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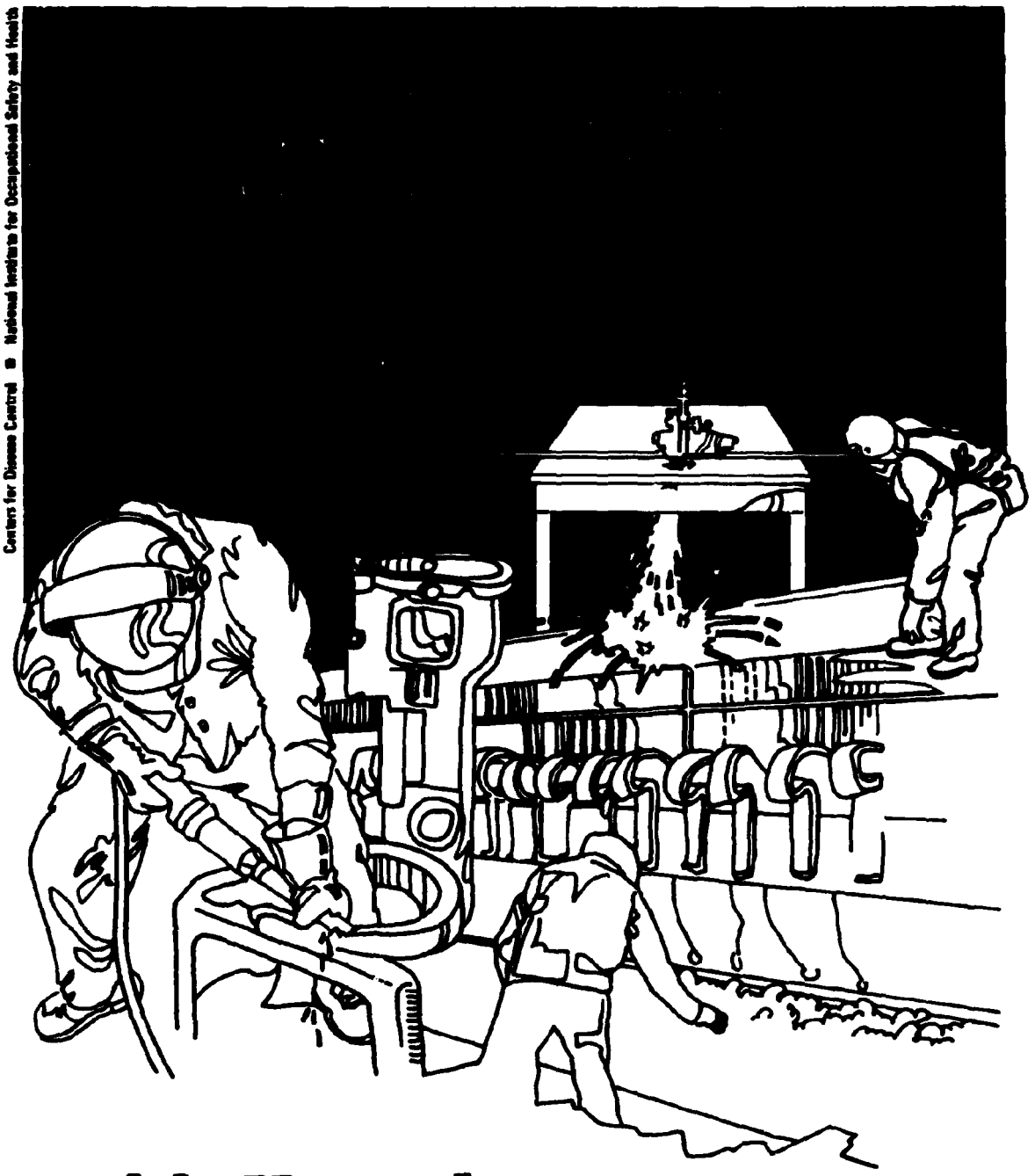

