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Environmental Sciences
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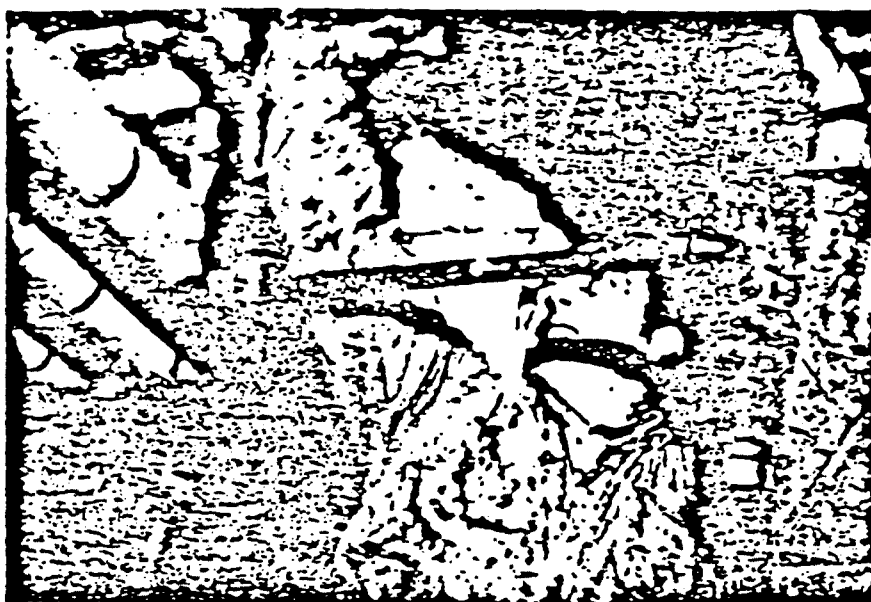
INSULATION HYGIENE PROGRESS REPORTS

FROM THE INSULATION INDUSTRY HYGIENE RESEARCH PROGRAM

Irving J. Seftell, M.D., Program Director

Vol. 2, No. 2

Summer 1977



This asbestos worker is applying insulation in the unventilated and confined space of a ship's engine room. Note asbestos-containing material on his overalls.

NYC Leads USA - Sets Rules For Spray

In a historic action, the Environmental Protection Administration and the Department of Air Resources of New York City have promulgated interim orders governing the spraying on City construction sites of any insulation material containing asbestos.

First Such Action

The orders went into effect April 13. They detail the steps that must be taken by spray contractors during application. These steps will minimize exposure to spray applicators, to other construction workers on a job site, and also to the general population living or working nearby.

This action by New York City is the first such in the United States. It brought to fruition a cooperative effort by Mount Sinai School of

Medicine's Insulation Industry Hygiene Research Program, New York City's Department of Air Resources, and various industry groups which began last summer.

As part of this cooperative effort, a joint program of asbestos sampling and analysis was initiated by Mount Sinai and the Department of Air Resources last July. At the same time the Sprayed Mineral Fiber Manufacturers' Association and the New York City Plasterers' Association met to establish industry safety practices and control procedures for spray application. (See Fall 1969 issue of *Insulation Hygiene Progress Reports*.)

In addition, consultation on various aspects of the problem of spray insulation took place between IIHRP staff and building owners, architects, general contractors, and, especially,

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Shipyards Tour Shows Hazards to Workers

Air samples taken from ship compartments in eight shipyards of the Gulf Coast are now being examined for asbestos fiber content in the New York laboratories of the Insulation Industry Hygiene Research Program.

Two scientist investigators, Dr. Harry Heimann and Mr. William B. Reitze, secured the samples during a recent two-week tour. They visited yards at Houston, Galveston, Beaumont, New Orleans, Pascagoula, Mobile, Jacksonville and Tampa.

They carefully inspected aircraft carriers, destroyers, Navy supply ships, container ships, and tankers.

Arrangements for the tour were made through the cooperation of the United States Department of Labor and the International Office of the International Association of Heat and Frost Insulators and Asbestos Workers.

