

OVERVIEW

DO A 022314
CONFIDENTIAL

CONSOLIDATED AUDIT CELL SERVICE

DATES: MARCH 24, 25, 1992
TIME: 7:30 A.M. - 3:30 P.M.
PLACE: DOW CONFERENCE CENTER (RELIANCE)
CELL SERVICE CONFERENCE ROOM

AGENDA CONSOLIDATED AUDIT

TUESDAY, MARCH 24

7:30 - 9:30	PLANT PRESENTATION-DOW CONF. CENTER (RELIANCE) (SEE SEPARATE DETAILED GUIDELINE)
9:30 - 10:30	CELL SERVICE BLOCK TOUR
10:30 - 10:45	ELECTICAL 5 - POINT AUDIT SUMMARY
10:45 - 11:30	LOSS PREVENTION/FIRE AUDIT
11:30 - 12:00	LUNCH (CELL SERVICE)
12:00 - 3:30	OCCUPATIONAL HEALTH AUDIT

WEDNESDAY, MARCH 25

8:30 - 10:00	H.M.T.R.
10:00 - 11:00	REACTIVE CHEMICAL AUDIT
11:00 - 11:30	SAFETY/SECURITY AUDIT
11:30 - 12:00	LUNCH (CELL SERVICES)
12:00 - 3:00	SAFETY/SECURITY AUDIT (CON'T)

- *EMPLOYEE INTERVIEW SUMMARY
MAJOR MANAGER/SECTION MANGER
- *EMPLOYEE SURVEY SUMMARY
SAFETY SUPERINTENDENT
- *SAFETY SUPERINTENDENT/SAFETY DEPT.
HOUSEKEEPING INSPECTION

3/10/92

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**CONSOLIDATED AUDIT
CELL SERVICE**

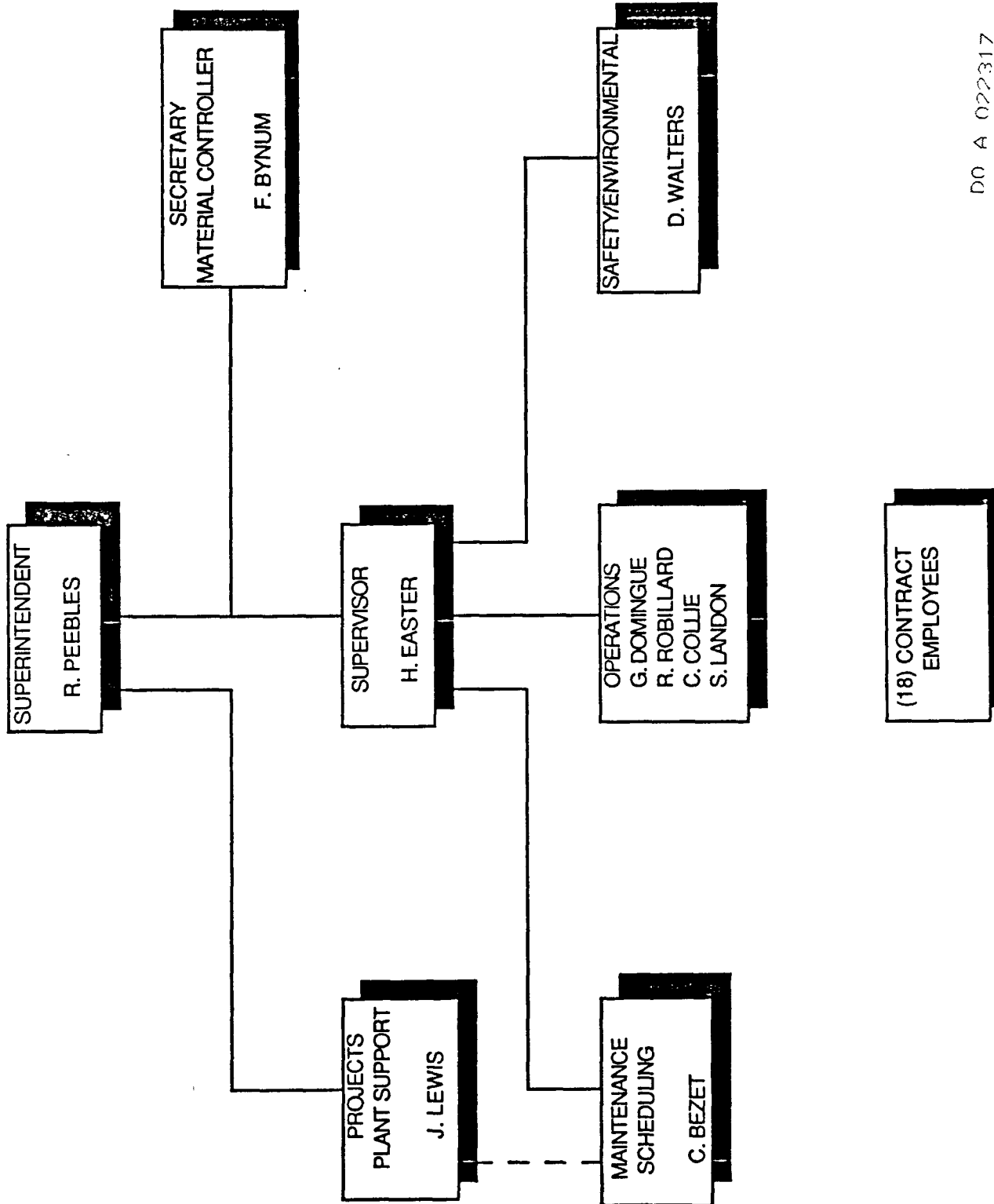
DATE: TUESDAY, MARCH 24, 1992
TIME: 7:30 A.M. - 9:30 P.M.
PLACE: DOW CONFERENCE CENTER (RELIANCE)

