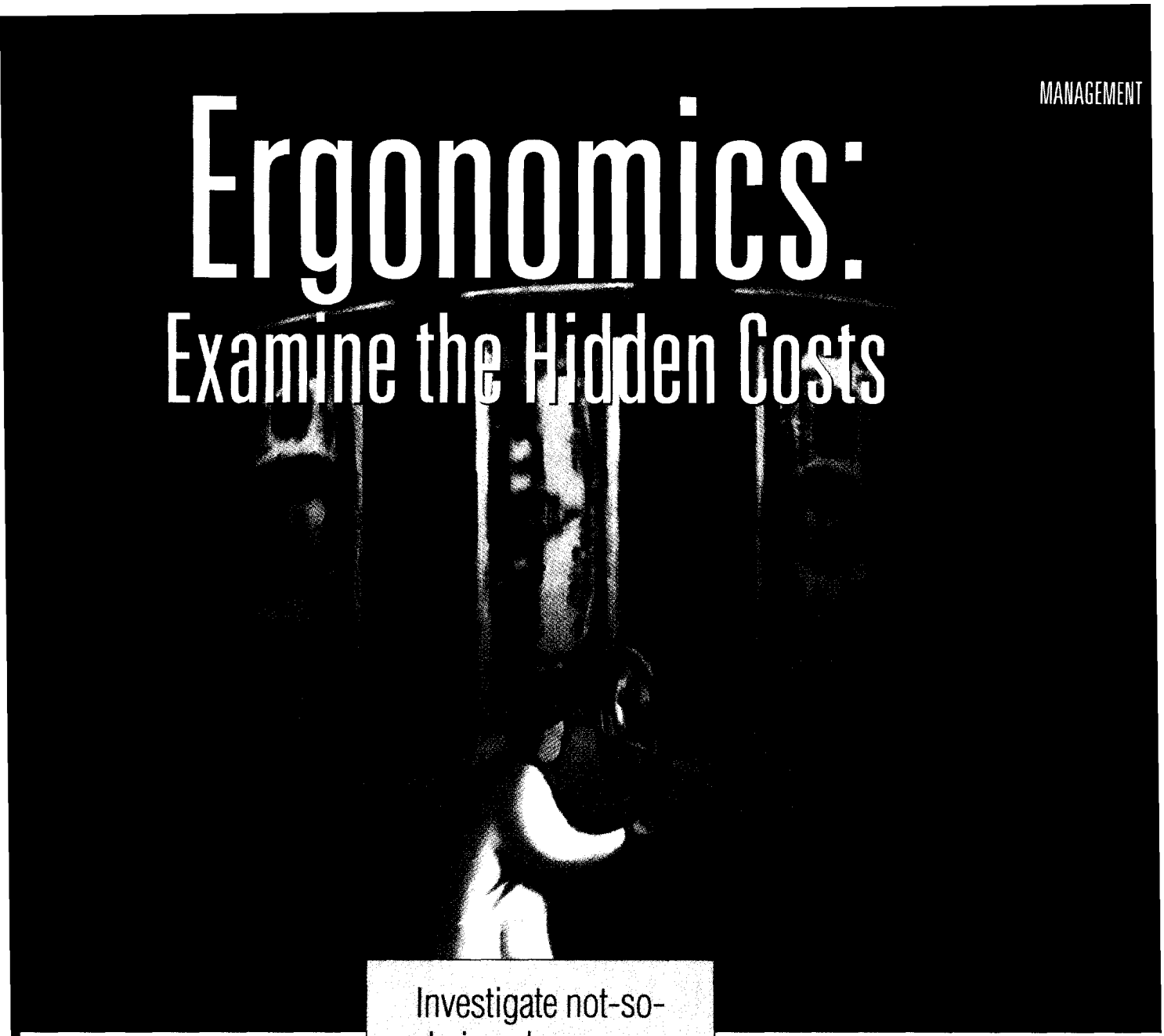
Ergonomics: Examine the Hidden Costs



Investigate not-so-obvious losses as a way to improve both ergonomics and the bottom line.

