

Subject: Occupational Safety and Health - Exposure to Airborne
Asbestos Fibers

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Company Medical Directors and Safety Coordinators

from:

Assistant Vice Presidents - Human Resources and Support
Services; Corporate Medical Director

description:

Provides guidelines to protect employees from occupational exposure to
airborne asbestos fibers.

* * *

Section 29 CFR 1910.1001 of Standards issued by the Occupational Safety and Health Administration (OSHA) requires all employers to establish and maintain an effective program for protecting their employees from exposures to airborne asbestos fibers which are above those permitted by this Standard. This letter and its attachment provide guidelines and procedures to assist the Operating Telephone Companies in developing and implementing the programs that are necessary to safeguard the health of their employees and to assure compliance with the current OSHA Standard for asbestos.

In recent years, the Bell System has made substantial progress toward eliminating the purchase and use of buildings, products and other materials which contain asbestos. Unfortunately, the elimination of asbestos in new production processes, products, and materials, and in the construction of new buildings and other facilities, does not guarantee that all potential exposures to asbestos have been eliminated in the existing work environment. Baseline environmental studies conducted by the Environmental Health and Safety Department of Bell Telephone Laboratories show that Bell System workplaces generally do not expose employees to hazardous concentrations of asbestos fibers. Where exposures do occur, they are generally well below those permitted by the current OSHA standard. However, these studies have identified several potential sources of contamination which result either from earlier use of asbestos (i.e., fireproofing and insulation for buildings, steam pipes, boilers, air plenums, etc.) or from existing uses of asbestos for which no suitable substitutes have yet been found (i.e., motor vehicle brake shoes and clutches).



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GL 77-07-024, Motor Vehicle Maintenance - Brakes and Clutches, and GL 78-08-054, Motor Vehicle Maintenance - Protection Against Exposure to Asbestos Fibers, provided recommendations and procedures for protecting employees from exposure to airborne asbestos fibers while performing maintenance operations on brake and clutch assemblies in Company-owned motor vehicles. When properly implemented, these procedures will reduce asbestos exposure levels below those allowed by the present Standard.

SR 79-05-398, Occupational Safety and Health - Exposure to Airborne Asbestos Fibers - Request for Survey requested the Operating Telephone Companies to initiate a comprehensive survey to identify Company-owned and leased facilities in which sprayed-on asbestos was used for fireproofing and heat insulation. RL 79-07-254, Asbestos Hazards in Leased Buildings, recommended that facilities under consideration for lease be reviewed for potential hazards caused by the use of building materials that contain asbestos. SR 80-06-010, Occupational Safety and Health - Sprayed-on Asbestos in Company-owned and Leased Buildings, recommends procedures that should be followed in buildings identified by this survey to minimize the risk of exposing employees to asbestos fibers which are potentially harmful to their health.

Station and PBX installation, rearrangement, and repair operations require employees to enter and work in buildings owned or leased by customers in which sprayed-on asbestos may have been used for general fireproofing or heat insulation. Where exposures to asbestos fibers jeopardize the safety or health of company employees who must enter these workplaces to conduct company business, the Companies should follow policies and procedures included in PO 80-07-216.

Detailed information is included in the attached "Guidelines for Controlling Occupational Exposure to Asbestos Fibers" to assist the Companies in developing and implementing a program for identifying, evaluating, and controlling potential sources of exposure found in their work environments. Copies of all pertinent documentation are included in the Appendix. Estimated costs for implementing this program in Company-owned and leased buildings were included in SR 80-06-010. Estimated costs for customer premises have not been provided since estimates of the frequency and severity of asbestos hazards on customer premises are not available.

An information package is being developed to assist the Companies to inform their employees about the nature and source of potential exposure to asbestos in their workplaces and work environments. Information concerning cost and availability of this package will be available later this year.

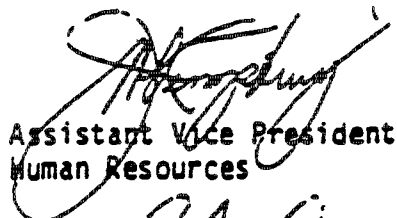
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Questions regarding this letter, or its attachment, should be referred to the following persons:

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Attachment

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EXECUTIVE OVERVIEW

The guidelines provide the basic information needed by the Operating Telephone Companies to develop, introduce and maintain a comprehensive program for protecting employees from occupational exposure to airborne asbestos fibers.

The hazards of asbestos are well documented and universally recognized. Asbestos has been long known to cause asbestosis, and is also implicated as a cause of lung cancer. In recognition of the serious health hazards associated with this substance, the Occupational Safety and Health Administration (OSHA) has imposed strict regulations designed to protect employees from exposure to asbestos in their workplaces and work environments. Issued as Section 29 CFR 1910.1001 of the Code of Federal Regulations, the standard establishes permissible exposure limits for airborne asbestos fibers. It also specifies the methods, work practices, monitoring and recordkeeping procedures, and medical surveillance programs which employers must establish to protect employees from excessive exposure to this substance.

The OSHA Standard for Asbestos requires each employer to cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether any employee's exposure to asbestos fibers is above permissible exposure limits established by the Standard. If these limits are exceeded, the employer must immediately undertake a compliance program to protect employees from exposure.

In this connection, each Operating Telephone Company must undertake a program of visual inspection and personal and environmental monitoring to determine whether its workplaces are in compliance with the provisions of this Standard. This program must include Company-provided workplaces in Company-owned or leased buildings. It may also include specific telephone company work operations in customer-provided workplaces where asbestos has been used for general fireproofing and heat insulation.

In all situations where personal and environmental monitoring results indicate that employee exposures exceed the limits established by the Standard, the Operating Telephone Company must immediately initiate a compliance program to protect employees from these exposures.

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Each Operating Telephone Company should identify the department and organization which is responsible for the development and implementation of company policy with respect to asbestos. In most Companies, this responsibility has already been assigned to the Personnel Department where it is currently shared by the Medical and Safety organizations.

- (1) The Company Safety Coordinator is normally the primary contact for information concerning standards, sampling and analytical procedures, and maintaining results. Interpretation of results should be a joint function of the Safety and Medical organizations in consultation with the Bell Laboratories Environmental Safety and Health Department.
- (2) The Company Medical Director provides technical support and directs the development and implementation of the medical surveillance program for asbestos.
- (3) In some Companies, these activities may be coordinated and directed by an Occupational Health Working Group (OHWG) as recommended in General Letter (GL 75-02-130) dated February 19, 1975.

These guidelines are intended to assist Company Medical Directors, Safety Coordinators, and others responsible for employee safety and health in developing the policies and programs needed to comply with specific requirements of the "Asbestos" Standard. They provide:

- . Basic procedures for assessing the safety of the work environment.
- . Specific engineering controls and administrative procedures for controlling asbestos when found in employees' workplaces.
- . Details concerning the personal protective equipment (respirators and clothing) which must be provided to employees exposed to potentially harmful concentrations of airborne asbestos fibers.
- . Information needed to develop training programs for familiarizing employees with the hazards of asbestos and with procedures that have been initiated to protect them from harmful exposure.

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- . Details concerning the medical surveillance programs and recordkeeping procedures that must be implemented for employees who have been exposed to potentially hazardous levels of asbestos fibers.

