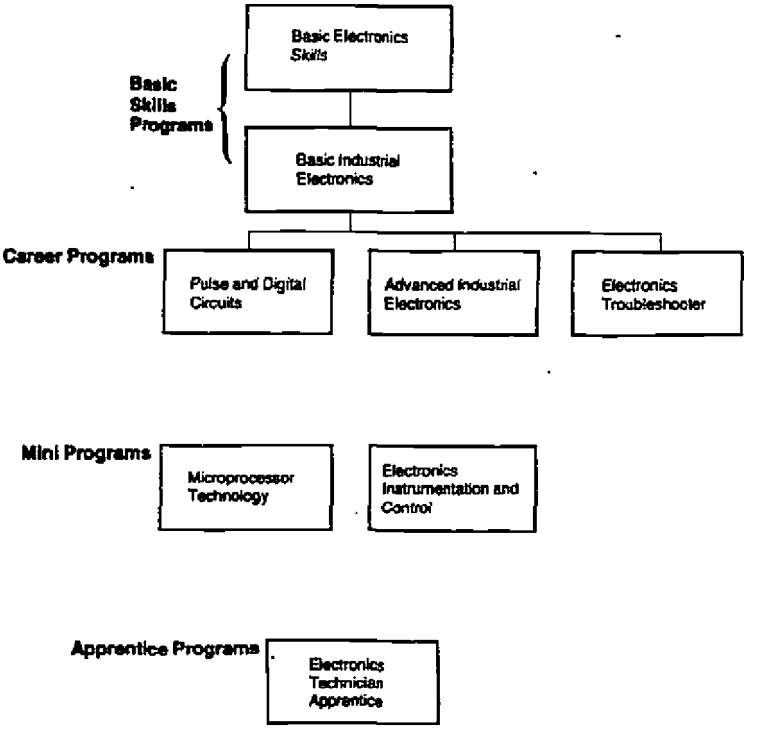
Integrated Circuits . . . Pulse and Digital Circuits . . . Microprocessors . . . Electronic Instrumentation and Control . . .

New knowledge, skills and techniques are required for today's electronics.

These ICS-Intext programs will give your employees the skills and knowledge they need to perform as Electronics Technicians, Industrial Electronics Specialists, Electronics Systems Electricians or Electronics Troubleshooters.

These programs are especially valuable for upgrading your present Plant and Maintenance Electricians who will be required to repair and maintain equipment.

ELECTRONICS TECHNOLOGIES



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Teach your employees the latest diesel and automotive technologies. ICS-Intext can give your company the competitive edge by providing [illegible]r workers with up-to-date training in these [illegible]as.

There are programs for all levels of employees, from entry-level to advanced . . . even specialized programs that familiarize your workforce with the features of specific engines.

DIESEL AND AUTOMOTIVE TECHNOLOGIES

Basic Skills Program

- Basic Diesel Mechanics

Career Programs

- Cummins Diesel Engine Mechanic
- Mack Diesel Engine Mechanic
- Detroit Diesel Engine Mechanic
- Heavy Equipment Mechanic
- Truck Mechanic
- Diesel-Gas Mechanic
- Municipality Mechanic
- Automotive Mechanic

Mini Programs

- Automotive Body Rebuilding and Refinishing Specialist
- Automobile Tune-Up Specialist

Apprentice Programs

- Heavy-Duty Equipment Mechanic Apprentice
- Heavy-Duty Truck Mechanic Apprentice

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VIDEO PROGRAMS

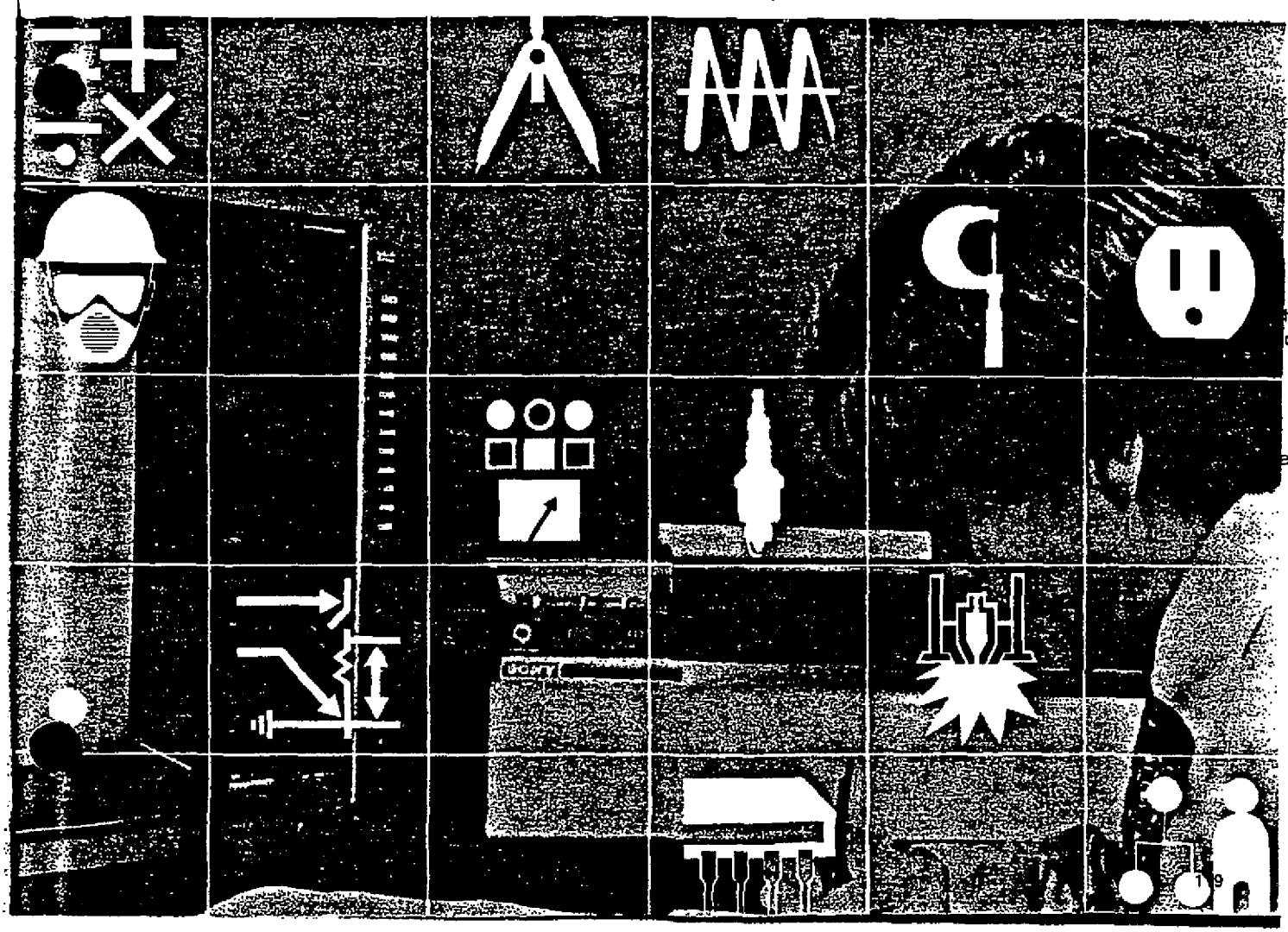
ICS-Intext can provide your company with full color videotapes covering a wide variety of industrial and technical skills areas. The impact of "hands-on" training is built right into every ICS-Intext videotape, which makes this media especially effective in action training areas like **Welding** or **Machine Technology.** In addition, your trainees receive the important factor of consistent instruction with videotapes—there is no chance of variations that can occur with different instructors.

ICS-Intext offers complete videotape programs as well as individual videotapes. Video programs are comprised of a series of videotapes about a particular subject, arranged in a logical learning sequence. Programs are available in various subject areas from the "basics", such as **Shop Math** and **Blueprint Reading,** to specific technical areas including **Microprocessor Interfacing** and **Software Management for Small Computers.**

Individual videotapes may be used as optional supplements to many of the ICS-Intext Standard Programs. Refer to the Standard Program section of this Catalog for the optional videotapes suggested for each individual program.

In addition, supplementary videotexts accompany some of the videotapes. These videotexts include glossaries, background information, illustrations and quizzes to ensure optimum training experiences.

All ICS-Intext videotapes are available in ¾" U-Matic, ½" VHS and ½" Beta I formats.



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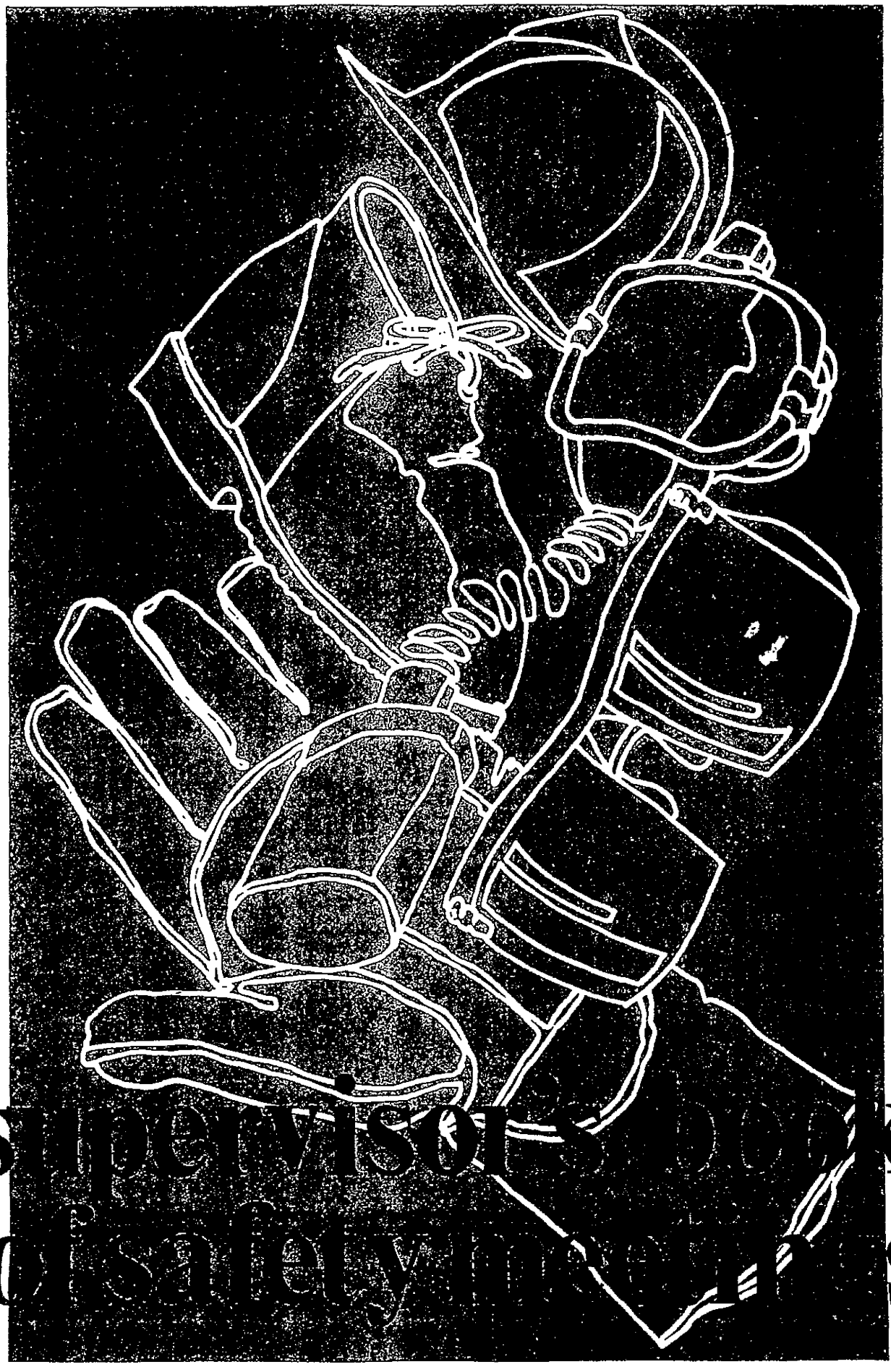

supervisor's book of safety meetings

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BUREAU OF BUSINESS PRACTICE
Waterford, CT 06386

LEHMAN 01495

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INTRODUCTION

Although safe work habits are largely a matter of individual responsibility, too many supervisors make the mistake of underestimating the importance of their role in communicating safety awareness to their employees. For example, it may be the worker's responsibility to put on safety gloves before handling a caustic cleaning solution. But if the supervisor has not repeatedly stressed the hazard involved, or has failed to convince the employee that handling this chemical entails the risk of injury to the skin, then the likelihood that the employee will run that risk is greatly increased. It may be the worker's responsibility to actually put on the gloves when conditions warrant, but it is the supervisor's responsibility to instill the proper attitude and to motivate workers to take the necessary precautions to ensure the safety and well-being of the department.

Acknowledging this responsibility is half the battle. The other half is taking an active approach to developing your employees' safety awareness. Holding regular safety meetings is certainly a step in the right direction, and you will find the meeting plans outlined in this book an invaluable source of help in organizing your safety communication efforts in this area. But there are other steps involved in developing safety awareness that will both contribute to the success of these meetings and ensure that the policies and procedures discussed there are carried out on a day-to-day basis.

The SUPERVISOR'S SAFETY AWARENESS CHECKLIST that follows summarizes the steps you should take in communicating to your employees the importance of a safe attitude on the job. As you go over the points outlined on the left of the chart, use the space on the right (or a spare piece of paper) to jot down specific actions that you might take to implement these suggestions, the names of people you might contact for help or advice, questions you must answer before taking action, and any other notes that pertain to your particular situation. You will see occasional "prompts" in italics to help you examine your situation more closely.

The notes you take, in conjunction with the steps outlined in the checklist, will tell you exactly what you have to do to communicate safety awareness to your subordinates.

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SUPERVISOR'S SAFETY AWARENESS CHECKLIST

I. Introduce New Employees to Safety Policies and Procedures.

A. Start stressing the importance of safety to the new employee on his or her first day on the job.

1. Minimize the possibility that the employee will be injured before becoming completely familiar with safety procedures.

2. Discourage the new hire from developing poor safety habits through ignorance or inexperience.

B. Find out exactly who is responsible for safety orientation in your company.

1. Coordinate your orientation efforts with those of the personnel department.

2. Go over specific safety regulations and procedures carefully as soon as possible after the new worker arrives on the job.

a. Use a safety orientation checklist to make sure you don't overlook anything.

b. Encourage the new employee to ask questions.

Use the space below to note employees, equipment or procedures which require attention.

▶ *How can we improve the orientation given new hires and transfers into the department? Discuss this with* _____ .

II. Use Safety Training Sessions to Communicate the Importance of Safety.

A. Make sure that safety training is ongoing.

1. Schedule department safety meetings on a regular basis.

2. Hold informal "toolbox" meetings to discuss safety-related issues.

3. Make safety a regular topic of discussion when you have informal

▶ *When was our last safety meeting—and when should the next be scheduled?*

LEHMAN 01499

conversations with individuals or small groups of employees.

B. Learn to recognize and avoid the following pitfalls in conducting safety training sessions:

1. Intimidating your employees by threatening them with the consequences of disobeying safety rules.
2. Discouraging their participation by doing all the talking yourself.

C. Make sure you follow the three principles of a good safety training session:

1. Focus your sessions on areas in which accident rates have been high or on the increase.
2. Demonstrate (if possible) how safety practices work.
3. Encourage employees to participate in demonstrating the correct procedures.

D. During the training session itself, remember the following:

1. Confine yourself to a single topic.
2. Demonstrate the correct safety procedures.
3. Open the session up for discussion.
4. Use follow-up training to reinforce the safety message.

▶ *How can I avoid these pitfalls in the safety training given my employees?*

▶ *What topics should be discussed?*

III. Point Out Safety Hazards Whenever You See Them.

A. Every time you spot a safety violation or an unsafe act, take the following approach:

1. Listen to the employee's explanation of why he or she ignored safety procedures.

▶ *Which workers have been observed in unsafe acts or conditions lately?*

LEHMAN 01500

2. Criticize the employee's actions in a constructive manner, focusing on the hazard rather than on the individual who caused it.
3. Demonstrate the correct safety procedure.
4. Repeat the warning.
5. Look for improvements in work methods that might minimize this hazard in the future.

B. Look for opportunities to repeat and reinforce the safety message; never take it for granted that you're doing everything you can to communicate safety awareness.

▶ *How could handling of the situation have been improved to reinforce the safety awareness of these workers?*

IV. Investigate Accidents Promptly

A. Investigate all accidents immediately—even when no injury has occurred.

B. Gather the key facts from the employee and any witnesses who saw the accident happen. Get answers to the following questions.

1. Who was injured?
2. Where did the accident take place?
3. What happened (step by step, if possible)?
4. Which part of the body was injured?
5. How serious was the injury?
6. What medical treatment was given?

C. Put to use the information gathered during the investigation.

1. Is additional safety training needed?
2. Should we make changes in methods, equipment, layout, etc.?

D. Use the opportunity an accident presents to communicate the importance

▶ *How can our accident and near-miss investigations be improved to provide more useful information?*

▶ *Can we make better use of the information these investigations provide? How?*

LEHMAN 01501

of safety at a time when employees' awareness is heightened.

V. Communicate Your Own Attitude Toward Working Safely.

A. Learn to recognize the symptoms of poor safety communications:

1. Do employees claim to be ignorant of safety rules?
2. Do they misunderstand safety procedures?
3. Do they deliberately disregard safety instructions?
4. Do they fail to take safety instructions seriously?

B. If *ignorance* of safety rules is a problem, take the following corrective action:

1. Make sure your explanations of safety rules are clear.
2. Conduct regular follow-up training.
3. Discipline those individuals who persist in ignoring the rules.

C. If *misunderstanding* of safety rules is a problem, take the following action:

1. Issue instructions in clear, simple language.
2. Ask questions to make sure your employees understand.
3. Issue frequent reminders about the importance of following safety procedures.

D. If employees *deliberately disregard* safety instructions, take the following corrective action:

1. Reexamine your own attitude toward safety to make sure you're not undermining your own message.
2. Consider the possibility that your

▶ *What are we doing to overcome poor employee attitudes toward job safety and health in this department?*

▶ *What more can we do?*

LEHMAN 01502

employees are trying to express anger or resentment toward you, and then deal with the cause of their anger accordingly.

E. If employees *don't consider safety instructions important,* take the following action:

1. Make sure *you're* not taking safety for granted.
2. Make safety a routine part of new employee orientation.
3. Emphasize the link between safe work habits and performance appraisal.
4. Discipline employees who fail to obey safety rules.

LEHMAN 01503

WHY ARE SAFETY MEETINGS SO IMPORTANT?

Why is it so important that supervisors meet regularly with small groups of employees to discuss the various aspects of job safety and health? Because it is only through face-to-face contact that effective communication on the subject can take place. The open, informal atmosphere of a small group meeting encourages the kind of questions and discussion that "personalize" the issue of safety by focusing on its day-to-day applications. What other purposes do regular safety meetings serve?

They encourage safety awareness. Other means of getting the safety message across are often too easily ignored. But when a small group of workers gets together to discuss the hazards they have encountered and the steps they can take to eliminate them, it increases each worker's safety consciousness.

They get employees actively involved. In a sense, safety meetings put employees "on the spot"; that is, they demand feedback. They get employees thinking about safety and encourage them to come up with ideas and suggestions for preventing accidents and minimizing the hazards with which they are most familiar.

They motivate employees to follow proper safety practices. Small group meetings are the best place to demonstrate the uses of protective equipment, proper lifting techniques, and other specific safety procedures.

They can nip safety hazards in the bud. A department safety meeting is the time to pinpoint minor hazards before they result in real problems. It also presents a good opportunity to discuss hazards that are inherent in the environment and that experienced employees are likely to take for granted.

They introduce workers to new safety rules, equipment, and preventive practices. In addition to introducing new things, a safety meeting is a good time to reinforce the importance of long-standing safety procedures and to remind employees of the reasons behind them.

They provide vital information on accident causes and types. Regular meetings are the best way of keeping employees up-to-date on the hazards in their environ-

LEHMAN 01504

ment and what the company is doing about them. They also make it easier for the company to maintain accurate accident statistics, an important tool in tracing the progress of prevention efforts.

Types of Meetings

Departmental or work group safety meetings can take a number of different forms. One example is the "tailboard conference" used by public utility crews before they tackle a job. The crew gathers around its truck to discuss the work, laying out the tools and materials they'll need and deciding who will handle each task. Another example is a departmentwide meeting that is held shortly after an accident has occurred (see Meeting 3). Its purpose is to make other employees aware of the hazard, to discuss why the accident happened, and to head off similar incidents in the future. Some companies use small group meetings to supplement safety campaigns or to reinforce company policies. Such meetings usually focus on a specific safety problem—for example, fire prevention, proper lifting and carrying techniques, etc.

While safety meetings obviously require some planning and forethought, there is a danger in adhering to a set "formula." Employees quickly become blasé about attending meetings that are carbon copies of each other. This is why you, their supervisor, must go one step further and see to it that: (1) their interest is aroused and held; (2) they are not overloaded with information and ideas; (3) they are comfortable enough—both physically and emotionally—to prevent restlessness and encourage participation; and (4) they leave the room with an improved attitude and more useful information than they had when they came in.

Perhaps the most successful type of safety meeting—and one that lends itself to a small group format—is the weekly instructional meeting designed to provide employees with the pertinent facts about a specific hazard or safety procedure. Such meetings typically last only 5 or 10 minutes—long enough to get the information across but short enough to avoid boredom and restlessness. The meetings outlined in the following chapters can be presented as is or integrated into a longer meeting format. They make use of statistics, visual aids, and other devices to catch and hold employees' attention. But their impact on employees' attitudes and work practices depends on your ability to plan and communicate.

Preparation and Planning

Each chapter in this book presents you with a "script" for a meeting on a particular safety topic. No matter what topic you choose, there are a few guidelines you should follow in preparing for your meeting:

1. *Choose your topic carefully.* A subject that is related to a recent accident or the purchase of new machinery will make a greater impression on employees than a less timely topic.

2. *Gather your facts and figures.* Be sure they are complete and accurate. Consider whether they might have more impact in the form of a chart or other visual aid.

3. *Map out your presentation.* Decide ahead of time on the best way to present

LEHMAN 01505

the subject of the meeting. Try to anticipate your employees' questions and reactions. Outline what you hope to accomplish in terms of changed attitudes, reduced accident rates, etc.

4. *Set a time limit.* Decide on a realistic timetable and stick to it. Employees are more apt to pay attention when they know the meeting isn't going to drag on for hours.

5. *Practice your delivery.* You don't necessarily have to stand in front of a mirror and rehearse, but at least give some thought to how your employees will interpret your manner of presentation. Try to convey your sincerity and interest through your stance, gestures, and tone of voice.

6. *Devise strategies to get employees involved.* Think up questions requiring more than a Yes or No answer. Set aside some time at the end for discussion, and prepare some thought-provoking comments that will keep the discussion going.

How to Conduct a Meeting

If you've been thorough in your preparation and planning, the meeting will practically run itself. While most supervisors who are not in the habit of conducting weekly safety sessions will approach the task with some initial trepidation, experience usually lays these fears to rest.

Here are the basic steps that should be followed in conducting a meeting on almost any safety topic:

I. *Introduce the topic.* Tell the group in straightforward terms what the meeting is all about. If you have a punch line or some other good lead-in, use it; otherwise, keep it simple. Don't go overboard trying to be clever.

II. *Present the facts.* Be as concise as possible in providing your employees with any necessary background on the subject. Then present your facts and figures in as interesting a manner as possible.

III. *Demonstrate.* Acting out or role playing a safety procedure is one way of making sure your message has been received. Using visual aids is another (see section below on "Using Visuals and Statistics"). Anything you can do to demonstrate your points—and get employees involved in the demonstration—is going to give your meeting added impact.

IV. *Open the meeting up for discussion.* Use the discussion period to answer questions, clarify misunderstandings, and obtain feedback from employees. An active discussion is usually a good indication that your meeting has been successful.

V. *Summarize the major points.* When your time has run out, it's a good idea to recap what has been discussed and decided. If the group has agreed on steps to correct a hazard or improve an unsafe condition, this is the time to remind employees about what they have agreed to do.

LEHMAN 01506

Using Visuals and Statistics

The danger inherent in routine weekly meetings has already been mentioned. If you want to prevent a "ho-hum" attitude among employees, you're going to have to put forth a continual effort to keep your safety meetings lively and interesting. Audio-visual aids and carefully chosen statistics are two excellent means of reinforcing your points and at the same time maintaining a high level of interest among your listeners.

Statistics, for example, can be compiled from department records of accidents and injuries. In addition to providing the means for an objective evaluation of your department's overall progress in meeting company safety goals, statistics are also useful in pinpointing problem areas. For example, if 10 percent of the accidents that occurred throughout the department last year involved eye injuries, this is a good indication that your employees need more training in eye safety equipment and procedures.

Statistics can also be an effective motivational tool. Suppose you're trying to impress upon your employees the importance of wearing safety shoes. They may not come right out and say it, but most of them are probably thinking that the odds of dropping a heavy tool or piece of equipment on their feet are one in a million. They're bound to change their attitude, however, if you point out that X number of employees ended up on crutches last year because they didn't wear the proper footgear. It may sound like a negative approach to the subject of safety, but statistics have a way of driving the message home.

The same can be said of visual and audio-visual aids. Encompassing everything from homemade flip charts to slick, professionally made films, visual aids can be used to inform, persuade, motivate, and entertain; they can also be used to solve problems. But don't let your visual aids run your meeting. Visual aids are only effective when used to back up what *you* have to say.

How to Use This Book

Each of the meeting outlines that follow presents a suggested topic for a weekly safety talk lasting five to ten minutes—perhaps longer if a good discussion gets started. But your presentation should last no longer than that, and the meeting as a whole should be kept within a reasonable time limit. Select a time and a place conducive to attentive listening. Asking eight employees to crowd into a small office where most of them can't even sit down, for example, or scheduling the meeting for late Friday afternoon is guaranteed to undermine the best laid plans.

At the beginning of each meeting outline you will find a brief summary of what the meeting should accomplish ("Meeting Objective"), what materials you should bring with you, and how often meetings on this particular subject should be held. When visual aids or other supplementary materials are appropriate to the subject, they are either included or it is noted where they might be obtained. The meeting plan itself is presented in outline form so that you can easily follow it item for item or else adapt it to your company's needs. You will be more successful in getting your message across if you can inject a certain amount of spontaneity into your presentation—using anecdotes to illustrate your points, or drawing on experiences that your employees have shared. But the outline has been carefully organized to cover all the most significant points in the order in which they should be presented to employees.

LEHMAN 01507

When you have selected the topic for your weekly meeting, review the outline in advance to familiarize yourself with information and to see what supplementary material might be used to reinforce or illustrate it. If you can think of any appropriate anecdotes or examples of accidents that have occurred in your company, make a note on the outline wherever they might logically fit in. Keep the outline in front of you during the meeting and refer to it frequently so you don't get off on a tangent. If a point is raised in discussion that you would like to include in your next meeting on the subject, make a note in the margin.

If you plan to use visual aids with which you are not familiar, preview them first. Check out any equipment you will need—slide or overhead projectors, movie projectors, etc. If you're going to demonstrate a certain safety procedure, rehearse it briefly so that you don't waste time during the meeting trying to get it right. In short, do everything possible to make sure that the meeting runs smoothly. Employees will be easily distracted by disorganization, rambling discussion, or a malfunctioning movie projector. And the information you're trying to convey is too important to risk losing through mismanagement.

LEHMAN 01508

MEETING 1: Spotting Hazards

Meeting Objective: To encourage your employees to spot hazards in their immediate work area before they result in accidents or injuries.

Materials: Work up and mimeograph a list of common hazards in your department, as well as a sheet on accident statistics for your area; if possible, photographs of hazards spotted during the past week/month, etc.; if you have an inspection checklist, mimeograph it so employees can see what you look for—this will help them see what to look for themselves. (A broad inspection checklist is provided on page 12. Feel free to modify it to fit your department's needs.)

Frequency: At least twice a year; quarterly if accident rate is high or change in equipment, procedures, etc., have created new hazards.

I. How can you spot a hazard? Look around you and ask yourself, "How could an accident occur here?"

   A. Cite easy-to-spot hazards. (Give relevant examples from your department: frayed electrical cords, spills, unguarded machinery, etc.)

   B. Discuss hidden hazards. (Give examples: How much noise is too much noise? How do you know if fumes in the air are toxic? etc.)

   C. Most hazards fall into one of two categories: unsafe acts or unsafe conditions.

      1. Statistics reveal that for every on-the-job accident caused by unsafe conditions, roughly *four* can be attributed to unsafe acts.
         a. Therefore, concentrate your efforts on recognizing unsafe acts.
         b. List most common unsafe acts. (Give relevant examples of each from your department.)
            (1) Operating without authority
            (2) Failure to secure, e.g., ladders, materials, etc.
            (3) Failure to signal or warn
            (4) Operating at unsafe speed
            (5) Bypassing safety devices

LEHMAN 01509

(6) Using unsafe equipment
(7) Unsafe loading of materials
(8) Unsafe placing of materials
(9) Taking unsafe position or posture when handling materials
(10) Working on dangerous or moving equipment
(11) Horseplay
(12) Failure to lock out or tag out unsafe machinery

2. But don't overlook unsafe conditions; keep in mind that unsafe conditions are often the *result* of unsafe acts.
   a. List most common conditions leading to accidents and injuries. (Give examples of each.)
      (1) Lack of guards
      (2) Inadequate guards
      (3) Defects in equipment or materials
      (4) Hazardous arrangement of machines, tools, supplies, etc.
      (5) Improper illumination
      (6) Unsafe ventilation

D. Daily self-inspections are the best way to spot hazards in your area. (Pass out copies of your inspection checklist.)

1. Objective: to locate as many safety and health hazards as possible *before* they have a chance to cause an accident.

2. Know what you're looking for.
   a. Familiarize yourself with OSHA standards and regulations that apply to your job. (Note: It's a good idea to work with the company safety director in drawing up a list summarizing these regs. Then you can pass it out to employees during the meeting.)
   b. Familiarize yourself with existing safety checklists. (Pass out copies of checklist for your department.)
   c. Draw up your own inspection checklist; set up an inspection schedule for yourself (what to check daily, weekly, etc.).

E. Discuss other ways of identifying hazards.

1. Photo-inspections (If you have an instant-developing camera, use it to record hazards before and after they have been corrected. Bring the pictures to the next meeting and ask employees to identify "What is wrong with this picture?")

2. Past experience (Hand out sheets on most common hazards and accident statistics for your department. Discuss how analysis of accidents and injuries that have occurred in the past can be used to head off similar incidents in the future. Give examples.)

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INSPECTION CHECKLIST

The following checklist covers all the areas necessary for a successful safety inspection. A few of the items listed may not apply directly to your department, and a few others are items you may check only once a year. Feel free to modify it to fit your department's needs.

HOUSEKEEPING
[ ] Is the work area clean and orderly?
[ ] Are floors free from protruding nails, splinters, holes and loose boards?
[ ] Are aisles and passageways kept clear of obstructions?
[ ] Are permanent aisles and passageways clearly marked?
[ ] Are covers or guardrails in place around open pits, tanks and ditches?

FLOOR AND WALL OPENINGS
[ ] Are ladderways and door openings guarded by a railing?
[ ] Do skylights have screens or fixed railings which would prevent someone from falling through?
[ ] Do temporary floor openings have standard railings or someone constantly on guard?
[ ] Are wall openings with a drop of more than 4 feet guarded by a standard railing?
[ ] Are open-sided floors, platforms, and runways having a drop of more than 4 feet guarded by a standard railing and toeboard?
[ ] Do all stairways with 4 or more risers have a handrail?
[ ] Are stairways strong enough? too steep? adequately illuminated? slip resistant?

MEANS OF EXIT
[ ] Are there enough exits to allow prompt escape?
[ ] Do employees have easy access to exits?
[ ] Are exits unlocked to allow egress?
[ ] Are exits clearly marked?
[ ] Are exits and exit routes equipped with emergency lighting?

PERSONAL PROTECTIVE EQUIPMENT
[ ] Is required equipment provided, maintained and used?
[ ] Does equipment meet requirements? Is it reliable?

EMPLOYEE FACILITIES
[ ] Are facilities kept clean and sanitary?
[ ] Are toilets kept clean and in good repair?
[ ] Are cafeteria facilities provided where toxic chemicals are used? Do employees use them?

MEDICAL AND FIRST AID
[ ] Is there a hospital, clinic or infirmary nearby?
[ ] Are there employees trained as first-aid practitioners on each shift worked?
[ ] Are physician-approved first-aid supplies available?
[ ] Are first-aid supplies replenished as they are used?

FIRE PROTECTION
[ ] Are fire extinguishers chosen for the type of fire most likely in that area?
[ ] Are there enough extinguishers present to do the job?
[ ] Are extinguisher locations conspicuously marked?
[ ] Are extinguishers properly mounted and easily accessible?
[ ] Are all extinguishers fully charged and operable?
[ ] Are special purpose extinguishers clearly marked?

MATERIALS HANDLING AND STORAGE
[ ] Is adequate clearance allowed in aisles where materials must be moved?
[ ] Are tiered materials stacked, interblocked, locked and limited in height to maintain stability?
[ ] Are storage areas kept free of tripping, fire, explosion and pest hazards?
[ ] Is proper drainage provided?
[ ] Are signs warning of clearance limits posted?
[ ] Are powered industrial truck operators adequately trained?

MACHINE GUARDING
[ ] Are point-of-operation guards in place and working on all operating equipment?
[ ] Are all belts and pulleys less than 7 feet from the floor (and within reach of workers) guarded?
[ ] Are spinning parts guarded?

ELECTRICAL
[ ] Are all machines properly grounded?
[ ] Are portable hand tools grounded or double insulated?
[ ] Are junction boxes closed?
[ ] Are extension cords out of the aisles where they may be abused by heavy traffic?
[ ] Are extension cords being used as permanent wiring? It's a dangerous thing to do.

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MEETING 2: Reporting Hazards

Meeting Objective: To acquaint employees with hazard reporting procedures and safety suggestion program; to stress their responsibilities to report hazards and suggest changes.

Materials: Hazard report forms and safety suggestion forms (can be mimeographed from examples provided on pages 14 and 15).

Frequency: Twice a year or quarterly; should always follow Meeting 1.

I. Reporting procedures (what to do when you spot a health or safety hazard.)

   A. If the hazard is easy to correct, do so immediately.

   B. Whether or not you have been able to correct the hazard, fill out a "hazard spot card" or appropriate report form and hand it to your supervisor (pass out copies of appropriate report form).

      1. Note the following information about the unsafe act or unsafe condition.
         a. *Where* the hazard was spotted
         b. *Date* and *time*
         c. *Nature* of hazard
         d. Your *name* and names of any other employees involved (Stress that these reports are *not* to be used to pin the blame on anyone.)
         e. *Action* taken or recommended to control/eliminate the hazard.

II. Safety Suggestion Program as a means of eliminating unsafe conditions (Hand out safety suggestion forms.)

   A. How suggestion program works (location of suggestion boxes, monetary or other rewards, etc.)

   B. When to submit a suggestion to safety committee rather than filling out

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hazard report form or taking corrective action on your own

1. When the suggested action to eliminate the hazard is beyond your control or authority (e.g., changing work method or procedures)

2. When the danger is not imminent

3. When the suggestion involves an innovation (e.g. designing a new machine guard or inventing a safety device)

C. Example of a hazardous procedure or condition that was eliminated through employee's suggestion

III. Discussion/question-and-answer period (Ask employees to recall hazards they have spotted recently and then review the steps they should take.)

HAZARD IDENTIFICATION FORM

Employee name _____ Date _____
Department _____
Supervisor _____
Department head _____

DESCRIBE HAZARD:

Location _____
Time spotted _____
Describe hazard thoroughly _____

Immediate action taken _____

Supervisor's comments _____

Supervisor's signature _____ Date _____
Department head's signature _____ Date _____

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SAFETY SUGGESTION FORM

Employee name _____ Date _____
Department _____
Supervisor _____
Department head _____

SUGGESTION (describe fully, include department involved) _____

Supervisor's comments _____

Department head's comments _____

Supervisor's signature _____ Date _____
Department head's signature _____ Date _____

MEETING 3: What Went Wrong?

Meeting Objective: To determine the cause and the circumstances surrounding an accident that has just occurred; to decide what action should be taken to avoid a similar accident in the future.

Materials: Blackboard and chalk; supervisor's accident investigation or report forms so employees can see what information is important. (OSHA Form 101, reproduced on page 17, will give them a good idea.)

Frequency: Unscheduled meeting; called whenever an accident has taken place.

I. What happened (Stress to employees that the purpose of the meeting is to discover the *facts* surrounding the accident, not to find fault or place the blame on any individual.)

   A. Employee's account (if not injured or if injuries do not require immediate medical attention)

   B. Witnesses' account (if any other employees saw the accident take place)

[Participants in or witnesses to the accident should be allowed to speak freely, without interruption. If there is a disagreement that can't be resolved, make a note of it for further investigation.]

II. The key facts (Use the blackboard to jot them down.)

   A. *Nature of injury*

   B. *Part of body* injured or affected by injury

   C. *Source of injury*—object, substance, or bodily motion that produced injury

   D. *Type of accident* or manner in which person was injured

   E. *Hazardous condition* or circumstances

   F. *Agency of accident*—object, substance, or part of the premises in which hazardous condition existed (Be specific.)

   G. *Unsafe act* that caused or permitted the accident to occur

III. Why are these facts important? (Use the accident as an example for each of the following, if applicable.)

   A. They help us identify the source of the accident so that corrective action can be taken.

   B. They make it easier for us to compile statistics that reveal patterns of accident occurrence within the department.

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C. They indicate the need for changes in methods, procedures, equipment, layout, etc.

D. They reveal the need for additional safety training.

E. They help us evaluate the progress of our accident prevention program.

F. They pinpoint the information needed to fill out the accident investigation/report form.

IV. What can be done to ensure that an accident like this doesn't happen again?

A. Open discussion (Let employees suggest solutions, preventive measures, etc.)

B. Summary (Try to reach a consensus on what concrete steps can be taken to eliminate the hazard that caused the accident or correct the behavior that resulted in injury; write these steps down on the blackboard and leave the board standing for a few days where employees will be reminded of what is to be done.)

OSHA No. 101
Case or File No._____

Form approved
OMB No. 44R 1453

SUPPLEMENTARY RECORD OF OCCUPATIONAL INJURIES AND ILLNESSES

EMPLOYER

1. Name _____
2. Mail address _____
(No. and street) (City or town) (State)
3. Location, if different from mail address _____

INJURED OR ILL EMPLOYEE

4. Name _____ Social Security No._____
(First name) (Middle name) (Last name)
5. Home address _____
(No. and street) (City or town) (State)
6. Age_____ 7. Sex: Male_____ Female_____ (Check one)
8. Occupation _____
(Enter regular job title, not the specific activity he was performing at time of injury.)
9. Department _____
(Enter name of department or division in which the injured person is regularly employed, even though he may have been temporarily working in another department at the time of injury.)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____
(No. and street) (City or town) (State)
If accident or exposure occurred on employer's premises, give address of plant or establishment in which it occurred. Do not indicate department or division within the plant or establishment. If accident occurred outside employer's premises at an identifiable address, give that address. If it occurred on a public highway or at any other place which cannot be identified by number and street, please provide place references locating the place of injury as accurately as possible.
11. Was place of accident or exposure on employer's premises?_____ (Yes or No)
12. What was the employee doing when injured? _____
(Be specific. If he was using tools or equipment or handling material, name them and tell what he was doing with them.)
13. How did the accident occur?_____
(Describe fully the events which resulted in the injury or occupational illness. Tell what happened and how it happened. Name any objects or substances involved and tell how they were involved. Give full details on all factors which led or contributed to the accident. Use separate sheet for additional space.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

14. Describe the injury or illness in detail and indicate the part of body affected. _____
(e.g.: amputation of right index finger at second joint; fracture of ribs; lead poisoning; dermatitis of left hand, etc.)
15. Name the object or substance which directly injured the employee. (For example, the machine or thing he struck against or which struck him; the vapor or poison he inhaled or swallowed; the chemical or radiation which irritated his skin; or in cases of strains, hernias, etc., the thing he was lifting, pulling, etc.)
16. Date of injury or initial diagnosis of occupational illness _____
(Date)
17. Did employee die?_____ (Yes or No)

OTHER

18. Name and address of physician _____
19. If hospitalized, name and address of hospital _____

Date of report_____ Prepared by _____
Official position_____

MEETING 4: Lifting and Carrying

Meeting Objective: To reduce back injuries by teaching employees the proper lifting and carrying techniques.

Materials: Slides, posters, charts, or other visual aids demonstrating how to lift and carry heavy loads; statistics on back injuries for your department; a heavy box or load for demonstration purposes.

Frequency: Quarterly; more often if back injuries are on the rise or if you observe employees lifting improperly.

I. Statistics on injuries resulting from improper lifting and carrying (If you have compiled statistics for your own department or work area, use them to draw employees' attention to the seriousness of the problem.)

   A. Manual handling of materials accounts for approximately 25 percent of all occupational injuries.

   B. In some industries, 90 percent of those employees suffering from back pain attribute it to work-related accidents—as opposed to only 30 to 50 percent in the general population.

   C. Low back pain is second only to head colds as the leading cause of absenteeism. Right now, 7 million employees are being treated for chronic back problems and new cases occur at the rate of about 2 million a year.

II. Types of injuries and ways of avoiding them

   A. What kinds of injuries might result from improper lifting and carrying? (Give examples.)
      1. Injuries to the hands and fingers—cuts, splinters, pinched fingers, etc.
      2. Injuries to the feet, toes, and legs—losing balance or dropping a heavy object
      3. Injuries to the eyes, head, and trunk—opening a wirebound box or

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bale, handling cable or metal strapping, etc.

4. Hernias and back injuries—most common of all

B. Most of the strains, sprains, fractures and bruises that result from handling materials on the job are caused by *unsafe practices*.

1. Improper lifting
2. Carrying too heavy a load
3. Incorrect gripping
4. Failing to observe proper foot or hand clearances
5. Failing to use or wear proper equipment

C. Note some ways to avoid these injuries.

1. Eliminate the need to lift materials manually by using mechanical lifting devices whenever possible.
2. Select employees who are physically qualified for the job—pre-employment physical exams are used to determine how much an employee can safely lift.
3. Train employees to lift properly.

III. How to lift and carry safely (Set up charts, posters, or slides showing proper techniques; arrange for employee demonstration.)

A. Before you lift anything, follow this procedure.

1. Inspect materials for slivers, jagged edges, burrs, rough or slippery surfaces, protruding nails, etc.
2. Make sure your hands are free of oil and grease.
3. Wipe off any wet, greasy, slippery or dirty objects before trying to handle them.
4. Get a firm grip on the object.
5. Keep your fingers away from pinch points.
6. Wear the appropriate protective clothing (safety shoes, hand leathers or gloves, etc.).

B. Assume the correct posture for lifting. (Demonstrate or illustrate.)

1. Keep your feet parted—one alongside, one behind the object.
2. Keep your back straight, but not necessarily vertical.
3. Tuck your chin in.
4. Grip the object with the whole hand.
5. Tuck your elbows and arms in.
6. Keep your body weight directly over your feet.

C. Follow these steps for lifting, carrying, and setting the load down. (Demonstrate or illustrate.)

1. Size up the load, estimating weight, size and shape. If the load is too much to handle, get help.
2. Stand close to the object, keeping your feet 8-12 inches apart for

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good balance.

3. Bend the knees to a comfortable position and get a good handhold.
4. Using both leg and back muscles, lift the load straight up. Move smoothly and easily, pushing with the legs and keeping the load close to your body.
5. Lift the object to carrying position. Avoid twisting and turning about until the lift is completed.
6. To turn the body, change foot positions and check to see that your path of travel is clear before moving.
7. To set the load down, bend the knees using leg and back muscles. When load is securely positioned, release it.

D. Discuss the handling of specific shapes. (Demonstrate special techniques for any of the following that apply to the work performed by your employees.)

1. Boxes or cartons
2. Bags or sacks
3. Barrels and drums
4. Long objects (ladders, lumber, pipe, etc.)
5. Flat material (glass, sheet metal, plywood, etc.)
6. Others

E. Discuss team lifting and carrying. (Demonstrate if applicable.)

1. Load should be distributed equally.
2. Coordinate your movements with those of the other person so you both start and finish the lift action at the same time and turn together.

IV. Accessories for lifting and carrying (Discuss the location and proper use of the following, if applicable.)

A. Hooks and handles
B. Crowbars
C. Rollers and cradles
D. Jacks
E. Handtrucks, dollies, wheelbarrows
F. Shovels
G. Others

V. Importance of physical fitness

[If your company has a physical fitness program that includes special exercises to strengthen leg and back muscles for lifting, this is the time to review the need for these exercises and to remind employees of the purpose they serve.]

VI. Discussion/question-and-answer session (Summary of major points; good idea to call on a couple of employees to demonstrate techniques reviewed during meeting.)

MEETING 5: Forklift Safety

Meeting Objective: To instruct employees in the proper techniques for operating and maintaining power lift trucks.

Materials: Slides or photographs illustrating safe procedures; forklift operator's and maintenance checklist (see pages 23 and 24); list of hazards that you've compiled from misuses spotted in your department.

Frequency: Twice a year.

I. While the use of a forklift or other types of materials handling equipment reduces the possibility of injuries resulting from lifting and carrying, it creates other safety hazards; accidents involving operators and pedestrians, piling of materials, etc.

   A. One third to one half of all industrial truck accidents involve injuries to pedestrians. Therefore, training in safe procedures should extend not only to operators but to other personnel so that they will be more aware of the hazards they face.

   B. Cite the most common situations resulting in accidents.
      1. Failure to chock wheels of a trailer that is being unloaded by a forklift
      2. Failure to use a forklift with the correct lift capacity
      3. Overloading
      4. Failure to look while driving in reverse
      5. High tiering
      6. Excessive forward or reverse tilt
      7. Operating at excessive speeds
      8. Accepting hitchhikers
      9. Driving a forklift as you would a car
      10. Abandoning a "live" forklift

   C. Cite recurrent misuses that you've spotted. (Pass out list of misuses that you've compiled and discuss with employees.)

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II. Safety rules and regulations involving forklifts (Show slides or photos demonstrating safety procedures; expand the list below to meet your company's requirements. Pass out operator's checklist.)

A. Be aware of the fact that operating a forklift is *not* like driving a car. Discuss how a forklift is operated.
   1. Steered by the *rear* wheels
   2. Steers more easily when loaded
   3. Often driven in reverse
   4. Often steered with one hand, the other being used to operate the controls

B. Operate forklifts within appropriate speed limits. (Be specific.)
   1. Start and stop gradually to prevent load from shifting.
   2. Turn at a safe speed, smoothly and gradually.

C. Learn to judge correct aisle width for the truck size and load.

D. Watch out for overhead structures (sprinkler systems, electrical conduits, etc.).

E. Park the forklift—with forks on the ground, brakes set, and engine off—before you walk away from it. Never park forklift in an aisle or doorway, or obstruct materials or equipment that someone may need access to: an unauthorized worker may be tempted to move it.

F. Use the mirrors that are mounted at corners and in blind spots to see pedestrians and oncoming vehicles.

G. If the load obstructs your view, operate the truck in reverse, but never back up without looking.

H. Sound horn when approaching pedestrians.

I. Never take on passengers.

J. Do not raise or lower loads en route.

K. Be familiar with and observe the maximum load limit for your truck.
   1. Refuse unstable or excessive loads.
   2. Make sure irregular shaped materials are secured.

L. Go slowly when ascending or descending a grade.
   1. If grade exceeds 10 percent, drive with load upgrade.
   2. If truck is unloaded, drive with forks downgrade.
   3. Tilt load back on all grades.
   4. Use low gear when descending a grade.

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M. Never use a forklift as an elevator unless a safety pallet, with handrails and toeboards, is securely seated on the forks.

III. Inspection and maintenance responsibilities

A. Even when mechanical malfunction results in an accident, the operator is at fault.

B. Every forklift operator should check out a machine before using it. (Pass out maintenance checklist; discuss each item briefly if necessary.)

1. Engine oil level
2. Radiator water level
3. Fuel level
4. Obvious damage or leaks
5. Condition of tires
6. Head and tail lights
7. Warning light
8. Hour meter
9. Other gauges and instruments
10. Horns
11. Steering
12. Service brakes
13. Parking brake
14. Hydraulic controls

FORKLIFT MAINTENANCE CHECKLIST

Before operating your forklift, check the following items. Return the checklist to your supervisor.

[ ] engine oil level
[ ] radiator water level
[ ] fuel level
[ ] check for damage or leaks
[ ] tire condition
[ ] head and tail lights
[ ] warning light
[ ] hour meter
[ ] other gauges and instruments
[ ] horns
[ ] steering
[ ] service brakes
[ ] parking brake
[ ] hydraulic controls

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FORKLIFT SAFETY CHECKLIST

Only trained drivers will be allowed to operate forklift trucks. Untrained operators are a danger to themselves and others. The following are not merely guidelines. They are minimum standards of safety in the operation of forklifts. Each operator should study them, know them, and follow them.

1. Check equipment to see that it is in safe operating condition. If in doubt, contact _____, and do not operate until approval is given.
2. Do not speed, and do not stop suddenly.
3. Slow down at intersections and sound horn.
4. Be on the alert for pedestrians. Slow down and sound the horn to clear the aisle.
5. Face the load squarely, and enter pallets with forks level and under the load as far as possible.
6. Do not attempt to exceed the capacity of your forklift by carrying loads which are too heavy or unbalanced.
7. Operators should face their destination. If unable to see over the load, the truck should be driven backwards.
8. When unloaded, the truck's forks should be to the floor and all the way in. When loaded, the truck's forks should be high enough to clear the floor and not be overextended.
9. When traveling, watch for low entrances and overhead obstructions.
10. Use safety cages and belts to give solid and secure footing when order-picking.
11. Never leave a forklift unattended.
12. When parked, forks should be flat to the floor, shift levers in neutral, and the brake set.
13. Never allow people to ride the forks.
14. Avoid oily floors. If you spot an oil spill, notify Maintenance immediately.
15. Learn the dimensions of storage racks. Place loads on racks squarely, securely, and with no overhang.

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MEETING 6: Dock Plates, Conveyors, and Cranes

Meeting Objective: To review the safety procedures for the use of dock plates, conveyors, and cranes; to create an awareness of the hazards involved not only among operators but among other personnel.

Materials: Drawings, photographs, or slides showing safe and/or unsafe practices.

Frequency: Once or twice a year.

I. Selection standards for operators

   A. Operators of industrial trucks, cranes, and conveyors must possess certain physical qualities as well as the proper training and authority to handle their equipment safely. (Ask employees *why* each of the following physical qualifications is important.)
      1. Good vision
      2. Good hearing
      3. Fast reactions
      4. Coordination
      5. Strong, healthy heart and absence of any illness that might cause fainting

   B. Discuss the importance of preselection physical exam.

   C. In short, the severity of the hazards involved in the use of loading and unloading equipment warrants the strictest possible selection and training standards.

II. Dock plates (bridge plates)

   A. Basic safety procedures
      1. Dock plates should be fastened down to prevent them from "walking" or sliding when in use.
      2. Plates should be large and strong enough to hold the heaviest load, including the equipment. Use a safety factor of 5 or 6.

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3. Edges should be turned up, or angle iron can be welded to the edges, in order to keep trucks from running over the edge.
4. Plates should be kept in good condition, with no curled corners or bends. They should be kept clean and dry—clear of snow and ice, and free of oil or grease.
5. To use a plate, employees should slide it into place, not drop it. It must be kept under control and not allowed to bounce.
   a. Large plates should be set in place by mechanical equipment.
   b. If mechanical equipment is not available, sufficient people should be assigned to the job and handholds or other means of safe handling provided.
6. The wheels of trucks or trailers backed up to the dock should be blocked or chocked to prevent movement.
7. When not in use, dock plates should be placed safely to avoid tripping hazards. They should not be stored on edge.
8. Other company safety rules should be discussed.

III. Conveyors (belt, slat, apron, chain screw, bucket, pneumatic, aerial, portable, gravity, live roll, and vertical types)

A. Basic safety procedures
   1. Never let anyone ride on conveyors.
   2. Pinch points (gears, chain drives, and revolving shafts) should be guarded and the guards left in place.
   3. Power should be shut off and switch locked out during servicing.
   4. Gravity conveyors should be equipped with earning devices or protective devices to prevent people's hands from being caught.
   5. Pneumatic conveyors must be shut off and locked before inspections or repairs are made, in order to keep material from being blown into worker's face. Inspector should wear goggles and, if necessary, respiratory equipment.
   6. Screw conveyors should be completely enclosed whenever possible. Any exposed sections should be covered with a metal grate or a solid metal plate.
   7. The entire conveyor mechanism should be inspected periodically, and any part showing signs of excessive wear should be replaced immediately.
      a. Schedule for inspections
      b. Points to inspect: brakes, backstops, antirunaway devices, overload releases, etc.
   8. All machine parts should be lubricated according to manufacturer's instructions.

B. Operating precautions (Refer to company safety manual.)

C. Maintenance and inspection procedures

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IV. Cranes

A. Basic safety procedures

1. Standard signals should be thoroughly understood by both operator and signalman.
2. People working with or near a crane should keep out from under the load, should be alert at all times, and should watch warning signals closely.
3. No crane should be loaded beyond its rated load capacity and the weight of all auxiliary handling devices (hoist blocks, hooks, slings) must be considered part of the load rating. Legible rating charts should be fixed to the crane cab where operator can refer to them easily.
4. Hoist chain or rope must be free from kinks or twists and must not be wrapped around the load; loads must be attached to the load block hook by means of a sling or other approved device.
   a. Load must be secured and properly balanced in the sling or lifting device.
   b. Before starting to hoist, make sure multiple part lines are not twisted around each other.
5. Hooks should be brought over load slowly to prevent swinging. During hoisting operation, there should be no sudden acceleration or deceleration of the moving load.
6. Cranes must not be used for side pulls, unless specifically authorized by a responsible person.
7. Never hoist, lower, or travel while an employee is on the load or hook, and never carry loads over people.
8. Test brakes each time a load approaching the rated load capacity is handled.
9. Operator must not leave his or her position at the controls while load is suspended.

B. Maintenance and inspection procedures

V. Discussion/summary of major points

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MEETING 7: Ropes, Chains, and Slings

Meeting Objective: To familiarize employees with the properties, uses, and care of ropes, chains, and slings.

Materials: Samples of worn and damaged ropes, wire ropes, and chains.

Frequency: Once or twice a year.

I. Safety precautions for the use of ropes

A. Different types of rope; importance of understanding the properties of each

1. Fiber ropes—manila, sisal, hemp, nylon (Summarize uses in your department.)
   a. Safe working loads
   b. Breaking strengths
   c. Maintenance procedures
      (1) Cleaning
      (2) Drying
      (3) Proper storage
   d. Avoiding unnecessary wear and tear
   e. Splicing techniques
   f. Inspection schedule and procedures

2. Rope slings (primarily manila)
   a. Basic precautions
      (1) Make sure sling is in good condition and of sufficient strength.
      (2) Reduce load by one half after six months, even if sling shows no signs of wear.
      (3) If sling shows evidence of cuts, excessive wear, or other damage, destroy it.

3. Wire rope
   a. Reasons used instead of fiber
      (1) It has greater strength for same diameter and weight.
      (2) Its strength is constant when wet or dry.

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(3) It has constant length under varying weather conditions.
(4) It has greater durability.

b. Causes of deterioration (Show samples.)
(1) Wear (particularly on outside wires)
(2) Corrosion (interior wires)
(3) Kinks (from improper installation, hoisting with slack in rope, etc.)
(4) Fatigue (due to excessive bending stresses, whipping, vibration, pounding, etc.)
(5) Drying out (heat and operating pressures)
(6) Overloading
(7) Overwinding
(8) Mechanical abuse (pinching, cutting, or dragging)

c. How to improve safety and efficiency
(1) Using sheaves and drums of suitable size and design
(2) Proper lubrication
(3) Proper maintenance of rope and hoisting equipment

d. Inspection and replacement schedule and procedures

II. Safety precautions for chains and chain slings

A. Types of chain and uses of each
1. Alloy steel chain
2. Wrought iron chain (largely replaced by alloy chain)
3. Heat-treated carbon steel chain (for chain slings)
4. Special-purpose alloy chains (resistance to corrosive substances)
5. Proof coil chain (miscellaneous uses; *never* used for slings)

B. Load limits and break test limits for types of chain in use in your depart ment
1. Causes of failure (Show samples.)
a. Embrittlement caused by cold working of metal surface
b. Failure of weld
c. Repeated severe bending or deformation of links
d. Metal fatigue
e. Brittleness caused by defects in the metal
f. Tensile failure—full elongation of the links

C. Hooks and attachments

D. Inspection procedures (Look for the following.)
1. Bent links
2. Cracks in weld area, shoulders, or other sections
3. Transverse nicks and gouges
4. Corrosion pits
5. Elongation

E. Safe practices (Refer to company safety rules.)

III. Discussion/summary of major points

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MEETING 8: Materials Storage

Meeting Objective: To review the proper methods of stacking and storing the materials used by employees; to alert them to the hazards posed by unsafe storage practices.

Materials: Drawings, photographs, or slides illustrating safe and unsafe storage methods.

Frequency: Quarterly.

I. Materials storage may not seem like a particularly hazardous area, but it can pose unexpected dangers that result in serious injuries. (If you can think of an example from your experience to illustrate each of the following, use it.)
   A. Toppling over of heavy materials that have been improperly stacked
   B. Collisions between improperly stored materials and forklifts or pedestrians
   C. Breakage of containers with hazardous or toxic substances
   D. Obstruction of fire-fighting equipment, first-aid equipment, fuse boxes, etc., that are needed in an emergency
   E. Fire hazards posed by improper storage of flammable and combustible materials

II. General safety precautions (Use illustrations.)
   A. Follow the storage plan for your area.
      1. Planned storage minimizes the handling necessary to bring materials into production and move them out for shipping.
      2. A good storage plan avoids obscuring emergency equipment, sprinkler systems, lights, etc.

   B. Observe proper clearances.
      1. At least 18 inches clearance below sprinkler heads should be allowed to reduce interference with water distribution (36 inches if material being stored is flammable).
      2. Aisles carrying one-way traffic should not be less than three feet wider than the widest vehicle is when loaded.
      3. Keep materials out of aisles and out of loading and unloading areas.

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C. Use racks, pallets, or skids whenever possible. Material stored in this way can be moved easily and quickly with less material damage and fewer injuries. When possible, material piled on skids or pallets should be cross-tied.

D. Know the maximum height limits for piling or stacking materials and observe maximum height lines.

E. Consider the shape of the container.

1. Cartons
   a. Sheets of heavy wrapping paper placed between layers of cartons will help prevent shifting.
   b. Cross-tying will prevent shifting and sagging and permit higher stacking.
   c. Remember that increased humidity may cause corrugated paper cartons to slump.
2. Bags
   a. Bagged materials should be cross-tied with the mouths of the bags toward the inside of the pile.
   b. Piles over five feet high should be stepped back one row. Step back an additional row for each additional three feet of height.
   c. Sacks should be removed from the top of the pile, not halfway up or from a corner.
3. Bar stock and pipes
   a. Don't let material protrude into aisles.
   b. Larger diameter bars and pipes should be piled in layers separated by strips of wood or iron bars.
   c. When making a pyramid pile, set the pieces down rather than drop them, and never use hands or feet to stop rolling or sliding materials.
4. Sheet metal
   a. Handle with hand leathers or leather gloves, or gloves with metal inserts.
   b. Large amounts should be handled in bundles by power equipment.
5. Barrels or kegs
   a. If stored on their sides, barrels should be pyramided with the bottom rows securely blocked.
   b. If piled on end, the layers should be separated by planks.
6. Other containers requiring special storage methods

F. Consider the contents. (Discuss special storage considerations for any of the following materials that apply to your area.)
1. Hazardous liquids (acids, etc.)
2. Gas cylinders
3. Combustible solids
4. Others

III. Discussion/summary of major points

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MEETING 9: Ladder Safety

Meeting Objective: To review the safety standards and recommended safety precautions relating to the use of ladders; to cut down on the number of accidents resulting from falls and improper use.

Materials: Diagrams, photographs, or slides illustrating various safe and unsafe practices.

Frequency: Two or three times a year, depending on the extent to which ladders are used in your work area.

I. Ladder safety standards (Briefly review safety standards and company rules concerning ladders.)

   A. Construction
   B. Coating (wood ladders)
   C. Nonslip bases and safety tops
   D. Markings
   E. Storage
   F. Inspection (Pass out ladder inspection checklist.)

II. Safe practices (Illustrate with diagrams or photographs.)

   A. Placement
      1. Use the four-to-one ratio; that is, place the ladder so its feet are one foot away from what it leans against for every four feet in height to the point where the ladder rests. Example: If the top of a 16-foot ladder leans against a wall, its feet should be placed four feet from the wall.
      2. Never use a ladder in a horizontal position as a runway or scaffold.
      3. Never place a ladder in front of a door that opens toward it unless the door is locked, blocked, or guarded by someone.
      4. Place a portable ladder so that both side rails have secure footing. Provide solid footing on soft ground to prevent the ladder from sinking.

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5. Place the ladder's feet on a substantial and level base, not on movable objects.
6. Never lean a ladder against unsafe backing, such as loose boxes or barrels.
7. When you use a ladder for access to high places, securely lash or otherwise fasten the ladder to prevent its slipping.
8. Extend the ladder's side rails at least three feet above the top landing.

B. Ascending or descending a ladder
1. Hold on with both hands when going up or down. If material must be handled, raise or lower it with a rope.
2. Always face the ladder when ascending or descending.
3. Never slide down a ladder.
4. Be sure that your shoes are not greasy, muddy, or slippery before you climb.
5. Do not climb higher than the third rung from the top on straight or extension ladders, or the second tread from the top of stepladders.

C. Electrical hazards
1. Since metal ladders are electrical conductors, they should never be used around electrical circuits or in places where they may come in contact with such circuits.
2. Metal ladders should be marked with signs or decals reading "Caution: Do not use near electrical equipment."

D. Other safety precautions
1. Never use makeshift ladders, such as cleats fastened across a single rail.
2. Be sure that a stepladder is fully open and the divider locked before you start to climb it.
3. Before using a ladder, inspect it for defects.
4. Never use a defective ladder. Tag or mark it so that it will be repaired or destroyed.
5. Don't splice short ladders together—they won't be strong enough.
6. Keep ladders clean and free from dirt and grease, which might conceal defects.
7. Don't use ladders during a strong wind except in an emergency, and then only when they are securely tied.
8. Do not leave placed ladders unattended, especially outdoors, unless they are anchored at top and bottom.

III. Discussion/summary of major points

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MEETING 10: Safety Belts and Life Lines

Meeting Objective: To review the types, uses, inspection and care procedures, and precautions associated with safety belts and life lines.

Materials: Different types of safety belts and life lines used by your employees, for demonstration purposes.

Frequency: Twice a year; more often if use of belts and life lines is widespread.

I. Who needs safety belts and life lines?
   A. Employees who work at high levels
   B. Employees who work in closed spaces where the air supply may not be adequate
   C. Employees who work where they may be buried by loose materials or injured in confined spaces

II. Safety belts
   A. Two basic types of use
      1. Normal use—comparatively mild stresses more or less regularly applied to belt in regular course of work
         a. Hoisting or lowering a worker
         b. Providing employee with steady support while working
      2. Emergency use—stopping a worker safely if he or she should fall
         a. Impact force considered when selecting the proper safety belt
         b. Impact force depends on
            (1) Weight of employee
            (2) Distance of fall
            (3) Suddenness of stopping—most important factor

   B. Types of belts (Discuss the types used by your employees.)
      1. Body belts: for limited movement and positioning to restrict worker to a safe area to prevent fall
      2. Chest harness: used where freedom of movement is most important and where only limited-fall hazards exist

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3. Body harness: for use when worker must move about at dangerous heights
4. Suspension belt: for use where it is not possible to work from a fixed surface and employee must be totally supported by suspension harness

C. Care of safety belts
   1. Cleaning
   2. Drying
   3. Oiling (leather belts)
   4. Avoidance of excessive heat

D. Inspection and testing
   1. Inspection before each use and periodic inspection schedule
   2. Inspection of leather and fabric
   3. Inspection of hardware
   4. Testing procedures

III. Life lines
   A. Types of rope used (manila, nylon, etc.) and properties of each
   B. Importance of knowing the breaking strength
   C. Shock-absorbing devices
   D. Danger associated with knots
   E. Inspection and care
      1. Examination for cuts and broken fibers
      2. Look for discoloration and deterioration
      3. Cleaning procedures

IV. Discussion/summary of major points

LEHMAN 01534

MEETING 11: Safety on Scaffolding

Meeting Objective: To review the hazards associated with working on scaffolds and the precautions that must be taken to prevent accidents.

Materials: Slides or photographs showing the types of scaffolding used by your employees and illustrating safe practices.

Frequency: Twice a year; more frequently if scaffolding is in constant use.

I. Types of scaffolds and basic safety standards

   A. Types of scaffolds in common use
      1. Tubular scaffolds
      2. Suspended scaffolds
      3. Mobile (rolling) scaffolds

   B. Safety standards (Discuss each item briefly.)
      1. Strength: scaffold designed to support at least four times the anticipated weight of workers and materials
      2. Railings and toeboards
      3. Overhead protection
      4. Means of access (Review basic ladder safety steps.)

II. Two basic safety hazards: falls and injuries from falling objects

   A. Preventing falls (Give illustrations.)
      1. Inspect the scaffold you are going to work on before you use it.
      2. If you have to climb ladders to get onto the scaffold, watch your step and observe all safe practices regarding the use of ladders. (See Meeting 9.)
      3. Hold on to the siderail extension of the ladder when getting on and off the scaffold working platform, and don't carry material up or down the ladder.
      4. Keep scaffold free of waste material, which can cause tripping or falling accidents.

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5. In winter, clean ice and snow off the scaffold before you use it.
6. Make sure that handrails and toeboards are secure.
7. Check to see that scaffold planks do not project more than six inches beyond the crossbeams. If the planks are too long, they may tip.
8. Never use a makeshift scaffold.
9. Never jump from the scaffold to the ground.
10. Never ride on a scaffold that is being moved by someone below.
11. Make sure that you lock the castor brakes or block rollers on rolling scaffolds before you get up on the scaffold to work.

B. Eliminating falling-object hazards (Give examples.)
1. Observe good housekeeping rules on scaffold platforms.
2. Make sure that toeboards are in place to prevent material from being kicked off.
3. Don't allow tools or material to lie loose on a scaffold platform. Clean the platform at the end of each work shift.
4. If there is anyone working above you, there should be overhead protection on your scaffold—in addition to your hard hat.
5. Never throw any tool or other object to another person.
6. Always pass material that is to be shifted from one person to another; if material or tools are raised or lowered, use a hand line with bucket or canvas bag.
7. A person at floor level who is hoisting a load with a hand line or lowering a load from a scaffold platform should stand in the clear, just in case the line snags and dumps the load unexpectedly.
8. If masonry chipping or demolition work is being done, place a wire mesh screen in the space between the platform and the top handrail. Tarpaulins can be laid on the platform itself to prevent material from falling through.
9. Where falling objects may be a regular hazard, hard hats are a must.

C. Testing scaffold planks

D. Other company safety regulations concerning scaffolds

III. Discussion/summary of major points

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MEETING 12: Hand Tools

Meeting Objective: To review the basic rules for hand-tool safety and to explain the reasons behind company tool control and maintenance procedures.

Materials: Frequently used hand tools for demonstration purposes.

Frequency: At least twice a year; more often if accidents are on the increase or if hand tools are in constant use.

I. Why does the use of hand tools require safety procedures?

   A. Each year, hand tools are responsible for about 7 to 8 percent of all compensable injuries.

   B. These injuries often involve severe disabilities. (Give examples of how the injuries listed below might be incurred by the hand tools commonly used by your employees.)
      1. Loss of eyes/vision, e.g., using striking tools without eye protection
      2. Puncture wounds, e.g., using a screwdriver with a loose handle which causes the hand to slip
      3. Severed fingers, tendons, and arteries, e.g., using a dull knife; requires so much force that your hand may slip down the blade
      4. Broken bones, e.g., using the wrong hammer for the job and smashing a finger
      5. Contusions, e.g., using a small wrench for a big job; bruising a knuckle
      6. Infections, e.g., ignoring a cut in the skin made by a dirty chisel

   C. Perhaps the major reason for such accidents is that most people take hand tools for granted; they use them at home and are not accustomed to following regular inspection and maintenance procedures.

II. The four basic rules for hand tool safety (Give relevant examples or demonstrate.)

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A. Select the right tool for the job.

B. Keep tools in good condition.

C. Use tools properly.

D. Keep tools in a safe place.

III. Specific safety procedures for use and handling of tools in your area (Demonstrate.)

A. Metal-cutting tools (chisels, hacksaws, files, cutters, etc.): Never strike a file against metal vises or other objects.

B. Wood-cutting tools (wood chisels, saws, hatchets, etc.): Never use axes or hatchets on metal, stone, or concrete.

C. Miscellaneous cutting tools (planes, scrapers, bits, knives, etc.): Never carry a scraper around in your pocket.

D. Torsion tools (wrenches, tongs, screwdrivers, etc.): Never hold small work in your hand when using a screwdriver.

E. Shock tools (hammers, etc.): Never use a hammer with a chipped face.

IV. Centralized tool control

A. Assures uniform inspection and maintenance of tools by trained employee

B. Promotes tool safety; toolroom attendant recommends, issues right type of tool

C. Facilitates the keeping of effective records on tool failure and other accident causes

D. Brief review of company tool control procedures
1. System for checking out and returning tools
2. Getting tools repaired or reconditioned
3. Tool inspection procedures

E. Policy regarding personal tools
1. Quality and safety standards that must be met
2. Inventory and inspection

V. Maintenance and repair

A. Responsibility for maintenance and repair of hand tools
1. Toolroom attendant's responsibility—to store tools safely and conveniently, to ship defective tools to maintenance, etc.

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2. Employee's responsibility—to use the right tool for the job, to use it correctly, to check its condition before using, to return it to its right spot, etc.
3. Supervisor's responsibility—to periodically inspect toolroom housekeeping, tool maintenance, etc.

B. Regular maintenance procedures (if applicable)
1. Tempering
2. Safe-ending
3. Dressing
4. Checking handles

VI. Safe procedures for carrying tools

A. Carrying tools while climbing; e.g., should be properly secured

B. Avoiding loose and mislaid tools (Give examples of hazards.)

C. Chisels, screwdrivers, and pointed tools; e.g., should never be stuck into pockets

D. Handing tools from one worker to another; e.g., always offer the handle of the tool

VII. Off-the-job safety with hand tools (Preventing accidents in the home: Work safety practices should be followed at home.)

VIII. Discussion/summary of major points

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MEETING 13: Portable Power Tools

Meeting Objective: To focus employees' attention on the special hazards presented by portable power tools and to review the basic safety rules concerning their use.

Materials: Commonly used power tools, for demonstration purposes.

Frequency: At least once a year; more often if accidents are on the increase or power tools are in widespread use.

I. The safety hazards posed by portable power tools (In some ways, they are more serious than those associated with stationary machines.)

   A. Portable power tools are difficult to guard completely.

   B. Because of their mobility, there is the added hazard of coming in contact with the operator's body.

   C. Because the tool may have been dropped or mishandled, there is the possibility of breakage or damage that is not readily apparent.

   D. The source of power (electrical, hydraulic, etc.) comes in close contact with the operator.

II. Types of power tools and the hazards they pose

   A. Portable power tools are divided into five groups according to the power source; each group presents its own special kind of hazard.
      1. Electric tools (electric shock hazard)
      2. Pneumatic tools (noise, flying chips, etc.)
      3. Gasoline-powered tools (fuel hazards)
      4. Hydraulic tools (leaks and pressure hazards)
      5. Explosive-actuated tools (accidental discharge, ricochets, ignition of explosive, flying particles)

   B. Cite the most common injuries resulting from improper use and handling of power tools.
      1. Burns
      2. Cuts
      3. Electric shock

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4. Particles in the eye
5. Falls (tripping over cords and hoses)

III. Basic safety rules for power tools (Demonstrate where appropriate.)

A. Know your tools—read the owner/operator's manual carefully.

B. Ground all tools, unless double-insulated.

C. Keep guards in place and in working order.

D. Keep the work area clean.

E. Avoid dangerous environments (especially dark or wet locations).

F. Use the right tool for the job; never use an undersized tool.

G. Never leave tool in an overhead place where it might fall.

H. Suspend cords and hoses over aisles where they won't pose tripping hazards; if laid across floor, protect them with wooden strips or special raceways.
   1. Don't hang cords or hoses over nails, bolts, or sharp edges.
   2. Keep them away from oil, chemicals, and hot surfaces.

I. Use the proper protective equipment—goggles, earplugs, respirators, rubber gloves, safety shoes, etc.

J. Don't overreach—keep proper footing and balance.

K. Disconnect tools when not in use.

L. Remove adjusting keys and wrenches before turning tool on.

M. Avoid accidental starting—don't carry plugged-in tool with finger on switch.

N. Use clamps or a vice—not your hands—to secure your work.

IV. Inspection and repair procedures (Hand out inspection checklists.)

A. Inspection schedule for power tools
   1. Who is responsible for inspection (tool room attendant, employee/operator, etc.)
   2. When inspection should take place

B. Responsibility for repairs
   1. Who is responsible and who has the authority to make repairs
   2. Danger involved in "makeshift" repairs

C. Cleaning procedures (solvents to use, etc.)

V. Discussion/summary of major points

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MEETING 14: Machine Guards

Meeting Objective: To alert employees to the hazards of working with machinery; to familiarize them with the various types of guards and to emphasize their importance in preventing accidents.

Materials: Slides or photographs illustrating correct position and use of machine guards; good idea to make this a roving meeting, taking employees from machine to machine—the machine guards themselves will make the best demonstration materials.

Frequency: Once or twice a year.

I. Why must machines be guarded?

   A. Any part of a machine that moves presents a hazard. Guarding eliminates or controls this danger.

   B. Discuss the most dangerous machine motions.
      1. Rotating
      2. Reciprocating and transverse motions
      3. In-running nip points
      4. Cutting actions
      5. Punching, shearing, and bending

[Give an example of each type of motion and the injury it might cause as it applies to the machinery used in your department; for example, even a smooth shaft rotating slowly can grasp clothing or hair, etc.]

II. Types of machine guards and their uses (Illustrate.)

   A. Enclosure guards are preferable to all other types because they prevent access to dangerous moving parts by enclosing them completely.
      1. They are used on power presses, sheet leveling or flattening machines, milling machines, gear trains, drilling machines, etc.
      2. Fixed guards may be adjustable to accommodate different sets of

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tools or various kinds of work. However, once they have been adjusted, they should remain "fixed."

B. Interlocking guards are the first alternative when fixed guards or enclosures are not practicable.

1. Purpose: prevents operation of the control that sets the machine in motion until the guard or barrier is moved into position
2. Types
   a. A barrier that shuts off or disengages power, preventing the machine from starting when the guard is open
   b. Electric contact or mechanical stop that activates a brake when any part of the operator's body enters the danger zone
   c. Two-handed tripping devices
3. Commonly used on bakery machinery, guillotine cutters, power presses, dough mixers, centrifugal extractors, tumblers, and some kinds of pressure vessels

C. Automatic guards must prevent the operator from coming in contact with the dangerous part of the machine while it is in motion, or must be able to stop the machine in case of danger.

1. Examples: pull-away or hand-restraint devices; photoelectric relay switch that stops the current to the machine
2. Importance of proper adjustment and maintenance

D. Remote control, placement, feeding, ejecting may be used to protect the operator from dangerous points-of-operation.

1. Examples: two-handed operating devices; chutes, hoppers, conveyors, etc., to feed stock automatically; special jugs or feeding devices made of metal or wood; mechanical or air-operated ejecting devices
2. May be used to complement another type of guard or as a substitute

III. Safe practices regarding machine guards

A. No guard, barrier, or enclosure should be adjusted or removed for any reason by anyone unless that person has specific permission and has been trained to do the job.

B. Before safeguards or other guarding devices are removed so that repairs or adjustments can be made or equipment can be serviced, the power for the equipment must be turned off and the main switch locked out and tagged.

C. No machine should be started unless the guards are in place and in good condition.

D. Defective or missing guards should be reported to the supervisor im-

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mediately.

E. Employees should not work on or around mechanical operating equipment while wearing neckties, loose clothing, watches, rings, or other jewelry.

IV. Maintenance, overhaul, and replacement of machine guards (Summarize company practices, inspection procedures, etc.)

V. Discussion/summary of major points

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MEETING 15: Working With Hazardous Materials

Meeting Objective: To review the hazards posed by the materials with which your employees work; to teach them the proper techniques for handling, storing, and transporting these materials. (For this meeting you will have to "fill in the blanks" a bit. There exist many known and unknown hazardous substances in the workplace. These all must be dealt with differently, but they all must be dealt with safely.)

Materials: Slides or photographs illustrating proper safety techniques and protective equipment.

Frequency: At least twice a year; more often if hazardous materials are handled regularly.

I. What are hazardous materials and what are the dangers they represent? (Discuss any of the types of hazardous materials listed below that are used in your department.)

   A. Hazardous liquids (caustics or acids)—danger of burns

   B. Hazardous gases—danger of explosion and/or toxic effect

   C. Inorganic dusts (mineral dusts)—danger of inhalation (asbestos, silica, etc.)

   D. Metals, metalloids, and their compounds (lead, mercury, arsenic, etc.) —danger of toxic effect

   E. Organic dusts (dusts produced by grain, wood, cotton, etc.)—danger of explosion

   F. Organic solvents—hazards dependent on toxicity, vapor pressure, and use (can be absorbed, ingested, or inhaled)

   G. Pesticides—danger of poisoning through ingestion or inhalation

II. What can be done to draw attention to these hazards so that people don't overlook them or take them for granted?

   A. Proper labeling (signs, color coding, etc.)

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B. Periodic air sampling

C. Close monitoring of employee health

D. Safety posters in storage or handling areas

III. Safe storage of hazardous materials (Since storage facilities and procedures will vary with the type of hazardous material being handled, focus on company rules and occupational safety and health standards relating to the particular hazards faced by your employees.)

A. Special containers (drums, carboys, cylinders, bins, etc.) and how they should be stacked, piled, or stored

B. Materials handling equipment (carboy trucks, etc.)

C. Ventilation of storage areas

D. Proper lighting of storage areas

IV. Safe handling of hazardous materials

A. Wear the proper protective equipment (demonstrate).

B. Keep floors clean; never allow them to become slippery.

C. Know what steps to take in an emergency; know where first-aid equipment is located and how to use it.

D. Always read the label before handling a container.

E. Follow company rules for showering, changing clothes, etc.

F. Be familiar with the symptoms of overexposure to a hazardous material (itching, burns, fever, etc.).

V. Discussion/summary of major points

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MEETING 16: Flammable and Combustible Liquids

Meeting Objective: To define the properties of flammable and combustible liquids; to help employees understand why they are so hazardous and what steps they can take to prevent an unnecessary fire or explosion.

Materials: Blackboard or flipcharts illustrating how vapors are formed. how combustion takes place, etc.

Frequency: Quarterly if flammable and combustible materials are handled on a regular basis.

I. Definitions: the distinction *between flammable and combustible*
   A. The lowest temperature at which a liquid releases enough vapor to start burning is called the *flash point.*

   B. Flammable liquids have flash points below 100° Fahrenheit (i.e.. they will release enough vapor to form burnable mixtures with air at temperatures below 100°F). Examples include carbon disulfide. ether, acetone, benzene, gasoline, lacquer thinner, alcohol, toluene. turpentine, etc.

   C. Combustible liquids have flash points above 100° Fahrenheit (i.e., they must be heated to temperatures greater than 100°F before they will release enough vapor to form burnable mixtures).

      1. This can happen when a combustible liquid comes in contact with a hot surface.

      2. Examples include fuel oils, kerosene. ethylene glycol. creosote oil. formaldehyde (37% solution), mineral oil, safety solvent. phenol, hydraulic fluid, transformer oil, linseed oil.

II. Why are these liquids so hazardous?

   A. Flammable liquids vaporize and form flammable gas mixtures when they are left in open containers. when leaks or spills occur. or when they are heated.

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1. The degree of danger is determined by a number of factors.
   a. The flash point of the liquid
   b. The concentration of vapors in the air
   c. The possibility of a source of ignition nearby
      (1) Hot surfaces—hot plates and electric coils, overheated bearings
      (2) Open flames—pilot lights, smoking materials
      (3) Hot particles and embers—grinding, welding
      (4) Sparks—static electricity from rotation belts or transferring liquids, sparks from electrical tools, etc.
2. If an ignition source does come in contact with the right combination of vapor and air, fire or explosion can result, causing serious injury and loss of life or jobs.
3. Give an example of how such an incident might occur in your department, using the hazardous materials with which your employees work.

B. Cite some toxic effects of flammable liquids and their vapors.
1. Irritation of the skin
2. Irritation and/or damage to the lungs from inhalation
3. Irritation and/or damage to the eyes

III. Safety precautions

A. Fire prevention steps
1. Keep liquid vapors confined so they can't mix with air; or ventilate the area with fresh air. When liquids are sprayed indoors (e.g., spray painting), ventilated booths or room must be used.
2. Remove all possible ignition sources (prohibit smoking, etc.).
3. Remove the air (oxygen) necessary for fire to burn.

B. Safe handling and storage
1. Use the proper equipment in handling hazardous liquids (safety cans with spring-loaded closures, covered bench cans, safety disposal cans, etc.) so that vapors can't escape. *Never* use open containers, buckets, cans, tanks, and drums for flammable and combustible liquids.
2. Isolate flammable and combustible liquids (if possible) in a special room with fire-resistant walls, doors, ceiling, and floors.
3. Know the location and operation of the appropriate fire extinguishing equipment.

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4. Make sure that all flammable and combustible liquids are properly labeled.
5. Try to keep only one day's supply of flammable and combustible liquids at the worksite; the reserve should be kept in a fireproof cabinet or room.
6. Use only approved explosion-proof equipment in hazardous locations.

IV. Discussion/summary of major points

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MEETING 17: Working With Solvents

Meeting Objective: To review the hazards associated with solvents; to instruct employees in safe procedures and the use of protective equipment when working with or around solvents.

Materials: Flipcharts showing types of solvents and their physiological effects; standard labeling procedures.

Frequency: Twice a year; more often if solvents are used regularly.

I. Why are organic solvents so hazardous?

   A. Some solvents can break down into acids, poisonous gases, or corrosive components if exposed to hot surfaces.

   B. Some solvents can react chemically with other substances.

   C. *All* solvents produce vapors that can cause problems if the concentration gets too high. Exposure to too much solvent vapor can cause irritation of the eyes, dizziness, nausea, rashes and other skin disorders.

II. How to avoid these hazards by reading the labels on solvents carefully

   A. The label should contain specific information. (Show sample.)

      1. Name of product
      2. Signal word designating degree of hazard (Danger, Warning, or Caution)
      3. Statement of hazards (extremely hazardous, flammable, etc.)
      4. Precautionary measures to be taken or action to be avoided (e.g., avoid breathing vapor, keep away from heat or open flame)
      5. Instruction in case of contact or exposure (e.g., flush eyes or skin with plenty of water for at least 15 minutes)
      6. Poison sign (skull-and-crossbones), followed by first-aid instructions or antidote

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III. Safe procedures for handling solvents

A. While using solvents, wear splashproof chemical goggles—and know where the nearest eye-wash fountain is.

B. To protect your skin, wear suitable gloves and protective garments where required.

C. If your clothes become soaked with solvent, remove them and take a shower; don't put them back on until they're thoroughly dry.

D. Smoke only in approved areas.

E. Take precautions in cold-cleaning operations.

1. Keep your head back so you won't be in the direct line of escaping vapor.

2. Wear suitable gloves when using solvents for wiping, dipping, spraying, or flushing.

F. Use soap or mild detergent and water rather than solvents to clean grease, oil, dirt, or anything else off your skin.

G. Place all rags, waste, paper towels, etc., soaked with solvent in airtight, all-metal safety containers.

H. Store and transport small quantities of solvent only in approved safety containers, properly marked.

I. Ground and bond all metal containers when transferring a flammable solvent from one container to another.

J. Make sure you have adequate ventilation when you use cold-cleaning solvents in a small room.

K. Use respiratory equipment when you enter areas where the solvent vapor levels are—or might be—high. Don't rely on your nose to warn you of excessive concentrations—some dangerous vapors have no odor warning at all.

L. Don't do any welding (or let anyone else weld) close to areas where solvents are being used. The heat of welding can cause dangerous solvent breakdown conditions, as well as fire or explosion.

IV. What to do in case of emergency

A. If someone is overcome by solvent vapors

1. Get medical help immediately.
2. Remove the person to fresh air.
3. Loosen clothing.
4. Give artificial respiration if breathing has stopped.

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5. Keep patient quiet and warm (but not hot).
6. Don't give anything by mouth to an unconscious person.

B. When a spill occurs

1. Evacuate the area (if it's a big spill).
2. Clean it up as soon as possible, wearing proper protective equipment.
3. If the solvent can't be reclaimed for further use, put it in a galvanized or stainless steel pail with a tight lid.
4. Later on, dispose of the solvent safely—don't pour it down a sewer.

C. In case of fire

1. Evacuate the area.
2. Trained personnel should extinguish the fire with carbon dioxide, dry chemical, foam, or a water fog.
3. Handle the burned solvent as though it were an acid.

V. Discussion/summary of major points

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MEETING 18: Good Housekeeping Practices

Meeting Objective: To remind employees of the importance of keeping their work areas clean and orderly; to focus their attention on the types of accidents that can be caused by poor housekeeping practices.

Materials: Photographs (taken with instant-developing camera) of housekeeping hazards; housekeeping inspection checklist. (If you don't already have one, it may be a good idea to draw one up based on the housekeeping tips provided on page 56—if employees see what you look for they will get a better idea of what they should look for.)

Frequency: Quarterly.

I. Why is housekeeping so important?

   A. Cite types of accidents that frequently result from inadequate housekeeping.
      1. *Tripping* over loose objects on floors, stairs, and platforms
      2. *Slipping* on wet, greasy, or dirty floors
      3. *Bumping* against projecting or misplaced materials
      4. *Puncturing or scratching* hands or other parts of the body on protruding nails, hooks, or rods
      5. *Injuries from falling objects*

   B. The bigger the plant, the more serious the problem can be.
      1. Employees tend to take housekeeping for granted and may slack off from time to time.
      2. Housekeeping is the one area of accident prevention in which *all* employees (blue-collar, white-collar, administrative, etc.) must share the responsibility.

II. Where to concentrate your housekeeping efforts (Use photographs to illustrate.)

   A. Work areas: Avoid unnecessary clutter.

   B. Machines and equipment: Avoid crowding; provide racks or containers for tools, jigs, and fixtures.

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C. Aisles: Keep free of material, finished parts and scrap.

D. Floors: Make sure they are vacuumed and scrubbed regularly; spills should be cleaned up immediately.

E. Walls and ceilings: See to it that they are scrubbed and painted when necessary; clothing and supplies should be hung on racks; clutter should be confined to a bulletin board.

F. Storage facilities: Follow appropriate storage procedures.

G. Employee facilities: Keep personal belongings in lockers; washrooms should be cleaned regularly.

III. Housekeeping inspections (Hand out inspection checklists.)

A. Know your housekeeping responsibilities. Recognize when a housekeeping job exceeds your responsibility or capability and call in help (maintenance personnel, etc.).

B. Know what to inspect and how often to inspect it. (Refer to inspection checklist and/or schedule.)

IV. Results of good housekeeping

A. It reduces operating costs: Once a housekeeping system has been established, less time and effort are required to keep the work area clean.

B. It increases production: Delays and interference from excess materials, loose tools, etc., are avoided.

C. It improves production control: Material and parts do not get lost or mixed up.

D. It conserves materials and parts: Unused materials are easily and quickly removed to the proper place.

E. It saves production time: There is no need to search for tools, parts, etc.

F. It lowers accident rates.
1. Open aisles permit faster traffic with fewer collisions.
2. Clean floors mean less slipping, tripping, and falling.
3. A reduction of object hazards results in fewer injuries.

G. It reduces fire hazards: Fires result from, or are spread by, poor housekeeping conditions.

V. Room for improvement? (Ask your employees to contribute their suggestions for better housekeeping in your department; ask them to specify areas that they feel pose a particular safety hazard.)

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GOOD HOUSEKEEPING TIPS

1. Give your immediate work area a good cleaning at the end of each day—sweep up rubbish and put tools away.
2. Dispose of combustible rubbish in fire-resistant receptacles.
3. Dispose of oily rags in closed metal containers. Maintain regular disposal.
4. Clean oily deposits from walls, ceilings, exhaust ducts and mechanical equipment periodically.
5. Remove combustible lint and dust from ledges, beams and equipment as it accumulates.
6. Remove oily metal chips and rubbish to outside storage locations on schedule.
7. Keep aisles and passageways clear of stock and other obstructions at all times.
8. Don't block valves, hose stations, fire extinguishers or fire exits.
9. Keep packing material in metal-lined bins with self-closing covers.
10. Follow the clean-out schedules for electric motors, switch enclosures, contactors, etc.
11. Keep solvents, thinners, etc., in approved safety containers.
12. Avoid drippings—clean up spills promptly.
13. Keep spray residues in covered containers and remove at the end of each day.
14. Limit flammable liquids, cement, paint, etc., to only one day's supply at the working area.
15. Empty drip pans and replace absorbent compounds frequently.
16. Avoid overlubrication.
17. Keep a minimum supply of lubricants in the work area.
18. Clean up oily lint conditions continuously.

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MEETING 19: Protecting the Eyes and Face

Meeting Objective: To reduce accidents involving injuries to eyes and face by educating employees about the importance of wearing the proper protective equipment.

Materials: Samples of the various types of safety goggles, face shields, etc., used in your department.

Frequency: At least twice a year; quarterly if your employees are exposed to serious eye and face hazards on a daily basis.

I. Why are eye injuries so common?

   A. Industrial eye injuries occur at a rate of *two per minute* and are the costliest in terms of lost production and earning power.

   B. Of the more than 1,000 industrial eye injuries that occur every working day, over 90 percent of them are needless and preventable.

   C. Discuss the chief causes of on-the-job eye injuries.
      1. Flying objects (especially those set in motion by hand tools)
      2. Abrasive wheels (small flying particles)
      3. Corrosive substances
      4. Injurious light or heat rays
      5. Splashing metal
      6. Poisonous gas or fumes

II. What can be done to prevent injury to the eyes?

   A. Wear the proper protective equipment. (Discuss any of the following that apply.)
      1. Cover goggles
      2. Protective spectacles
      3. Protective spectacles with side shields
      4. Cup goggles

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5. Splash-resistant goggles
6. Dust goggles
7. Miners' goggles
8. Melters' goggles
9. Welders' goggles

B. Make sure the goggles or glasses are comfortable and properly fitted.

1. Fitting, adjusting, and maintaining eye equipment
2. Defogging materials
3. Cleaning goggles
4. Use of sweatbands

C. Don't make excuses for failing to wear safety goggles.

1. "They're too uncomfortable": Get them adjusted or refitted by a professional.
2. "I can't see with them": Clean them regularly; keep them in a case or a place where they won't get scratched.
3. "They give me a headache": Get the fit checked or the head strap adjusted; see an eye doctor.
4. "I forget to put them on": *Never* an acceptable excuse.

D. Don't wear contact lenses where there are considerable amounts of dust, smoke, irritating fumes, or liquid irritants that could splash into the eyes.

1. Never wear contact lenses as a substitute for protective eye equipment.
2. If you must wear contact lenses on the job, get written authorization from your eye doctor and wear safety goggles over your contacts.

E. Wear your safety goggles at home, too (when using power tools, spray-painting, etc.).

F. Know the appropriate first-aid measures for eye emergencies; for example, flushing eye with water if a chemical has been splashed.

III. Face protection

A. Cite the most common hazards to the face and neck.

1. Flying particles
2. Sprays of hazardous liquids
3. Splashes of molten metals
4. Hot solutions

B. Discuss types of protective equipment (focus on those in use by your

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employees) and where they should be used.

1. Face shields (clear plastic)—sawing or buffing, sanding or light grinding, handling chemicals
2. Babbitting helmets—for molten metal
3. Welding helmets—molten metal and radiation
4. Hand-held shield—inspection work, tack welding, etc.
5. Acidproof hoods—corrosive chemicals
6. Hoods with air supply—toxic fumes, dusts, mists, gases

IV. Discussion/summary of major points

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MEETING 20: Protecting the Feet and Legs

Meeting Objective: To reduce accidents involving injuries to the feet and legs by educating employees about the importance of wearing the proper protective equipment.

Materials: Safety shoes and leg protection worn by your employees.

Frequency: Once a year, or more frequently if safety shoes are worn on a daily basis.

I. The alarming facts about foot injuries

   A. About a quarter of a million disabling occupational foot injuries occur each year.

   B. A Bureau of Labor Statistics study conducted in 1979 reveals that over 75 percent of these foot injuries happen to workers who aren't wearing safety shoes.

   C. Discuss the major causes of these accidents. (Ask employees to suggest how each type of accident might occur in your area.)

      1. 60 percent from falling objects
      2. 16 percent from stepping on a sharp object
      3. 13 percent from feet being struck by rolling objects

II. Types of safety shoes and their uses (Discuss any of the following that apply.)

   A. Metal-free shoes, boots, etc., are used where there are specific electrical hazards or fire and explosion hazards.

   B. "Congress" or gaiter-type shoes protect people from splashes of molten metal or welding sparks.

   C. Shoes with reinforced soles or innersoles of flexible metal are worn where there are hazards from protruding nails, etc.

   D. Rubber boots and shoes, leather shoes with wood soles, or wood-soled sandals are used for wet work conditions.

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MEETING 21: Protecting the Head

Meeting Objective: To reduce accidents involving injuries to the head by educating employees about protective head gear.

Materials: Samples of the various types of safety hats worn by employees in your department.

Frequency: Semiannually if safety hats or helmets are worn regularly.

I. Who needs special head protection?

   A. All employees engaged in occupations that pose special hazards to the head

      1. Falling objects
      2. Flying particles
      3. Electric shock
      4. Overhead spills of chemicals, acid, or hot liquids

   B. Particularly high-risk industries: tree trimming, construction work, shipbuilding, logging, mining, overhead line construction or maintenance, and metal or chemical production

II. Types of protective head gear and what they are designed to protect the head from

   A. Safety helmets (Discuss construction and usage of the type your employees wear.)

      1. Full-brimmed
      2. Brimless with peak

   B. Bump caps—for use where a brim might get in the way; in confined spaces where exposure is limited to bumping; should never be worn where there is exposure to more serious hazards

   C. Hair protection caps—for use by employees with long hair who work

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around chains, belts, or other machines

III. Design features

A. Suspension

1. The distance between the top of a head and the helmet shell is known as the "crown clearance"; it determines the amount of protection offered against impact and penetration.
2. A suspension that is too rigid can transmit the shock of impact and fracture the neck vertebrae.
3. A suspension that is too flexible permits contact with the head upon impact, causing skull fracture or concussion.
4. A damaged or worn suspension should be replaced immediately.

B. Chin strap: made of leather, fabric, or elastic; prevents the hat from falling off or being blown off

C. Liner: for warmth in cold weather

D. Eye shield: may be attached if required

IV. Safety precautions

A. Never leave your safety helmet on the rear window shelf of an auto or truck; sunlight may affect its protective quality, and an emergency stop can turn the helmet into a dangerous missile.

B. Never keep anything under your safety hat (pack of cigarettes, wallet, etc.); it interferes with the suspension.

C. Clean the hat and suspension regularly (at least every 30 days).

D. Never attempt to repair the shell of a hat once it has been broken or punctured.

E. Never drill holes in a safety hat to "improve ventilation" or cut notches in the brim.

F. Replace a damaged helmet immediately.

G. If the hat is giving you a headache, make sure it is fitted properly.

H. Never remove the suspension for any reason.

V. Discussion/summary of major points

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MEETING 22: Ear Protection

Meeting Objective: To educate employees about the hazards of excessive noise; to emphasize the importance of wearing the proper protective equipment.

Materials: Drawings or diagrams of the human ear and how earplugs work; samples of earplugs, earmuffs, etc., used by employees.

Frequency: Twice a year if noise is a major hazard.

I. When is hearing protection needed?

   A. Noise standards and how company noise levels measure up

   B. Engineering controls currently in use to decrease noise levels (acoustical enclosures, etc.)

   C. Audiometric testing program to determine the need for hearing protection

   D. Sources of "noise pollution" in the working environment and effectiveness of existing engineering controls (If engineering controls are not sufficient, personal protective equipment is needed.)

II. What types of hearing protection are available?

   A. Insert-type ear protectors (earplugs)

      1. Two types
         a. Aural type—placed inside the ear canal
         b. Superaural type—seals the external edge of the ear canal
      2. Materials used—pros and cons of each
         a. Rubber or plastic
         b. Wax
         c. Cotton
      3. Importance of proper fit; procedures for fitting

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4. Possible discomfort if points of pressure develop
    a. A good seal cannot be obtained without some initial discomfort.
    b. There should be no lasting problems if earplugs are made of soft material and kept clean.
5. Complaint that earplugs make it difficult to hear conversation (Tests show that when noise level is higher than 85 dB, speech is more easily understood with earplugs in place than without them.)

B. Muff-type protectors

1. Cup or muff covers the external ear to provide an acoustical barrier.
2. Liquid or grease-filled cushions give better noise suppression than plastic or foam rubber types, but may present leakage problems.
3. Head size and shape also affect noise suppression.

C. Helmet protectors

1. They completely surround the head.
2. Suppression of sound is achieved through the acoustical properties of the helmet.
3. Cost and bulk normally preclude use of helmet for most jobs.

III. How effective are commercially available earplugs?

A. If properly fitted and used, earplugs generally reduce the amount of noise reaching the ear by 25 to 30 dB in the higher frequencies, which are the most harmful.

B. The better type of earmuffs may reduce noise by an additional 10 to 15 dB.

C. Combinations of earplugs and earmuffs give 3 to 5 more dB of noise protection.

IV. Discussion/summary of major points

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MEETING 23: Protecting Your Hands

Meeting Objective: To reduce the number of accidents involving injury to the hands by educating employees about specific hazards and protective equipment.

Materials: Slides or photographs of operations that are hazardous to the hands; sample gloves, hand leathers, etc.

Frequency: Quarterly.

I. Five basic types of mechanical action that can trap hands (Give examples of these actions as they are used in your department.)

   A. Shearing

      1. Examples include ordinary scissors, guillotine cutters, cleavers, axes, knives, screw or worm conveyors, any two hard-edged objects that pass close together.
      2. Keep hands and fingers away from *any* tight places that can present slicing hazards.

   B. Rotating (Spinning motion may have a horizontal or vertical axis, or it may be at an angle.)

      1. Examples include rotary saw, fan blades, lathe, power drill.
      2. Watch out for toothed, spike, or jagged edges that can slash into fingers.

   C. In-running nip from any parallel wheels, rollers, or shafts turning inward together

      1. Examples include gears, belt and pulley, rack and pinion, chain and sprocket.
      2. Learn to recognize and stay clear of the grabbing power of the in-running nip.

   D. Puncturing from any device or tool that can penetrate flesh if it slips or gets out of control

      1. Examples include screwdriver, awl, knife point.

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2. Remember that a puncture can be twice as dangerous as a superficial cut because it carries the threat of deep infection; get first aid right away.

E. Smashing

1. Examples include hammer, factory presses, "pinch points."
2. Watch out when putting down heavy objects, moving loads through doorways, maneuvering drums and cylinders.

II. Protective equipment for hands

A. Asbestos gloves and treated terry cloth gloves protect against burns and discomfort when hands are exposed to heat.

B. Metal mesh gloves, used by those who work with knives, protect against cuts and blows from sharp objects.

C. Rubber gloves are worn by electricians to keep hands insulated from shock.

D. Rubber, neoprene, and vinyl gloves are used when handling most chemicals and corrosives. (Note: not for use with some solvents.)

E. Leather gloves resist sparks, moderate heat, and cushion against blows.

F. Chrome-tanned cowhide gloves with a steel-stapled leather patch on palms and fingers are often used in foundries and steel mills.

G. Cotton or fabric gloves provide suitable protection against dirt, chafing, or abrasion.

H. Coated fabric gloves protect against moderately concentrated chemicals.

I. Hand leathers or hand pads are often better than gloves for protection against heat, abrasion, and splinters.

III. Basic safety precautions

A. Never try to "cheat" a guard or any safety device.

B. Disconnect power to clean, oil or adjust a machine; lock it out if work rules require it.

C. Remove rings, watchbands, bracelets, etc., when working with machinery.

D. Use gloves to protect your hands from chemicals and rough objects; but never wear them around moving machinery.

E. Use the right tools and keep your hands out of tight places.

F. Use a brush or hook—not bare hands—to clear away filings or shavings from work areas.

G. If an accident occurs, get first aid right away.

IV. Discussion/summary of major points

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MEETING 24: *Breathing Safely*

Meeting Objective: To control respiratory hazards by educating employees about the selection, use, and care of the proper protective equipment.

Materials: Respiratory equipment currently in use.

Frequency: Twice a year.

I. When is respiratory equipment needed?
   A. Air contaminants range from relatively harmless substances to toxic dusts, vapors, mists, fumes, and gases that may be extremely harmful. (Describe the nature of the contaminants in your work area.)
   B. Standards specify "safe levels" of certain airborne contaminants.
      1. Ideally, these safe levels can be achieved through engineering controls.
      2. When engineering controls are not technically feasible, or when the hazardous operation is performed only infrequently (making these controls impractical), respiratory protection is needed.
   C. Respiratory equipment should also be regarded as emergency equipment; for example, if leaks or breakdowns should occur.

II. Selection of the proper respiratory equipment
   A. Discuss the factors to consider in choosing the right kind of respirator.
      1. The nature of the hazardous operation or process
      2. The type of air contaminant, including its physical properties, chemical properties, physiological effects on the body, and its concentration
      3. The period of time for which respiratory protection must be provided
      4. The location of the hazard with respect to a source of uncontaminated air

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5. The employee's state of health
6. The functional and physical characteristics of the various respiratory devices

B. Using the wrong kind of respirator for the hazard involved can be dangerous: For example, particulate filter respirators are of no value as protection against solvent vapors, injurious gases, or lack of oxygen.

III. Types of respirators and their uses (Focus on the type used by your employees.)

A. Air-purifying respirators remove contaminants from the air being breathed.

1. Gas masks
2. Chemical cartridge respirators
3. Particulate filter respirators
4. Combination respirators

B. Air supplied respirators deliver breathing air through a supply hose connected to the wearer's facepiece.

1. Hose masks
2. Air line respirators
3. Abrasive blasting respirators
4. Air supplied suits and hoods

C. Self-contained breathing devices afford complete respiratory protection in any toxic or oxygen-deficient atmosphere.

1. Oxygen re-breathing type
2. Self-generating type
3. Demand type
4. Pressure-demand type

IV. Care of respiratory devices

A. Schedule for cleaning and repair of respirators

B. Inspection procedures and schedule

C. Methods of disinfection

D. Preventive maintenance steps

E. Importance of keeping respirator on at all times when working in contaminated atmosphere

V. Discussion/summary of major points

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MEETING 25: Dress Right for Safety

Meeting Objective: To remind employees of the link between company dress codes and job safety; to emphasize the need for protective clothing when working under certain conditions.

Materials: Drawings, safety posters, etc., showing "do's and don'ts" of dressing for work.

Frequency: Twice a year.

I. What is considered "safe" clothing for work?

   A. For some jobs, ordinary clothing—clean, in good repair, and suited to the work involved—may be considered "safe."

      1. Good fit is important.
         a. Trousers shouldn't be too long.
         b. Cuffs should never be worn while performing operations that produce flying embers, sparks, or other harmful matter that might get caught.
         c. Loose-fitting garments should be avoided.

   B. For jobs involving exposure to fire, extreme heat, molten metal, corrosive chemicals, cold temperatures, cuts from handling materials, etc., special protective clothing may be required.

II. Safety precautions regarding regular work clothes

   A. Don't wear anything that could get caught in a machine.

      1. Neckties or scarves that go around the neck
      2. Wristwatches with buckle or clamp-on bands
      3. Rings, necklaces, bracelets, or dangling earrings
      4. Shirts with dangling cuffs or tails

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5. Gloves

B. Don't wear clothing soaked in oil or flammable solvent.

C. Don't buy poorly-made or low-quality work clothes; well-made clothes may cost a little more, but they fit better, last longer, and are safer and more comfortable.

D. Replace or repair torn or worn-out items immediately.

E. Keep your work clothes clean; dusty or dirty clothes can cause skin rash and irritation.

F. Don't cut corners by wearing old dress shoes for work; well-built shoes in good condition with sensible heels are safer, and they cut down on fatigue.

III. Special protective clothing (Discuss those that apply.)

A. Aluminized and reflective clothing: Reflects radiant heat.

B. Asbestos clothing: Protects against intense conducted heat and against flames.

C. Flame-resistant cotton fabric: Often used as hair covering for people who work near sparks and open flames.

D. Impervious materials (rubber, neoprene, vinyl, etc.): Protect against dust, vapors, mists, moisture and corrosives.

E. Leather clothing: Protects against light impact, sparks, molten metal splashes, and infrared and ultraviolet radiation.

F. Synthetic fibers (orlon, Dynel, Vinyon): Resist acids, many solvents, mildew, abrasion and tearing, and repeated launderings.

G. Water-resistant duck: Protects from water and noncorrosive liquids.

H. Glass fiber: Used in multi-layer construction to insulate clothing.

IV. Safety and hair styles

A. Head guards, caps, nets, etc., are designed to keep hair from catching in machinery.

B. Flame-resistant headgear should be worn for work around sparks or flames.

C. Hair length poses additional problems with regard to safety equipment.

1. Men with extremely long, heavy sideburns may find it difficult to get a proper fit when wearing earmuffs.

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2. Large, bushy mustaches and beards can interfere with the proper fitting of respiratory equipment and breathing apparatus.
3. Long or bushy hair may make it difficult to wear a safety hat.

V. Where the company stands

A. Company policy regarding appropriate dress for work

B. Company policy regarding hair length/style and wearing of protective equipment

C. Disciplinary measures that will be taken if employee fails to adhere to appropriate dress regulations.

VI. Discussion/summary of major points

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MEETING 26: Fire Prevention

Meeting Objective: To instruct employees in how to spot and report fire hazards, what to do in a fire emergency, and how to handle fire-fighting equipment; to reduce fire hazards by emphasizing preventive measures.

Materials: Mimeographed fire prevention checklists (see page 77), chart showing different types of fire extinguishers and their uses (see page 76), photographs taken around the department showing existing fire hazards (poor housekeeping, etc.).

Frequency: Twice a year.

I. What causes fires in an industrial environment? (Give examples your employees can relate to.)

   A. Electrical causes (22%)—lax maintenance in wiring, motors, switches, lamps, and heating elements

   B. Matches and smoking (18%)—near flammable liquids, stored combustibles, etc.

   C. Friction (11%)—hot bearings, misaligned or broken machine parts, choking or jamming materials, poor adjustment of moving parts

   D. Hot surfaces (9%)—exposure of combustibles to furnaces, hot ducts or flues, electric lamps or heating elements, and hot metal

   E. Overheated materials (7%)—abnormal process temperatures, materials in dryers, overheating of flammable liquids

   F. Open flames—gasoline or other torches, gas or oil burners

   G. Foreign substances (5%)—foreign material in stock

   H. Spontaneous heating (4%)—deposits in ducts and flues, low-grade storage, scrap waste, oily waste and rubbish

   I. Cutting and welding (4%)—highly dangerous in areas where sparks can ignite combustibles

   J. Combustion sparks (4%)—burning rubbish; foundry cupolas, furnaces,

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and fireboxes

K. Miscellaneous (10%)—including incendiary cases, fires spreading from adjoining buildings, molten metal or glass, static electricity near flammable liquids, chemical action, and lighting

II. Spotting fire hazards in your work area (Hand out inspection checklists.)

A. Be familiar with the causes listed above.

B. Know what to inspect on a daily, weekly, monthly, etc., basis. (Review briefly the employee's responsibility for fire inspection.)

C. When you spot a fire hazard, know what to do.

1. Eliminate it immediately, if you are capable and have the authority to do so.
2. Fill out a fire hazard report form (hand out report forms) and bring it to your supervisor's attention.

III. If a fire has started

A. Notify the appropriate personnel (company fire brigade, your supervisor, safety director, etc.) or turn in a general alarm. (Specify company procedure.)

B. If the fire is not out of control, attempt to extinguish it with the appropriate fire extinguishing equipment. (Review definitions of Class A, B, C, and D fires. Pass around a chart on types of fires and extinguishers.)

1. Plain water, gas-propelled (Class A fires)
2. Soda-acid (Class A fires)
3. Foam (Class A and B fires)
4. Loaded steam (Class A and B fires)
5. Vaporizing liquid (Class B and C fires)
6. Carbon dioxide (Class B and C fires)
7. Dry chemical (Class B and C fires)

C. If the fire is out of control or is not in your area, follow evacuation procedures. (Review company evacuation plan, location of fire exits, steps to take before leaving the building, etc.)

IV. General safety precautions for avoiding fire

A. Smoking

1. Obey "No Smoking" signs.
2. Watch for danger spots even if no warning is posted (e.g., temporary storage area that contains combustibles).
3. Don't lay lighted cigarettes on wooden tables or workbenches, even if smoking is permitted.

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4. Never flick a butt or knock out a pipe in a wastebasket or trash can.

B. Flammable and combustible liquids

1. Keep these liquids away from open flames and motors that might spark.
2. When you transfer them, bond the containers to each other and ground the one being dispensed from, to prevent sparks from static electricity.
3. Clean up spills right away, and put oily rags in a tightly covered metal container.
4. Change clothes immediately if you get oil or solvents on them.
5. Watch out for empty containers that held flammable or combustible liquids; vapors might still be present.
6. Store these liquids in approved containers in well-ventilated areas away from heat and sparks.
7. Be sure all containers for flammable and combustible liquids are clearly—and correctly—labeled.

C. Electricity

1. Check for frayed insulation and damaged plugs on power cords or extension cords; damp or wet wires; oil and grease on wires.
2. A cord that's warm to the touch when current is passing through should warn you of a possible overload—or hidden damage.
3. Don't overload motors; watch for broken or oil-soaked insulation, excessive vibration or sparks; keep motors lubricated to prevent overheating.
4. Defective wiring, switches and batteries on plant vehicles should be replaced immediately.
5. Electric lamps need bulb guards to prevent contact with combustibles and to help protect the bulbs from breakage.
6. Don't try to fix electrical equipment yourself if you're not a qualified electrician.

D. Housekeeping

1. Keep your work area clean.
2. Passageways and fire doors should be kept clear and unobstructed.
3. Material must not obstruct sprinkler heads or be piled around fire extinguisher locations or sprinkler controls.
4. Combustible materials should be present in work areas only in quantities required for the job, and should be removed to a designated storage area at the end of each workday.

E. Hot work

1. Never do cutting or welding without supervision or a hot work per-

mit.

2. Watch out for molten metal; it can ignite combustibles or fall into cracks and start a fire that might not erupt until hours after the work is done.
3. Portable cutting and welding equipment is often used where it's unsafe; keep combustibles at least 35 feet from a hot work area.
4. Be sure tanks and other containers that have held flammable or combustible liquids are completely neutralized and purged before you do any hot work on them.
5. Have another employee on hand to put out a fire before it can get out of control.

V. Discussion/summary of major points

TYPES OF FIRES AND EXTINGUISHANTS

COMBUSTIBLE MATERIAL	CLASS OF FIRE & EXTINGUISHER MARKING	EXTINGUISH WITH
paper, wood, cloth	A (ordinary combustibles)	water, soda-acid and dry chemical rated "A, B, C"
oil, tar, gasoline, paint	B (flammable liquids)	foam, carbon dioxide, liquid gas (Halon), and dry chemical rated "B, C" or "A, B, C"
electric motors, power cords, wiring, and transformer boxes	C (electrical equipment)	carbon dioxide, liquid gas (Halon), and dry chemical rated "B, C" or "A, B, C"
sodium, zinc, phosphorous, magnesium, potassium and titanium —especially as dust or turnings	D (special metals)	use only special dry powder extinguishants marked for this purpose

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FIRE PREVENTION CHECKLIST

[ ] Have you put out your cigarette before entering a "No Smoking" area?
[ ] Have you dumped all oil-soaked rags, shavings, and waste in self-closing metal containers?
[ ] Have you disposed of all empty boxes, cartons, excelsior, or loose paper?
[ ] Are all flammable liquids stored in metal containers away from excessive heat?
[ ] Do you use the right cleaning agent for a job? Remember: Benzine, gasoline, or any other flammable liquid should NOT be used as a cleaning agent.
[ ] Have you hung your clothing in a metal locker? Clothes hanging on walls or behind doors are an invitation to fire.
[ ] Are all fire doors, stairways, and aisles clear? These are not storage areas and shouldn't be used as such.
[ ] Have you left your work area clean before punching out? Make sure floors, ceiling, walls, ledges, beams, and equipment in your immediate work area are free of dust, lint, and loose paper.
[ ] Have you checked power cords for frayed insulation or damaged plugs? If a cord you are using gets warm, stop using it—this could be a sign of overload or a clue that something else is wrong.
[ ] Are electric lamps protected by guards?
[ ] Is the motor you are using running smoothly? If it's vibrating excessively or throwing sparks, stop using it. Make sure it's well lubricated and not overloaded.
[ ] Have you notified Maintenance of any electrical equipment in need of repair? Defective equipment should not be left lying around—although you know not to touch it, others may not. And don't try to fix electrical equipment yourself—that's what an electrician is paid for.
[ ] Do you know where fire extinguishers are located, and do you know how to use them—just in case?
[ ] Do you know where the nearest exits are located so that you can get out fast if necessary?
[ ] Do you know how to turn in an alarm if you discover a fire?
[ ] Do you know your company evacuation procedure?

LEHMAN 01576

MEETING 27: Electrical Safety

Meeting Objective: To familiarize employees with common electrical hazards in the workplace; to review electrical safety procedures.

Materials: Electrical safety checklist (if available).

Frequency: Twice a year.

I. Two basic types of electrical hazards

   A. The danger of electrical fires: Electricity is the biggest single cause of industrial fires.

      1. Most of these fires stem from improper installation of electrical equipment and poor electrical maintenance.
      2. The biggest problem is that we take electricity for granted; many electrical hazards cannot be seen.

   B. The danger of electric shock: The severity of such an accident depends upon the voltage conducted through the victim, but fatalities are not uncommon.

II. Spotting electrical hazards (Hand out electrical safety checklist.)

   A. Know what constitutes an electrical hazard and where in your work area these hazards are most likely to exist.

      1. Electric tools and equipment
      2. Wiring, plugs, extension cords, etc.
      3. High-voltage equipment
      4. Switches
      5. Static electricity
      6. Fuses and circuit breakers
      7. Other

   B. Inspect the work area for electrical hazards on a regular basis.

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C. Report electrical hazards immediately to your supervisor or the safety director.

III. Preventive measures

A. Grounding: Never let yourself be part of the circuit between one wire and another, or between one wire and a ground.

1. Ground faults can occur anywhere that electrical equipment is in operation without protection.
2. Ground fault interrupters are one form of protection—designed to limit electric shock to a current and length of time that will not produce serious injury.

B. Insulation consists of non-current-carrying or di-electric materials such as varnishes, paints, rubber, plastic, special tapes, etc.

1. Procedures for testing insulation
2. Double-insulated tools (alternate to equipment grounding)

C. Testing equipment consists of growlers, power factor meters, rotation testers, cable fault testers, circuit analyzers, leakage testers, etc.

1. Who is authorized to use testing equipment
2. When to use this equipment

IV. First aid for electric shock victims (Demonstrate techniques.)

A. Mouth-to-mouth resuscitation

B. External cardiac compression (professional instruction required)

C. Treating electrical burns

V. Discussion/summary of major points

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MEETING 28: First Aid

Meeting Objective: To familiarize employees with the company's first-aid program, including special training courses, first-aid kits, and basic emergency treatment; to reduce infection, disability, and compensation claims through prompt attention to and reporting of minor injuries.

Materials: Sample first-aid kit, mimeographed list of first-aid emergency procedures (see pages 82 and 83).

Frequency: Once or twice a year.

I. Two basic kinds of first aid

   A. Emergency treatment given in the case of accident or sudden illness before a doctor arrives

   B. Prompt attention given to injuries (cuts, scratches, burns, etc.) which are usually so minor that the injured person does not have to seek medical attention

II. The company's first-aid program (Focus on those aspects that apply to your program.)

   A. First-aid training (Specify where training is available, e.g., in-house, local schools and colleges, Red Cross, YMCA, etc.)

      1. Resuscitation techniques (mouth-to-mouth, CPR, etc.)
      2. How to stop bleeding
      3. Bandaging
      4. Transporting an accident victim
      5. Dealing with fractures
      6. Treating serious injuries (concussions, appendicitis, etc.)
      7. Other courses available

   B. First-aid kits and supplies (Show sample kits.)

      1. Types of kits (personal kits, departmental kits, trunk kits, etc.) and

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their contents
2. Location of first-aid kits
3. Maintenance and supervision of kit contents (by medical personnel, qualified first-aid attendant, etc.)

C. First-aid reference sources

1. Red Cross first-aid textbook
2. Bureau of Mines manual of first-aid instruction
3. Company safety manual

D. Medical facilities and personnel (location, staff, etc.)

E. First-aid records and reporting system (hand out report form.)

1. Importance of first-aid reports in revealing accident causes and patterns (For example, a high frequency of incidents involving splinters might indicate need for protective gloves, better maintenance of rough pallets, etc.)
2. Role of accident and first-aid records in compensation cases

III. What you can do

A. Know your own limitations; don't try to administer treatment that you aren't qualified to give.

B. If medical attention is warranted, send for it immediately—or have someone else send for it while you administer the appropriate first aid.

C. Learn (and review constantly) the basic procedures for treating medical emergencies. (Use flip charts or transparencies; demonstrate.)

1. Severe bleeding (how to apply direct pressure, when to use a tourniquet, elevating the injury, etc.)
2. Stoppage of breathing (mouth-to-mouth resuscitation)
3. Shock
4. Poisoning
5. Fracture
6. Burns

D. Know where emergency medical treatment kits are located and how to use their contents.

E. Know where eye-wash fountains and other emergency equipment are located and how to use it properly.

IV. Discussion/summary of major points

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FIRST-AID EMERGENCY PROCEDURES

First aid is the treatment given a victim prior to the arrival of professional medical assistance. Note: First aid in no way replaces the attention of a physician. If there is any question about the seriousness of an accident victim's injury, contact a doctor as soon as possible. Give the following information:

1. What has happened—and when
2. Where the victim is located
3. What first aid has been provided

While the following guidelines are not a substitute for first-aid training, they will help you provide first aid in six serious emergency situations.

BROKEN BONES

Call for medical assistance. If a doctor or ambulance can arrive within a short time, make no attempt to move the victim unless absolutely necessary. Attempt to immobilize the injured limb to prevent further injury. If the victim must be moved, splint the injured part with any available rigid material long enough to reach above and below the break. Secure the splint above and below the break. Never attempt to set a broken bone—wait for a doctor. Watch for signs of shock and treat as discussed below.

If broken bone pierces the skin, serious injury may have taken place. Make no attempt to move the injured limb. Apply a pressure dressing to control bleeding as described in the next section. Expect shock and treat as described.

BLEEDING

Call for medical assistance. If bleeding is severe, apply firm, steady pressure to the wound with layers of sterile gauze pads or bandages. If they aren't available, use any cloth. Don't remove this dressing. If the pad becomes saturated with blood, add more layers. Bandage the pads firmly in place. If no gauze or cloth is available, close the wound with your fingers, holding it closed. Keep the victim lying down until a physician arrives. Elevate the bleeding part to help control bleeding. Never use a tourniquet to control bleeding unless you are dealing with an amputated, crushed, or mangled limb. Use a tourniquet ONLY as a last-resort effort to save a victim's life, because applying a tourniquet improperly may result in loss of limb.

BURNS

Minor Burns: Immerse burned part in clear, cold water or apply ice for pain relief. Bandage with sterile pad or clean cloth. If pain persists, apply mild burn ointment.

Severe Burns: Call for medical assistance. Take immediate steps to relieve pain, prevent infection, and treat victim for shock as described below. If burn was caused by fire, boiling liquid, or hot metal, do not strip away clothing over the affected area. Keep air away from burn by covering area loosely in place. Apply no grease or ointment. Keep victim lying down. If conscious, give victim plenty of water.

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Chemical Burns: Flush burn with large amounts of water. Cover burn with cleanest cloth available, and have victim lie down until a doctor arrives. For chemical burns of the eye, flush with great amounts of water immediately, cover the eye, and rush the victim to the doctor.

POISONING

Call a doctor or poison control center at once: If victim loses consciousness, give no other first aid. If breathing stops, start mouth-to-mouth resuscitation. Follow the instructions of the doctor or poison control center.

SHOCK

After any injury, expect shock—a condition in which vital body functions are slowed down. The symptoms are: weakness; cold, pale, clammy skin with beads of perspiration on face and palms; rapid, weak pulse; chills, nausea; irregular breathing. Any or all of these symptoms may be evident.

First aid involves keeping the victim warm—covered with blankets to prevent loss of body heat—and lying down. Keep victim's airway open. If victim vomits, turn his head to the side. If victim is conscious and able to swallow, give water. If victim becomes nauseated, stop liquids. Contact a doctor as soon as possible.

BREATHING

If breathing stops for any reason, begin mouth-to-mouth resuscitation immediately. If possible, have someone else contact a doctor. Follow these steps:

1. Place victim on his or her back and determine if there is anything in the victim's mouth. If there is, turn the victim's head to one side and wipe out the mouth with a finger.
2. Straighten the victim's head and tilt it back so that the chin points up. Push the jaw down to keep the victim's tongue from blocking the airway.
3. Place your mouth over the victim's and pinch his nostrils shut with your fingers.
4. Breathe into the victim's mouth until the chest rises.
5. Remove your mouth and listen for the sound of escaping air. If you don't hear it, check the victim's head and jaw positioning and repeat the process. If there is no sound of escaping breath this time, turn the victim on his or her side and slap on the back between the shoulders. Check the mouth again for foreign matter.
6. Repeat steps 2, 3, and 4, removing your mouth to allow breath to escape from the victim's lungs. This process should be repeated about 12 times per minute for an adult. Above all, keep repeating the process until help arrives.

LEHMAN 01582

MEETING 29: Fitness and Health

Meeting Objective: To focus employees' attention on the link between personal health and fitness and on-the-job accident rates; to familiarize employees with the company's programs and services to help them maintain their fitness and health.

Materials: Mimeographed list of outside organizations in your area that provide fitness and health services (give addresses and phone numbers).

Frequency: Once or twice a year.

I. Why are fitness and health so important?

   A. For the employee, maintaining a certain level of physical well-being means fewer illnesses, longer life.

   B. For the company, it means fewer workers' comp claims, lower accident rates, and an increase in production and profit figures.

   C. Therefore, company-sponsored efforts to encourage employees to keep themselves healthy and physically fit offer mutual benefits and should be taken advantage of.

II. Exercise and diet

   A. Proper exercise and nutrition is the key to good health and long life (fewer back problems, heart attacks, and other ailments associated with overweight and inactivity).

   B. What is the "right" amount of exercise for you and how should you go about getting it?
      1. Tailor your exercise regime to your current state of physical fitness, age, weight, etc.
      2. You should obtain the advice of a doctor or trained individual before embarking on a physical fitness program. (If the company physician can provide such guidance, encourage employees to go to him/her; if you have a health and fitness coordinator, she or he

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may be able to sit down with the employee and outline an exercise program.)

3. In-house exercise facilities: if your company maintains a gym or activity areas, discuss their use, location, and availability.
4. List outside exercise facilities such as the local YMCA/YWCA, college or university whose facilities are open to the public, etc.

C. Improve your nutrition.

1. The company cafeteria (food alternatives, low-cal lunches, etc.)
2. Where to obtain dietary counseling (the company medical staff, health program coordinator, etc.)
3. Setting a goal for yourself (cutting out snacks, reducing total daily calorie intake, etc.)

III. Getting help if you're an alcoholic

A. It is to the company's advantage as well as the employee's to get prompt, professional help in dealing with alcoholism.

1. American workers are currently "drinking up" 10 billion dollars a year of industry profit.
2. Approximately 90 to 95% of all alcoholics are employed, making alcoholism a serious problem for industry.
3. In addition to being absent an average of 22 to 30 working days each year from the effects of alcohol, these employees have twice as many accidents.

B. Discuss where to get the kind of help you need.

1. The company's alcoholism treatment program (Explain the program briefly if you have one.)
2. Local alcoholic treatment centers
3. Alcoholics Anonymous

C. What are the consequences if you *don't* get help?

1. Disciplinary action (leading up to termination)
2. A serious accident involving you or your co-workers
3. Long-term damage to your health and well-being

IV. Dealing with stress

A. Safety experts agree that stress is a prime factor in a large number of job-related accidents. The employee who is under stress or trying to cope with emotional problems is preoccupied and less apt to pay attention to what he/she is doing.

B. Discuss where to get help if you are experiencing marital, financial,

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legal, or health-related problems.

1. The personnel department (Specify what kind of problems the personnel staff is equipped to handle.)
2. In-plant counselors (if your company has them)—where to find them, how to set up an appointment, kinds of problems they are equipped to deal with
3. Private counseling agencies—where to find them, how the company can help you get the counseling you need

C. The most important thing is to recognize when you are under stress and not only take constructive steps to solve your problems but also redouble your safety efforts in the meantime to prevent an accident.

V. What you can do to stay fit and healthy

A. Quit smoking: Join Smokenders, start a no-smoking pool, etc.

B. Cut down on high-calorie snacks and substitute nutritious snacks (fruit, etc.).

C. Moderate your alcohol intake; even if you're not an alcoholic, alcohol is high in calories and can impede your work performance.

D. Exercise during lunch hour: Use company exercise facilities, take a walk, jog, etc.

E. Take advantage of the programs offered by the company and the community to improve your physical condition.

VI. Discussion/summary of major points

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MEETING 30: Off-the-Job Safety

Meeting Objective: To encourage employees to follow the same safety procedures at home and in their outside activities as they use on the job; to reduce off-the-job accidents by making employees more aware of the hazards they face once they leave the plant.

Materials: Slides or photographs depicting off-the-job hazards (lifting and carrying heavy objects, using power tools, etc.); leaflets, brochures, etc., on specific off-the-job safety topics. (These can be obtained by writing to: OSHA Publications Office, Room S1212, Frances Perkins Building, Third St. and Constitution Ave., N.W. Washington, DC 20210, 202/523-6138.)

Frequency: Twice a year.

I. Why is off-the-job safety just as important—if not more so—as safety at work?

   A. A recent study revealed that accidents away from work accounted for more than 70 percent of all deaths and more than 55 percent of all injuries to employees.

   B. In some industries, disabling injuries occur 10 to 20 times as often off the job as on the job.

   C. The reason for this high incidence of accidents at home, on the road, etc., is that once employees leave work, they are no longer protected by machine guards, safety gear, and specialized training in safe practices.

II. Where do injuries occur off the job?

   A. Transportation—accidents involving cars, bicycles, buses, motorcycles, trains, boats, planes, and pedestrians

   B. Home—accidents caused by vehicles, firearms, machinery, tools, fire, explosion, exposure to heat or cold, electricity, toxic materials, falls,

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slips, improper lifting, sharp objects, overexertion, etc.

C. Public—injuries other than "transporation" or "home" caused by firearms, fire, explosion, falls, slips, striking objects, animals or insects, fights, assaults, etc.

III. Why is the company so concerned about your safety off the job?

A. All injuries, no matter where they occur, are a waste of manpower. While the company has a legal obligation to prevent injuries on the job, it has a moral responsibility to try to prevent injuries away from the job.

B. The cost of off-the-job accidents each year is about twice the $9 billion annual cost of on-the-job accidents. Operating costs and production schedules are affected just as much when employees are injured away from work as when they are injured on the job. And the personal cost to injured employees and their families is often beyond measurement.

C. Off-the-job safety is therefore good business for the company as well as the employee. Neither can afford to waste valuable skills and training.

IV. What are the most common off-the-job safety hazards that you should be aware of, and what can be done to eliminate them?

A. Falls: Use ladders properly; use safety belts; clean up spills.

B. Motor vehicle accidents: Practice defensive driving; don't speed; exercise extreme caution in snow or rain.

C. Poisoning: Be familiar with the poisons around your home; know what antidotes to use; know how to contact your local poison center.

D. Fire: Purchase a fire extinguisher and know how to use it; inspect your garage and basement for fire hazards; inspect electrical wiring, etc.

E. Drowning: Make sure you know how to swim; enroll in a safe boating course.

F. Electrical shock: Inspect appliances, cords, outlets, etc.; avoid wet environments when working with electricity.

G. Back injuries: practice safe lifting and carrying techniques when you lift heavy loads.

V. Discussion/summary of major points

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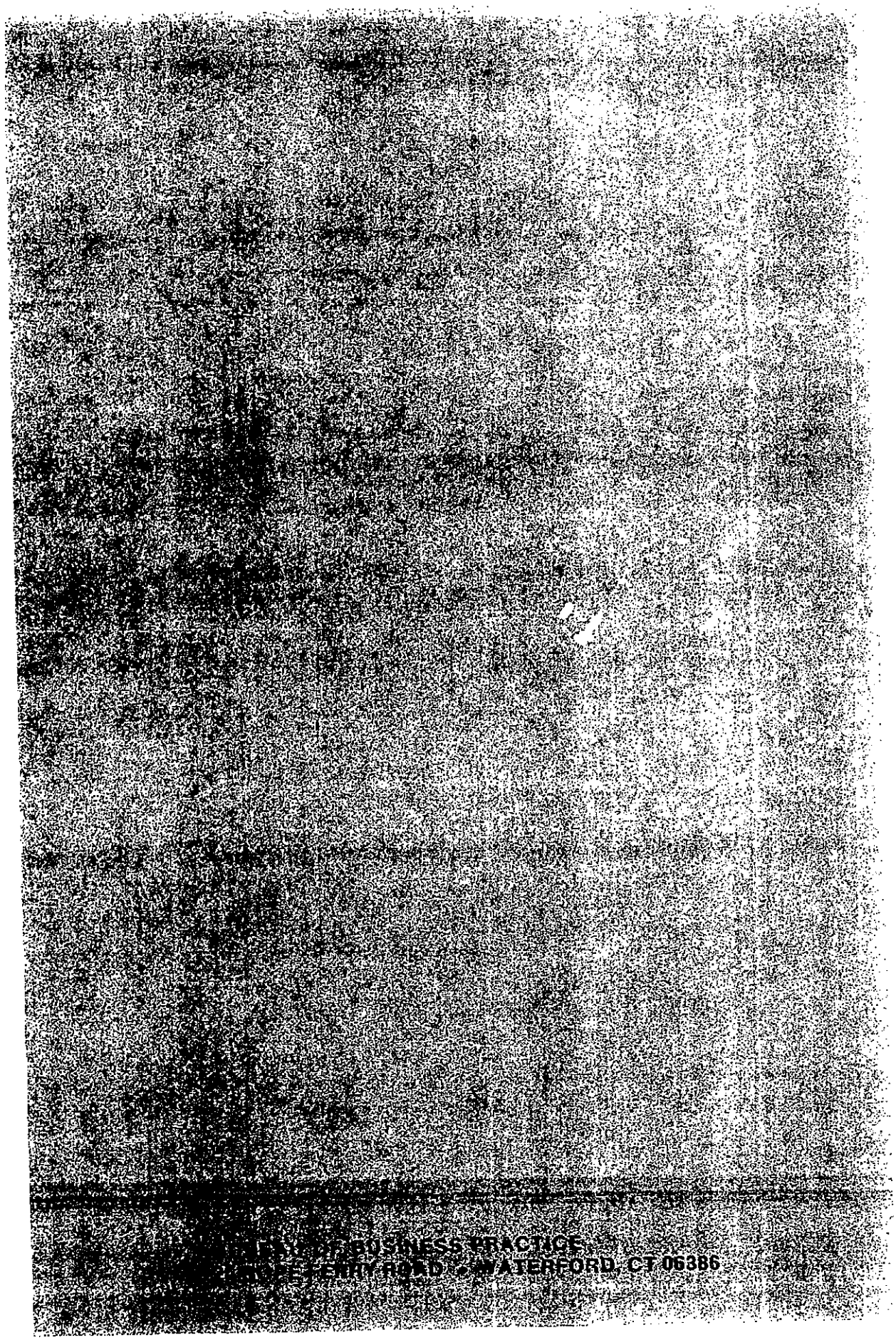
BUSINESS PRACTICE
WATERFORD, CT 06386

CUSTOMER SPECIFICATION SHEET

NO. 81310 C

Invoice copies _____

Ship to: Sam Fong Cosmetics Co., Ltd.

Bill of Lading _____

Ship from 29 - S. Plainfield OR _____ FOB CIF Hong Kong

Bill to: Sam Fong Cosmetics Co., Ltd., Tien Chu Centre, Blk. 2, 8th Floor, 1E Mok Cheong Street, Kowloon, Hong Kong

Name / Street Address / City & State

81310 I2 ZO

CODE

Ship to: See Bill of Lading

Name / Street Address / City & State

CODE

Routing: Ship via truck to harbor for export. Freight prepaid.

Spec. Instructions Send freight bill to: Cyprus Industrial Minerals Company
Attn: Int'l Dept.
P.O. Box 3299
Englewood, CO 80155

PRODUCT (S)

Name Tons as ordered SUPRAFINO, 50# Bag, DFW, "S" Ton Price Special CODE 1706

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend: STANDARD PRODUCT SPECIFICATIONS

Form: Grind: Moisture:

Type of package: 50# Bag with Product Name. Type of car: Container

Spec. Inst.
1. Mark bags as specified on B/L.
2. Palletize as specified per B/L.
3. Stretchwrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: I2

Industry: ZO

BILLING

Freight: Inland & Ocean Frt.
Forwarding Fees
Extras: Insurance
Stretchwrap

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: Letter of Credit

Discount:

Date: 5/1/86 KMS

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SANDOZ

CUSTOMER SPECIFICATION SHEET

NO. 81248 A

Invoice copies _____ Ship to: Sandoz, Inc.
E. Hanover, NJ

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Sandoz, Inc., 59 Route 10, East Hanover, NJ 07936 Attn: Acct's. Payable
Name | Street Address | City & State | CODE

Ship to: Sandoz, Inc., Route #10, East Hanover, NJ 07936 | 81248 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Lestician ~~Jay~~ JAYWAY TRUCKING
1-800-323-0634
201-838-3298
91st. Street
Bloomingdale, N.J. 07043

Spec. Instructions
1. Deliver to Bldg.# ____. (To appear on B/L.)
2. Deliver before 2PM. (To appear on B/L.)
3. Cert. of Analysis to be mailed separately to Attn: Jim Orbe, Bldg. 414, bill-to address; include PO#, Lot#, Code#.

PRODUCT (S)

Name Tons as ordered ALTALC 400 USP/"S" bag pal Ton Price Book CODE 1865

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend: GLUE EACH BAG - PALLETIZE ON GMA PALLET (5 TIE X 7 HIGH)

CODE 810 MUST BE PH 9 OR LESS

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and Cust. code (to be advised each order)/PO#. (Code is either 810.00.03.6 or 811.00.03.6, or both)

Type of car: Truck

Spec. Inst.
1. Glue and palletize best way for load, using 4-tie pattern NO TALLER THAN 34" including pallet (8-high is limit!). Stretch wrap.
2. Code all bags and paperwork as instructed under "Type of Package" (above).
3. Mail Cert. of Analysis as described under Routing Special Instructions (above).

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Attn: Jim Orbe, Bldg. 414 at bill-to
Shipping Notice:
Invoice:
Other: Cert. of Analysis to Jim Orbe (see above).

SALES DEPARTMENT INFORMATION

Branch:
Salesman: A1
Industry: Z1

BILLING

Freight:
Extras: GMA # 50
Weight:
Taxable:

Commission to: _____
Amount of Commission: _____
Terms:
Discount:

Date: 6/6/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 54051 A

Invoice copies _____

Ship to: Mary Kay c/o Kolmar
Port Jarvis, NY

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Mary Kay Cosmetics, Inc., Mfg. Div., PO Box 47310, Dallas, TX 75247
Name / Street Address / City & State — CODE

Ship to: Mary Kay Cosmetics c/o Kolmar Labs., King St., Port Jarvis, NY 12771 — 54051 A1 Z1
Name / Street Address / City & State — CODE

Routing: Motor Freight Collect via Lestician

Spec. Instructions 1. Call ahead for delivery appointment. (914)856-5311.

PRODUCT (S)

Name 20 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# white T/M bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Sales: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 2/4/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 54405 B

Invoice copies _____

Ship to: Max Factor & Co.
Oxford, NC

Bill of Lading _____

Ship from: 29 So. Plainfield OR _____ FOB Plant

Bill to: Max Factor & Co., PO Box 1168, Oxford, NC 27565
Name | Street Address | City & State

CODE

Ship to: Max Factor & Co., 1501 Williamsboro, Oxford, NC
Name | Street Address | City & State

54405 A1 Z1
CODE

Routing: Motor Freight Collect via Burlington (Tel. 201-864-0400)

Spec. Instructions
1. Plant to arrange carrier.
2. Extra copy of B/L to accompany shipment as packing list, along with Cert. of Analysis (see below).

PRODUCT (S)

Name Tons as ordered SUPRA/S bg pal code 88-3306-00-00 Ton Price Book CODE

Name Tons as ord'rd SUPRAFINO/S bg pal 88-3396-00-00 Ton Price Book CODE

PRODUCT SPECIFICATION

Blend:

Sp. Inst.#4. Mill to UPS preshipment sample to ship-to-addr.; Attn: Judy Langdon

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name and cust codes as noted above, & cust. PO#.

Type of car: Truck

Spec. Inst.
1. Glue and palletize 34 bags per GMA pallet. (Supra- 5-tie; Suprafino- 4-tie.) Stretchwr
2. Plant to attach container label in upper right corner of every pallet.
3. Cert. of Analysis must accompany every shipment in envelope attached to packing list copy of B/L. Mark B/L: One (1) envelope- 1 lb. CofA to include all test results & statement "Bacteria less than 100 col/gm; Asbestos not detected per CTFA JF-1."

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Add Sp. Inst. #4 02/22/85mh/bh

Terms:

Discount:

Date: 5/11/84 rt

LEHMAN 01592

MAX FACTOR

NORTON SIMON INC
COMPANY

Max Factor & Co.
P.O. Box [illegible]
[illegible]
Oxford, North Carolina [illegible]
(919) 693-0200

January 11, 1984

Cyprus Industrial Minerals Company
Suite 401
1101 Kings Highway North
Cherry Hill, NJ 08034
ATTN: Sales Department

Dear Sir:

It has been brought to our attention by Max Factor's Receiving Department that your company is repeatedly remiss in including required information with each shipment. Max Factor requires all the information indicated on the enclosed case corner labels as well as:

1. A packing list with each shipment and its location clearly marked.

2. All partial cases clearly and specially marked for easy location and verification. (See enclosed sample labels).

Our Receiving Department will monitor performance by receipt and note on the Receiving Log. Purchasing will receive a copy of the log daily to enforce compliance. Continued infractions will result in invoice deductions covering Max Factor's additional labor.

We anticipate and appreciate your positive response.

Regards,

Thomas W. McGraw

Thomas W. McGraw
Purchasing Manager

sp

cc: James Lumpkins

CODE: MATNEY

CUSTOMER SPECIFICATION SHEET

NO. 04045 B

Invoice copies _____

Ship to: Arthur Matney Co.
Brooklyn, NY

Bill of Lading _____

Ship 29 So. Plainfield DR _____ FOB Plant

Bill to: Arthur Matney Co., 360 Furman St., Brooklyn, NY 11201 _____
Name | Street Address | City & State | CODE

Ship to: Arthur Matney Co., 360 Furman St., Brooklyn, NY 04045 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via ~~MINI-MAX~~ BEST RATE METROWEST OR MINIMAX

Spec. Instructions

Some orders specify APCO 516-293-0353 Brian/Rich

PRODUCT (S)

Name 20 tons MISTRON RCS-VM/"S" bag pal Ton Price SPECIAL CODE 1035

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Color: Color to match standard sample.
Loose bulk density: 15± 0.5

Form: Grind: Moisture:

Type of package: 50# T/M White bag with product name and cust. codes: AM 2110/PO#

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as noted above.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Gas: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 2/8/83 rr

CUSTOMER SPECIFICATION SHEET

NO. 54400 B

Invoice copies _____

Ship to: Maybelline
N. Little Rock, AR

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Maybelline (Name) PO Box 372 (Street Address) Memphis, TN 38151 (City & State) CODE

Ship to: Maybelline, C/O Microbiotrol, (Name) Central Jersey Indust.Park, Chimney Rock Rd., 8 E.Easy St., (Street Address) Bound Brook NJ 08805 (City & State) 54400 A1 Z1 CODE

Routing: Motor Freight Collect
Plant to arrange carrier

Spec. Instructions 1. Plant to include copy of B/L as packing slip;
Mark B/L article description: 1 envelope containing packing slip- 1 lb.

