



PB93-215127

NIOSH

Comments to the Coast Guard

COMMENTS FROM THE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ON
THE COAST GUARD
ADVANCE NOTICE OF PROPOSED RULEMAKING ON
CONTROLLING THE MARINE ASBESTOS HAZARD

46 CFR Part 197
Docket No. CGD 88-103

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health

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The National Institute for Occupational Safety and Health (NIOSH) has reviewed the advance notice of proposed rulemaking and supports the proposed changes to the Coast Guard Naval and Vessel Inspection Circular (NVIC) 6-87 for the control and reduction of asbestos exposure to industrial maritime employees working aboard marine vessels and shore installations. We have provided ^{below} suggestions for your consideration on the proposed plan to reduce maritime exposure to airborne asbestos fibers (AAF).

ESTABLISHING A PERMISSIBLE EXPOSURE LIMIT

In testimony to the Occupational Safety and Health Administration (OSHA), NIOSH has testified that there is no safe airborne concentration of fibers for any asbestos mineral [NIOSH 1984a; NIOSH 1990; NIOSH 1991a]. In our 1991 testimony [NIOSH 1991a], NIOSH supported the OSHA proposal to reduce the permissible exposure limit (PEL) for asbestos to 0.1 fibers per cubic centimeter of air (f/cc) for all workers.

The current NIOSH recommended exposure limit (REL) is 0.1 f/cc [NIOSH 1991a]. However, even at this concentration, OSHA has estimated that the mortality risk would be 3.4 deaths per 1000 workers for a lifetime of exposure to asbestos [55 Fed. Reg. 29712]. Therefore, NIOSH has urged that the goal be to eliminate exposures to asbestos fibers or, where they cannot be eliminated, to limit them to the lowest feasible concentration [NIOSH 1984a; NIOSH 1991a].

The Coast Guard proposed that its PEL (for 24 hours per day, 7 days per week) be based on a linear extrapolation of the current OSHA PEL of 0.2 f/cc. The proposed Coast Guard PEL is inconsistent with the NIOSH REL and the proposed OSHA PEL. Recognizing this, the Coast Guard should base its PEL upon a linear extrapolation of the proposed OSHA PEL of 0.1 f/cc, rather than the current OSHA PEL of 0.2 f/cc.

MEDICAL SURVEILLANCE

NVIC 6-87 recommends that seamen exposed to airborne asbestos fibers at or above the action level enter a program of medical surveillance such as that required by the OSHA program for the construction industry.

In this regard, we have reviewed both the OSHA asbestos standard for general industry (29 CFR 1910.1001) and the OSHA asbestos standard for the construction industry (29 CFR 1926.58). With regard to the medical surveillance program for the workers exposed to asbestos, these two are similar and comprehensive. They include requirements or specifications for health questionnaires, physical examinations, pulmonary function tests, chest roentgenograms, and recordkeeping.

The proposed Coast Guard regulation is consistent with the current OSHA regulations with the exception of the Coast Guard proposed requirement for employers to retain medical surveillance records for the duration of employment and the following three years, versus retaining the records for the following 30 years under the OSHA regulations. The Coast Guard bases this recommendation upon the relatively low numbers of industrial maritime workers and the

significant decline in the number of commercial vessels with asbestos installed that can be expected in the next 20 years. The Coast Guard maintains that central retention of these records would allegedly not add much to the "asbestos exposure" database. While this may be true in the aggregate, an exposed worker may develop an asbestos-related disease many years after his medical records were destroyed. The Coast Guard regulation should be consistent with the OSHA requirement for record retention that requires records to be kept for the duration of employment plus 30 years (29 CFR 1910.1001, 29 CFR 1910.58, 29 CFR 1910.20).

MONITORING OF AIR/ANALYTICAL METHODS

Air Sampling

In order to determine the AAF exposures to maritime workers, and thereby the extent of exposure control required, a periodic personal air monitoring program is essential. If air sampling is not feasible for all workers, then a monitoring program using a representative sample of workers such as a "zone" [Corn and Esmen 1979] sampling strategy could be employed. This type of a monitoring program should be scheduled on a rotating basis to ensure that each worker is monitored within a specified time period. Also, whenever any major changes occur in the work environment such as new equipment installation, old equipment removal, or exposure control installation, air monitoring should be conducted to evaluate the effect of these changes on worker AAF exposure in the affected area.

