FILE NAME: Hopeman Brothers (HB)

DATE: 1972 Nov 10

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DOCUMENT DESCRIPTION: Inspection Report - Results of Detailed Study of Asbestos Fiber Concentrations in the Work Environment of Hopeman Bros. Inc. with Cover Memo from Tulane University

last done for

TULANE UNIVERSITY
NEW ORLEANS, LA. 70112

Office of the Vice President
For Health Affairs
1430 Tulane Avenue

November 13, 1972

Mr. Kenneth Wood, Superintendent
Hopeman Bros , Inc.
c/o Avondale Shipyards
Post Office Box 50280
New Orleans, La., 70150

Dear Mr. Wood:

First, let me offer my apology for the tardiness of the final report. Things have been very busy around here lately.

Transmitted this date under separate cover, are three copies of the "Results of Detailed Study of Asbestos Fiber Concentration in the Work Environment of Hopeman Bros., Inc."

The results of the detailed study are extremely impressive in that the fiber concentrations in this environment not only met present requirements of OSHA but also the proposed 1976 requirements.

Needless to say, the success of maintaining low asbestos fiber levels in this environment is contingent upon the control equipment and any alterations to the controls, under which the data was obtained, could adversely affect the asbestos fiber concentration. Therefore, any changes in the sawing technique or fiber collection method should be elvauated for efficiency.

Enclosed is a bill for service rendered for the final study. As you may recall, the original proposal called for seven (7) mandays to perform the work for both the preliminary and detailed studies. The actual number of mandays required for the total project was approximately 6.4 mandays.

I have certainly enjoyed working with you on this project and if there are any questions pertaining to the reports, please call me at 588-5486.

Sincerely,

Max L. Richard

Max L. Richard, R.S.,
Registration Number - 473



RESULTS OF DETAILED STUDY OF ASBESTOS FIBER CONCENTRATIONS IN THE WORK ENVIRONMENT OF HOPEMAN BROS., INC.

NOVEMBER 10, 1972

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INTRODUCTION

A preliminary study of asbestos exposure was conducted in the Hopeman Brothers work environment during the month of July 1972. The results of this study indicated that the average asbestos fiber concentration was 0.0229 fibers, greater than five (5) microns in length per cubic centimeter of air. The study consisted of three samples collected on millipore filters plus one blank sample for background determinations. Based on the findings of the preliminary study, the recommendation was made that additional samples be collected for a detailed study. This was accomplished on August 21 and September 26, 1972.

PURPOSE

The detailed study in this work environment was conducted for the following reasons:

1. To further determine employee exposure to asbestos fibers.
2. To further substantiate that the fiber concentration remained consistently below the level required by the Occupational Safety & Health Act of 1970.
3. To encompass all phases of the operation.
4. To further determine whether the vacuum devices used in the operations were sufficient for the collection and retention of asbestos fibers greater than five (5) microns in length.
5. To determine whether employees can work in this environment without the use of respiratory protection.
6. To fulfill the sampling requirements set by the Occupational Safety & Health Act of 1970.

SAMPLING

On August 21, 1972, eight (8) samples of two hundred and forty (240) minutes each, plus five (5) blanks were collected in the work environment. The filter surfaces on two of the 240 minute samples were extremely loaded with particulate matter and could not be processed. For this reason, one (1) additional sixty (60) minute sample and one (1) blank were collected for the bevelling and predrilling operation on September 26, 1972 as shown in the following table of results.

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All samples were collected according to the Occupational Safety & Health Act, "Asbestos Sampling Data Sheet # 2". Appendix I gives information on the calibration of sampling pumps and the sampling method.

SAMPLE EVALUATION

All samples were counted according to the Occupational Safety & Health Act, "Asbestos Sampling Data Sheet # 2," during the month of October 1972. Appendix II gives information on the handling and counting method.

