

**Bell Laboratories**

subject Evaluation of Employees' Exposures
to Spray-On Insulation above Hung
Ceilings, Merrillville, IN
Case: 48106-3

date July 6, 1983
from P. C. Payne
MH 78691
1F-108, x3094

MEMORANDUM FOR RECORD

Summary

On June 9, 1983 an evaluation of Indiana Bell Telephone (IBT) employees' exposures to asbestos was performed while installing cable above hung ceilings. The survey was done at the Twin Towers, 1000 E. 80th, Merrillville, Indiana.

Four personal and two area airborne fiber samples were collected during the work operation. All of the fiber sample concentrations were below the Occupational Safety and Health Administration's (OSHA) permissible exposure limit (PEL) for asbestos of 2 fibers per cubic centimeter of air averaged over an eight-hour work shift. No asbestos fibers were detected in any of the three bulk insulation samples collected from the ceiling beams.

Recommendations include inform employees of exposure results and develop procedures for working with asbestos in customer premises.

Introduction

Mr. Robert Richmond of Indiana Bell Telephone Safety requested this survey be done to evaluate employees' exposures to asbestos insulation while installing cable above hung ceilings at a customer premise location. Ms. Patricia Payne of Bell Laboratories and Mr. Edward Thornburgh of IBT Safety performed the asbestos survey in Suite 333 located at 1000 E. 80th, Merrillville, IN.

Four IBT employees installed telephone equipment in this customer premise. Two employees pulled cable through the hung ceiling, where sprayed-on insulation material coated the ceiling beams overhead. The other two employees installed PBX equipment.

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The employees working above the hung ceiling asked if the insulation material contained asbestos. The building manager, Mr. Ed Levine, reported the insulation contained asbestos. During the asbestos survey, two employees wore protective clothing and respirators while the PBX installers did not wear any protective clothing.

Recommendations

1. Inform employees monitored of their personal exposures.
2. Follow guidelines in "Procedures for Employees Working in Hung Ceilings with Asbestos Insulation."

Methods

Four personal and two area filter samples were collected during the cable installation operation. Before and after use each personal sampling pump was calibrated with a Kurz mass flow meter using a 0.8µm mixed cellulose ester membrane filter in line.

In accordance with National Institute for Occupational Safety and Health's (NIOSH) P&CAM 239, air filter samples were analyzed for asbestos fibers by phase contrast microscopy. One hundred microscope fields were examined, with each field area equal to 0.011 millimeter squared. The sample fiber concentrations are reported in Table One.

Three bulk insulation samples were collected from the sprayed-on insulation material on the ceiling beams. The analyses were done at Bell Laboratories by polarized light microscopy together with dispersion staining.

Results

No asbestos fibers were detected in any of the bulk insulation samples. Fibrous glass was the major component in these samples. These results indicate asbestos was not present in the spray-on insulation material on the ceiling beams.

According to NIOSH P&CAM 239 "Asbestos in Air," an asbestos fiber is defined as rod-shaped with a length greater than five microns and a length to diameter ratio of 3 to 1 or more. Thus, any fiber meeting this definition is included in the total fiber count used to calculate fiber concentrations.

Since no source of asbestos was present in the area, the fiber samples do not contain asbestos fibers; instead they most likely contain fibrous glass fibers. Based on the total fibers counted, the fiber concentrations are below the OSHA PEL for asbestos. Therefore, no potential health hazard was found due to asbestos during this survey.

Discussions

No source of asbestos was found in the area surveyed. Consequently, the use of respirators and personal protective clothing was not necessary at this location.

Unfortunately, some potential problems were recognized which need to be addressed during future work operations in customer premises. The employees disturbed the loose insulation above the hung ceilings. No provisions for clean-up were arranged. "Procedures for Employees Working in Hung Ceilings with Asbestos Insulation" provides guidelines to follow during similar operations.

Bell Laboratories' Environmental Health, Environmental Management and Safety Department is willing to assist Indiana Bell Telephone prepare a company asbestos policy, and evaluate asbestos health hazards.