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend: 2 STEEL BANDS
2 SHEETS CARDBOARD
2 LABELS SPECIAL INSTRUCTIONS TO MICROBIOTROL
ALSO P.O. & CODE ON CARDBOARD & CUST NAME

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and codes: 08490-40

Type of car: Truck

SPECIAL INSTRUCTION #5 Plant to mark pallets & 3 bags on each side of pallet: "Dust inhalation hazard" "Target Organ Effect" TYPE STENCIL ON OFFICE TYPEWRITER

Spec. Inst.
1. Purchasing Control# (upper left on PO) to appear on all paperwork.
2. Glue and palletize 1 ton per ~~DRW~~ pallet, (40X48) overall pallet height not to exceed 42". GMA
3. Plant to band pallets.
4. Co-shipment sample to C.Parker, 3030 Jackson Ave., Memphis TN 38151.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

J: Banding on pallets. $2.00/ton

Weight:

Taxable: CHG: Rtg; Bag Code & Spec. Inst. #3. 1-13-86mh
ADD: Spec.Inst. #5. 6-4-86mh

Commission to: _____

Amount of Commission: _____

Terms: ADD:Mfg. date to bag code.3/18/83 rt
CHG: #1/ 8/12/83 rt

Discount: CHG: Spec.Inst. 2. 11-14-83 rt
CHG: Ship-to-address. 9-9-85mh mh

Date: 1/24/83 rt

LEHMAN 01595

MICROBIOTROL :
DO NOT CUT
STRAPS. ACCESS
ALL BAGS FROM
SIDES

MICROBIOTROL :
DO NOT CUT
STRAPS. ACCESS
ALL BAGS FROM
SIDES

MICROBIOTROL :
DO NOT CUT
STRAPS. ACCESS
ALL BAGS FROM
SIDES

MAX FACTOR LABEL

CATALOG NUMBER	
DESCRIPTION OF ITEM	
DATE PACKAGED	**PURCHASE ORDER NO.**
QUANTITY PER CARTON	**BATCH/LOT NO.**

CUSTOMER SPECIFICATION SHEET

NO. 54406 A
54405

Invoice copies _____

Ship to: Max Factor & Co.
Clearfield, UT

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: Max Factor & Co., PO Box 1168, Oxford, NC 27565 Attn:Acc'ts Payable _____
Name | Street Address | City & State | CODE

Ship to: Max Factor & Co., Freeport Center, Clearfield, UT 84106 54406 W1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via APA Trucking

Spec. Instructions

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted]: NOTE: CONTAINER LABELS ARE LOCATED IN MILL OPERATOR'S SUPPLY CABINET. ATTACH TO EACH PALLET UPPER R. CORNER. ALSO ATTACH PACKING LIST ENVELOPE WITH PACKING LIST & CERT. OF ANAL. INSIDE.

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and Cust. code: 88-3306/PO#

Type of car: Truck

SUPRA 5 TIE w/34 BAGS EA.
S.F. 4 TIE w/34 BAGS EA.

S.F. CODE 88-3396-00-00 GMA

Spec. Inst.
1. Glue and palletize ~~1 ton per~~ pallet, or best way for load.
2. Ship entire order quantity from one lot only. (EACH PRODUCT)
3. Cert. of Analysis must accompany shipment- attach to extra copy of B/L which will serve as packing list.
4. Plant to attach container label in upper right corner of every pallet, and advise Cust. Serv. when supply is depleted.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: W1

Industry: Z1

BILLING

Freight:

[redacted]:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: ADD:Bag codes. 6/6/83 rt
ADD: Spec.Inst.4. 11/14/83 rt/mh

Discount:

Date: 6/3/83 rt

LEHMAN 01599

CODE: PONDS

CUSTOMER SPECIFICATION SHEET

NO. 12390 A (Revised)

Invoice copies _____

Ship to: Chesebrough Ponds, Inc.
Clinton, CT

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: Chesebrough Ponds, Inc., John St., Clinton, CT 06413
Name | Street Address | City & State | CODE

Ship to: Chesebrough Ponds, Inc., Heritage Park, Route 145, Clinton, CT 12390 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up. Tel. (203)669-8601 Phyllis Perkins to arrange pick-up.

Spec. Instructions

PRODUCT (S)

Name 20 tons MONOBLEND/ bag pal Ton Price Book CODE 1765

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted] Blend: SUPRA 50-248
MONO. 50-311
OLY. 50-309
SF 50-3-2056

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name and codes: 50311/Cust. PO#, Lot#.

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Code bags as shown above.
4. Lot# must appear on all paperwork.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

[redacted]

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: CHG:Routing. 3/7/83 rt

Discount:

Date: 10/19/82 rt (Revised & Retyped)

CUSTOMER SPECIFICATION SHEET

NO. 14865 A (Revised)

Invoice copies _____

Ship to: Coty Products
Sanford,NC

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Coty Products, Division of Pfizer, PO Box 1026, Sanford, NC 27731-1026
Name | Street Address | City & State | CODE

Ship to: Coty Products, Division of Pfizer, 1400 Broadway Rd., Sanford NC 27731-1026 14865 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Burlington
Plant to call 1-800-652-2793 to arrange carrier

Spec. Instructions B/L description to read: Talc, ground".

PRODUCT (S)

Name 20 tons SUPRA/ bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and codes: 2-00-101-465 & Cust. PO#.

Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

as:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Ship-to-address, CHG: Zip code. 11-20-84mh

Terms: CHG: Rtg. 5-14-86mh

Discount:

Date: 9/24/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 00534 A

Invoice copies _____ Ship to: Avon-Mirabella, Inc.

Bill of Lading _____

Ship from 29-South Plainfield OR _____ FOB Plant

Bill to: Avon-Mirabella, Inc., P.O. Box 3918, Aquadilla, Puerto Rico 00605
Name Street Address City & State

00534 T1 ZO
CODE

Ship to: Avon-Mirabella, Inc., 111 Maltese Drive, Totowa, New Jersey 07512
Name Street Address City & State

CODE

Routing: Ship via Regional Consolidators. Freight collect.

Spec. Instructions Send freight bill to: Avon-Mirabella, Inc.
P.O. Box 3918
Aguadilla, P.R. 00605

PRODUCT (S)

Name Tons as ordered OLYMPIC TALC, DFW, "S" Ton Price Special CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Fineness: Grind: Moisture:

Type of package: 50# Export Bag with product name. Type of car: Truck

Spec. Inst. 1. Palletize on DFW pallets.
2. Mark bags as indicated on B/L.
3. Stretchwrap

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: I1

Industry: ZO

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: Net 30 Days

Taxable: Discount:

Date: 1/21/86 KMS

CUSTOMER SPECIFICATION SHEET

NO. 03753 A

Invoice copies

Ship to: Aerosol Research Labs
Holbrook, MA

Bill of Lading

From 29 So. Plainfield OR FOB Plant

Bill to: Aerosol Research Labs (Name) 606 South St. (Street Address) Holbrook, MA 02343 (City & State) CODE

Ship to: Aerosol Research Labs (Name) 606 South St. (Street Address) Holbrook, MA (City & State) 03753 A1 Z1 CODE

Routing: Customer Pick-up

Spec. Instructions

PRODUCT (S)

Name 20 tons OLYMPIC/"S" bag pal Ton Price Book CODE 1515

Name Ton Price CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to:

Extras: Amount of Commission:

Weight: Terms:

Taxable: Discount:

Date: 12/20/82 vt

CUSTOMER SPECIFICATION SHEET

NO. 13291 A

Invoice copies _____

Ship to: Clairol, Inc. c/o Kolmar Labs
Port Jervis, NY

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Clairol, Inc., #1 Blachely Rd., PO Box 10213, Stamford, CT 06922 _____
Name | Street Address | City & State | CODE

Ship to: Clairol, Inc., c/o Kolmar Labs, King St., Port Jervis, NY 13291 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect- Best way

Spec. Instructions 1. Send freight bill to Clairol, Inc.,PO Box 10213,Stamford,CT 06922
(TO APPEAR ON B/L)

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name Clairol Product Code 873 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and codes: 873/PO#/Lot# Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags (as above).
3. Stretch wrap.
4. Code 873, PO#, Lot# to appear on all paperwork.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Tax: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 8/13/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 56706 A

Invoice copies _____ Ship to: The MEM Company
Northvale, NJ

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: The MEM Company (Name) 122 Union Street (Street Address) Northvale, NJ 07647 (City & State) _____ (CODE)

Ship to: The MEM Company (Name) Union Street Ext. (Street Address) Nothvale, NJ (City & State) 56706 A1 Z1 (CODE)

Routing: Motor Freight Prepaid via Mini-Max
Mark B/L: Freight Prepaid. Send Freight Bill to: Technical Traffic Consultants
20 Squadron Blvd.
New City, NY 10956

Spec. Instructions

PRODUCT (S)

Name 12 tons SUPRA/"S" bag pal Ton Price special CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per ~~DFW~~ GM4 @ 50 pallet, (MUST BE 40x48 PALLET!).

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 4/4/83 rc

CUSTOMER SPECIFICATION SHEET

NO. 56717 A

Invoice copies _____

Ship to: Mennen Co.
Morristown, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Mennen Company, Hanover Ave., Morristown, NJ 07960 _____
Name | Street Address | City & State | CODE

Ship to: Mennen Company, Hanover Ave., Morristown, NJ 56717 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via ~~Interchange~~. PIONEER

Spec. Instructions: Must call ahead for Delivery Appointment.

PRODUCT (S)

Name 20 tons OLYMPIC/"S" bag pal Ton Price Book CODE 1515

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Grind:

CAR TYPE: Truck MOISTURE:
Form: Grind:

Type of package: 50# bags

SPECIAL INSTRUCTION #6.
Plant to mail Cert. of Analysis stating: "Olympic talc complies with CTFA JF-1 Regulations concerning asbestos. On the basis of X-ray diffraction, this lot does not contain asbestos. Olympic talc meets bacteria and mold specifications of less than 100 col./gm." ATTN: J.Montero, Q.C. Manager.

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet. (40"x48")
2. Code bags 10362 and Lot#.
3. Stretch wrap.
4. Ship from one lot only.
5. Copy of B/L to be attached to last pallet in trlr in envelope marked: "Packing List".

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Tax:

Weight:

Taxable:

Commission to: _____
CHG: Spec.Inst. #6. 6-18-87mh

Amount of Commission: _____

Terms: ADD: DFW size. 5/15/82 rt
ADD: #3. 9/14/83 rt

Discount: ADD: #4. 5-17-84 mh
ADD: Spec.Inst. #5.11-6-84

Date: 1/11/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 12040B

Invoice copies _____

Ship to: Charles of the Ritz Group Ltd.
Holmdel NJ

Bill of Lading _____

Ship from 29 So.Plainfield OR _____ FOB Plant

Bill to: Charles of the Ritz Group, Ltd., Accounts Payable Dept., PO Box 711, Holmdel NJ 07733
Name | Street Address | City & State

Ship to: Charles of the Ritz Group, Ltd., Rt. 35, Holmdel NJ 07733
Name | Street Address | City & State

Routing: Customer Pick Up

Spec. Instructions Plant must call 48 hrs. in advance of scheduled pick-up date to confirm arrangements. REQUEST CALL-BACK FOR CONFIRMED DATE.
Tel. (201)739-6027 Terry or Ann. EVELYN
6028

PRODUCT (S)

Name 20 tons Orean/Bg Pal Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION (SF USUALLY LBS. NOT TONS)

Blend: CODE FOR S.F. 06-02166-00-093
SUPRA 06-02175-00-093

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name and Cust. 06-02168-00-093 & PO# Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretchwrap.
3. Code each face of pallet with Customer Code:06-02168-00-093 & PO#. Bag codes not required.
4. Copy of B/L to be included as packing list. 5. SHIP FROM ONE LOT ONLY.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: M2

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

CHG: Bill-to-address. 5-23-86mh

Weight: Terms:

Taxable: Discount:

Date: 6-6-85mh

CODE: CHANEL

CUSTOMER SPECIFICATION SHEET

NO. 11965 A

Invoice copies _____

Ship to: Chanel, Inc.
Piscataway, NJ

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Chanel, Inc., 876 Centennial Ave., Piscataway, NJ 08854
Name | Street Address | City & State | CODE

Ship to: Chanel, Inc., 876 Centennial Ave., Piscataway, NJ 11965 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Lestician Trucking

Spec. Instructions Mark B/L: "A.M. DELIVERY ONLY"
Customer Product Code 00-2431

PRODUCT (S)

Name 20 tons SUPRA/ "S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# white bags with cust. code 00-2431 Type of car: Truck

Spec. Inst.
1. Glue and palletize on DFW pallets, 40 bags per pal.
2. Show Lot# and cust. code on bags and paperwork.
3. Stretch wrap.
4. Certificate of Analysis to be mailed to:Chanel Research Center,Bill-to address, Attn:Meena Shukla,Quality Assurance.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: ADD:Inst.#4. 12/13/82 rt

Taxable: Discount:

Date: 4/28/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 51565 B

Invoice copies _____

Ship to: Len-Ron Mfg. c/o Kolmar
Port Jervis, NY

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Len-Ron Mfg. Co., Inc., 350 Service Rd., Melville, NY 11747
Name | Street Address | City & State

CODE

Ship to: Len-Ron Mfg. c/o Kolmar Labs, King St., Port Jervis, NY 51566 A1 Z1
Name | Street Address | City & State

CODE

Routing: Motor Freight Collect via Olpag (516) 752-9853

Spec. Instructions

PRODUCT (S)

Name Tons and materials as ordered Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with pproduct name & codes as requested with each order

Type of car: Truck

Spec. Inst.
1. Glue and palletize best way for load.
2. Code bags as requested with each order.
3. Stretch wrap.
4. Cert. of analysis to be mailed to ATTN: Carolyn Holtz at bill-to-address

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Tax:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Routing, 5-7-86mh

Terms:

Discount:

Date: 3/28/83 rt

COVE L.R.

ALTALC 300 ONLY

CUSTOMER SPECIFICATION SHEET

NO. 51565C

Invoice copies _____

Ship to: Len-Ron Mfg. Co., Inc.
Melville NY

Bill of Lading _____

Ship from 29 So.Plainfield OR 23 Alpine FOB Plant

Bill to: Len-Ron Mfg. Co., Inc. (Name) 350 Service Rd. (Street Address) Melville NY 11747 (City & State)

CODE

Ship to: Len-Ron Mfg. Co., Inc., A.S.R., 71 Maxess Rd., Melville NY (Name / Street Address / City & State)

51565 A1 21

CODE

Routing: Motor Freight Collect via Olpag (516) 752-9853

Spec. Instructions
1. Customer truck may have to pick up in two loads. Plant to advise Cust. Service of this situation, should it occu
2. B/L must show: Carrier must call 516-454-5385 for delivery appointment.

PRODUCT (S)

Name Tons as ordered Altalc 300 USP/Bg Pal Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and code: 9999-69-0244 + P.O. on all Bags

Type of car: Customer truck

Spec. Inst.
1. Glue & palletize 1 ton per pallet, stretchwrap.
2. Code bags as noted above.
3. Certificate of analysis to accompany shipment.
4. Loose bulk density to approx. 21 lbs./ft3. NO SO2 odor.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: 21

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 7-30-84 mh

CUSTOMER SPECIFICATION SHEET

NO. 04505 E

Invoice copies _____ Ship to: Avon Products, Inc.

Bill of Lading: _____

29- South Plainfield, N.J. OR _____ FOB Plant

Bill to: Avon Products, Inc., Attn: Accts Payable, P.O. Box 933, Rye, N.Y. 10581 [redacted]
Name Street Address City & State

Ship to: Avon Service Center, 111 Maltese Drive, Totowa, New Jersey 07512 (201) 890-[redacted]
Name Street Address City & State

Routing: Ship via truck, freight collect.

Spec. Instructions Send freight bill to Avon Products, Inc.
P.O. Box 933
Rye, N.Y. 10581
Attn: Accts Payable

PRODUCT (S)

Name TONS AS ORDERED ALTALC 400 Ton Price BOOK CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

d:

Form: Grind: Moisture:

Type of package: 50 # bags with product name Type of car: truck

Spec. Inst.
1. DFW Pallets
2. Mark Bags as indicated on B/L
3. Stretchwrap

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch: IO

Salesman: GPP

Industry: 21

Ship To & Routing Chngd. 12/10/85 KMS

BILLING

Freight:

s:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: Net 30 Days

Discount:

Date: 10-10-84 LS

CUSTOMER SPECIFICATION SHEET

NO. 04510 A

Invoice copies _____

Ship to: Avon Products, Inc.
Springdale, OH

Bill of Lading _____

Ship from 29 South Plainfield OR _____ FOB Plant

Bill to: Avon Products, Inc., 175 Progress Place, Springdale, OH 45246
Name Street Address City & State

CODE

Ship to: Avon Products, Inc., 175 Progress Place, Springdale, OH
Name Street Address City & State

04510 A1 Z1
CODE

Routing: Motor Freight Collect via Regional Consolidated

Spec. Instructions Regional Consolidated TEL: (201)792-3100.

PRODUCT (S)

Name Tons as Ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# bags Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Code bags: 0-747-1 + P.O.
3. Stretch wrap.
4. CONSOLIDATE ALL AVON SHIPMENTS ON 3 MASTER B/L. (SEE EXAMPLE)

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: CHG:Reg.Cons, tel.#. 3/7/83 rt

Discount:

Date: 4/14/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 20948 B

Invoice copies

Ship to: Frank E. Dempsey & Sons, Ltd.
Leaside, Ontario, Canada

Bill of Lading

From 29 So. Plainfield OR FOB Plant

Bill to: Frank E. Dempsey & Sons, Ltd., 47 Davies Ave., Toronto, Ontario, CAN M4M2A9
Name Street Address City & State CODE

Ship to: Frank E. Dempsey & Sosn, Ltd., 45 Esandar Dr., Leaside, Ontario Canada 20948 Q4 Q0
Name Street Address City & State M4G 4C5 CODE

Routing: Customer Pick-up through border broker: Universal Custom Broker, Ltd.
15 Toronto St., Suite 1100,
Toronto, Ontario,
Canada M5C 2E3

Spec. Instructions

Mail Certificate to George Krein
(Bill to Address)

PRODUCT (S)

Name Tons and materials as ordered Ton Price Book CODE

Name Ton Price CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bags with product name and customer codes to be advised with each order

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet, or best way for load.
2. Code bags as noted with each order.
3. Stretch wrap.
4. Certificate of analysis with actual test results to accompany shipment.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice: CCI AND CANADIAN EXPORT DEC MUST ACCOMPANY SHIPMENT.
Mail copies to Carol at ship-to address & to Cust.Service.
Other: and to border broker.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: Q4

Industry: Q0

BILLING

Freight:

Gas:

Weight: CHG: Spec.Inst. #4. 11-20-86mh

Taxable:

Commission to: Frank E. Dempsey

Amount of Commission: 5%

CHG: Ship-to-address. 3-15-85mh

Terms: CHG: Commission rate. 4/26/83 rt
CHG: Broker address. 7-19-83 mh

Discount: CHG: Slsm.& Indst. code. 7-25-83 mh
ADD: Spec.Inst.#4. 12-5-84mh

Date: 2/4/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 20948 A

Invoice copies _____

Ship to: Frank E. Dempsey & Sons, Ltd.
Leaside, Ontario, Canada

Bill of Lading _____

23 Alpine OR _____ FOB Plant

Bill to: Frank E. Dempsey & Sons, Ltd., 47 Davies Ave., Toronto, Ontario, Can. M4M2A6 CODE
Name Street Address City & State

Ship to: Frank E. Dempsey & Sons, Ltd., 45 Esandar Dr., Leaside, Ontario, Can. M4G 4C5 20948 Q1 Z1 CODE
Name Street Address City & State

Routing: Customer Pick-up via Reiter Wholesale Dist. through border broker:
UNIVERSAL CUSTOM BROKER, LTD
PO Box 1250- Station B
Fort Erie, Ont., Canada
L2A5N9

Spec. Instructions

PRODUCT (S)

Name Tons as ordered ALTALC 400/ bag pal Ton Price Book CODE 1856

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Bag code: FEDCO 400 TALC & Lot#.
3. Stretch wrap.
4. Certificate of analysis to accompany shipment.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: Q1

Industry: Z1

BILLING

Freight:

Weight: ADD: Spec.Inst. #4. 1-26-86mh

Taxable:

Commission to: Frank E. Dempsey

Amount of Commission: 5%

Terms: CHG: Ship-to-address. 3-15-85mh
CHG: Slsmn. code. 2/4/83 rt
CHG: Commission rate. 4/26/83 rt

Discount: CHG: Spec. Inst. #1. 11-8-85mh

Date: 1/9/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 04440 C

Invoice copies _____ Ship to: Avon Products, Inc. Morton Grove, IL

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Avon Products, Inc., 6901 Golf Rd., Morton Grove, IL 60053 _____ CODE
Name | Street Address | City & State

Ship to: Avon Products, Inc., 6901 Golf Rd., Morton Grove, IL 04440 A1 Z1 CODE
Name | Street Address | City & State

ALLEN FRT. 1-800 255-0238

Routing: Motor Freight Collect via Regional Consolidators

Spec. Instructions FOR MORE THAN ONE SHIPMENT, ON SAME WK., SAME CARRIER, USE MASTER B/L & CONSIGN TO: AVON C/O REGIONAL CONSOLIDATE 55 VAN KUEREN AVE, JERSEY CITY - SHOW SPLIT IN BODY OF B/L. INCLUDE SIGNED COPIES OF INDIVIDUAL B/L'S ATTACHED TO FRT. (SEE EXAMPLE)

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet or best way for truck.
2. Code bags 0-0747-1 and PO#.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to:

Extras: Amount of Commission:

Weight: Terms:

Taxable: Discount:

Date: 6/4/82 rt

LEHMAN 01616

CUSTOMER SPECIFICATION SHEET

NO. 04495 A

Invoice copies _____

Ship to: Avon Products, Inc.
Hillburn, NY

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Avon Products, Inc. (Name) 1 Division St. (Street Address) Suffern, NY 10901 (City & State) Attn:Acct'g Dept.

CODE

Ship to: Avon Products, Inc., c/o Hillburn Warehouse 4th St. (Name / Street Address) Hillburn, NY 10931 (City & State) 04495 A1 Z1

CODE

Routing: Motor Freight Collect via S.M.S. Express
Tel. ~~(914) 357-4935 or 4936~~ 652-6361

Spec. Instructions

PRODUCT (S)

Name Tons as Ordered SUPRA/ "S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Grade:

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet, or best way for truck.
2. Code bags: 0-0747-1, and cust. PO#.
3. Stretch wrap.
4. Plant must consolidate all Hillburn shipments for the week and make one shipment using a Master Bill of Lading. (SEE EXAMPLE)

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Sales:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: CHG: Bill & Ship addresses. 11/9/82
CHG: Bill to address. 2-24-84 mh

DiscountCHG: Routing & ADD: #4. 4/3/84 rt
also CHG Bill-to address

Date: 3/8/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 20560 A

Invoice copies _____

Ship to: Davlyn Industries, Inc.
Cranbury, NJ

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: Davlyn Industries, Inc., 105 Melrich Rd., Cranbury, NJ 08512
Name | Street Address | City & State | CODE

Ship to: Davlyn Industries, Inc., 105 Melrich Rd., Cranbury, NJ 08512 20560 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Lestician

Spec. Instructions

PRODUCT (S)

Name 20 tons SUPRA/"S" bag pal [illegible] Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted] d:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

[redacted] ras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 5/24/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 77293 A

Invoice copies _____

Ship to: Revlon, Inc.
Edison, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Revlon, Inc., Accounts Payable, PO Box 853, Metuchen, NJ 08840 _____
Name | Street Address | City & State | CODE

Ship to: Revlon, Inc., Woodbridge Warehouse, Grace St. and Old Post Rd., Edison, NJ 77293 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up

Spec. Instructions 1. Call Traffic Dept. one week prior to pick-up date: (201) 287-7054

PRODUCT (S)

Name 15,125 tons SUPRA/ "S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

#6. C/A including asbestos analysis to be sent to: Brian Wilburn, Q.C. Dept. by plant. "This lot contains no asbestos using CTFA J4-1 test method" on C of A.

Form: Grind: Moisture:

Type of package: 50# bags Type of car: Customer Truck

Spec. Inst.
1. Glue and palletize 605 bags on 15 DFW pallets. (40"x 48")
2. Use corrugated cardboard slip sheet under bottom bag layers.
3. Bag codes: ROWND 98775, Lot#, Cust. PO#, and weights in kilos.
4. Stretch wrap.
5. Stock # ROWND 98775 to appear on all paperwork.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice:

Other:

Shipping Notice: Plant to call Mrs. Betty Lenart on ship date. 201-287-1400 EXT 7311.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Commission to: _____

Amount of Commission: _____

ADD: Ship notice. 5-23-86mh

Terms: ADD: Spec. Inst. #5. 3/30/82 rt
ADD: DFW size. 5/15/82 rt

Discount: ADD: Spec. Inst. #6. 5-25-84 mh
CHG: Phone#. 3-26-85mh

Weight:

Taxable:

Date: 1/14/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 74222A

Invoice copies _____

Ship to: Polycom Huntsman Inc.
Donora PA

Bill of Lading _____

Ship from 29 So. Plainfield NJ OR _____ FOB Plant

Bill to: Polycom Huntsman Inc., (Name) PO Box 492, (Street Address) Donora PA 15033 (City & State) CODE

Ship to: Polycom Huntsman Inc., (Name) Washington St., Donora Industrial Park, (Street Address) Donora PA 15033 (City & State) 74222 M2 LO CODE

Routing: Motor Freight Collect

Spec. Instructions Plant to arrange carrier

PRODUCT (S)

Name 20 tons Mistron ZSC-VM/ "S" Bg Pal Ton Price Book CODE 0407

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M Bags with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Stretchwrap.
3. CERTIFICATE OF ANALYSIS CERTIFYING THE PARTICAL SIZE DISTRIBUTION AND BRIGHTNESS SENT ATTN SCOTT MORFORD GEB ≠ SCREEN

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: M2

Industry: LO

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 1-21-86mh

CUSTOMER SPECIFICATION SHEET

NO. 56717 C

Invoice copies _____ Ship to: Mennen Co. Morristown, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Mennen Company, Hanover Ave., Morristown, NJ 07960 CODE
Name Street Address City & State

Ship to: Mennen Company, Hanover Ave., Morristown, NJ 56717 A1 Z1 CODE
Name Street Address City & State

Routing: Motor Freight Collect via Pioneer Freight

Spec. Instructions 1. Delivery appointment required. TEL. (201)631-9089.

PRODUCT (S)

Name 20 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name Spec. 10628 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

SPECIAL INSTRUCTION #6.
Copy of B/L to be attached to last pallet in trailer in envelope marked: "Packing List".

Form: Grind: Moisture:

Type of package: 50# white T/M bag with product name and cust. code: 10628 Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per 40x48 pallet.
2. Code bags as described above.
3. Stretch wrap.
4. Ship from one lot only.
5. Mail Cert. of Analysis MUST be mailed to:Jose Montero at bill-to address, ATTN:QC Dept

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Gas: Amount of Commission: _____
ADD: Spec.Inst. #6.11-6-84 mh
CHG: Routing. 6-22-87mh

Weight: Terms:

Taxable: Discount:

Date: 2/17/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 11280 A

Invoice copies _____

Ship to: Carter Wallace, Inc., c/o Peterson Puritan
Cumberland, RI

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: Carter-Wallace, Inc., Drawer 12, Cranbury, NJ 08512 — CODE
Name / Street Address / City & State

Carter-Wallace, Inc.

Ship to: c/o Peterson Puritan, Inc., Martin St., Cumberland, RI 02864 — 11280 A1 Z1
Name / Street Address / City & State — CODE

Routing: Motor Freight Collect via Pioneer TEL.(201)887-0543

Spec. Instructions 1. Call Peterson Puritan for docking appointment. (401)333-4200

PRODUCT (S)

Name 12 tons SUPRAFINO/"S" bag pal — Ton Price Book — CODE 1706

Name _____ — Ton Price _____ — CODE _____

PRODUCT SPECIFICATION

[redacted]

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and cust. code: B-669/PO# — Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet. SHIP FROM ONE LOT ONLY.
2. Code bags as noted above. Stretch wrap.
3. Cert. of Analysis must show: Lead content less than 20ppm, Arsenic content less than 3ppm
4. Cert. of Analysis to be mailed to Mr. Bill Easterbrooks at Peterson Puritan (ship-to) & to: Dr. D.Daoust, QC Dept., Carter-Wallace, PO Box#1, Cranbury, NJ 08512.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

[redacted]

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: CHG:#2 & #3, 6/7/83 rt

Discount:

Date: 2/17/83 rt

LEHMAN 01622

CUSTOMER SPECIFICATION SHEET

NO. C-04505

Invoice copies _____ Ship to: Avon Products Inc. Int'l Div.

Bill of Lading _____

Via S. Plainfield (29) OR _____ FOB S. Plainfield

Bill to: Avon Products Inc. 9W 57th St., New York, N.Y. 10019 — 04505-T5-Z1
Name | Street Address | City & State | CODE

Ship to: See B/L — CODE
Name | Street Address | City & State

Routing: Truck to harbor prepaid for export

Spec. Instructions: Send freight bills to Avon Products Inc.
9 W 57th Street
New York, N.Y. 10019

PRODUCT (S)

Name: Tons as ordered, Supra talc exp. bag — Ton Price: Book — CODE: 1705

Name: _____ — Ton Price: _____ — CODE: _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 lb export bag with product name. Type of car: Truck

Spec. Inst.: 1. Palletize on DFW pallets; 40 bags/pallet.
2. Stretch wrap

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Bill to Address Shipping Notice: Bill to Address

Invoice: Bill to Address

Other:

SALES DEPARTMENT INFORMATION

Branch: T-5

Salesman: CRM

Industry: Z1

BILLING

Freight: Commission to: None

Extras: DFW pallets @ Book
Stretch-wrap @ Book

Amount of Commission: None

Weight: Terms:

Taxable: Discount:

11/5/79

CUSTOMER SPECIFICATION SHEET

NO. 72820 A (Revised)

Invoice copies _____ Ship to: L. Perrigo Co. Allegan, MI

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: L. Perrigo Co., (Name) 117 Water St., (Street Address) Allegan, MI 49010 (City & State) CODE

Ship to: L. Perrigo Co., (Name) 117 Water St., (Street Address) Allegan, MI 49010 (City & State) 72820 A1 Z1 CODE

Routing: Customer Pick-up

Spec. Instructions Plant to call Bob Decker to arrange pick-up. 616-396-1964.

PRODUCT (S)

Name 20 tons MONOBLEND/ bag pal Ton Price Book CODE 1765

Name Cust. product code RM 3833 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bags with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code pallet face with cust. product code RM 3833 & cust. PO#.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Terms: Amount of Commission: _____

DEL: Spec.Inst. #4. 5-30-86mh

ADD: Rtg. Spec. Inst. 5-30-86mh

Weight:

Terms: ADD:Inst.#4.11/1/82 rt
CHG: Price to Special. 6/7/83 rt
CHG:Price to Book. 6/8/83 rt

Taxable: Discount:

Date: 9/9/82 rt

CODE: CARTER A

CUSTOMER SPECIFICATION SHEET

NO. 11279

Invoice copies _____ Ship to: _____

Bill of Lading _____

[redacted] _____ OR _____ FOB _____

Bill to: CARTER-WALLACE (Name) P.O. Box 1 (Street Address) Cranbury, N.J. 08512 (City & State) Attn Purchasing (CODE)

Ship to: Carter-Wallace Inc, Manufacturing Bldg Half Acre Rd. (Name / Street Address) Cranbury, N.J. (City & State) (CODE)

Routing: MOTOR FREIGHT COLLECT Carrier must call (609) 448-6002 X 301 for dock app't at destination

Spec. Instructions Certificat of analysis must be mailed to Dr. D. Daoust, VP Quality Control Dept at sold to address
CODE BAGS: B-1224

PRODUCT ($)

Name _____ Ton Price _____ CODE _____

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted] Blend:

Form: Grind: Moisture:

Type of package: Type of car:

Spec. Inst.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman:

Industry:

BILLING

Freight: Commission to: _____

[redacted]as: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: _____

CUSTOMER SPECIFICATION SHEET

NO. 48435 C

Invoice copies _____

Ship to: Kolmar Labs
Port Jervis, NY

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Kolmar Labs. (Name) King St., (Street Address) Port Jervis, NY 12771 (City & State) _____ (CODE)

Ship to: Kolmar Labs. (Name) King St., (Street Address) Port Jervis, NY (City & State) 48435 A1 Z1 (CODE)

Howard S 212 929-4406

Routing: Motor Freight Collect via ~~Mortorano~~ Freight Systems ~~-800-334-3872.~~

Spec. Instructions 1. Extra copy of B/L to be attached to last pallet in truck marked "Packing list." Mark B/L: "One (1) envelope-1 lb."

PRODUCT (S)

Name Tons as ordered 'SUPRA/"S" bag pal (Code 143748) Ton Price Book CODE 1705

Name Tons as ordered SUPRAFINO/"S" bag pal (Code 143764) Ton Price Book CODE 1706

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and customer codes: 143748 (Supra)
143764 (Suprafino)

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as above.
3. Stretch Wrap.
4. Plant to send C/A including all test data, plus Bacteria (less than 100 col./gm), Asbestos N.D.using CTFA J 4-1, Lead (Less than 20 ppm) & Arsenic (Less than 3 ppm) to: ATTN:Ms.Kathy Burns. 1 copy to Cust. Serv.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Class:

Weight:

Taxable:

Commission to: _____

CHG: Rtg. 1-21-87mh

Amount of Commission: _____

CHG: Rtg.Spec.Inst. 10-25-84mh

Terms: CHG:Product Cust. Codes.6/9/83 rt
ADD: Spec.Inst. #4. 1-11-84 mh

Discount: CHG: Routing.2-24-84 mh
ADD: Rtg.Spec.Inst.#1. 5-17-84 mh

Date: 1/19/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 48435 A

Invoice copies _____

Ship to: Kolmar Labs
Port Jervis, NY

Bill of Lading _____

From 29 So. Plainfield OR 27 Grand Island FOB Plant (or Mines)

Bill to: Kolmar Labs, (Name) King St., (Street Address) Port Jervis. NY 12771 (City & State) _____ CODE

Ship to: Kolmar Labs, (Name) King St., (Street Address) Port Jervis. NY (City & State) 48435 A1 Z1 CODE

Routing: Motor Freight Collect via ~~Mortorano~~ Howards Freight Systems ~~800-334-3872~~

Spec. Instructions
1. When shipping from Grand Island, carrier to be advised- bill for Inbound Freight less MIT charges.
2. Extra copy of B/L to be attached to last pallet in truck marked "Packing List." Mark B/L: "One (1) envelope - 1 lb."

PRODUCT ($)

Name Tons as ordered OLYMPIC/ bag pal Ton Price Book CODE 1515

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet (or best way for load).
2. Stretch wrap.
3. Mark each face of pallet with Cust. code: 143695.
4. Plant to send C/A including all test data,plus bacteria (less than 100 Col./gm) asbestos N.D. Using CTFA J4-1,Lead (Less than 20 ppm) &Arsenic (Less than 3 ppm) to Attn: Ms. Kathy Burns. 1 copy to Cust. Serv.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Class: When shipping from Grand Island only:
1. Stretch wrap- Book
2. Inbound Freight at current rate.

Weight:

Taxable: CHG: Rtg. 1-21-87mh

Commission to: _____

Amount of Commission: _____

Terms: CHG: Rtg.Spec.Inst. 10-25-84mh
CHG:Routing. 3/7/83 rt
CHG: Rtg. 12-14-83 mh

Discount: ADD: Spec.Inst. 4. 1-11-84 mh
ADD: Rtg.Spec.Inst.#2. 5-17-84 mh
CHG: Rtg. 8-30-84 mh

Date: 9/24/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 70010 A

Invoice copies _____

Ship to: PLC Specialties
Fairlawn, NJ

Bill of Lading _____

29 So. Plainfield, NJ OR _____ FOB Plant

Bill to: PLC Specialties, 20-10 Maple Ave., Fairlawn, NJ 07412
Name | Street Address | City & State

CODE

Ship to: PLC Specialties, 20-10 Maple Ave., Fairlawn, NJ
Name | Street Address | City & State

70010 A1 Z1
CODE

Routing: Motor Freight Collect via Apex out of business
A.M. Delivery preferred

Spec. Instructions 1. Plant to arrange carrier.

PRODUCT (S)

Name 20 tons SUPRA/ bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend: 50/50 - Korean/Italian or 100% Italian

Form: Grind: 25 lbs./ft.^{3} Minimum loose density Moisture:

Type of package: 50# T/M white bag with product name and code: RTL 1119 X Type of car: Truck

Spec. Inst.
1. Code bags as above.
2. Glue and palletize 1 ton per pallet.
3. Stretch wrap.

BAG WTS, CRITICAL!! CHECK PALLET

SPECIAL DOCUMENT MAILING

Record PALLET WTS

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Gas:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: ADD: Routing Inst. 1-9-84 mh
CHG: Routing instuctions. 11/8/83 rt
ADD: Blend & Grind Inst. 11/14/83

Discount: CHG: Routing. 4-16-86mh

Date: 11/24/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 00244A

Invoice copies _____ Ship to: PLC Specialties Fairlawn NJ

Bill of Lading _____

Ship from 29 South Plainfield NJ OR _____ FOB Same

Bill to: Chanel Inc., (Name) 876 Centennial Ave., (Street Address) Piscataway NJ 08854 (City & State)

CODE

Ship to: PLC Specialties, (Name) 20-10 Maple Street, (Street Address) Fairlawn NJ 07410 (City & State) 00244 A2 Z1

CODE

Routing: Motor Freight Collect via Apex

Spec. Instructions A.M. Delivery Preferred

PRODUCT (S)

Name 12 tons Supra/Bg Pal Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M bags with product name and Cust. Code: 00-2431

Type of car: Truck

Spec. Inst.

1. Glue and palletize 1 ton per DFW pallet.
2. Code bags as noted above.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A2

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 6-22-87mh

Prince Matchabelli

JOHN STREET, CLINTON, CONNECTICUT 06413
TELEPHONE 203-669-8601
D-U-N-S # 00-145-6599

November 12, 1987
SECOND REQUEST

Customer Service
Traffic Department
Cyprus Industrial Mineral Co.
Talc Division
651 Metuchen Road
South Plainfield, NJ 07080

DearGentlemen:

On all future releases to Chesebrough-Pond's facilities from your plant in South Plainfield, NJ, please use the following routing:

TO: Prince Matchabelli Div., Huntsville, AL

Via: Thurston Motor Lines

This carrier can be contacted for pickups by calling: 201-225-6363.

Huntsville, AL

NOTE: All shipments to Huntsville, AL are to be forwarded freight collect. Failure to comply with these instructions will result in charge-backs for excess freight.

The above routing applies for LTL less than 5M# shipments only. Shipping instructions to other Chesebrough-Pond's facilities and shipments exceeding 5M LBS. are to be coordinated through this department by contacting either myself or Regis Kennedy at 203-669-8601.

This routing supersedes all previous instructions and your compliance will be greatly appreciated.

Sincerely,

CHESEBROUGH-POND'S INC.

Charles N. MacKenzie
Traffic Manager

CNM:sms
(5682Y)
(5683Y)
CC: Mr. Ernest Brantley
Thurston Motor Lines
600 Johnston Road
Charlotte, NC 28206

COPE: PLOUGH

CUSTOMER SPECIFICATION SHEET

NO. 74104 B

Invoice copies _____ Ship to: Plough, Inc Memphis, TN

Bill of Lading ✓

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Plough, Inc. (Name) 3030 Jackson Ave. (Street Address) Memphis, TN 38151 (City & State) _____ CODE

Ship to: Plough, Inc. (Name) 3022 Jackson Ave. (Street Address) Memphis, TN (City & State) 74104 A1 Z1 CODE

Routing: Customer Pick-up

Spec. Instructions One envelope containing packing list: 1 lb.

PRODUCT (S)

Name Tons as ordered SUPRAFINO/S bag pal Ton Price Book CODE 1706

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with prodcut name and customer code#: 08190-40/PO# Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Extra copy of B/L to accompany shipment as packing list.
4. Certificate of analysis to accompany shipment to attn: Fay Brwon, Quality Control.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

as:

Weight:

Taxable:

Commission to: ADD: Spec.Inst. #4. 3-15-85mh

Amount of Commission: _____

ADD: Rtg, Spec.Inst., & Spec. Inst.#4.

Terms: 4-19-84 mh

Discount:

Date: 1/10/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 12400 A

Invoice copies _____ Ship to: Chesebrough Ponds, Inc. Perth Amboy, N.

Bill of Lading _____

Ship from 29- South Plainfield, N.J. OR _____ FOB Plant

Bill to: Chesebrough-Ponds, Inc. 33 Benedict Place, Greenwich, Conn. 06830
Name | Street Address | City & State

Ship to: Chesebrough-Ponds Inc. Perth Amboy Warehouse, Sheridan & Paterson Streets
Name | Street Address | City & State Perth Amboy, N.J.

Routing: Via truck to warehouse. Freight collect.

Spec. Instructions Submit sample for analysis to Group Leader, Chesebrough-Ponds, In
International R&D, Trumbull Industrial Park, Trumbull, Conn. 0661

PRODUCT (S)

Name TONS AS ORDERED OLYMPIC TALC EXPORT BAGS Ton Price BOOK CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 # export bags with product name Type of car: truck

Spec. Inst.
1. DFW Pallets
2. Stretchwrap
3. Mark bags as indicated on B/L

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Bill to Add. Shipping Notice: Bill to Add.

Invoice: Bill to Add.

Other:

SALES DEPARTMENT INFORMATION

Branch: I6

Salesman: CWA

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: Net 30 Days

Discount:

CUSTOMER SPECIFICATION SHEET

No. 12395 A

Invoice copies _____ Ship to: Chesebrough-Ponds, Inc.
Perth Amboy, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant
Export Raritan Ctr,

Bill to: Chesebrough-Ponds, Inc., Acct. Dept., 2ndFloor/Raritan Plaza III, Edison, NJ 08837
Name | Street Address | City & State | CODE

Ship to: Chesebrough-Ponds, Inc., Perth Amboy Dist. Ctr., Sheridan & Paterson Sts., Perth Amboy, NJ 08861 | 12395 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Lestician

Spec. Instructions

PRODUCT (S)

Name Tons and materials as ordered/"S" bag pal Ton Price Book CODE _____

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Prod: SUPRA 50-248
MONO 50-311
OCY 50-309

Form: Grind: Moisture:

Type of package: 50# white T/M bag with product name and Cust. code and PO#. Type of car: Truck

Spec. Inst.
1. Glue and palletize best way.
2. Code bags as advised with each order.
3. Stretch wrap.
4. Send preshipment sample (200 grams) of each product to: Peter Tuite, Chesebrough-Ponds, Inc., 40 Merritt Blvd., Trumbull, CT 06611

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Gross: Amount of Commission: _____

Weight: Terms: CHG: #4. 11/21/83 rt

Taxable: Discount:

Date: 1/17/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 24853 C

Invoice copies _____

Ship to: J.P. Stevens
Stuart, VA.

Bill of Lading _____

29 So. Plainfield, OR _____ FOB Plant

Bill to: J.P. Stevens, Patrick Plant, Hwy 58 East, Stuart, VA 24171 _____
Name | Street Address | City & State | CODE

Ship to: J.P. Stevens, Patrick Plant, Hwy 58 East, Stuart, VA 24171 24853 AH RO
Name | Street Address | City & State | CODE

Routing: Customer Pick-Up.

Spec. Instructions: Plant to call 3 days in advance for pick-up information.
Mr. Daryl Moore (703)694-3131 Ext. 15.

PRODUCT (S)

Name 20 tns Supra EF/Semi-Bulk Ton Price Special CODE 1750

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: Semi-Bulk Bag Type of car: Truck

Spec. Inst.
1. Palletize 1 ton per DFW pallet.
2. Plant to mark each bag indicating trip number.
3. Lot# to appear on B/L.
4. Cert. of Analysis to accompany shipment stating: "We certify that lot____ contains no asbestiform amphiboles when tested using CTFA method J 4-1". Attn: Bob Linscott.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: AH

Industry: RO

BILLING

Freight:

Gas:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: Delete: DFW Charge. 3-9-84 mh
ADD: Spec.Inst. #4. 4-29-86mh

Discount:

Date: 7-18-73 mh

CUSTOMER SPECIFICATION SHEET

NO. 12375 A

Invoice copies _____

Ship to: Chesebrough Ponds, Inc.
Huntsville, AL

Bill of Lading _____

[redacted] 29 So. Plainfield _____ OR _____ FOB Plant

Bill to: Chesebrough Ponds, Inc. (Name) 1000 James Record Rd., (Street Address) PO Box 1348, Huntsville, (City & State) AL 35806 CODE

Ship to: Chesebrough Ponds, Inc. (Name) 1000 James Record Rd., (Street Address) Huntsville, AL (City & State) CODE

Routing: Motor Freight Collect (CHALIE MCKENZIE 203-669-8601 EXT. 2205

CALL ~~TOTAL DIST. SERVICES~~ 48 HRS ADVANCE FOR P/U
FULL LOADS 203-~~581~~-5744 ASK FOR ERIC

Spec. Instructions

LTL USE ~~BARON-DIXON~~ ROADWAY OVER 10,000#
CALL CHARLE MCKENZIE FOR CARRIER

PRODUCT (S)

Name 12 tons SUPRAFINO/"S" bag pal Ton Price Book CODE

Name _____ Ton Price _____ CODE

[redacted]

[redacted] SUPRA CODE 50-248 PRODUCT SPECIFICATION

Blend:

TRUCKER MUST CALL FOR DEL. APPOINTMENT

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name and Cust. codes: 50-3-2056/PO Type of car: Truck

Spec. Inst.
1. Palletize 1 ton per pallet.
2. Code bags as above.

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment:	Shipping Notice:	Branch:
Invoice:		Salesman: A1
Other:		Industry: Z1

BILLING

Freight: Commission to: _____

[redacted]as: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 9/21/83 rt

LEHMAN 01635

CUSTOMER SPECIFICATION SHEET

NO. 12390 A (Revised)

Invoice copies _____ Ship to: Chesebrough Ponds, Inc. Clinton, CT

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Chesebrough Ponds, Inc., John St., Clinton, CT 06413
Name | Street Address | City & State | CODE

Ship to: Chesebrough Ponds, Inc., Heritage Park, Route 145, Clinton, CT 12390 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up. Tel. (203)669-8601 Phyllis Perkins to arrange pick-up.

Spec. Instructions

PRODUCT (S)

Name 20 tons MONOBLEND/ bag pal Ton Price Book CODE 1765

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend: Supra - 50-248
mono - 50-311
Cly - 50-309
SF - 50-3-2056

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name and codes: 50311/Cust. PO#, Lot#.

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Code bags as shown above.
4. Lot# must appear on all paperwork.
5. Cert. of analysis to accompany shipment - attn: Jim Maresca.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Gas:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: CHG:Routing. 3/7/83 rt
ADD: Spec. Inst. #5. 1-14-86mh

Discount:

Date: 10/19/82 rt (Revised & Retyped)

CUSTOMER SPECIFICATION SHEET

NO. 90581 A

Invoice copies _____

Ship to: Union Carbide Corp.
Piscataway, NJ

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Union Carbide Corp., (Name) P0 Box 670, (Street Address) Bound Brook, NJ 08805 (City & State) _____ (CODE)

Ship to: Union Carbide Corp., (Name) River Rd., (Street Address) Piscataway, NJ (City & State) 90581 A4 L0 (CODE)

Routing: Motor Freight Collect via Hmieleski

Spec. Instructions 1. Carrier to call Bound Brook Plant Dispatcher 24 hrs. in advance for unloading appointment--(201)469-2577.
DRIVER GO DIRECT TO BLDG. 101 POLYETHELENE.

PRODUCT (S)

Name 20 tons Mistron ZSC-VM/"S" bag pal Ton Price Book CODE 0407

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: Bagged Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Code each face of pallets with Cust. Code 84110 & Cust. P.O.#
4. Certificate of Analysis & test results. A blandet Certification taht; Coating weight = 0.75%,minimum, Minerals Analysis = talc - 96%, minimum & asbestos - none; moisture = 0.5% maximum.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other: Certificate of Analysis & Test Results MUST be mailed to: Dept. Head,Quality Control,Bldg.101, at bill-to address

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A4

Industry: L0

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Spec. Inst. #3. 8-17-84 mh
Terms: ADD; Spec. Inst. 4. 4-16-85mh
CHG: Routing. 6-11-87mh

Discount: CHG:Tonnage and ADD; PO#'s to Inst.#3 and Cert. & Test Instructions. 11/23/82 rt

Date: 6/18/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 12040 C

Invoice copies _____

Ship to: Charles of the Ritz c/o B.H. Krueger
Fairlawn, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Charles of the Ritz Group, Ltd., PO Box 711, Accounts Payable Dept. Holmdel NJ 07733
Name | Street Address | City & State

CODE

Ship to: Charles of the Ritz Group. Ltd., c/o B.H. Krueger, 17-9 Zinc Place, Fairlawn, NJ 07412
Name | Street Address | City & State

12040 A1 Z1

CODE

Routing: Customer Pick-up

Spec. Instructions
1. Plant to call 48 hrs. in advance of scheduled pick-up date to confirm arrangements. REQUEST CALL-BACK FOR CONFIRMED DATE. TEL:(201)739-6027, Terry or Ann.
2. For 24-ton loads, specify larger trailer requirement. Partial pick-up may be required.

PRODUCT (S)

Name 24 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and cust. code: 06-02175-00-93 and PO# Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as noted above.
3. Stretch wrap.
4. Copy of B/L to accompany shipment as packing list.
5. SHIP FROM ONE LOT ONLY.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Bs:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Bill-to-address. 5-23-86mh

Terms:

Discount:

Date: 4/14/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 12040 A

Invoice copies _____

Ship to: Charles of the Ritz Group. Ltd.
Holmdel, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Charles of the Ritz Group, Ltd., PO Box 711, Accounts Payable Dept., Holmdel NJ 07733
Name | Street Address | City & State

CODE

Ship to: Charles of the Ritz Group, Ltd., Rt. 35, Holmdel, NJ 07733 — 12040 A1 Z1
Name | Street Address | City & State — CODE

Routing: Customer Pick-up

Spec. Instructions 1. Plant must call 48 hrs. in advance of scheduled pick-up date to confirm arrangements. REQUEST CALL-BACK FOR CONFIRMED DATE, TEL: (201)739-6027, Terry or Ann.

PRODUCT (S)

Name 20 tons SUPRA/ bag pal — Ton Price Book — CODE 1705

Name _____ — Ton Price _____ — CODE

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name, lot#. & P.O.#. Type of car: Customer truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Code each face of pallet with Customer Code: 06-02175-00-093, & p.o.#. Bag codes not required.
4. Copy of B/L to be included as packing list; 5. SHIP FROM ONE LOT ONLY.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

as: ADD: P.O. # to bag marks & ADD: Spec. Inst. 4, 1/14/83 rt/mh
ADD: Inst.#5. 2/17/83 rt

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____ CHG: Bill-to-address, 5-23-86mh

Terms:

Discount:

Date: 10/27/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 48435 D

Invoice copies _____ Ship to: Kolmar Labs

Bill of Lading _____

Ship from 29 - S. Plainfield OR _____ FOB Plant

Bill to: Kolmar Labs, King Street, Port Jervis, NY 12771
Name Street Address City & State

Ship to: Kolmar Labs, King Street, Port Jervis, NY 12771
Name Street Address City & State

Routing: Motor Freight COLLECT, VIA ~~Rice Way (201) 795-1756~~. HOWARDS EXPRESS

Spec. Instructions 1. Extra copy of B/L to be attached to last pallet in truck marked "Packing List". Mark B/L: "One (1) envelope-1 lb."

[redacted]

PRODUCT (S)

Name Tons as ordered Supra, Exp. Bag, "S", Code 143748 Ton Price Book CODE [redacted]

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# Export Bag with product name and customer code: 143748 (Supra) 143764 (SUPRAFINO) Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as above.
3. Stretchwrap
4. Plant to send C/A including all test data, plus Bacteria (less than 100 col./gm), asbestos N.D. using CTFA J 4-1, Lead (less than 20 ppm) & Arsenic (less than 3 ppm) to Attn: Ms. Kathy Burns. 1 copy to Cust. Serv.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: IO

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 8/21/85 KMS

CODE: L.R.

CUSTOMER SPECIFICATION SHEET

NO. 51565 A

Invoice copies _____

Ship to: Len-Ron Mfg. Co., Inc.
Melville, NY

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Len-Ron Mfg. Co., Inc., 350 Service Rd., Melville, NY 11747
Name | Street Address | City & State — CODE

Ship to: Len-Ron Mfg. Co., Inc., A.S.R., 71 Maxess Rd., Melville, NY — 51565 A1 Z1
Name | Street Address | City & State — CODE

Routing: ONLY PALLETS 40X48 TO A.S.R. WAREHOUSE
~~OVERSIZE (S.F.N.A. ALTALC 400)~~ TO 350 SERVICE RD.
Motor Freight Collect via OLPAG (516) 752-9853
CUST. WILL NO LONGER ACCEPT ANYTHING BUT 40X48
GMA PALLETS NO OVERHANG 54" MAX HT.

Spec. Instructions
1. Customer truck may have to pick up in two loads.
Plant to advise Cust. Service of this situation, should it occur.
2. B/L must show: "Carrier must call 516-454-5385 for delivery appointment."

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal — Ton Price Book — CODE 1705

Name Tons as ordered SUPRAFINO/"S" bag pal — Ton Price Book — CODE 1706

Name Tons as ordered ALTALC 400 USP/"S" bag pal — Ton Price Book — CODE 1856

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and codes: Suprafino: 9999-69-0154
Supra: 9999-69-0104 Altalc 400 USP: 9999-69-0054, Altalc 300 9999-69-0244, P.O.#
Cust. PO# on all bags

Type of car: Customer truck

Spec. Inst.
1. Code bags as above.
2. Ship 1 ton per pallet, stretch wrapped.
3. Cert. of analysis to accompany shipment. — ATTN: DAVID MILLER

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Gas: Amount of Commission: _____

Weight: ADD:Routing Inst.2. 4/3/84 rt

Taxable:

Terms: CHG:Ship-to address. 10/2/4/83 rt
CHG:Routing,sample ship-to name; &
ADD:Supra and code. 2/8/83 rt

Discount: CHG: Inst. 3. 4/18/83 rt/mh

Date: 12/16/82 rt

CUSTOMER SPECIFICATION SHEET

No. 24853 C

Invoice copies _____ Ship to: J.P. Stevens
Stuart, VA.

Bill of Lading _____

29 So. Plainfield _____ OR _____ FOB Plant

Bill to: J.P. Stevens, Patrick Plant, Hwy 58 East, Stuart, VA 24171
Name | Street Address | City & State | CODE

Ship to: J.P. Stevens, Patrick Plant, Hwy 58 East, Stuart, VA 24171 | 24853 AH RO
Name | Street Address | City & State | CODE

Routing: Customer Pick-Up.

Spec. Instructions: Plant to call 3 days in advance for pick-up information.
Mr. Daryl Moore (703)694-3131 Ext. 15.

PRODUCT (S)

Name 20 tns Supra EF/Semi-Bulk Ton Price Special CODE 1750

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: Semi-Bulk Bag Type of car: Truck

Spec. Inst.
1. Palletize 1 ton per DFW pallet.
2. Plant to mark each bag indicating trip number.
3. Lot# to appear on B/L.
4. Cert. of Analysis to accompany shipment stating: "We certify that lot____ contains no asbestiform amphiboles when tested using CTFA method J 4-1". Attn: Bob Linscott, also include moisture & 200 mesh screen results.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: AH

Industry: RO

BILLING

Freight: Commission to: _____

Gas: Amount of Commission: _____

Weight: Delete: DFW Charge. 3-9-84 mh
Terms: ADD: Spec.Inst. #4. 4-29-86mh
CHG: Spec.Inst. #4. 10-27-86mh

Taxable: Discount:

Date: 7-18-73 mh

CODE: J. LABS

CUSTOMER SPECIFICATION SHEET

NO. 45784

Invoice copies _____ Ship to: _____

Bill of Lading _____

Ship from _____ OR _____ FOB _____

Bill to: JERICHO LABS (Name) 245 Oser Ave (Street Address) Hauppauge, NY (City & State) _____ CODE

Ship to: JERICHO LABS (Name) 245 Oser Ave. (Street Address) Hauppauge, NY (City & State) _____ CODE

Routing: MOTOR FREIGHT COLLECT

Spec. Instructions

PRODUCT (S)

Name _____ Ton Price _____ CODE _____

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: Type of car:

Spec. Inst.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman:

Industry:

BILLING

Freight:

Terms:

Weight:

Taxable:

Commission to:

Amount of Commission:

Terms:

Discount:

Date: _____

CUSTOMER SPECIFICATION SHEET

NO. 32440 A

Invoice copies _____

Ship to: Firestone Indust. Prods.
Noblesville, IN

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Firestone Industrial Products, Firestone Blvd. & 17th St., Noblesville, IN 46060
Name — Street Address — City & State — CODE

Ship to: Firestone Industrial Products, Firestone Blvd. & 17th St., Noblesville, IN 32440 M2 RO
Name — Street Address — City & State — CODE

Routing: Motor Freight Collect via McLean

Spec. Instructions
1. Mark B/L: "One (1) only envelope containing Packing Slip- 1 lb.
2. Copy of B/L to accompany shipment in separate envelope.

PRODUCT (S)

Name 5 tons SUPRA/ bag pal Ton Price Book CODE 1705

Name FSTN 21-0016-15/Vendor Payment#C-3852 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name & codes: FSTN 21-0016-15, Cust. PO#. Type of car: Truck

Spec. Inst.
1. Code bags as noted above.
2. Glue and palletize 1 ton per pallet.
3. Stretch wrap.
4. Certificate of analysis to accompany shipment.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: M2

Industry: RO

BILLING

Freight:

Mas:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: ADD:Vendor Payment#. 1/13/83 rt
ADD: Spec.Inst. #4. 5-23-86mh

Discount:

Date: 11/12/82 rt

CODE: PETERSON

CUSTOMER SPECIFICATION SHEET

NO. 72890 A

Invoice copies _____ Ship to: Peterson Puritan, Cumberland, RI

Bill [illegible]ding _____

29 So. Plainfield OR PO Box 500, FOB Plant

Bill to: Peterson Puritan, Martin St., Cumberland, RI 02864 CODE
Name Street Address City & State

Ship to: Peterson Puritan, Martin St., Cumberland, RI 72890 A1 Z1 CODE
Name Street Address City & State

Routing: To be advised with each order.

Spec. Instructions

PRODUCT (S)

Name Tons as ordered SUPRAFINO/ "S" bag pal Ton Price Book CODE 1706

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per DFW pallet.
2. Code bags: 001-18-0913, Cust PO#.
3. Stretch wrap.
4. MATERIAL MUST MEET ALL AVON SPECIFICATIONS.
5. Cust PO#, Part# to appear on all paperwork

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

[illegible]:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

ADD: PO Box to Bill-TO. 7-25-83 mh

Terms:

Discount:

Date: 2/19/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 72890 B

Invoice copies _____ Ship to: Peterson Puritan
Cumberland, RI

Bill of Lading _____

From 29 So. Plainfield OR _____ FOB Plant

Bill to: Peterson Puritan, Martin St., P.O. Box 500, Cumberland, R.I. 02864 _____
Name | Street Address | City & State | CODE

Ship to: Peterson Puritan, Martin St., Cumberland, RI 72890 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up

Spec. Instructions 1. Customer may request shipments be made motor freight collect.
2. DELIVERIES BY APPOINTMENT ONLY CARRIER TO CALL:401-333-4200

PRODUCT (S)

Name 12 tons ALTALC 400 USP/"S" bag pal Ton Price Boo's CODE 1856

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# white T/M bag with product name Type of car: Truck

Spec. Inst. 1. Palletize 1 ton per pallet.
2. Stretch wrap.
3. Code each face of pallet with customer code: 001-18-0322 and his PO#.
4. Cert of Analysis & test results to be mailed to Bill Easterbrooks at Bill-to (include lead & arsenic content as lead 20ppm Arsenic 3ppm

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Address:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: ADD; RTG, INST. #2 & SPEC.INST #4
6-18-83 jld&CHG: Bill address

Discount:

Date: 12/10/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 94985 A

Invoice copies _____

Ship to: Charles A. Wagner Co., Inc.
Philadelphia, PA

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Charles A. Wagner Co., Inc., PO Box 9816, Philadelphia, PA 19140
Name | Street Address | City & State | CODE

Ship to: Charles A. Wagner Co., Inc., 4455 N. 6th St. Philadelphia, PA | 94985 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Funk's Hauling TEL.(215)676-1730

Spec. Instructions

PRODUCT (S)

Name 20 tons SUPRA/ 3S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Grind:

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. ~~Bag code 1705~~ and Lot#.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Gas: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 1/9/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 57646 A

Invoice copies _____

Ship to: Valspar Corp. (Was Mobil Chem.)
Edison, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Valspar Corp., P.O. Box M1, Short Hills NJ 07078
Name | Street Address | City & State | CODE

Ship to: Valspar Corp., C/o Mobil Chemical Co., Rt. 27 & Vineyard Rd., Edison, NJ 08817 — 57646 A1 AO
Name | Street Address | City & State | CODE

Routing: Customer Pick-Up

Spec. Instructions

PRODUCT (S)

Name 12 tons BEAVERWHITE 325/"S" bag pal Ton Price Book CODE 1655

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Lot#: Code Bags PE-102-S1-a use Label on Each Pallet For P.O. #)

Form: Grind: Moisture:

Type of package: 50# bags with product name. Type of car: Cust. Truck

Spec. Inst. 1. Glue and palletize one ton per DFW pallet.
2. Code bags: PE-102-S-1, Lot#, (Cust PO#) Chemical Description for level I N/C.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice: To ship-to address.

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: AO

BILLING

Freight:

Terms:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

CHG: Routing & Tonnage. 4/15/83 rt
Terms: ADD: Spec. Inst. 4-19-83 rt/mhmh
CHG: Rtg. 12-14-83 mh
Discount: CHG: Bill & Ship to name. 8-7-84 mh

Date: 1/19/82 rt

FULFLEXB

CUSTOMER SPECIFICATION SHEET

NO. 34040 A (Revised)

Invoice copies: _____

Ship to: Fulflex of N, Carolina, Inc.
Scotland Neck, NC

Bill of Lading: _____

Ship from: 29 So. Plainfield OR _____ FOB Plant

Bill to: Fulflex, Inc., PO Drawer 539, Bristol, RI 02809 _____
Name | Street Address | City & State | CODE

Ship to: Fulflex of N. Carolina, Inc., 500 E. 7th St., Scotland Neck, NC 27874 34040 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via ~~Pacesetter~~ (800) 334-7239
SINGER 722-3510

Spec. Instructions

PRODUCT ($)

Name 20 tons SUPRA/ bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Material must be Bacteria Controlled.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 9/17/82 rt

FULFLEXA

CUSTOMER SPECIFICATION SHEET

NO. 34035 A (Revis

Invoice copies _____

Ship to: Fulflex, Inc.
Bristol, RI

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Fulflex, Inc., PO Drawer 539, Bristol, RI 02809
Name / Street Address / City & State

CODE

Ship to: Fulflex, Inc., Warehouse Stock, Franklin & Buttonwood Sts., Bristol, RI 34035 A1 Z1
Name / Street Address / City & State

CODE

Routing: Motor Freight Collect via C-Line

Spec. Instructions 1. Plant to call 1-800-556-3866 one day prior to shipment.

PRODUCT (S)

Name 20 tons SUPRA/ bag pal Ton Price Special CODE 1705

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package 50# T/M white bag with product name Type of car: Truck Type of car:

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Material must be Bacteria Controlled.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Commission to: _____

Amount of Commission: _____

Terms: CHG:Price 8/22/83 rt
CHG:Tonnage;ADD;Routing Inst.#1.
8/19/83 rt

Weight:

Taxable:

Discount:

Date: 9/17/82 rt

LEHMAN 01650

CUSTOMER SPECIFICATION SHEET

NO. 81857 B

Invoice copies _____

Ship to: Scott Paper
Chester, PA

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Scott Paper Co., Front & Avenue of the States, Chester, PA 19013
Name | Street Address | City & State

CODE

Ship to: Scott Paper Co., Front & Avenue of the States, Chester, PA 19013
Name | Street Address | City & State

81857 A4 PO

CODE

Routing: Motor Freight Collect via Dameo Trucking

Spec. Instructions 1. Plant to arrange carrier.

PRODUCT (S)

Name 20 tons MISTRON VAPOR-VM/bulk Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: Bulk Type of car: Bulk PD Hopper truck

Spec. Inst.
1. Load truck to capacity. DO NOT EXCEED CAPACITY OF TRUCK.
2. Plant to report shipments by TWX on shipment, specifying ESTIMATED WEIGHT. Accurate weight is to be reported on copy of Bill of Lading to be mailed to Customer Service. Include on face of B/L: Gross, Tare, and Net Weights.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A4

Industry: PO

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 1/7/85 rt

CUSTOMER SPECIFICATION SHEET

NO. 77295 A

Invoice copies _____

Ship to: Revlon, Inc.
Phoenix, AZ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Revlon, Inc. Accounts Payable, PO Box 993, Edison NJ 08818 CODE
Name | Street Address | City & State

Ship to: Revlon, Inc., Receiving Dept., 4301 W. Buckeye Rd., Phoenix, AZ 77295 A1 Z1 CODE
Name | Street Address | City & State

Routing: Customer Pick-up

Spec. Instructions 1. Plant to call Revlon Transportation Dept. one week prior to scheduled pick-up date. (201) 287-7054.

PRODUCT (S)

Name 15.125 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name ROWND 98775 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name & Cust. codes: ROWND 98775/PO#. Type of car: Truck

Spec. Inst. 1. Glue and palletize best way for load. Use 40X48 DFW pallets only.
2. Code bags as noted above.
3. Stretch wrap.
4. C of A including asbestos to be sent to:Cheryl Martin, Q.C.Dept.by plant, "This lot contains no asbestos using CTFA J4-1 test method: on C of A.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice:

Other:

Shipping Notice: Plant to call Mrs. Betty Lenart with ship info. 201-287-1400 Ext. 7311.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

ADD: Spec.Inst.#4. 5-25-84 mh

Terms: CHG: Phone#. 3-26-85mh
ADD: Ship notice. 5-23-86mh

Discount: CHG: Bill-to-address. 10-9-87mh

Date: 8/10/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 99810D

Invoice copies _____

Ship to: Cyprus Industrial Minerals Co.
Los Angeles CA

Bill of Lading _____

Ship from 29 So. Plainfield NJ OR _____ FOB Same

Bill to: Cyprus Industrial Minerals Co., PO Box 3299, Englewood CO 80155
Name | Street Address | City & State

CODE

Ship to: Cyprus Industrial Minerals Co., PO Box 23931
C/O Dart Warehouse Corp., 1430 S. Eastman Avenue, Los Angeles CA 90023
Name | Street Address | City & State

CODE

Routing: Motor Freight Collect
Carrier to call 24 hours in advnace for delivery appointment.
213-264-1011

Spec. Instructions Send freight bill to Cyprus Industrial Minerals Co.,
PO Box 3299, Englewood CO 80155

PRODUCT (S)

Name Tons and material as ordered Ton Price _____ CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M Bags with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per DFW pallet. LIGHT GLUE ONLY.
2. Stretchwrap.
3. Mill to mail 4th copy of B/L to ship to address; mail 5th copy to Englewood office.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman:

Industry:

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 7-3-87mh

CUSTOMER SPECIFICATION SHEET

NO. 61129.A

Invoice copies

Ship to: Nassau Chemical Corp.
Trenton, NJ

Bill of Lading

Ship from: 29 So. Plainfield OR FOB Plant

Bill to: Nassau Chemical Corp., 1008 Whitehead Rd. Extension. Trenton. NJ 08638
Name | Street Address | City & State | CODE

Ship to: Nassau Chemical Corp., c/o Trenton Int'l Warehouse, 200 Kelsey Ave., Trenton, NJ 61129 A4 RO
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Lestician

Spec. Instructions

PRODUCT (S)

Name 12 tons SUPRA/bag pal Ton Price Book CODE 1705

Name Ton Price CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. Code pallet faces: CODE 980.

NO B.C. REQUIRED ... RUBBER APPLICATION

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A4

Industry: RO

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to:

Amount of Commission:

Terms:

Discount:

Date: 11/12/82 tt

LEHMAN 01654

CUSTOMER SPECIFICATION SHEET

NO. 04505 C

Invoice copies _____ Ship to: Avon Products, Inc.

Bill of Lading _____

Ship from 29 - S. Plainfield OR _____ FOB Plant

Bill to: Avon Products, Inc., P.O. Box 933, Rye, NY 10581 Attn: Accts. Payable
Name | Street Address | City & State

Ship to: See B/L
Name | Street Address | City & State

Routing: Ship via truck for export, freight prepaid per B/L.

Spec. Instructions Send freight bill to: Avon Products, Inc.
P.O. Box 933
Rye, NY 10581
Attn: Accts Payable

PRODUCT (S)

Name Tons as ordered SUPRA TALC, Export Bags, "S" Ton Price Special CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# Bag with product name. Type of car: Truck

Spec. Inst. 1. Mark bags as indicated on B/L.
2. Palletized on DFW pallets as specified.
3. Stretchwrap

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: IO

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: Net 30 Days

Taxable: Discount:

Date: Rev. 2/25/86 KMS

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER'S NO. [redacted] 86623/86599/86602

AGENT'S NO.

SOLD TO

AVON.....

CONSIGNED TO AND DESTINATION

AVON C/O REGIONAL CONSOLIDATORS
55 VAN KEURAN AVE
JERSEY CITY, N.J. OR AVON C/O
SMS EXPRESS 150 ORANGE AVE.
SUFFERN, N.Y.

SLSMN	OUR CUST. NO.	CUST. ORDER DATE	CUSTOMER ORDER NO.	CUST. REQUESTS A-ARR. S-STOP	SHIP WEEK OF

"Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission."

FROM: CYPRUS Cyprus Industrial Minerals Company	F.O.B.	CAR NUMBER	DATE SHIPPED
AT: S.PLAINFIELD, N.J.	[redacted]	2014035	11/6/84

ROUTING: COLLECT

SPECIAL INSTR.: DRIVER: This is a master bill of lading to consolidate two or more orders. PLease sign each individual B/L in addition to this master. They will be used to invoice our custumer. Copy #3 of each order will be attached to frt. to serve as packing lists. Copy #2 & 3 of this B/L are yours.

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Cyprus Industrial Minerals Company
[signature]
(Signature of Consignor)

If charges are to be prepaid, write or stamp here, "To Be Prepaid."

Rec'd $ _____ to apply in prepayment of the charges in the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid).

Charges Advanced:

$ _____

This car is loaded in compliance with requirements of Sections 500.70 to 500.78 inclusive of O.D.T. 18-A Revised Part 500.

Cyprus Industrial Minerals Company

By _____

This shipment is correctly described.

Correct weight is _____ lbs. Subject to verification by ☐ Eastern, ☐ Western (SAC), ☐ Southern Weighing and Inspection Bureaus, or ☐ Transportation Freight Bureau (A-13203).

By _____

Making in transit information, if applicable, is entered on the reverse side of Bill of Lading.

QTY. ORDERED BAGS	QTY. ORDERED TONS	ITEMS BETWEEN DOUBLE LINES ARE NOT PART OF B/L	PRODUCT NO.	QTY. SHIPPED BAGS	QTY. SHIPPED TONS
140	[redacted]	BAGS GROUND TALC			

SPLIT:

AVON,6901 golf RD, MORTON GROVE, IL.

40 bgs. code 0-0773-1, po 15851, lotS07184V, 2,020#

20 bgs. code 0747, po 6129 rel. E, lot S07244 1,010#

AVON, 175 PROGRESS PLACE,SPRINGDALE,OHIO

80 bgs. code 0-0780-1,po 15815, lot A102542 4,040#

PALLETIZED ON 4 DFW PALLETS 140 lbs.

NO. PACKAGES	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUB. TO COR.)	CLASS OR RATE	✓
[redacted]	BAGS GROUND TALC - COMPACTED INTO PELLETS			
140@50.5#	BAGS GROUND TALC TESTING NOT LESS THAN 99% THRU 200 MESH SCREEN	7,070#		
	BAGS GROUND TALC OTHER THAN TALC TESTING NOT LESS THAN 99% THRU MESH SCREEN			
3	[redacted] PACKING LISTS ATTACHED TO FRT.	3#		
	BAGS GROUND TALC			
	TALC, CRUDE			
	DIATOMACEOUS EARTH			

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". NOTE— Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding per

Cyprus Industrial Minerals Company Shipper Per [signature]

Permanent Post Office address of shipper ENGLEWOOD, CO. 80112

Agent REGIONAL CONSOLIDATORS

Per

LEHMAN 01656

KRAUS

CUSTOMER SPECIFICATION SHEET

NO. 48575 A

Invoice copies _____

Ship to: Kraus Chemical Co.
E. Providence, RI

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Kraus Chemical Co., 156 Valley St., E. Providence, RI 02914 _____
Name / Street Address / City & State / CODE

Ship to: Kraus Chemical Co., 156 Valley St., E. Providence, RI 48575 A1 Z1
Name / Street Address / City & State / CODE

Routing: Customer Pick-up

Spec. Instructions

PRODUCT (S)

Name 12 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretch wrap.
3. CERTIFICATION OF ANALYSIS MUST ACCOMPANY SHIPMENT.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 3/10/83 rt

KRUEGER

CUSTOMER SPECIFICATION SHEET

NO. 05632 A

Invoice copies _____

Ship to: B.H. Krueger
Fairlawn, NJ

Bill of Lading _____

[redacted]29 So. Plainfield OR _____ FOB Plant

Bill to: B.H. Krueger; 17-09 Zinc Pl., Fairlawn, NJ 07410
Name | Street Address | City & State

CODE

Ship to: B.H. Krueger, 17-09 Zinc Pl., Fairlawn, NJ
Name | Street Address | City & State

05632 A1 Z1
CODE

Routing: Customer Pick-up

Spec. Instructions

PRODUCT (S)

Name Tons as ordered SUPRA/"S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

[redacted]lend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and cust. code: 4435/PO# Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet, or best way for load.
2. Stretch wrap.
3. Certification of Analysis must accompany shipment. Staple envelope to B/L.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

[redacted]s: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 4/19/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 07126 A

Invoice copies _____

Ship to: Bristol-Myers Company Int'l Div.

Bill of Lading _____

29 - South Plainfield OR 27 - Grand Island FOB Plant

Bill to: Bristol-Myers Company Int'l Division, 345 Park Avenue, New York, NY 10154 07126 11 21
Name Street Address ATTN: Accts Payable, 11th Floor City & State CODE

Ship to: Bristol-Myers International Group, 42 Mayfield Avenue, Bldg. 444, Edison, NJ
Name Street Address City & State 08818 CODE

Routing: Via truck to Edison warehouse for export. Freight COLLECT.

Spec. Instructions Send freight bill to: Bristol-Myers Company Int'l Division
345 Park Avenue
New York, NY 10154
Attn: Accounts Payable
11th Floor

PRODUCT (S)

Name Tons as ordered Olympic Talc, DFW, "S" Ton Price Special CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 lb. export bag with product name Type of car: Truck

Spec. Inst. 1. DFW Pallets
2. Stretchwrap
3. Mark bags as indicated on B/L.

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment: Englewood	Shipping Notice: Englewood	Branch:
Invoice: Englewood		Salesman: I1
Other:		Industry: Z1

Added Location 27 - Grand Island 9/16/85 KMS

BILLING

Freight: Inland Freight Commission to: _____

Gas: Amount of Commission: _____

Weight: Terms: Net 30 Days

Taxable: Discount:

Date: Rev. & Retyped 7/8/85 KMS

CUSTOMER SPECIFICATION SHEET

NO. 00492A

Invoice copies

Ship to: S. Black Ltd.

Bill of Lading

Ship from 29 - S. Plainfield OR FOR Plant

Bill to: S. Black Ltd., 30/31, Islington Green, London N.1. 8DU, England, U.K. 00492 Z1
Name | Street Address | City & State | CODE

Ship to: See Bill of Lading
Name | Street Address | City & State | CODE

Routing: Customer to arrange for pick-up at plant.

Spec. Instructions

PROOUCT (S)

Name Tons as ordered Suprafino, DFW, "S" Ton Price Special CODE 1706

Name Ton Price CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# Export Bag with product name. Type of car:

Spec. Inst.
1. Palletize as specified per Bill of Lading.
2. Mark bags as noted on Bill of Lading.
3. Stretchwrap.

EXTRA STRETCH WRAP FOR EXPORT

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: 13

Industry: Z1

BILLING

Freight:

Extras: Stretchwrap

Weight:

Taxable:

Commission to: CIM-U.K. BA# 12672952

Amount of Commission: 5%

Terms: ~~Cash In Advance~~ NET 30 DAYS

Discount:

Date: 11/4/85 KMS

CUSTOMER SPECIFICATION SHEET

NO. 03400 A

Invoice copies _____

Ship to: American Standard Inc.
Trenton NJ

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: American Standard, Inc., US Plumbing Products, PO Box 8305, Trenton, NJ 08650 Attn:Payable
Name | Street Address | City & State

Ship to: American Standard, Inc., US Plumbing Prods., Klockner Rd., Trenton, NJ
Name | Street Address | City & State

Routing: Motor Freight Collect via Dameo Trucking Co.
SPECIFY 1,500 CU.FT. TRAILER CAPACITY

Spec. Instructions

PRODUCT (S)

Name 24 tons STAEWHITE 200/bulk Ton Price Book CODE

Name Code 4-10-1300 Ton Price _____ CODE

PRODUCT SPECIFICATION

[redacted] Blend:

Form: Grind: Moisture:

Type of package: BULK Type of car: Tank Truck

Spec. Inst. 1. Load truck to capacity.

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment:	Shipping Notice:	Branch:
Invoice:		Salesman: A4
Other:		Industry: CO

BILLING

Freight: Commission to: _____

[redacted] as: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 10/13/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 36350A

Invoice copies _____

Ship to: Polymer Inc. (Was Georgia Pacific)
Farmingdale NY

Bill of Lading _____

Ship from 29 So.Plainfield OR _____ FOB Plant

Bill to: Polymer Inc., 110-120 Adams Blvd., Farmingdale NY 11735
Name | Street Address | City & State

CODE

Ship to: Polymer Inc., 110-120 Adams Blvd., Farmingdale NY 11735
Name | Street Address | City & State

36305 M2 LO

CODE

Routing: Customer Pick-up

Spec. Instructions

PRODUCT (S)

Name Tons as ordered Mistron ZSC-VM/Bg Pal Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M Bag with product name and Cust. Code: AE 316

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretchwrap.
3. Code bags and all paperwith Cust. Code as noted above.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: M2

Industry: LO

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 6-4-85mh (Revised & Retyped)

CUSTOMER SPECIFICATION SHEET

NO. 00597A

Invoice copies _____

Ship to: Certified Chemicals, Inc.
Cinnaminson NJ

Bill of Lading _____

Ship from: 29 St. Plainfield NJ OR _____ FOB Plant

Bill to: Certified Chemicals, Inc., 2200 Garry Road, Cinnaminson NJ 08077
Name / Street Address / City & State

Ship to: Certified Chemicals, Inc., 2200 Garry Road, Cinnaminson NJ 08077
Name / Street Address / City & State

CODE 00597 A5 Z1 CODE

Routing: Motor Freight Collect

Spec. Instructions: Customer to arrange carrier

PRODUCT (S)

Name 20 tons Orean/Bg Pal Ton Price Special CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Stretchwrap.
3. Certificate of analysis to accompany shipment - attn: Lon Lonker

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment:	Shipping Notice:	Branch:
Invoice:		Salesman: A5
Other:		Industry: Z1

BILLING

Freight: Commission to: _____

Sales: Amount of Commission: _____

Target: Terms:

Invoice: Discount:

Date: 5-19-86th

P.2/4

CUSTOMER SPECIFICATION SHEET

NO. 20315A

Invoice copies _____

Ship to: Dartco Mfg.
Agusta GA

Bill of Lading _____

Ship from: 29 So.Plainfield OR _____ FOB Plant

Bill to: Dartco Mfg., (Name) PO Box 5867, (Street Address) Augusta GA 30906 (City & State)

CODE

Ship to: Dartco Mfg., (Name) Tobacco & Clanton Rds., (Street Address) Gracewood GA (City & State)

20315 A3 LØ

CODE

Routing: CR-Potomac Yard/SRS

Spec. Instructions Rate Item # 2400, Tariff CR3003D must appear on the bill of and waybill.

PRODUCT (S)

Name 85 tons Supra/Bulk Ton Price Special CODE 1700

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

SPECIAL INSTRUCTION #3.
Plant to load car upon arrival at S.Plainfield. Plant to advise Cust. Service upon arrival and loading.

Blend:

Form: Grind: Moisture:

Type of package: Bulk

Type of car: Leased hopper car
ACFX 59794 thru 59799

Spec. Inst.
1. Load car to full visible capacity.
2. Plant will express mail sample to Technical Services Lab, Englewood, CO, who will test for L.O.I., Acid Solubles, (%CaO), Oil Absorption (SRO) and Surface Area. Complete results including GEB, 200 Mesh Screen and Loose Bulk Density will be obtained by plant and a C/A will be mailed promptly from S.Plainfield to: Mr. R.Erb, Quality Control Supervisor, Dartco Mfg., Inc., PO Box 208, Augusta GA 30812.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A3

Industry: LØ

BILLING

Freight:

Extras:

Weight: ADD: Rate Item & Tariff #. 10-31-85mh
CHG: Tons. 6-17-87mh

Taxable:

Commission to: _____
CHG: Rate & Tariff #'S. 10-25-84mh

Amount of Commission: _____
CHG: Bill-to-address. 10-31-84mh

Terms: ADD: Spec.Inst. #2. 11-14-84 mh
CHG: Spec.Inst. #2. 1-8-85mh

Discount: ADD: Spec.Inst. #3. 3-15-85mh
CHG: Ship-to City & State.10-22-85mh

Date: 9-10-84 mh

REEVES
GRACE PLANT
REEVES BROTHERS, INC.

P.O. Box 431, Rutherfordton, N.C. 28139 • Telephone (704) 286-9126

April 28, 1987

CYPRUS INDUSTRIAL MINERAL
Attn: Traffic Manager
651 Metuchen Road
South Plainfield, NJ 07080

Dear Sir:

Because of the rapidly escalating costs of warehousing, labor and transportation, we find it necessary to ask our supplier's cooperation in using designated methods of shipping to our facilities.

We require carriers who will give us good, consistent service, prompt expediting, fast tracing and minimum claim problems.

Therefore, please use this letter as your authority to route all future truck shipments via Carolina Freight Carriers Corporation.

Should you have any problems meeting with this request, I would appreciate hearing from you as soon as possible.

Thank you for your cooperation.

Sincerely,

REEVES BROTHERS, INCORPORATED

Jerry L. Justice

JLJ/mab

CUSTOMER SPECIFICATION SHEET

NO. 99800D (Revised)

Invoice copies _____

Ship to: CYMIN. c/o USCO Warehouse (Was Garland)
Dallas, TX

Bill of Lading _____

Ship from: 29 South Plainfield OR _____ FOB Plant

Bill to: Cyprus Industrial Minerals Co, P.O. Box 3419, Englewood, CO 80155
Name | Street Address | City & State | CODE

Ship to: Cyprus Industrial Minerals Co c/o USCO Dist. Svcs. 2271 French Settlement Rd, Dallas, TX 75212 99800 WH 00
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect.

Spec. Instructions: Mark B/L Collect. Send freight bill to Cyprus Industrial Minerals Co, P.O. Box 3419, Englewood, CO 80155

PRODUCT (S)

Name Tons and material as ordered/bag, DFW Pal, "S" Ton Price _____ CODE _____

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M bag with product name Type of car: Truck

Spec. Inst.: 1. Palletize on DFW pallets. LIGHT GLUE ONLY
2. Mill to mail 4th copy of B/L to ship to address.
3. Mill to Telex warehouse on ship date with trailer# and routing: 709017
4. Stretchwrap

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice: See #3 above

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman:

Industry:

BILLING

Freight: Commission to:

Extras: Amount of Commission:

Weight: Terms:

Taxable: Discount:

Date: 9-26-85 (revised)

CUSTOMER SPECIFICATION SHEET

NO. 00628A

Invoice copies _____

Ship to: Foseco Canada Limited
Guelth Ontario Canada

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Frank E. Dempsey & Sons Ltd., 47 Davies Ave., Toronto Ontario Canada _____
Name | Street Address | City & State M4M 2B1 | CODE

Ship to: Foseco Canada Limited, 201 Alice Street, Guelth Ontario Canada 00628 QE AO
Name | Street Address | City & State N1E 3A7 | CODE

Routing: Customer Pick Up

Spec. Instructions Ship through Universal Custom Brokers Ltd., 15 Toronto St., Suite 1100, Toronto Ontario Canada M5C 2E3

PRODUCT (S)

Name 20 Tons Supra/Bg Pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M White Bag with product name Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Stretchwrap.
3. Export Dec. & CCI must accompany shipment.
4. Cert. of Analysis to accompany shipment.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: QE

Industry: AO

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: Frank E. Dempsey & Sons

Amount of Commission: 5%

Terms:

Discount:

Date: 7-24-86mh

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER'S NO. 86602

AGENT'S NO.

SOLD TO

AVON PRODUCTS, INC.
6901 GOLF RD.
MORTON GROVE, IL. 60053

CONSIGNED TO AND DESTINATION

AVON PRODUCTS, INC.
6901 GOLF RD.
MORTON GROVE, IL.

SLSMN	OUR CUST. NO.	CUST. ORDER DATE	CUSTOMER ORDER NO.	CUST. REQUESTS	SHIP WEEK OF	"Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission."
	04440	10-1-84	15851	A-ARR S-SHIP 11-5-84		

FROM: CYPRUS Cyprus Industrial Minerals Company	F.O.B.	CAR NUMBER	DATE SHIPPED
AT: #29 SO.PLAINFIELD,N.J.	PLANT	2014035	11/6/84

ROUTING: MOTOR FRT. COLLECT VIA REGIONAL CONSOLIDATORS

SPECIAL INSTR.: CODE BGS: 0-0773-1/ PO#

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
- The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Cyprus Industrial Minerals Company
[signature]
(Signature of Consignor)

If charges are to be prepaid, write or stamp here, "To Be Prepaid"

Rec'd $ _____ to apply in prepayment of the charges in the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid).

Charges Advanced:

$ _____
This bill is loaded in compliance with requirements of Sections 500.70 to 500.79 inclusive of D.O.T. 13 A Revised Part 500.

Cyprus Industrial Minerals Company

By _____

This shipment is correctly described

Correct weight is _____ lbs. Subject to verification by ☐ Eastern, ☐ Western (SA), ☐ Southern Weighing and Inspection Bureau, or ☐ Transcontinental Freight Bureau (A-1320)

By _____

Mailing in transit information, if applicable, is entered on the reverse side of Bill of Lading

DTY. ORDERED BAGS	DTY. ORDERED TONS	ITEMS BETWEEN DOUBLE LINES ARE NOT PART OF B/L	PRODUCT NO.	DTY. SHIPPED BAGS	DTY. SHIPPED TONS
40	1.	SUPRAFINO BG/PAL	1706	40	1.
		CODE BGS: 0-0773-1. PO#			
		LOT # ~~S07266~~ S07184V			

PALLETIZED ON 1 DFW PALLET 35 LBS.

NO. PACKAGES	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUB. TO COR.)	CLASS OR RATE	✓
	BAGS GROUND TALC - COMPACTED INTO PELLETS			
40@50.5#	BAGS GROUND TALC TESTING NOT LESS THAN 90% THRU 200 MESH SCREEN	2,020#		
	BAGS GROUND TALC OTHER THAN TALC TESTING NOT LESS THAN 90% THRU MESH SCREEN			
	BAGS TALC TAILINGS			
	BAGS GROUND TALC			
	TALC, CRUDE			
	DIATOMACEOUS EARTH			

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". NOTE — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically

LEHMAN 01668

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — Not Negotiable

RECEIVED, Subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading,

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER'S NO. 86623

AGENT'S NO.

SOLD TO

AVON PRODUCTS, INC.
6901 GOLF RD.
MORTON GROVE, IL. 60053

CONSIGNED TO AND DESTINATION

AVON PRODUCTS, INC.
6901 GOLF RD.
MORTON GROVE, IL.

SLSMN	OUR CUST. NO.	CUST. ORDER DATE	CUSTOMER ORDER NO.	CUST. REQUESTS A=ARR. S=SHIPS	SHIP WEEK OF	"Shippers imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission."
	04440	11-2-84	6129 REL F	11-5-84		

FROM: **CYPRUS** Cyprus Industrial Minerals Company — F.O.B. — CAR NUMBER 2014035 — DATE SHIPPED 11/6/84

AT: #29 SO. PLAINFIELD, N.J. PLANT

ROUTING: MOTOR FRT. COLLECT VIA REGIONAL CONSOLIDATORS

SPECIAL INSTR.: CODE BGS: 0747 ,PO#

Subject to Section 7 of Conditions of applicable bill of lading if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Cyprus Industrial Minerals Company
(Signature of Consignor)

If charges are to be prepaid write or stamp here. To Be Prepaid

Rec'd $ to apply in prepayment of the charges on the property describe hereon.

Agent or Cashier

Per (The signature here acknowledges only the amount prepaid.)

Charges Advanced.

$

This car is loaded in compliance with requirements of Sections 500.70 to 500.79 inclusive of O.D.T. 18-A Revised Part 500

Cyprus Industrial Minerals Company

By

This shipment is correctly described

Correct weight is ____ lbs. Subject to verification by ☐ Eastern ☐ Western (S.A.) ☐ Southern Weighing and Inspection Bureaus or ☐ Transcontinental Freight Bureau (A 1320)

By

Mailing in transit information if applicable, is entered on the reverse side of Bill of Lading.

QTY. ORDERED BAGS	QTY. ORDERED TONS	ITEMS BETWEEN DOUBLE LINES ARE NOT PART OF B/L	PRODUCT NO.	QTY. SHIPPED BAGS	QTY. SHIPPED TONS
20	.50	SUPRA BG/PAL	1705	20	.50
		CODE BGS: 9747, PO#			
		LOT # S07244			

PALLETIZED ON 1 DFW PALLET 35 LBS.

NO. PACKAGES	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUB. TO COR.)	CLASS OR RATE	✓
	BAGS GROUND TALC - COMPACTED INTO PELLETS			
20@50.5#	BAGS GROUND TALC TESTING NOT LESS THAN 99% THRU 200 MESH SCREEN	1,010#		
	BAGS GROUND TALC OTHER THAN TALC TESTING NOT LESS THAN 99% THRU 200 MESH SCREEN			
	BAGS TALC TAILINGS			
	BAGS GROUND TALC			
	TALC, CRUDE			
	DIATOMACEOUS EARTH			

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". NOTE — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding per

Agent REGIONAL 11/6/84

Per Charles Tonelli (AO)

Cyprus Industrial Minerals Company — Shipper Per

LEHMAN 01669

CUSTOMER SPECIFICATION SHEET

NO. 04496 A

Invoice copies _____ Ship to: AVON LOMA LINDA, PUERTO RICO

Bill of Lading _____

From 29- SOUTH PLAINFIELD, N.J. OR _____ FOB South Plainfield, NJ

Bill to: AVON LOMA LINDA, P.O. BOX 3918, AGUADILLA, P.R. 00605
Name | Street Address | City & State

04496-T3-Z1

Ship to: AVON SERVICE CENTER, 111 Maltese Drive, Totowa, New Jersey (201) 890-4400
Name | Street Address | City & State

Routing: VIA TRUCK TO WARHOUSE PREPAID FOR EXPORT.

Spec. Instructions SEND FREIGHT BILL TO CYPRUS INDUSTRIAL MINERALS CO.
ATTN: INTERNATIONAL DEPT.
P.O. BOX 3299
ENGLEWOOD, COLORADO 80155

PRODUCT (S)

Name TONS AS ORDERED OLYMPIC TALC Ton Price BOOK CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50 # bags with product name Type of car: Truck

Spec. Inst.
1. DFW PALLETS
2. STRECHWRAP
3. MARK BAGS AS INDICATED ON B/L

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment: Englewood	Shipping Notice: Englewood	Branch:
Invoice: Englewood		Salesman: 11
Other:		Industry: Z1

Ship To Add. & Salesman Code Chngd. 12/10/85 BILLING KMS

Freight: Commission to: _____

Tax: Amount of Commission: _____

Weight: Terms: Net 30 DAYS

Taxable: Discount:

Date: 12-28-83 LS

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading,

the property described below, in apparent good order, except as noted (contents and condition of contents or packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER'S NO. 86599

AGENT'S NO.

SOLD TO

AVON PRODUCTS INC.
175 PROGRESS PLACE
SPRINGDALE, OHIO

CONSIGNED TO AND DESTINATION

AVON PRODUCTS INC.
175 PROGRESS PLACE
SPRINGDALE, OHIO

SLSMN	OUR CUST. NO.	CUST. ORDER DATE	CUSTOMER ORDER NO.	CUST. REQUESTS A=ARR. S=SHIP	SHIP WEEK OF	"Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission."
	04510	9-21-84	15815	S 10/29/84		

FROM: CYPRUS Cyprus Industrial Minerals Company	F.O.B.	CAR NUMBER	DATE SHIPPED
AT: #29 SO.PLAINFIELD,N.J	PLANT	2014035	11/6/84

ROUTING: MOTOR FREIGHT COLLECT VIA REGIONAL CONSOLIDATED

SPECIAL INSTR.: CODE BGS: 0-0780-1/PO#

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Cyprus Industrial Minerals Company
[signature]
(Signature of Consignor)

If charges are to be prepaid, write or stamp here, "To Be Prepaid."

Rec'd $ _____ to apply in prepayment of the charges in the property described hereon.

Agent or Carrier

Per _____
(The signature here acknowledges only the amount prepaid).

Charges Advanced:

$ _____

This car is loaded in compliance with requirements of Sections 500.70 to 500.79 inclusive of O.B.T. 18-S Revised Part 500.

Cyprus Industrial Minerals Company

By _____

This shipment is correctly described

Correct weight is _____ lbs. Subject to verification by ☐ Eastern, ☐ Western (SA), ☐ Southern Weighing and Inspection Bureaus or ☐ Transcontinental Freight Bureau (A-1520).

By _____

Billing in transit information if applicable, is entered on the reverse side of Bill of Lading.

QTY. ORDERED BAGS	QTY. ORDERED TONS	ITEMS BETWEEN DOUBLE LINES ARE NOT PART OF B/L	PRODUCT NO.	QTY. SHIPPED BAGS	QTY. SHIPPED TONS
80	2.	ALTALC 400 USP BG/PAL	1856	80	2.

CODE BGS: 0-0780-1/PO#

LOT # A102542

PALLETIZED ON 2 DFW PALLETS 70 LBS.

NO. PACKAGES	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUB. TO COR.)	CLASS OR RATE	✓
	BAGS GROUND TALC - COMPACTED INTO PELLETS			
80@50.5#	BAGS GROUND TALC TESTING NOT LESS THAN 99% THRU 200 MESH SCREEN	4,040#		
	BAGS GROUND TALC OTHER THAN TALC TESTING NOT LESS THAN 99% THRU MESH SCREEN			
	BAGS TALC TAILINGS			
	BAGS GROUND TALC			
	TALC, CRUDE			
	DIATOMACEOUS EARTH			

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". NOTE— Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____

Agent REGIONAL CONSOLIDAT

LEHMAN 01671

Mara Products

CUSTOMER SPECIFICATION SHEET

NO. 52440 A

Invoice copies _____

Ship to: Lloyd Manufacturing Co.
Warren, RI

Bill of Lading _____

[redacted]9 So. Plainfield OR _____ FOB Plant

Bill to: Lloyd Manufacturing Co., 130 Franklin St., Warren, RI 02885
Name | Street Address | City & State | CODE

Ship to: Lloyd Manufacturing Co., 130 Franklin St., Warren, RI 52440 A4 RO
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via Plymouth Rock tel. 800-652-2766 or 215-743-3300

Spec. Instructions

PRODUCT (S)

Name 20 tons SUPRA/"s" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted]:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per pallet.
2. Stretchwrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A4

Industry: RO

BILLING

Freight:

[redacted]as:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Delete: WCD Bag Code. 6-29-83 mh
Terms: CHG: Rtg. 10-24-83 rt/mh

Discount:

Date: 4/11/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 20950 A

Invoice copies _____

Ship to: Frank E. Dempsey & Sons, Ltd.
Lachine, Quebec, Canada

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Frank E. Dempsey & Sons, Ltd., 47 Davies Ave., Toronto, Ontario, Can. M4M2A9
Name | Street Address | City & State | CODE

Ship to: Frank E. Dempsey & Sons, Ltd., 2380 46th Ave., Lachine, Quebec, Can. H8T2P3 20950 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up through Border Broker: IMPEX CUSTOM BROKERS, LTD.
407 McGill, Suite 411
Montreal, Quebec, Canada H2Y2G3

Spec. Instructions

PRODUCT (S)

Name 20 tons SUPRA/ "S" bag pal Ton Price Book CODE 1705

Name 1 ton SUPRAFINO/ "S" bag pal Ton Price Book CODE 1706

PRODUCT SPECIFICATION

Brand:

Form: Grind: Moisture:

Type of package: 50# bags with product name. Type of car: Truck

Spec. Inst. 1. Mark bags: Supra-FEDCO 700 & Suprafino-FEDCO 800 both with Lot#.
2. Glue and palletize 1 ton per DFW pallet.
3. Stretch wrap.

NOTE: B/L to show Commision 7.5%

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Class:

Weight:

Taxable:

Commission to: Frank E. Dempsey & Sons, Ltd.

Amount of Commission: 7.5%

Terms: ADD: Broker's mail code. 1/25/82 rt

Discount:

Date: 1/7/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 20951A (Revised)

Invoice copies

Ship to: Frank E. Dempsey & Sons, Ltd.
Lachine, Quebec, Canada

Bill of Lading

Ship from 29 So. Plainfield OR FOB Plant

Bill to: Frank E. Dempsey & Sons, Ltd., 47 Davies Ave., Toronto, Ontario Canada M4M 2A9
Name | Street Address | City & State

CODE

Ship to: Frank E. Dempsey & Sons, Ltd., 2380 46th Ave., Lachine, Quebec, Canada H8T 3C9
Name | Street Address | City & State

20951-QE-00

CODE

Routing: Customer Pick-Up

Spec. Instructions: Ship through border broker: Affiliated Customs Services, 450 Ste-Helene St., Montreal, Quebec, Canada H2Y 2L2.

PRODUCT (S)

Name 20 tons Supra/"S" Bag DFW Pal Ton Price Book CODE 705

Name Ton Price CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# Bags with product name Type of car: Truck

Spec. Inst.: 1. Glue and palletize 1 ton per DFW pallet.
2. Stretchwrap.
3. Export Declaration & CCI to accompany shipment: Mail 1 copy each to Cust. Service, and to Bill-to-address above, and 1 copy to broker.
4. Certificate of analysis with actual test results to accompany shipment.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: QE

Industry: QQ

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: Frank E. Dempsey & Sons, Ltd.

Amount of Commission: 5%

ADD: Spec. Inst. #4. 1-24-86mh

Terms: CHG: Spec. Inst. #3. 6-25-86mh

CHG: Spec. Inst. #4. 11-20-86mh

Discount:

Date: 11-5-85 (Revised & Retyped)mh

CUSTOMER SPECIFICATION SHEET

NO. 00498A

Invoice copies _____

Ship to: Colgate Palmolive, C/O Contract Pkg. Totowa NJ

Bill of Lading _____

Ship from 29 So Plainfield OR _____ FOB Plant

Bill to: Colgate Palmolive Co., (Name) PO Box 401, (Street Address) Jersey City NJ 07302 (City & State)

CODE

Ship to: Colgate Palmolive Co., C/O Contract Packaging Corp., (Name) 10 West End Road, (Street Address) Totowa NJ 07512 (City & State)

00498A1 Z1

CODE

Routing: Motor Freight Collect Reliable
Carrier to call 24 hours in advance for delivery appointment
201-256-1020 Jim Ward

Spec. Instructions Plant to arrange carrier

PRODUCT (S)

Name 20 tons Supra/Bg Pal Ton Price Special CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bags with product name and Customer Code: M6020

Type of car: Truck

Spec. Inst. 1. Glue and palletize 1 ton per DFW pallet.
2. Code bags as noted above.
3. Stretchwrap.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: Al

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 2-12-86mh

CODE:

CUSTOMER SPECIFICATION SHEET

NO. 13608 A

Invoice copies COLGATE

Ship to: Colgate Palmolive Co.
Jersey City, NJ

Bill of Lading

29 So. Plainfield OR FOB Plant

Bill to: Colgate Palmolive Co., PO Box 401, Jersey City, NJ 07302
Name | Street Address | City & State

CODE

Ship to: Colgate Palmolive Co., 74 Grand St., Jersy City, NJ 13608 A1 Z1
Name | Street Address | City & State

CODE

Routing: Motor Freight Collect METROWEST
Carrier to call 24 hrs in advance of delivery for dock appointment
(201) 547-2683 Richie Geismer.

Spec. Instructions Deliver in afternoons up until 2:30 PM.
Plant to arrange best carrier.

PRODUCT (S)

Name 20 tons DOVER 50./ "S" bag pal Ton Price SPECIAL CODE 1715

Name Ton Price CODE

PRODUCT SPECIFICATION

Grade: DOVER 50 CODE M6020
METRACE 200 M6670

Form: Grind: Moisture:

Type of package: 50# bags with product name. Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per DFW pallet.
2. Code bags ~~M6670~~, Lot#, P.O.#. M6020
3. Lot# to appear on all paperwork.
4. Stretch wrap.
5. Pre-shipment sample each lot for customer approval.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Shipping Notice: To Ship-to address.

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Commission to:

Class:

Amount of Commission:

Weight: ADD: Rtg. Inst. 1-16-84 mh

Terms: CHG: Product, price, cust. code. 10/27/83 rt

Taxable:

Discount: CHG: Bag Code. 11-2-83 rt/mh
CHG: Routing instructions. 11/8/83 rt

Date: 1/7/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 13765

Invoice copies: _____ Ship to: _____

Bill of Lading: _____

_____ OR _____ FOB _____

Bill to: COLOR TECHNIQUES INC. TOMS RIVER, N.J. CODE
Name Street Address City & State

Ship to: COLOR TECHNIQUES INC. TOMS RIVER, N.J. CODE
Name Street Address City & State

Routing:

MOTOR FREIGHT COLLECT VIA SHALLCROSS EXPRESS

Spec. Instructions:

PRODUCT (S)

Name 1 (TON) SUPRAFINO Ton Price _____ CODE _____

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Brand: DO NOT SHIP SUPRAFINO-R USE @ SUPRAFINO-V ONLY

Form: Grind: Moisture:

Type of package: Type of car:

Spec. Inst.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman:

Industry:

BILLING

Freight:

Tax:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: _____

(SET UP)

Copies to:

SCHED.	PLANT	SALES	BRANCH	MASTER FILE	APPROVED BY	DATE

ADDITIONAL INFORMATION:

APPROVE AND FORWARD			

CODE: ELI

CUSTOMER SPECIFICATION SHEET

NO. 52301 A

Invoice copies _____

Ship to: Eli Lilly & Co.
Roanoke, VA

Bill of Lading _____

[redacted] 29 So. Plainfield OR _____ FOB Plant

Bill to: Eli Lilly & Co., Roanoke Mfg., 4411 Hollins Ave. N.E., Roanoke, VA 24012
Name | Street Address | City & State | CODE

Ship to: Eli Lilly & Co., Roanoke Mfg., 4411 Hollins Ave. N.E., Roanoke, VA | 52301 A1 Z1
Name | Street Address | City & State | CODE

Routing: ~~Motor Freight Collect via Mason Dixon~~ JAY LINES
~~GREAT COASTAL EXP. 344-6200~~ ~~378-5112~~
~~EAST BRUNSWICK, NJ~~

Spec. Instructions

PRODUCT (S)

Name 20 tons SUPRA/ "S" bag pal Ton Price Special CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

[redacted] Blend:

Form: Grind: Moisture:

Type of package: 50# bag Type of car: Truck

Spec. Inst.
1. Glue and palletize one ton per DFW pallet.
2. Code bags RP-0033.
3. Stretch wrap.

SPECIAL DOCUMENT MAILING		SALES DEPARTMENT INFORMATION
Order Acknowledgment:	Shipping Notice:	Branch:
Invoice:		Salesman: A1
Other:		Industry: Z1

BILLING

Freight:

[redacted] ras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

ADD: Bag Code & Phone # for Blue Ridge

Terms: CHG: Routing & 8/12/82 rt/mh
price to special. 1-9-84 mh

Discount:

1/22/82 mh

CUSTOMER SPECIFICATION SHEET

NO. 51007 A (Revised)

Invoice copies _____ Ship to: L.A. Dreyfus
Edison, NJ

Bill of Lading _____

From 23 Alpine OR _____ FOB Plant

Bill to: Synthetic Specialties Co., PO Box 120, Middletown, NJ 07748
Name | Street Address | City & State | CODE

Ship to: L.A. Dreyfus Co., 3775 Park Ave., Edison, NJ 51007 A1 Z1
Name | Street Address | City & State | CODE

Routing: Motor Freight Collect via RFI Transport 800-525-9857

Spec. Instructions 1. Bill freight to consignee.
2. Call DeWitt & Pacesetter (In order) if RFI cannot pick-up.

PRODUCT (S)

Name 20 tons ALTALC 400 USP/"S" bag pal Ton Price Book CODE 1856

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and cust. codes: P-400 USP/PO# Type of car: Truck

Spec. Inst. 1. Glue and palletize: 10 pallets @ 44 bags and 10 pallets @ 36 bags; 20 pal./trailer.
2. Code bags as above; stretch wrap.
3. Analyze lot using Dreyfus acid soluble test.
4. Send pre-shipment sample to: Terry McCreesh, 3775 Park Ave., Edison, NJ 08820 TEL: (201) 549-1000
DO NOT CODE OR SHIP MATERIAL UNTIL SAMPLE APPROVAL HAS BEEN GIVEN.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice:

Other:

Shipping Notice: Mill to call Jack Paterno at bill-to (201)671-5372 on ship date with trailer# and Lot#.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Extras:

Weight: CHG: Rtg. ADD: Rtg Inst.2. 12-8-83 rt

Taxable:

Commission to: Synthetic Specialties

Amount of Commission: 7.5%

Terms: CHG:Routing & freight billing. 2/21/83 rt

Discount: CHG:Sample mail address. 3/4/83 rt

LEHMAN 01681

CUSTOMER SPECIFICATION SHEET

NO. 77293 A

Invoice copies _____ Ship to: Revlon, Inc. Edison, NJ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Revlon, Inc., Accounts Payable, PO Box 993, Edison NJ 08818 CODE
Name | Street Address | City & State

Ship to: Revlon, Inc., Woodbridge Warehouse, Grace St. and Old Post Rd., Edison, NJ 77293 A1 Z1 CODE
Name | Street Address | City & State

Routing: Customer Pick-up

Spec. Instructions 1. Call Traffic Dept. one week prior to pick-up date: (201) 287-7054

PRODUCT (S)

Name 15.125 tons SUPRA/ "S" bag pal Ton Price Book CODE 1705

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

#6. C/A including asbestos analysis to be sent to: Brian Wilburn, Q.C. Dept. by plant. "This lot contains no asbestos using CTFA J4-1 test method" on C of A.

Form: Grind: Moisture:

Type of package: 50# bags Type of car: Customer Truck

Spec. Inst.
1. Glue and palletize 605 bags on 15 DFW pallets. (40"x 48")
2. Use corrugated cardboard slip sheet under bottom bag layers.
3. Bag codes: ROWND 98775, Lot#, Cust. PO#, and weights in kilos.
4. Stretch wrap.
5. Stock # ROWND 98775 to appear on all paperwork.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice:

Other:

Shipping Notice: Plant to call Mrs. Betty Lenart on ship date. 201-287-1400 EXT 7311.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Commission to: _____

Amount of Commission: _____

Terms: CHG: Bill-to-address. 10-9-87mh
ADD: Ship notice. 5-23-86mh
ADD: Spec. Inst. #5. 3/30/82 rt
ADD: DFW size. 5/15/82 rt

Weight:

Taxable:

Discount: ADD: Spec. Inst. #6. 5-25-84 mh
CHG: Phone#. 3-26-85mh

Date: 1/14/82 rt

CUSTOMER SPECIFICATION SHEET

NO. 77294B

Invoice copies _____ Ship to: Revlon International, Metuchen, N.J.

Bill of Lading _____

Ship from 29 - So. Plainfield, NJ OR _____ FOB Plant

Bill to: Revlon International, C/O Riros A/C Payable, P.O. Box 853, Metuchen, NJ 08840 77294-I3-Z1
Name Street Address City & State CODE

Ship to: Revlon International, 55 Talmadge Rd., Edison, NJ 08818
Name Street Address City & State CODE

Routing: Truck to harbor collect for export.

Spec. Instructions: Send freight bill to: Revlon International
C/O Riros A/C Payable
P.O. Box 853
Metuchen, NJ 08840

PRODUCT (S)

Name Tons as ordered SUPRAFINO Ton Price Special CODE 1706

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# bags with product name Type of car: Truck

Spec. Inst. 1. DFW Pallets
2. Stretchwrap
3. Mark bags as indicated on B/L.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Int'l. Dept. Shipping Notice: Int'l. Dept.

Invoice: Int'l. Dept.

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: I3

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: Net 30

Taxable: Discount:

Date: 3/8/88 MAB

CUSTOMER SPECIFICATION SHEET

NO. 77294B

Invoice copies _____ Ship to: Revlon International, Metuchen, N.J.

Bill of Lading _____

Ship from 29 - So. Plainfield, NJ OR _____ FOB Plant

Bill to: Revlon International, C/O Riros A/C Payable, P.O. Box 853, Metuchen, NJ 08840 77294-I3-Z1
Name | Street Address | City & State | CODE

Ship to: Revlon International, 55 Talmadge Rd., Edison, NJ 08818 _____
Name | Street Address | City & State | CODE

Routing: Truck to harbor collect for export.

Spec. Instructions: Send freight bill to: Revlon International
C/O Riros A/C Payable
P.O. Box 853
Metuchen, NJ 08840

PRODUCT (S)

Name Tons as ordered SUPRAFINO Ton Price Special CODE 1706

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# bags with product name Type of car: Truck

Spec. Inst.
1. DFW Pallets
2. Stretchwrap
3. Mark bags as indicated on B/L.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Int'l. Dept. Shipping Notice: Int'l. Dept.

Invoice: Int'l. Dept.

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: I3

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: Net 30

Taxable: Discount:

Date: 3/8/88 MAB

CUSTOMER SPECIFICATION SHEET

NO. 83303 A

Invoice copies _____

Ship to: Shulton, Inc.
Memphis TN

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to:	Shulton, Inc.	PO Box 1999	Memphis TN 38101	83303 A1 Z1
	Name	Street Address	City & State	CODE
Ship to:	Shulton, Inc.	1725 S. 3rd. St.,	Memphis TN 38109	
	Name	Street Address	City & State	CODE

Routing: Customer Pick Up

Spec. Instructions

PRODUCT (S)

Name Tons as ordered Supra/Bg Pal Ton Price Special CODE 1755

Name _____ Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Blend: SPECIAL INST. #5. Mill Supra EF, report as Supra EF (1755). Mark bags and papers "SUPRA".

Form: Grind: Moisture:

Type of package: 50# bag Type of car: truck

Spec. Inst.
1. Glue & palletize 1 ton per DFW pallet.
2. Mark bags with product code 0000-825820
3. Stretchwrap
4. Mill to test material for black specks in water slurry before shpmnt to customer.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight: Commission to: _____

Basis: Amount of Commission: _____

Weight: ADD: Spec inst #4

Taxable: Terms: ADD: Spec.Inst. #5. chg. prod.code, chg price to special. 1-24-85mh

Discount:

Date: 10-11-82 mh

CUSTOMER SPECIFICATION SHEET

NO. 00735 B

Invoice copies: _____ Ship to: Rost - France Sarl

Bill of Lading: _____

Ship from: 29 - S. Plainfield OR _____ FOB: BOB Plant

Bill to: Rost - France Sarl, 6, Rue De Vouille, 75015 Paris, France — 00735 I3 Z0
Name / Street Address / City & State — CODE

Ship to: See Bill of Lading — CODE
Name / Street Address / City & State

Routing: Ship via Truck to harbor for export, freight collect.

Spec. Instructions: See Bill of Lading

PRODUCT (S)

Name: Supra, DFW, "S" or SUPRAFINO Ton Price: Special CODE: 11705

Name: _____ Ton Price: _____ CODE: _____

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 lb. bag with product name. Type of car: Truck

Spec. Inst. 1. Mark bags/pallets as per B/L.
2. Palletized & Stretchwrap per B/L.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: I3

Industry: Z0

BILLING

Freight: Inland & Ocean Frt.
Forwarding Fees

Extras: Stretchwrap
Insurance

Weight:

Taxable:

Commission to: Cyprus - Belgium

Amount of Commission: 5%

Terms: Net 30 Days.

Discount:

Date: 5/27/87

CUSTOMER SPECIFICATION SHEET

NO. 00571B

Invoice copies _____ Ship to: _____

Bill of Lading _____

Ship from 29 - South Plainfield OR _____ FOB _____

Bill to: Schering Corporation Del Peru S.A., Paseo de la Republica 3153, San Isidro 00571 11 21
Name | Street Address | City & State Lima, Peru CODE

Ship to: see bill of lading CODE
Name | Street Address | City & State

Routing: Ship via truck to harbor for export. Freight prepaid.

Spec. Instructions Send freight bill to: Cyprus Industrial Minerals Company
Attn: Int'l Dept.
P.O. Box 3299
Englewood, CO 80155

PRODUCT (S)

Name Tons as ordered Supra, DFW Ton Price _____ CODE 0705

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 lb. white bag w/product name Type of car: Truck

Spec. Inst. 1. Mark bags as indicated on B/L.
2. Palletize and stretchwrap as specified on B/L.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Englewood Shipping Notice: Englewood

Invoice: Englewood

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: Il

Industry: 21

BILLING

Freight: Inland & Ocean Frt.
Whaffage & handling

Extras: Forwarding Fees
Stretchwrap

Weight:

Taxable:

Commission to: Quimilar

Amount of Commission: 5%

Terms: Letter of Credit

Discount:

Date: 9/19/86 ms

CUSTOMER SPECIFICATION SHEET

NO. 00585A

Invoice copies _____ Ship to: Faberge Inc. Pomona CA

Bill of Lading _____

Ship from 29 South Plainfield OR _____ FOB Plant

Bill to: Faberge Inc., Faberge Division; 440 Franklin Turnpike, Mahwah NJ 07430 _____
Name | Street Address | City & State | CODE

Ship to: Faberge Inc., 2750 S. Towne Ave., Pomona CA 91766 00585 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer pick up

Spec. Instructions 1. Plant to call John McGeehin at 201-529-5100 to arrange carrier.
FAX # 529-5100 SWITCH BOARD FAX EXT. # 246 (mail room)
(SEE INSTRUCTIONS FAX BOOK)

PRODUCT (S)

Name 20 tons Monoblend "S"/Bg Pal Ton Price Special CODE 1765

Name _____ Ton Price _____ CODE _____

Blend: PRODUCT SPECIFICATION SPECIAL INSTRUCTION #5. Certificate of anlaysis with actual test results must accompany shipment.

Form: Grind: Moisture:

Type of package: 50# T/M White bags with product name and Customer Code: 107718 Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Stretchwrap.
3. Code bags as noted above.
4. Plant to send 2 one pint pre-shipment samples to bill to address, attn: Lou LaFord.
4. Plant to RUSH lot sample to Englewood Lab for testing as soon as possible. Lab to perform XRD scan on lot immediately. Mail ~~results~~ to bill to address attn: Mr. Terry Smith, Director Corporate Technical Services. SCAN

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice: MINIMUM LOOSE DENSITY: 23 LBS./CU. FT.

Other:

SALES DEPARTMENT INFORMATION

Branch: FT.

Salesman: A1

Industry: Z1

BETH SNENICKI - Lab Q.C.

BILLING

Freight: SCOTT VOLUME METER 6-7 GMS SPEC. Commission to: _____

Extras: 1, 3½, 5 Z. BOTTLES Amount of Commission: _____

Weight:

Taxable:

CHG: Name in Spec.Inst. #4. 6-2-86mh
Terms: ADD: Spec.Inst. #5. 11-20-86mh

Discount:

Date: 4-22-86mh

CUSTOMER SPECIFICATION SHEET

NO. 02195A (Revised)

Invoice copies _____

Ship to: Almay, Inc.
Apex NC

Bill of Lading _____

From 29 So.Plainfield OR _____ FOB Plant

Bill to: Almay Inc., (Name) PO Box 748, (Street Address) Apex NC 27502 (City & State)

Ship to: Almay Inc., (Name) Schieffelin Rd., (Street Address) Apex NC (City & State)

CODE
02195 A5 Z1
CODE

Routing: Motor Freight Collect ~~Apex~~ BURLINGTON

Spec. Instructions 1. Plant to arrange best carrier.

PRODUCT (S)

Name Tons as ordered SUPRA/"S" Bg Pal of Suprafino Ton Price Book CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and Cust. PO#, & Cust. Code: 1736700 - SUPRA 1735900 - SUPRAFINO

Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as noted above.
3. Stretchwrap.
4. Certificate of Analysis must accompany shipment in envelope stapled to B/L; Mark B/L- "One (1) envelope-1 lb." Certificate must have actual test results.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A5

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms: ADD: pH statement-see back. 12-5-84mh
CHG: Spec. Inst. #4. 12-12-84mh
CHG: Slsm. code. 1-8-85mh

Discount:

Date: 11-27-84 mh (Revised & Retyped)

CUSTOMER SPECIFICATION SHEET

NO. 03455 A

Invoice copies _____

Ship to: Amway Corp.
Ada, MI

Bill of Lading _____

Ship from 29 So. Plainfield OR _____ FOB Plant

Bill to: Amway Corp., A/P Dept., Mail-cd 33A-1A, 7575 E. Fulton St., Ada, MI 49355
Name | Street Address | City & State

CODE

Ship to: Amway Corp., Receiving 58 Whse., 7575 E. Fulton Rd., Ada, MI 49355 03455 A1 Z1
Name | Street Address | City & State

CODE

Routing: ~~Customer pick-up~~ Consolidated Entrys collect

Spec. Instructions

PRODUCT (S)

Name Tons as ordered SUPRA/bag pal Ton Price SPECIAL CODE 7551

Name Part # R0342 Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name and cust PO#/R0342 Type of car: Customer truck

Spec. Inst.
1. MILL AND REPORT AS SUPRA EF (1755); MARK BAGS AND SHIPPING PAPERS AS "SUPRA"!
2. INVOICE AS "SUPRA" (1755), AT BOOK PRICE FOR SUPRA (1705).
3. Glue and palletize 1 ton per pallet, or best way.
4. Code bags as noted above.
5. Customer may require pre-shipment sample. Info will be supplied w/ ea. order.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Extras:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

Terms:

Discount:

Date: 11/27/84 rt

CUSTOMER SPECIFICATION SHEET

NO. 02195B

Invoice copies _____ Ship to: Almay Inc.
Apex NC

Bill of Lading _____

Ship from 29 So.Plainfield OR _____ FOB Same

Bill to: Almay Inc., (Name) PO Box 748, (Street Address) Apex NC 27502 (City & State)

CODE

Ship to: Almay Inc., (Name) Schieffelin Rd., (Street Address) Apex NC 27502 (City & State)

02195 A3 Z1

CODE

Routing: Motor Freight Collect via Burlington Industries

Spec. Instructions 1. Plant to arrange carrier.

PRODUCT (S)

Name Tons as ordered Suprafino S/Bg Pal Ton Price Book CODE [illegible]

Name _____ Ton Price _____ CODE [illegible]

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50# T/M White bag with product name & Cust. PO#, & Cust. Code 1735900 Type of car: Truck

Spec. Inst.
1. Glue and palletize 1 ton per pallet.
2. Code bags as noted above.
3. Stretchwrap.
4. Plant to send pre-shipment sample to ship-to-address.
5. Cert. of Analysis to accompany shipment in envelope stapled to B/L; Mark B/L "One (1) envelope-llb." Show actual test results.

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Shipping Notice:

Invoice:

Other:

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A3

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms:

Taxable: Discount:

Date: 7-22-87 mh

Sample Almay

Cyprus Industrial Minerals Company
Talc Division
7200 South Alton Way
Post Office Box 3419
Englewood, Colorado 80155
303-740-5444

CERTIFICATION OF ANALYSIS

Cyprus Industrial Minerals Co. certifies that the material described below is within standard specifications for this product. Typical Data Sheets are available for each product on request.

Product Name	Supra
Lot Number	S 04114
Cyprus Order	N/A
Ship Date	N/A
Quantity Shipped	N/A
Customer Name	Almay Incorporated
Customer City and State	Apex, NC
Customer Purchase Order Number	N/A
Customer Product Code	N/A

TEST RESULTS:

Loose Density- 24.15, Reflectance- 87.0, Mesh- 98.2 thru 200 mesh, Tapped Density-58 lbs/ft^{3} $\pm$2, Acid Solubles- 6.0% max., pH- 9.5 $\pm$0.5, As- less than 2 ppm, Pb- less than 20 ppm, Asbestos- certified free of asbestos using test method CTFA J 4-1.

LINE #1 IS ACTUAL TEST RESULT INFO →

TYPICAL DATA SUGGEST YOU TYPE UP A "MASTER" WITH THIS INFO, THEN PLUG IN TEST RESULTS, PO#'s, ETC. WITH EA. ORDER

Charles T. Felger

C. T. Felger
Marketing Services Manager

Sample Almay

Cyprus Industrial Minerals Company
Talc Division
7200 South Alton Way
Post Office Box 3419
Englewood, Colorado 80155
303-740-5444

CERTIFICATION OF ANALYSIS

Cyprus Industrial Minerals Co. certifies that the material described below is within standard specifications for this product. Typical Data Sheets are available for each product on request.

Product Name	Supra
Lot Number	S 04114
Cyprus Order	N/A
Ship Date	N/A
Quantity Shipped	N/A
Customer Name	Almay Incorporated
Customer City and State	Apex, NC
Customer Purchase Order Number	N/A
Customer Product Code	N/A

TEST RESULTS:

LINE #1 IS ACTUAL TEST RESULT INFO →

Loose Density- 24.15, Reflectance- 87.0, Mesh- 98.2 thru 200 mesh, Tapped Density-58 lbs/ft^{3} +2, Acid Solubles- 6.0% max., pH- 9.5 +0.5, As- less than 2 ppm, Pb- less than 20 ppm, Asbestos- certified free of asbestos using test method CTFA J 4-1.

TYPICAL DATA SUGGEST YOU TYPE UP A "MASTER" WITH THIS INFO, THEN PLUG IN TEST RESULTS, PO#'S, ETC. WITH EA. ORDER

Charles T. Felger

C. T. Felger
Marketing Services Manager

CUSTOMER SPECIFICATION SHEET

NO. 77295 A

Invoice copies _____

Ship to: Revlon, Inc.
Phoenix, AZ

Bill of Lading _____

29 So. Plainfield OR _____ FOB Plant

Bill to: Revlon, Inc. Accounts Payable, PO Box 853, Metuchen, NJ 08840
Name | Street Address | City & State | CODE

Ship to: Revlon, Inc., Receiving Dept., 4301 W. Buckeye Rd., Phoenix, AZ 77295 A1 Z1
Name | Street Address | City & State | CODE

Routing: Customer Pick-up

Spec. Instructions 1. Plant to call Revlon Transportation Dept. one week prior to scheduled pick-up date. (201) 287-7054.

PRODUCT (S)

Name 15.125 tons SUPRA/"S" bag pal Ton Price Book CODE 1705

Name ROWND 98775 Ton Price _____ CODE _____

PRODUCT SPECIFICATION

Form: Grind: Moisture:

Type of package: 50# T/M white bag with product name & Cust. codes: ROWND 98775/PO#. Type of car: Truck

Spec. Inst.
1. Glue and palletize best way for load. Use 40X48 DFW pallets only.
2. Code bags as noted above.
3. Stretch wrap.
4. C of A including asbestos to be sent to:Cheryl Martin, Q.C.Dept.by plant, "This lot contains no asbestos using CTFA J4-1 test method: on C of A.

SPECIAL DOCUMENT MAILING

Order Acknowledgment:

Invoice:

Other:

Shipping Notice: Plant to call Mrs. Betty Lenart with ship info. 201-287-1400 Ext. 7311.

SALES DEPARTMENT INFORMATION

Branch:

Salesman: A1

Industry: Z1

BILLING

Freight:

Weight:

Taxable:

Commission to: _____

Amount of Commission: _____

ADD: Spec.Inst.#4. 5-25-84 mh

Terms: CHG: Phone#. 3-26-85mh
ADD: Ship notice. 5-23-86mh

Discount:

Date: 8/10/83 rt

CUSTOMER SPECIFICATION SHEET

NO. 77294A

Invoice copies _____ Ship to: Revlon, Inc. Metuchen, N.J.

Bill of Lading _____

Ship from (29) So. Plainfield, N.J. OR _____ FOB Plant

Bill to: Revlon Inc. C/o Riros A/C Payable P.O. Box 853 Metuchen, N.J. 08840
Name Street Address City & State

Ship to: Revlon Inc. C/o Vornado Whse. Route 18 West Ferris St., E. Brunswick, N.J.
Name Street Address City & State

Routing: Truck to harbor prepaid for export.

Spec. Instructions Send freight bill to Revlon Inc
C/o Riros A/C Payable
P.O. Box 853
Metuchen, N.J. 08840

PRODUCT (S)

Name TONS AS ORDERED SUPRA Ton Price BOOK CODE

Name _____ Ton Price _____ CODE

PRODUCT SPECIFICATION

Blend:

Form: Grind: Moisture:

Type of package: 50 # Bags with product name Type of car: Truck

Spec. Inst.
1. DFW Pallets
2. Stretchwrap
3. Mark bags as indicated on B/L

SPECIAL DOCUMENT MAILING

Order Acknowledgment: Bill to Add. Shipping Notice: Bill to Add.

Invoice: Bill to Add.

Other:

SALES DEPARTMENT INFORMATION

Branch: XO

Salesman: CWA

Industry: Z1

BILLING

Freight: Commission to: _____

Extras: Amount of Commission: _____

Weight: Terms: Net 30

Taxable: Discount:

Date: 12-15-83 LS

TREMOLITE TEST

LEHMAN 01696

See files for granulometry printout

CYPRUS INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING September

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Supra	S09256	23.28	—	85.5	200	97.9	0.3%	✓	✓
Supra 1-7	S09256A	19.72	—	86.0	200	98.0	0.4%	✓	✓
Supra	S09266	23.46	—	87	200	98.0	.4%	✓	✓
Supra E.F. *	S04246E	23.65	— *	86.5	200	99.2	0.4%	—	✓
Supra EF	S10026E	21.72	— *	86.0	200	99.2	0.4%	—	✓
Supra	S09276	22.09		87	200	99.6	3%	✓	
Supra EF	S09296EF								
Supra	S09296	22.34		86.5	200	98.2	3%	✓	
Supra	S09306							✓	

LEHMAN 01697

CYPRUS INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING Oct 86

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SUPRA	S10306	24.02		87	200	98.6	.4%	—	✓
2SC	S10296Z	13.79		88	325	99.8	.5%		✓
SUPRA	S10296G	23.34		88	200	98.2	.3%		✓

LEHMAN 01698

CYPRESS INDUSTRIAL MINERALS
651 Watchung Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING October 1986

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	Hegman / moist	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SUPRA	S10016	22.28		86.5	200	98.4	3%		✓
SUPRA FF	S10026F	21.72		86.	200	99.2	4%	✓	✓
SUPRA	S10026	22.15		86.5	200	98.1	4%	✓	✓
SUPRA	S10046	22.71		86.	200	97.6	3%	✓	✓
OREAN	S10076K	25.52		90.5	200	99	4%	✓	✓
SUPRA	S10046F	22.07		86.5	200	94	4%	✓	✓
SUPRA	S10256	[illegible]		86.5	200	98	4½		✓
OREAN	S10086K	26.40		89	200	88	3%		✓
	S10076	22.34		87	200	98	4%		✓
	S10246	22.03		88	200	98.6	3%		✓
	S10256	21.72		86	200	98	3%		✓
	S10106K	30.45		88	200	90	3%		✓
	S10096K	26.15		91	200	86	3%		✓
	S10286	22.15		88	200	98.4	3%		✓
	S10276V	15.23		89	~~300~~	~~98~~	3.5%		✓
	S10026	23.46		86	200	98	4%		✓
	S10066	22.09		86	200	98	3%		✓
	S10286G	23.6		88	200	98	3%		✓
	S10206Z	15.72		87	325	99.8	6%		✓

LEHMAN 01699

[redacted] INDUSTRIAL MINERALS
651 Metuchan Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING November 86

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SuperA	511246	23.84		87	200	98	14%	✓	✓
SuperA	511256	22.9		86	200	98.4	3%	✓	✓

LEHMAN 01700

CYPRUS INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING November 86

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	~~HEGMAN~~ Meq/min/ft	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Supra E.F.	S11056E	21.84	—	87.0	200	99.6	0.4%	—	✓
~~EF~~	~~S11076E~~								✓
~~EF~~	~~S11116E~~								✓
EF	S11046E	21.84		87	200	99.8	.4%	—	✓
SFINO	S11076V	20.90		87	200	99.8	.4%		✓
Supra ~~EF~~	S11136E	22.90		87	200	98.4	.3%	✓	✓
EF	S11076E	20.9		87	200	99.8	.4%		✓
EF	S11116E	20.6		88	200	99.8	.3%		✓
SUPRA	S11136E	21.53		87	200	99.6	.3%	✓	✓
Mistron	S11146Z	13.91		87	325	99.8	.5%		✓
Suprafino	S11186V	15.91		90	325	99.8	.4%	✓	✓
Suprafino	S11196V	15.41		89	325	99.8	.4%	✓	✓ (1 [illegible] 4)
Supra Darco	S11186	21.97		86	200	98.86	.3%	✓	✓
~~[illegible]~~	~~[illegible]~~								✓
SUPRA	S11216	22.96		87	200	98	.3%	✓	✓
SUPRA	S11206	23.24		87	200	98	.3%	✓	✓
SUPRA	S11226	23.09		87	200	98.2	4%	✓	—
SUPRA	S11236	22.78		87	200	99.8	4%	✓	—
Suprafino	S11196V								

(6-20)

LEHMAN 01701

CYPRUS INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING December 1986

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Supra	S12026	21.53		87	200	98.8	.3%	✓	✓
SUPRA E.F	S12056E	21.97	N.A.	87.0	200	99.5	N.A.	—	✓
MUSKOX RSS	S12026S	16.66		85.	300	99.8	.5%	✓	✓
SUPRA	S12046	22.84		86.0	200	98.4	.4%	✓	✓
SUPRA	S12116E	21.47		87.0	200	99.6	.4%	—	✓
SUPRA EF	S12056E	21.97		87.	200	99.5	.3%	—	✓ bag 2.5-3.5
SUPRA	S12126	23.15		86.	200	98.2	.3%	✓	✓
SUPRA	S12136	22.46		86	200	98.4	.4%	✓	✓
SUPRA	S12146	23.96		87	200	98	3%	✓	✓
SUPRA	S12156	22.40		86	200	98.2	3%	✓	✓
Supra	S12166	22.40		86	200	98.4	.3%	✓	✓
SUPRA	S12176	22.84		86	200	98.8	.4%	✓	✓
Supra	S12186	22.40		86	200	98	4%	—	✓
SUPRAEF	S12306E	22.71		86	200	99.8	4%	—	✓
SUPRAEF	S12316E	22.09		87	200	99.8	4%	—	✓

LEHMAN 01702

CYPRUS INDUSTRIAL MINERALS
651 Mutuchan Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING January 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SUPRA	501097	22.71		82	200	97.4	.4%	✓	✓
SUPRA	501137	22.21		87	200	97.6	.4%	✓	✓
SUPRA	501147	23.28		87	200	98.2	.4%	✓	✓
SUPRA CT	501067E	21.65		87	200	99.8	4%	—	✓
SUPRA Disco	501077	22.90		86	200	98.3	4%	—	✓
SUPRA	501157	21.71		86	200	97.6	.4%	✓	✓
SUPRA	501167	23.03	1 thru 13	87	200	98	.3%	✓	✓
SUPRA Disc	501167	23.12		87	200	98	.4%	—	✓
SUPRA	501167		14 thru 20		200				
SUPRA	501227	23.28		86	200	98.2	.4%	✓	✓
SUPRA	501277	22.78		86	200	98.4	.3%	✓	✓
SUPRA	501287	24.84		87	200	97.4	.4%	✓	✓
MINUSIL 25C	501672				300			—	✓

LEHMAN 01703

CYPRUS INDUSTRIAL MINERALS
651 Watchung Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING March 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SupraEF	503077E								✓
OCEAN	503117K	25.65		87		99.6	3.9	✓	✓
SUPRAFINE	503077V	16.53		87		99.8	4%	✓	✓
Supra	503127	23.20		86		98.6	4%	✓	✓
Supra	503077	23.53		88	270	98.6	4%	✓	✓
SupraEF	503067E								✓
Supra	503057	2365		86		98.	3%	✓	✓
mistron	503122Z	16.16		88	325	99.8	.6%		✓
Supra	503177	23.34		87	200	97.6	.4%	✓	✓
mistron	503177Z	14.48		86		99.9	4%	—	✓
SUPRAFINE	503127	23.34		88		98.6	4%	✓	✓
Supra	503187	23.34		86		98.6	4%	✓	✓
Supra	503197	23.40		86		98.6	4%	✓	✓
Supra	503207	23.53		87		98.	4%	✓	✓
mistronZSC	503197Z	14.16		86		99.9	.3%		✓
Supra	503217	23.40		87		97.8	4%	✓	✓
Supra	503217	23.53		87		97.6	4%	✓	✓
Supra	[illegible]7	23.46		87		98.	4%	✓	✓

LEHMAN 01704

CE[illegible] INDUSTRIAL MINERALS
651 Watchung Road
Bo; Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY WEEK ENDING AUGUST

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	Avg. Moist. HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
SUPER	S080116	23.84		87	200	99.4	.4	✓	✓
[illegible]	S08016	22.59		86	[illegible]	99.6	.3	✓	✓
EF. S.B	S080116E	21.79		86	200	99.2	.4	—	✓
SUPER	S080316	22.75		[illegible]	[illegible]	99.8	.3	✓	✓
SUPER	S080416	22.98		87	200	97.8	.3	✓	✓
SUPER FINE	S080816	21.77		86	200	99.9	.4	✓	✓
[illegible]	S080865	16.91	—	84	325	99.9	4.5 .6	✓	✓
[illegible]	S081516	24.02		86	200	98.0	.3	✓	✓
SUPER	S081416	22.21	—	86	200	98.2	.4	✓	✓
[illegible]	S081265 1-8	17.35	—	84	325	99.9	4.0	✓	✓
SUPER EF	S08136E	22.90	—	86	200	99.1	.4	—	✓
SUPER EF	S08226E 1-15	22.90	—	85.5	200	99.0		—	✓
SUPER EF	S08216E	22.09	—	86	200	99.1	.4	—	✓

LEHMAN 01705

CYPRUS INDUSTRIAL MINERALS
651 Watchan Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING March 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Supra	S03267	23.59		87		97.6	.4%	✓	✓
Suprafino	S03267V	16.79	Bag #1 & 5	89		97.6	.5%	✓	✓
Suprafino	S02267R		Bag #2					✓	✓
Supra	S03277	23.46		86		97.8	.4%	✓	✓
Supra	S03287	23.53		86		97.6	.4%	✓	✓
Supra	S03297	24.21		86		98.8	.4%	✓	✓
Mistron	S03277R	12.85		90		99.9	5 .6%	—	✓
ZSC	S03317Z							—	✓
~~DARCO~~ Supra	~~S04017~~							—	✓
~~Oly~~	~~S04037B~~	~~23.96~~		86		98.2	4%	✓	✓
~~Oly~~	~~S04047B~~								✓
Suprafino	S03287V	15.10		89		99.9	5%	✓	✓
~~Suprafino~~	~~S04037V~~							NO B/C	✓
Supra	S03307	24.02	7-20	86		98.2	4%	✓	✓
Supra	S03317	23.84		86		98.4	.4%	✓	✓
Mistron	Shubton S03317Z	14.23		89		99.9	.5%	—	✓

LEHMAN 01706

[illegible] INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING April 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Dartco Supra	S04017							—	✓
Oly	S04037B	23.96		86		98.2	4%	✓	✓
Oly	S04049B	24.71		86		98.4	4%	✓	✓
Suprafino	S04037V	15.48		89		99.6	.4%	No B/C	✓
Supra EF	SP Stevens S04097F							—	✓
Dynamic	S04057B	24.77	1-16	84		98.1	4%	✓	✓
[illegible]	S03267V	16.79	16-26	89		99.6	5%	✓	✓
Supra E 1	S04117E	21.15	~~Bag 1~~ 1-20	87		99.8	5%	✓	✓
Supra E 1	S04127E	21.97	1-12	87		99.6	.4%	✓	✓
Supra-F	S04157D	[illegible]		87		98	.4%	✓	✓
Supra	S04217	23.03		86		98	.4%	✓	✓
Supra	S04227	22.40		86		98	.4%	✓	✓
Supra	S04237	22.28		87		98.6	.4%	✓	✓
Supra	S04247	23.53	1-16	87		98	.4%	✓	✓
Suprafino	S04227V	15.10	1-19	90	325	99.8	.4%	✓	✓
Supra	S04257	23.46		87		98.4	.4%	✓	✓
Supra	S04267	23.53		86	200	98.7	.4%	✓	✓
Mistron	S04297Z	13.35		88	325	99.8	.5%		✓
~~[illegible]~~	~~[illegible]~~								
~~Supra~~	~~S04227~~								

LEHMAN 01707

CYPRUS INDUSTRIAL MINERALS
651 Metuchen Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING May 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Monoblend	S05057M	22.59		87	200	99.	.4%	✓	✓
Monoblend	S05067M	22.53		87		99	.4%	✓	✓
Mistron	S05057Z	13.42		88	325	99.9	.5%		✓
J.P. Stevens Supra EE	S05067E								✓
Mistron ZSC	S05067Z	13.35		87	325	99.9	.5%		✓
Supra	S05127	23.40		86		98.8	.4%	✓	✓
Supra	S05147	23.59		86		98.8	.4%	✓	✓
Supra	S05137	23.53		86		98.8	.4%	✓	✓
Supra	S05157	23.71		86		98.7	.4%	✓	✓
Supra	S05177								✓
Supra	S05167								✓
Monoblend	S05167M							✓	✓
Monoblend	S05207M								✓
Supra Fino	S05217V							✓	✓
Supra [illegible]	S05217E								✓
Mistron ZSC	S01.47E								✓
Supra	S05197							✓	✓
Supra	S05007							✓	✓

LEHMAN 01708

CYPRESS INDUSTRIAL MINERALS
651 Metuchan Road
So. Plainfield, N.J. 07080
LOC# 29

LABORATORY SUMMARY

WEEK ENDING April 1987

PRODUCT	LOT	LOOSE DENSITY	50-TAP DENSITY	REFLECTANCE	MESH	%	HEGMAN	BIO-LAB SAMPLE	TREMOLITE SAMPLE
Supra	504297	23.40		86	200	98.	4%	✓	✓
Supra	504277	23.40		86	200	98.8	4%	✓	✓

LEHMAN 01709

ATTN: KEITH LEHMAN

Lot #	Product	Status
S11187E	SuPRA EF	Hold
S11187Z	MISTRON ZSC	Ship
S12027	SuPRA	Hold
S12037	SuPRA	Hold
S12087	SuPRA	Hold
S12097	SuPRA	Ship
S12167Z	MISTRON ZSC	Ship

Tracy Jones / CIMC, Carlsville

South Plainfield

Tremolite G.C.

Scan #	LOT #	PRODUCT	Shipped 10/87 and detected see attached memo
XT 702	S09297V	Suprafine	ND
XT 703	S09297E	Supra E.F.	ND
XT704	S09107	Supra	

South Plainfield

Tremolite Q.C

Scan#	Product	Lot#	Shipped amt. detected
XT734	Supra EF	S10067E	ND
XT735	Supra	S10077	ND
XT736	Supra	S10147	ND
XT737	Suprafino	S10017V	NO

South Plainfield

			not detected
XT 706	Supra	Lot # 510067	ND
XT 707	Supra EF	" 510027E	ND
XT 708	Supra EF	" 509307E	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Oct 13, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

Tremolite Q.C.

Shipped 10/16/87

Scan #	Lot #	Product	amt detected
XT794	S10167	Supra	ND
XT795	S10157	Supra	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Oct 26, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, NJ

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST LA, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A., CA

TELEPHONE NUMBER: (213) 478 0462

MAR 27 '87 09:04 CYPRUS MINERALS, ENGLEWOOD, CO P.1/3

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado

Date 3-27-87

TO	FROM
Name KEITH LEHMAN	Name RICK RICARDO
Company CIMC	Company CIMC
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303 740 5714 Mail Code 106B
Verification Telephone No.	

This Transmission Consists of 2 Pages (Including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 00-1000 (11-86)

LEHMAN 01717

Pg 2 of 2

ATTN: KEITH LEHMAN

da Reference*	Lot #	PRODUCT	% AMORPHOUS
S[illegible]56	S03217	Supra	N.D
S7857	S03197Z	Mistron ZSC	N.D
S[illegible]58	S03247	Supra	N.D.
S[illegible]59	S03257	Supra	N.D.

Rick Richard[illegible]/CYPRUS

ATTN: KEITH LEHMAN

[illegible]	LOT #	PRODUCT	% Amphibole
57853	S03187	Supra	N.D.
57854	S03197	Supra	N.D.
57855	S03207	Supra	N.D.

RICK RICARDO / CYPRUS

MAR 25 '87 10:08 CYPRUS MINERALS, ENGLEWOOD, CO P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Colorado

Date 3-25-87

TO	FROM
J. LEHMAN	Name RICK RICARDO
CIMC	Company CIMC - QUALITY ASSURANCE
City/Country Golden Plainfield, N.J.	Account Code QA-309
Telephone No.	Telephone No. (303) 740-5714 Mail Code 106R
Confirmation Telephone No.	

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Ricoh 230:	(303) 740-5224	333A
Ricoh 120:	(303) 740-5049	333A

Pg 2 of 2

ATTN: KEITH LEHMAN

Dahn Reference #	LOT #	PRODUCT	% TREMOLITE
57845	S03127Z	MISTRON ZSC	N.D.

RICK RICARDO/CYPRUS

MAR 19 '87 08:07 CYPRUS MINERALS ENGLEWOOD P.1/2

[illegible] TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 3-19-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CYPRUS / South Plainfield, N.J.	Company CYPRUS / Quality Assurance
City/State/Country	Account Code 309
Facsimile Telephone No. 61	Telephone No. 303 740-5714 — Mail Code 106B
Verification Telephone No.	

19 [illegible]

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

[illegible]

LEHMAN 01722

ATTN: KEITH LEHMAN

Date Reference #	Lot #	PRODUCT	% TREMOLITE
S7816	SO3117K	OREAN	N.D.
S7842	SO305	Supra	N.D.
S7843	SO30	Supra	N.D.
S7844	SO312	Supra	N.D.

RICK RICARDO / CYPRUS

MAR 17 '87 13:18 CYPRUS MINERALS, ENGLEWOOD, CO P.1/2

TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado

Date 3-17-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CYPRUS / S. Plainfield, N.J.	Company CYPRUS / Quality Assurance
City/State/Country	Account Code 309
Facsimile Telephone No. 61	Telephone No. 303 740-5714 Mail Code 1066
Verification Telephone No.	

