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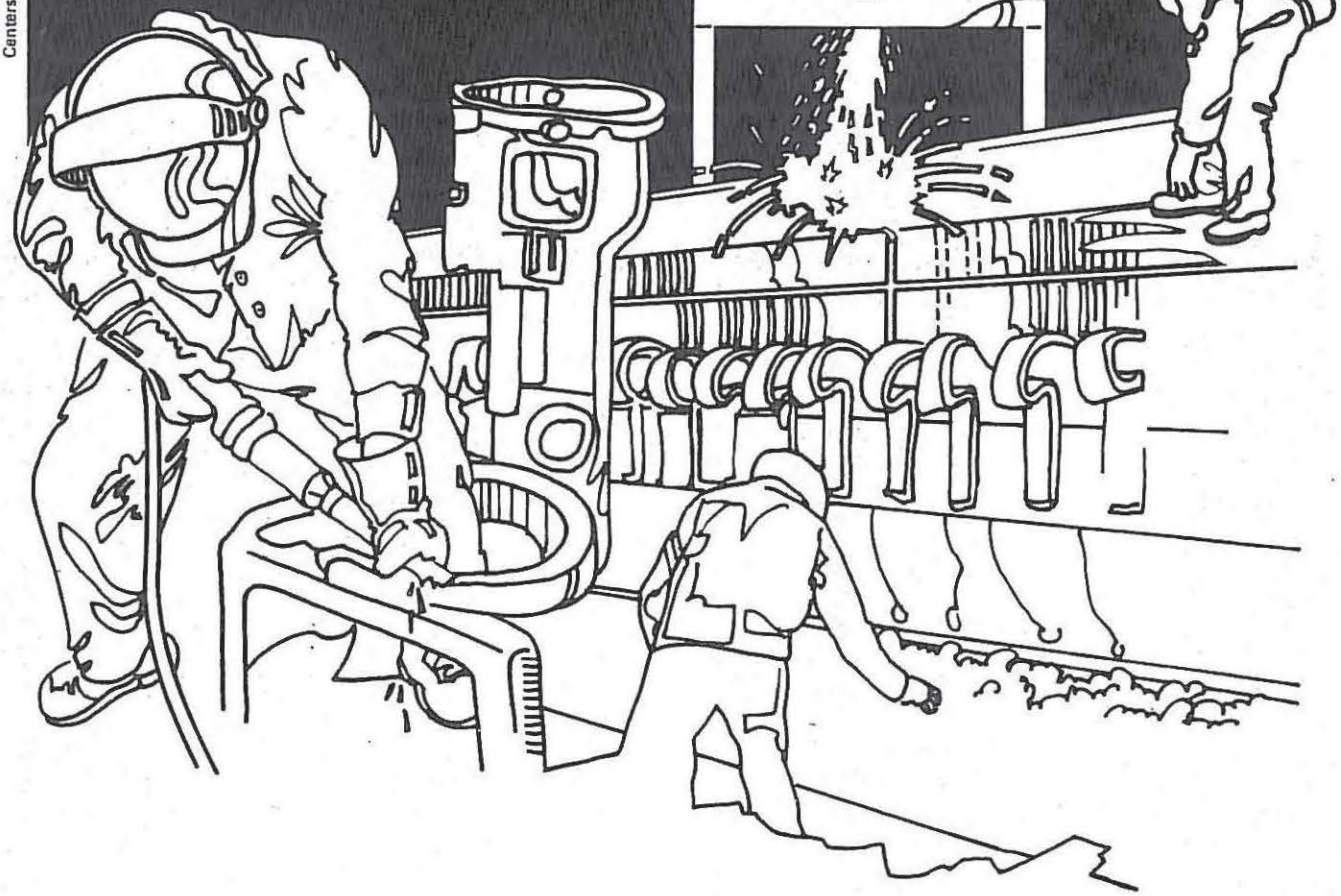

Health Hazard Evaluation Report

HETA 84-043-1429
PENNSYLVANIA DEPARTMENT
OF TRANSPORTATION
TRANSPORTATION AND SAFETY BUILDING
HARRISBURG, PENNSYLVANIA

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

HETA 84-043-1429
MARCH 1984
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NIOSH Investigator:
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I. Summary

In November 1983, the National Institute for Occupational Safety and Health (NIOSH) received a request to evaluate potential asbestos exposures at the Pennsylvania Department of Transportation and Safety Building in Harrisburg, Pennsylvania. The concern was that the fireproofing material contained 12 percent (%) asbestos and due to water leakage from the upper floors, the asbestos fibers may have become airborne.