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ESULTS OF SAMPLES COLLECTED ON AUGUST 21, 1972

mple ber	Description	Flow Rate	Time on	Time off	Total Sampling Time	Total Volume of air sampled	Asbestos Fibers 5 Microns or greater	
							Fiber count on filter	Fibers/cc of air
1	Personal sample Marinite 36 sawing operation Cabin Deck	2 L/M	7:43 a.m	11:43 a.m.	240 min.	480,000 cc	4,414	0.009[illegible]
2	General environment - Marinite 36 sawing operation Cabin Deck	2 L/M	7:45 a.m.	11:45 a.m.	240 min.	480,000 cc	5,478	0.011414
3	Personal sample Marine Veneer Drilling operation Cabin Deck	2 L/M	7:49 a.m.	11:49 a.m.	240 min.	480,000cc	2,410	0.005021
4	Personal sample Marine Veneer Sawing operation Cabin Deck	2 L/M	7:55 a.m.	11:55 a.m.	240 min.	480,000 cc	1,190	0.002480
5	Personal sample Marinite 36 sawing operation Main & Upper Deck	2 L/M	8:06 a.m.	12:06 p.m.	240 min.	480,000 cc	7,298	0.015205
6	Sample voided after 7 minutes. Reasons: Discovered air leak around "o" ring changed to # 8 filter	2 L/M	8:03 a.m.	8:10 a.m.	----	-----	----	------
7	Personal sample Marine Veneer Bevelling & pre-drilling operation Shack	2 L/M	7:26 a.m.	11:26 a.m.	240 min.	480,000 cc	Filter surface loaded with particulate matter-unable to process	
8	General environmental Marine Veneer sawing operation Main & Upper Deck	2 L/M	8:13 a.m.	12:13 p.m.	240 min.	480,000	Filter surface loaded with particulate matter unable to process (*See notes for sample 7 & 8, Table II	
9	Personal sample clean up operation	2 L/M	11:50 a.m.	12:30 p.m.	40 min.	80,000 cc	6,466	0.080[illegible]

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RESULTS OF BLANKS COLLECTED ON AUSUT 21, 1972

nk	Description	Flow Time	Time on	Time off	Total Sampling time	Total volume of air sampled	Asbestos Fibers 5 Microns or greater	
							Fiber count on filter	Fibers/cc of air
1	Exposed to Environment of Marinite 36 Sawing operation Cabin Deck	No air Flow	8:55 a.m.	--	-----	------	0	-----
2	Exposed to Personal sampling environment of Marine Veneer sawing operation, Cabin Deck	No air flow	9:03 a.m.	---	-------	-----	1	----
3	Exposed to personnal sampling environment of Marine veener drilling operation Main Deck	No air flow	9:07 a.m.	----	------	-----	3	-----
4	Exposed to personal sampling environment of Marine veener predrilling & Bevelling operation Shack	No Air Flow	7:30 a.m.	--	-------	-----	0	----
5	Exposed to personal sampling of Marinite 36 sawing operation Cabin Deck	No Air Flow	9:55 a.m.	---	-----	-----	2	----

Note: Sample # 7 was repeated on September 26, 1972 (See Table III for results)
Note: Sample # 8 was not repeated as results of previous samples indicate that additional sampling was not necessary

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Results of sample and Blank collected on September 26, 1972

mple nber	Description	Flow Rate	Time on	Time off	Total Sampling Time	Total Volume of air sampled	Asbestos Fibers 5 Microns or greater: Fiber coun on filter	Fibers/cc of air
1	Personal sample Bevelling & Pre-drilling operation Shack	2 L/M	10:00 a.m.	11:00 a.m.	60 min.	120,000 cc	48	0.0004
ank	Exposed to Bevelling & Predrilling Operation Shack	No Air Flow	10:30 a.m.	---	----	-----	0	-----

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SUMMARY

The results of the preliminary and detailed studies in the work environment of Hopeman Brothers, Inc. aboard a LASH vessel, Avondale Shipyard, indicates that the average asbestos fiber concentration of fibers greater than five (5) microns in length per cubic centimeter of air was consistently below the TLV required by the Occupational Safety & Health Act of 1970.

A. Preliminary Study - 0.02290 - Average fibers/cc greater than 5 microns

B. Detailed Study - 0.07791 - Average fibers/cc greater than 5 microns

C. Total, both studies 0.05040 - Average fibers/cc greater than 5 microns

A total of 13 samples (approximately 37 hours sampling time) and seven (7) blank samples were collected during this project and no one individual sample was above the TLV.

CONCLUSIONS

Based on the results of the studies and the work performed on the project, the following conclusions were drawn:

1. Asbestos exposure to employees in this work environment was well within the criteria set by OSHA, 1970.

2. All phases of the sawing, clean up and drilling operations evaluated during the studies that were related to asbestos fiber dispersion in the work atmosphere were within the required TLV.

3. The vacuum system used on the sawing and drilling equipment for the collection and retention of asbestos fibers greater than five (5) microns in length was sufficient for reducing the asbestos fiber concentration below the TLV.