Health Hazard Evaluation Report

TA 80-115-802
CENTERS FOR DISEASE CONTROL
ATLANTA, GEORGIA

REGION-4

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH 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.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

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16. Abstract (Limit: 200 words) Employee exposures to xylene (1330207), ethyl-alcohol (64175), formaldehyde (50000) and asbestos (1332214) were evaluated at the Centers for Disease Control (CDC) (SIC-9199) in Atlanta, Georgia on October 9 and 10, 1980. The measurements were made in response to a request from the Office of Biosafety at CDC to evaluate employee exposure to organic solvents and asbestos. Personal and area samples for evaluating exposure to organic solvents were analyzed by gas chromatography; asbestos was estimated by polarized light microscopy and dispersion staining techniques. In five area and personal samples, xylene concentrations ranged from 1 to 5 milligrams per cubic meter (mg/cu m); the OSHA permissible exposure limit (PEL) is 435mg/cu m on a 8 hour time weighted average. Ethyl-alcohol ranged from 6 to 8mg/cu m; the OSHA PEL for ethyl alcohol is 1900mg/cu m. Formaldehyde ranged from 1 to 3mg/cu m, exceeding the NIOSH ceiling limit of 1.2mg/cu m for a 30 minute average. No asbestos fibers were found in air samples, but 6 of 13 bulk insulation samples contained chrysotile asbestos in concentrations 5 to 60 percent. The author concludes that a health hazard exists at CDC from overexposure to formaldehyde, and six areas have a potential for airborne asbestos exposure. Recommendations include the provision of adequate ventilation to control formaldehyde vapors, the replacement of asbestos insulation, provision of an employee education program, and provision of personal protective equipment.

17. Document Analysis a. Descriptors

Hazards-confirmed, Alcohols, ALdehydes, Asbestos-dusts, Organic-solvents, Chemical-exposure, Industrial-health, Dust-exposure

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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NIOSH INVESTIGATOR:
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I. SUMMARY

On September 8, 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request for technical assistance from the Office of Biosafety, Centers for Disease Control (CDC), Atlanta, Georgia. It was requested that exposures to organic solvents in the laboratories and to airborne asbestos in several working areas be evaluated. On October 9-10, 1980, environmental measurements were made to determine employees' exposures to xylene, ethyl alcohol, formaldehyde and asbestos. Thirteen bulk insulation samples were collected in eight buildings to determine if asbestos might be present in insulation and ceiling tiles.

On the days of sampling, xylene concentration ranged from 1 to 5 mg/M^3 (milligrams of substance per cubic meter of air); the OSHA permissible exposure limit (PEL) for xylene is 435 mg/M^3 based on an 8-hour time weighted average (TWA) concentration. Ethyl alcohol ranged from 6 to 8 mg/M^3; with a PEL of 1900 mg/M^3. Formaldehyde ranged from 1 to 3 mg/M^3 and exceeded the NIOSH recommended ceiling limit of 1 ppm (1.2 mg/M^3), 30 minute average. No asbestos fibers were found in air samples; however, six of thirteen bulk insulation samples contained chrysotile asbestos ranging from 5% to 60%.

Based on this evaluation NIOSH has determined that a health hazard existed from overexposure to formaldehyde at the Centers for Disease Control. The possibility of airborne asbestos exposure does exist in six areas where asbestos in bulk insulation samples was found. These areas should be under surveillance until the asbestos is contained with a protective coating or replaced.

KEYWORDS: SIC 9199, Xylene, ethyl alcohol, formaldehyde and asbestos.

II. INTRODUCTION

In September, 1980, NIOSH received a request for technical assistance from the Office of Biosafety, Centers for Disease Control, Atlanta, Georgia. It was requested that exposures to organic solvents in the laboratories be evaluated. Also concern had been voiced by several CDC personnel that airborne asbestos might occur in certain working areas due to loosening and air entrainment of fibers from walls that had been covered with an asbestos matting for sound insulation purposes.