17 MAR 87 13:18

This Transmission Consists of 2 Pages (Including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Ricoh 230:	(303) 740-5224	333A
Ricoh 120:	(303) 740-5049	333A

Form No. 4753 (11-85)

MAR 16 '87 11:03 CYPRUS MINERALS ENGLEWOOD

P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 3-16-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CYPRUS / South Plainfield, NJ	Company CYPRUS / Quality Assurance
City/State/Country	Account Code 309
Facsimile Telephone No.	Telephone No. (303) 740-5714 — Mail Code 106B
Verification Telephone No.	

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1760 (11-86)

LEHMAN 01725

pg 2 of 2

ATTN: KEITH LEHMAN

Our Reference #	Lot #	PRODUCT	% TREMOLITE
S7814	S030774E	Supra E.F.	N.D.
S7815	S030774V	Supra FINO	N.D.
S7816	S031174K	OREAN - HOLD: further testing being done. Showing some prob.	

Rick Ricardo / CYPRUS

ATTN: KEITH LEHMAN

Date Reference #	LOI #	PRODUCT	%TREMOLITE
S7769	S02187	Supra (for Dartco)	N.D.
S7770	S02277E	Supra EF	N.D.
S7771	S03067E	Supra EF	N.D.

Rick Ricardo / Cyprus

MAR 12 '87 10:17 CYPRUS MINERALS

TRANSMISSION
Englewood, Colorado
Telecopy Center

Date 3-11-87

TO	FROM
Name KEITH LEHMAN	Name RICK RICARDO
Company CYPRUS / South Plainfield, NJ	Company CYPRUS / QUALITY ASSURANCE
City/State/Country	Account Code 309
Facsimile telephone No.	Telephone No. 74-5714 Mail Code 106B
Confirmation Telephone No.	

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Telecopier Numbers

		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

MAR 12 '87 10:16 CYPRUS MINERALS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S7846	S031772	Mistron	N.D.
S7847	S03177	Supra	N.D.
S7852R	S03127	Supra	N.D.

Rick Ricardo / CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 3-20-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CYPRUS / South Plainfield, NJ.	Company CYPRUS / Quality Assurance
City/State/Country	Account Code 309
Facsimile Telephone No.	Telephone No. 303 740-5714 / Mail Code 106B
Verification Telephone No.	

20 MAR 87 15: 12

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

ATTN: KEITH LEHMAN

Re-Tests

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7405	SO 11157	SUPRA	N.D.
S7406	SO 11167	SUPRA	N.D.
S7407	S10256 #1	SUPRA	N.D.
S7408	S10256 #5	SUPRA	N.D.
S7409	S10256 #19	SUPRA	N.D.
S7410	S10246 #6	SUPRA	N.D.
S7411	S10246 #8	SUPRA	N.D.
S7412	S10246 #9	SUPRA	N.D.
S7413	S10246 #14	SUPRA	N.D.
S7414	S10036 #1	SUPRA	N.D.
S7415	S10036 #2	SUPRA	N.D.
S7416	#3	Coming Soon - NOT YET AVAILABLE	
S7417	S10036 #4	SUPRA	N.D.
S7418	S10036 #5	SUPRA	N.D.
S7419	S10036 #6	SUPRA	N.D.
S7420	S10036 #7	SUPRA	N.D.
S7421	S10036 #8	SUPRA	N.D.
S7422	S10036 #9	SUPRA	N.D.
S7423	S10036 #10	SUPRA	N.D.
S7424	S10036 #11	SUPRA	N.D.
S7425	S10036 #12	SUPRA	N.D.
S7426	#13	Coming Soon - NOT YET AVAILABLE	
S7427	S10036 #14	SUPRA	N.D.
S7428	S10036 #15	SUPRA	N.D.
S7429	S10036 #16	SUPRA	N.D.

JAN 27 '87 10:26 CYPRUS MINERALS ENGLEWOOD P.2/3

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7430	S10036 # 17	SUPRA	N.D.
S7431	S10036 # 18	SUPRA	N.D.
S7432	S10036 # 19	SUPRA	N.D.
S7433	S10036 # 20	SUPRA	N.D.

Sorry For the Delay.

RICK RICARDO / CYPRUS

JAN 27 '87 18:27 CYPRUS MINERALS ENGLEWOOD

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
57416	S10036 #3	SUPRA	N.D.
57426	S10036 #13	SUPRA	N.D.

Rick Ricardo / Cyprus

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
57560	S01297	Supra	test Not Yet complete
57561	S02037	Supra	N.D.
57562	S02047	Supra	N.D.
57563	S02057	Supra	N.D.
57564	S02067	Supra	N.D.

RICK RICARDO / CYPRUS

FEB 10 '87 12:55 CYPRUS MINERALS ENGLEWOOD

2 of 2

LOT #	Product	% TREMOLITE
S10161K	Ocean	0.1
S10086K	"	0.1
S10066	Supra	N.D.
S10096K	Ocean	N.D.
S10076	Supra	N.D.
S10076K	Ocean	N.D.
S10036 HOLD	Supra	0.2
S10026	"	N.D.
S10016	"	N.D.
S10056	"	N.D.
S0426E	Supra E.F.	N.D.
S10286	Supra	N.D.
S10026E	Supra E.F.	N.D.

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7430	S10036 # 17	SUPRA	N.D.
S7431	S10036 # 18	SUPRA	N.D.
S7432	S10036 # 19	SUPRA	N.D.
S7433	S10036 # 20	SUPRA	N.D.

Sorry For the Delay.

RICK RICARDO / CYPRUS

JAN 27 '87 10:27 CYPRUS MINERALS ENGLEWOOD

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7405	S01157	SUPRA	N.D.
S7406	S01167	SUPRA	N.D.
S7407	S10256 #1	SUPRA	N.D.
S7408	S10256 #5	SUPRA	N.D.
S7409	S10256 #19	SUPRA	N.D.
S7410	S10246 #6	SUPRA	N.D.
S7411	S10246 #8	SUPRA	N.D.
S7412	S10246 #9	SUPRA	N.D.
S7413	S10246 #14	SUPRA	N.D.
S7414	S10036 #1	SUPRA	N.D.
S7415	S10036 #2	SUPRA	N.D.
S7416	#3	Coming soon - NOT YET AVAILABLE	
S7417	S10036 #4	SUPRA	N.D.
S7418	S10036 #5	SUPRA	N.D.
S7419	S10036 #6	SUPRA	N.D.
S7420	S10036 #7	SUPRA	N.D.
S7421	S10036 #8	SUPRA	N.D.
S7422	S10036 #9	SUPRA	N.D.
S7423	S10036 #10	SUPRA	N.D.
S7424	S10036 #11	SUPRA	N.D.
S7425	S10036 #12	SUPRA	N.D.
S7426	#13	Coming soon - NOT YET AVAILABLE	
S7427	S10036 #14	SUPRA	N.D.
S7428	S10036 #15	SUPRA	N.D.
S7429	S10036 #16	SUPRA	N.D.

JAN 27 '87 10:26 CYPRUS MINERALS ENGLEWOOD P.2/3

2 of 2

Sent 11/21/86
attn: K. Lehman

	Lot #	Product	% Tremolite
✓	S10256 Hold	Supra	0.2
	S10286	Supra	N.D.
✓	S10246 Hold	Supra	0.1
	S10046	(Cetyl) Supra	N.D.
	S102062	Mistron	N.D.
✓	S10166Z Hold	Mistron	0.1
	S101562	Mistron	N.D.
	S10296V	SuperFino	N.D.

B. Anderson

Pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
57416	S10036 #3	SUPRA	N.D.
57426	S10036 #13	SUPRA	N.D.

RICK RICARDO / CYPRUS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7713	S02217E	Supra E.F.	N.D.
S7714	S02267Z	Mistron ZSC	N.D.
S7715	S02277R	Supra Fino-R	N.D.
S7716	S02287Z	Mistron ZSC	N.D.

Rick Richrdo / CYPRUS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference*	Lot*	PRODUCT	% TREMOLITE
57712	S022670	DOVER 50	N.D.

RICK RICARDO/CYPRUS

Page 2 of 2

ATT.: K. Lehman Sent 12/19/86.

LOT #	Product	% Tremolite
512136	Supra	N.D.
512156	Supra	N.D.
512146	Supra	N.D.
512166	Supra	N.D.
512176	Supra	N.D.

B. Anderson/Cyprus

ATTN: KEITH LEHMAN

Data Reference #	LOT	PRODUCT	% TREMOLITE
57656	087	Supra	N.D.
57657	[illegible]7V	Suprafino	N.D.
57658	50[illegible]7V	Suprafino	N.D.
57659	50[illegible]	Supra	N.D.

RICK RICARDO/CYPRUS

FEB 25 '87 13:26 CYPRUS MINERALS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference*	LOT*	PRODUCT	%TREMOLITE
S 7572	S02067E	Supra EF	N.D.
S7560	S01297	Supra	N.D.

Rick Ricardo / CYPRUS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7607	SO 2077	Supra	N.D.
S7608	SO 2137 V	Suprafino	N.D.

RICK RICHARDO/CYPRUS

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% TREMOLITE
S7402	S01097	SUPRA	N.D.
S7403	S01137	SUPRA	N.D.
S7404	S01147	SUPRA	N.D.

RICK RICARDO / CYPRUS

Lot #	Product	% Tremolite
S01167	Supra	N.D

per Rick 1/19/87

Received 1/15/87.

pg. 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	Lot #	PRODUCT	% TREMOLITE
S7401	S01067E	Supra EF	N.D.

RICK RICARDO / CYPRUS

~~2/6/87~~
Received 2/9/87

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference#	Lot #	Product	% TREMOLITE
S7456	SO11572	mistron ZSC	N.D.
S7457	SO1227	Supra	N.D.
S7458	SO1277	Supra	N.D.
S7459	SO1287	Supra	N.D.

RICK RICARDO / CYPRUS

Page 2 of 2

ATTN: K. Lehman Sent 12/19/86.

Lot #	Product	% Tremolite
512136 ✓	Supra	N.D.
512156 ✓	Supra	N.D.
512146 ✓	Supra	N.D.
512166 ✓	Supra	N.D.
512176 ✓	Supra	N.D.

B. Anderson/Cyprus

Sent 12/16/86

ATTN: K. Lehman

Lot #	Product	% Tremolite
S120560E	Supra EF	N.D.
S12126	Supra	N.D.
S12116E	Supra EF	N.D.

Bret / cyprus

Sent To K. Lehman 2 of 2

ATTN: K. Leitman

Lot #	Product	%Tremolite
S12046	Supra	N.D.

Bret A. Anderson / Cyprus

DEC 11 '86 13:37 CYPRUS MINERALS ENGLEWOOD

Sent 12/16/96

ATTN: K. Lehman

Lot #	Product	% Tremolite
S120560E	Supra EF	N.D.
S12126 ✓	Supra	N.D.
S12116E	Supra EF	N.D.

Bret / cyprus

South Plainfield

Tremolite Q.C.

Scan #	LOT #	PRODUCT	Shipped 10/87 sent (detected) see attached memo
XT 702	S09297V	Suprafine	ND
XT 703	S09297E	Supra E.F.	ND
XT704	S09107	Supra	ND

Oct 6, 1987

Keith Lehman
CIM, South Plainfield

Regarding Superfino lot # 509297V:
R. Zazynski has asked that a hold is placed on this lot, and that a sample from each pallet be sent to the L.A. Lab for tremolite analysis.

Linda Howard
CIM, WEST LOS ANGELES

Samples Sent 10/7/87
UPS Next Day Air

TREMOLITE QC.

Shipped 9/87

Scan #	Lot #	Product	Amt. Asbestos
XT 623	509/675	Mistron R.C.	ND
XT 624	509 227 M	Monoblend	ND
XT 625	509/87E	Supra F.F.	ND
XT 626	509/675	Mistron R.C.5.	ND

RAPID[illegible] TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Sept 25, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A. CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

TREMOLITE Q.C.

Scan #	LOT #	Product	Shipped 9/11/87 amt. deducted
XT556	509107	Supra	ND
XT557	509047	"	ND
XT558	509057	"	
XT559	509067	"	ND
XT560	509087	"	ND
XT561	509097	"	ND

Shipped 9/14/87

XT562	509027	SW 200	ND
XT563	509037	SW 200	ND
XT564	509037	Supra	ND
XT565	508017V	Suprafine	ND
XT566	508277R	Suprafine R	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Sept 22, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST LA, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Sept 9, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A., CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A., CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

TREMOLITE Q.C.

Shipped 9/2/77

Scan #	LOT #	PRODUCT	AMT. SHIPPED
XT473	508277E	SUPRA B.F.	ND
XT474	509017	Supra	ND
XT475	509027	Supra	ND

South Plainfield

TREMOLITE Q.C. Shipped 8/28/87

LOT #	[illegible]	[illegible]
402 5082570	DOVER 50	ND
[illegible] 57R	Supra R	ND
[illegible] 3D	Supra	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Sept 2, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, NJ

MAIL CODE:

NUMBER OF PAGES: 1

XT407
-77404

FROM: L. HOWARD

COMPANY: CIM, WEST L.A., CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A., CA

TELEPHONE NUMBER: (213) 478 0462

So. Plainfield

TREMOLITE QC Shipped 8/21/87

#405 SO 9267 D POWER SO NO

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Aug 21, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A., CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

TREMOLITE QC.

[illegible]

[illegible]	508197Z	MISTRAN ZSC	ND
[illegible]	508207E	SUPRA EF	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: August 26, 91

TO: KEITH LEHMAN

COMPANY: CYPRUS PLANSIFTER CO

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CYPRUS INDUSTRIAL MINERALS CO.

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CYPRUS PLANSIFTER CO

TRANSMITTED BY: L. HOWARD

LOCATION: CYPRUS, WEST LOS ANGELES, CA

TELEPHONE NUMBER: (213) 478-0462

South Plainfield

TREMOLITE Q.C. Shipped 9/15/87

	LOT #	Product	Amt Ord.
XL371	50725 7Z	Micronex 2.5C	NO
XT372	508127	Supra	NO

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Aug 25, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST LA, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST LA, CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield N.J.

TREMOLITE Q.C. Shipped 8/13/87

N1331 Sup... LOT# 509127 ND

SOUTH PLAINFIELD, N.J.

TREMOLITE Q.C. Shipped 9/11/87

N1330 MISTRON ZSC LOT# 5081072 ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Aug. 21, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, NJ

MAIL CODE:

NUMBER OF PAGES: 61

FROM: L. HOWARD

COMPANY: CIM, WEST LOS ANG.

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, NJ

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A. CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

TREMOLITE Q.C. Shipped 8/11/87

XT312	Olympic	50 80176	ND
XT313	Suprafino	50 8[illegible]7V	ND
XT314	Mistron ZSC	50 90572	ND
XT315	Supra	50 8[illegible]7	ND
XT316	Supra	50 8[illegible]7	ND
XT317	Supra	50 8[illegible]7	ND

CONFIDENTIAL

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: August 18, 1987

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

South Plainfield

TREMONTE Q.C.

Shipped 8/9/97

Scan #	LOT #	PRODUCT	
XT277	S 080577E	Supra E.F	N/A
XT278	S 073177	Olympic	NO
XT279	S080777	Supra	NO

South Plainfield

TREMOLITE Q.C. Shipped 8/7/87

Scan#	Lot #	Product	
XT277	S 080 57E	Supra E.F.	ND
XT278	S 073178	Olympic	ND
XT279	S08077	Supra	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Aug 17, 1991

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J

MAIL CODE:

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST LA, CA

MAIL CODE:

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: KEITH LEHMAN

COMPANY: CIM, S. PLAINFIELD, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST L.A, CA

TELEPHONE NUMBER: (213) 478 0462

TREMOLITE Q.C.

XT217	Monoblend	50731	F	GE [illegible]	ND
... 218	Supra	507207			ND
XT219	Supra bf	507307E			ND
XT220	Mistron ZSC-LM	72772			ND

DODGE-NEWARK
SUPPLY COMPANY, INC.
19B ROUTE 46 • FAIRFIELD, NJ 07006
Phone 201/575-7033
Distributors of Power Transmission & Pneumatic Equipment
BRANCH: 807 RARITAN CENTER • EDISON, NJ 08837 • PHONE: 201/225-2700

S07187 - ND

S07177 - ND

S07157 - ND

S07147R ND

S07147D ND

S07037E

S07017 ND

S06267U ND

Per Bob [illegible]
8/6/87

OUT OF STATE PHONE: 1-800-351-9600

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 8-7-87

TO		FROM	
Name KEITH LEHMAN		Name Rick RICARDO	
Company CIMC		Company CIMC- Quality Assurance	
City/State/Country South Plainfield, N.J.		Account Code QA-309	
Facsimile Telephone No.		Telephone No. 303-740-5714	Mail Code 104B
Verification Telephone No.			

MESSAGE CENTER
REC'D ____ SENT ✓

7 AUG 87 9:50

AUG 7 1987

AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

ATTN: KEITH LEHMAN

Data Reference #	Lot #	Product	% Amphibole
S 8841	S07017	Supra	N.D.
S8842	S07037E	Supra E.F.	N.D.
S8843	S07147D	Dover 50	N.D.
S8844	S07147R	Supra fino - R	N.D.
S8845	S07157	Supra	N.D.
S8846	S07177	Supra	N.D.
S8848	S07187	Supra	N.D.
~~S8621~~			

Rick Ricardo/Cyprus

SOUTH PLAINFIELD, N.J.
CORRECTION TO REPORT SENT ON 8/4/77
TREMOLITE Q.C.

XT 190	SUPRA	507297	NO
XT 191	SUPRA	507307	NO

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: 8/10/87

TO: KIETH LEHMAN

COMPANY: CIM, SOUTH PLAINFIELD, N.J.

MAIL CODE: -

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST CA. CA

MAIL CODE: -

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: K. LEHMAN

COMPANY: CIM, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, CA

TELEPHONE NUMBER: (213) 478 0462

SOUTH [illegible], NJ.

TREMOLITE Q.C. [illegible] 8/4/87

SCAN #	SAMPLE DESCRIPTION		AMT DETECTED
XT190	SUPRA	LOT # S[illegible]	.09
XT191	SUPRA	LOT # S07[illegible]	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: August 7, 1987

TO: KENNETH LEHMAN

COMPANY: CIM, SOUTH PLAINFIELD

MAIL CODE: -

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST LA.

MAIL CODE: -

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: K. Lehman

COMPANY: CIM, S. Plainfield

TRANSMITTED BY: L. Howard

LOCATION: CIM, WLA

TELEPHONE NUMBER: (213) 478-0462

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 8-7-87

TO	FROM
Name KEITH LEHMAN	Name Rick RICARDO
Company CIMC	Company CIMC- Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 Mail Code 104B
Verification Telephone No.	

7 AUG 87 9:50

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5049

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	Lot #	PRODUCT	% Amphibole
S8841	S07017	Supra	N.D.
S8842	S07034L	Supra E-F	N.D.
S8843	S07147D	Dover 50	N.D.
S8844	S07147R	Supra fino-R	N.D.
S8845	S07157	Supra	N.D.
S8846	S07177	Supra	N.D.
S8848	S07187	Supra	N.D.

Pink: Pinkerton/Cyprus

South Plainfield

Tremolite Q.C. Shipped 7/28/87

CAN #	LOT #	PRODUCT	AMT. DETECTED
XT137	507287	SUPRA	ND
XT138	507247	SUPRA	ND

RAPICOM TRANSMITTAL SHEET
CYPRUS INDUSTRIAL MINERALS COMPANY, LOS ANGELES, CALIFORNIA

DATE: Aug. 3, 1987

TO: KIETH LEHMAN

COMPANY: CIM, SOUTH PLAINFIELD, N.J.

MAIL CODE: -

NUMBER OF PAGES: 1

FROM: L. HOWARD

COMPANY: CIM, WEST L.A., CA

MAIL CODE: -

PLEASE TRANSMIT THE ATTACHED INFORMATION AS SOON AS POSSIBLE

TO: K. LEHMAN

COMPANY: CIM, S. Plainfield, N.J.

TRANSMITTED BY: L. HOWARD

LOCATION: CIM, WEST LA, CA

TELEPHONE NUMBER: (213) 478-0462

South Plainfield, N.J.

TREMOLITE P.C. Shipped 7/27/87

SCAN #	LOT #	PRODUCT	AMT. DETECTED
XT106	LOT 507107	Supra	NO
XT107	" 5072276	Supra E.P.	NO
XT108	" 507237	Supra	NO
XT109	" 5072272	Mistron 2SC	NO

SOUTH PLAINFIELD VIA/Renver [illegible]

TREMOLITE Q.C. [illegible]

XT110	507197	Super	ND
XT111	5071672	Mistron 2SC	ND

ATTN: KEITH LEHMAN

Data Reference #	Lot #	Product	To AMPHIBOLE
58835	S06267V	SupraFino	N.D.

RICK RICARDO / CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 7-22-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, NJ.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 Mail Code 1045
Verification Telephone No.	

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(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

pg 1 of 1

ATTN: KEITH LEHMAN

Date Reference #	LOT #	PRODUCT	% Amphibole
S8735	S061972	Mistron	N.D.
S8736	S06257	Supra	N.D.
S8737	S06267	Supra	N.D.
S8738	S06277	Supra	N.D.
S8739	S06307	Supra	N.D.

Rick Richardson/CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 7 15 87

TO	FROM
Name KEITH LEHMAN	Name Rick Richardson
Company PIMC	Company CMC, Quality Assurance
City/State/Country South Plain field, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 Mail Code 104B
Verification Telephone No.	

5 JUL 07 14: 43

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
58673	S06117	Supra	N.D.
58674	S06127	Supra	N.D.
58675	S06207	Supra	N.D.
58676	S06247	Supra	N.D.

Rick Ricardo / CYPRUS

JUL 02 '87 15:26 CYPRUS MINERALS,EN [illegible]OOD,CO P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 7-2-87

Name KEITH LEHMAN	Name Rick Richard
Company CMC	Company CMC - Quality Assurance
City/State/Country South Plainfield, NJ.	Account Code QA-309
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code 106B
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

JUN 30 '87 12:30 CYPRUS MINERALS* ENGLEWOOD,CO P.1/2

Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 6-30-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plain Field, N.J.	Account Code [illegible]
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code 1063
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

LEHMAN 01796

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
58582	506117	Supra	N.D.

Rick Ricardo / CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 6-30-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code 1063
Verification Telephone No.	

MESSAGE CENTER
REC.____ SENT ✓
JUN 30 1987
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

This Transmission Consists of 2 Pages (Including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S8663	S06177	Supra	N.D.
S8664	S06187	Supra	N.D.
S8665	S06197	Supra	N.D.

Rick Ricardo /CYPRUS

JUL 01 '87 11:29 CYPRUS MINERALS, ENGLEWOOD, CO P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 7-1-87

Name KEITH LEHMAN	Name Rick Ricardo
Company CMC	Company CMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code CCHP
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

ATTN: KEITH LEHMAN

Data Lfemme No.	LOT #	PRODUCT	% Amphibole
58575	S05187	Supra	N.D.
58576	S05217V	Supra fino	N.D.
58577	S06027	Supra (Dartco)	N.D.
58578	S060475	Mistron RCS	N.D.
58579	S06[illegible]787	OLYMPIC	N.D.
58580	S060578S	OLYMPIC	N.D
58581	S06107E	Supra E.F.	N.D

Duplicate? Sent

Rick Ricardo / Cyprus

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 6-19-87

TO	FROM
Name Keith Lehman	Name Rick Richards
Company CMC	Company CMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303 740-5714 Mail Code 106B
Verification Telephone No.	

19 JUN 87 14: 05

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(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S8562	S05277	Supra	N.D.
S8563	S052777	MISTRON ZSC	N.D.
S8564	S05287	Supra	N.D.
S8565	S05297	Supra	N.D
S8566	S05307	Supra	N.D.

Rick Richardo / CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 6-8-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plain Field, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code 106B
Verification Telephone No.	

This Transmission Consists of 2 Pages (Including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 230:	(303) 740-5049	333A

Form 40-1000 (03/87)

pg 2 of 2

ATTN: KEITH LEHMAN

Ltr. Reference #	LOT #	Product	% Amphibole
S8466	SO51477	MISTRON ZSC	N.D.
S8467	SO5167M	MonoBlend	N.D.
S8468	SO5197	Supra	N.D.
S8469	SO5207	Supra	N.D
S8470	SO5217E	Supra EF	N.D
S8471	SO5217V	Supra fino-VM	N.D
S8472	SO5227M	Monoblend	N.D

Rick Ricard / CYPRUS

Please return to Carol

ATTN: KEITH LEHMAN

Data Reference*	LOT#	PRODUCT	% Amphibole
58459	S05137	Supra	N.D.
58460	S05167	Supra	N.D.
58461	S05177	Supra	N.D.
58462	S05147	Supra	N.D.
58463	S05157	Supra	N.D.

Rick Ricardo / Cyprus

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S8284	S050672	Mistron 3SC	N.D.
S8285	S05127	Supra	N.D.

Rick Ricardo/CYPRUS

ATTN: KEITH LEHMAN

Lab. Reference*	LOT*	PRODUCT	% Impurities
S8279	SOS0572	Mistron ZSC VM	N.D.
S8280	SOS057M	Monoblend	N.D.
S8281	SOS057E	Supra EF	N.D.
A8282 (S)	SOS067M	Monoblend	N.D.

Rick Richards / Cyprus

[redacted]

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 5-13-87

TO	FROM
Name KEITH LEHMAN	Name Rick Richard
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 / Mail Code 106B
Verification Telephone No.	

13 MAY 87 14:54

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303 740-5049	333A

Form 40-1000 (11-86)

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 5-4-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code RA-309
Facsimile Telephone No.	Telephone No. (303) 740-5714 Mail Code 106B
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

ATTN: KEITH LEHMAN

Data Reference #	Lot #	Product	% Amphibole
S8222	S04277	Supra	N.D.
S8223	S04307	Steawhite	N.D.
S8224	S042977	MISTRON	N.D.
S8225	S04297	Supra	N.D.

Rick Ricard/Cyprus

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-30-87

TO	FROM
Name KEITH LEHMAN	Name RICK RICARDO
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code OA-309
Facsimile Telephone No.	Telephone No. 303 740-5714 / Mail Code 106B
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
) 58092	S04247	Supra	N.D.
58219	S04227-V	Suprafino	N.D.
58220	S04257	Supra	N.D.
58221	S04267	Supra	N.D.

Rick Ricardo / CYPRUS

pg 2 of 2

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% AMMONIA
58047	S04227	Supra	N.D.
58091	S04237	Supra	N.D.

Rick Ricardo/CYPRUS

APR 28 '87 14:01 CYPRUS MINERALS P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-24-87

TO	FROM
Name KEITH LEHMAN	Name RICK RICARDO
Company CIMC	Company CIMC Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 / Mail Code 1068
Verification Telephone No.	

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL (303) 740-5048

(Original - Please Number All Pages)

Facsimile Machines		Room
Rapicom 230:	(303) 740-5024	333A
Rapicom 120:	(303) 740-5049	333A

Form 40 1000 (11-86)

Pg 2 of 2

ATTN: KEITH LEHMAN

Date Referenced	LOT#	PRODUCT	% Available
S8046	S04217	Supra	N.D.

Rick Ricardo/Cyprus

APL 28 '87 11:11 CYPRUS MINERALS ENGL[illegible] P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-28-87

TO	FROM
Name KEITH LEHMAN	Name Rick RICARDO
[illegible] CLAMP	[illegible] CLAMP [illegible]
[illegible]	[illegible]
Facsimile Telephone No.	Telephone No. 303 740 5714 — Mail Code 106B
Verification Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION PLEASE CALL: (303) 740 5040

(Originator - Please Number All Pages)

Facsimile machines:		Room
[illegible]	[illegible]	[illegible]
Raplcom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

ATTN: KEITH LEHMAN

Data Reference #	LOT #	Product	% Amphibole
S8041	S041570	Supra	N.D

Rick Ricardo / CYPRUS

APR 24 '87 09:45 CYPRUS MINERALS, ENGLEWOOD, CO

P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-24-87

Name KEITH LEHMAN	Name RICK RICARDO
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA 309
Facsimile Telephone No.	Telephone No. 303 740-5714 / Mail Code 1066
Verification Telephone No.	

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(Originator - Please Number All Pages)

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

pg 2 of 2

ATTN: KEITH LEHMAN

data Reference #	LOT #	PRODUCT	% AMPHIBOLE
S8024	S033307	Supra	N.D
S8025	S033317	Supra	N.D
S8026	S033172	Mistron ZSC	N.D
S8027	S04057B	OLYMPIC	N.D
S8028	S04097F	Supra E F	N.D
S8029	S04117E	Supra E.F.	
S8030	S04127E	Supra E.F.	

Rick Ricardo / CYPRUS

APR 21 '87 12:52 CYPRUS MINERALS, ENGLEWOOD, CO P.1/2

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-21-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 / Mail Code 106B
Confirmation Telephone No.	

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

(Originator - Please Number All Pages)

Facsimile Machines:		Room
Ruplcom 220:	(303) 740-5224	333A
Ruplcom 130:	(303) 740-5049	333A

Form 40-1000 (11-86)

Pg 7 of 7

ATTN: KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S8016	S04017	Dartco Supra	N.D.
S8019	S04047B	OLYMPIC	N.D.

RICK RICARDO/CYPRUS

APL 13 '87 15:53 CYRRUS MINERALS [illegible]TEWOOD P.1/2

[illegible] TRANSMISSION
C[illegible] Minerals Company
[illegible], Colorado
[illegible]

Date 4-13-87

To		From	
Name	KEITH LEHMAN	Name	Rick Ricardo
Company	CIMC	Company	CIMC - Quality Assurance
City/State/Country	South Plainfield, N.J.	Account Code	QA-309
Facsimile Telephone No.		Telephone No.	303-740-5714
		Mail Code	106B
Verification Telephone No.			

15 [illegible]

[illegible] Transmission Sheet of [illegible] Please Including this page.

[illegible] OCCUR DURING TRANSMISSION PLEASE CALL: (303) [illegible]

(Originator - Please Number All Pages)

Facsimile Machines		Room
[illegible]	(303) 740-5776	333A
[illegible]	(303) 740-6040	333A

[illegible]

LEHMAN 01823

 4/9/87

Pg 2 of 2

ATTN: KEITH LEHMAN

Reference #	Lot #	PRODUCT	% Amphibole
S8014	S03287V	Supra Fino	N.D
S8015	S03317Z	Mistron ZSC VM	N.D
S8017	S04[illegible] B	OLYMPIC	N.D.
S8018	S040[illegible]	Supra Fino	N.D.

Rick Ricard / CYPRUS

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 4-6-87

TO	FROM
Name KEITH LEHMAN	Name Rick Ricardo
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303 740-5714 / Mail Code 106B
Verification Telephone No.	

6 APR 87 15:20

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IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

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Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

By 2 of 2

ATTN. KEITH LEHMAN

Data Reference #	LOT #	PRODUCT	% Amphibole
S7921	503297Z	Mistron ZSC	N.D.

Rick Ricardo / Cyprus

ATTN: KEITH LEHMAN

Data Reference #	Lot #	PRODUCT	% Amphibole
S7918	S03277	Supra	N.D
S7919	S03287	Supra	N.D.
S7920	S03297	Supra	N.D.

Rick Ricardo / CYPRUS

ATTN: KEITH LEHMAN

Data Reference*	LOT#	PRODUCT	% Amphibole
57860	503267	Supra	N.D.
57911	503267V	Supra Fino	N.D.

Rick Ricardo/Cyprus

FACSIMILE TRANSMISSION
Cyprus Minerals Company
Englewood, Colorado
Telecopy Center

Date 3-30-87

TO	FROM
Name KEITH LEHMAN	Name RICK RICARDO
Company CIMC	Company CIMC - Quality Assurance
City/State/Country South Plainfield, N.J.	Account Code QA-309
Facsimile Telephone No.	Telephone No. 303-740-5714 / Mail Code 106B
Verification Telephone No.	

This Transmission Consists of 2 Pages (including this page)

IF ANY PROBLEMS OCCUR DURING TRANSMISSION, PLEASE CALL: (303) 740-5048

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Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (11-86)

2 of 2

Date Shipped

	Lot #	Product	% Tremolite
11/11/86	S10106K	Orean	0.1
10/20/86	S10086K	"	0.1
	S10066	Supra	N.D.
	S10096K	Orean	N.D.
	S10076	Supra	N.D.
	S10076K	Orean	N.D.
	S10036 Hold	Supra	0.2
	S10026	"	N.D.
	S10016	"	N.D.
	S10056	"	N.D.
	S0426E	Supra E.F.	N.D.
	S10286	Supra	N.D.
	S10026E	Supra E.F.	N.D.

MJL,

Only the stock on hand was retested. 27 samples from lots S10246, S10256, + S10036 were re-checked & not detected. Lots S10106K, S10086K, S10166Z + most of S10246 + S10256 had been shipped prior to detection of Tremolite and prior to "HOLD" policy. Retains are available for all lots if you want them re-tested.

[illegible]

2 of 2

Sent 11/21/86

ATTN: K. Lehman

Date Shipped	Lot #	Product	% Tremolite
11/10/86 ✓	S10256 Hold	Supra	0.2
	S10286	Supra	N.D.
11/13/86 ✓	S10246 Hold	Supra	0.1
	S10046	(Coty) Supra	N.D.
	S1020062	Mistron	N.D.
10/20/86 ✓	S10166Z Hold	Mistron ZSC	0.1
	S1015621	Mistron	N.D.
	S10246V	SuprFino	N.D.

B. Anderson

TREMOLITE q.c. Superfine Lot # 5092971 V (cont.) (2)

Scan #	Pallet #	amt. detected
XT 722	14	ND
XT 723	15	ND
XT 724	16	ND
XT 725	17	ND
XT 726	18	.27%
XT 726A		TRACE
XT 726B		.17%
XT 726C		TRACE
XT 727	19	.10%
727A		TRACE
XT 727B		TRACE
XT 727C		TRACE
XT 728	20	.34
XT 728A		TRACE
XT 728B		.11
XT 728C		TRACE

(1)

Tremolite Quality Control South Plainfield

Superfine Lot # 5092977V

Scan number	PALLET number	amount detected, as compared to a standard .5% BWT TREMOLITE
XT709	1	ND
XT710	2	ND
XT711	3	.26%
XT711A		.11
XT711B		.08
XT711C		TRACE
XT712	4	ND
XT713	5	.15%
XT713A		.18
XT713B		.01
XT713C		.13
XT714	6	ND
XT715	7	ND
XT716	8	.14%
XT716A		TRACE
XT716B		TRACE
XT716C		TRACE
XT717	9	TRACE
XT717A		TRACE
XT717B		.20%
XT717C		TRACE
XT718	10	ND
XT719	11	ND
XT720	12	ND
XT721	13	ND

avg = .15%

South Plainfield

Tremolite Q.C.

shipped 10-7-87

					Pallet #	Amt. detected
	XT709	Superfine	Lot # S09297V	"	#1	ND
	XT710	"	"	"	#2	ND
3	XT711	"	"	"	#3	TRACE *
4	XT712	"	"	"	#4	ND
5	XT713	"	"	"	#5	TRACE *
6	XT714	"	"	"	#6	ND
7	XT715	"	"	"	#7	ND
8	XT716	"	"	"	#8	TRACE *
9	XT717	"	"	"	#9	TRACE *
10	XT718	"	"	"	#10	ND
	[illegible]	"	"	"	#11	[illegible]
	XT720	"	"	"	#12	
	XT721	"	"	"	#13	ND
	XT722	"	"	"	#14	ND
	XT723	"	"	"	#15	ND
16	XT724	"	"	"	#16	ND
17	XT725	"	"	"	#17	ND
18	XT726	"	"	"	#18	TRACE *
19	XT727	"	"	"	#19	TRACE *
20	XT728	"	"	"	#20	TRACE *

* Additional sampling + analysis is in progress

simile Transmission
16-166 Rev. 3-77

Page 1 of 2

Date: 12-22-87

Name	Company	City and State	Telecopier Phone
E. Lehman	CIM	So. Plainfield, NJ	201-754-0083
Name	Company	Phone	Mail Code
RACY JONES	CIM PECO CERTIFICATION	(404) 382-5353	

ATTN: KEITH LEHMAN

Lot #	Product	Status
S11187Z	MISTRON ZSC	Ship
S12097	SUPRA	Ship
S12167Z	MISTRON ZSC	Ship

Terry James / CIMC, Cal...

12-23-87

Summary of Supra Lot S12027 Pallet Samples

Lot #	Product	% Amphibole
S12027 (1)	Supra	0.1
S12027 (2)	Supra	ND
S12027 (3)	Supra	ND
S12027 (4)	Supra	0.15
S12027 (5)	Supra	ND
S12027 (6)	Supra	0.10
S12027 (7)	Supra	0.15
S12027 (8)	Supra	0.42
S12027 (9)	Supra	0.79
S12027 (10)	Supra	0.52
S12027 (11)	Supra	0.14
S12027 (12)	Supra	ND
S12027 (13)	Supra	0.52
S12027 (14)	Supra	0.88
S12027 (15)	Supra	0.13
S12027 (16)	Supra	Rerun
S12027 (17)	Supra	0.23
S12027 (18)	Supra	0.10
S12027 (19)	Supra	0.14
S12027 (20)	Supra	ND

14 out of 20 contain measureable Amphibole.

LOT #	PRODUCT	% AMPHIBOLE	
S12037(1)	SUPRA	(ND)	
S12037(2)		0.21	
S12037(3)		0.13	
S12037(4)		(ND)	
S12037(5)		0.42	
S12037(6)		ND	
S12037(7)		0.56	FRT Cost S.P. 7
S12037(8)		0.33	Alpine
S12037(9)		ND	
S12037(10)		0.16	
S12037(11)		ND	
S12037(12)		ND	
S12037(13)		ND	
S12037(14)		0.10	
S12037(15)		ND	
S12037(16)		0.15	
S12037(17)		0.17	
S12037(18)		1.26	
S12037(19)		0.23	
S12037(20)		ND	

11 out of 20 contain measurable amphibole.

ATTN: KEITH LEHMAN

Lot #	Product	Status
S11187E	SUPRA EF	Hold
S11187Z	MISTRON ZSC	Ship
S12027	SUPRA	Hold
S12037	SUPRA	Hold
S12087	SUPRA	Hold
S12097	(SUPRA)	Ship —
S12167Z	MISTRON ZSC	Ship
12197	SUPRA	Hold
12237	SUPRAFINO	Hold

Tracy Jones / CIMC, Cartersville

12187	SUPRA	Hold
12207	SUPRA	Hold
12307	SUPRAFINO	Ship

12-23-97

Rich -

This information was faxed to Keith Lehman yesterday. Prior to that, the information above was transmitted by phone. All phone correspondence will be backed by a fax in the future.

- Ken

Facsimile Transmission

Page 1 of 2

1/6/88

To name	Company	City and State	Telephone Number
K B. Lehman	CIM	So. Plainfield, NJ	201 754-0083
From Name	**Company**	**Phone**	**Mail Code**
TRACY JONES	CIM FIELD CERTIFICATION	(404) 382-5353	

ATTN: KEITH LEHMAN

LOT #	PRODUCT	STATUS
S12187	SUPRA	HOLD
S12187	SUPRA	HOLD
S12197	SUPRA	HOLD
S12272E	SUPRA EF	HOLD
S12237V	SUPRAFINO	SHIP
S12207	SUPRA	HOLD
S12307	SUPRA	HOLD
S12237	SUPRA	HOLD

TRACY JONES / CIMC, CARTERSVILLE

Facsimile Transmission

Form 16-166 Rev. 3-77

Page 1 of 2

To: Name	Company	City and State	Telephone Phone
K. B. Lehman	CIM	So. Plainfield, NJ	201-754-0083
From: Name	**Company**	**Phone**	**Mail Code**
TRACY JONES	CIM FRUD CERTIFICATION	(404) 382-5353	

Date 1-8-88

ATTN. KEITH LEHMAN

LOT #	PRODUCT	STATUS
S12317	SUPRA	HOLD
S01018	SUPRA	HOLD
S01058	SUPRA	HOLD

TRACY JONES / CIMC CARTERSVILLE

acsimile Transmission

Page 1 of 2

Date 1-13-88

To: Name	Company	City and State	Telephone Phone
K. B. Lehman	CIM	So. Plainfield, NJ	201-754-0083
From: Name	Company	Phone	Mail Code
TRACY JONES	CIM FROD CERTIFICATION	(404) 382-5353	

ATTN: KEITH LEHMAN

LOT #	STATUS	PRODUCT
SO1068	HOLD	SUPRA
SO1078	HOLD	SUPRA
SO1088	HOLD	SUPRA
SO1098	HOLD	SUPRA
SO1108	HOLD	SUPRA

TRACY JONES / CIMC, CARTERSVILLE

ATTN: KEITH LEHMAN

LOT #	PRODUCT	STATUS
S0113BZ	MISTRON ZSC	SHIP
S0119B	STEALWHITE 200	SHIP

acsimile Transmission

orm 16-136 Rev. 3-87

Page 1 of 2

Date: 1-20-88

To: Name	Company	City and State	Telephone Phone
K. B. Lehman	CIM	So. Plainfield, NJ	201-754-0083
From: Name	Company	Phone	Mail Code
TRACY JONES	CIM FOOD CERTIFICATION	(404) 382-5353	

ATTN: KEITH LEHMAN

LOT #	STATUS
S01138E	HOLD

simile Transmission

Pg 1 of 3

3-15-88

Name	Company	City and State	Telephone Phone
. B. Lehman	CIM	So. Plainfield, NJ	201-754-0083
n' Name	Company	Phone	Mail Code
Keith Lass	CIM FROD. CERTIFICATION	(404) 382-5353	

LOT #	Product	Status
5021882	Mistron ZSC	SHIP
5022082		SHIP
5022382		SHIP
5022482		SHIP
5022682		SHIP
5022782		SHIP
5022982	Mistron ZSC	SHIP

2 of 3 (KP)

Summary of Supra Pellet Samples (composite and grab)

3-15-88

LOT #	% Amph. Comp	% Amph. Grab	Status	Comments
S12197(1)			HOLD	
(2)			HOLD	
(3)			HOLD	
(4)			HOLD	
(5)			HOLD	
(6)			HOLD	
(7)			HOLD	
(8)			HOLD	
(9)			HOLD	
(10)			HOLD	
(11)			HOLD	
(12)			HOLD	
(13)			HOLD	
(14)			HOLD	
(15)			HOLD	
(16)			HOLD	
(17)			HOLD	
(18)			HOLD	
(19)			HOLD	
S12197(20)			HOLD	

3 of 3 (Ke)

Summary of Supra Pellet Samples (composite and grab)

3-15-88

Lot #	% Amph Comp.	% Amph Grab	Status	Comments
S12307 (1)			HOLD	
(2)			HOLD	
(3)			HOLD	
(4)			HOLD	
(5)			HOLD	
(6)			HOLD	
(7)			HOLD	
(8)			HOLD	
(9)			HOLD	
(10)			HOLD	
(11)			HOLD	
(12)			HOLD	
(13)			HOLD	
(14)			HOLD	
(15)			HOLD	
(16)			HOLD	
(17)			SHIP	
(18)			HOLD	
(19)			SHIP	
S12307 (20)			HOLD	

JEFFREY MANUFACTURING CO.
Double Roll Crushers
(Cangro - distributor)

LEHMAN 01853

PINEBROOK, N.J.
201-575-0503
DAVE STREETER.

JEFFREY – MFG. Co.
7 GLENWOOD AVE. –
E. DEANGE 07017
201-675-1050

TONY – LORIO

BOB CRUM, –

Oxford
STOCK No. 752½
MADE IN U. S. A.

FRANK E. BOATE
SALES ENGINEER
INDUSTRIAL DIVISIONS

THE JEFFREY MANUFACTURING CO.
COLUMBUS, OHIO 43216

WOOLWORTH BUILDING
233 BROADWAY
NEW YORK, N. Y.
TELE. 267-0437

CUMBERLAND 9-3000
AREA CODE 215

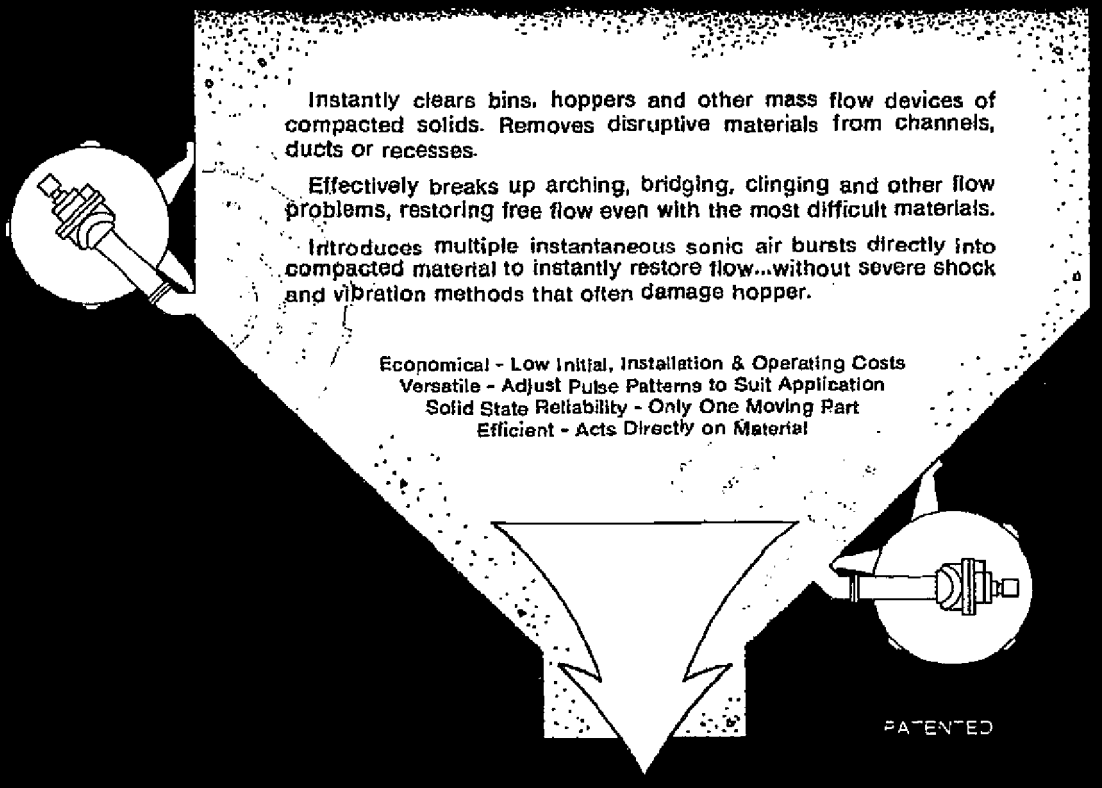
STOODY CO. PENNSYLVANIA

HARD-FACING ALLOYS
STAINLESS STEEL

WILLIAM P. HACKETT
SALES REPRESENTATIVE

2158 CHURCH ST.
PHILADELPHIA, PA. 19124

the UNIQUE PULSONIC™ BIN ACTIVATOR



Instantly clears bins, hoppers and other mass flow devices of compacted solids. Removes disruptive materials from channels, ducts or recesses.

Effectively breaks up arching, bridging, clinging and other flow problems, restoring free flow even with the most difficult materials.

Introduces multiple instantaneous sonic air bursts directly into compacted material to instantly restore flow...without severe shock and vibration methods that often damage hopper.

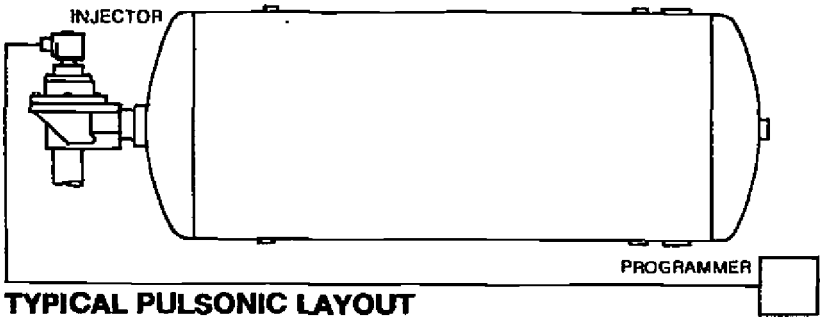
Economical - Low Initial, Installation & Operating Costs
Versatile - Adjust Pulse Patterns to Suit Application
Solid State Reliability - Only One Moving Part
Efficient - Acts Directly on Material

PATENTED

TRY IT AT NO RISK

GUARANTEE

The Pulsonic Bin Activator System must perform to your complete satisfaction or it may be returned for full credit.



TYPICAL PULSONIC LAYOUT

DESCRIPTION

A Pulsonic Bin Activator system has two parts: (1) an INJECTOR consisting of a compressed air reservoir with a solenoid operated release valve, and (2) a PROGRAMMER for controlling the pattern of multiple instantaneous air bursts from the injectors.

A Pulsonic system consists of a single programmer and one or more injectors.

The overall system features simplicity of design, solid state reliability, efficient and versatile operation, low energy consumption and low initial and installation costs with little, if any, maintenance.

PRINCIPLE OF OPERATION

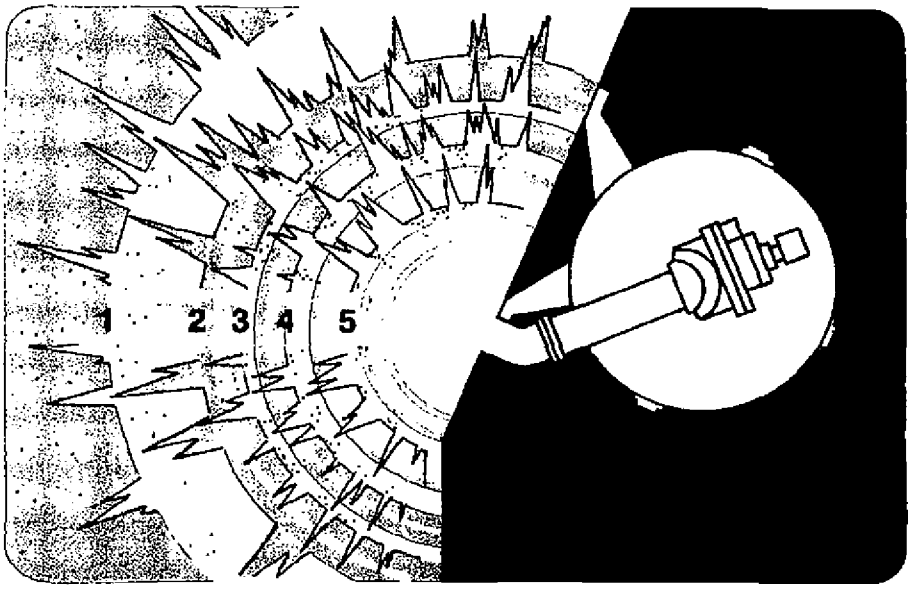
The Pulsonic Bin Activator system injects pre-programmed multiple sonic air blasts directly into the compacted material, restoring free flow in less than 1 to a few seconds. Frees even the most difficult to move materials by breaking up the compaction, aerating it, thus restoring free flow.

The frequency of air bursts can be programmed in the sub-sonic to low sonic range to direct multiple air bursts at whatever pattern most effectively restores material flow. The use of multiple injectors can overlap, space or parallel the pattern. The air burst pattern and number of injectors depends on bin size, shape and flow characteristics of the material being transported.

In the short instant (20 to 100 milliseconds) of the compressed air burst, each burst or injection of compressed air acts directly on the particles it contacts and causes motion in line with the movement and expansion of air. Simultaneously, with the initial movement of the materials, there is aeration of the materials from the expansion of the compressed air. The programmer is set so that before the moving particles from the initial burst come to rest, a second energy release of compressed air is injected into the bulk material. Since the moving particles from the initial burst are still moving, and the activated area is at an elevated pressure, the second burst imparts a greater movement, disruption or aeration force because it is acting on or amplifying the initially moved particles. Each subsequent energy release is programmed to act on materials that are not at rest, but rather have kinetic energy in their movement such that the subsequent energy releases, even though of lesser energy levels than previous bursts, are more effective than the previous bursts due to the amplification effect. The energy level of the particles in motion increases with each burst or pulse to a higher level, and this higher motion is transmitted to more and more particles with impact and aeration stimulation extended into the entire vessel. The energy bursts or pulses are released at a field adjustable rate or frequency that is most responsive to the bulk material in order to achieve sonic stimulation as well. The multiple instantaneous energy releases of impact, aeration and sonic stimulation, act in concert with one another directly on the material to immediately induce free flow. An entire storage vessel can be totally activated to induce free flow in from less than one second to a few seconds. Disruptive materials in pipes, recessed channels, seal areas and other areas are also similarly removed within this time frame.

The field adjustable air burst pattern allows the operator to select a pattern of air bursts that is most effective for his application resulting in minimum energy consumption. This is done by simply setting the dials on the programmer. The dials control the frequency, duration and cycle of the air burst patterns.

TYPICAL AIR BURST PATTERN



A typical air burst pattern could be programmed to inject five air bursts simultaneously from each of two injectors at a frequency of 20 per second. The injectors could be connected to fire alternately which would double the frequency. It may be that three bursts per injector would establish free flow or it may require nine. Whatever the system requires is simply set into the programmer. The established program is automatically repeated at the time interval selected.

FIELD ADJUSTMENTS

Field adjustment of the Pulsonic System is accomplished by simply setting dials on the programmer. These dials control:

A. Time between programs (1 to 999 minutes)

B. The total number of air bursts per program (1 - 9)

C. The duration of each burst (milliseconds)

D. The time between bursts (milliseconds)

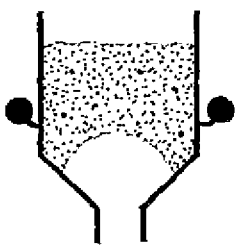
These adjustments permit the operator to vary the number, duration and rhythm of bursts, and the time between burst cycles. Thus, a finely "tuned" program can be achieved that will eliminate material blockages and keep the system free flowing at the minimum amount of energy necessary.

MOUNTING LOCATION

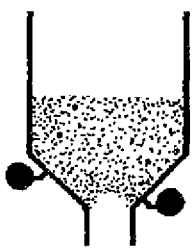
We will be pleased to recommend mounting locations of injectors based on your sketch or drawing of your specific material flow problem. On new installations, recommendations will be made based on experiences in similar structures.

For prevention of material retention in recesses, ducts or channels sketches or drawings of problem areas are necessary.

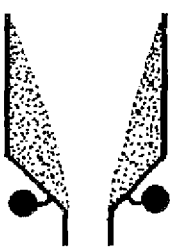
SUGGESTED MOUNTING LOCATIONS FOR COMMON FLOW PROBLEMS



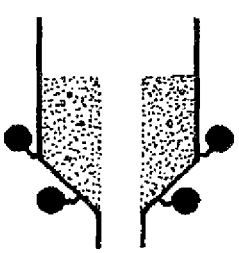
ARCHING



BRIDGING

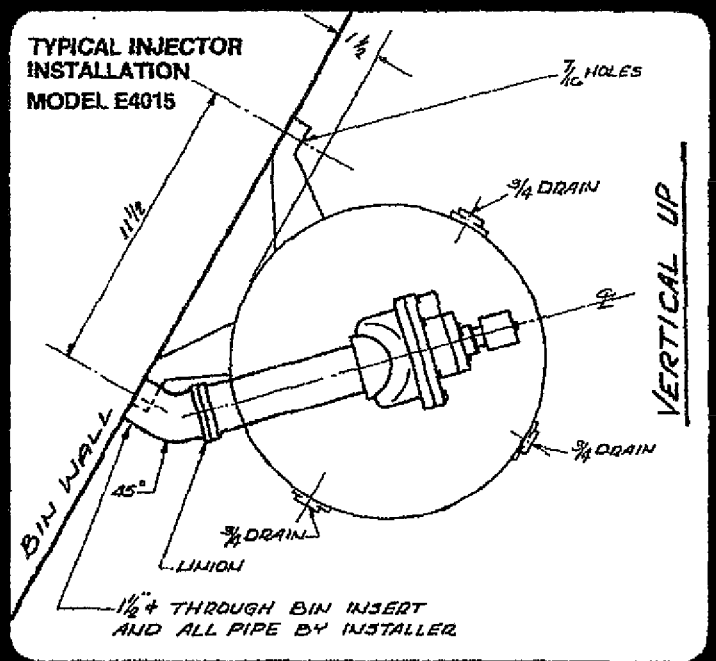


CLINGING



PIPING OR RATHOLE

TYPICAL INJECTOR INSTALLATION
MODEL E4015



INSTALLATION

EASY TO INSTALL

Injectors are complete with mounting legs and all field connections can be made with standard pipe.

Connect shop air to tank and power (120-60) to programmer.

EASY TO CONTROL

The programmer will activate the system:

A. Manually on demand
B. Automatically on signal
C. Automatically on time interval

EASY TO ADJUST

The versatility of the Pulsonic system reduces the troublesome task of relieving material blockages to simply dialing the best program for maximum effectiveness and efficiency.

EASY TO SERVICE

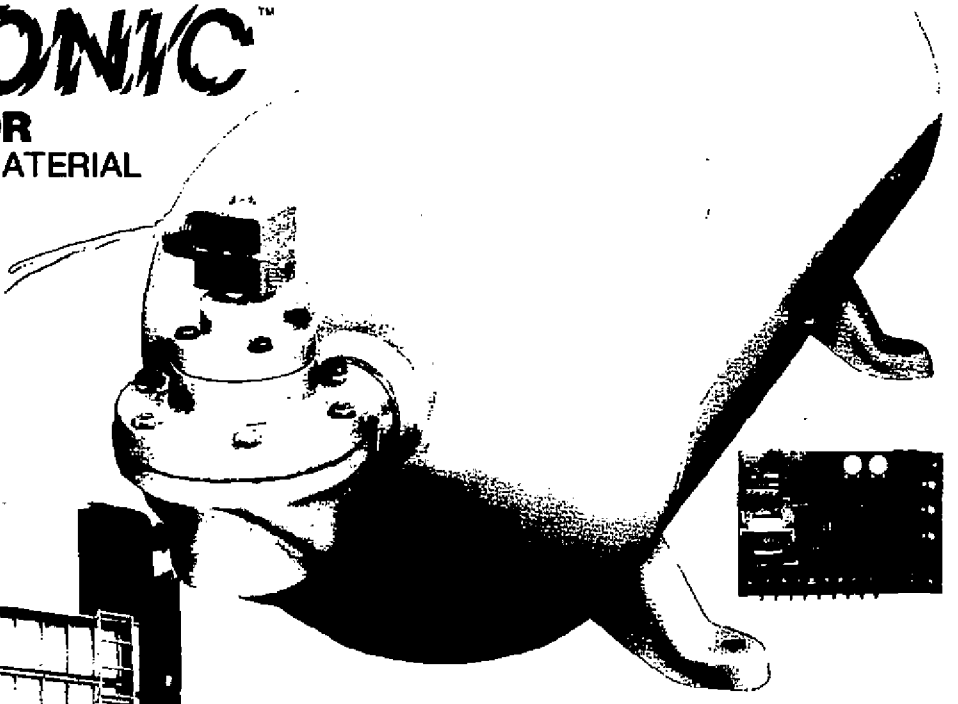
The injector valve is the only component with moving parts. Thousands of these valves have over 5 years of field operating time as proof of performance reliability. If service is ever required, one kit replaces all moving parts without disturbing pipe or mounting connections.

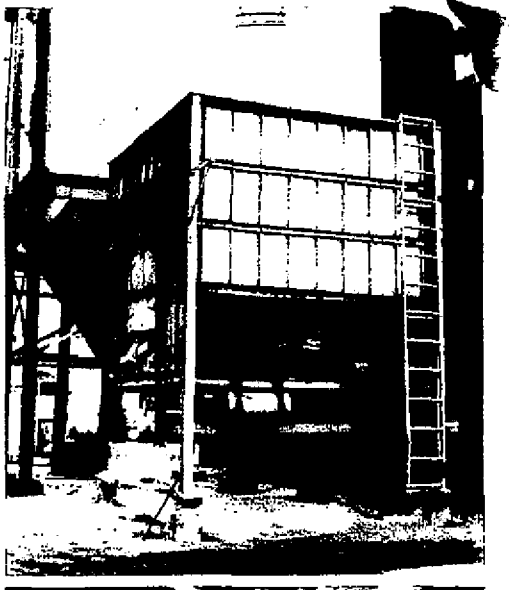
TRY IT AT NO RISK

Let us propose a Pulsonic system to solve your flow problem, or order one programmer per system and the number of injectors you estimate are required to solve a problem. We will be pleased to assist you with recommendations for your particular system.

THE PULSONIC™ BIN ACTIVATOR

SOLVES TOUGH MATERIAL FLOW PROBLEMS





A CASE IN POINT

THE PROBLEM...Wood chips, sawdust and sanding fines were constantly "bridging" in the 10 ft. sq. x 20 ft. high hopper with a screw feed discharge...particularly during periods of high humidity. These stoppages continually interrupted the fuel supply to a 75 h.p. waste wood boiler.

THE REMEDY...A Pulsonic Bin Activator system of one programmer and two injectors. The program selected was to pulse simultaneously directly into the material with a 50 millisecond blast, 30 millisecond off time and a second 50 millisecond blast to complete the program. This program is automatically repeated every 15 minutes.

THE RESULTS...Since installation in November 1977, there has not been a material flow interruption in the hopper. The system operates continuously, 24 hours a day, 7 days a week. The installation uses only 35 S.C.F. of air per hour!

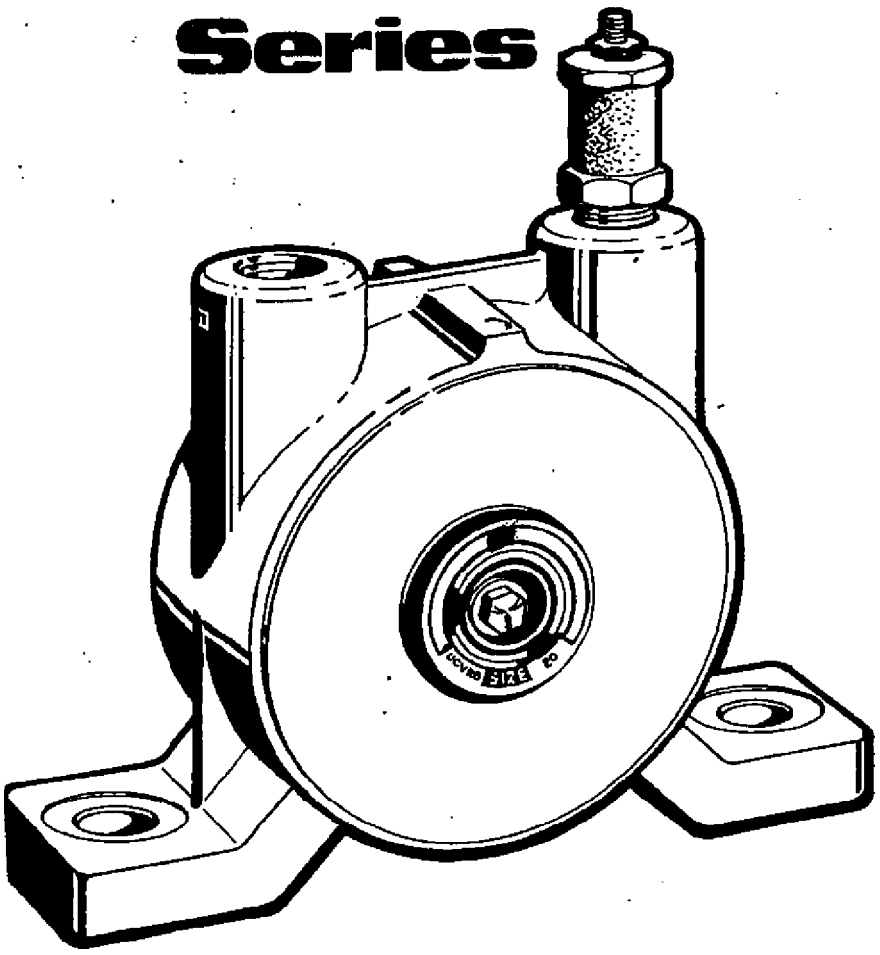
PULSONICS CORPORATION

999 Airport Road
Lakewood, New Jersey 08701
Phone (201) 367-0800

Printed in U.S.A.

Catalog No. 101-A

Martin's VIBROLLER® Series



MARTIN ENGINEERING COMPANY

The ultimate in design

Wide Range of Frequency . . . 6,100 to 26,000 VPM

Wide Range of Forces . . . 31 to 3,000 Foot lbs. Force

Quiet . . . 85 dBA or less

Simple to Rebuild . . . less than 50% of New Cost

Lowest Air Consumption of Any Rotary Pneumatic Vibrator . . . Size for Size.

Utmost In Dependability . . . One Moving Part

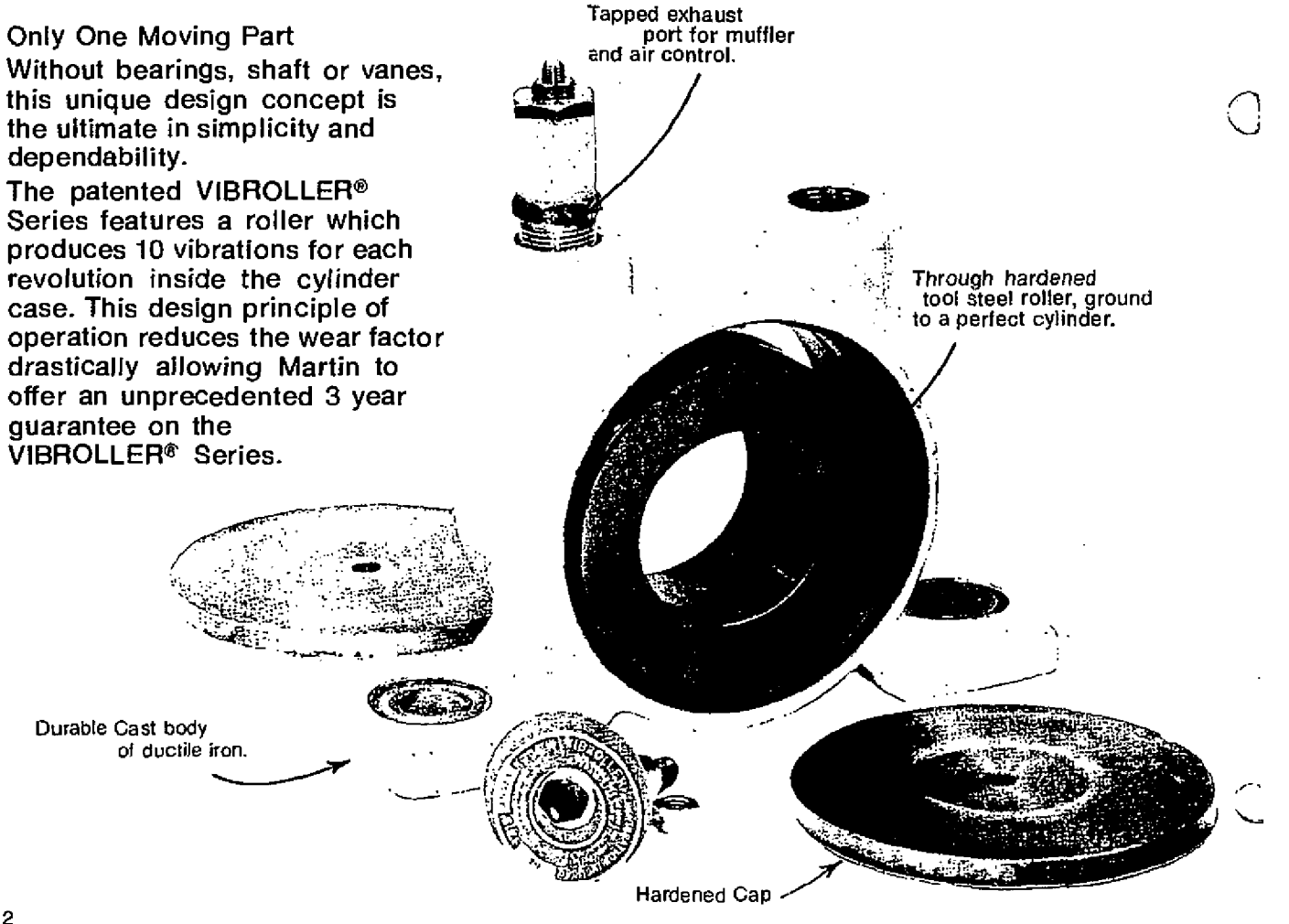
Virtually Maintenance Free . . . No Bearings, Shaft, or Vanes

Versatile . . . Lightweight . . . Fills a multitude of application needs . . . Variety of body styles.

Only One Moving Part

Without bearings, shaft or vanes, this unique design concept is the ultimate in simplicity and dependability.

The patented VIBROLLER® Series features a roller which produces 10 vibrations for each revolution inside the cylinder case. This design principle of operation reduces the wear factor drastically allowing Martin to offer an unprecedented 3 year guarantee on the VIBROLLER® Series.



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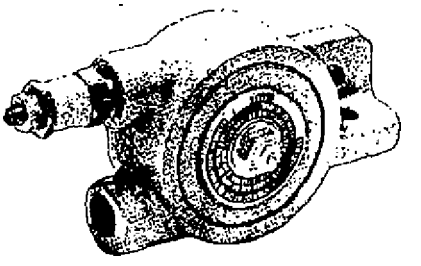
Variety of sizes and styles to meet any job.

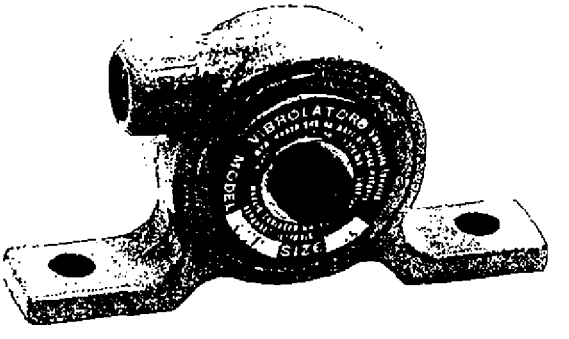
Versatile BDR

Small and lightweight to fill a multitude of application needs. Maximum VPM ranges from 19,000 to 26,000 with power to handle bins with material in excess of 2,000 lbs. in sloping portion. The unique dual mount bracket offers a wide choice of mount position and vibration direction. Tapped exhaust allows unit to be equipped with muffler — regulator for quiet, controlled vibration to fill your needs.



Rugged CVR

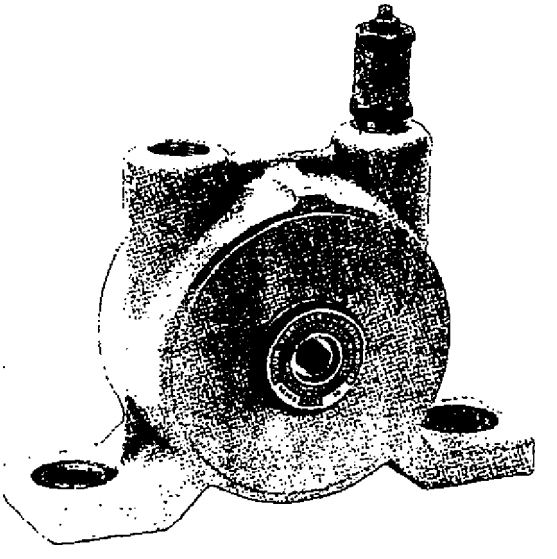
Available in two sizes, both with a two-hole mount. Frequency range is from 8000-26,000 VPM, developing a maximum of 540 pounds of force. The CVR series can be matched to containers with up to 5400 pounds material in the slope portion.



Air Control UCVR

Tapped inlet and exhaust ports for complete air control. Exhaust air can be fed from the area or muffled. Quiet power for effective vibration.

The UCVR Series is available in a wide range of sizes to meet a multitude of application needs. With forces to 3,000 lbs. Capable of moving material in bins with up to 30,000 lbs. in the sloping portion.



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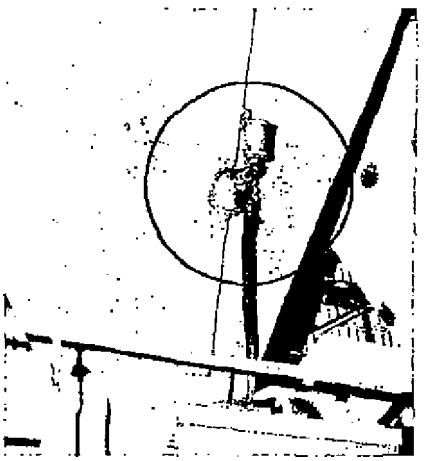
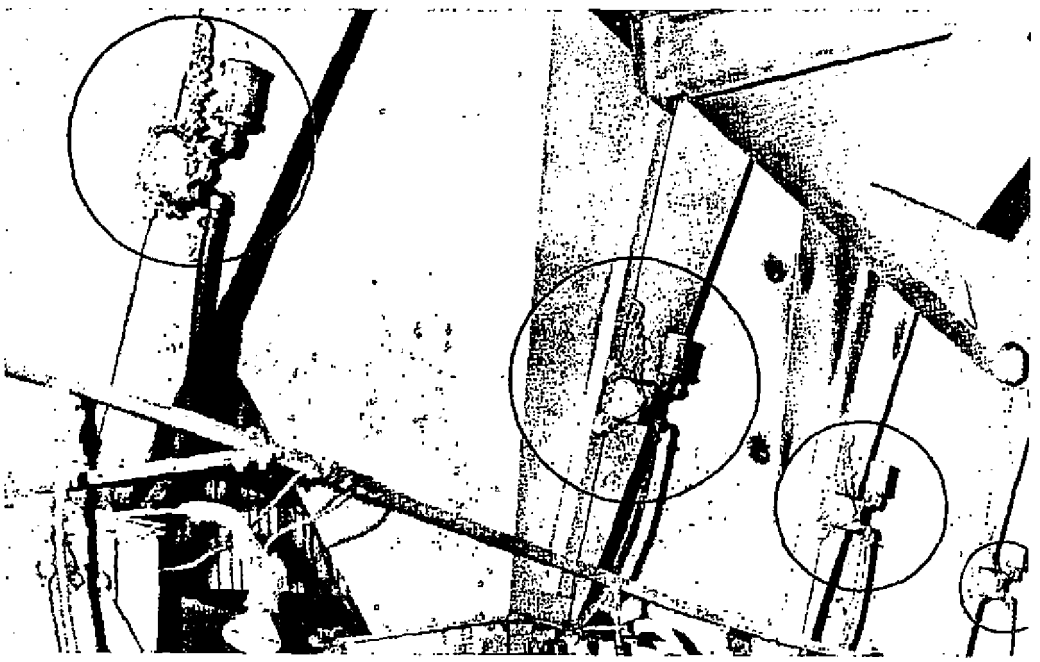
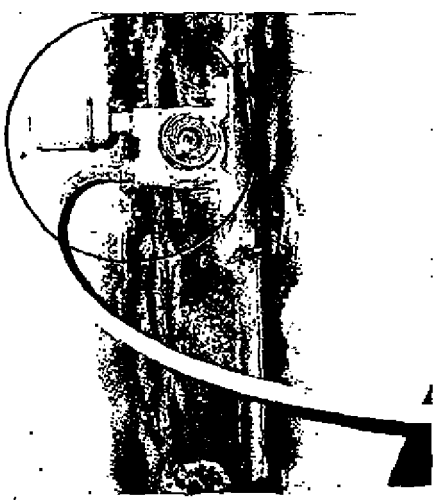
Applications



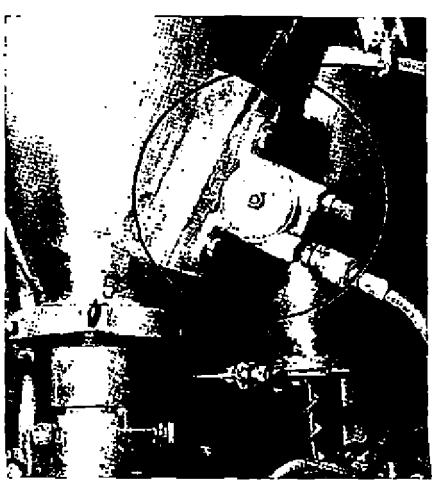
Quietly, efficiently and economically these UCVR6-.5's keep molding lines free from troublesome sand flow problems.





Unaffected by adverse operating conditions, Martin's VIBROLLER® Series will give years of dependable service.

Stubborn clay flows easily with induced vibration from Martin's UCVR4-.05.



UCVR4-.05 assures this food processor of trouble free material storage and transfer . . . quietly and economically.

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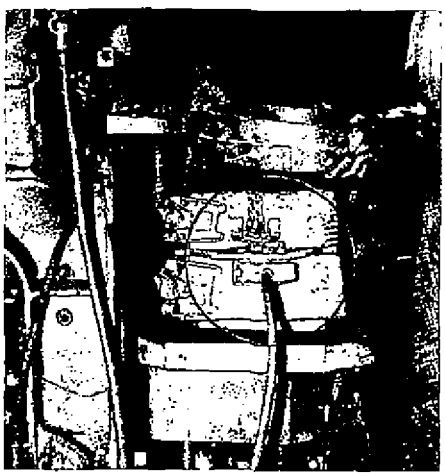
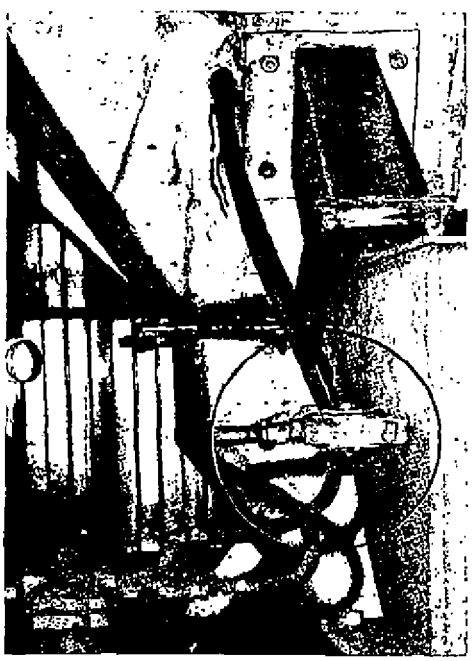
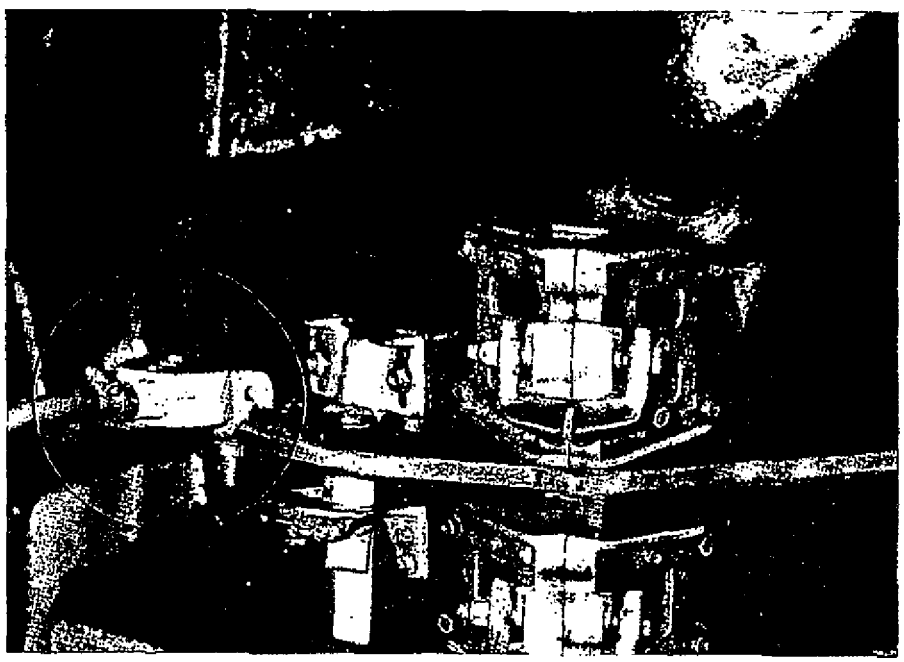
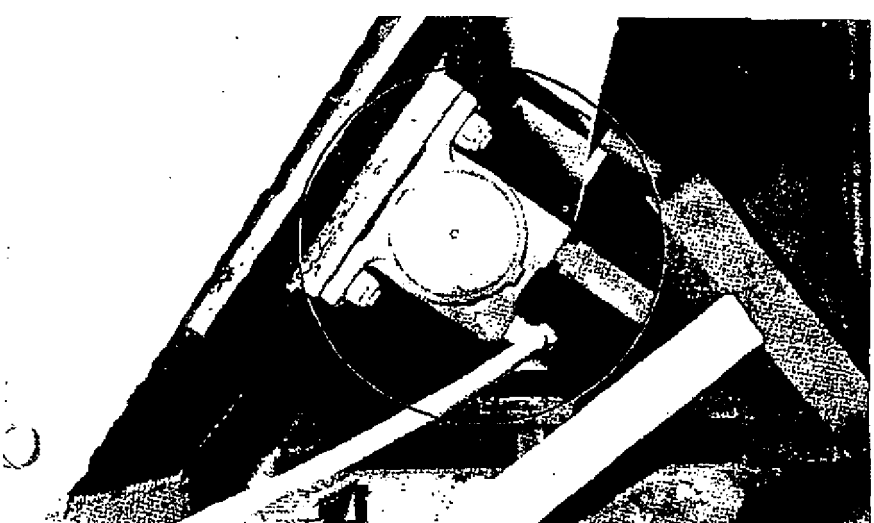


Coal blockage frequently plugged this chute — no longer a problem with the aid of Martin's UCVR4-.05.

Patented BDR Series makes matchplate work trouble free while increasing production efficiency — quiet, under 85 dBA.







UCVR8-.8 eliminates shutdown due to material blockage in charging hopper.

VIBROLLER® Vibrator keeps sluggish conveyor system moving by cutting friction drag.

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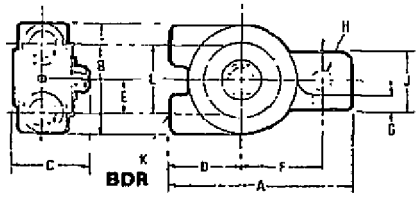
Dimensions

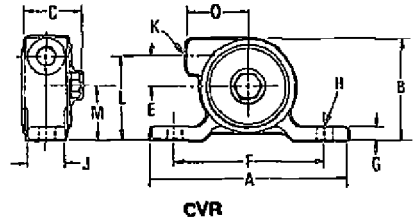
DIMENSIONAL CHART — INCHES

CVR-10	3⅞	2	1⅛	1⅛	⅜	3	⅛	⅜	⅝	⅛	1⅜	1⅛
CVR-19	5⅛	3⅛	1⅜	2⅛	⅜	4	⅜	⅜	1⅛	⅛	2⅜	1⅜
BDR-10	3⅛	1⅞	1⅜	1⅛	⅜	1⅜	⅛	⅜	1⅛	⅛		
BDR-13	3⅜	2⅛	1⅜	1⅜	⅜	1⅜	⅜	⅜	1⅛	⅛		
BDR-16	4⅛	2⅜	1⅜	1⅜	⅜	1⅜	⅜	⅜	1⅛	⅛		
UCVR4-.05	5	3⅜	1⅜	1⅞	1⅜	4	⅜	⅜	⅜	⅛		
UCVR6-5	7⅜	5⅜	4⅛	2⅞	2⅜	6	⅜	⅜	1⅞	⅜		
UCVR8-20	10	6⅞	4	3⅜	4⅜	8	⅜	⅜	2⅜	⅜		
UCVR8-.8	10	6⅞	4	3⅜	4⅜	8	⅜	⅜	2⅜	⅜		

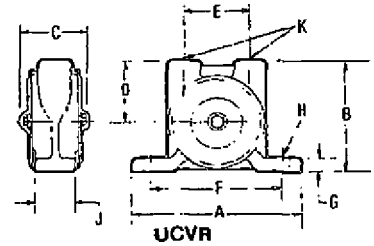
†Bolt Size *Pipe Tap Size



BDR



CVR



UCVR

PERFORMANCE CHART

MODEL NO.	DIAMETER	FT.						MAX. RPM	MIN. RPM
CVR-10	.003	10	SPEED-VPM FORCE-LBS. CFM	19,000 31 —	23,000 45 2	25,000 53 2	26,000 58 4	580	
CVR-19	.05	8	SPEED-VPM FORCE-LBS. CFM	8,000 91 2,5	11,000 172 5	14,500 299 10	19,500 540 14	5,400	13,500
BDR-10	.003	10	SPEED-VPM FORCE-LBS. CFM	19,000 31 —	23,000 45 2	25,000 53 2	26,000 58 4	580	16,200
BDR-13	.008	10	SPEED-VPM FORCE-LBS. CFM	12,000 33 —	22,000 110 2	24,000 131 4	25,000 142 6	1,420	22,000
BDR-16	.02	10	SPEED-VPM FORCE-LBS. CFM	8,000 36 —	13,500 104 3	17,000 164 5	19,000 205 7	2,050	13,300
UCVR4-.05	.05	8	SPEED-VPM FORCE-LBS. CFM	8,000 91 2.5	11,000 172 5	14,500 299 10	19,500 540 14	5,400	13,500
UCVR6-.5	.5	20	SPEED-VPM FORCE-LBS. CFM	5,500 430 6	8,000 910 15	10,000 1,421 21	10,500 1,566 29	15,200	7,350
UCVR8-2.0	2.0	40	SPEED-VPM FORCE-LBS. CFM	4,200 1,003 20	5,600 1,782 35	6,105 2,150 46	7,000 2,785 60	28,000	4,900
UCVR8-.8	.8	18	SPEED-VPM FORCE-LBS. CFM	6,100 846 30	10,000 2,273 40	10,500 2,506 46	11,500 3,006 52	30,000	6,400

*Rule of Thumb vibrator Sizing
One pound vibrator force for each ten pounds of bin content.
Mount vibrator as close as possible to material outlet.
Reinforce mount area to prevent flexure of bin wall at mount location.

**All tests conducted with muffler on exhaust port and vibrator *securely mounted* on standard test block. VPM shown, represents highest speed that vibrator can attain while producing sound levels of 85 dBA or less. Measured by standard sound level meter on "A" scale, slow response at 3 feet from vibrator.

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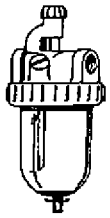
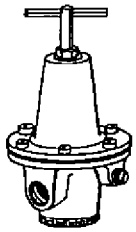
Accessories

CRAP TRAP* Filter. Fits ¾" air line equipped with Dixon coupling.
*T.M. Reg.



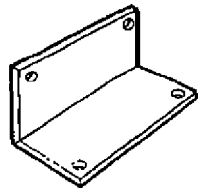
Lubricator. Feeds proper amount of oil into air flow, extends vibrator life.



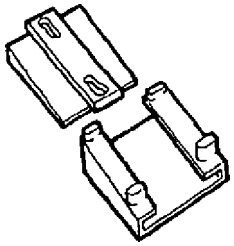
Regulator. Control and adjust air flow to regulate vibrator.

VIBROLLER® TYPE VIBRATOR MOUNT SELECTOR CHART

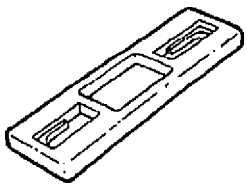
VIBRATOR MODEL	PERMANENT MOUNT					QUICK CHANGE MOUNT	
	TYPE F	TYPE H	TYPE V	ANGLE	SWIVEL	WEDGE TYPE	CLAMP BLOCK
CVR-10				1A	1		1
CVR-19	1F	4H	4V	2A	2	SBF-SBM	2
BDR-10 BDR-13 BDR-16						PF-PM	
UCVR4-.05	1F	4H	4V	2A	2	SBF-SBM	2
UCVR6-5	4F	5H	5V	4A	4	LBF-LBM	4
UCVR8-.8 UCVR8-20	5F	6H	6V	6A	5	LBF-LBM	5C



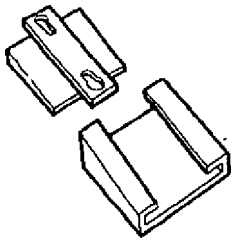
Angle Mount — Bolt or weld on, permanent mount, allows vibrator mounting parallel to surface. Available for all UCV models, bracket for use on flat structures only.



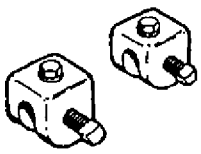
LBF-LBM — Have the same taper and width used in standard railroad car vibrator wedge. Female LBF is weldable steel alloy for welding or bolting in place.



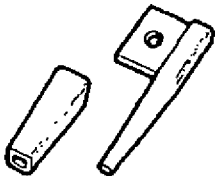
"F" Type Mount — These cast, permanent brackets make mounting easy on steel structures. Weld to flat surface and install bolts through "T"-slots.



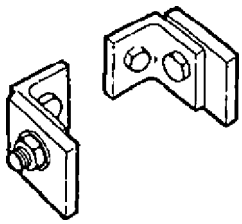
SBF-SBM — SBF is weldable steel wedge receiver (female bracket) to take mount SBM. Use where vibrator is to be moved from job to job.



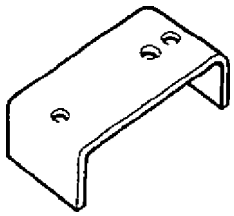
Clamp Blocks — Find the most effective location for vibration. Clamp Blocks can be clamped easily to angle — no welding, drilling or cutting. These rugged clamping blocks make vibrator installation easy — for trial purposes or permanently. Attached and removed with standard wrench by two hardened steel set screws.



PF-PM Mount — Quick change brackets for BD Series vibrators. Female section PF is welded to each structure to be vibrated. Male section, PM, is bolted to vibrator and inserted in the PF mount in an instant for use as needed.



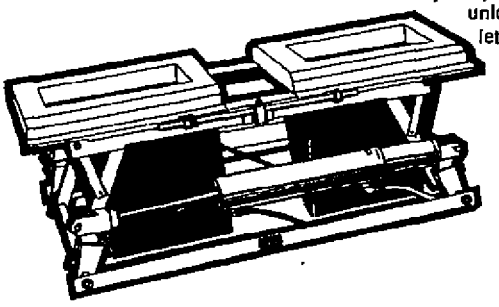
Swivel Mount — Weld on bracket makes mounting to conical hoppers easy. Swivel action allows vibration to be induced parallel or perpendicular to surface.



"H" & "V" Type Mount — These rugged permanent mounts are for use on all type hoppers. Heavy formed or structural channel provides optimum vibration transfer in vertical or horizontal plane.

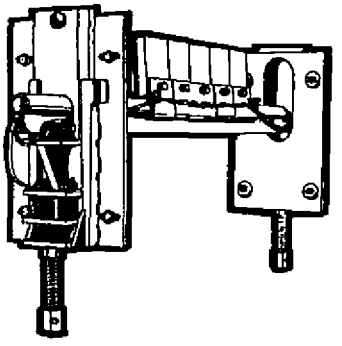
LEHMAN 01867

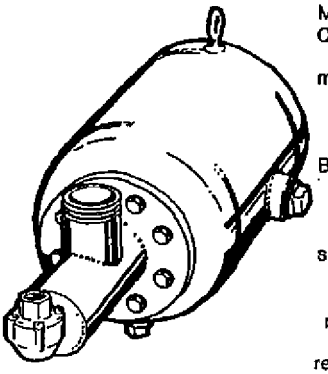
Cut costs — increase production with Martin quality products.



Heavy Duty BOOT-LIFT® Connector — Ready to unload cars in seconds. Spot the car and let air actuated hydraulic cylinders do the work with only 1 CFM of air. Even adjusts to tilted cars. A model for any hopper car, including cars with round discharge, making unloading *faster, safer, and cleaner.*

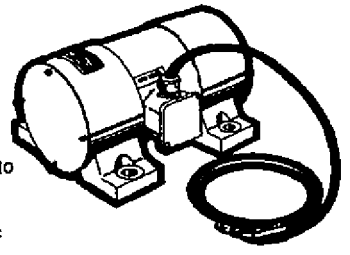
TRAC-MOUNT® BELT CLEANER
Unique system eliminates belt shutdown and special tools for cleaner maintenance. No need to work around moving belts either. Blade unit slides out for service. System is effective on sticky build-up. Unique tension spring arrangement allows cleaner to work effectively, even on mechanical splices.

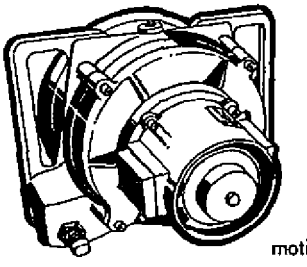




BIG BLASTER® AIR CANNON
Martin BIG BLASTER® Air Cannons break up and aerate the most stubborn material, whether bridged, ratholed, or clinging to the walls of a container. The BIG BLASTER® Air Cannon has also proven highly effective for cleaning material build-up under screens, in chutes, and at conveyor transfer points. Compressed air is retained in the reservoir. Open the patented quick release valve and the explosive charge of compressed air is *expelled into* the structure. This sudden powerful release of energy directly into the material causes it to flow freely — quickly restoring container's original capacity.

MOTOMAGNETIC® ELECTRIC SERIES —
Choose any voltage and phase — you will find a Martin electric Vibrator to match any job. From a "tickle" to great force for massive hoppers. Electric vibrators offer quiet work power with easy remote control. Variable features allow precise control.





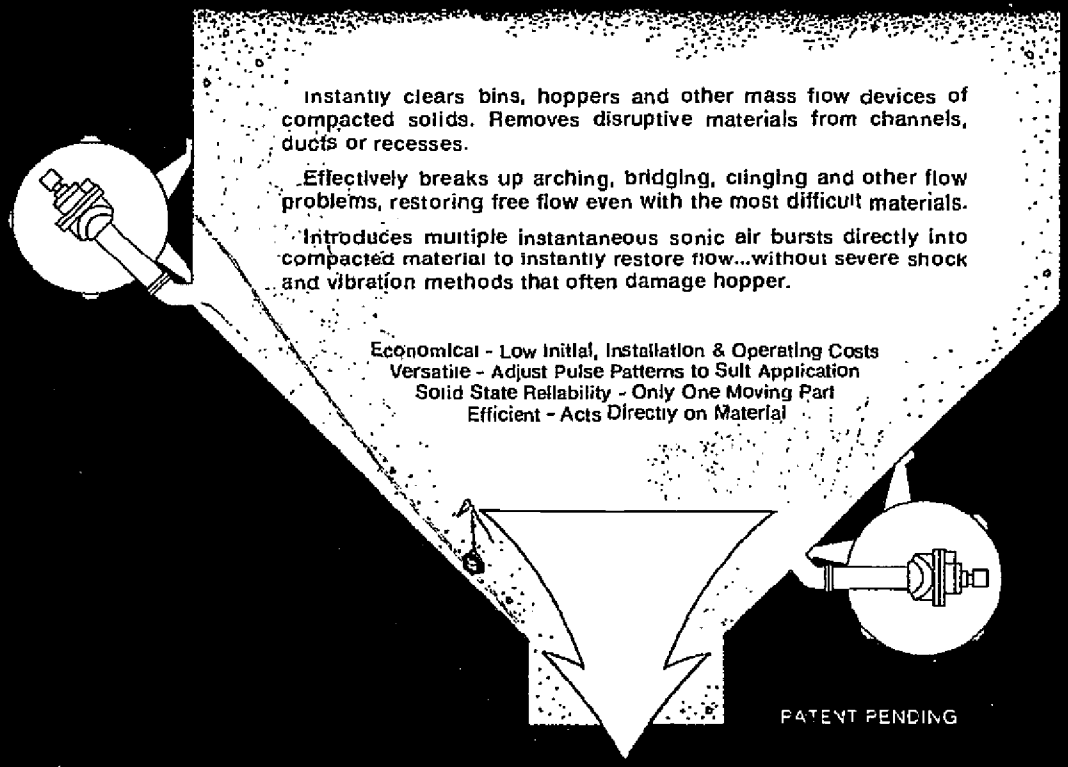
BRUTE® Series —
Pneumatic, electric or hydraulic motive power — Rugged and durable. Power to spare for the big jobs. **BRUTE®** Vibrators produce more force than any other vibrator to quietly move the most stubborn materials.

MARTIN ENGINEERING COMPANY
U.S. ROUTE 34
NEPONSET, ILLINOIS 61345
(IN ILLINOIS) — 309/594-2384
1-800-447-5681

2731-679.CH

Printed in U.S.A.

the UNIQUE PULSONIC™ BIN ACTIVATOR



Instantly clears bins, hoppers and other mass flow devices of compacted solids. Removes disruptive materials from channels, ducts or recesses.

Effectively breaks up arching, bridging, clinging and other flow problems, restoring free flow even with the most difficult materials.

Introduces multiple instantaneous sonic air bursts directly into compacted material to instantly restore flow...without severe shock and vibration methods that often damage hopper.

Economical - Low Initial, Installation & Operating Costs
Versatile - Adjust Pulse Patterns to Suit Application
Solid State Reliability - Only One Moving Part
Efficient - Acts Directly on Material

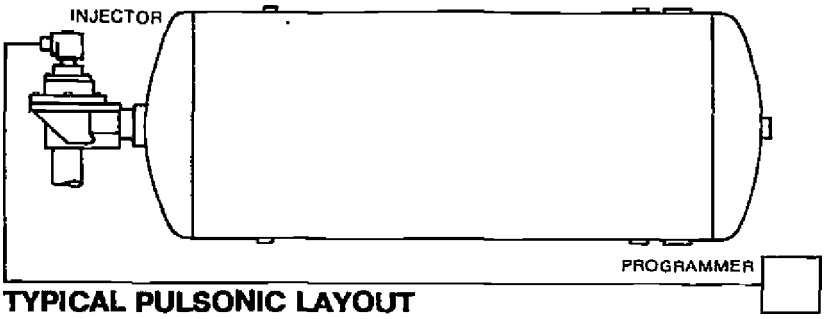
PATENT PENDING

TRY IT AT NO RISK

GUARANTEE

The Pulsonic Bin Activator System must perform to your complete satisfaction or it may be returned for full credit.

APM TECHNOLOGY INC.
REPRESENTATIVE
P. O. Box 575, 78 Main St.
Madison, N. J. 07940
201 - 966-1245



TYPICAL PULSONIC LAYOUT

DESCRIPTION

A Pulsonic Bin Activator system has two parts: (1) an INJECTOR consisting of a compressed air resevoir with a solenoid operated release valve, and (2) a PROGRAMMER for controlling the pattern of multiple instantaneous air bursts from the injectors.

A Pulsonic system consists of a single programmer and one or more injectors.

The overall system features simplicity of design, solid state reliability, efficient and versatile operation, low energy consumption and low initial and installation costs with little, if any, maintenance.

PRINCIPLE OF OPERATION

The Pulsonic Bin Activator system injects pre-programmed multiple sonic air blasts directly into the compacted material, restoring free flow in less than 1 to a few seconds. Frees even the most difficult to move materials by breaking up the compaction, aerating it, thus restoring free flow.

The frequency of air bursts can be programmed in the sub-sonic to low sonic range to direct multiple air bursts at whatever pattern most effectively restores material flow. The use of multiple injectors can overlap, space or parallel the pattern. The air burst pattern and number of injectors depends on bin size, shape and flow characteristics of the material being transported.

In the short instant (20 to 100 milliseconds) of the compressed air burst, each burst or injection of compressed air acts *directly* on the particles it contacts and causes motion in line with the movement and expansion of air. Simultaneously, with the initial movement of the materials, there is aeration of the materials from the expansion of the compressed air. The programmer is set so that before the moving particles from the initial burst come to rest, a second energy release of compressed air is injected into the bulk material. Since the moving particles from the initial burst are still moving, and the activated area is at an elevated pressure, the second burst imparts a greater movement, disruption or aeration force because it is acting on or amplifying the initially moved particles. Each subsequent energy release is programmed to act on materials that are not at rest, but rather have kinetic energy in their movement such that the subsequent energy releases, even though of lesser energy levels than previous bursts, are more effective than the previous bursts due to the amplification effect. The energy level of the particles in motion increases with each burst or pulse to a higher level, and this higher motion is transmitted to more and more particles with impact and aeration stimulation extended into the entire vessel. The energy bursts or pulses are released at a field adjustable rate or frequency that is most responsive to the bulk material in order to achieve sonic stimulation as well. The multiple instantaneous energy releases of impact, aeration and sonic stimulation, act in concert with one another directly on the material to immediately induce free flow. An entire storage vessel can be totally activated to induce free flow in from less than one second to a few seconds. Disruptive materials in pipes, recessed channels, seal areas and other areas are also similarly removed within this time frame.

The field adjustable air burst pattern allows the operator to select a pattern of air bursts that is most effective for his application resulting in minimum energy consumption. This is done by simply setting the dials on the programmer. The dials control the frequency, duration and cycle of the air burst patterns.

A typical air burst pattern could be programmed to inject five air bursts simultaneously from each of two injectors at a frequency of 20 per second. The injectors could be connected to fire alternately which would double the frequency. It may be that three bursts per injector would establish free flow or it may require nine. Whatever the system requires is simply set into the programmer. The established program is automatically repeated at the time interval selected.

FIELD ADJUSTMENTS

Field adjustment of the Pulsonic System is accomplished by simply setting dials on the programmer. These dials control:

A. Time between programs (1 to 999 minutes)

B. The total number of air bursts per program (1 - 9)

C. The duration of each burst (milliseconds)

D. The time between bursts (milliseconds)

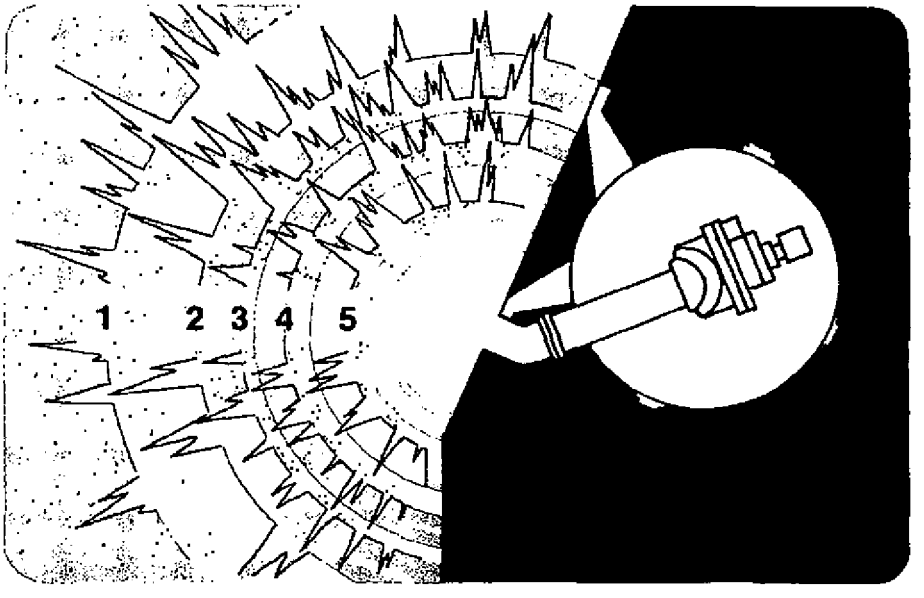
These adjustments permit the operator to vary the number, duration and rhythm of bursts, and the time between burst cycles. Thus, a finely "tuned" program can be achieved that will eliminate material blockages and keep the system free flowing at the minimum amount of energy necessary.

MOUNTING LOCATION

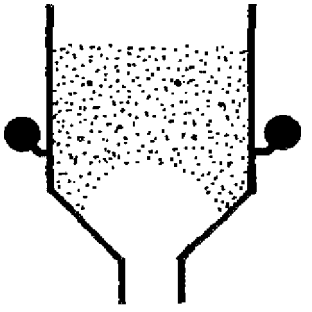
We will be pleased to recommend mounting locations of injectors based on your sketch or drawing of your specific material flow problem. On new installations, recommendations will be made based on experiences in similar structures.

For prevention of material retention in recesses, ducts or channels sketches or drawings of problem areas are necessary.

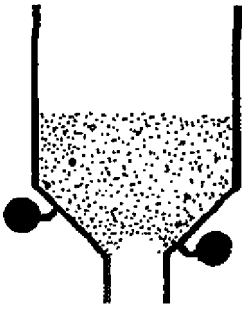
TYPICAL AIR BURST PATTERN



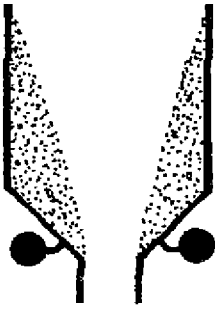
SUGGESTED MOUNTING LOCATIONS FOR COMMON FLOW PROBLEMS



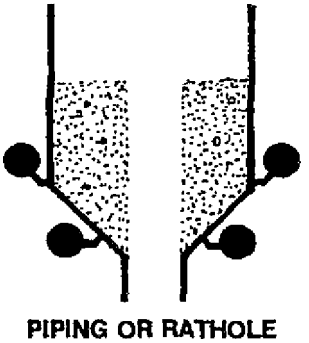
ARCHING



BRIDGING

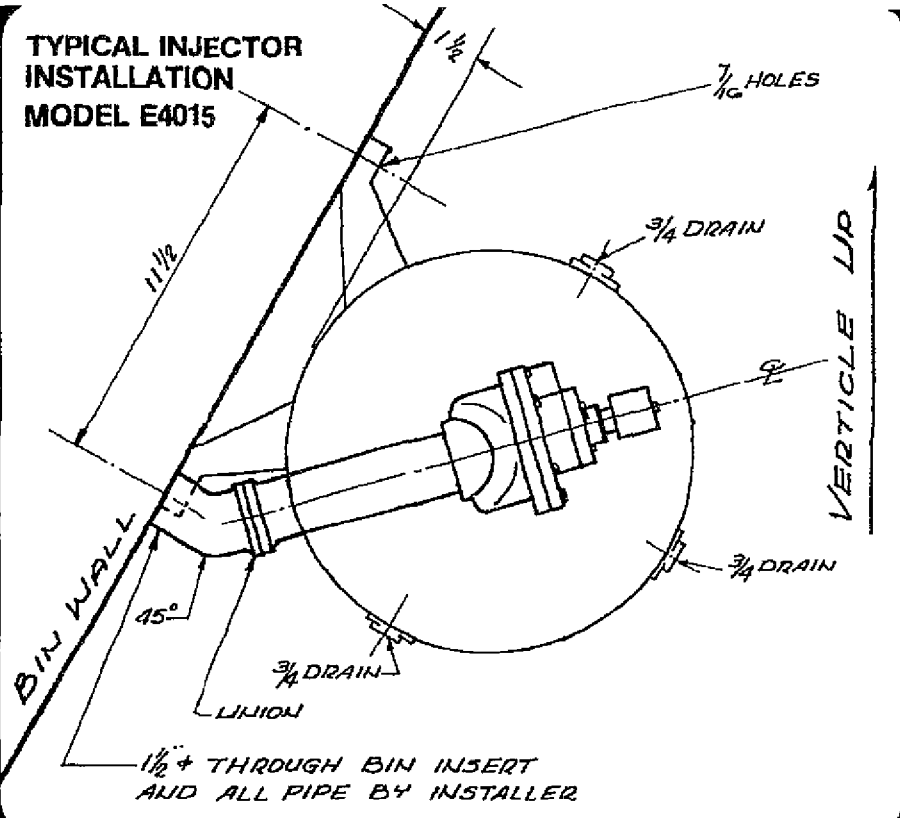


CLINGING



PIPING OR RATHOLE

TYPICAL INJECTOR INSTALLATION MODEL E4015



INSTALLATION

EASY TO INSTALL

Injectors are complete with mounting legs and all field connections can be made with standard pipe.

Connect shop air to tank and power (120/60) to programmer.

EASY TO CONTROL

The programmer will activate the system:

A. Manually on demand
B. Automatically on signal
C. Automatically on time interval

EASY TO ADJUST

The versatility of the Pulsonic system reduces the troublesome task of relieving material blockages to simply dialing the best program for maximum effectiveness and efficiency.

EASY TO SERVICE

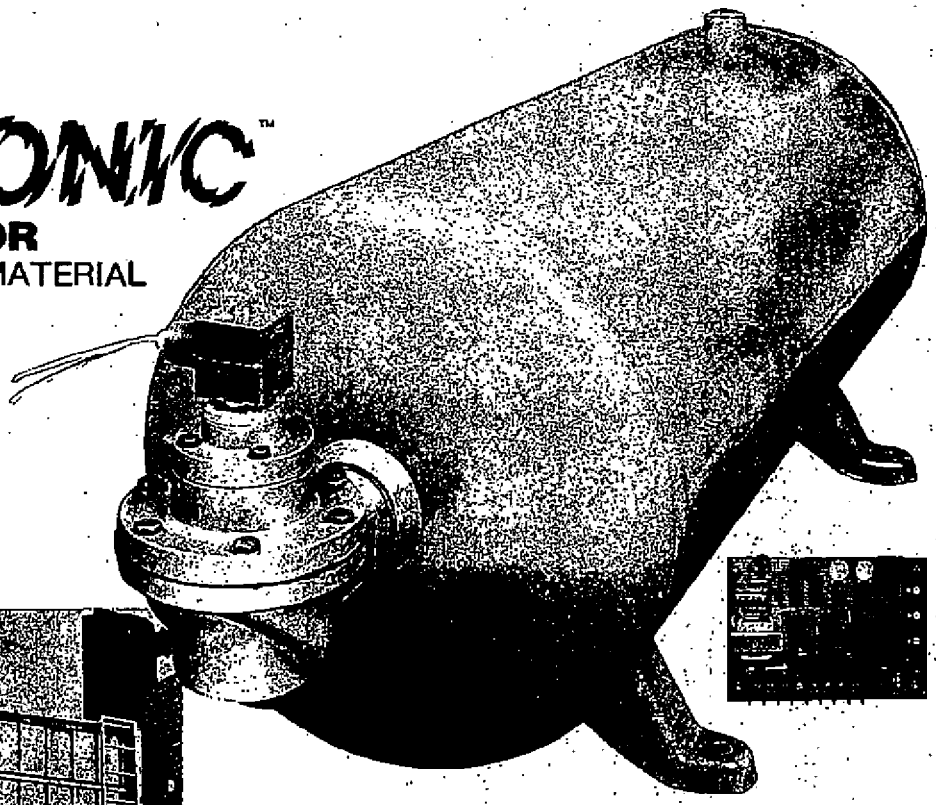
The injector valve is the only component with moving parts. Thousands of these valves have over 5 years of field operating time as proof of performance reliability. If service is ever required, one kit replaces all moving parts without disturbing pipe or mounting connections.

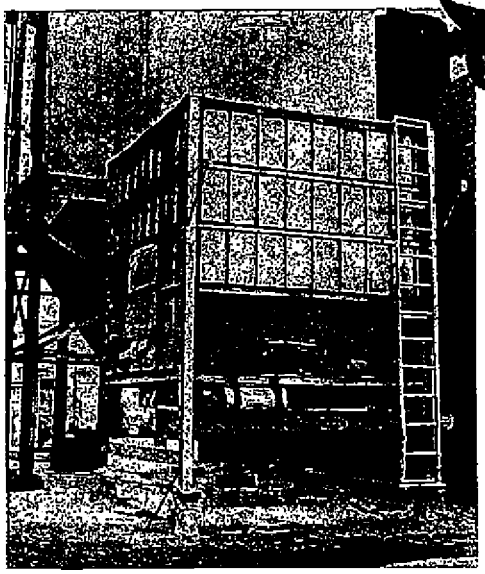
TRY IT AT NO RISK

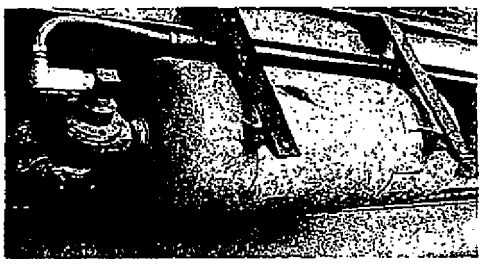
Let us propose a Pulsonic system to solve your flow problem, or order one programmer per system and the number of injectors you estimate are required to solve a problem. We will be pleased to assist you with recommendations for your particular system.

THE PULSONIC™ BIN ACTIVATOR

SOLVES TOUGH MATERIAL FLOW PROBLEMS







A CASE IN POINT

THE PROBLEM...Wood chips, sawdust and sanding fines were constantly "bridging" in the 10 ft. sq. x 20 ft. high hopper with a screw feed discharge...particularly during periods of high humidity. These stoppages continually interrupted the fuel supply to a 75 h.p. waste wood boiler.

THE REMEDY...A Pulsonic Bin Activator system of one programmer and two injectors. The program selected was to pulse simultaneously directly into the material with a 50-millisecond blast, 30 millisecond off time and a second 50 millisecond blast to complete the program. This program is automatically repeated every 15 minutes.

THE RESULTS...Since installation in November 1977, there has not been a material flow interruption in the hopper. The system operates continuously, 24 hours a day, 7 days a week. The installation uses only 35 S.C.F. of air per hour!

PULSONICS CORPORATION

777 Airport Road
Lakewood, New Jersey 08701
Phone (201) 367-0800

Printed in U.S.A.

Catalog No. 101

MYRLEN, INC.

25 CLOVER LANE • RANDOLPH, N.J. 07869 • 201 895-3098
P.O. Box 353 Mt. Freedom, N.J. 07970
(201) 895-4739

PACKING LIST

Sold To:

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651 Meteuchen Rd.
S. Plainfield, NJ

Ship To:

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Cust. P.O. #

verbal Jim KosAPETHIS

Date Rec'd.

7/25/85

Date Shipped

7/25/85

Shipped Via. O.T.

Special Instructions

Terms:

MEMO BILLING/ FOR TRIAL WITH PULSONICS UNITS

line #	Quantity Ord.	Quantity Shp.	Part Number	Description	Price Ea.	Amount
1	4	4	VA-51	Airsweep Stimulators Complete		
2	4	4	MVA-51	Mounting Plates for above		

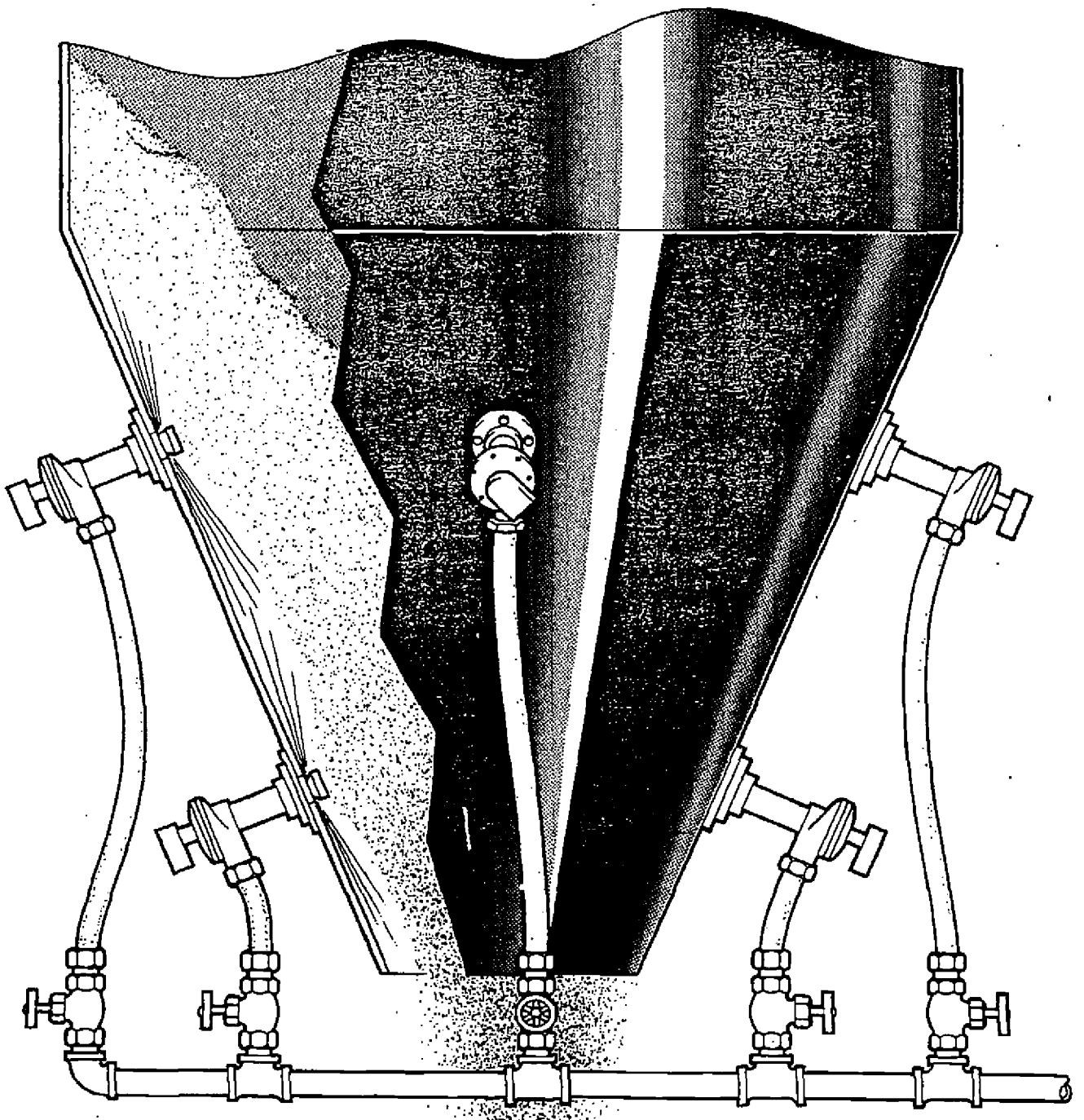
J Kapsaft

Unshipped Items are backordered unless otherwise specified

Airsweep™

MYRLEN, INC.

Bin Activator
Sweeps Away: Ratholes, Arching, Buildup and Clogging



MYRLEN, INC.

Airsweep System:

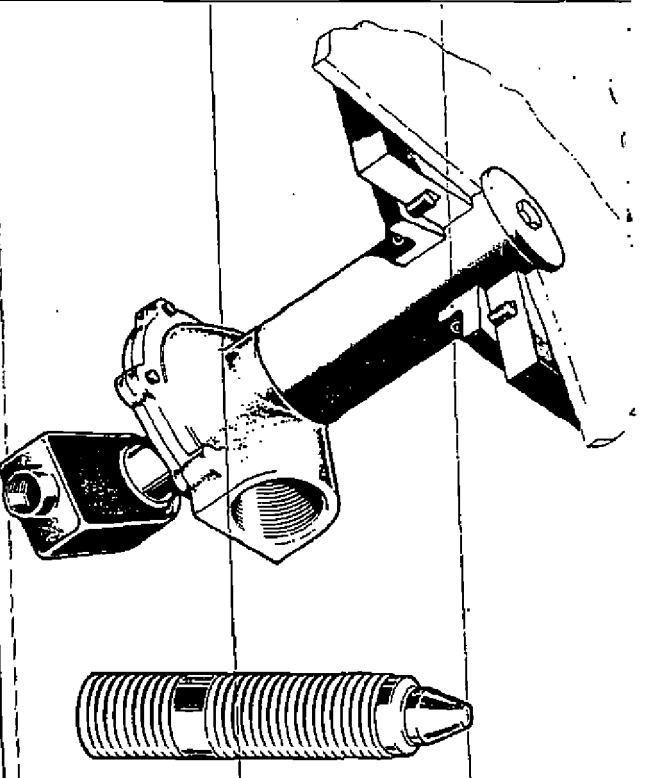
Keys to Superiority

AIRSWEEP system is precisely what its name implies — a unique automatic method for maintaining the flow of materials that tend to hang up in bins, chutes, hoppers and silos by "sweeping" the walls with a controlled release of compressed air. No blasting. No vibration. No manual or mechanical shock treatments.

AIRSWEEP industrial application and performance package is unmatched. There is no comparable system.

- **Blast-free**
- **Vibration-free**
- **Shock-free**
- **Feedback clog-free**
- **Minimum air usage operates on plant air systems with easily adjustable control of air usage.**
- **Minimum maintenance**
- **Minimum installation cost**
- **Maximum economy**
- **Maximum efficiency**
- **Maximum versatility dial control of pulse duration, pulse interval, cycle frequency.**
- **Acceptable noise levels**
- **Automatic control**
- **Simplicity of operation**

AIRSWEEP system is *the* solution to ratholing, arching, build-up, clogging, moisture and related problems inhibiting the efficient movement of fine, sticky problem materials.

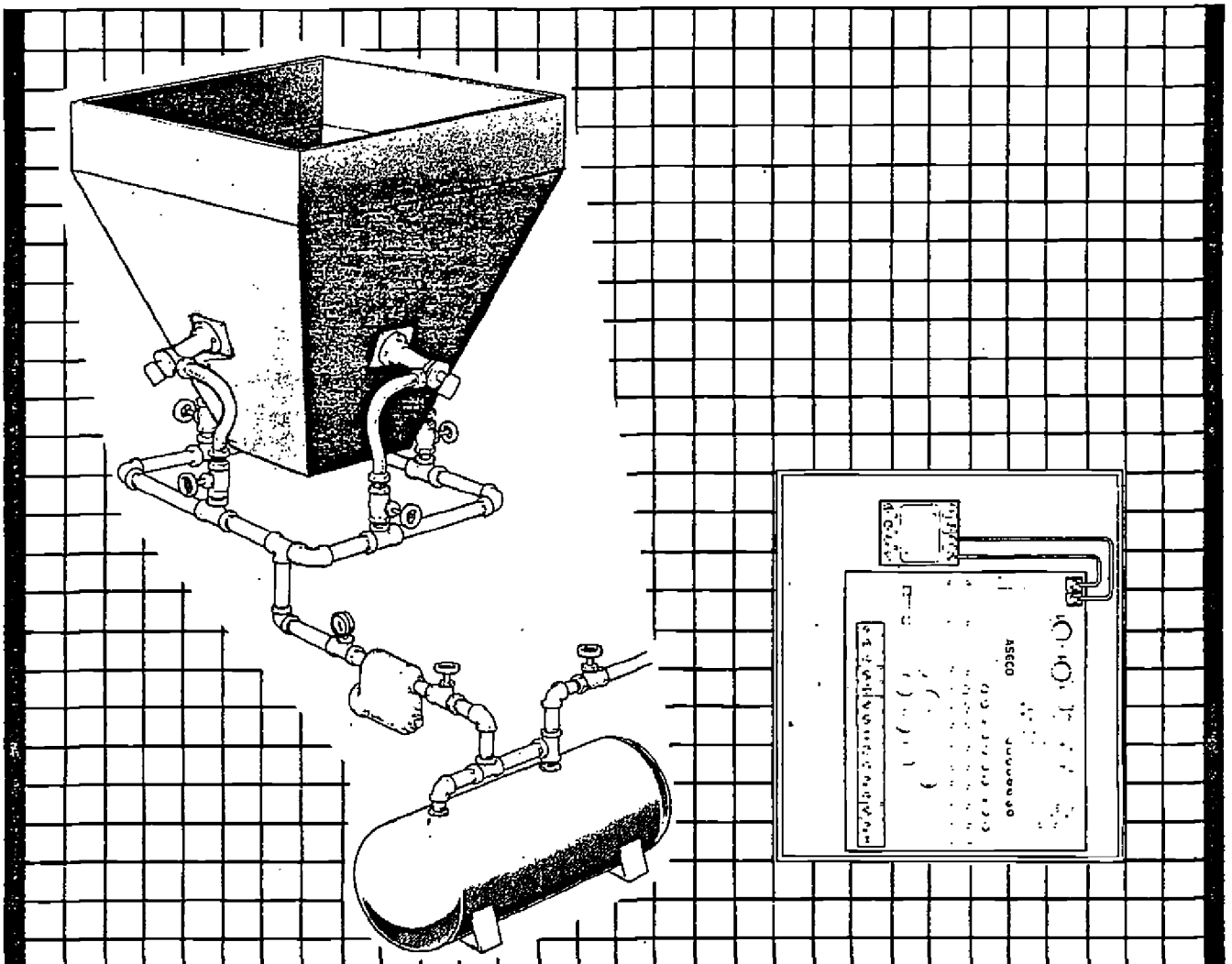


Airsweep:

The How and Why of the Unit

Simplicity with a Purpose:
A basic mechanical device in concept. The AIRSWEEP unit incorporates design simplicity to accommodate ease-of-installation, minimum maintenance requirements and maximum overall economy and efficiency. Both MYRLEN AIRSWEEP unit and the component ASGCO solenoid valve feature a single moving part —the AIRSWEEP piston rod and the solenoid diaphragm. Fittings are standard N.P.T. thread. The AIRSWEEP unit is mounted flush with the inside surface of the silo, bin or chute plate. When the normally closed, fast acting solenoid valve is activated, a pulse of compressed air is released into the body of the AIRSWEEP unit. The air forces a spring loaded piston outward to a distance of approximately 1/8 of an inch, releasing the air over the surface of the plate. The plate is swept clean of material in a circular pattern with an effective radius of approximately 3 feet (6 foot diameter). The inside surface of the piston is designed to direct the air flow parallel to the surface to achieve this sweeping effect on the fine materials adhering to the plate. Although the head of the piston is exposed, the flow of material next to the plate is the most sluggish, thus creating minimal wear on the piston head. Also, because the high-velocity air is directed parallel to the plate-work and not directly into it, the plate is subject to little wear, further contributing to the minimal maintenance requirements of the AIRSWEEP system.

MYRLEN, INC.

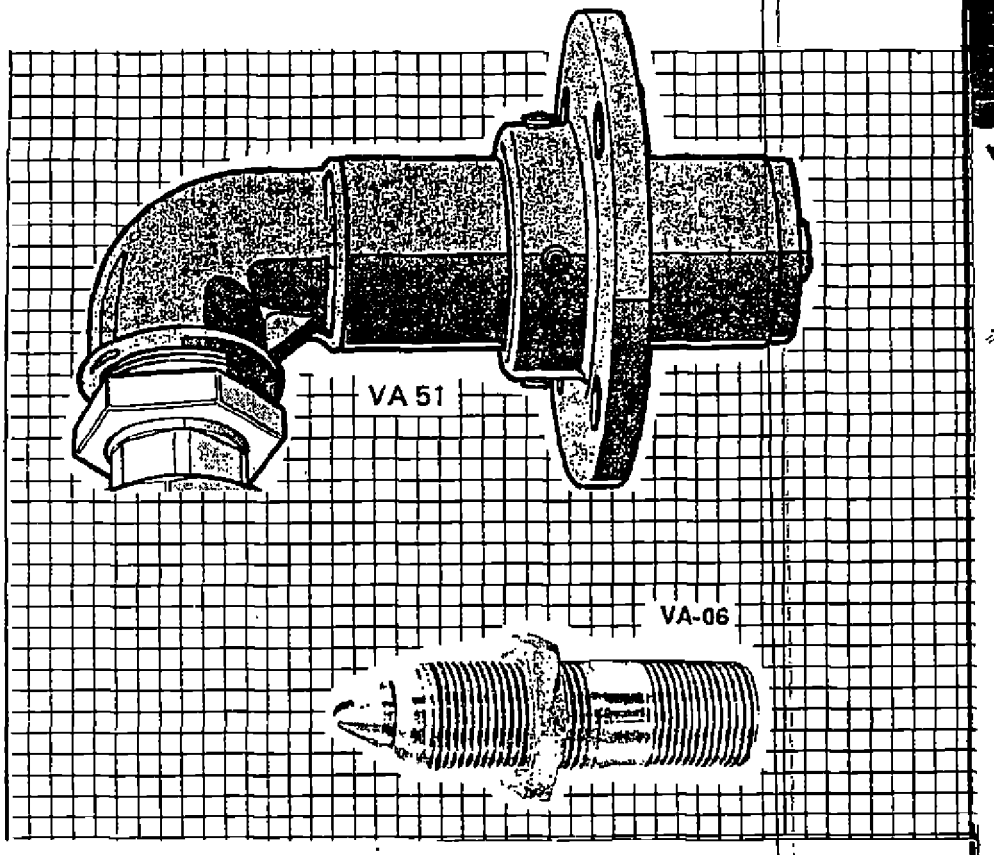


Airsweep

Efficient Simplicity in Action

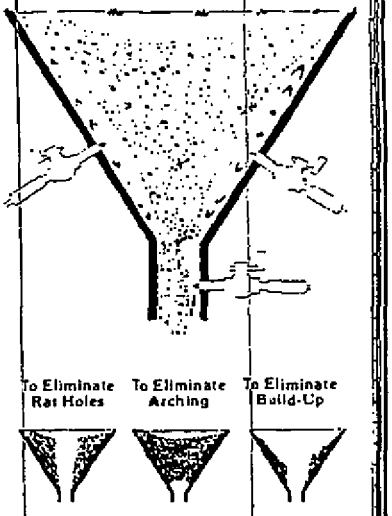
As illustrated, MYRLEN AIRSWEEP system can be applied to the solution of material movement problems with customized versatility. The requirements are basic: ❶ AIRSWEEP units with component solenoid valves, installed in concert with the material handling needs of the system. ❷ A 120 volt power source to energize the sequential controller. The board can be energized by a simple on/off manual switch or, preferably, tied into the control circuit that opens the discharge device such as a gate, valve, or feeder. ❸ The ASGCO Solid State Sequencing Controller, which automatically regulates air pulse cycles, pulse duration and frequency. Ease of controller adjustment complements the versatility of the system. ❹ A compressed air supply, capable of providing gauge pressures of 80 to 125 psi for models.

- Models available to handle large or small capacity bins, hoppers or silos.



Airsweep System

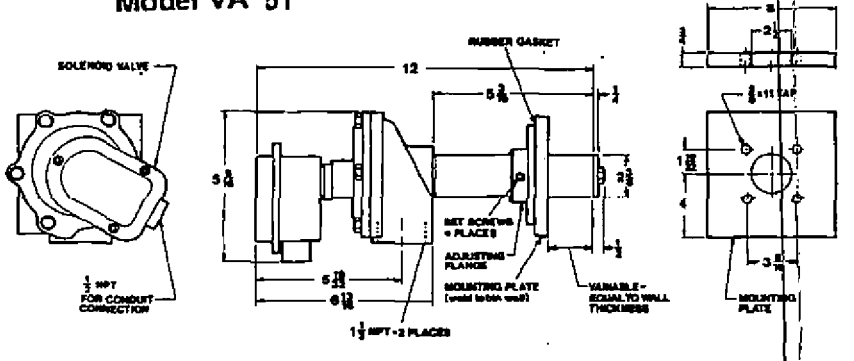
Guaranteed To Move Materials Fast



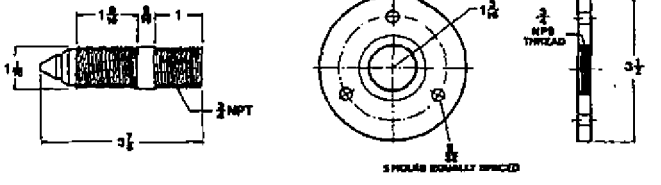
- A rotating air jet "Lifts" materials off walls with a "Sweeping" motion.
- For moving difficult materials in industrial applications.
- Can be installed without discharging bins, hoppers or silos.
- Low noise level.
- Operates on standard air pressure 80 to 100 psi.
- Low air consumption.

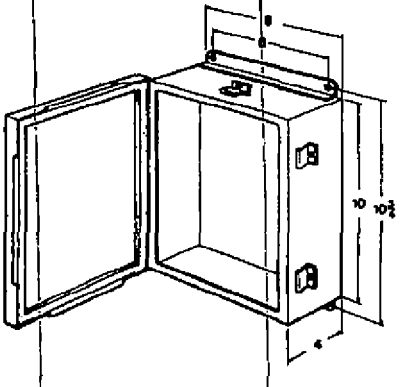
DIMENSIONS

Model VA 51

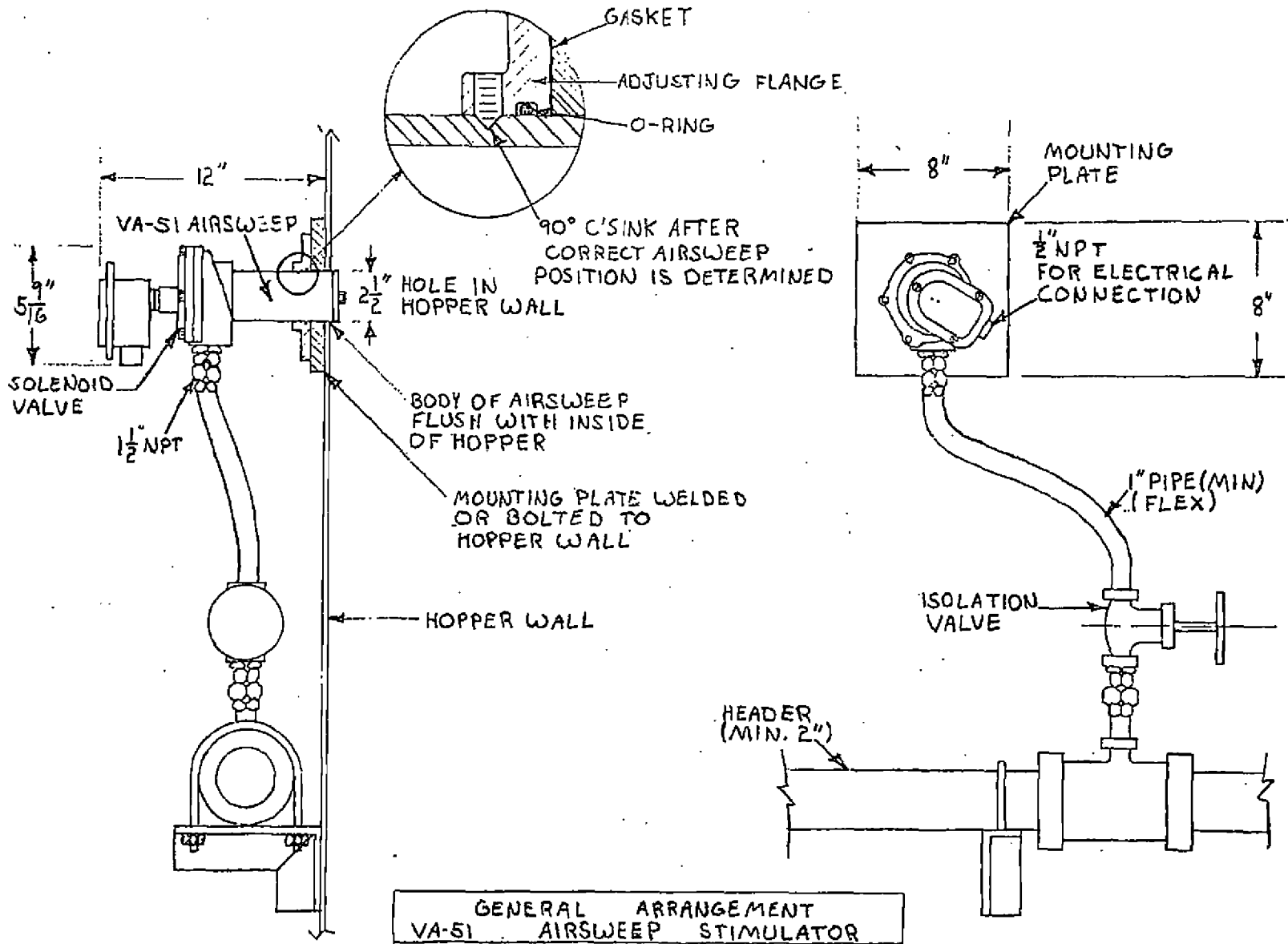


Model VA06





MYRLEN, INC. P.O. Box 353 Mt. Freedom, New Jersey 07970 (201) 895-4739



GENERAL ARRANGEMENT VA-51 AIRSWEEP STIMULATOR
MYRLEN INC PO BOX 353 MT FREEDOM, NJ 07970 201-895-4739
6/14/82 TEE CO

LEHMAN 01878

NEW YORK CITY OFFICE
P. O. BOX 714
CLIFTON, N. J. 07013

TEL: 201/472-0717
MANHATTAN
TEL: 212/244-6940

ROBIN BELL
SALES ENGINEER

ERIEZ
MAGNETICS

HEADQUARTERS
ERIE, PENNSYLVANIA, U.S.A.

To: Mr. Dan Sabia
Metropolitan Talc
Metuchen Road
South Plainfield, N.J.

Mr. Hamilton
201-546-0217
80 Bergen Ave.
Clifton N.J.
07011

ERIEZ MAGNETICS
NEW YORK DISTRICT OFFICE
P.O. BOX 714
CLIFTON, N. J. 07013

HI-VI

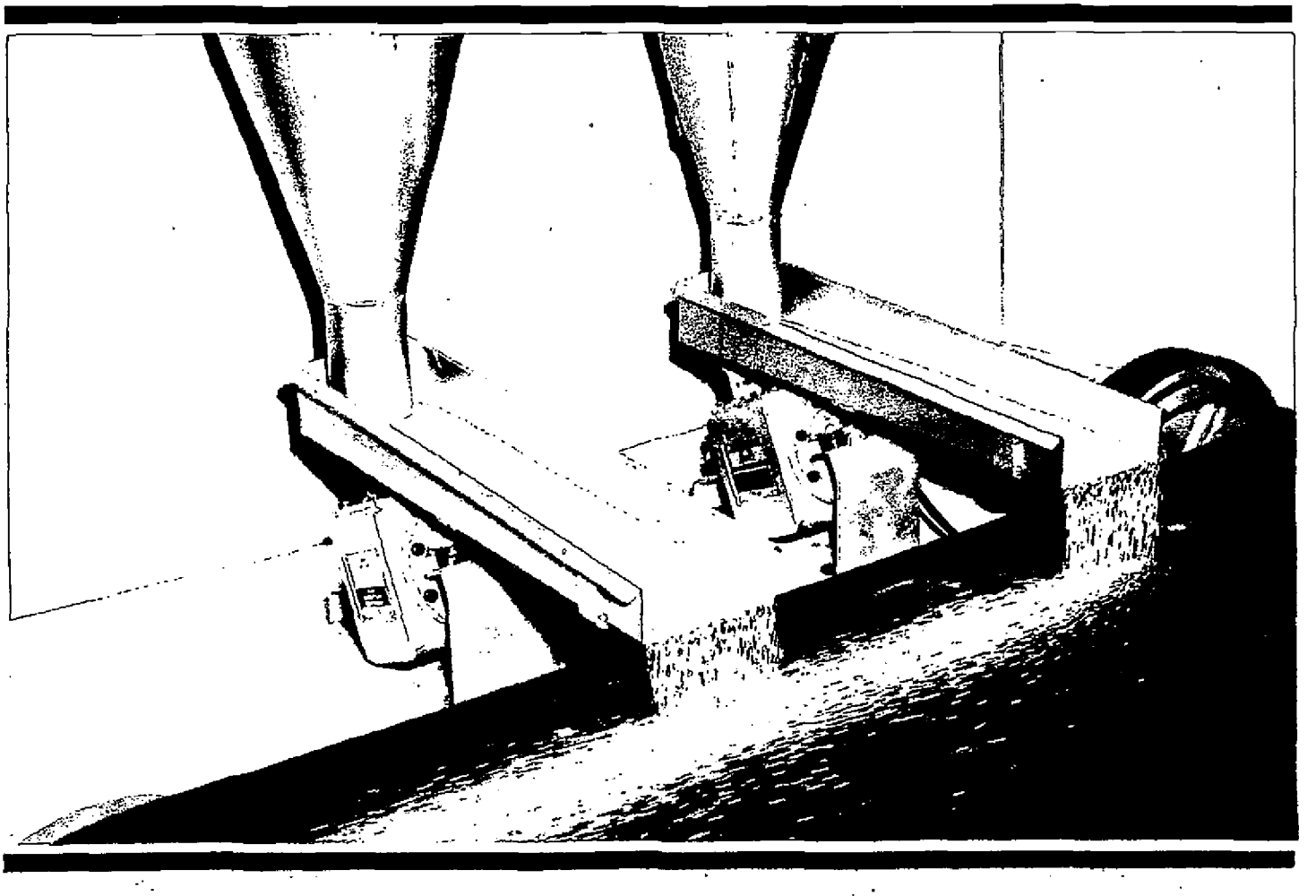
AC OPERATED

ELECTRO-PERMANENT MAGNETIC

vibratory feeders

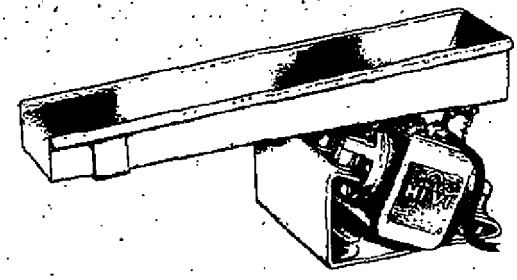
ERIEZ MAGNETICS

7 Light-duty units for precision feeding of bulk materials.



MODEL 10A

***FOR FEEDING UP TO 1,250 LBS. PER HOUR**



ACCURATELY FEED ALMOST ANY TYPE OF BULK MATERIAL WITH UNSURPASSED LINEAR CONTROL

These feeders. with their totally enclosed patented magnetic drive. can feed practically any bulk material from micron size to big, bulky chunks. Simple AC controls operate the feeders with "watch-like" precision. The smallest feeder. will feed from a few ounces to 1,250 lbs. per hour. Other models feed up to 22 tons per hour.

They provide stepless. controlled feeding from 0 to 100% of their capacity. Use them to provide easily controlled feed to conveyor belts. screens. mills. kilns, batching systems, packaging and bagging lines. weight scales, etc. HI-VI units have no frictional parts requiring lubrication and periodic maintenance. The powerful magnetic drive is enclosed . . . the spring system is constructed of epoxy fibre-glass . . . the electric coil and permanent magnets are epoxy encapsulated . . . all are selfcleaning. making changes from one run of material to another almost instantaneous and no time is required for cleaning or adjusting between various runs of materials.

With HI-VI you get moisture—and dust-resistant enclosed units which are standard, or specially constructed units for hazardous. dusty locations . . . you can choose from a number of standard trays . . . flat, tubular. half-round, "V" groove, etc.. depending on your feeding problem . . . you need no rectifier. merely dial the precise feed rate you want on the simple, maintenance-free control box furnished with each feeder.

Eriez has a standard model for the majority of feeding applications. Special units can be had with multiple drives for greater capacities or special size trays.

Operation is economical, clean and quiet . . . no air required . . . no high maintenance mechanical shaking!

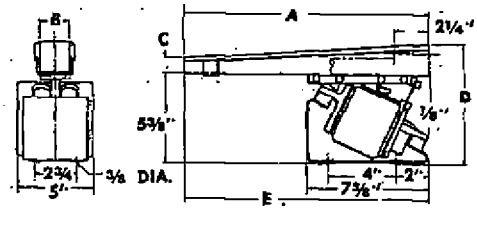
Choose Eriez and benefit from these many exclusive operating advantages!