**AGENDA
PLANT PRESENTATION/DISCUSSION/TOUR**

- | | | |
|---------------------------|---|--------------|
| I. | PROCESS AND UNIT OPERATIONS | 45 MINUTES |
| | *PROCESS FLOW SHEETS
*CRITICAL INSTRUMENT DEVICES AND FUNCTIONS
*PLOT PLAN LAYOUT | |
| II. | ORGANIZATION | 10 MINUTES |
| III. | REVIEW OF PLANT/DEPARTMENT POLICIES/
PROCEDURES AND COMMUNICATIONS | 20 MINUTES |
| IV. | REVIEW OF TRAINING AND RETRAINING PROGRAMS | 10 MINUTES |
| V. | REVIEW OF SIGNIFICANT INCIDENTS/MAJOR CONCERNS | 15 MINUTES |
| | *SAFETY - OSHA RECORDABLE DATA LAST 3 YEARS
*MEDICAL - MEDICAL VISIT DATA LAST 3 YEARS | |
| VI. | PLANT/DEPARTMENT INDOCTRINATION | 20 MINUTES |
| VII. | PLANT GENERAL TOUR | 60 MINUTES |
| | *PROJECTS
*AREAS OF CONCERN
*MAINTENANCE SHOPS
*MOTOR CONTROL CENTERS
*EATING FACILITIES
*LABS | |
| PLANT TOUR GUIDES: | | |
| | SAFETY/SECURITY/OCCUPATIONAL
HEALTH/REACTIVE CHEMICALS | DEAN WALTERS |
| | LOSS PREVENTION/HMTR | JOHN LEWIS |

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3/3/92:LLM

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PROCESS DESCRIPTION

GENERAL:

The Cell Service plant is primarily a disassembly/ reclamation/ assembly operation involving the handling, shipping, receiving of parts and asbestos. Few reactive or flammable chemicals are involved.

CHLORINE CELL:

The cell is composed of three basic parts: The anode, cathode, and frame. The Dow cell has vertical anodes made of titanium expanded metal coated with ruthenium oxide and steel screen or punched plate cathodes supporting a deposited asbestos diaphragm. The frame is cast from polymer concrete. Cells are placed on skid beams juxtaposed and clamped together with tie rods to form a series. Covers are placed over the series.

In operation a brine level is maintained in the cover. Direct current is introduced into the series. The chlorine ion is oxidized at the anode to form chlorine gas which rises to the top of the cover. The sodium ion joins the hydroxyl ion as it migrates to the cathode. The diaphragm inhibits hydroxyl ion back migration and hypochlorite formation. Hydrogen forms on the cathode. The catholyte, composed of NaCl, NaOH and water, mixed with H₂ gas, over flows out the top sides of the cell. The cell effluent flows down into a header below the cell. The hydrogen rises into a header above the cell.

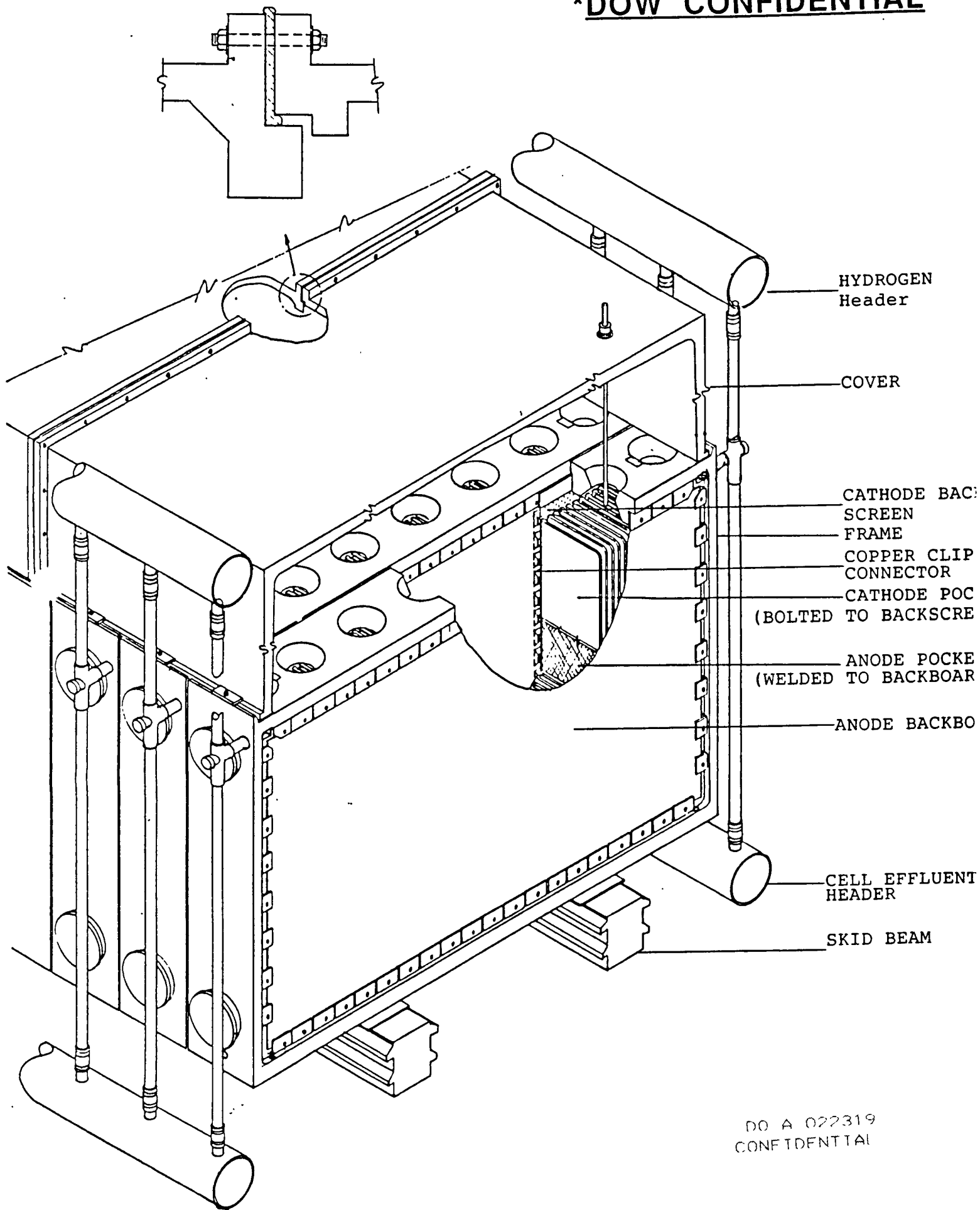
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PRODUCED FOR THE ASBESTOS DATABASE