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GUIDELINES FOR EVALUATING AND CONTROLLING OCCUPATIONAL EXPOSURES TO ASBESTOS

1. INTRODUCTION

- 1.01 The hazards of asbestos are well documented and universally recognized. Asbestos has long been known to cause asbestosis, a disease characterized by scarring and thickening of lung tissue. Today it is implicated as a cause of lung cancer. The early detection and subsequent treatment of these diseases is usually difficult because the symptoms may not be clinically evident until 20 years after the first exposure. Additionally, there is no agreement on safe exposure levels. In recognition of the serious health hazards associated with asbestos, the Occupational Safety and Health Administration (OSHA) has imposed strict regulations designed to protect employees exposed in the workplace.
- 1.02 The deluge of information about this proven cause of cancer has produced understandable concern among many employees about the possibility of hazardous exposures to this substance in the Bell System work environment. These guidelines are intended to assist the Operating Telephone Companies in recognizing and evaluating exposures to asbestos fibers which may be found in the work environment, and in developing and implementing programs for insuring that employees are protected from harmful exposure to this substance.

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2. SCOPE AND LIMITATIONS

- 2.01 In recent years, the Bell System has made substantial progress toward eliminating the purchase and use of buildings, products and other materials which contain asbestos. Unfortunately, the elimination of asbestos in new production processes, products, and materials, and in the construction of new buildings and other facilities, does not guarantee that all exposures to asbestos have been eliminated in the existing work environment. Baseline environmental studies conducted by the Environmental Health and Safety Department of Bell Telephone Laboratories show that Operating Telephone Company workplaces generally do not expose employees to hazardous concentrations of asbestos fibers. Where exposures do occur, they are generally well below those permitted by the current OSHA standard. However, these studies have identified several potential sources of contamination which result either from earlier use of asbestos (i.e., fireproofing and insulation for buildings, steam pipes, boilers, air plenums, etc.) or from existing uses of asbestos for which no suitable substitutes have yet been found (i.e., motor vehicle brake shoes and clutches).
- 2.02 Until such time as appropriate substitutes are found for all applications, and materials which contain asbestos are eliminated from the Operating Telephone Company work environment, suitable engineering controls, personal protective equipment, and other work practices must be used to minimize the risk of exposing employees to potentially harmful concentrations of asbestos fibers. In this connection, these "Guidelines for Controlling Occupational Exposure to Asbestos Fibers" have been prepared to assist the Operating Telephone Companies in developing and implementing a general program for identifying, evaluating, and controlling potential sources of exposure found in their work environments.
- 2.03 Section 29 CFR 1910.1001 of Standards promulgated by the Federal Occupational Safety and Health Administration contains regulations for protecting employees from harmful exposures to asbestos which may be found in their workplaces. This standard establishes permissible exposure limits for airborne concentrations of asbestos fibers. It also specifies the methods, work practices, monitoring and recordkeeping procedures, and medical surveillance programs which employers must establish to protect employees from excessive exposure to this substance.

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- 2.04. These guidelines are intended to assist Company Medical Directors, Safety Coordinators, and others responsible for employee health and safety in developing the policies and programs needed to comply with specific requirements of the "Asbestos" Standard. They provide:
- . Basic procedures for assessing the safety of the work environment.
 - . Specific engineering controls and administrative procedures for controlling asbestos when found in certain workplaces.
 - . Details concerning the personal protective equipment (respirators and clothing) which must be provided to employees who are exposed to potentially harmful concentrations of airborne asbestos particles.
 - . Information needed to develop training programs for familiarizing employees with the hazards of asbestos and with the programs that have been initiated to protect them from harmful exposures.
 - . Details concerning the medical surveillance programs and recordkeeping procedures that must be implemented for employees who have been exposed to potentially hazardous levels of asbestos fibers.

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3. BACKGROUND

- 3.01 The unique combination of properties of fibrous asbestos minerals has been recognized and valued by mankind since the days of the early Greeks. Asbestos is resistant to heat and chemical attack, and possesses high tensile strength and flexibility.
- 3.02 The term asbestos does not describe a specific mineral. It is a generic term for a group of hydrated mineral silicates which can appear in a fibrous crystal form (asbestiform) and when crushed can separate into flexible fibers. The two most common types of asbestos are the serpentine and amphibole mineral groups. Chrysotile asbestos is the only common type of asbestiform serpentine and comprises 95% of the world's production and use. The amphibole asbestos varieties in decreasing quantity of usage are amosite, crocidolite, anthophyllite, tremolite, and actinolite.
- 3.03 Almost one million tons of asbestos are used in the United States each year. In 1974, approximately 70-80 percent of the asbestos produced was used in the construction industry while 20-30 percent was used in non-construction industries. Approximately 92 percent of the half million tons used in the construction industry is firmly bonded, i.e., the asbestos is "locked in" in such products as floor tiles, asbestos cements, and roofing felts and shingles; while the remaining 8 percent is friable or in powder form present in insulation materials, asbestos cement powders, and acoustical products. As expected, these latter materials generate more airborne fibers than the firmly bonded products. The 220,000 tons of asbestos used in non-construction industries in 1974 were utilized in such products as textiles, friction material including brake linings, and clutch facings, paper, paints, plastics, roof coatings, floor tiles, and miscellaneous other products.¹

1. Asbestos: An Information Resource. U.S. Department of Health Education and Welfare, DHEW Publication Number (NIH) 79-1681, May 1978, 9-15.

4. DEFINITIONS:

- 4.01 OSHA - Occupational Safety and Health Administration.
- 4.02 NIOSH - National Institute for Occupational Safety and Health.
- 4.03 Asbestos - A group of hydrated mineral silicates which can appear in a fibrous crystal form (asbestiform) and when crushed can separate into flexible fibers. Examples included in OSHA standards include chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- 4.04 Asbestos Fibers - Asbestos fibers longer than 5 micrometers with a 3 to 1 length/diameter ratio.
- 4.05 Permissible Exposure - Limit (PEL) The maximum 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed: (two fibers longer than 5 micrometers per cubic centimeter of air).
- 4.06 Ceiling Concentration - The maximum concentration of airborne asbestos fibers to which an employee can be exposed at any time: (10 fibers longer than 5 micrometers per cubic centimeter of air).

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5. EXPOSURE MECHANISMS

- 5.01 When asbestos dust enters the air, it is in the form of fine fibers. The fine dimensions of the fibers make them readily airborne and are therefore easily inhaled.
- 5.02 Inhalation is the most serious biological route of entry for asbestos fibers. The most important factor in the deposition of inhaled asbestos in the human lung is fiber diameter. Asbestos fibers with small diameters, approximately 0.5 micrometer, may be deposited according to airflow patterns in pulmonary spaces.

Fibers may then embed themselves in the airways or lung tissues or may penetrate by unknown means the pleural and peritoneal cavities. Although many fibers are eliminated via the normal lung clearance mechanisms, there is evidence from human autopsy of numerous fibers in the pleura (the serous membrane covering the surface of the lungs), the thoracic diaphragm and the inner chest wall.

- 5.03 Although fibers may also enter the body through ingestion, this route of entry does not appear to pose the serious health hazard that inhalation does.

6. EFFECTS OF EXPOSURE

- 6.01 The inhalation of asbestos fibers may result in a chronic respiratory disease, asbestosis, characterized by interstitial pleural fibrosis of the lungs. As the disease progresses the obliterative changes which occur include thickening or fibrosis about the alveoli. Fibrous and calcified pleural plaques may be found in individuals exposed to asbestos fibers. Increased risks of developing pleural or peritoneal mesothelioma are also associated with exposures to airborne respirable asbestos fibers. Asbestos has been linked moreover, with gastro-intestinal, oropharyngeal and laryngeal cancer. Other adverse health effects such as pleural mesothelioma however, appear to have no relationship to smoking habits.²
- 6.02 The clinical manifestations of pulmonary asbestosis include shortness of breath, rales at the lung bases and frequently clubbing of the fingers. Breathing is restricted, and a decrease in vital capacity is evident. These clinical signs and the changes in pulmonary function may be present before roentgenologic signs of asbestosis are detected.