Produced under U.S. Pat. No. 2,895,064 and others issued or pending.

The smallest feeder in the line, this tiny. economy model will give you precise feeding of the most minute amounts of materials. It is ideal for additive feeding, small packaging operations and laboratory use.

TRAY TYPE	A	B	C	D	E
Narrow Flat	16	2	1	7⅜	15⅞
90° V	16	1½	¾	6⅞	15⅞
Half Round	16	1½	¾	7⅛	15⅞
Tubular	15	1⅛ O.D.		6⅞	14⅞

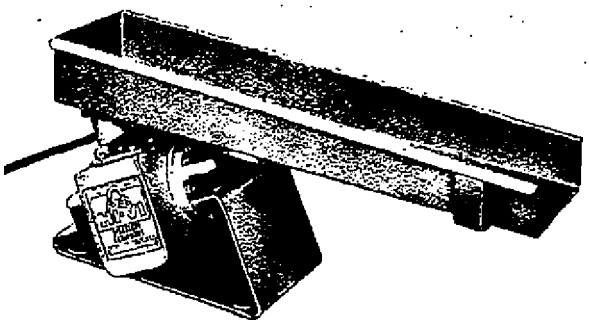
Power Supply	115 V. 60 cycle 1 phase
Full Load Power Consumption	6 watts
Full Load Power Input—115 Volt	0.5 amp
Control	Model D
Weight (with control box)	23 pounds



*All feeding capacities are based on dry sand weighing 100 lbs. per cubic foot. Increased capacities can be expected by feeding down slope.

MODEL 20 A

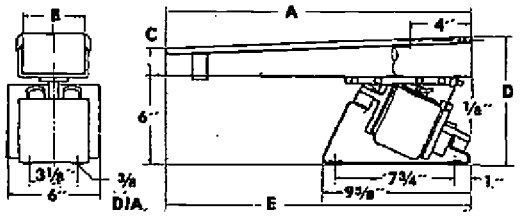
FOR FEEDING UP TO 2 TONS PER HOUR



These small machines have higher output capacities than any units of a comparable physical size regardless of densities of the materials usually fed by this method. Control gives you precise, measured feed from a few ounces to the full capacity of two tons.

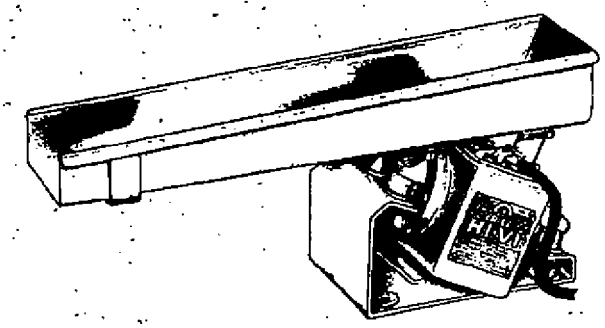
TRAY TYPE	A	B	C	D	E
Narrow Flat	20	4	1¾	8⅝	19⅞
Wide Flat	14	7	1¾	8⅝	13⅞
90° V	20	3	1½	8½	19⅞
Half Round	20	3	1½	8½	19⅞
Tubular	19	2 O.D.		8½	18⅞

Power Supply	115 V. 60 cycle 1 phase
Full Load Power Consumption	15 watts
Full Load Power Input—115 Volt	0.5 amp
Control	Model D
Weight (with control box)	32 pounds



MODEL 30 A

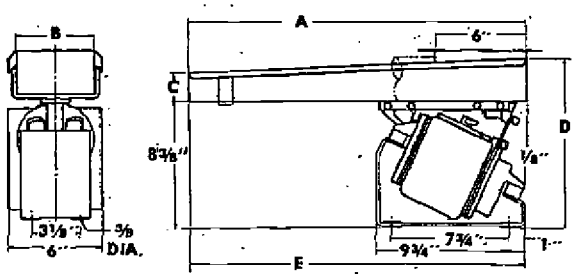
FOR FEEDING UP TO 4 TONS PER HOUR



All of these compact units have been designed to produce the most uniform feed possible, with the variety of applications. A more accurate uniformity of operation than with other types of feeders is assured . . . one of the variables, the "airgap" adjustment has been eliminated.

TRAY TYPE	A	B	C	D	E
Narrow Flat	22	5	1⅞	11¼	21⅞
Wide Flat	20	7	1⅞	11¼	19⅞
90° V	20	4	2	11¼	19⅞
Tubular	19	3 O.D.		11⅞	18⅞
Half Round	20	4	2	11⅜	19⅞

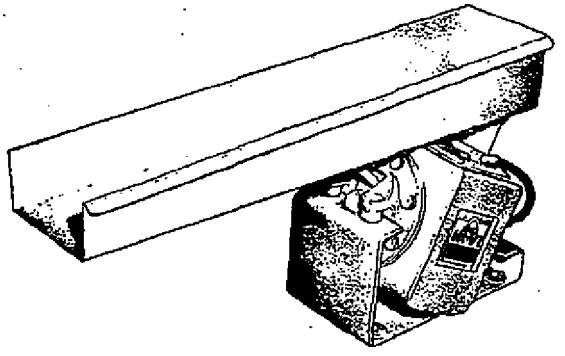
Power Supply	115 V. 60 cycle 1 phase
Full Load Power Consumption	15 watts
Full Load Power Input—115 Volt	1.2 amp
Control	Model F
Weight (with control box)	49 pounds



LEHMAN 01883

MODEL 40A

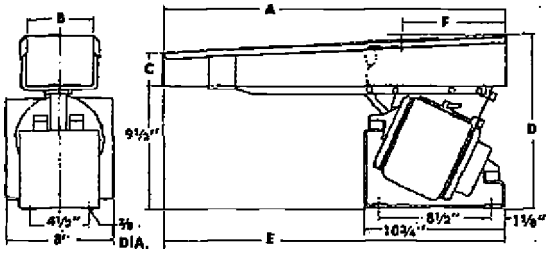
FOR FEEDING UP TO 5 TONS PER HOUR



This medium size model is small enough to handle many low-capacity feeding jobs yet big enough to pour out 5 tons an hour if this is required. It has many applications including controlled feeding to pulverizers, grinders, packaging machines, feeding to batch weighers, conveyor belts, inspection lines, screens, furnaces, etc.

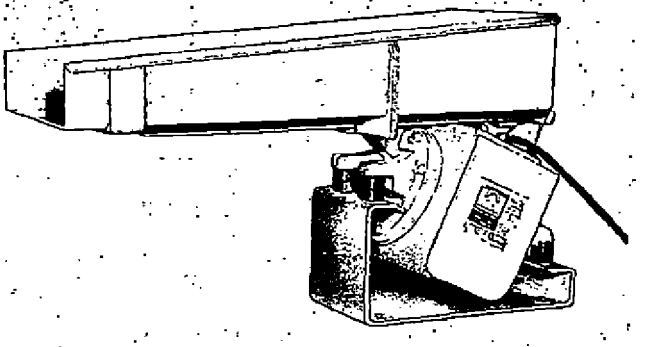
TRAY TYPE	A	B	C	D	E	F
Narrow Flat	26	5	2½	13¼	25⅛	
Medium Flat	20	7	2½	13¼	22¾	
Wide Flat	17	9	2½	13¼	22¾	
Tubular	36	3 O.D.		13½	36⅞	6
Tubular	25	4 O.D.		14¼	25⅛	8
Half Round	26	4	2	13½	25⅛	

Power Supply	115 V. 60 cycle 1 phase
Full Load Power Consumption	30 watts
Full Load Power Input—115 Volt	1.75 amp
Control	Model F
Weight (with control box)	92 pounds



MODEL 45A

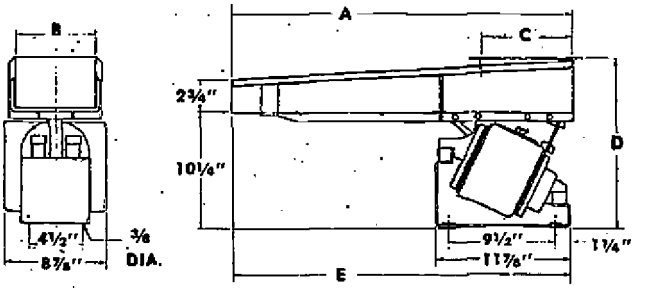
FOR FEEDING UP TO 7 TONS PER HOUR



All of these models are completely enclosed so the drive element is protected against damage or decreased efficiency due to contamination by moisture and foreign materials. Special construction is also available for installation in those areas where Class II, Group G equipment is normally used.

TRAY TYPE	A	B	C	D	E
Narrow Flat	30	7		14¾	29⅛
Medium Flat	24	9		14¾	26⅛
Wide Flat	20	12		14¾	23⅛
Tubular	30	4 O.D.	8	15½	31
Tubular	24	6 O.D.	10	17¾	26⅛

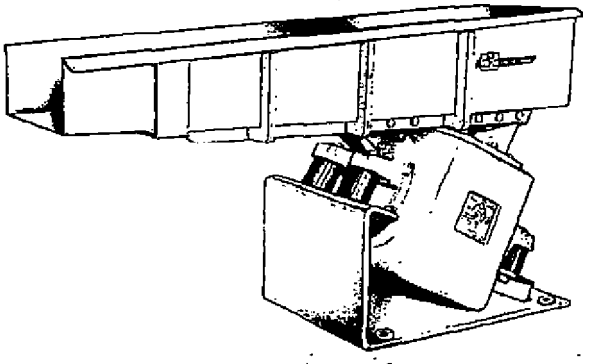
Power Supply	115 V. 60 cycle 1 phase
Full Load Power Consumption	30 watts
Full Load Power Input—115 Volt	1.75 amp
Control	Model F
Weight (with control box)	106 pounds



LEHMAN 01884

MODEL 50A

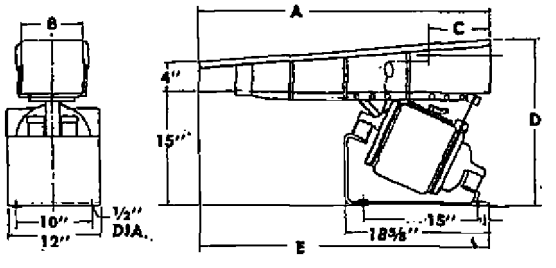
FOR FEEDING UP TO 15 TONS PER HOUR



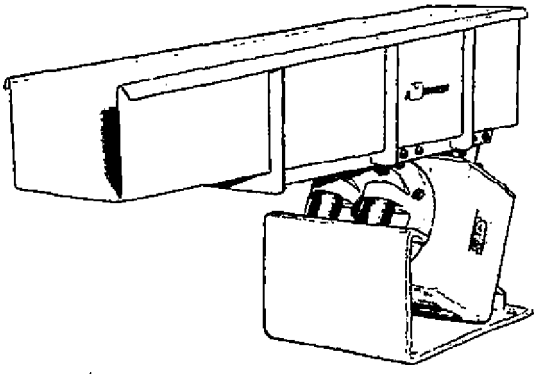
This rugged unit has been designed for many medium to heavy feeding applications where accurate control is essential. It is ideal for feeding to batch weighing scale hoppers, processing mills, pulverizers, driers and conveyor lines.

TRAY TYPE	A	B	C	D	E
Narrow Flat	38	9		22	37⅜
Medium Flat	26	13		22	35
Wide Flat	22	17		22	31
Tubular	48	4 O.D.	8	20	47⅜
Tubular	42	6 O.D.	12	22½	41⅜
Tubular	38	8 O.D.	16	24½	37⅜
Half Round	38	8		23	37⅜

Power Supply	115 or 230 V. 50-60 cycle 1 ph.
Full Load Power Consumption	160 watts
Full Load Power Input—115 Volt	4 amp
Control	Model G
Weight (with control box)	317 pounds



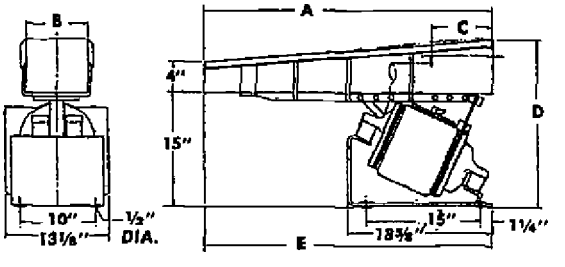
MODEL 55A



No rectifiers are needed with any of these HI-VI feeders. Merely wire into any AC line. Controls, to provide the full feed range, are of potentiometer or the variable auto-transformer type. Their only function is to vary the applied line voltage from zero to 100%. As an example, this feeder with its control will provide precise feeding from a few ounces to 22 tons per hour.

TRAY TYPE	A	B	C	D	E
Narrow Flat	38	9		22	37⅜
Medium Flat	26	13		22	35
Wide Flat	22	17		22	31
Tubular	48	4 O.D.	8	20	47⅜
Tubular	42	6 O.D.	12	22½	41⅜
Tubular	38	8 O.D.	16	24½	37⅜
Half Round	38	8		23	37⅜

Power Supply	115 or 230 V. 50-60 cycle 1 ph.
Full Load Power Consumption	120 watts
Full Load Power Input—115 Volt	4 amp
Control	Model G
Weight (with control box)	338 pounds



Large, Heavy-duty Models also available.

ERIEZ AC OPERATED VIBRATORY FEEDERS ARE AT WORK IN NEARLY EVERY INDUSTRY! A FEW VARIED APPLICATIONS ARE ILLUSTRATED BELOW.

(1) In the world's largest walnut processing facility—Diamond Walnut Grower's Stockton, Calif. plant—all nutmeats are given a rigid final inspection before packaging. This involves use of 40 Eriez Vibratory Feeders to maintain a constant, uniform flow of nutmeats to inspectors at final grading tables.

"We get a precisely controlled flow and even distribution of nutmeats over the width of the final grading tables," said E. S. Dourgarian, and association official.

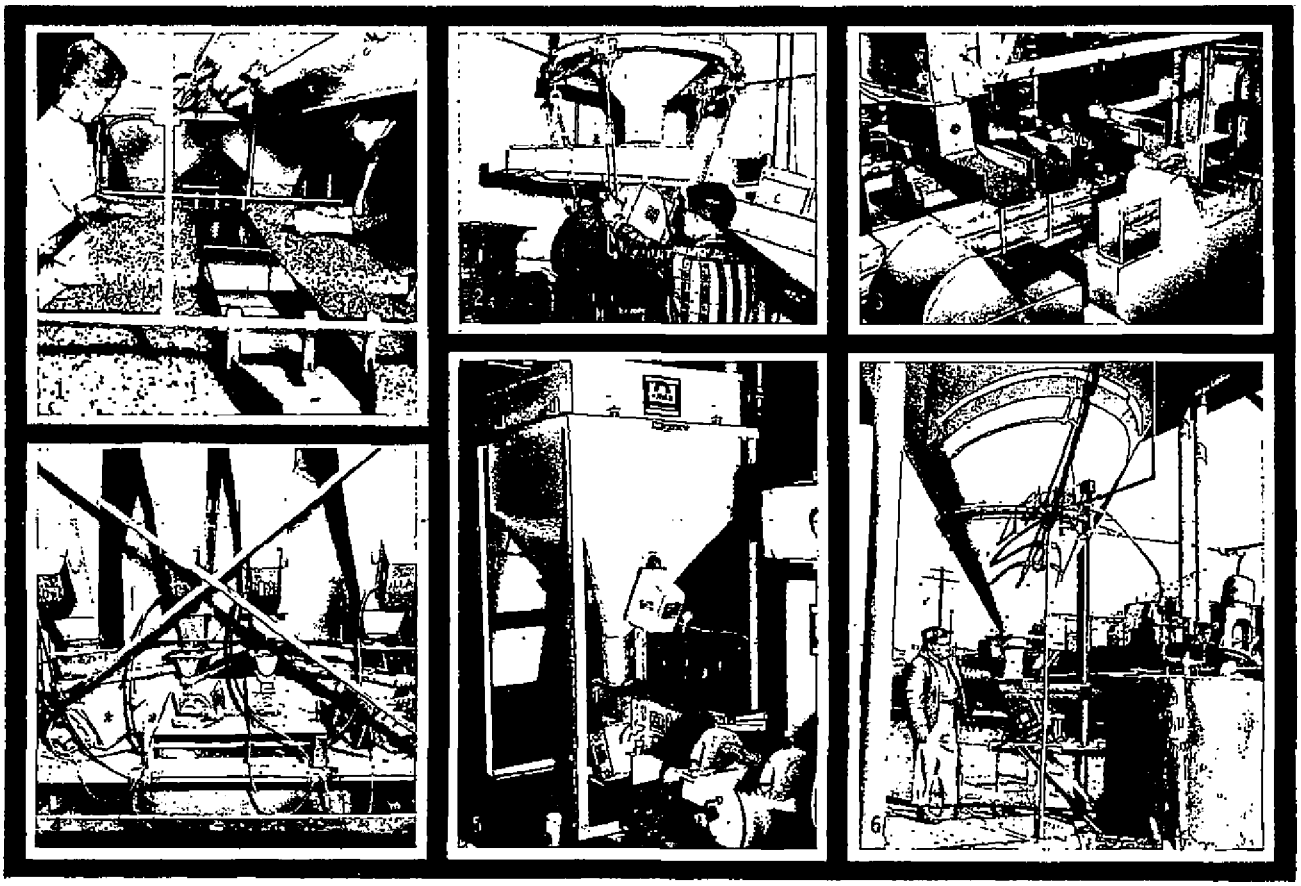
(2) Eriez Vibratory Feeder at Union Carbide Nuclear, mounted under storage bin's discharge cone, is positioned by operator for precise ore feeding to one of surrounding crushers and screens. AC feeder is installed on trolley assembly which turns a full circle to provide delivery of ore in any direction.

(3) Eriez Feeders are at work in the House of Edgeworth where they help prepare tobacco for market. Here a bank of three feeders, synchronized to feed exact amount of tobacco into metal containers, is used in filling tins.

(4) Proportioning materials to make space age alloys is an exacting process accomplished by vibratory action at Reading Alloys, Inc., Wyomissing, Pa. Photo shows rear view of four material storage hoppers equipped with Eriez Bin Vibratory feeders below hoppers assure precise feed to a mixing drum.

(5) In the production of resin-impregnated glass fiber cloth at Thiokol Chemical Corporation's Panelyte Division, in Trenton, N. J., an Eriez Volumatic Feeder maintains a continuous, uniform approximately one layer deep to the conveyor belt on an Eriez High-Intensity Electromagnetic Separator.

(6) Hydrated lime discharge from an overhead storage bin into an Eriez Vibratory Feeder is fed in the precise amounts to the plant sewage treatment tank at Trubek Laboratories in Rutherford, N. J. The AC feeder, which needs no rectifier, delivers lime at rates up to five tons per hour, about 18 times faster than previous method.



ERIEZ MAGNETICS

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ERIEZ OF CANADA, Ltd., 133 Oakdale Rd., Toronto (Downsview), Ont., Canada

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JEFFREY

THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO 43216, U. S. A.

CANGRO TRANSMISSION CO. of N. J.
Power Transmission & Conveyor Equipment
295 Crooks Avenue Clifton, N. J. 07011
Telephone 772-7662

LEHMAN 01887

DATE OF ISSUE AUGUST 21,1967

TO CANGRO TRANSMISSION OF NEW JERSEY
STREET
CITY
STATE

(FOR METRO TALC CO.)

TYPE OF DATA PARTS LIST

For

TYPE OF EQUIPMENT 20" X 18" DOUBLE ROLL CRUSHER

CUSTOMER ORDER NO.	JEFFREY ORDER NO.

SERIAL NO. 8161

JWS

NOTE

This catalog has been prepared for your convenience in the identification of parts needed for the maintenance of the above specified equipment. It is advisable that you forecast as accurately as possible your requirements for Renewal Parts to assure that the necessary items will be available when needed to keep your equipment in efficient operating condition. Better service is assured when genuine JEFFREY parts are used and Lubrication Instructions are followed.

COMPLETE ITEMS

The term "COMPLETE", as used in this catalog, designates an assembly or sub-assembly that can be ordered as a unit. The name of the unit is printed in CAPITAL LETTERS, and indented items that are listed under the complete unit are the parts that are included in the unit.

INSTRUCTIONS FOR ORDERING REPAIR PARTS

(1) In all cases give Jeffrey Order Number and Serial Number of equipment for which parts are desired.

(2) State explicitly how goods are to be shipped, whether by freight, express or parcel post. If special routing is desired, it should be noted on each order.

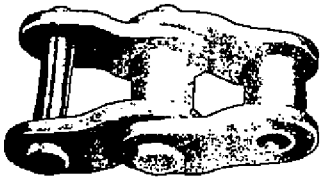
(3) Give catalog numbers, if available, accompanied by names of articles. This enables us to identify the parts without question. If unable to give catalog numbers, please furnish full description of the parts desired.

(4) In correspondence concerning orders, always give the order number and/or date of same.

(5) All claims must be made promptly upon receipt of goods.

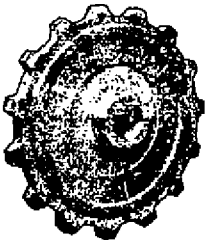
(6) Always communicate with nearest field office before returning material of any kind. Mark all returned packages plainly with your name and address and forward shipping receipt to the nearest field office.

JEFFREY MACHINES AND PRODUCTS FOR TODAY'S INDUSTRIES

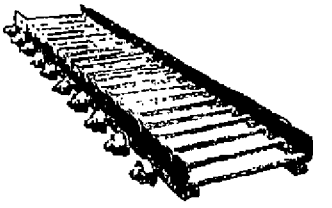


Drive Chains

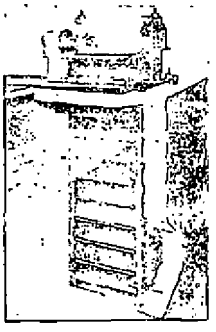
Conveyor Chains



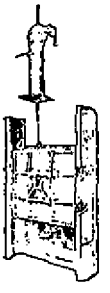
Sprockets



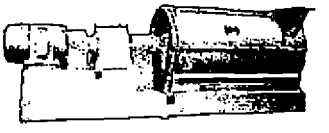
Apron Conveyors



Sanitation Equipment

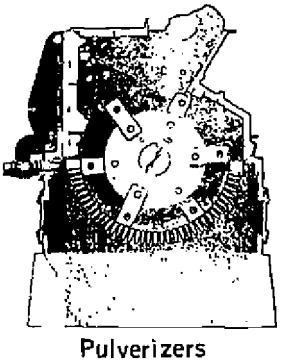


Sluice Valves

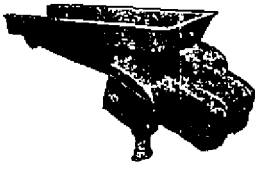


Foundry Sand Mullers

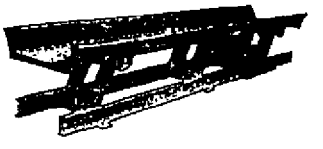
Bucket Elevators



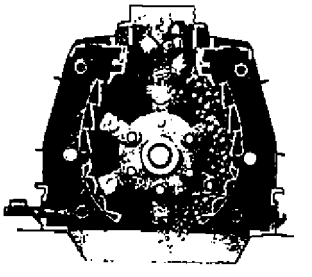
Pulverizers



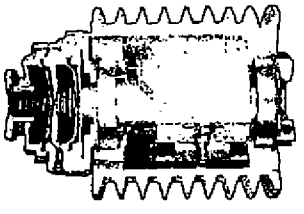
Vibrating Feeders



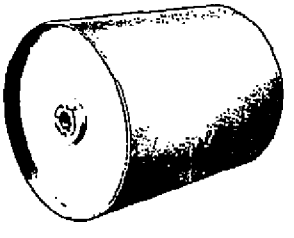
Vibrating Conveyors



Reversible Impactors



Automatic Clutches



Welded Steel Pulleys

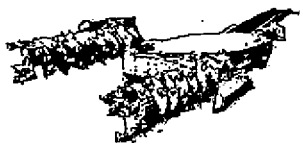
Belt Idlers

Screw Conveyors

THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO 43216, U.S.A.

JEFFREY PRODUCTS FOR THE MINING INDUSTRY



Continuous Miners — Bridge Conveyors

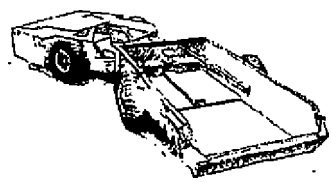
Locomotives

Cutting Machines

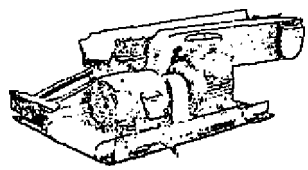
Loading Machines

Continuous Miners (COLMOL)

Ratio Feeders

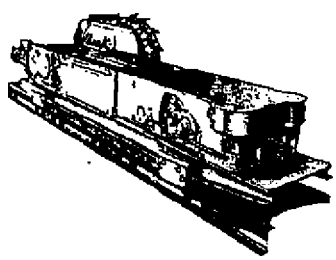


Ramcars

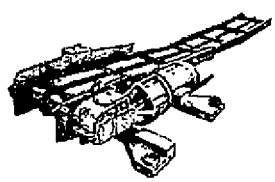


Chain Conveyors

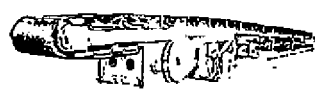
Bridge Carriers



Anderton Shearer

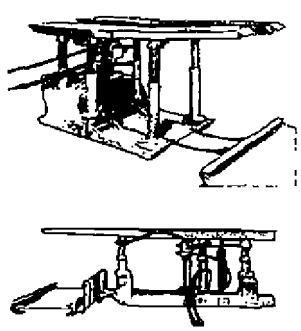


Armoured Conveyors

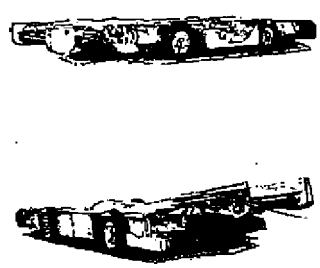


Belt Conveyors

Roof Drills



Roof Supports



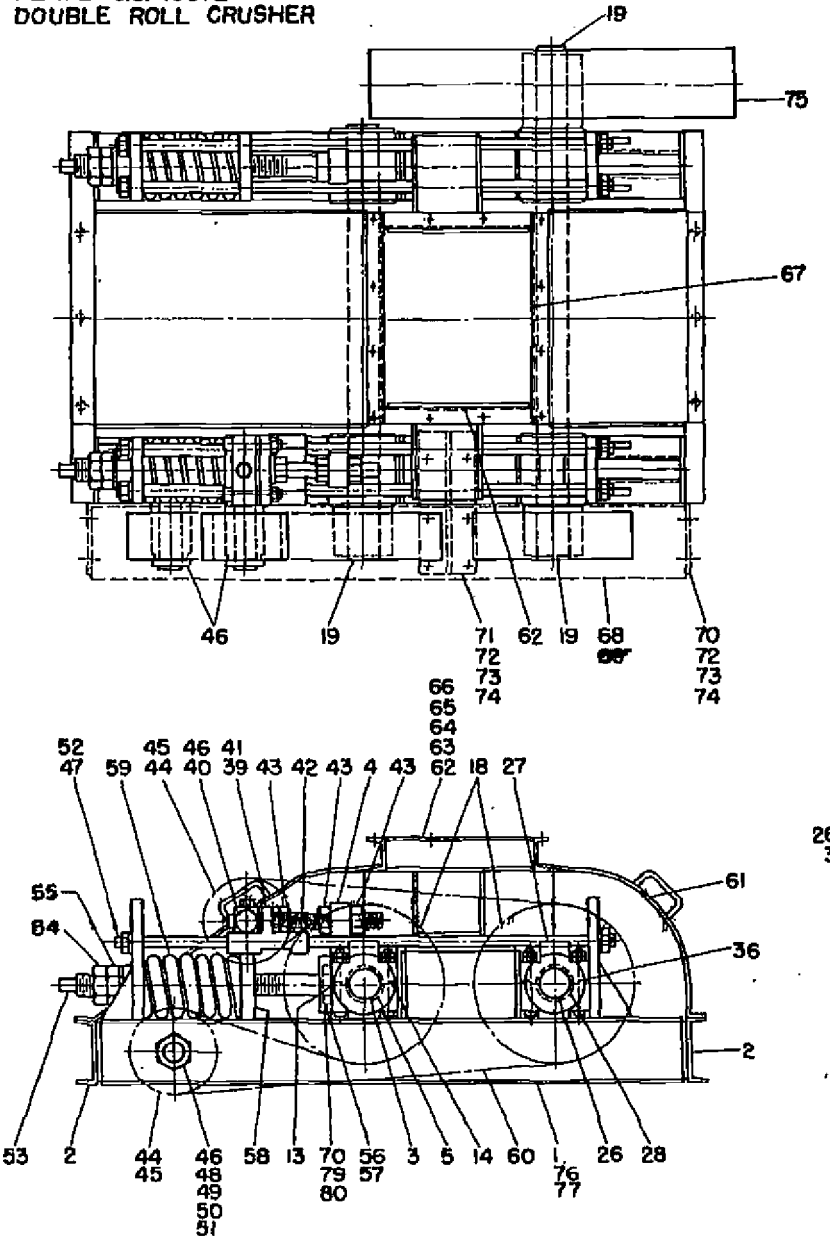
Shuttle Cars

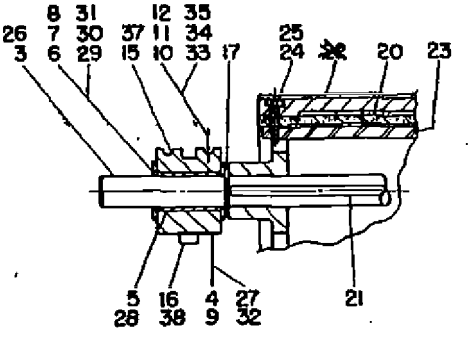
Aerodyne Fans-Blowers

THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO 43216, U.S.A.

PLATE C.S. 10972
DOUBLE ROLL CRUSHER





TYPICAL SECTION THRU
BEARINGS, DRUMS & SEGMENTS

20" x 18" DOUBLE ROLL CRUSHER WITH STRUCTURAL STEEL FRAME, FLAT BELT DRIVE, SPLIT BEARINGS, & ADJ. UPPER IDLER BRACKET

SERIAL # 8161

C.S. 10971
Calls List Drg. Q-30537 Gr. 3

Illustrated on C.S. 10972

2 pages, page 1

Ref. No.	Name of Part		Cat. No.
	20" x 18" DOUBLE ROLL CRUSHER, C.S. 10971.		.222347
1	Side Frame	(2 req'd).	218573
2	End Frame.	(2 req'd).	218563
3	Adjustable Roll Shaft.	(1 req'd).	218576
4	ADJUSTABLE ROLL SHAFT BEARING COMPLETE		.222208
5	Bushing (2-Pieces)	(1 req'd).	222207
6	Machine Screw, #10-24 thd. x 3/8" Flat Head.	(12 req'd).	15354
7	Packing Washer (4-Pieces).	(2 req'd).	222206
8	Packing Ring (Felt).	(4 req'd).	222205
9	HOUSING COMPLETE	(1 req'd).	222204
10	Check Nut, 5/8" Std. Hex..	(4 req'd).	63086
11	Hex. Head Nut, 5/8".	(4 req'd).	63070
12	Machine Bolt, 5/8"-11 x 5 1/2" lg. Sq. Hd.	(4 req'd).	13054
13	Shim	(2 req'd).	222203
14	Shim	(2 req'd).	222202
15	Bearing Cap (Drg.XH-36909 Mk.2).	(1 req'd).	
16	Bearing Base (Drg.XH-36909 Mk.1)	(1 req'd).	
17	Snap Ring.	(4 req'd).	218565
18	Pulley, 15".	(2 req'd).	218582
19	Gib Key, 3/4".	(3 req'd).	29488
20	Crusher Roll	(2 req'd).	225629
21	Key, 3/4" Sq. x 20 1/2" lg. (Drg.XQ-30537 Mk.10)	(2 req'd).	
22	~~Segment (Per Order).~~	(req'd).	
23	Segment Clamp (Per Order).	(12 req'd).	218595
24	Cap Screw, 3/4"-10 x 3" lg. Hex. Head. . . .	(32 req'd).	218685
25	Lockwasher, 3/4"	(32 req'd).	23358
26	Fixed Roll Shaft	(1 req'd).	218577
27	FIXED ROLL SHAFT BEARING COMPLETE.		.222211
28	Bushing (2-Pieces)	(1 req'd).	222207
29	Machine Screw, #10-24 thd. x 3/8" lg. Fl.Hd.	(12 req'd).	15354
30	Packing Washer	(2 req'd).	222206
31	Packing Ring (Felt).	(4 req'd).	222205
32	Housing Complete	(1 req'd).	222210
33	Check Nut, 5/8" Std. Hex.	(4 req'd).	63086
34	Hex. Head Nut, 5/8".	(4 req'd).	63070
35	Machine Bolt, 5/8"-11 x 5 1/2"lg. Sq. Hd.. . .	(4 req'd).	13054
36	Shim	(4 req'd).	222202
37	Bearing Cap (Drg.H-36911 Mk.2)	(1 req'd).	
38	Bearing Base (Drg.H-36911 Mk. 1)	(1 req'd).	
39	IDLER SHAFT BEARING COMPLETE	(1 req'd).	222168
40	Idler Pulley Shaft	(1 req'd).	222169
41	Bracket Body	(1 req'd).	222170
42	ADJUSTABLE IDLER ROD	(1 req'd).	222212
43	Nut, 1 1/4"-7 thd. Hex. Head	(3 req'd).	63074

LEHMAN 01892

C.S. 10971
2 pages, page 2

Ref. No.	Name of Part	Cat. No.
	DOUBLE ROLL CRUSHER (CON'T)	
44	8" IDLER PULLEY . . . . . (2 req'd)	218583
45	Bushing. . . . . (1 req'd)	265196
46	Set Collar . . . . . (2 req'd)	201865
47	Bearing Hold Down Rod. . . . . (4 req'd)	218564
48	LOWER IDLER SHAFT. . . . . (1 req'd)	218568
49	2" Std. Hex. Nut . . . . . (2 req'd)	63077
50	Lockwasher, 2" . . . . . (1 req'd)	23367
51	Cut Washer . . . . . (2 req'd)	60863
52	Lockwasher, 1" . . . . . (8 req'd)	23361
53	ADJUSTABLE SCREW . . . . . (2 req'd)	218570
54	Check Hex. Nut, 2" (Drg.Q-30537 Mk.25) . . . . (2 req'd)	
55	Std. Hex. Nut, 2". . . . . (2 req'd)	63077
56	Key, 1/2" Sq. x 5/8" lg. (Drg.Q-30537 Mk.45) . . (2 req'd)	
57	Adjustable Screw Collar. . . . . (2 req'd)	218388
58	Adjustable Screw Nut. . . . . (2 req'd)	218571
59	Spring . . . . . (2 req'd)	218569
60	Belt . . . . . (1 req'd)	218596
61	Housing. . . . . (1 req'd)	218574
68	R.H. Guard, Gr. 1 (Per Order). . . . . (1 req'd)	218575
~~69~~	~~L.H. Guard, Gr. 2 (Per Order). . . . . (1 req'd)~~	~~218586~~
70	Bracket. . . . . (2 req'd)	218587
71	Bracket. . . . . (1 req'd)	218588
72	Machine Bolt, 1/2"-13 x 1" lg. Square Head . . . (8 req'd)	10097
73	Hex. Nut, 1/2"-13 . . . . . (8 req'd)	63069
74	Lockwasher, 1/2". . . . . (8 req'd)	23354
75	Flywheel . . . . . (1 req'd)	213177
76	Machine Bolt, 5/8"-11 x 1 3/4" lg. Square Head . (4 req'd)	13039
77	Lockwasher, 5/8"-11.	23356
78	Machine Bolt, 3/8"-16 x 6" lg. Square Head . . . (2 req'd)	12752
79	Fin. Hex. Nut, 3/8"-16 . . . . . (2 req'd)	63068
80	Spring Lockwasher, 3/8". . . . . (2 req'd)	23352

Per Order

Sheave	
Pulley	
V-Belt	
Alemite Compressor	221009
Socket Wrench.	222754

62- GUARD PLATES (2-REQ.) CAT. 225630
67- HOPPER " (2-REQ.) " 225631

LEHMAN 01893

LUBRICATION INSTRUCTIONS FOR JEFFREY DOUBLE ROLL CRUSHERS

The shafts on this type machine are mounted in bronze bushed type bearings. Do not unnecessarily load bearings with too tight drive belts. Immediately investigate and determine the cause of any abnormal heating of the bearings.

Bearings of this type are to be grease lubricated. The bearings should be lubricated with a high quality grease made by a reputable manufacturer and satisfactory for this service. The grease should be a multi-purpose, highly stable bearing grease with a water repellent soap base and a worked penetration of between 265 and 295 (NLGI #2) and suitable for temperatures from 5° below zero to approximately 250° F.. Jeffrey Lubricant No. 63 meets the above requirements. The time interval between greasing should be governed by the service expected. Small amounts of grease applied at close intervals will give much better service than large amounts applied at very infrequent intervals.

Keep bearings clean and free from grit. Use clean grease at all times. If grit and grease are allowed to mix and are present in the bearings their life will be very short. When greasing add sufficient grease so that it will work out the ends and force away any dirt and grit that may be present.

The gears should be lubricated frequently with a special grease to cut down on noise and also wear. The grease used should be a type made to be used on open gearing. (This applies only on crushers having countershaft drive.)

OPERATING INSTRUCTIONS FOR JEFFREY DOUBLE ROLL CRUSHERS

The crusher should be allowed to reach its full speed before any material is fed into it. The feed should enter the crusher so that it will strike as nearly as possible at the junction of the two rolls. It then can be crushed and discharged quickly, without being handled in the crusher more than is necessary. If the feed is either side of the junction of the rolls, the material will tend to churn around and this will result in lowered capacity.

Before turning off the power, when stopping the crusher, care should be taken to first shut off the feed and then allow sufficient time for all material to be completely discharged. This is important to eliminate danger of plugging, because if a plug-up should occur, the material must be cleaned out by hand as the crusher will not start under a loaded condition.

Periodic inspection should be made to check for wear and possibility of need for replacements parts. The main parts of wear on these crushers are the segments and bushings.

On crushers using manganese steel segments, the teeth can be rebuilt with "build-up" rod to the original shape and then hardcoated with a regular hardcoat or self-hardening rod. On crushers using white iron segments, the teeth cannot be rebuilt when worn down, but the segments must be replaced.

To replace the segments, remove the end housing covers. Remove the bolts from each individual segment. Replace with a new segment as each of the old ones are removed. This avoids extra time later on. Check all segment bolts and replace with new ones if the bolts are worn to any extent. In placing new segments on the rolls, make sure all bolts fit correctly and are tightened as tight as possible.

The bronze bushings used should be replaced before they are allowed to wear to the point where the housings are being damaged. If the bearings are properly and regularly lubricated as they should be, the bushings will give a lot of service. If the bearings are not properly lubricated, the bushings will wear rapidly and will have to be replaced at frequent intervals.

To replace the bushings, it is necessary to remove the bearing hold down rods and raise the crusher rolls to be able to get to the bushings. When the bushings are machined at the factory, they are match marked in pairs for proper alignment and they should be placed in the housing with the match marks together to provide proper alignment when installed.

The crusher can be set for different size products by adjusting the spacing between the rolls. This is accomplished by setting the adjusting rods as desired. The amount of pressure required to compress the springs can also be adjusted by the setting of the adjusting screw nuts on the adjusting rods. In setting either the clearance between the rolls or the spring adjustment, check to make sure that both sides of the machine are set equally to avoid unequal pressure on the two sides.

Order replacement parts by Mark (MK) No. or Part No., and also by the Catalog No. or Patt. No., from the Parts list furnished by The Jeffrey Manufacturing Company.

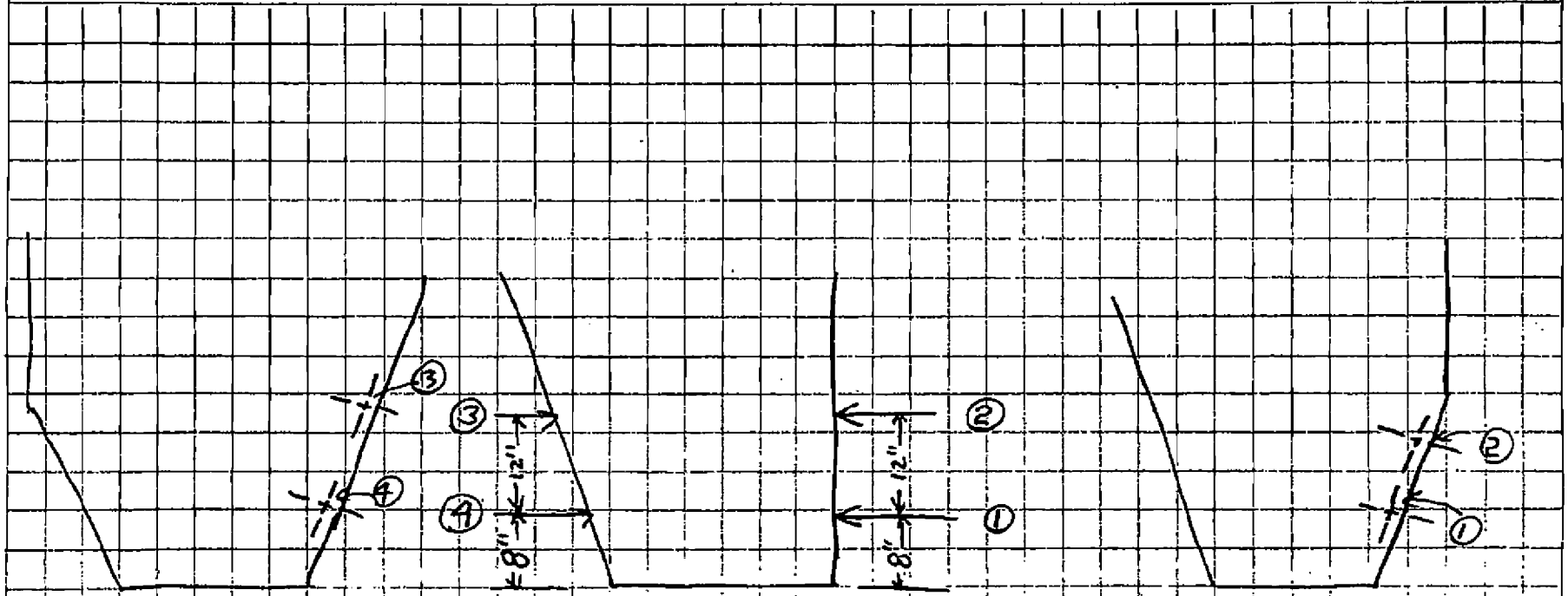
PULSONICS

LEHMAN 01896

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK20822C	SHEET OF
Part Name CRUDE MILL SUPPLY	SHOP ORDER
Quantity	BY hm
	DATE SEPT 22-1982

DESCRIPTION



LEFT END SIDE RIGHT END

ALL MTD CLOSE TO EDGE AS POSSIBLE

ALL ON "A" OF PROGRAMMER

PULSONICS CORPORATION

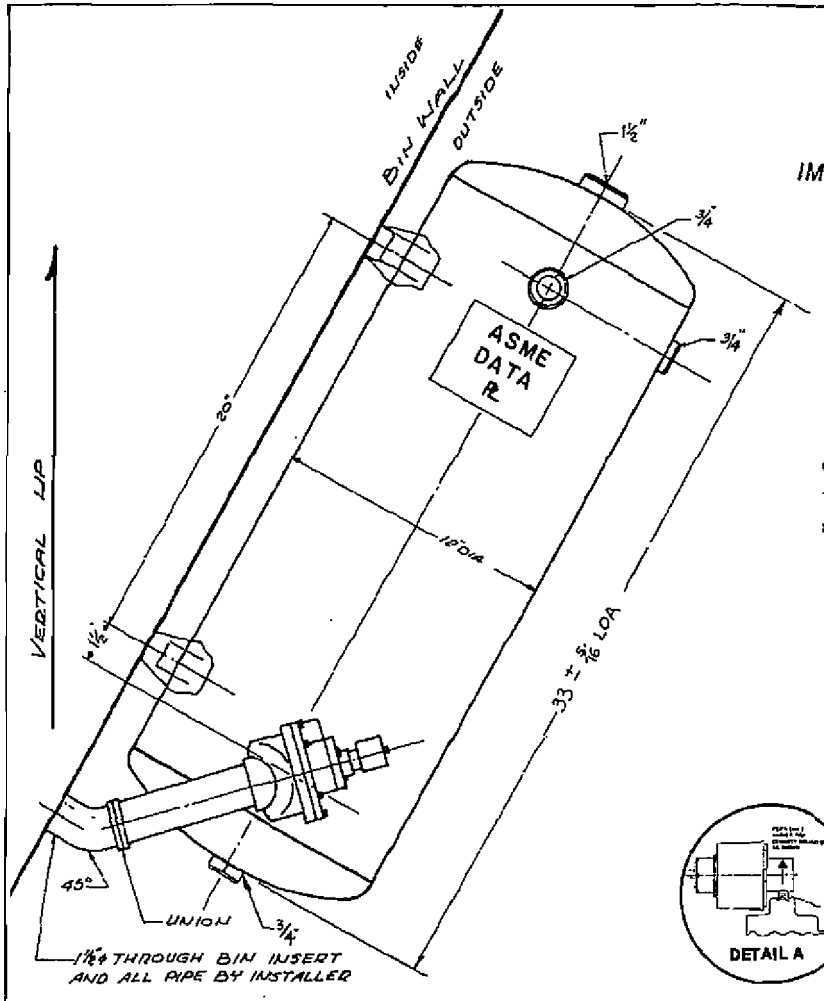
FORM 810522

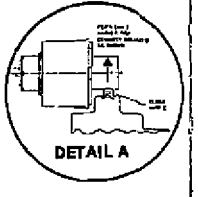
LEHMAN 01897

TYPICAL INSTALLATION LAYOUT

FOR INJECTOR MODEL E4015-4 NEMA 4 (FOR NEMA 7-9 SEE DETAIL A)

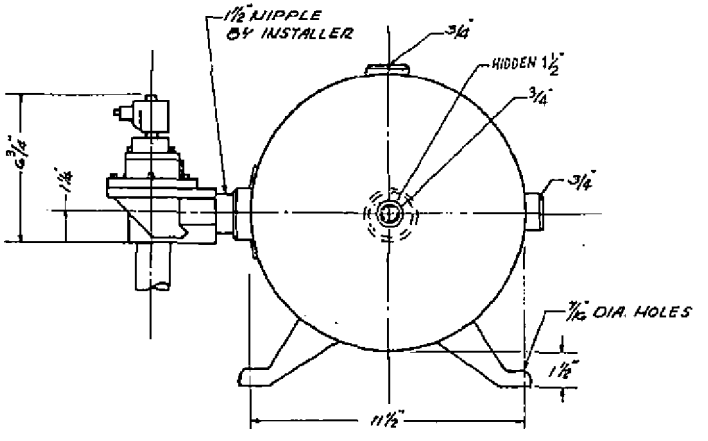
IMPORTANT: PRIOR TO INSTALLATION, REVIEW INSTRUCTIONS & CAUTION NOTES





CAUTION - The Pulsonic System injects multiple instantaneous blasts directly into the hopper or vessel at the pressure supplied to the injector at a frequency set by the programmer creating reaction forces of impact and vibration. The vessel or hopper must be sufficiently constructed to contain these forces without damage.

1. Position valve so it is vertically above the connection into the bin.
2. Secure tank positively to prevent any movement of assembly because with each energy release, there is a reaction force.
3. Connect valve inlet to tank with close nipple to fully restrain valve.
4. Connect valve outlet with pipe of minimum length for restrained entry into the bin wall at designated location. Secure piping to contain energy release with no movement to prevent damage.
5. The supply line is to have a manual shut-off valve and regulator adjustable to 110 PSI. A filter regulator is recommended to prevent foreign objects from entering the valve mechanism or hopper.
6. A manual drain valve should be installed at the lowest tank connection for periodic draining of condensate.
7. Proper venting of the air directed into the hopper or vessel is necessary.
8. All mechanical connections are to be per good mechanical practice in compliance with all applicable codes.



ASSEMBLY END VIEW WITH VALVE POSITION VERTICAL

PULSONICS
CORPORATION
999 AIRPORT ROAD, LAKEWOOD, N.J. 08701
PHONE: (201) 367-0800

TITLE	PULSONIC VIL	
DATE 1/8/80	DRAWING NUMBER 791227A	REV. 1

LEHMAN 01898

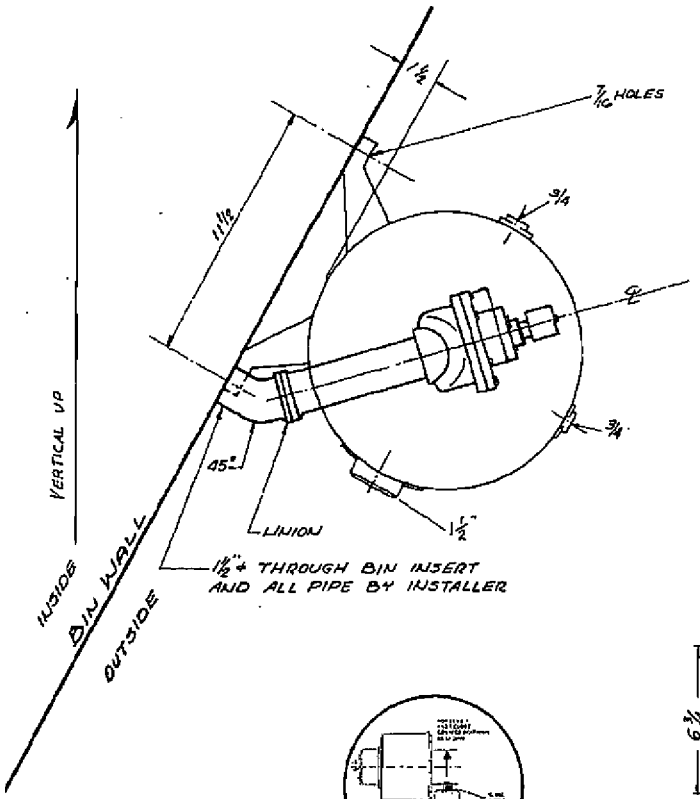
TYPICAL INSTALLATION LAYOUT

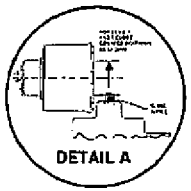
FOR INJECTOR MODEL E4015-4 NEMA 4 (FOR NEMA 7-9 SEE DETAIL A)

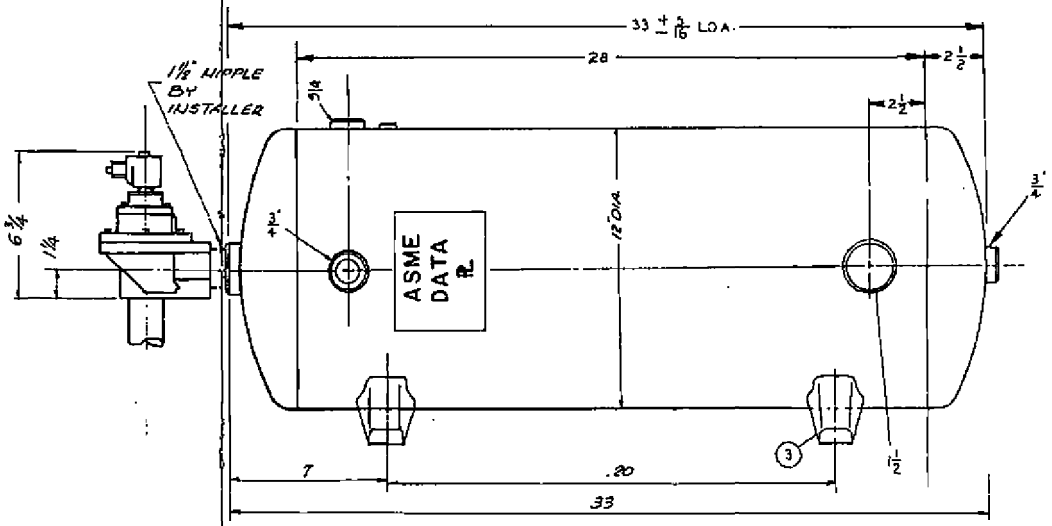
IMPORTANT: PRIOR TO INSTALLATION REVIEW INSTRUCTIONS & CAUTION NOTES

CAUTION - The Pulsonic System injects multiple instantaneous blasts directly into the hopper or vessel at the pressure supplied to the injector at a frequency set by the programmer creating reaction forces of impact and vibration. The vessel or hopper must be sufficiently constructed to contain these forces without damage.

1. Position valve so it is vertically above the connection into the bin.
2. Secure tank positively to prevent any movement of assembly because with each energy release, there is a reaction force.
3. Connect valve inlet to tank with close nipple to fully restrain valve.
4. Connect valve outlet with pipe of minimum length for restrained entry into the bin wall at designated location. Secure piping to contain energy release with no movement to prevent damage.
5. The supply line is to have a manual shut-off valve and regulator adjustable to 1 to 10 PSI. A filter regulator is recommended to prevent foreign objects from entering the valve mechanism or hopper.
6. A manual drain valve should be installed at the lowest tank connection for periodic draining of condensate.
7. Proper venting of the air directed into the hopper or vessel is necessary.
8. All mechanical connections are to be per good mechanical practice in compliance with all applicable codes.







ASSEMBLY SIDE PROJECTION WITH VALVE POSITION VERTICAL

PULSONICS
CORPORATION
999 AIRPORT ROAD, LAKEWOOD, N.J. 08701
PHONE: (201) 367-0800

TITLE		
PULSONIC TIL		
DATE 4/15/78	DRAWING NUMBER 770901A	REV. D

LEHMAN 01899

PULSONICS
CORPORATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

PARTIAL CUSTOMER LIST

Air Correction Div., (UOP Inc.)
Allied Chemical Corporation
Aluminum Co. of Canada Ltd.
Andco Power Industry Products Inc.
Anheuser-Busch Inc.
Armstrong World Industries Inc.
Asbury Graphite Mills Inc.
Bahnson Co.
Bally Block Co.
Canadian Millwork Inc.
Chicago Conveyor Corp.
Chicopee Research Div.
Ciba-Geigy Corp.
Conwed Corp.
C.P. Inc.
D.C.E Vokes Inc.
Discwasher Inc.
Dixie Manufacturing Co. Inc.
Dow Chemical Co.
Dresser Industries/Lodge-Cottrell
E.I. DuPont de Nemours & Co. Inc.
Dustell Ltd.
Exxon Chemical Co.
Flo Trend Systems Inc.
Ford Motor Co.
Foremost Machine Builders Inc.
General Electric Co.
W.R. Grace & Co.
Griffin Environmental Co. Inc.
Inland Steel Co.
Interrad Corp./General Motors Corp.
Lamson Corp.
Lever Brothers Co.
Lyndal Chemical Co.
Manchaug Corp.
Merck & Co.
Mikropul Corp.
Mobile Chemical Co.
Monsanto Co.
Morrison Inc.
Occidental Chemical Co.
Owens-Illinois Inc.
Pacific Smelting Co.
Pennsylvania Power Co.
Pullman-Kellogg
Research Cottrell Inc.
SASIB Corp. of America
Saytech Inc.
Semco Inc.
Shamrock Chemicals Corp.
Shell Chemical Co.
Sonic Corp./NPC Inc.
Southeastern Minerals Inc.
Southern Materials Co. Inc.
A.E. Staley Manufacturing Co.
Stauffer Chemical Co.
Steel Heddle Manufacturing Co.
Superior Steel Fabricators Inc.
Tenneco Inc.
Tennessee River Pulp & Paper Co.
Tonk Products
U.S. Gypsum Co.
U.S. Steel Corp.
Vertac Inc.
Wedco Inc.
Westinghouse Electric Corp.
Wheelabrator-Frye Inc.
Winders & Geist Inc.

Mr. Keith B. Lehman
Cyprus Industrial Minerals Company
September 22, 1982

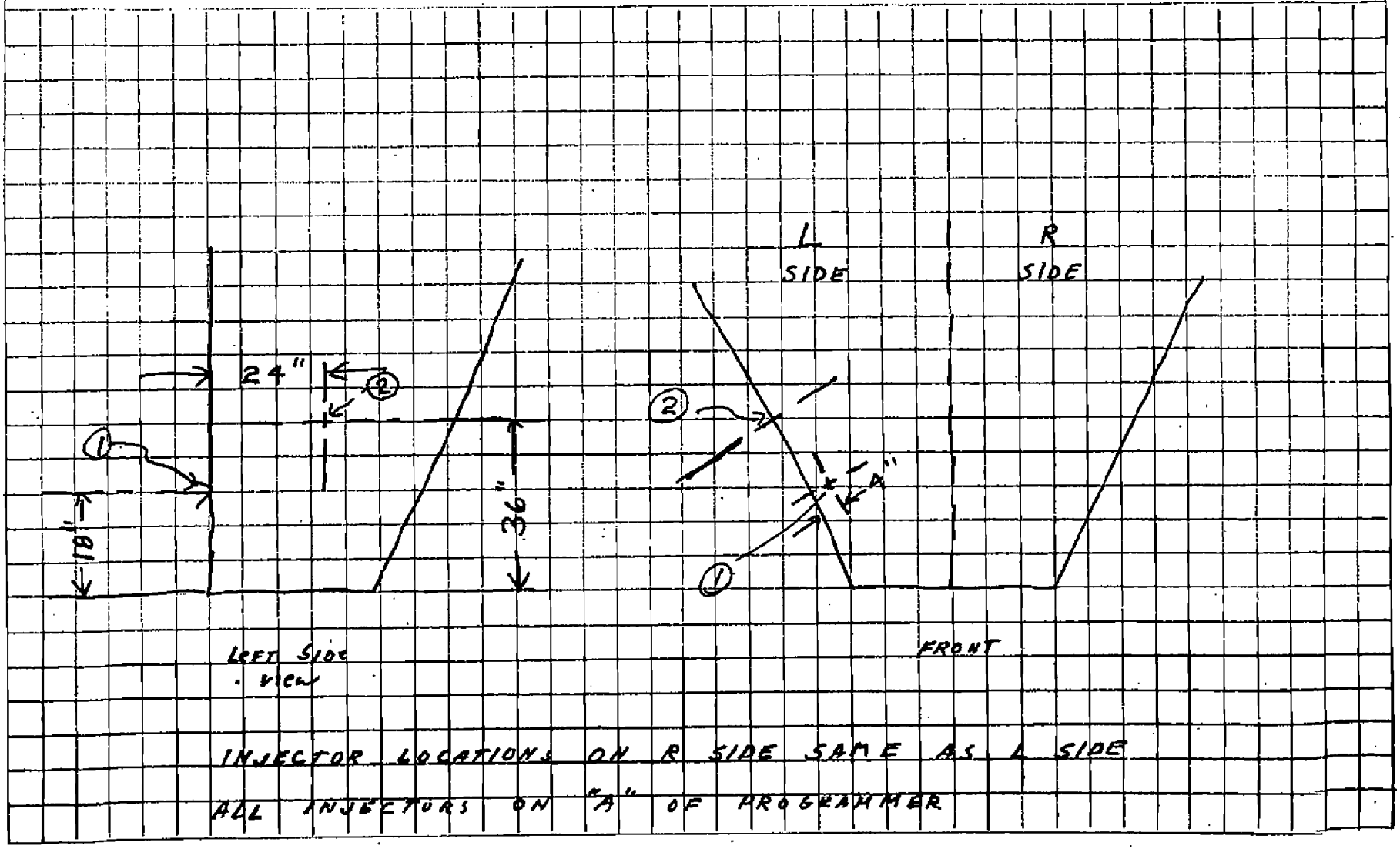
cc: Mr. Eric A. Persson
APM Technology

Enclosures: Sketch # SK20922D
Quotation # P820906
Sketch # SK20922B
Initial Settings Drawing #791237A-22B
Quotation # P820907
Sketch # SK20922C
Initial Settings Drawing #791237A-22C
Operating Logic Sheet # 791245A
Typical Installation Drawing #791227A
Partial List of Customers #80-17
Pulsonic Brochure #101A

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK 20922 B	SHEET OF
Part Name VERTICAL MILL PRODUCTS HOPPER	SHOP ORDER
Quantity	BY JM
	DATE Sept 22, 1982

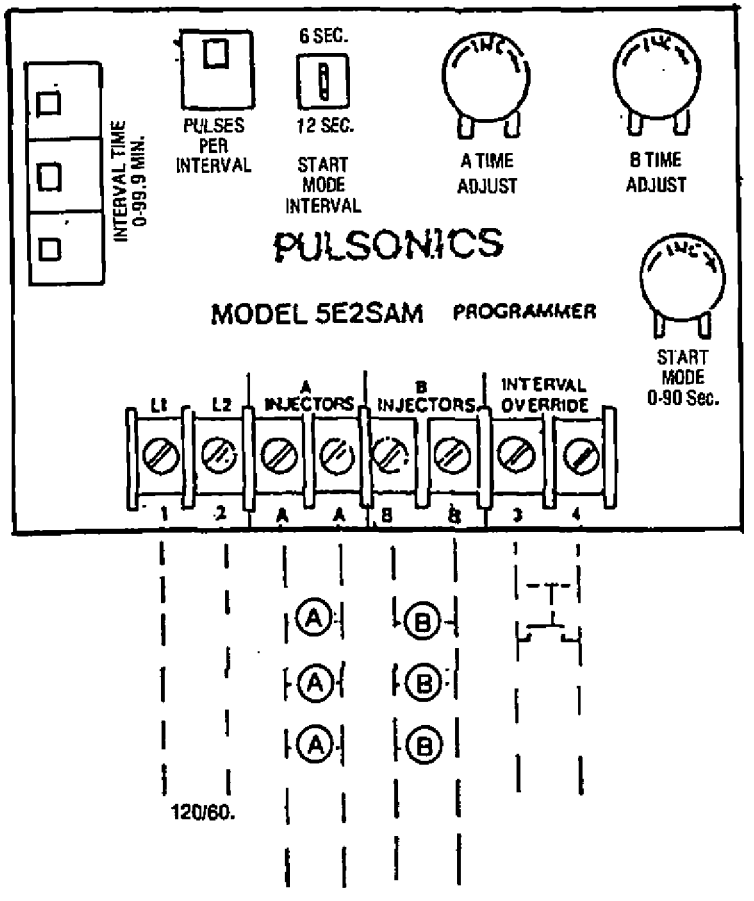
DESCRIPTION



PULSONICS CORPORATION

FORM 810522

LEHMAN 01902



- - - - FIELD WIRE BY INSTALLER

(A) A INJECTORS (10 MAX)

(B) B INJECTORS (10 MAX)

OPERATING LOGIC:

UPON APPLICATION OF POWER, THE A AND B INJECTORS ARE SEQUENTIALLY TURNED ON AND OFF FOR A NUMBER OF CYCLES DETERMINED BY THE SETTING OF THE PULSES PER INTERVAL SELECTOR SWITCH (0-9 PULSES). THE ON TIMES OF THE INJECTORS ARE ADJUSTABLE.

ALSO, UPON APPLICATION OF POWER, A TIME INTERVAL IS INITIATED, AFTER WHICH THE INJECTORS ARE AGAIN SEQUENTIALLY CYCLED. THE TIME INTERVAL IS ADJUSTABLE BY THE INTERVAL TIME THUMBWHEEL SWITCHES (0-99.9 MIN.). THE TIME INTERVAL IS REINITIATED AT THE END OF THE LOAD CYCLE.

UPON APPLICATION OF POWER, THE ADJUSTABLE START MODE FROM 0-90 SECONDS REPEATS THE SELECTED PROGRAM OF PULSES AT A 6 OR 12 SECOND INTERVAL. WITH THE DIP SWITCH IN THE 6 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 3 SECONDS AFTER POWER UP, AND AT 6 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. WITH THE DIP SWITCH IN THE 12 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 6 SECONDS AFTER POWER UP, AND AT 12 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. AFTER COMPLETION OF THE SELECTED START TIME, THE PROGRAMMER WILL CYCLE AT AN INTERVAL DETERMINED BY THE INTERVAL SELECTOR SWITCHES.

TERMINALS FOR INTERVAL OVERRIDE SWITCHES ARE PROVIDED TO INITIATE INJECTOR CYCLES ANYTIME DURING THE TIME INTERVAL WITHOUT RESETTING THE TIME INTERVAL.

WITH THE INTERVAL TIME SELECTOR SWITCHES SET TO 000, THE LOADS ARE ACTIVATED UPON APPLICATION OF POWER, AFTER WHICH THE LOADS ARE INOPERATIVE, EVEN WITH THE INTERVAL OVERRIDE SWITCH UNTIL A FINITE TIME IS SELECTED BY THE INTERVAL TIME SWITCHES.

TITLE

MODEL 5E2SAM
PROGRAMMER

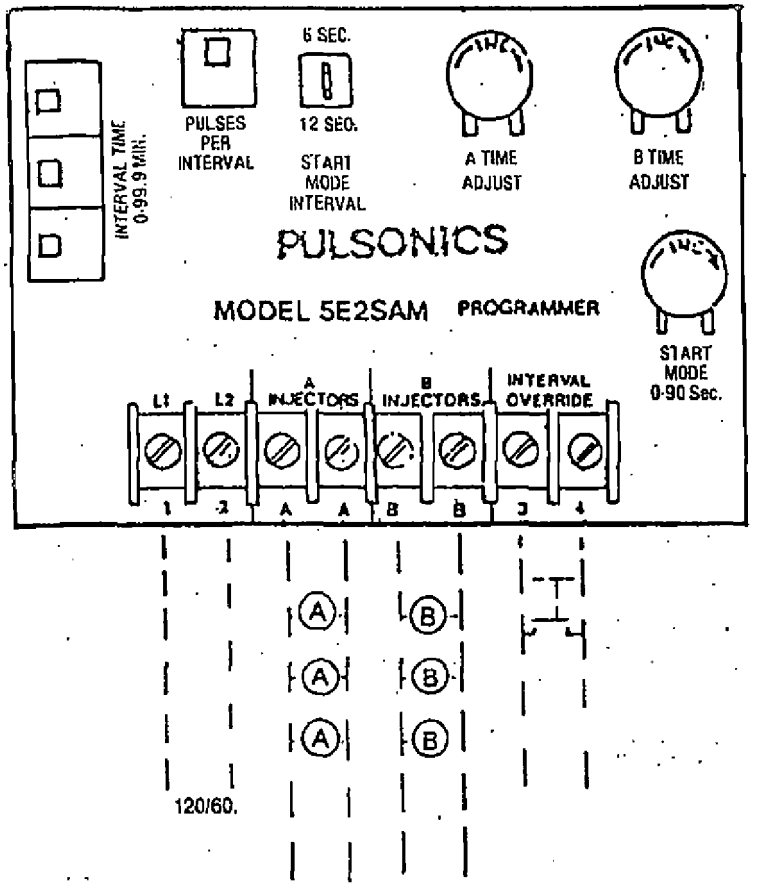
1. PHYSICAL LAYOUT
2. OPERATING LOGIC

PULSONICS CORPORATION
999 Airport Road, Lakewood, New Jersey 08701

DATE 9/21/81

DRAWING 791245A

LEHMAN 01903



– – – – FIELD WIRE BY INSTALLER

Ⓐ A INJECTORS (10 MAX)

Ⓑ B INJECTORS (10 MAX)

OPERATING LOGIC:

UPON APPLICATION OF POWER, THE A AND B INJECTORS ARE SEQUENTIALLY TURNED ON AND OFF FOR A NUMBER OF CYCLES DETERMINED BY THE SETTING OF THE PULSES PER INTERVAL SELECTOR SWITCH (0-9 PULSES). THE ON TIMES OF THE INJECTORS ARE ADJUSTABLE.

ALSO, UPON APPLICATION OF POWER, A TIME INTERVAL IS INITIATED, AFTER WHICH THE INJECTORS ARE AGAIN SEQUENTIALLY CYCLED. THE TIME INTERVAL IS ADJUSTABLE BY THE INTERVAL TIME THUMBWHEEL SWITCHES (0-99.9 MIN.). THE TIME INTERVAL IS REINITIATED AT THE END OF THE LOAD CYCLE.

UPON APPLICATION OF POWER, THE ADJUSTABLE START MODE FROM 0-90 SECONDS REPEATS THE SELECTED PROGRAM OF PULSES AT A 6 OR 12 SECOND INTERVAL. WITH THE DIP SWITCH IN THE 6 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 3 SECONDS AFTER POWER UP, AND AT 6 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. WITH THE DIP SWITCH IN THE 12 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 6 SECONDS AFTER POWER UP, AND AT 12 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. AFTER COMPLETION OF THE SELECTED START TIME, THE PROGRAMMER WILL CYCLE AT AN INTERVAL DETERMINED BY THE INTERVAL SELECTOR SWITCHES.

TERMINALS FOR INTERVAL OVERRIDE SWITCHES ARE PROVIDED TO INITIATE INJECTOR CYCLES ANYTIME DURING THE TIME INTERVAL WITHOUT RESETTING THE TIME INTERVAL.

WITH THE INTERVAL TIME SELECTOR SWITCHES SET TO .000, THE LOADS ARE ACTIVATED UPON APPLICATION OF POWER, AFTER WHICH THE LOADS ARE INOPERATIVE, EVEN WITH THE INTERVAL OVERRIDE SWITCH UNTIL A FINITE TIME IS SELECTED BY THE INTERVAL TIME SWITCHES.

TITLE

MODEL 5E2SAM
PROGRAMMER

1. PHYSICAL LAYOUT
2. OPERATING LOGIC

PULSONICS CORPORATION
999 Airport Road, Lakewood, New Jersey 08701

DATE 9/21/81

DRAWING 791245A

LEHMAN 01904

PULSONICS CORPORATION

TERMS AND CONDITIONS OF SALE

GENERAL CONDITIONS

(1) Prices are subject to change without notice, and are subject to correction of errors.

(2) All orders are subject to acceptance on receipt at Pulsonics Corporation.

(3) Invoicing will be at prices in effect at time of shipment.

(4) Quotations are void unless accepted within thirty (30) days from date quoted.

TAXES

Prices do not include any federal, state, or municipal sales, excise or other taxes which the Company may be required by law to collect. Such taxes will be billed in addition to the prices listed.

PACKAGING AND MARKING

Unless otherwise stated on quotation, will be in accordance with our standard practices.

CANCELLATION

All orders become firm commitments upon their acceptance. Thereafter they may not be cancelled or changed without Pulsonic's permission.

CLAIMS

No claim for shortages or error in shipment will be allowed unless reported in writing to the factory within ten (10) days from receipt of material. Title to merchandise passes to purchaser when goods are delivered to a carrier. Purchaser must file all claims for damage in transit with the carrier.

CONFLICT WITH PULSONIC CONTROLS TERMS AND CONDITIONS

Purchase orders containing language which modifies, adds to, is repugnant to or is inconsistent with Pulsonic's terms and conditions of sales as contained herein are accepted by Pulsonic only on the express condition that any such language in customer's purchase order shall be inoperative, and that the liabilities of Pulsonics shall be determined solely by Pulsonic's own terms and conditions of sale.

RETURNS

New and unused material returned for credit will not be accepted unless written permission has been given by the factory Only material of current design in active demand will be considered for return. Credit, if any, for such material is subject to a restocking charge based on date of manufacture.

GUARANTEE

All Pulsonic products are guaranteed against defective material or workmanship for a period of one year. Defective products or parts thereof returned to the factory with transportation charges prepaid and found by factory inspection to be defective, and not inoperative because of damage or abuse, will be replaced or repaired free of charge. The Company assumes no liability for consequential damages of any kind, including incidental labor or other costs

The guarantee is expressly in lieu of other warranties, obligations, or liabilities, expressed or implied, by the Company or its representatives All statutory or implied warranties, other than title, are hereby expressly negated and excluded.

Pulsonic products restricted or plugged by dirt or other foreign material from the system on which installed will not be considered as defective. Pulsonic products returned under the terms of this guarantee must be properly tagged indicating the reason for the return. The word "defective" alone will not justify free repair or replacement.

Products or parts thereof replaced or repaired under the conditions of this guarantee will be returned transportation charges prepaid within the United States by best and most economical means.

****

PULSONICS
CORPORATION

QUOTATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

For: Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080
(201) 754-4880

Our Quotation No. P820906
Date September 22, 1982
Attention: Mr. Keith B. Lehman
C/C Mr. Eric A. Persson

Reference: Vertical Mill Products

In accordance with the reference shown, we are pleased to quote as follows:

Pulsonic Bin Activator System to initiate and maintain free flow of fine talc from the storage silo hopper section. The system will include 1 programmer, Model# 5E2SAM-4, in a Nema 4 enclosure and 4 injectors, Model # E4015-4 having Nema 4 enclosures.

The Model # 5E2SAM programmer is to be field wired to the injectors and supplied from a 120/60 power source. When power is applied to the programmer, the injectors will be signaled per the selected operating logic as defined in Print # 791245A.

Each Model # E4015-4 injector consists of a solenoid controlled diaphragm valve to operate per the above programmer and a 2 cu. ft. code welded air reservoir. The reservoir and valves are to be close connected shown in the typical installation arrangements with all fittings, pipe and interconnections supplied by the installer.

☐ Further definition of injector locations, electrical connections and control will be provided on intent to purchase or placement of order.

☒ Recommended injector locations and electrical connections are per Print # SK 20922B.

Total Net $1625.00

DELIVERY Stock
TERMS Net 30 Days
F.O.B. Lakewood, N.J.
This Quotation to remain firm for _____ **days.**

Your favorable consideration will be much appreciated.

By: Michael M. Mokris

GUARANTEE:

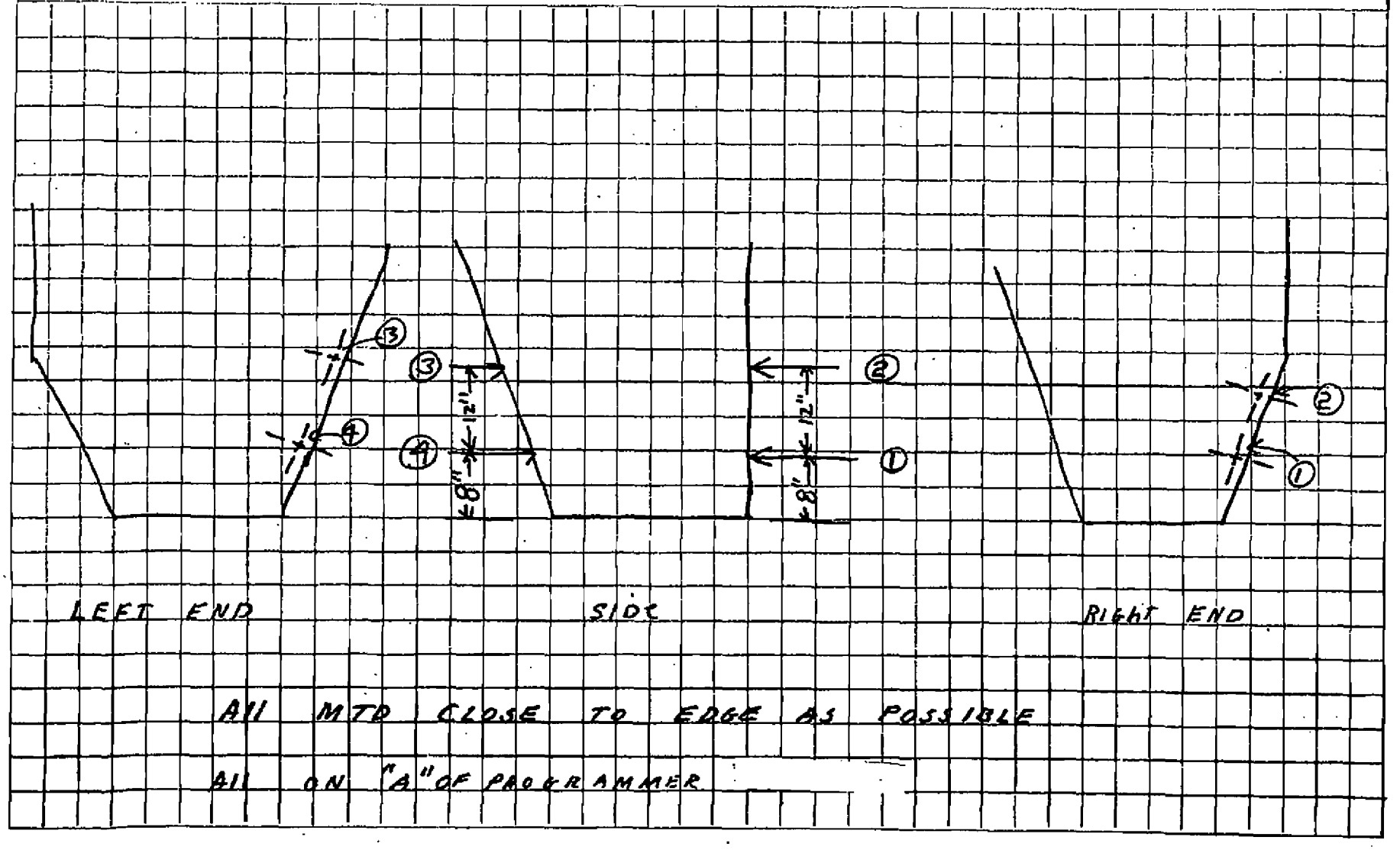
The Pulsonic bin activator system must perform to your complete satisfaction or it may be returned for full credit.

811002

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK20922C	SHEET OF
Part Name CRUDE MILL SUPPLY	SHOP ORDER
Quantity	BY JM
	DATE SEPT 22-1982

DESCRIPTION



ALL MTD CLOSE TO EDGE AS POSSIBLE

ALL ON "A" OF PROGRAMMER

FORM 810522

PULSONICS CORPORATION

LEHMAN 01907

PROGRAMMER

1. Interval Time 050 - Increase to conserve energy - decrease to maintain flow should flow diminish or stop as field conditions dictate.
2. Pulses Per Interval 3 - Decrease to conserve energy - Increase if flow not initiated.
3. "A Time Adjust ↖ - Adjust to most effective frequency and form.
4. "B" Time Adjust 4 - Adjust to most effective frequency and form.

PNEUMATIC

1. Set Supply Pressure 50 - PSIG - Test for best effective setting from lowest to highest.

The air per sequence from each injector at the above settings is 2.75 SCF (Not SCFM)

title: INITIAL SETTINGS	PULSONICS CORPORATION, 777 Airport Road, Lakewood, New Jersey 08701
CUSTOMER: CYPRUS – VERTICAL MILL	DATE: 3/81
DRAWING: 791237A – 22B	

LEHMAN 01908

PULSONICS
CORPORATION

QUOTATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201/367-6800

For: Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080
(201) 754-4880

Our Quotation No. P820907
Date September 22, 1982
Attention: Mr. Keith B. Lehman
C/C Mr. Eric A. Persson

Reference: Crude Mill Supply

In accordance with the reference shown, we are pleased to quote as follows:

Pulsonic Bin Activator System to initiate and maintain free flow of mixed talc from the storage silo hopper. The system will include 1 programmer, Model# 5E2SAM-12, in a Nema 12 enclosure and 4 injectors, Model # E4015-4 having Nema 4 enclosures.

The Model # 5E2SAM programmer is to be field wired to the injectors and supplied from a 120/60 power source. When power is applied to the programmer, the injectors will be signaled per the selected operating logic as defined in Print # 791245A.

Each Model # E4015-4 injector consists of a solenoid controlled diaphragm valve to operate per the above programmer and a 2 cu. ft. code welded air reservoir. The reservoir and valves are to be close connected shown in the typical installation arrangements with all fittings, pipe and interconnections supplied by the installer.

☐ Further definition of injector locations, electrical connections and control will be provided on intent to purchase or placement of order.

☒ Recommended injector locations and electrical connections are per Print # SK 20922C.

Total Net $1625.00

DELIVERY Stock
TERMS Net 30 Days
F.O.B. Lakewood, N.J.

Your favorable consideration will be much appreciated.

This Quotation to remain firm for _____ days. By: _____
Michael M. Mokris

GUARANTEE: *The Pulsonic bin activator system must perform to your complete satisfaction or it may be returned for full credit.*

811002

PULSONICS
CORPORATION

777 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

September 22, 1982

OCT 12 Rec'd

Mr. Keith B. Lehman
Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080

Subject: Quotation # P820906 and P820907

Dear Keith:

Thank you very much for your time on Thursday, September 16th when I called with Mr. Eric Persson of APM Technology when we discussed two flow probelms.

On Quotation # P820906 for the vertical mill products we have prepared a series of drawings, initial settings and are including supplemental data defining the operation and sequence of the system.

Please note that for the initial settings we anticipate operating at a relatively low pressure and anticipate it may even be less than this.

The system is quoted with one programmer and four injectors. With two sets of contacts it can be arranged that if draw down is from but one side of the split hopper only those injectors should be activated. The sketch # SK20922D shows a suggested schematic for this.

Quotation # P820907 is for the crude mill supply and you will note that we quoted the same programmer for both even though we initially spoke of using different programmers for each. Our reason for this is that the similarity could promote interchangeability and familiarity with adjustments.

We look forward to working with you on this project and with our offices close to your plant we could offer assistance on start up and tuning.

All of this equipment is quoted on a full money refund guarantee.

Very truly yours,

Mike

Michael M. Mokris

MMM/pap

PROGRAMMER

1.	Interval Time	050	- Increase to conserve energy - decrease to maintain flow should flow diminish or stop as field conditions dictate.
2.	Pulses Per Interval	3	- Decrease to conserve energy - Increase if flow not initiated.
3.	"A Time Adjust	R	- Adjust to most effective frequency and form.
4.	"B" Time Adjust	1	- Adjust to most effective frequency and form.

PNEUMATIC

1.	Set Supply Pressure	90	- PSIG - Test for best effective setting from lowest to highest.

The air per sequence from each injector at the above settings is 5.0 SCF (Not SCFM)

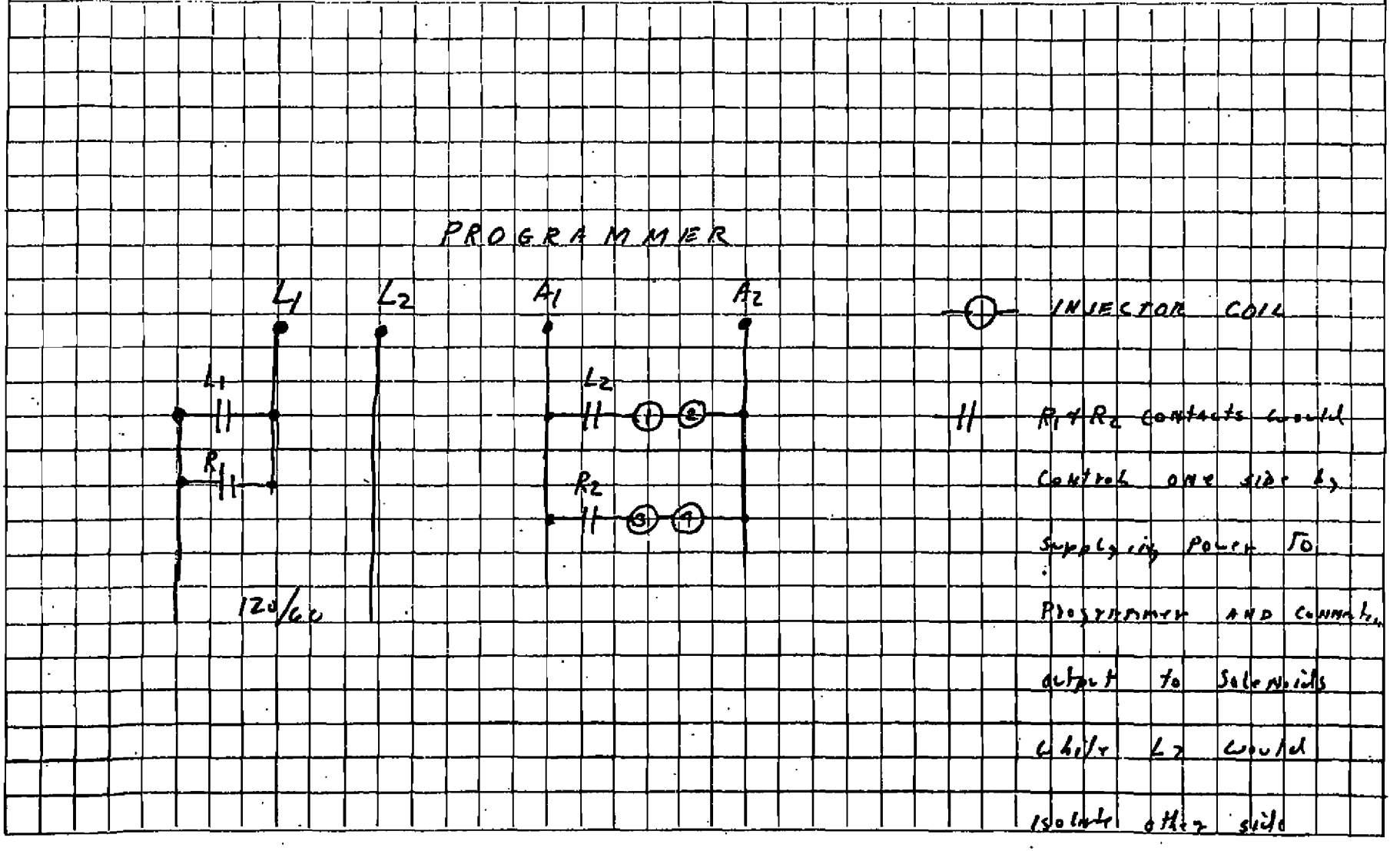
title: INITIAL SETTINGS		PULSONICS CORPORATION 777 Airport Road, Lakewood, New Jersey 08701	
CUSTOMER: CYPRUS- CRUDE MILL SUPLY	DATE: 3/81	DRAWING: 791237A-22C	

LEHMAN 01911

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK 209220	SHEET OF
Part Name VERTICAL MILL SUGGESTED ELEC SCHEMATIC	SHOP ORDER
Quantity	BY JMS
	DATE

DESCRIPTION



PULSONICS CORPORATION

FORM 810522

LEHMAN 01912

PROGRAMMER

1. Interval Time 050 - Increase to conserve energy - decrease to maintain flow should flow diminish or stop as field conditions dictate.
2. Pulses Per Interval 3 - Decrease to conserve energy - Increase if flow not initiated.
3. "A Time Adjust ↖ - Adjust to most effective frequency and form.
4. "B" Time Adjust 1 - Adjust to most effective frequency and form.

PNEUMATIC

1. Set Supply Pressure 50 - PSIG - Test for best effective setting from lowest to highest.

The air per sequence from each injector at the above settings is 2.75 SCF (Not SCFM)

title: INITIAL SETTINGS	PULSONICS CORPORATION 777 Airport Road, Lakewood, New Jersey 08701		
CUSTOMER: CYPRUS – VERTICAL MILL	DATE: 3/81	DRAWING: 791237A – 22B	

LEHMAN 01913

PULSONICS
CORPORATION

777 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

September 22, 1982

Mr. Keith B. Lehman
Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080

Subject: Quotation # P820906 and P820907

Dear Keith:

Thank you very much for your time on Thursday, September 16th when I called with Mr. Eric Persson of APM Technology when we discussed two flow probelms.

On Quotation # P820906 for the vertical mill products we have prepared a series of drawings, initial settings and are including supplemental data defining the operation and sequence of the system.

Please note that for the initial settings we anticipate operating at a relatively low pressure and anticipate it may even be less than this.

The system is quoted with one programmer and four injectors. With two sets of contacts it can be arranged that if draw down is from but one side of the split hopper only those injectors should be activated. The sketch # SK20922D shows a suggested schematic for this.

Quotation # P820907 is for the crude mill supply and you will note that we quoted the same programmer for both even though we initially spoke of using different programmers for each. Our reason for this is that the similarity could promote interchangeability and familiarity with adjustments.

We look forward to working with you on this project and with our offices close to your plant we could offer assistance on start up and tuning.

All of this equipment is quoted on a full money refund guarantee.

Very truly yours,

Mike

Michael M. Mokris

MMM/pap

Mr. Keith B. Lehman
Cyprus Industrial Minerals Company
September 22, 1982

cc: Mr. Eric A. Persson
APM Technology

Enclosures: Sketch # SK20922D
Quotation # P820906
Sketch # SK20922B
Initial Settings Drawing #791237A-22B
Quotation # P820907
Sketch # SK20922C
Initial Settings Drawing #791237A-22C
Operating Logic Sheet # 791245A
Typical Installation Drawing #791227A
Partial List of Customers #80-17
Pulsonic Brochure #101A

PULSONICS
CORPORATION

QUOTATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

For: Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080
(201) 754-4880

Our Quotation No. P820906
Date September 22, 1982
Attention: Mr. Keith B. Lehman
C/C Mr. Eric A. Persson

Reference: Vertical Mill Products

In accordance with the reference shown, we are pleased to quote as follows:

Pulsonic Bin Activator System to initiate and maintain free flow of fine talc from the storage silo hopper section. The system will include 1 programmer, Model# 5E2SAM-4, in a Nema 4 enclosure and 4 injectors, Model # E4015-4 having Nema 4 enclosures.

The Model # 5E2SAM programmer is to be field wired to the injectors and supplied from a 120/60 power source. When power is applied to the programmer, the injectors will be signaled per the selected operating logic as defined in Print # 791245A.

Each Model # E4015-4 injector consists of a solenoid controlled diaphragm valve to operate per the above programmer and a 2 cu. ft. code welded air reservoir. The reservoir and valves are to be close connected shown in the typical installation arrangements with all fittings, pipe and interconnections supplied by the installer.

☐ Further definition of injector locations, electrical connections and control will be provided on intent to purchase or placement of order.

☒ Recommended injector locations and electrical connections are per Print # SK 20922B.

Total Net $1625.00

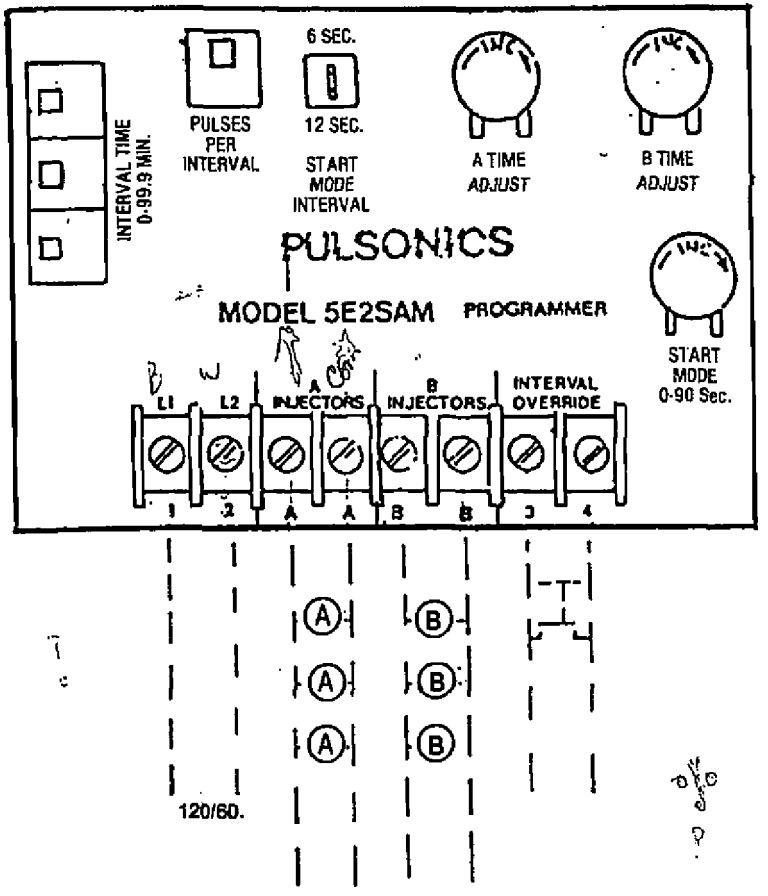
DELIVERY Stock
TERMS Net 30 Days
F.O.B. Lakewood, N.J.

Your favorable consideration will be much appreciated.

This Quotation to remain firm for _____ days. By: Michael M. Mokris

GUARANTEE: *The Pulsonic bin activator system must perform to your complete satisfaction or it may be returned for full credit.*

811002



– – – – FIELD WIRE BY INSTALLER

(A) A INJECTORS (10 MAX)

(B) B INJECTORS (10 MAX)

OPERATING LOGIC:

UPON APPLICATION OF POWER, THE A AND B INJECTORS ARE SEQUENTIALLY TURNED ON AND OFF FOR A NUMBER OF CYCLES DETERMINED BY THE SETTING OF THE PULSES PER INTERVAL SELECTOR SWITCH (0-9 PULSES). THE ON TIMES OF THE INJECTORS ARE ADJUSTABLE.

ALSO, UPON APPLICATION OF POWER, A TIME INTERVAL IS INITIATED, AFTER WHICH THE INJECTORS ARE AGAIN SEQUENTIALLY CYCLED. THE TIME INTERVAL IS ADJUSTABLE BY THE INTERVAL TIME THUMBWHEEL SWITCHES (0-99.9 MIN.). THE TIME INTERVAL IS REINITIATED AT THE END OF THE LOAD CYCLE.

UPON APPLICATION OF POWER, THE ADJUSTABLE START MODE FROM 0-90 SECONDS REPEATS THE SELECTED PROGRAM OF PULSES AT A 6 OR 12 SECOND INTERVAL. WITH THE DIP SWITCH IN THE 6 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 3 SECONDS AFTER POWER UP, AND AT 6 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. WITH THE DIP SWITCH IN THE 12 SECOND POSITION, THE SELECTED PROGRAM WILL OCCUR AT POWER UP, AT 6 SECONDS AFTER POWER UP, AND AT 12 SECOND INTERVALS THEREAFTER FOR THE DURATION OF SELECTED START TIME. AFTER COMPLETION OF THE SELECTED START TIME, THE PROGRAMMER WILL CYCLE AT AN INTERVAL DETERMINED BY THE INTERVAL SELECTOR SWITCHES.

TERMINALS FOR INTERVAL OVERRIDE SWITCHES ARE PROVIDED TO INITIATE INJECTOR CYCLES ANYTIME DURING THE TIME INTERVAL WITHOUT RESETTING THE TIME INTERVAL.

WITH THE INTERVAL TIME SELECTOR SWITCHES SET TO 000, THE LOADS ARE ACTIVATED UPON APPLICATION OF POWER, AFTER WHICH THE LOADS ARE INOPERATIVE, EVEN WITH THE INTERVAL OVERRIDE SWITCH UNTIL A FINITE TIME IS SELECTED BY THE INTERVAL TIME SWITCHES.

TITLE

MODEL 5E2SAM
PROGRAMMER

1. PHYSICAL LAYOUT
2. OPERATING LOGIC

PULSONICS CORPORATION
999 Airport Road, Lakewood, New Jersey 08701

DATE 9/21/81

DRAWING 791245A

LEHMAN 01947

PULSONICS
CORPORATION

QUOTATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

For: Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080
(201) 754-4880

Our Quotation No. P820907
Date September 22, 1982
Attention: Mr. Keith B. Lehman
C/C Mr. Eric A. Persson

Reference: Crude Mill Supply

In accordance with the reference shown, we are pleased to quote as follows:

Pulsonic Bin Activator System to initiate and maintain free flow of mixed talc from the storage silo hopper. The system will include 1 programmer, Model# 5E2SAM-12, in a Nema 12 enclosure and 4 injectors, Model # E4015-4 having Nema 4 enclosures.

The Model # 5E2SAM programmer is to be field wired to the injectors and supplied from a 120/60 power source. When power is applied to the programmer, the injectors will be signaled per the selected operating logic as defined in Print # 791245A.

Each Model # E4015-4 injector consists of a solenoid controlled diaphragm valve to operate per the above programmer and a 2 cu. ft. code welded air reservoir. The reservoir and valves are to be close connected shown in the typical installation arrangements with all fittings, pipe and interconnections supplied by the installer.

☐ Further definition of injector locations, electrical connections and control will be provided on intent to purchase or placement of order.

☒ Recommended injector locations and electrical connections are per Print # SK 20922C.

Total Net $1625.00

DELIVERY Stock
TERMS Net 30 Days
F.O.B. Lakewood, N.J.
This Quotation to remain firm for _____ days.

Your favorable consideration will be much appreciated.

By: Michael M. Mokris

GUARANTEE: *The Pulsonic bin activator system must perform to your complete satisfaction or it may be returned for full credit.*

811002

PULSONICS CORPORATION

TERMS AND CONDITIONS OF SALE

GENERAL CONDITIONS

(1) Prices are subject to change without notice, and are subject to correction of errors.

(2) All orders are subject to acceptance on receipt at Pulsonics Corporation.

(3) Invoicing will be at prices in effect at time of shipment.

(4) Quotations are void unless accepted within thirty (30) days from date quoted.

TAXES

Prices do not include any federal, state, or municipal sales, excise or other taxes which the Company may be required by law to collect. Such taxes will be billed in addition to the prices listed.

PACKAGING AND MARKING

Unless otherwise stated on quotation, will be in accordance with our standard practices.

CANCELLATION

All orders become firm commitments upon their acceptance. Thereafter they may not be cancelled or changed without Pulsonic's permission.

CLAIMS

No claim for shortages or error in shipment will be allowed unless reported in writing to the factory within ten (10) days from receipt of material. Title to merchandise passes to purchaser when goods are delivered to a carrier. Purchaser must file all claims for damage in transit with the carrier.

CONFLICT WITH PULSONIC CONTROLS TERMS AND CONDITIONS

Purchase orders containing language which modifies, adds to, is repugnant to or is inconsistent with Pulsonic's terms and conditions of sales as contained herein are accepted by Pulsonic only on the express condition that any such language in customer's purchase order shall be inoperative, and that the liabilities of Pulsonics shall be determined solely by Pulsonic's own terms and conditions of sale.

RETURNS

New and unused material returned for credit will not be accepted unless written permission has been given by the factory Only material of current design in active demand will be considered for return. Credit, if any, for such material is subject to a restocking charge based on date of manufacture.

GUARANTEE

All Pulsonic Products are guaranteed against defective material or workmanship for a period of one year. Defective products or parts thereof returned to the factory with transportation charges prepaid and found by factory inspection to be defective, and not inoperative because of damage or abuse, will be replaced or repaired free of charge. The Company assumes no liability for consequential damages of any kind, including incidental labor or other costs

The guarantee is expressly in lieu of other warranties, obligations, or liabilities, expressed or implied, by the Company or its representatives All statutory or implied warranties, other than title, are hereby expressly negated and excluded.

Pulsonic products restricted or plugged by dirt or other foreign material from the system on which installed will not be considered as defective. Pulsonic products returned under the terms of this guarantee must be properly tagged indicating the reason for the return. The word "defective" alone will not justify free repair or replacement.

Products or parts thereof replaced or repaired under the conditions of this guarantee will be returned transportation charges prepaid within the United States by best and most economical means.

****

PULSONICS
CORPORATION

999 Airport Road
~~Lakewood, New Jersey 08701~~
Bellville
Phone (201) ~~367-0800~~

OCT 14 Rec'd

LETTER OF TRANSMITTAL

DATE	JOB NO.
October 12, 1982	
ATTENTION: Mr. Keith B. Lehman	
RE: Pulsonic Quotation #'s P820906 & P820907	

TO: Cyprus Industrial Minerals Company
651 Metuchen Road
So. Plainfield, N.J. 07080

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:
☒ Drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications
☒ Copy of letter ☐ Change order ☒ Quotations

COPIES	DATE	NO.	DESCRIPTION
1	9/22/82	Letter	Letter dated September 22, 1982 from Michael M. Mokris
1	9/22/82	SK20922D	Vertical Mill Suggested Electrical Schematic
1	9/22/82	P820906	Quotation Ref: Vertical Mill Products
1	9/22/82	SK20922B	Vertical Mill Products Hopper
1	3/81	791237A-22B	Initial Settings Drawing - Vertical Mill
1	9/22/82	P820907	Quotation Ref: Crude Mill Supply
1	9/22/82	SK20922C	Crude Mill Supply
1	3/81	791237A-22C	Initial Settings Drawing - Crude Mill Supply
1	9/21/81	791245A	Operating Logic Sheet Model 5E2SAM Programmer
1	1/8/80	791227A	Typical Installation Drawing Rev.1 Injector E4015-4, 7&9
1		80-17	Partial List of Customers
1		101A	Pulsonic Brochure

THESE ARE TRANSMITTED as checked below:
☐ For approval ☒ As requested by Mr. Eric Persson - APM Technology
☐ For your use ☐ For review and comment
☐ _____
☐ FOR BIDS DUE _____ 19____

REMARKS Mr. Persson had mentioned in our telephone conversation yesterday that you had not yet received the originals of all of the above listed documents.whereas he had already received his photocopies. Possibility that they were lost in mail so am forwarding these copies.

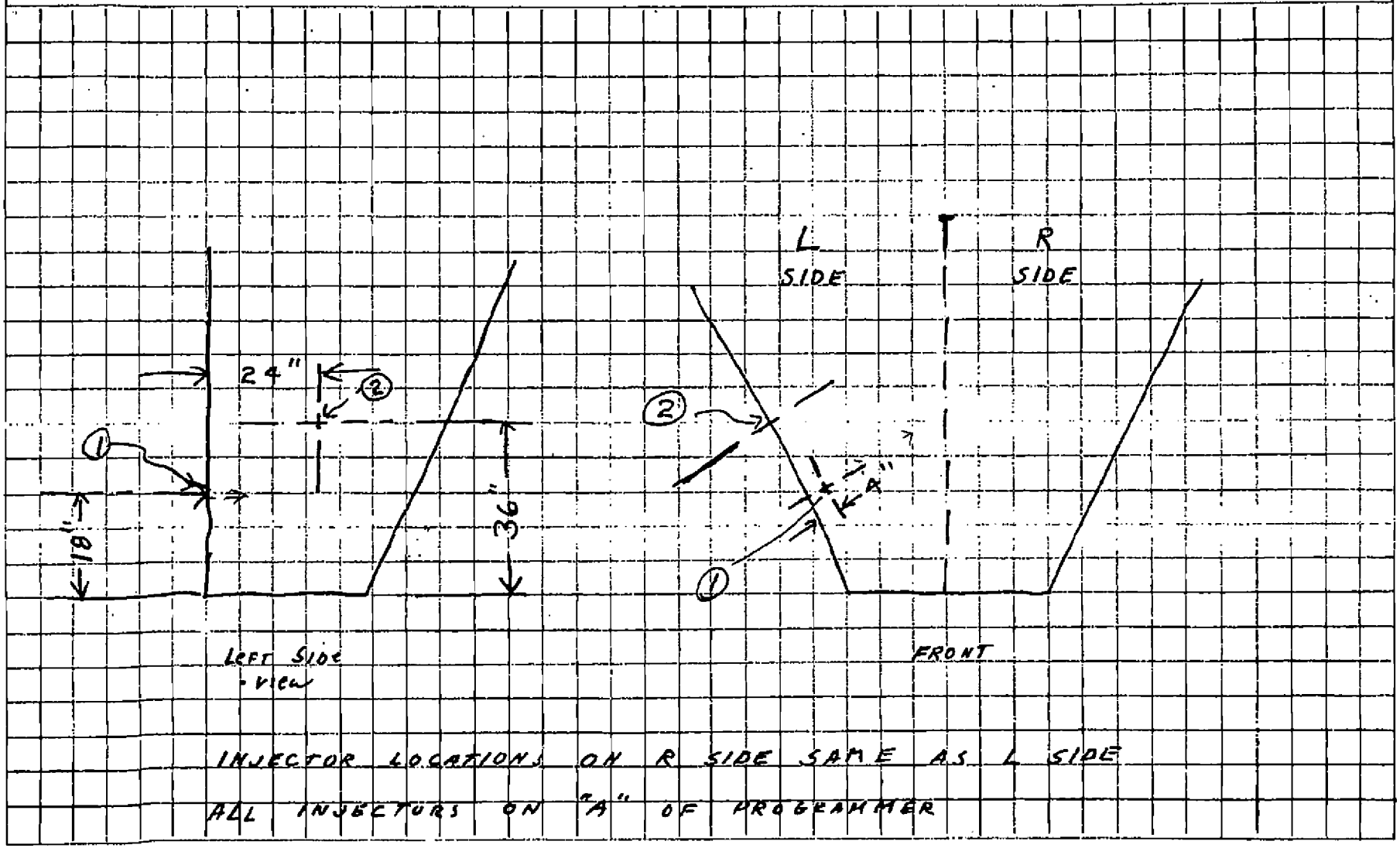
COPY TO _____ SIGNED: Pat pizzolorusso

810512

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK 20922 B	SHEET OF
Part Name VERTICAL MILL PRODUCTS HOPPER	SHOP ORDER
Quantity	BY JM
	DATE Sept 22, 1982

DESCRIPTION



PULSONICS CORPORATION

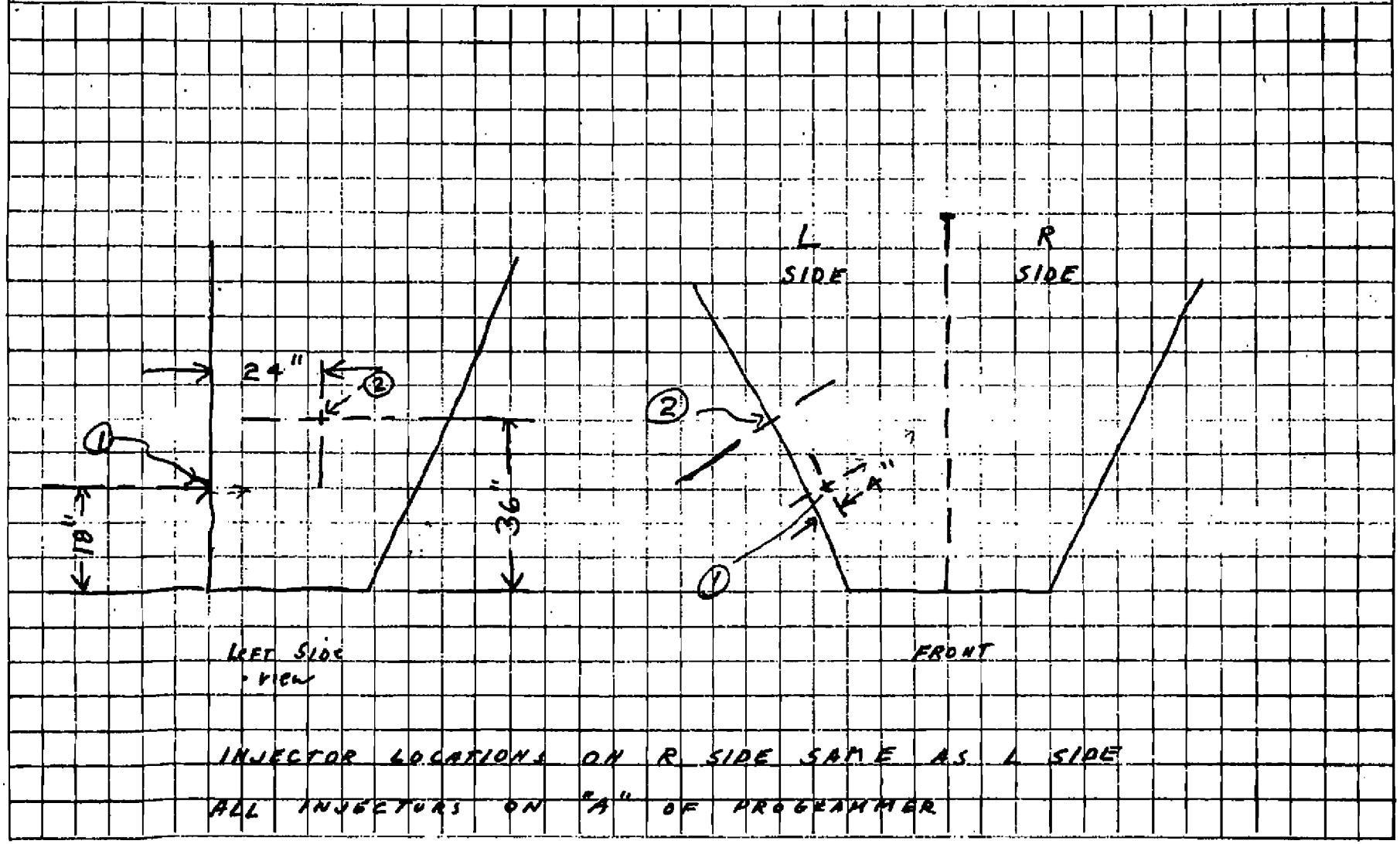
FORM 810522

LEHMAN 01921

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK 20922 B	SHEET OF
Part Name VERTICAL MILL PRODUCTS HOPPER	SHOP ORDER
Quantity	BY bm
	DATE Sept 22, 1982

DESCRIPTION



INJECTOR LOCATIONS ON R SIDE SAME AS L SIDE

ALL INJECTORS ON "A" OF PROGRAMMER

FORM 810522

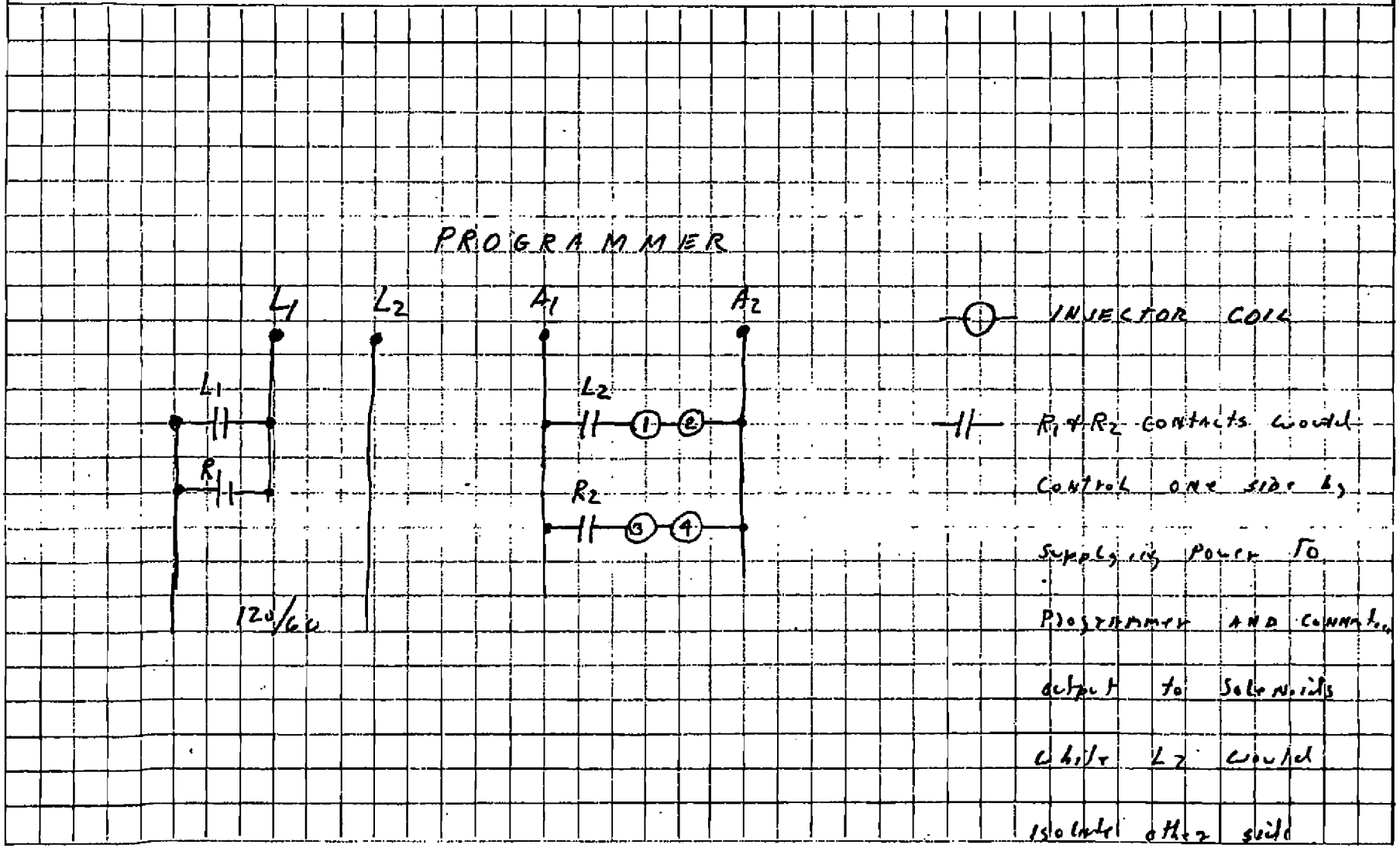
PULSONICS CORPORATION

LEHMAN 01922

QUOTATION SHEET

Customer CYPRUS	OPERATION NO.
Part No. SK 209220	SHEET OF
Part Name VERTICAL MILL SUGGESTED ELEC SCHEMATIC	SHOP ORDER
Quantity	BY JMS
	DATE

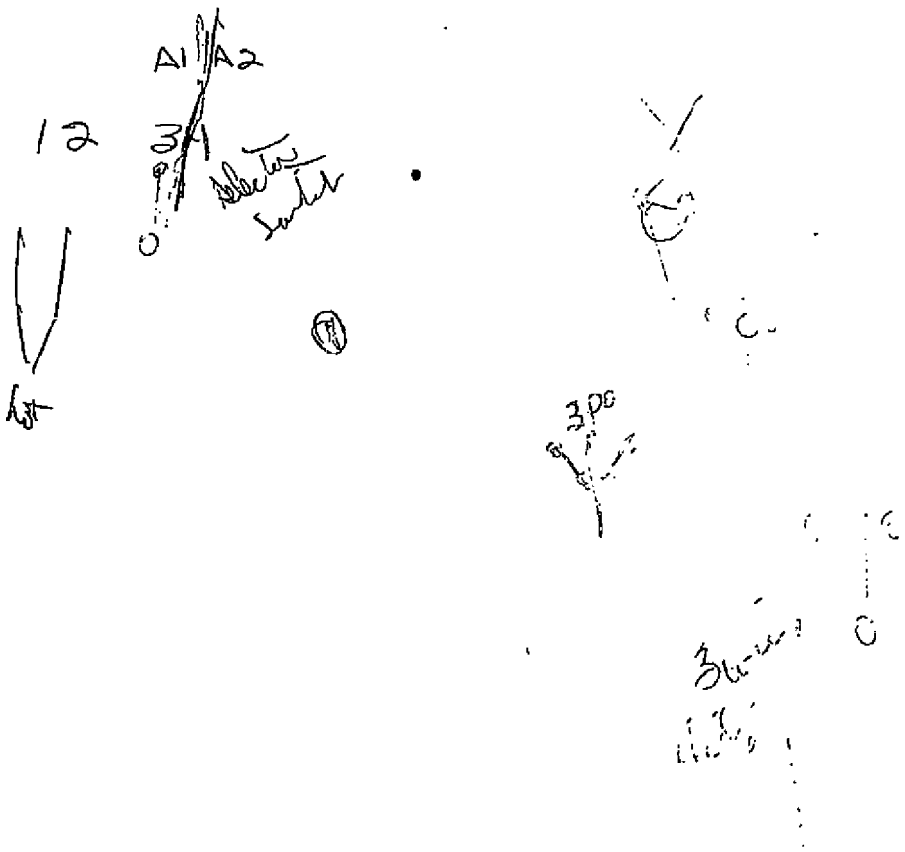
DESCRIPTION



PULSONICS CORPORATION

FORM 810522

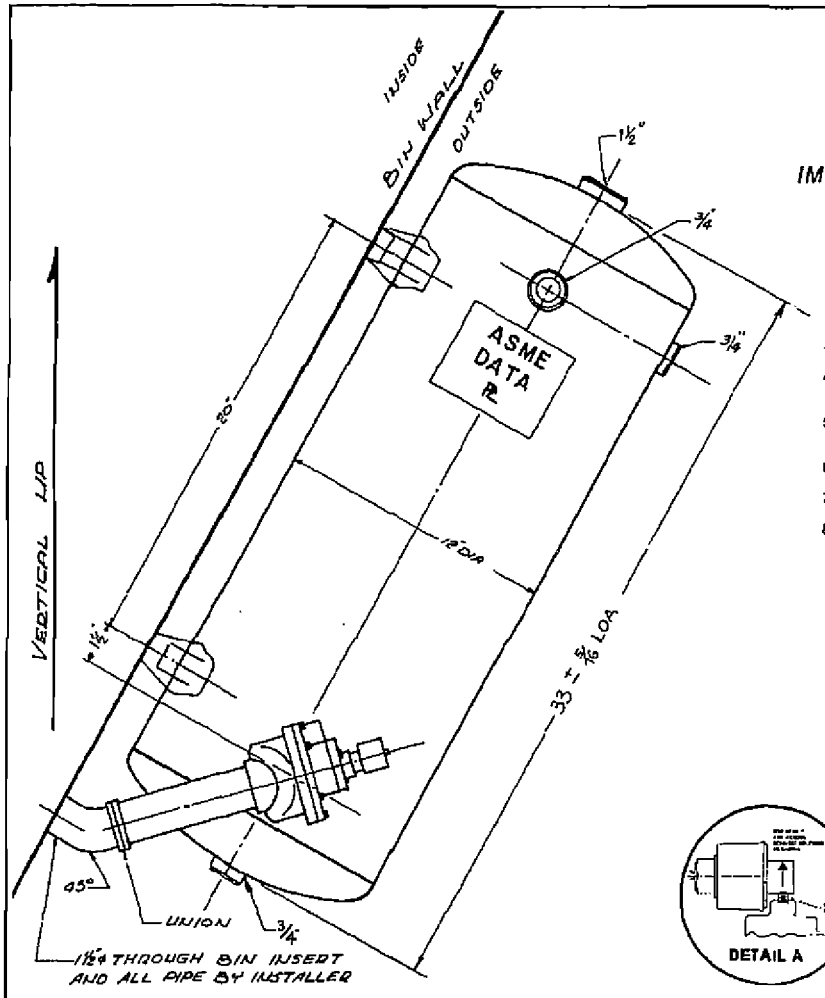
LEHMAN 01923

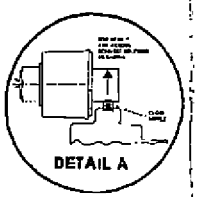

A1
A2
12
3
3PC

TYPICAL INSTALLATION LAYOUT

FOR INJECTOR MODEL E4015-4 NEMA 4 (FOR NEMA 7-9 SEE DETAIL A)

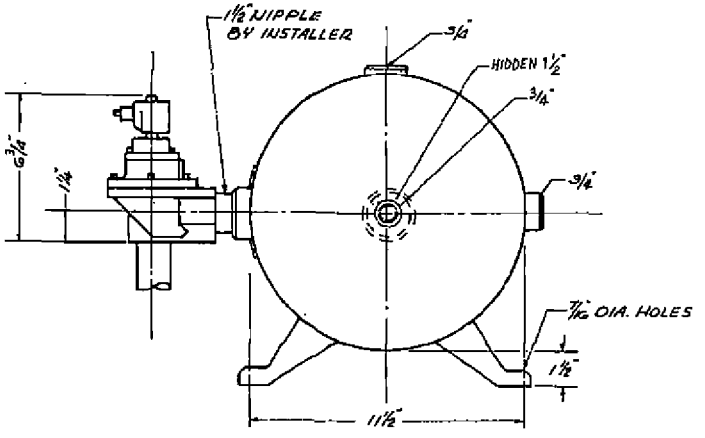
IMPORTANT: PRIOR TO INSTALLATION REVIEW INSTRUCTIONS & CAUTION NOTES





CAUTION - The Pulsonic System injects multiple instantaneous blasts directly into the hopper or vessel at the pressure supplied to the injector at a frequency set by the programmer creating reaction forces of impact and vibration. The vessel or hopper must be sufficiently constructed to contain these forces without damage.

1. Position valve so it is vertically above the connection into the bin.
2. Secure tank positively to prevent any movement of assembly because with each energy release, there is a reaction force.
3. Connect valve inlet to tank with close nipple to fully restrain valve.
4. Connect valve outlet with pipe of minimum length for restrained entry into the bin wall at designated location. Secure piping to contain energy release with no movement to prevent damage.
5. The supply line is to have a manual shut-off valve and regulator adjustable to 110 PSI. A filter regulator is recommended to prevent foreign objects from entering the valve mechanism or hopper.
6. A manual drain valve should be installed at the lowest tank connection for periodic draining of condensate.
7. Proper venting of the air directed into the hopper or vessel is necessary.
8. All mechanical connections are to be per good mechanical practice in compliance with all applicable codes.



ASSEMBLY END VIEW WITH VALVE POSITION VERTICAL

PULSONICS
CORPORATION
999 AIRPORT ROAD, LAKEWOOD, N.J. 08701
PHONE: (201) 367-0800

TITLE		
PULSONIC VIL		
DATE 1/8/80	DRAWING NUMBER 791227A	REV. 1

LEHMAN 01925

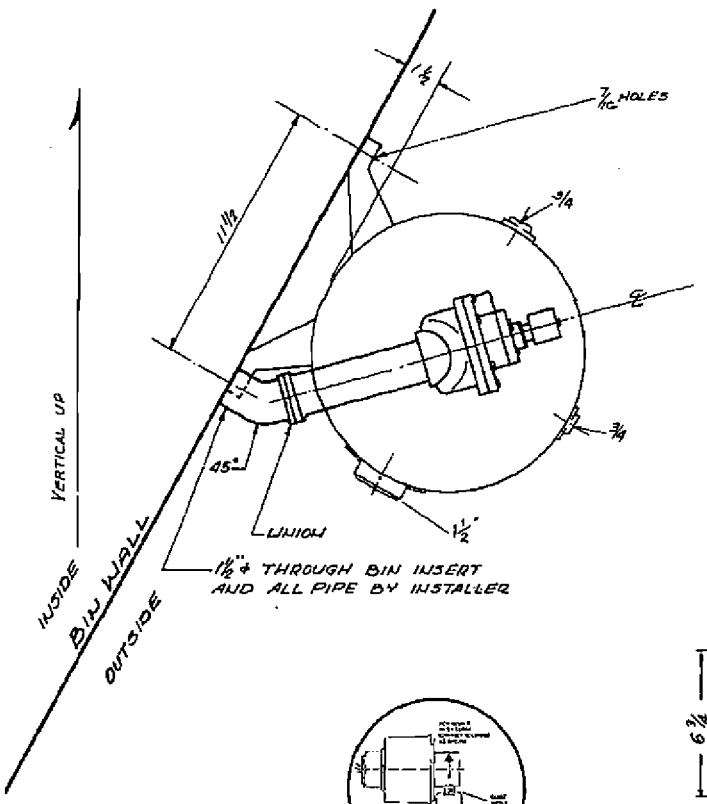
TYPICAL INSTALLATION LAYOUT

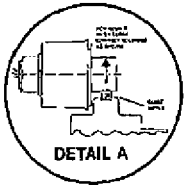
FOR INJECTOR MODEL E4015-4 NEMA 4 (FOR NEMA 7-9 SEE DETAIL A)

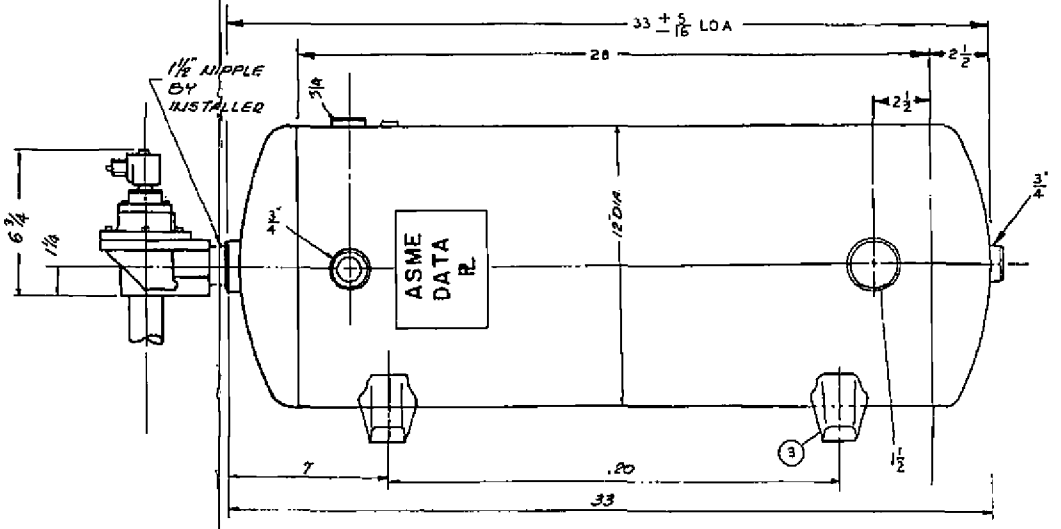
IMPORTANT: PRIOR TO INSTALLATION REVIEW INSTRUCTIONS & CAUTION NOTES

CAUTION - The Pulsonic System injects multiple instantaneous blasts directly into the hopper or vessel at the pressure supplied to the injector at a frequency set by the programmer creating reaction forces of impact and vibration. The vessel or hopper must be sufficiently constructed to contain these forces without damage.

1. Position valve so it is vertically above the connection into the bin.
2. Secure tank positively to prevent any movement of assembly because with each energy release, there is a reaction force.
3. Connect valve inlet to tank with close nipple to fully restrain valve.
4. Connect valve outlet with pipe of minimum length for restrained entry into the bin wall at designated location. Secure piping to contain energy release with no movement to prevent damage.
5. The supply line is to have a manual shut-off valve and regulator adjustable to 110 PSI. A filter regulator is recommended to prevent foreign objects from entering the valve mechanism or hopper.
6. A manual drain valve should be installed at the lowest tank connection for periodic draining of condensate.
7. Proper venting of the air directed into the hopper or vessel is necessary.
8. All mechanical connections are to be per good mechanical practice in compliance with all applicable codes.







ASSEMBLY SIDE PROJECTION WITH VALVE POSITION VERTICAL

PULSONICS
CORPORATION
899 AIRPORT ROAD, LAKEWOOD, N.J. 08701
PHONE: (201) 367-0800

TITLE		
PULSONIC TIL		
DATE 4/15/78	DRAWING NUMBER 770901A	REV. D

LEHMAN 01926

PULSONICS
CORPORATION

999 AIRPORT ROAD
LAKEWOOD, NEW JERSEY 08701
201-367-0800

PARTIAL CUSTOMER LIST

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Allied Chemical Corporation
Aluminum Co. of Canada Ltd.
Andco Power Industry Products Inc.
Anheuser-Busch Inc.
Armstrong World Industries Inc.
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Bahnson Co.
Bally Block Co.
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Manchaug Corp.
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Mobile Chemical Co.
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Scotch® 7664 "Post-it" Routing-Request Pad

ROUTING - REQUEST

Please

- [x] READ
- [ ] HANDLE
- [ ] APPROVE

and

- [ ] FORWARD
- [x] RETURN
- [ ] KEEP OR DISCARD
- [ ] REVIEW WITH ME

Date _____

To JK

RJB SAYS
Thru USE
these IN
ALPINE FOR
Packer Bags

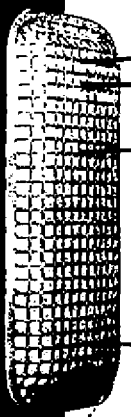
Room AREATION

A TYPICAL EXAMPLE

of BIN-FLO

efficiency

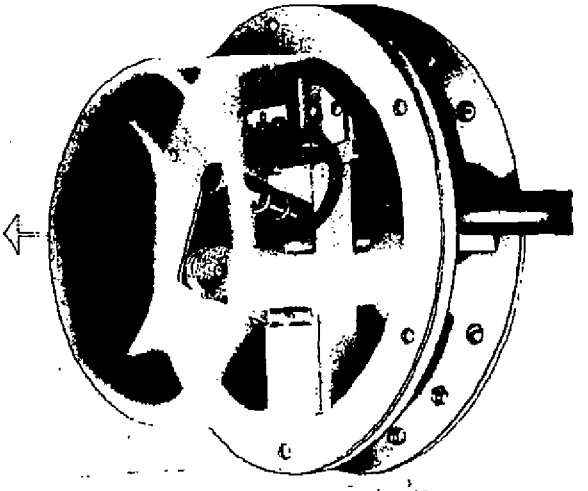
The labor saving advantages of Bin-Flo Aerators are obvious. A cement company, for example, reports that Bin-Flo units on silo bottoms and in Fuller-Huron air feeders bring cement in a steady flow from a battery of 40 silos each 90 feet tall. It is no longer necessary to have men feed cement from the silos into the conveyors. The air supply to the Bin-Flo units is controlled automatically by solenoid valves actuated by Bin-Dicator level indicators on the conveyors.



BIN-FLO AERATOR

- **Replaces mechanical vibrators.**
- **Replaces men with hammers or rods.**
- **Replaces high pressure air systems.**

FORM NO. BF-1 10M-9-55 LITHO IN U. S. A.



THE BIN-DICATOR COMPANY
P. O. Box 3708
DETROIT 15, MICHIGAN

BIN-FLO AERATOR
is a product of
THE BIN-DICATOR CO.

The Bin-Dicator, a material level indicator, is in use by hundreds of firms handling bulk materials. It consists of a diaphragm operated switch used successfully on materials ranging in weight from 4 to 350 lbs. p.c.f.

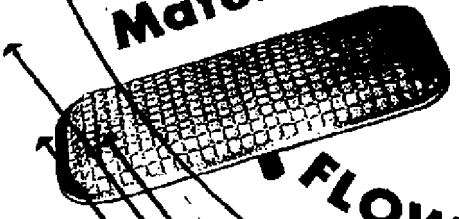
Illustrated is the standard Model "A" Bin-Dicator with Mercury switch. Other models are available with sensitive Micro Switch for light materials or explosion-proof Micro Switch for hazardous locations. Write for details.

Model-L — 55 14.50

L — 6"

LL — 12"

Keep Bulk Materials



FLOWING

TYPICAL BIN-FLO AERATOR LAYOUTS

THE LAYOUTS shown below are typical of many installations. Our engineering department is prepared to make other recommendations and layouts for your particular problem. Just submit dimensional sketches or drawings of your bins and state the type of material being handled. If a number of bins are involved, a brief description of the operating characteristics of your system will be helpful.

BIN-FLO AERATORS ARE EASY TO INSTALL

A Bin-Flo Aerator layout can be designed for any of the many variations in bin size and design by adhering to a few simple rules:

1. Bin-Flo units should be placed in rows (as illustrated below) at points of restricted flow. The number of units required depends upon the spacing of the units and the size and design of the bin.

2. Bin-Flo units should be placed 12' to 15' on centers, with the first unit in each row placed as near to the edge of the outlet as possible.

3. The number of rows of Bin-Flo units to be used depends upon the nature of the material and the operating objective. If the material shows unusual resistance to flow, or if it is important to empty the bin as completely as possible rather than to provide steady flow, more rows of Bin-Flo units will be required.

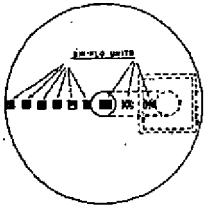


Figure 1

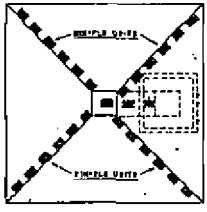


Figure 2

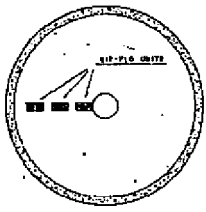


Figure 3

Bins with Conical Bottoms

One row of BIN-FLO aerator units is usually sufficient to promote flow of material from bins of this type. Additional rows of BIN-FLO aerator units may be provided, located at the quarter points of the hopper bottom, if the material exhibits very poor flow characteristics, and if more complete emptying of the bin is desired.

To prevent clogging of material in the discharge pipe or chute, one row of BIN-FLO aerator units should be provided on the underside of the slope as shown above.

Bins with Pyramidal Bottoms

One row of BIN-FLO aerator units should be carried up each of the four valleys of the bin bottom. Normally on a bin of this type, it is necessary to operate only one row of the BIN-FLO aerator units at one time, while emptying the bin. However, it is usually desirable to install the additional rows of BIN-FLO units to provide more complete emptying of the bin and to utilize the full working capacity of the bin.

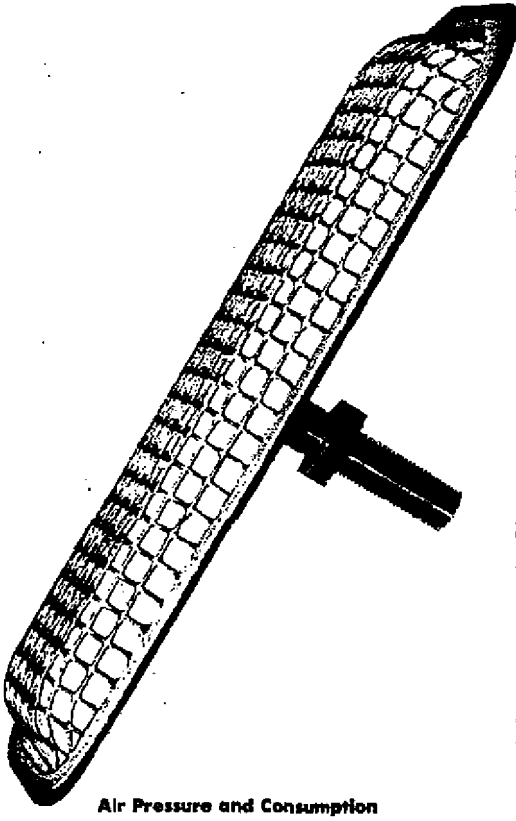
Bins or Silos with Flat Bottoms

One row of BIN-FLO aerator units placed on the flat bottom of bins or silos is usually sufficient to promote flow of material from a bin of this type. Additional rows of BIN-FLO aerator units placed at the quarter points of the flat bottom will result in more complete emptying of the bin and increased effective storage capacity.

Model "M" or Model "O" BIN-FLO units suitable for these applications.

LEHMAN 01930

AIR SUPPLY DATA



Air Pressure and Consumption

The nature and flow characteristics of material will determine the required amount of air pressure. The recommended pressure is 1 to 5 p.s.i. The most efficient pressure can be determined by making a small test installation and observing the results under various air pressures.

Bin-Flo Aerators require from 3 to 7 C.F.M. of air at the above recommended pressures.

Air Supply

Air for the Bin-Flo system can be furnished by any one of several methods.

Existing compressed air supply may be used with a pressure reducing regulator of adequate capacity for the number of Bin-Flo units to be supplied. For small test installations, a hand operated needle valve and pressure gauge may be employed.

Low pressure blowers of the Roots-Connersville type are a satisfactory and economical means of supplying air for the Bin-Flo system. These rotary, positive displacement blowers are available in a number of sizes and pressure ranges.

We will gladly recommend blowers suitable for your Bin-Flo system.

Air Supply Piping

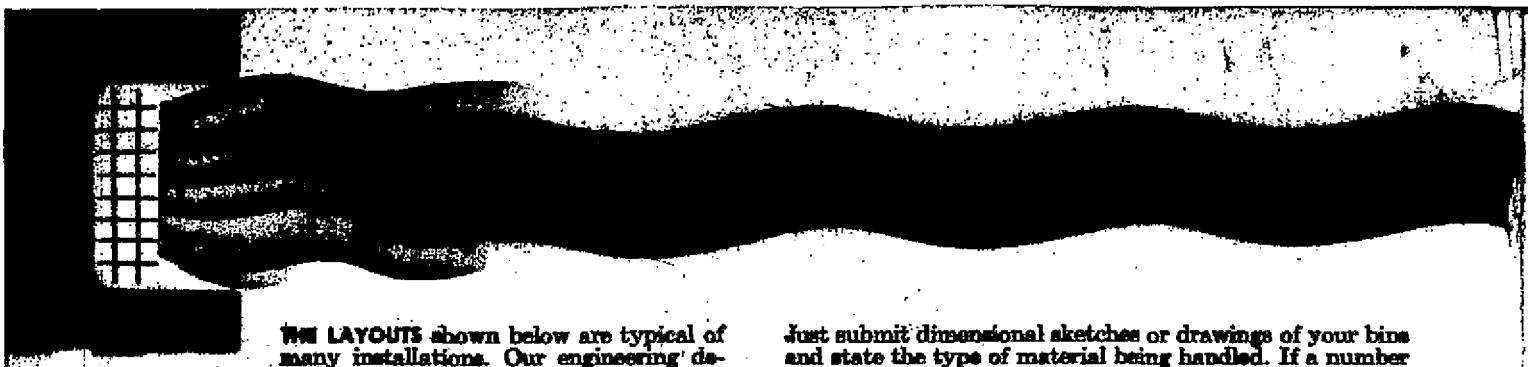
The air supply pipes running to manifolds, and the manifolds supplying each row of Bin-Flo units should be large enough to supply the required volume of air at the required pressure. Undersized piping results in excessive pressure drop, and insufficient volume of air. The supply lines between the source of air and the manifolds should be increased above the manifold size as the length of the run increases. This is necessary to avoid excessive pressure drop.

Each individual installation must, of course, take into account the number of units in the system, the length of run from the source of air supply, and the number of elbows, tees, and other fittings. As a general guide, the minimum pipe sizes which should be used for the manifolds supplying Bin-Flo units is ½" for 1 to 4 Bin-Flo units, ¾" for 6 to 10, and 1" for 11 to 15.

Our engineering department will be glad to check your proposed piping layouts and make recommendations.

BIN-FLO AERATOR

Keeps Bulk Materials Flowing



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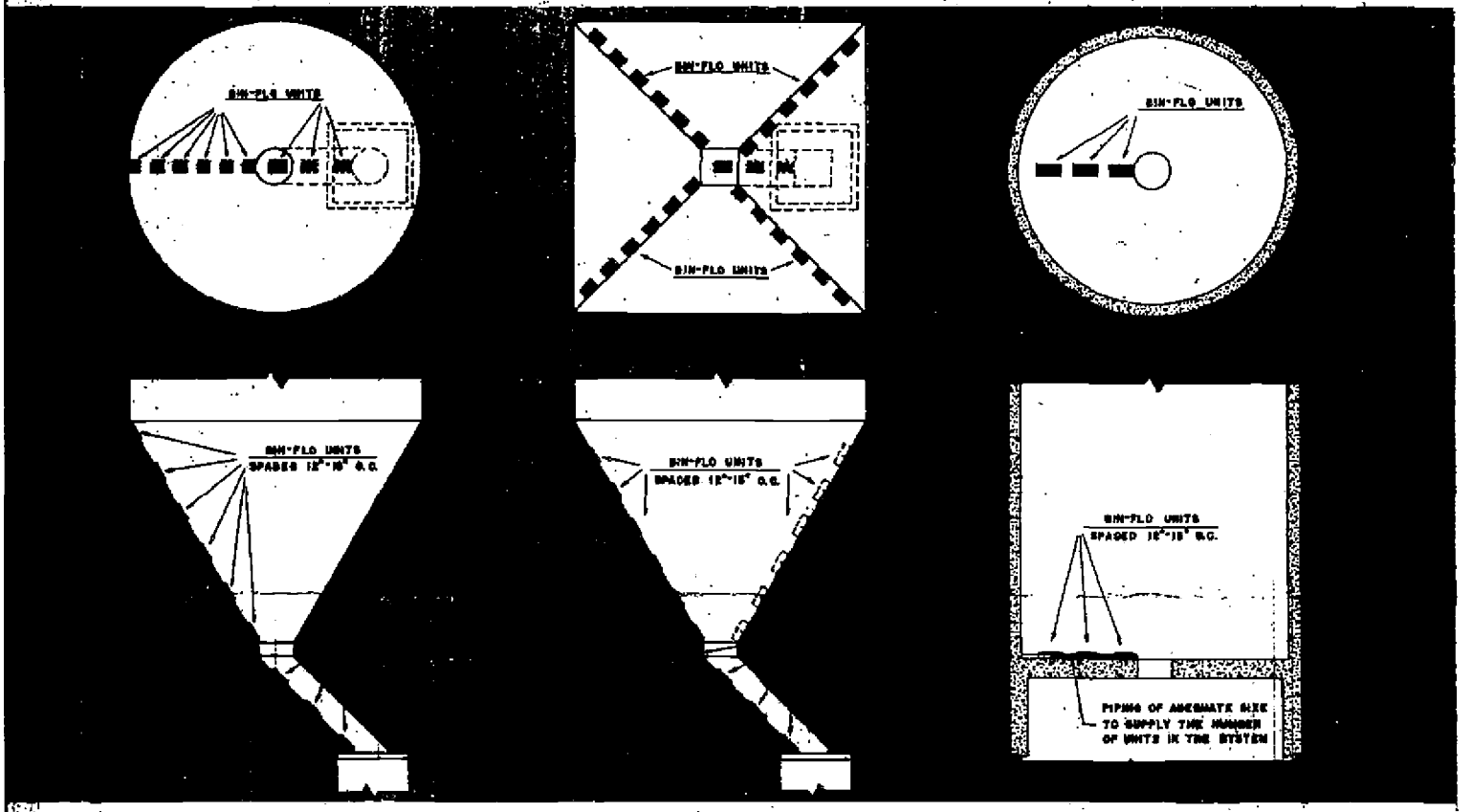

Figure 1 *Figure 2* *Figure 3*

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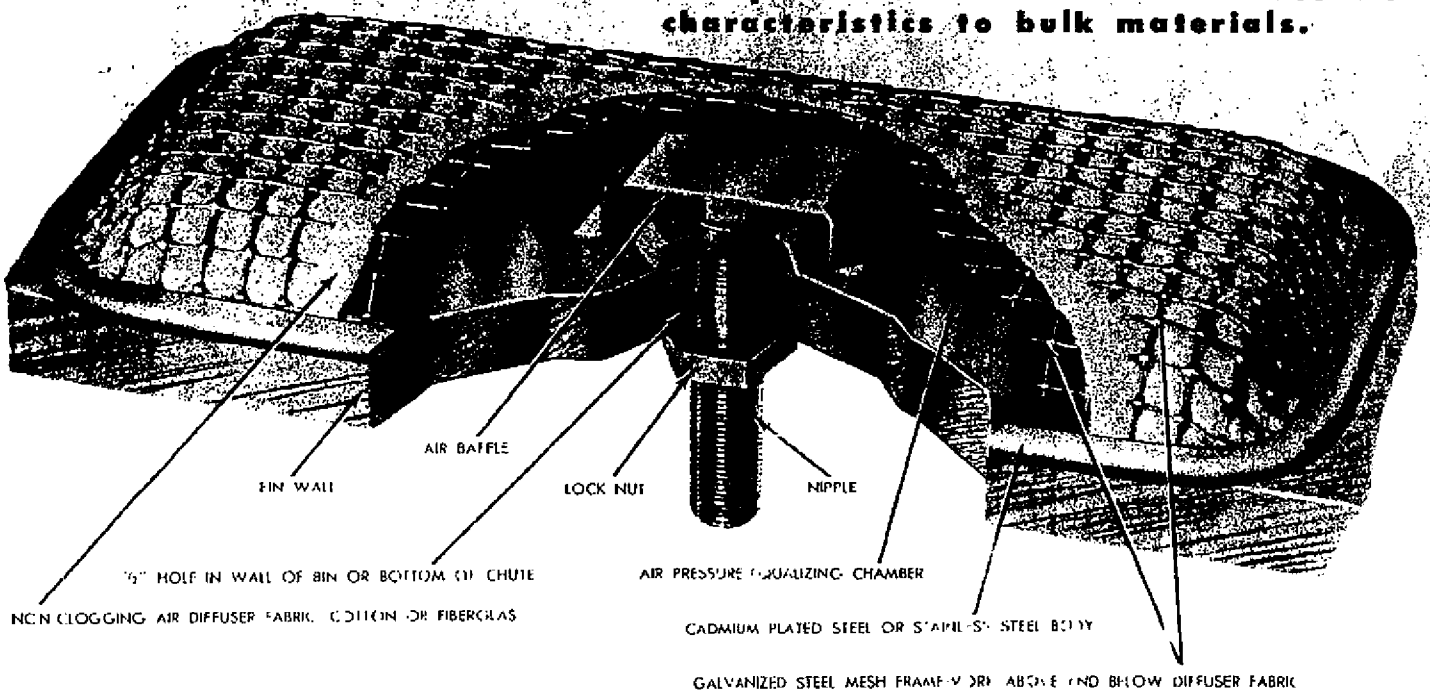
Model "M" or Model "O" BIN-FLO units suitable for these applications.