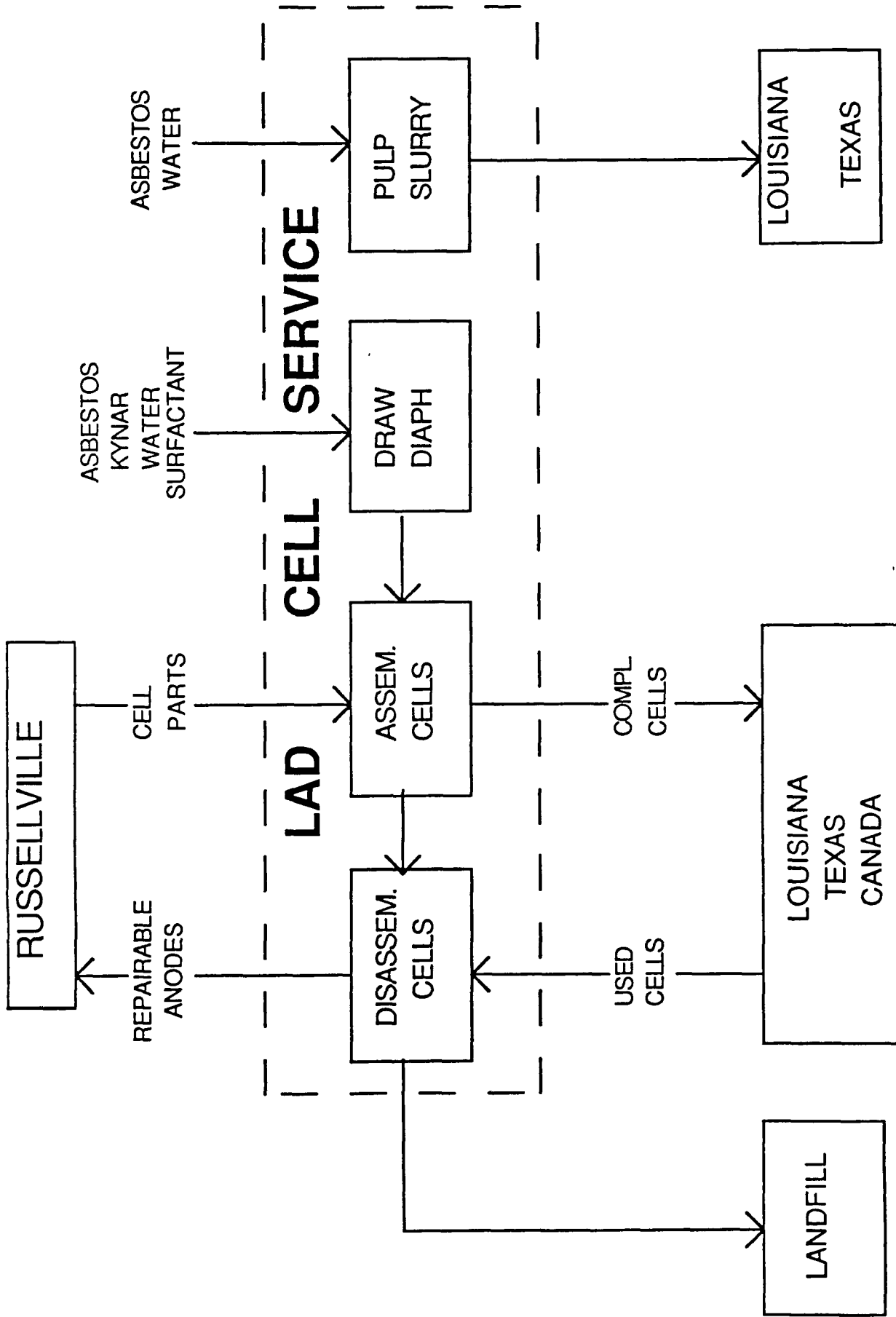
DATE: 3-13-92

MASTER No. 431055 Jm

DOW CONFIDENTIAL



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DO A 022320
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DATE: 3-13-92

MASTER No. 431055 *gm*

DATE: 3-12-92MASTER No. 431055 *JM*CELL FRAME:

Cell Service receives used cells, places them in a soak pit to keep the diaphragm soft so it can be easily separated and thereafter be washed from the cathode. The cell is removed from the soak pit, placed on a conveyor line and moved for disassembly and assembly access. The cathode is removed from the frame and placed in a soak pit. The frame and anode assembly is manually washed and the anode removed. If the frame is not suitable for future service with minor repairs, it is sent to landfill, otherwise it is cleaned, repaired and fitted with a suitable anode and cathode. New, replacement frames are shipped from Dow, Russellville, Arkansas.

CATHODE/DIAPHRAGM:ASBESTOS REMOVAL:

The cathode is placed in a washer in which high pressure water blasts deposited asbestos from the cathode. The wash water is supplied by a 12-stage well-injection type pump driven by a 1000 HP gas turbine. The asbestos/water is clarified, filtered and the water is recycled through the washer. Asbestos from the clarifier bottom is concentrated on a vacuum belt filter, collected and landfilled. Overflow asbestos containing water from all processes, including slab drainage are pumped through a filter to waste treating.

Few used cathodes are suitable for rediaphragming. New cathodes and cathode parts are supplied by Russellville.

