

HARVARD UNIVERSITY
SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF INDUSTRIAL HYGIENE

100 Mt. Auburn Street
Cambridge, Massachusetts

November 10, 1942

Bath Iron Works
Bath, Maine

Gentlemen:

Att'n: Mr. J. Newell

Further investigation has been made on the health hazard involved in work on asbestos pipe coverings to determine the extent of the health risk. Analysis of samples of the commonly used pipe covering materials show sufficient quantities of asbestos present to warrant care in its handling. Since the asbestos found is not easily respirable the control of the hazard is simplified. Wetting before cutting or pounding into shape should give adequate control for most of the work. The pressed pieces which require cutting with a band saw, however, present much more of a problem, for this process can only be effectively controlled by the installation of an exhaust system designed so as to capture all dust created in the cutting process. Where all other control methods fail, the dusty processes should be segregated and the workmen required to wear dust respirators.

Of prime importance is the examining by chest X-ray all employees exposed to this work. Periodic examinations of chests should also be made every six months.

Our engineers are available for checking conditions in pipe covering shops if a request for their services is made.

We attach hereto the petrographic analyses of the samples of material you sent us. The analyses are made by Dr. Charles R. Williams of this school. They indicate clearly that it would be advisable to apply a reasonable amount of dust control in handling these materials.

We attach also a copy of a letter from the Union Asbestos and Rubber Company.

Sincerely yours,

Philip Drinker

Philip Drinker

OPY

MR JOHNSON

HOME

ENG.

JAN.13,1945

BATH IRON WORKS

Maine

#16633

ASBESTOSIS HAZARD

The following counts were obtained at the Bath Iron Works. In all cases these counts are the average of not less than 2, and sometimes of 4 in each locality given:

Shop

Cutting asbestos (The field reveals much long-fibered material)	38 million
General air	52 million
Mixing cement	50 million-plus
Saw- without blower	50 million-plus
Saw- with blower	42 million

The following counts were taken on board ship:

In quarters	40 million
In fire room	34 million
In forward quarters	50 million-plus

In all counts except those taken in cutting asbestos, there appeared to be a great deal of material about 1 micron in diameter and of a very uniform size. This did not appear to be in the least fibrous, and I suspect it may be particles of cement which are used in the mixture. Certain of the basic materials used contain large quantities of diatomite.

Edward Thompson
RH

Industrial Hygienist
Home Office Div., Eng. Dept.

COPIES TO: Mr. Locke
Prof. Drinker
Dr. Williams

(This was made at request of U.S. Maritime Commission & Navy. This is not to be made public or shown to any unauthorized persons.)

Philip Drinker, USMC
Chief Health Consultant)

(2)

U.S.Navy-U.S.Maritime Commission War Shipping Administration

Safety and Industrial Health Program

Report on Investigation

of

Asbestosis from Amosite Pipe Covering at Bath Iron Works

Bath, Maine

December 19, 1944.

References: (a) Report of Industrial Health Survey of Sept. 24, 1942.
(b) " " " " " Re-Survey of April 9, 10, 1943.
(c) " " " " " " Sept. 20-23, 1944.

(d) "Minimum Requirements for Safety and Industrial Health in Contract Shipyards" approved by U.S.Navy, U.S.Maritime Commission and War Shipping Administration.

(This document contains information affecting the national defense of the United States within the meaning of the Espionage Act 50 U.S.C. 31 and 32. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.)

BY

W.C.Dreessen, Surgeon, U.S. Public Health Service, Bethesda, Maryland

W.E.Fleischer, Lt. Comdr. MC, USNR, Health Consultant
Office of the Regional Director of Construction
U.S. Maritime Commission, East Coast

3

Personnel interviewed:

Dr. E.M.Fuller,Jr In charge of Pre-employment and
periodic check-up physical examinations

This investigation was made at the direction of the Chief Health Consultant of the U.S.Maritime Commission, inasmuch as we had heard that there was concern among the pipe covering crews who feared that the amosite was causing some respiratory troubles.

Medical

There are about 120 workers engaged in handling asbestos in the Pipe Coverer's Shop and on board ships under construction. Chest X-rays are being taken first on those with the longest exposure, i.e. over two years, of which it is estimated that there are about 50 workers. In the near future all of the 120 will have a chest plate taken.