BIN-FLO

TRADE-MARK. PATENTS PENDING

Low pressure diffused air restores flow characteristics to bulk materials.



A simple, low-cost device to provide uniform and continuous flow of dry, finely ground materials from bins, hoppers and chutes . . .

HOW IT WORKS AND WHAT IT DOES

The Bin-Flo Aerator restores to any dry, pulverized material its original capacity to flow readily from bins or through chutes.

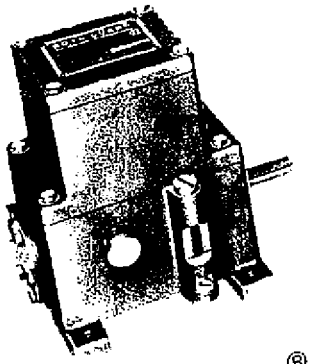
This flow characteristic exists when air is present in the material, but after a period of storage the air escapes, allowing the material to pack and preventing its flow.

The Bin-Flo aerator replaces the air so that the material again moves freely.

This is done by injecting in automatically controlled volume of air at low pressures into the material through a non-clogging fabric diffuser. Operation can be intermittent or continuous and can be controlled manually or automatically, as required.

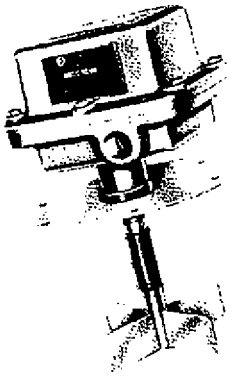
Bin-Flo Aerators can be used on such materials as —

Gypsum • Soda Ash • Lime • Flour • Bran • Portland Cement • Bentonite • Clay • Casein Glue Sawdust • Carbon Black • Chemicals • Barytes • Iron Ore • Feed • Cereals • Diatomaceous Earth Fuller's Earth • Pigments • Soap Powder • Detergents • Fly Ash • Plastic Moulding Compound



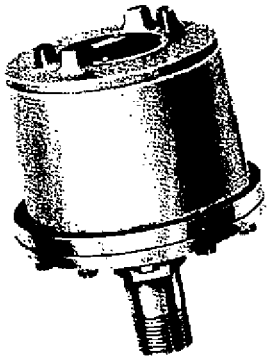
ROTO-GUARD®

Shaft Motion Indicator



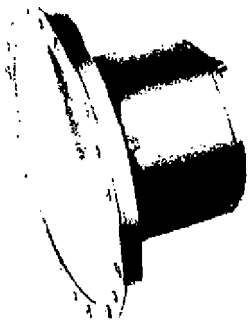
ROTO-BIN-DICATOR®

The Original Paddle Type Level Control



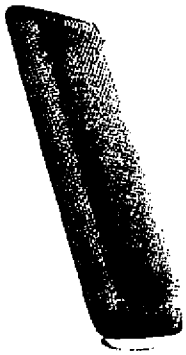
LIQUID LEVEL BIN-DICATOR®

Hi and/or low liquid levels



BIN-DICATOR®

Diaphragm-Type Level Control



BIN-FLO®

Areator . . . Mounts from outside the Bin

BINDICATOR®

Level Control Company . . . And That's All

Bindicator first designed electro-mechanical level controls back in 1936. Through the years we became well known, the leader. But for the '70's there is a new challenge. Develop products to meet new materials and handling requirements. We are meeting these needs and now have the most complete, accurate and dependable line of level controls available . . . and are matching it with constantly growing engineering and field sales staffs.

There are now 1076 standard Bindicator level controls to solve every conceivable materials handling problem. And yours is probably among them.

BINDICATOR®

1915 Dove Street
Port Huron, Mich. 48060
313-987-2700
800-521-6361

systematx

1802 South Bay Street
Eustis, Florida 32726
(904) 357-5100

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THE SALES DIVISION OF INDUSTRIAL SYSTEMATICS CORP.

Professional Sales Representation
Instruments Systems & Controls

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BINDICATOR

LEVEL CONTROLS

You should have been notified by BINDICATOR or one of our own Sales People that SYSTEMATX is now The Stocking Distributor for Bindicator Products in Florida, Georgia, and Alabama.

Please note in your Vendor Records our Office closest to you as your Bindicator ordering point. Should you have Stock Room or Engineering Groups who might order Bindicator Products please notify them of this change also.

Bindicator has modified their marketing from Factory Direct Sales to Local Distributors/Representatives. As your authorized Distributors SYSTEMATX can provide Faster Delivery from stock, reduced transportation charges, and qualified technical assistance in your area.

Please direct ALL Orders to SYSTEMATX at one of our Offices listed below. We will do our best to work with you on ALL Bindicator Product Applications.

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904/ 357-5100

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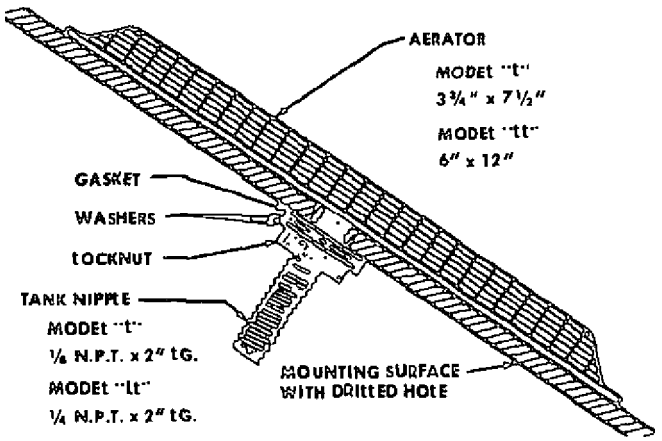
Birmingham, Al. 35226
205/ 979-2070

507 Valenti Court
Riverdale, Ga. 30274
404/ 471-3718

BINDICATOR
A LEVEL CONTROL COMPANY

1915 DOVE ST., PORT HURON
MICHIGAN 48060
TELEPHONE (313) 987-2700

BIN-FLO® AERATORS



MODEL "L" INSTALLATION

Drill 7/16" hole through bin wall or mounting surface at the center of each BIN-FLO aerator location. Insert tank nipple (short tapered thread end) in the aerator unit and place unit inside the bin, inserting the tank nipple through the drilled hole in the bin wall.

Place gasket on the nipple next to outside of bin wall together with sufficient spacer washers and lock securely in place with locknut.

Install piping to BIN-FLO aerators and complete connection to the air supply.

MODEL "LL" INSTALLATION

Drill 9/16" hole through bin wall at the center of each BIN-FLO aerator location and proceed as above.

AIR SUPPLY PIPING

Piping of adequate size to carry the required volume of low pressure air must be provided to assure reliable operation of the BIN-FLO aerators. As a general guide the following minimum pipe sizes should be used for the manifolds to which the aerators are attached. In all cases the number of pipe fittings should be held to a minimum.

MODEL "L"		MODEL "LL"	
Pipe Size	Number of BIN-FLO Aerators	Pipe Size	Number of BIN-FLO Aerators
¾"	1-5	1"	1-5
1"	6-9	1¼"	6-8
1¼"	10-12	1½"	9-11

AIR SUPPLY

The best and usually the most economical air supply is from a positive displacement low pressure blower.

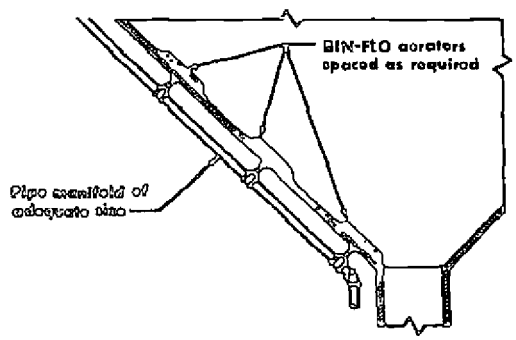
For test applications or applications involving less than 30 CFM, compressors may be used in conjunction with a pressure reducing regulator and filter or moisture trap on the low pressure side.

The following table shows the volume of air one BIN-FLO aerator (uncovered) will use at various operating pressures. Check the pressure near the most distant BIN-FLO aerator with the bin empty.

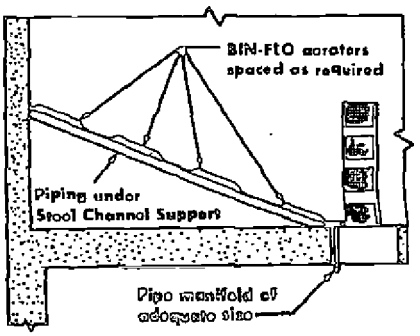
Air Pressure P.S.I.	Air Consumption Per BIN-FLO Aerator — In Cubic Feet Per Minute	
	MODEL "L"	MODEL "LL"
½	2.7	6.0
1	4.2	7.5
1½	5.0	9.1
2	5.7	10.4
2½	6.1	11.7
*3	6.5	12.7
3½	6.9	13.8
4	7.1	14.7
4½	7.4	15.6
5	7.6	16.4

*3 P.S.I. is recommended and used on most applications.

INSTALLATION IN THIN WALLED BIN



INSTALLATION IN FLAT BOTTOM SILO

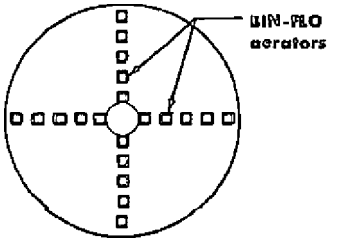


HOW MANY PER ROW?

To determine the number of BIN-FLO aerators required for each row:

Measure the length of the sloping side of the hopper on which the aerators are to be installed. Refer to the table at right—select Model to be used (Model "L" Standard or "LL" Large) and the spacing of the units: Read down the column until the approximate length of the slope is reached: The number of aerators required is shown at the left. Example: The 6' 11" slope will require 6 Model "L" Aerators mounted on 15" centers.

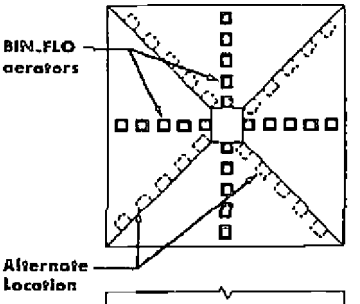
NO. OF AERATORS IN ONE ROW	DISTANCE UTILIZED BY ONE ROW OF AERATORS			
	MODEL "L" MOUNTED ON		MODEL "LL" MOUNTED ON	
	12" Centers	15" Centers	20" Centers	24" Centers
2	1'-8"	1'-11"	2'-8"	3'-0"
3	2'-8"	3'-2"	4'-4"	5'-0"
4	3'-8"	4'-5"	6'-0"	7'-0"
5	4'-8"	5'-8"	7'-8"	9'-0"
6	5'-8"	6'-11"	9'-4"	11'-0"
7	6'-8"	8'-2"	11'-0"	13'-0"
8	7'-8"	9'-5"	12'-8"	15'-0"
9	8'-8"	10'-8"	14'-4"	17'-0"
10	9'-8"	11'-11"	16'-0"	19'-0"

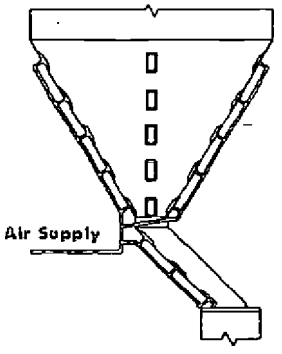


CONICAL HOPPER

In a conical hopper four rows of BIN-FLO aerators, located as shown, are normally required. The Model "L" should be used in small cones as the smaller aerator adapts better to the curved surface.

To prevent clogging of material in discharge pipe or chute install one row of aerators on the under side of the slope, as shown.

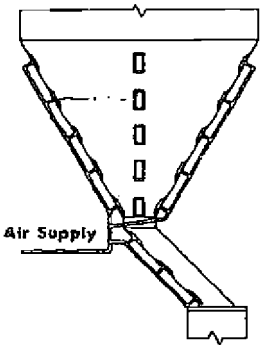


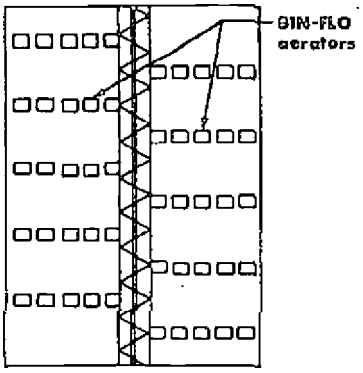


PYRAMIDAL HOPPER

In a pyramidal hopper four rows of BIN-FLO aerators centered on the sloping sides usually assures full and uniform flow. For minimum retention of material in the corners, an alternate location in the valleys is suggested.

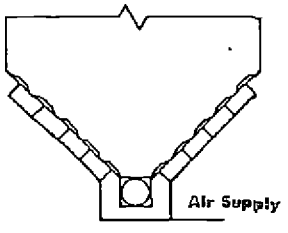
To prevent clogging of material in discharge pipe or chute install one row of *BIN-FLO aerators on the under side* of the slope, as shown.





V-BOTTOM BIN

This layout may be used in bins emptied by screw conveyor, belt conveyor or other means where the discharge opening runs the entire length of the bin, it provides full and uniform flow to the discharge opening without bridging over the outlet. Number or rows of BIN-FLO aerators required and spacing will depend upon size of bin as well as material *being handled.*



CERTIFIED FOR

YOUR ORDER_____

OUR ORDER _____

PER _____

MODEL _____

CONSTRUCTION _____

PROGRAMMER

1. Interval Time 050 - Increase to conserve energy - decrease to maintain flow should flow diminish or stop as field conditions dictate.
2. Pulses Per Interval 3 - Decrease to conserve energy - Increase if flow not initiated.
3. "A Time Adjust R - Adjust to most effective frequency and form.
4. "B" Time Adjust 1 - Adjust to most effective frequency and form.

PNEUMATIC

1. Set Supply Pressure 90 - PSIG - Test for best effective setting from lowest to highest.

The air per sequence from each injector at the above settings is 5.0 SCF (Not SCFM)

title: INITIAL SETTINGS	PULSONICS CORPORATION 777 Airport Road, Lakewood, New Jersey 08701	
CUSTOMER: CYPRUS - CRUDE MILL SUPLY	DATE: 3/81	DRAWING: 791237A-22C

LEHMAN 01937

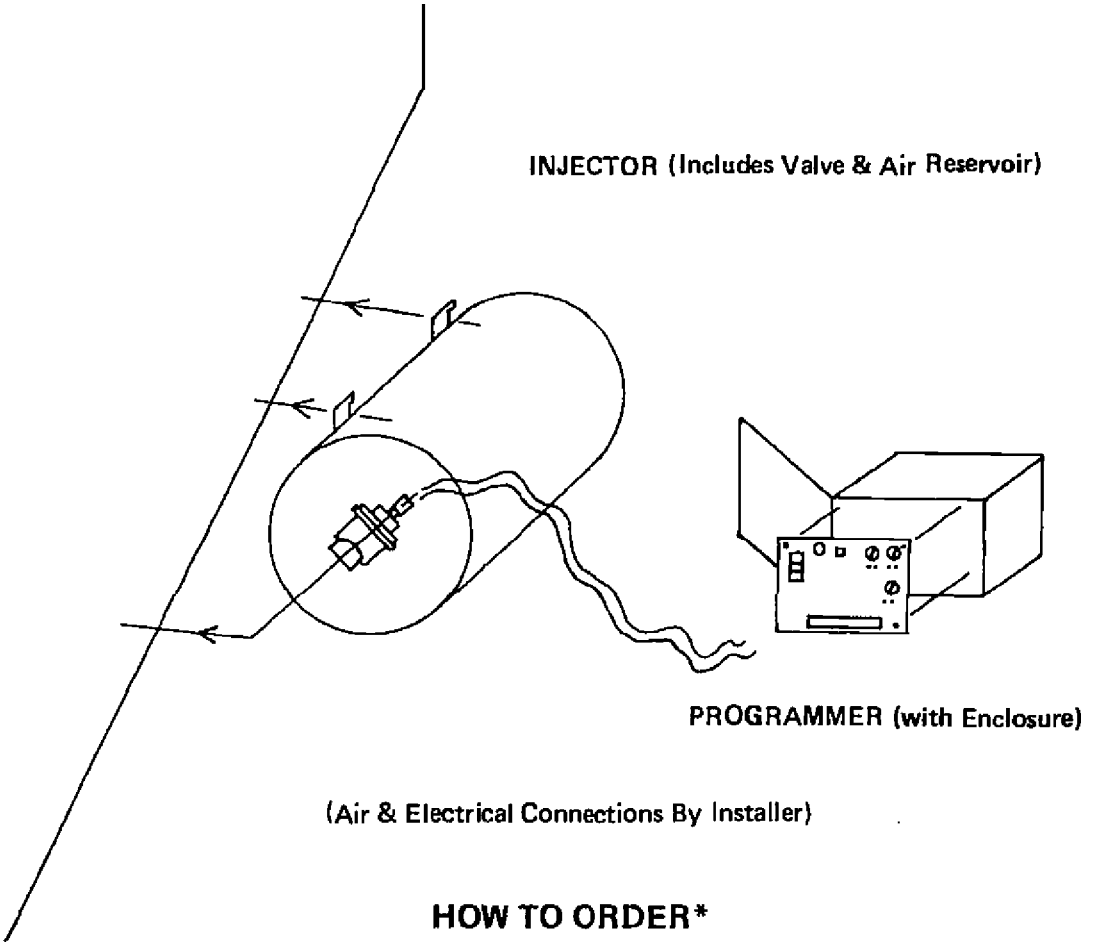
PART NUMBER CROSS-REFERENCE LIST 9/83

NEW #	OLD#	PRE-1980	NEW #	OLD #	PRE-1980
P1010	E1007-4		P4102	4102	279-002
P1479	E1007-7&9		P4109	4109	279-009
P3010	(New)		13947	(New)	
P3479	(New)		P4113	4113	279-013
P4040	E4015-4		P4118	4118	279-020
P4079	E4015-7&9		P4110	4110	279-010
P4040S	(New)		P4103	4103	279-003
P4079S	(New)		P4104	4104	279-004
P5E12	5E2SAM-12		P4106	4106	279-006
P5E04	5E2SAM-4		P4122	4122	279-025
P5E09	5E2SAM-9		01930	(New)	
P5E07	(New)		01852	(New)	
P5E2SAM	5E2SAM		P4115	4115	279-017
P3E12	3E2AM-12		P4123	4123	
P3E04	3E2AM-4		P4116	4116	279-018
P3E09	3E2AM-9		P4126	4126	
P3E07	(New)		P4128	4128	
P3E2AM	3E2AM		P4130	4130	
P4E2AM	4E2AM		P4117	4117	279-019
P4125	4125		P4127	4127	
P4033	4033	279-014	04131	4131	
P4124	4124	279-024	P4119	4119	279-021
P4101	4101	279-001			
09909	(New)				
P4132	4132				

PULSONICS™

PRICE LIST

EFFECTIVE 9/1/83
SUPERSEDES 1/29/82



HOW TO ORDER*

Basically, each Bin Activating System will consist of a

P R O G R A M M E R , and one or more

I N J E C T O R S .

Order (1) PROGRAMMER for each bin(s) that will operate at the same time. (one programmer can operate up to 20 injectors).

INJECTORS — should be sized according to bin size:

¼" — for bins less than 24" in width or dia.
¾" — for bins from 2' to 6' in width or dia.
1½" for bins over 6' in width or dia.

Injector quantity and location will depend upon:

A) BIN CONFIGURATION
B) PRODUCT CHARACTERISTICS
C) PLACE AND NATURE OF FLOW FAILURE
(ex: Ratholing above discharge;
or bridging over cone section;
or clinging to sides-first 5 feet

THEN: 1) SELECT PROGRAMMER
2) DETERMINE QUANTITY AND SIZE OF INJECTORS

* * *

*For best results consult your PULSONICS representative to determine the proper equipment for your application. He can provide you with instructions and sketches to help with installation.

INJECTORS

PART NO.	APPLICATION	NET PRICE
	¼" INJECTOR with 155 cubic inch Reservoir	
P1010	Nema 1	$ 95.00
P1479	Nema 4, 7, 9	135.00
	¾" INJECTOR with 480 cubic inch Reservoir	
P3010	Nema 1	$195.00
P3479	Nema 4, 7, 9	225.00
	1½" INJECTOR with 2 cubic foot Reservoir	
P4040	Nema 4 Carbon Steel Reservoir	$335.00
P4079	Nema 7, 9 Carbon Steel Reservoir	375.00
P4040S	Nema 4 Stainless Steel Reservoir	860.00
P4079S	Nema 7, 9 Stainless Steel Reservoir	900.00

PROGRAMMERS

PART NO.	INTERVAL LOGIC	ENCLOSURE	NET PRICE
P5E12	STD PROGRAMMER	Nema 12	$465.00
P5E04	Adjustable from 0.1 minute min. to 99.9 minute max. with adjustable start mode 0-90 seconds.	Nema 4	485.00
P5E09		Nema 9	585.00
P5E07		Nema 7	975.00
P5E2SAM		None	408.00
P3E12	Use where interval time must exceed 100 minutes. NO START MODE Adj. from 1 minute min. to 999 minutes max.	Nema 12	465.00
P3E04		Nema 4	485.00
P3E09		Nema 9	585.00
P3E07		Nema 7	975.00
P3E2AM		None	408.00
P4E2AM	Superseded by 5E2SAM. Available for replacement only. 0.1 to 99.9 minute NO START MODE	None	$408.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
OEM PRICES AVAILABLE UPON REQUEST

SPARE PARTS

EFFECTIVE 4/1/83
SUPERSEDES 1/29/82

PART NO.	DESCRIPTION	NET PRICE
DIAPHRAGM VALVES		
P4125	1½" Diaphragm Valve with Solenoid	$145.00
*P4033	1½" Diaphragm Valve with Solenoid	* 130.00
P4124	1½ Diaphragm Valve for Remote Solenoid	100.00
P4101	¼" Diaphragm Valve for Remote Solenoid	40.00
09909	¾" Diaphragm Valve for Remote Solenoid	62.00
SOLENOID VALVES		
P4132	Solenoid Valve Nema 1	42.00
P4102	Solenoid Valve Nema 4/7/9	60.00
*P4119	Solenoid Valve Nema 4	*N/A
RESERVOIRS		
P4109	155 cu. in. Steel	45.00
13947	480 cu. in. Aluminum	115.00
P4113	2 cu. ft. Steel	210.00
P4118	2 cu. ft. Stainless Steel	930.00
BRACKETS & FITTINGS		
P4110	Bkt. Set for P4109	10.25
P4103	¼" Cl. Nipple	1.75
P4104	¼" St. Tee	7.80
P4106	THD Adapter w/o Ring	3.50
P4122	1/8 Cl. Nipple	2.00
01930	¾" Tee	4.30
01852	¾" Cl. Nipple	1.75

*P4033 – Available as Replacement until Supply is Depleted – Then Use P4125
*P4119 – Use P4102 as Direct Substitute for Replacement

REPAIR KITS

PART NO.	DESCRIPTION	USED ON	NET PRICE
P4115	Diaphragm Valve Kit	P4033, P4124, P4125	$ 35.00
P4123	Diaphragm Valve Kit	P4101	10.00
14570	Diaphragm Valve Kit	09909	18.00
P4116	Solenoid Valve Kit	P4033	15.00
P4126	Solenoid Valve Kit	P4102	12.00
P4128	Solenoid Valve Kit	P4132	15.00
P4130	Solenoid Valve Kit	P4125	16.00
P4117	Replacement Coil	P4033, P4119	15.00
P4127	Replacement Coil	P4102, P4132	21.00
P4131	Replacement Coil	P4125	11.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
OEM PRICES AVAILABLE UPON REQUEST

CINCINNATI
Voice Recorder

LEHMAN 01943

R.M. WOOD COMPANY

CINCINNATI TIME RECORDER DISTRIBUTORS.—~~SERVICE REPORT~~

REPORT NO. BRANCH Newark, N.J. DATE May 21, 1968

MECH. NO. MODEL

DATE INSTALLED NEW REPAIR JOB

USER Metropolitan Tube Co.
(PLEASE PRINT NAME AND ADDRESS)

STREET ADDRESS Metuchen Road. CITY-STATE South Plainfield N.J.

TROUBLE

HOW CORRECTED

TIME ON JOB HRS.	MIN.	TRAVELING TIME HRS	MIN	TOTAL TIME HRS.	MIN.		AMOUNT		FINAL TEST

STREET CAR FARE R. R. FARE N.J. Sales Tax 3% HOTEL

PARTS & MATERIAL FURNISHED 1- C.T.R Model 3071 Clipper 200 00

1- #2549A Card Rack 8 50

CHECK CLASS OF SERVICE

INSTALLATION	GUARANTEE NEW EQUIPMENT	GUARANTEE SERVICE REPAIRS	CHARGE	SERVICE CONTRACT	TOTAL	AMOUNT
						268 50

REMARKS: Spec. 117 V.A.C. 60~ TAX 8 04

Type Wheels; Day - 0-23 hours, minutes

For C.3000 Time Cards - Cards free (1000)

INSPECTOR R M Wood USER SIGN [illegible] (Metro. Tube)

LEHMAN 01944

R.M. WOOD COMPANY
CINCINNATI TIME RECORDER DISTRIBUTORS.—SERVICE REPORT

REPORT NO. BRANCH DATE Oct 10 1968

MECH. NO. 709866 MODEL 3071

DATE INSTALLED NEW REPAIR JOB

USER Metropolitan Tele
(PLEASE PRINT NAME AND ADDRESS)

STREET ADDRESS Mitchell Rd CITY-STATE So Plainfield NJ 07080

TROUBLE Not cutting Cards

NOW CORRECTED Channel Cutter

TIME ON JOB HRS.	TIME ON JOB MIN.	TRAVELING TIME HRS.	TRAVELING TIME MIN.	TOTAL TIME HRS.	TOTAL TIME MIN.		AMOUNT	FINAL TEST
	30							

STREET CAR FARE R. R. FARE HOTEL

PARTS & MATERIAL FURNISHED

CHECK CLASS OF SERVICE

INSTALLATION	GUARANTEE NEW EQUIPMENT	GUARANTEE SERVICE REPAIRS	CHARGE	SERVICE CONTRACT	TOTAL

REMARKS:

INSPECTOR Ralph F Hutton USER SIGN

LEHMAN 01945

633-0320

CINCINNATI TIME
A UNIT OF GENERAL SIGNAL

1733 CENTRAL AVE. CINCINNATI, OHIO 45214
D.U.N.S. 423-8044 TEL. (AREA CODE 513) 241-5500 TELEX 021-347

INVOICE NO. 291526

SOLD TO
CYPRUS INOUSTRIAL MINERALS
651 METUCHEN RD
SOUTH PLAINFIELO NJ 07080

SHIP TO
CYPRUS INDUSTRIAL MINERALS
651 METUCHEN RO
SOUTH PLAINFIELO NJ 07080

PAYMENT DUE UPON RECEIPT OF INVOICE.

TERMS: NET CASH 30 DAYS

PAGE 1

ACCOUNT NO	REFERENCE NO	SLMN	CUST REFERENCE NO	SHIP VIA	DATE
228337-00000	3912580-00	5200	45013	0	5/25/82

NE	PRODUCT	D/S	DESCRIPTION	QUANTITY ORDERED	QUANTITY SHIPPED	UNIT PRICE	EXTENDED PRICE	AMOUNT
30	OC-3000		CARDS	1	1	25.00	25.00	25.00
10	TRANS		TRANSPORTATION	1	1	2.85	2.85	2.85
			SALES TAX				1.25	1.25
			TOTAL AMOUNT OUE				29.10	

JUN 02 Rec'd

REMITTANCE STUB

TO ASSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE DETACH THIS STUB AND RETURN IT WITH YOUR CHECK.

ACCOUNT NO
228337-00000

REFERENCE NO
3912580-00

DATE ISSUED | SLMN
5/25/82 | 5200

PLEASE DETACH ← HERE

AMOUNT DUE
29.10

REMIT TO CINCINNATI TIME RECORDER CO.
POST OFFICE BOX 98025, CHICAGO IL 60693

INVOICE NO.
291526

Loc. 29, Code 652
Sent 6/2/82

Cyprus Industrial Minerals Company

Purchase Order

555 South Flower Street
Los Angeles, California 90071
Telephone (213) 489-3700

Ship To:
Acknowledgement Requested

CYPRUS INDUSTRIAL MINERALS
651 METUCHEN ROAD
SO. PLAINFIELD, N. J. 07080

Invoice in triplicate

Vendor

CINCINNATI TIME RECORDER CO.
1733 CENTRAL AVE.
CINCINNATI, OHIO 45214

To:

SAME

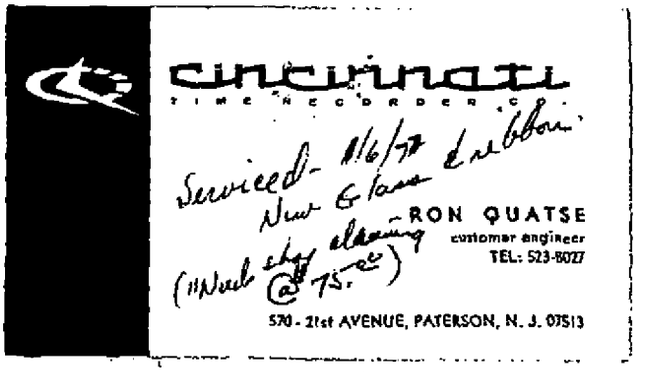
Date	Ship Via		Date Required	Terms
4/27/82	BEST WAY		ASAP	NET 30
Quantity Ordered	**Quantity Received**	**Description**	**Unit Price**	**Total**
1,000		PRODUCT #C3000 TIME CARDS	14.55M	14.55

45013

Above order number must appear on all papers and packages relative to this order.

Approved

CYPRUS



cincinnati
TIME RECORDER CO.

Serviced - 11/6/77
New Glass & ribbon
(11 Need shop cleaning @ 75.00)

RON QUATSE
customer engineer
TEL: 523-8027

570 - 21st AVENUE, PATERSON, N. J. 07513

FORM S-22A

MODEL NO.	SERIAL NO.

CUSTOMER NAME

DATE

ADDRESS

CITY

STATE

SERVICE CODE	COMP. / INCOMP.	BILLABLE

cincinnati

CE CALL REPORT

HOURS	TENTHS
FINISHED	
STARTED	
TOTAL	
TRAVEL	
ACTUAL	

TROUBLE FOUND

HOW CORRECTED

	PARTS	
QTY.	PART NO.	PRICE
		$
		$

LABOR	
PARTS	
TAX	
TRAVEL	
TOTAL	$

CE SIGNATURE

CUSTOMER SIGNATURE

197637

SLL

— WARRANTY —

This is to certify that this Time Recorder Serial No. 209864 was thotoughly inspected, tested and found to be standard in every way.

We guarantee this Time Recordet to be ftee ftom defects in material and wotkmanship for a period of one year ftom date of installation, provided that the Time Recordet ot the part claimed defective is returned Prepaid to oui tactory ot authotized service station.

THE CINCINNATI TIME RECORDER CO.

1733 Central Avenue Cincinnati 14, Ohio

GS CINCINNATI TIME
656 Allwood Road
Clifton, N. J. 07012

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 265 CINCINNATI, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

GS CINCINNATI TIME
656 Allwood Road
Clifton, N. J. 07012

CTT-3000
will make your time more profitable

The CTT-3000 Time Totalizer is an advanced microprocessor-based attendance recorder that automatically calculates and prints the totals of regular, overtime and premium overtime hours for up to 200 employees.

Features:

• Prints IN and OUT rings with accumulated time • Prints daily summary of attendance time • Accumulates overtime and premium time • Inhibits prints unless programmed or authorized • Prepares card for use by preprogramming • Multiple shift capability • One week, two week and semi-monthly pay periods • Battery standby permits total performance during power failure • Flexible grace period and pay interval selections • Automatic lunch deduct and paid absence options • Programmable signal control on four circuits • Automatic seasonal time changes • Horizontal card insertion with automatic transport • Can be linked into computer payroll packages • Totally electronic, one moving part

A UNIT OF GENERAL SIGNAL

CINCINNATI TIME

TIME EQUIPMENT EXCELLENCE SINCE 1896

Printed in U.S.A.

Form DMP 3000 82

I want to make my time more profitable!

Send me more information on the CTT3000 Time Totalizer and how it can handle today's payroll!

Name _____ Title _____ Number of Employees _____

Firm Name _____ Number of Facilities _____

Address _____

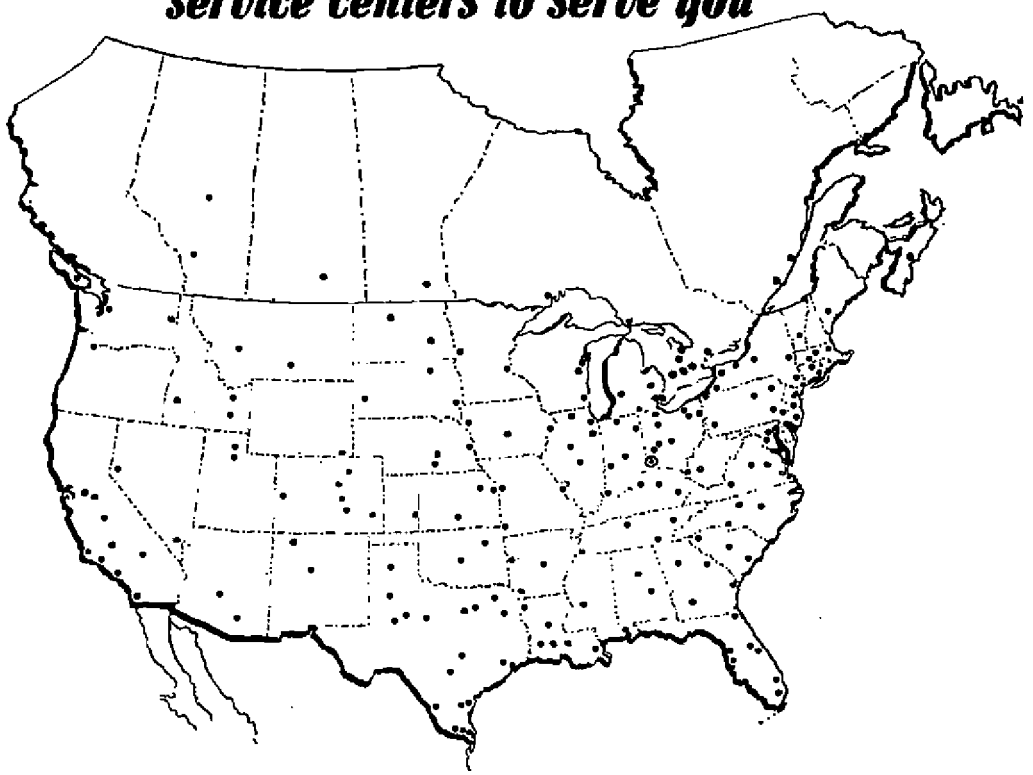
City _____ State _____ Zip _____ Phone _____

LEHMAN 01952

LEHMAN 01953

*A COMPLETE LINE OF TIME EQUIPMENT**

with a network of more than 225 sales-service centers to serve you



***Fire alarms**
Coded and non-coded supervised systems

***Master time and program systems**
Automatic control of industrial/institutional plant facilities

***Time recorders**
Payroll or Attendance, Job Cost, Time Stamps

***Indicating wall clocks**

***Signaling devices**
Bells, Horns, Buzzers, Chimes

***Auto-matic parking control equipment**
Ticket Printer—Dispenser, Parking Gates, Control Units, Counters, Tickets, Racks, Curbing

***Service-supplies**
Cards, Racks, Ribbons, Parts, Maintenance Agreements

***Data collection systems**

A Cincinnati representative is as near as your phone—listed in the Yellow Pages under "Time Recorders" and/or "Parking Control Equipment."

cincinnati

TIME RECORDER C

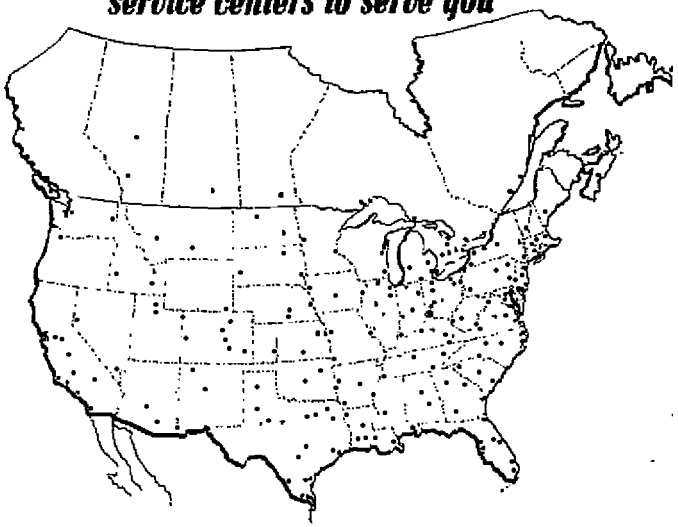
1733 CENTRAL AVE. • CINCINNATI, OHIO 45214 • TEL. (AREA CODE 513) [illegible]-5500

PRINTED IN U.S.A.

Form B-109-1

A COMPLETE LINE OF TIME EQUIPMENT*

with a network of more than 225 sales-service centers to serve you



***Fire alarms**
Coded and non-coded supervised systems

***Master time and program systems**
Automatic control of industrial/institutional plant facilities

***Time recorders**
Payroll or Attendance, Job Cost, Time Stamps

***Indicating wall clocks**

***Signaling devices**
Bells, Horns, Buzzers, Chimes

***Auto-matic parking control equipment**
Ticket Printer—Dispenser, Parking Gates, Control Units, Counters, Tickets, Racks, Curbing

***Service-supplies**
Cards, Racks, Ribbons, Parts, Maintenance Agreements

***Data collection systems**

A Cincinnati representative is as near as your phone—listed in the Yellow Pages under "Time Recorders" and/or "Parking Control Equipment."

cincinnati

TIME RECORDER CO.

1733 CENTRAL AVE. • CINCINNATI OHIO 45214 • TEL-1-AREA CODE 1131 [illegible]

PRINTED IN U.S.A.

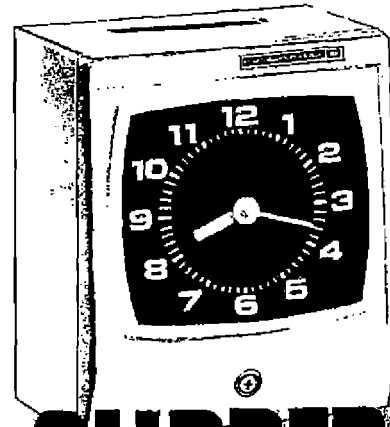
Form B-109-1

LEHMAN 01954

The New

3 in 1

Recorder



CLIPPER

AUTOMATIC TIME RECORDER

$260.00

Bill Ringing & 40.00

cincinnati

TIME RECORDER CO.

1733 CENTRAL AVE. CINCINNATI, OHIO 45214 TELEPHONE CODE 513 241-5600

Why Accept Less?

CLIPPER

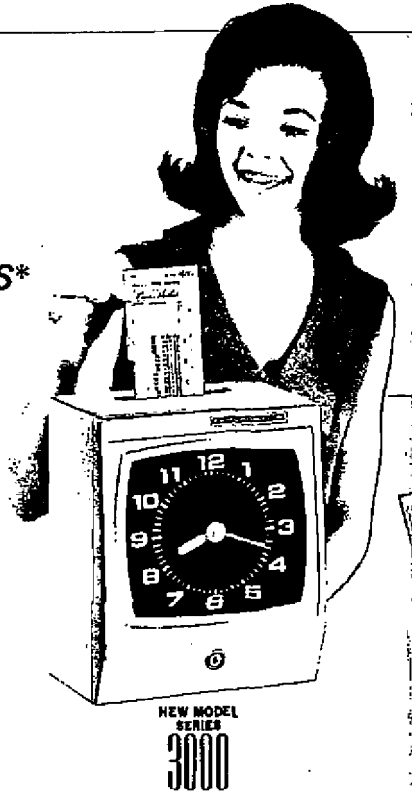
*PERFORMS 3 OPERATIONS**

and it's

FULLY AUTOMATIC

with Exclusive

UP-THE-CARD CONSECUTIVE SPACING



*ATTENDANCE

Ideal for institutions, restaurants, laundries, dry cleaning establishments, small industrial plants, etc., where the number of regular employees is limited or where staggered or overlapping work schedules are involved.

Direct subtraction of elapsed time (0-23) for faster auditing can be accomplished more easily with UP-THE-CARD consecutive spacing. This advanced feature assures a perfect registration sequenced by the clipped portion of the card that cannot overprint.

*AUDIBLE SIGNAL CONTROL MINUTE- TO -MINUTE PROGRAM CONTROL

New Mylar Program Tape assures precise minute-to-minute control of work schedules. With an optional bell ringer attachment, the Cincinnati Clipper will sound "start", "stop" signal, "warning" or "rest break" signal, etc. Programs can easily be changed, corrected or cancelled, thus providing you with complete control of work schedules.

The modern design of the Clipper will blend with your office decor yet retain its durability for in-plant use against tampering.

*JOB COSTING

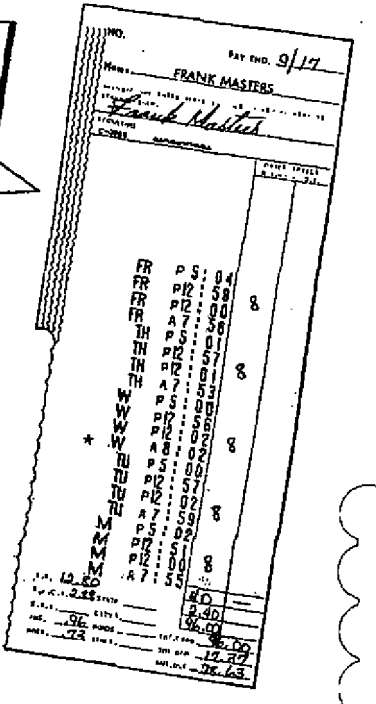
Job cost accounting guarantees a profit on your direct labor time. Production model changes, breakdowns, rest periods, work shift operations, etc., can be accurately recorded and legibly interpreted for faster computing and verification. Referring to our Minutes Are Money chart, you can readily see what only five minutes a day's lost production time can cost.

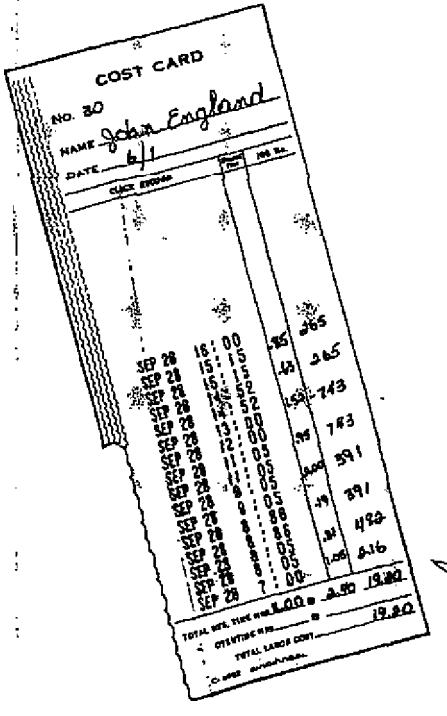
for Regular and Irregular

ATTENDANCE

The Model 3000, with its Exclusive UP-THE-CARD spacing (24, 30 or 34 spaces) registers IN and OUT for weekly, two-weekly, and semi-monthly payroll periods.

Registration available on Standard card width include typewheel combinations of Day or Date, Hours and Minutes with or without Tardy Symbol. (Optional Year and/or Month typewheel or Month only with or *without Tardy Symbol*).





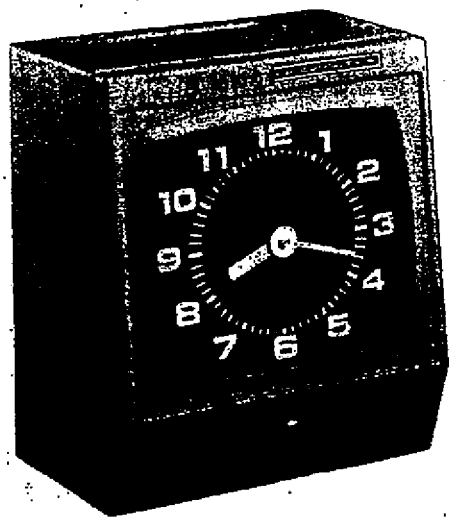
JOB COSTING

Records start and finish of various jobs, and, with the use of the 0-23 hour (continental time) typewheel, provides direct subtraction in computing elapsed time per job, and/or operation.

RISING LABOR COSTS DEMANDS ACCURATE PAYROLL RECORDS!

LEHMAN 01955

File/ Cincinnati Time



INSTALLATION and SETTING INSTRUCTIONS

For the Cincinnati Clipper Recorder
Model 3000 Series

UNPACK AND INSPECT

The outer carton should be checked for visible damage. If outer carton is damaged, special attention should be given to the contents of the carton. If recorder is damaged, contact carrier at once and file claim. Remove white bag containing keys and mounting screws. To remove case cover – insert key in lock and turn counterclockwise to unlock. Place hands at bottom sides of cover, pull out bottom and lift cover free of the mechanism. Notify factory immediately of any errors in contents. Retain cartons and packing material and note method of packing for possible re-shipment.

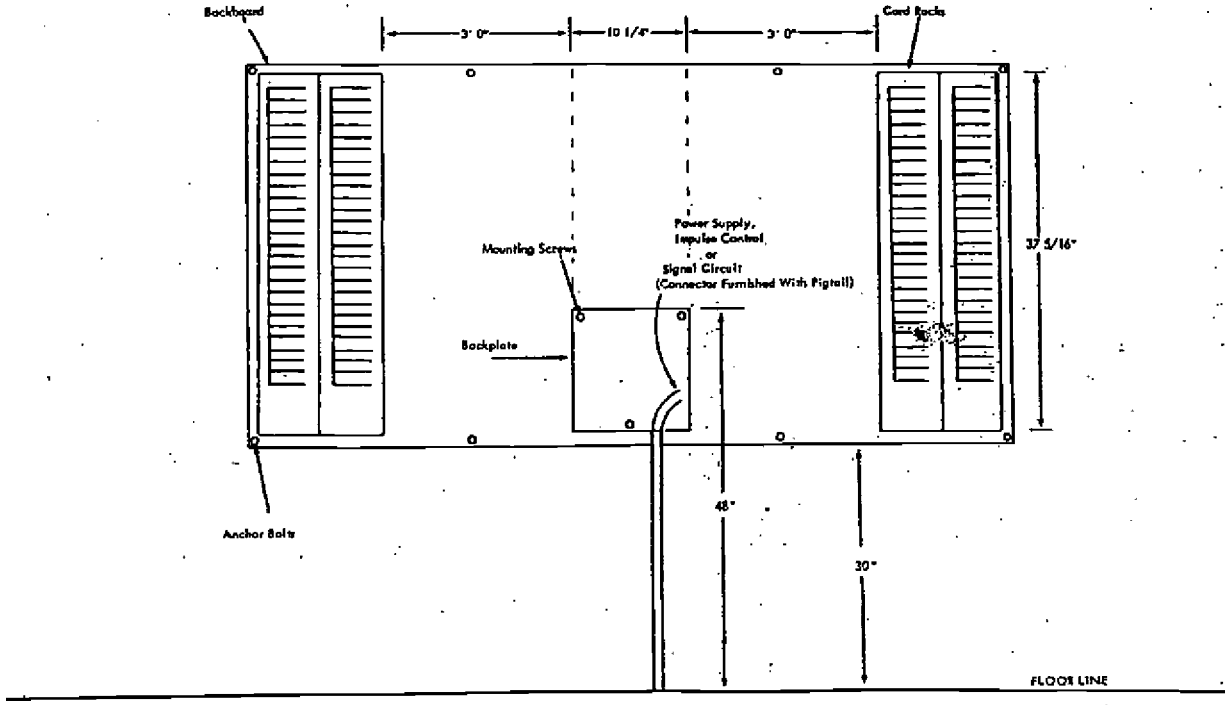
RECORDER LOCATION

An Attendance Time Recorder produces the most satisfactory results when the location is carefully selected. The recorder should be installed to offer ready access to all employees, permitting free passage. The location should be as free from dirt and dampness as possible. Proper mounting, good lighting and adequate space are essential for satisfactory results.

Three holes in the back of recorder are provided for rigid wall mounting, or the recorder may be table or bench mounted by using the four holes in the bottom. Rubber pads are supplied for insertion in the bottom where this type of mounting is preferred. The recommended height of the card receiver is 48" above the floor.

CARD RACKS

It is recommended that card racks be located at least three feet from the recorder to take full advantage of the rapid recording obtainable from the Attendance Recorder.

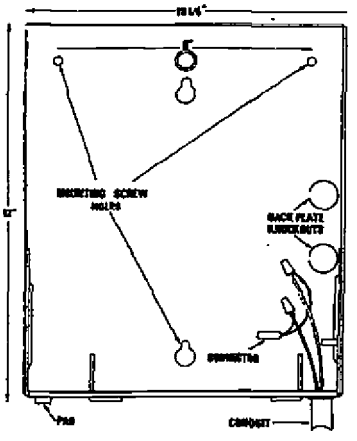


ELECTRICAL INSTALLATION

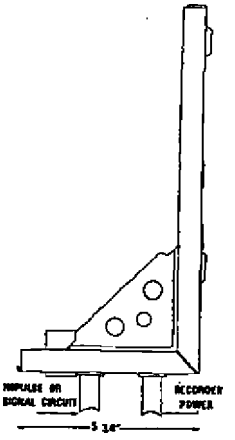
To avoid inadvertent power interruptions it is recommended that the electrical supply be wired directly into the recorder. Fire Underwriters specifications for a permanently mounted device require the use of conduit or flexible armored cable terminated at the opening in the bottom right side of the recorder. The wires supplying 115v AC power should be connected with wire nuts to the black and white pig-tails from the connector marked INPUT 105-125v AC. The wires from the signal circuit can be connected in the same manner to the yellow pig-tails from the connector marked SIGNAL OUTPUT. Remove the fibre terminal cover, make wire nut connections and replace cover with the wires clear of the case.

Power supply must conform to the voltage and frequency shown on the recorder plate.

IMPORTANT: Clipper recorders are shipped with the signal circuit providing 115v AC signal power. If low voltage signal operation is required apply the signal output of the recorder to the 115v primary terminals of a signal transformer and wire the signals to the secondary. If an external source of power is to be used for signals, remove the red lead from terminal #2 and the yellow signal wire from terminal #4 and connect these wires to the external power source.



DIMENSIONS FOR MOUNTING BACK AND BOTTOM UNIT

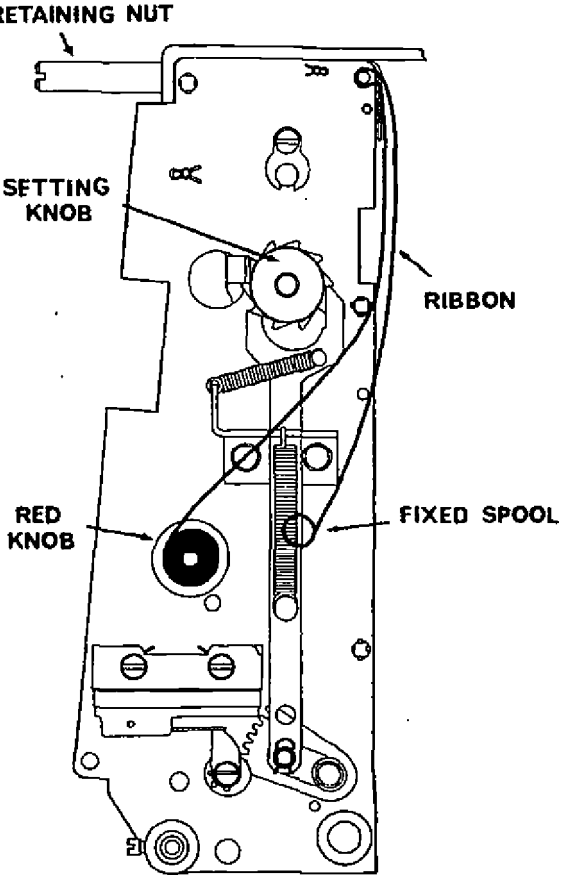


REPLACING INK RIBBON

The ribbon spools are accessible by unscrewing the two head retaining nuts holding the type head in position and allowing the unit to pivot to its forward position. Rotate the spool with the RED KNOB on the right side in a counterclockwise direction until the ribbon pulls on the other spool. CAUTION: If the knob does not turn easily it may be necessary to operate the ribbon reverse toggle to disengage the pawl from the drive ratchet of the fixed spool. Release the ribbon by lifting it off the hook and complete winding on the spool. Pull the red knob away from its shaft and, lifting the ribbon reverse finger away from the spool, remove the ribbon and spool and discard.

Install new ribbon and spool with its red stripe at the right side of type head and feed it as illustrated around the guides and rollers. Attach the hole in the end of the ribbon to the hook on the fixed spool and take up slack by turning red knob.

Use only CTR nylon ribbon Part No. 19500 for clear registrations.



LEHMAN 01957

SETTING TIME

Before attempting to set the recorder to time it should be recognized that the Clipper is a 24-hour device and must be set to either AM or PM.

1. Remove cover. DO NOT TURN HANDS OF CLOCK.

2. Rotate the knurled setting knob on the right side of the recorder counterclockwise until the clock dial indicates the correct time. CAUTION: If the setting knob is locked or locks while being turned, do not use force.

Do not attempt to rotate backward to retard time.

3. Check whether the recorder is in the AM or PM by making a card registration. If the Clipper has a program attachment for signal and/or tardy mark control, check that it is synchronized with the type head by observing the hour (0-23) and the minute (0-59) printed on the tape and viewed in the punch block guide hole. It should be 10 minutes ahead of the pilot dial.

4. The day or date wheel can be turned and set for the proper position by pushing the top of the type wheel with the eraser end of a pencil. Verify the proper setting by making a card registration. The day or date wheel may be turned backward.

   CAUTION: Do not attempt to advance the minute and hour type wheels.

5. The optional month and year type wheels are concealed by the ribbon at the left side of the type head and are accessible by removing retaining nuts and allowing the type head unit to pivot toward you. To change these wheels rotate the red ribbon knob to obtain some slack in the ribbon and allow it to be moved away from the type wheels. Push the type wheel until the proper character is in the print position. Take up ribbon slack with the red knob and restore type head to its operating position.

SETTING SYMBOL

Initially the tardy symbol must be set manually to conform with the schedule and will be then automatically controlled by the tape program attachment. If the symbol is out of step, it can be set in the same manner as the month and year wheel. Note, however, that the symbol type wheel can be moved in one direction only - upward from the print line.

INSTRUCTIONS FOR SETTING SIGNAL & TARDY SYMBOL SCHEDULES:

Signal and tardy symbol programs are controlled by a two-channel mylar tape device located behind the clock face. The tape has 1440 punch positions for every minute of the day on each channel. The minute and hour is printed on each position. The channel nearer the dial is used for the signal program. The other channel controls a solenoid that positions the tardy symbol type wheel.

To set a schedule write down the times the signal should sound. List the times the symbol should be advanced to the printing position and the times it should be removed. Then, proceed as follows:

1. Disconnect the power just after the recorder has advanced a minute.

2. Rotate the setting knob counterclockwise until the time of the first scheduled operation printed on the tape appears in the guide hole of the red plastic punch block. Note that the clock dial will indicate 10 minutes behind the time visible in the guide hole.

3. Insert the manual punch in the guide hole (inner position next to dial for signal program, outer position for tardy symbol program), press down and rotate until it cuts a clean hole in the tape, the chad entering the punch and is withdrawn on removing it.

4. When the schedule is completely set up check the operation by turning the setting knob to a minute before a programmed function and allowing the recorder to perform automatically.

5. To take out a programmed operation use the cancelling patches provided. Peel off a patch and place it over the hole to be cancelled. Place another patch on the back of the tape over the same hole. Press the patches together firmly with the fingers, making sure both patches adhere to the tape and are clear of sprocket holes and the tape edge.

CARD CLIPPINGS

A container in the base of the Clipper will hold clippings from approximately 50,000 registrations. Empty container as required.

MAINTENANCE

We recommend that the recorder be cleaned, by blowing with an air hose or using a soft brush, at least twice a year. At the same time, a drop or two of oil should be applied to all bearings and parts that turn. Over-lubrication will cause unnecessary collection of dirt.

SUPERVISION

It is recommended that responsibility for your time recorder system be assigned to one person. In this way the supply of ribbons, clock keys, schedules and setting as well as the placing of calls for service can be handled more effectively.

CINCINNATI TIME RECORDER SERVICE

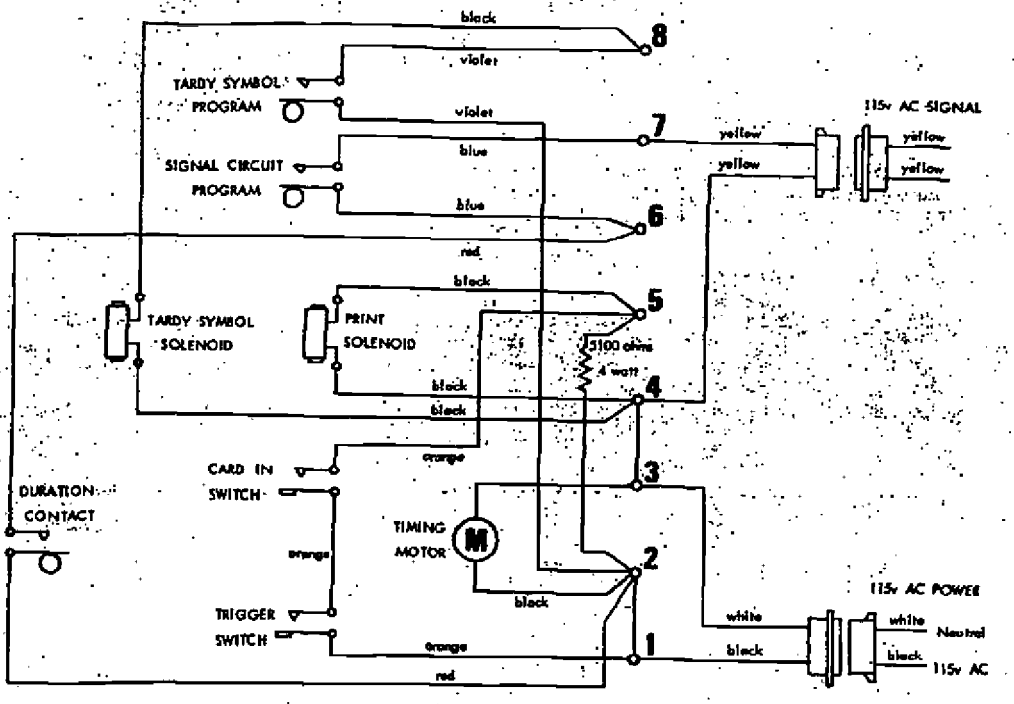
A trained Cincinnati Time Recorder customer engineer will assist with any service requirements. Call or write the CTR Representative in your area for assistance.

To obtain perfect records and the years of trouble free service built into your new Cincinnati Time Recorder, we recommend periodic inspections by your local authorized Cincinnati Customer Engineer under preventive maintenance agreement.

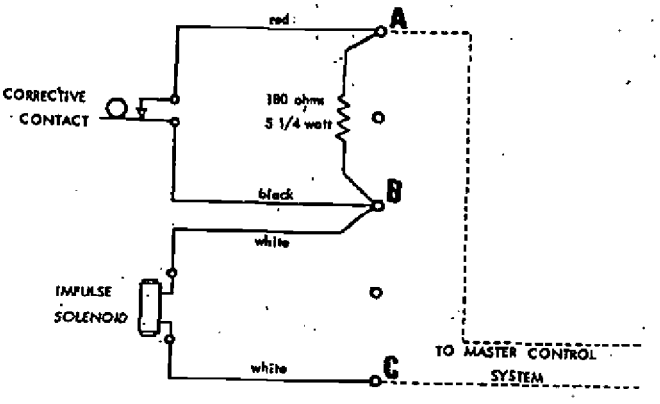
TIME CARDS

Either your local representative or the factory can supply your time card requirements. PLEASE RE-ORDER BY FORM NUMBER.

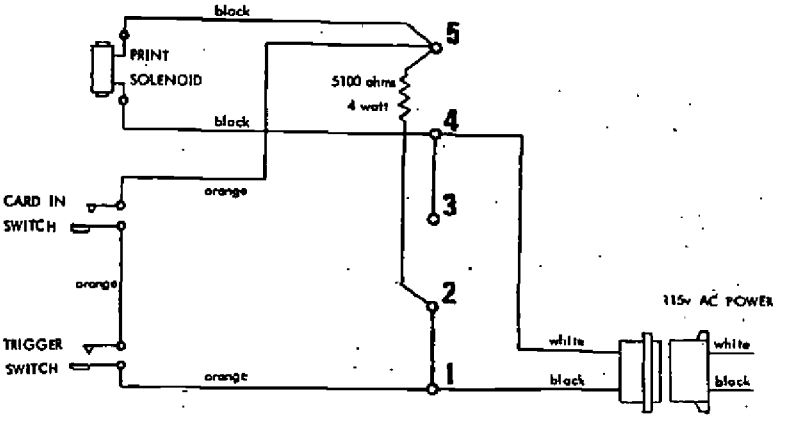
LEHMAN 01958



Clipper Wiring Diagram, Synchronous Motor Operation, with Signal Circuit and Tardy Symbol features.

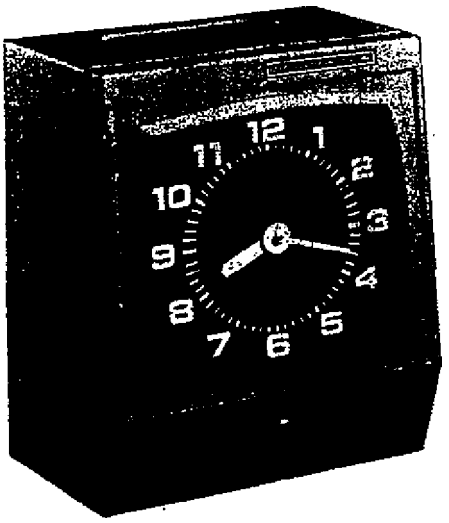


Clipper Wiring Diagram, Impulse Operation, with connections for control by MP Dual Voltage Two-wire System.



LEHMAN 01959

SCL
RFW



INSTALLATION and SETTING INSTRUCTIONS

For the Cincinnati Clipper Recorder
Model 3000 Series

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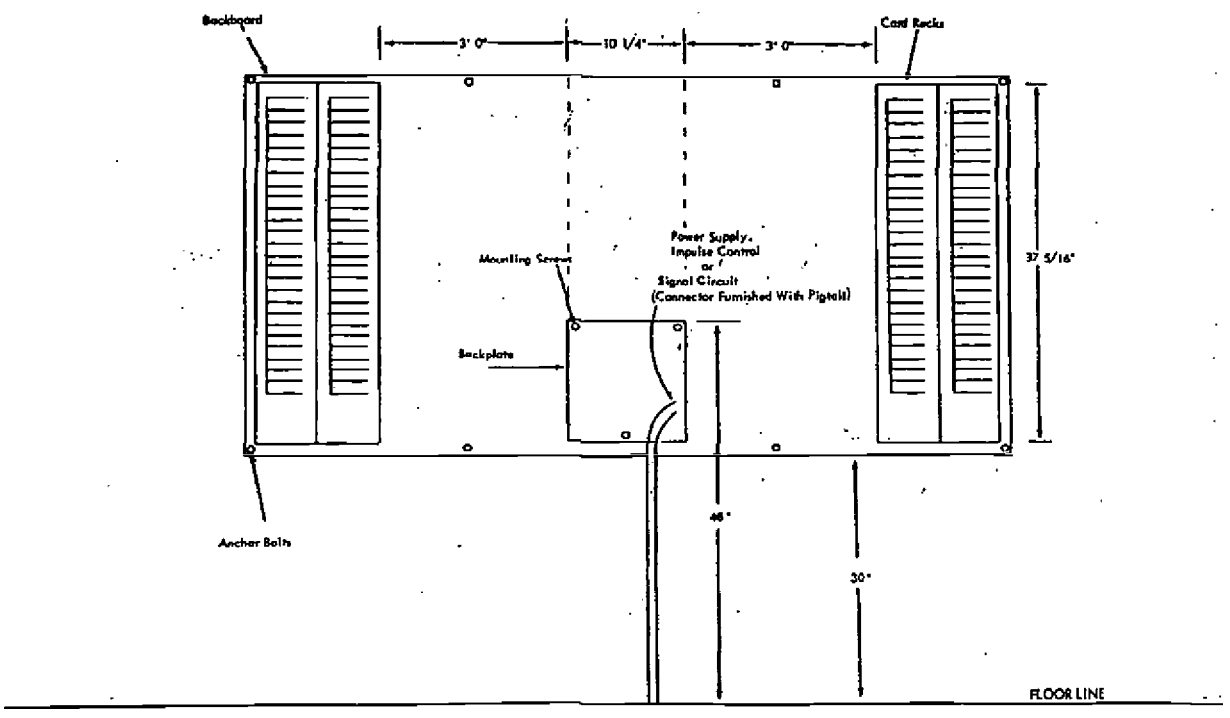

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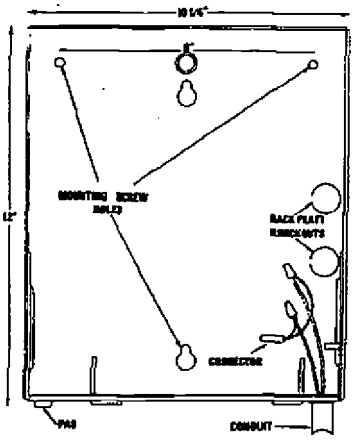
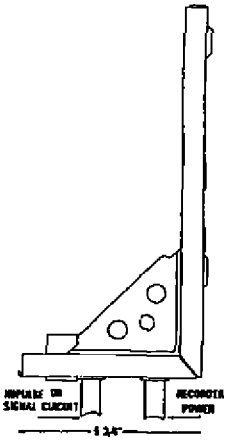


DIMENSIONS FOR MOUNTING BACK AND BOTTOM UNIT



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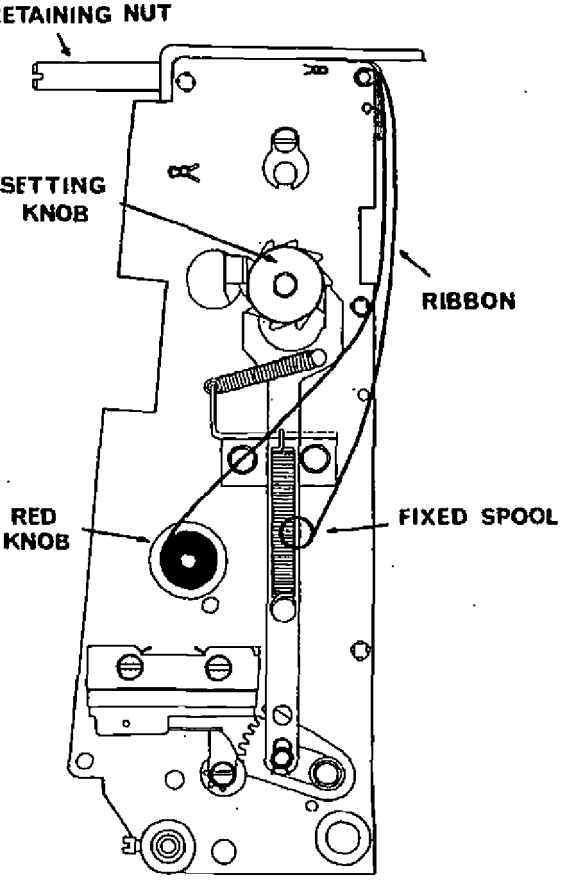

LEHMAN 01961

SETTING TIME

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CARD CLIPPINGS

A container in the base of the Clipper will hold clippings from approximately 50,000 registrations. Empty container as required.

MAINTENANCE

We recommend that the recorder be cleaned, by blowing with an air hose or using a soft brush, at least twice a year. At the same time, a drop or two of oil should be applied to all bearings and parts that turn. Over-lubrication will cause unnecessary collection of dirt.

SUPERVISION

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CINCINNATI TIME RECORDER SERVICE

A trained Cincinnati Time Recorder customer engineer will assist with any service requirements. Call or write the CTR Representative in your area for assistance.

To obtain perfect records and the years of trouble free service built into your new Cincinnati Time Recorder, we recommend periodic inspections by your local authorized Cincinnati Customer Engineer under preventive maintenance agreement.

TIME CARDS

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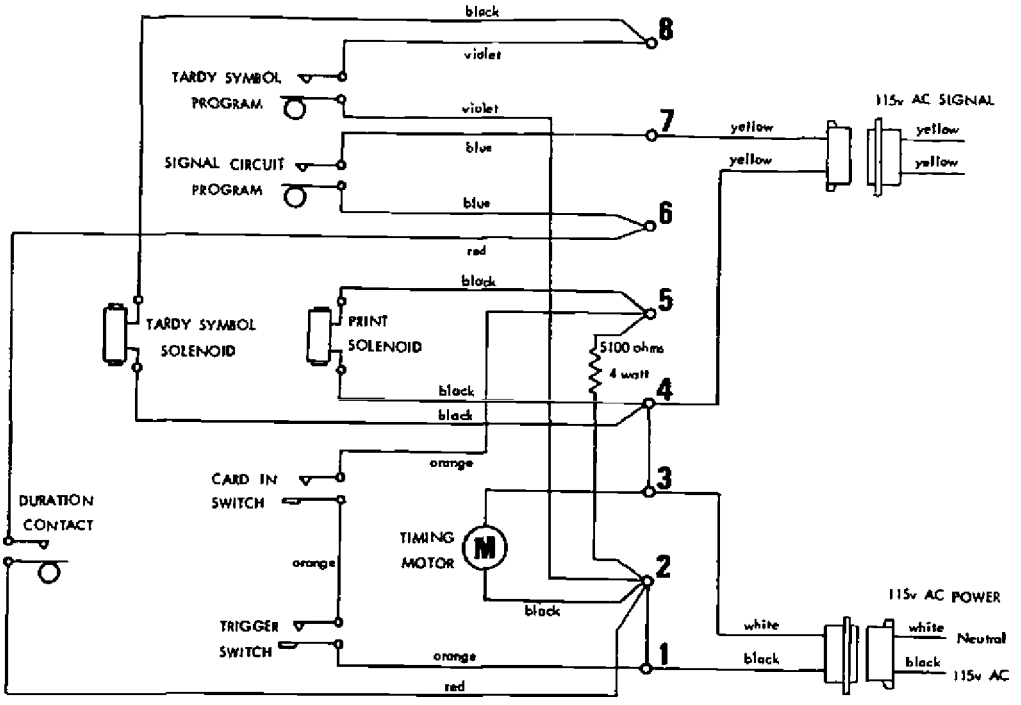
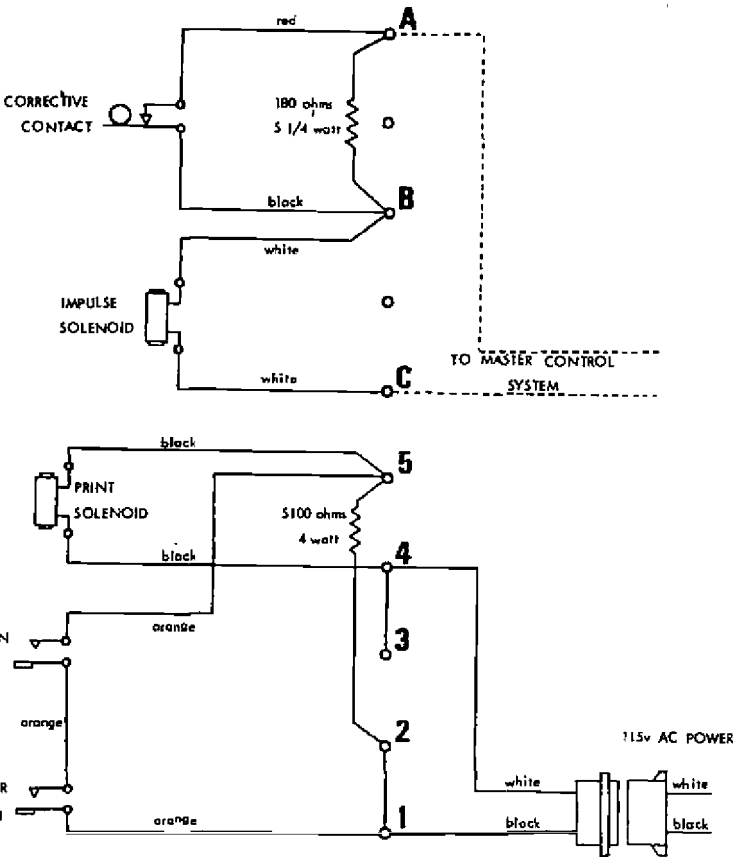
LEHMAN 01962



Clipper Wiring Diagram, Synchronous Motor Operation, with Signal Circuit and Tardy Symbol features.

Clipper Wiring Diagram, Impulse Operation, with connections for control by MP Dual Voltage Two-wire System.



Form I-2000

LEHMAN 01963

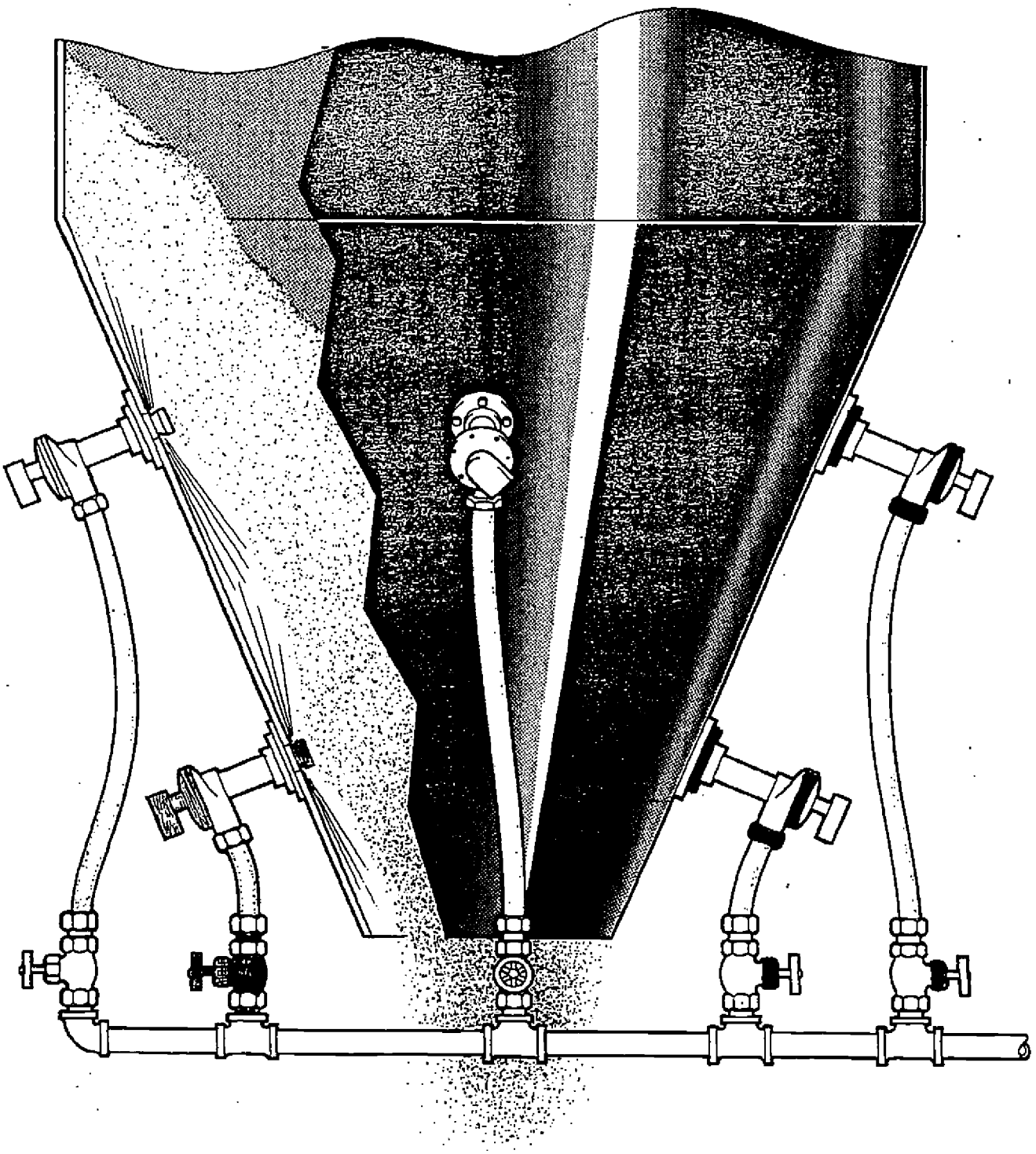
VIBCO (VIBRATORS)

LEHMAN 01964

Airsweep™

MYRLEN, INC.

Bin Activator
Sweeps Away: Ratholes, Arching, Buildup and Clogging



MYRLEN, INC.

Airsweep System:

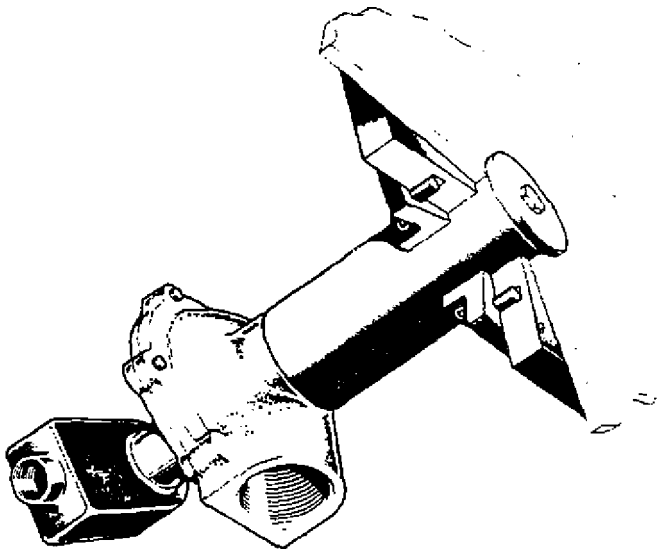
Keys to Superiority

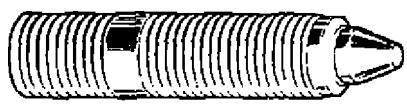
AIRSWEEP system is precisely what its name implies — a unique automatic method for maintaining the flow of materials that tend to hang up in bins, chutes, hoppers and silos by "sweeping" the walls with a controlled release of compressed air. No blasting. No vibration. No manual or mechanical shock treatments.

AIRSWEEP industrial application and performance package is unmatched. There is no comparable system.

- **Blast-free**
- **Vibration-free**
- **Shock-free**
- **Feedback clog-free**
- **Minimum air usage operates on plant air systems with easily adjustable control of air usage.**
- **Minimum maintenance**
- **Minimum installation cost**
- **Maximum economy**
- **Maximum efficiency**
- **Maximum versatility dial control of pulse duration, pulse interval, cycle frequency.**
- **Acceptable noise levels**
- **Automatic control**
- **Simplicity of operation**

AIRSWEEP system is *the* solution to ratholing, arching, build-up, clogging, moisture and related problems inhibiting the efficient movement of fine, sticky problem materials.



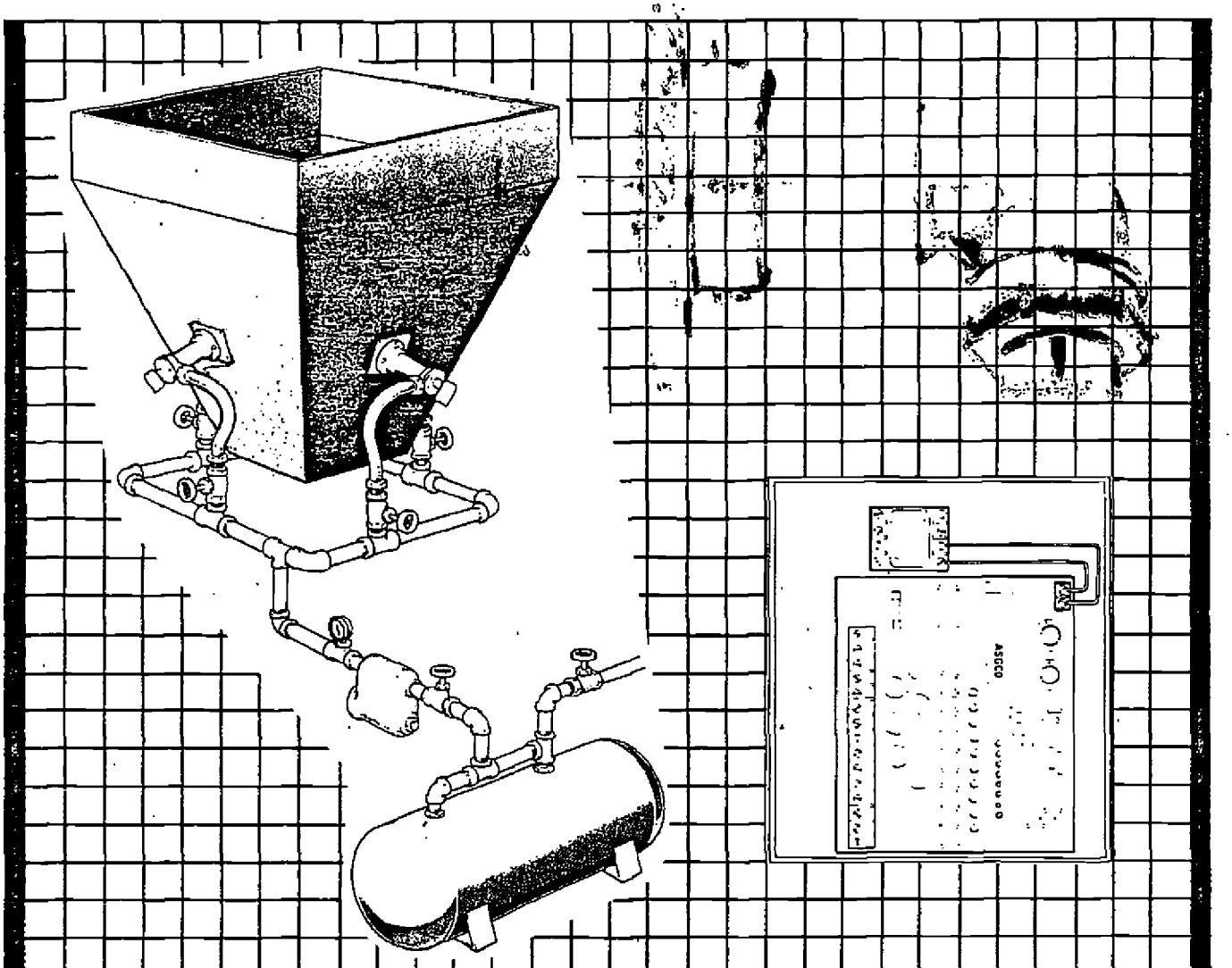


Airsweep:

The How and Why of the Unit

Simplicity with a Purpose:
A basic mechanical device in concept. The AIRSWEEP unit incorporates design simplicity to accommodate ease-of-installation, minimum maintenance requirements and maximum overall economy and efficiency. Both MYRLEN AIRSWEEP unit and the component ASCO solenoid valve feature a single moving part —the AIRSWEEP piston rod and the solenoid diaphragm. Fittings are standard N.P.T. thread. The AIRSWEEP unit is mounted flush with the inside surface of the silo, bin or chute plate. When the normally closed, fast acting solenoid valve is activated, a pulse of compressed air is released into the body of the AIRSWEEP unit. The air forces a spring loaded piston outward to a distance of approximately 1/8 of an inch, releasing the air over the surface of the plate. The plate is swept clean of material in a circular pattern with an effective radius of approximately 3 feet (6 foot diameter). The inside surface of the piston is designed to direct the air flow parallel to the surface to achieve this sweeping effect on the fine materials adhering to the plate. Although the head of the piston is exposed, the flow of material next to the plate is the most sluggish, thus creating minimal wear on the piston head. Also, because the high-velocity air is directed parallel to the plate-work and not directly into it, the plate is subject to little wear, further contributing to the minimal maintenance requirements of the AIRSWEEP system.

MYRLEN, INC.



Airsweep

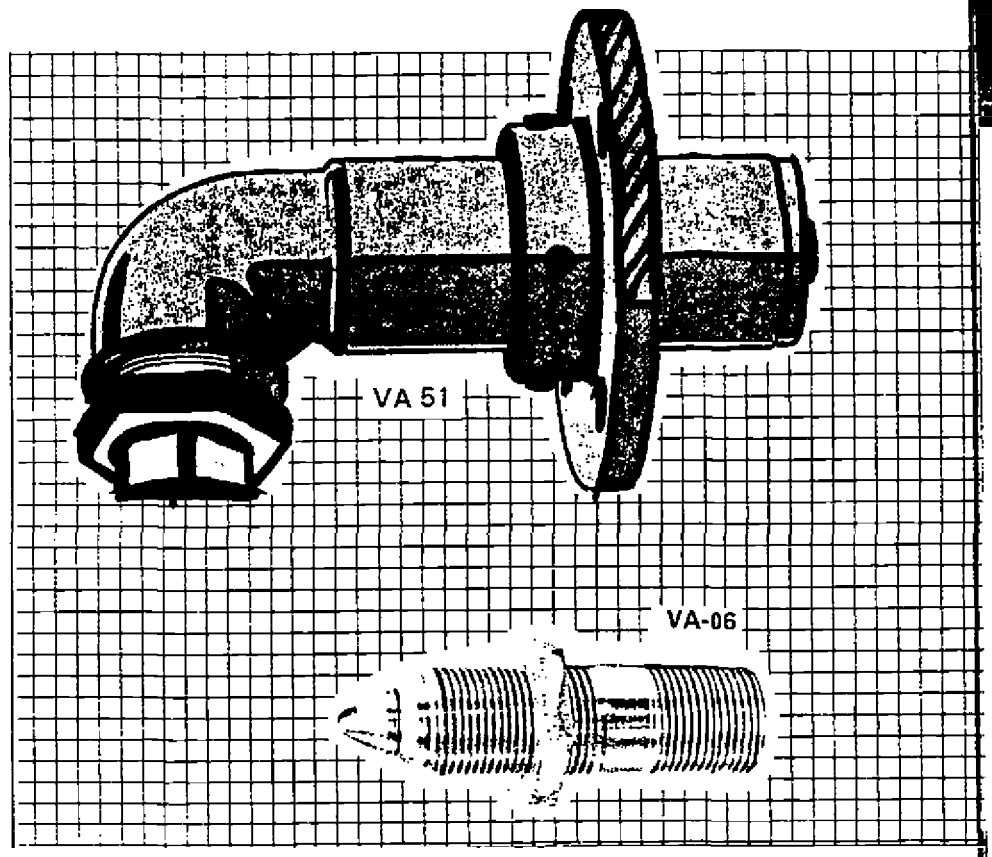
Efficient Simplicity in Action

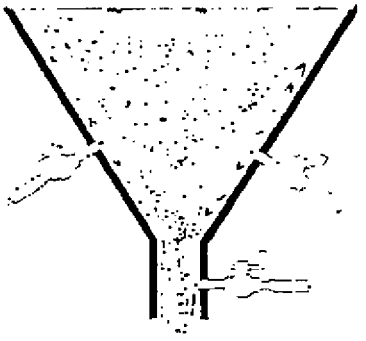
As illustrated. MYRLEN AIRSWEEP system can be applied to the solution of material movement problems with customized versatility. The requirements are basic: ❶ AIRSWEEP units with component solenoid valves. installed in concert with the material handling needs of the system. ❷ A 120 volt power source to energize the sequential controller. The board can be energized by a simple on/off manual switch or, preferably. tied into the control circuit that opens the discharge device such as a gate, valve. or feeder. ❸ The ASGCO Solid State Sequencing Controller, which automatically regulates air pulse cycles. pulse duration and frequency. Ease of controller adjustment complements the versatility of the system. ❹ A compressed air supply. capable of providing gauge pressures of 80 to 125 psi for models.

- Models available to handle large or small capacity bins, hoppers or silos.

Airsweep System

Guaranteed To Move Materials Fast

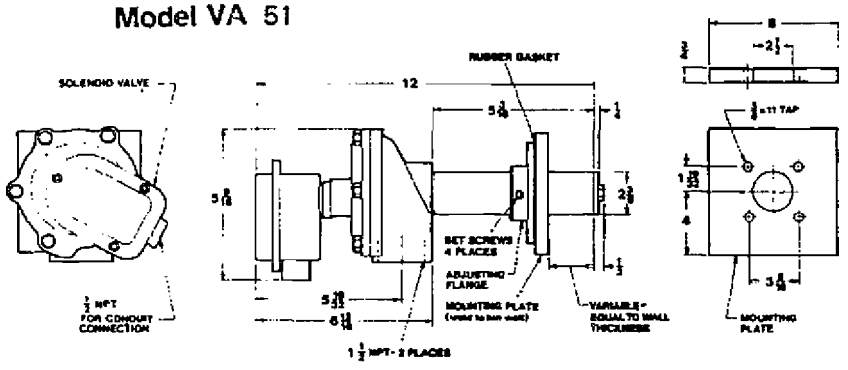


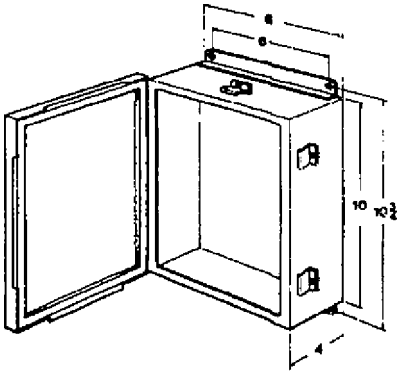


- A rotating air jet "Lifts" materials off walls with a "Sweeping" motion
- For moving difficult materials in industrial applications
- Can be installed without discharging bins, hoppers or silos
- Low noise level.
- Operates on standard air pressure 80 to 100 psi.
- Low air consumption

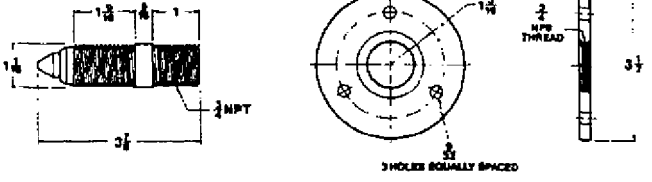
DIMENSIONS

Model VA 51





Model VA06



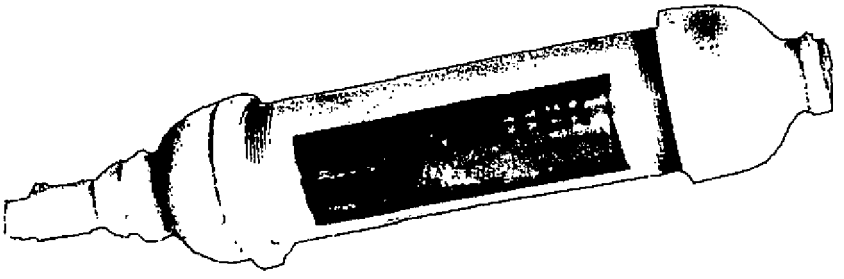
MYRLEN, INC. P.O. Box 353 Mt. Freedom New Jersey 07970 (201) 895-4733

VIBCO
Area Code
401-539-2392
P.O. Box 8
Stilson Road
Wyoming, R.I. 02898

PRODUCT INFORMATION BULLETIN

VIBCO MINI-BLASTER

In addition to VIBCO's regular Blasters, VIBCO has developed a line of MINI-BLASTERS for the small process bins. The MINI-BLASTER works on the same principle as the larger blasters with the patented ball valve design.



TECHNICAL DATA

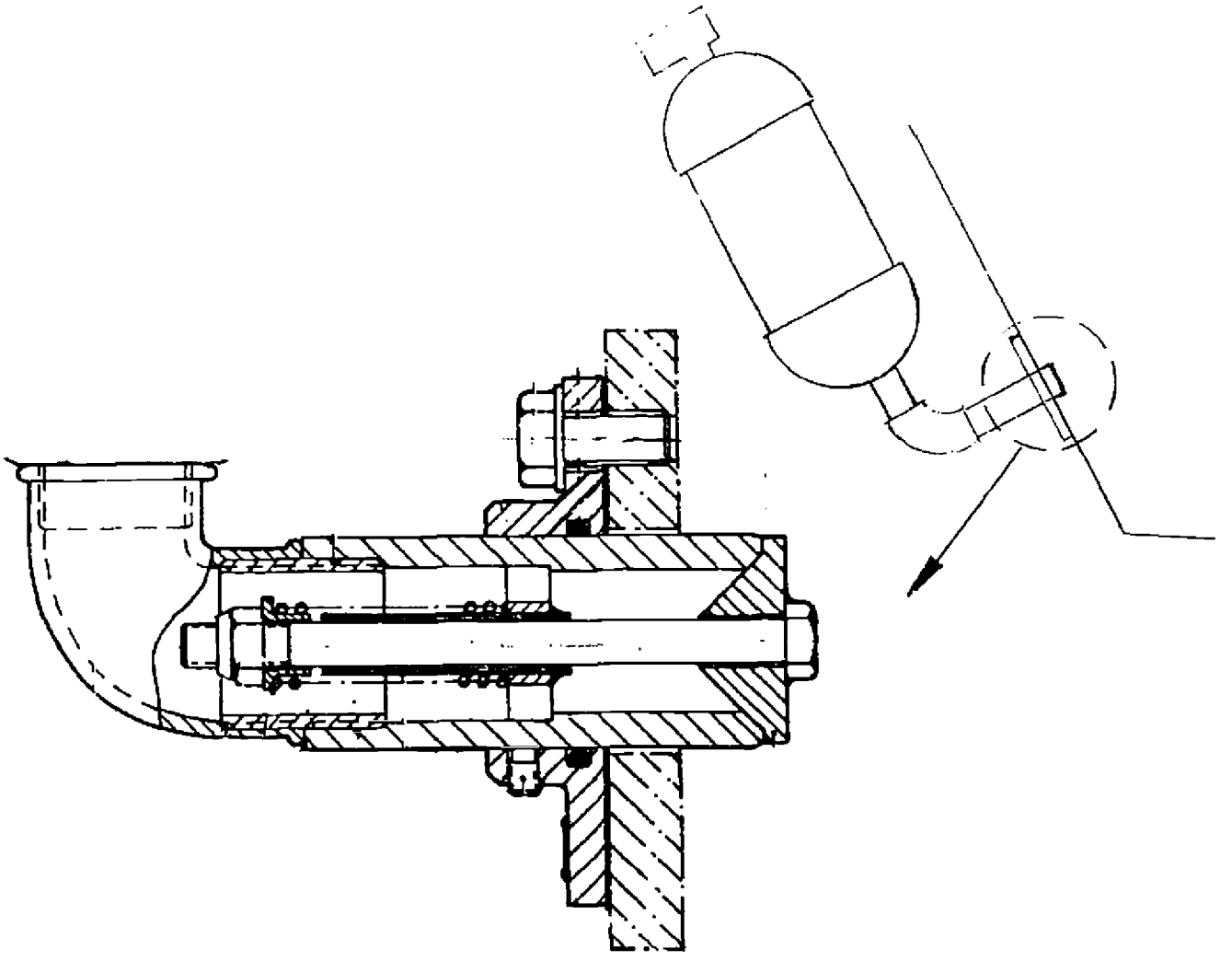
MODEL	CU.FT. VOLUME	FREE AIR 80 PSI CU.FT.	LENGTH	DIAMETER	DISCHARGE SIZE	WEIGHT
ABS-1	.05	.27	18½"	4½	3/4 NPT	15 LBS.
ABS-1½	.11	.6	24"	5½	1¼ NPT	25 LBS.

HOW TO SELECT

If the bin is 5' to a maximum of 10' in diameter or width, use the ABS-1½, for smallerthan 5' bins, use the ABS-1.

SWEEPER-VALVES

The VIBCO Sweeper-Valve is added to the ABS-2, ABS-1½ and ABS-1 blasters to deflect the blast along the side of the bin to break the bond and the friction between the material and the bin wall. The Sweeper-Valve is especially suitable when material bridges close to the discharge due to flow obstructions at the discharge, such as feed screws, discharge pipes, etc., or in pharmaceutical or similar applications when the bin has to be cleaned after each batch of material.



HOW IT WORKS

The Sweeper-Valve consists of a cylinder with a spring loaded piston that, under spring tension, closes off the discharge opening. When the air in the air blaster tank is released, it forces the spring loaded piston outward about 1/8", releasing the air blast in a circular pattern over the surface of the bin wall. The V-2 and the V-1½ have an effective radius of 3' and the V-1 has a radius of 1½. As soon as the blast is over (normally 1/3 second) the spring forces the piston back in it's seat, flush with the bin wall, closing off the inlet and preventing material from entering the valve, thus preventing contamination if the bin is filled with different materials.

BLASTER MODEL	VALVE	AIR PRESSURE MAX.	AIR PRESSURE MIN.	AIR RELEASE	ACTION RADIUS
ABS-2	V-2	100	30	4 CU.FT.	3'
ABS-1½	V-1½	100	30	4 CU.FT.	3'
ABS-1	V-1	100	30	2 CU.FT.	1½'

LEHMAN 01970

MYRLEN

Airsweep

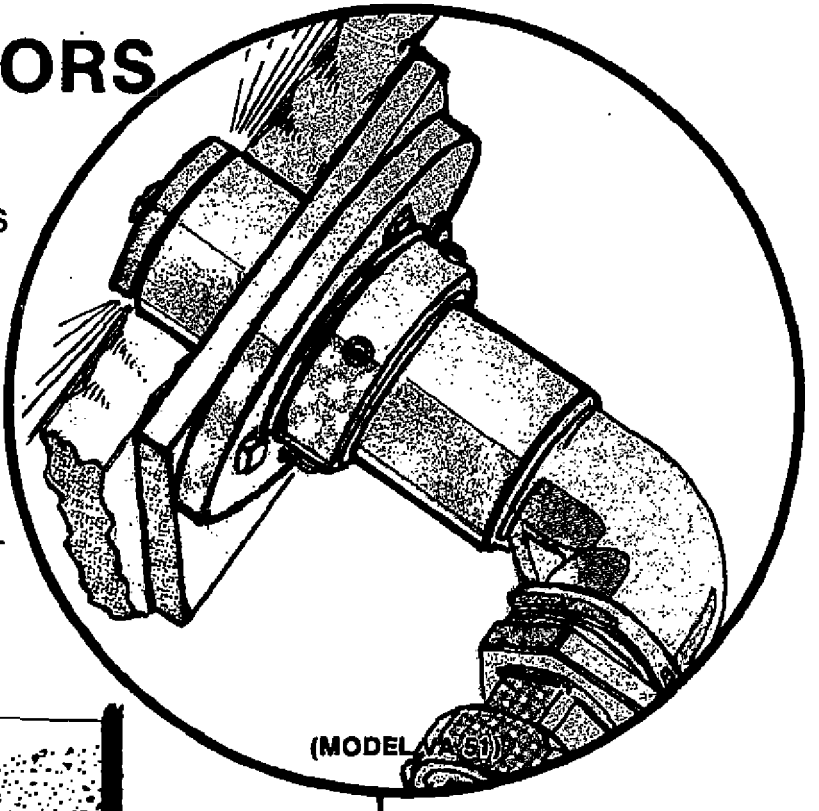
STIMULATORS

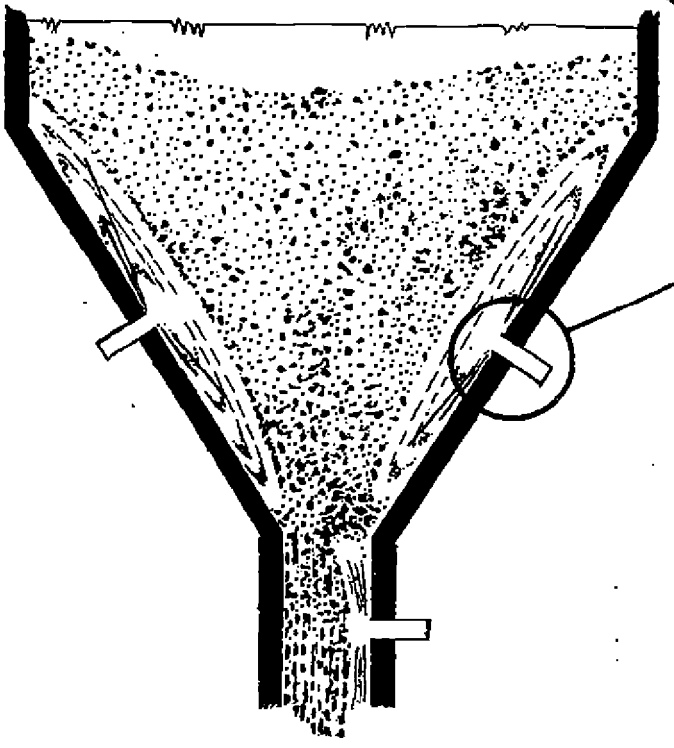
Sweeps • Blasts • Aerates

Induces Material Flow

Low Air Consumption

New Dust Type Design Keeps Airsweep Jam-Free





ELIMINATES

Ratholes • Arching • Build-up
Flow Blockages • Dead Storage
Airlancing • Sledging • High
Maintenance/Labor Costs • Noise
Down Time

RESTORES

- Full Bin Capacity
- Steady, Reliable Flow
- Full Production
- Efficiency/Economy

4. FUNCTION OF CONTROL BOX

(A) WILL REMOTE CONTROL BE USED YES [ ] NO [ ]

(B) WILL MANUAL OVERRIDE BE NEEDED YES [ ] NO [ ]

(C) IS 110 VOLT – 60HZ AVAILABLE YES [ ] NO [ ]

(D) PLEASE SPECIFY ANY SPECIAL FEATURE REQUIRED

_____

_____

5. GENERAL

(A) AIR SUPPLY AVAILABLE AT BIN

_____ PSI AND _____ CFM

(B) PIPE SIZE _____ DIA.

COMMENTS:

_____

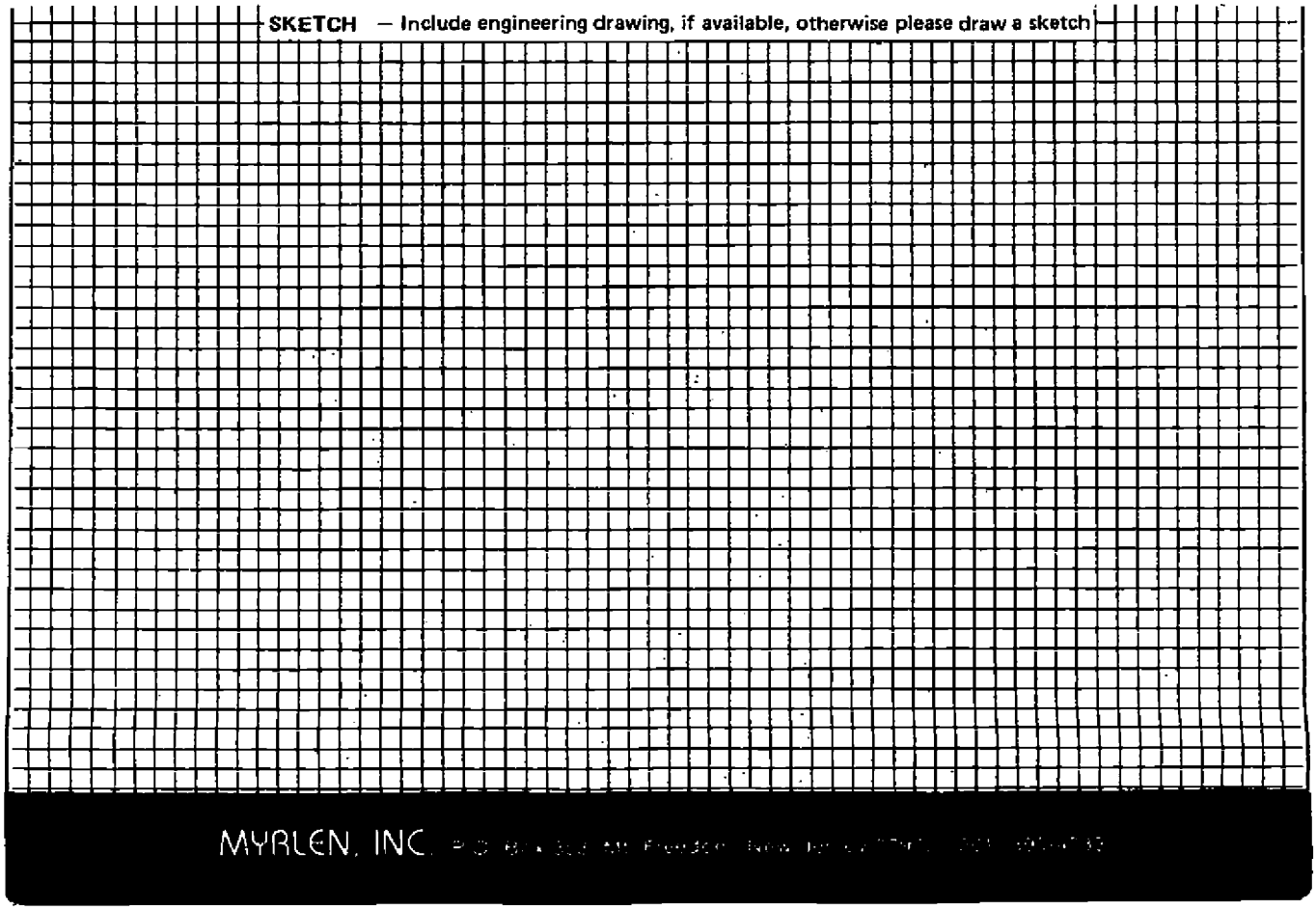
_____

_____

_____

_____

SKETCH – Include engineering drawing, if available, otherwise please draw a sketch



MYRLEN, INC.

New Airsweep Design - Simple, Efficient, Jam-Free

POSITIVE SWEEP & PUSH

New design combines powerful 0.3 second air sweep along walls with inward 'push' to lift and dislodge sticky, hard-to-move powdered materials from bins, hoppers, chutes. Result is positive, reliable flow. Unnecessary work stoppages and bin clean-out are eliminated.

TOTAL SYSTEM APPROACH

Myrlen Airsweep teams up with a special dust-type solenoid and electronic timer for the full System approach. The System intermittently 'fires' small amounts of high velocity air in shear to the container wall. The rate is programmed according to the problem and desired flow and can be esily adjusted as conditions vary. Up to an 8-foot diameter full circle sweep is attained using standard plant air. An "average" Airsweep System uses less than 10 CFM.

MODELS FOR ALL SIZE APPLICATIONS

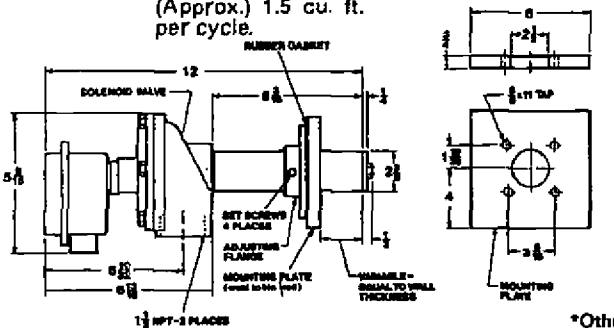
Two Airsweep models fit all flow problems and structures. Mounts easily to concrete, wood or steel and can be installed without first emptying the bin. Airsweeps are aiding material flow in bins, hoppers, silos, chutes, batchers, conveyor transfer points, screen decks, feeders, centrifuges...or any place granular material builds up or bridges. There is no vibration, stress or wear to the wall. Airsweeps are virtually noiseless and can operate in temperatures above 900 degrees.

VIRTUALLY MAINTENANCE-FREE

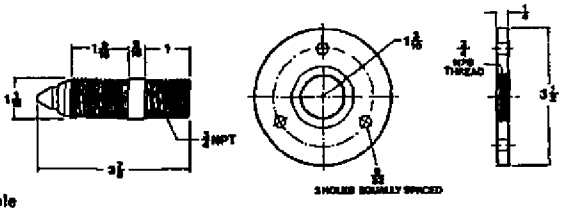
Myrlen's dust-type piston nozzle features a single moving part that recloses and reseals after firing. This locks out fines and material feed-back and eliminates clogging and jamming...keeps Airsweep operational for years without attention.

Dimensions & Specifications

Model VA-51 2", carbon steel*). Operates on 80 - 100 psi. Air Usage: (Approx.) 1.5 cu. ft. per cycle.



Model VA-06 (3/4", 304 stainless steel*). Operates on 40 - 60 psi. Air Usage: (Approx.) 0.4 cu. ft. per cycle.



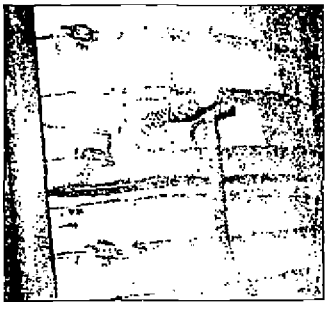
*Other Material Available

GUARANTEED SOLUTION

Tough flow problem? Send the specifics of your application to us for free engineered proposal...no obligation. Myrlen guarantees satisfactory performance or the Airsweep System may be exchanged or returned.

AIRSWEEP USE LIST INCLUDES:

Metallic ores, foundry sands. coal, coke, precipitator dust, clay, detergent, fertilizer, feed, food products, plastics, cement, talc, lime.



VA-51 eliminates ratholes on concrete silo in foundry.

Typical Airsweep System: 1) Airsweep; 2) Control Box; 3) Solenoid; 4) Air Receiver.

VA-06 keeps coal on the move above table feeder.

MYRLEN, INC. P.O. Box 353, Mt. Freedom, New Jersey 07970, (201) 895-4739

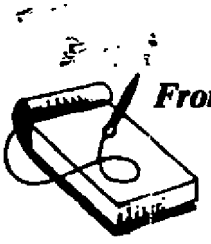
INC.

Area Code
401-539-2392

NJ # 201-895-4739

Leonard Rose
District Manager

P.O. Box 8
Stilson Road
Wyoming, R.I. 02898



From the desk of

LEONARD ROSE

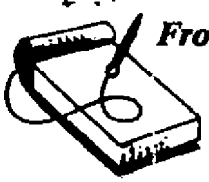
6/21/85

JIM -

FIRST, thanks very much for supplying the man-power (and brainpower, too) in troubleshooting the vibrator problem!

SECONDLY, literature enclosed covering the aeration unit. They are in stock, $16.00 each. 4-8 takes care of a medium sized bin. Satisfaction guarante

Thirdly, reminder about the airsweeps — Trial offer (free) for as many as you require If they work for you, we would bill you at $150.00 each, for as many as you



From the desk of

LEONARD ROSE

#2

wish to keep. Trial period would be 30 - 60 days, or whatever - - -

I will be in touch to find out your thoughts on all this. —

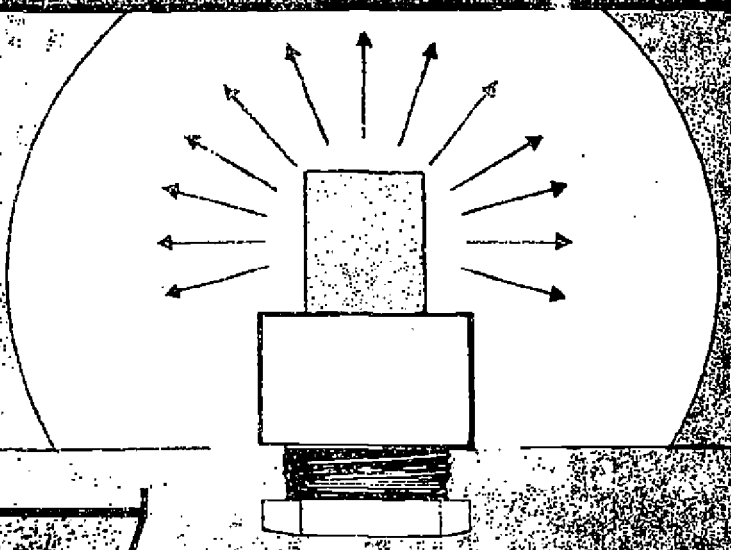
Thanks again

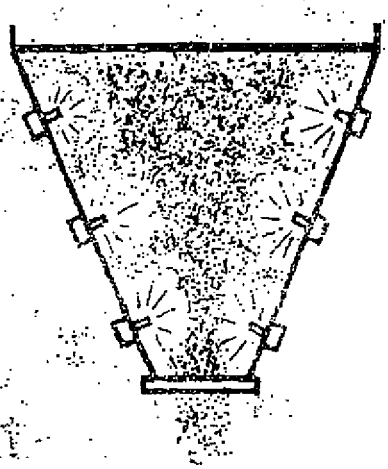
Len Rose

YOUR BIN DISCHARGE PROBLEMS ARE SOLVED

EASILY
QUICKLY
AT LOW COST
MINIMUM LABOR
MINIMUM DOWNTIME

COLEMAN AirPort





AIRPORT'S EFFICIENT AERATION

Fluidizes your product and provides uniform, uninterrupted flow from the bin. AirPort's injection of air is not a straight line blast, but a multi-directional dispersal which thoroughly agitates the material and also clears stubborn residue from the sides of the bin cone.

So called "difficult" materials which tend to hang up or bridge are quickly dislodged and kept moving by AirPorts.

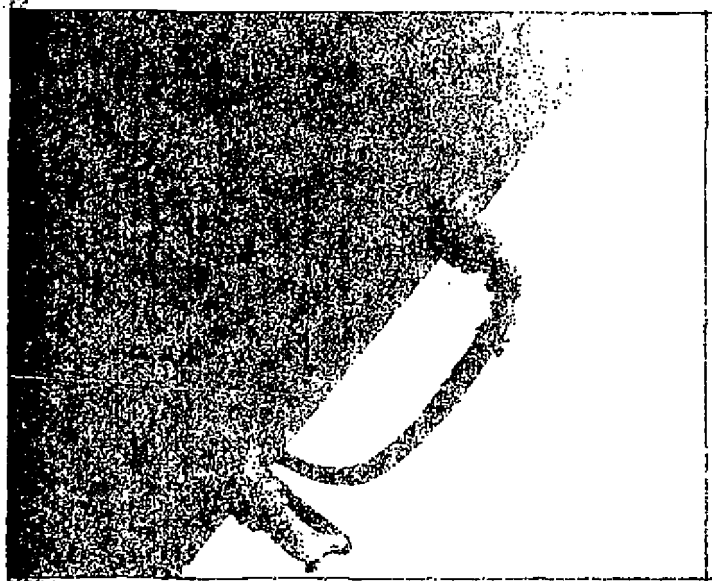
Units are completely accessible from outside for fast, convenient installation. If your present equipment is not doing the job, it's easy to change over to AirPorts. Your problem will become a thing of the past.

MYRLEN, INC.
P.O. [illegible]
Mt. Freedom, New Jersey 07970

The AirPort concept was originated to provide the features most wanted by users of *aeration equipment:*

Simpler design
More dependability
Lower Cost
Lower cost
Easier installation

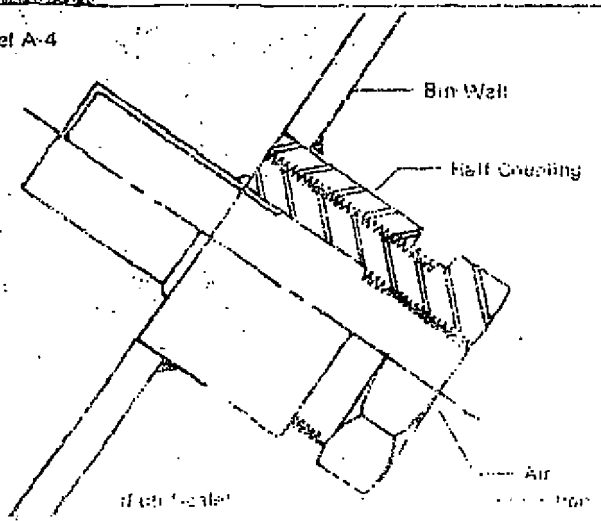
AirPorts have been thoroughly tested and proven in numerous installations. Stubborn materials such as finely packed powders are readily fluidized in hoppers, large bins or small spouts.



RUGGED CONSTRUCTION

AirPorts are made of fine micron porous bronze with a brass base. They are built for durability in tough operations. They can handle pressures from 1 to 100 psi and withstand temperatures up to 1000°F. Air consumption is 5 cfm at 3 psi and 10 cfm at 5 psi.

Model A-4



EASY INSTALLATION

Installation is simple. Drill a 1" hole in the bin or *chute and weld on the half coupling*, then screw in the aerator. Connect air to AirPort's 1/2" female pipe threads, normally with a 3/8" hose connection from a header. They fit on small diameter chutes and at the base of conical hoppers.

Other aerators install inside the bin so you can't get to them when the bin is full. Others are difficult to install from outside, requiring large diameter cut-outs plus numerous bolt holes. This type makes installation difficult in round spouts or at the bottom of conical hoppers. AirPort is easy, accessible and fits anywhere.

Represented by

MYRLEN, INC.

P.O. Box 363,
Mt. Freedom, New Jersey 07970

[illegible]

LEHMAN 01978

NOVEMBER INSPECTION MSHA 1985

LEHMAN 01979

FACSIMILE TRANSMISSION

Date 4/20/89

TO	FROM
Name K. Lehman	Name Beth Brown
Company CIM	Company CIM
City/State/Country So. Plainfield, NJ	Account Code 173
Facsimile Telephone No.	Telephone No. 5441 / Mail Code 3210
Verification Telephone No.	

This Transmission Consists of: 4 pages (including this page)

(Originator-Please number all pages.)

Cyprus Minerals Company Telecopy Center
Phone: (303) 740-5048

Facsimile Machines:		Room
Rapicom 230:	(303) 740-5224	333A
Rapicom 120:	(303) 740-5049	333A

Form 40-1000 (05-86)

September 21, 1987

G. H. Peppard
Secretary, Personnel and Salary Committee
Mail Code 201C

GENERAL WAGE INCREASE -- SOUTH PLAINFIELD, NEW JERSEY

Personnel and Salary Committee approval is requested to implement a $ .40 per hour across-the-board wage increase effective October 1, 1987 for the five non-represented hourly employees at CIM's South Plainfield Mill.

The annual straight-time cost of the proposed increase is approximately $4,160 and represents a 4.0% increase.

Background

South Plainfield, the smallest of CIM's talc mills, is located in the highly industrialized area of northern New Jersey near Newark and Elizabeth. The mill produces cosmetic talc from Montana and Italian crude. In addition to talc processing, the facility is now being used as a base for the Manager Cosmetic, Pharmaceutical and Foods Industry Sales.

South Plainfield is one of the few non-union operations in the area, and although the mill has not experienced any organizing activity since 1981, the possibility of future attempts still exists.

Justification

The attached survey presents wage data from four companies in South Plainfield's immediate area, plus information developed from a state-wide survey conducted by the New Jersey Employers Council. American Cyanamid, Northeastern, Nuodex and Union Carbide are all large chemical processing facilities in South Plainfield, while the Employers Council information was developed from organizations much closer in size to the South Plainfield Mill.

The survey shows that while Cyprus' rates continue to be substantially lower than the chemical processing facilities, the comparison with the smaller facilities represented in the Council data indicates that South Plainfield is more in line with state-wide rates. The differences between South Plainfield and the large chemical operations are consistent with past surveys and can be attributed to the region and its concentration of unionized companies. However, when compared with operations of like size and similar levels of business activity, Cyprus wage rates are more competitive.

CIM management contends that, based on business forecasts for the remainder of 1987 and all of 1988, it is economically unrealistic to implement the 10% to 20% increases necessary to achieve parity with the larger chemical employers represented in the survey. However, the proposed 4.0% increase will result in wage rates that compare favorably with other operations in the five- to ten-employee range.

Recommendation

CIM management supports the $ .40 per hour wage increase on the basis that it is necessary to maintain a competitive wage structure yet remain within the budgeted increase of 5.0%, allow our employees to keep pace with rising costs, and, at the same time, control costs to ensure profitability in industrial mineral's markets.

Mr. H. T. Mulryan concurs with this recommendation.

J. A. Krivanek
Vice President Human Resources
Mail Code S202

JAK:rlf

Attachment

H. T. Mulryan
R. J. Buettner
M. J. Lonang
J. E. Sanderson

APPROVED:

G. H. Peppard
Secretary, Personnel and Salary Committee

Date

CYPRUS INDUSTRIAL MINERALS COMPANY

SOUTH PLAINFIELD WAGE SURVEY

Effective October 1, 1987

pany Survey

	Cyprus Current	Cyprus Proposed (% Incr)	American Cyanamid	North-Eastern	Nuodex	Union Carbide	Survey Average	Cyprus Proposed vs. Survey Avg.
	9.60	10.00 (4.2%)	10.43	10.86	12.53	12.19	11.50	- 1.50
	9.75	10.15 (4.1%)	10.43	13.16	12.46	12.88	12.23	- 2.08
or	9.85	10.25 (4.1%)	10.43	12.16	12.53	12.88	12.00	- 1.75
	10.25	10.65 (3.9%)	11.54	13.16	12.67	13.93	12.83	- 2.18
	11.10	11.50 (3.6%)	12.78	14.37	13.70	14.45	13.83	- 2.33

ployers Council Survey of Comparable Companies

	Cyprus Proposed	Survey Median	Cyprus Proposed vs. Survey Median
	10.00	9.91	- .09
	10.15	10.26	- .11
or	10.25	N/A	N/A
	10.65	12.32	- 1.67
	11.50	13.75	- 2.25

o Data Available

OCT 01 '87 07:55 CYPRUS-IND MIN ENGL 303 740 5168 P.4

LEHMAN 01983

f. Agent Ghent: Lalemant

g. Discharge: Ghent - Sifferdok

h. Transit Time: 60 days (approximately)

3. Italian Crude to South Plainfield, NJ (Charles Mathieu)

a. Supplier: SOC TALCO E GRAFITE VAL CHISONE
Pinerolo, Italy
Telex # 843-21-0113 TALCVC I

b. Agent Italy: Agenzia Maritima Carlini
Savona, Italy
Telex # 843-27-1638 CARLINI

c. Ocean Carrier: Varies - spot charter - 3000 to 5000 MT

d. Agent U.S.: Bresnan Shipping
New York, NY (A. A. Mintoo)
Telephone # (212) 371-7609
Telex # 125172 BRESHIPS

(Ship), Anna Dent, Anna Dent

e. Discharge: Port of Newark
Berth 12, 8, or 10

f. Stevedores: M. P. Howlett (Dan Withen)
Telephone # (201) 866-1566

g. Truck to Plant: Matthew De Palma
Philadelphia, PA (Joe Adams) (Len Becker)
Telephone # (215) 535-3737 [illegible] 1620

h. Transit Time: 14 days (approximately)

i. Customs Broker: Meadows Wye & Co., Inc.
111 Broadway
New York, NY 10006

Telephone # (212) 349-3950

Mr. Ray McLoughlin, Representative

Berth #12

*revised 2/6/81

WAGE SURVEY

No. Of Employees	Job Titles	South Plainfield Current Rate	CHEVRON	TENNECO
2	Packer	$8.00	$8.97	
1	Warehouse Man	8.10	8.97	
1	Mobil Equip. Oper	8.20	8.97	
1	Mill Operator	8.60	9.54	
1	Mechanic	9.40	9.97	
6	TOTAL			
Straight Time Average		8.38	9.28	
Date Last Increase			6/27/83	
AMOUNT			5%	
Number Hourly Employees		6	25	
Union		No	AFL-CIO	
Dental Plan		Yes	Yes	
2nd Shift		.15	.25	
3rd Shift		.25	.25	
Products		Talc	Chemicals	

LEHMAN 01985

American Cyanamid	Natl Lead Industries	Union Carbide	Northeastern Products	Survey Average
$8.77	$9.72	$10.41	$8.73	$9.32
8.77	9.79	11.02	10.58	9.82
8.77	9.79	11.02	9.78	9.66
9.69	9.73	12.44	10.58	10.39
10.75	10.66	11.54	11.55	10.89
9.35	9.93	11.28	10.24	10.01
1/25/83	2/1/83	5/83	6/83	
5%	7%	N/A	N/A	
600	48	500	50	
ICWU	OCAW	OCAW	No	
Yes	Yes	Yes	Yes	
.25	.21	.35	10% of hour wage per hr.	
.50	.21	.50 + .20	" "	
Calcium, Chemicals	Titanium	Rotating Chemicals, Powders, Plastics etc.	Resins, Dry & Fluid	

U.S. Department of Labor

Mine Safety and Health Administration
P.O. Box 1874
Albany, NY 12201-1874

August 5, 1987

Mr. Keith B. Lehman, Mill Superintendent
Cyprus Mines Corporation
651 Metuchen Road
South Plainfield, New Jersey 07080

Dear Mr. Lehman:

The enclosed inspection report covers a Federal inspection of the South Plainfield Mill, I.D. No. 28-00959, South Plainfield, New Jersey, conducted on July 20-22, 1987. The inspection was made pursuant to Public Law 91-173 (83 STAT. 742) as amended by Public Law 95-164 (91 STAT. 1290).

Industrial hygiene samples, collected during this inspection, require laboratory analysis. You will receive a supplement to this inspection report upon completion of the analysis.

Actions taken as a result of this inspection were:

ORIGINAL ACTIONS THIS INSPECTION:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:	1	1				
Orders:						

ACTIONS ON PREVIOUS VIOLATIONS:

	Issue	Terminate	Modify	Extend	Rep by Order	Vacate
Citations:						
Orders:						

Sincerely yours,

Harold L. Thompson

Harold L. Thompson
Subdistrict Manager
Metal and Nonmetal Mine Safety and
Health, Northeastern District

cc: T. K. Shea, Chief Mine Safety Engineer, Dept. of Labor and Industry

ATTACHMENT

Man-hours for the first quarter of 1987 were 3,585. Man-hours for the second quarter of 1987 were 3,612. There were no reportable accidents. The incidence rate and severity measure were zero.

Safety was discussed with four employees. Topics were dust, noise, and electrical safety. The plant was in very good condition. The writer also discussed and demonstrated electrical examinations with the mill foreman and electrician. The superintendent was very cooperative and safety conscious. This was a well handled operation.

A review of records indicated the operator was in compliance with Part 50 reporting requirements outlined in Part 50.10, .20 and .30.

Pending the results of dust samples being analyzed in our laboratory, a supplemental report will follow.

Mine Citation/Order

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Violation Data

1. Date: Mo 07 Da 21 Yr 97 | 2. Time (24 Hr. Clock): 1110 | 3. Citation/Order Number: 2629286

4. Served To: Keith Lehman Mill Superintendent | 5. Operator: Cyprus Mines Corporation

6. Mine: South Plainfield Mill | 7. Mine ID: 28-00959 | (Contractor)

8. Condition or Practice | 8a. Written Notice (103g) ☐

The Roller mill 5HP motor did not have a proper connector where the flexible conduit enters the motor junction box. This could allow the conduit to be pulled out of the box and cause the conductors to be chafed to expose a bare conductor to possible electrical contact by employees. The area is a platform and exposure would be minimal.

See Continuation Form (MSHA Form 7000-3a) ☐

9. Violation | A. Health ☐ Safety ☒ Other ☐ | B. Section of Act: — | C. Part/Section of Title 30 CFR: 56.12008

Section II—Inspector's Evaluation

10. Gravity:

A. Injury or Illness (has) (is): No Likelihood ☐ Unlikely ☒ Reasonably Likely ☐ Highly Likely ☐ Occurred ☐

B. Injury or Illness could reasonably be expected to be: No Lost Workdays ☐ Lost Workdays or Restricted Duty ☐ Permanently Disabling ☐ Fatal ☒

C. Significant and Substantial (See Reverse): Yes ☐ No ☒ | D. Number of Persons Affected: 1

11. Negligence (check one)

A. None ☐ B. Low ☐ C. Moderate ☒ D. High ☐ E. Reckless Disregard ☐

12. Type of Action: 104(a), | 13. Type of Issuance (check one): Citation ☒ Order ☐ Safeguard ☐

14. Initial Action: A. Citation ☐ B. Order ☐ C. Safeguard ☐ D. Written Notice ☐ | E. Citation/Order Number | F. Dated Mo Da Yr

15. Area or Equipment

16. Termination Due | A. Date: Mo 07 Da 22 Yr 97 | B. Time (24 Hr. Clock): 1600

Section III—Termination Action

17. Action to Terminate

18. Terminated | A. Date: Mo Da Yr | B. Time (24 Hr. Clock)

Section IV—Automated System Data

19. Type of Inspection (activity code): 01 | 20. Event Number: 1837115 | 21. Primary or Mill: M

22. Signature: David W. Knepack | 23. AR Number: 923

MSHA Form 7000-3, Mar 85 (Revised)

Mine Citation/Order Continuation

U.S. Department of Labor
Mine Safety and Health Administration

Section I—Subsequent Action/Continuation Data

1. Subsequent Action	1a. Continuation	2. Dated (Original Issue)	Mo	Da	Yr	3. Citation/Order Number
☒	☐		07	21	87	2629286-01

4. Served To	5. Operator
Keith Lehman Superintendent	Cyprus Mines Corporation

6. Mine	7. Mine ID	
South Plainfield Mill	28-00959-	(Contractor)

Section II—Justification for Action

A proper connector was installed to connect the flexible conduit to the motor junction box

See Continuation Form ☐

Section III—Subsequent Action Taken

8. Extended To	A. Date	Mo	Da	Yr	B. Time (24 Hr. Clock)	C. Vacated ☐	D. Terminated ☒	E. Modified ☐

Section IV—Inspection Data

9. Type of Inspection	10. Event Number
01	183715

11. Signature	AR Number	12. Date	Mo	Da	Yr	13. Time (24 Hr. Clock)
Paul W Hnipach	923		07	22	87	1030

MSHA Form 7000-3a, Mar 85 (revised)

LEHMAN 01989

CIN -TALC
ASSETS BY EQUIPMENT NO.
MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
03236	COMPRESSOR	25 HP INGERSOLL AIR	329	29	0979	500.00
03236	COMPRESSOR					500.00
03237	TRUCK	TOWMOTOR CAT LIFT AUTO TRANS	329	29	0979	4,100.00
03237	TRUCK					4,100.00
03238	TRUCK	TOWMOTOR CAT LIFT AUTO TRANS	329	29	0979	4,100.00
03238	TRUCK					4,100.00
03239	UNLOADER	MELROE BOBCAT BOX CAR	329	29	0979	2,000.00
03239	UNLOADER					2,000.00
03240	TRACTOR	FORD W/FRONT END LOADER	329	29	0979	2,000.00
03240	TRACTOR					2,000.00
03243	SILO	2 15' DIA X 32' BULK STORAGE	329	29	0979	10,980.00
03243	SILO					10,980.00
03244	MAINTENANCE	MISC EQUIP & TOOLS	329	29	0979	3,000.00
03244	MAINTENANCE					3,000.00
03286		MISC FIXED ASSET ACQUISITION COST APE 388	329	29	1079	5,349.00
03286						5,349.00
03287	STORAGE PAD	PAVING CRUDE APE 388A	329	29	1079	17,378.00
03287	STORAGE PAD					17,378.00
03288	WRAP MACHINE	IPN 487S SR STRETCH APE 388E	329	29	1179	4,101.00
03288	WRAP MACHINE					4,101.00
03289	TRUCK	CAT LIFT 750-6 87W00980 APE 388F	329	29	1179	21,121.00
03289	TRUCK					21,121.00
03291	THX MACHINE	ADDL COST APE 388P	329	29	1279	524.00
		ASR 53 APE 388P	329	29	1279	2,417.00
03291	THX MACHINE					2,941.00

LEHMAN 01990

ASSETS BY EQUIPMENT NO.

MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
03470	PLANT	IMPROVEMENTS AFE 3864 m/h ITEMS WORN OUT + REPLACED	329	29	0680	51,662.00
03470	PLANT					51,662.00
03554	AUDIO VIEWER	AFE 685	329	29	1180	538.00
03554	AUDIO VIEWER					538.00
04024	MILL	ROLLER REPAIR AFE 3880 PARTS WORN OUT REPLACED	329	29	0880	24,878.00
04024	MILL					24,878.00
04025	WELDER	MILLER AMP 200 SN JA362155 AFE 723	329	29	0181	829.00
04025	WELDER					829.00
04092	SHOP TOOLS	AFE 3880 just identify	329	29	0481	1,248.00
04092	SHOP TOOLS					1,248.00
04093	RAIL DOCK	PLATE AFE 730	329	29	0381	915.00
04093	RAIL DOCK					915.00
04144	DRYER	PROD ELEVATOR AFE 3860	329	29	0380	565.00
04144	DRYER					565.00
04145	PLANT	GUARDS & RAILING AFE 3886	329	29	0481	17,152.00
04145	PLANT					17,152.00
04146	PLANT	ACCESS DOORS AFE 3880	329	29	1280	1,635.00
04146	PLANT					1,635.00
04147	COMPRESSOR	JOY MODEL TA220IAAF SN 145545 AFE 663	329	29	0681	21,880.00
04147	COMPRESSOR					21,880.00
04148	UNIT	OIL DISPENSING MODEL HDC12-101180 AFE 786	329	29	0681	3,098.00
04148	UNIT					3,098.00
04198	SHOP TOOLS	ADDL COST C/R 04092 3880 not identify	329	29	0481	1,350.00
04198	SHOP TOOLS					1,350.00
04200	CYCLONE	ROLLER MILL REPLACEMENT AFE 635	329	29	1080	11,250.00

LEHMAN 01991

CIM--TALC
ASSETS BY EQUIPMENT NO.

MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
04200	CYCLONE					11,250.00
04202	RACK	OIL STORAGE ADDL COST C/R 04148	329	29	0681	173.00
04202	RACK					173.00
04203	CONDITIONER	AIR BIOLAB 12000 BTU CARRIER AFE 813	329	29	0781	474.00
04203	CONDITIONER					474.00
04251	SHOP TOOLS	ADDL COST C/R 04092 AFE 3880 not identify	329	29	0481	78.00
04251	SHOP TOOLS					78.00
04252	SYSTEM	VACUUM AFE 631 & ADDL COST 04252	329	29	0981	28,081.00
04252	SYSTEM					28,081.00
04333	AREA	WAITING-FOR TRUCK DRIVER ADDL COST CR4333 AF	329	29	1181	2,594.00
04333	AREA					2,594.00
04334	LOADER	920 CAT SN 62K10730 AFE 892	329	29	1181	49,000.00
04334	LOADER					49,000.00
04547	DOCK SEALS	AFE 937	329	29	0182	2,219.00
04547	DOCK SEALS					2,219.00
04781	LOADER	SKID-STEER SN 11568	329	29	1282	14,162.00
04781	LOADER					14,162.00
04818	BIN	VENTING IMPROVEMENTS	329	29	0682	31,099.00
04818	BIN					31,099.00
05047	OVEN	LITTON MICROWAVE AFE 1074	329	29	1282	413.28
05047	OVEN					413.28
05048	HOIST	50 FT IRS3 ELECTRIC JET AFE 1075	329	29	1282	1,103.92
05048	HOIST					1,103.92
05049	SAW	JET BAND NVBS 712 AFE 1085	329	29	1282	1,650.00

LEHMAN 01992

NILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
05049	SAW					1,650.00
05050	WELDER	MILLER CP-300 MIG W/WIRE FEED SN JC646062	329	29	1282	1,961.00
05050	WELDER					1,961.00
35031		SALES TAX	329	29	0485	82.20
35031						82.20
35031	TYPEWRITER	SILVERREED MEMORY EX66	329	29	0485	1,370.00
35031	TYPEWRITER					1,370.00
35999			329	29	0979	2,000.00
		ADDL COST	329	29	0984	43.65
35999						2,043.65
35999	CABINET	FOR VTR C50E TV UNITS	329	29	0884	340.00
35999	CABINET					340.00
43003		Preload	329	29	0384	350.00
43003						350.00
43003	PICK UP	1982 FORD F-250 VIN 1FTHF25Z3CPA19481 PINA P	329	29	0584	4,025.12
43003	PICK UP					4,025.12
84020	CLASSIFIER	JET STREAM - AFE 83-17 ADDL DETAILS REQD	329	29	0384	51,573.57
		JET STREAM AFE 83-17 ADDL COST	329	29	0884	244.62
84020	CLASSIFIER					51,818.19
84032		ADDL COST	329	29	1185	1,351.71
84032						1,351.71
84032	CONTROLLER	ROLLER MILL REJECT	329	29	1085	442.13
84032	CONTROLLER					442.13
84034	SYSTEM	SEMI-BULK PACKAGING AFE 85-03	329	29	1285	28,021.25
84034	SYSTEM					28,021.25
85016	BRIGHTIMETER	MODEL S/4 S/N 40421 Transferred	329	29	1283	8,487.09

LEHMAN 01993

MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
85018	BRIGHTIMETER					6,487.09
93011	RAMP	RAIL RAMP 20M	329	29	1083	2,550.00
93011	RAMP					2,550.00
93012	FREIGHT	ON UNIDENTIFIED ARTICLE	329	29	1083	181.88
93012	FREIGHT					181.88
93013	RAMP	CRUDE UNLOADING RAMP AND PAD	329	29	1283	3,400.00
93013	RAMP					3,400.00
93013	PLATE	FABRICATED DOCK PLATE FOR CRUDE UNLOADING RA	329	29	1283	350.00
93013	PLATE					350.00
93013	COLOR TV	PJC42300	329	29	0784	301.94
93013	COLOR TV					301.94
93013	RECORDER	VIDEO VJ255	329	29	0784	453.46
93013	RECORDER					453.46
93020	PROJECTOR	USED MOVIE PROJECTOR	329	29	1183	425.00
93020	PROJECTOR					425.00
93023	PLATFORM	CRUDE UNLOADING Duplication of 93013	329	29	1283	3,400.00
93023	PLATFORM					3,400.00
93038		AIRCONDITIONING UNIT (CARRIER) S/N 5380144	329	29	0684	410.00
		SALES TAX	329	29	0684	24.60
93038						434.60
93076		TAX	329	29	0185	32.16
93076						32.16
93076	DOOR	2/8 X T/O STEEL	329	29	0185	535.95
93076	DOOR					535.95
93124		ADDL COST	329	29	0385	247.35

LEHMAN 01994

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
93124		ADDL COST LABOR	329	29	0285	248.09
		SALES TAX	329	29	0385	15.00
		TRAILER RESTRAINT	329	29	0285	2,569.00
93124						3,079.44
93147		ADDL COST	329	29	0885	34.51
93147						34.51
93147	BULKRAILSYST	MAGNET FBA3T	329	29	0785	3,094.00
93147	BULKRAILSYST					3,094.00
93148		ADDL COST	329	29	0585	127.41
93148						127.41
93148	CURTAIN	NOISE CONTROL	329	29	0385	2,399.08
93148	CURTAIN					2,399.08
93148		TAX	329	29	0385	18.01
93148						18.01
93154	GRANULOMETER	PARTICLE SIZE ANALYZER AFE 85-20 Transfer G.E.	329	29	0186	26,265.63
93154	GRANULOMETER					26,265.63
93999			329	29	0983	759.00
93999						759.00
93999	RAILCARACCES	ADDITIONAL ACCESSORIES	329	29	0185	2,717.09
		ADDL CUST	329	29	0185	739.23
			329	29	0285	-22.52
		STEEL TUBING	329	29	0185	585.66
		3T4-409 16GACARBON STEEL-6 SLIPCOUPLIN	329	29	0185	858.41
93999	RAILCARACCES					4,922.91
96000	REPAIRS	TO LOADING DOCK REMOVED CONCRETE PIER	329	29	1183	100.00
96000	REPAIRS					100.00
97006	BLDG	ADD COST (Tarps curtain)	329	29	1185	1,280.00
97006	BLDG					1,280.00

LEHMAN 01995

CIH--TALC
ASSETS BY EQUIPMENT NO.

MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
97006	STORAGE BLDG	ADD COST AFE 83-20 ← REVISED PRINTS	329	29	0186	400.00
97006	STORAGE BLDG					400.00
97006	BLDG	CRUDE STORAGE BLDG	329	29	1185	79,909.84
		TAXES	329	29	1185	76.80
97006	BLDG					79,986.64
						2,435,662.16

LEHMAN 01996

CIM--TALC
ASSETS BY EQUIPMENT NO.

