

making extensive outreach materials on ergonomics available with the final standard.

*Effectiveness of Training.* Some stakeholders submitted data to the record on the effectiveness of ergonomics training. Several commenters noted that they had developed training programs, had coordinated programs through outside organizations such as universities, or were in the process of developing or testing training programs (see, e.g., Exs. 30-3826, 32-198-4, 32-77-2, 32-185-3, 30-1294, 30-3336, Tr. 2776, Tr. 2761, 30-449, 30-2713, 30-3368, 30-3758, 30-3867, Tr. 3129-3219, Tr. 14969-15072). Stakeholders described some of the achievements of these programs (see, e.g., Exs. 32-198-4, 32-185-3, 30-449, 30-3336, 30-3758, 30-3867, Tr. 7982), including their contribution to the decrease in the rate of MSDs observed among their members (Tr. 7982) and continued reductions in workers' compensation costs even in the face of increases in wages and health care costs (Exs. 30-3336, 30-3867, 30-4496). The thrust of these comments is that ergonomically aware workers can help their co-workers and their employers to prevent MSDs (Ex. 30-3758).

Several studies in the record demonstrate the benefits of ergonomics training. For example, a study by Parenmark, Engvall, and Malmkvist showed that workers receiving training had a reduced number of lost workdays due to MSDs compared with untrained controls (Ex. 26-6). The number of days lost as a result of arm-neck-shoulder complaints was reduced by half in the trained new hires compared with the control group (Ex. 26-6, Table 2).

An AFGE health and safety representative referenced an Ergonomic Workplace Survey conducted by Rani Lueder, CPE, for the Social Security Administration in 1997 (Ex. 30-449). The large majority of respondents who received the training considered the training helpful, and the trained respondents reported consistently lower rates of discomfort for all body parts, were more willing to report MSD discomfort to their supervisors, and were more satisfied than untrained workers with their supervisors' responses (Ex. 30-499). Also, respondents who were trained were more likely to adjust their chairs, worktables, and other equipment to reduce the risk factors present.

Many commenters at the hearings described the training component of their ergonomics programs (see, e.g., Tr. 12367-12373, Tr. 7977-7982). The extent of the training being

administered varied widely, from very simple training to comprehensive efforts. OSHA believes that the training program required by the final rule will do much to increase the level of ergonomics knowledge and understanding among employees, their supervisors, and managers. This knowledge, in turn, will translate in practice to fewer MSDs, improved morale, and greater productivity. There is evidence in the record that good training programs operate in just this way. For example, a 1997 article in the *American Journal of Health Promotion* [Ex. 500-71-63] reports that ergonomics training programs lasting about an hour and administered to computer operators described in the article as "high risk" led every trainee subsequently to make changes either in their workstations or their work practices. About two-thirds of the trainees made ergonomically advantageous changes to both.

Another study (Ex. 500-71-59) reports that factory processing line workers who were trained in MSD hazard recognition were subsequently better able to recognize hazards and more willing to report them to their supervisors. OSHA believes that the experiences of these companies will be repeated frequently once the final rule's training requirements are implemented.

*Retraining of employees who have already received training.* The proposed rule stated that employers do not have to provide initial training to current employees, new employees and persons involved in setting up and managing the ergonomics program if they have received equivalent training in the subjects this standard requires within the last 3 years. However, the proposal stated that employers must provide initial training to such individuals in any of the required topics that their prior training did not cover. The final rule, at paragraph (t)(5), provides that if an employee has received training in a required topic within the previous 3 years, the employer need not provide initial training to that employee in that topic.

Several commenters supported this proposed requirement (see, e.g., Exs. 30-3765, 32-300-1, 30-1671, 30-3284). Some organizations asked OSHA to clarify how the Agency expects an employer to verify such prior training (Exs. 30-3826, 32-300-1). OSHA does not require employers availing themselves of this "portability of training" provision to have written documentation of the employee's prior training or to require the employee to pass an examination (Ex. 30-3826). The Agency does, however, expect employers who wish to benefit from this

provision to assure themselves that employees have in fact had the prior training and have sufficient knowledge to work safely.

A number of commenters objected either to the prior training exemption altogether or to the fact that OSHA proposed to permit training given in the 3 years prior to the compliance date to qualify for the portability exemption (see, e.g., Exs. 30-3686, 30-2116, 30-2809, 30-2825, 30-2847, 30-3001, 30-3033, 30-3035, 30-3258, 30-3332, 30-4159, 30-4536, 30-4546, 30-4547). OSHA has decided in the final rule to retain the training exemption as proposed, because the Agency believes that employees who have received all of the required training elsewhere do not need to be retrained until their refresher training date comes up. Although employees who have had prior training are not required to take initial training, all employees in jobs that meet the Action Trigger must receive refresher training.

OSHA received several non-specific comments only tangentially related to the proposed training provisions. These primarily concerned what the commenters perceived as "vagueness" in the proposed language of the regulatory text. For example, some participants believe that employers will not be able to train their employees because, in their opinion, the standard isn't clear about the steps that need to be taken (see, e.g., Exs. 32-368-1, 30-325, 30-494, 30-2846) and assert that this will make training more difficult and costly than usual (see, e.g., Exs. 32-368-1, 30-1668, 30-2846, 30-3781, 30-3593).

In the final rule, OSHA has revised the proposed standard's training requirements extensively and has clarified areas of overlap and confusion. For example, the basic information requirements in paragraph (d) now apply to all covered employers and are intended to ensure that all employees are familiar with the elements of the OSHA standard, and this topic is no longer also included in the required training topics.

Some commenters argued that OSHA should phase in compliance requirements for the training provisions because it will take time to develop adequate in-house materials. OSHA is aware that it takes time to develop training materials, but OSHA is also aware that many trade associations and other organizations, as well as employers, already have such materials. Further, OSHA is making many outreach materials available at the time the standard is published and in the months thereafter. Consequently, OSHA