Of the 50 workers 38 have already been X-rayed and all of this group have been handling asbestos pipe covering from 2 to 9 years. It was interesting to note that the two individuals with the longest exposures of 5 and 10 years were in the older age group, being 59 and 65 years of age respectively. All of the 38 films were reviewed and 12 of these patients showed significant X-ray changes consistent with exposure to dusty environment. History and physical examination by Dr.Fuller indicated that in all of the 38 patients respiratory symptoms and physical signs were minimal.

On X-ray interpretation these 38 patients could be divided into four groups:

1. The two older workers referred to above, the appearance of whose chest X-rays was consistent with the diagnosis of well established asbestosis. These plates also showed signs typical of advanced age, such as cardio-vascular changes etc.
2. A group of four workers whose exposure was from two and a half to four years whose chest X-ray appearances were consistent with a diagnosis of asbestosis.
3. A group of six workers whose exposure was from two to two and a half years and whose chest films showed minimal changes but not sufficient for a definite diagnosis of asbestosis.
4. A group of 26 workers whose exposure was from two to two and a half years and whose chest films were considered negative.

(4)

It was considered significant that those workers with the most marked X-ray changes were those who presumably were exposed to the heavier concentrations of dust, such as operators of the band saw and small rotary power driven saws.

In those workers whose X-rays were consistent with a diagnosis of asbestosis, the changes consisted of bilaterally symmetrical increased reticulation of the lung fields resembling a ground glass appearance. Such lung field markings are indistinguishable from those induced by chrysotile asbestos. No evidence of active tuberculosis was noted on any of the films.

Description of Pipe Coverer's Shop

This shop occupies about half of a loft and is partially segregated from sheet metal workers at the other end of the loft. The more dusty phases of the work such as band saw cutting and the mixing troughs are located at the far end of the loft. Local exhaust ventilation was installed on the band saw several months ago and removes some of the dust arising during the cutting of pipe insulat. Respirators were being worn by several workers using the small rotary saws. It is anticipated in the near future, that the insurance carrier, American Mutual Liability Insurance Co. of Boston, Mass. will take dust samples throughout the shop. We know the personnel of the insurance carrier, have discussed the problem with them and would have complete confidence in their appraisal of this job.

Recommendations:

1. It is recommended that all of the remaining asbestos workers be given a chest X-ray in the near future.
2. Unless the dust exposure is controlled as outlined below, the workers in groups 1 and 2 above, should be transferred to a non-dusty occupation.
3. Groups 1, 2 and 3 should have a chest X-ray at yearly intervals.
4. If the dust exposure is not controlled all asbestos workers should have a chest X-ray at yearly intervals.

(5)

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(6)

5. While the local exhaust on the hand saw removes a considerable proportion of the dust, it is not considered adequate. This ventilation should be corrected so that the dust is removed.

6. Unless properly ventilated the band saw and mixing trough operations should be isolated from each other and from the rest of the shop. All workers on these operations should wear either approved air line respirators or respirators approved for pneumoconiosis-producing dusts.

7. If the dust counts taken by the insurance show, that after isolation of the above operations, the amount of asbestos dust in the general shop is sufficiently high to produce an asbestosis hazard, then the general ventilation of the shop should be improved.

Note: Reference (a) recommended as follows:

"The conditions in this shop present a very real asbestosis hazard and immediate steps should be taken to segregate the most dusty processes into a well ventilated area. Local exhaust systems of proper design should be installed. However, if conditions cannot be completely controlled in this manner, then suitable dust respirators should be worn by the workers. Periodic physical examinations of the chests of all workers should be made."

SUGGESTED SAFETY PROGRAM
FOR HANDLING
ASBESTOS & DIATOMACEOUS EARTH PRODUCTS

1. Provide adequate ventilation at all points where dust is created in handling Asbestos Products and Diatomaceous Earth Products capable of producing Silicate Dust.
2. Require all employees to wear suitable approved respirator when engaged in any work where there could be exposure to Asbestos Dust.
3. Provide pre-employment medical examination and X-ray examination of the chest area for those who are to be employed in work where there is exposure to Asbestos Dust.
(The purpose of the pre-employment examination is to eliminate prospective workers who have respiratory ailments or who are susceptible to respiratory ailments.)
4. Provide periodic medical and chest X-ray examinations for all employees engaged in work where there is an exposure to Asbestos Dust. It is suggested that such periodic medical and X-ray examinations be made at intervals of at least every six months.

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