The practicality of using maritime workers to perform the AAF sampling is discussed in part 6 of the "Questions" section of proposed regulation. It would be acceptable to train workers to conduct the air monitoring. However, an industrial hygienist should be consulted to design the initial sampling strategy and set up the sampling schedule, interpret sampling results, and to reevaluate the strategy periodically.

As was stated in the notice, problems may arise with AAF sampling in dusty environments. It is important to sample areas where mariners are situated for most of the day, especially in situations where friable asbestos is present. It would be feasible for clean areas (such as berthing areas, living quarters, etc.) to analyze for compliance with a standard lower than 0.1 f/cc provided the sample volume exceeds 1,000 liters. These requirements may necessitate the use of high-flow-rate pumps or area sampling. If area sampling is conducted, it should be representative of the exposures that occur in the worker's breathing zone. For areas such as galleys and welding areas, there may be other sources of contamination. Again, area sampling using high-flow-rate pumps may be necessary.

Analytical Methods

In our 1991 testimony to OSHA [NIOSH 1991a], NIOSH stated that: (1) for regulatory purposes, phase contrast microscopy (PCM) is the most practical technique for assessing asbestos fiber exposures when using the criteria given in NIOSH analytical method 7400 [NIOSH 1984b], and (2) concentrations below 0.1 f/cc can be accurately measured in certain occupational environments. The

limits of fiber detection and quantitation using Method 7400 depend on the sample volume and the quantity of interfering dust. The limit of detection is 0.01 f/cc in a 1000-liter air sample from environments free of interferences [NIOSH 1991a]. Limits of detection and limits of quantitation are shown in Figures 1 through 4 for various sampling conditions.

NIOSH recognizes that mixed fiber exposures may occur in the workplace and that fibers may need to be identified. In such cases, Method 7400 can be supplemented with electron microscopy as described in Method 7402 [NIOSH 1984b], using electron diffraction and microchemical analysis to improve the specificity of the fiber determinations.

Quality control of sampling and analysis must be, at a minimum, in exact compliance with all sampling and analytical requirements set forth in the cited methods.

PCM is applicable to the maritime environment as inferred from U.S. Navy practice, announced in 1987, to equip industrial hygiene officers assigned to tenders and repair ships with phase contrast microscopes [Rose 1987].

ENGINEERING CONTROLS/SAFE WORK PRACTICES

As described in the "Assumptions" and "Permissible Exposure Level" sections of the proposed regulation, maritime workers aboard vessels offshore have the potential for exposure to asbestos 24 hours a day, seven days a week. Therefore, exposure concentrations on the offshore vessels should be reduced as much as possible. One method of lowering the AAF exposure within the enclosed spaces on these vessels (crew quarters, etc.) would be to equip the heating, ventilation, and air-conditioning ventilation system with a state-of-the-art particulate filtering system. This could consist of an electrostatic, or at a minimum, a high-efficiency particulate air (HEPA) filtering system. Such filtering systems are capable of removing the majority of particles in the respirable size range (HEPA filters are more than 99.97% efficient for filtering particles having an aerodynamic diameter of 0.3 micrometer).

Safe work practices should be applied to all work involving materials containing asbestos. All marked areas containing asbestos hazards should be identified, and a plan that is reviewed by an industrial hygienist should be implemented to control hazards. It may be appropriate to require an asbestos survey of all vessels as part of the training in safe work practices.

Safe work practices utilized for working with asbestos in industry are directly applicable to maritime work. Safe work practices are required by the U.S. Navy, and have been used successfully in Naval shipyards aboard ships [U.S. Navy 1987]. Where hygiene facilities cannot practically be located at the abatement site, practices such as double suiting (where the worker wears two Tyvek®-like suits into the enclosure and, when exiting the enclosure, removes the outer, asbestos-contaminated suit in an air lock) and the use of shower trailers have been used successfully in Naval shipyards. Compressed air should never be used for cleaning asbestos-laden gear.

NIOSH has also conducted studies on the use of glove bags for controlling asbestos exposures during maintenance operation [NIOSH/EPA 1990; NIOSH 1991b; NIOSH 1991c].

