samples, which are taken at locations outside the exposure envelope surrounding the employee as he or she works, generally cannot reflect the exposure experience of a particular worker accurately.

However, although employers are required to determine the exposure of each employee exposed to asbestos, this determination is not required to be based on separate measurements taken for each employee. Instead, the revised standard permits employers to use a "representative" measurement to characterize the exposures of more than one employee when these employees perform essentially the same job under the same conditions. For these types of situations, it may be sufficient for the employer to monitor one or a few of these employees to obtain data that are "representative" of the exposure of the remaining employees in the group. As permitted in paragraph (f)(1)(iii), representative personal sampling for employees engaged in similar work and exposed to similar concentrations of asbestos fibers can be achieved by measuring the exposure of that member of the exposed group who can reasonably be expected to have the highest exposure and then attributing this exposure level to the remaining employees in the group.

In many work situations, this representative monitoring approach may be more cost-effective than individual monitoring of all employees to determine the exposures of affected employees. However, employers are free to use any monitoring approach that will correctly identify the breathing-zone exposures of their employees to airborne asbestos.

Paragraph (f)(2)(i) of the revised rule contains requirements for initial monitoring for construction employees exposed to asbestos. In this paragraph OSHA requires employers to conduct initial monitoring at the start of each new asbestos job in order to assess the effectiveness of existing engineering controls and to provide information necessary for the proper selection of appropriate respirators.

OSHA believes that initial monitoring is essential for protecting employee health because it provides the employer with information for determining the necessity for using engineering controls, instituting or modifying work practices, and selecting appropriate respiratory protection. Recognizing the varied nature of construction projects, OSHA has required that initial monitoring for employee exposures be conducted at the start of each new construction project that involves the handling or disturbing of asbestos-containing materials.

Paragraph (f)(2)(ii) allows employers to dispense with initial monitoring if they can demonstrate by means of objective data that asbestos-containing products or material cannot release airborne fibers in concentrations exceeding the action level. OSHA believes that employers may be able to obtain data from the manufacturers of asbestos-containing products that demonstrate that these materials will not release asbestos at levels that exceed the action level, even under worst case conditions. This exemption is similar to those included in recent OSHA health standards (see for example, 29 CFR 1910.1047, ethylene oxide) and reflects the suggestion of the BCTD (Ex. 87-2) and the AIA/NA (Ex. 84-307) that employers be exempted from monitoring when employees are handling asbestos products that are not capable of releasing a significant amount of fibers.

OSHA also provides an exemption in paragraph (f)(2)(iii) for employers who have historical monitoring data. OSHA has included this exemption in recognition of the fact that many employers are currently conducting exposure monitoring on construction sites; this exemption would prevent these employers from having to repeat monitoring activity for construction jobs that are substantially similar to previous jobs for which monitoring was conducted.

However, such monitoring data must have been obtained from projects conducted by the employer that meet the following conditions:

(1) The data upon which judgments are based are scientifically sound and collected using methods that are sufficiently accurate and precise.

(2) The processes and work practices in use when the historical data were obtained are essentially the same as those to be used during the job for which initial monitoring will not be performed.

(3) The characteristics of the asbestos-containing material being handled when the historical data were obtained are the same as those on the job for which initial monitoring will not be performed.

(4) Environmental conditions prevailing when the historical data were obtained are the same as for the job for which initial monitoring will not be performed.

OSHA believes that if an employer has monitoring data that meet these conditions, he or she can be reasonably confident that these data are representative of employee exposures that will be encountered on a new construction site. The Associated General Contractors of America (AGC) suggested that OSHA permit a variant of this historical monitoring data provision (Ex. 84-457). The AGC noted that OSHA's traditional requirements for initial monitoring may not be appropriate for construction worksites because of the short duration of many construction operations. The AGC stated:

> Construction contractors have often found the benefits of monitoring to be quite limited. Their problem is that taking air samples, and getting results, takes far too long. By the time the results arrive, the contractors' employees have often already completed their work with the material containing asbestos. (Ex. 84-457)

The AGC suggested that OSHA permit contractors who begin an asbestos project such as asbestos removal, renovation, or maintenance activities to either (1) conduct initial monitoring at the beginning of each project, or (2) use exposure data from a data base of historical exposure monitoring results obtained from different employers conducting similar projects (Ex. 84-457). The AGC was of the opinion that:

> . . . a contractor choosing to consult an appropriate data base should not also have to monitor. The data base would serve the same essential purposes that monitoring would otherwise serve. It would inform the contractor of what to expect, and provide him with a sound basis for selecting respiratory protection and assessing the need for other steps. In fact, the data base would be superior to monitoring to the extent that it would eliminate the time lag in getting results from laboratories. (Ex. 84-457)

Although Joe Adam, Director of the Department of Safety and Health, United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada pointed that creating such a data base would require a considerable amount of monitoring, OSHA encourages employers to compile and use any information that will aid in the protection of workers' health. OSHA would permit the use of such data in lieu of initial monitoring if information from the data base is available and sufficiently detailed to meet the requirements of paragraph (f)(2)(iii) for historical data.

Paragraph (f)(3) requires that employers conduct daily air monitoring for asbestos in areas where the airborne concentration of asbestos exceeds the PEL. This requirement differs from the periodic monitoring requirement in the revised general industry standard for asbestos, which mandates quarterly monitoring of employees whose exposures exceed the action level.

Many commenters noted that mandating pre-set monitoring frequencies, such as those prescribed in other OSHA health standards for fixed worksites, may be inappropriate for

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