MILL-SOUTH PLAINFIELD MONTH OF JUL.1986

EQUIPMENT NUMBER	ARTICLE	DESCRIPTION	COMPANY	CONTROL NUMBER	ACQ-DATE	FINANCIAL ADJUSTED AMOUNT
03223	SHED	RAIL CAR	329	29	0979	34,442.00
03223	SHED					34,442.00
03224	MILL	BUILDING	329	29	0979	113,762.00
03224	MILL					113,762.00
03225	WAREHOUSE		329	29	0979	152,378.00
		ADDITION	329	29	0979	28,179.00
03225	WAREHOUSE					180,557.00
03227	OFFICE & LAB		329	29	0979	151,335.00
03227	OFFICE & LAB					151,335.00
03227	SHOP & LAB	ADDITION	329	29	0979	37,573.00
03227	SHOP & LAB					37,573.00
03229	SYSTEM	UNLOADING HOPPER CAR	329	29	0979	94,976.00
03229	SYSTEM					94,976.00
03230	DRYER SYSTEM		329	29	0979	284,927.00
03230	DRYER SYSTEM					284,927.00
03231	SYSTEM	MILL FEED CONVEYOR	329	29	0979	189,951.00
03231	SYSTEM					189,951.00
03232	SYSTEM	MILL GRINDING & PACKING	329	29	0979	199,344.00
03232	SYSTEM					199,344.00
03233	SYSTEM	ROLLER MILL & PACKING	329	29	0979	532,281.00
03233	SYSTEM					532,281.00
03234	SYSTEM	BULK STORAGE LOADING & TRANSFER	329	29	0979	37,573.00
03234	SYSTEM					37,573.00
03235	COMPRESSOR	15 HP INGERSOLL AIR	329	29	0979	500.00
03235	COMPRESSOR					500.00

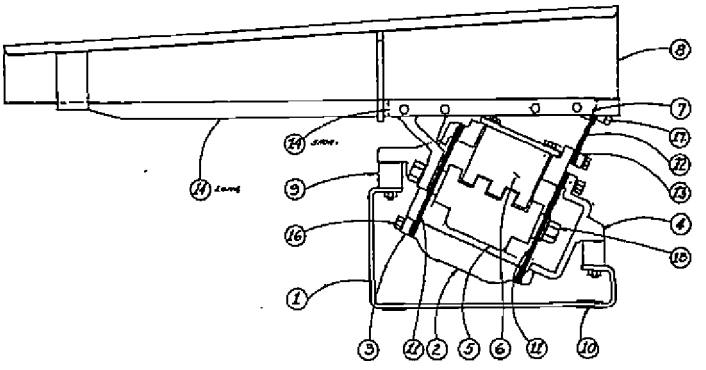
LEHMAN 01997

ERIEZ MAGNETICS

LEHMAN 01998

ERIEZ HI-VI VIBRATORY EQUIPMENT

10A, 20A, 30A, 40A, 45A, 50A & 55A VIBRATORY FEEDER PARTS LIST



10A

Part No.	Name	Qty. Each	Cost
1	Base	1	$ 8.25
2	Body Casting	1	17.50
3	Clamp Ring, Front	1	6.25
4	Clamp Ring, Rear	1	7.50
5	Armature Assembly	1	19.00
6	Electrical Assembly, 115V	1	29.00
7	Tie Bar (Both Sections)*	1	10.25
8	Tray (Specify)	1	
	(a) 2 x 16 Flat		22.00
	(b) 1½ x 16 Half-Round		32.00
	(c) 1½ x 16 Vee		22.00
	(d) 1 x 15 Tubular		55.00
9	Shock Mount	4	$ .50 ea.
10	Grommet	4	.20 ea.
11	Dist Spring (Set)**	1	11.25
12	Tuning Spring (Specify)	-	2.00
	4 Ply		
	5 Ply		
	7 Ply		
	9 Ply		
13	Tuning Spring Clamp	2	1.75 ea.
14	Tray Mounting Channel	1	1.75
15	Tie Bar Alignment Plate (Not part of Assembly)	1	.65

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style, Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Dist Spring are furnished as a set only. Replacement must be made both front and rear.

20A

Part No.	Name	Qty. Each	Cost
1	Base	1	$ 8.75
2	Body Casting	1	20.00
3	Clamp Ring, Front	1	6.75
4	Clamp Ring, Rear	1	8.25
5	Armature Assembly	1	30.00
6	Electrical Assembly, 115V	1	29.00
7	Tie Bar (Both Sections)*	1	10.75
8	Tray (Specify)	1	
	(a) 4 x 20 Flat		24.00
	(b) 7 x 14 Flat		28.00
	(c) 3 x 20 Half-Round		34.00
	(d) 3 x 20 Vee		28.00
	(e) 2 x 19 Tubular		49.00
9	Shock Mount	4	$ .50 ea.
10	Grommet	4	.20 ea.
11	Dist Spring (Set)**	1	12.50
12	Tuning Spring (Specify)	-	2.00
	4 Ply		
	5 Ply		
	7 Ply		
	9 Ply		
13	Tuning Spring Clamp	2	1.75 ea.
14	Tray Mounting Channel	1	1.75
15	Tie Bar Alignment Plate (Not part of Assembly)	1	.65

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style. Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Dist Spring are furnished as a set only. Replacement must be made both front and rear.

30A

Part No.	Name	Qty. Each	Cost
1	Base	1	$10.00
2	Body Casting	1	20.75
3	Clamp Ring, Front	1	7.00
4	Clamp Ring, Rear	1	11.25
5	Armature Assembly	1	29.00
6	Electrical Assembly, 115V	1	34.00
7	Tie Bar (Both Sections)*	1	12.00
8	Tray (Specify)	1	
	(a) 5 x 22 Flat		30.00
	(b) 7 x 20 Flat		32.00
	(c) 4 x 20 Half-Round		38.00
	(d) 4 x 20 Vee		32.00
	(e) 3 x 19 Tubular		74.00
9	Shock Mount	4	$ .50 ea.
10	Grommet	4	.20 ea.
11	Dist Spring (Set)**	1	13.75
12	Tuning Spring (Specify)	-	2.00
	4 Ply		
	5 Ply		
	7 Ply		
	9 Ply		
13	Tuning Spring Clamp	2	1.75 ea.
14	Tray Mounting Channel	1	2.00
15	Tie Bar Alignment Plate (Not part of Assembly)	1	.65

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style. Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Dist Spring are furnished as a set only. Replacement must be made both front and rear.

40A

Part No.	Name	Qty. Each	Cost
1	Base	1	$12.50
2	Body Casting	1	49.00
3	Clamp Ring, Front	1	10.50
4	Clamp Ring, Rear	1	12.50
5	Armature Assembly	1	39.00
6	Electrical Assembly, 115V	1	70.00
7	Tie Bar (Both Sections)*	1	17.00
8	Tray (Specify)	1	
	(a) 5 x 26 Flat		37.00
	(b) 7 x 20 Flat		40.00
	(c) 9 x 17 Flat		42.00
	(d) 4 x 26 Half-Round		52.00
	(e) 3 x 26 Tubular		97.00
	(f) 4 x 25 Tubular		102.00
9	Shock Mount	4	1.50 ea.
10	Grommet	4	.20 ea.
11	Dist Spring (Set)**	1	18.75
12	Tuning Spring (Specify)	-	3.75
	5 Ply		
	7 Ply		
	9 Ply		
	11 Ply		
	13 Ply		
13	Tuning Spring Clamp	2	3.00 ea.
14	Tray Mounting Channel* (Specify)		
	Long (19")		3.25
	Short (9-5/8")		2.00
15	Tie Bar Alignment Plate (Not part of Assembly)	1	1.75

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style. Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Dist Spring are furnished as a set only. Replacement must be made both front and rear.

45A

Part No.	Name	Qty. Each	Cost
1	Base	1	$ 12.50
2	Body Casting	1	65.00
3	Clamp Ring, Front	1	10.50
4	Clamp Ring, Rear	1	12.50
5	Armature Assembly	1	39.00
6	Electrical Assembly, 115V	1	70.00
7	Tie Bar (Both Section)*	1	17.00
8	Tray (Specify)	1	
	(a) 7 x 30 Flat		65.00
	(b) 9 x 24 Flat		65.00
	(c) 12 x 20 Flat		65.00
	(d) 4 x 30 Tubular		100.00
	(e) 6 x 24 Tubular		100.00
9	Shock Mount	4	3.75 ea.
10	Grommet	4	.20 ea.
11	Disc Spring (Set)**	1	$ 44.00
12	Tuning Spring (Specify)	-	3.75
	5 Ply		
	7 Ply		
	9 Ply		
	11 Ply		
	13 Ply		
13	Tuning Spring Clamp	2.	3.00 ea.
14	*Tray Mounting Channel* (Specify)		
	Long (22")		4.50
	Short (9-4½")		3.25
15	Tie Bar Alignment Plate (Not Part of Assembly)	1	3.25

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style, Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Disc Spring are furnished as a set only. Replacement must be made both front and rear.

50A

Part No.	Name	Qty. Each	Cost
1	Base	1	$ 47.00
2	Body Casting	1	137.00
3	Clamp Ring, Front	1	23.25
4	Clamp Ring, Rear	1	27.50
5	Armature Assembly	1	79.00
6	Electrical Assembly 115 V. or 230 V. (Specify)	1	82.50
7	Tie Bar (Both Sections)*	1	37.00
8	Tray (Specify)	1	
	(a) 9 x 38 Flat		85.00
	(b) 13 x 26 Flat	1	95.00
	(c) 17 x 22 Flat		95.00
	(d) 8 x 38 Half Round		115.00
	(e) 4 x 48 Tubular		115.00
	(f) 6 x 42 Tubular		115.00
	(g) 8 x 38 Tubular		115.00
9	Shock Mount	4	3.50 ea.
10	Grommet	4	.50 ea.
11	Disc Spring (Set)**	1	70.00
12	Tuning Spring (Specify)	-	6.25
	7 Ply		
	9 Ply		
	11 Ply		
	13 Ply		
	15 Ply		
13	*Tuning Spring Clamp*	2	2.50 ea.
14	Tray Mounting Channel (Specify)		
	Long (28")		7.00
	Short (15")		5.00
15	Tie Bar Alignment Plate (Not part of Assembly)	1	2.00

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style. Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Disc Spring are furnished as a set only. Replacement must be made both front and rear

55A

Part No.	Name	Qty. Each	Cost
1	Base	1	$ 47.00
2	Body Casting	1	136.00
3	Clamp Ring, Front	1	23.25
4	Clamp Ring, Rear	1	27.50
5	Armature Assembly	1	79.00
6	Electrical Assembly 115 V or 230 V (Specify)	1	82.00
7	Tie Bar (Both Sections)*	1	37.00
8	Tray (Specify)		
	(a) 9 x 38 Flat		85.00
	(b) 13 x 26 Flat	1	95.00
	(c) 17 x 22 Flat		95.00
	(d) 8 x 38 Half Round		115.00
	(e) 4 x 48 Tubular		115.00
	(f) 6 x 42 Tubular		115.00
	(g) 8 x 38 Tubular		115.00
9	Shock Mount	4	3.50 ea.
10	Grommet	4	.50 ea.
11	Disc Spring Set (Specify)	1	130.00
12	Tuning Spring (Specify)	-	6.25
	7 Ply		
	9 Ply		
	11 Ply		
	13 Ply		
	15 Ply		
13	Tuning Spring Clamp	2	2.50 ea.
14	Tray Mounting Channel (Specify)		
	Long (28")		7.00
	Short (15")		5.00
15	Tie Bar Alignment Plate (Not Part of Assembly)	1	2.00

Note: Parts not listed above (screws, nuts and washers) are standard items obtainable at any industrial supply house. Parts 16, 17 and 18 (Spring Clamp Screws) are of high-strength steel.

Parts listed above must be secured from Eriez Manufacturing Company. When ordering parts, be sure to specify Feeder Model and Style. Part No., and Quantity.

* To insure proper alignment of the bar and tray mounting channel, only matched 2 section tie bars are furnished.

** Disc Spring are furnished as a set only. Replacement must be made both front and rear.

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ERIEZ OF CANADA Ltd., 133 Oakdale Rd., Toronto (Downsview), Ont., Canada

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MODELS 10A, 20A, 30A, 40A, 45A, 50A and 55A
Installation, Operating & Maintenance Instructions

(WITH REFERENCES TO PARTS LIST)

BEFORE STARTING YOUR VIBRATORY FEEDER

MOUNTING

This HI-VI model should be mounted on a flat surface in one of the following ways:

A. POSITIONED AND FASTENED (Fig. 1)

Fastened to desired surface with bolts or screws of proper size through the base grommets. Use flat washers under the bolt heads. Do not fasten the bolts or screws too tightly or the vibration isolating effect of the grommets will be lost.

Fig. 1

B. POSITIONED BUT NOT FASTENED (Fig. 2)

Fixed headless stud pins of proper size and spacing. Set the base (with base grommets in place) over the pins.

Fig. 2

C. NOT POSITIONED OR FASTENED

Simply place on a flat surface in the desired position.

ELECTRICAL CONNECTIONS (Fig. 3)

1. Check the specifications of the power line to be certain that they are the same as those shown on the nameplate of the Feeder and Control.
2. Connect the black and the white wires in the Feeder power cord to the terminals in the control box marked "Output".
3. Connect the green wire (ground) to the lug provided in the box.
4. Connect the power line to the terminals in the control box marked "Line".
5. Connect the lug in the control box to a good earth ground (a cold water line is excellent). If a **well-grounded** metallic conduit system is used, the latter connection may be dispensed with.

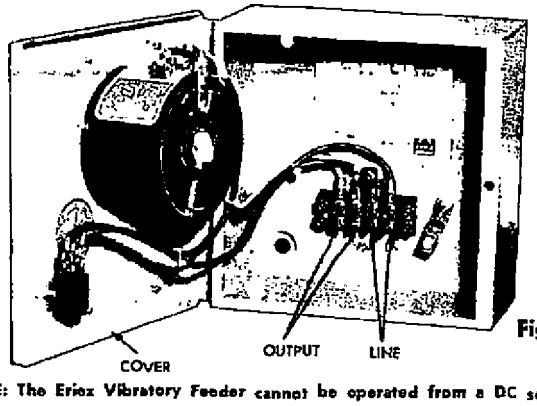

Fig. 3

NOTE: The Eriez Vibratory Feeder cannot be operated from a DC source

YOU ARE NOW READY TO START YOUR VIBRATORY FEEDER

OPERATION AND MAINTENANCE

To start the Vibratory Feeder after all connections have been made, turn the switch on the control to the "ON" position and adjust the feed rate by rotating the control knob. Normally no warm-up period is required. **Do not operate the unit with any associated equipment touching any part of the unit.**

No routine maintenance or lubrication is required, except that any accumulation of foreign matter should be periodically removed from between the tray and the body to prevent restriction of movement of the vibratory elements.

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SPECIAL TRAYS AND ATTACHMENTS

Eriez engineering service should always be consulted before undertaking the design or construction of special trays. Neither standard or special trays as furnished by Eriez Manufacturing Co., should be modified or attachments made without first consulting us. **(See Standard Tray Specifications.)**

ADJUSTMENT (Tuning)

The adjusting means is solely for producing optimum performance of the unit where a specific material of low (under 40 lbs./cu. ft.) or high (over 150 lbs./cu. ft.) density is to be handled continuously . . . also where off-standard sizes and shapes of trays are required.

This unit is tuned by changing the stiffness of the tuning spring (See Fig. 4) or springs. This adjustment consists of varying the number of springs, or the number of fiberglass plies in individual springs.

In NORMAL OPERATION at full voltage the total displacement measured at the back of the tiebar (or the back of the tray if a displacement sticker is used) is .030" for 10A; .045" for 20A through 55A. In general these displacements should not be exceeded by more than .005".

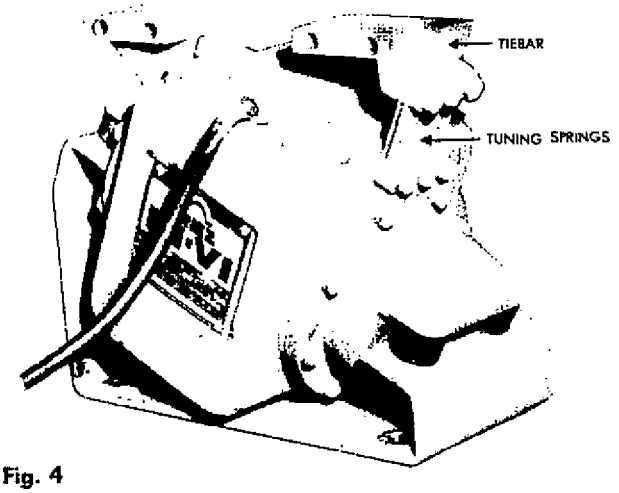

Fig. 4

HOW TO MEASURE DISPLACEMENT (See Fig. 4)

With unit operating observe where the fine gray lines on the displacement sticker meet. This point will be higher or lower as the displacement changes. Opposite the point where they meet, read amount of displacement. If a rule is used, the displacement can readily be measured as a "blurred bar" at the back of the tiebar.

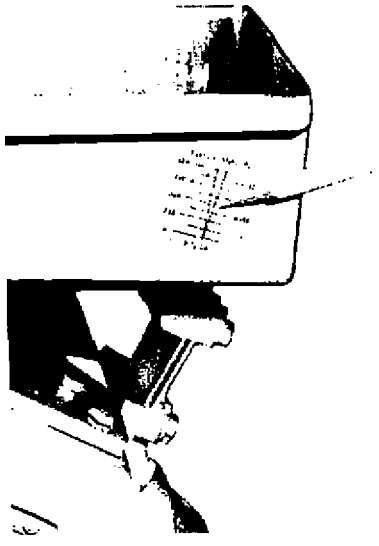

Fig. 5

NEVER OPERATE THE UNIT IN A STRIKING CONDITION!

A. Adjusting (tuning) Guide

The following general rules should be borne in mind when making adjustments.

1. To **increase** the tray displacement, **decrease** the stiffness of the spring system.
2. To **decrease** the tray displacement, **increase** the stiffness of the spring system.

The above rules are true where the unit is operating on the normal side of the tuning curve. If increasing or decreasing the spring stiffness has an opposite effect, it means that the mass of the tray and/or load has been great enough to throw the operating point to the reverse side of the curve, which is undesirable. In this event, the stiffness should be increased (or the tray-load mass reduced) until the behavior is in accordance with rules (1) and (2) above. The unit can then be properly tuned.

To serve as a guide to the stiffness of the tuning springs, each spring is marked with a code number. Example: 13— 125. The first two digits indicate the number of plies in the spring. The following numbers indicate the relative spring stiffness. The higher this number, the stiffer the spring.

The total stiffness of the spring system is the sum of the relative stiffness numbers. By combinations of standard stiffness springs, virtually any desired stiffness can be obtained.

B. ADJUSTMENT FOR NON-STANDARD TRAYS

In the adjustment of the unit, the following steps should be followed:

1. Attach the tray (see Tray Installation Procedure). Be sure that all bolts are tight.
2. Energize the unit at the nameplate voltage and frequency.
3. a) If a control box is used, turn the control slowly toward the full "ON" position and observe the unit in operation. If a control box is not used, turn the unit on and off quickly and note its performance during the "ON" period.

   b) If a hammering noise is in evidence, the tray

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displacement is excessive. To produce normal quiet operation at full voltage, increase the stiffness of the tuning spring stack by substituting a leaf or leaves of greater ply for one or more of the tuning spring leaves, or by adding additional leaf or leaves, until approximately normal total displacement is obtained. Under normal operating conditions, the unit may be turned on or off without any momentary or prolonged striking noise.

c) If the displacement at full voltage is considerably less than normal, decrease the tuning spring stiffness by substituting leaves of lesser ply. When installing tuning springs, **be sure that all spring clamping screws are tight.** Additional springs may be purchased from Eriez Mfg. Co.

C. ADJUSTING OR TUNING FOR VARIOUS DENSITIES OF MATERIALS

The unit may be adjusted to provide optimum performance for a specific density of material in the same manner as described for non-standard trays. When a unit is adjusted, with the tray empty, to the normal total displacement for that unit (given above), it is set for optimum performance on a material having a density of 100 lbs./cu. ft. All standard units are so adjusted at the factory. For very light materials, optimum performance occurs with displacements above the normal value, but not to exceed .005" above the normal value. For denser materials, optimum performance occurs with displacements below the normal value.

The basic characteristic of these units is such that the volume output is virtually constant for materials from 40 lbs./cu. ft to 150 lbs./cu. ft. when units are equipped with standard trays. When non-standard trays are used (particularly large trays), a tuning change is often necessary to provide optimum performance for a specific material; also, since the actual "dead" weight of material on the tray may be appreciable.

REPAIRS
Coil Replacement

The coil in a vibratory Feeder may require replacement due to operation at over-voltage, or normal "aging" of the unit. Re-assembly after a coil change will require checking and possible re-centering of the air gap between the E-Frame and the permanent magnet elements. In the 30A, 40A, 45A, 50A, and 55A the air gap is directly accessible from the outside of the unit as described below. In the 10A and 20A, the air gap is not directly accessible from the outside, so that a somewhat different adjustment procedure is required.

The following procedure should be followed in removing and replacing the electrical assembly (See Fig. 6 & 7.

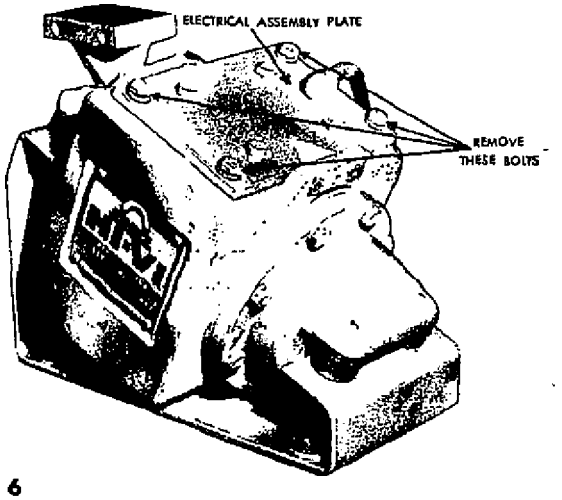

Fig. 6

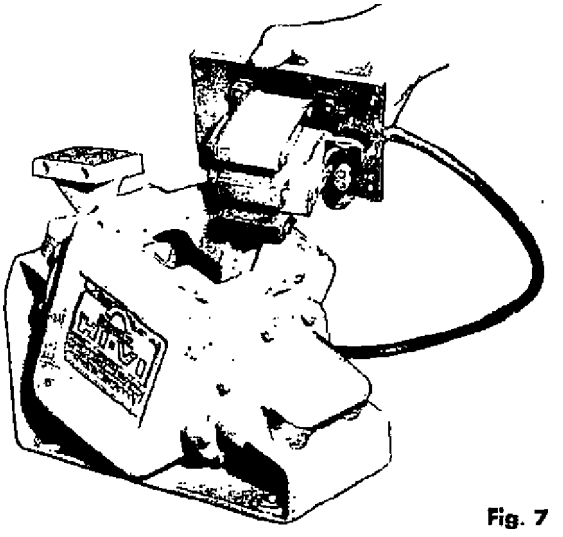

Fig. 7

1. Remove the screws securing the lower end of the tuning spring and those securing the tray channel to the front section of the tiebar. Remove the tray, the rear section of the tiebar and the tuning springs in one piece.
2. Remove the screws securing the electrical assembly plate to the body casting and lift the entire electrical assembly out of the body cavity.
3. Remove defective coil or E-Frame assembly and install new coil or E-Frame assembly (Order from Eriez parts list).
4. In replacing the electrical assembly, insert it into original position in the body casting. DO NOT FORCE THE ASSEMBLY INTO PLACE. When properly aligned, the assembly will go in readily although there will be a distinct "pull" exerted by the permanent magnet in the armature. To overcome this pull, it may be necessary to guide the plate with a screwdriver, meanwhile applying pressure to the top of the plate.
5. Start the electrical assembly plate screws into the casting, but do not tighten completely.

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6. 30A, 40A, 45A, 50A, and 55A only. (See Fig. 8).

   a) Remove the cover nameplate from one side of the body casting. With a screwdriver, remove the cork from the gap access port.

   b) Working through the gap access port in the side of the body casting, and using a non-magnetic feeler gauge approximately .072" thick (furnished with each unit), check the air gaps between the E-Frame legs and the armature pole pieces (See Fig. 9). These gaps should be uniform in width and parallel and as nearly alike as possible. If they are not, they should be adjusted by shifting the electrical assembly plate. In checking and adjusting the gaps, it may be found convenient, and the internal parts will be easier to see, if both cover nameplates and both corks are removed.

   c) Tighten the electrical assembly plate screws and replace the cover nameplates.

7. 10A and 20A only.

   a) After installing the electrical assembly and inserting the screws somewhat loosely, approximately center the assembly with respect to the armature. This can be done by noting the front and rear points at which the E-Frame contacts the armature. Tighten the electrical assembly screws.

   b) Reinstall the tray-tiebar-tuning spring assembly (See instructions below).

   c) With the unit operating at normal displacement, check the centering of the electrical assembly with respect to the armature by exerting equal hand pressure alternately forward and backward on the tray. If such equal hand pressure causes armature striking in one direction but not in the other, the electrical assembly should be loosened slightly and shifted in the same direction until striking ceases to occur. Retighten the screws.

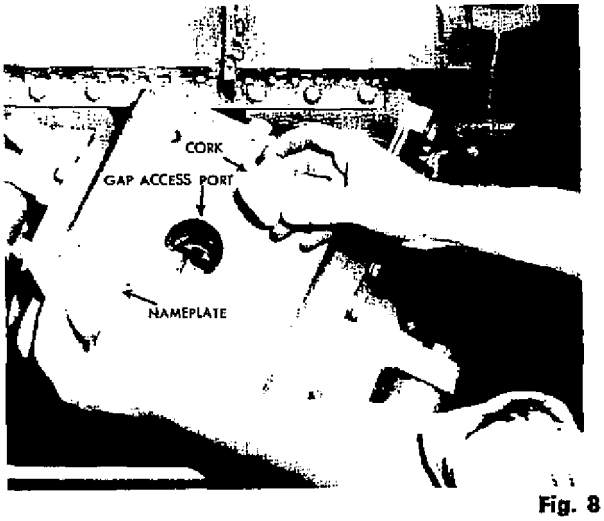
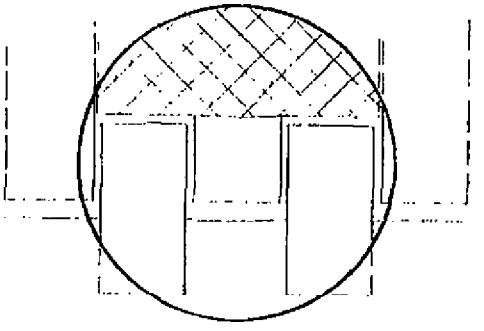


Fig. 8



AIR GAPS - ADJUST to .072" **Fig. 9**

TRAY INSTALLATION PROCEDURE

Use of the Alignment Plate (See Fig. 10)

The alignment plate furnished should be used to insure proper alignment of the tray, tiebar and tuning springs whenever a new tray is installed, or an old one reinstalled after repair work. The following instructions should be followed:

1. Attach the rear section of the tiebar to the body casting, using the alignment plate in place of the tuning springs. This puts the two sections of the tiebar into proper dimensional relationship.
2. Attach the tray and fasten the bolts securely. (See Fig. 11).
3. Remove the alignment plate and install tuning springs in the proper number and ply to give the desired displacement (See Fig. 12). See tuning instructions.

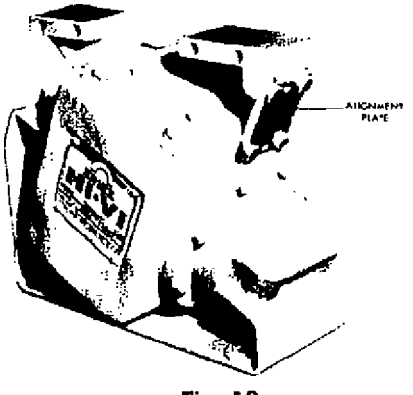


Fig. 10

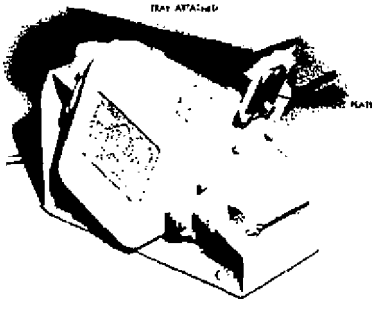


Fig. 11

Fig. 12

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SPRING CHANGE OR REPLACEMENT

Although the non-metallic disc springs used in these HI-VI Feeders have outstanding life characteristics, failure may eventually occur, especially if the displacement is greater than normal. The symptoms of such failures are:

1. Erratic behavior of the unit.
2. Greatly reduced displacement or
3. Greatly increased and perhaps uncontrollable displacement.

If spring failure is suspected, the base should be removed (See Fig. 13) and the **front** disc spring carefully examined for signs of delamination or breakage, especially at the center of the spring. A failed spring can be recognized by the appearance of the surface adjacent to the steel hub of the spring. If this surface has a discolored or whitish appearance in this area, perhaps accompanied by a bulging or irregular appearance, the spring is defective and should be replaced. If found defective, the front spring should be removed and replaced **before disturbing the rear spring** (See Fig. 14). Remove the tray, the front section of the tiebar and the front clamp ring, replace the spring, and replace the clamp ring and the tiebar section in order. Make sure that the arrow stamped on the spring points up, and that the tiebar section is straight and lined up with the rear section.

After the front spring has been checked and, if found defective, replaced, the rear spring should be checked, in much the same fashion **without disturbing the front spring** (See Fig. 15). Remove the rear clamp ring, examine the spring, replace if necessary (making sure that the arrow stamped on the spring points up and that the holes line up with the tapped holes in the body casting after the center bolt is tightened), and reinstall the rear clamp ring. The other parts can then be reassembled, following the tray installation procedure described, and the unit tuned to the correct displacement.

WHEN TIGHTENING THE DISC SPRING CENTER CLAMP BOLTS, THE FOLLOWING BOLT TORQUE VALUES SHOULD BE ADHERED TO, OR AT LEAST CLOSELY APPROXIMATED:

10A	—	25 lbs. - ft.	40A	—	70 lbs. - ft.
20A	—	30 lbs. - ft.	45A	—	70 lbs. - ft.
30A	—	40 lbs. - ft.	50A	—	275 lbs. - ft.
			55A	—	275 lbs. - ft.

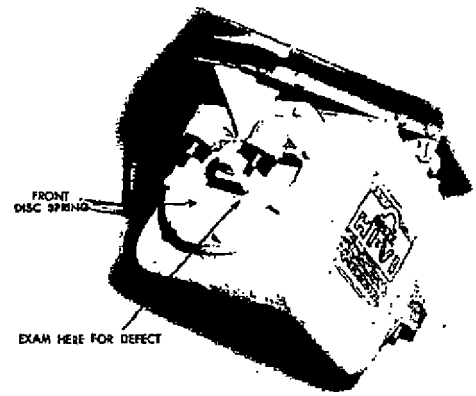


Fig. 13

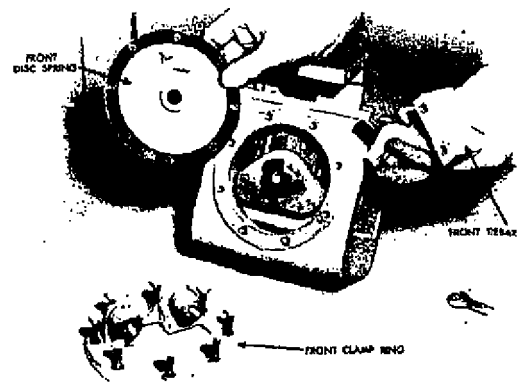


Fig. 14

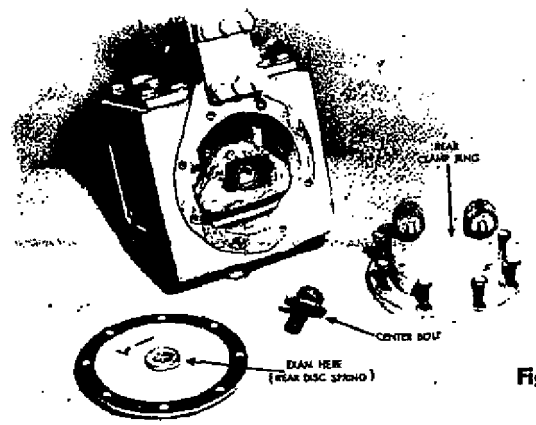
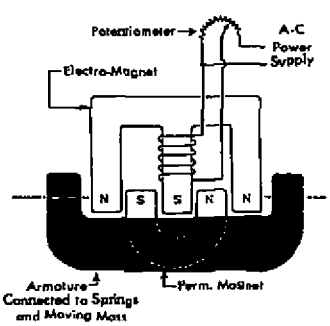


Fig. 15



The HI-VI Magnetic Drive Circuit

Old-style electromagnetic equipment has an inefficient attract-release type operation, where a mass mounted on springs is attracted by a DC electromagnet and returned to its original position solely by the springs. The new HI-VI method incorporates a lifetime permanent Alnico magnet and is operated directly from an alternating current line.

In the HI-VI method, the spring mounted mass is alternately both attracted and repelled by an AC electromagnet assisted by the springs.

Intermeshing a fixed polarity permanent magnet with an alternating polarity AC electromagnet eliminates the rectifier since you would have an alternating attracting and repelling force as the polarity of the electromagnet alternated.

It will be noted that the pole pieces of the permanent magnet are intermeshed in the air gaps of an electromagnet. The polarity of the permanent magnet is fixed: the polarity of the electromagnet alternates at the line frequency. We have shown the polarity of the electromagnet as it would exist on one side of the sine wave. Note that both poles of the permanent magnet are being attracted toward the unlike electromagnet poles. They are also being repelled in the same direction by the like electromagnet poles. This results in four forces accumulating to drive the armature in the same direction. It also results in closing the magnetic circuit through the electromagnet providing a magnetizing effect on the permanent magnet on each side of the sine wave. The demagnetizing force is very minor for the attracting force and the magnetic lines of flux would much prefer to be attracted than repelled. This always tends to place the permanent magnet in a magnetizing circuit regardless of where the AC current is on the sine wave. As the polarity of the electromagnet changes, all of the forces are reversed and the Permanent magnet armature is driven in the opposite direction.

ERIEZ MAGNETICS, ERIE, PA., U. S. A.

HI-VI VIBRATORY FEEDER SERVICE CHART

	NATURE OF PROBLEM	Misapplication	Tampering or Changing of Base or Tray	Loose Spring Clamp or Tray Mounting Bolts	Coil Failure	Control Failure	Incorrect Voltage	Spring Failure	Foreign Material Between Tray & Reaction Mass	Incorrect Tuning	Poor or Broken Weld on Tray	Incorrect Factory Adjustment	Sympathetic Vibration in Other Equipment	In Contact with Other Equipment	Line Voltage Variation	Blown Fuse or Circuit Breaker	Other Electrical Connections	Shockmount Deterioration	Corrosive or Abrasive Material	Product Variation
Initial Installation	Reduced or Low Output	1				5	6	7	8	9							16			
	Noisy but Output Okay			3					8	9	10	11	12	13						
	Noisy Certain Periods Only														14					
Develop After Satisfactory Initial Operation	Completely Inoperative				4	5		7								15	16			
	Operating But Reduced Output		2	3		5	6	7	8								16			
	Output Okay Too Much Noise							7	8	9	10				14					
	Gradual Fading					5		7												
	Excessive Tray Wear																		18	
	Turbulent Flow										10							17		
	Inconsistent Output					5									14					19

● Numbers in squares indicate possible causes of trouble and corrective measures to be taken. (See list below.)

1. *Misapplication*- Feeder too small -Product difficult or impossible to handle Impossible temperatures or atmospheres - Impossible dimensional requirements - Feeding requirements too precise or excessive-- Consult Engineering.

2. Tampering or Changing of Base or Tray - Extensions, covers, weights, screens or other modifications or attachments that may have affected performance. Disassembly or other modifications without either carefully following printed instructions or consulting Eriez Manufacturing Company.

3. Loose Spring Clamp or Tray Mounting Bolts - Tighten all bolts except center bolt of each disc spring.

4. Coil Failure -Replace coil or coil and "E" frame assembly. Order from Eriez parts lists. Follow maintenance instructions carefully.

5. Control Failure Check for burned out powerstat or rheostat, defective capacitor, defective switch, loose wiring, defective transformer (if used). Order new parts from Eriez. *Possibility special control needed* - Consult Engineering.

6. Incorrect voltage Check nameplate specifications and line voltage.

7. Spring Failure See maintenance instructions. Disassemble for examination. If a disc spring has failed, it will show either as complete breaking away of the center steel hub or delamination adjacent to this hub. A white area of irregular shape around the hub indicates delamination. Tuning spring failure will also show up as white areas. Order new parts from factory and replace per instructions.

8. Foreign Material – Examine and remove foreign material.

9. Incorrect Tuning -- See maintenance instructions. To increase displacement and output, use fewer or lesser ply tuning springs. To decrease displacement and eliminate striking, use more or greater ply tuning springs. (Note: **Opposite** on HS Feeder only.)

10. Poor or Broken Weld on Tray—Check and correct.

11. *Incorrect Factory Adjustment* – See maintenance instructions (Gap adjustment).

12. Sympathetic Vibration in Other Equipment—Check and correct.

13. Contact with Other Equipment—Check and correct.

14. Line Voltage Variation -Check and install voltage re - ator if necessary.

15. Blown Fuse or Circuit Breaker - Check for short circuits and correct.

16. Other Electrical Connections -- Check all connections and correct.

17. Shockmount Deterioration – Check and correct.

18. Corrosive or Abrasive Material—May require special tray -- Consult Eriez Manufacturing Company.

19. Product Variation – If product density, moisture content or other characteristics vary, customer should take own corrective measures.

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World Authority In Magnetic Services and Equipment

ERIEZ OF CANADA Ltd., 133 Oakdale Rd., Toronto (Downsview), Ont., Canada

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AIR MATIC/THE BIG BLASTER
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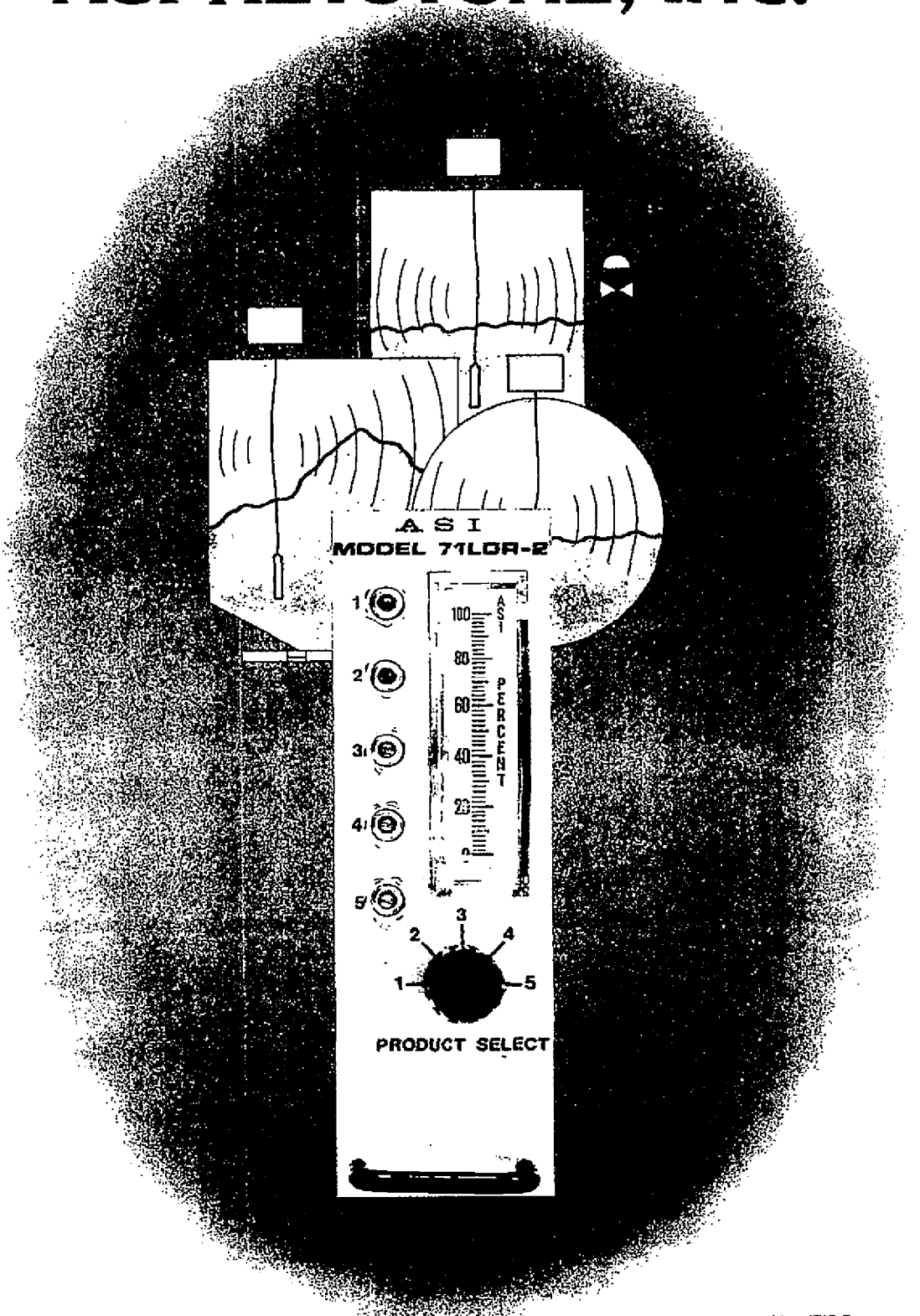
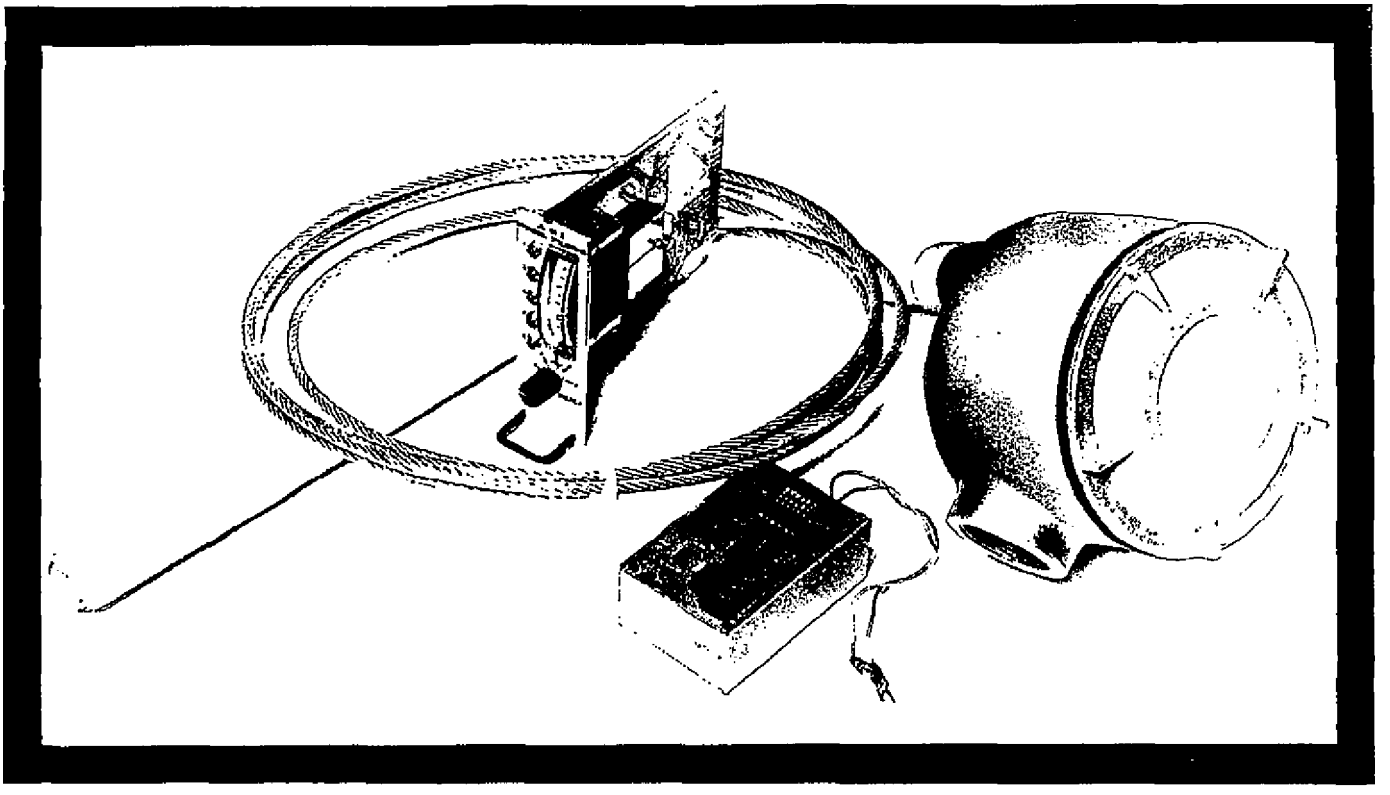
Service Group: We repair all makes and models of pneumatic, electric, hydraulic, gasoline, and mechanical tools or equipment. We stand ready to perform the installation and maintenance of belt conveyor products or to instruct or supervise your people in these areas.

ASI-KEYSTONE, INC.



KASITRONIC™



KASITRONIC™... Radio frequency sets the tone for repeatable, versatile level detection

INTRODUCTION

The compact **Kasitronic™** continuous level measurement system, from ASI-Keystone, Inc., reflects bold innovation and a practical standard for level detection. Repeatability and versatility are the key words for this new radio frequency system, which consists of two basic components. These are 1) Level Transmitting Unit, normally mounted on top of the bin or tank, and 2) Receiver Display Unit, usually installed in a central control room up to 500 feet away. Operation and calibration is carried out easily at both detector and receiver end.

OPERATION

The Level Transmitter is connected to a heavy duty steel antenna cable that hangs stationary in the bin or tank. A high frequency signal is transmitted on the hanging antenna which penetrates the product mass inside the vessel. Any change in product height will trigger a transmitter frequency change, due to the "loading" effect on the antenna. The frequency is not affected by dust or product build-up, so that a concise, repeatable reading is assured every time. Actual frequency changes are sent to the remotely mounted receiver unit which converts the data received and displays the percent of level on an analog meter read-out panel. The receiver unit is equipped with a product select switch for repeatable measurement of products with totally different densities in the same bin or tank. Up to five separate products can be measured. Special set-point and process output options are also available.

Kasitronic™ systems are already at work throughout the world measuring a variety of products including plastics, fertilizer, flour, dry chemicals, potato flakes, corn, brewers malt, aggregate (up to 1″ dia.), wheat, crushed coal, limestone, cement, barite, etc.

SPECIFICATIONS

A103LT Transmitter

HOUSING:	Class I, Group D, Div. 1; Class II, Groups E, F & G, Div. 1.
COMPENSATED TEMPERATURE RANGE:	– 40° to 185°F.
ANTENNA:	Standard—¼" O.D. nylon coated steel—4,400 lb. strength Optional—⅜" O.D. polyethylene coated steel—10,500 lb. strength Process—¼" O.D. teflon coated 316 stainless steel

71LDR Standard Receiver Unit

COMPENSATED TEMPERATURE RANGE:	± 15°F deviation from 75°F ambient.

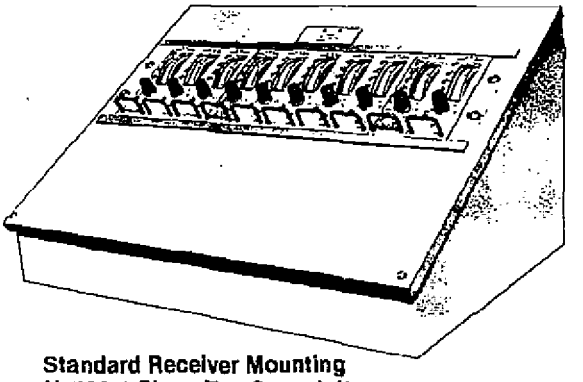
Receiver Mounting—
ASI standard 10 unit module rack and Nema I consolette enclosure.
(Optional Nema 4 or 12)
Field Installation—

ELECTRICAL:	Belden #9402 or equivalent electrical cable. (500 ft. maximum on standard system)

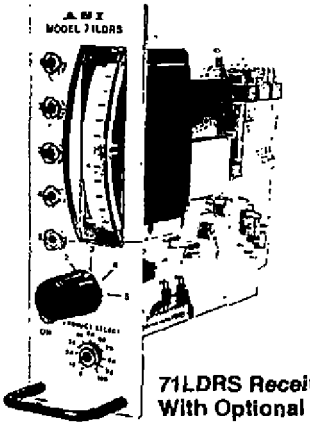
A standard 10 bin system requires 3 amps at 120 V 60 Hz.

INSTALLATION

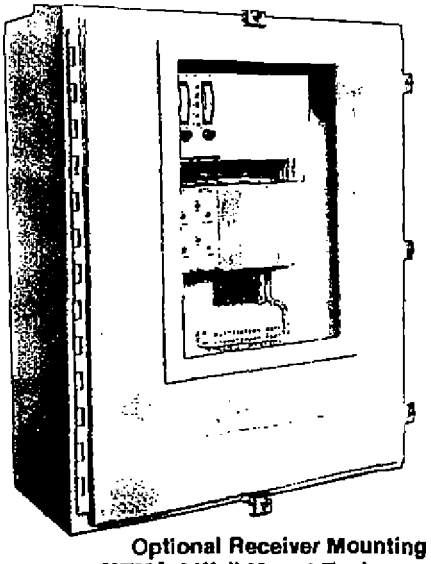
The **Kasitronic™** has been designed for easy installation on either steel or concrete tanks, allowing the abrasive resistant antenna cable to hang freely from the top. A 1¼" NPT half coupling or threaded flange plate should be provided for a standard tank mounting. The standard Kasitronic antenna is shipped complete with a free-hanging nylon weight. An optional insulated eyebolt tie-down kit is available. For all statically charged materials, a static suppressor is recommended to prevent electronic damage to the transmitter.



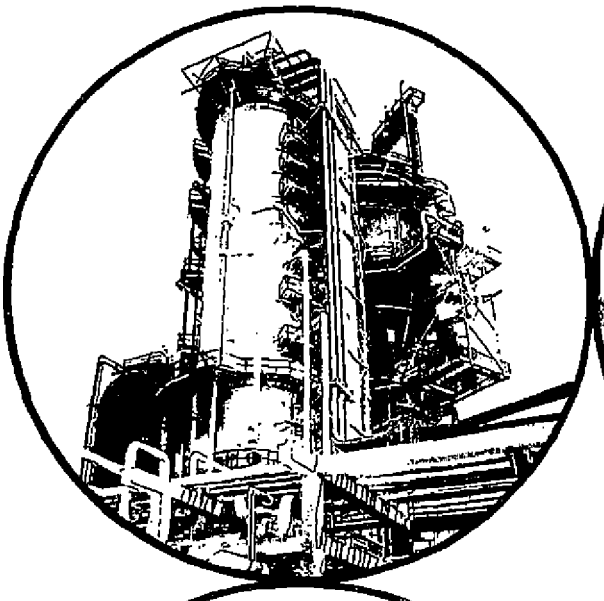
Standard Receiver Mounting
NEMA 1 Slope Top Consolette

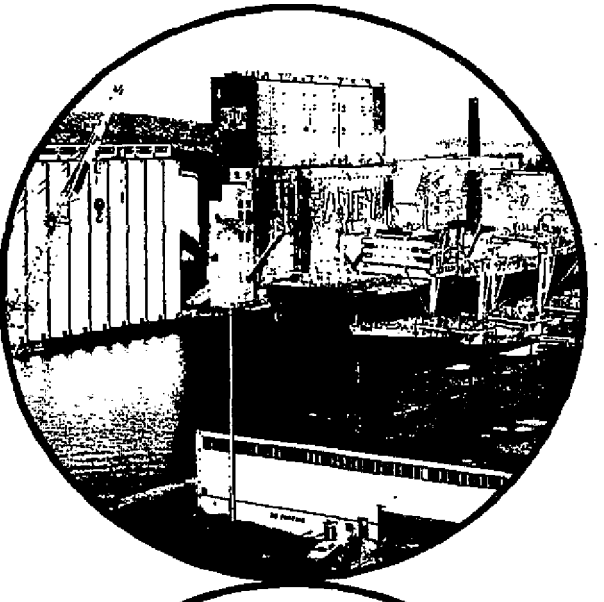


71LDRS Receiver
With Optional Setpoint



Optional Receiver Mounting
NEMA 4 Wall Mount Enclosure





SYSTEM SPECIFICATIONS

- Operating accuracy of ± 5% of full scale on consistent materials
- Repeatability of ± 2% of full scale on consistent materials
- Transmitter equipped for outside mounting, while receiver enclosure (all models) requires environmental protection (75°F ± 15°F)
- 5-Product calibration switch is standard on all receiver models

OUTSTANDING FEATURES

- Solid state construction for long lasting reliability
- Not affected by radio or walkie-talkie interferencc
- Easy mounting and calibration without the need for bulky field test equipment
- Transmitter to receiver signals are 0-50KHz, 180° out of phase, thus eliminating false signals from line interference
- Optional multiple set-point outputs, 0-5 or 0-10VDC output, 4-20 or 10-50MA output.

ASI KEYSTONE INC.

A subsidiary of Keystone International, Inc.
P.O. BOX 11605 ☐ HOUSTON, TX 77016 ☐ (713) 692-8546
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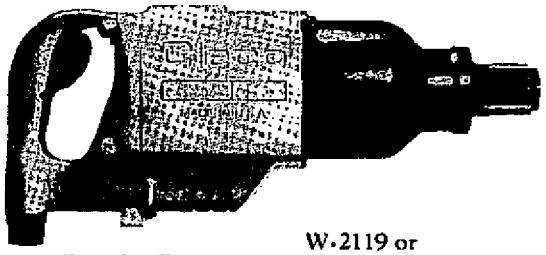
CLECO® tools are now on sale.

NEW

WP-421D
Extra-Heavy Duty
1/2" Impact Wrench

Only $335.00
Regular Price $495

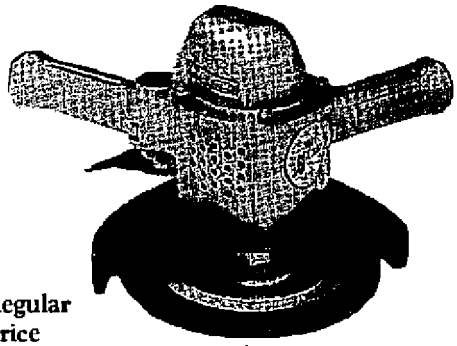


Regular Prices:
W-2119 $2825
W-2120 $2725

W-2119 or
W-2120
1-1/2" Impact Wrench

Only $2,199.00

1760VSL ManGuard Grinder



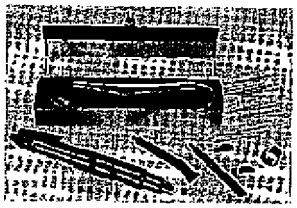
Regular Price $545

Only $375.00

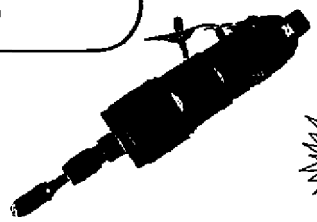
B1-CLT & Needle Scaler Kits

Only $235.00
B1-CNB-LT
Regular Price $420

Only $155.00
B1-CLT
Regular Price $275



Special Sale Price
B1-CNB-LT Kit
Regular Price $485



NEW

G-5 Grinder
Die Grinder 25000 rpm

Only $135.00
Special Introductory Price

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CEMENT FLOUR SALT SAND FLY ASH
FERTILIZER COAL ACIDS CARBON BL
FLY ASH WATER CAUSTICS WOOD FIB
SLURRIES CARBON BLACK SALT SAN
DAMP CEMENT FERTILIZER COAL ACI
PLASTICS OILS WOOD FIBERS CAUST
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CEMENT FLOUR SALT SAND WOOD CH
FERTILIZER COAL ACIDS CEME
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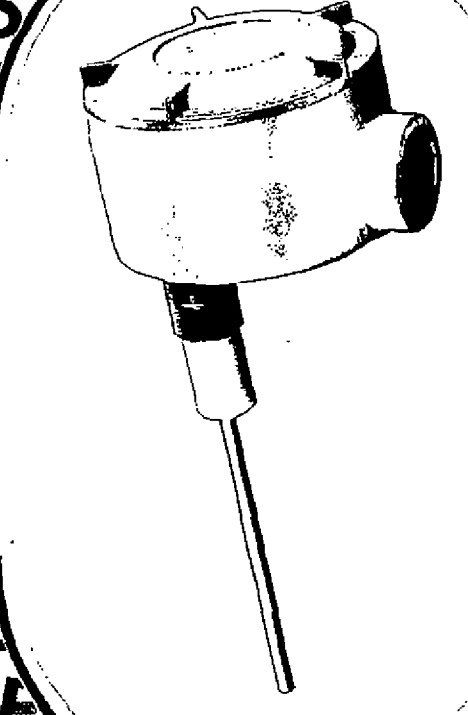
SLURRIES CARBON OIL

ASI-KEYSTONE

KASITROL®

U.S. Patent 4,222,267



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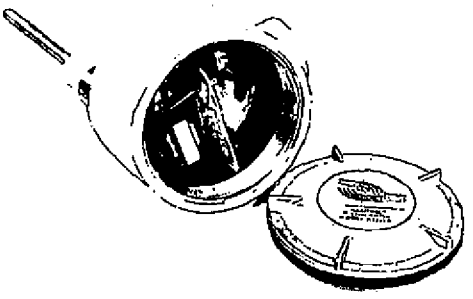
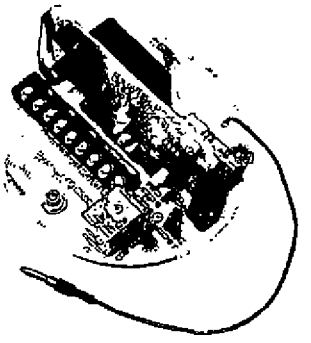




KASITROL® ... The Innovative Level Detector with Wide-Ranging Applications and Proven Accuracy.

GENERAL OPERATION

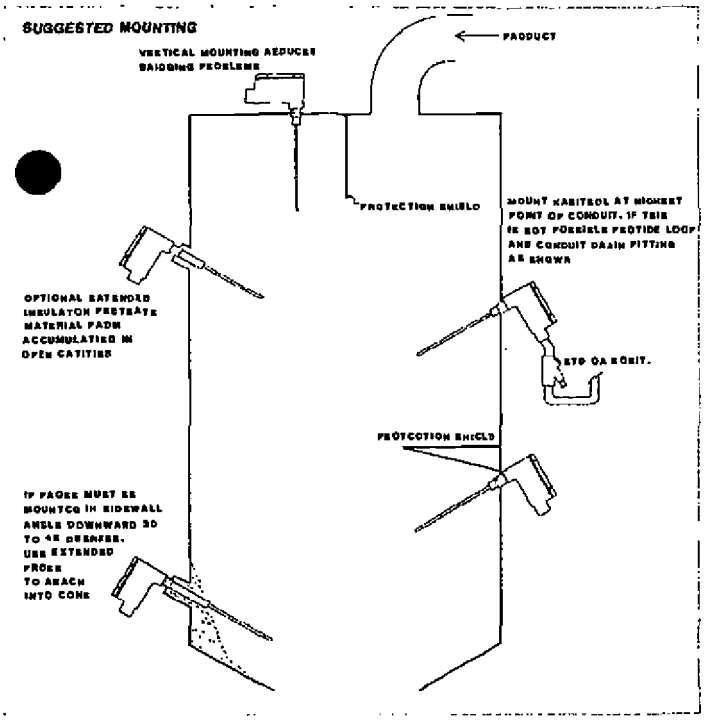
The ASI-Keystone **Kasitrol®** Model A101LS is used to detect the presence of a material at a given level in a tank, bin or other container. It can be used with an extremely wide range of both liquid and solid materials which may be electrically conductive or non-conductive. In some cases the **Kasitrol®** can be used to detect the level of an interface between a lighter and heavier substance such as that found in an oil and water separator.

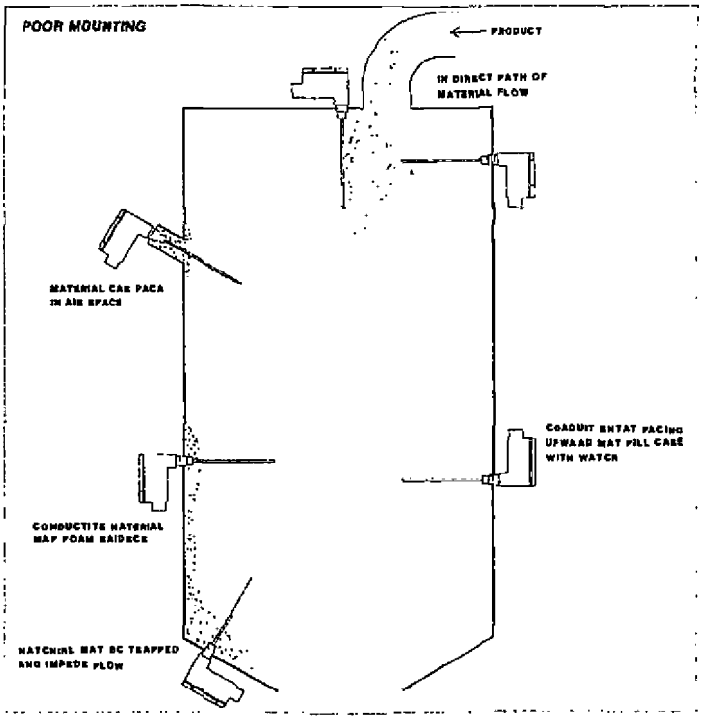
The standard version of the **Kasitrol®** is housed in an explosion-proof enclosure with an integral 10 inch long probe. The standard probe is a solid ½ inch diameter stainless steel rod. Many optional extras are available with the **Kasitrol®**, including extended solid probes up to 10 feet in length, flexible cable probes up to 100 feet and more in length, fully coated or insulated probes in both solid or cable types, special high temperature probes, remotely mounted probes and probes for use in high pressure applications. In addition, special coatings are offered for applications involving corrosive materials. Applications assistance is available through our distributors as well as from the factory.

APPLICATIONS

In most applications, the installation and calibration of the **Kasitrol®** are easily accomplished by a competent electrician. Mounting the unit requires three basic steps. First, provide an opening in the tank or other container. Second, fit this opening with a pipe coupling or other threaded entry. Third, install the **Kasitrol®** securely into the coupling or other fitting. The wiring to the unit may consist of as few as three wires, depending upon the application. No test equipment is required to calibrate the unit since the necessary calibration indicators are built into the unit. Seasonal recalibration of the unit is unnecessary due to its exceptional stability.

Because of the patented detection technique used in the **Kasitrol®**, it can easily tolerate large amounts of sticky material build-up on the probe. In addition, the rugged construction techniques used in building the probes allow them to support the weight of such a build-up. All of this is accomplished while maintaining the ultimate in simple probes offering the widest possible range of applications.





FEATURES

- ☐ Simple, yet rugged probe construction
- ☐ Probe length may be field modified (SS probe only)
- ☐ Replaceable teflon sheath on TEF models
- ☐ Modular electronic circuit design for easy replacement and repair
- ☐ Drift-free electronic package
- ☐ Easy step-by-step calibration with visual indicator
- ☐ 'Failsafe' selectable for high or low level
- ☐ DPDT relay, contacts rated 5 amp resistive @ 28 VDC or 115 VAC
- ☐ Ignores significant product buildup
- ☐ Electronics may be remote mounted up to 12 feet (exception: dual set point)
- ☐ High pressure rating (on select models)
- ☐ Dual set points (on select models)

MODELS

KASITROL
Model A101LS

Measures virtually the entire spectrum of liquid and dry products. Standard 10" probe is ½" diameter stainless steel with optional lengths and teflon coating available. Operating temperature −40° to +185°F; Standard voltage 120 VAC with 220 VAC available.

DUAL SET POINT
Model A104LS

Offers the same features as Model A101LS with the added advantage of 2 adjustable set points. Standard probe lengths of 4' and 10' with optional lengths and teflon coating available. Operating temperature: −40°F to +185°F; Standard voltage 120VAC.

TIME DELAY
Model A101LS-TD

Includes all **Kasitrol®** features and options, plus a time delay device to eliminate improper switching due to air pockets, waves, splashing, etc.

REMOTE
Model A101LS-M11145

Comes with complete **Kasitrol®** features and options with the further advantage of remotely mounted electronics for use where vibration occurs.

HI-TEMPERATURE REMOTE
Model A101LS-M11158

Features remotely mounted electronics for high temperature applications up to 1400°F. Probe available in 4" or 18" lengths.

CAUSTIC/ACIDIC
Model A101LS-CA

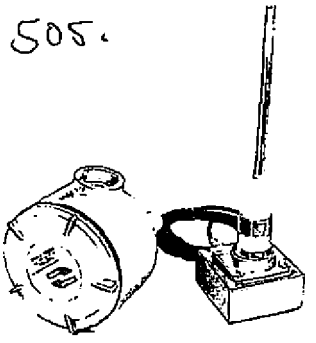
Made for tough chemical environments, standard 10" probe has teflon covering all wetted parts. Optional probe lengths and ryton coated housing available. Probe temperature: 400°F maximum.

FLY ASH
Model A101LS-FA

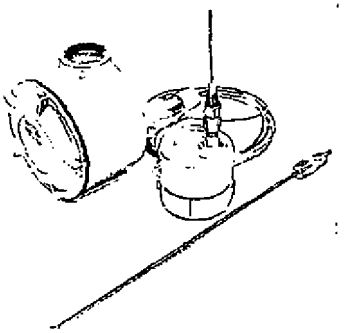
Operates in fly ash and other high temperature materials unaffected by normal hopper build-up. 12" sensing probe extends from 12" inactive section which can insert through up to 8" of insulated hopper wall and 4" of material build-up on the inner wall. Probe temperature: 800°F maximum.

505.

TIME DELAY

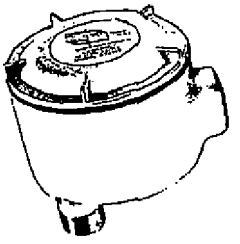


REMOTE PROBE



HI-TEMP PROBE

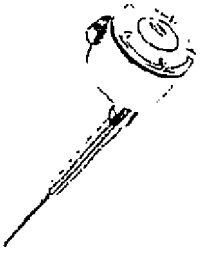
CAUSTIC PROBE



STANDARD UNIT

DUAL SET POINT

TEFLON PROBE



FLY ASH PROBE

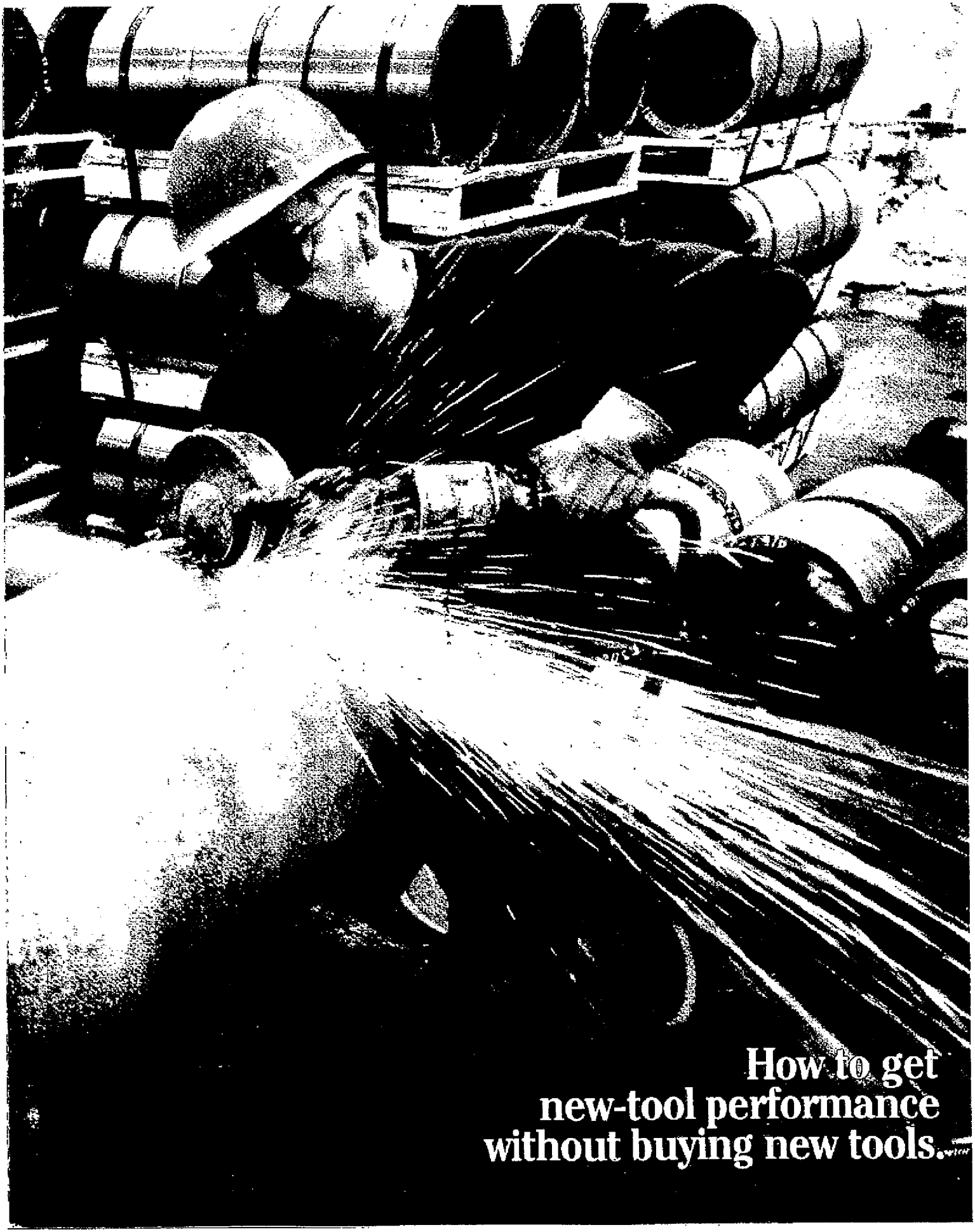
ASI KEYSTONE INC.

A subsidiary of Keystone International, Inc.
P.O. BOX 40966 ☐ HOUSTON, TX 77240 ☐ (713) 466-8844
TOLL FREE 1-800-231-6066 ☐ TELEX-203207 KII

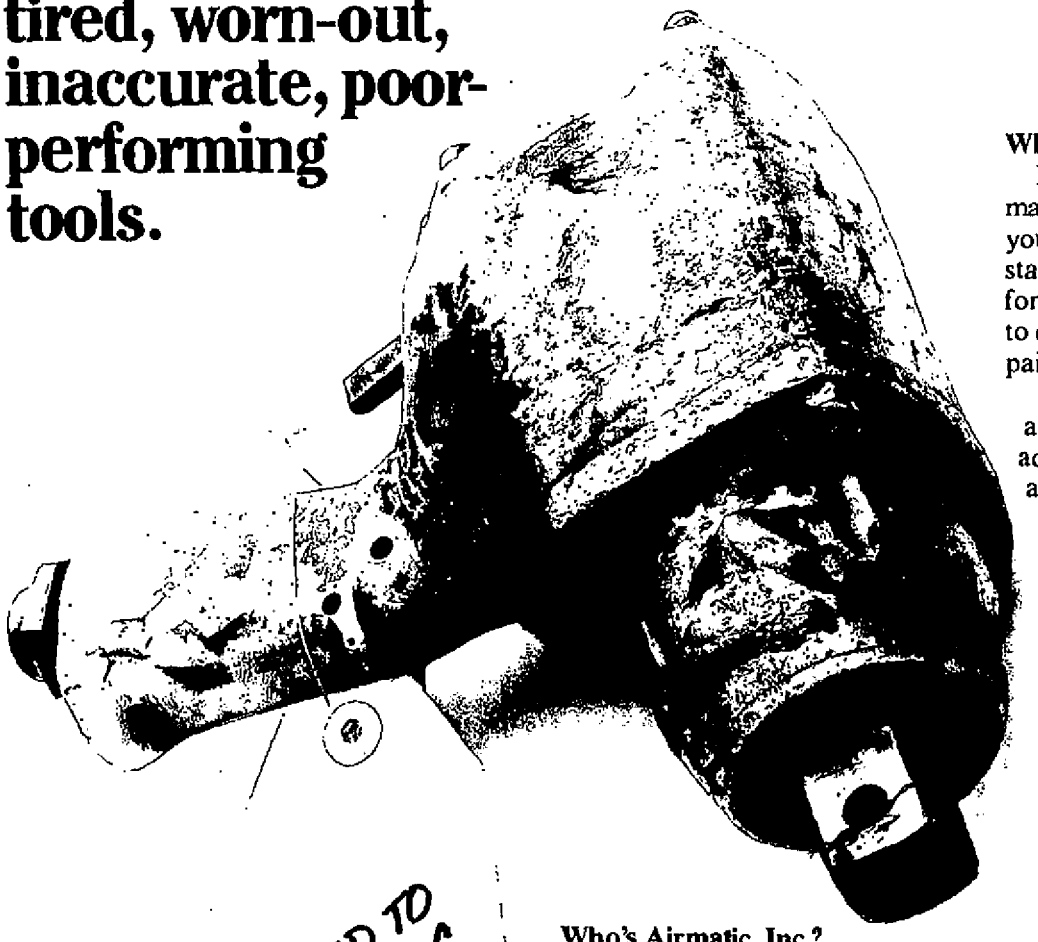
SPECIFICATIONS

ENVIRONMENTAL
Operating Temperatures STD:
−40°C to +85°C (−40°F to 185°F)
Operating Pressure (Inside Vessel) STD:
Vacuum to 1500 psi
Hazardous Area Classification:
Class I, Group D, Div. 1, (Group C optional),
Class II, Groups E, F & G, Div. 1; NEMA 4
ELECTRICAL (Electronic Unit)
Input Power:
95 to 130 volts AC, 50 to 60 hertz, 2 watts
190 to 260 volts AC, available on special order

Relay Contact Rating:
5 amps resistive @ 120 VAC or 28 VDC (up to 240 VAC @ reduced current)
Sensitivity:
With an initial load of 30 picofarads, an increase of one (1) picofarad can be detected.
Temperature Stability:
Equivalent to less than 1 picofarad from −40°C to +85°C (−40°F to +185°F)


How to get
new-tool performance
without buying new tools.

Give Airmatic your tired, worn-out, inaccurate, poor-performing tools.



SEND TO AIRMATIC FOR REPAIRS

Why go outside for tool repair?

For most companies, it's a simple matter of economics. If you go outside, you don't have to maintain a trained staff of mechanics. There's no need for parts inventory or the paperwork to control it. No need for special repair facilities or equipment either.

When you assign tool repair to an outside company, you can take advantage of specialized expertise and facilities that are dedicated to tool repairing. Tools are repaired more efficiently than if you did the work yourself.

Tools that are kept in peak operating and safe condition have a direct effect on your bottom line. Production increases and downtime costs decrease. Morale improves, too, because operators know they have better tools. Experience proves they will also handle them more carefully.

Who's Airmatic, Inc.?

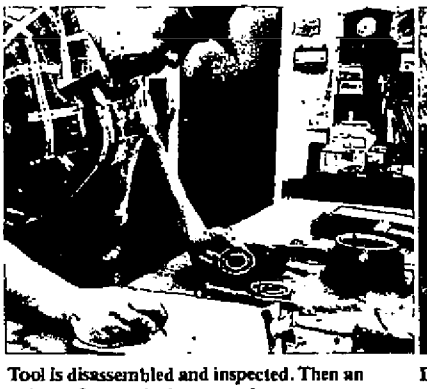
Airmatic, Inc. is a company with almost forty years' experience in tool sales, tool repairs and rebuilding, and tool accessories. We repair all makes and models of pneumatic, electric, hydraulic, gasoline and mechanical tools or equipment.

Why go to Airmatic for repairs?

We're specialists in the field. Many of the nation's largest tool manufacturers have appointed us as their authorized service center.

We can repair your tools on an individual basis or under national or regional contracts. The repair work done on every tool that comes into

Your tool gets expert attention from start to finish.



Tool is disassembled and inspected. Then an estimate for repairs is prepared.

Disassembled tool is cleaned in an ultrasonic vapor degreaser.

If necessary, parts are sandblasted to remove rust and scale and to expose hidden defects.

After new parts are received fr the tool is reassembled.

We'll give you back repaired, reconditioned, peak-performing tools.

our plant is recorded for future reference. We always know, and can tell you, exactly what service was performed on any tool during its lifetime.

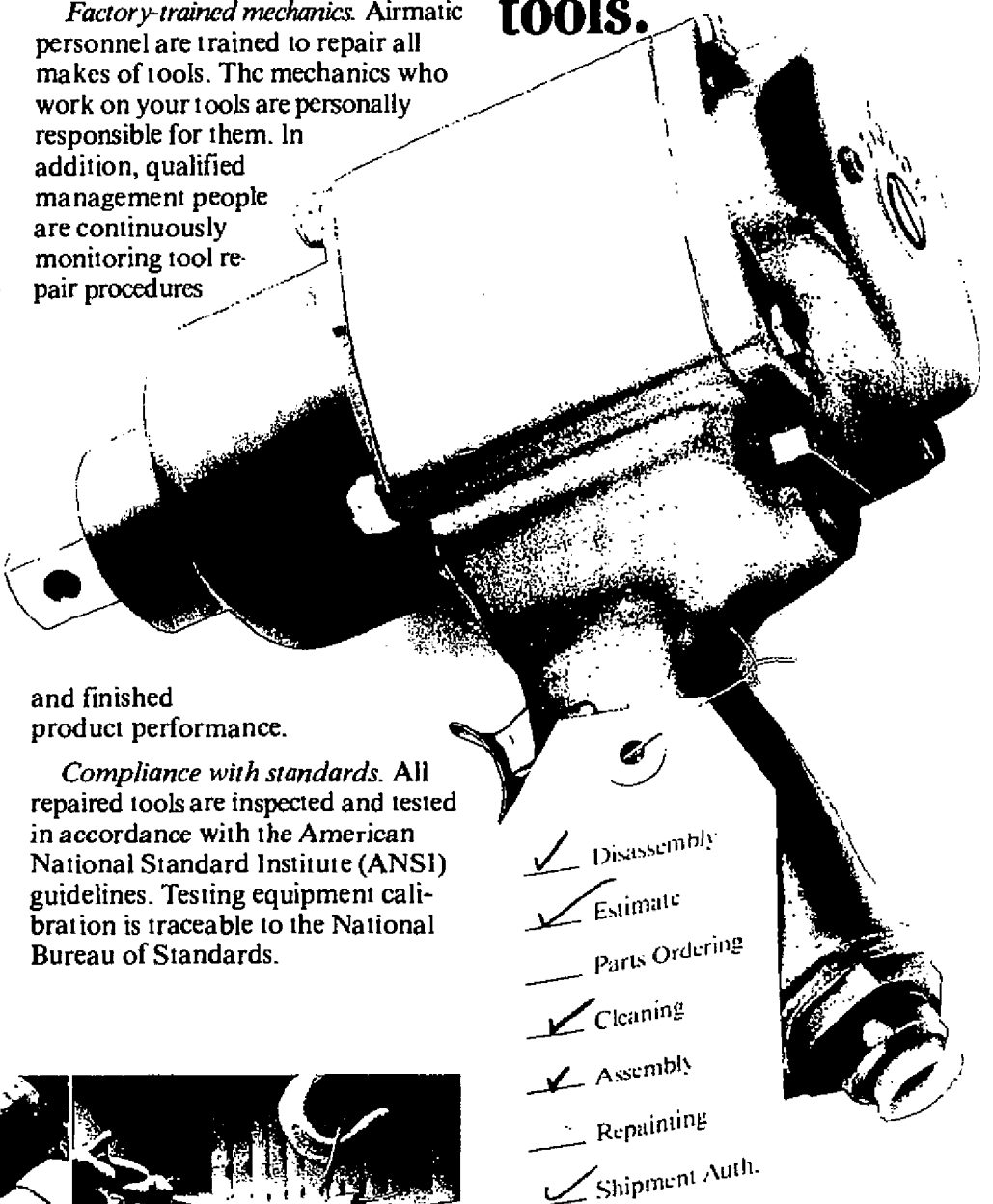
10,000-part computerized inventory. Airmatic maintains a quarter-million-dollar inventory of replacement parts, including many for obsolete tools. This means we usually have the necessary parts in stock so that work can progress on your tools without delay. We also have parts diagrams and operating instructions on file for thousands of makes and models of tools.

Verbal or written estimates. Unless we have prior blanket authorization, we disassemble incoming tools and give you an estimate of the cost of repairs. Work will not proceed until you give the okay. If the estimate exceeds 60% of the cost of replacement, we will not recommend repairs. If you want to replace the tool, chances are we can supply what you need.

Modern well-equipped service shop. Our facilities and equipment include the most up-to-date equipment available, such as labor-saving cleaning and finishing equipment, automatic parts degreasers, pressure blast cleaners, sophisticated testing instruments and gauges, and specially designed repair station fixtures.

Factory-trained mechanics. Airmatic personnel are trained to repair all makes of tools. The mechanics who work on your tools are personally responsible for them. In addition, qualified management people are continuously monitoring tool repair procedures and finished product performance.

Compliance with standards. All repaired tools are inspected and tested in accordance with the American National Standard Institute (ANSI) guidelines. Testing equipment calibration is traceable to the National Bureau of Standards.



...inventory,

Tool is tested for performance on various testing equipment.

Finally, the repaired tool is custom finish-painted and shipped.

To make good products, you need good tools. Airmatic keeps them that way.

Fill in and mail this reply card for complete information on Airmatic tool repair.

Yes. I believe you can repair tools better, faster and cheaper than we can. Please tell me more.

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone (Area Code) _____

We have the following brands of tools:

_____

_____

_____

_____

All repairs covered by Airmatic warranty.

Our warranty is a guarantee against defects in material or workmanship on every unit serviced by us, regardless of the date the unit leaves our shop.

Warranty is subject to our examination of the unit claimed to be defective, and is contingent upon proper use in accordance with manufacturer's recommendations and instruction, and shall not apply to equipment which has been subjected to misapplication, misuse, negligence, accident or tampering in any way so as to affect its normal performance.

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AIRMATIC INC.

7317 State Road, P.O. Box 6231
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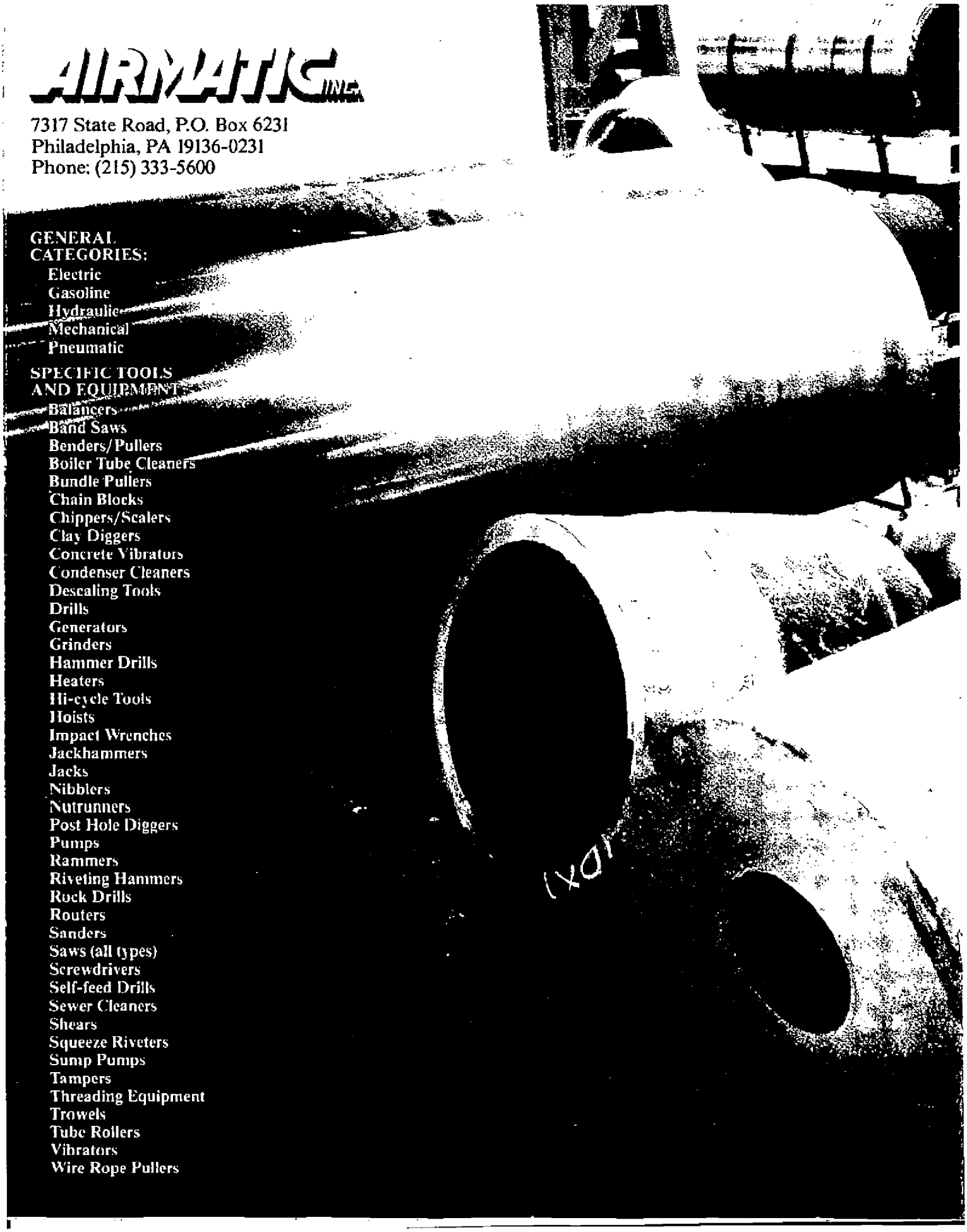
Phone: (215) 333-5600



GENERAL CATEGORIES:

- Electric
- Gasoline
- Hydraulic
- Mechanical
- Pneumatic

SPECIFIC TOOLS AND EQUIPMENT

- Balancers
- Band Saws
- Benders/Pullers
- Boiler Tube Cleaners
- Bundle Pullers
- Chain Blocks
- Chippers/Scalers
- Clay Diggers
- Concrete Vibrators
- Condenser Cleaners
- Descaling Tools
- Drills
- Generators
- Grinders
- Hammer Drills
- Heaters
- Hi-cycle Tools
- Hoists
- Impact Wrenches
- Jackhammers
- Jacks
- Nibblers
- Nutrunners
- Post Hole Diggers
- Pumps
- Rammers
- Riveting Hammers
- Rock Drills
- Routers
- Sanders
- Saws (all types)
- Screwdrivers
- Self-feed Drills
- Sewer Cleaners
- Shears
- Squeeze Riveters
- Sump Pumps
- Tampers
- Threading Equipment
- Trowels
- Tube Rollers
- Vibrators
- Wire Rope Pullers

MINPAK DRIVE
Vertical Mill Feeder 1974

LEHMAN 02025

APRIL 1973

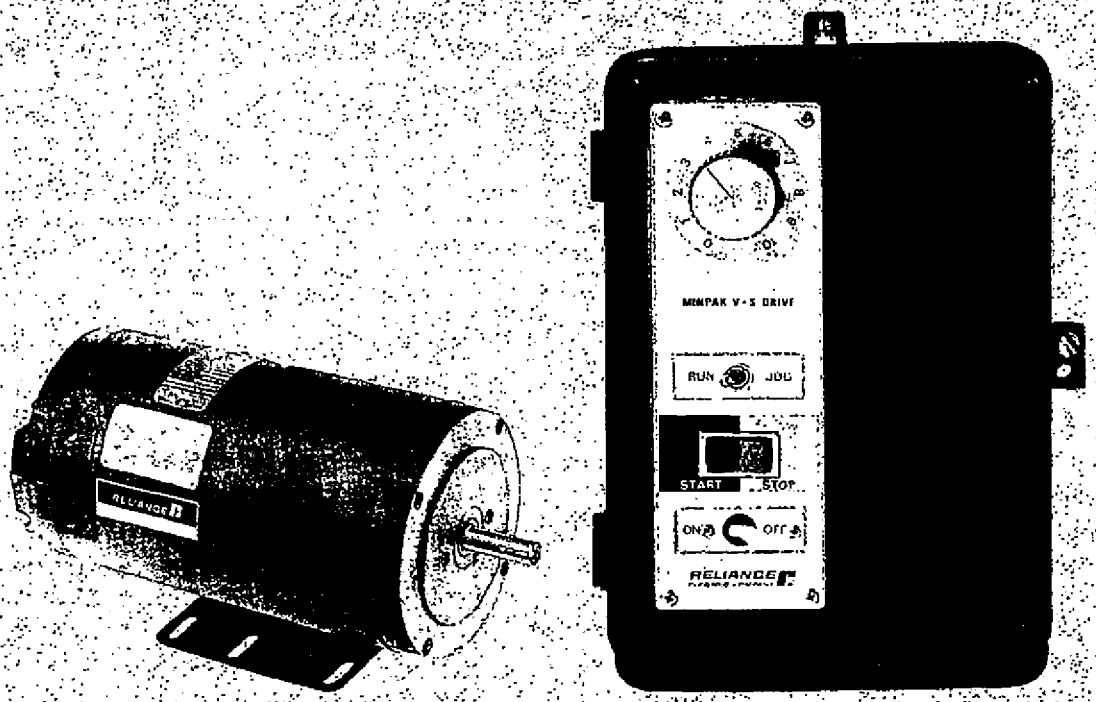
INSTRUCTION MANUAL D-3696-3

Replaces D-3696, D-3696-1, D-3696A-1, and D-3696-2

Installing and Operating Reliance

MINPAK

V★S Drives 1/4 - 3 Hp



RELIANCE ELECTRIC COMPANY

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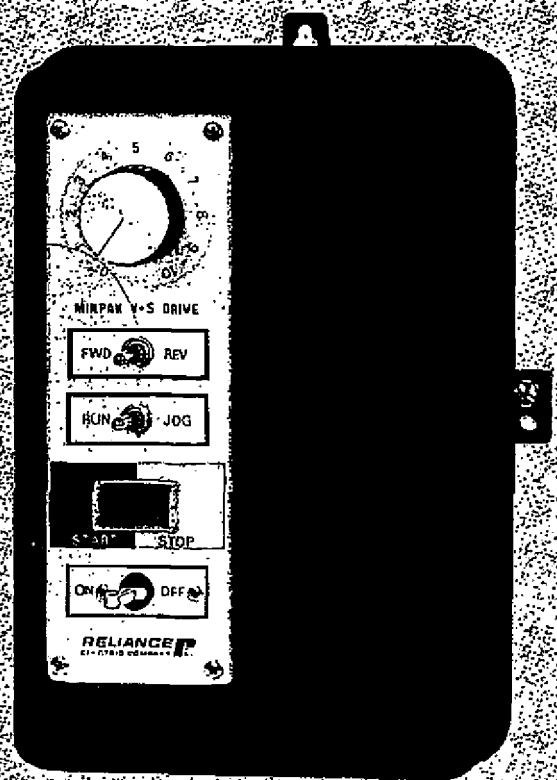

MinPak drive with Reversing Kit installed.

INTRODUCTION

This instruction manual contains installation, operation and troubleshooting procedures for Reliance MinPak D-c V*S Drives rated 1/4 thru 3 hp. When installed and operated in accordance with these instructions, your MinPak V*S Drive should give you years of trouble-free service.

Reliance MinPak D-c V*S Drives consist of three basic elements: an adjustable speed d-c drive motor, a solid-state control unit, and a compact, built in or remote-mounted operator's control station.

Application Manual

A MinPak Application Manual, D-9037-1, is available from your local distributor or Reliance Sales Office. This manual contains drive and speed-reducer selection information, plus several circuit modifications which can easily adapt a MinPak Drive to many different application requirements.

Drive Motor

For motor ratings 1/4 thru 3/4 hp at 115 v, and 1 hp drip-proof at 230 volts, a permanent magnet motor is standard; enclosed motors rated 1 hp, and both enclosure types rated 1-1/2 – 3 hp at 230 v use a conventional wound field motor. The major difference between the two lies in the absence of a shunt field coil in the permanent magnet motors. This means that only two wires are required to connect the P.M. motors of the lower-horsepower drives. Refer to the data supplied with your motor to determine if a field connection is required.

Control Cabinet

The control cabinet houses the power conversion and control circuits which rectify the incoming a-c line voltage and convert it into an adjustable d-c voltage to power the motor. Page 7 shows the interior of the control cabinet with the control circuitry mounted on a printed circuit board. To the left of the circuit board is the solid-state "Power Cube" rectifier. This unique module contains the two thyristors and three diodes that comprise the MinPak drive's rectifier. Although directly mounted to the cabinet (which also acts as a heat sink for the power cube), the power cube is completely electrically isolated from the cabinet.

Operator's Control

A complete operator's control station may be mounted in the front door of the MinPak enclosure. These controls include a master speed control potentiometer, a jog-run selector switch, a start-stop selector and an a-c circuit break-

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DESCRIPTION

er. (A Forward-Reverse selector switch can also be added if a Reversing kit has been installed in the drive.) This control station may also be remotely mounted in a separate enclosure should you wish to locate the controls away from the main control unit. Refer to page 4 and 5 for details.

BASIC FUNCTIONS

The standard MinPak V*S Drive includes the following basic functions:

- Start, Stop and Speed Adjustment
- Unidirectional Operation (coast-to-rest)
- 2% Speed Regulation (voltage feedback)
- Adjustable Current Limit (5 to 150% of full load current)
- Adjustable maximum speed
- A-c over current protection (via line input circuit breaker)
- Adjustable IR drop compensation
- Jog (by selector switch)
- Motor thermostat protection (1-1/2 — 3 hp)

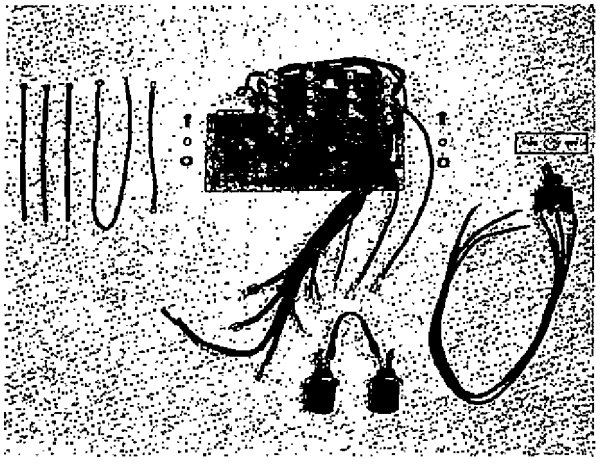
Modification Kits

In addition to these basic functions, modification kits are available for the following:

- Contactor reversing (including anti-plug protection) with dynamic braking
- Dynamic Braking
- D-c motor contactor
- Speed indicating meter
- Minimum Speed Control

Each of the modification kits includes all components, mounting hardware and wiring, and comes complete with full, step-by-step installation instructions. Kits may be added at any time, anywhere, by virtually anyone.

The photo below shows the components included in the Reversing and Dynamic Braking Kit, No. 11C86.



BASIC CONTROL SPECIFICATIONS

Input Voltage — 1/4 — 3/4 hp single phase, 115 volts a-c +10% — 5%, 60 Hz ± 5 Hz

1 — 3 hp single phase, 230 volts a-c +10% — 5%, 60 Hz ± 5 Hz

Output Voltage — 1/4 — 3 hp, 0-90 volts d-c for armature, 50V field available but not required for permanent magnet motors

1 — 3 hp, 0-180 volts d-c for armature, 100V d-c for field

Armature Circuit Load Capacity — 150% for 1 minute

Ambient Temperature Range — 10°C to 40°C

Altitude — 0 to 3,300 feet

MAXIMUM CURRENT RATINGS

Drive HP Rating	A-C Line 60 Hz		D-C Armature		D-C Field (1)	
	Volts (+10% —5%)	Current (RMS)	Volts	Current	Volts	Current
1/4 & 1/3	115	7.6	90	4.5	50	2
1/2	115	10.4	90	6	50	2
3/4	115	12.6	90	8.5	50	2
1	230	8.6	180	6	100	2
1-1/2	230	11.2	180	9	100	2
2	230	15	180	11	100	2
3	230	23.2	180	17	100	4

(1) Field not required for permanent magnet motors.

CHANGEABLE HORSEPOWER CAPABILITY

By changing the current feedback resistor (see photo Page 7), the horsepower rating of the drive can be changed, as long as the rating of the Power Cube is not exceeded and the drive is kept within the same a-c voltage rating. The current feedback resistors are color coded to aid in selecting the proper resistor. The table below lists the resistors and their ratings.

If a resistor is changed in a drive, be sure nameplate in the control cabinet is changed to reflect the new horsepower rating. Example: A 3/4 hp MinPak Drive is available but it is to be operated with a 1/3 hp motor. Solution: Replace the 0.05 ohm current feedback resistor (color code orange) with a 0.15 ohm (color code blue) Part number 63481-32F.

Drive Rating Hp	A-C Input	Max. Hp Rating of Power Cube	Resistor Color Code	Ohms	Resistor Part No.
1/4 & 1/3	115 v	3/4	Blue	0.15	63481-32F
1/2	115 v	3/4	Silver	0.1	63481-32E
3/4	115 v	3/4	Orange	0.05	63481-32G
1	230 v	1-1/2	Silver	0.1	63481-32E
1-1/2	230 v	1-1/2	Orange	0.05	63481-32G
2 & 3	230 v	3	Green	0.03	63481-32H

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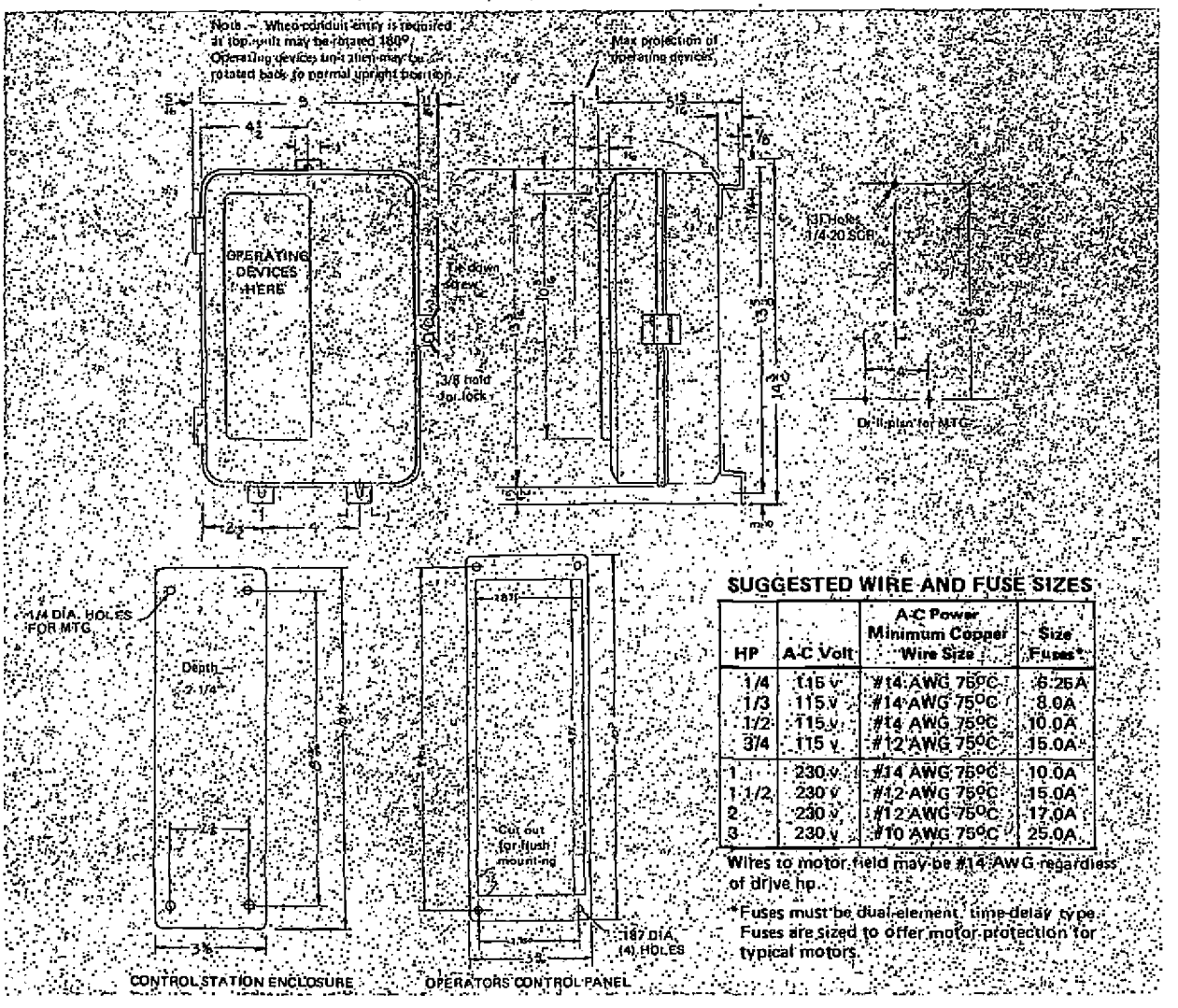
INSTALLATION PROCEDURE

MOUNTING THE DRIVE

Three mounting feet are provided on the back of the control cabinet to mount the drive to a wall. On the bottom lip of the case are two conduit knockouts for interconnecting cabling. Should you wish to bring in your conduit from the top of the drive cabinet, simply mount the cabinet upside-down (this will not affect its operation in any way).

If the cabinet is mounted upside-down and the operator's controls are mounted in the cabinet door, you will need to remove the control panel and rotate it 180°. **Do not attempt to drill any extra cable entry holes in the top of the case.** Doing so may damage the drive's components. The dimensions of the drive cabinet and mounting holes are provided below.



SUGGESTED WIRE AND FUSE SIZES

HP	A-C Volt	A-C Power Minimum Copper Wire Size	Size Fuses*
1/4	115 v.	#14 AWG 75°C	6.25A
1/3	115 v.	#14 AWG 75°C	8.0A
1/2	115 v.	#14 AWG 75°C	10.0A
3/4	115 v.	#12 AWG 75°C	15.0A
1	230 v.	#14 AWG 75°C	10.0A
1 1/2	230 v.	#12 AWG 75°C	15.0A
2	230 v.	#12 AWG 75°C	17.0A
3	230 v.	#10 AWG 75°C	25.0A

Wires to motor field may be #14 AWG regardless of drive hp.

*Fuses must be dual-element, time-delay type. Fuses are sized to offer motor protection for typical motors.

WIRING THE DRIVE

The figure on page 5 shows the basic interconnections required between the control cabinet, the drive motor and the operator's controls. Connect the drive exactly as shown using appropriate wire sizes listed in the table above or as dictated by your local electrical codes. Detailed schematic drawings are shown on pages 9 to 13.

The controller must be connected to a 60 Hz a-c supply of either 115 v or 230 v depending upon the drive rating as indicated on the cabinet nameplate.

NOTE: The circuit breaker in the MinPak drive offers over-current protection for the Power Cube which contains the power semi-conductors, but is NOT a disconnecting device as required by the National Electric Code. Interrupting capacity of the circuit breaker (Part No. 65241-37E) is 5000 amp.

A two-pole fused disconnect must be installed in the a-c line. If an a-c line transformer is used, the fused disconnect should be connected between the transformer and the drive. The fuses protect the drive wiring and supply motor running over-current protection for fractional horsepower drives. The fuses should be selected from the table above and should be of the dual-element slow-blow type.

A motor thermostat gives motor protection in the integral ratings. Therefore, it is essential to properly connect the motor thermostat in series with the STOP button (wire 33 or 133) as shown in the schematic diagram, pages 9 through 13.

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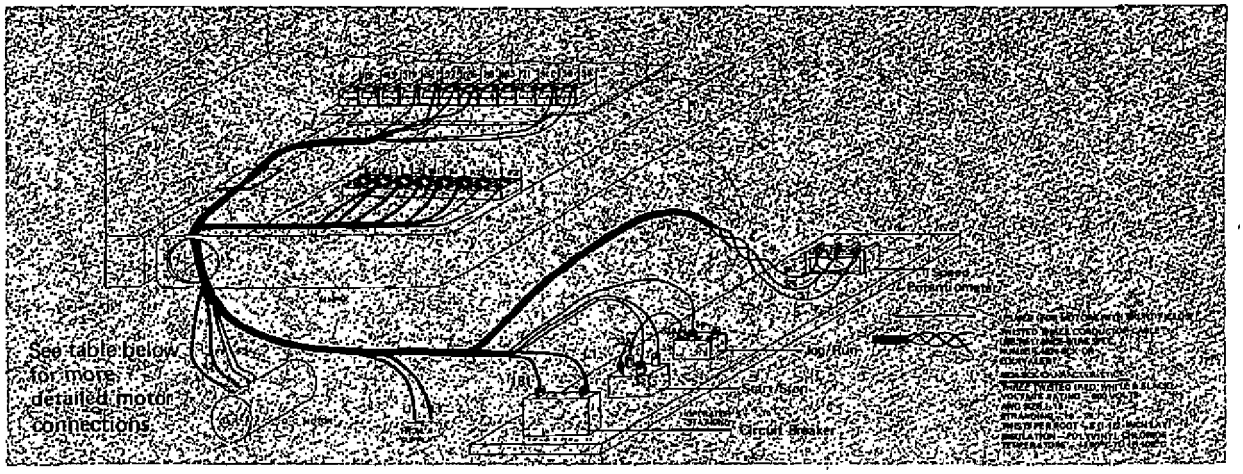
If one side of the a-c supply is grounded, the grounded line should be connected to terminal L2.

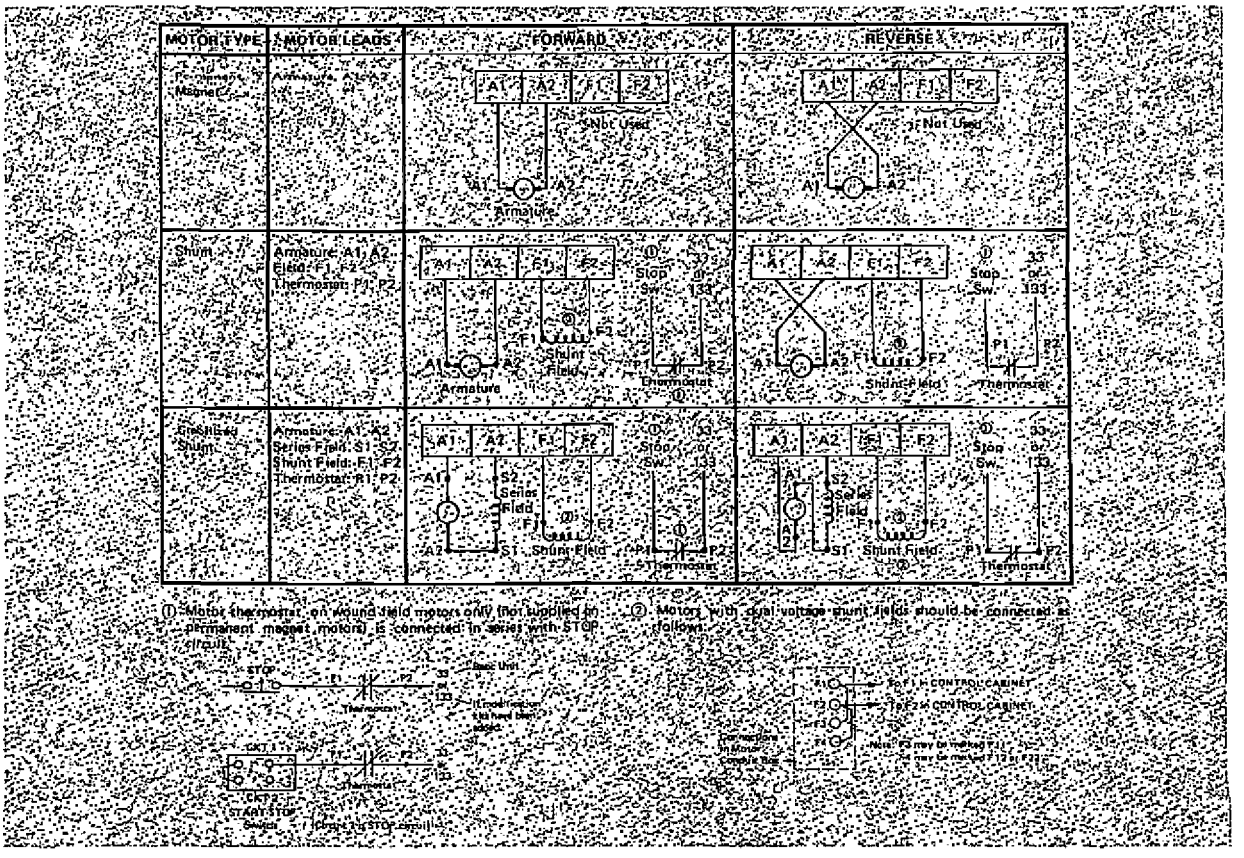
CAUTION: Depressing the STOP switch does NOT remove power from the drive controller or the motor field. Therefore, the circuit breaker should be turned OFF whenever the drive cabinet is opened, or if the drive is connected on an ungrounded or 230 v system, the fused disconnect should be opened before opening the drive cabinet.

WARNING: If your drive cabinet is mounted such that the cabinet is not grounded, a ground wire in the a-c supply cable should be connected to the cabinet for personal safety. A ground terminal "GND" has been provided for your convenience. Also, the motor should be grounded by solidly connecting a ground wire to a screw on the conduit box. If the motor is accessable while it is running, a protective guard should be installed around all rotating parts.



MOTOR CONNECTIONS

The following table shows details of motor connections to the MinPak Drive. "Forward" is counter-clockwise rotation facing the commutator end of the motor. "Reverse" is clockwise rotation facing the commutator end.



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OPERATING

INITIAL ADJUSTMENTS

There are three controls located on the main circuit board in the control cabinet. These controls (the Maximum Speed Potentiometer, the Current Limit Potentiometer, and the IR Drop Compensation Potentiometer) have been factory preset for proper operation and should not require any initial adjustment.

Starting

1. Apply a-c power to the drive by closing the a-c line circuit breaker.

2a. (All unidirectional drives)
Momentarily depress the Start selector and the motor will accelerate to the speed selected on the master speed potentiometer.

2b. (Reversing drives)
With the drive at rest, select the desired direction of rotation with the Forward-Reverse selector switch.

Momentarily depress the Start selector and the drive will accelerate to the speed selected on the master speed potentiometer.

Speed Adjustment

The basic speed of the drive is controlled by the master speed potentiometer. This may be adjusted while the drive is running, or (as noted above) while the drive is at rest. When the drive is started, it will automatically accelerate to the speed selected by the master speed potentiometer.

Jogging

To operate the drive in the Jog mode:

1. Put the Jog-Run selector in the Jog position.
2. Depress the Start selector and hold it in this position. The drive will accelerate to the speed selected by the master speed potentiometer until the Start selector is released. Releasing the Start selector will stop the drive.

Stopping

To stop the drive, simply depress the Stop selector. The drive will then coast-to-rest unless equipped with the optional dynamic braking modification kit. DO NOT ATTEMPT TO REPEATEDLY STOP THE DRIVE USING THE A-C LINE CIRCUIT BREAKER EXCEPT UNDER EMERGENCY CONDITIONS. DOING SO MAY REDUCE DRIVE LIFE.

NOTE: If the drive is equipped with an optional DB or Reversing kit, the drive will stop faster by pressing Stop than by turning the circuit breaker to Off.

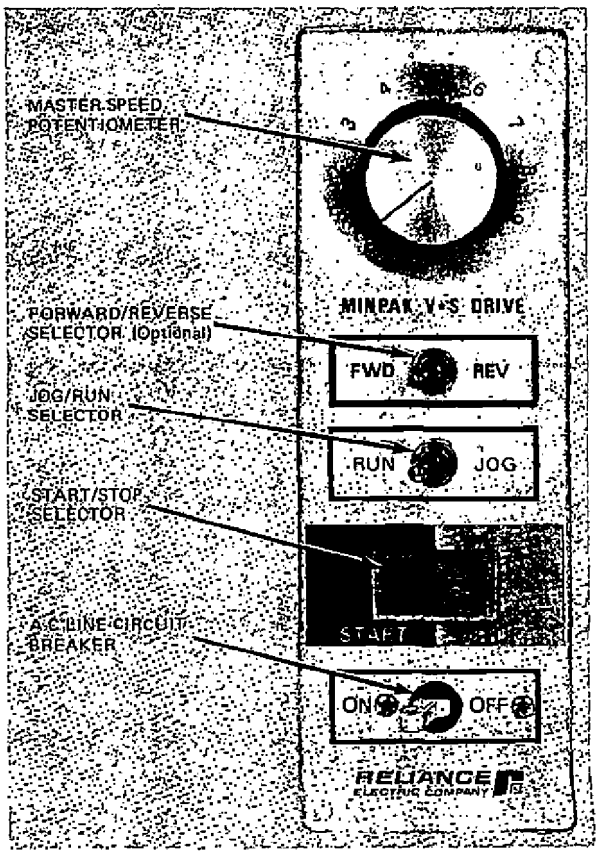
With the drive running . . .

Operating the Forward-Reverse selector while the drive is running will cause the drive to stop. An internal anti-plug relay prevents the drive from being restarted until the motor has decelerated to a slow enough speed to be reversed. ALWAYS STOP THE DRIVE BEFORE ATTEMPTING TO CHANGE ITS DIRECTION OF ROTATION. The Start selector must be depressed to restart the drive.

FINAL ADJUSTMENT PROCEDURE

Read the following instructions completely before making the final adjustments. Couple the motor to the load and allow at least thirty minutes warmup before adjusting.

1. With the drive running, set the master speed potentiometer for maximum speed.
2. Maximum speed has been factory preset for 1750 rpm. However, should you wish to lower this setting, you may do so by adjusting the maximum speed potentiometer on the printed circuit board (Page 7). Use a hand held tachometer or visually observe machine operation to determine the proper setting for this control. Note: Turning the Maximum Speed Control fully clockwise will cause the drive to run at full speed regardless of the Master Speed Potentiometer setting. Therefore, the Maximum Speed Control should *not* be set in the maximum setting.
3. If the motor speed oscillates or hunts when the maximum speed potentiometer is adjusted, turn the IR Drop Compensation potentiometer counter-clockwise until the drive stabilizes.
4. The Current Limit potentiometer is factory preset for 150% of rated torque load. To reduce the torque output of the drive, turn this potentiometer counter-clockwise. Note: Turning this control too far counter-clockwise may prevent the drive from accelerating to desired speed.



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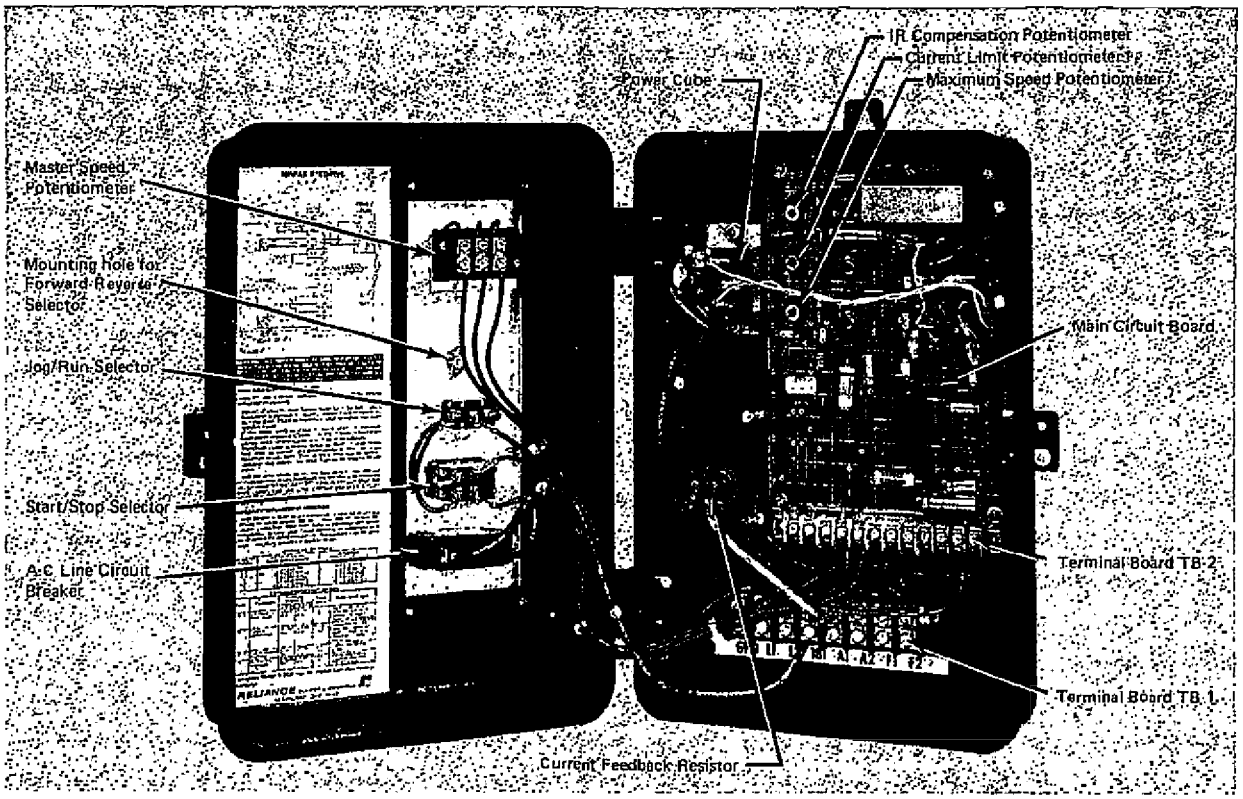
PROCEDURE

WARNING: A-C POWER MUST BE DISCONNECTED (ALL A-C LINES) FROM THE DRIVE CABINET BEFORE IT IS SAFE TO TOUCH ANY OF THE INTERNAL PARTS OF THIS DRIVE. CIRCUITS ARE AT LINE POTENTIAL WHETHER THE CIRCUIT BREAKER IS OPEN OR CLOSED. USE EXTREME CAUTION!



TROUBLESHOOTING AND REPAIR

If, after following the instructions in the previous sections, you are unable to operate the drive, first carefully recheck all wiring for proper and secure connections. If the drive is still inoperative, make the following voltage checks using a conventional multimeter.

WARRANTY/REPLACEMENT PROGRAM

Reliance MinPak V*S Drives are warranted for a period of one year in service or not to exceed 18 months from date of manufacture, whichever comes first. Your local Reliance distributor will furnish a replacement part or unit found defective in workmanship or material within the above time period. This warranty does not cover damage in shipment, equipment abuse or misuse.

TROUBLESHOOTING CHART

Step	Function Being Checked	Terminals	Voltage Should Be		Comments
			1/4 — 3/4 hp (115 v a-c input)	1 — 3 hp (230 v a-c input)	
1	Incoming A-C Power	L1: L2	115 v a-c	230 v a-c	Significantly lower values indicates faulty power system or loose connections in power system.
2	Power to drive components	L2: 181	115 v a-c	230 v a-c	Significantly lower voltage indicates circuit breaker is OFF, or defective, or loose connections.
3	Start circuit	32; 33 or 133 if drive has M, DB or Rev Kit	Zero	Zero	Any voltage here indicates start circuit is NOT closed. Check start button (switch) and wiring.
4	Speed pot. voltage supply	28(+); 32(—)	8 to 10 v d-c	8 to 10 v d-c	If no voltage here, replace printed circuit board.

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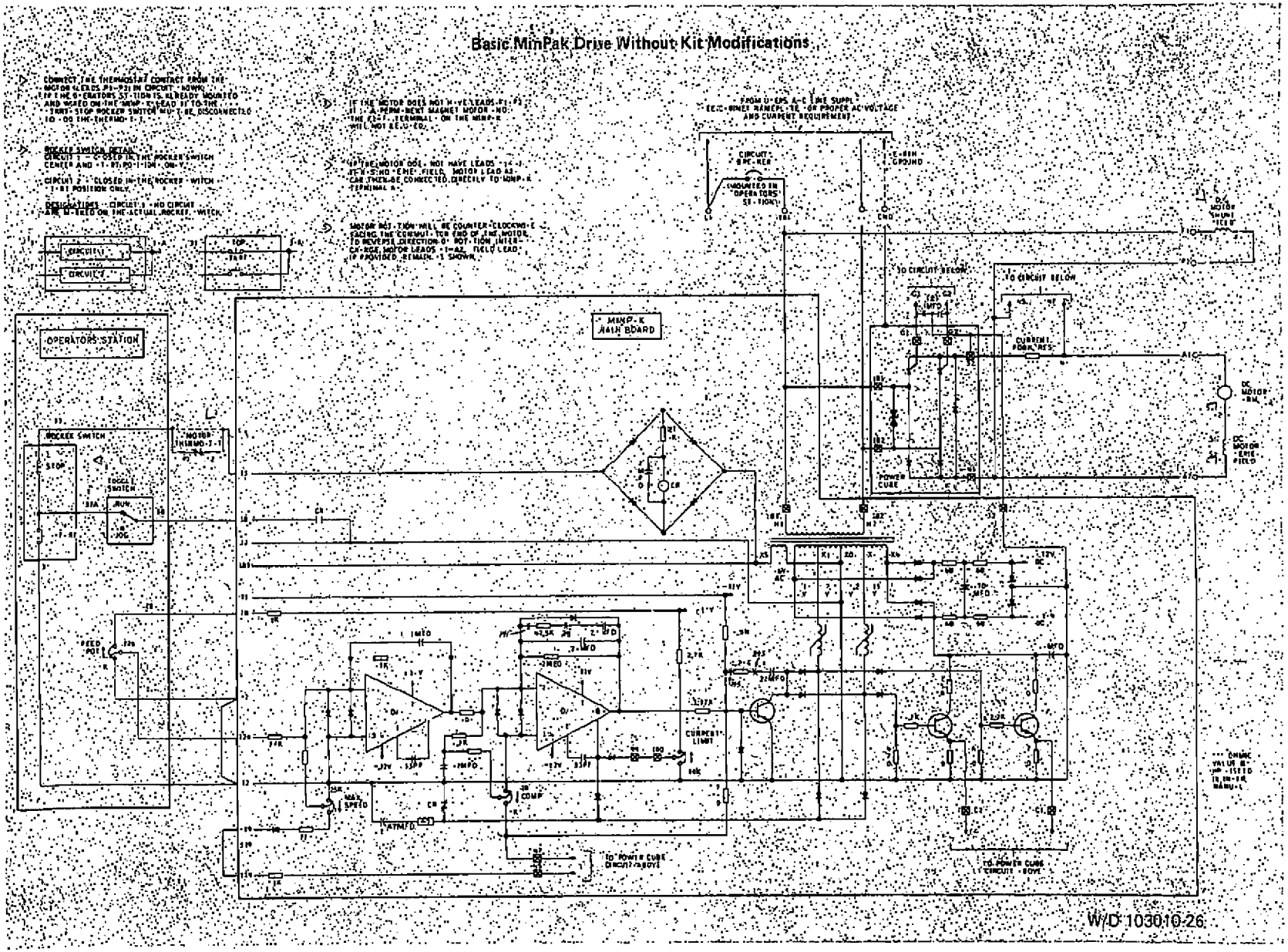
TROUBLESHOOTING CHART (Cont'd)

Step	Function Being Checked	Terminals	Voltage Should Be		Comments
			1/4 – 3/4 hp (115 v a-c input)	1 – 3 hp (230 v a-c input)	
5	Speed reference voltage	126(+): 32(–)	0 to 10 v d-c	0 to 10 v d-c	If voltage does not vary when speed pot. is turned or if there is no voltage, check wiring to speed pot: assure jumper or a resistor is connected between terminals 32 and 57: replace speed pot.
6	Gate voltage	G1(+) disconnected from Power Cube: 32(–)	0 – 2.2 v d-c (approx.)	0 – 2.2 v d-c (approx.)	Gate voltage should vary as the reference voltage (126 to 32) varies: if not replace printed circuit board. Note: Reconnect gate lead to Power Cube after checking.
7	Gate voltage	G2(+) disconnected from Power Cube: 32(–)	0 – 2.2 v d-c (approx.)	0 – 2.2 v v d-c (approx.)	Same as for checking G1 above.
8	A-C volt. to Power Cube	181; 182	115 v a-c	230 v a-c	Significantly lower values indicate faulty wiring between terminal board and Power Cube, or a-c power supply is faulty. See Steps 1 and 2.
9	Motor field Supply	F1(+): F2(–)	50 v d-c	100 v d-c	If no voltage here, replace Power Cube.
10	Motor armature voltage	A1: A2	0 to 90 v d-c	0 to 180 v d-c	Armature voltage should vary as reference voltage varies: if not replace Power Cube. However, be sure gate leads G1 and G2 were properly replaced to Power Cube.



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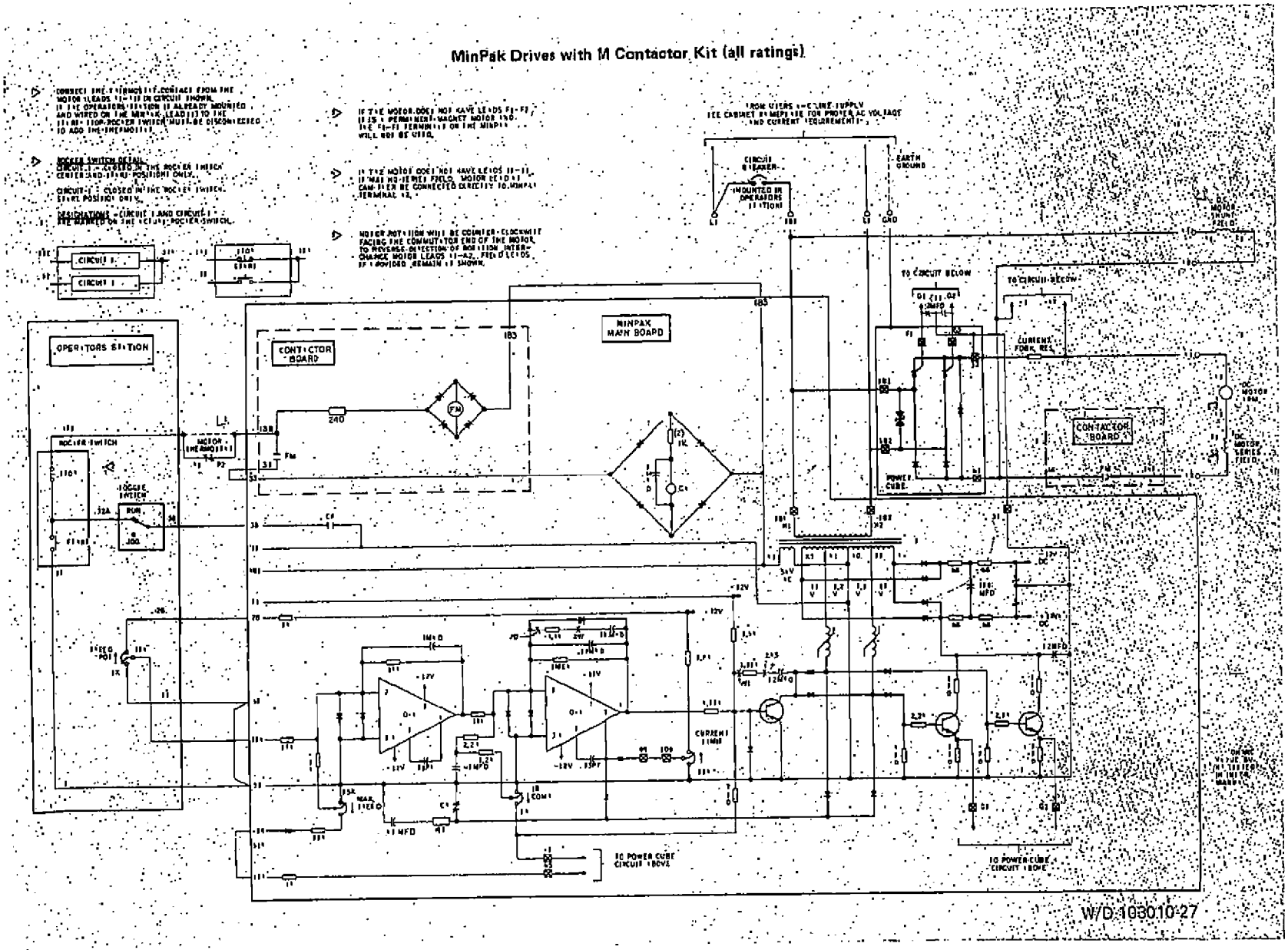
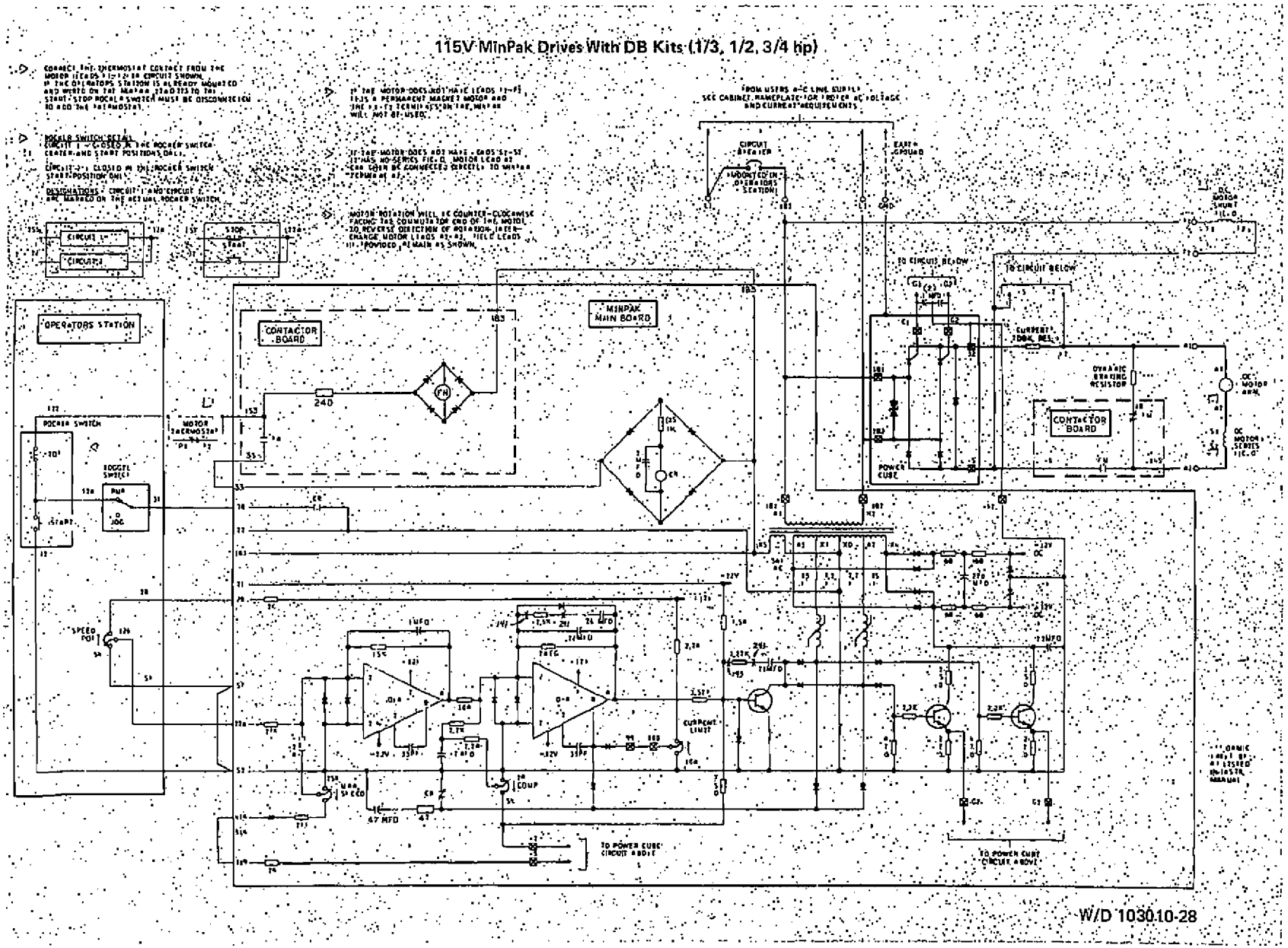
MinPak Drives with M Contactor Kit (all ratings)





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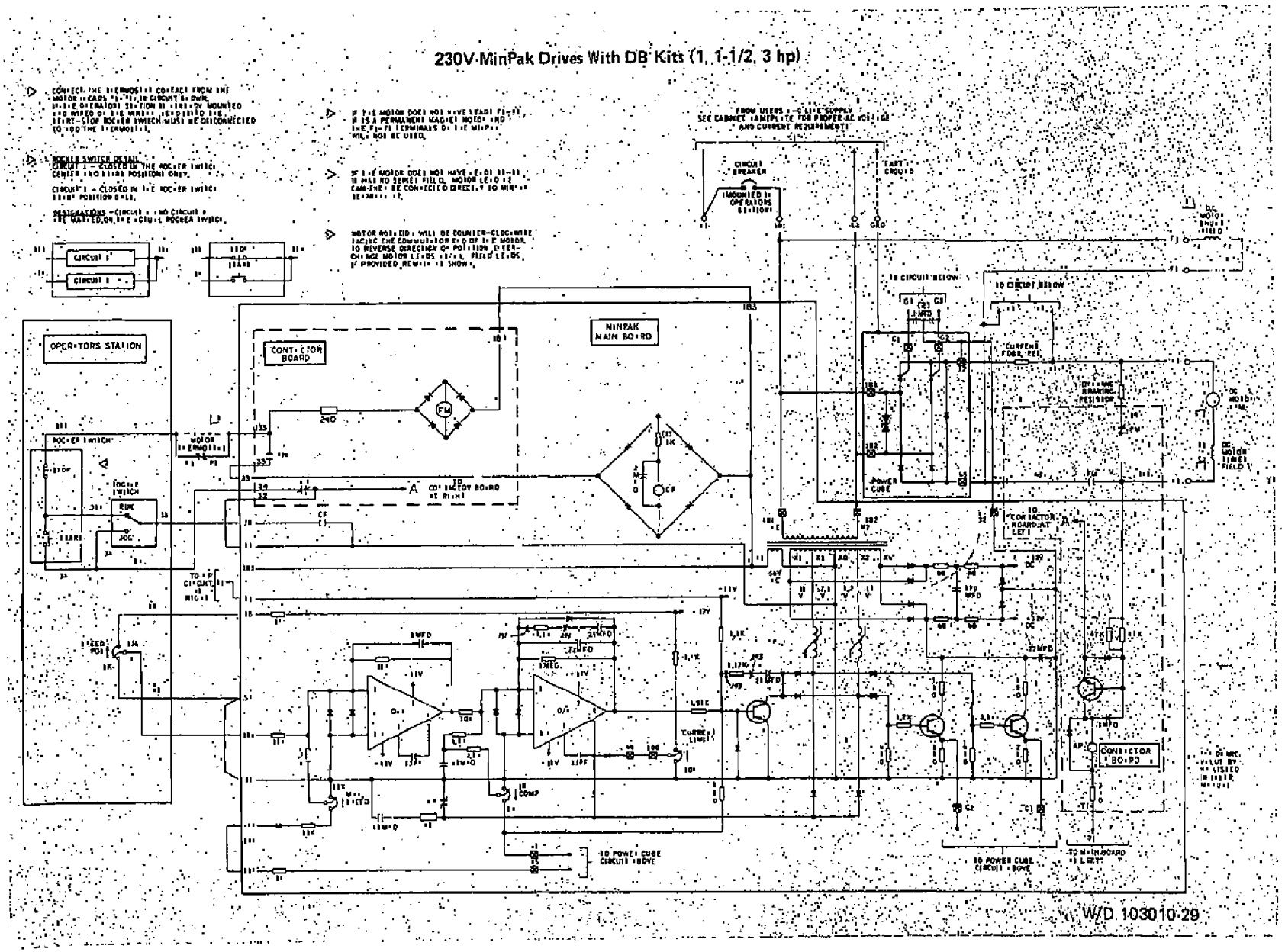
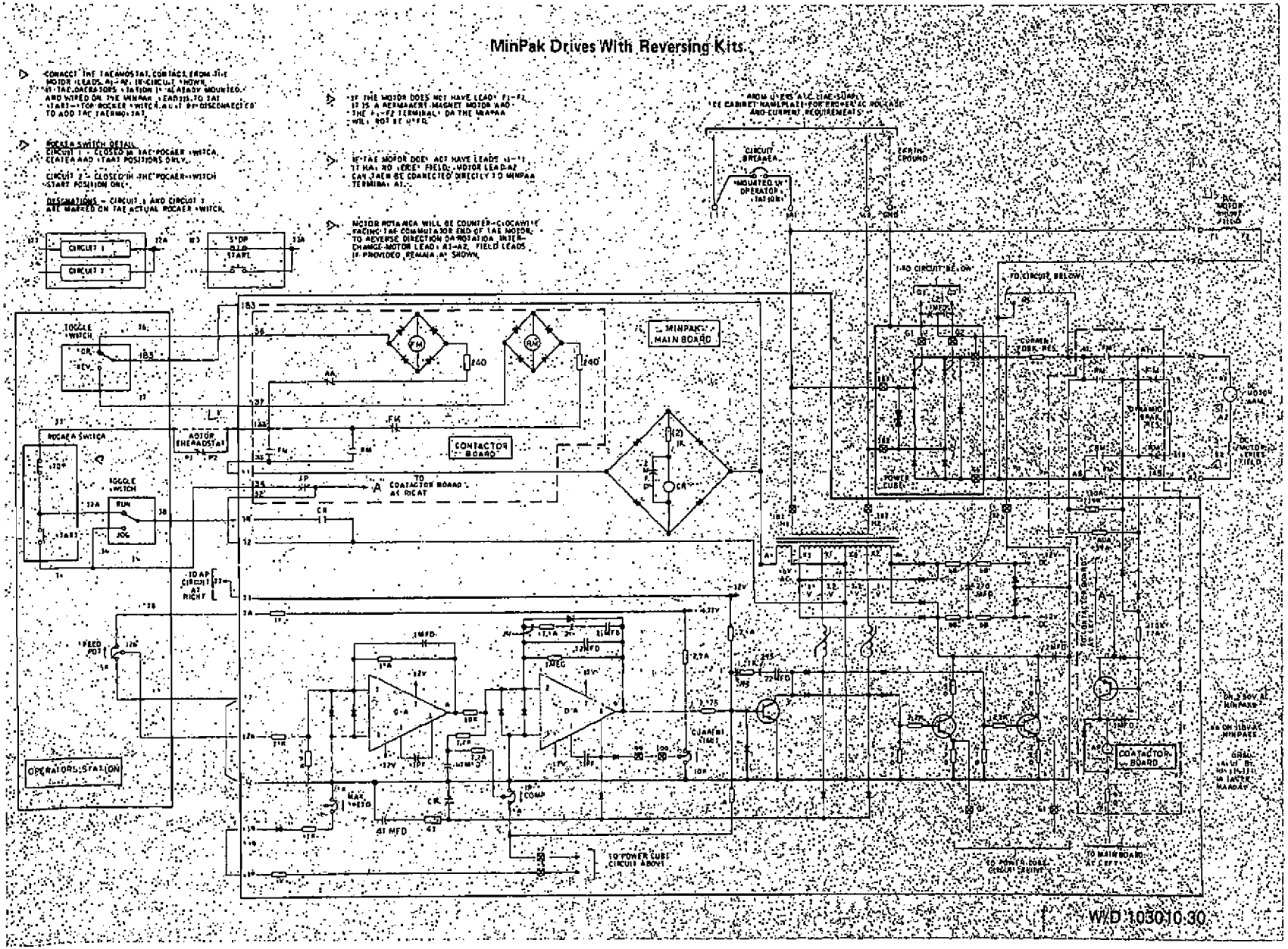
230V-MinPak Drives With DB Kits (1, 1-1/2, 3 hp)





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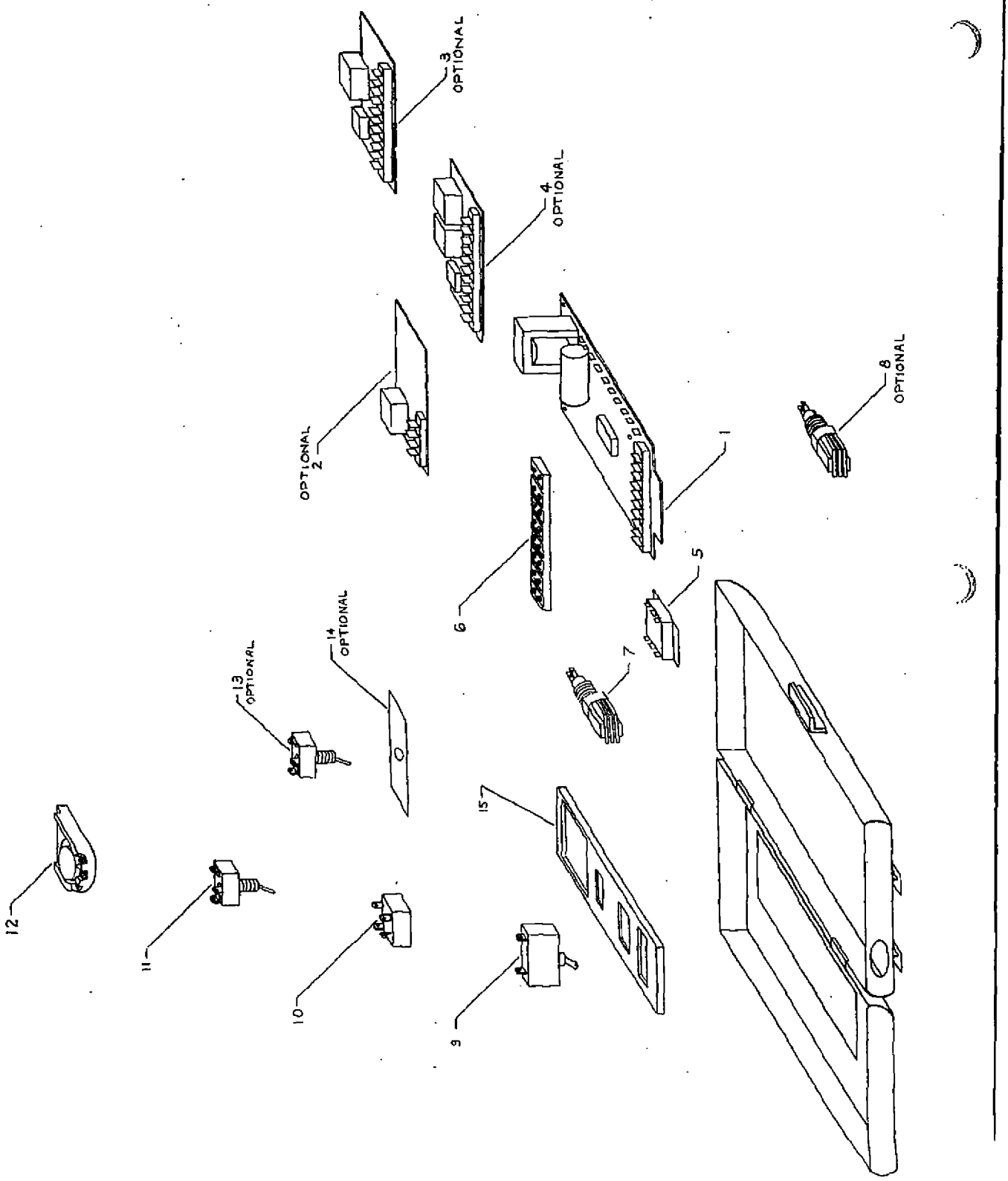
3 OPTIONAL
4 OPTIONAL
OPTIONAL 2
8 OPTIONAL
1
6
5
7
14 OPTIONAL
13 OPTIONAL
15
12
11
10
9

MINPAK PARTS LIST

Drawing Reference No.	Part	Part No.
1	Controller Card (1/4 – 3/4 hp) 60 hz	0-51381-11
	Controller Card (1 – 3 hp) 60 hz	0-51381-13
	Special MinPak V*S Drives designed for 50/60 hz operation have Controller Cards as follows:	
	1/4 – 3/4 hp	0-51381-15
	1 – 3 hp	0-51381-17
2	Optional – "M" Contactor Assembly	0-51382
3	Optional – Contactor Assembly for 115 v DB Kits	0-51382
	Contactor Assembly for 230 v DB Kits	0-51382-2
4	Optional – Reversing Contactor Assembly for 115v Kits (1/3 – 3/4 hp)	0-51382-1A
	Reversing Contactor Assembly for 230v Kits (1 – 3 hp)	0-51382-3
5	Power Cube – 115 Volt, 1/4 – 3/4 hp	701819-X (Model No. 11C350)*
	Power Cube – 230 Volt, 1 – 1-1/2 hp	701819-AB (Model No. 11C351)*
	Power Cube – 230 Volt, 3 hp	701819-1AB (Model No. 11C352)*
6	Power Terminal Board	49455-T
7	Signal Resistor – 115 Volt	
	1/3 hp 0.15 Ω	63481-32-F (blue)
	1/2 hp 0.1 Ω	63481-32-E (silver)
	3/4 hp 0.05 Ω	63481-32-G (orange)
7	Signal Resistor – 230 Volt	
	1 hp 0.1 Ω	63481-32-E (silver)
	1-1/2 hp 0.05 Ω	63481-32-G (orange)
	3 hp 0.03 Ω	63481-32-H (green)
8	Optional – Dynamic Braking Resistor	
	1/4 – 1/2 hp Qty. 1 22.5 Ω	63481-32D
	3/4 hp Qty. 2 6 Ω ea.	63481-32A
	Optional – Dynamic Braking Resistor	
	1 – 1-1/2 hp Qty. 2 16 Ω ea.	63481-32C
	2 – 3 hp Qty. 2 10 Ω ea.	63481-32B
9	Circuit Breaker	65241-29E or 65241-37E
10	Start/Stop Switch	602907-8A
11	Jog/Run Selector Switch	49869-1A
12	Speed Potentiometer Assembly	76500-T
13	Optional – Forward/Reverse Selector Switch	49869-1A
14	Optional – FOR-REV Legend Plate	69371-52A
15	Operator's Control Plate without Elements	86483-3B

*Power Cubes are available as new apparatus by the model number shown.