On November 15, 1983, NIOSH conducted an environmental survey of the Building. Nineteen area air samples were collected on 14 floors of the Building and all showed total airborne concentrations of asbestos fibers to be none detected at a limit of 0.01 asbestos fibers per cubic centimeter (f/cc) as compared to the Occupational Safety and Health Administration (OSHA) standard for asbestos of 2.0 f/cc for an eight-hour average daily exposure. NIOSH recommends that exposure to asbestos be reduced to the lowest feasible limit. Two bulk samples, ceiling from Rooms G-103 and G-134B, were examined by polarized light microscopy and dispersion staining techniques. Both samples contained approzimately 35% chrysotile asbestos.

Based on the environmental results, it is concluded that the technical, clerical and administrative personnel in the Transportation and Safety Building were not exposed to airborne asbestos fibers at the time of this survey. Further details and recommendations are in this report.

KEYWORDS: 9621 (Regulation and Administration of Transportation Programs), asbestos.

II. Introduction

On November 1, 1983, NIOSH received two requests from the personnel director and the representative of the employees for a health hazard evaluation at the Pennsylvania Transportation and Safety Building, Harrisburg, Pennsylvania. Both expressed concern that the clerical and administrative employees may be exposed to asbestos. A previous evaluation, June 1976 by the Pennsylvania Bureau of Environmental Control, showed as high as 12% asbestos in the fireproofing compound on the steel girders in the false ceiling. The concern was further compounded by the fact that water leaks occurred in certain areas and the fireproofing may have deteriorated.

There are approximately two-thousand employees engaged in highway and administration and regulatory control functions. This is a 14-story building which is leased and maintained by the General Services Bureau. The building has been occupied since 1969 when it was built.

III. Evaluation Methods and Results

Three area samples for airborne asbestos fiber were collected on 0.8-micrometer pore size mixed cellulose membrane filters in a three-piece open faced filter holder. A personal sampling pump operating at 1.70 liters was used. The sampling time was approximately four hours. These samples were analyzed for asbestos fibers according to NIOSH Method P&CAM 239[1] utilizing phase contrast microscopy.

The samples are reported in total fibers per filter. The following calculation was performed to convert fibers/filter to fibers/cc.

$$\frac{\text{Fibers/Filter}}{(\text{Sample Vol. L})(1000)} = \text{f/cc}$$

The limit of detection (LOD) has been determined to be 4500 fibers/filter. A detection limit is calculated by dividing the minimum observable fibers by the maximum number of fields specified by the method.

The air fiber concentrations for the 19 air samples were less than the laboratory limit of detection (0.01 f/cc) The OSHA legal standard is 2.0 f/cc for an eight-hour average daily exposure. NIOSH recommends that exposure to asbestos be reduced to the lowest feasible limit. OSHA has proposed an Emergency Temporary Standard to lower the limit to 0.5 f/cc, however, it has been stayed.

Two bulk samples from the girders in the ceiling in Rooms G-103 and G-134B, which were most affected by the water leakage, both showed the asbestos content to be approximately 35%.

IV. Findings and Recommendations

During this visit, it was noted that many ceiling tiles were removed and never replaced by the maintenance personnel from the General Services Bureau. It was also learned that the water leakage necessitated the removal and replacement of many of the panels. Certain areas were also renovated.

As time passes, it would be expected that some deterioration would occur in the integrity of the fireproofing material. Such deterioration could possibly result in hazardous asbestos exposures to the office workers. Based upon these findings and considerations, it is appropriate that the following recommendations be made:

1) All tiles that have been removed should be promptly replaced following the completion of repairs.

2) Maintenance employees shall be informed when working in areas where they may be exposed to asbestos, appraised of the hazards and precautions necessary.

3) General Services Bureau (GSB) should adhere to OSHA's requirements for a minimal acceptable respirator program, since occasionally it is necessary for GSA staff to utilize respirators.

4) During any renovation or maintenance activity which disturbs the asbestos containing fireproofing material, the common and accepted control measures should be followed. These control measures include contaminant barriers, worker protection, use of wetting agents, proper cleanup, proper waste disposal, and air monitoring. Proper control programs have been presented in a number of NIOSH[2], OSHA[3], and EPA[4] publications.