Other Workers Endangered

The handling of asbestos insulation products presents a health hazard not only to the insulation workers but also (because of the confined areas) to the allied shipbuilding trade workers.

Dr. Heimann and Mr. Reitze found that the three most serious hazards appear to be

1. the extreme dustiness during removal of old insulation
2. an almost total lack of ventilation in confined spaces
3. the spread of dust from work areas into other regions of the ship.

Methods to remove old insulation with a minimum of dust production are receiving top priority consideration by Mount Sinai's engineers.

The design of a typical ship includes many small compartments

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PURPOSES OF THE INSULATION INDUSTRY HYGIENE RESEARCH PROGRAM

1. To develop improved methods for minimizing exposure of insulation workers to dusts and fumes encountered in their work.
2. To disseminate knowledge of these improved methods of dust control wherever they may be applied advantageously and to offer cooperation, advice and assistance toward their universal adoption.



(l. to r.) New York's Mayor Lindsay, Commissioner of Air Resources Robert N. Rickles, and Environmental Protection Administrator Jerome Kretchmer discuss the new spray orders at City Hall.

NYC Leads USA—Sets Rules For Spray

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the World Trade Center engineers and their general contractor, Tiabman Construction Company.

The interim orders will remain in force until adoption of final regulations following public hearings. The hearings are to be held within six weeks, according to Jerome Kretchmer, newly appointed New York City Environmental Protection Administrator. The new rules include requirements that

- (a) any spray area be completely enclosed by tarpaulins,
- (b) the area be vacuum-cleaned after application, and
- (c) insulation in air circulation plenums or ducts containing asbestos be coated with a sealant to preclude erosion of asbestos-containing material into the air of the building.

(See page 3 for complete regulations.)

Some Contractors Made Effort

Dr. Robert N. Rickles, New York City's new Commissioner of Air Resources, emphasized the need for specific procedures that are enforceable and noted that voluntary measures to

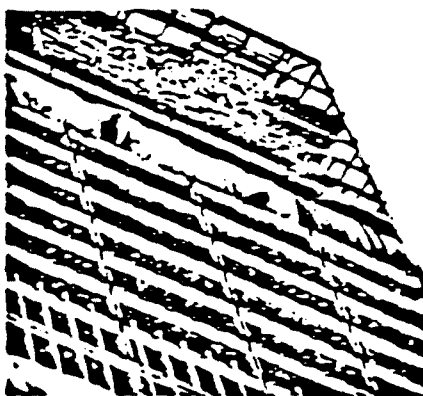
reduce environmental exposures were not uniformly followed.

"Some contractors," he added, "made an effort to contain their spray operation." (See Spring 1970 issue of *Progress Reports* for story on World Trade Center.) "Other operators, however," he went on, "made only minimal efforts at containment. We also found that cleanup of waste was a serious problem everywhere, with workers of all trades being exposed continually to the debris of spray fireproofing insulation."

Dr. Irving J. Selikoff, IIHRP Director, endorsed the City regulations. "The technology for safe application of sprayed mineral fireproofing material exists," he said. "However, the utilization of appropriate containment and cleanup techniques must be uniform throughout the industry if we are to succeed in solving the health problem of mineral fibers in urban air."

"It is of importance, too, to note the Environmental Protection Administration's concern with coatings of air plenums in buildings already in construction since it wishes to insure that air in ventilating systems not be contaminated by foreign material."

Text of the New Spray Rules:



Four examples of trade practices the new rules ban: (top to bottom) Spraying without any containment at all; Inadequate tarping; asbestos-containing debris uncleared up; and spray material that has been allowed to fall down on to construction equipment.

1. Before the start of spraying operations all floor areas shall be swept broom clean. Before the application of asbestos-containing material commences, the floor of the area shall be cleared of all objects, material and equipment other than that employed in the application of the asbestos containing insulation or all objects, materials, etc. shall be covered with plastic or plastic-coated tarpaulins in a manner that precludes the subsequent dispersal of asbestos particulates.

