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TEXAS DIVISION
FREEPORT, TEXAS 77541

ENVIRONMENTAL HEALTH REPORT

RE-EVALUATION OF ASBESTOS EXPOSURES,

CELL SERVICE, A-1323 AND A-1022 BUILDING

FILE NO. A10-196

DATE September 12, 1973

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Summary

The cell service employees exposure to asbestos fibers were re-evaluated during the diaphragm drawing operations. The time-weighted average and peak exposures to asbestos fibers are within acceptable levels, though the peak exposures could approach the maximum allowable concentration. The employees should continue to wear respiratory protection during the weighing and dumping of asbestos into the drawing vat.

Attached are recommendations that could reduce exposure to airborne asbestos to employees even more than the precautions already taken.

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[redacted]

PROBLEM

Industrial Hygiene was asked to re-evaluate the exposures of Cell Service employees to asbestos fibers during the diaphragm drawing operations.

CONCLUSIONS

(1) The employees time-weighted average and peak exposures to asbestos fibers are within acceptable levels.

(2) During the weighing and dumping of asbestos, peak concentrations could approach the maximum allowable concentration for short term exposure. The men working around the pulling tank when asbestos bags are handled and dumped into the vat should continue to wear respiratory protection.

RECOMMENDATIONS

(1) Empty asbestos bags should be stored in a plastic bag and sealed before disposal.

(2) Employees who work regularly with asbestos should have clean work clothes daily. (Work clothes are not to be takn home for laundering).

(3) Continue the work practice of wearing respiratory protection whenever asbestos is handled.

(4) Showering should be compulsory at the end of the work day for those employees with significant exposures.

(5) Engineering methods to be utilized to eliminate asbestos exposure to employees.

PRESENTATION OF DATA

Table I, II, and III shows the operators exposure to asbestos fibers based on an 8 hour day when the drawing operation is in progress at A-1322 and A-1022. His time-weighted average and peak exposures were within acceptable levels based on the present standard.

Table A shows the results of the sample analyses for the various Cell Services operations. The highest asbestos fiber concentration, up to 5.86 fibers/ml, were found during the weighing and du

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PRESENTATION OF DATA (continued)

dumping of asbestos. Because of the variability in the asbestos handling procedures (and in the fiber counting technique) the operator peak exposures could exceed the allowable ceiling concentration. The men working around the drawing vat, during the handling of dry asbestos, should wear respiratory protection.

Asbestos fiber levels exceeding 0.5 fibers/ml were found only in the immediate area of the drawing vat. The exposures of the other employees working in the building were well within acceptable levels. Their TWA* exposure would be in the .01 to .03 fibers/ml range.

SAMPLE AND ANALYSIS

Breathing zone and general area air samples were collected on 47 mm diameter (.8 micron pore size) membrane filters at a sample rate of about 2.0 Lpm. The fibers on the filters were counted by the standard phase - contrast microscopy technique at 450 magnification by the Texas Division Microscopy Laboratory.

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* Time-Weighted Average (TWA) - The average exposure of asbestos fibers to employees during an eight hour work day.

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TABLE I

CELL SERVICES OPERATOR (DIAPHRAGM DRAWING) EXPOSURES

TO ASBESTOS FIBERS, CHLORINE 5, A-1322 BUILDING

OPERATION	A TIME PER 8 HR. DAY (MIN.)	B AVERAGE CONC. (FIBERS/M1)	A X B / 480
Weighing and dumping asbestos bags into mixing tank	12	2.21	.050
Diaphragm drawing operation	324	.009	.006
Lunch & Breaks and other misc. work	144	-	
Time-Weighted Average	480		.056
Threshold Limit Value *			5.0
Maximum Allowable Conc.		10.0	

* Threshold Limit Value (TLV) - The time weighted average concentration to which it is believed that most people could be exposed daily without adverse effect.

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TABLE II

CELL SERVICES OPERATOR (DIAPHRAGM DRAWING) EXPOSURES

TO ASBESTOS FIBERS, CELL SERVICES, A-1022 BUILDING

OPERATION	A TIME PER 8 HR. DAY (MIN.)	B AVERAGE CONC. (FIBERS/Ml)	A X B / 480
Dumping Asbestos from bags into slurry tank	75	2	.31
Slurry tank operation (dipping cathode)	75	.04	.006
Analyzing slurry tank solution (asbestos & caustic)	75	.04	.006
Breaks, Lunch, misc. duties	255		
Time Weighted Average	480		.322
Threshold Limit Value*			5.0
Maximum Allowable Conc.		10.0	

*Threshold Limit Value (TLV) - The time-weighted average concentration to which it is believed that most people could be exposed daily without adverse effect.