2. Smoking and Health, a report of the Surgeon General. U.S. Department of Health, Education and Welfare, DHEW Publication Number (PHS) 79-50066, p. 7-11-7-13.

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- 6.03 Other functional disorders encountered in asbestosis include reduction of pulmonary diffusing capacity and impairment of gas exchange.
- 6.04 The respiratory disability of asbestosis is severe, progressive, and irreversible. It is characterized by progressive changes on chest roentgenograms, increasing exertional dyspnea and disability.

Changes on chest roentgenograms may appear after 10 years of exposure to asbestos but more typically appear after 20 years. Serial chest roentgenograms will show progressive pulmonary reactions and pleural thickening. Neoplastic changes generally occur after 20 years of continuous exposure or 20 years after the original exposure as in those who develop mesothelioma.³

7. EXPOSURE CRITERIA AND STANDARDS

- 7.01 When the first asbestos criteria document was published in 1972, the National Institute for Occupational Safety and Health (NIOSH) recommended a standard of 2.0 asbestos fibers per cubic centimeter of air based on a count of fibers greater than 5 micrometers in length. This standard was recommended with the stated belief that it would "prevent" asbestosis and with the open recognition that it would not "prevent" asbestos-induced neoplasms. Furthermore, data were presented which supported the fact that technology was available to achieve that standard and that the criteria would be subject to review and revision as necessary.
- 7.02 On June 7, 1972, the Occupational Safety and Health Administration (OSHA) promulgated a standard for occupational exposure to asbestos containing an 8-hour time-weighted average (TWA) concentration exposure limit of 5 fibers longer than 5 micrometers per cubic centimeter of air, with a ceiling limitation against any exposure in excess of 10 fibers per cubic centimeter. The standard further provided that the 8-hour TWA was to be reduced to 2 fibers per cubic centimeter on July 1, 1976. This is the current standard which is found in 29 CFR 1910.1001.
- 7.03 On October 11, 1978 OSHA issued Program Directive #300-16 to provide uniform inspection and compliance procedures for the medical examination requirement in the current asbestos standard, 1910.1001(j)(2), or (3) or (4). Under this directive the term "exposed to airborne concentrations of asbestos fibers" is administratively interpreted to mean exposed to a minimum of 0.1 asbestos fibers longer than 5 micrometers per cubic centimeter of air. Medical examinations will be required for any 7 to 8 hour time-weighted average concentration of asbestos fibers above this level.

3. Asbestos: An Information Resource, 35-37.

4. Ibid., p. 1.

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8. SOURCES OF EXPOSURE

8.01 In the Bell System, there are various sources of exposure to airborne asbestos fibers. Many buildings constructed between 1958 and 1972 were insulated for fire protection purposes with a sprayed-on asbestos coating. These are light weight construction buildings and are basically limited to administrative offices, not equipment buildings.

8.02 An AT&T company-wide survey has been conducted (SR 79-05-398) to determine which buildings have sprayed-on asbestos insulation. In addition to sprayed-on insulation on structural members of buildings, duct work and piping are commonly insulated with asbestos sheeting. Asbestos work gloves, drop cloths and insulating tape, brake shoes and clutch plates are all potential sources for asbestos exposure.

8.03 Of particular concern are exposures to employees who work within hung ceilings, doing such work operations as installing or removing telephone cable, and electrical wiring. Factors affecting the extent of exposure include:

- (1) the type of sprayed-on material, i.e. percent asbestos
- (2) friability of the surface of the sprayed-on material
- (3) proximity of work performed to sprayed-on material
- (4) duration of work performed
- (5) use of hung ceiling as return air plenum
- (6) type of work being performed i.e. major renovation vs routine maintenance.
- (7) other work operations in the area

In addition, during cable installation the following factors affect employee exposure:

- (8) point of cable lashing
- (9) point of cable placement
- (10) cable size

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8.04 The extent of exposure to employees working in buildings containing sprayed-on material who perform tasks which in no way affect the sprayed-on material is typically quite low (less than 0.1 fibers per cubic centimeter of air). SR 80-06-010 presents guidelines to be followed in buildings with sprayed-on asbestos.

8.05 Vehicle maintenance workers involved with the inspection and changing of brake shoes and clutch plates have been studied to determine the extent of their exposure to asbestos fibers liberated during these work tasks. Effective measures have been developed for controlling these exposures, and were transmitted to the Operating Telephone Companies in GL 77-07-024 and GL 78-05-045.

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9. CORPORATE RESPONSIBILITIES

9.01 OSHA Standards for Asbestos require each employer to cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether any employee's exposure to asbestos fibers is above permissible exposure limits established by the Standard. If the limits are exceeded, the employer must immediately undertake a compliance program to protect employees from these exposures.

9.02 In this connection, each Operating Telephone Company must undertake a program of visual inspection and personal and environmental monitoring to determine whether its workplaces are in compliance with the provisions of this Standard. This program must include:

- (1) Company-provided workplaces in company-owned or leased buildings.
- (2) Specific work operations performed in both company-provided and customer-provided workplaces where asbestos or products containing asbestos, have been used for general fireproofing and heat insulation. These work operations include:
 - (a) motor vehicle maintenance operations on brake systems and clutch assemblies,
 - (b) building maintenance and repair operations,
 - (c) major building repairs, rearrangements, and renovations,
 - (d) station installation, rearrangement, and repair operations.

9.03 In all situations where personal and environmental monitoring results indicate that employee exposures exceed the limits established by the Standard, the Operating Telephone Company must immediately initiate a compliance program to protect employees from these exposures. This program may include any or all of the following:

- (1) Feasible technological (Engineering) controls. These controls include but are not limited to:
 - (a) isolation of processes utilizing asbestos
 - (b) enclosure
 - (c) exhaust ventilation and dust collection

- (2) Work practices
- (3) Material substitution to minimize or eliminate the use of asbestos and asbestos containing materials.
- (4) Personal protective equipment including approved air purifying respirators and protective clothing for those employees who are exposed to airborne concentrations of asbestos fibers which exceed 2 fibers per cubic centimeter of air based on an 8-hour TWA.
- (5) Change rooms
- (6) Periodic personal and environmental monitoring of employee exposure in areas where asbestos fibers are released.
- (7) Caution signs and labels
- (8) Recordkeeping systems for personal and environmental monitoring results.
- (9) Medical examinations and records.

9.04 Each Operating Telephone Company should identify the department and organization which is responsible for the development and implementation of company policy with respect to asbestos. In most Companies, this responsibility has already been assigned to the Personnel Department where it is currently shared by the Medical and Safety organizations.

- (1) The Company Safety Coordinator is normally the primary contact for information concerning standards, sampling and analytical procedures, and maintaining results. Interpretation of results should be a joint function of the Safety and Medical organizations in consultation with the Bell Laboratories Environmental Safety and Health Department.
- (2) The Company Medical Director provides technical support and directs the development and implementation of the medical surveillance program for asbestos.
- (3) In some Companies, these activities may be coordinated and directed by an Occupational Health Working Group (OHWG) as recommended in General Letter (GL 75-02-130) dated February 19, 1975.