III. EVALUATION METHODS

Xylene and ethyl alcohol vapor concentration in air were determined by collecting personal and area samples on 150 mg charcoal tubes using personal sampling pumps operating at 100 cc/minute flow rates and were analyzed by gas chromatography following a modification of NIOSH method P&CAM 127 using a Hewlett-Packard 5731A gas chromatograph equipped with a flame ionization detector.

Formaldehyde vapor samples were collected in 150 mg charcoal tubes using personal sampling pumps operating at 100 cc/minute flow rate and were analyzed via ion chromatography on a Dionex Model 10 ion chromatograph. NIOSH method P&CAM 318 was followed with minor variations in the preparation and analysis of samples.

Personal and area air samples were used for measuring asbestos exposure. These samples were collected on mixed cellulose ester filter using personal sampling pumps operated at 1.5 liters per minute. The samples were analyzed according to NIOSH method P&CAM 239 utilizing phase contrast microscopy.

A visual estimation of the percentage of asbestos in bulk samples that were collected was made utilizing polarized light microscopy and dispersion staining techniques.

IV. RESULTS AND DISCUSSION

Results of environmental samples collected for xylene, ethyl alcohol and formaldehyde are shown in Table I. Xylene concentration ranged from 1 to 5 mg/M^3, the OSHA PEL for xylene is 435 mg/M^3 based on an 8-hour time weighted average concentration. Ethyl alcohol ranged from 6 to 8 mg/M^3 with a PEL of 1900 mg/M^3. Formaldehyde ranged from 1 to 3 mg/M^3 and exceeded the NIOSH recommended ceiling limit of 1.2 mg/M^3, 30 minute average. The asbestos in air samples (Table II) were found to be below the limit of detection. Table III shows that six of thirteen bulk samples contained chrysotile asbestos ranging from 5% to 60%.

Based on the environmental evaluation conducted by NIOSH on October 9-10, 1980, it has been determined that a health hazard existed from overexposure to formaldehyde in Building #1 Room SD-215 at the Centers for Disease Control. The possibility of airborne asbestos exposure does exist in six areas where asbestos in bulk samples was found. These areas should be under surveillance until the asbestos is contained with a protective coating or replaced.

V. RECOMMENDATIONS

1. Investigate the possibility of providing adequate ventilation in Building 1 Room SD-215 to control formaldehyde vapors. Until such time a NIOSH approved respirator should be worn.

2. Investigate the possibility of containing or replacing the asbestos with a less hazardous substance in the six areas listed in Table III.

3. An educational program should be instituted so that employees are made aware of the hazards associated with organic solvents. Good work practices and first-aid procedures should be included in this program.

4. All containers containing solvents and acids should be properly marked and stored in appropriate enclosures.

5. Personal protective equipment should be provided for employees exposed to hazards which cannot be adequately abated by engineering controls; at no time should personal protective equipment preclude engineering controls.

6. Should any employee be required to enter the crawl space above the auditorium, asbestos fibers might be dislodged from the walls by mechanical friction. Hence, it is recommended that the individual engaged in such activity be provided a NIOSH approved respirator for asbestos during the time spent in the crawl space.

VI. AUTHORSHIP AND ACKNOWLEDGEMENTS

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VII. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22151. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

1. Office of Biosafety, CDC
2. NIOSH RPC Region IV
3. OSHA Regional Admin. IV

Table I

Results of Breathing Zone and Area Samples
for Xylene, Ethyl Alcohol, and Formaldehyde