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TABLE III

CELL SERVICES TOWMOTOR OPERATOR EXPOSURES TO ASBESTOS

FIBERS, CHLORINE V, A-1322 BUILDING

OPERATION	A TIME PER 8 HR. DAY (MIN.)	B AVERAGE CONC. (FIBERS/M1)	A X B / 480
Transports Asbestos from A-1303 Warehouse to drawing vat	5	.033	.00
Misc. duties, breaks, lunch	475		
Time-Weighted Average	480	.033	.00
Threshold Limit Value*			5.0
Maximum Allowable Conc.		10.0	

*Threshold Limit Value (TLV) - The time weighted average concentration to which it is believed that most people could be exposed daily without adverse effect.

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TABLE A

CELL SERVICES SUMMARY OF SAMPLE ANALYSIS

AREA OPERATION	NO. OF SAMPLES	ASBESTOS CONCENTRATION FIBERS/ML	
		Range	Average
OPERATOR Weighing and dumping asbestos into mixing tank (A-1323)	3	.41 to 3.34	2.210
OPERATOR Dumping asbestos into vat (A-1022)	4	.46 to 5.86	2.000
General work around drawing vat (A-1323) No activity	4	.0 to .030	.010
General work around drawing vat during dumping and drawing operation (A-1323)	7	0 to .06	.022
General work around drawing vat (A-1022) No activity	2	.029 to .041	.035
General work around drawing vat during dumping and drawing operation A-1022	11	.0 to 5.33	.581
Tow motor moving asbestos bags to vat (A-1323 & A-1022)	5	0 to .04	.027
Employees work clothes (dirty & dry)	1	1.3	1.3

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ENVIRONMENTAL RESEARCH SAMPLE RECORD

FILE NUMBER	PROCESS	BLDG. NO.	DATE
A 10-196	Cell Services (Asbestos) Diaphragm Drawing	A-1323	6-6-73

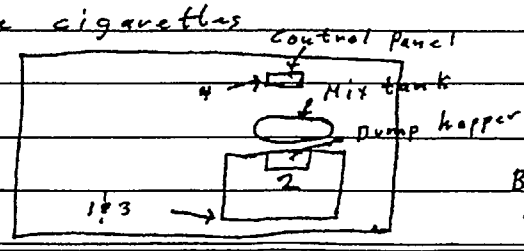
MATERIAL	SAMPLING METHOD	TRAPPING MEDIUM
Asbestos	Cellulose Filter	.8 μ Millipore Filter

EQUIPMENT NUMBER	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP.	INSIDE TEMP.
	MSA Monitor Pumps	8	≈ 2 ℓ/m	°F	°F

REMARKS (VENTILATION, ETC.)

Drawing M-61 cells, two at a time.

SAMPLE NO.	Pump CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME START	TIME INCREMENT	CONCENTRATION
CS-1	4	On northeast railing of dumping platform. No dumping going on. Ventilation; none to speak of. Doors to bldg. are all open	8:35 to 9:05	30 min	.021 f/cc
CS-2	1	On operator Edwards. Dumped 250 lbs of asbestos into the hopper. Asbestos fiber dumps in air above hopper, but did not generally fly around. Operator Edwards wore Acme respirator	9:00 to 9:05	5 min	3.34 f/cc
CS-3	1	Same as CS-1 on platform during drawing. Post dumping	9:05 to 9:35	30 min	.006 f/cc
CS-4	4	At control panel for drawing operation. During drawing operation, post dumping. Note: both operators Edwards & Cook smoke cigarettes	9:05 to 9:35	30 min	.009 f/cc



B. S. Horvath
6-6-73

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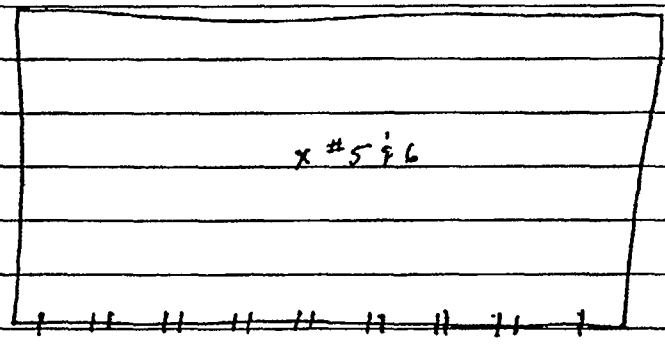
FORM O-16670 PRINTED IN U.S.A. 10-62

ENVIRONMENTAL RESEARC. SAMPLE RECORD

FILE NUMBER	PROCESS			BLDG. NO.	DATE
A10-196	Asbestos Warehouse			A-1303	6-6-73
MATERIAL	SAMPLING METHOD			TRAPPING MEDIUM	
Asbestos	Cellulose Filter			.8μ Millipore Filter	
EQUIPMENT NUMBER	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP.	INSIDE TEMP.
	MSA Monitor Pumps	8	≈2 l/m	°F	°F

REMARKS (VENTILATION, ETC.)