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9.05 Overall direction of compliance activities for the Bell System is assigned to the Bell System Occupational Health Working Group. This Group is composed of Safety, Health, and other technical representatives from the AT&T General Departments, Bell Telephone Laboratories, Western Electric, and the OTCs. The Bell System Occupational Health Working Group is responsible for:

- (1) Coordinating the evaluation of the Bell System work environment and assessing the impact of health regulations and standards.
- (2) Recommending appropriate action to the AT&T General Departments concerning compliance with all mandated health standards.
- (3) Coordinating the development of training for company medical and safety personnel in the recognition and evaluation of occupational health hazards.
- (4) Assisting the Operating Telephone Companies in their efforts to identify, evaluate, and control occupational health hazards found in the workplace.

9.06 Technical assistance to the Operating Telephone Companies is provided by the Bell System Services Group of the Environmental Health and Safety Department of Bell Telephone Laboratories. The Bell System Services Group provides the following services:

- (1) Advice and assistance in identifying, measuring, and evaluating specific hazards to health found in the workplace.
- (2) Assistance in measuring and evaluating employee exposure to hazardous substances.
- (3) Advice and assistance regarding the equipment, processes and methods used to protect employees from excessive exposure to hazardous substances.

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10. EVALUATION OF EXPOSURE

RECOGNITION

- 10.01 Initial determination to evaluate possible sources of exposure should be based on the following:
- (1) AT&T surveys of buildings with sprayed-on insulation including bulk sample analysis. (SR 79-05-398 and SR 80-06-024)
 - (2) AT&T guidelines, including work practices and engineering controls, to prevent asbestos exposure to employees engaged in the maintenance of brakes and clutch plates. (See GL: 78-08-045 and GL: 77-07-024)
 - (3) Measurements of exposure to airborne asbestos fibers in various work environments due to employee complaints or customer concerns.

Personal Monitoring

- 10.02 Personal monitoring is completed by placing a small filter cassette on an employee's shirt collar. Air is pulled through the filter by a battery powered sampling pump worn on the employee's belt and attached to the filter cassette with a piece of plastic tubing. The sampling equipment is worn during the entire work shift so the total employee exposure may be assessed. The samples are then sent to a laboratory for analysis by the technique of phase contrast microscopy as required by OSHA. The airborne fiber concentration is calculated by dividing the number of fibers on the filter by the volume of air pulled through the pump.
- 10.03 Each Operating Telephone Company should be capable of performing airborne asbestos sampling. Safety supervisors in Operating Telephone Companies who have completed the AT&T course on the "Recognition and Evaluation of Occupational Health Hazards" should be able to perform this type of sampling. The Bell Laboratories Environmental Health and Safety Department is available to assist in any aspect of this work.
- 10.04 The eight-hour time weighted averages are calculated from the following formula:

$$\frac{C_1T_1 + C_2T_2 + \dots + C_nT_n}{480 \text{ minutes}}$$

where C = Airborne fiber concentration in fibers per cubic centimeter

T = Time period of sample in minutes.

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- 10.05 If the sampling period is less than 480 minutes, the eight hour time weighted average is extrapolated from the available data and industrial hygiene professional judgment.
- 10.06 These values are then compared with the OSHA Standard for asbestos which is 2 fibers per cubic centimeter of air. If the fiber concentration (TWA) equals or exceeds 0.1 fibers per cubic centimeter, medical examinations are required.

Instrumentation

- 10.07 There are a variety of analytical techniques for determining asbestos in air as well as in other forms such as bulk insulation samples. These techniques include optical and electron microscopy, x-ray diffraction, and differential thermal analysis. Asbestos fiber identification and quantitation in occupational and environmental air samples is difficult for a variety of reasons:
- (1) Asbestos fibers are generally present in low mass quantities even though fiber number concentrations may be high.
 - (2) Many instrumental analytical techniques cannot differentiate asbestos fibers from their nonfibrous mineralogic polymorphs.
 - (3) Many airborne asbestos fibers are generally below resolution limits of the optical microscope. These fibers may only be detected by using electron microscopic methods.
 - (4) For identification of the various asbestos fiber types by electron microscopy, electron diffraction and microchemical analyses must be performed which require expensive instrumentation and analysis time.

Analytical Techniques

- 10.08 Phase contrast optical microscopy is the analytical technique specified by OSHA for determining compliance with the Occupational Safety and Health Administration asbestos standard. The method consists of collecting breathing zone samples during 7 to 8-hour periods on membrane filters (millipore AA). These filters have a nominal pore size diameter of 0.8 micrometer. Air is pulled through the filters using battery powered pumps manufactured by Bendix, Mine Safety Appliance or Dupont at a flow rate of 2.0 liters per minute. The pumps are calibrated by the soap bubble flowmeter technique.

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10.09 Samples are analyzed by first clearing the membrane filter to make it optically transparent, then by fiber counting at 400-500X magnification by phase contrast optical microscopy. Asbestos fibers are defined as those particles with a length greater than 5 micrometers and a length-to-diameter ratio of 3:1, or greater. This technique, by which only fibers longer than 5 micrometers are counted, is recognized as only an index of total fiber exposure and does not imply that shorter fibers do not pose a health hazard.

The relative proportion of airborne fibers longer than 5 micrometers has been shown to vary from 1 to approximately 50% depending on the industrial operation and asbestos fiber type. In addition to problems of detecting short fibers, phase contrast microscopy may not be specific for asbestos fibers in industrial operations where mixed fiber types are encountered.

10.10 The technique of transmission electron microscopy (TEM) is used to identify and differentiate asbestos fibers from their nonfibrous polymorphs. This analytical technique is able to detect fibers whose diameters are below the resolving power of the light microscope.

10.11 In addition to superior resolution capabilities, most modern transmission electron microscopes are equipped with electron diffraction facilities. Crystalline materials scatter electrons in regular patterns related to their crystal structure. Visual observation of single fiber (single crystal) electron diffraction patterns may be used to differentiate chrysotile fibers from amphibole fibers.

10.12 To identify bulk samples of asbestos, the techniques of x-ray diffractometry in conjunction with optical microscopy are used. X-ray diffractometry is one of the standard mineralogic techniques used in the analysis of solid crystalline phases. Using the polarizing microscope, various optical crystallographic measurements such as refractive index, extinction angles, and sign of elongation may be measured and compared with data reported for standard asbestos reference samples.

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10.13

Dispersion staining with polarized light is becoming a widespread technique for identifying asbestos fibers from bulk samples. With this technique, the fibers are immersed in a mounting medium with a steeper dispersion curve than the fibers. Using plane polarized light, asbestos fibers show two characteristic dispersion staining colors; one for the light vibration parallel to and the other for that perpendicular to the fiber length. The dispersion colors depend on the refractive index media in which the fibers are mounted. Dispersion staining colors may change slightly depending on the geographic area from which the asbestos was mined and subsequent treatment. Fibers less than 0.5 micrometer in diameter may not be identified by this technique because of difficulties in distinguishing colors.

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11. METHODS OF COMPLIANCE

GENERAL

- 11.01 Provisions for compliance with the Standard include a number of measures designed to control occupational exposures to asbestos fibers and to protect employees who are exposed to airborne asbestos fibers in their workplaces.

Engineering Controls and Work Practices

- 11.02 The Standard requires feasible technological (Engineering) controls and appropriate work practices as the primary means of compliance. These controls are required when the 8 hour TWA is greater than 2 fibers per cubic centimeter of air. They include but are not limited to the following:

(1) Engineering Controls

- (a) Isolation of processes utilizing asbestos
- (b) Enclosure of dry operations
- (c) Use of local exhaust ventilation and dust collection systems. Systems should be designed and maintained in accordance with ANSI Z9.2-1971.
- (d) Ventilation of hand and power operated tools which may produce or release asbestos fibers in excess of prescribed exposure limits.

