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PEARL HARBOR NAVAL SHIPYARD
Pearl Harbor, Hawaii

Ser 78-14
Code 185.6

INDUSTRIAL HYGIENE INVESTIGATION SHEET

SHOP 38
Simulated Gasket Cutting Operation

DATE: 16 May 1978
REPORT DATE: 17 May 1978

INVESTIGATOR:

Kim Koyamatsu

REFERENCES:

- (a) U.S. Dept. of HEW, Criteria Document for Asbestos "AM 72-10267.
- (b) DECAINST 6260.1, Control of Asbestos Exposure to Naval Personnel and to Environments
- (c) RUMEN ltr, RUMEN-5533: DER: pas, 6260.4A of 7 March 1977
- (d) Federal Register, Occupational Safety and Health Standards Vol 39, No. 125, Part II, 27 June 1974.

PROBLEM:

To determine the airborne asbestos concentration as a result of a simulated gasket cutting and asbestos material handling operation. This investigation was ordered by Timmy Choy Code 140, as a result of a walk-through asbestos survey of SHOP 38 on 16 May 1978.

OPERATION:

Nearly all the Shop 38 employees make gaskets out of asbestos material (consako). According to Gideon Kaonohi, 038-11409, General Foreman, they make gaskets as needed, sometimes aboard ship. The following asbestos materials are used:

Description	Manufacturer	F.S.N.
1/32" sheet	Garlock	5330005859502
1/16" or 3/32" sheet	Garlock	5330002222563

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Description	Manufacturer	F.S.N.
1/8" sheet	Garlock	5330009424728
1/16" sheet	Nicolet Ind.	5330005859501
1/8" sheet woven asbestos & rubber w/wire insert	Fed Spec. HHP31 type 2	5330002689880
valve packing (used on shafts)	John Crane	(local purchase)

The average maximum time that a worker will spend per day making gaskets is one-half hour. When a large number of gaskets is needed, shop employee is assigned the job which may take 45-60 minutes. The workers use tinsnips, aviation shears or a variable size gasket cutter to cut the gaskets. Then they use a metal template and hammer to punch out the holes. When it is inconvenient to obtain these tools, they may use the valve itself as a template and create a gasket by placing the consako over the valve and hammering at the edges. Because hammering out a gasket is messy and produces a low quality gasket, this rarely is done. The shop employees also handle asbestos valve packing: cutting it with a shear and fitting it around shafts. Sometimes they hammer it, causing disintegration of the woven network.

Up to now the workers have not been using personal protective equipment or posting signs. Housekeeping details are often ignored, particles of debris are just brushed aside. No special provisions for disposing of waste material have been adhered to. The consako material is stored haphazardly, pieces are often left laying around the shop.

The present operation was performed on a table on the ewa side of the shop. The worker was Harold Ahuna, badge no. 038-11596. The table was covered with canvas, no containment was used. He was instructed to simulate the typical gasket making and asbestos material handling methods used by the shop employees. He used tinsnips, a metal template, and a hammer. Men were working ten feet away and hand printed sign saying "Caution Asbestos Test" was displayed.

INVESTIGATION PROCEDURE:

1. Three Bendix Super Sampler Pumps BDX41, serial numbers 3-77-08, 3-77-03 and 3-77-14. Pumps were calibrated on 8 May 1978 with a Universal Pump Calibrator, Model 302. Flow rates ranged from 1.29 to 1.67 l/min.
2. Millipore aerosol field monitors with cellulose ester filters, pore size .8

The undersigned took three air samples. One was taken as close to the cutting operation as possible in order to estimate the concentration

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of fibers created. One was taken ten feet in back of the operator in the breathing zone of the nearest workers. One operator breathing zone sample was taken in order to estimate the exposure of the operator. Sampling time was approximately one-half hour. The sampling records the airborne asbestos concentration produced by a composite of asbestos handling operations and would thus represent a typical day's exposure of a X38 employee. These operations included pounding the consako material with a hammer, punching holes by hammering the material on a dummy plate, cutting with tinsnips, cutting holes with template and hammer, cleaning up by placing debris into blue poly bags, wiping the area with a paper towel and rolling up the canvas covering on the workbench to dispose of it.

The cassettes were analyzed as directed in reference (a).

Dummy plate to simulate valve flange

The results are tabulated in Table 1.

DISCUSSIONS:

The T.W.A. fiber counts were lower than the two fibers per c.c. T.W.A. standard promulgated in reference (b). On the other hand, reference (c) notes that NIOSH recommended in 1976 that the time weighted average occupational exposure to asbestos fibers be lowered to .1 fiber/cc. with this in mind, BUMED has recommended that all personnel who are exposed to concentration of .1 fiber/cc should be included in the Asbestos Medical Surveillance Program. Since the T.W.A. produced by the operation (sample 1) is very close to .1 f/cc, men who make gaskets should also be included in that program. Also, since the object of the Shipyard Asbestos Control Program is to "Keep fibers out of people's lungs," the personal protective measures as outlined in references (b) & (d) should be instituted.

RECOMMENDATIONS:

1. A separate room in Shop 38 should be set aside for all gasket making operations. The area should be posted as described in reference (d).
2. The personal protective equipment outlined in reference (b) should be worn by gasket makers.
3. More attention should be paid to housekeeping details. Larger pieces of asbestos material should be stored in blue poly bags and smaller pieces in zip-lock plastic bags. Dry sweeping should not be allowed. The area should be vacuumed with an NRMC-approved asbestos vacuum cleaner. Care should be taken not to produce airborne particles in all operations.

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4. All asbestos material should be labeled with black and yellow asbestos caution tags described in reference (d).
5. An acceptable substitute for asbestos valve packing cord should be found.
6. All men who handle the asbestos valve packing cord should wear both cotton gloves and surgical gloves. They should wash their hands and arms thoroughly after completing the work. In addition, cutting tools should be cleaned with a damp rag.
8. All asbestos scrap and asbestos contaminated waste bag and dumped in a designated asbestos dumpster.
9. All Shop employees should be given an asbestos indoctrination since nearly all of them make gaskets or handle other asbestos material at one time or another.
10. All gasket makers should be included in the Asbestos Medical Surveillance Program.
11. A more indepth study on the relationship between local air currents and asbestos fiber dispersion should be made by the Industrial Hygienist.

K. E. KOYAMATSU

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Table 1

Monitoring results of Simulated Gasket
Cutting Operation Shop 38

<u>Sample</u>	<u>Time</u>	<u>Area</u>	<u>fibers/c.c.</u>	<u>TWA</u>
1	1245-1317	Within one foot of operation	.69	.09 fibers/cc
2	1245-1318	10 feet from operator	0	0
3	1245-1315	Breathing zone	.21	.03 fibers/cc

Note: TWA is based on 1 hour maximum exposure time.

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