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FOR FRESH IDEAS IN AUTOMATION . . .

General Offices, 24701 Euclid Avenue, Cleveland, Ohio 44117

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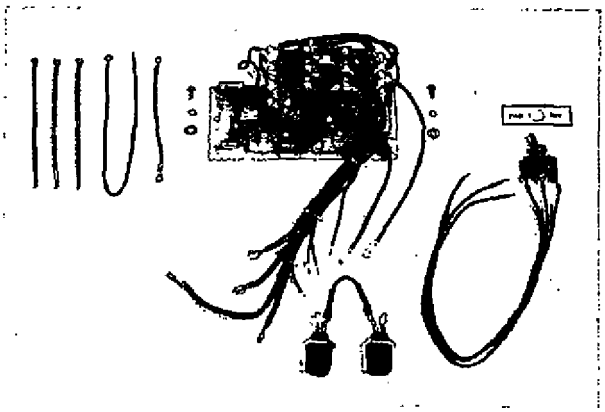
INSTRUCTION SHEET D-3700-4

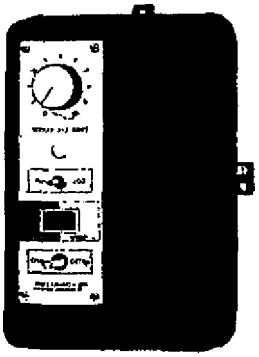
For Kits: 11C83K (1/4 & 1/2 hp)
11C84K (3/4 hp)
11C85K (1 & 1-1/2 hp)
11C86K (2 & 3 hp)

MINPAK REVERSING AND DYNAMIC BRAKING MODIFICATION KITS



- Can be installed anywhere — in minutes — with no special skill required.
- Simple fast installation — screwdriver only tool required — no holes to drill or leads to cut.
- Includes all necessary components and mounting hardware.
- Converts unidirectional drive to bidirectional (forward and reverse) operation, DB and anti-plug protection also provided.
- Other kits available, call your local Reliance distributor for details.

This Armature Reversing Kit is one of a series of modification kits available for the Reliance Single Phase MinPak D-c V*S Drive. It provides all of the components and mounting hardware needed to modify any basic 1/4 — 3 hp MinPak V*S Drive. Adding this kit converts a standard unidirectional drive to a bidirectional drive capable of operating in both forward and reverse modes. A forward-reverse selector switch on the operator's control panel determines the direction of rotation. Dynamic braking is provided to quickly slow down the drive so that it can be rapidly reversed. Anti-plug protection is also included which ensures that the drive will be at a low speed before the reversing function is accomplished.



Others in this series include kits for adding an "M" contactor as well as an M Contactor + DB. Each kit contains the components and mounting hardware needed to custom-tailor each drive to its intended application. All mounting holes are predrilled, all leads are precut, attached and numbered for fast, nearly effortless installation. For further information on other kits contact your local Reliance distributor or sales office.

Kit Number	Horsepower Rating	Input Voltage	"M" Contactor Assembly	Dynamic Braking Resistors	Mounting Hardware Provided With Each Kit
11C83K	1/4 & 1/2	115	0-51382-1A	(1) 63481-32D	(2) #8 – 32 x 3/8" Round Head Machine Screw (2) #8 Split Lockwasher (2) #8 Flatwasher (3) Self-locking Plastic cable ties, P/N 69306-3D (1) Jumper – 2" long (1) Reversing switch with attached precut leads (1) FWD-REV legend plate
11C84K	3/4	115	0-51382-1A	(2) 63481-32A	
11C85K	1 & 1-1/2	230	0-51382-3	(2) 63481-32C	
11C86K	2 & 3	230	0-51382-3	(2) 63481-32B	

INSTALLATION PROCEDURE

CAUTION: BE SURE THAT THERE IS NO A-C POWER APPLIED TO THE DRIVE WHILE THIS KIT IS BEING INSTALLED.

1 The easiest way to install this kit is to place the drive, face-up, on a flat workbench or table. If the drive is already installed, it must be removed from its normal wall-mounted position.

2 Open the door of the drive cabinet by turning its locking screw counter-clockwise.

NOTE: If this kit is being installed to replace an existing Reversing and DB Kit, please refer at this time to [1] below.

3 Remove the red wire which runs between terminal A2 and terminal F2 of terminal board TB-1. Also, remove the red wire between A1 of TB-1 and the signal resistor terminal.

4 Move wire numbered 33 from TB-2 to terminal 133 on TB-3 (Leave the other end connected to the START-STOP switch).

5 The dynamic braking resistor(s) should now be installed. Two pre-drilled holes are provided in the back of the cabinet, each covered by a plastic plug. If your kit contains only one dynamic braking resistor (A), remove the bottom plug only (see photo). If two dynamic braking resistors (A and B) are provided, remove both plugs.

To mount these resistors, removed the attached nut and insert the resistor through the pre-drilled hole, *from the back of the cabinet*, so that the tab terminal leads are inside. Replace the nut and tighten.

6 Next, install the contactor board by fastening it to the mounting brackets in the drive cabinet (see photo). Using the supplied mounting hardware, first slip a split lockwasher and a flat washer onto the mounting screws. Then, insert the screws thru the board and into the pre-threaded mounting brackets, tightening until snug.

7 You are now ready to continue wiring the kit. For your convenience, the contactor board is supplied with all of the necessary wires, pre-cut, numbered and bundled for easier routing. Choose the correct wiring table for your kit from the two tables below, and complete the wiring in accordance with its instructions.

Wire Connection Table No. 1
Kit Number 11C83K: 1/4 – 1/2 hp @ 115 Volts

FROM Bundled Wire Number	TO Terminal Number
33	33 on TB-2
71	71 on TB-2
32	32 on TB-2
45	F2 on TB-1
145	A2 on TB-1
147	A1 on TB-1
47	Signal Resistor Terminal
118	Either tab on the Dynamic Braking Resistor A
18	Other tab on the Dynamic Braking Resistor A
Continue to paragraph 8 for Operator's Control Panel Connections.	

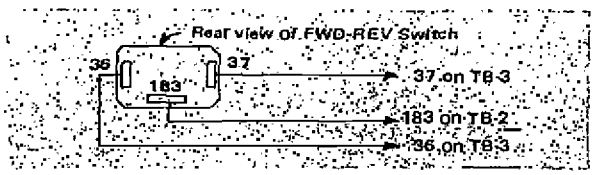
Note: Do NOT connect 183 on TB-3 to 183 on TB-2.

Wire Connection Table No. 2
Kit Number 11C84K: 3/4 hp @ 115 Volts
Kit Number 11C85K: 1 – 1 1/2 hp @ 230 Volts
Kit Number 11C86K: 2 – 3 hp @ 230 Volts

FROM Bundled Wire Number	TO Terminal Number
33	33 on TB-2
71	71 on TB-2
32	32 on TB-2
45	F2 on TB-1
145	A2 on TB-1
147	A1 on TB-1
47	Signal Resistor Terminal
118	Either tab of Dynamic Braking Resistor B
18	Either tab of Dynamic Braking Resistor A
Now, add the jumper provided between the remaining tab on Dynamic Braking Resistor A and the remaining tab on Dynamic Braking Resistor B.	
Continue to paragraph 8 for Operator's Control Panel Connections.	

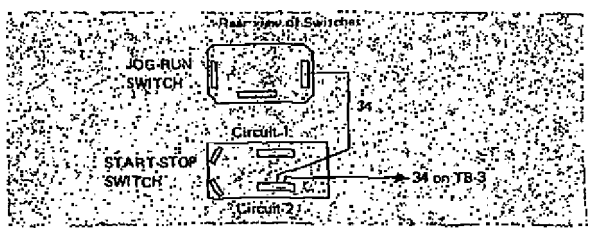
Note: Do NOT connect 183 on TB-3 to 183 on TB-2.

8 Install the FORWARD-REVERSE selector switch and the FWD-REV legend plate. Remove the plug in the hole above the JOG-RUN selector switch. Attach the FWD-REV legend plate by removing the backing to expose the adhesive and place the legend plate above the JOG-RUN switch. Next insert the FWD-REV selector switch in the hole and tighten the nuts provided.



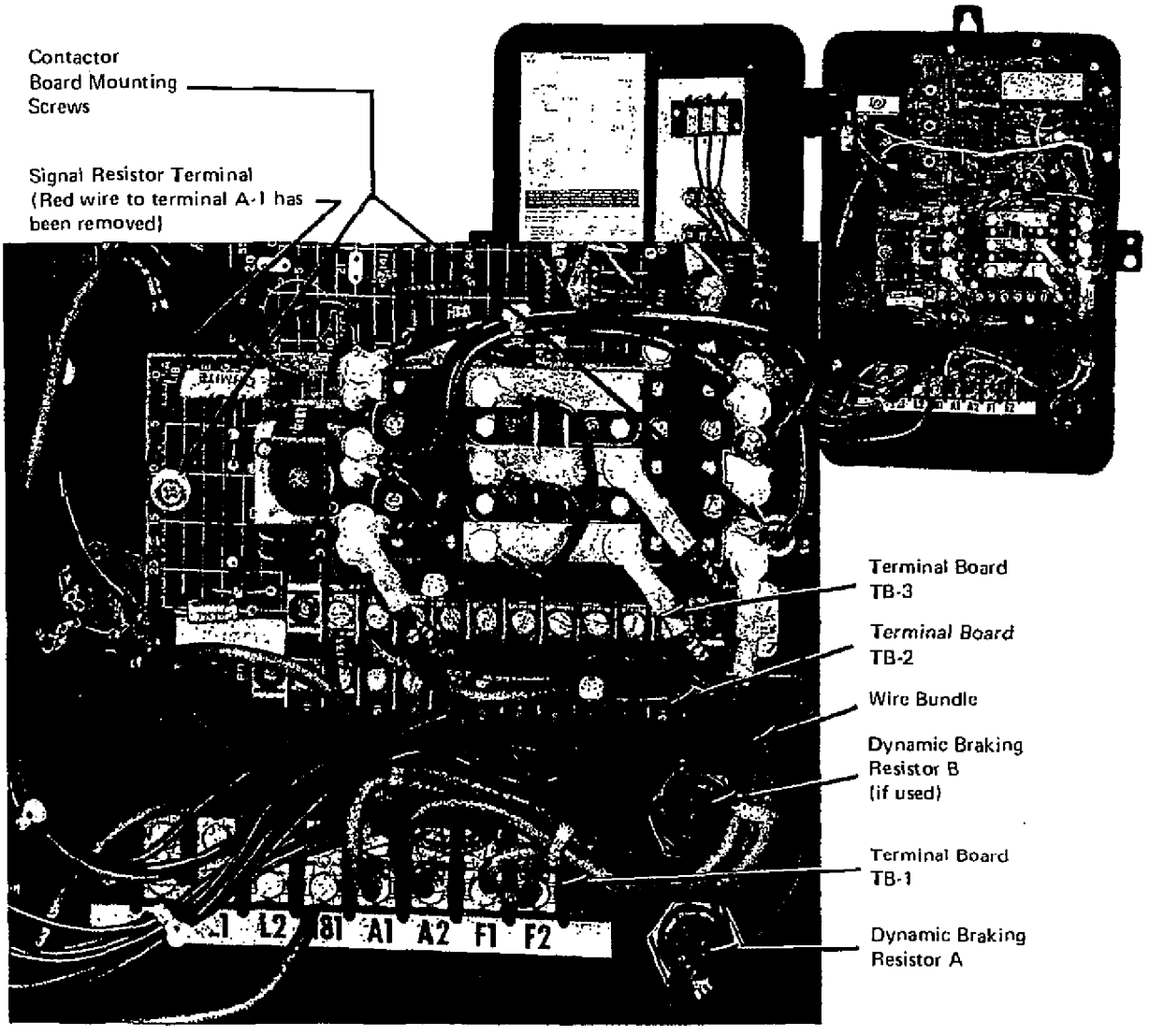
9 Connect the three numbered wires provided between the FWD-REV switch and TB-2 and TB-3 as shown in drawing at left.

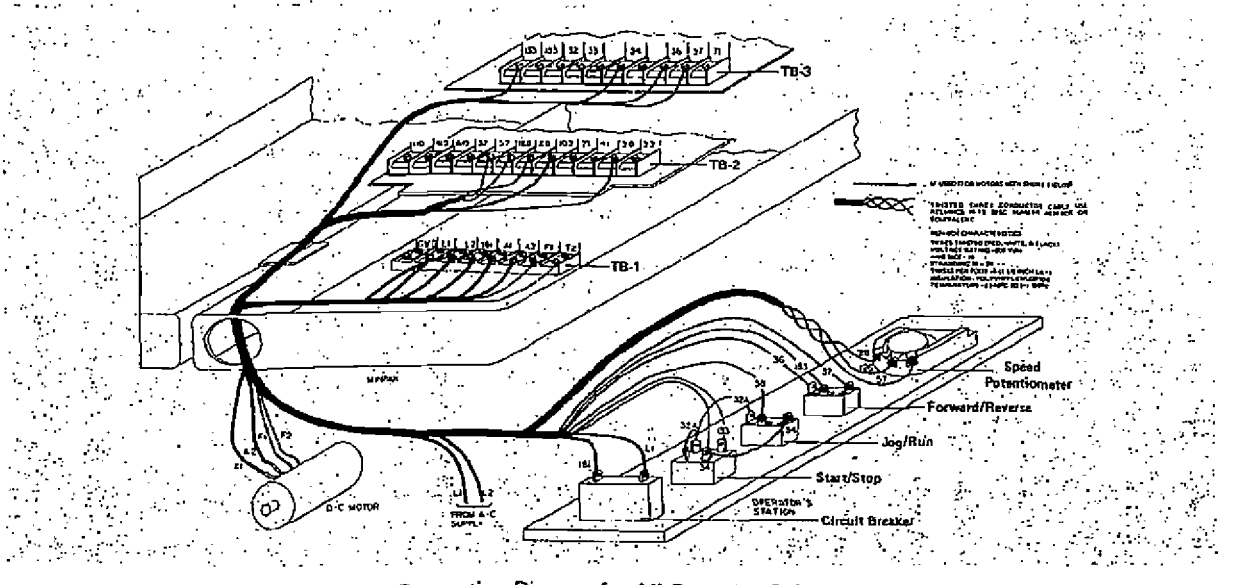
10 Remove completely wire 32 connected from the START-STOP switch to terminal 32 on TB-2; then add two wires numbered 34 supplied with the kit: (A) connect the short wire numbered 34 between the START-STOP switch and the JOG-RUN switch as shown in the drawing below: (B) connect the longer wire numbered 34 between the START-STOP switch and terminal 34 on TB-3.



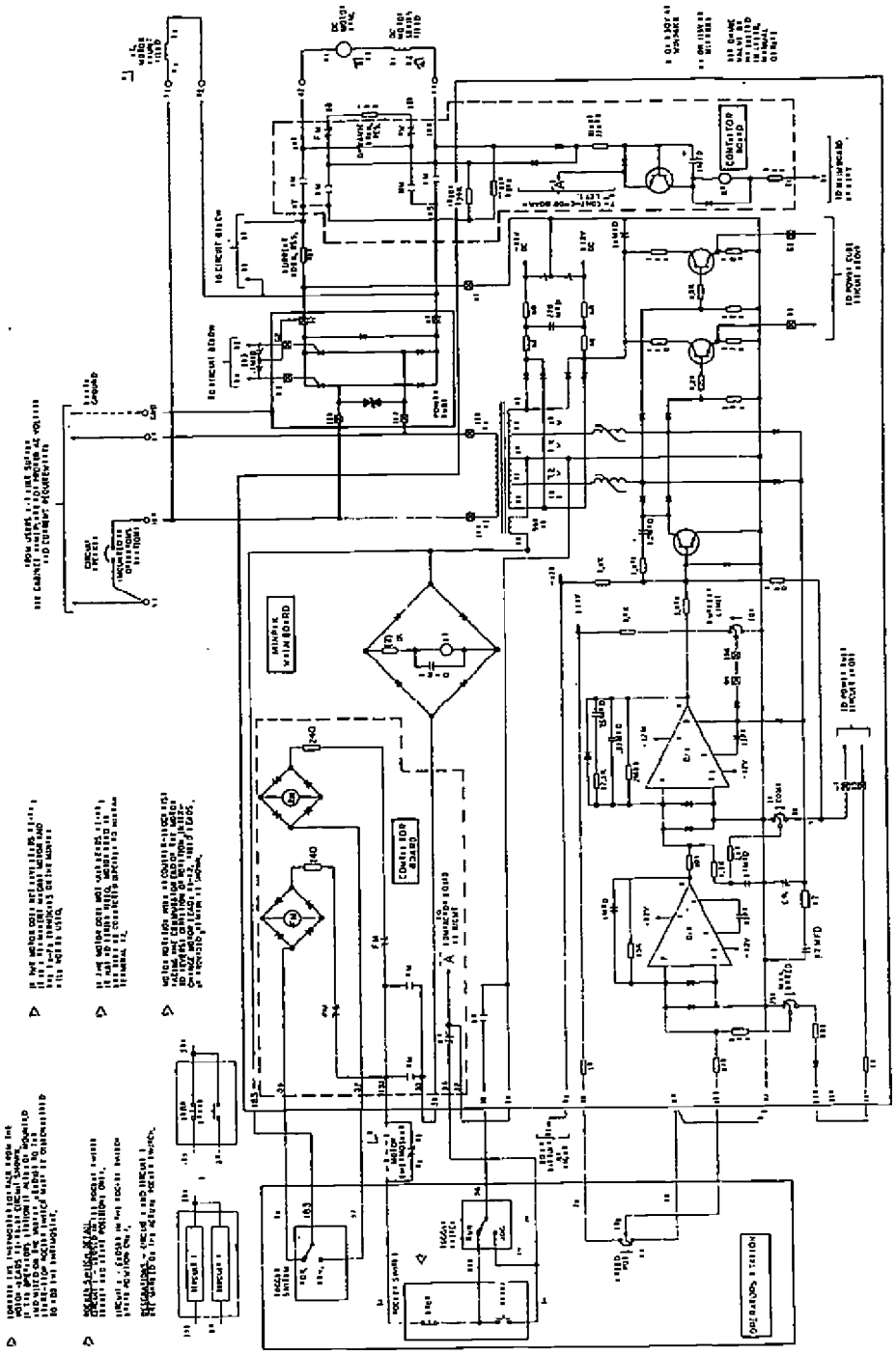
11 Check to assure that all wiring is in accordance with the Connection Diagram shown on the following page.

[1] On *some* Reversing and DB kits previously supplied the wire numbered 183 in this Instruction Sheet (see Connection Diagram for All Reversing Drives on opposite page) was numbered 35. If this was the case on the kit presently being replaced the wire numbered 35 should be removed from terminal 35 on TB-3 on the kit being replaced and connected to terminal 183 on TB-2 at this time.





Connection Diagram for All Reversing Drives



W/D 103010-30

☒ – Denotes Faston Connector

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INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE 45 RECORDING INSTRUMENTS

CAUTION: Read all of the information in this leaflet before proceeding as directed below. Before putting Type 45 recording instruments into service, remove all blocking which may have been inserted for the purpose of securing parts during shipment. and make sure that all moving parts operate freely.

GENERAL

The Type M45 ammeters and voltmeters conform to the requirements of ASA C39.2 for round chart recorders of the 2% accuracy class. Ammeters may be used on any commercial power frequency. Voltmeters must be used on the frequency for which they have been calibrated.

Type 45 recorders are weatherproof and may safely be used outdoors or in other environments where dust and moisture may be encountered. For use at temperatures below freezing. instruments with internal heaters can be supplied.

INSTALLATION

UNPACKING

Unpack carefully. Be sure that all small accessories, spare parts. etc., are found before discarding the packing material.

NAMEPLATE READING

The nameplate contains the following information:

Reference to quantity measured (amperes or volts). chart speed. type of clock (hand-wound spring type or synchronous motor driven). voltage and frequency rating of synchronous motor clock. full-scale range of measuring element. frequency rating. transformer ratio (if any). style number and serial number.

GROUNDING OF CASES

When instruments are used with potential or current transformers the instrument cases and the secondary of the instrument transformers should be grounded.

MOUNTING

For panel mounting. drill the panel according to the drilling plans in this leaflet. With flush-mounted instruments insert the body of the instrument through the panel so that the recorder flange is flush with the face of the panel. Fasten the recorder in this position by means of the mounting hardware provided. The method of mounting is illustrated in the cross section view on the drilling plan.

Connect the recorder according to the proper wiring diagram. using wire which is insulated to withstand the voltage and other conditions which will be encountered in service.

PLACING INSTRUMENT IN SERVICE

Synchronous clocks are self-starting when energized at the voltage and frequency specified on the nameplate. Hand-wound spring clocks should be wound full by means of the key provided. The winding arbor is accessible through a hole in the mechanism plate. When provided. the fluorescent light circuit operates from 120 v. 60 cycles. Once the circuit is energized at the instrument terminals, lighting may then be controlled by the switch on the mechanism plate.

Raise the pen from the mechanism plate by means of the pen lifter. Remove the chart arbor nut at the center of the mechanism plate. put the chart in position and replace and tighten the nut. The chart arbor is driven through a slip-clutch so it may be turned until the time indicator coincides with the proper time as read on the time arcs of the chart.

The mechanism plate is hinged at the left. Release the mechanism plate latch and swing the mechanism plate assembly outward.

Instruments are equipped with one of two types of inking system (as ordered): (1) conventional V-type open pen, or (2) sealed inking-system with tubular pen fed through plastic tubing from plastic ink sac located at the rear lower corner of the mechanism plate.

(1) V-type pens are filled from the dropper-type ink bottle. Ink flow can be started by moistening the writing tip or in extreme cases, drawing the edge of a piece of paper through the slotted tip. Pen capacity is about five drops of ink which is capable of producing several normal voltage variation charts

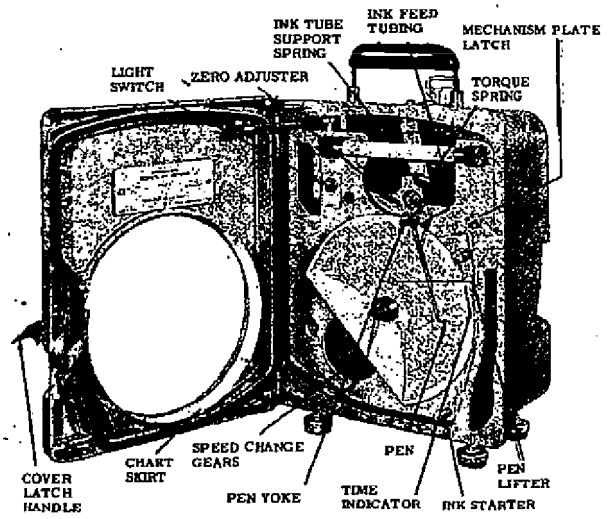


Fig. 1. Type PM-45 Double Range Recording Voltmeter with door open.

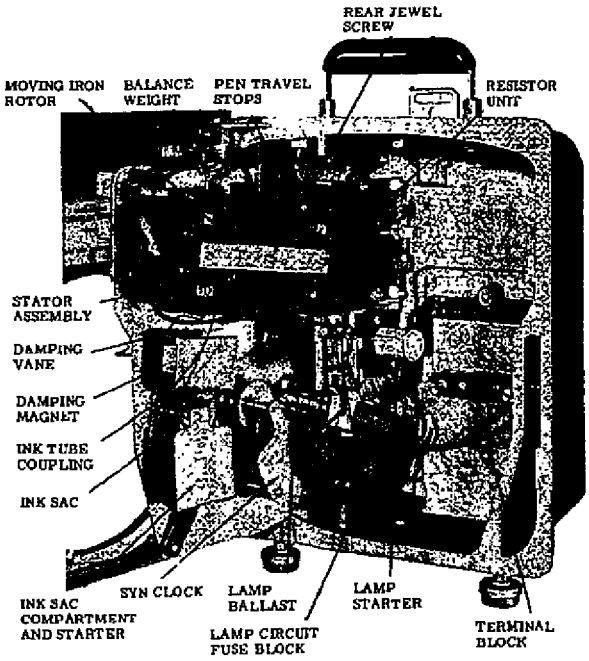


Fig. 2. Type PM-45 Double Range Voltmeter with hinged mechanism plate open. View shows internal components.

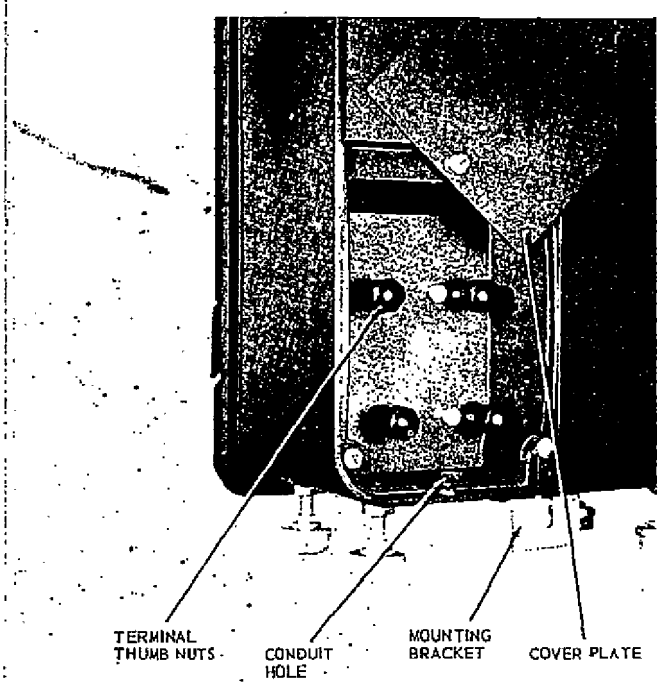
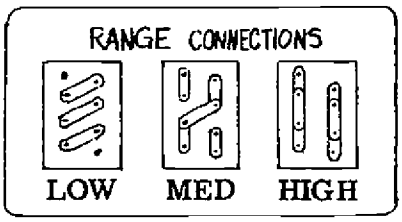


Fig. 3. Type PM-45 Recording Instrument. Rear view showing terminal compartment with cover plate open.



TRIPLE RANGE AMMETER CONNECTIONS (OLD DESIGN)

Fig. 4. Triple Range Ammeter connections. (Old Design)

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at 7-day rotation speed. It is recommended that the pen be filled each time the chart is changed.
(2) When received, the ink feed tubing of sealed inking systems is mounted in its spring support with one end fastened to the pen assembly and other end fastened to the tapered metallic coupling. The tubing is not attached to the sealed ink sac which is secured in its holder during shipment. Using a thumb and forefinger, pull back the top of the rear plate of the ink sac holder and remove the sac. Cut off the sac tubing at a point just below the seal and connect the ink sac to the inking system by inserting the tapered end of the metallic coupling into the open ink sac tubing. Apply sufficient manual pressure to assure a good tight connection. Pull open the top of the ink sac holder and drop the sac into the holder making certain the bottom of the sac is resting on the bottom of the holder. When released the spring action of the top of the holder will clamp on the top of the ink sac. Do not clamp on ink tubing. Re-latch mechanism plate and place a small piece of scrap paper under the pen tip. Depress the ink starting button until the ink flows thru the ink feed system and a drop of ink comes out of the pen tip onto the paper. Then release the starting button, remove the scrap paper and check the inking on the chart. Portable models should be carried and stored in an upright or on its back position thus preventing accidental flow of the ink from the sac.

MULTI-RANGE INSTRUMENTS

Triple-range ammeters have a range-changing switch located at the top left of the mechanism plate. the old superseded link design had range changing links as shown in Fig. 4.

Double-range voltmeters have a range changing switch located at the top left of the mechanism plate. On portable double-range voltmeters with synchronous clock, the clock motor is paralleled with the measuring circuit. When the range is changed, the clock motor and its series reactor are automatically connected for the proper voltage.

MAINTENANCE

PROCEDURE FOR CALIBRATION ADJUSTMENT

A. Check and adjust calibration as follows:
   1. Place the instrument in its normal operating position.
   2. Connect the instrument to the calibrating circuit with a reference standard instrument (ammeters in series with reference standard. — voltmeters in parallel with reference standard).
   3. Ammeters and left-zero voltmeters have calibration adjusted by setting pen to zero (unenergized) and adjusting effective torque of the spring by moving the clamping position at the outer convolution until the instrument tracks the scale properly. Shortening the effective spring length increases the spring torque and vice versa. The zero adjuster lever arm should be near mid-position. Rotate the large hex-head at the front center of the moving element (under the bearing screw lock-nut), to attain this condition. This has no effect on bearing end play.
   4. Suppressed-zero voltmeters have a combination of two calibration adjustments.
      a. Degree of suppression by rotating the hex head screw under the front bearing screw locknut.
      b. Spread of the scale by shortening or lengthening the effective length of the torque spring by means of the outer convolution spring clamp. Lengthening the effective spring length increases the scale spread and vice versa.
      c. Make a trial reading by energizing the voltmeter and noting the voltages required for the left end of the scale and for the major scale division below full scale. Adjust suppression and spread as necessary for the pen to track over the scale. The zero adjuster lever should be near the middle of its adjusting range which can be accomplished by proper adjustment of the hex head screw under the front bearing-screw locknut.

B. Mechanical Balance.

Moving elements are mechanically balanced to minimize position influence (change in indication resulting from instrument not being in perfectly vertical position). Balance weights are provided on the tail arm of the damping vane. The balance weight assembly is secured by a fillister head screw. The cylindrical bar for side balance is retained by an Allen head set screw. In case of calibration adjustment, it may be necessary to change the position of the weights for best scale tracking at all points.

DAMPING

Instruments are equipped with magnetic damping which has been adjusted to permit slight overshoot on sudden load changes. Damping is adjustable

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by changing the position of the damping magnet poles with respect to the damping vane. Loosening the two nuts holding the damping magnet bracket permits moving the magnet assembly up or down as necessary to decrease or increase damping to desired value. Lock nuts should then be tightened securely.

SEALED INKING SYSTEM

The pen is a special alloy tube with a highly polished writing tip. No attempt should be made to repolish it.

The ink feed tubing is made of a specially developed plastic tubing, chosen particularly for its characteristic of extreme flexibility.

Pen-to-paper pressure is controlled at the coupling of the plastic tubing and the pen. This pressure can be adjusted by first twisting the plastic tubing at the top of the metal pen assembly until the pen tip is lifted off the chart. The tubing should then be twisted in the opposite direction until the pen tip just touches the chart paper. A check of this adjustment may be made by manually lifting the pen tip approximately 1/2" from the chart and then releasing it. The pen should bounce slightly on the chart. A firm non-bouncing contact indicates excessive pressure. This adjustment is not critical but best writing and accuracy performance will be attained with a light continuous contact of the pen on the chart.

Replacement of Ink Feed Tubes

The ink tubing is the life line of your 45 Recorder and the installation of a replacement tube must be done with extreme care. Unreasonable pinching or twisting of this tubing may cause immediate or later inking failure. An extra long length of tubing is supplied to facilitate safe handling during installation and this excess tubing is later cut off.

To install new tubing first disconnect both ends of the old tubing and pull out of support spring. From the front side of the mechanism plate, feed the long plain end of the new tubing thru the support spring. Then pull the tubing thru the support spring until the smaller diameter section of the tubing is fully within the support spring. From the front side of the mechanism plate, feed the tube end with the plastic coupling thru the support arm and make a smooth looping connection to the pen. Slip the plastic coupling over the metal pen tube until there is a space of approximately 1/8 inch between the metal tube and the main plastic tubing. The metal tube and the main plastic tubing must not butt against each other.

From the rear of the mechanism plate direct the long end of the tubing down between the mechanism support post and the coil form. This prevents the ink feed tubing from becoming pinched by the mechanism plate latch. The smaller diameter section of tubing may extend beyond the protective support spring at the rear of the mechanism plate and care must be taken to prevent kinks in the tubing in this area.

After tubing is fully adjusted, excess tubing (approximately 9 inches) at the ink sac should be cut as required for coupling to the ink sac.

Replace ink sac in its holder and send ink thru tubing making certain all air is pushed out by the ink. Adjust pen-to-paper pressure as described above. Check calibration and, when required, adjust zero setting for ammeters and a selected voltage for voltmeters.

Cleaning Tubular Pens

If a pen becomes clogged and stops inking, try to clear it by pressing the pen starter button. If it cannot be cleared by this procedure, use the pen cleaning wire to clear the tip.

In severe cases, it is possible for an accumulation of paper fibers or dried ink to be pushed back by the pen cleaning wire to later re-enter the necked-down tip and again stop the flow of ink through the necessarily fine writing tip. In the event that this occurs, it is recommended that the following more thorough reverse-flushing procedure be followed, using pen syringe Style 837390:

1. Detach the plastic feed-tube coupling from the pen and remove the pen from the recorder.

2. Clear the tip by means of the pen cleaning wire.

3. Fill the pen syringe with water.

4. Insert the pen writing tip into the hole near the tip of the syringe and apply bulb pressure until water flows out of the pen inlet.

5. Reverse the pen and insert the inlet end of the pen-tube into the syringe hole and apply bulb pressure. A clean pen will emit a fine solid stream of water.

6. Remount pen in holder, attach feed tube, adjust pen-tip pressure, and restart the inking system.

It is suggested that the pen be cleaned by the above procedure each time the ink sac is replaced.

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FRICTION

Friction can best be detected by moving the pen slightly from side to side and noting whether the pen returns to its original position. Friction may be due to a damaged bearing or pivot, insufficient end play between pivots and bearings. mechanical interference or excessive pen tip pressure.

CAUTION: Before adjusting bearing screw (front or rear), loosen bearing screw locknut. Tighten locknuts upon completion of adjustment.

REMOVAL OF HINGED MECHANISM PLATE

The hinged mechanism plate, on which all internal components are mounted, can be removed as follows:

Disconnect the terminal leads from the case. Move the mechanism plate to a position approximately one quarter open. This is the only position from which the plate can be removed. Raise the mechanism plate until the lower pivot tab clears its bearing hole. Move the plate forward and downward to remove.

CHARTS AND INK

The paper used for the charts is of a special type and has been specifically developed for use in these recording instruments. It is manufactured by a carefully controlled process and conforms to rigid specifications to assure optimum recording qualities.

To completely assure the best over-all performance of the recording system, the recommended inks and charts must be used exclusively.

LAMP REPLACEMENT

On instruments supplied with illumination replace burned out lamps with any standard cool white 4 watt fluorescent lamp.

CHART DRIVE

Three types of chart drive units are available. These are interchangeable in mounting:

A. Synchronous motor drive. Standard speeds are 24 hours and 7 days per rotation. Speed is selected by interchanging two gears accessible through the opening in the mechanism plate. Gears are also available for 3 day rotation. Portable double voltage range voltmeters. have clock supply voltage automatically changed by the range-changing switch.

B. Hand-wound spring clocks will run eight days on one winding. 24 hour on 7 day rotation is selected by moving the speed change lever accessible through the opening in the mechanism plate.

C. Carry-over clocks have synchronous-motor drive in parallel unit a spring-driven clock which will continue to operate up to ten hours after supply voltage outage. Upon restoration of supply voltage, the clock spring accumulates reserve at the rate of one hour of reserve for each two hours of operation. Speed change gears are the same as for the conventional synchronous motor chart drive (A above).

ONE REVOLUTION CUT-OFF

This optional feature automatically raises the pen from the chart after completion of one revolution of the chart. This feature may be installed on a standard recorder by the addition of the pen lifter cam and replacement of the standard pen lifter with a special lifter. The height of the lifter can be adjusted by bending it to obtain clearance of the pen when the lifter is in its normal operating position. This adjustment must also assure the lifting of the pen from the chart when the lifter is raised by the cut-off cam. This pen lifter will not be automatically depressed upon closing the recorder door but must be depressed manually.

RECORDERS EQUIPPED FOR LOW TEMPERATURE SERVICE (SEALED INK SYSTEM ONLY)

This optional feature is necessary when the recorders are to be used in temperatures below +40°F. Recorders so equipped may be used in temperatures down to -40°F.

Recorders with this feature are equipped with two small step-down transformers, thermostatically controlled, the secondaries of which feed current through the ink tube support spring. The heat developed in this support spring maintains a temperature of the plastic ink tube that assures its flexibility. The primaries of the transformers are rated at 117 volts and are connected to appropriate voltage terminals.

During low temperature operation it is also necessary to use the low temperature ink S # 186-A-658G01.

REPAIRS AND RENEWAL PARTS

IMPORTANT: All recorders must have their moving elements blocked, the ink removed prior to shipment to the factory for service or repairs.

MOVING ELEMENT BLOCKING

The moving element of the "45" recorder should be confined during shipment. Facing the rear of the mechanism assembly, a rubber band should be stretch-

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ed over the balance arm of the moving element and between the ends of the two top posts of the mechanism.

Repair work can be done most satisfactorily at the factory. When returning an instrument for repairs, obtain a return material tag from your dealer or your nearest Westinghouse Sales Office to assure proper identification at the factory.

Orders for renewal parts should include the name of the part and the style number of the apparatus on the nameplate.

POWER CONSUMPTION

Type and Rating	At Rating	Watts	Vars	V.A.	% P. F.
M-45 Ammeter. 0-5 Amp	5A	.9	4	4.1	22
M-45 Voltmeter. 90-140 Volts	120V	10.3	3.1	10.7	96
Synchronous Motor Clock	120V	4	5.7	7	57

SUPPLIES FURNISHED WITH EACH RECORDER

(These may be reordered as necessary)

Quantity	Description	Style No.
1	Ink Sac. Red Ink (with sealed inking system only)	185A903G01
1 pkg.	Pen Cleaning Wires (with sealed inking system only)	542-D-716G02
1 bag	Mounting Hardware (Switchboard types only)	291B132G01
1	Pen Syringe (with sealed inking system only)	837390

ADDITIONAL SUPPLIES AVAILABLE ON ORDER

Description	Style No.
Pen Assembly (open V-type)	629A974G01
Pen Assembly (Sealed Inking system type	291B030G02
Ink Feed Tubing (2 tubes)	291B189G02
Ink Feed Metal Coupling	185A991H01
Tubing Support Spring	185A873G01
Bearing Screw	629A968G01
Pivot Assembly	116600
Chart Arbor Nut	836101
Synchronous motor, 120 volts. 60 cycles 1 RPM	1098213
Cover Gasket	836A643H01
Fluorescent Lamp	185A911H01
Lamp Starter	185A885H01
Lamp Fuse	542D755H13
Ink Sac. Red Ink for normal temperature service (+30 to +90F)	185A903G01
Ink Sac. Blue Ink for normal temperature service (+30 to +90F)	185A903G02
Ink Sac. Red Ink for extreme temp. (-40 to +30F &+90 to +120F)	186A658G01
Ink Feed Tubing (1 tube) and Ink Sac (Red Ink - Normal temp.)	291B189G04
Blue Ink for V-Pen (+30 to +90F) ¼ ounce	763A041G01
Blue Ink for V-Pen (-40F to +30F & +90 to +120F) ¼ ounce	763A041G02
Red Ink for V-Pen (+30 to +90F) ¼ ounce	763A041G03
Red Ink for V-Pen (-40 to +30F & +90 to +120F) ¼ ounce	763A041G04
* One Revolution of Chart Cut-Off Kit	542-D-755G03

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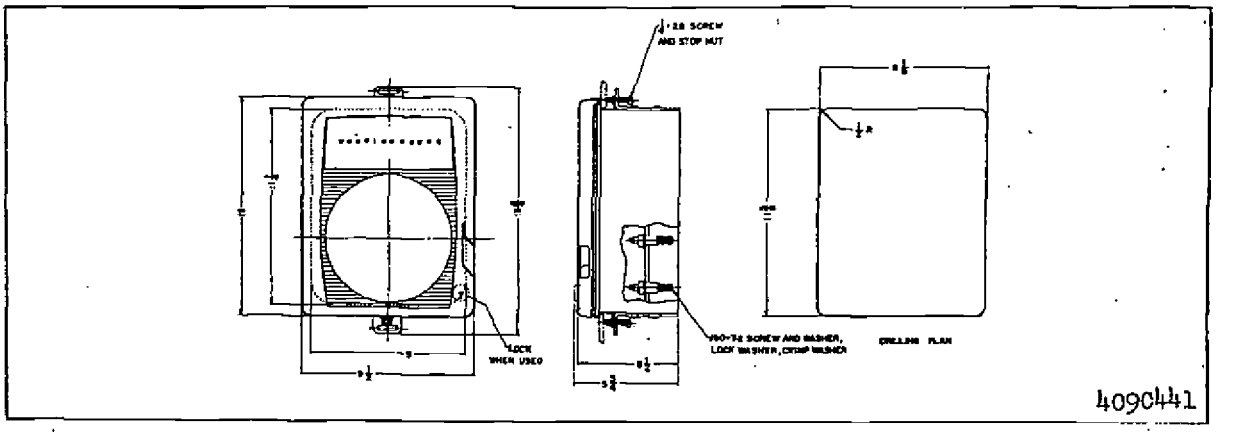

Fig. 5. Outline Dimensions and Drilling Plan for Flush Type 45 Recording Instruments.

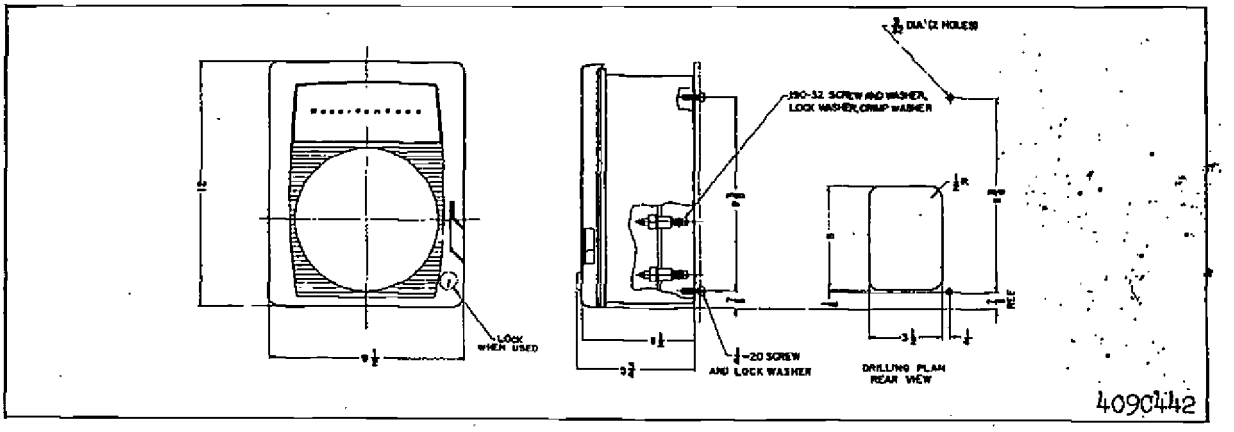

Fig. 6. Outline Dimensions and Drilling Plan for Projection Type 45 Recording Instruments.

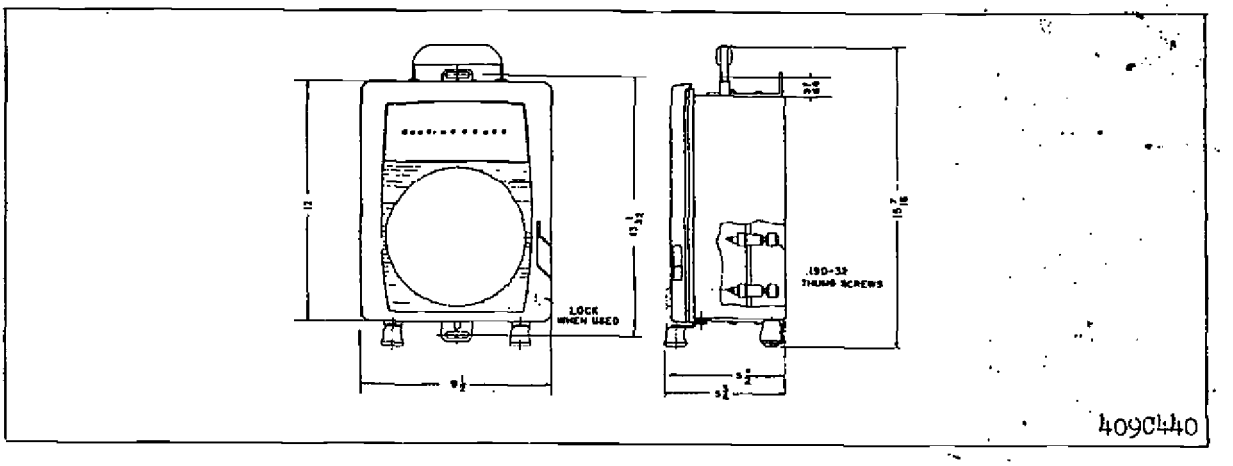

Fig. 7. Outline Dimensions for Portable Type 45 Recording Instruments.

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External Connection Diagrams

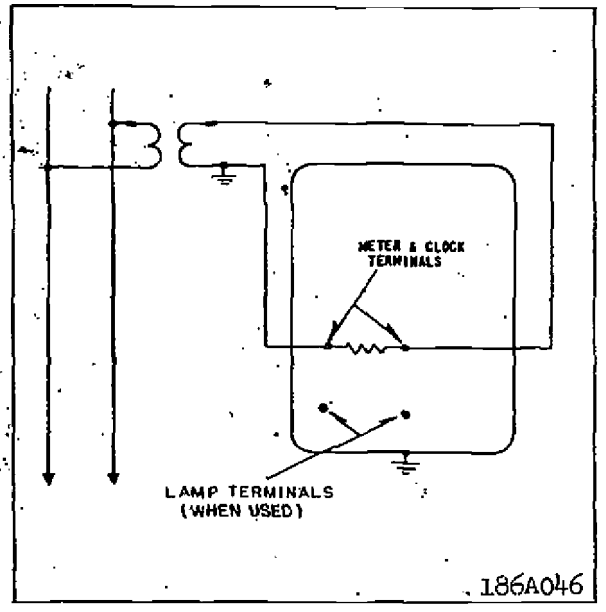


Fig. 8. Type M-45 A-C Voltmeter with PT. (All portable types except 450-700-volt range)

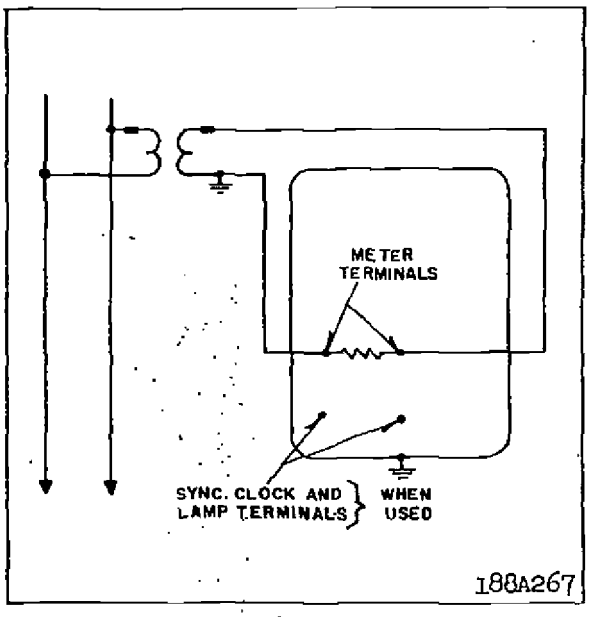


Fig. 9. Type M-45 A-C Voltmeter with PT. (All switchboard types and 450-700 volt range portable type)

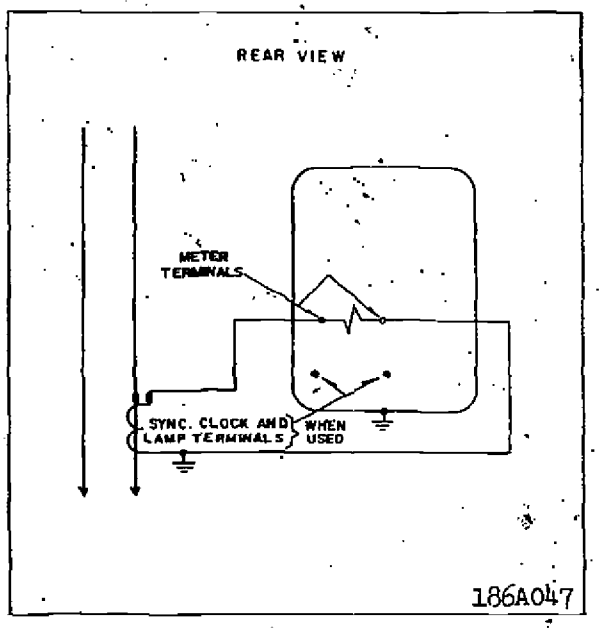


Fig. 10. Type M-45 A-C Ammeter with CT. (All switchboard and portable types)

WESTINGHOUSE ELECTRIC CORPORATION
RELAY-INSTRUMENT DIVISION **NEWARK, N. J.**
Printed in U.S.A.

LEHMAN 02054

SPERRY-VICKERS CONTROL VALVE

Amberg
5021 TS

LEHMAN 02055

Bill Davis

Lourey Rodriguez

INSTRUCTION MANUAL

EXTRON CO.
MINNEAPOLIS, MINN.

8043 LEWIS ROAD (612)544-4197

Instruction Manual
Current Sensitive Relay
Voltage Sensitive Relay

General:

Versatile module current/voltage sensitive relays are designed to detect under or over current/voltage conditions. Standard models for current detection are available with an integral shunt for AC or DC currents to 10 amperes, and for use with an external 50 MV current shunt or 5 amp secondary current transformer. Standard voltage detection models are available for AC or DC voltages from 0 to 460V.

These units include over or under setpoint relay output, local or remote setpoint adjustment, start-up time delay and adjustable trip time delay.

Specifications:

Input power:	1/60/115, 50 VA max.
Input current ranges:	0-10 amp AC/DC with integral shunt. With external 50 MV shunt or 5 amp current transformer, maximum current limited only by the maximum ratings of available shunts or CT's.
Input voltage ranges:	0-10V 10-120V 20-230V 40-460V
Input frequency:	D.C. current to 60 Hz A.C. current.
Output relay:	Form "C" contact, maximum power 75W, 250 VA, maximum voltage 230 VAC, AC maximum current 3 amps (Above are resistive load ratings. Use snubber or diode when driving inductive loads.)
Output relay logic:	Relay is energized above setpoint.

Operating temperature range:	0-50°C
Start-up time delay:	2-15 seconds (adjustable) output relay may be energized or de-energized during start-up delay depending on model selected.
Trip point time delay:	.1 - 2.5 sec. adjustable. 1 - 25 sec. adjustable.
Meter output:	0-1 ma or 0-10 VDC output to drive load meter. Output is calibrated so 0 - max. input equals 0 - 1 ma or 0 - 10 VDC to the meter.
Status indicator:	Yellow LED - Trip point reached. Red LED - Relay tripped.
Disable input:	Contact closure disables unit. Relay will be in normal operation mode. Start-up time delay starts when disable contact is opened.
Reset:	Relay reset pushbutton mounted on cover.
Setpoint monitor:	Output provided to measure actual setpoint.

Description of Operation:

Versatile module current sensors sense load current through the use of an on-board meter shunt, a remote 50 mV meter shunt or a 5 amp secondary current transformer. The signal from the on-board or remote shunt is a 0-50 mV signal. The 5 amp secondary current transformer signal is converted to a 0-50 mV via a resistor mounted on the input terminals to the current sensitive relay. The mV signal that is proportional to current is amplified and calibrated.

Versatile module voltage sensors use a voltage divider resistor network to develop a signal proportional to input voltage. The signal that is proportional to voltage is amplified and calibrated.

An absolute value circuit is used so the current/voltage signal can be A.C. or D.C. of any polarity. The resulting amplified voltage signal is calibrated so that 0 amps to maximum amps or 0 volts to maximum volts equals 0-10 VDC.

The calibrated voltage signal is compared to a setpoint voltage. Whenever the voltage goes above the setpoint, the trip point LED is energized. The energization of the output relay is delayed by a time delay circuit to eliminate nuisance tripping.

A start-up time delay circuit is included to allow the monitored process to achieve normal operating conditions before the current/voltage sensitive relay starts to work. The start-up time delay requires a normally closed contact be provided. The time delay start-up sequence starts when this contact is opened.

Installation:

When installing this equipment, check the following points:

A) Is the input power 120 VAC?

B) When using a current sensitive relay with an on-board shunt, is the load current ten amps or less?

C) When using a remote current shunt, is it properly sized for maximum current, and does it have a 50 mV output?

D) When using a current transformer, is it properly sized, and does it have a 5 amp secondary output?

Note: A meter shunt can be used for either D.C. or A.C. current detection. A current transformer can be used for A.C. current only.

E) When using a voltage sensitive relay, is it properly sized for the maximum voltage expected?

Do not mount the control on equipment or in a place where vibration could be a problem.

F) Refer to the connection diagram for the necessary connections using the following basic rules:

1) Input power should be fused using a 1 amp fuse.

2) Relay contacts are rated for 3 amps maximum. These contacts are pilot duty and should not be used to switch high current or high in-rush loads such as large motor starters or contactors.

3) A normally closed contact should be wired across terminals 7 and 8. This contact must open whenever the current/voltage sensitive relay is to be operational.

Adjustment Procedure:

The calibration of the versatile module current sensitive relay requires a VOM multi-meter, a small adjusting screw driver and a clamp-on or in-line load ammeter. Refer to the connection diagram and schematic diagram for the location of adjustment potentiometers.

Note: If a load indicating meter is supplied, it can be used for calibration instead of a VOM.

Current Calibration: (Current Sensitive Relays Only)

All Model 540 current sensitive relays are factory calibrated to obtain 10 VDC (0-1 mA) output from terminals 5 to 4. This factory calibration is based on a 10 amp input with the internal shunt, a 50 mV input from a meter shunt at full shunt amperage rating, or a 5 amp secondary current from a current transformer. Actual operating conditions may not exactly fit the factory calibration used. To calibrate the current sensitive relay, follow this procedure:

Step 1 - Turn power on to current sensitive relay.

Step 2 - Measure D.C. voltage from terminal 5(+) to terminal 4 (common).

Step 3 - Obtain zero load current.

Step 4 - Adjust offset potentiometer until voltage from 5 to 4 equals zero.

Step 5 - Obtain maximum load current expected.

Step 6 - Adjust CALIBRATE pot until D.C. voltage (5 to 4) equals 10 VDC.

Step 7 - The current sensor is now calibrated to output 0 to 10 VDC as load current goes from 0 to full load current.

Voltage Calibration: (Voltage Sensitive Relays Only)

All Model 540 voltage sensitive relays are factory calibrated to obtain 10 VDC (0-1 ma) output from terminals 5 to 4 when the maximum voltage for that particular model is inputted. Actual operating conditions may not exactly fit the factory calibration used. To calibrate the voltage sensitive relay, follow this procedure:

Step 1 - Turn power on to voltage sensitive relay.

Step 2 - Measure D.C. voltage from terminal 5 (+) to terminal 4 (common).

Step 3 - Obtain zero input voltage.

Step 4 - Adjust offset potentiometer until voltage from 5 to 4 equals zero.

Step 5 - Obtain maximum input voltage expected.

Step 6 - Adjust CALIBRATE pot until D.C. voltage (5 to 4) equals 10 VDC.

Step 7 - The voltage sensor is now calibrated to output 0 to 10 VDC as input voltage goes from 0 to maximum.

Trip Point Calibration (to be done only after calibration is completed):

Model 540 current/voltage sensitive relays are available with local or remote setpoint adjustment. The trip setpoint can be adjusted from 100% to 5% of full load amps or maximum input voltage.

- For local setpoint adjustment:

Step 1 - Turn power on to current/voltage sensitive relay.

Step 2 - Determine setpoint level as follows:

$$\frac{10 \times (\text{Desired percentage for trip point})}{100} = \text{Trip Point Voltage}$$

Step 3 - Measure voltage from terminal 10 (positive) to terminal 4 (common).

Step 4 - Adjust "SETPOINT" pot until voltage calibrated in step 2 is obtained.

Step 5 - The current/voltage sensitive relay is now adjusted to trip at the percentage of full load current or maximum voltage selected in step 2.

- For remote setpoint adjustment:

Step 1 - Turn power on to current/voltage sensitive relay.

Step 2 - Adjust remote setpoint pot to maximum position.

Step 3 - Measure voltage from terminal 9 (positive) to terminal 4 (common).

Step 4 - Adjust "SETPOINT" pot on versatile module to obtain 10 VDC.

Step 5 - Determine setpoint level as follows:

$$\frac{10 \times (\text{Desired percentage for trip point})}{100}$$

= Trip Point Voltage

Step 6 - Adjust remote setpoint pot to obtain the trip point voltage calculated in step 5.

Note: The setpoint pot adjustment in step 4 can be adjusted to any value from 10 VDC (FLA) down. By lowering its value, the maximum setpoint current/voltage that can be adjusted by the remote pot is reduced.

Start-Up Delay Time Adjustment:

All Model 540 current/voltage sensitive relays include an internal start-up time delay circuit. This time delay defeats the operation of the relay until an adjustable period of time has elapsed. The time delay period starts when the disable contact from terminal 7 to 4 is opened (normally when the load being monitored is started).

This time delay allows the load being monitored to achieve its normal operating state before the current/voltage sensitive relay starts to work.

The time delay is factory adjusted for 2 second delay. If a longer delay is required, adjust the START-UP DELAY POT CW to increase the time of delay (to 15 seconds).

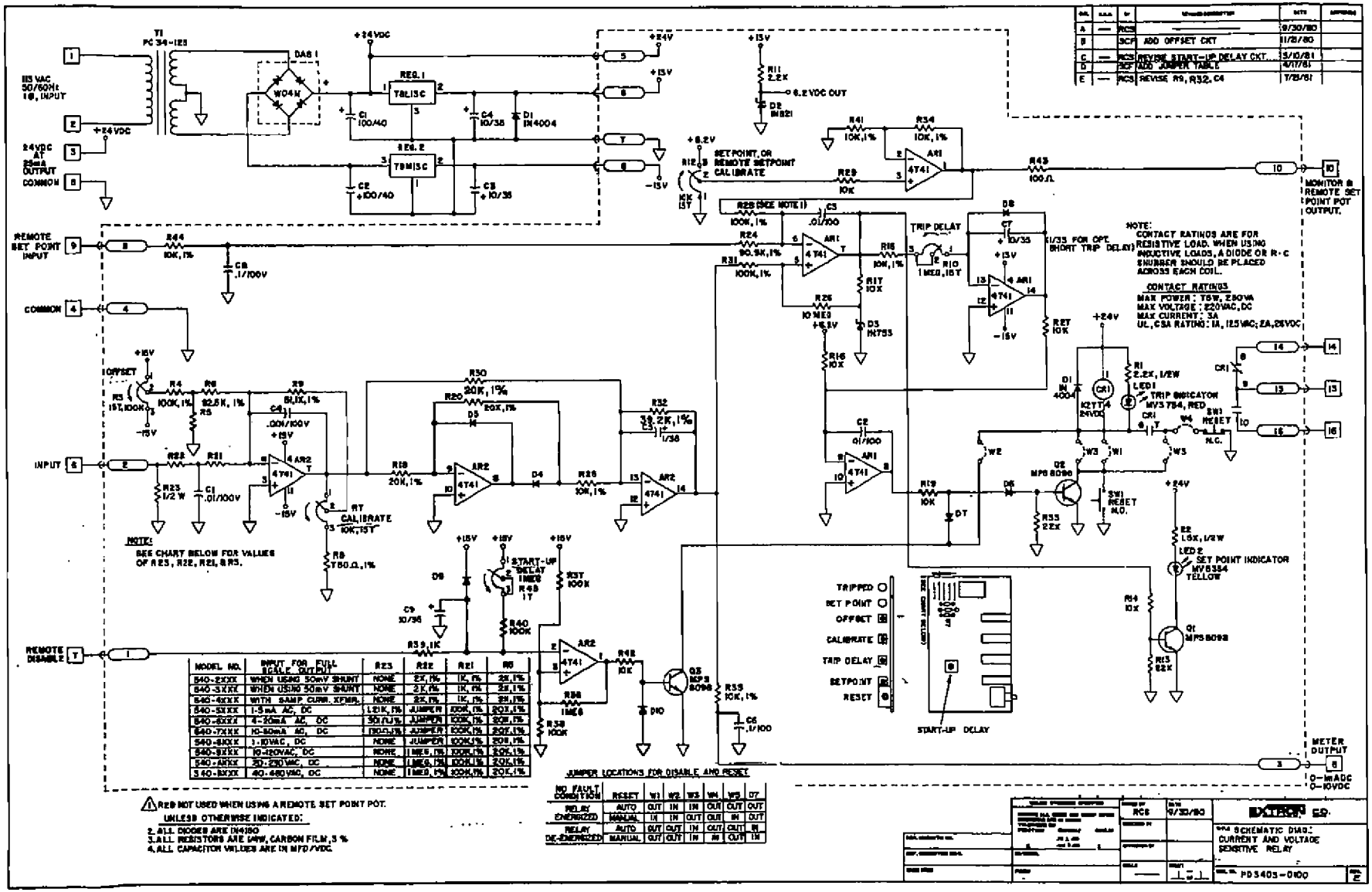
Trip Point Time Delay:

All Model 540 current/voltage sensitive relays include an internal trip point time delay circuit. This time delay circuit keeps the output relay from tripping when the set-point has been reached for an adjustable amount of time. This eliminates nuisance tripping caused by transient loads.

The time delay period is adjustable from .25 to 2.5 seconds or 2.5 to 25 seconds depending on model selected. The time delay is factory set for the fastest time in the range ordered. If a longer time delay is required, adjust the TRIP DELAY POT CW to increase the time.

Documentation:

PD5403-0100	Schematic
PC5404-0100	Connection Diagram Current Relay
PC5404-0101	Connection Diagram Voltage Relay
PC9086-0100	Versatile Module Mounting Dimensions



MODEL NO.	INPUT FOR FULL SCALE OUTPUT	R23	R22	R21	R5
540-2XXX	WHEN USING 50mV SHUNT	NONE	2K, 1%	1K, 1%	2K, 1%
540-3XXX	WHEN USING 50mV SHUNT	NONE	2K, 1%	1K, 1%	2K, 1%
540-4XXX	WITH SAMP CURR. XFMR.	NONE	2K, 1%	1K, 1%	2K, 1%
540-5XXX	1-5mA AC, DC	1.21K, 1%	JUMPER	100K, 1%	20K, 1%
540-6XXX	4-20mA AC, DC	30Ω, 1%	JUMPER	100K, 1%	20K, 1%
540-7XXX	10-50mA AC, DC	130Ω, 1%	JUMPER	100K, 1%	20K, 1%
540-8XXX	1-10VAC, DC	NONE	JUMPER	100K, 1%	20K, 1%
540-9XXX	10-120VAC, DC	NONE	1 MEG, 1%	100K, 1%	20K, 1%
540-AXXX	20-230VAC, DC	NONE	1 MEG, 1%	100K, 1%	20K, 1%
540-BXXX	40-460VAC, DC	NONE	1 MEG, 1%	100K, 1%	20K, 1%

JUMPER LOCATIONS FOR DISABLE AND RESET

NO FAULT CONDITION	RESET	W1	W2	W3	W4	W5	D7
RELAY ENERGIZED	AUTO	OUT	IN	IN	OUT	OUT	OUT
	MANUAL	IN	IN	OUT	OUT	IN	OUT
RELAY DE-ENERGIZED	AUTO	OUT	OUT	IN	OUT	OUT	IN
	MANUAL	OUT	OUT	IN	IN	OUT	IN

⚠1 R28 NOT USED WHEN USING A REMOTE SET POINT POT.

UNLESS OTHERWISE INDICATED:
2. ALL DIODES ARE IN4150
3. ALL RESISTORS ARE 1/4W, CARBON FILM, 5 %
4. ALL CAPACITOR VALUES ARE IN MFD/VDC.

RCS 9/30/80

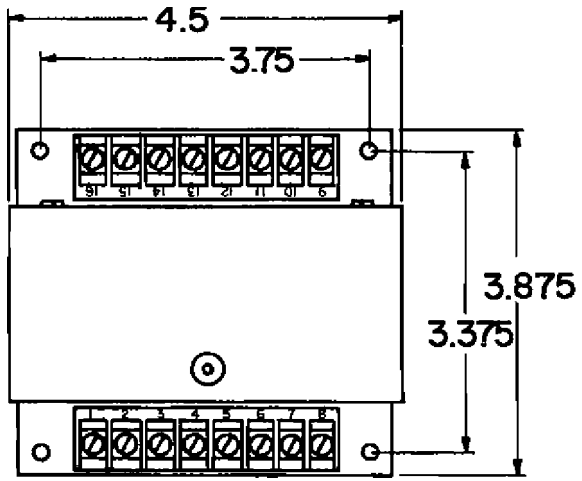
EXTRON CO.

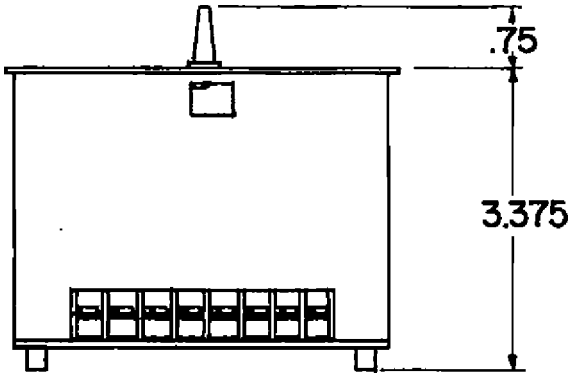
SCHEMATIC DIAG.: CURRENT AND VOLTAGE SENSITIVE RELAY

PD3403-0100 E

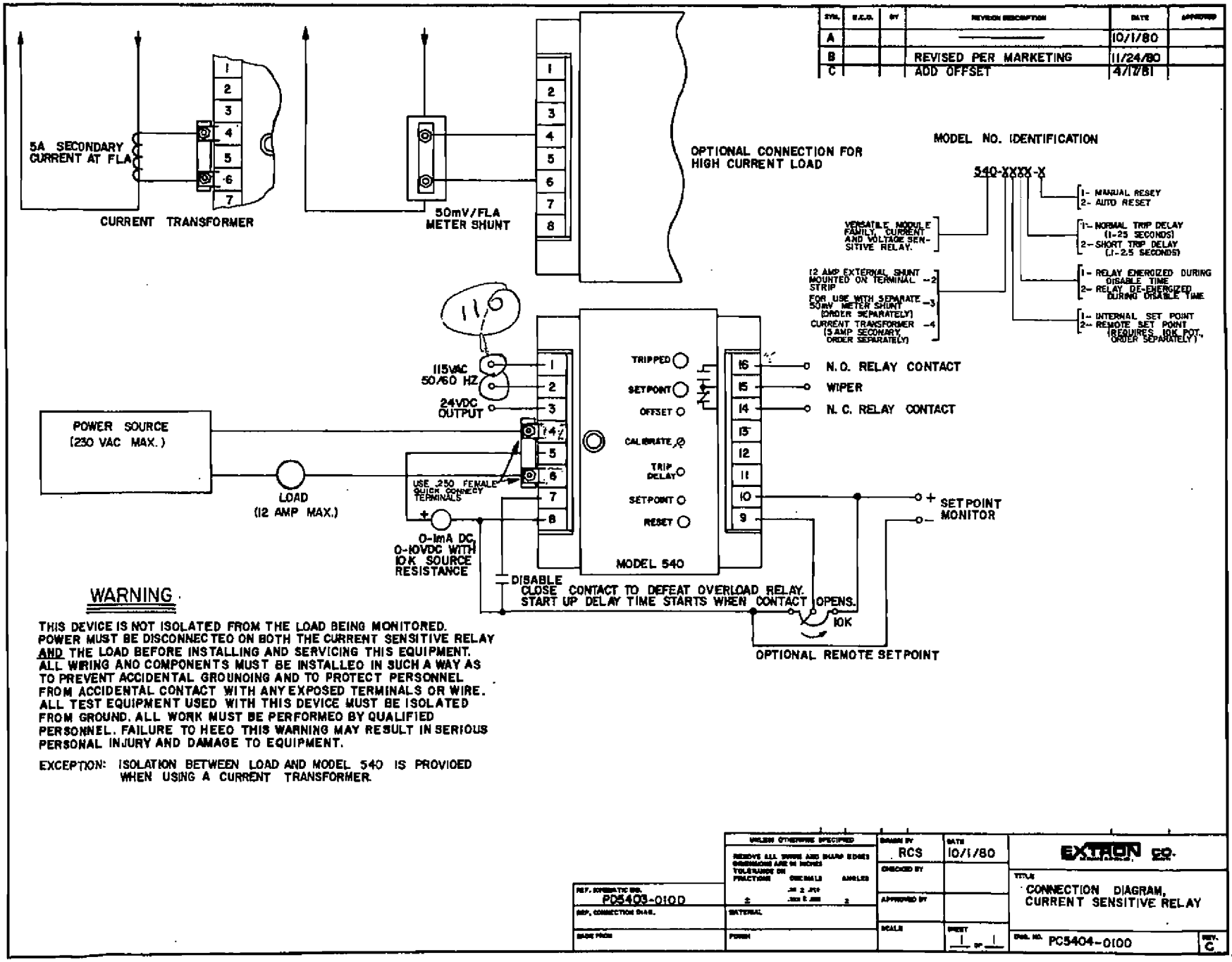
LEHMAN 02066

LEHMAN 02067





MATL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	EXTRON CO.	
FINISH	DRAWN BY JDC	DATE 7-22-75	TITLE MOUNTING DIMENSIONS, VERSATILE ELECTRONIC MODULE
NEXT ASSY	CHECKED BY		
APPLICATION	RELEASED BY		
NEXT USED ON	SCALE FULL	TOL	SHEET 1 of 1 DRAWING NO PC9086-0100 REV



SYM.	E.C.O.	BY	REVISION DESCRIPTION	DATE	APPROVED
A			———	10/1/80	
B			REVISED PER MARKETING	11/24/80	
C			ADD OFFSET	4/17/81	

WARNING

THIS DEVICE IS NOT ISOLATED FROM THE LOAD BEING MONITORED. POWER MUST BE DISCONNECTED ON BOTH THE CURRENT SENSITIVE RELAY AND THE LOAD BEFORE INSTALLING AND SERVICING THIS EQUIPMENT. ALL WIRING AND COMPONENTS MUST BE INSTALLED IN SUCH A WAY AS TO PREVENT ACCIDENTAL GROUNDING AND TO PROTECT PERSONNEL FROM ACCIDENTAL CONTACT WITH ANY EXPOSED TERMINALS OR WIRE. ALL TEST EQUIPMENT USED WITH THIS DEVICE MUST BE ISOLATED FROM GROUND. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL. FAILURE TO HEED THIS WARNING MAY RESULT IN SERIOUS PERSONAL INJURY AND DAMAGE TO EQUIPMENT.

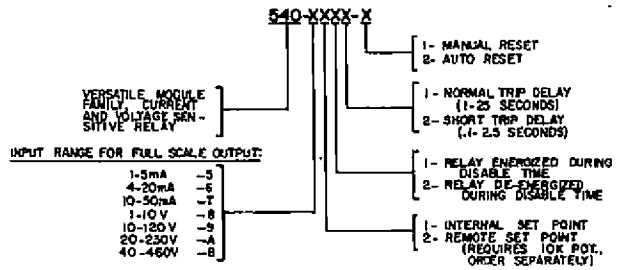
EXCEPTION: ISOLATION BETWEEN LOAD AND MODEL 540 IS PROVIDED WHEN USING A CURRENT TRANSFORMER.

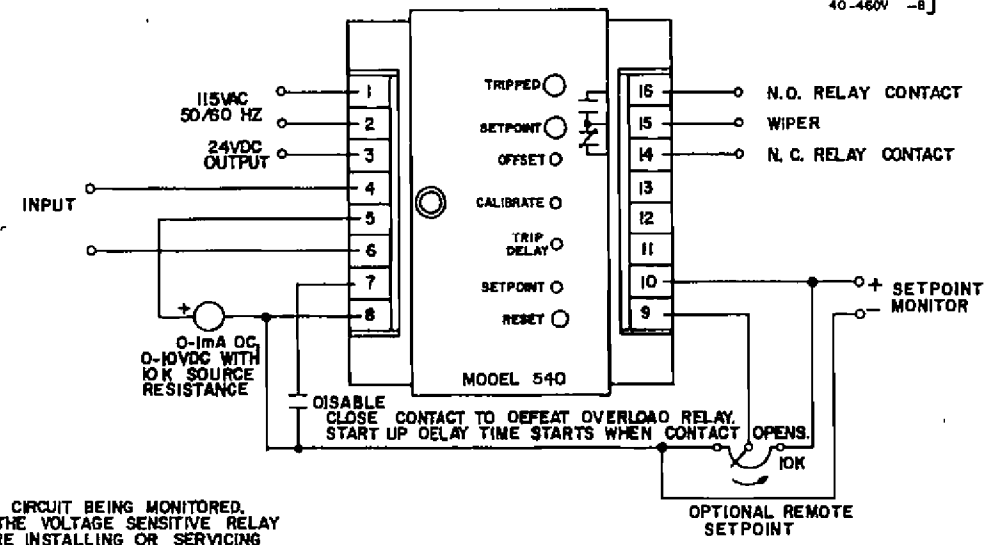
REF. SCHEMATIC NO. PC5403-0100	UNLESS OTHERWISE SPECIFIED	DRAWN BY RCS	DATE 10/1/80
REF. CONNECTION DIAG.	REMOVE ALL BURRS AND SHARP EDGES DIMENSIONS ARE IN INCHES TOLERANCE ON FRACTIONS ± DECIMALS ANGLES .XX ± .02 .XXX ± .005	CHECKED BY	EXTRON CO.
MADE FROM	MATERIAL FINISH	APPROVED BY	TITLE CONNECTION DIAGRAM, CURRENT SENSITIVE RELAY
		SCALE	SHEET 1 OF 1
			DWG. NO. PC5404-0100 REV. C

LEHMAN 02068

REVISION	E.C.O.	BY	REVISION DESCRIPTION	DATE	APPROVED
A			RELEASED	10-1-80	
B			ADD OFFSET	4/17/81	

MODEL NO. IDENTIFICATION





WARNING

THIS DEVICE IS NOT ISOLATED FROM THE CIRCUIT BEING MONITORED. POWER MUST BE DISCONNECTED ON BOTH THE VOLTAGE SENSITIVE RELAY AND THE CIRCUIT BEING MONITORED BEFORE INSTALLING OR SERVICING THIS EQUIPMENT. ALL WIRING AND COMPONENTS MUST BE INSTALLED IN SUCH A WAY AS TO PREVENT ACCIDENTAL GROUNDING AND TO PROTECT PERSONNEL FROM ACCIDENTAL CONTACT WITH ANY EXPOSED TERMINALS OR WIRE. ALL TEST EQUIPMENT USED WITH THIS DEVICE MUST BE ISOLATED FROM GROUND. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL. FAILURE TO HEED THIS WARNING MAY RESULT IN SERIOUS PERSONAL INJURY AND DAMAGE TO EQUIPMENT.

REF. SCHEMATIC NO. PC5403-0100	UNLESS OTHERWISE SPECIFIED: REMOVE ALL BURRS AND SHARP EDGES. DIMENSIONS ARE IN INCHES. TOLERANCE ON FRACTIONS ± DECIMALS .XX ± .010 .XXX ± .005 ANGLES ±	DRAWN BY RCS	DATE 10/1/80
REF. CONNECTION DIAG.	MATERIAL	CHECKED BY	
MADE FROM	FINISH	APPROVED BY	
		SCALE —	SHEET 1 OF 1

EXTRON CO.

TITLE: CONNECTION DIAGRAM, VOLTAGE AND PROCESS CONTROL RELAY

DWG. NO. PC5404-0101 REV. B

LEHMAN 02069

EXTRON COMPANY

WARRANTY

Extron warrants to the original purchaser all equipment and products manufactured by it and bearing its name to be free of defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of purchase from Extron. This warranty is applicable only if the Extron product and/or equipment is installed, operated and maintained in accordance with factory recommendations and procedures.

In the event the Extron product and/or equipment is found to be defective within the above-stated twelve (12) month period, Extron will repair or replace defective parts if the product or equipment is shipped prepaid to Extron's factory and if such product and/or equipment is found by Extron's inspection to be truly defective in workmanship or material. Extron will return-ship such repaired product and/or equipment prepaid within the continental United States. If Extron's inspection does not disclose any defect in workmanship or material, repairs will be made at a reasonable charge.

This warranty shall apply to only those products assembled and/or manufactured by Extron Co. Products manufactured by others but sold by Extron are not covered under this warranty. Warranty policies may be provided by the original manufacturer. Consult Extron for information regarding these warranties.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE AND THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO HIM OR RELIED UPON BY HIM WITH RESPECT TO THE QUALITY AND FUNCTION OF THE GOODS HEREIN SOLD.

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IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY OR TORT (INCLUDING NEGLIGENCE), SHALL EXTRON OR ITS SUPPLIERS BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING FOR PURPOSES OF ILLUSTRATION, BUT NOT FOR LIMITATION, LOSS OF PROFITS OR REVENUES, LOSS OF USE OF EQUIPMENT FURNISHED OR SERVICED BY EXTRON, DAMAGE TO, OR LOSS OF USE OF, ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE OR REPLACEMENT PRODUCTS, FACILITIES, SERVICE OR POWER, DOWN TIME COSTS, OR CLAIMS OF THE CUSTOMER'S CUSTOMER FOR SUCH DAMAGES. IF THE CUSTOMER TRANSFERS TITLE TO OR LEASES THE PRODUCTS SOLD OR SERVICED HEREUNDER TO ANY THIRD PARTY, THE CUSTOMER SHALL OBTAIN FROM SUCH THIRD PARTY A PROVISION AFFORDING TO THE COMPANY AND ITS SUPPLIERS THE PROTECTION OF THE PRECEDING SENTENCE, AND THE CUSTOMER WILL DEFEND AND HOLD EXTRON HARMLESS FROM ANY CLAIMS OF SUCH THIRD PARTIES.

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The furnishing of advice or other assistance without separate compensation therefor will not subject the company to any liability, either in contract, warranty, tort (including negligence), or otherwise.

Each of the foregoing paragraphs in this article will apply to the full extent permitted by law. The invalidity, in whole or part, of any paragraph will not affect the remainder of such paragraph or any other paragraph.

POWER DRAULICS-NIELSEN, INC.

670 East Lincoln Avenue
RAHWAY, NEW JERSEY 07065
(201) 574-0600

message | **reply**

to: CYPRUS INDUSTRIAL MINERAL CO
651 METUCHEN RD
SO. PLAINFIELD NJ 07080
JIM KOUSARTIS

subject PARTS DWG

FOLD

DT8P1-06-30-11 I953$
OCA 174 20 INSTALLATION DWG 521910A
OCTC 1 21 "
OCBW 2-20 "
PG 03 28 22 I3411$

NO PARTS DWG'S
USE VICKERS INDUSTRIAL PRODUCT CATALOG -

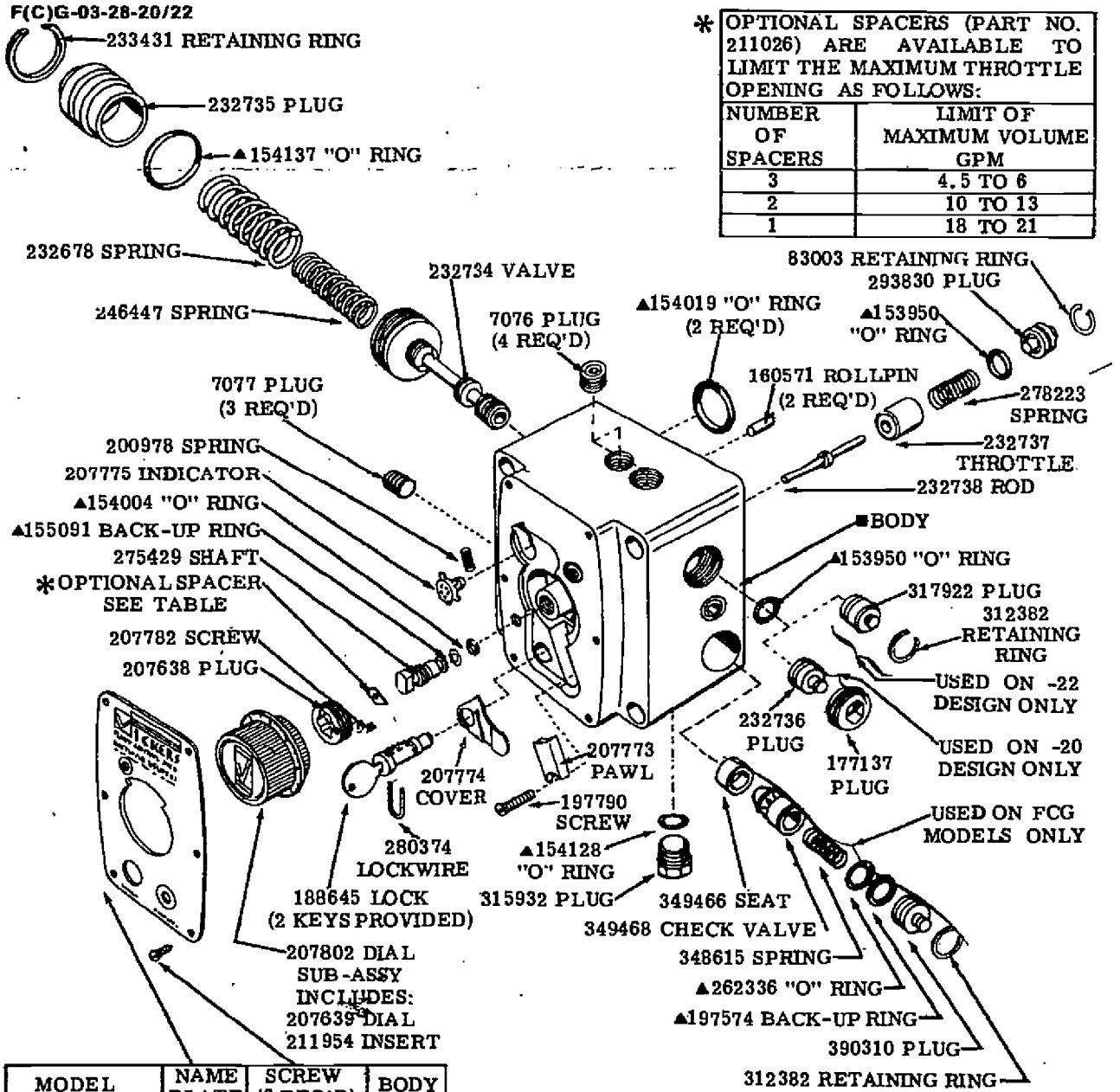
date 2-17-84 signed Teresa McCoy date _____ signed _____

SENDER: Mail white and pink copies with carbon intact. RECEIVER: Reply, retain white copy, return pink copy.

#33990. Amsterdam Printing and Litho Corp., Amsterdam, N.Y. 12010

FLOW CONTROL VALVES

F(C)G-03-28-20/22



* OPTIONAL SPACERS (PART NO. 211026) ARE AVAILABLE TO LIMIT THE MAXIMUM THROTTLE OPENING AS FOLLOWS:

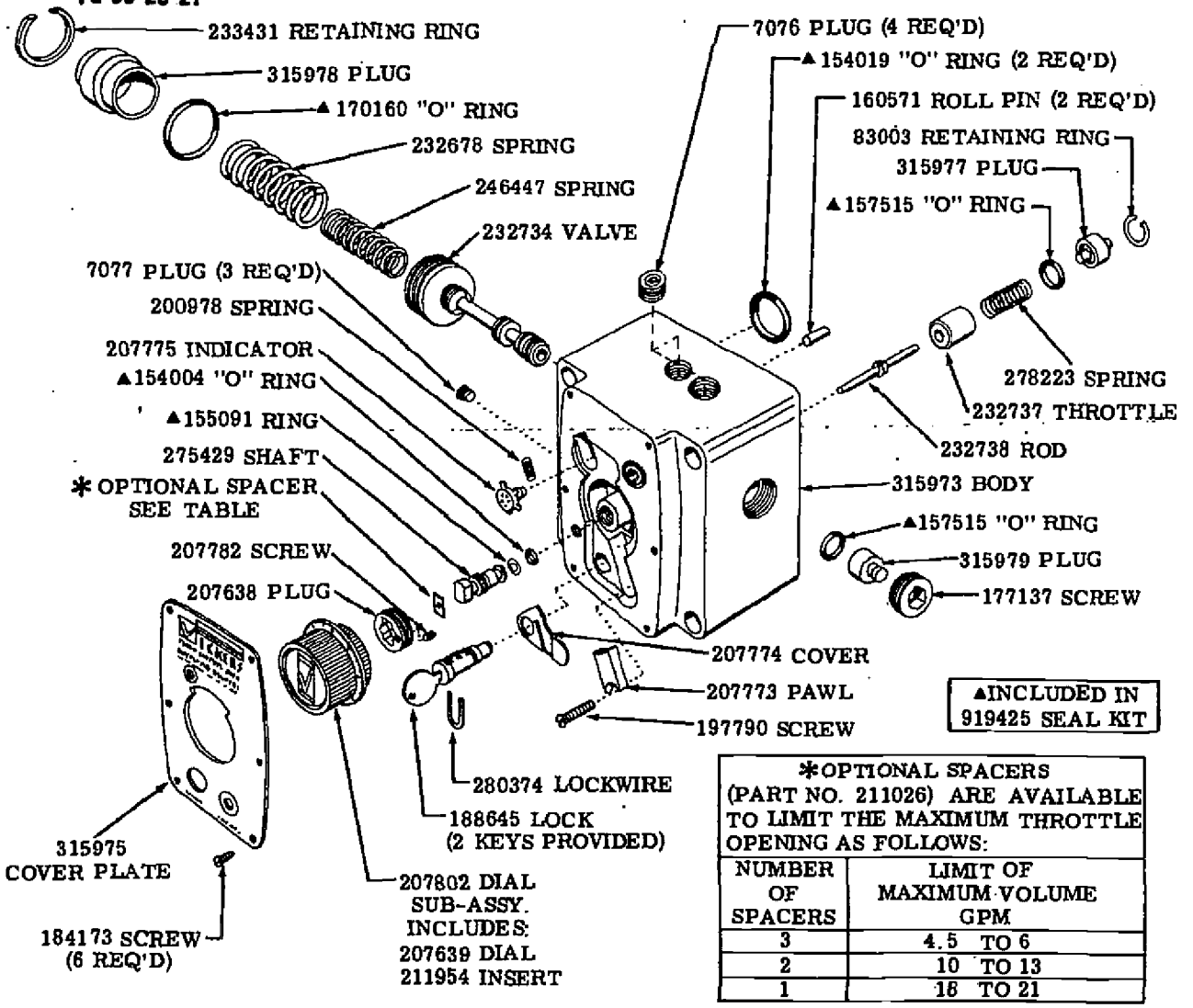
NUMBER OF SPACERS	LIMIT OF MAXIMUM VOLUME GPM
3	4.5 TO 6
2	10 TO 13
1	18 TO 21

MODEL	NAME PLATE	SCREW (6 REQ'D)	BODY ■
FG-03-28-20	232740	184173	232732
FG-03-28-22	315975	3X-117655	330937
FCG-03-28-22			390309

F3 EQUIVALENT 919398 SEAL KIT

▲INCLUDED IN 919213 SEAL KIT

FG-03-28-21



▲INCLUDED IN 919425 SEAL KIT

✱OPTIONAL SPACERS (PART NO. 211026) ARE AVAILABLE TO LIMIT THE MAXIMUM THROTTLE OPENING AS FOLLOWS:

NUMBER OF SPACERS	LIMIT OF MAXIMUM VOLUME GPM
3	4.5 TO 6
2	10 TO 13
1	16 TO 21

MODEL CODE BREAKDOWN

(F3)-F(C)G-03-28-2*

- MULTI-FLUID CAPABILITY
- FLOW CONTROL
- CHECK VALVE
- GASKET MOUNTED
- SERIES
- MAXIMUM CAPACITY (GPM)
- DESIGN

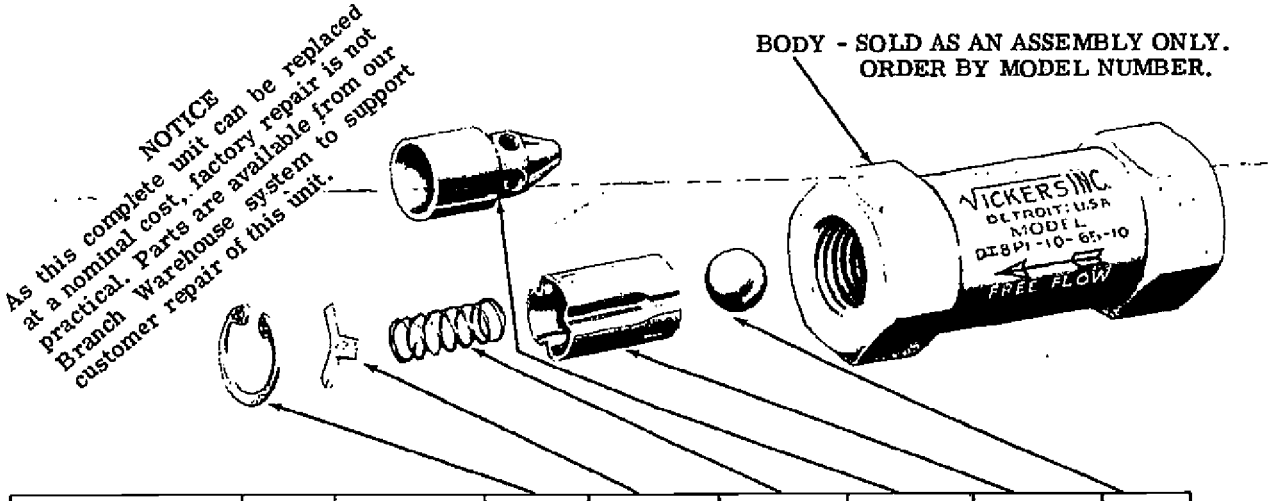
To insure sustained efficiency and maximum trouble-free life of this precision equipment, initial and continuous filtration of the fluid medium to 25 microns absolute or less is essential. (For information pertaining to Sperry Vickers economical 3 or 10 micron filters, see installation drawing 522140.)

Litho in U.S.A.

SPERRY VICKERS

Service Parts Information

DT 8 P1-10 & -11 SERIES IN-LINE CHECK VALVE



MODEL NUMBER	PIPE SIZE	CRACKING PRESSURE P.S.I.	SNAP RING	WASHER	SPRING	POPPET	SLEEVE	BALL
DT8P1-02-5-10	1/4	5	92733	113714	113559	—	113715	1651
DT8P1-02-30-10		30			216999			
DT8P1-02-65-10		65			114094			
DT8P1-03-5-10	3/8	5	106642	123740	123761	123737	—	—
DT8P1-03-30-10		30			217000			
DT8P1-03-65-10		65			123760			
DT8P1-06-5-11	3/4	5	98702	125673	125779	125674	—	—
DT8P1-06-15-11		15			222541			
DT8P1-06-30-11		30			216998			
DT8P1-06-65-11		65			125780			
DT8P1-10-5-11	1-1/4	5	113752	125635	125631	125634	—	—
DT8P1-10-30-11		30			216548			
DT8P1-10-50-11		50			257354			
DT8P1-10-65-11		65			125632			

ERIEZ MAGNETICS 1985

#211 Barrel Adaptor

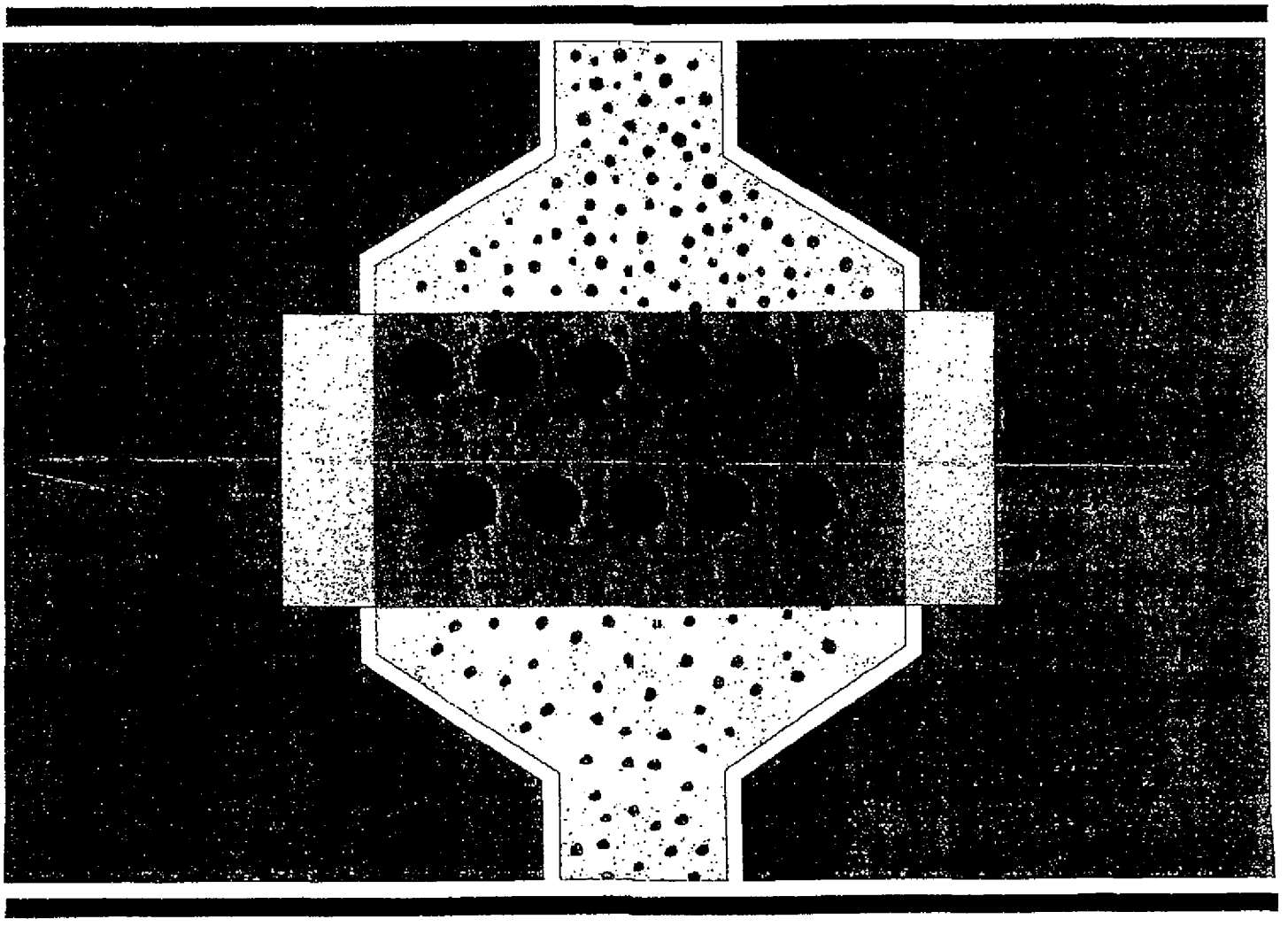
LEHMAN 02075

COMPLETE LINE
ERIUM POWERED
PERMANENT

grate magnets

ERIEZ MAGNETICS®

Powerful, permanent magnetic protection against fine iron and tramp iron. Designed for simple installation in steep-sloped hoppers, odd and irregular shaped hoppers, floor openings, vertical closed chutes, ducts, etc.



Here's the Most Complete Grate Magnet Selection Available . . . Sizes, Strengths and Models to Give You the Ultimate in Magnetic Protection.

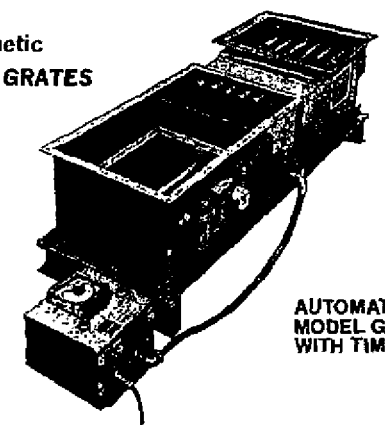
ERIEZ GRATE MAGNETS ARE NOW AVAILABLE IN SPECIAL SANITARY CONSTRUCTION.

These units are identical in strength to the standard Grate magnets. They are stainless steel throughout and are carefully manufactured to contain no pits, cracks or crevices in accordance with accepted standards of sanitation for food processing. Housings for these grate magnets can also be provided in stainless steel wihout cracks or crevices.

Sanitary grate magnets are mandatory in many food processing operations. They are also applied in the manufacture of pharmaceuticals, in the chemical industry where processing lines are alternately used for two or more incompatible products, and wherever the highest degree of product purity is required.

Eriez' high standards of quality control assure that Sanitary Grate Magnets will meet the specifications of regulatory agencies.

Permanent Magnetic SELF-CLEANING GRATES



AUTOMATIC MODEL GH-12 WITH TIMER

Automatic or manually operated Self-Cleaning Grates provide superior product purity and reduce maintenance time.

Self-Cleaning Grates eliminate the need to shut down product lines to remove, clean and reinstall magnetic elements. Easier, more frequent cleaning prevents excessive iron contamination buildup on the magnets and assures maximum separating efficiency.

Moveable magnetic tubes within stationary stainless steel tubes are used in the Self-Cleaning Grate. To clean the grate, the magnetic elements are withdrawn from the stationary housings in the area of product flow. A powerful new circuit within the inner tubes produces highly magnetic gaps that pull the entrapped iron contamination sideways along the surface of the stationary tubes. At a point outside the product flow, contamination is discharged. The entire cleaning operation takes place within six seconds. A one-finger pull on the smooth-sliding moveable tubes of the manually operated model is all that is required to clean the magnetic elements. The automatic model, designed for hard-to-reach locations or for installations that require very frequent cleaning, is pneumatically operated and equipped with a timer so the cleaning cycle can be adjusted to the amount of contamination to be removed.

Both models are available in three sizes: 14" x 12", 16" x 20", and 20" x 20" (357 x 305, 406 x 508, 508 x 508mm). All have a flanged inlet and outlet for easy installation in vertical closed chutes and ducts.

[illegible]

Wing and Drawer Type MAGNETIC GRATES

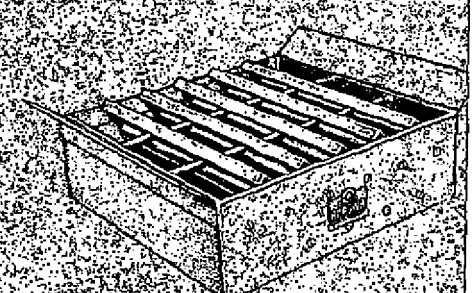
Single bank units are ideal for the majority of average tramp iron removal problems.

Double bank units are designed to give double protection in installations where the problem of iron contamination is particularly acute. These models have a second row of magnetic tubes aligned directly below the open spaces between tubes in the top row.

Wing type units can be quickly put to work in hoppers and floor openings. Adjustable wings add to ease of installation . . . no bolting necessary . . . units can be lifted out for easy cleaning.

Drawer-type Grates have been specifically designed for use in closed chutes and ducts. They come complete with handle, angle slides and latches. These models are easily inspected and cleaned by sliding the "magnetic drawer" from an opening made in side of housing.

Rugged grid protects the magnets, slows and directs material stream onto all of the powerful magnetic tubes . . . fast and easily cleaned . . . all sizes can be furnished entirely of stainless steel . . . installation is fast and simple . . . no wiring . . . no operating maintenance. Each type is available in 163 standard sizes from 2½" x 4" to 36½" x 36" (64 x 102 to 927 x 914mm). Dimensions are flexible so special sizes can be furnished. All models perform well on free-flowing materials whose maximum size does not exceed ¼" to ½" (12mm) in diameter.



Produced under U.S. Pat. No. 2,733,812 and others pending.

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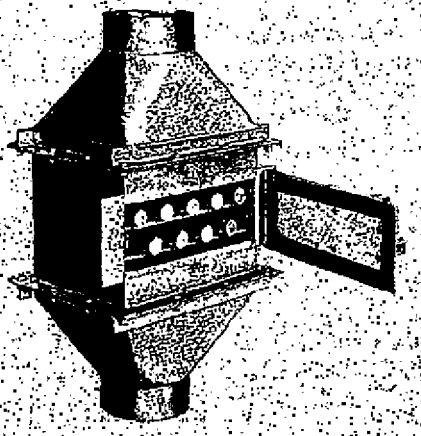


Permanent Magnetic
GRATES IN HOUSING

Fine Iron and Tramp Iron Removal in Enclosed Flow Lines is Simplified by Eriez Multiple-bank Units Built into Convenient Housings.

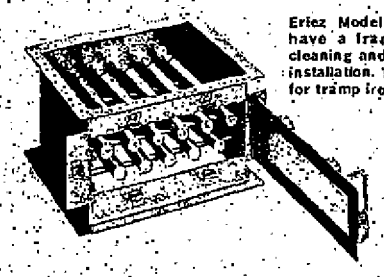
These models have door front which encloses the Magnetic Grates within the Housing, and makes them readily accessible for cleaning. Two models are available, each designed for the specific type of separation to be accomplished.

Model TGH-2 For Tramp Iron Removal

This is a Double-bank unit. Magnetic elements are spaced on two-inch centers with a one-inch clear space between the tubes. Grid bars are included with this type Grate to direct the material flow to the first bank of magnets.

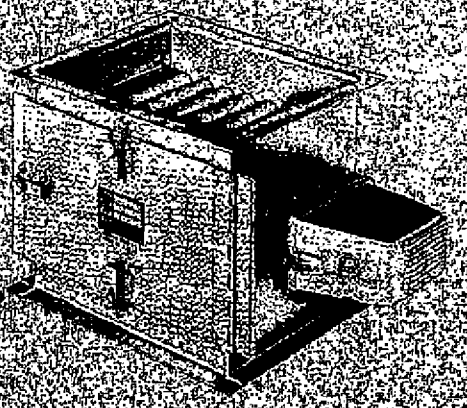
Model FGH-4 For Fine Iron Removal

The magnets used for the removal of fine iron are somewhat different from the tramp iron Grate. Four individual banks of magnets, 1¼" (32mm) high, are used. Tube spacing is on 1½" (38mm) centers with a ½" (13mm) clear space between the tubes. The tubes are staggered in the various banks so the material will come into contact with a number of the tubes to assure maximum separation efficiency.



Eriez Model TGH and FGH grate magnets have a frameless construction for easy cleaning and a low profile for close-quarters installation. The unit shown is recommended for tramp iron removal.

Specifications subject to change without notice.

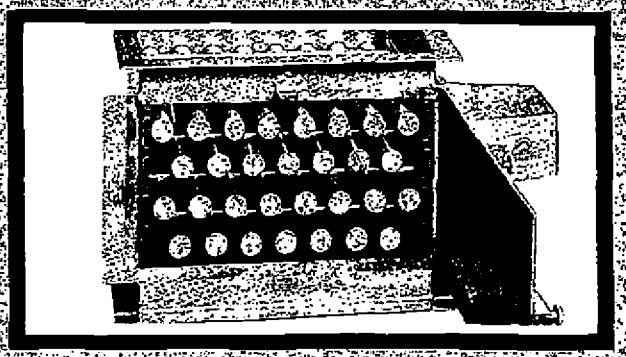


Vibratory
GRATES IN HOUSING

Both Eriez Model TGH-2 and FGH-4 Grates in Housing are available in vibratory types for use in those applications involving semi-free flowing, powdery and bridging materials that may adhere to or build up on the magnetic tubes and thus partially or completely fill the open areas between the magnetic tubes and cause a blockage of the material flow. The vibratory action transmitted to the magnetic tubes shakes loose the adhering particles, thus preventing a build-up of material and positively promoting a continuous flow of material through the unit.

In the vibratory types, the Grate Magnets are of heavy duty, all welded construction. An ERIEZ HI-VI Unit Vibrator is mounted on one side of the housing. A Vibrator Control for separate remote mounting is normally also furnished so that the amplitude of vibration may be adjusted to just that necessary to assure continuous product flow.

Vibratory Grates in Housing, like this fine iron grate with four separate banks, are used with difficult-to-more materials requiring the ultimate in separating performance.



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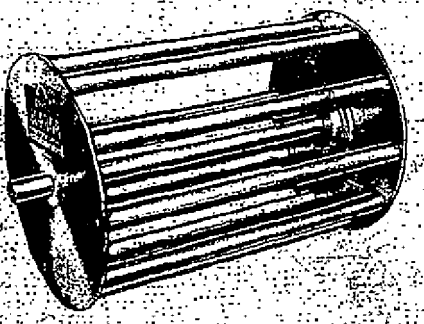


Permanent Magnetic
ROTA-GRATES

These Revolving Models Provide Speedy Automatic Removal of Unwanted Iron from Bulk Materials that Tend to Stick, Clog and Bridge . . .

Eriez Rota-Grates have been specially designed to remove both large pieces of unwanted iron as well as minute ferrous particles from material flows that tend to clog and bridge when passed through small openings. This dual action unit rotates a number of powerful magnetic tubes through the material. The magnetic action attracts and holds the unwanted iron, and the rotary action prevents the material flow from packing and plugging processing line.

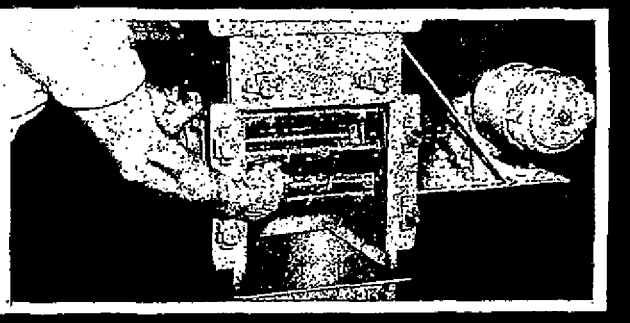
This action further combs and breaks materials apart that tend to cling together, forces all particles to pass through moving magnetic tubes. Look at Rota-Grate's Many Features . . .

Provide magnetic protection without restricting and clogging material flow . . . Rugged physical structure, magnetic elements completely encased in stainless steel and fastened to stainless steel end plates, with bronze hubs and steel shaft, assures long hard usage . . . available in 24 sizes—

12" (305mm) diameter, 4" (102mm) wide thru* 36" (914mm)
16" (406mm) diameter, 8" (203mm) wide thru 36" (914mm)
22" (559mm) diameter, 12" (305mm) wide thru 36" (914mm)
*Widths in 4" (102mm) increments

Rota-Grates provide excellent separating efficiency on many finely ground cohesive materials, such as: gypsum, barium carbonate, fuller's earth, lime, cohesive chemicals, confectionery sugar, cornstarch, flour, wood flour and fibrous materials like chopped hay, alfalfa, flax, etc.

This Rota-Grate installation at American Zinc Oxide Company's Columbus, Ohio plant insures separation of accidental lines from finished zinc oxide. Material passes from screw conveyor, through Rota-Grate in chute, into an elevator.



This Rota-Grate in Housing installation, mounted in a vertical chute, removes fine particles of iron as well as tramp iron from finely ground asbestos.

Permanent Magnetic
ROTA-GRATE IN HOUSING

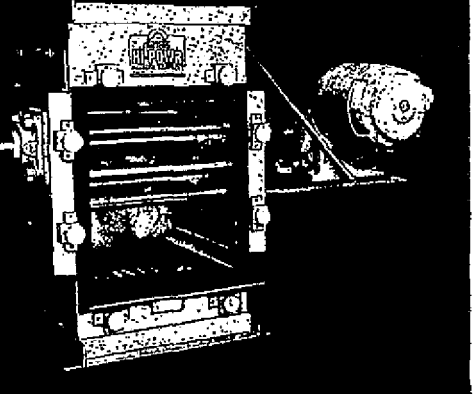
These Housed Models Provide Greatly Simplified Installation Where An Enclosed Unit is a Necessity.

Magnetic Rota-Grates can be had in a sturdy ⅛" (3mm) thick *black iron or stainless steel housing. This housed magnetic* separator greatly simplifies installation where an enclosed unit is a necessity. Rota-Grates in Housings are available with or without motor drives.

The internal Rota-Grate must be continuously rotated at a constant speed, slow enough to enable the magnetic tubes to catch the unwanted iron and fast enough to prevent clogging and bridging of sticky and difficult materials. This is accomplished with Gear-motor drive operating at 16.5 R.P.M. with a direct drive to the Rota Grate shaft by means of a flexible coupling.

Rota-Grates in Housings are ideal for installation where materials being handled are such that completely enclosed systems are vital, such as dusty materials. The top and bottom of the unit has a flange of 1½" x 1½" (38 x 38mm) angle on all sides to facilitate installation to your duct work.

Rota-Grates in Housings can be had with or without the motor and motor assembly. If you are furnishing the motor, we caution you to observe recommended speeds for best separating results.



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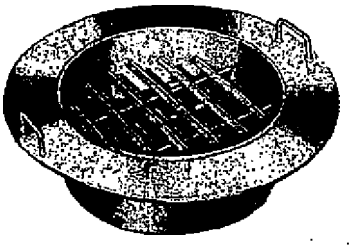


Permanent Non-Electric

BA GRATE MAGNETS

This Separator Provides "Final Magnetic Action" On Bulk Foods, Chemicals, Pharmaceuticals, etc. Being Packaged In Barrels Or Similar Type Containers.

These units are the result of many requests for a portable type magnetic separator for use in a final separating action as materials are being packed in barrels or other types of large containers.

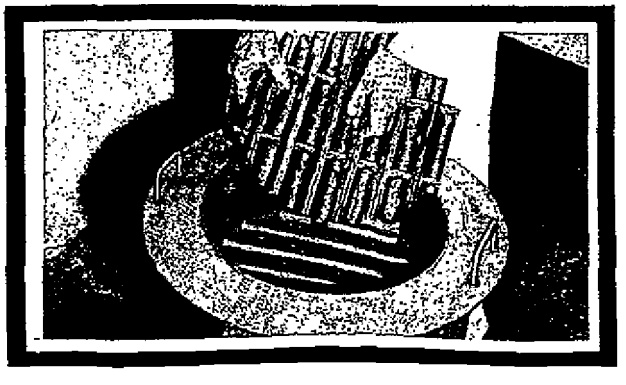
Model BA permanent magnetic Grates fit in or on standard barrels 15½, 17 or 20 inches (394, 432 or 508mm) in diameter. Two basic types are available . . . Model TBA for tramp iron removal (large pieces or iron), with magnetic tubes on 2 inch (51mm) centers and Model FBA for best separation of fine iron contaminants, with tubes on 1½ inch (38mm) centers.

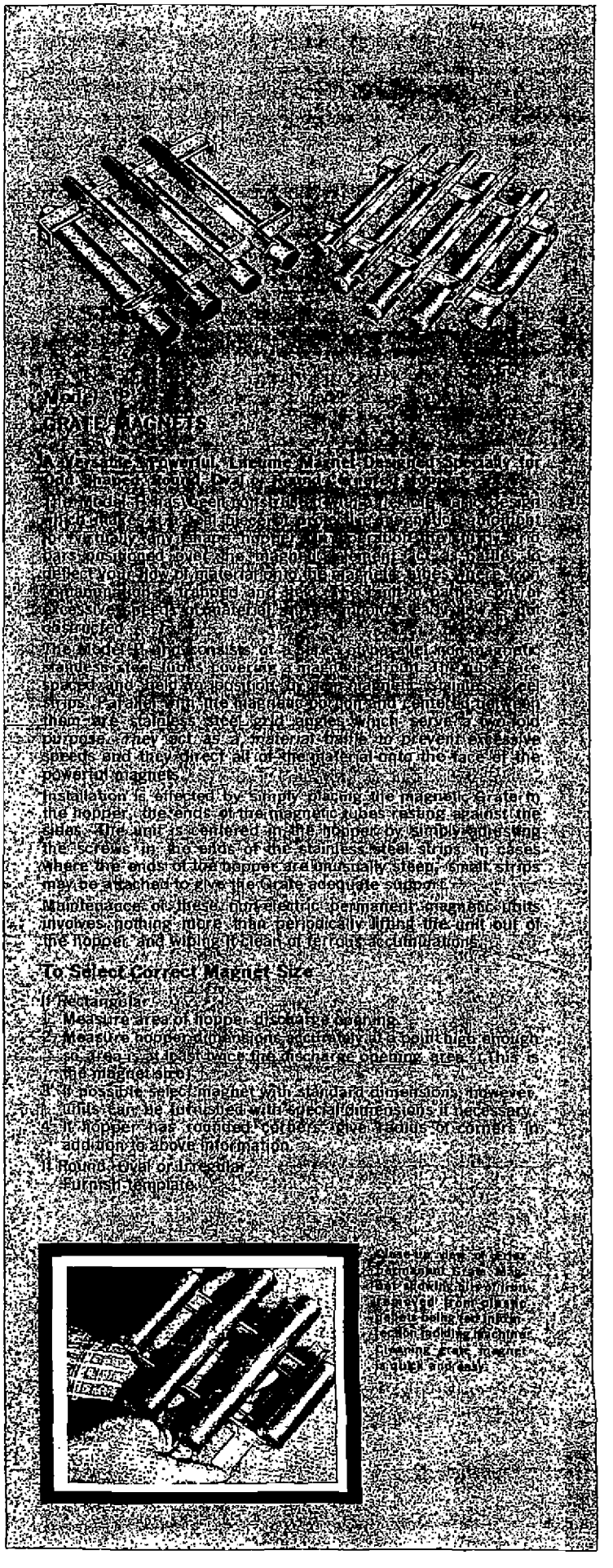
Put them to use on free-flowing materials when sizes do not exceed ⅜ to ½ inch (12mm) in diameter for the TBA model and 3/16 to ¼ inch (6mm) diameter for the FBA model. They can incorporate from one to four banks of one inch diameter magnetic tubes which are rigidly welded to spacer support bars and mounted in a 15 inch (381mm) diameter housing. A ¼ inch thick, 22 inch (6 x 559mm) diameter collar is provided at either the top or bottom of the housing enabling the separator to fit into or on top of the barrel. Handles mounted to the collar enable transfer of the separator from one barrel to another.

The banks of grate magnets are placed in the housing in a staggered position and lock into place with the support bars fitted into the grooves of the preceding grate.

A unit of standard construction has stainless steel tubes with mild steel frame, flange and handles. On stainless steel units the frame, flange and handles are also of stainless steel.

Photo shows a unit being installed in a drum. In this installation it is preventing iron particles from being packaged in bulk vitamin products.





Model BA

GRATE MAGNETS

A versatile, powerful, Lifetime Magnet Designed Specially for Bulk Product Source Over Barrels, Drums or Containers

Model BA grate magnets are designed to provide maximum protection against tramp iron and fine iron contaminants in virtually any plant. Simply put, the magnetic tubes or bars are spaced over the mouth of containers to intercept and deflect your flow of material into the magnetic tubes where iron contaminants are trapped and held. The tubes are spaced to prevent excessive piling of material and to provide maximum area for the material to flow.

The Model BA grate consists of a [illegible] magnetic stainless steel tubes covering a magnetic field. The tubes are spaced and held in position by [illegible] stainless steel strips. Parallel with the magnetic tubes and centered between them are stainless steel grid angles which serve a two-fold purpose. They act as a material baffle to prevent excessive speeds and they direct all of the material onto the face of the powerful magnets.

Installation is effected by simply placing the magnetic grate in the hopper, the ends of the magnetic tubes resting against the sides. The unit is centered in the hopper by simply adjusting the screws in the ends of the stainless steel strips. In cases where the ends of the hopper are unusually steep, small strips may be attached to give the grate adequate support.

Maintenance of these non-electric permanent magnetic units involves nothing more than periodically lifting the unit out of the hopper and wiping it clean of ferrous accumulations.

To Select Correct Magnet Size

If Rectangular

1. Measure area of hopper discharge opening.
2. Measure hopper discharge opening accurately at a point just above the magnet tubes.
3. It is best to select a grate area at least twice the discharge opening area. This is the magnet size.

It is possible select magnet with standard dimensions, however, units can be furnished with special dimensions if necessary.

If hopper has rounded corners, give radius of corners in addition to above information.

If Round, Oval or Irregular

Furnish template.

Close-up view of Grate Permanent Grate Mag[illegible] Bulk Products. Grate is removed from plastic container being filled. Section holding magnets. Cleaning grate magnet is quick and easy.

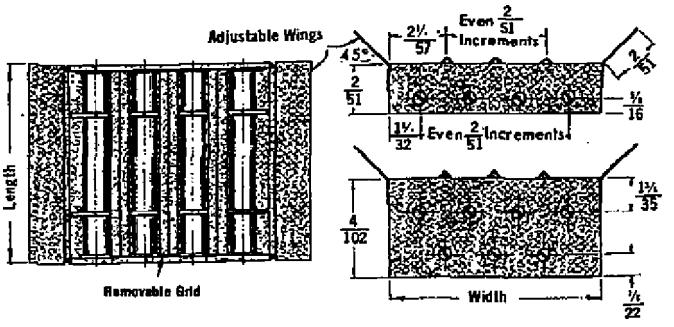
Grate Magnet Specifications

Inches
Millimeters

S-1 SINGLE BANK WING TYPE
S-2 DOUBLE BANK WING TYPE

One-inch diameter stainless steel tubes are spaced at 2" (51mm) centers allowing 1" (25mm) between tubes . . . these dimensions are flexible so special sizes can be furnished on request. Stainless steel wings, outside the ¼" (6mm) steel frame, are attached to the side where the even dimensions occur . . . the wings can be bent to fit openings which vary from our standard sizes.

S-2 Double-bank—Same construction as S-1 except a second row of magnetic tubes is aligned directly below the open space between tubes.

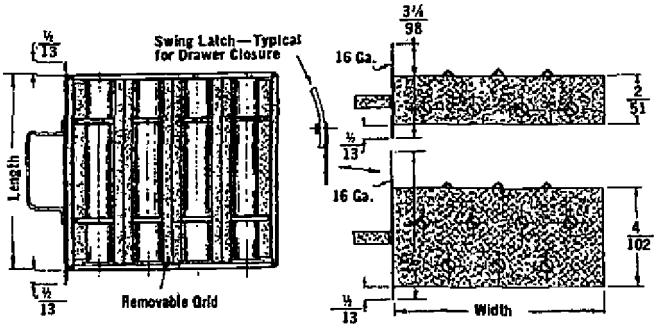


D-1 SINGLE BANK DRAWER TYPE
Net Weight 25 lb / sq ft (25kg/.2 sq m)
D-2 DOUBLE BANK DRAWER TYPE
Net Weight 35 lb / sq ft (35kg/.2 sq m)

The D-1 and D-2 have the same basic construction as the wing-types except units come complete with drawer front, handle, latch and slides.

SIZES—All models are built in any width 2½" (64mm) through 36½" (927mm) in 2" (51mm) increments in combination with any length 4" (102mm) through 36" (914mm) in 4" (102mm) increments.

Special sizes and all stainless steel construction available.



GRATES IN HOUSING

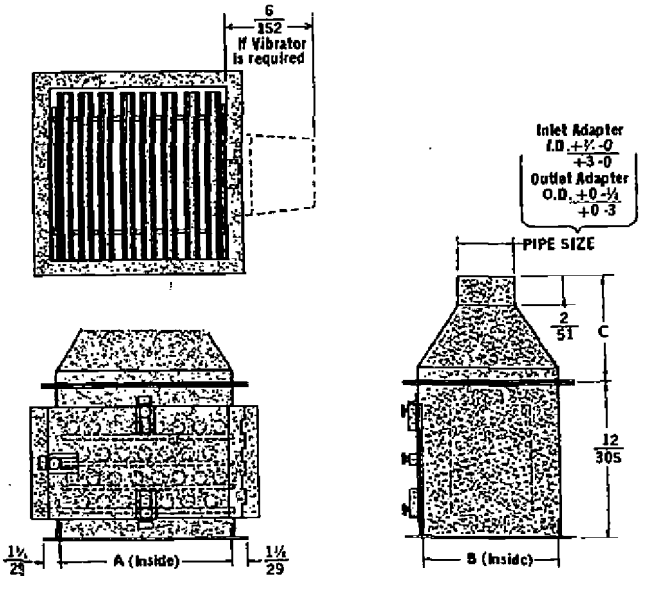
All Grates in Housing are single bank for ease of cleaning.

FGH FINE IRON GRATE

Four Grate magnets required for fine iron Housing. Grates No. 2 and 4 have one less tube than Grates No. 1 and 3 for staggered effect. Tubes are spaced on 1½" (38mm) centers.

Pipe Size		Grate Size		A		B		C	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2	51	8½x 6	216x152	8½	216	6	152	8	203
3	76	10½x 8	267x203	10½	267	8	203	8	203
4	102	12½x10	318x254	12½	318	10	254	8	203
5	127	14½x12	368x305	14½	368	12	305	8	203
6	152	16½x14	419x356	16½	419	14	356	9	229
8	203	18½x16	470x406	18½	470	16	406	9	229
10	254	24½x22	622x559	24½	622	22	559	11	279
12	305	26½x24	673x610	26½	673	24	610	11	305
14	356	28½x26	713x660	28½	724	26	660	14	356
16	406	32½x30	825x762	32½	825	30	762	16	406

Adapters are available with the housings as optional equipment.



Housing and Adapters — ⅛" (3mm) Black Iron unless otherwise specified. 12" (305mm) heights dimension remains constant for all sizes. 1/16" (2mm) gasket for all door fronts.

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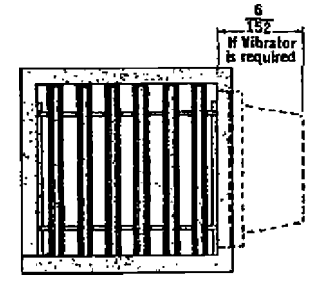
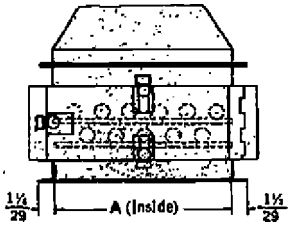
TGH-2 TRAMP IRON GRATE

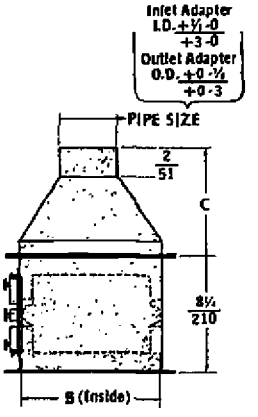
These units are primarily for installation in round pipe lines and are sized and listed accordingly. The adapters (optional) available are for adapting these units to specific round pipe lines. The units can, however, be used in rectangular duct systems of equivalent cross-sectional area comparable to the area of the round pipe sizes shown. The extremely small sizes listed are not generally recommended for pipe feed, but are ideal for applications of very low volume. In general, the Grate size selection should be such that the open area of the Grate is about 10% greater than the cross-sectional area of the feed pipe or duct. Housing and Grate framework is steel . . . entire unit can be furnished of all stainless steel as special.

Housing and Adapters — 1/8" (3mm) black iron unless otherwise specified. 8 1/4" (210mm) height dimension remains constant for all sizes. 1/16" (2mm) gasket for all door fronts.

Magnetic tubes are spaced on 2" (51mm) centers. Bottom row has one less tube for staggered effect.







Pipe Size		Grate Size		A		B		C	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
4	102	8½x 6	216x152	8½	216	6	152	8	203
6	152	10½x 8	267x203	10½	267	8	203	8	203
8	203	12½x10	318x254	12½	318	10	254	8	203
10	254	14½x12	368x305	14½	368	12	305	8	203
12	305	16½x14	419x356	16½	419	14	356	9	229
14	356	18½x16	470x406	18½	470	16	406	9	229
16	406	22½x20	572x508	22½	572	20	508	10	254
18	457	24½x22	622x559	24½	622	22	559	11	279
20	508	26½x24	673x610	26½	673	24	610	12	305
24	610	28½x26	724x660	28½	724	26	660	14	356

Adapters are available with the housings as optional equipment.

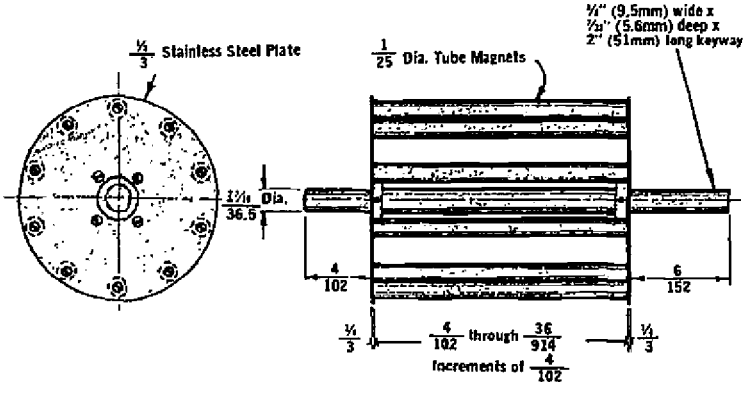
ROTA-GRATE

Operating speed should be no greater than 30 rpm, preferably less, depending upon the condition of the material being processed. Average speed for best results is 16.5 rpm. Baffles should be installed ahead of the Rota-Grate so that all material is directed through the magnetic area.

When enclosing a Rota-Grate within a housing, provision should be made for a clean-out door. Cleaning is accomplished by simple hand removal of the ferrous materials accumulated. Frequent cleaning will maintain the unit at its full separating efficiency.

SUGGESTED INSTALLATIONS

Rota-Grates may be installed at the discharge of either open or enclosed chutes, or may be enclosed within housings in open or closed duct systems. They are built complete with a shaft with ample extensions for a flange type or pillow block type bearings as well as for the drive pulley.



WEIGHTS:

4" (102mm) wide x 12" (305mm) diameter—25 lb (11kg); add 9 lb (4kg) for each additional 4" (102mm) of width.
8" (203mm) wide x 16" (406mm) diameter—40 lb (18kg); add 12 lb (5kg) for each additional 4" (102mm) of width.
12" (305mm) wide x 22" (559mm) diameter—70 lb (32kg); add 16 lb (7kg) for each additional 4" (102mm) of width.

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Inches
Millimeters

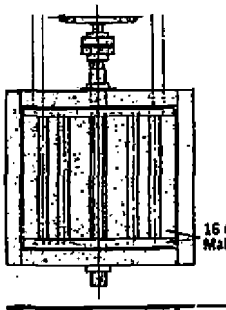
ROTA-GRATE IN HOUSING

These units can be had with or without the motor and motor assembly. If you furnish the motor, observe recommended speeds for best separating results. Standard motor supplied is 16.5 rpm, 1/3 hp, 60 cycle, 3 phase 220/440V—direct drive to Rota-Grate shaft with flexible coupling.

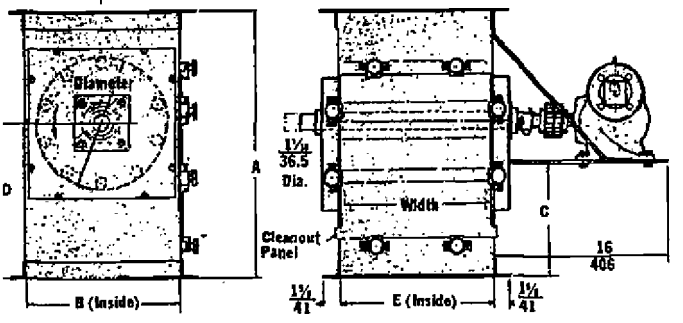
A cover plate closes off a clean-out opening in the housing. When this panel is removed and slid in a grooved slot in the housing, it acts as a shelf to keep ferrous particles from dropping into the line. The magnetic tubes are in easy access for cleaning when this cover is removed.

Frequency of cleaning will be determined by the amount of contamination in the material. The unit should be cleaned often enough to prevent an excessive accumulation of the ferrous contamination on the magnetic tubes. Where necessary, baffles should be installed ahead of the Rota-Grate to assure all material passing through the magnetic area.

All weights are net for Rota-Grate and Housing only. If motor and motor mount assembly is desired add 110 lb (50kg).



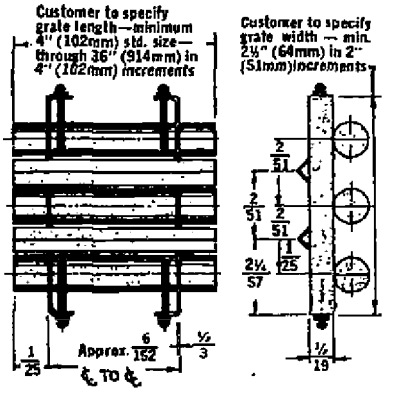
Diameter	A		B		C		D	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
12	305	24	610	14	356	10⅛	257	14	356
16	406	28	711	18	457	12⅛	308	16	406
22	559	32	813	24	610	15⅛	384	19	483



Width		12" Diameter (305mm)				16" Diameter (406mm)				22" Diameter (559mm)				E	
		Weight of Unit		Volume up to		Weight of Unit		Volume up to		Weight of Unit		Volume up to			
in.	mm	lb	kg	cu ft/hr	cu m/hr	lb	kg	cu ft/hr	cu m/hr	lb	kg	cu ft/hr	cu m/hr	in.	mm
4	102	78	35	200	6	—	—	—	—	—	—	—	—	4⅞	124
8	203	102	46	400	11	112	51	550	16	—	—	—	—	8⅞	225
12	305	118	54	600	17	131	59	825	23	165	75	1200	34	12⅞	327
16	406	128	58	800	23	149	68	1100	31	187	85	1600	45	16⅞	428
20	508	149	68	1000	28	169	77	1375	39	209	95	2000	57	20⅞	530
24	610	165	75	1200	34	186	84	1650	47	231	105	2400	68	24⅞	632
28	711	182	83	1400	40	208	94	1925	55	253	115	2800	79	28⅞	733
32	813	197	89	1600	45	225	102	2200	62	275	125	3200	91	32⅞	835

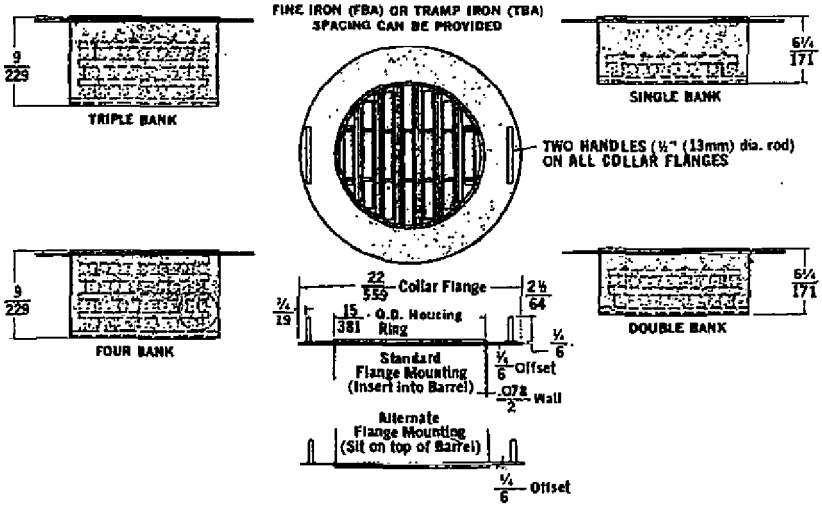
Housing Material — ⅛" (3mm) black iron or stainless steel 304 — housing to be dust tight.

MODEL P GRATE MAGNET



The Model P is available in rectangular, oval and round designs to fit any size or shape of hopper. Sturdy grid bars deflect material flow to the magnetic tubes where iron contamination is trapped and held.

MODEL BA



LEHMAN 02083

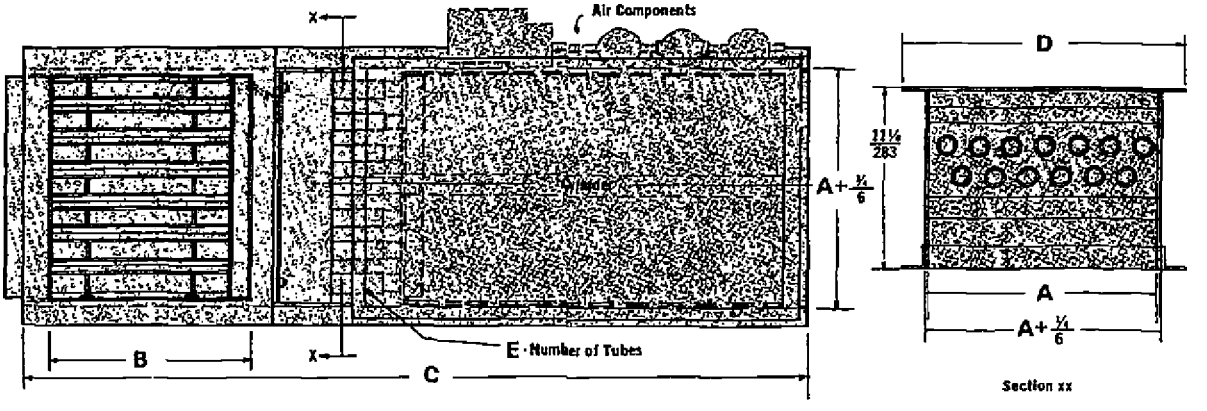
Self Cleaning Grate Magnets

Inches
Millimeters

MODEL GH-12 (Automatic)

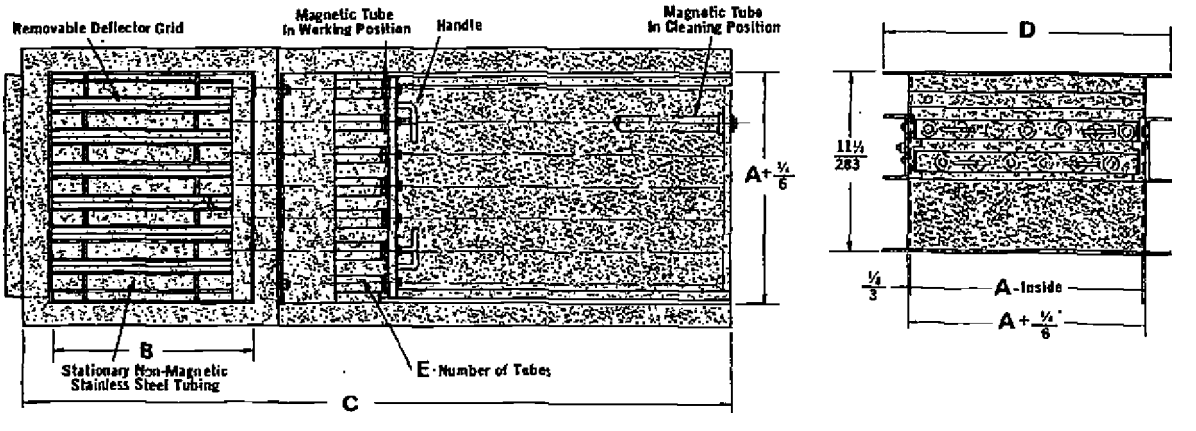
Nominal Size		A		B		C		D		E	Weight		Capacity*	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		lb	kg	cu ft/hr	cu m/hr
14x12	356x305	14	356	12	305	48	1219	17¼	438	13	180	82	500	14
16x20	406x508	16	406	20	508	56	1422	19¼	489	15	195	88	1000	28
20x20	508x508	20	508	20	508	56	1422	23¼	591	19	230	104	1200	34

*Average capacities are based on dry, granular, free-flowing materials.



MODEL GH-22 (Manual)

Nominal Size		A		B		C		D		E	Weight		Capacity*	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		lb	kg	cu ft/hr	cu m/hr
14x12	356x305	14	356	12	305	42⅝	1083	17¼	438	13	165	30	500	14
16x20	406x508	16	406	20	508	58⅝	1489	19¼	489	15	180	36	1000	28
20x20	508x508	20	508	20	508	58⅝	1489	23¼	591	19	210	50	1200	34



LEHMAN 02084

ERIEZ GRATE MAGNETS SOLVE MANY PROCESSING PROBLEMS FOR ALL TYPES OF USERS . . .

These magnets are installed everywhere! They are preventing machinery damage . . . eliminating product contamination . . . up grading some materials and guarding against production shutdowns. A few typical installations are pictured below.

A 15 Grate Magnets are installed beneath a conveyor line carrying sugar to storage bins prior to packaging at the Toronto plant of Canadian and Dominion Sugar Company Ltd. The units guard against ferrous oxide from machinery getting into the finished product.

B A nationally prominent wholesale baker relies on Eriez Grates for an added margin of safety in protecting product purity and preventing damage to processing machinery. Fine ferrous contamination is shown on the magnetic grate which is installed in the plant's micro pulverizer which crushes sugar used to make filler for the firm's cream-filled sandwich cookies and wafers.

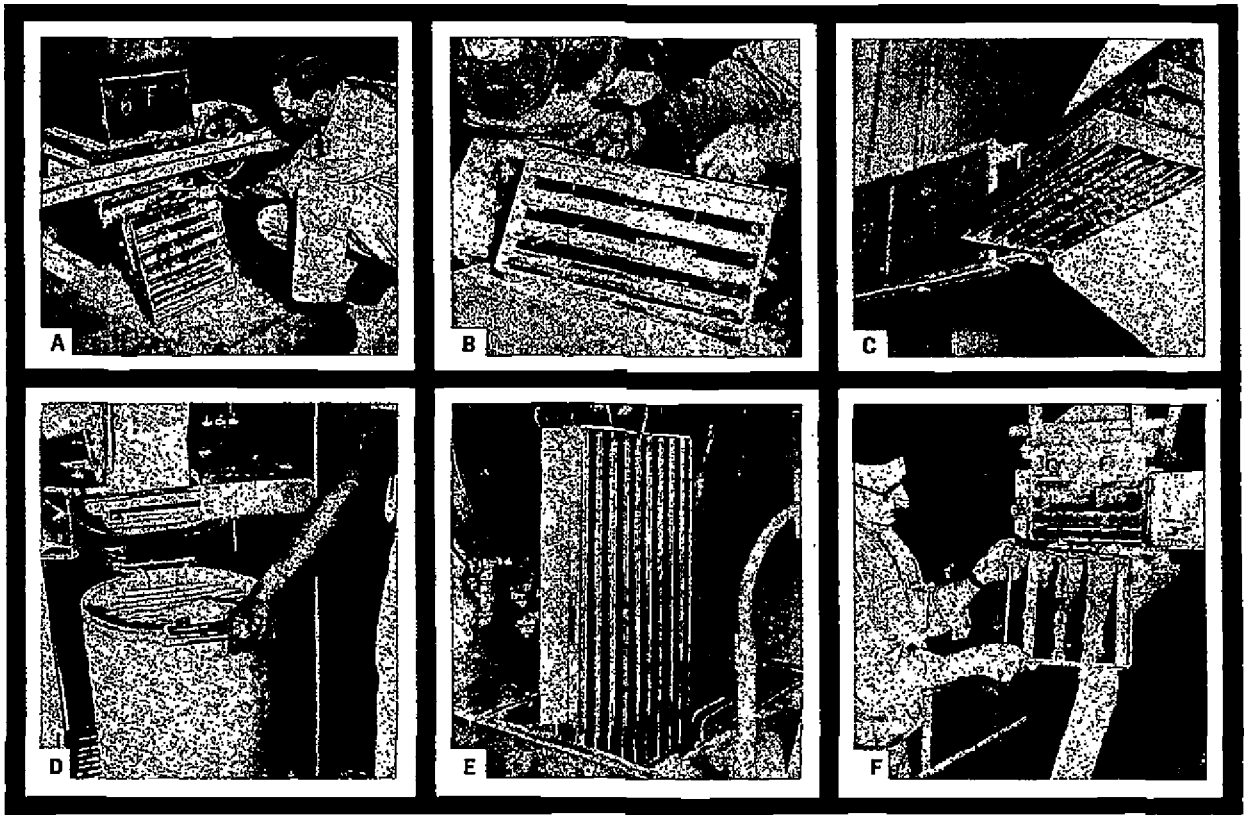
C This is a multiple-bank installation (note the fine iron contamination) used to provide the ultimate in fine iron removal. Installed in a processing line it removes all ferrous particles from a granular material being processed.