(2) Work Practices

- (a) Thorough wetting of asbestos when it is handled, mixed, applied, removed, cut or scored in order to prevent the emission of airborne fibers. Wetting usually requires the addition of a penetrant to the water solution.
- (b) When removing asbestos from pipes or other structures the material should not be dropped or thrown but carefully lowered to the floor in order to prevent the emission of asbestos fibers.
- (c) Controls to prevent the release of asbestos fibers, such as wetting, enclosure or ventilation, should be used when removing asbestos containing materials from shipping containers.

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- (d) Employees engaged in the removal or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or covering should be provided with approved respiratory equipment and special clothing.

Note: The OSHA Standard requires the use of Type "C" supplied - air respirators continuous flow or pressure demand class when exposure is expected to exceed 100 times allowable concentrations.

- 11.03 Compliance with the standard may not be achieved through the use of administrative controls (i.e. rotating employees to shorten exposure time) or the use of respirators, except during the time required to install engineering controls and institute work practices in situations where engineering or work practice controls are either technically not feasible or feasible to an extent insufficient to reduce fiber concentrations below acceptable limits, (i.e. spraying, demolition or removal of asbestos insulation) and during emergencies.
- 11.04 It is company policy to minimize and/or eliminate the use of asbestos and asbestos containing materials to the maximum extent possible via material substitution. The ideal substitute is one which has no health hazard associated with it and does the job just as well. The location of substitutes should be given priority consideration.

Personal Protective Equipment

11.05 Respiratory Protection:

Where air purifying respirators are permitted, they should be selected from those approved by NIOSH. The selection of respirators will depend on the exposure. The following types are prescribed in the standard.

- (1) Air purifying respirators. These are to be used when the ceiling or 8-hour time weighted average concentration of asbestos is reasonably expected to exceed no more than 10 times the prescribed limits. Examples of approved equipment are:

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Mine Safety Appliance Co.
400 Penn Center Blvd.
Pittsburgh, PA 15235

MSA No. 459440
Comfo II Type F
TC-21, C-133

3M Company
Occ. H/S Products Dept.
1201 Hudson Road
St. Paul, MN. 55101

No. 8710
Disposable type

- (2) Powered air purifying respirators. These are to be used when the ceiling or 8-hour time weighted average concentration of asbestos is reasonably expected to exceed 10 times but not 100 times the prescribed limits.

The units are expensive and complex to maintain. If the concentration of asbestos is expected to exceed 10 times the prescribed limits, consideration should first be given to supplied air devices with hood and protective clothing.

Manufacturers of powered air purifying respirators include:

3M
Occupational Health and Safety Products
3M Center
St. Paul, Minn. 55101

Racal Airstream Inc.
5 Research Place
Rockville, MD 20850

- (3) Type "C" supplied-air respirators continuous flow or pressure demand class. These are to be used when the ceiling or 8-hour time weighted average concentration of asbestos is reasonably expected to exceed 100 times the prescribed limits and during, demolition or removal operations involving asbestos.

The type "C" respirator is an air line respirator for entry into and escape from atmosphere not immediately dangerous to life or health, which consists of a source of respirable breathing air, a hose, a detachable coupling, a control valve, orifice, a demand valve or pressure demand valve, an arrangement for attaching the hose to the wearer and a face piece, hood, or helmet.

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Manufacturers of air line respirators include the following:

Mine Safety Appliances Co.
400 Penn Center Blvd.
Pittsburgh, PA 15235

Willson Safety Products
P.O. Box 626
Reading, PA 19603

American Optical Corporation
Southbridge, MA 01550

11.06 Whenever respiratory protective equipment is provided all provisions of OSHA 1910.134 "Respiratory Protection" must be complied with. See the Appendix for the "Requirements for a Minimal Acceptable Respiratory Program."

11.07 Protective Clothing

The standard requires the employer to provide and require the use of special clothing for any employee exposed to airborne concentrations of asbestos fibers which exceed the prescribed ceiling level and for those employees involved in the demolition or removal of asbestos. The special clothing required include the following:

- (1) Coveralls or similar whole body clothing.
Resin-impregnated paper or similar disposable clothing may be used to avoid laundering problems associated with fabric type clothing.
- (2) Head covering - a hard hat or bump cap is adequate.
- (3) Gloves - any hard-finished impermeable glove.
- (4) Foot covering - rubber boots or disposable foot covering such as the Edmont Poly-D boots are recommended.

Change Rooms

11.08 The employer must provide change rooms at places of employment where employees are regularly exposed to concentrations of asbestos fibers in excess of the prescribed exposure limits. Additionally, the employer must provide two separate lockers or containers for each employee so separated or isolated as to prevent the contamination of the employee's street clothes from his work clothes.

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Laundrying of Asbestos Contaminated Clothing

- 11.09 The standard requires that laundrying be done in such a way as to prevent the release of airborne asbestos fibers in excess of prescribed limits. If clothes are sent out for laundrying, the employer must inform the person doing the work of the aforementioned requirement. Contaminated clothing must be transported in labeled impermeable bags or other sealed containers. See labeling section for specific label required.

Note: The laundrying requirements could be avoided through the use of disposable clothing.

Monitoring

- 11.10 Personal and environmental monitoring must be conducted in every place of employment where asbestos fibers are released. See Section 10 for details regarding sampling and analytical methodologies.

- (1) Personal monitoring. Samples must be collected from within the employee breathing zone in order to determine his 8-hour time weighted average and ceiling exposure to asbestos fibers. The frequency and pattern of monitoring should be such that it represents with reasonable accuracy the levels of employee exposure. In cases where employee exposures are reasonably expected to exceed the prescribed exposure limits, sampling must be repeated at least every six months.
- (2) Environmental Monitoring. Samples must be collected from areas of a work environment which are representative of the airborne concentration of asbestos which may reach the breathing zone of employees. Samples should be collected for the determination of eight-hour time weighted average and ceiling concentrations of asbestos fibers. The frequency and pattern of monitoring should be such that it represents with reasonable accuracy the level of employee exposure. In cases where employee exposures are reasonably expected to exceed the prescribed exposure limits, sampling must be repeated at least every six months.

Note: Personal monitoring must be accomplished whenever asbestos demolition or removal work is done. OSHA compliance officers have interpreted that, because work of this nature is done intermittently, and because the concentration of asbestos fibers may vary over wide limits, monitoring must be conducted each time a demolition or removal job involving asbestos is performed, and that monitoring must be conducted irrespective of the provision and use of respiratory protective equipment. Their position is further supported by the employee notification requirement of the standard.

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- 11.11 Employee observation of monitoring. The standard requires that affected employees or their representatives be given a reasonable opportunity to observe any monitoring required.
- 11.12 Exposure Records. All records of the work, monitoring, employees involved, results of sampling and related informations must be kept in a plant OSHA file on this subject. These records must be maintained for at least twenty years and should be made available upon request to the Assistant Secretary of Labor for Occupational Safety and Health, the director of the National Institute for Occupational Safety and Health and to authorized representatives of either. Additionally, every employee and former employees shall have reasonable access to any record required to be maintained which indicates the employees' own exposure to asbestos fibers.
- 11.13 Employee Notification. Any employee found to be exposed to concentrations of asbestos in excess of the prescribed limits must be notified in writing within five days of the finding. The employee must also be notified of the corrective action being taken.