SAMPLE NO.	Pump CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME START	TIME INCREMENT	CONCENTRATION
CS-5	1	A-1303 Warehouse (No Activity)	2:23 to 2:43	20min	.015 f/cc
CS-6	4	Same location as CS-5, but with towmotor coming in and out	2:52 to 3:02	10min	.032 f/cc
CS-7	1	On towmotor operator, Man making 4 runs at the warehouse using same pallet load of intact bags.	2:52 to 3:02	10min	.030 f/cc



8 doors equally spaced on south wall

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ENVIRONMENTAL RESEARC.. SAMPLE RECORD

FILE NUMBER	PROCESS	BLDG. NO.	DATE
A10-196	Cell Services (Asbestos) Diaphragm Drawing	A-~~1033~~ 1022	6-6-73

MATERIAL	SAMPLING METHOD	TRAPPING MEDIUM
Asbestos	Cellulose Filter	.8 μ Millipore Filter

EQUIPMENT NUMBER	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP.	INSIDE TEMP.
	MSA Monitor Pumps	8	≈2 l/m	°F	°F

REMARKS (VENTILATION, ETC.)

Used Cleco type holders except on sample 205 (All doors open in A-~~1033~~ 1022) Pump

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME START	TIME INCREMENT	CONCENTRATION
101	2	On man dumping asbestos into vat (Dumped 3½ bags weighing 240 lbs) Visible asbestos in air during dumping operation	11:08 to 11:18	10min	.466 f/cc
102	8 hour Pump 5	Center of bldg. ≈30' S.W. of drawing vat during dumping of asbestos during sample 101	11:13 to 11:28	15min	.099 f/cc
103	1	In center of bldg (no activity)	10:53 to 11:13	20min	.029 f/cc
201	2	On hand rail behind platform for vat. (Complete operation after dumping asbestos) Dumping cathode & drying.	12:03 to 1:09	66min	.018 f/cc
202	8 hour pump 5	Middle of bldg. ≈30' S.W. of vat (Complete operation after dumping asbestos) Dumping cathode & drying	12:03 to 1:09	66min	-0-

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ENVIRONMENTAL RESEARC[illegible] SAMPLE RECORD

FILE NUMBER	PROCESS	BLDG. NO.	DATE
A10-196	Cell Services Diaphragm Drawing	A-1022	6-7-73

MATERIAL	SAMPLING METHOD	TRAPPING MEDIUM
Asbestos	Cellulose Filter	.8 μ Millipore Filter

EQUIPMENT NUMBER	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP.	INSIDE TEMP.
4, 5, & 6	MSA Monitor Pump	8		°F	°F

REMARKS (VENTILATION, ETC.)

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME START	TIME INCREMENT	CONCENTRATION
Pump 1	203	Mixing asbestos & epoxy for repairing Cl_2 cells. between A-1020 & 1022. Monitor on man. He is mixing epoxy and dry asbestos with electric meter mixer in 10 qt. bucket. Takes asbestos out of open bag with 1 gal. container & adds to bucket & starts mixer again. This was done 3 times. Puts gloves in trash container. Dry asbestos can be seen on his clothes. (Washes ~~and~~ clothes at home)	12:22 to 12:32	10m	1,131 f
Pump 1	204	101 oven B (in middle) 200°F in oven	1:04 to 1:06	2m	.149
Pump 4	205	A-1023 Asbestos Storage	1:10 to 1:45		0

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ENVIRONMENTAL RESEARCH. SAMPLE RECORD

FILE NUMBER	PROCESS		BLDG. NO.	DATE
A10-196	Cell Services Diaphragm Drawing		A-1022	6-7-73
MATERIAL	SAMPLING METHOD	TRAPPING MEDIUM		
Asbestos	Cellulose Filter	.8μ millipore filter		
EQUIPMENT NUMBER	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP.	INSIDE TEMP.
4, 5 & 6	MSA Monitor Pumps	8		°F	°F

REMARKS (VENTILATION, ETC.)

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME START	TIME INCREMENT	CONCENTRATION
	Pump			Min	
301	2	On handrail behind man dumping asbestos (3½ bags - 250 lbs)		7	.488 f/cc
302	5	On center of bldg. ≈ 30' S.W. of vat during dumping of asbestos		7	.035 f/cc
303	1	On man dumping asbestos. Putting asbestos bags on platform & opening and dumping bags. Then putting bags in dumpster.		7	1.19 f/cc

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