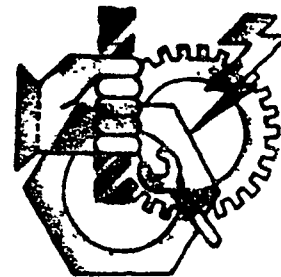


Plant Engineering Letter

Letter No. 80-1
March 17, 1980



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Plant Engineering Office
Manufacturing Staff

ASBESTOS - RECOMMENDED WORK PRACTICES

Asbestos is a recognized human carcinogen. The first regulation limiting employee exposure to asbestos was promulgated in 1972. In July 1976, the Occupational Safety and Health Administration (OSHA) established a two fiber per cubic centimeter exposure limit. OSHA is considering an even lower permissible exposure limit indicating growing concern over asbestos exposure and use.

Despite the hazards associated with asbestos fiber, the reduction in allowable exposure limits, and the number of proven cases of cancer caused by exposure to asbestos, workers tend to ignore the hazard. A potential hazard exists wherever asbestos is cut, ripped, drilled, ground, or handled in any way which causes dust to become airborne. The best way to minimize the effects of asbestos exposure is to follow good work practices and use equipment designed to protect employees from breathing asbestos.

This article lists the work practices which should be used if asbestos must be handled. These work practices are based on OSHA regulations, Company guidelines, and common sense. In those cases where asbestos is being removed (as in thermal insulation on pipes), it is suggested that available substitutes be used for replacement. Some substitutes are listed below. Company research projects are presently underway to attempt removal of asbestos from all Company operations wherever it is possible.

Pipe Insulation

Most pipe insulation installed prior to 1960 contains asbestos. Generally maintenance and/or replacement of insulated pipes requires removal of the asbestos covering. To minimize the release of asbestos fibers into the air and decrease potential employee exposure, the following work practices should be followed:

- All employees removing asbestos pipe insulation must wear approved respirators and special clothing. This is not only a good work practice, it is a requirement of OSHA regulation 29CFR 1910.1001 (C)(2)(iii). Contact Industrial Hygiene and Toxicology (313) 337-8955 for information on approved respirators.
- OSHA regulation 1910.1001 contains explicit requirements and work practices which must be followed when the potential for asbestos overexposure can occur. The regulation provides details on: respirator programs, change rooms and clothes lockers, area and personal sampling requirements, caution signs and labels, house-keeping, waste disposal, medical recordkeeping and medical examinations. The regulation should be consulted and followed particularly in those areas where asbestos is encountered routinely.
- Isolate the area to keep other employees as far as possible from the repair operation. The surfaces to be repaired should be wetted down where possible or treated with commercially available dust suppressant to control dispersion of asbestos fibres.
- Place plastic sheeting on the floor beneath the repair site so that all pieces of insulation, however small, can be collected when finished. Pedestrian and vehicular traffic can redispurse asbestos into the air if pieces are left on the floor.

- If it is necessary to sweep the asbestos, the floor should be wetted down to keep the fibers from becoming airborne. Approved vacuum cleaners should be used to clean the floor of any remaining dried asbestos dust and small pieces of material (see Plant Engineering Office, Manufacturing Staff Maintenance Bulletin No. 137 for recommended vacuum cleaners).
- All waste, scrap, and debris, as well as asbestos-contaminated clothing, should be placed in sealed, impermeable bags or containers for proper disposal. No asbestos-containing insulation should ever be placed in open trash containers or dumpsters. All waste material containing asbestos or containers into which they are placed for disposal must be labeled in accordance with OSHA Standard 1910.1001 (G)(2)(i)(ii).
- Because asbestos fiber can be dispersed throughout adjacent areas by ventilation systems, air-supply fans in the vicinity of asbestos removal projects should be turned off; exhaust fans should be left on (unless these fans are part of an air recirculation system) to keep the area under negative pressure.

When repair operations are complete, if the pipe must be reinsulated, asbestos containing products are not to be used for two reasons: (1) cutting and fitting of asbestos-containing insulation generates significant amounts of airborne asbestos fiber even though it cannot be seen, and (2) eventually asbestos will be banned from use completely except where suitable substitutes are not available. Future regulations may even require complete removal of asbestos already installed in Company facilities.