2. The entire floor, or the part of the floor to be insulated, shall be enclosed with plastic or plastic-coated tarpaulins in a manner which shall preclude the escape of asbestos-containing material from the enclosure. All interior open areas, such as elevator shafts, stairwells, etc. shall be enclosed in a manner which shall prevent the escape of asbestos-containing material from the working area. "Stack effect" of the shafts, stairwells, etc. shall be considered in providing proper enclosures. An enclosure will be considered satisfactory only if visible insulating material cannot escape from the enclosure.

3. Wet asbestos-containing material which has fallen to the floor shall be immediately swept up and placed in a container having walls, bottom, and a tight cover strong enough to resist tearing or breaking under normal handling conditions and clearly marked as containing asbestos waste. The contents of the aforementioned containers shall not be transferred to another container, but the container shall be placed directly upon a vehicle for disposal at an approved site.

4. All floors will be vacuumed shortly after drying. The vacuum cleaner shall contain a strong, single-service, disposable inner bag of durable material which shall be removed from the vacuum cleaner and tightly sealed. The bag shall then be placed in a container of the type described in paragraph 3, which shall thereafter be placed on a vehicle for removal and disposal at an approved site.

5. The materials used to form the enclosure shall be thoroughly vacuumed upon completion of the application of the insulation in the area. The entire floor area, all ledges and surfaces including tarpaulins upon which waste insulation material may have fallen, shall then be vacuumed or revacuumed before removal of the enclosures.

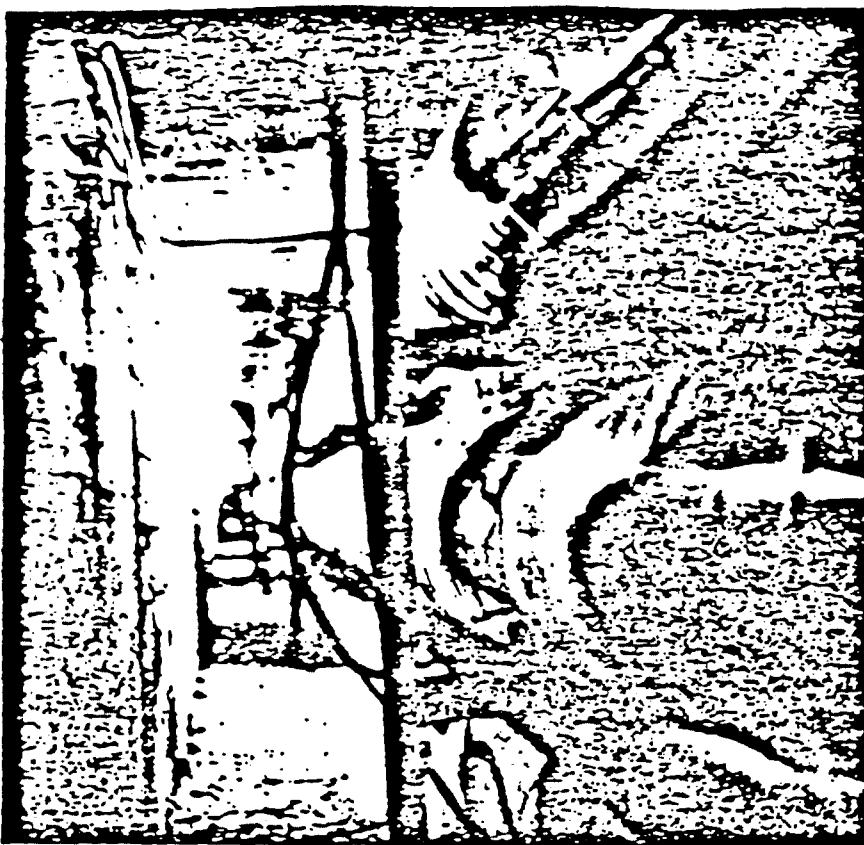
6. Enclosures shall not be dismantled until the area has been thoroughly vacuumed after completion of spraying and cleanup.