ASBESTOS HANDLING:

Louisiana Division is the only Dow site in the U.S.A. handling dry asbestos fibers. Suitable protective equipment, procedures and monitoring is used.

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Palleted, wrapped or boxed sacks of asbestos are received in enclosed trailers. The material is off-loaded and stored in a controlled access room in Block 26 warehouse. Pallets are moved to Cell Service storage/handling as needed.

A manually operated baglifter assists in handling bags. Bags are placed on a conveyor which feeds an enclosed automatic debagging machine. The debagged asbestos falls through a lump breaker and into either of two agitated vessels where it is mixed with water. The storage/handling room, lab, and equipment are vented through a HEPA-OSHA approved, high efficiency-filter. A particle detector continuously monitors the filter blower discharge and is tied into an alarm/shutdown circuit. Filter differential pressure monitoring and documented filter inspections are also measures taken to maintain a safe environment.

ASBESTOS PULP SLURRY:

Asbestos/water slurry is supplied to LAD and Texas chlorine plants for treatment of operating cells diaphragms. The two LAD chlorine plants own 1000 gallon portable trailers which are filled as needed. Two Dow owned tank trailers transport slurry to Texas. A lighted, access platform with a ramp and a safety harness monorail provides safe access to the top of the tank trailer.

DIAPHRAGM DEPOSITING/BAKING:

The asbestos diaphragm is deposited on the perforated steel cathode pockets and back screen by immersing the cathode assembly in a slurry of refined asbestos fibers and drawing a vacuum on the diaphragm.

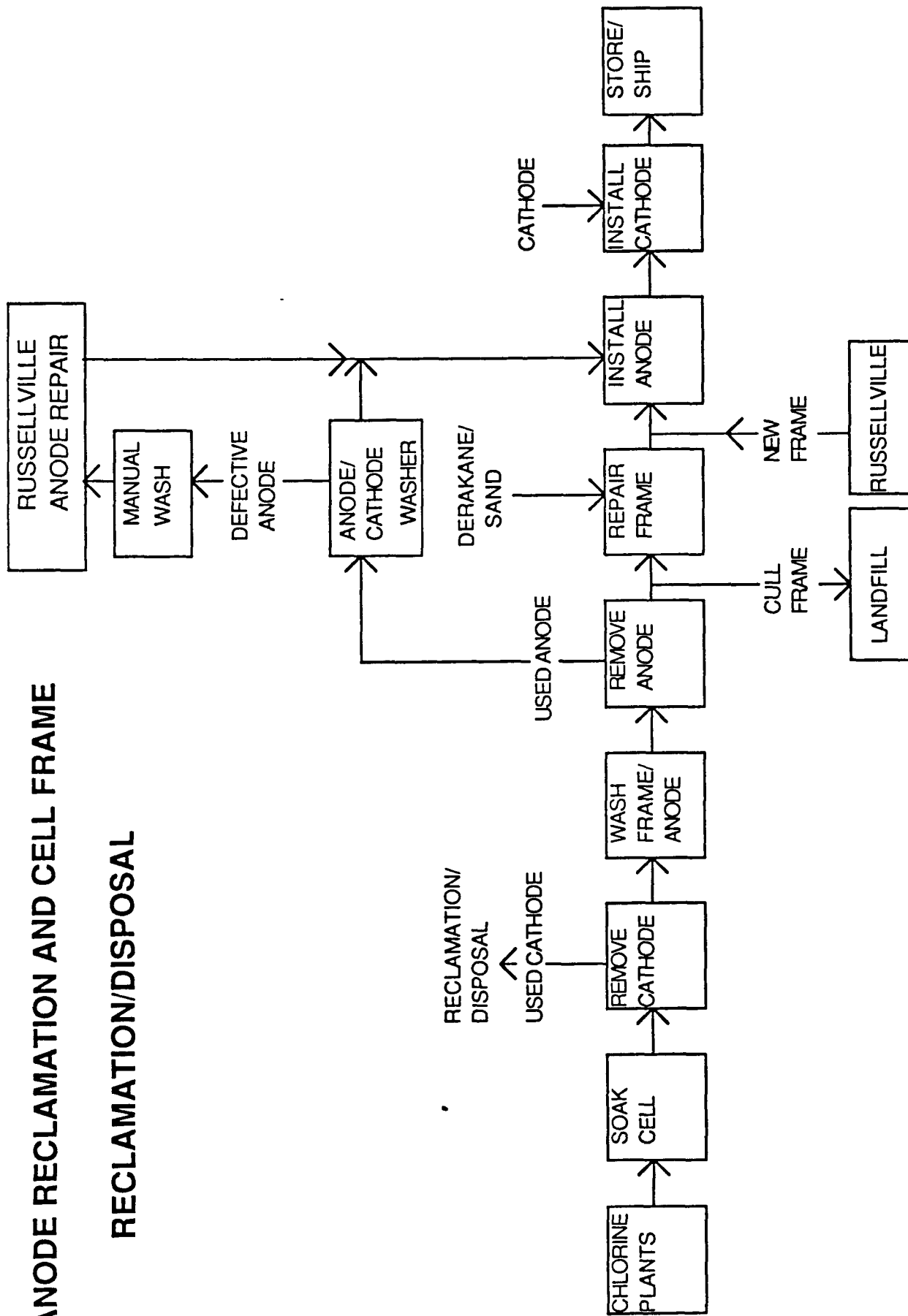
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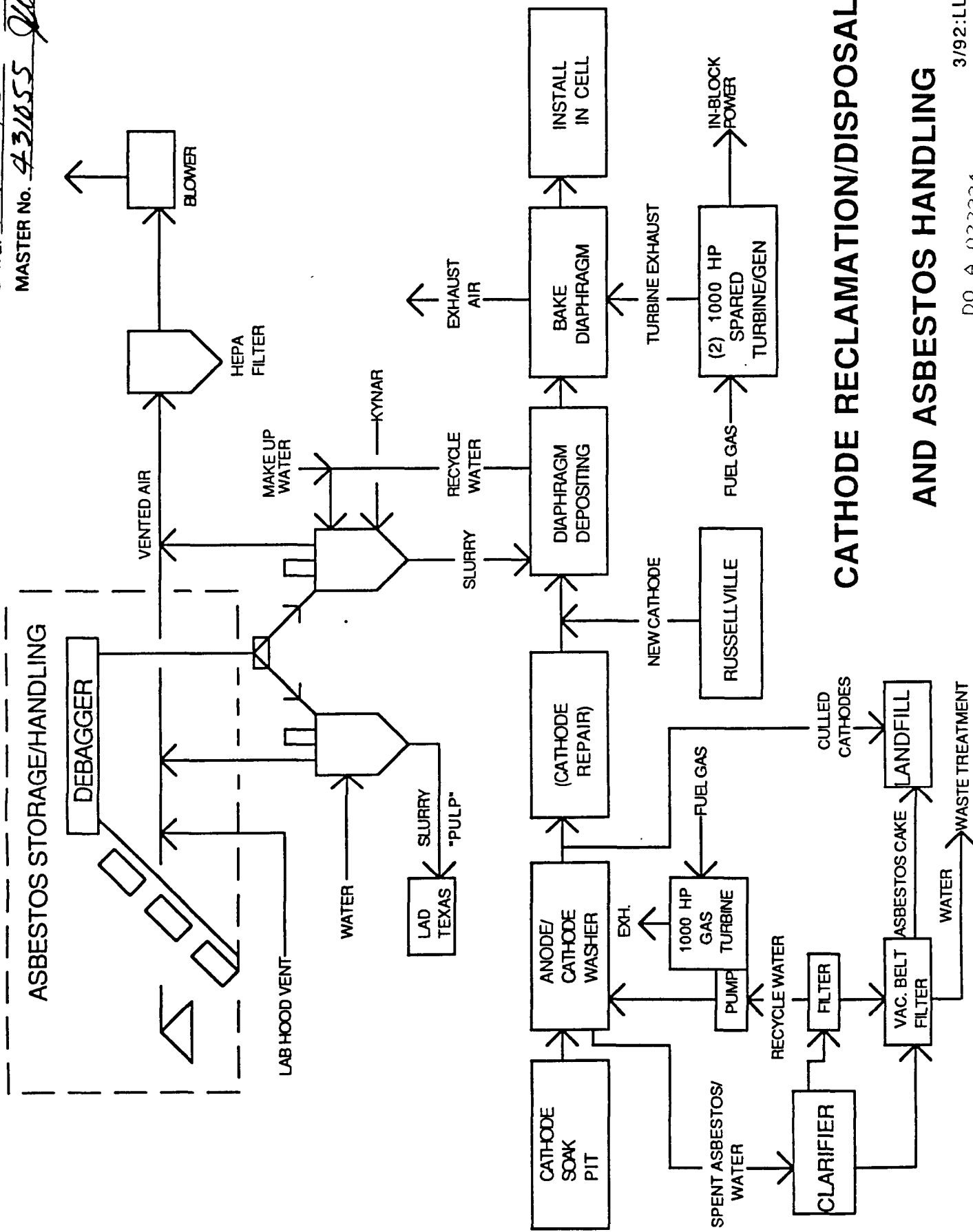
DATE: 3-13-92

