

What is feasible, however, is to provide employees with a tool that enables them to do their own assessment of the tasks that they perform that may pose an ergonomic risk.

Recognizing the need for such a tool, a small global project team was brought together at Dow to develop a risk identification tool focusing on ergonomics. Early on, the team agreed that the tool needed to have the following attributes: (1) provide a simple explanation of the risk factors of concern: posture, force, repetition, and duration; (2) empower employees to rate their tasks against the risk factors of concern; (3) provide employees with a clear path of where they need to focus to make improvements in their tasks so as to prevent potential injuries; and (4) provide a mechanism for comparing ergonomic task risks within a department or group so that priorities for interventions can be established.

With these attributes in mind, the team focused on an earlier tool that had been piloted at Dow's Texas operations. Seeing the possibilities with this initial tool, the team refined and enhanced the initial approach so as to meet the desired tool attributes. The end result of this effort is a single, user-friendly scoring card that is meant for all employees regardless of their jobs. When used as designed, with the completion of both baseline and follow-up cards, the tool serves as a device to track the effectiveness of solutions that are implemented. It has been piloted in both operations and maintenance settings as well as with computer workstation users. Responses to date have shown the tool to be very easily understood as well as flexible enough to address a wide variety of tasks.

This presentation will focus on the major aspects of this tool including training and data collection. In addition, plans for leveraging the learning value from this tool across facilities will be shared.

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VALIDITY OF SELF-REPORTED ERGONOMIC EXPOSURE DATA AMONG LINE-PACED PRODUCTION WORKERS. L.A. MacDonald, M. Petersen, C. Estill, M. Sweeney, NIOSH, Cincinnati, OH

An investigation was conducted at an appliance manufacturing facility to examine the concordance between self-reported ergonomic exposure and exposure data collected by trained ergonomists. Data on exposure were obtained by two methods: (1) self-administered questionnaire and (2) direct observational assessment. Exposure characteristics included in the assessment were repetitive motion patterns of the hands and arms, postural conditions of the shoulders and torso, use of the hand as a hammer (impact force), power tool use, presence of tool suspension, and foot pedal use. For repetition and forward flexion of the torso, responses were categorized into low, moderate, and high. All other variables were dichotomous.

Analysis was restricted to all nonrotating line-paced production workers (n=123). Kappa values and percentage agreement were obtained, with and without regard to symptom status. Moderate strength of agreement was found for the presence of tool suspension (kappa=0.49, 79% agreement). Based on kappa values, slight agreement (kappa=0.0 to 0.2) was found for repetition, shoulder elevation, devia-

tions of the torso (moderate flexion, lateral, twist, and extension), and poor agreement (kappa < 0.0) was found for severe forward flexion of the torso, the three-level torso flexion variable, power tool use, impact force, and foot pedal use. As has been reported in other studies, a large discrepancy was found between the results obtained by use of the kappa statistic and the results obtained by percentage agreement, with percentage agreement values being inflated when the exposure event is rare. Presence of symptoms did not have a consistent influence on agreement. These results demonstrate the need to explore methods for improving agreement between self-reports and observational data, even for dichotomous level exposure variables.

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IMPROVING ERGONOMICS PROGRAM EFFECTIVENESS USING AN INTRANET. S.M. Evans, Susan Evans & Associates, Inc., Vienna, VA; B.S. Joseph, Ford Motor Co., Dearborn, MI

Corporate ergonomics programs must be diligent to control costs and improve effectiveness. For a global company the size of Ford Motor Co., managing a company-union ergonomics process driven by plant-level ergonomics concerns is especially challenging. The process itself is documentation driven, and relies on Local Ergonomics Committees (LECs) comprised of union and company personnel (including medical, safety, engineering, and ergonomics) to identify, track, document, and resolve ergonomics problems in the plant, and report their progress to management. The administrative requirements of the process can take time away from resolving ergonomics problems. Since most LECs document manually, the database of lessons learned is confined to each LEC's file cabinet. Sharing information across plants is difficult at best.

To reduce the LEC administrative burden and to improve information sharing, the UAW-Ford National Joint Committee on Health and Safety developed ErgoRx: Ford's Automated Evidence Book using a Web-browser interface to send and receive data from a centralized database over a corporate intranet. Data is entered into the system once and feeds multiple reports to fulfill documentation and management requirements. ErgoRx shares job location, injury, severity, and occurrence data with other corporate systems.

Corporate and division ergonomics personnel may view LEC data remotely and obtain measures of overall program effectiveness directly. Users can view other plants' completed concerns and share ergonomic problems and solutions on-line. LECs can electronically submit completed concerns as ergonomic best practices for distribution to the global Ford community through a corporate Best Practices site.

The intranet architecture permits cost-effective management and distribution of the ErgoRx software and documentation. Updates are made at the central server, giving users immediate access to the latest versions and most recent data. In reducing administrative workload and facilitating information sharing among plants and management, ErgoRx serves as a key component of Ford's global ergonomics strategy.

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MEASURING THE EFFECTIVENESS OF ERGONOMICS. R.B. Barker, V.C. Calvez, J.B. Nelson, The Joyce Institute/A Unit of Arthur D. Little Seattle, WA

Demonstrating the positive impact of implementing ergonomics is crucial to developing and maintaining the support of management. Operations and engineering are often reluctant to incorporate ergonomics into the design of work areas, equipment, and processes because they are unaware of the benefits. Therefore, if health and safety professionals can document that ergonomics can improve productivity, product quality, costs of materials, and labor costs, they can be more successful in promoting ergonomics as a means of reducing injuries.

Health/safety professionals and ergonomics practitioners, working in cooperation with operations and engineering, can use a defined methodology to do the following: identify and prioritize the problem jobs; select the appropriate metrics for each job; implement; and document value of the improvement. The methodology is applicable in a wide range of industries and for many types of jobs. In a case example from the paper industry, ergonomics improvements in the process and design of the equipment produced simultaneous reductions in ergonomics stressors and in the number of labor hours. An example from a receiving area demonstrates a reduction in the number of manual transfers per package and a reduction in order processing time. An example from the communications sector utilizes a multifaceted performance index to track performance quickly on a quarterly basis. The performance index combines safety outcome data with safety activity measures, absenteeism, turnover, and employee performance measures into a single scale score that can be readily tracked and compared across time.

The methodology described can assist practitioners in implementing ergonomics during the design of new and existing systems.

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THE FEASIBILITY IMPLEMENTATION SURVEY OF THE SEMI-S2 ERGONOMICAL GUIDELINES FOR SEMICONDUCTOR PLANTS. C.W. Lu, C. Chang, Occupational Safety and Health Institute, Kaohsiung Medical College, Kaohsiung City, Taiwan

Semiconductor industries have rapidly become one of the most important industries since they were established a decade ago in Taiwan. Due to the technology promotion and productivity growth, operators have to move more quickly and handle more heavy tools or material in new plants than they do in old plants.

The Semiconductor Equipment and Material Institute (SEMI) has written standard procedures and standards (SEMI-S2), and been looking forward to uniting the IC manufacture standards. The SEMI standards have regarded ergonomics or human factors. Now, the procedure written by SEMI is a volunteer program. However, it may be changed to an enforced program or a new technical gap of entry companies.

In this research, ergonomics checklists have been generated and transferred to Chinese for an in-plant survey to find the ergonomic hazards in the 20 semiconductor plants.

Abstracts

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