7. All areas used for opening bags containing asbestos insulating material and/or charging of hoppers shall be enclosed in such a manner that asbestos-containing insulating material shall not be permitted to escape from the immediate area in which such activity takes place.

8. Signs shall be posted outside enclosures warning persons of the hazard of entering the enclosure without appropriate mask and other apparel.

9. All persons involved in the spraying of asbestos at the site must be furnished with Bureau of Mines approved respirators for pneumoconiosis-producing dust and must be furnished with suitable coveralls which will be left at the site and thereby preclude the removal of asbestos from the site. No person shall be permitted in an area in which asbestos spraying or handling has taken place until final vacuuming referred to in paragraph numbered "5" herein, unless such person is furnished with and wears a Bureau of Mines approved respirator for pneumoconiosis-producing dust and coveralls of the type described herein. Facilities shall be provided and procedures instituted and supervised that preclude the removal and dispersal of asbestos-containing material from the construction site on the clothing or other appurtenances of persons leaving the area.

10. Any plenum or other structures coated with asbestos-containing insulation which is intended for use in the circulation of air in the building must be thoroughly cleaned of all debris and waste insulation. All applied asbestos-containing insulation within a plenum or duct must be coated with a sealant which precludes exposure of the asbestos-containing material to the circulating air.



Insulating pipes with asbestos-containing material in so confined a space as this adds to the danger of breathing the dust.

Confined Spaces Add Yet Another Danger

The Insulation Industry Hygiene Program has found answers to a number of problems in the asbestos insulation industry.

Coated calcium silicate pipe covering and block, plastic mixing bags, and proper use of dust collection devices are some of the solutions. All contain the dust at its source and all significantly reduce worker exposure to asbestos.

Portable Exhaust Systems

Some insulation work, however, presents problems not easily solved by containment at the source. Shipboard work, both application and tear out, and covering steam lines in confined tunnels are two such types of work.

When there is poor ventilation in such work areas, removal of dust is made difficult and temperatures may rise to much above 100° F. To these

twin problems, two complementary solutions are now being studied by IIHRP engineers—the use of portable exhaust systems and self-contained air supply respirators.

Cool Air to the Face

In the confined space of a tunnel, the use of an exhaust system at a nearby manhole can reduce both the dust level and the working temperature. In many cases, easily obtainable and inexpensive exhaust systems of less than 5000 cubic feet per minute capacity would suffice. IIHRP engineers and industrial hygienists will be pleased to assist any contractor or union having specific problems associated with tunnel work.

Aboard ship, some use is made of portable low-volume exhaust systems, designed principally to control fumes from welding operations. These systems, however, are ineffective in

Shipyards Tour Shows Hazards

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with little natural ventilation. When the ship is in operation, the air in these compartments is changed by means of a forced ventilation system. But during construction or rebuilding, it remains stagnant. Fine dust and fibers put into the air by fitting and handling calcium silicate block or amosite blankets remain suspended for hours.

Special Techniques Needed

Dust generated by hand sawing or fitting asbestos block can easily fall two or three decks through gratings. The fibers thus deposited throughout an engine room may contaminate a ship for months. Here the use of drop cloths or boxes to contain the dust can improve conditions measurably.

Some of the methods being developed by the Insulation Industry Hygiene Research Program for controlling asbestos dust at land-based building construction sites can be used aboard ships. It is evident, however, that further special dust control techniques will have to be developed for the protection of all craftsmen in shipbuilding trades. Hence, the priority now being given to these problems by the IIHRP.

changing the large volume of air in most ship compartments.

In some spaces having large volumes of air, exhaust systems of sufficient capacity to maintain clean air are either too costly or impractical to use. In these cases the solution may lie in self-contained battery-operated air supply respirators.

These respirators—far more comfortable to wear than standard ones—not only provide almost absolute respiratory protection from dust, but provide a cool stream of air to the worker's face. Batteries and motors have already been developed of sufficiently light weight as not to be objectionable. Several later models are under study by the IIHRP and full details and descriptions will be forthcoming in a future issue of *Insulation Hygiene Progress Reports*.