Caution Signs and Labels

- 11.14 Caution signs. Each work area where airborne concentrations of asbestos fibers may be in excess of the prescribed exposure limit must be posted with a precautionary warning sign. The signs shall display the following legend:

Asbestos

Dust Hazard

Avoid Breathing Dust

Wear assigned protective equipment

Do not remain in area unless your work requires it

Breathing asbestos dust may be hazardous to your health

For sign specifications see 1910.1001 (g) (1) (ii)

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- 11.15 Caution labels shall be placed on all raw materials, mixtures, scrap, waste, debris and other products containing asbestos fibers. Their containers shall also be labeled. Labels are not necessary if the asbestos fibers have been modified so that, during reasonable use and handling, no airborne concentrations in excess of prescribed limits are released. Modifiers include bonding agents, coatings, and binders. The label shall state the following:

Caution
Contains Asbestos
Avoid Creating Dust
Breathing Asbestos May Cause
Serious Bodily Harm

For label specifications see 1910.1001(g) (2) (11)

Housekeeping

- 11.16 The standard requires that all surfaces be maintained free of accumulations of asbestos fibers, if the dispersion of such accumulations would result in excessive concentrations.
- 11.17 All cleanup of asbestos dust should be performed by approved vacuum cleaners equipped with special absolute filters, or wet methods in order to prevent the dispersion of asbestos fibers. Under no circumstances shall compressed air or dry brushing be permitted. Additionally, employees should be instructed to vacuum off protective clothing with approved vacuum cleaner at the end of work periods so that movement and activity will not cause asbestos fibers to become airborne and spread the contamination.

Waste Disposal

- 11.18 All asbestos waste scrap, debris, bags, containers, equipment and asbestos-contaminated clothing, consigned for disposal must be collected and disposed of in sealed impermeable bags or containers bearing caution labels.
- 11.19 EPA requirements for disposal of hazardous solid waste materials have become very strict. Only approved hazardous material landfill sites may be used for such disposal. Companies are advised to check with the State Waste Management Agency for compliance with local disposal regulations.

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Medical Examinations

- 11.20 The employer must provide or make available medical examinations to employees exposed to asbestos fibers. See Sections 13, 14 and 15 for details.
- 11.21 Types of examinations
- (1) Preplacement examinations are to be provided within 30 days of a worker's first employment in an occupation exposed to airborne concentrations of asbestos fibers.
 - (2) Annual examinations are to be provided to all workers exposed to airborne concentrations of asbestos fibers.
 - (3) Termination of employment examinations are to be provided within 30 days before or after the employee's last day of employment in an occupation exposed to airborne concentrations of asbestos fibers.
- 11.22 Medical Records. The employer must maintain complete and accurate records of the medical examinations required. These records must be maintained by the employer for at least 30 years.
- Additionally, these records must be made available to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of NIOSH, to authorized physicians or medical consultants of either, and upon the request of an employee or former employee, to his physician. Notification of requests by OSHA or NIOSH for records should be provided to the AT&T Safety and Medical organization.
- 11.23 In addition, on October 11, 1978, an OSHA Program Directive was released which established a minimum airborne fiber concentration for initiating and continuing medical examinations. This level is equal to a minimum exposure of 0.1 asbestos fibers longer than 5 micrometers in length per cubic centimeter of air as 7- to 8-hour time weighted average concentration. Additional requirements concerning sampling techniques were included in the directive. These requirements specify how often a filter must be changed during a 7 or 8 hour sampling period.
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- (1) Exposure to asbestos dust with low levels of contamination (e.g., mixed with other minerals):

For exposures to dust that are mostly asbestos and are expected to be below the permissible exposure limit, the same filter should be used for the entire shift, but no longer than 8 hours.

For exposures expected to be at or above the permissible exposure limit, several samples may be required during the shift to avoid overloading the filters.

- (2) Exposures to asbestos dust with high levels of contamination:

Several samples may be required during the shift to avoid overloading the filter.

Filters should be changed only after a minimum of 1 hour of sampling time for exposures expected to be close to 0.1 fibers per cubic centimeter of air. Seven or eight 1-hour samples can be collected during the day.

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12. EMPLOYEE INFORMATION AND TRAINING

GENERAL

- 12.01 As part of the overall program for controlling occupational asbestos exposures, it is necessary that each Operating Telephone Company implement a program to provide training and information to each employee who is or may become exposed to asbestos. All employees will not necessarily need to receive the same training - some information is appropriate to all while other information should be tailored to the specific job situation.
- 12.02 A basic booklet on asbestos exposure written in layman's language is available from the U. S. Department of Health and Welfare. Operating Telephone Companies may desire to make this booklet available to their employees as part of the information and training program.

Practical Interpretation of Exposure Criteria

- 12.03 The exposure criteria presented elsewhere in these Guidelines, as well as that found in the OSHA Standard, tends to be misleading to those individuals not familiar with the details of asbestos fiber monitoring and analysis. In order to put these criteria into an understandable perspective, several fundamental points should be emphasized:
- (1) The analytical method for counting asbestos fibers only counts those fibers that have a length to width ratio of at least 3:1 and are at least 5 micrometers in length. This does not imply that fibers of other dimensions are either not present or that they are not harmful. It is merely a standard method of counting.
 - (2) The breathing of one or two fibers, or a low level, short term exposure, does not mean ultimate asbestos-related disease. The current allowable airborne concentration for an 8 hour day is 2 fibers per cubic centimeter of air, which is 2 million fibers per cubic meter. The average worker breathes 10 cubic meters of air during 8 hours, thus, the total countable fibers allowed are approximately 20 million for the 8 hour day.
 - (3) All fibers that are inhaled do not remain in the body. In fact, most inhaled fibers are either exhaled directly or removed by the lung's natural cleansing mechanism.

I. Asbestos Exposure - U. S. Department of Health and Welfare
Publication No. (NIH) 78-1594.

SWBT 002311

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- (4) Asbestos fiber exposure is not confined solely to occupational situations. Samples taken of ambient air in a variety of locations indicate a general background level of countable fibers - as high as 0.02 fibers per cubic centimeter (20,000 fibers per cubic meter) of air sampled on city sidewalks.

Sources of Employee Exposure

- 12.04 All employees who may potentially be exposed to asbestos fibers in the course of their regular job assignments should be trained to recognize those situations where asbestos may be encountered and those work operations that can cause asbestos fibers to become airborne. The mere presence of asbestos does not present a health hazard. The asbestos-containing materials must be disturbed in some manner to cause fibers to become airborne, where they subsequently can be inhaled or deposited on clothing and the body for a potential exposure at a later time.
- 12.05 In addition to understanding where asbestos may be encountered and the work actions that may create airborne asbestos fibers, all employees should be instructed on procedures to follow when they suspect asbestos in a situation that is non-routine or does not conform to those operations where proper work methods have been established.

Engineering Controls and Work Practices

- 12.06 Every employee who is assigned to work in an environment that may result in exposure to airborne asbestos fibers should be thoroughly familiar with the engineering controls and work practices applicable to that particular job. Particular attention must be given to those specific control and practice functions that minimize or eliminate the generation of airborne fibers.

Personal Hygiene and Protective Clothing

- 12.07 Good personal hygiene habits should be practiced whenever employees may work in the vicinity of asbestos and asbestos-containing materials whether or not there is an actual exposure situation.
- 12.08 If employees will be assigned to tasks where the permissible exposure level (PEL) may be exceeded, protective clothing, respiratory protection, and adherence to good personal hygiene measures become mandatory. Appropriate hygiene practices include the following:
- (1) Prohibition of eating, drinking, and smoking in the exposure area.

