

opportunity for its release into the atmosphere can occur at numerous points during mining and milling, primary and secondary manufacture, extended periods of use, construction and demolition, brake repair, and disposal.

In urban areas, particularly, airborne emissions also occur during the normal use and wear of friction materials such as brake and clutch linings. The final rule is not anticipated to impact directly on these sources of emissions outside of the workplace. To the extent that substitutes may be developed and used in these products as a result of the rule, however, there would be a potential benefit to the environment.

As the level of asbestos fibers in the workplace is lowered to meet the PEL, there is a potential for more fibers to be vented outside of that environment, depending on the job performed and control method used. For example, as a result of EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (49 FR 67:13659-13665, April 5, 1984) many industries choose to clean workplace air, thereby removing asbestos fibers, before it is vented to the outside environment. Where baghouses and other gas-cleaning devices are used to capture fibers, the 99.9 percent efficiency rate of these devices will remain unchanged. Because these controls are capable of capturing fibers as small as 0.5 microns in diameter and even as small as 0.1 microns (but with less efficiency), more fibers would be captured, potentially benefitting the ambient atmosphere.

In manufacturing processes, emissions result primarily from the handling and mixing of dry asbestos fibers and during operations such as blending and mixing, the weaving of asbestos fibers into textiles, and in the sanding, finishing, and culling of hard asbestos products. Emissions from the manufacturing process can be controlled by using local exhaust ventilations, dust collection and cleaning systems, and enclosures, by capturing and filtering devices such as baghouses, electrostatic precipitators and wet scrubbers, by using wet processes instead of dry when possible, by reducing the amount of asbestos added to products and by properly disposing of the waste materials.

Emissions also occur from extended periods of use of products: during grinding and fitting operations in replacing and repairing brake linings and clutch facings; during installation of asbestos-cement pipe insulation; during the cutting or sawing of asbestos-cement sheet, and other construction materials; during demolition, or rip out of spray-on

insulation materials,³ and during disposal operations.

In the construction and demolition industries, where exposures can far exceed 2 f/cc, the reduced PEL will have a beneficial impact on the workplace environment. Where regulated areas and air-tight enclosures are used in renovation and demolition operations, the amount of ambient emissions will be reduced. Similarly, the use of work practice, such as wetting down, or point source of controls, such as portable capture devices, will reduce ambient air emissions of asbestos fibers. Where respirators alone are used to achieve compliance and provide worker protection in specific environments, the level of ambient air emissions will remain constant.

In shipbuilding operations in the past, asbestos materials were used extensively in ceiling tile for overheads, and in fire-resistant sheets for bulkheads and insulation. As of 1978, the Maritime Administration's specification for government-subsidized ships required that nonasbestos materials be used in shipbuilding. As a result, asbestos insulation and cement materials have been replaced by products such as mineral wool and mineral wool cement. Ships built after 1978 are therefore assumed to be free of asbestos.

Although current shipbuilding operations do not generate exposures to asbestos, exposures are potentially high in ship repair and maintenance of already existing asbestos materials. The nature of this work frequently precludes the use of many engineering controls and extensive work practices. The combined use of work practices, protective clothing, and air-line respirators has been the means of controlling exposures to asbestos emissions. The actual physical configuration of ships also imposes constraints on some tear-out operations. For example, hatchways are narrow, space for life-support and power lines is limited, boiler and fire rooms are located in the lowest levels of the ship, hatchways and stairways must not be blocked, and in general, there is a need for egress in cases of emergency.

As many engineering controls appear to be infeasible in various ship repair operations, a PEL of 0.2 f/cc would not

significantly alter the present level of ambient air emissions of asbestos, or affect the external environment. Worker protection can be afforded, however, by reducing the exposure levels with the use of air-line or, in some cases, full-mask respirators.

In the automotive aftermarket, exposures to airborne emissions occur in the remanufacturing and repairing of brakes and clutches. In the remanufacturing sector, exposures occur during refacing and finishing activities. In refacing operations, local controls, including shrouded machine tools with local exhaust systems, can be used to remove abraded material from the work area. In some cases, hoods and upgraded general ventilation systems exist, and overall, local vacuuming is believed to be practiced fairly extensively. In finishing operations, the control methods include the use of local controls, such as shrouds on grinders and the local vacuum collection systems.

In the general repair sector, until recently, it was common practice to use compressed air to remove asbestos fibers and wastes during the cleaning of the brake drums and bell housings prior to repair. This practice has been replaced with the use of compressed air-hoses to apply a solvent mist to remove asbestos residue from the brake drums before repair. In other instances, damp wiping is performed, wetting agents are used, and high-efficiency particulate air (HEPA) vacuum systems are employed. Where enclosed vacuum systems and the compressed-air solvent-mist process are employed, exposure levels below the action level can be attained. It is believed that the OSHA recommended spray can/solvent mist process will reduce exposures and emissions even further. These types of controls and work practices would benefit the workplace environment and lessen the potential for the release of fibers to the external environment.

In sum, the use of local controls, filters, collection devices and wet methods would reduce levels of airborne emissions in the workplace. Further, because of the nature of EPA's emissions standard (40 FR 199:483012, October 14, 1975), many industry operations already use engineering controls where feasible to reduce the amount of emissions to the atmosphere. Controls already in place are anticipated to continue to operate effectively in reducing emissions under the rule. As asbestos fibers are removed from the atmosphere by such controls, any fibers collected could be disposed of as solid waste or could comprise

³ In 1973, EPA banned the use of spray-on insulation of fireproofing materials containing more than 1 percent asbestos by weight. But these, as well as decorative materials excluded from the ban, can and do exist in buildings that are renovated or demolished and, consequently, can pose significant sources of exposures [Exhibit No. 84-414]. Also, the OSHA rule would prohibit the spray-on application of asbestos materials in all affected industries.