It's time to take a closer look. Companies already pay for workers' compensation. "But people are becoming more attuned to ergonomics for improving productivity, reducing product damage and increasing accuracy in orderpicking and in assembly," says Brian McNamara, president of Southworth Products Group. "Show me a safety issue, and I'll show you a real productivity bottleneck," he adds. His firm demystifies ergonomics using an easy-to-understand comic book to teach ergonomic principles.

Joe Selan, senior vice president of Advanced Ergonomics, says, "Very often we take too narrow a view in calculating return on investment for ergonomics." It's not just avoiding injuries. He finds that is just a small slice of the pie.

by Christopher Trunk, managing editor

Don't rely on the government to help you identify the whole picture of ergonomic costs. "There is little available from regulatory sources on how to economically justify ergonomics," says Selan.

The economics of ergonomics

However, there's lot of industry experience on ergonomic costs. "I find many jobs with ergonomic problems also have productivity and quality problems as well," says David Alexander, president of Auburn Engineers. He and others have uncovered the hidden costs of poor ergonomics and suggest these remedies:

- Avoid ongoing losses. These include workers' compensation from poorly designed work areas, poor-quality assemblies from work-

Ergonomics shouldn't wait until injuries occur or until OSHA is hanging out in your doorway. There's too much money to be made with ergonomic principles in the workplace. — Brian McNamara

ers faced with either protecting their ongoing tendinitis or properly torquing fasteners on an assembly line. Poor-quality work often contributes to increased warranty and service costs.

The ongoing cost of both defective work and production bottlenecks can be reduced with common-sense remedies like better lighting, non-skid floor mats, easy-to-use tools, and work areas suited to workers of different sizes, shapes and strength.

- Enhance current performance. Solving existing ergonomic problems can return you to expected levels. But an analysis of the worksite can reduce costs in labor or combine jobs using power tools and automated handling equipment.
- Improve quality of worklife. Jobs with ergonomic problems have higher turnover and absenteeism. A 1994 study by Lavendar and Marras found that jobs with high physical demands had turnover rates five to 11 times higher than low physical demand jobs, says Selan. "The costs of increased turnover accumulate in product damage, reduced production and training costs."
- Reduce expensive, traumatic injury. Back injuries, cumulative stress disorders and body cuts are often due to poorly designed workplaces. For example, these injuries can cascade as workers drop a load on their toes and feet because of their other injuries. Selan maintains you can reduce cumulative stress disorders at your plant by 30% by bringing demands within common-sense, acceptable levels. Do this with redesign, training, better supervisory control and equipment purchases.
- Design to lessen human error. "Many workplaces are designed to cause human error," says David Alexander, president of Auburn Engineers, "and errors crop up in shipping, orderpicking and assembly." He says coding of numbers and letters should be short and difficult to transpose. A good code lets a worker discover an error early on.
- Design ergonomics into the workplace. Retrofitting ergonomics can costs significantly more than in the design stage.
- Improve management/labor relations. Ergonomics issues have played a role in strikes at U.S. automotive manufacturing plants. Workers say they want a safer work environment, and they see ergonomics as a safety issue. "But ergonomic changes can threaten unions because you're talking job change," says Selan. He adds that a perceived benefit can quickly become a perceived threat, so include unions from the start.

More flexible workforce

Experts find that taking the pressure of poor ergonomics off the worker generates more production. "When compared to palletizing boxes manually, workers using lift-assist devices can use 40% less energy. That puts a worker in a less stressful situation, and energy savings can be used for improved throughput over the whole shift," says McNamara.

When hiring, downsizing or redesigning for production changes, a well-designed workplace lets you assign workers more flexibly. There is less concern for hiring and retaining only strong, young workers.