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- (2) No food, beverages or smoking materials may be stored in the exposure area.
- (3) Hands, face, and forearms should be washed prior to eating, drinking or smoking.

In situations where protective clothing is provided for employees, they should be instructed on the procedures for proper handling of contaminated clothing at the end of the work shift.

Respiratory Protection

- 12.09 Before employees may be assigned to tasks where respirators are required, the employees shall be trained in the specific instructions applicable to the respirator that will be worn. In addition to adequate instruction concerning use and care of the respirator, employees may not be issued respirators unless it has been determined by medical evaluation that they are physically capable of wearing the respirator. Details of the complete respirator requirements may be found in BSP 010-170-001 (see Appendix).

Medical Surveillance Program

- 12.10 Any employees who may be candidates for the medical surveillance program (required for exposures at or above 0.1 fiber per cubic centimeter of air) should be provided information relative to the program. This information should include a description of the surveillance program and the purpose of the surveillance.
- 12.11 The format for providing education on the medical surveillance program may be divided into a pre-examination introduction followed by more detailed information on specific aspects at the time of the first examination.

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13. MEDICAL SURVEILLANCE

BIOLOGICAL MONITORING

13.01 Not Applicable To Asbestos

Medical Examinations

13.02 Eligibility

- (1) Bell System employees shall be offered medical examinations and their records included as part of the record-keeping program required by OSHA CFR 1910.1001, when they have had a demonstrated Bell System work-related exposure to a 7 to 8-hour TWA concentration of 0.1 fibers per cubic centimeter of air of asbestos fibers longer than 5 micrometers (action level).
- (2) Bell System employees shall have a medical examination prior to assignment on any job in which there is a probable exposure to asbestos at or above the action level as defined above.
- (3) Bell System employees may be offered a medical examination (which should include the required elements of the asbestos surveillance examination), when one of the following criteria is met:
 - (a) individual has a past history of exposure in the Bell System to asbestos or to material suspected, but not proven to be, asbestos.
 - b) individual has symptoms which are attributed to working in a dusty environment in the Bell System and there is a work history as in (a) above.
- (4) Any Bell system employee assigned to tasks requiring the use of respirators shall be given a medical examination in order to determine if that employee will be able to function normally wearing a respirator.

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13.03 Frequency of Examinations

- (1) Annually for individuals with recurring exposure(s) to asbestos at or above the action level at any time during the 12 month period since previous examination.
- (2) Medical examinations should be provided to all individuals within 30 days after any repeat exposure at or above the action level when the exposure occurs more than 12 months after their previous asbestos medical surveillance examination.

13.04 Content of Examinations

Refer to Medical Surveillance Directive 1.00 for details (Section 14).

- (1) Physical examination
- (2) History (including a specific respiratory occupational exposure).
- (3) X-ray - 14" X 17" PA chest roentgenogram
- (4) Pulmonary function tests
FVC
FEV_{1.0}
- (5) Other tests and procedures as appropriate.

13.05 Medical Removal

OSHA 1910.1001 (d)(2)(iv)(c) states that "No employee shall be assigned to tasks requiring the use of respirators if, based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by his use of a respirator. Such employees shall be rotated to another job or given an opportunity to transfer to a different position whose duties he is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he had just prior to such transfer, if such a different position is available".

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14. MEDICAL SURVEILLANCE DIRECTIVE FOR OCCUPATIONAL EXPOSURES
ASBESTOS (MSD 1.00)

- 14.01 General: Employees who are exposed to concentrations of asbestos fibers exceeding 0.1 fibers greater than 5 microns in length per cubic centimeter on an 8 hour time weighted average (TWA) basis shall be given medical examinations as described below.
- 14.02 Specific: Motor vehicle mechanics performing work operations described in GL 77-07-024 and their immediate supervisors shall be given medical examinations as described below.
- 14.03 Medical Examination Content: A comprehensive medical examination shall include, as a minimum, a chest roentgenogram (posterior - anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease and smoking habits, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_{1.0}).
- 14.04 Medical Equipment: A single breath wedge bellows spirometer of at least 7.5 liter capacity and equipped with the means to produce a permanent record is minimally adequate for the measurements of FVC and FEV_{1.0}. Periodic calibration techniques for all spirometers are recommended.
- 14.05 Frequency: Medical examinations shall be made available as follows:
- (1) PREPLACEMENT: Preplacement examinations shall be made available to each employee within 30 calendar days following his first employment as a mechanic or supervisor.
 - (2) ANNUAL: At least annually thereafter a comprehensive medical examination shall be offered to each mechanic or supervisor.

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- (3) **TERMINATION OF EMPLOYMENT:** Within 30 days before or after the termination of employment (or change of job assignment) of any employee engaged as a mechanic or supervisor, a comprehensive medical examination shall be made available.

14.06 Record Retention: Complete and accurate records of all such medical examinations (including x-rays and specific test results) shall be retained for at least 30 years.

14.07 Access to Records: The results of the medical examination should be discussed with the employee.

The contents of the records of the medical examinations required by this section shall be made available pursuant to 29 CFR 1910.20 - OSHA Standard on Access to Employee Exposure and Medical Records.

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15. RECORDKEEPING REQUIREMENTS

15.01 Exposure Monitoring:

- 1 Source (bulk, air)
- 2 Number of samples
- 3 Location and date
- 4 Personnel exposed - name, SS#
- 5 Environmental conditions
- 6 Extent and type of respirators used
- 7 Laboratory performing analysis
- 8 Results - by duration of sample and 8-hour TWA by individual

15.02 Medical Records:

- 1 Name and SS#
- 2 Job Code(s) and location(s) in which exposure(s) occurred
- 3 Details of Bell System, work-related exposure(s) - Date(s) and measurement(s) of specific exposure(s) (cross-reference to 15.01) and duration of general exposure(s).
- 4 History of Non-Bell System exposures
- 5 Chest X-ray - date and interpretation
- 6 Pulmonary function tests - date and results.

15.03 Retention:

Exposure and Medical Records to be retained for 30 years after individual's last examination or as the law may require.

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15.04 Access To Exposure Records:

Reasonable access by employees to their own personal exposure records must be allowed, as required by OSHA 29 CFR 1910.1001 and 1910.20.

15.05 Medical Records:

Medical records pertaining to asbestos exposures must be made available as follows if authorized by the employee:

- (1) Assistant Secretary of Labor for Occupational Safety and Health.
- (2) Director of NIOSH.
- (3) An authorized representative.
- (4) A physician authorized by the employee.

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16. APPENDIX

16.01 Relevant Standards

- (1) OSHA Asbestos Standard 29 CFR 1910.1001
- (2) OSHA Program Directive #300-16

16.02 Relevant Letters

- (3) GL: 77-07-024 Motor Vehicle Maintenance - Brakes and Clutches
- (4) GL: 78-08-045 Motor Vehicle Maintenance - Protection Against Exposure to Asbestos Fibers
- (5) SR: 79-05-398 Occupational Safety and Health - Exposure to Airborne Asbestos Fibers - Request For Survey
- (6) RL: 79-07-254 Asbestos Hazards in Leased Buildings
- (7) SR: 80-06-010 Occupational Safety and Health - Sprayed-on Asbestos in Company-owned And Leased Buildings
- (8) P : 80-07-216 Occupational Safety and Health - Hazards in Customer Premises or Workplaces.