4. Employees may work under these environmental conditions at minimal risk without respiratory protection.

5. All sampling requirements by OSHA has been fulfilled.

6. The asbestos levels determined by this study were in compliance with the proposed 1976 standard of two fibers per cc, greater than 5 microns in length.

EXHIBIT

RECOMMENDATIONS

It is recommended that this work environment be re-evaluated at one year intervals to insure continuing compliance with OSHA standards.

The foregoing report is based in its entirety on work performed by Max L. Richard as an independent consultant and no official endorsement by Tulane University is implied.

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APPENDIX I

EQUIPMENT

1. Mine Safety Appliance, Model G Gravimetric Personal Pumps, Bureau of Mines Approval No. 2G-2239-Occupational Safety & Health Act Approval No. 1A-101.

2. Mine Safety Appliance filter holders and sampling assemblies.

3. Millipore filters - Cat. No. MAW P0037AO - 37 mm Diameter .8 micron pore size

CALIBRATION OF PUMPS

The personal pumps were calibrated to obtain a flow rate of 2 l/m with sampling line, filter and filter assembly attached using a Precision Wet Test Meter. Flow rates were checked three times on each pump and a reference mark was established on the flow rate indicator located on the side of the pump.

SAMPLING PROCEDURE

1. Immediately prior to sampling, each pump was operated for approximately two minutes without the filter assembly to insure proper operating temperature of the pump.

2. The sampling line was attached and the pumps were operated again for approximately one minute to clear the sampling line of any material that was foreign to the sampling environment.

3. The sampling port caps of the filter were removed and the filter was mounted on the filter holder assembly and aligned for proper fitting around the O ring in the filter holder.

4. The pump was turned on, the intake port of the filter was sealed off and the sampling assembly was checked for leaks. This was accomplished by observing the position of the flow rate indicator.

5. The face cap of the filter was removed, the pump turned on, time on was logged and the sampling period begun.

6. Flow rates were checked during the sampling period at five (5) minute intervals by observing the flow rate indicator. Flow rate adjustments were made as necessary during the sampling period as the filter surface area became loaded with particulate material.

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7. At the end of each sampling period the time off was logged, the face caps and port caps were replaced and the filter was packed for transportation. The collection side of the filter was placed in an up right position to prevent migration of fibers across the filter surface.

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LABORATORY COUNTING PROCEDURE

Asbestos fiber counting was done using a Baush and Lomb PR-27 equipped with phase contrast accessories. The microscope contained a porton reticle which projects a constant counting area and has provisions for measuring fibers of greater than five microns in length. All counting was done at 430 magnification using a 10x eyepiece and 43x objective.

Following is the laboratory procedure used in fiber counting:

1. The field monitors were unpacked taking care that the collection surface remained in an upright position.

2. The mounting solution was prepared. A one to one solution by volume of dimethyl phthalate and diethyl oxalate was prepared and placed in a balsam bottle. To this 0.05 grams of filter material was added for each milliliter of solution. The added filter material increases the viscosity of the mounting solution and prevents migration of the fibers from one counting field to another. The solution was allowed to dissolve for several hours and then refrigerated to extend shelf life.

3. The samples were counted in the same order as collected and each sample was prepared and mounted just prior to counting as follows:

   A. The face cap and retaining ring was removed from the field monitor and the filter sample removed with tweezers.

   B. The filter sample was sectioned into three circular pieces. These pieces represented 61.98% of the total filter sample surface area of 855.3006 square millimeters.

   C. Using a medicine dropper, small drops of mounting media were placed on a 25 x 75 mm slide for each sector of the sample. The sectors were then placed over the mounting media, sample side up, and covered with a 1 - $1\frac{1}{4}$" cover slip. Each slide was identified by sample number and date.

   D. The mounted slides were allowed to dry for approximately 45 minutes to obtain complete clarity.

4. The sectors were counted and a count of all fibers greater than 5 microns in lengths were recorded.

5. The following formula was used to calculate fiber concentration:

$$\text{CONCENTRATION} = \frac{(\text{Av Fiber Cnt})\ (\text{Filter Area})}{(\text{Field Area})\ (\text{sample Volume})\ (1000)}$$

Average Fiber Count: Average fiber count per size range

Filter Area: 855.3006 mm^2 for 37mm Diameter membrane filters

Counting Area: Reticle calibrated in mm^2

Sample Volume: Total time x flow rate, expressed in liters

1000: Converts liters to milliliters

1 Milliliter = 1 cubic centimeter