5) All of the exposed asbestos containing fireproofing materials should be suitably enclosed, encapsulated, or removed.

6) The building should be periodically monitored for the conditions under which asbestos exposures might exist. This monitoring program should include ample environmental sampling to detect the presence of airborne asbestos fibers or asbestos contamination in the work areas.

7) Should it become evident, as a result of the asbestos monitoring program, that asbestos fibers are reaching the normal work areas of the building then it will become necessary to promptly remove, isolate, or encapsulate the asbestos containing fireproofing material.

8) All employees who have had previous exposure to asbestos or who are performing maintenance with a potential for asbestos exposure should have medical surveillance(5).

Required components of medical surveillance program include periodic measurements of pulmonary function (forced vital capacity (FVC)), and forced expiratory volume for one second (FEV), and periodic chest roentgenograms (postero-anterior 14 X 17'). Additional medical requirement components include a history to describe smoking habits and details on past exposures to asbestos and other dusts and to determine presence or absence of pulmonary, cardiovascular, and gastrointestinal symptoms, and a physical examination, with special attention to pulmonary rales, clubbing of fingers, and other signs related to cardio-pulmonary systems.

V. Authorship and Acknowledgments

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NIOSH, Region III, Philadelphia, PA

Acknowledgments

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Salt Lake City, UT

VI. Distribution and Availability

Copies of this Determination Report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, OH 45226. After 90 days, this report will be available through the National Technical Information Service (NTIS), Springfield, VA. Information regarding its availability through NTIS can be obtained from NIOSH, Publications Office, at the Cincinnati address.

Copies of this report have been sent to:

1. Pennsylvania Department of Transportation and Safety
2. Employee Representative
3. NIOSH, Region III

For the purpose of informing the 2000 employees of the results of the Pennsylvania Department of Transportation and Safety Building survey, the employer shall promptly "post" for a period of 30 calendar days, the Determination Report in a prominant place(s) near where employees work.

VII. References

1. NIOSH Manual of Analytical Methods, Volume I, NIOSH Publication #77-157A

2. Good Practice Manual for Insulation Installers, NIOSH Publication #77-188, 1977.

3. Asbestos: Worker Health Alert, U.S. Department of Labor, OSHA #3069, 1980.

4. Asbestos-Containing Materials in School Buildings: A Guidance Document, Part 1 &:2, U.S. Environmental Protection Agency Publication #C00090, 1979.

5. Criteria for a Recommended Standard, Occupational Exposure to Asbestos, NIOSH Publication #HSM 72-10267, 1972, Revised 1976 Publication #77-169.

TABLE I

Pennsylvania Transportation and Safety Building
Harrisburg, Pennsylvania
HETA 84 043

Air Sample Results for Asbestos

November 22-23, 1983

Sample Time	Location	Concentration (f/cc)*	Remarks
11/22/83			
08:43-13:20	B-103	N.D.**	Inside ceiling
08:50-13:23	G-134	N.D.	
08:56-13:25	G-134B	N.D.	Two panels open
09:02-13:30	B-118	N.D.	
09:12-13:36	B-158	N.D.	
09:29-;3:14	211-A	N.D.	
09:33-13:15	204	N.D.	
09:38-13:07	410	N.D.	
09:42-13:10	404	N.D.	
11/23/83			
08:04-10:22	G-103	N D.	Work area
08:09-10:27	G-134B	N.D.	
08:15-12:26	617	N.D.	
08:18-12:18	605	N.D	
08:22-12:15	816	N.D.	
08:25-12:12	804	N.D.	
08:30-12:04	1217	N.D.	
08:33-12:06	1209	N.D.	
08:36-12:08	1013	N.D.	
08:38-12:10	1006	N.D.	

*Denotes - Fibers greater than 5 micrometers in length per cubic centimeter.
** Denotes - None detected, limit of detection is 0.01 f/cc.

TABLE II

Bulk Sample Analysis for Asbestos

Sample Site	Asbestos Content
G 103	Approximately 35 percent
G 134B	Approximately 35 percent

Criteria for Asbestos

NIOSH recommended standard for asbestos fibers	LFL***
OSHA legal standard for asbestos fibers	2.0

*** LFL - Lowest feasible limit