pliability and minor surface defects—will also affect protection, as will poor maintenance and conditions of temperature and humidity. . . . Insofar as comfort is likely to increase respirator wear, positive pressure respirators are superior to negative-pressure because they are more likely to be accepted by workers for regular use. (Ex. 330)

Many commenters requested that the selection of respirators be dictated by the exposure levels that exist in the workplace environment (Exs. 90–160; 90–173; 90–182; 339; Tr. 7/12, p. 338). For example, the Industrial Safety Equipment Association stated:

The type of respirators to be required for employees engaged in spraying, demolition and removal operations should depend on the airborne exposure levels measured for each exposed person and the proper type of respirator should be selected accordingly. If such measures are not possible, a supplied-air respirator should be required. . . .

Techniques have progressed so that relatively low levels of asbestos can be maintained in the workplace. Rather than required air-supplied respirators in all removal and demolition operations, the type of respiratory protection selected should correspond to the highest concentration of asbestos anticipated in the particular workplace. (Ex. 90–182)

Similarly, Richard Roll, Assistant Vice President for Bell Communications Research, stated:

The requirements of the present standard for a supplied air respirator whenever asbestos is removed are over restrictive in many work situations. Almost all maintenance activities on asbestos covered piping and equipment involve the removal of some of the asbestos insulation material. Work practices (wet methods, enclosure, vacuum systems) have been developed to minimize the potential for employee exposure in those situations. It makes no sense to require supplied air respirators in these work operations merely on the technicality that some asbestos material will be removed. Respirator selection should be a function of airborne fiber concentration rather than category of work. (Ex. 90–173)

Julia L. Phillips, an Attorney with the Environment, Materials and Logistics Division of E. I. DuPont de Nemours and Company noted that air line respirators and self-contained breathing apparatus had significant disadvantages when used in asbestos abatement projects (Ex. 339). Ms. Phillips stated:

Air line respirators or self-contained breathing apparatus (SCBA) create safety hazards in a complicated [asbestos] removal operation where workers are constantly climbing or descending ladders or scaffolding because of the increased risk of tripping and falling. (Ex. 339)

OSHA agrees that positive-pressure supplied-air respirators provide a greater level of protection than do half-mask negative-pressure respirators. OSHA believes that employers should have the flexibility to use any of the available respirators that provide sufficient protection to reduce the exposures to levels below the PEL. Furthermore, the safety problems associated with the use of supplied-air respirators cannot be ignored. OSHA believes that respirators should be selected that both provide adequate protection from exposure to airborne asbestos fibers and minimize the risk of accident and injury potentially caused by the use of cumbersome supplied-air respirators. In addition, OSHA has historically used a tiered approach to the application of respiratory protection in nearly all standards governing occupational health hazards. (See, for example, 29 CFR 1910.1047, ethylene oxide; 29 CFR 1910.1017, vinyl chloride; and 29 CFR 1910.1045, acrylonitrile).

Therefore, OSHA has developed the protocol contained in Table D–4 of the standard for the application of respirators, which:

(1) Allows the use of negative-pressure air-purifying respirators equipped with high-efficiency filters for concentrations of asbestos fibers less than 10 times the PEL.

(2) Allows the use of full-facepiece air-purifying respirators with high-efficiency filters for concentrations of asbestos fibers less than 50 times the PEL.

(3) Allows the use of powered air-purifying respirators with high-efficiency filters or half-mask supplied-air respirators operated in the positive-pressure mode for concentrations of asbestos fibers less than 100 times the PEL.

(4) Requires the use of full-facepiece supplied-air respirators operated in the positive-pressure mode or full-facepiece self-contained breathing apparatus operated in the positive-pressure mode for concentrations of asbestos fibers that exceed 100 times the PEL.

Data presented by the Building and Construction Trades Department, AFL–CIO (Ex. 330) indicated that the proper use of respirators may depend, to a large extent, on the workers comfort and preference for various types of respirators. Therefore OSHA has required that employers provide powered air-purifying respirators for employees who request them for concentrations of asbestos fibers less than 100 times the PEL. OSHA believes that this provision will increase the effectiveness of respiratory protection programs while allowing employers to select the most cost-effective respiratory protection options that will reduce exposure to below the PEL.

Many commenters presented information on fit-testing requirements for respirators (Exs. 263; 330; 123–A; 90–233; 302; 322; 328; Trs. 6/21, p. 75; 6/29, p. 232; 7/2, p. 25; 7/3, p. 48; 7/10, p. 299; 7/11, p. 119). Several commenters recommended that quantitative fit testing be required. For example, NIOSH commented, ". . . we want to reiterate our position that we recommend a quantitative respirator fit-testing program as previously stated in comments on the proposed lead standard" (Ex. 117–A).

Conversely, the Asbestos Information Association/North America (AIA/NA) stated that the record does not support that quantitative fit-testing procedures are more effective in providing good respirator fit than sound qualitative fit-testing procedures. The AIA/NA commented that there is no need for fitting protocols to be rigidly specified in the final standard, because techniques are widely published in industrial hygiene publications and because the 29 CFR 1910.134 requirement that the respirator be worn in a test atmosphere as part of the training program . . . would allow employers the flexibility to take advantage of improvements in fit-testing procedures in future years" (Ex. 328).

Many commenters favored the use of either quantitative or qualitative fit-testing procedures or both. The BCTD's recommended standard requires quantitative fit testing to be performed on an employee before he or she begins any asbestos-related work and at least annually thereafter, and whenever an employee's facial features change or other conditions of wear affect fit. The BCTD's standard requires daily qualitative fit testing, using methods that are adequate to ensure a proper fit for half-mask negative-pressure respirators. An article published in the American Industrial Hygiene Journal in February, 1983 (K. E. Hardis, C. A. Cadena, C. A. Carlson, R. A. da Roza, and B. J. Held: American Industrial Hygiene Association Journal (44) February, 1983) presented data on the effectiveness of qualitative fit-testing protocols for detecting poorly fitting facepieces with protection factors greater than 10. This article reported that for a fit factor of 10, 93 to 100 percent of poorly fitting half-mask respirators could be detected by qualitative methods. The article also reported that, when used to test for a fit factor of 100, qualitative methods were capable of detecting only 23 to 48 percent of the inadequately fitting full-facepiece respirators.

Therefore, based on these data, OSHA has allowed in paragraphs