MASTER No. 431055 JLR

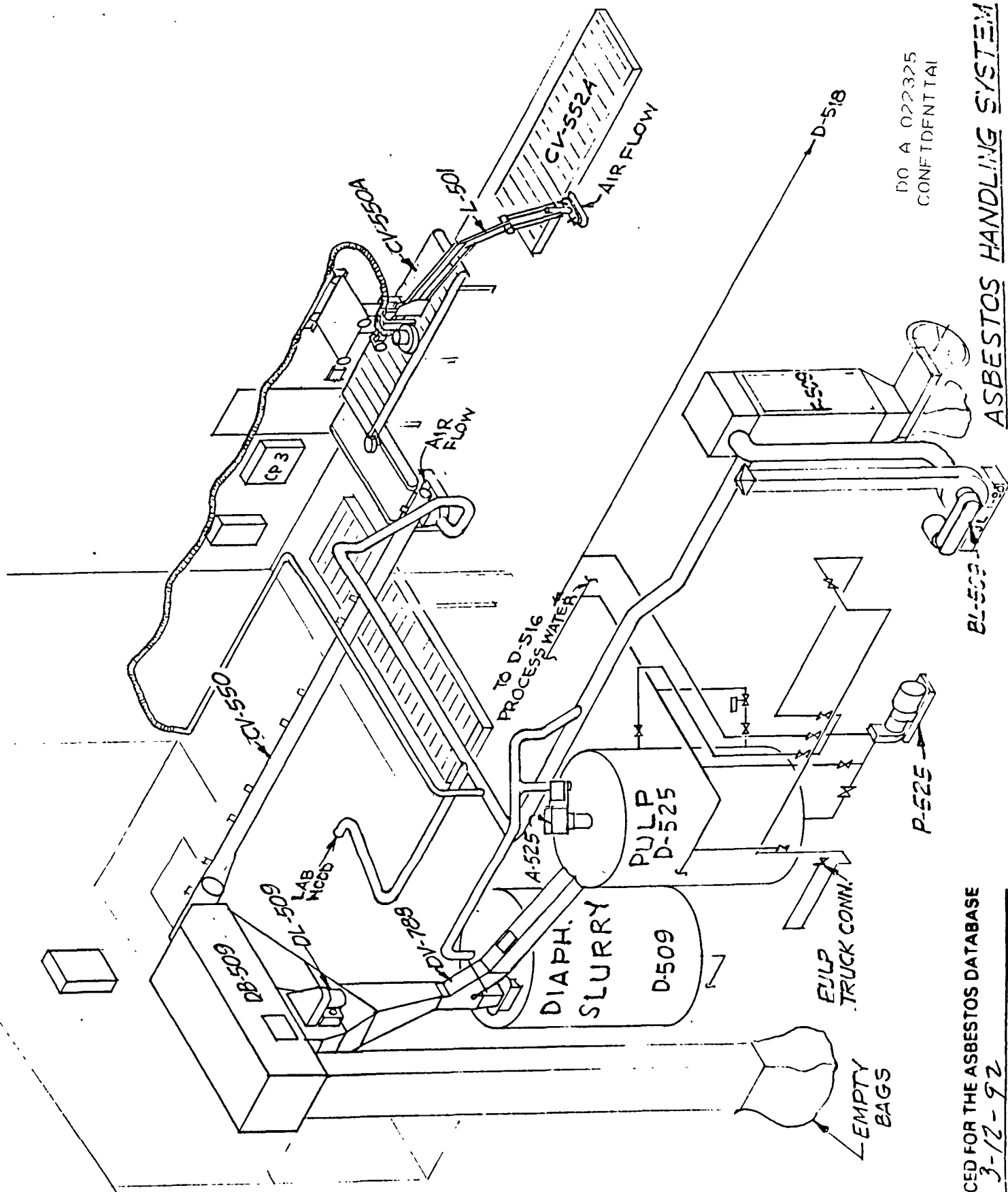
ANODE RECLAMATION AND CELL FRAME

RECLAMATION/DISPOSAL





CATHODE RECLAMATION/DISPOSAL AND ASBESTOS HANDLING



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ASBESTOS HANDLING SYSTEM

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DATE: 3-12-92

MASTER No. 431055 *gll*

The drawing slurry contains Kynar, a fluorine polymer. The drawn cathode is placed in an oven where moisture is removed and the Kynar is sintered. The drying medium is hot exhaust gas discharged from a gas turbine which drives a generator.

After baking, inspection etc. the cathode is placed in the cell frame.

ANODE:

Anodes requiring repair, generally to the backboard, are sent to Russellville. Prior to the shipment these anodes are machine washed in the same washer used to wash cathodes (above). However, lower pressure recycled water is used. Anodes in bad repair are salvaged, not landfilled, because of the metal value.

Anodes not requiring repair are removed for gasket replacement and inspection and cleaning of the frame and anode seal surfaces.

CELL STORAGE/SHIPPING:

Completed cells are stored in Blocks 26, 35, and 56 covered storage areas. Cell shipped off site are wrapped, loaded onto open trailers, lashed and tarped.

TRAILER ACCESS STATION:

A lighted, access platform with a ramp and safety harness monorail has been installed to provide safe access to trailers for loading and unloading operations such as blocking, lashing, tarping.

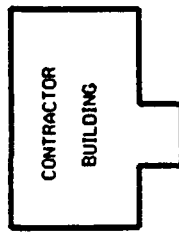
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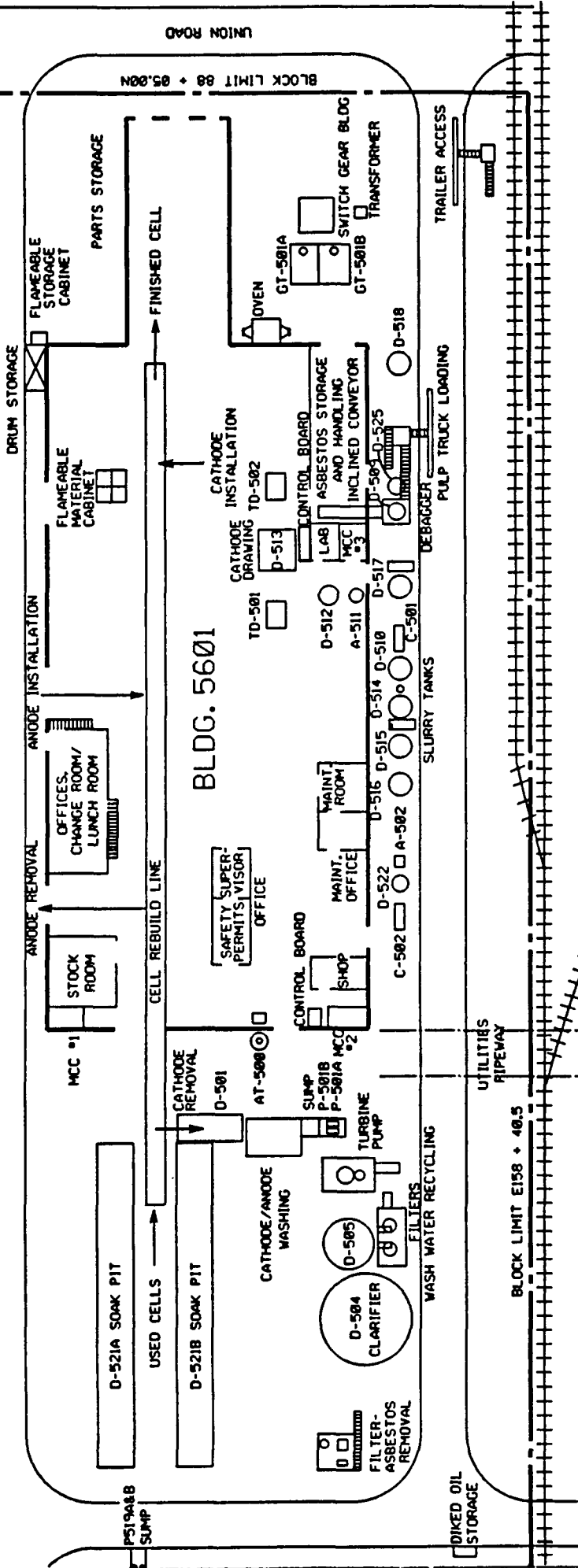
BLOCK LIMIT E161 + 42

PARTS STORAGE YARD

PS22



CONTRACTOR
BUILDING



BLDG. 5601

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BLOCK 56 CELL SERVICE

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DATE: 3-12-92
MASTER No. 431055 JML
401-001-C52-001

CRITICAL INSTRUMENTS

SUMMARY:

There are 49 critical instruments including vibration monitors. The instruments protect rotating equipment; gas turbines (3), one twin-screw air compressor and one 12-stage centrifugal pump. Two instruments guard against the discharge of asbestos particles to the atmosphere.