Patricia C. Payne
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Table One

Fiber Sample Results of Employees' Exposures During Cable Installation Above Hung Ceilings, Merrillville, IN
June 9, 1983

<u>Sample Description</u>	<u>Duration (minutes)</u>	<u>Volume of Air (L)</u>	<u>Fibers Counted*</u>	<u>Concentration (Fibers/cc)</u>
Employee #1 Installs Cable	266	526.7	26	0.03
Employee #2 Installs Cable	263	507.6	64	0.09
Employee #3 EWX Installer	298	506.6	35	0.05
Employee #4 EWX Installer	284	516.9	32	0.04
Area - in Ceiling Next to Eqt. Room	385	731.5	33	0.03
Area - in Room 5 While Employee Works	385	750.8	22	0.02

*Per 100 microscope fields, with each area equal to 0.011 mm².

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Attachment I

Procedures for Employees Working
in Hung Ceilings with Asbestos Insulation.

1. First of all, determine if asbestos is present in the sprayed-on insulation. If asbestos is detected, then appropriate precautionary measures may be taken prior to the start of the installation operation.
2. Next, conduct an asbestos survey in the area to determine employees' exposures to asbestos. Based on these results, recommendations for respirators and personal protective clothing could be made. (See attached "Respirator Program for Employees Working in Hung Ceilings with Asbestos Insulation.")

Other Bell Laboratories' results indicate airborne fiber concentrations during cable installation in hung ceilings is well below the OSHA asbestos standard, so respirators have not been warranted.

In the event employees request the use of a respirator, although not required, the OSHA guidelines for training, fit testing, and medical examinations are recommended.

3. Alter work operations to minimize the amount of insulation material disturbed. Whenever possible, wet-down the asbestos insulation to reduce the airborne fiber levels. Carefully pull cable through the ceiling to avoid dislodging asbestos insulation.
4. Use drop cloths (plastic sheets) below the work operation to catch any dislodged asbestos insulation. This procedure will aid clean-up and prevent asbestos contamination.
5. Place waste asbestos materials, (i.e., respirators, clothing, insulation, sheeting, etc.) in a double plastic bag, label and seal. This should be sent to the environmental coordinator for proper disposal in accordance with state and federal regulations.

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Respirator Program for Employees Working
in Hung Ceilings with Asbestos Insulation

I. Introduction - Establish need for a Program

To establish a respirator program to protect those individuals performing work in hung ceilings containing asbestos, a number of requirements must be fulfilled (see OSHA CFR 1910.134).

NOTE: Respirators are intended to be used only when acceptable engineering control measures designed to keep dust to a minimum are not feasible or when they are being instituted.

- 1) The first requirement is the written program stating standard operating procedures.

A Program Administrator should be appointed to perform the various duties associated with the program.

- 2) The second requirement of the program is the proper selection of a respirator. The respirator selected must be appropriate in terms of both type of hazard as well as degree of hazard.

The 3M 9910 respirator has been approved by NIOSH-MSHA for asbestos bearing dusts.

- 3) The third requirement is the instruction and training in the proper use of respirators and their limitations. The 3M 9910 for example is approved for dusts and mists with a TWA not less than 0.05 mg/m^3 . The user should be aware of this respirator's inability to protect against vapors and gases. This respirator is not approved for arsenic and metal fume. The 3M 9910 is a disposable single use respirators. It should not be worn for more than one day, and should be changed more frequently, if needed.

Fitting instructions must be clearly demonstrated. Even a simple mask such as the 9910 must be donned correctly to be effective. Both straps must be used. Facial hair must not interfere with the mask's seal to the face.

The 3M 9910 has a protection factor of 5. This means it cannot be used in atmospheres containing concentrations of the contaminant in excess of 5 times the permissible exposure limit.

- (4-7) Other non-disposable respirators require special cleaning, maintenance and storage requirements which will not be covered here.
- 8) The next requirement is that appropriate surveillance of the work area conditions and degree of employee exposure or stress be maintained.
- 9) There shall be regular inspection and evaluation to determine the continued effectiveness of the respirator program.
- 10) Persons requiring respirators shall be determined physically able to wear them. The local physician shall determine what health and physical conditions are pertinent. Medical records should be established for these individuals.
- 11) Approved respirators shall be used. The 3M 9910 as mentioned earlier has a NIOSH-MSHA approval.