Currently, there is not any one material on the market which can be substituted for asbestos in all of its applications. As regulations tighten, it is expected that manufacturers will produce substitute materials. There are insulation substitutes currently on the market and some are listed in "Mechanical Design and Equipment Standards" (Plant Engineering Office, Manufacturing Staff, Page M4-1, January 1976). Typical substitutes are listed below:

Steam Piping

Inside Boiler Houses

Manufacturer

Certain-Teed Saint Goban (CSG)
Johns-Manville
Owens-Corning
Celotex Corporation
Pabco

Acceptable Material

Snap-On (to 450 F)
Calcium Silicate
Kaylo
Careytemp Expanded Silca (1/2")
Calcium Silicate

Inside Manufacturing and Office Buildings

Manufacturer

Certain-Teed Saint Goban (CSG)
Johns-Manville
Owens-Corning Fiberglas
Pabco

Acceptable Material

Snap-On
Flame Safe
Heavy Density Sectional
Calcium Silicate

Condensate Piping -- (Inside Building)

Manufacturer

Armstrong Cork Co.
Certain-Teed Saint Gobain (CSG)
Johns-Manville
Owens-Corning Fiberglas

Acceptable Material

FR/Armaflex
Snap-On
Flame Safe
One Piece

Brake and Clutch Repair

Brake and clutch mechanisms on vehicles, presses and cranes utilize asbestos friction materials. Overexposure to asbestos fiber in the air can occur during inspection and repair operations especially when compressed air is used to blow off dust. The Plant Engineering Office, Manufacturing Staff Maintenance Bulletin No. 137 recommends a procedure for minimizing asbestos fiber exposure. Important points are summarized below:

- . Under no circumstances should compressed air blowoffs be used to clean parts which may contain asbestos laden dust.
- . Brake and clutch mechanisms should be cleaned using an industrial vacuum cleaner with a filter system capable of capturing a three micron particle size. Information is available from the Industrial Hygiene and Toxicology Department on availability of recommended units.
- . Disposal of any asbestos laden waste resultant from brake or clutch repair and maintenance or from vacuum cleaning should be by an employee wearing an approved respirator. The waste material and any vacuum cleaner bags should be placed in sealed containers and labeled as to the hazardous nature of their contents. Vacuum cleaner bags are not to be emptied by shaking; these bags are not to be reused.
- . The repair area should be kept clean of all visible dust on the floor. Even small amounts become airborne repeatedly by pedestrian and vehicular traffic. If sweeping is practiced, it should be done only after wetting down the floor. Approved vacuum cleaners should be used to clean the dried asbestos dust from the floors. Conventional vacuum cleaners may not be capable of retaining asbestos fibers which may penetrate the filter and be dispersed into the air.
- . Any grinding or cutting of asbestos containing material must be done with local exhaust ventilation which conforms to OSHA Standard 1910.1001.

General Precautions

The work practices above are intended to help in minimizing the hazard involved in handling this substance. In addition to insulation removal and brake and clutch repair, the following general precautions are recommended which pertain to respirator usage:

- . Employees must be trained in the proper use of respirators and their limitations.
- . Respirators should be cleaned and disinfected after each day's use.
- . Employees must be evaluated by medical personnel to determine if they are qualified to do required tasks while wearing respirators.

- Initial monitoring must be conducted (as prescribed in CFR 1910.1001 (F)(1) to determine if employees exposure to asbestos is below allowable levels.

There are other maintenance materials that may contain asbestos and may be in use at Company facilities. To the extent that commercially available alternates are available, they should be substituted for any materials presently in use which may contain asbestos. While the following list, condensed from a government synopsis of asbestos-containing products, is not all inclusive, it can be useful in suggesting candidate materials for which asbestos substitutes may already be available:

- Paper Products: pipe and boiler covering, sheets for heat insulation, millboard sheet, filtering materials.
- Cloth and Woven Products: seals for high temperature gaskets, valve stem packing, insulation for glass-handling tools.
- Flame Resistant Garmets: gloves and mittens, sleeves and arm protectors, aprons, blankets.
- Asbestos Cement Products: welding shields, siding.
- Miscellaneous: acoustical and sprayed thermal insulation, asbestos powder, bulk fiber.

In future Plant Engineering Letters we plan to include additional information on asbestos as well as on other material which could contain potentially carcinogenic substances.

PROTECTION OF SPRINKLER HEADS DURING PAINTING OPERATIONS — UPDATE

As a result of the last article on the above subject (Plant Engineering Letter 79-4) some important comments have been received from the Corporate Fire Control Office. The Fire Control Office concurs with the requirement to cover sprinkler heads during painting operations, however, it should be emphasized that the protective material used must not interfere with the normal operation of the sprinkler. Reference to "canvas covers" as one of the approved methods of protection should, therefore, be deleted from page 4, line 11 of Letter 79-4.

Two references were also made on the same page to cleaning of painted sprinkler heads. Fire Control Bulletin No. 8, entitled "Automatic Sprinkler Systems," dated September 14, 1979, states that painted sprinkler heads should not be cleaned but should be promptly replaced with new heads. The reference to cleaning painted sprinkler heads on page 4, lines 16 and 21 of Letter 79-4, should also be deleted.

2-7-8

INDEX OF M-NUMBER MATERIALS USED BY MAINTENANCE — Revised Edition

The following is a revision of information that was originally published in Maintenance Bulletin #51, October 1977.

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CODE

‡ indicates that a written Standard is applicable

• indicates that an Engineering Specification is applicable

~~Nil~~ indicates no written Standard; generic items

ES-M-Numbers refer to Engineering Specifications rather than Manufacturing Standards