

configuration of the area, whether the regulated area is permanent, the airborne asbestos concentration, the number of employees in adjacent areas, and the period of time the area is expected to have exposure levels above the PEL. Permitting employers to choose how best to identify and limit access to regulated areas is consistent with OSHA's belief that employers are in the best position to make such a determination based on the specific conditions of their workplaces.

6. Paragraph (f). Methods of Compliance.

The final standard requires employers to institute engineering and work practice controls to reduce the exposures of employees to or below the permissible exposure limit, except to the extent that the employer establishes that such controls are not feasible. If engineering and work practice controls have been implemented but are not sufficient to reduce exposures to the permissible limit, respirators selected in accordance with paragraph (g) shall be used to supplement the engineering and work practice controls. This is changed from the proposal which would have retained the current requirement that employers use feasible engineering and work practice controls to reduce exposures to 2 f/cc, but would have allowed them to reduce exposures below 2 f/cc to the new PEL using any feasible combination of engineering controls, work practices or respiratory protection.

The final standard's provisions on preference in control strategy are consistent with those adopted by OSHA in all previously promulgated health standards. Similarly, they continue the preference contained in the generic standards addressing this issue: OSHA's Carcinogen Policy Standard 29 CFR 1910.111 (h)-(i); the Respiratory Protection Standard 29 CFR 1910.134(a)(1), which applies to all exposures to airborne toxins; and in the Air Contaminant Standard, 29 CFR 1919.1000(e), which applies to exposures to all substances listed in Tables Z-1, Z-2, and Z-3. The policy was inherent in national consensus standards which were adopted by OSHA in 1971 pursuant to the section 6(a) rulemaking provisions of the OSHA Act 1970, without public comment. In addition, the requirements are the same as those contained in the existing standard, except that the controls in the existing standard are required at 2 f/cc whereas the controls in the revised standard are required at 0.2 f/cc. The basic justification for the engineering and

work practice provisions still pertain today.

OSHA's decision is based primarily on the overwhelming record support from all segments of the affected public. It is consistent with OSHA's traditional policy regarding the hierarchy of controls. This hierarchy as expressed in the preambles to most OSHA health standards specifies that engineering and work practice controls be used in preference to respiratory protection. Engineering controls are the preferred means of compliance because they reduce exposure hazards in the workplace environment by removing the airborne contaminant. Engineering controls may include the installation of local exhaust ventilation, modification of a process so as to reduce emission of the contaminant into the workplace, or substitution of another substance. Work practice controls reduce worker exposures by altering the manner in which a task is performed and are often necessary for the effective operation of engineering controls. Therefore, work practice controls are also a preferred means of controlling exposures.

Respirators have traditionally been accorded the least preferred position in the hierarchy of controls because of the many problems inherent in their use. Respirators are capable of providing adequate protection only if they are properly selected for the concentrations of airborne contaminants present, properly fitted to the employee, properly and conscientiously worn by the employee, carefully maintained, and replaced when they have ceased to provide adequate protection. While theoretically it is possible for all of these conditions to be met, it is more often the case that they are not. From a practical approach, it is difficult to achieve and maintain the above conditions consistently in many workplace environments. As a consequence, the protection of employees by respirators is not always effective.

Most participants who addressed this issue, including industrial hygiene experts appearing on behalf of government, industry, public interest groups and unions, were opposed to OSHA's proposal to give respiratory protection the same priority as engineering and work practice controls. They affirmed the theoretical and practical superiority of engineering and work practice controls to reduce employee exposure to asbestos. For example, Organization Resources Counselors (ORC), an industry consultant, stated:

ORC recommends that employers be required to institute engineering controls, to

the extent feasible, to control employee exposures to airborne asbestos fibers to or below Permissible Airborne Concentrations (PAC). . . . The priority of control methods required by ORC's recommendation, i.e., use of respiratory protection only as a supplement to engineering controls and work practices or as an interim measure while engineering controls and work practices are being implemented, is consistent with the policy approach taken in all prior air contaminant standards promulgated by OSHA [Ex. 123A].

Representatives of the Asbestos Information Association of North America which represents 52 member companies who mine, mill, and manufacture products containing asbestos, stated:

. . . The OSHA permissible exposure level (PEL) should be reduced to the lowest level feasible through engineering and work practice controls. Like many other participants in this rulemaking, AIA/NA does not believe OSHA should rely on respirator use when engineering and work practice controls can feasibly achieve the PEL [Ex. 231].

Dr. Morton Corn of Johns Hopkins and the former head of OSHA commented:

. . . Engineering controls are at the top of the 'hierarchy of controls' because they fail with less frequency than other types of controls. Failure of controls are greatest when they are associated with responsibilities placed on the worker minute by minute, hour by hour and day by day. Engineering controls remove this responsibility from the worker and permit he/she to do his/her work effectively without this additional burden. There is nothing reported in either the literature or by word of mouth that suggests valid reasons for departing from using engineering controls as the primary method for controlling asbestos in the workplace [Ex. 176A].

Dr. Held, a consultant in respiratory protection, speaking on behalf of the AFL-CIO, stated with regard to the primacy of engineering controls:

I can only endorse a position that requires engineering controls, when feasible, to reduce exposures below the established PEL. Respirators should only be used when engineering controls are not technically feasible, while engineering controls are being installed and evaluated, for non-routine jobs (i.e., maintenance work), and for emergencies. This principle has always been maintained by respirator experts and industrial hygienists, knowing that respiratory protection, is not as reliable as engineering controls. . . . I do not know of any standard, book, or article written on respiratory protection that does not endorse this basic approach [Ex. 171].

NIOSH and private organizations representing occupational health expertise also endorsed the general primacy of engineering and work