

SUMMARY

The Forest Industry Health Research Program, Pulp and Paper Sector, initiated an investigation of ergonomic concerns in the pulp and paper industry. The objective was to determine, from a variety of sources, the important ergonomic issues and priorities. Investigative methods included: analysis of accident and injury data; review of research literature on pulp and paper ergonomics; interviews with individuals from various organizations; visits to pulp mills to talk with management and workers and to observe ergonomic problems; and a questionnaire assessment at selected mills of workers' opinions.

The literature review located several reports describing typical accidents and injuries for the pulp and paper industry. Five studies discussed the new design or redesign of workplaces and jobs in processing industries. Three of these dealt specifically with ergonomics application early in design procedures for building a control room and introducing computerization. Several studies detail changes in the work environment as a result of computerization, especially the increase in mental workload and subsequent job monotony. Ample evidence exists that new computerized systems, such as pulp mills, require a new style of organization to promote good work environments, work content, and highly qualified and internally motivated personnel.

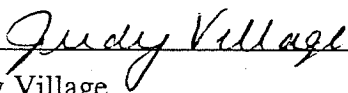
Results of the investigation confirmed three hypotheses. The first is that pulp and paper workers are suffering accidents and injuries related to job demands and task, equipment and mill design. The risk of injury to tradesmen (welders, millwrights, mechanics and other construction trades) is greater than 2.5-times that of pulp mill workers. The increased risk for tradesmen is a reflection of heavier job demands, poor lifting aids, problems with access to equipment, inadequate handtools and awkward postures caused by insufficient planning when designing and installing equipment. The chance of injury in a pulp mill, however, is less than in a sawmill by a factor of 1.4 to 3.0.

The second hypothesis is that design of operator workplaces does not facilitate optimal adjustability and variation of posture to allow an operator to adapt the workplace to his or her body size and work habits. Pulp mill operators and office workers reported pain, discomfort and fatigue in their lower back, neck and shoulders, directly related to design and layout of workstations and demands for prolonged sitting. Eye strain and concerns about environmental control (inconsistent temperatures, noise, and lighting) were also common.

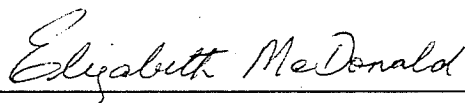
The third hypothesis is that with increasing automation and computerization, organizational design strategies to minimize boredom and monotony and increase job satisfaction are becoming important ergonomic issues. Mill operators reported a strong feeling of loss of control after computerized processing was implemented. Software and graphics design has proceeded unsystematically throughout the industry, resulting in operators receiving too much information or the wrong type of information, and lacking control over the information

presented. Automation has removed a great deal of the decision-making responsibility from mill operators. More than a third of the workers responding to the questionnaire reported monotony. Workers commented that monotony, complacency, inattentiveness and fatigue (due to shiftwork) are the most common causes of injuries.

Ergonomics has an important role in the pulp and paper industry in areas of equipment design, workstation design, reduction of accidents and injuries, and organization of work to increase variety and job content. One recommendation is that ergonomic training be conducted for health and safety committees, management, union, engineers, designers, maintenance workers and operators. Individual companies should rank high-risk occupations and tasks for further ergonomic evaluation and industry associations or a group such as FIHRP could prioritize high-risk areas common to all mills, such as design of better lifting devices, for future analysis. An ergonomic checklist of workstation design (similar to the FIHRP checklist for Forestry Equipment) should be designed and made available to mills. Systematic evaluations should be conducted of organizational changes, such as job rotation and increased job content to monitor the potential benefits and problems. Finally, companies that are rebuilding, or building new, should make provisions for ergonomic input early in design stages, especially with respect to access to equipment and structural and space provision for lifting aids for maintenance workers.



Judy Village
Ergonomics Specialist
Occupational Health Group



Elizabeth McDonald
Program Leader
Occupational Health Group