16.03 Other Information

- (9) Requirements For A Minimal Acceptable Respiratory Program
- (10) USPHS/NIOSH Membrane Filter Method For Evaluating Airborne Asbestos Fibers
- (11) BSP 010-170-001 (Provisional)

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SWBT 002320

Subject: Central Office Cable Penetration Closures

GL: 74-10-033

date: October 8, 1974



American Telephone and
Telegraph Company
195 Broadway
New York, N.Y. 10007
Phone (212) 383-8800

file no [of 74-10-033
other

to: Chief Engineers, General Plant Managers, Medical Directors
and OSHA Coordinators.

from: Director - Outside Plant, Safety and Supplies
Engineering Director - Equipment and Buildings
and Medical Director

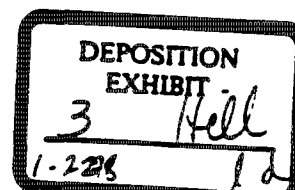
synopsis: Provides interim instructions for replacing transite wall and floor
covers with steel plates.

* * *

Attached to this letter is a Temporary Instruction being issued by Western Electric Company to replace existing instructions regarding transite floor and wall coverings. These interim measures were adopted after a series of meetings between Western Electric, Bell Telephone Laboratories, and A.T. & T. Plant, Engineering and Medical Departments.

Effective September 1, 1974 all orders shipped from Western that require material to close new cable holes will have steel plates substituted for transite. In addition, all jobs engineered after October 1, 1974 which require cutting of existing covers to add cable or equipment will receive steel covers to replace the transite covers that would normally be cut in the field. The cost of the steel replacement covers will be borne by the associated companies and should be included in all future engineering.

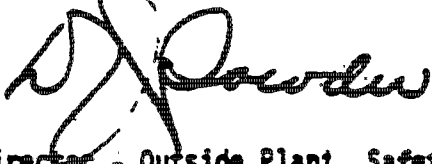
This interim change is being implemented to provide Western Electric Installers and Telephone Company Operating Personnel with a better health environment. Transite board contains asbestos and cannot be cut, drilled or filed without releasing low levels of airborne asbestos dust particles, which over a long period of time can create a health problem. Existing floor and wall coverings do not present any source of airborne particles and are to be left in place. Effective with this letter, however, there is to be no further cutting or



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shaping of existing transite covers - a substitute steel cover should be obtained from Western Electric if any changes in configuration become necessary.

The Bell Telephone Laboratories are continuing their investigation of fire and smoke penetration through floor and wall cable openings. Pending the final results of their testing program, the interim instructions outlined above will be followed.

A handwritten signature in dark ink, appearing to read "J. Powder". The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.

Director - Outside Plant, Safety and Supplies

A handwritten signature in dark ink, appearing to read "L. W. Turner". The signature is written in a cursive style with a prominent horizontal line across the top.

Engineering Director - Equipment and Buildings

A handwritten signature in dark ink, appearing to read "R. W. Stone M.D.". The signature is written in a cursive style with a large initial "R" and a long, sweeping underline.

Medical Director

Attachment

SUBJECT: BUILDINGS: Sprayed Asbestos Fireproofing



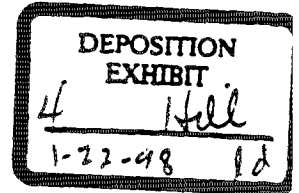
American Telephone
& Telegraph Company

185 BROADWAY, NEW YORK, N.Y. 10007

212 393-9800

DATE June 23, 1970

FILE NO. 1A5



TO Chief Engineers (copies to Building Engineers and Medical Directors)

FROM Engineering Director-Equipment and Buildings

SYNOPSIS Indicates possible health hazards with the use of sprayed-asbestos fireproofing, glass fiber or asbestos interior duct linings.

* * *

Recent articles in various building trade publications and newspapers have referred to possible health hazards associated with the use of sprayed asbestos fireproofing on steel-framed buildings. Medical research has indicated that asbestos fibers can be injurious to an individual's health. Therefore, if asbestos fireproofing is proposed or specified on a building project, it must be applied in such a manner as not to endanger the individuals applying the asbestos or people in the vicinity of the application.

The use of asbestos or glass fiber for interior duct lining has also been questioned as a possible health hazard. Suspended ceiling supply or return air plenums lined with asbestos or fiberglass are susceptible to contaminating the air stream with fibers from ceiling panels and/or asbestos fibers from fireproofed structural members. Methods to preserve the use of these materials in building construction and not create a health hazard are being developed.

Advice and recommendations pertaining to developments in the solution to this problem will be furnished as soon as they are available. In the meantime, we would suggest that you review the design criteria and application methods proposed on any buildings now being designed or in early stages of construction, that may be involved with using asbestos or glass fiber material. Alternative methods of applying fireproofing or lining the interior of air ducts should be considered.

We would appreciate any local information on application methods or special surface treatments that have been used to gain acceptance of the use of these materials.

At Dr. E. Schowalter's request, this letter is also being sent to Medical Directors.

W. H. Turner

Engineering Director

CWH:DAL

005665

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FIRST CLASS MAIL
COMPANY PRIVATE

APR 1 1974

Installation Engineering Handbook 30
Western Electric
Service Division

TI Section 15D

ADVANCE
TEMPORARY INSTRUCTION
COPY
CABLE PENETRATION - CLOSURES

1. GENERAL

- 1.1 The purpose of this Temporary Instruction is to provide Installation with the history and to explain the reason why the floor and wall cable hole cover material is being changed from transite to steel.
- 1.2 The Bell System cable hole assemblies have been accepted throughout the country for over fifty years. However, there are no records of BTL tests establishing their fire resistance capabilities. Accordingly, in 1970, CIE requested AT&T to approve the replacement of transite with steel in order to reduce the Installer's effort in fabricating cable hole penetration closures. In August, 1971, AT&T requested BTL-Whippany to undertake an analytical and experimental program to upgrade the fire policy described in EL 1343. As a result, a group at Whippany was formed and a full scale test facility, equivalent to a Central Office building bay two stories high, was constructed at Chester Laboratories, N.J.
- 1.3 Over the past several years, numerous tests have been conducted to establish minimum standard time requirements for smoke and fire penetration through cable hole assemblies. Tests at Bell Telephone Laboratory are still in progress to determine if any further improvements to the cable hole concept can be made.
- 1.4 The substitution of steel for transite floor covers will reduce material cost and fabrication time; but more important, it will improve the Installer's environment. When transite material is cut, it produces low levels of airborne asbestos dust particles. Accordingly, the Installer is required to wear a respirator and gloves as protection. Cutting of steel will eliminate this potential health problem and the need for these personnel protection requirements.
- 1.5 Because of the importance of improving the Installer's environment, a program to replace the transite material used as cable penetration closures with steel plates has been initiated. All orders (requiring material for closing new cable holes) which are shipped after 9/1/74 will be provided with steel floor and wall plates. All orders engineered after 10/1/74 which require the opening of an existing cable hole to add additional cables, will receive steel plates to replace the existing transite covers.

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2. INSTRUCTION

- 2.1 Disregard all figures in Series 15 of Handbook 30 depicting transite material when steel floor and wall closure plates are received on job site. Install steel floor and wall closures in manner similar to transite covers.
- 2.2 Cut floor and wall steel plates with the R-4355 Hobbler similar to the ceiling steel plates.
- 2.3 The replaced transite wall and floor covers are not to be cut-up or in any way reduced in size prior to disposal via the local scavenger service.

Engineering Planning Manager
Common Installation Engineering

002392