Task evaluation pays dividends

The Material Handling Institute is taking a giant step forward on task evaluation with the new CD-ROM it is soon to offer. (See *High-Powered Ergonomics on CD-ROM* on page 76.) McNamara, vice chairman of the Ergonomics and Safety Equipment product section of MHI, says you can use this CD software to adjust the workplace demands of task frequency, distance traveled and weight lifted.

"Task evaluation also takes into account what is up and down the line from an awkward task," says McNamara. He paints this picture: If a container arrives at a workstation

An Ergonomics Hit List

Buyers routinely describe problems to ergonomic experts and equipment suppliers. Here's a list. Recognize any?

- *Awkward material handling.* To do their jobs, workers are forced into a frequent combination of lift, bend, reach and stretch. Add to that hard-to-hold products, which can be easily handled with manipulators.
- *Repetitive lifting of loads.* "We see companies setting limits of 40- to 50-pound loads for their workers without any assist," says Steve Klostermeyer, industry manager for Zimmerman Handling Systems. He warns that even loads under the limit, when handled with much repetition, can be dangerous. Removing weight from the lifting task with an assist reduces stress on the body and can improve productivity over the long term, he adds.
- *Dangerous loads and high scrap rates.* Heavy sheets of glass or metal can have sharp edges, causing injury even when using gloves. Vacuum grips can help. "Scrap rates can be high as workers drop product that is both difficult to grasp and dangerous," says Klostermeyer.
- *Poor lighting, cluttered work areas and hard floors.* This trio impacts heavily on error rates and safe movement . "Workers just can't lift safely on oily or slippery floors," finds Klostermeyer.

Anatomy of an Ergonomics Program

Joe Selan, senior vice president of Advanced Ergonomics, Inc., lays out five elements of an ergonomics program:

1. Health and risk factor surveillance. You need a mechanism, probably a risk analysis survey, for determining the location and extent of ergonomic problems. Prioritize those problems. An expert can help prioritize and judge effectiveness.

2. Job analysis and design. Evaluate problem jobs based on ergonomic design guidelines. Make necessary changes.

3. Medical management. Report injuries early on, provide conservative treatment and make a return-to-work plan. Condition returning workers to a task to see if they can perform it without pain.

4. Training. This ranges from upper-level management down to line workers. Covered are ergonomic issues and individual roles.

5. Implementing the program. This is accomplished by an ergonomics team at each warehouse or plant location. The team represents upper management, health & safety, supervisors, workers, engineers, maintenance technicians and union representatives. The team does not necessarily perform each of the above tasks, but members manage progress. Implementing includes the job of selling the ergonomics program to upper management, supervisors, right down to the line workers themselves.

A health & safety professional typically starts an ergonomics program by approaching upper management. The total, real costs of poor ergonomics, as described in this article, are used in this presentation.

Many choose an ergonomics expert to help. Choose one skilled in each aspect of the above program. The expert should perform the training and provide a road map for the team, and analyze worksites. Count on the professional to prioritize among problem jobs and make sure the most problematic are remedied.

The expert must measure injury reduction, quantify performance improvement against anticipated goals and tweak the program to make it generate better productivity and fewer errors.

For help, contact The Human Factors & Ergonomics Society in Santa Monica, California, for a list of ergonomic consultants. Each expert has a description. Choose one with expertise in manual handling, warehousing, manufacturing. Phone (310) 394-1811.

weighing 40 pounds, can work up the line be adjusted so the container weighs just 10 pounds, but is passed more frequently? That would save on losses due to worker injury and fatigue. "If the container load can't be redistributed," adds McNamara, "then you'll need an ergonomic device down the line."

Ergonomics programs: style = cost

Alexander describes three kinds of ergonomics programs with widely varying business costs. Let's say a worker is cut.