Centers for Disease Control
Atlanta, Georgia

October 9-10, 1980

Job and/or Location	Sampling Period	Sample Volume Liters	Type	Xylene mg/M^3*	Ethyl Alcohol mg/M^3	Formaldehyde mg/M^3
Bldg#1 Room SD-215	0938-1110	18	BZ**	-	-	3
Bldg#1 Room SD-215	0939-1110	16.6	GA***	-	-	1
Bldg#1 Room 2326	1025-1539	59.6	GA	1	8	-
Bldg#1 Room 2326	1026-1539	61.9	GA	3	6	-
Bldg#1 Room 2326	1026-1539	62.4	GA	5	6	-
Environmental Criteria (mg/M^3)				435	1900	
NIOSH Ceiling Limit for Formaldehyde 1.2 mg/M^3 (30 minute)						1.2
Limit of Detection				0.01 mg	0.02 mg	15 ug

* mg/M^3 - Milligrams of substance per cubic meter of air
** BZ - Breathing Zone
*** GA - General Area

Xylene and Ethyl Alcohol samples were collected on 150 mg charcoal tubes and analyzed by gas chromatography following a modification of NIOSH method P&CAM 127 using a Hewlett-Packard 5731A gas chromatograph equipped with a flame ionization detector.

Formaldehyde samples were collected on 150 mg charcoal tubes and analyzed via ion chromatography on a Dionex Model 10 ion chromatograph. NIOSH method P&CAM 318 was followed with minor variations in the preparation and analysis of samples.

Table II

Results of Breathing Zone and Area Samples for Asbestos

Centers for Disease Control
Atlanta, Georgia

October 10, 1980

Job and/or Location	Sample Period	Sample Volume Liters	Type	Asbestos Concentration (Fibers/cc)
Projection Room #3	0855-1515	570	GA*	LD**
Projection Class Rm#1	0857-1515	562	GA	LD
Robin Room	0910-1515	488	GA	LD
Power House Operator	1000-1050	75	BZ***	LD
Dr. Dan Palmer Oven	1428-1555	130	GA	LD

Present OSHA Standard	Recommended NIOSH Standard
2.0 f/cc - 8 hour TWA	0.1 f/cc - 8 hour TWA
10.0 f/cc - 15 minute ceiling	0.5 f/cc - 15 minute ceiling

* GA - General Area
** LD - Less than detectable limits
*** BZ - Breathing Zone

Concentrations of asbestos are given in fibers greater than 5u in length per cubic centimeter of air (f/cc)
Limit of Detection used by the laboratory was 0.01 f/cc.

The above asbestos samples were analyzed according to NIOSH method P&CAM 239 utilizing phase contrast microscopy.

Table III

Results of Bulk Samples Collected for Asbestos

Centers for Disease Control
Atlanta, Georgia

October 9-10, 1980

Field Number	Type	Location	Asbestos %	Type
A-1	Bulk	Bldg#2 Class Rm#1 Projection Room	40	Chrysotile
A-2	Bulk	Bldg#7 Penthouse	5	Chrysotile
A-3	Bulk	Bldg#11 North Hall Storage Area	No asbestos detected	
A-4	Bulk	Bldg#6 Demineralizer Room 555B6	30	Chrysotile
A-5	Bulk	Bldg#2 Projection Room #3	40	Chrysotile
A-6	Bulk	Bldg#1 Main Building #3 Connector	No asbestos detected	
A-7	Bulk	Bldg#10 Super Power Cement Mix	No asbestos detected	
A-8	Bulk	Bldg#4 Room 206 (Ceiling Material)	No asbestos detected	
A-9	Bulk	Bldg#10 Power Plant Domestic Water Heater	No asbestos detected	
A-10	Bulk	Bldg#8 Insulation Material Around Pipe	60	Chrysotile
A-11	Bulk	Bldg#6 ESO Day Room	No asbestos detected	
A-12	Bulk	Bldg#7 SSB Level Hallway	No asbestos detected	
A-13	Bulk	Bldg#10 Crane Absorption Unit II	40	Chrysotile

A visual estimation of the percentage of asbestos was made on the above numbered samples utilizing polarized light microscopy and dispersion staining techniques.