There is no process control computer.

STRENGTHS:

Testing is up to date and documented.

OPPORTUNITIES FOR IMPROVEMENTS:

P&ID's and written emergency procedures should be upgraded/provided in accordance with LP 15,4.

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PRODUCED FOR THE ASBESTOS DATABASE

DATE: 3-13-92

MASTER No. 431055-911

CRITICAL INSTRUMENTS

EQUIPMENT ID	INSTRUMENT	FUNCTION	ALARM	TRIP	TEST FREQ. WEEKS
C-502	C-502 1PS	SHUT DOWN C-502 IN THE EVENT THE OIL PRESSURE DIF. PRESS. ACROSS THE COMPRESSOR DROP TO 15#		15PSI	52
	C-502 1TAS	SHUT DOWN C-502 IN THE EVENT THE DISCHARGE TEMPERATURE REACHES THE SET POINT		215 DEG. F	52
	C-502 3	SHUT DOWN COMP. IF VIBRATION REACHES SET POINT	SEE TABLE 1		26
GT-501A	CGA GT-501A	ALERT OPERATIONS OF DEVELOPING EXPLOSIVE MIXTURES IN AREAS MONITORED	20% LEVEL		13
	GT-501A 1	PREVENT START UP OF TURBINE WITH NO OIL PRESSURE AND COOL TURBINE BEARINGS AND SHAFT ON SHUT DOWN		8 PSI DEC. 12 PSI INC.	52
	GT-501A 2	SHUT DOWN TURBINE IF OIL TEMPERATURE REACHES 175 DEG. F. MINUS 5 DEG. F.	160 DEG. F	175 DEG. F.	52
	GT-501A 3	SHUT DOWN TURBINE ON LOW OIL PRESSURE		42 PSI	52
	GT-501A 4	SHUT DOWN TURBINE IF SPEED REACHES OVERSPEED SET POINT TO PREVENT TURBINE WRECK		23,600 RPM	26
	GT-501A 5	SHUT DOWN TURBINE IN THE EVENT AIR FILTER DIFF. PRES. REACHES SET POINT	2" WATER	3" WATER	52
	GT-501A 6	SHUT DOWN TURBINE IF VIBRATION REACHES SET POINT	SEE TABLE 1		30
	GT-501A 9	ENERGIZE ALARM WHEN EGT REACHES SET POINT SHUT DOWN TURBINE WHEN EGT REACHES SET POINT	1125 DEG.F.	1200 DEG. F.	52

CRITICAL INS...UMENTS

EQUIPMENT ID	INSTRUMENT	FUNCTION	ALARM	TRIP	TEST FREQ WEEKS
GT-501B	CGA GT-501B	ALERT OPERATIONS OF DEVELOPING EXPLOSIVE MIXTURES IN AREAS MONITORED	20% LEVEL		13
	GT-501B 1	PREVENT START UP OF TURBINE WITH NO OIL PRESSURE AND COOL TURBINE BEARINGS AND SHAFT ON SHUTDOWN		8 PSI DEC. 12 PSI INC.	52
	GT-501B 2	SHUT DOWN TURBINE IF OIL TEMPERATURE REACHES 175 DEG. F. PLUS OR MINUS 5 DEG. F.	160 DEG. F.	175 DEG. F.	52
	GT-501B 3	SHUT DOWN TURBINE ON LOW OIL PRESSURE		42 PSI	52
	GT-501B 4	SHUT DOWN TURBINE IF SPEED REACHES OVERSPEED SET POINT TO PREVENT TURBINE WRECK.		23.600 RPM	26
	GT-501B 5	SHUT DOWN TURBINE IN THE EVENT AIR FILTER DIF. PRES. REACHES SET POINT.	2" WATER	3" WATER	52
	GT-501B 6	SHUT DOWN TURBINE IF VIBRATION REACHES SET POINT	SEE TABLE 1		30
	GT-501B 9	ENERGIZE ALARM WHEN EGT REACHES SET POINT SHUT DOWN TURBINE WHEN EGT REACHES SET POINT.	1125 DEG. F	1200 DEG. F.	52
GT-502	CGA GT-502	ALERT OPERATION OF DEVELOPING EXPLOSIVE MATERIALS IN AREAS MONITORED	20% LEVEL		13
	GT-502 1	PREVENT START UP OF TURBINE WITH NO OIL PRESSURE AND COOL TURBINE BEARINGS AND SHAFT ON SHUT DOWN		8 PSI DEC. 12 PSI INC.	52
	GT-502 2	SHUT DOWN TURBINE IF OIL TEMPERATURE REACHES 175 DEG. F. PLUS OR MINUS 5 DEG. F.	160 DEG. F.	175 DEG. F.	52
	GT-502 3	SHUT DOWN TURBINE ON LOW OIL PRESSURE		42 PSI	52