- Compliance oriented. Nothing happens at this workplace unless OSHA or an attorney tells the company to do something. Then an expert is hired to fix only that problem. This is the most costly program.
- Expert driven. A safety worker accompanies the worker to medical treatment. Safety expert investigates worksite, makes both recommendations and changes. Nothing happens unless safety expert is present.
- Culture driven. Worker goes to medical, and a return-to-work plan is written. The area supervisor inspects the worksite, writes a report, develops corrective ideas and presents the report the next morning to the plant manager. Approval is given and the changes are made. It requires training the supervisor in safe practices. Expert trains supervisor. This is the least expensive program.

Economic downturns

"The major pitfall to ergonomics teams is that they start off enthusiastic, and then after six months, grind to a halt because no one is measuring progress and effectiveness," says Selan. He advises you establish mechanisms to collect data on a broad range of costs, injuries and productivity before and after the ergonomic program is begun.

"Typically our firm is contacted after the workcell is designed and built," says Steve Klostermeyer, industry manager for Zimmerman Handling Systems/Ingersoll-Rand Company. Or, he says, production and lifting requirements change over time. Installing a lift/assist device in the design phase is cleaner, less complex than shoehorning it in later.

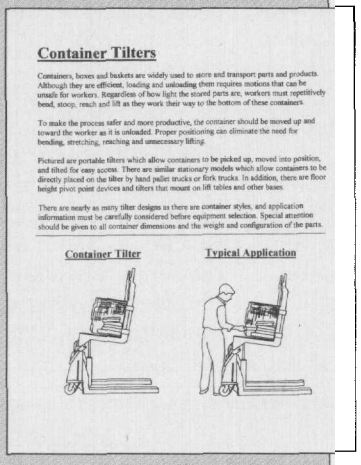
It is a common problem for companies to justify ergonomics based on just one criterion, typically a single injury. "That's a mistake," says McNamara, "because it requires another injury before ergonomics is again considered." He suggests that supervisors be empowered to evaluate their workplace from a productivity viewpoint and thereby eliminate potential ergonomic problems.

Apply the same thinking to ergonomics as you do to process machinery. "You don't wait until the machine is broken down to replace or maintain it," advises McNamara. During machine failure, you lose productivity waiting for a replacement; the same applies to ergonomics in the workplace. **MHE**

High-Powered Ergonomics on CD-ROM

Task Analysis & Equipment Recommendation is a new, interactive CD-ROM that can improve ergonomics at your worksite. It will soon be available from the Ergonomic Assist Systems & Equipment (E.A.S.E.) product section of the Material Handling Institute.

"This software analyzes all common, manual material handling tasks," says Joel Eterovich, a graduate research engineer at Cleveland State University who helped fine-tune the ergonomics software. He says it can help a warehouse or manufacturing plant supervisor classify tasks along industry-accepted guidelines, analyze tasks and identify the appropriate ergonomic equipment to prevent problems.



A screen from the primer on ergonomics equipment.

The CD-ROM offers:

- A basic introduction to ergonomics for the layman;
- On-screen videos and narration of manufacturing and warehouse tasks that define ergonomic terms;
- A technical, ergonomic formula-based section offering the four major methods for evaluating tasks using measurements you make on-site at your facility. Upon completing an evaluation, the software quickly recommends equipment to solve potential problems;
- A primer on ergonomic equipment covering how to use it, what it looks like and how to contact equipment manufacturers. The software can print this primer for you to study later.

I tried the software and found it easy to use for a typical non-ergonomics expert. The formula-based section was somewhat daunting, but lots of helpful hyper-text links provide explanations for the various equations used. With study, even the non-expert could use the equations to adjust work tasks to prevent problems. The CD-ROM even prints out a built-in software user's guide if you prefer a hard-copy or misplace the manual.

Cleveland State University professor Dr. Andrew Liou says, "This software takes ergonomics a step further. It makes evaluation easier while immediately connecting evaluation of tasks to appropriate, corrective equipment."

To purchase the CD-ROM, **Circle 500** on the Reader Service Card and information will be sent to you when the product is ready.

Also available is *Application Guidelines for Ergonomic Assist and Safety Equipment*, a publication available for $8 from the Literature Department of MHI. Phone (704) 676-1190.