Abstracts

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A NIOSH Machine Risk Reduction Workshop

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The risk of injury from machinery in US workplaces is high. Between 1992 and 2000, there were, on average, 148 fatalities per year involving caught-in-running-machinery. For 1992-2000, there were, on average, 133,511 cases per year of nonfatal machine-related injury involving lost workdays. The majority of these (65%) were in the manufacturing industry.

A US task group recently developed a technical reference guideline, ANSI B11 TR3, "A Guide to Estimate, Evaluate, & Reduce Risks Associated with Machine Tools", that is intended to bring machine tool risk assessment practice in the US up to or above the level now required by ISO 14121, "Safety of Machinery - Principles of Risk Assessment". NIOSH conducted a workshop on the new US guideline as a first step in a research project to evaluate its effectiveness. Partners in this study include General Motors, Liberty Mutual Insurance, and the Association for Manufacturing Technology. The ANSI guideline emphasizes identifying tasks and hazards not previously considered, particularly those associated with maintenance and teamwork among line workers, engineers, and safety professionals.

The workshop trained labor and management participants from the automotive, industrial and consumer products, metal stamping, and medical devices industries on the TR3 process for reducing machine-related risk. Software tailored to the TR3 process was used to facilitate and document assessments. A multiple-choice knowledge test and Likert scale questionnaire were administered to the trainees before and after training. Test questions were taken from materials developed for the training. The attitude questions were designed to elicit responses about how confident trainees felt about applying risk concepts.

Gains were achieved in knowledge of risk reduction concepts for this pilot sample (n = 11). The mean percentage of correct responses increased from 65% (SD=4.6) in the pretest to 74% (SD=2.8) in the posttest. Comparisons of pre-training and post-training survey responses revealed increases in participant confidence of their ability to evaluate levels of risk associated with tasks from different machines (18% increase). Survey responses also revealed increases in participant confidence that their company was using a systematic approach towards preventing machine-related injury (9% increase).

Upon completion of the workshop, participants were able to explain key terms and concepts used in risk assessment, conduct a risk assessment using the software, and understand maintenance risk assessment applications. As the TR3 evaluation study proceeds, participating companies will focus on two matched machinery systems for study; one will have the TR3 risk assessment process applied, and the other will remain in use without utilizing the TR3 risk assessment process. At the end of one year, these two machinery systems will be evaluated for safety and productivity improvements. The numerous positive responses of workshop attendees indicate that the evaluation study will proceed to a successful conclusion.

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