CRITICAL INSTRUMENTS

EQUIPMENT ID	INSTRUMENT	FUNCTION	ALARM	TRIP	TEST FREQ WEEKS
P-502	GT-502 4	SHUT DOWN TURBINE IF SPEED REACHES OVERSPEED SET POINT TO PREVENT TURBINE WRECK		23,600 RPM	26
	GT-502 4A	SHUT DOWN TURBINE IF TURBINE SPEED REACHES OVER SPEED SET POINT TO PREVENT TURBINE WRECK		23,600 RPM	26
	GT-502 5	SHUT DOWN TURBINE IN THE EVENT AIR FILTER DIF. PRES. REACHES SET POINT	2" WATER	3" WATER	52
	GT-502 6	SHUT DOWN TURBINE IF VIBRATION REACHES SET POINT	SEE TABLE 1		30
	GT-502 9	ENERGIZE ALARM WHEN EGT REACHES SET POINT SHUT DOWN TURBINE WHEN EGT REACHES TRIP SET POINT	1125 DEG. F.	1200 DEG. F.	52
	P-502 1	SHUT DOWN GT-502 IN THE EVENT P-502 SUCTION PRES. REACHES LOW SUCTION SET POINT		50 PSI	52
	P-502 2	SHUT DOWN GT-502 IF DISCHARGE PRESSURE REACH REACH HIGH DISCHARGE TRIP SET POINT		3500 PSI	52
	P-502 3	SHUT DOWN GT-502 IF P-502 CASE TEMPERATURE REACHES SET POINT	180 DEG.F.	195 DEG.F.	52
	P-502 4	SHUT DOWN GT-502 IF P-502 OIL PRESSURE DECREASES TO SET POINT		5 PSI	52
	P-502 5	SHUT DOWN GT-502 IN THE EVENT THE THRUST BEARING TEMPERATURE REACHES SET POINT		190 DEG. F.	52

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CRITICAL INSTRUMENTS

EQUIPMENT ID	INSTRUMENT	FUNCTION	ALARM	TRIP	TEST FREQ WEEKS
F-509	F-509 Dp	SHUTDOWN ASBESTOS BAG FILTER BLOWER BL 509 IN EVENT OF LOW FILTER DIFFERENTIAL PRESSURE		1.8 IN WATER	1
	PD 509	SHUTDOWN ASBESTOS BAG FILTER BLOWER BL 509 IN EVENT PARTICLES DETECTED		DETECTS PARTICLES	1

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PRODUCED FOR THE ASBESTOS DATABASE
DATE: 3-13-92
MASTER No. 431035 JH

TABLE ONE VIBRATION MONITORS

EQUIPMENT/LABEL	TYPE	MOUNT	PLANE	LOCATION	NORMAL	ALARM	TRIP
*GT501 A&B							
GT501-6.1	ACCEL.	CASE	RAD.	OUTBD.BRG.	3 G	12 G	14.5 G
GT501-6.2	ACCEL.	CASE	RAD.	INBD.BRG.	3 G	10 G	14 G
*GT501A&B GR.							
GT501-6.3	ACCEL.	CASE	RAD.	CASE	5 G	12 G	14 G
GT501-6.4	PROX.	2@180 DEG.	AX	DRIVE CPLG.	+2,-3 MILS	+/-20 MILS	20 MILS
GEN 501 A&B							
GT501-6.5	VEL.	(2) @90 DEG.	RAD.	INBD.BRG.	1.4 IN/SEC	3 IN/SEC	4 IN/SEC
GT501-6.6	VEL.	(2) @90 DEG.	RAD.	OUTBD.BRG.	.8 IN/SEC	3 IN/SEC	4 IN/SEC
GT-502							
GT502-6.1	ACCEL.	CASE	RAD.	OUTBD.BRG.	2 G	12.5 G	14 G
GT502-6.2	ACCEL.	CASE	RAD.	INBD.BRG.	2 G	12 G	14 G
*GT502 GR							
GT502-6.3	ACCEL.	CASE	RAD.	CASE	1.5 G	11.5 G	13.5 G
GT502-6.4	PROX.	(2) @90 DEG.	AX	DRIVEN CPLG.	+4/+2 MILS	+/-10 MILS	+/-20 MILS
GT502-6.7	PROX.	(2) @90 DEG.	AX	DRIVEN CPLG.	-1/-2 MILS	+/-10 MILS	+/-20 MILS

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TABLE ONE VIBRATION MONITORS

EQUIPMENT/LABEL	TYPE	MOUNT	PLANE	LOCATION	NORMAL	ALARM	TRIP
*P-502							
GT 72-6.5	PROX.	(2) @90 DEG.	RAD.	INBD. BRG.	3 MILS	3.8 MILS	4.2 MILS
GT502-6.6	PROX.	(2) @90 DEG.	RAD.	OUTBD. BRG.	2 MILS	2.6 MILS	2.8 MILS
**C-502							
GT502-1	PROX.	THRU COVER	AX.	INBD. THRUST DRIVEN ROTOR END	-8 MILS	-	+/-21 MILS
GT502-2	PROX.	THRU COVER	AX.	OUTBD. THRUST DRIVE ROTOR END	-6 MILS	-	+/-22 MILS
GT502-3	VEL	CASE	RAD	INBD. VIBR.	22 IN/SEC	-	50 IN/SEC
GT502-4	VEL	CASE	RAD	OUTBD. VIBR	10 IN/SEC	-	50 IN/SEC

*BENTLY NEVADA

**I.R.D.

SUMMARY

1. A PARTS HANDLING OPERATION

NO PROCESS REACTIONS

**OPERATIONS UPSETS HAVE NO IMMEDIATE
UPSTREAM OR DOWNSTREAM IMPACT**

SMALL VOLUME OF FLAMMABLES INVOLVED

2. SMALL OPERATION, EXPERIENCED PEOPLE

**10 DOW PEOPLE, 18 CONTRACT PEOPLE WORKING
ON SAME SHIFT**

ONE-ON-ONE COMMUNICATION PREDOMINATES

3. SIGNIFICANT POINTS

**ONLY DOW PLANT IN THE U.S. HANDLING DRY
ASBESTOS**

ROUTINE HANDLING OF 3-4 TON CHLORINE CELLS

**MORE LABOR INTENSIVE, LESS CAPITAL
INTENSIVE THAN CHEMICAL PROCESSING
OPERATIONS**

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LLM:3/13/92

PRODUCED FOR THE ASBESTOS DATABASE

DATE: 3-13-92

MASTER No. 431055 *JMC*