concerns as regarding disposable respirators:

> We get very upset with them in the State of Alabama. I feel that they're a false sense of security and, therefore, they're probably a higher hazard than if you were using no respirator at all.
>
> I know that may shock some folks, especially the ones that are selling these. But we feel like . . . their usage is detrimental to the worker's safety. (Tr. 6/20, p. 196)

The Los Alamos Scientific Laboratory evaluated six models of disposable respirators for sodium chloride aerosol leakage while they were being worn by test subjects (Ex. 219). The results indicated that only two of the six models tested provided a protection factor of five for all members of the 10-member test panel. One model showed a decrease in the level of protection offered after exposure to a humid atmosphere. Two of the six models showed variations in the level of proteciton provided over a 6-hour workshift. Finally, all models appeared to fit male facial sizes better than female facial sizes.

NIOSH took the following position regarding single-use respirators at the informal hearing on asbestos:

> Under Title 30, Code of Federal Regulations, Part 11, (30 CFR 11), NIOSH is required to test and certify respirators within the categories specified therein when such devices are submitted to NIOSH by applicants. Currently, 30 CFR 11, Subpart K defines a number of dust, fume, and mist respirators which may be used for protection against certain hazardous particulate atmospheres. Among the respirators defined in Subpart K are single-use dust respirators designed as respiratory protection against pneumoconiosis-producing and fibrosis-producing dusts, or dusts and mists. The Subpart goes on to list asbestos as one of the dusts against which the single-use dust respirator is designed to protect [Subpart K, sec. 11.130(h)]. Though at the time of the promulgation of Subpart K, it may have been assumed appropriate to list asbestos as a fibrosis-producing particulate against which the single use disposable respirator could be reasonably expected to provide adequate protection, NIOSH is no longer confident that such an assumption is reasonable because asbestos is also [a] potent carcinogen. The current requirements of 30 CFR 11 for approval of a single-use dust respirator or dust and mist respirator do not include any tests with a fibrous challenge. NIOSH is currently in the process of undertaking a comprehensive revision of 30 CFR 11 and intends to address the issue of appropriate respiratory protection for use against asbestos and to require that any respirator for which such approval is sought be proven to provide effective protection against asbestos. NIOSH may change the regulations included in 30 CFR 11 only in accordance with procedures set forth in the Administrative Procedures Act. In the interim, NIOSH will continue to approve single-use and replaceable dust/mist respirators for use against asbestos when such approvals are applied for only because of the legal requirement in the current approval regulations. However, NIOSH does not recommend the use of such respirators where exposures to asbestos may occur on the basis that such is not a prudent occupational health risk. (Ex. 117-A)

NIOSH submitted to the rulemaking record a copy of an internal memo, dated November 29, 1979, that addresses inquiries regarding the use of disposable respirators for protection against asbestos. This memo stated:

> These approvals were probably granted when asbestos was classified as a "suspect" carcinogen and now that it is classified as a definite carcinogen I feel strongly that some changes in the approval need to be made. . . .
>
> . . . perhaps a policy statement that the use of disposable respirators are not and will not be approved for a material that is classified as a carcinogen as soon as that classification occurs [should be issued] and no matter what for or when the original certification was issued. (Ex. 150)

OSHA has carefully weighed the evidence addressing the performance of disposable respirators and has determined that these respirators cannot be relied on to provide adequate protection from exposure to asbestos. OSHA's determination is based on the fact that (1) most disposable respirators are not equipped with high-efficiency filters and (2) there is no acceptable method for verifying the fit of disposable respirators. Therefore, OSHA has not allowed the use of disposable respirators in the revised standard for construction.

A significant amount of information was submitted to the rulemaking record that addressed the appropriate selection of filter media for air-purifying respirators (Exs. 84-256, 84-472). OSHA has used these data to determine the appropriate filter media for use in negative-pressure air-purifying respirators used by employees in both general industry and construction. The NIOSHA/MSHA certification criteria (30 CFR 11.13 (a) and (c)) dictate that high-efficiency filters for air-purifying respirators be used for substances for which a PEL of less than 0.050 mg/m^3 has been established. Conversion factors published by the Chronic Hazard Advisory Panel on Asbestos of the Consumer Product Safety Commission enable the conversion of the 0.2 f/cc PEL to an approximate concentration expressed in mg/m^3. Using these conversion factors, OSHA has determined that the 0.2 f/cc PEL equates approximately to a concentration of 0.006 mg/m^3 (Ex. 84-256). Therefore, OSHA believes that only those air-purifying respirators equipped with high efficiency filters are certified by NIOSH for protection against asbestos at the 0.2 f/cc PEL.

OSHA's decision to require high-efficiency filters for air-purifying respirators is further supported by a 1984 study conducted by the Los Alamos National Laboratory (LANL) on the performance of five models of respirator filters. The LANL study demonstrated the superior effectiveness of high-efficiency filters. The filters were challenged with a chrysotile aerosol, and the asbestos fiber penetration of the media was measured during simulation of different environmental conditions. One of the five models tested was a high-efficency (dust/mist/fume/radionuclide) respirator filter. The filters were tested under various conditions, including after exposures to organic oil mist, after prolonged storage at high humidity, and when uncontaminated (fresh from the package). The high-efficiency filter functioned consistently well under all experimental conditions and exhibited chrysotile asbestos penetrations of less than 0.1 percent during all experimental conditions. None of the other four respirator filters consistently exhibited chrysotile asbestos penetrations lower than 0.1 percent during all experimental conditions (Ex. 84-472).

Several commenters suggested that supplied-air respirators were so superior to negative-pressure respirators that supplied-air respirators should be required whenever respiratory protection is necessary to reduce employee exposure to asbestos. For example, the Building and Construction Trades Department, AFL-CIO, stated:

> Respirator fitting is one of the major factors severely restricting effective use of negative pressure respirators. . . . The act of working disrupts the seal and prevents certain determination of its effectiveness. . . .
>
> Other variations also limit negative pressure respirator protection reliability and certainty. Personal factors—including body movements, weight loss or gain, age, facial wrinkles, scars, dentures, eye glasses, lung capacity, general health, physiology and facial hair—contribute to the poor performance of negative pressure respirators. The amount of time the respirator is worn is a factor as well. Longer periods of wear tend to result in deterioration of the worker's ability to maintain the many unnatural and uncomfortable behaviors required for good fit. These factors are especially significant with negative pressure respirators, where protection is based upon the face seal, as opposed to positive pressure respirators, in which the air-flow counteracts interruptions in the face seal. The condition of the negative pressure respirator—strap adjustment,