REFERENCES

Corn M and Esmen NA [1979]. Workplace exposure for classification of employee exposures to physical and chemical agents. Am Indust Hyg J 40:47-57.

55 Fed. Reg. 29712 [1990]. Occupational Safety and Health Administration: occupational exposure to asbestos, tremolite, anthophyllite and actinolite; proposed rule.

NIOSH [1984a]. Testimony of the National Institute for Occupational Safety and Health on the Occupational Safety and Health Administration proposed rule on occupational exposure to asbestos, Docket No. H-033, June 21, 1984. NIOSH policy statements. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health.

NIOSH [1984b]. NIOSH manual of analytical methods - third edition. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, GPO Stock No. 917-011-00000-1.

NIOSH [1990]. Testimony of the National Institute for Occupational Safety and Health on the Occupational Safety and Health Administration notice of proposed rulemaking on occupational exposure to asbestos, tremolite, anthophyllite, and actinolite: 29 CFR Parts 1910 and 1926, Docket No. H-033d, May 9, 1990. NIOSH policy statements. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health.

NIOSH/EPA [1990]. An evaluation of glove bag containment in asbestos removal. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, and the U.S. Environmental Protection Agency, Office of Research and Development, DHHS (NIOSH) Publication No. 90-119.

NIOSH [1991a]. Testimony of the National Institute for Occupational Safety and Health on the Occupational Safety and Health Administration proposed rule on occupational exposure to asbestos, tremolite, anthophyllite, and actinolite: 29 CFR Parts 1910 and 1926, Docket No. H-033e, January 24, 1991. NIOSH policy statements. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health.

NIOSH [1991b]. In-depth survey report: evaluation of the aero-pipe capsule (negative pressure glove bag) during the removal of asbestos-containing pipe lagging. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, NIOSH Report No. ECTB 147-21a.

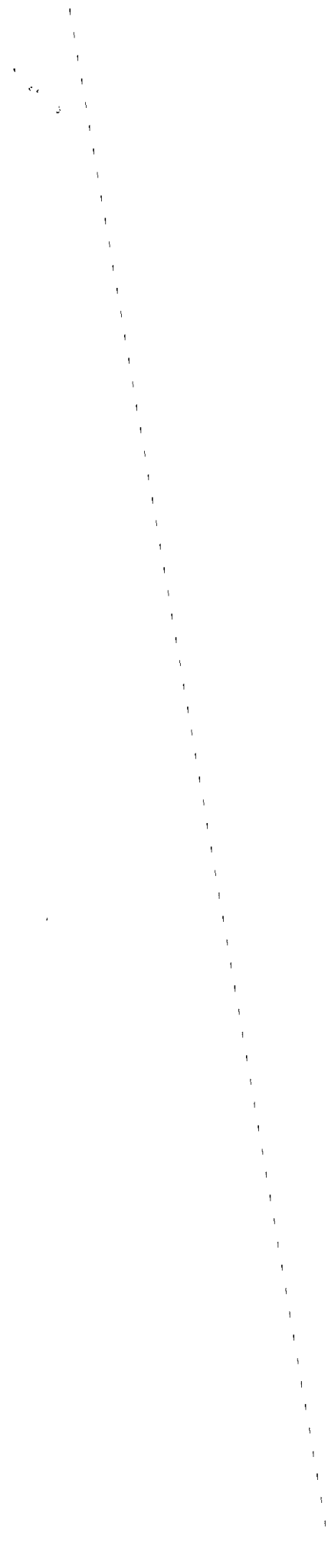
NIOSH [1991c]. In-depth survey report: evaluation of a custom fabricated negative air glove bag during the removal of asbestos-containing pipe lagging. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, NIOSH Report No. ECTB 147-22a.

Rose VE (ed.) [1987]. News of governmental agency and departmental activities. Appl Industr Hyg 2:R-21.

U.S. Navy [1987]. Navy occupational safety and health (NAVOSH) program manual. Chapter 17: Asbestos. Washington, DC: Department of the Navy, Office of the Chief of Naval Operations. OPNAVINST 5100.23B, Change 3.

Enclosures and/or attachments that are not included are available free of charge from the NIOSH Docket Office (513/533-8450).

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