

## Ergonomics:

# Reducing work-related injury and increasing the bottom line

There is no doubt that ergonomic injuries are expensive. According to Liberty Mutual, in 1998 the workers compensation direct cost of work related musculoskeletal disorders was \$12.1 billion in the U.S. alone (*Liberty Mutual Workplace Safety Index*, Liberty Mutual (2002), Boston, MA). In addition, indirect costs have been estimated to be as high as \$54 billion annually, including reduced productivity of replacement workers and lost production time. Many countries already have ergonomics regulations in place including the United Kingdom, Canada and Japan. Recently, a light manufacturing and assembly company in central New York completed an ergonomics training and health & safety project with RIT. They reduced workers compensation premiums from \$100,000 to \$30,000 annually in just two years. Unfortunately, many decision makers feel they cannot afford to invest time or money into an ergonomics program. Realistically, companies cannot afford to ignore ergonomics since implementing ergonomic

thinking has been shown to increase productivity and improve quality of work.

### Trauma disorders

Ergonomic injuries are often identified as cumulative trauma disorders, repetitive motion injuries and musculoskeletal disorders that involve injuries or illnesses to soft tissues resulting from repetitive use or overuse. Many times these disorders occur in the upper extremity and lower back. Although lower back injuries are a higher occurrence, carpal tunnel syndrome is a more common buzzword. While many types of work can cause these disorders, there are a number of key risk factors, including high hand activity, forceful excursions, awkward posture and environmental factors. A combination of any of these can increase the potential for body damage.

In addition, a worker's personal risk factors can increase the likelihood of ergonomic injuries. Those involved in hobbies which require repeated motions and live unhealthy lifestyles, may attempt to avoid injury, yet still develop problems. One thing workers can do to reduce their risk for injury is to start by living a healthier lifestyle. Refraining from smoking, eating healthy and exercising can all reduce personal risk of injury and should be encouraged by employers.

### Responsibilities

Still, businesses need to take responsibility for the work place factors they can control.

When NC3R works with employers we assess their current systems and work to reduce or omit factors that can lead to injury. Improved engineering and design of systems is always the first step in addressing these issues. However, reengineering is not always possible so NC3R also works to address other aspects of the workplace. For example, administrative controls limit worker exposure through worker selection, exercise and stretching or training.

In addition, job rotation can be an effective way of reducing exposure to repetitive motion in particular, as long as the rotation does not expose workers to the same risk fac-



The author of this article, Tracy Freas, contributed this article to ReMaTecNews. A staff engineer at NC3R, Tracy Freas has a BS in industrial and manufacturing engineering from Rochester Institute of Technology in New York State. She is working towards her Masters degree in manufacturing and management leadership. Her current activities include managing two grants that address ergonomics and health & safety assessment and training, performing technical assessments to streamline processes and reduce material handling. She has trained over 800 individuals and participated in over 40 training projects within a variety of industries.

## The National Centre for Remanufacturing and Resource Recovery

The National Center for Remanufacturing and Resource Recovery (NC3R) at Rochester Institute of Technology (RIT) is internationally recognized as a leading center for applied research in remanufacturing. NC3R's mission is to deliver to industry advanced technologies and tools for efficient and cost-effective remanufacturing and to design products that have no negative environmental impact. NC3R has provided ergonomics and health & safety training for a variety of industries including remanufacturing, foundries and assembly plants for over eight years. Ergonomics is engineering for human capabilities to ensure musculoskeletal injuries are avoided or reduced. In the last year, more than 2,000 people were trained through this program at RIT.

tors as the previous job. Finally, the use of personal protective equipment (PPE) can also reduce injury. However, protective equipment can be a quick fix and not a long term solution and should only be permitted if engineering and administrative controls are infeasible.

Repetitive motion injuries are a real problem for business and industry, leading to higher overhead and increased inefficiency. Ergonomics programs and training can offer solutions to these problems, reducing injury and saving hundreds of dollars in workers compensation costs, health care coverage and lost production. NC3R is dedicated to providing businesses with the latest technological advances in ergonomics to assist in making the workplace safer and more productive.