D One hundred percent protection against ferrous contamination is the record established by magnetic grates at a large pharmaceutical products manufacturer. Powerful magnetic grates assure Warner-Chilcott Laboratories, Morris Plains, New Jersey, of ferrous-free materials used in the production of antiacid tablets. The BA Grate shown acts as a final protective measure in maintaining Warner-Chilcott's high level of product purity.

E The Process Equipment Division of Automotive Rubber Co. Inc. (ARCO) of Detroit, has helped a customer bypass weekends of dirty work by installing Eriez Magnetic Grates in a double-drum rotary washer.

Grates remove ferrous fines and particles from the washer's recirculating alkaline bath and spray to prevent a build-up of metallic residue on the bottom of the washer's tanks. Re-circulating wash water, containing ferrous particles, is pumped through the grates at 300 gallons per minute. Two 42 x 22 inch grate magnets are used on each side of the washer. The grates attract and firmly hold the ferrous particles until the grates are removed for wiping.

F Magnetic protection prevents rust spots in finished refractory brick at North American Refractories Co.'s Womelsdorf, Pa., plant. The grates remove rust-causing fine iron contamination from refractory materials. Fine iron is seen clinging to the magnetic elements of one of the grates which has been removed from the housing.



ERIEZ MAGNETICS

World Authority in Magnetic and Vibratory Applications

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Eriez of Canada, Ltd., 133 Oakdale Rd., Downsview (Toronto), Ontario, Canada

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784-15M-DP ERIEZ MANUFACTURING CO. PRINTED IN U.S.A.

IMPORTANT INSTRUCTIONS

REGARDING SHORTAGES OR DAMAGED GOODS

EXAMINE THIS SHIPMENT! IF ANY DAMAGE OR SHORTAGE IS FOUND, NOTATION TO THAT EFFECT SHOULD BE MADE ON THE CARRIER'S DELIVERY RECEIPT. WHEN DAMAGE IS CONCEALED, NOTIFY THE DELIVERING CARRIER AT ONCE, AND REQUEST HIM TO MAKE AN INSPECTION. CONFIRM TELEPHONE CONVERSATION IN WRITING. IF INSPECTION IS NOT MADE YOU SHOULD PREPARE AN AFFIDAVIT STATING THAT YOU NOTIFIED THE TRANSPORTATION COMPANY ON A CERTAIN DATE AND THEY FAILED TO COMPLY.

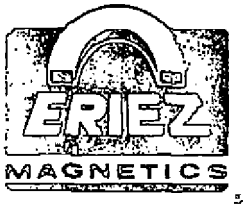
IT IS ABSOLUTELY NECESSARY THAT THE CARRIER BE NOTIFIED WITHIN 15 DAYS FROM THE DATE OF DELIVERY IN ORDER TO BE IN A POSITION TO PRESENT A CLAIM.

PLEASE SAVE ALL CONTAINERS AND PACKING MATERIALS. MAKE YOUR CLAIM PROMPTLY, FOR THE TRANSPORTATION COMPANY WILL NOT CONSIDER A CLAIM UNLESS PRESENTED WITHIN NINE MONTHS FROM DATE OF SHIPMENT.

WHILE OUR RESPONSIBILITY CEASES WHEN MATERIAL IS TURNED OVER TO THE TRANSPORTATION COMPANY WE ARE WILLING TO ASSIST YOU IN PROCESSING YOUR CLAIM, HOWEVER, IN DOING THIS WE DO NOT ASSUME ANY RESPONSIBILITY FOR COLLECTION OF CLAIMS OR REPLACEMENT OF MATERIAL. THE AMOUNT OF ANY CLAIM FOR LOSS OR DAMAGE IS NOT DEDUCTIBLE FROM OUR INVOICE, AND PAYMENT OF OUR INVOICE SHOULD NOT BE DELAYED AWAITING THE ADJUSTMENT OF SUCH CLAIMS.

ERIEZ MANUFACTURING COMPANY

PRODUCERS OF SEPARATION.....VIBRATION.....MAGNAMATION EQUIPMENT



warranty

REPAIR OF EQUIPMENT AND INDEMNITIES

Eriez equipment is backed by Eriez' reputation as a quality manufacturer, and by the outstanding customer service which Eriez voluntarily provides as it deems necessary.

In addition, Eriez equipment is backed by Eriez' standard one year factory warranty in which:

For the benefit of the original purchaser, Eriez warrants all new equipment of its manufacture to be free from defects in material and workmanship; and will replace or repair, free of charge, at its factory in Erie, Pa, or other locations designated by it, any part or parts returned to it by the purchaser which Eriez examination shall show to have failed under normal use and service by the original purchaser within one year following shipment to the purchaser. Eriez obligation under this warranty is conditioned upon it receiving prompt notice of claimed defects which shall in no event be later than thirty (30) days following expiration of the one year warranty period; and is limited to repair or replacement as aforesaid.

THIS WARRANTY IS EXPRESSLY MADE BY ERIEZ AND ACCEPTED BY PURCHASER IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, EXPRESSED, IMPLIED OR STATUTORY; NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.

Eriez neither assumes nor authorizes any person to assume for it any other liabilities with respect to its equipment. Eriez shall not be liable for normal wear and tear, nor any consequential damage or loss of time due to partial or complete inoperability of its equipment for any reason whatsoever.

The responsibility of Eriez for damages due to injury or death of employees of the purchaser or ultimate user of equipment, caused by the equipment, shall be limited to that portion of such damages as might be attributable to the negligence or strict liability or other tortious conduct of Eriez. Purchaser and ultimate user agrees to indemnify Eriez and hold Eriez harmless from any further damages, indemnity, or contribution.

Eriez reserves the right to make improvements in its products without being obligated to incorporate these improvements in products already sold and installed.

This warranty shall not apply to equipment or parts thereof which have been altered or repaired outside of an Eriez factory, or subjected to mis-use, abuse, neglect or accident, or damaged by improper installation or application.

Eriez makes no warranty with respect to parts, accessories, or components manufactured by others. The warranty, if any, which applies to such items is that offered by their respective manufacturers.

Upon buying Eriez equipment or parts purchaser expressly agrees to the foregoing warranty provisions including limitation of remedies, and expressly waives any and all other warranties or undertakings in respect to such equipment.

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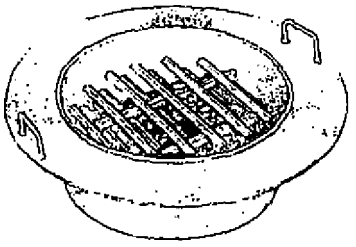


BA Grate magnets

This Separator Provides "Final Magnetic Action" On Bulk Foods, Chemicals, Pharmaceuticals, etc. Being Packaged In Barrels Or Similar Type Containers.

These units are the result of many requests for a portable type magnetic separator for use in a final separating action as materials are being packed in barrels or other types of large containers.

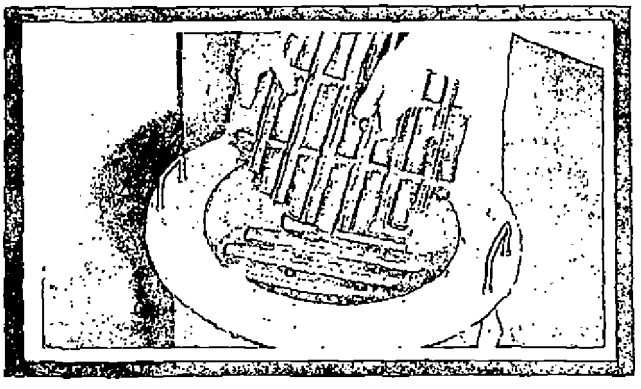
Model BA permanent magnetic Grates fit in or on standard barrels 15½, 17 or 20 inches (394, 432 or 508mm) in diameter. Two basic types are available . . . Model TBA for tramp iron removal (large pieces or iron), with magnetic tubes on 2 inch (51mm) centers and Model FBA for best separation of fine iron contaminants, with tubes on 1½ inch (38mm) centers.

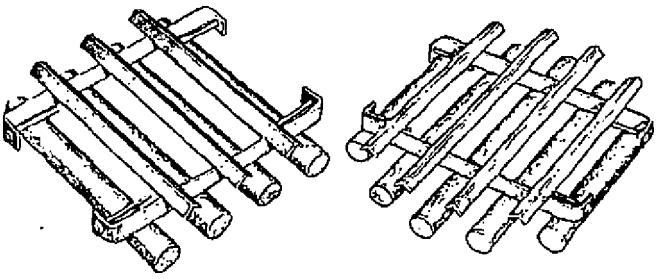
Put them to use on free-flowing materials when sizes do not exceed ⅜ to ½ inch (12mm) in diameter for the TBA model and 5/16 to ¼ inch (6mm) diameter for the FBA model. They can incorporate from one to four banks of one inch diameter magnetic tubes which are rigidly welded to spacer support bars and mounted in a 15 inch (381mm) diameter housing. A ¼ inch thick, 22 inch (6 x 559mm) diameter collar is provided at either the top or bottom of the housing enabling the separator to fit into or on top of the barrel. Handles mounted to the collar enable transfer of the separator from one barrel to another.

The banks of grate magnets are placed in the housing in a staggered position and lock into place with the support bars fitted into the grooves of the preceding grate.

A unit of standard construction has stainless steel tubes with mild steel frame, flange and handles. On stainless steel units the frame, flange and handles are also of stainless steel.

Photo shows a unit being installed in a drum. In this installation it is preventing iron particles from being packaged in bulk vitamin products.





Model "P"
GRATE MAGNETS

A Versatile, Powerful, Lifetime Magnet Designed Specially for Odd Shaped, Round, Oval or Round Cornered Hoppers . . .

The Model P has been constructed with a flexible basic design which makes it a real piece of protective magnetic equipment for virtually any shape hopper. In operation the sturdy grid bars positioned over the magnetic element act as baffles to deflect your flow of material onto the magnetic tubes where iron contamination is trapped and held. The built-in baffles control excessive speeds of material, but a smooth steady flow is not obstructed.

The Model P unit consists of a series of parallel non-magnetic stainless steel tubes covering a magnetic circuit. The tubes are spaced and held in position by non-magnetic stainless steel strips. Parallel with the magnetic portion and centered between them are stainless steel grid angles which serve a two-fold purpose. They act as a material baffle to prevent excessive speeds and they direct all of the material onto the face of the powerful magnets.

Installation is effected by simply placing the magnetic Grate in the hopper, the ends of the magnetic tubes resting against the sides. The unit is centered in the hopper by simply adjusting the screws in the ends of the stainless steel strips. In cases where the ends of the hopper are unusually steep, small strips may be attached to give the Grate adequate support.

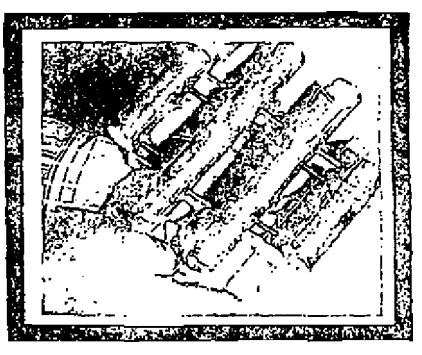
Maintenance of these non-electric permanent magnetic units involves nothing more than periodically lifting the unit out of the hopper and wiping it clean of ferrous accumulations.

To Select Correct Magnet Size

If Rectangular

1. Measure area of hopper discharge opening.
2. Measure hopper dimensions accurately at a point high enough so area is at least twice the discharge opening area. (This is the magnet size).
3. If possible select magnet with standard dimensions; however, units can be furnished with special dimensions if necessary.
4. If hopper has rounded corners, give radius of corners in addition to above information.

If Round, Oval or Irregular
Furnish template.



Close-up view of Eriez permanent Grate Magnet showing bits of iron removed from plastic pellets being fed into injection molding machine. Cleaning grate magnet is quick and easy.

LEHMAN 02088

Inches
Millimeters

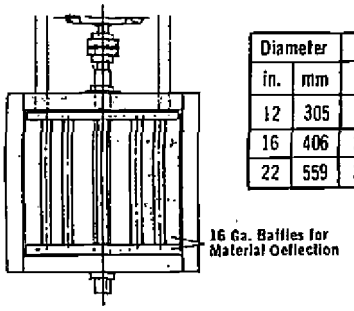
ROTA-GRATE IN HOUSING

These units can be had with or without the motor and motor assembly. If you furnish the motor, observe recommended speeds for best separating results. Standard motor supplied is 16.5 rpm, 1/3 hp, 60 cycle, 3 phase 220/440V—direct drive to Rota-Grate shaft with flexible coupling.

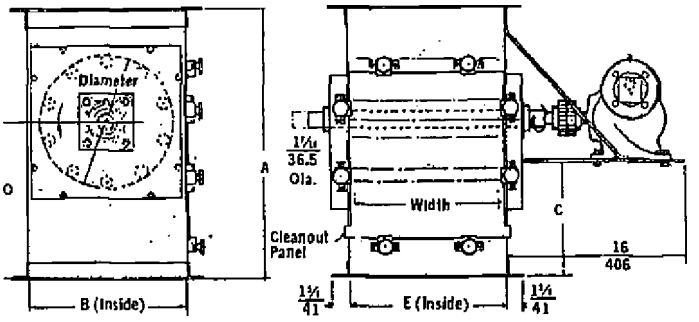
A cover plate closes off a clean-out opening in the housing. When this panel is removed and slid in a grooved slot in the housing, it acts as a shelf to keep ferrous particles from dropping into the line. The magnetic tubes are in easy access for cleaning when this cover is removed.

Frequency of cleaning will be determined by the amount of contamination in the material. The unit should be cleaned often enough to prevent an excessive accumulation of the ferrous contamination on the magnetic tubes. Where necessary, baffles should be installed ahead of the Rota-Grate to assure all material passing through the magnetic area.

All weights are net for Rota-Grate and Housing only. If motor and motor mount assembly is desired add 110 lb (50kg).



Diameter	A		B		C		D	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
12	305	24	610	14	356	10¼	257	14	356
16	406	28	711	18	457	12⅛	308	16	406
22	559	32	813	24	610	15½	384	19	483



	12" Diameter (305mm)				16" Diameter (406mm)				22" Diameter (559mm)					
Width		Weight of Unit		Volume up to		Weight of Unit		Volume up to		Weight of Unit		Volume up to		E	
in.	mm	lb	kg	cu ft/hr	cu m/hr	lb	kg	cu ft/hr	cu m/hr	lb	kg	cu ft/hr	cu m/hr	in.	mm
4	102	78	35	200	6	—	—	—	—	—	—	—	—	4⅞	124
8	203	102	46	400	11	112	51	550	16	—	—	—	—	8⅞	225
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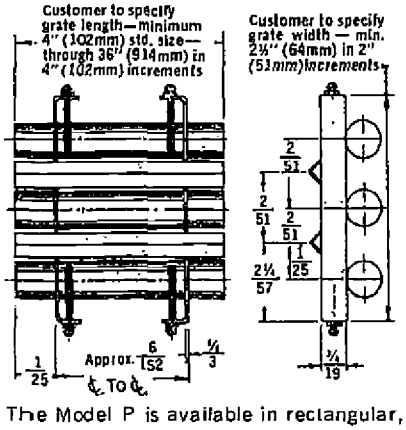
28	711	182	83	1400	40	208	94	1925	55	253	115	2800	79	28⅞	733
32	813	197	89	1600	45	225	102	2200	62	275	125	3200	91	32⅞	835

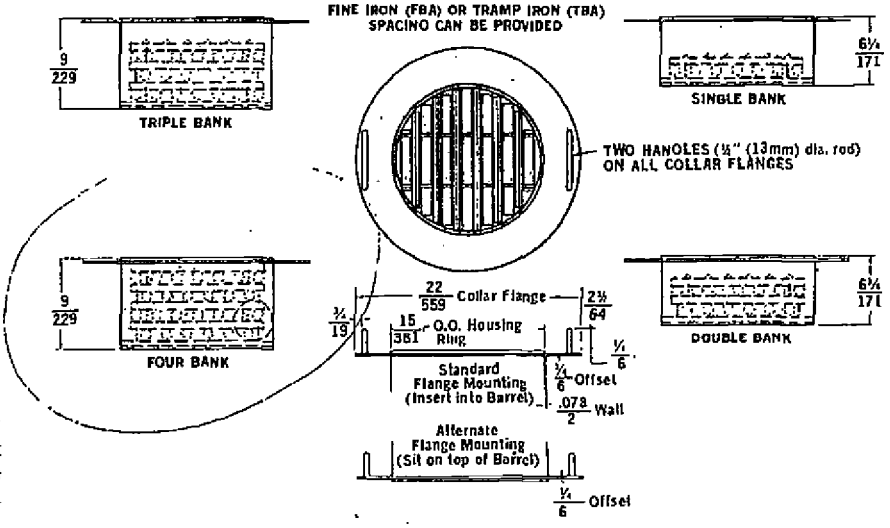
Housing Material — ⅛" (3mm) black iron or stainless steel 304 — housing to be dust tight.

MODEL P GRATE MAGNET



The Model P is available in rectangular, oval and round designs to fit any size or shape of hopper. Sturdy grid bars deflect material flow to the magnetic tubes where iron contamination is trapped and held.

MODEL BA



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CYPRUS INDUSTRIAL MINERALS
MONTHLY REPORT
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CYPRUS INDUSTRIAL MINERALS

MONTHLY REPORT

FEBRUARY 1989

Cyprus Industrial Minerals
Monthly Report Summary
February 1989

Talc product revenues from continuing operations were approximately equal to the budget of $7.5MM as higher revenues at the Western talc operations ($.4MM) were offset by shortfalls at the European operations ($.4MM). Contributing to the higher revenues were higher crude sales ($.6MM) of which 6.3M tons ($.5MM) were budgeted for January. Partially offsetting were lower industrial sales volumes ($.2MM). Lower European revenues resulted from lower sales volumes (1.8M tons).

Total expenses of $7.2MM were $.3MM higher than budget, primarily due to higher costs at Windsor and CIM talc, in addition to higher depreciation and administrative costs. This was a 3% increase over budget.

Clay earnings included a $3.0MM gain on the sale of the kaolin operations. The ball clay operations will be sold on March 31 for $7.3MM.

February and year-to-date operating income were $2.7MM and $2.5MM over budget respectively. The major components of this variance were:

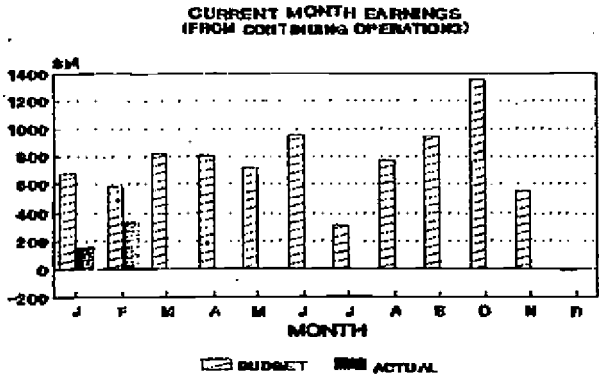
	Feb. $MM	YTD $MM
Budgeted Operating Income	.6	1.3
Realizations - Crude	(.2)	-
- F.G. CIM Talc	.1	.2
- F.G. Windsor	.1	.2
- F.G. Green Mtn.	-	.1
Sales Volumes - Crude	.5	-
- F.G. European	(.1)	(.2)
- F.G. Windsor	-	(.1)
- F.G. Green Mtn.	(.1)	(.1)
Unit Costs - CIM Talc	(.4)	(.5)
- Windsor	(.4)	(.7)
Misc. Income - CIM Talc	.2	.2
Currency Exchange Gain	-	.1
Clay	3.0	3.3
Actual Operating Income	3.3	3.8

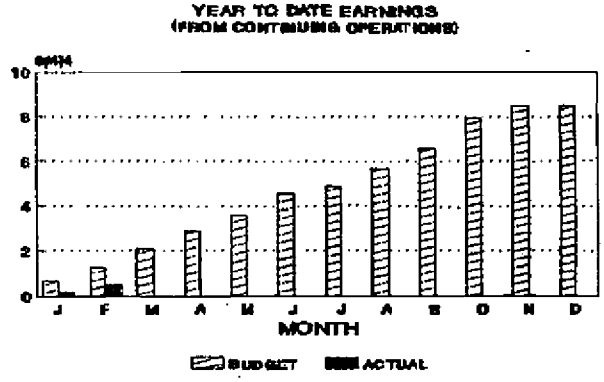
Capital spending of $.5MM was $.1MM below budget in February primarily due to lower expenditures at Yellowstone and Grand Island. At Yellowstone, the purchase of a haul truck was delayed as were some of the costs related to the installation of the ACM at Grand Island.

LW-MRS:1

CYPRUS INDUSTRIAL MINERALS
CONSOLIDATED INCOME STATEMENT
FEBRUARY 1989

CURRENT MONTH					YEAR TO DATE			
ACTUAL		BUDGET			ACTUAL		BUDGET	
$M	%	$M	%		$M	%	$M	%
7,517	100.0%	7,505	100.0%	REVENUE (PRODUCT)	14,286	100.0%	14,954	100.0%
5,505	73.2%	5,380	71.7%	COST OF GOODS SOLD	10,590	74.1%	10,609	70.9%
724	9.6%	637	8.5%	D,D & A	1,402	9.8%	1,274	8.5%
952	12.7%	907	12.1%	CORPORATE S,G & A	1,803	12.6%	1,814	12.1%
336	4.5%	581	7.7%	INC. FROM CONT. OPER	491	3.4%	1,257	8.4%
2,986		0		CLAY	3,298		0	
3,322		581		OPERATING INCOME	3,789		1,257	
724		637		ADD:D,D & A	1,402		1,274	
40		0		CLAY D,D & A	173		0	
(462)		(615)		LESS:CAPITAL EXPEND	(582)		(2,621)	
3,624		603		OPERATING CASH FLOW	4,782		(90)	





CYPRUS INDUSTRIAL MINERALS
SALES SUMMARY
February 1989

Current Month				Year-To-Date		
Act	Bud	Var		Act	Bud	Var
			NET PRODUCT REVENUE($M)			
2,609	2,787	(178)	Talc - US Finished Goods	5,387	5,117	270
756	146	610	Talc - Crude	810	711	99
793	731	62	Talc - Green Mtn	1,534	1,406	128
1,558	1,769	(211)	Talc - Ghent	3,133	3,412	(279)
76	232	(156)	Talc - Malaga	189	532	(343)
1,228	1,275	(47)	Talc - Windsor	2,220	2,550	(330)
17	0	17	Clay - Mistron Casc.	48	0	48
497	562	(65)	Barite	965	1,229	(264)
7,534	7,502	32	Continuing Oper.	14,286	14,957	(671)
930	0	930	Clay	2,238	0	2,238
8,464	7,502	962	Total Revenue	16,524	14,957	1,567
			TONS SOLD(M)			
13,075	14,264	(1,189)	Talc - US Finished Goods	27,232	26,483	749
8,051	1,190	6,861	Talc - Crude	8,421	7,570	851
6,622	7,181	(559)	Talc - Green Mtn	13,616	14,245	(629)
5,746	7,000	(1,254)	Talc - Ghent	11,580	13,664	(2,084)
1,008	1,500	(492)	Talc - Malaga	2,211	3,000	(789)
14,199	17,000	(2,801)	Talc - Windsor	26,273	34,000	(7,727)
38	0	38	Clay - Mistron Casc.	85	0	85
2,809	3,640	(831)	Barite	5,373	7,620	(2,247)
51,540	51,775	(235)	Continuing Oper.	94,791	106,582	(11,791)
21,726	0	21,726	Clay	54,686	0	54,686
73,266	51,775	21,491	Total Tons Sold	149,477	106,582	42,895
			REALIZATIONS($/TON)			
200	195	5	Talc - US Finished Goods	198	193	5
94	123	(29)	Talc - Crude	96	94	2
120	102	18	Talc - Green Mtn	113	99	14
271	253	18	Talc - Ghent	271	250	21
75	155	(80)	Talc - Malaga	85	177	(92)
86	75	11	Talc - Windsor	84	75	9
567	0	567	Clay - Mistron Casc.	565	0	565
177	154	23	Barite	180	161	19
146	145	1	Continuing Oper.	151	140	11
43	0	43	Clay	41	0	41
116	145	(29)	Average Realization	111	140	(29)

Industrial Minerals
Tonnage Operating Statistics
February 1989

Current Month				Year-to-Date		
Actual	Budget	Var.	Crude Mined	Actual	Budget	Var.
			Talc			
13,848	18,900	(5,052)	Yellowstone	31,125	37,800	(6,675)
1,852	1,684	168	Beaverhead	3,422	3,368	54
603	1,333	(730)	Antler	1,765	2,666	(901)
-	673	(673)	Alpine	-	1,346	(1,346)
1,235	7,187	(5,952)	Troy	1,235	14,398	(13,163)
5,663	7,029	(1,366)	Hamm	11,356	13,974	(2,618)
1,849	2,717	(868)	Hammondsville - WMI	4,247	5,434	(1,187)
12,986	16,592	(3,606)	Ludlow - WMI	25,666	33,184	(7,518)
1,602	1,100	502	California - WMI	2,456	2,200	256
39,638	57,215	(17,577)	Total Talc Mined	81,272	114,370	(33,098)
			Mill Production			
			Talc			
8,051	890	7,161	Three Forks - Crudes	8,421	7,170	1,251
8,991	9,688	(697)	- Finished Goods	20,393	19,376	1,017
-	300	(300)	Brownsville - Crudes	-	400	(400)
2,927	3,147	(220)	Grand Island	5,958	6,294	(336)
1,133	1,303	(170)	Alpine	2,447	2,606	(159)
3,689	4,541	(852)	Chester	8,396	9,082	(686)
2,731	3,000	(269)	Johnson	5,168	6,000	(832)
1,288	1,833	(545)	West Windsor - WMI	2,444	3,666	(1,222)
11,196	14,067	(2,871)	Ludlow - WMI	22,764	28,134	(5,370)
1,134	1,100	34	California - WMI	1,991	2,200	(209)
-	160	(160)	Houston	-	280	(280)
6,208	7,047	(839)	Ghent	12,163	13,664	(1,501)
1,123	1,543	(420)	Malaga	2,185	3,086	(901)
48,471	48,619	(148)	Total Talc Milled	92,330	101,958	(9,628)
			Barite			
2,783	2,500	283	Cartersville	5,094	5,000	94
-	1,240	(1,240)	Houston	-	2,480	(2,480)
2,783	3,740	(957)	Total Barite Milled	5,094	7,480	(2,386)
			Clay			
84	-	84	Sandersville - Mistron Cascade	165	-	165

GG-Tonnage: 1

Industrial Minerals
Sales Tons by Producing Location
February 1989

Current Month				Year-to-Date		
Actual	Budget	Var.		Actual	Budget	Var.
			Talc			
8,051	890	7,161	Three Forks - Crudes	8,421	7,170	1,251
9,264	9,736	(472)	- Finished Goods	18,809	18,564	245
-	300	(300)	Brownsville - Crudes	-	400	(400)
-	-	-	S. Plainfield	7	-	7
2,625	3,316	(691)	Grand Island	5,944	5,981	(37)
1,185	1,212	(27)	Alpine	2,470	1,938	532
3,807	4,546	(739)	Chester	8,304	8,956	(652)
2,815	2,771	44	Johnson	5,312	5,289	23
1,552	1,833	(281)	West Windsor - WMI	2,711	3,666	(955)
11,370	14,067	(2,697)	Ludlow - WMI	21,456	28,134	(6,678)
1,277	1,100	177	California - WMI	2,106	2,200	(94)
-	160	(160)	Houston	-	280	(280)
5,746	7,047	(1,301)	Ghent	11,580	13,664	(2,084)
1,008	1,543	(535)	Malaga	2,211	3,086	(875)
48,700	48,521	179	Total Talc Sold	89,331	99,328	(9,997)
			Barite			
2,809	2,240	569	Cartersville	5,373	4,860	513
-	1,240	(1,240)	Houston	-	2,480	(2,480)
2,809	3,480	(671)	Total Barite Sold	5,373	7,340	(1,967)
			Clay			
30	-	30	Sandersville - Mistron Cascade	85	-	85

Cyprus Industrial Minerals
Corporate Cost Summary
February, 1989
$M

Current Month Actual	Current Month Budget	Current Month Var		Year-to-Date Actual	Year-to-Date Budget	Year-to-Date Var
235	290	(55)	President	440	581	(141)
			Marketing/Sales			
19	16	3	VP Marketing/Sales	42	32	10
70	91	(21)	Paper Sales	158	181	(23)
46	64	(18)	Industrial Sales	114	128	(14)
23	35	(12)	Cos, Pharm, Food Sales	59	71	(12)
9	28	(19)	Int'l Sales	26	56	(30)
26	25	1	Marketing	43	50	(7)
96	103	(7)	Product Development	199	205	(6)
7	9	(2)	QA/Product Safety	14	17	(3)
10	11	(1)	Product Safety	20	22	(2)
53	59	(6)	Sales Services	126	119	7
359	441	(82)	Total Marketing & Sales	801	881	(80)
			Operations			
10	20	(10)	VP Operations	24	39	(15)
32	46	(14)	Engineering	64	93	(29)
(22)	4	(26)	Resource Development	(58)	8	(66)
20	70	(50)	Total Operations	30	140	(110)
56	62	(6)	Controller	122	124	(2)
27	38	(11)	Human Resources	80	76	4
63	62	1	Depreciation	126	124	2
7	7	(0)	Control Report	15	14	1
9	0	9	Limestone	19	0	19
71	0	71	Other	68	0	68
847	970	(123)	Total Before Chg-Outs	1,701	1,940	(239)
(778)	(778)	0	Monthly Charge-Outs	(1,558)	(1,558)	0
69	192	(123)	Total After Chg-Outs	143	382	(239)

The President's department was $55M under budget for the month primarily due to lower miscellaneous expenses ($44M).

The Sales and Marketing departments were $82M below budget primarily due to lower salaries and benefits ($52M) and lower travel expense ($52M) partially offset by higher outside services ($18M) and higher office rent ($21M).

The Operations departments were under budget by $50M primarily due to lower outside services ($24M) and lower miscellaneous expense ($19M).

The negative Resource Development expense represents budgeted costs charged out to the mining locations in excess of actual expenses.

Costs for the previously sold limestone operation were for workers compensation, medical and dental expenses.

Other includes a $50M provision for talc litigation expenses determined to be uncollectable from insurance carriers, and $21M of 1987 property taxes for the sold Los Angeles laboratory.

LWCorpCost:1

CYPRUS INDUSTRIAL MINERALS
CAPITAL EXPENDITURE SUMMARY
FEBRUARY 1989
$M

Current Month Act	Current Month Bud	Current Month Var		Year-To-Date Act	Year-To-Date Bud	Year-To-Date Var
315	405	(90)	Talc - Yellowstone	317	805	(488)
16	-	16	- Three Forks	(10)	85	(95)
12	50	(38)	- Grand Island	14	110	(96)
(3)	-	(3)	- Alpine	4	10	(6)
-	-	-	- Beaverhead/Alder	-	5	(5)
-	-	-	- Antler	-	-	-
-	-	-	- Other	-	-	-
340	455	(115)	Total Talc	325	1,015	(690)
			Green Mountain - Talc			
10	30	(20)	Johnson	19	60	(41)
-	-	-	Chester	-	10	(10)
10	30	(20)	Total Green Mountain	19	70	(51)
89	100	(11)	Windsor Minerals	136	200	(64)
-	-	-	Western Source,Inc.	-	-	-
89	100	(11)	Total Windsor Minerals	136	200	(64)
			Barite			
(3)	-	(3)	- Cartersville	75	83	(8)
12	-	12	- Houston	15	8	7
9	-	9	Total Barite	90	91	(1)
13	20	(7)	Corporate	8	195	(187)
-	10	(10)	Ghent	3	240	(237)
-	-	-	Malaga	-	810	(810)
1	-	1	Clay	1	-	1
462	615	(153)	Total Capital Expenditures	582	2,621	(2,039)

- Yellowstone's expenditures were for the small particle sorter and the bulk anfo system. The budgeted capital was for a loader and a haul truck.
- The capital spending at Three Forks was primarily for improvements to the crude loading area.
- Grand Island's expeditures related to improvements to the crude unloading area and a crude storage shed. The budgeted expenditures were for the installation of the air classifier mill.
- Johnson's spending was primarily for Troy float plant improvements and for computers.
- Windsor's spending was associated with the rotary dryer and product silos at the Columbia mill.
- Barite expenditures primarily related to the installation of an ACM at Houston.
- Budgeted Malaga expenditures are related to mine development which will actually take place later in the year.
- Budgeted Ghent expenditures are for the computer installation and mill improvements that will be completed in future months.

LW-CapExpS:1

CIM
CAPITAL EMPLOYED
FEBRUARY 28, 1989
M$

	#111 CLAY	#116 BARITE	#329 TALC	#115 GREEN MTN	#541 GHENT	#540 MALAGA	#110 INTERNATIONAL	#109 HQ	#127 WINDSOR	#128 WESTERN	CONTINUING OPERATIONS TOTAL	* DISCONTINUED OPERATIONS TOTAL	TOTAL
CURRENT ASSETS													
Cash	7	9	20	7	1,054	688		9	414	15	2,221		2,221
Receivables	2,591	1,112	6,845	1,777	4,026	162	121	406	1,735	144	19,221	29	19,250
Inventory-product	255	1,502	6,478	1,102	5,504	621			581	71	16,118		16,118
Inventory-M&S	117	651	1,471	570	465		18	149	521	64	4,448		4,448
Prepaids	40		27	6	860		1	79			1,015		1,015
Less: CURRENT LIABILITIES													
S/T Notes payable & deferred	(1)	(7)				(141)					(151)		(151)
Accounts payable	(790)	(215)	(1,719)	(500)	(1,708)	(157)	(10)	(170)	(158)	(11)	(5,660)	11	(5,647)
Accrued liabilities	(110)	(155)	(791)	(152)	(513)	(11)	(41)	(1,492)	(101)	(27)	(1,917)	(1,165)	(5,082)
Taxes payable	(18)	(14)	(428)	(40)	(1,109)	(2)	(1)	(1,096)	19	4	(4,687)	(19)	(4,706)
Dividends payable											0		0
NET WORKING CAPITAL	1,989	1,081	11,901	2,970	8,579	1,118	98	(4,115)	1,115	258	28,888	(1,142)	27,666
NON-CURRENT ASSETS													
Deferred charges	61	26	248	160	(181)	105		92	9,128		9,617		9,617
Property, plant & equipment	2,624	6,108	21,211	17,401	4,455	4,822	4	1,149	24,118	1,214	85,550		85,550
Other assets							1,456				1,456		1,456
NON-CURRENT LIABILITIES													
Longterm debt											0		0
Deferred tax					(245)				(1)	2	(244)		(244)
Other	(424)	(14)	(656)	(665)		(18)					(1,777)	(85)	(1,862)
TOTAL CAPITAL EMPLOYED	4,250	9,201	12,726	19,868	12,606	6,847	1,558	(874)	16,560	1,496	121,418	(1,227)	122,201

* Includes company #114, Thompson Weinman and #151, Harcon Barge

LEHMAN 02103

CYPRUS INDUSTRIAL MINERALS
PRODUCT INVENTORY ANALYSIS
FEBRUARY 1989

INVENTORY LOCATION	BALANCE 01/31/89			BALANCE 02/28/89			VARIANCE		
CRUDE	TONS	VALUE	$/TON	TONS	VALUE	$/TON	TONS	VALUE	$/TON
YELLOWSTONE	9,635	492,601	51.13	12,093	623,046	51.52	2,458	130,445	0.40
BEAVERHEAD	427	39,565	92.66	486	45,033	92.66	59	5,468	0.00
ALDER	6,392	328,025	51.32	6,453	331,168	51.32	61	3,143	0.00
ANTLER	5,998	312,927	52.17	5,851	305,247	52.17	(147)	(7,680)	(0.00)
TROY	75,242	695,071	9.24	70,515	647,420	9.18	(4,727)	(47,651)	(0.06)
SUB-TOTAL	97,694	1,868,189	19.12	95,398	1,951,914	20.46	(2,296)	83,725	1.34
JOHNSON	8,346	141,997	17.01	7,939	140,953	17.75	(407)	(1,044)	0.74
CHESTER	3,562	28,260	7.93	4,184	56,036	13.39	622	27,776	5.46
CARTERSVILLE	9,352	572,626	61.23	9,183	589,585	64.20	(169)	16,959	2.97
HOUSTON	7,833	756,813	96.62	7,779	799,058	102.72	(54)	42,245	6.10
WESTERN SOURCE	1,669	22,070	13.22	2,137	28,259	13.22	468	6,189	0.00
COLUMBIA	5,347	41,283	7.72	5,228	45,252	8.66	(119)	3,969	0.93
WEST WINDSOR	3,755	133,258	35.49	4,848	147,429	30.41	1,093	14,171	(5.08)
THREE FORKS	24,345	1,278,061	52.50	16,733	888,618	53.11	(7,612)	(389,443)	0.61
GRAND ISLAND	1,558	200,249	128.53	2,257	243,966	106.09	699	43,717	(20.44)
ALPINE	14,602	1,412,486	96.73	13,987	1,363,646	97.49	(615)	(48,840)	0.76
GHENT *	60,732	4,998,034	82.30	51,785	4,560,902	88.07	(8,947)	(437,132)	5.78
SUB-TOTAL	141,101	9,585,137	67.93	126,060	8,863,704	70.31	(15,041)	(721,433)	2.38
TOTAL CRUDE	238,795	11,453,326	47.96	221,458	10,815,618	48.84	(17,337)	(637,708)	0.88
FINISHED GOODS									
JOHNSON	2,940	440,000	149.66	2,856	439,549	153.90	(84)	(451)	4.24
CHESTER	411	22,494	54.73	293	18,349	62.62	(118)	(4,145)	7.89
GHENT	3,549	767,823	216.35	4,376	943,441	215.59	827	175,618	(0.75)
CARTERSVILLE	728	104,161	143.08	702	103,857	147.94	(26)	(304)	4.87
HOUSTON	0	0	0.00	55	9,341	169.84	55	9,341	169.84
ALPINE	705	172,303	244.40	649	158,616	244.40	(56)	(13,687)	(0.00)
THREE FORKS	1,645	193,206	117.45	1,446	169,833	117.45	(199)	(23,373)	(0.00)
GRAND ISLAND	352	65,360	185.68	730	135,546	185.68	378	70,186	(0.00)
COLUMBIA	3,164	77,600	24.53	2,749	71,780	26.11	(415)	(5,820)	1.59
WEST WINDSOR	2,135	428,456	200.68	1,330	318,138	239.20	(805)	(110,318)	38.52
WESTERN SOURCE	1,220	50,965	41.77	1,077	42,475	39.44	(143)	(8,490)	(2.34)
WAREHOUSES	10,200	2,258,728	221.44	9,908	2,213,680	223.42	(292)	(45,048)	1.98
TOTAL FINISHED GOODS	27,049	4,581,096	169.36	26,171	4,624,605	176.71	(878)	43,509	7.34
TOTAL INVENTORY	265,844	16,034,422	60.32	247,629	15,440,223	62.35	(18,215)	(594,199)	2.04
ADJUSTMENTS:									
DIMTA (EST.)		623,000			623,000				
CLAY		430,000			255,000				
ADJUSTED TOTAL		17,087,422			16,318,223				

* INCLUDES ELIMINATION ENTRY

CYPRUS INDUSTRIAL MINERALS
PRODUCT INVENTORY ANALYSIS
FEBRUARY 1989

INVENTORY LOCATION	BALANCE 02/28/88			BALANCE 02/28/89			VARIANCE		
CRUDE	TONS	VALUE	$/TON	TONS	VALUE	$/TON	TONS	VALUE	$/TON
YELLOWSTONE	17,762	1,165,288	65.61	12,093	623,046	51.52	(5,669)	(542,242)	(14.08)
BEAVERHEAD	317	37,790	119.21	486	45,033	92.66	169	7,243	(26.55)
ALDER	4,160	256,984	61.78	6,453	331,168	51.32	2,293	74,184	(10.45)
ANTLER	1,561	86,116	55.17	5,851	305,247	52.17	4,290	219,131	(3.00)
TROY				70,515	647,420	9.18	70,515	647,420	9.18
SUB-TOTAL	23,800	1,546,178	64.97	95,398	1,951,914	20.46	71,598	405,736	(44.50)
JOHNSON				7,939	140,953	17.75	7,939	140,953	17.75
CHESTER				4,184	56,036	13.39	4,184	56,036	13.39
CARTERSVILLE	8,176	350,229	42.84	9,183	589,585	64.20	1,007	239,356	21.37
HOUSTON				7,779	799,058	102.72	7,779	799,058	102.72
WESTERN SOURCE				2,137	28,259	13.22	2,137	28,259	13.22
COLUMBIA				5,228	45,252	8.66	5,228	45,252	8.66
WEST WINDSOR				4,848	147,429	30.41	4,848	147,429	30.41
THREE FORKS	17,120	1,080,389	63.11	16,733	888,618	53.11	(387)	(191,771)	(10.00)
GRAND ISLAND	1,198	140,270	117.09	2,257	243,966	108.09	1,059	103,696	(8.99)
ALPINE	7,939	1,333,845	168.01	13,987	1,363,646	97.49	6,048	29,801	(70.52)
S. PLAINFIELD	89	16,692	187.55				(89)	(16,692)	(187.55)
GHENT *	18,833	2,643,155	140.35	51,785	4,560,902	88.07	32,952	1,917,747	(52.27)
SUB-TOTAL	53,355	5,564,580	104.29	126,060	8,863,704	70.31	72,705	3,299,124	(33.98)
TOTAL CRUDE	77,155	7,110,758	92.16	221,458	10,815,618	48.84	144,303	3,704,860	(43.32)
FINISHED GOODS									
JOHNSON				2,856	439,549	153.90	2,856	439,549	153.90
CHESTER				293	18,349	62.62	293	18,349	62.62
GHENT	N/A	892,580	N/A	4,376	943,441	215.59	4,376	50,861	215.59
CARTERSVILLE	751	180,559	240.42	702	103,857	147.94	(49)	(76,702)	(92.48)
HOUSTON				55	9,341	169.84	55	9,341	169.84
ALPINE	529	169,332	320.10	649	158,616	244.40	120	(10,716)	(75,70)
THREE FORKS	2,467	379,596	153.87	1,446	169,833	117.45	(1,021)	(209,763)	(36.42)
GRAND ISLAND	410	83,096	202.67	730	135,546	185.68	320	52,450	(16.99)
S. PLAINFIELD	556	214,402	385.62				(556)	(214,402)	(385,62)
COLUMBIA				2,749	71,780	26.11	2,749	71,780	26.11
WEST WINDSOR				1,330	318,138	239.20	1,330	318,138	239.20
WESTERN SOURCE				1,077	42,475	39.44	1,077	42,475	39.44
WAREHOUSES	7,329	1,897,372	258.89	9,908	2,213,680	223.42	2,579	316,308	(35,46)
TOTAL FINISHED GOODS	12,042	3,816,937	316.97	26,171	4,624,605	176.71	14,129	807,668	(140,26)
TOTAL INVENTORY	89,197	10,927,695	122.51	247,629	15,440,223	62.35	158,432	4,512,528	(60,16)
ADJUSTMENTS:									
DIMTA (EST.)					623,000				
CLAY		577,025			255,000				
ADJUSTED TOTAL		11,504,720			16,318,223				

* INCLUDES ELIMINATION ENTRY

CYPRUS INDUSTRIAL MINERALS
MANPOWER REPORT
FEBRUARY 1989

Location	Salaried Actual	Salaried Budget	Hourly Actual	Hourly Budget	Total Actual	Total Budget	Total Variance
Corporate							
President	2	2	0	-	2	2	0
Sales/Marketing	67	60	0	-	67	60	7
Operations	13	11	0	2	13	13	0
HR & Safety	3	5	0	-	3	5	(2)
Controller	15	13	0	-	15	13	2
Total Corporate	100	91	0	2	100	93	7
Talc							
U.S. Operations							
Alder	1	1	3	3	4	4	0
Alpine	6	6	16	15	22	21	1
Beaverhead	2	3	17	17	19	20	(1)
Chester	3	4	12	15	15	19	(4)
Grand Island	4	4	20	23	24	27	(3)
Johnson	6	7	20	21	26	28	(2)
Three Forks	10	11	46	49	56	60	(4)
Western Source	9	-	0	-	9	-	9
Windsor	41	45	58	56	99	101	(2)
Yellowstone	7	7	128	120	135	127	8
Eastern Operations	4	7	0	-	4	7	(3)
Western Operations	8	8	0	-	8	8	0
Total U.S. Operations	101	103	320	319	421	422	(1)
European Operations							
Ghent	31	42	27	29	58	71	(13)
Malaga	19	8	4	14	23	22	1
Total European Ops	50	50	31	43	81	93	(12)
Total Talc	151	153	351	362	502	515	(13)
Barite							
Cartersville	8	7	40	37	48	44	4
Houston	2	2	3	8	5	10	(5)
Total Barite	10	9	43	45	53	54	(1)
Clay							
Aiken	-	-	-	-	-	-	-
Gleason	5	-	52	-	57	-	57
Sandersville	-	-	-	-	-	-	-
Total Clay	5	-	52	-	57	-	57
TOTAL CIM	266	253	446	409	712	662	50

NOTE: As of February 28, 1989, there were 7 casual equivalent full time employees. The control budget did not include any casual employees.

RFManpower

CYPRUS INDUSTRIAL MINERALS
Trade Accounts Receivable Monthly Report
February 1989

Division	Total	Current	Past Due 01-30 Days	31-60 Days	61-90 Days	Over 90 Days	Total Past Due
Talc - CIM - Co. 329*	$ 6,646,540	$4,543,603	$1,294,321	$273,128	$110,584	$424,904	$2,102,937
Talc - Vermont - Co. 335*	1,710,275	1,366,664	303,099	20,227	(212)	20,497	343,611
Barite - Co. 336	1,220,133	668,557	244,409	250,759	14,814	41,594	551,576
Clay - Co. 333*	2,600,630	1,198,492	819,508	216,548	182,950	183,132	1,402,138
Total CIM Trade Receivable	$12,177,578	$7,777,316	$2,661,337	$760,662	$308,136	$670,127	$4,400,262

Total	Current	01-30 Days	31-60 Days	61-90 Days	Over 90 Days
100%	64	22	6	3	5

Days sales outstanding calculated on a rolling three-month average.

	Days Sales Outstanding February 1989	January 1989	February 1988
Talc - CIM - Co. 329**	62.03	65.58	63.65
Talc - Vermont - Co. 335	N/A	N/A	N/A
Barite - Co. 336	N/A	N/A	N/A
Clay - Co. 333*	71.52	69.01	77.94
Total CIM Days Sales Outstanding	64.13	66.45	67.84

*Includes International Sales

** Talc & Barite combined - Company breakout not available until March.

CIM:870890302

LEHMAN 02107

CIM CLAY - DIVISION OF CYPRUS MINES
Income Statement
February 1989

Current Month Actual			Year to Date Actual	
$M	$/Ton		$M	$/Ton
944	43.45	Finished Goods Revenues	2,261	41.35
0	0.00	Crudes Revenues	0	0.00
944	43.45	Gross Product Revenues	2,261	41.35
(14)	-0.64	Sales Discount & Commissions	(23)	-0.42
930	42.81	Net Product Revneues	2,238	40.92
2,962	136.33	Other Revenues	2,987	54.62
3,892	179.14	Total Revenues	5,225	95.55
26	1.27	Salaries	52	0.98
240	11.72	Hourly Labor	445	8.37
73	3.57	Benefits	140	2.63
39	1.90	Payroll Taxes	63	1.19
34	1.66	Supplies	101	1.90
105	5.13	Maintenance & Repair	199	3.74
14	0.68	Power	72	1.35
35	1.71	Fuel & Water	98	1.84
30	1.47	Bags	73	1.37
11	0.54	Chemicals	34	0.64
(12)	-0.59	Freight	61	1.15
0	0.00	Outside Services	3	0.06
9	0.44	Royalties & property	27	0.51
60	2.93	Selling & administrative	129	2.43
(2)	-0.10	Taxes Other Than Income	13	0.24
139	6.79	Other	175	3.29
801	39.12	Cash Costs	1,685	31.70
23	1.12	Charge-ins	34	0.64
824	40.24	Total Cash Costs	1,719	32.34
40	1.95	Depreciation	173	3.26
42		Inventory Change	35	
906	41.70	Total Expenses	1,927	35.24
2,986	137.44	Operating Earnings	3,298	60.31
25,794		Tons Mined	70,636	
20,475		Tons Milled	53,148	
21,726		Tons Sold - Finished Goods	54,686	

NOTE: NO CONTROL BUDGET WAS COMPILED FOR THE CLAY OPERATIONS DUE TO THE ANTICIPATED DISPOSITION OF THOSE OPERATIONS.

LEHMAN 02108

CIM-TALC

Cyprus Industrial Minerals
CIM Talc Division (Co. 329)
Monthly Operating Report
February 1989

Month ($M)				Y-T-D ($M)		
Actual	Budget	Var.		Actual	Budget	Var.
3382	2933	449	Revenue (Product)	6245	5828	417
3135	2865	270	Cost of Goods Sold	6124	5580	544
247	68	179	Operating Earnings	121	248	(127)
13105	14264	(1159)	Tons Sold-Fin. Goods	27317	26483	834
8051	1190	6861	-Crude	8421	7570	851
13135	12788	347	Tons Milled	28963	28276	687
16303	22590	(6287)	Tons Mined	36312	45180	(8868)

U. S. Talc earnings were $.2MM above budget, primarily due to a 6,000 ton crude shipment to Nihon Mistron that was budgeted for January. Higher realizations of finished goods were a result of the sales mix and were offset by higher unit costs.

February and year-to-date variances were as follows:

	Feb.	Y-T-D
Budget Operating Earnings	68	248
Realizations - Crude	(232)	19
- Finished Goods	65	157
Volumes - Crude	493	36
- Finished Goods	3	(4)
Costs	(377)	(556)
Other Revenues	227	221
	247	121

LW-MRS:7

Shipping Location

CYPRUS INDUSTRIAL MINERALS
TALC SALES SUMMARY
FEBRUARY 1989

CURRENT MONTH ACT	CURRENT MONTH BUDGET	CURRENT MONTH VARIANCE		YEAR TO DATE ACTUAL	YEAR TO DATE BUDGET	YEAR TO DATE VARIANCE
			REVENUE ($M)			
840	877	(37)	Three Forks - F.G.	1,658	1,686	(28)
756	93	663	Three Forks - Crude	810	643	167
447	519	(72)	Grand Island	1,010	935	75
393	423	(30)	Alpine	816	671	145
17	0	17	Mistron Cascade	48	0	48
0	53	(53)	Brownsville - Crude	0	68	(68)
929	968	(39)	Warehouses/Other	1,903	1,825	78
3,382	2,933	449	Total Revenue	6,245	5,828	417
			TONS SOLD			
6,008	6,519	(511)	Three Forks - F.G.	11,891	12,234	(343)
8,051	890	7,161	Three Forks - Crude	8,421	7,170	1,251
1,814	2,359	(545)	Grand Island	4,366	4,269	97
1,147	1,189	(42)	Alpine	2,407	1,897	510
30	0	30	Mistron Cascade	85	0	85
0	300	(300)	Brownsville - Crude	0	400	(400)
4,106	4,197	(91)	Warehouses/Other	8,568	8,083	485
21,156	15,454	5,702	Total Tons Sold	35,738	34,053	1,685
			REALIZATIONS ($/TON)			
139.81	134.53	5.28	Three Forks - F.G.	139.43	137.81	1.62
93.90	104.49	(10.59)	Three Forks - Crude	96.19	89.68	6.51
246.42	220.01	26.41	Grand Island	231.33	219.02	12.31
342.63	355.76	(13.13)	Alpine	339.01	353.72	(14.71)
566.67	0.00	566.67	Mistron Cascade	564.71	0.00	564.71
0.00	176.67	(176.67)	Brownsville - Crude	0.00	170.00	(170.00)
226.25	230.64	(4.39)	Warehouses/Other	222.11	225.78	(3.68)
159.86	189.79	(29.93)	Average Realization	174.74	171.14	3.60

Note: Warehouse realizations are strongly influenced by the mix of shipping locations due to the freight component included in sales price.

CIM TALC - DIVISION OF CYPRUS MINES
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
2.638	201.30	2.787	195.39	5.91	Finished Goods Revenues *	5.461	199.91	5.117	193.22	6.69
756	93.90	146	122.69	-28.79	Crudes Revenues **	810	96.19	711	93.92	2.26
- (12)	-0.57	0	0.00	-0.57	Sales Discounts & Commissions	(26)	-0.73	0	0.00	-0.73
3.382	159.86	2,933	189.79	-29.93	Net Product Revenues ***	6.245	174.74	5,828	171.14	3.60
242	11.44	15	0.97	10.47	Other Revenues	251	7.02	30	0.88	6.14
3.624	171.30	2.948	190.76	-19.46	Total Revenues ***	6.496	181.77	5,858	172.03	9.74
105	4.96	117	7.63	-2.68	Salaries	216	5.78	236	6.58	-0.81
456	21.52	540	35.23	-13.71	Hourly Labor	983	26.29	1.081	30.16	-3.86
104	4.91	231	15.07	-10.16	Benefits	186	4.98	461	12.86	-7.89
61	2.88	0	0.00	2.88	Payroll Taxes	124	3.32	0	0.00	3.32
137	6.47	115	7.50	-1.04	Supplies	268	7.17	233	6.50	0.67
110	5.19	135	8.81	-3.62	Maintenance & Repair	260	6.95	272	7.59	-0.63
118	5.57	115	7.50	-1.93	Power	206	5.51	231	6.44	-0.93
127	5.99	131	8.55	-2.55	Fuel & Water	307	8.21	263	7.34	0.88
14	0.66	19	1.24	-0.58	Explosives	44	1.18	37	1.03	0.14
149	7.03	161	10.50	-3.47	Bags	308	8.24	321	8.95	-0.72
54	2.55	43	2.81	-0.26	Chemicals	92	2.46	85	2.37	0.09
243	11.47	197	12.85	-1.38	Freight	498	13.32	393	10.96	2.36
194	9.16	115	7.50	1.65	Outside Services	325	8.69	232	6.47	2.22
6	0.28	25	1.63	-1.35	Rail Car Expense	28	0.75	50	1.39	-0.65
5	0.24	0	0.00	0.24	Insurance	11	0.29	0	0.00	0.29
1	0.05	0	0.00	0.05	Royalties & property	8	0.21	0	0.00	0.21
162	7.65	51	3.33	4.32	Selling & administrative	220	5.88	102	2.85	3.04
99	4.67	96	6.26	-1.59	Property Taxes	200	5.35	192	5.36	-0.01
54	2.55	160	10.44	-7.89	Other	104	2.78	284	7.92	-5.14
2.199	103.79	2.251	146.86	-43.06	Cash Costs #	4.388	117.38	4.473	124.78	-7.41
474	22.37	474	30.92	-8.55	Charge-ins	948	25.36	948	26.45	-1.09
2.673	126.17	2.725	177.78	-51.61	Total Cash Costs #	5.336	142.73	5.421	151.23	-8.50
213	10.05	178	11.61	-1.56	Depreciation	426	11.40	356	9.93	1.46
491		(23)			Inventory Change	613		(167)		
3.377	159.62	2.880	186.36	-26.74	Total Expenses ***	6.375	170.38	5.610	164.74	13.64
247	11.68	68	4.40	7.28	CIM TALC Operating Earnings***	121	3.39	248	7.28	-3.90
16.303		22.590		(6.287)	Tons Mined	36.312		45.180		(8.868)
13.135		14,138		(1.003)	Tons Milled	28.963		28,276		687
21.186		15.328		5.858	Tons Produced #	37.384		35,846		1,538
8.051		1.190		6.861	Tons Sold - Crude **	8.421		7.570		851
13.105		14.264		(1.159)	Tons Sold - Finished Goods *	27.317		26.483		834
21.156		15,454		5.702	Total Tons Sold ***	35.738		34.053		1.685

THREE FORKS MILL
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
852	141.81	877	134.53	7.28	Finished Goods Revenue *	1,677	141.03	1,686	137.81	3.22
756	93.90	93	104.49	-10.59	Crude Revenue **	810	96.19	643	89.68	6.51
(12)	-0.85	0	0.00	-0.85	Sales Discount ***	(19)	-0.94	0	0.00	-0.94
1,596	113.52	970	130.92	-17.40	Net Product Revenue ***	2,468	121.50	2,329	120.03	1.48
8	0.57	15	2.02	-1.46	Other Revenues	42	2.07	30	1.55	0.52
1,604	114.09	985	132.95	-18.86	Total Revenues ***	2,510	123.57	2,359	121.57	2.00
24	2.67	30	3.10	-0.43	Salaries	51	2.50	60	3.10	-0.60
127	14.13	121	12.49	1.64	Hourly Labor	253	12.41	241	12.44	-0.03
39	4.34	53	5.47	-1.13	Benefits	68	3.33	105	5.42	-2.08
26	2.89	37	3.82	-0.93	Supplies	60	2.94	74	3.82	-0.88
46	5.12	41	4.23	0.88	Maintenance & Repair	75	3.68	83	4.28	-0.61
45	5.01	59	6.09	-1.09	Power	109	5.34	119	6.14	-0.80
46	5.12	48	4.95	0.16	Fuel & Water	120	5.88	96	4.95	0.93
113	12.57	107	11.04	1.52	Bags	239	11.72	213	10.99	0.73
0	0.00	0	0.00	0.00	Chemicals	2	0.10	0	0.00	0.10
0	0.00	2	0.21	-0.21	Outside Services	0	0.00	4	0.21	-0.21
2	0.22	0	0.00	0.22	Insuranse	4	0.20	0	0.00	0.20
6	0.67	25	2.58	-1.91	Rail Car Expense	28	1.37	50	2.58	-1.21
24	2.67	24	2.48	0.19	Taxes Other Than Income	48	2.35	48	2.48	-0.12
19	2.11	60	6.19	-4.08	Other	46	2.26	117	6.04	-3.78
517	57.50	607	62.65	-5.15	Mill Cash Costs #	1,103	54.09	1,210	62.45	-8.36
196	21.80	196	20.23	1.57	Charge-ins	392	19.22	392	20.23	-1.01
713	79.30	803	82.89	-3.58	Total Cash Costs #	1,495	73.31	1,602	82.68	-9.37
80	8.90	81	8.36	0.54	Depreciation	159	7.80	159	8.21	-0.41
866		353			Inventory Change	957		739		
1,659	118.00	1,237	166.96	-48.96	Total Expenses ***	2,611	128.54	2,500	128.84	-0.29
(55)	-3.91	(252)	-34.01	30.10	Operating Earnings ***	(101)	-4.97	(141)	-7.27	2.29
8,991		9,688		(697)	Tons Milled #	20,393		19,376		1,017
6,008		6,519		(511)	Tons Sold - Finished Goods*	11,891		12,234		(343)
8,051		890		7,161	Tons Sold - Crude**	8,421		7,170		1,251
14,059		7,409		6,650	Total Tons Sold***	20,312		19,404		908
3,183		3,217		(34)	Transfers to Warehouse	8,261		6,330		1,931

Three Forks Mill
Analysis of Inventory Change
For the Two Months Ended February 28, 1989

	$	Tons	$/Ton
Inventory 1/1/89:			
Crude at the mine - Yellowstone	292,924	27,334	10.72
Crude at the mine - Beaverhead	24,097	222	108.55
Crude at the mine - Antler	301,721	5,638	53.52
Crude at the mine - Alder	298,762	6,059	49.31
Crude at the mill	1,420,562	22,387	63.45
Finished goods	132,413	1,065	124.33
Total	2,470,479	62,705	
Inventory 2/28/89:			
Crude at the mine - Yellowstone	623,046	36,490	17.07
Crude at the mine - Beaverhead	45,033	486	92.66
Crude at the mine - Antler	305,247	5,851	52.17
Crude at the mine - Alder	331,168	6,453	51.32
Crude at the mill	888,618	16,733	53.11
Finished goods	169,832	1,446	117.45
Total	2,362,944		
Decrease (increase) in inventory	107,535		
Crude transferred out:			
Alpine mill	(141,560)	968	146.24
Grand Island mill	(394,980)	6,024	65.57
Freight	166,000		
Product transferred to warehouses	(970,490)	8,263	117.45
To zero mine costs	2,190,000		
Inventory change	956,505		

InvAnal:3

GRAND ISLAND MILL
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
447	246.42	519	220.01	26.41	Finished Goods Revenue	1,012	231.79	935	219.02	12.77
0	0.00	0	0.00	0.00	Crude Revenue	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Sales Discount	(2)	-0.46	0	0.00	-0.46
447	246.42	519	220.01	26.41	Net Product Revenue	1,010	231.33	935	219.02	12.31
2	1.10	0	0.00	1.10	Other Revenues	4	0.92	0	0.00	0.92
449	247.52	519	220.01	27.51	Total Revennes *	1,014	232.25	935	219.02	13.23
10	3.42	12	3.81	-0.40	Salaries	21	3.52	24	3.81	-0.29
29	9.91	43	13.66	-3.76	Hourly Labor	83	13.93	86	13.66	0.27
10	3.42	16	5.08	-1.67	Benefits	23	3.86	32	5.08	-1.22
22	7.52	18	5.72	1.80	Supplies	40	6.71	36	5.72	0.99
11	3.76	11	3.50	0.26	Maintenance & Repair	23	3.86	21	3.34	0.52
28	9.57	19	6.04	3.53	Power	28	4.70	38	6.04	-1.34
31	10.59	21	6.67	3.92	Fuel & Water	44	7.39	43	6.83	0.55
26	8.88	41	13.03	-4.15	Bags	53	8.90	82	13.03	-4.13
28	9.57	22	6.99	2.58	Chemicals	49	8.22	43	6.83	1.39
0	0.00	0	0.00	0.00	Freight	0	0.00	0	0.00	0.00
2	0.68	5	1.59	-0.91	Outside Services	3	0.50	11	1.75	-1.24
0	0.00	0	0.00	0.00	Insurance	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Royalties & property	0	0.00	0	0.00	0.00
3	1.02	0	0.00	1.02	Selling & administrative	7	1.17	0	0.00	1.17
3	1.02	3	0.95	0.07	Taxes Other Than Income	6	1.01	6	0.95	0.05
5	1.71	4	1.27	0.44	Other	9	1.51	8	1.27	0.24
208	71.06	215	68.32	2.74	Mill Cash Costs **	389	65.29	430	68.32	-3.03
71	24.26	71	22.56	1.70	Charge-ins	142	23.83	142	22.56	1.27
279	95.32	286	90.88	4.44	Total Cash Costs **	531	89.12	572	90.88	-1.76
14	4.78	16	5.08	-0.30	Depreciation	28	4.70	33	5.24	-0.54
0		122			Inventory Change	203		281		
293	161.52	424	179.74	-18.22	Total Expenses *	762	174.53	886	207.54	-33.01
156	86.00	95	40.27	45.73	Operating Earnings *	252	57.72	49	11.48	46.24
2,927		3,147		(220)	Tons Produced **	5,958		6,294		(336)
1,814		2,359		(545)	Tons Sold *	4,366		4,269		97
736		957		(221)	Transfers to Warehouse	1,604		1,712		(108)

Grand Island Mill
Analysis of Inventory Change
For the Two Months Ended February 28, 1989

	$	Tons	$/Ton
Inventory 1/1/89:			
Crude at the mill	110,537	935	118.22
Finished goods	166,173	764	217.50
Total	276,710	1,699	
Inventory 2/28/89:			
Crude at the mill	243,966	2,257	108.09
Finished goods	135,546	730	185.68
Total	379,512	2,987	
Decrease (increase) in inventory	(102,802)		
Crude transferred in	394,980	6,024	65.57
Product transferred to warehouses	(297,831)	1,604	185.68
Freight	209,000		
Inventory Change	203,347		

InvAnal:2

ALPINE MILL
Income Statement
FEBRUARY 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
191	142.61	421	155.76	-11.11	Finished Goods Revenue	820	140.67	671	151.72	-11.04
0	0.00	0	0.00	0.00	Sales Discount	(4)	-1.66	0	0.00	-1.66
191	142.61	421	155.76	-11.11	Net Product Revenue	816	139.01	671	151.72	-14.71
18	15.69	0	0.00	15.69	Other Revenues	5	2.08	0	0.00	2.08
411	158.31	421	155.76	2.56	Total Revenues *	821	141.09	671	151.72	-12.61
11	11.47	15	11.51	-0.04	Salaries	24	9.81	11	11.90	-2.09
11	27.16	26	19.95	7.41	Hourly Labor	66	26.97	51	19.57	7.40
11	9.71	11	9.98	-0.27	Benefits	20	8.17	25	9.59	-1.42
9	7.94	12	9.21	-1.27	Supplies	20	8.17	24	9.21	-1.04
23	20.10	9	6.91	13.35	Maintenance & Repair	36	14.71	19	7.29	7.42
12	28.24	21	16.12	12.11	Power	51	20.84	42	16.12	4.71
11	11.47	17	13.05	-1.57	Fuel & Water	31	12.67	14	11.05	-0.18
9	7.94	11	9.98	-2.01	Bags	15	6.11	26	9.98	-1.85
26	22.95	21	16.12	6.81	Chemicals	16	14.71	42	16.12	-1.40
0	0.00	0	0.00	0.00	Freight	0	0.00	0	0.00	0.00
1	0.88	1	0.77	0.12	Outside Services	1	0.41	1	0.18	0.02
1	0.88	0	0.00	0.88	Insurance	1	0.41	0	0.00	0.41
1	0.88	1	0.77	0.12	Taxes Other Than Income	2	0.82	2	0.77	0.05
5	4.41	1	2.10	2.11	Other	9	1.68	6	2.10	1.18
175	154.46	152	116.65	37.80	Mill Cash Costs **	112	127.50	101	116.27	11.21
65	57.37	65	49.88	7.48	Charge-ins	110	51.11	110	49.88	1.24
240	211.81	217	166.54	45.29	Total Cash Costs **	442	180.61	411	166.16	14.47
11	9.71	9	6.91	2.80	Depreciation	22	8.99	18	6.91	2.08
166		128			Inventory Change	265		121		
417	161.56	154	297.71	65.81	Total Expenses *	729	102.87	574	102.58	0.28
(6)	-5.23	69	58.81	-63.26	Operating Earnings *	92	18.22	97	51.11	-12.91
1,111		1,101		(170)	Tons Produced **	2,447		2,606		(159)
1,147		1,189		(42)	Tons Sold *	2,407		1,897		510
44		23		21	Transfers to Warehouse	95		41		54

Alpine Mill
Analysis of Inventory Change
For the Two Months Ended February 28, 1989

	$	Tons	$/Ton
Inventory 1/1/89:			
Crude at the mine	62,059	4,918	12.62
Crude at the mill	1,447,880	11,143	129.94
Finished goods	175,714	706	248.89
Total	1,685,653	16,767	
Inventory 2/28/89:			
Crude at the mine	38,489	3,259	11.81
Crude at the mill	1,325,157	10,728	123.52
Finished goods	158,616	649	244.40
Total	1,522,262		
Decrease in inventory	163,391		
Crude transferred in	141,560	968	146.24
Product transferred to warehouses	(21,508)	95	226.40
Freight	19,000		
Credit for Australian crude damage	(37,000)		
Inventory Change	265,443		

InvAnal:4

YELLOWSTONE MINE
Production Costs
February 1985

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
25	1.81	20	1.06	0.75	Salaries	51	1.64	40	1.06	0.58
219	15.81	306	16.19	-0.38	Hourly Labor	478	15.36	611	16.16	-0.81
79	5.70	119	6.30	-0.59	Benefits	153	4.92	237	6.27	-1.35
34	2.46	20	1.06	1.40	Supplies	67	2.15	40	1.06	1.09
27	1.95	63	3.33	-1.38	Maintenance & Repair	115	3.69	126	3.33	0.36
8	0.58	9	0.48	0.10	Power	8	0.26	18	0.48	-0.22
37	2.67	45	2.38	0.29	Fuel	110	3.53	90	2.38	1.15
14	1.01	19	1.01	0.01	Explosives	44	1.41	37	0.98	0.43
0	0.00	0	0.00	0.00	Chemicals	0	0.00	0	0.00	0.00
0	0.00	1	0.05	-0.05	Freight	0	0.00	1	0.03	-0.03
147	10.62	33	1.75	8.87	Outside Services	224	7.20	68	1.80	5.40
1	0.07	0	0.00	0.07	Insurance	2	0.06	0	0.00	0.06
0	0.00	0	0.00	0.00	Royalties & property	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Selling & administrative	0	0.00	0	0.00	0.00
(1)	-0.07	55	2.91	-2.98	Taxes Other Than Income	47	1.51	110	2.91	-1.40
4	0.29	8	0.42	-0.13	Other	10	0.32	15	0.40	-0.08
594	42.89	698	36.93	5.96	Mine Cash Costs	1.309	42.06	1.393	36.85	5.20
118	8.52	118	6.24	2.28	Charge-ins	236	7.58	236	6.24	1.34
712	51.42	816	43.17	8.24	Total Cash Costs	1.545	49.64	1.629	43.10	6.54
66	4.77	66	3.49	1.27	Depreciation	134	4.31	133	3.52	0.79
(931)		(882)		0.00	Inventory Change	(1.679)		(1.762)		0.00
(53)	-3.83	0	0.00	-3.83	Total Expenses	0	0.00	0	0.00	0.00
13.848		18.900		(5.052)	Tons Mined & Sorted	31.125		37.800		(6.675)
1.487		4.253		(2.766)	Tons Tailings Produced	4.546		8.506		(3.960)
15.335		23.153		(7.818)	Tons Mined	35,671		46,306		(10.635)

Memo:
To arrive at $/Ton - Tons Mined & Sorted was used

BEAVERHEAD MINE
Production Costs
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
9	4.86	12	7.13	-2.27	Salaries	18	5.26	25	7.42	-2.16
45	26.46	44	26.13	0.33	Hourly Labor	102	29.81	92	31.32	2.49
10	5.72	18	10.69	-0.97	Benefits	33	9.64	38	11.28	-1.64
26	15.66	27	16.03	-0.37	Supplies	62	18.12	57	16.97	1.15
4	2.16	10	5.94	-3.78	Maintenance & Repair	10	2.92	21	6.24	-3.31
6	3.24	6	3.56	-0.32	Power	8	2.34	13	3.86	-1.52
0	0.00	0	0.00	0.00	Fuel & Water	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Bags	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Chemicals	0	0.00	0	0.00	0.00
6	3.24	0	0.00	3.24	Freight	11	3.21	0	0.00	3.21
0	0.00	12	7.13	-7.13	Outside Services	0	0.00	24	7.13	-7.13
1	0.54	0	0.00	0.54	Royalties & property	1	0.29	0	0.00	0.29
0	0.00	0	0.00	0.00	Selling & administrative	0	0.00	0	0.00	0.00
32	17.28	12	7.13	10.15	Taxes Other Than Income	45	11.15	24	7.13	6.02
5	2.70	4	2.38	0.32	Other	11	3.21	7	2.08	1.14
153	85.85	145	86.10	-0.25	Mine Cash Costs	301	87.96	301	89.37	-1.41
31	16.74	31	18.42	-1.67	Charge-ins	61	17.83	61	18.11	-0.29
158	102.59	176	104.51	-1.92	Total Cash Costs	362	105.79	362	107.48	-1.70
6	3.24	6	3.56	-0.32	Depreciation	13	3.80	13	3.86	-0.06
(797)		(182)			Inventory Change	(375)		(375)		
(13)	-7.02	0	0.00	-7.02	Total Expenses	0	0.00	0	0.00	0.00
1,852		1,684		168	Tons Mined & Sorted	3,427		3,368		54
0		0		0	Tons Screenings Produced	0		0		0
1,852		1,684		168	Total Mined	3,427		3,368		54

ANTLER MINE
Production Costs
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
0	0.00	0	0.00	0.00	Salaries	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Hourly Labor	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Benefits	0	0.00	0	0.00	0.00
0	0.00	1	0.75	-0.75	Supplies	0	0.00	2	0.75	-0.75
0	0.00	1	0.75	-0.75	Maintenance & Repair	1	0.57	2	0.75	-0.18
0	0.00	0	0.00	0.00	Power	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Fuel & Water	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Bags	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Chemicals	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Freight	0	0.00	0	0.00	0.00
43	71.31	56	42.01	29.30	Outside Services	93	52.69	111	41.64	11.06
1	1.66	0	0.00	1.66	Royalties & property	8	4.53	0	0.00	4.53
0	0.00	0	0.00	0.00	Selling & administrative	0	0.00	0	0.00	0.00
3	4.98	1	0.75	4.22	Taxes Other Than Income	4	2.27	2	0.75	1.52
0	0.00	8	6.00	-6.00	Other	0	0.00	15	5.63	-5.63
47	77.94	67	50.26	27.68	Mine Cash Costs	106	60.06	132	49.51	10.54
15	24.88	15	11.25	13.62	Charge-ins	30	17.00	30	11.25	5.74
62	102.82	82	61.52	41.30	Total Cash Costs	136	77.05	162	60.77	16.29
0	0.00	0	0.00	0.00	Depreciation	0	0.00	0	0.00	0.00
(83)		(82)			Inventory Change	(136)		(162)		
(21)	-38.14	0	0.00	-38.14	Total Expenses	0	0.00	0	0.00	0.00
603		1,333		(730)	Tons Mined	1,765		2,666		(901)

ALPINE MINE
Production Costs
FEBRUARY 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
0		0	0.00	0.00	Salaries	0		0	0.00	0.00
0		0	0.00	0.00	Hourly Labor	0		0	0.00	0.00
0		0	0.00	0.00	Benefits	0		0	0.00	0.00
2		0	0.00	0.00	Supplies	2		0	0.00	0.00
0		0	0.00	0.00	Maintenance & Repair	0		0	0.00	0.00
0		0	0.00	0.00	Power	0		0	0.00	0.00
0		0	0.00	0.00	Fuel & Water	0		0	0.00	0.00
0		0	0.00	0.00	Bags	0		0	0.00	0.00
0		0	0.00	0.00	Chemicals	0		0	0.00	0.00
0		0	0.00	0.00	Freight	0		0	0.00	0.00
1		6	8.92	-8.92	Outside Services	1		13	9.66	-9.66
0		0	0.00	0.00	Royalties & property	0		0	0.00	0.00
0		0	0.00	0.00	Selling & administrative	0		0	0.00	0.00
1		0	0.00	0.00	Taxes Other Than Income	2		0	0.00	0.00
0		0	0.00	0.00	Other	0		0	0.00	0.00
4	0.00	6.00	8.92	-8.92	Mine Cash Costs	5	0.00	13	9.66	-9.66
15		15	22.29	-22.29	Charge-ins	30		30	22.29	-22.29
19		21	31.20	-31.20	Total Cash Costs	35		43	31.95	-31.95
6		0	0.00	0.00	Depreciation	12		0	0.00	0.00
0		(21)			Inventory Change	0		(43)		
25		0	0.00	0.00	Total Expenses	47		0	0.00	0.00
0		673		(673)	Tons Produced	0		1,346		(1,346)

WAREHOUSING
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
929	225.25	968	230.64	-4.39	Finished Goods Revenue	1,904	222.22	1,825	225.78	-3.56
0	0.00	53	176.67	-176.67	Crude Revenue	0	0.00	68	170.00	-170.00
0	0.00	0	0.00	0.00	Sales Discount	(1)	-0.12	0	0.00	-0.12
929	226.25	1,021	227.04	-0.79	Net Product Revenue	1,903	222.11	1,893	223.15	-1.05
18	4.38	0	0.00	4.38	Other Revenues	3	0.35	0	0.00	0.35
947	230.64	1,021	227.04	3.60	Total Revenues	1,906	222.46	1,893	223.15	-0.70
10	2.44	0	0.00	2.44	Supplies	13	1.52	0	0.00	1.52
0	0.00	0	0.00	0.00	Maintenance & Repair	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Power	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Fuel & Water	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Bags	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Chemicals	0	0.00	0	0.00	0.00
237	57.72	196	43.58	14.14	Freight	487	56.84	392	46.21	10.63
0	0.00	0	0.00	0.00	Outside Services	0	0.00	0	0.00	0.00
63	15.34	51	11.34	4.00	Selling & administrative	119	13.89	102	12.02	1.86
(1)	-0.24	0	0.00	-0.24	Taxes Other Than Income	(1)	-0.12	0	0.00	-0.12
0	0.00	41	9.12	-9.12	Other	0	0.00	52	6.13	-6.13
309	75.26	288	64.04	11.21	Total Cash Costs	618	72.13	546	64.36	7.76
0	0.00	0	0.00	0.00	Depreciation	0	0.00	0	0.00	0.00
577	140.53	541	120.30	20.22	Inventory Change	1,360	158.73	1,032	121.66	37.08
886	215.78	829	184.35	31.44	Total Expenses	1,978	230.86	1,578	186.02	44.84
61	14.86	192	42.70	-27.84	Operating Earnings	(72)	-8.40	315	37.13	-45.54
4,106		4,197		(91)	Tons Sold - Finished Goods	8,568		8,083		485
0		300		(300)	Tons Sold - Crude	0		400		(400)
4,106		4,497		(391)	Total Tons Sold	8,568		8,483		85
3,963		4,197		(234)	Transfers to Warehouse	9,962		8,083		1,879

Warehousing
Analysis of Inventory Change
For the Two Months Ended February 28, 1989

	$	Tons	$/Ton
Inventory 1/1/89	2,284,433	9,769	233.85
Inventory 2/28/89	2,213,680	9,908	223.42
Decrease (increase) in inventory	70,753		
Products transferred in:			
Alpine Mill	21,508	95	226.40
Three Forks Mill	970,490	8,263	117.45
Grand Island Mill	297,831	1,604	185.68
Inventory Change	1,360,582		

InvAnal:1

ADMINISTRATIVE COSTS
Income Statement
February 1989

Current Month Actual	Current Month Budget	Variance		Year to Date Actual	Year to Date Budget	Variance
$M	$M	$M		$M	$M	$M
0	0	0	Finished Goods Revenue	0	0	0
0	0	0	Crude Revenue	0	0	0
0	0	0	Sales Discount	1	0	1
0	0	0	Net Product Revenue	1	0	1
197	0	197	Other Revenues	197	0	197
197	0	197	Total Revenues	198	0	198
24	28	(4)	Salaries	51	56	(5)
0	0	0	Hourly Labor	1	0	1
(53)	12	(65)	Benefits	(111)	24	(135)
61	0	61	Payroll Taxes	124	0	124
1	0	1	Supplies	1	0	1
0	0	0	Maintenance & Repair	0	0	0
0	1	(1)	Power	2	1	1
0	0	0	Fuel & Water	2	0	2
0	0	0	Bags	1	0	1
0	0	0	Chemicals	0	0	0
0	0	0	Freight	0	0	0
0	0	0	Outside Services	2	0	2
0	0	0	Insurance	4	0	4
0	0	0	Royalties & property	0	0	0
64	0	64	Selling & administrative	62	0	62
37	0	37	Taxes Other Than Income	47	0	47
48	32 *	16	Other	50	64	(14)
182	73	109	Administrative Cash Costs	236	145	91
(53)	(53)	0	Charge-outs	(105)	(105)	0
129	20	109	Total Cash Costs	131	40	91
30	0	30	Depreciation	58	0	58
0	0	0	Inventory Change	0	0	0
159	20	139	Total Expenses	189	40	149
38	(20)	58	Operating Earnings	9	(40)	49

Memo:
Includes VanHorn, Ferney, Los Angeles, South Plainfield, and Western Operations Headquarters

*Including Western Operations T & E ($12M) and Gaikin accrual ($20).

Other income resulted from a reconciliation of accounts receivable.

KISTRON CASCADE
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
17	566.67	0		566.67	Finished Goods Revenue	48	564.71	0		564.71
0	0.00	0		0.00	Crude Revenue	0	0.00	0		0.00
0	0.00	0		0.00	Sales Discount	0	0.00	0		0.00
17	566.67	0		566.67	Net Product Revenue	48	564.71	0		564.71
0	0.00	0		0.00	Other Revenues	0	0.00	0		0.00
17	566.67	0	0.00	566.67	Total Revenues	48	564.71	0	0.00	564.71
0	0.00	0		0.00	Salaries	0	0.00	0		0.00
0	0.00	0		0.00	Hourly Labor	0	0.00	0		0.00
0	0.00	0		0.00	Benefits	0	0.00	0		0.00
4	47.62	0		47.62	Supplies	4	24.24	0		24.24
0	0.00	0		0.00	Maintenance & Repair	0	0.00	0		0.00
0	0.00	0		0.00	Power	0	0.00	0		0.00
0	0.00	0		0.00	Fuel & Water	0	0.00	0		0.00
0	0.00	0		0.00	Bags	0	0.00	0		0.00
0	0.00	0		0.00	Chemicals	5	30.30	0		30.30
0	0.00	0		0.00	Freight	0	0.00	0		0.00
0	0.00	0		0.00	Outside Services	1	6.06	0		6.06
0	0.00	0		0.00	Insurance	0	0.00	0		0.00
0	0.00	0		0.00	Royalties & property	0	0.00	0		0.00
0	0.00	0		0.00	Selling & administrative	0	0.00	0		0.00
0	0.00	0		0.00	Taxes Other Than Income	0	0.00	0		0.00
0	0.00	0		0.00	Other	0	0.00	0		0.00
4	47.62	0	0.00	47.62	Cash Costs	10	60.61	0	0.00	60.61
16	190.48	16		190.48	Charge-ins	31	187.88	32		187.88
20	238.10	16		238.10	Total Cash Costs	41	248.48	32		248.48
0	0.00	0		0.00	Depreciation	0	0.00	0		0.00
10		0		0.00	Inventory Change	17		0		0.00
30	1000.00	16		1000.00	Total Expenses	58	682.35	32		682.35
(13)	-433.33	(16)	0.00	-433.33	Operating Earnings	(18)	-117.65	(32)	0.00	-117.65
84		0		84	Tons Produced	165		0		165
30		0		30	Tons Sold	85		0		85

GREEN MOUNTAIN

GREEN MOUNTAIN TALC

MONTHLY REPORT

FEBRUARY 1989

Green Mountain Talc
Monthly Operating Report
February 1989

Operating earnings of $65M (including corporate charge-ins) were $23M over budget. Contributions to earnings by operation are as follows:

	$M		
	Act	Bud	Var
Chester	45	24	21
Johnson	7	18	(11)
Eastern Operations (after charge-outs)	4	-	4
Other	9	-	9
Total Green Mountain	65	42	23

Operating earnings at both milling locations were improved by higher average realizations with unit costs close to budget. The income from eastern operations administration represents the actual costs for February below charged-out amounts. The other unbudgeted costs are reversals of prior month unallocated costs. These were allocated to Chester and Johnson in February.

The operating variances from budget are as follows:

	Month $M	Y-T-D $M
Budgeted Operating Earnings	42	39
Realizations - Chester	13	51
- Johnson	42	71
Customer Freight Expense	(27)	(29)
Unit Costs Johnson	(15)	69
Unit Costs chester	34	27
Marble Mart Income	(3)	(6)
Eastern Admin. Costs	4	16
Unallocated Costs	9	-
Inventory Change	(34)	(152)
Actual Operating Earnings	65	86

Higher realizations were experienced as more cosmetic grade customers purchased Johnson's product and a favorable mix improved Chester's realizations. Realizations were 18.90/ton above budget, while milling costs were within 16.54/ton of budget. This is even though mills were only operating at 85% of budget.

The budgeted Marble Mart income did not occur sice the lease was cancelled.

Customer freight expense represents approximately one-half month accrual based on billings in February.

GM-MOR:1

Green Mountain Talc
Monthly Operating Report
February 1989

Current Month Actual	Current Month Budget	Current Month Var		Year-to-Date Actual	Year-to-Date Budget	Year-to-Date Var
3,807	4,546	(739)	Tons Sold - Chester	8,304	8,956	(652)
2,815	2,771	44	- Johnson	5,312	5,289	23
6,622	7,317	(695)	Total Tons Sold	13,616	14,245	(629)
3,689	4,541	(852)	Tons Produced - Chester	8,396	9,082	(686)
2,731	3,000	(269)	- Johnson	5,168	6,000	(832)
6,420	7,541	(1,121)	Total Tons Produced	13,564	15,082	(1,518)
5,663	7,029	(1,366)	Tons Mined - Hamm	11,356	14,058	(2,702)
1,235	7,187	(5,952)	- Troy	1,235	14,374	(13,139)
6,898	14,216	(7,318)	Total Tons Mined	12,591	28,432	(15,841)
			Financial Statistics:			
765	739	26	Revenue ($M)	1,524	1,410	114
640	637	3	Operating Costs ($M)	1,318	1,251	67
60	60	-	Corp. Charge-Ins ($M)	120	120	-
700	697	3	Cost of Goods Sold	1,438	1,371	67
65	42	23	Operating Income ($M)	86	39	47
70	67	3	Add: D, D & A ($M)	137	134	3
10	30	(20)	Less: Cap. Expend. ($M)	19	70	(51)
125	79	46	Operating Cash Flow ($M)	204	103	101
74.60	63.81	10.70	Ave. Real.($/T Sold)-Chester	73.22	63.53	9.69
171.23	163.12	8.11	-Johnson	169.99	159.20	10.79
115.67	102.07	13.60	Ave. Green Mtn. Real.	110.97	99.05	11.92
50.69	48.74	1.95	Cash Cost ($/T Prod.)-Chester*	50.38	48.45	1.93
160.92	145.94	14.98	-Johnson*	156.44	147.33	9.11
99.69	87.39	12.30	Ave. Cash Cost/Ton Prod.	92.45	87.39	4.66
62.78	58.28	(4.50)	Total Cost ($/T Sold)-Chester*	61.54	57.74	3.80
168.74	156.62	(12.12)	-Johnson*	173.95	156.74	17.21
107.82	96.23	(11.59)	Ave. Total Cost/Ton Sold	105.39	96.31	9.08

*Including Corp. Charge-Ins

Location:Consolidated

GREEN MOUNTAIN TALC
Operating Report
February 1989

Current Month						Year to Date					
Actual		Budget		Var		Actual		Budget		Var	
$M	$/ton	$M	$/ton	$/ton		$M	$/ton	$M	$/ton	$/ton	
793	119.75	731	99.89	19.86	Product Revenue	1,534	112.66	1,406	98.70	13.96	
0	0.00	3	0.34	(0.34)	Rental Income(Marble Mart)	0	0.00	5	0.35		
(27)	(4.08)	0	0.00	(4.08)	Other Revenue(Cust Freight)	(23)	(1.69)	0	0.00	(1.69)	
766	115.68	733	100.23	15.44	Total Revenue *	1,511	110.97	1,411	99.05	11.92	
38	5.92	26	3.43	2.49	Salaries	78	5.73	52	3.45	2.28	
65	10.12	73	9.67	0.46	Hourly Labor	132	9.69	146	9.68	(0.01)	
34	5.30	29	3.84	1.46	Benefits	58	4.26	58	3.85	(0.41)	
12	1.87	38	5.09	(3.22)	Supplies	28	2.06	76	5.04	2.98	
59	9.19	51	6.76	2.43	Maint. & Repairs	135	9.91	113	7.49	(2.42)	
92	14.33	110	14.62	(0.29)	Power	187	13.73	221	14.65	0.92	
36	5.61	14	1.83	3.77	Fuel/Water	51	3.75	29	1.92	(1.82)	
29	4.52	41	5.45	(0.93)	Bags	50	3.67	83	5.50	1.83	
5	0.78	2	0.20	0.58	Chemicals	8	0.59	3	0.20	(0.39)	
76	11.84	28	3.71	8.12	Freight	153	11.24	56	3.71	(7.52)	
48	7.48	13	1.66	5.81	Outside Services	57	4.19	25	1.66	(2.53)	
2	0.31	0	0.00	0.31	Royalties/Property Exp.	9	0.66	0	0.00	(0.66)	
19	2.96	9	1.19	1.77	Prop. & Franchise Taxes	34	2.50	18	1.19	(1.30)	
54	8.41	21	2.78	5.63	Other	88	6.46	74	4.91	1.56	
569	88.63	454	60.23	28.39	Mill Cash Cost **	1,068	78.44	954	63.25	15.18	
64	9.97	71	9.42	0.55	Charge-ins	128	9.40	142	9.42	(0.01)	
633	98.60	525	69.65	28.95	Total Cash Costs **	1,196	87.84	1,096	72.67	15.17	
70	10.90	67	8.88	2.02	Depreciation	140	10.28	134	8.88	1.40	
(2)	(0.31)	99	13.13	(13.44)	Inventory Change	89	6.54	142	9.42	(2.88)	
701	105.86	691	94.47	11.39	Total Expenses *	1,425	104.66	1,372	96.31	8.34	
65	9.82	42	5.77	4.05	Operating Earnings *	86	6.32	39	2.74	3.58	
6,420		7,541		(1,121)	Tons Milled(M) **	13,564		15,082		(1,518)	
6,622		7,317		(695)	Tons Sold(M) *	13,616		14,245		(629)	
11,575		4,634		6,941	Crude Tons Used(M)	23,600		29,268		(5,668)	

GREEN MOUNTAIN TALC
INVENTORY REPORT
FEBRUARY 1989

MINE - TROY	$/TON	TONS	$
BEGINNING INVENTORY	9.24	75,242	695,071
ADD: PRODUCTION	25.38	1,235	31,350
LESS: TRANSFERS	9.24	5,962	55,089
ENDING INVENTORY	9.52	70,515	671,332
INV. CHG. ON B. SHEET			(23,739)
P & L IMPACT			23,739

MINE - HAMM	$/TON	TONS	$
BEGINNING INVENTORY			
ADD: PRODUCTION	13.32	5,663	75,420
LESS: TRANSFERS	13.32	5,663	75,420
ENDING INVENTORY		0	0
INV. CHG. ON B. SHEET			
P & L IMPACT			

MILL - JOHNSON	$/TON	TONS	$
BEGIN INVENTORY	17.01	8,346	141,997
TRANSFER FROM MINE	9.94	7,195	71,513
FREIGHT COSTS			33,186
CHG. IN WORK IN PROCESS	27.30	165	4,505
G & A COSTS			107
LESS: CRUDE USED	13.77	7,767	106,986
ENDING INVENTORY	18.18	7,939	144,322
INV. CHG. ON B. SHEET			2,325
P & L IMPACT			(2,325)

MILL - CHESTER	$/TON	TONS	$
BEGIN INVENTORY	7.93	3,562	28,260
TRANSFER FROM MINE	13.32	5,663	75,420
G & A COSTS			317
LESS: CRUDE USED	8.28	3,808	31,537
TRANSFER TO JOHNSON	13.32	1,233	16,424
ENDING INVENTORY	13.39	4,184	56,036
INV. CHG. ON B. SHEET			27,776
P & L IMPACT			(27,776)

SUMMARY:	CHESTER	JOHNSON	TROY	HAMM	TOTAL
MINE COSTS	58,996	47,774	(31,350)	(75,420)	0
FINISHED GOODS	4,145	451			4,596
CRUDE-MILL	(27,776)	(2,325)			(30,101)
-MINE		23,739			23,739
TOTAL	35,365	69,639	(31,350)	(75,420)	(1,766)

Location:Chester

GREEN MOUNTAIN TALC
Income Statement
February 1989

Current Month						Year to Date				
Actual		Budget		Var		Actual		Budget		Var
$M	$/ton	$M	$/ton	$/ton		$M	$/ton	$M	$/ton	$/ton
298	78.28	279	61.35	16.92	Product Revenue	621	74.78	564	62.97	11.81
0	0.00	3	0.55	(0.55)	Rental Income(Marble Mart)	0	0.00	5	0.56	
(14)	(3.68)	0	0.00	(3.68)	Other Revenue(Cust Freight)	(13)	(1.57)	0	0.00	(1.57)
284	74.60	281	61.90	12.69	Total Revenue	608	73.22	569	63.53	9.68
8	2.17	11	2.33	(0.16)	Salaries	16	1.91	21	2.31	(0.41)
12	3.25	23	5.06	(1.81)	Hourly Labor	27	3.22	46	5.06	1.85
10	2.71	10	2.24	0.47	Benefits	15	1.79	20	2.20	0.42
3	0.81	7	1.55	(0.74)	Supplies	7	0.83	14	1.54	0.71
19	5.15	16	3.52	1.63	Maint. & Repairs	70	8.34	32	3.52	(4.81)
43	11.66	43	9.37	2.28	Power	81	9.65	85	9.36	(0.29)
2	0.54	0	0.00	0.54	Fuel/Water	4	0.48	1	0.11	(0.37)
9	2.44	12	2.59	(0.15)	Bags	17	2.02	24	2.64	0.62
0	0.00	0	0.00	0.00	Chemicals	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Freight	1	0.12	0	0.00	(0.12)
0	0.00	3	0.66	(0.66)	Outside Services	1	0.12	5	0.55	0.43
0	0.00	0	0.00	0.00	Royalties/Property Exp.	0	0.00	0	0.00	0.00
10	2.71	4	0.92	1.79	Prop. & Franchise Taxes	16	1.91	8	0.88	(1.02)
10	2.71	15	3.30	(0.59)	Other	10	1.19	52	5.73	(4.53)
126	34.16	143	31.56	2.60	Mill Cash Cost	265	31.56	308	33.91	(2.35)
30	8.13	30	6.61	1.53	Charge-ins	60	7.15	60	6.61	0.54
156	42.29	173	38.17	4.12	Total Cash Costs	325	38.71	368	40.52	(1.81)
48	13.01	42	9.19	3.82	Depreciation	89	10.60	83	9.14	1.46
35	9.49	42	9.25	0.24	Inventory Change	100	11.91	76	8.37	3.54
239	62.78	257	56.54	6.24	Total Expenses	514	61.90	527	58.84	3.05
45	11.82	24	5.36	6.46	Operating Earnings	94	11.32	42	4.69	6.63
3.689		4.541		(852)	Tons Milled(M)	8.396		9.082		(686)
3.807		4.546		(739)	Tons Sold(M)	8.304		8.956		(652)
3.808		4.634		(826)	Crude Tons Used(M)	8.328		9.268		(940)

-Higher than budget realizations were due to a favorable product mix

-Total operating costs were under budget due to a lower crude used cost. This was a result of low cost $/ton inventory from January which was consumed in February

-Unit costs were higher due to low sales volume.

-Recoveries this month were 97%.

CIM-GREEN MOUNTAIN
CHESTER
FEBRARY 1989

FINISHED GOODS	TONS	VALUE	$/TON
12/31/88 BALANCE LAYER 1	225	19,745	87.76
ADD: 01/31/89 PRODUCTION	4,707	399,499	84.87
LESS: 01/31/89 SALES	4,521	396,750	87.76
01/31/89 BALANCE	411	22,494	54.73
ADD: 02/28/89 PRODUCTION	3,689	231,000	62.62
LESS: 02/28/89 SALES			
LAYER 1	411	22,494	54.73
LAYER 2	3,396	212,651	62.62
02/28/89 BALANCE	293	18,349	62.62
INVENTORY CHANGE		(4,145)	

SUMMARY

MINE COSTS	58,996
FINISHED GOODS	4,145
CRUDE-MILL	(27,776)
TOTAL INVENTORY CHANGE	35,365

Location:Johnson

GREEN MOUNTAIN TALC
Income Statement
February 1989

Current Month						Year to Date				
Actual		Budget		Var		Actual		Budget		Var
$M	$/ton	$M	$/ton	$/ton		$M	$/ton	$M	$/ton	$/ton
495	175.84	452	163.12	12.73	Product Revenue	913	171.88	842	159.20	12.68
(13)	(4.62)		0.00	(4.62)	Other Revenue(Cust Freight)	(10)	(1.88)	0	0.00	(1.88)
482	171.23	452	163.12	8.11	Total Revenue	903	169.99	842	159.20	10.79
15	5.49	15	5.09	0.41	Salaries	30	5.80	31	5.17	0.64
53	19.41	50	16.64	2.77	Hourly Labor	104	20.12	100	16.67	3.46
23	8.42	19	6.25	2.17	Benefits	38	7.35	38	6.33	1.02
9	3.30	31	10.44	(7.15)	Supplies	21	4.06	62	10.33	(6.27)
38	13.91	35	11.67	2.25	Maint. & Repairs	62	12.00	81	13.50	(1.50)
49	17.94	68	22.56	(4.61)	Power	105	20.32	136	22.67	(2.35)
34	12.45	14	4.61	7.84	Fuel/Water	47	9.09	28	4.67	4.43
20	7.32	29	9.78	(2.45)	Bags	32	6.19	59	9.83	(3.64)
5	1.83	2	0.50	1.33	Chemicals	8	1.55	3	0.50	1.05
38	13.91	28	9.33	4.58	Freight	75	14.51	56	9.33	5.18
10	3.66	10	3.18	0.48	Outside Services	24	4.64	20	3.33	1.31
0	0.00	0	0.00	0.00	Royalties/Property Exp.	0	0.00	0	0.00	0.00
9	3.30	5	1.60	1.70	Prop. & Franchise taxes	13	2.52	10	1.67	0.85
35	12.82	6	2.00	10.82	Other	66	12.77	22	3.67	9.10
338	123.76	311	103.64	20.13	Mill Cash Cost	625	120.94	646	107.67	13.27
41	15.01	41	13.67	1.35	Charge-ins	82	15.87	82	13.67	2.20
379	138.78	352	117.30	21.47	Total Cash Costs	707	136.80	728	121.33	15.47
26	9.52	25	8.42	1.10	Depreciation	51	9.87	51	8.50	1.37
70	25.63	57	19.00	6.63	Inventory Change	170	32.89	66	11.00	21.89
475	168.74	434	156.69	12.05	Total Expenses	928	174.70	845	159.77	14.93
7	2.49	18	6.43	(3.94)	Operating Earnings	(25)	(4.71)	(3)	(0.57)	(4.14)
2,731		3,000		(269)	Tons Milled(M)	5,168		6,000		(832)
2,815		2,771		44	Tons Sold(M)	5,312		5,289		23
7,767		10,000		(2,233)	Crude Tons Used(M)	15,272		20,000		(4,728)

-Realizations were $8.11/ton above budget as increases in higher priced cosmetic sales were partially offset by decreases in paper sales.

-Inventory change was higher than budget due to very low production with high mine costs. In addition, the budgeted inventory change reflected a 229 buildup of finished goods inventory.

-Recoveries this month were 35%.

CIM-GREEN MOUNTAIN
JOHNSON
FEBRUARY 1989

FINISHED GOODS	TONS	VALUE	$/TON
12/31/88 BALANCE LAYER 1	3,000	490,087	163.36
ADD: 01/31/89 PRODUCTION	2,437	357,828	146.83
LESS: 01/31/89 SALES	2,497	407,915	163.36
01/31/89 BALANCE LAYER 1	503	82,172	163.36
01/31/89 BALANCE LAYER 2	2,437	357,828	146.83
01/31/89 BALANCE TOTAL	2,940	440,000	149.66
ADD: 02/28/89 PRODUCTION	2,731	433,000	158.55
LESS: NON-INV COST	2,731	11,805	4.32
ADJ PRODUCTION	2,731	421,195	154.23
LESS: 02/28/89 SALES			
LAYER 1	503	82,172	163.36
LAYER 2	2,312	339,474	146.83
02/28/89 BALANCE LAYER 1	125	18,354	146.83
02/28/89 BALANCE LAYER 2	2,731	421,195	154.23
02/28/89 BALANCE TOTAL	2,856	439,549	153.90
INVENTORY CHANGE		(451)	

SUMMARY

MINE COSTS	47,774
FINISHED GOODS	451
CRUDE-MILL	(2,325)
-MINE	23,739
TOTAL INVENTORY CHANGE	69,639

Location:Hamm

GREEN MOUNTAIN TALC
Income Statement
February 1989

Current Month						Year to Date				
Actual		Budget		Var		Actual		Budget		Var
$M	$/ton	$M	$/ton	$/ton		$M	$/ton	$M	$/ton	$/ton
1	0.18	0	0.00	0.18	Maint. & Repairs	1	0.09	0	0.00	(0.09)
19	3.36	62	8.82	(5.47)	Contract Mining	10	0.88	125	8.89	8.01
37	6.53	0	0.00	6.53	Freight	77	6.78	0	0.00	(6.78)
3	0.53	0	0.00	0.53	Outside Services	5	0.44	0	0.00	(0.44)
2	0.35	1	0.14	0.21	Royalties/Property Exp.	9	0.79	2	0.14	(0.65)
1	0.18	0	0.00	0.18	Prop. & Franchise Taxes	2	0.18	0	0.00	(0.18)
0	0.00	0	0.00	0.00	Other	1	0.09	0	0.00	0.09
63	11.12	63	8.96	2.16	Mine Cost	105	9.25	127	9.03	0.21
12	2.12	0	0.00	2.12	Charge-ins	23	2.03	0	0.00	2.03
75	13.24	63	8.96	4.28	Total Cash Costs	128	11.27	127	9.03	2.24
(75)	(13.24)	(63)	(8.96)	(4.28)	Inventory Change	(128)	(11.27)	(127)	(9.03)	(2.24)
0	0.00	0	0.00	0.00	Total Expenses	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Operating Earnings	0	0.00	0	0.00	0.00
5,663		7,029		(1,366)	Tons Mined(M)	11,356		14,058		(2,702)

Location:Troy

GREEN MOUNTAIN TALC
Income Statement
February 1989

Current Month						Year to Date				
Actual		Budget		Var		Actual		Budget		Var
$M	$/ton	$M	$/ton	$/ton		$M	$/ton	$M	$/ton	$/ton
1	0.81	0	0.00	0.81	Maint. & Repairs	1	0.81	0	0.00	0.81
14	11.34	65	9.04	2.29	Outside Services	16	12.96	130	9.04	3.91
1	0.81	0	0.00	0.81	Prop. & Franchise taxes	1	0.81	0	0.00	0.81
0	0.00	0	0.00	0.00	Other	0	0.00	0	0.00	0.00
16	12.96	65	9.04	3.91	Mine Cost	18	14.57	130	9.04	5.53
16	12.96	0	0.00	12.96	Charge-ins	33	26.72	0	0.00	26.72
32	25.91	65	9.04	16.87	Total Cash Costs	51	41.30	130	9.04	32.25
(32)	(25.91)	(65)	(9.04)	(16.87)	Inventory Change	(51)	(41.30)	(130)	(9.04)	(32.25)
0	0.00	0	0.00	0.00	Total Expenses	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Operating Earnings	0	0.00	0	0.00	0.00
1,235		7,187		(5,952)	Tons Mined(M)	1,235		14,374		(13,139)

Cyprus Industrial Minerals
Eastern Operations Administration
February 1989

Current Month				Year-to-Date		
Actual	Budget	Var		Actual	Budget	Var
17.0	23.3	(6.3)	Salaries	32.0	46.6	(14.6)
3.0	5.6	(2.6)	Benefits	8.0	11.2	(3.2)
10.0	3.3	6.7	Travel	10.0	6.6	3.4
-	2.0	(2.0)	Other	1.0	4.0	(3.0)
30.0	34.2	(4.2)	Total Cost	51.0	68.4	(17.4)
(11.4)	(11.4)	-	Less: Alpine Charge-Outs	(22.8)	(22.8)	-
(11.4)	(11.4)	-	Chester Charge-Outs	(22.8)	(22.8)	-
(11.4)	(11.4)	-	Johnson Charge-Outs	(22.8)	(22.8)	-
(34.2)	(34.2)	-	Total Charge-Outs	(68.4)	(68.4)	-
(4.2)	-	(4.2)	Net Administrative Costs	(17.4)	-	(17.4)

Salary costs were below budget due to two budgeted positions which were not charged (Accountant and Safety). Travel expenses are over budget due to Raymond Morris clearing all expenses.

LW-EastOp

WINDSOR

WINDSOR MINERALS

MONTHLY REPORT

FEBRUARY 1989

Windsor Minerals, Inc.
Monthly Operating Report
February 1989

Windsor's loss of $54M was $295M below budget as higher unit costs and lower sales volumes were partially offset by higher realizations. All mines and mills experienced higher costs but they were most pronounced at the West Windsor facility where difficulties with the new columnar flotation cells were encountered. Industrial sales were lower than budget, but are expected to reach budgeted levels by year end. Higher realizations resulted from a favorable product mix of higher priced floated product.

The operating variances from budget are as follows:

		Feb.	YTD
Realizations	- Floated	60	115
	- Dry Ground	28	50
Unit Costs	- Floated	(282)	(516)
	- Dry Ground	(80)	(180)
Sales Volumes	- Floated	(2)	(42)
	- Dry Ground	(19)	(45)
Actual Operating Earnings		(54)	(135)

LW-MRS:6

CONSOLIDATED WINDSOR MINERALS
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
1.238	87.19	1.275	75.00	12.19	Finished Goods Revenues	2.246	85.49	2.550	75.00	10.49
(10)	-0.70	0	0.00	-0.70	Sales Discounts	(26)	-0.99	0	0.00	-0.99
1.228	86.48	1,275	75.00	11.48	Net Product Revenues	2,220	84.50	2,550	75.00	9.50
1	0.07	0	0.00	0.07	Other Revenues	1	0.04	0	0.00	0.04
1.229	86.56	1.275	75.00	11.56	Total Revenues	2.221	84.54	2.550	75.00	9.54
226	16.60				Salaries	465	17.10			
124	9.11				Hourly Labor	271	9.96			
1	0.07				Benefits	4	0.15			
52	3.82				Supplies	100	3.68			
126	9.25				Maintenance & Repair	223	8.20			
129	9.47				Power	247	9.08			
0	0.00				Fuel & Water	3	0.11			
3	0.22				Bags	4	0.15			
18	1.32				Freight	48	1.76			
(5)	-0.37				Outside Services	(1)	-0.04			
9	0.66				Insurance	18	0.66			
29	2.13				Royalties	59	2.17			
15	1.10				Property Taxes	33	1.21			
83	6.09				Other	132	4.85			
810	59.48	734	43.18	16.30	Operating Cash Costs	1.606	59.05	1.468	43.18	15.87
92	6.76	92	5.41	1.34	Charge-ins	183	6.73	183	5.38	1.35
902	66.24	826	48.59	17.65	Total Cash Costs	1,789	65.77	1.651	48.56	17.22
238	17.48	208	12.24	5.24	Depreciation	449	16.51	416	12.24	4.27
143					Inventory Change	118				
1.283	90.36	1.034	60.82	29.53	Total Expenses	2.356	89.67	2.067	60.79	28.88
(54)	-3.80	241	14.18	-17.98	Operating Earnings	(135)	-9.51	483	14.21	-19.34
13.618		17.000		(3.382)	Tons Milled	27.199		34,000		(6.801)
14.199		17.000		(2,801)	Tons Sold	26,273		34.000		(7.727)

WESTERN SOURCE
Income Statement
February 1989

Current Month Actual			Year to Date Actual	
$M	$/Ton		$M	$/Ton
87	68.13	Finished Goods Revenues	157	74.55
0	0.00	Sales Discounts	0	0.00
87	68.13	Net Product Revenues	157	74.55
0	0.00	Other Revenues	0	0.00
87	68.13	Total Revenues	157	74.55
7	6.17	Salaries	15	7.53
17	14.99	Hourly Labor	38	19.09
0	0.00	Benefits	0	0.00
1	0.88	Supplies	23	11.55
7	6.17	Maintenance & Repair	11	5.52
4	3.53	Power	2	1.00
0	0.00	Fuel & Water	0	0.00
0	0.00	Bags	0	0.00
10	8.82	Freight	12	6.03
0	0.00	Outside Services	0	0.00
1	0.88	Insurance	1	0.50
1	0.88	Royalties	1	0.50
1	0.88	Property Taxes	4	2.01
11	9.70	Other	7	3.52
60	52.91	Operating Cash Costs	114	57.26
5	7.94	Charge-ins	18	9.04
69	60.85	Total Cash Costs	132	66.30
13	11.46	Depreciation	26	13.06
6		Inventory Change	16	
88	68.91	Total Expenses	174	82.62
(1)	-0.78	Operating Earnings	(17)	-13.31
1,134		Tons Milled	1,991	
1,277		Tons Sold	2,106	

WINDSOR MINERALS
Income Statement
February 1989

Current Month Actual $M	Current Month Actual $/Ton		Year to Date Actual $M	Year to Date Actual $/Ton
1.151	89.07	Finished Goods Revenues	2,089	86.44
(10)	-0.77	Sales Discounts	(26)	-1.08
1.141	88.30	Net Product Revenues	2.063	85.36
1	0.08	Other Revenues	1	0.04
1.142	88.38	Total Revenues	2.064	85.41
219	17.54	Salaries	450	17.85
107	8.57	Hourly Labor	233	9.24
1	0.08	Benefits	4	0.16
51	4.09	Supplies	77	3.05
119	9.53	Maintenance & Repair	212	8.41
125	10.01	Power	245	9.72
0	0.00	Fuel & Water	3	0.12
3	0.24	Bags	4	0.16
8	0.64	Freight	36	1.43
(5)	-0.40	Outside Services	(1)	-0.04
8	0.64	Insurance	17	0.67
28	2.24	Royalties	58	2.30
14	1.12	Property Taxes	29	1.15
72	5.77	Other	125	4.96
750	60.08	Operating Cash Costs	1.492	59.19
83	6.65	Charge-ins	165	6.55
833	66.73	Total Cash Costs	1.657	65.73
225	18.02	Depreciation	423	16.78
137		Inventory Change	102	
1.195	92.48	Total Expenses	2.182	98.29
(53)	-4.10	Operating Earnings	(118)	-9.13
12,484		Tons Milled	25.208	
12.922		Tons Sold	24,167	

EUROPE-TALC

LEHMAN 02146

Cyprus Industrial Minerals
European Operations
February 1989

Ghent

February sales revenues were 60,429M Belgium Francs (BEF) ($1,558M), 10,345M BEF ($211M) under budget. Sales volumes of 4,746 short tonnes compared with 7,047 tons in the budget. Profit before tax was 17,293M BEF or $445M, which was slightly under budget in BEF and 2% over budget in U.S. dollars.

Applying different exchange rates to budget and actual activity caused this contradiction. Budget and actual amounts were converted at $1 to 40 BEF and $1 to 38.76 respectively. Had the actual average February rate been used to convert the budget amounts, U.S. dollar income would be slightly under budget in line with BEF income.

There was an average 2% sales price increase as of February 1, 1989 which partially explains some of the lower sales volumes. Average sales price for February was 5% higher than budget due to the price increase, and product mix favoring more expensive products.

Sales volumes to the paper and paint industries were 1,285 and 473 short tons under budget respectively.

A sale of 110 tons of Seabrook HSWF to the agriculture industry was budgeted for February but this crude will not arrive until the second half of March.

Sales volume to the ceramic, rubber, plastic and cosmetic industries were slightly over budget in February. In addition, a 360 ton unbudgeted sale of YS crude was made to East Germany.

February production was 6,208 ST with an efficiency of 1.47 ST/mhr. Total production cost was 6% under budget due to lower crude cost. All controllable production costs were at budgeted levels.

The pulverizer did not operate during February because spare parts did not arrive until the first week of March. To cut down high wear of the pulverizer, wider plates will be welded on the new hammers and a new liner made out of Ni-hard will be installed. Start-up date is expected to be March 13, 1989.

Production overhead was 392M BEF ($10M) over budget due to higher travel expenses for Malaga, and recruitment costs for the new plant engineer who started on February 15, 1989.

Selling expenses were 197M BEF ($5M) over budget due to recruitment costs for a new sales representative for France, a new logistic coordinator and the replacement of the U.K. sales manager.

G&A overhead was under budget due to unfilled accounting and secretarial positions included in the budget.

LW-MRS:2

Currency exchange gains of 2979M BEF ($77M) on U.S. dollar intercompany payables were partially offset by a loss of 1700M BEF ($44M) on pound payables and receivables resulting in a net currency exchange gain of 1279M BEF ($33M).

Outlook for March 1989: Expected sales of 6,600 ST, an income before tax of 14,304M BEF ($376M) compared with 7,366 ST and income before tax of 15,681 BEF ($392M) in the budget.

Malaga

Total sales revenue for February was 8,739M Pts ($76M) vs. 29,008M Pts ($232M) in the budget. Sales volumes amounted to 1,008 ST vs. 1,543 T in the budget, mainly low grade products at low sales prices.

Average realizations were 8,670 Pts/ST ($75/ST) compared with 18,798 Pts/ST ($150/ST) in the budget. Beginning in March 1989, the sales price for this low grade product will be increased by $10/ton. The sale of more high grade products (made from YS and Seabrook crude) is expected in the future.

Cost of sales was 15% over budget due to low efficiency 0.68 ST/mhr. Budgeted standard production cost was based on improved production facilities which would increase flexibility and outputs. The AFE and the plans for these improvements have been finalized and introduced for approval.

Overhead costs were under budget due to open positions as well as lower depreciation related to delayed capital expenditures.

Outlook for March: 1,200 ST and an income before tax of 4,000M Pts ($34M).

LW-MRS:3

CIM CONSOLIDATED EUROPEAN TALC
Income Statement
Period Ending 02/28/89

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
1,634	241.93	2,001	232.95	8.99	Product Revenues	3,322	240.88	3,944	235.46	5.42
0	0.00	0	0.00	0.00	Other Revenues	0	0.00	0	0.00	0.00
1,634	241.93	2,001	232.95	8.99	Total Revenues **	3,322	240.88	3,944	235.46	5.42
1,012	138.04	1,089	126.78	11.27	Direct Var. Costs	1,967	137.09	2,173	129.73	7.36
(51)	-6.96	0	0.00	-6.96	Spending Variance	(42)	-2.93	0	0.00	-2.93
48	6.55	37	4.31	2.24	Direct Fixed Costs	102	7.11	74	4.42	2.69
210	28.65	198	23.05	5.60	Selling	388	27.04	397	23.70	3.34
121	16.51	109	12.69	3.82	Administration	227	15.82	223	13.31	2.51
0	0.00	0	0.00	0.00	Exploration	0	0.00	0	0.00	0.00
(33)	-4.50	0	0.00	-4.50	Exchange (Gain) Loss	(188)	-12.55	0	0.00	-12.55
(1)	-0.14	0	0.00	-0.14	Other	0	0.00	0	0.00	0.00
1,306	178.15	1,433	166.82	11.33	Mill Cash Costs	2,462	171.59	2,867	171.16	0.43
103	14.05	103	11.99	2.06	Corporate Allocation	205	14.29	205	12.24	2.05
1,409	192.20	1,536	178.81	13.38	Total Cash Costs *	2,667	185.88	3,072	183.40	2.48
74	10.09	67	7.80	2.29	Depreciation/Amortization *	137	9.55	135	8.06	1.49
(176)		0			Inventory Change	(200)		0		
1,307	193.51	1,603	186.61	6.90	Total Expenses **	2,604	188.82	3,207	191.46	-2.64
327	48.42	398	46.33	2.08	Operating Earnings **	718	52.06	737	44.00	8.06
7,331		8,590		(1,259)	Tons Produced *	14,348		16,750		(2,402)
6,754		8,590		(1,836)	Tons Sold **	13,791		16,750		(2,959)

CIK - GHERT
Income Statement
Period Ending 02/28/89

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
1.558	271.15	1.769	251.03	20.12	Product Revenues	3.133	270.55	3.412	249.71	20.85
0	0.00	0	0.00	0.00	Other Revenues	0	0.00	0	0.00	0.00
1.558	271.15	1.769	251.03	20.12	Total Revenues	3.133	270.55	3.412	249.71	20.85
985	158.67	956	135.66	23.01	Direct Var. Costs	1.881	154.65	1,839	134.59	20.06
(51)	-8.22	0	0.00	-8.22	Spending Variance	(42)	-3.45	0	0.00	-3.45
48	7.73	37	5.25	2.48	Direct Fixed Costs	94	7.73	74	5.42	2.31
210	33.83	198	28.10	5.73	Selling	388	31.90	397	29.05	2.85
72	11.60	84	11.92	-0.32	Administration	154	12.66	170	12.44	0.22
0	0.00	0	0.00	0.00	Exploration	0	0.00	0	0.00	0.00
(33)	-5.32	0	0.00	-5.32	Exchange (Gain) Loss	(180)	-14.80	0	0.00	-14.80
(1)	-0.16	0	0.00	-0.16	Other	0	0.00	0	0.00	0.00
1.230	198.13	1.275	180.93	17.24	Mill Cash Costs	2.295	188.69	2.480	181.50	7.19
84	13.53	84	11.92	1.61	Corporate Allocation	168	13.81	168	12.30	1.52
1.314	211.66	1.359	192.85	18.81	Total Cash Costs	2.463	202.50	2.648	193.79	8.71
59	9.50	57	8.09	1.42	Depreciation	118	9.70	115	8.42	1.29
(176)		0			Inventory Change	(200)		0		
1.197	208.32	1.416	200.94	7.38	Total Expenses	2.381	205.61	2,763	202.21	3.40
361	62.83	353	50.09	12.73	Operating Earnings	752	64.94	645	47.50	17.44
6.208		7.047		(839)	Tons Produced	12,163		13,664		(1.501)
5.746		7.047		(1.301)	Tons Sold	11.580		13.664		(2.084)

Factor Analysis - February 1989 - Ghent

	M BEF	M $
Budget pretax income	17,385	353*
Lower gross profit as result of lower sales volumes (1,302 ST) and other product mix	(3,372)	(88)
Lower cost of goods sold, especially due to lower cost of crude used	1,978	51
Overhead costs (higher)/lower than Control Budget:		
- production (higher travel expenses due to Malaga acquisition)	(392)	(11)
- selling (recruitment costs sales rep. France, logistic coordinator, sales rep. U.K.)	(197)	(5)
- G&A (open position accountant and secretary)	612	16
Currency exchange gain - interco payables $ gain 2,979M BEF £ payables & receivables loss 1,700M BEF	1,279	33
Lower exchange rate US$ vs. BEF (actual rate vs. budget rate)	N/A	12
	17,293	361

LW-MRS:5

CIM - MALAGA
Income Statement
Period Ending 02/28/89

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
76	75.40	232	150.36	-74.96	Product Revenues	185	85.48	532	172.39	-86.91
0	0.00	0	0.00	0.00	Other Revenues	0	0.00	0	0.00	0.00
76	75.40	232	150.36	-74.96	Total Revenues	189	85.48	532	172.39	-86.91
27	24.04	133	86.20	-62.15	Direct Var. Costs	86	39.36	334	108.23	-68.87
0	0.00	0	0.00	0.00	Spending Variance	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Direct Fixed Costs	8	3.66	0	0.00	3.66
0	0.00	0	0.00	0.00	Selling	0	0.00	0	0.00	0.00
49	43.63	25	16.20	27.43	Administration	73	33.41	53	17.17	16.24
0	0.00	0	0.00	0.00	Exploration	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Exchange (Gain) Loss	0	0.00	0	0.00	0.00
0	0.00	0	0.00	0.00	Other	0	0.00	0	0.00	0.00
76	67.68	158	102.40	-34.72	Mill Cash Costs	167	76.43	387	125.41	-48.97
19	16.92	19	12.31	4.61	Corporate Allocation	37	16.93	37	11.99	4.94
95	84.59	177	114.71	-30.12	Total Cash Costs	204	93.36	424	137.39	-44.03
15	13.36	10	6.48	6.88	Depreciation/Amortization	19	8.70	20	6.48	1.21
0		0			Inventory Change	0		0		
110	109.13	187	121.19	-12.07	Total Expenses	223	100.86	444	143.88	-43.02
(34)	-33.73	45	29.16	-62.89	Operating Earnings	(34)	-15.38	88	28.52	-43.89
1,123		1,543		(420)	Tons Produced	2,185		3,086		(901)
1,008		1,543		(535)	Tons Sold	2,211		3,086		(875)

Factor Analysis - February 1989 - Malaga

	M Pts	M $
Budget pretax income	7,836	45*
Lower gross profit as result of lower sales volumes (536 ST) and other product mix at lower average sales prices (actual average sales price 9,561 Pts/T vs. 20,720 Pts/T in CB)	(6,609)	(57)
Amortization of pre-acquisition costs	-	(12)
Higher cost of goods sold	(2,819)	(25)
Lower depreciation (AFE on new investments has been introduced)	796	7
Lower overhead costs (one open position)	363	3
Lower exchange rate US$ vs. Pts (actual rate vs. budget rate)	N/A	5
	(433)	(34)

*at CB rate 1 US$ = 125 Pts

All other items are at average rate February 1989 1US$ = 115 Pts

LW-MRS:4

BARITE

BARITE DIVISION

MONTHLY REPORT

FEBRUARY 1989

Cyprus Industrial Minerals
Barite Division
Monthly Operating Report
February 1989

Barite's operating loss (after corporate charge-ins) ($46M) was $60M below budget for February. The loss was due primarily to lack of sales at the Houston facility which were budgeted at $148M. Zero sales volumes at Houston were due to budgeted sales to Colonial Rubber/DuPont and Fabricon which did not take place. The Houston facility is currently geared up for production and sales whenever the demand increases.

Houston received $12/ton from contract toll grinding services for Milpark. Costs to mill these products, however, were $97/ton due to no other tonnage, barite or talc, being milled.

Cartersville sales tonnages were 569 higher than budget resulting in increased revenues of $83M and realizations of $146, compared to average realizations budgeted at $185. Lower realizations were a result of increased sales of the lower priced #22 product.

Contributions to earnings by operation after charge-ins were as follows: ($M)

Month				YTD		
Actual	Budget	Var.		Actual	Budget	Var.
62	57	5	Cartersville	145	179	(34)
(90)	(31)	(59)	Houston	(154)	(61)	(93)
(18)	(12)	(6)	Cartersville Admin.	(33)	(24)	(9)
(46)	14	(60)	Operating Earnings	(42)	94	(136)

*Includes corporate charge-ins

Operating variances from budget were as follows: ($M)

	Month	YTD
Budgeted Operating Earnings	14	94
Cartersville - price variance	(19)	(62)
- volume variance	11	17
- operating cost variance	7	2
Houston - price variance	1	0
- volume variance	(5)	(47)
- operating cost variance	(55)	(46)
	(46)	(42)

Costs at Houston were $88M lower than budget due to no talc or barite production other than Milpark. However, costs per ton were high due to low production volumes and the incurrence of fixed costs designed to support a mixed talc and barite facility.

Costs at Cartersville were $87M higher than budget due to increased production volumes, increased maintenance and repair costs including crusher repairs and increased chemical usage at the flotation plant to improve recovery of filter cake. Chemical supply costs have increased 16% in 1989.

Barite-MOR:2

Cyprus Industrial Minerals
Barite Division
February 1989

Month				Year-to-Date		
Actual	Budget	Var.		Actual	Budget	Var.
			Operating Statistics			
2,809	2,240	569	Tons Sold - C'Ville	5,373	4,860	513
0	1,240	(1,240)	- Houston Barite	0	2,480	(2,480)
0	160	(160)	- Houston Talc	0	280	(280)
1,011	1,000	11	- Toll Grinding	3,049	2,000	1,049
3,820	4,640	(820)	Total Tons Sold	8,422	9,620	(1,198)
2,783	2,500	164	Tons Produced - C'Ville	5,094	5,000	94
0	1,240	(1,240)	- Houston Barite	0	2,480	(2,480)
54	160	(106)	- Houston Talc	54	280	(226)
933	1,000	(68)	- Toll Grinding	3,172	2,000	1,172
3,770	4,900	(1,250)	Total Tons Produced	8,320	9,760	(1,440)
			Financial Statistics ($M)			
497	414	83	Revenue - Cartersville	965	935	30
0	118	(118)	- Houston Barite	0	242	(242)
0	30	(30)	- Houston Talc	0	52	(52)
13	12	1	- Toll Grinding	37	24	13
510	574	(64)	Total Product Revenues	1,002	1,253	(251)
3	0	3	Other Revenues	7	0	7
385	298	(87)	Operating Costs - C'Ville	718	638	(80)
68	156	88	Operating Costs - Houston*	121	309	188
71	71	0	Corp. Charge-Ins - C'Ville	142	142	0
35	35	0	Corp. Charge-Ins - Houston*	70	70	0
559	560	1	Cost of Goods Sold	1,051	1,159	108
(46)	14	(60)	Operating Income	(42)	94	(136)
62	54	8	Add: D, D & A	124	109	15
9	0	(9)	Less: Cap. Expend.	70	91	21
7	68	(61)	Operating Cash Flow	12	112	(100)
181.56	184.82		Realization $/Ton-C'Ville	184.81	192.38	
12.86	12.00		-Houston Toll Grind	12.14	12.00	
148.04	132.44		Cash Cost ($/Ton Prod)-C'Ville**	167.26	138.80	
107.40	47.08		-Houston**	59.83	47.48	
162.34	164.73		Oper. Cost($/Ton Sold)-C'Ville**	160.06	160.49	
101.88	79.58		-Houston	62.64	79.62	

*Location is not currently providing a breakout of expenses between Houston Barite, Talc and Toll Grinding

**Including corporate charge-ins

Barite-MOR:1

CIM - BARITE DIVISION
February 1989 YTD

	CARTERSVILLE MINE	CARTERSVILLE MILL	SUB TOTAL	HOUSTON	SUB TOTAL	C'VILLE OTHER	BARITE TOTAL	BUDGET	VARIANCE
Finished Goods Revennes	0	993	993	0	993	0	993	1,229	(236)
Crude Revenues	0	0	0	0	0	0	0	0	0
Gross Product Revenues	0	993	993	0	993	0	993	1,229	(236)
Sales Discounts & Commissions	0	(28)	(28)	0	(28)	0	(28)	0	(28)
Net Product Revennes	0	965	965	0	965	0	965	1,229	(264)
Other Revenues	0	(2)	(2)	37	35	9	44	24	20
Total Revennes	0	963	963	37	1,000	9	1,009	1,253	(244)
Salaries	14	33	47	11	58	14	72	64	8
Hourly Labor	30	118	148	25	173	0	173	157	16
Benefits	9	30	39	9	48	(18)	30	68	(38)
Payroll Taxes	0	0	0	0	0	22	22	0	22
Supplies	14	67	81	(14)	67	(2)	65	70	(5)
Maintenance & Repair	18	127	145	16	161	0	161	104	57
Power	0	70	70	12	82	1	83	85	(2)
Fuel & Water	0	15	15	2	17	0	17	24	(7)
Bags	0	22	22	5	27	0	27	32	(5)
Chemicals	1	67	68	0	68	0	68	24	44
Freight	0	0	0	1	1	0	1	0	1
Outside Services	0	2	2	1	3	4	7	7	0
Royalties & property	3	13	16	0	16	(1)	15	10	5
Selling & administrative	0	0	0	0	0	(2)	(2)	0	(2)
Property Taxes	0	5	5	0	5	15	20	16	4
Other	1	10	11	55	66	8	74	47	27
Operating Cash Costs	90	579	669	123	792	41	833	708	125
Charge-ins	41	101	142	70	212	0	212	212	0
Total Cash Costs	131	680	811	193	1,004	41	1,045	920	125
Depreciation	56	66	122	1	123	1	124	109	15
Inventory Change	(187)	72	(115)	(3)	(118)	0	(118)	130	(248)
Total Expenses	0	818	818	191	1,009	42	1,051	1,159	(108)
Operating Earnings	0	145	145	(154)	(9)	(33)	(42)	94	(136)
Tons Milled - Barite		5,094	5,094	0			5,094	7,480	(2,386)
- Talc		0	0	54			54	280	(226)
Tons Sold - Finished Goods									
- Barite		5,373	5,373	0			5,373	7,340	(1,967)
- Talc		0	0	0			0	280	(280)

CIM - BARITE DIVISION
February 1989

	CARTERSVILLE MINE	CARTERSVILLE MILL	SUB TOTAL	HOUSTON	SUB TOTAL	C'VILLE OTHER	BARITE TOTAL	BUDGET	VARIANCE
Finished Goods Revenues	0	518	518	0	518	0	518	561	(51)
Crude Revenues	0	0	0	0	0	0	0	0	0
Gross Product Revenues	0	518	518	0	518	0	518	561	(51)
Sales Discounts & Commissions	0	(13)	(13)	0	(13)	0	(13)	0	(13)
Net Product Revenues	0	497	497	0	497	0	497	561	(64)
Other Revenues	0	(1)	(1)	13	12	4	16	12	4
Total Revenues	0	496	496	13	509	4	513	573	(60)
Salaries	7	15	22	5	27	5	32	32	0
Hourly Labor	7	68	75	12	87	0	87	79	8
Benefits	2	16	18	3	21	(8)	13	33	(20)
Payroll Taxes	0	0	0	0	0	11	11	0	11
Supplies	8	25	33	1	34	0	34	35	(1)
Maintenance & Repair	18	58	76	9	85	(1)	84	52	32
Power	0	32	32	10	42	1	43	43	0
Fuel & Water	0	11	11	1	12	0	12	12	0
Bags	0	13	13	5	18	0	18	16	2
Chemicals	0	22	22	0	22	0	22	12	10
Outside Services	0	0	0	0	0	3	3	4	(1)
Royalties & property	1	7	8	0	8	(1)	7	5	2
Property Taxes	0	2	2	0	2	9	11	8	3
Other	1	6	7	25	32	3	35	22	13
Operating Cash Costs	44	275	319	71	390	22	412	353	59
Charge-ins	21	50	71	35	106	0	106	106	0
Total Cash Costs	65	325	390	106	496	22	518	459	59
Depreciation	28	33	61	0	61	0	61	55	6
Inventory Change	(93)	76	(17)	(3)	(20)	0	(20)	45	(65)
Total Expenses	0	434	434	103	537	22	559	559	0
Operating Earnings	0	62	62	(90)	(28)	(18)	(46)	14	(60)
Tons Milled - Barite		2,783	2,783	0			2,783	3,740	(957)
- Talc		0	0	54			54	160	(106)
Tons Sold - Finished Goods									
- Barite		2,889	2,889	0			2,889	3,480	(671)
- Talc		0	0	0			0	160	(160)

Cyprus Industrial Minerals
Barite Division
Inventory Cost Flow
February 1989

	$/ton	Tons	$
Cartersville Mine - Barite			
Beginning Inventory	61.23	9,352	572,626
Add: Production	91.06	2,614	238,033
Less: Transfers to Mill	79.44	2,783	221,074
Ending Inventory	64.20	9,183	589,585
Inventory Change on Balance Sheet			16,959
P&L Impact (recorded at mill)			(16,959)
Cartersville Mill - Barite			
Crudes			
Beginning Inventory	0	0	0
Add: Transfers From Mine	79.44	2,783	221,074
Less: Crude Used	79.44	2,783	221,074
Ending Inventory	0	0	0
Inventory Change on Balance Sheet			0
P&L Impact			0
Finished Goods			
Beginning Inventory	143.08	728	104,161
Add: Production	163.61	2,783	455,316
Less: Cost of Goods Sold	162.20	2,809	455,620
Ending Inventory	147.94	702	103,857
Inventory Change on Balance Sheet			(304)
P&L Impact			304
Houston Mill - Talc			
Crudes			
Beginning Inventory	96.62	7,833	756,813
Add: Purchases*	0	0	47,896
Less: Crude Used	104.65	54	5,651
Ending Inventory	102.72	7,779	799,058
Inventory Change on Balance Sheet			42,245
P&L Impact			5,651

*Additional inventoriable costs of Australian purchase

Finished Goods			
Beginning Inventory	0	0	0
Add: Production	172.98	54	9,341
Less: Cost of Goods Sold	0	0	0
Ending Inventory	172.98	54	9,341
Inventory Change on Balance Sheet			9,341
P&L Impact			(9,341)

CIM - CARTERSVILLE BARITE
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$M		$M	$/Ton	$M	$/Ton	$M
510	181.56	414	184.81	-3.26	Finished Goods Revenue *	993	184.81	935	192.39	-7.57
(13)	-4.63	0	0.00	-4.63	Sales Discount *	(28)	-5.21	0	0.00	-5.21
497	176.93	414	184.82	-7.89	Net Product Revenue *	965	179.60	935	192.39	-12.79
3	1.07	0	0.00	1.07	Other Revenues	7	1.30	0	0.00	1.30
500	178.00	414	184.82	-6.82	Total Revenues *	972	180.90	935	192.39	-11.48
27	9.70	28	11.20	-1.50	Salaries	61	11.97	56	11.20	0.77
75	26.95	66	26.40	0.55	Hourly Labor	148	29.05	131	26.20	2.85
10	3.59	28	11.20	-7.61	Benefits	21	4.12	57	11.40	-7.28
11	3.95	0	0.00	3.95	Payroll Taxes	22	4.32	0	0.00	4.32
33	11.86	22	8.80	3.06	Supplies	79	15.51	44	8.80	6.71
75	26.95	45	18.00	8.95	Maintenance & Repair	145	28.46	90	18.00	10.46
33	11.86	35	14.00	-2.14	Power	71	13.94	70	14.00	-0.06
11	3.95	11	4.40	-0.45	Fuel & Water	15	2.94	22	4.40	-1.46
13	4.67	9	3.60	1.07	Bags	22	4.32	19	3.80	0.52
22	7.91	12	4.80	3.11	Chemicals	68	13.35	24	4.80	8.55
3	1.08	3	1.20	-0.12	Outside Services	6	1.18	7	1.40	-0.22
7	2.52	5	2.00	0.52	Royalties & property	15	2.94	10	2.00	0.94
0	0.00	0	0.00	0.00	Selling & administrative	(2)	-0.39	0	0.00	-0.39
11	3.95	8	3.20	0.75	Taxes Other Than Income	20	3.93	16	3.20	0.73
8	2.87	4	1.60	1.27	Other	19	3.73	6	1.20	2.53
339	121.81	276	110.40	11.41	Operating Cash Costs **	710	139.38	552	110.40	28.98
71	25.51	71	28.40	-2.89	Charge-ins	142	27.88	142	28.40	-0.52
410	147.32	347	138.80	8.52	Total Cash Costs **	852	167.26	694	138.80	28.46
61	21.92	51	20.40	1.52	Depreciation	123	24.15	102	20.40	3.75
(15)		(29)			Inventory Change	(115)		(16)		
456	162.34	369	164.73	-2.40	Total Expenses *	860	160.06	780	160.49	-0.43
44	15.66	45	20.09	-4.43	Operating Earnings *	112	20.84	155	31.89	-11.05
2,783		2,500		283	Tons Milled - Barite	5,094		5,000		94
0		0		0	- Talc	0		0		0
2,783		2,500		283	Total Tons Milled **	5,094		5,000		94
2,809		2,240		569	Tons Sold - Barite	5,373		4,860		513
0		0		0	- Talc	0		0		0
2,809		2,240		569	Total Tons Sold *	5,373		4,860		513
2,614		2,500		114	Filter Cake Produced	5,681		5,000		681

CIH - HOUSTON BARITE
Income Statement
February 1989

Current Month Actual		Current Month Budget		Variance		Year to Date Actual		Year to Date Budget		Variance
$M	$/Ton	$M	$/Ton	$/Ton		$M	$/Ton	$M	$/Ton	$/Ton
0	0.00	148	61.67	-61.67	Finished Goods Revenues	0	0.00	294	61.76	-61.76
0	0.00	0	0.00	0.00	Sales Discounts	0	0.00	0	0.00	0.00
0	0.00	148	61.67	-61.67	Net Product Revenues	0	0.00	294	61.76	-61.76
13	12.86	12	12.00	0.86	Toll Grinding Revenues	37	12.14	24	12.00	0.14
13	12.86	160	66.67	-53.81	Total Revenues	37	12.14	318	66.81	-54.67
5	5.07	4	1.67	3.40	Salaries	11	3.41	8	1.68	1.73
12	12.16	13	5.42	6.74	Hourly Labor	25	7.75	26	5.46	2.29
3	3.04	5	2.08	0.96	Benefits	9	2.79	11	2.31	0.48
1	1.01	13	5.42	-4.40	Supplies	(14)	-4.34	26	5.46	-9.80
9	9.12	7	2.92	6.20	Maintenance & Repair	16	4.96	14	2.94	2.02
10	10.13	8	3.33	6.80	Power	12	3.72	15	3.15	0.57
1	1.01	1	0.42	0.60	Fuel & Water	2	0.62	2	0.42	0.20
5	5.07	7	2.92	2.15	Bags	5	1.55	13	2.73	-1.18
20	20.26	20	8.33	11.93	Facility Lease	40	12.40	40	8.40	4.00
0	0.00	0	0.00	0.00	Freight	1	0.31	0	0.00	0.31
1	1.01	0	0.00	1.01	Outside Services	1	0.31	1	0.21	0.10
4	4.05	0	0.00	4.05	Other	15	4.65	0	0.00	4.65
71	71.94	78	32.50	39.44	Mill Cash Costs	123	38.13	156	32.77	5.35
35	35.46	35	14.58	20.88	Charge-ins	70	21.70	70	14.71	6.99
106	107.40	113	47.08	60.31	Total Cash Costs	193	59.83	226	47.48	12.35
0	0.00	4	1.67	-1.67	Depreciation	1	0.31	7	1.47	-1.16
(3)		74			Inventory Change	(3)		146		
103	101.88	191	79.58	22.30	Total Expenses	191	62.64	379	79.62	-16.98
(90)	0.00	(31)	-12.92	12.92	Operating Earnings	(154)	0.00	(61)	-12.82	-37.69
54		160		(106)	Tons Milled - Talc	54		280		(226)
0		1,240		(1,240)	Barite	0		2,480		(2,480)
933		1,000		(67)	Toll Grind	3,172		2,000		1,172
987		2,400		(1,413)	Total Production	3,226		4,760		(1,534)
0		160		(160)	Tons Sold - Talc	0		280		(280)
0		1,240		(1,240)	Barite	0		2,480		(2,480)
1,011		1,000		11	Toll Grind	3,049		2,000		1,049
1,011		2,400		(1,389)	Total Sales	3,049		4,760		(1,711)

PLANT TYPE: PLANT

CYPRUS INDUSTRIAL MINERALS
SALES BY PRODUCT AND SHIPPING LOCATION
FIGURES AS OF 02-89

PRINTED: 03/06/89

LOCATION: 0003 - FAGA, GA - MILL

		MONTH			YEAR TO DATE		
		ACTUAL	PLANNED	VARIANCE	ACTUAL	PLANNED	VARIANCE
13501-BARIMITE XF-BAGGED	TNS	544-543*	255	289	1,085 1084*	605	480
	SLS	$145,692	$68,917	$76,775	$289,543	$166,517	$123,026
	RLZ	$267.69	$270.26	($2.57)	$266.95	$275.23	($8.28)
13521-BARIMITE - BAGGED	TNS	55	90	(35)	191	138	53
	SLS	$14,688	$23,818	($9,130)	$50,983	$36,540	$14,443
	RLZ	$268.27	$264.64	$3.63	$267.27	$264.78	$2.49
13522-BARIMITE - BULK	TNS	0	0	0	0	400	(400)
	SLS	$0	$0	$0	($219	$100,800	($101,019)
	RLZ	$.00	$.00	$.00	$.00	$252.00	($252.00)
13531-NO 22 BARYTES - BAT	NB	1,788-1810*	1,545	243	3,389 3512*	3,067	322
	SLS	$283,032	$264,092	$18,940	$536,437	$524,991	$11,446
	RLZ	$158.27	$170.93	($12.66)	$158.28	$171.17	($12.89)
13532-NO 22 BULK	TNS	401	350	51	686	650	36
	SLS	$52,831	$57,050	($4,219)	$91,304	$105,950	($14,646)
	RLZ	$131.73	$163.00	($31.27)	$133.03	$163.00	($29.97)
TOTAL LOC# 0003							
	TNS	2,788 2369*	2,240	548	5,351 5573*	4,860	491
	SLS	$496,243	$413,877	$82,366	$968,047	$934,798	$33,249
	RLZ	$177.97	$184.77	($6.80)	$180.91	$192.35	($11.44)

*handwritten numbers represent amounts reported by the field for sales tonnages, differences are being researched.

LEHMAN 02163

PLANT TYPE: PLANT

CYPRUS INDUSTRIAL MINERALS
SALES BY PRODUCT AND SHIPPING LOCATION
FIGURES AS OF 02-89

PRINTED: 03/06/89

LOCATION: 0004 - HOUSTON, TX MILL

		MONTH			YEAR TO DATE		
		ACTUAL	PLANNED	VARIANCE	ACTUAL	PLANNED	VARIANCE
11621-STELLAR 200 BAG	TNS	0	80	(80)	0	140	(140)
	SLS	$0	$12,000	($12,000)	$0	$21,000	($21,000)
	RLZ	$.00	$150.00	($150.00)	$.00	$150.00	($150.00)
11623-STELLAR 400 BAG	TNS	0	80	(80)	0	140	(140)
	SLS	$0	$17,600	($17,600)	$0	$30,800	($30,800)
	RLZ	$.00	$220.00	($220.00)	$.00	$220.00	($220.00)
13532-ND 22 BULK	TNS	0	1,000	(1,000)	0	2,000	(2,000)
	SLS	$0	$70,000	($70,000)	$0	$140,000	($140,000)
	RLZ	$.00	$70.00	($70.00)	$.00	$70.00	($70.00)
13561-WHITE BARIMITE XF	TNS	0	40	(40)	0	40	(40)
	SLS	$0	$7,000	($7,000)	$0	$7,000	($7,000)
	RLZ	$.00	$175.00	($175.00)	$.00	$175.00	($175.00)
13561-BARYTES 200H	TNS	0	200	(200)	0	440	(440)
	SLS	$0	$20,000	($20,000)	$0	$44,000	($44,000)
	RLZ	$.00	$100.00	($100.00)	$.00	$100.00	($100.00)
TOTAL LOC# 0004							
	TNS	0	1,400	(1,400)	0	2,760	(2,760)
	SLS	$0	$126,600	($126,600)	$0	$242,800	($242,800)
	RLZ	$.00	$90.43	($90.43)	$.00	$87.97	($87.97)

LEHMAN 02164