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TITLE: EVALUATION OF ASBESTOS EXPOSURES, CHLORINE CELL MAINTENANCE, 853 BUILDING

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INFORMATIVE SUMMARY WITH CONCLUSIONS

The Utility Men's exposures to asbestos fibers were evaluated during the application of asbestos diaphragms on the chlorine cells. The time-weighted average and peak exposures to asbestos fibers were within acceptable levels, though the peak exposures could approach the maximum allowable concentration. The utility men working around the pulling tank should continue to wear respiratory protection during the weighing and dumping of asbestos.



REVIEWED BY J R Hayes 5-2-73

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PROBLEM

Industrial Hygiene was asked to evaluate the exposures of the Utility men to asbestos fibers during the application of asbestos diaphragms on the chlorine cells.

CONCLUSIONS

1. The Utility Men's time-weighted average and peak exposures to asbestos fibers were within acceptable levels.

2. During the weighing and dumping of asbestos, peak concentrations could approach the maximum allowable concentration for short term exposures. The men working around the pulling tank should wear respiratory protection during operations.

3. The following work practices should be continued:

   A. Empty asbestos bags should be stored in a plastic bag and sealed before disposal.

   B. A vacuum system with a filter on the exhaust should be used to pick up loose asbestos.

PROCESS

Asbestos is received at 853 Building in plastic lined bags which are stored near the pulling tank. As needed, the bags are hand carried to the tank edge, slit and dumped into the tank. The bags do not give the exact weight required, so some handling of the dry asbestos is necessary in weighing the last increment. A small canopy type hood provides some local exhaust during the weighing and dumping operations.

In the pulling tank, the asbestos is slurried with a caustic solution, using a hoe to break up the lumps. A vacuum is used to draw the slurry into a mixing tank where the asbestos is more evenly dispersed in the caustic solution. After being wetted with the caustic solution, the asbestos does not present a dust problem.

The slurry is returned to the pulling tank after a diaphragm has been positioned. A vacuum is drawn on the cell forming a thin asbestos mat on the diaphragm. The caustic filtrate is returned to the mixing tank.

SAMPLING AND ANALYSIS

Breathing zone air samples were collected on 37 mm diameter (0.8 micron pore size) membrane filters at a sample rate of about 2.0 lpm. General area samples were collected on

47 mm (0.8 micron pore size) membrane filters at a sample rate of 20 lpm.

The fibers on the filters were counted by the standard phase-contrast microcopy technique at 450 magnification by the Midland Division Microscopy Laboratory.

PRESENTATION OF DATA

Table I shows the Pulling Tank Operator's exposure to asbestos fibers based on an 8-hour day when the pulling tank is in operation. His time-weighted average and peak exposure were both within acceptable levels based on the present standards.

Table II shows the results of the sample analyses for the various cell maintenance operations. The highest asbestos fiber concentrations, up to 7.2 fibers/ml, were found during the weighing and dumping of asbestos. Because of the variability in the asbestos handling procedures (and in the fiber counting technique) the Pulling Tank Operator peak exposures could exceed the allowable ceiling concentration. The men working around the pulling tank, during the handling of dry asbestos, should continue to wear respiratory protection.

Asbestos fiber levels exceeding 0.5 fibers/ml were found only in the immediate area of the pulling tank. The exposures of the other Utility Men working in the building were well within acceptable levels. Their TWA exposure would be in the 0.25 to 0.35 fibers/ml range.

Table I

Chlorine Cells Maintenance, 853 Building Pulling Tank Operator's Exposure to Asbestos Fibers

Operation	A Time Per 8-Hr. Day (Min.)	B Average Conc. (Fibers/ml.)	A X B / 480
Weighing and dumping asbestos into pulling tank	60	4.62	0.58
Sampling slurry, running filter tests and drawing diaphragm on cells	120	0.23	0.06
General cell preparation	240	0.25	0.13
Lunch and Breaks	60	---	0.00
Time-Weighted Average	480		0.77
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

Chlorine Cells Maintenance, 853 Building Summary of Sample Analysis

Area Operation	No. of Samples	Asbestos Concentration (Fibers/ml.) Range	Average
Weighing and dumping asbestos into pulling tank	5	3.69-7.18	4.62
General work around pulling tank	4	0.12-0.39	0.23
Preparing cells for pulling tank, putting cells into ovens	5	0.13-1.03	0.25
Assembling screens, 20-30' south of pulling tank	3	0.21-0.32	0.28
Inserting graphite plates into cells 15-20' east of pulling tank	3	0.08-0.53	0.28

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