OSHA's Regulatory Role in Ergonomic Safety

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Issue Definition

This paper will discuss the policy of the Occupational Safety and Health Administration (OSHA) to establish and enforce regulations concerning ergonomics standards. The two main issues are whether the standards are necessary and if so, how adequate the proposed standards are to accomplish OSHA's goals. The challenge to engineers is to design the work environment to improve safety and productivity. This paper will explain how OSHA developed the standards, discuss the opposition to the standards, analyze policy alternatives, and provide recommendations.

OSHA's mission is, "to save lives, prevent injuries and protect the health of America's workers."[1] With these new standards OSHA is specifically targeting musculoskeletal disorders (MSDs). According to the National Institute for Occupational Safety and Health (NIOSH), MSDs are "disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, or spinal discs…that are not typically the result of any instantaneous or acute event (such as a slip, trip, or fall) but reflect a more gradual or chronic development."[2] Some examples include carpal tunnel syndrome and low back trauma. Linda Rosenstock, the director of NIOSH, says MSDs "are among the most prevalent medical problems in the U.S., affecting 7% of the population."[3]

Work-related musculoskeletal disorders (WMSDs) develop when work conditions significantly contribute to or prolong the effect of MSDs. According to the Bureau of Labor Statistics (BLS), there were 276,600 disorders associated with repeated trauma in 1997, accounting for 64 percent of all work-related illnesses and 4 percent of the 6.1 million workplace injuries and illnesses combined.[4] OSHA estimates the workers' compensation costs for WMSDs to be between $15 and $20 billion annually.[5] To address this costly concern, OSHA is in the process of creating a regulation that would require certain companies to begin ergonomics

programs.

OSHA defines ergonomics as "the science of fitting jobs to people."[6] More specifically, "Ergonomics seeks to maximize safety, efficiency and comfort by shaping the working environment to the operators' capabilities" as one ergonomist defines it.[7] This science studies how individuals perform tasks, analyzing the type of equipment used, the time frame, and the physical and psychological aspects of the working environment. The study is quantified in terms of distance, force, and frequency. The analyst, usually an engineer or safety professional, weighs these factors against the limitations of a human being and determines the optimal process to complete the task. Ergonomic fixes are highly individual and solutions vary from situation to situation.

However, it is not reasonable to require such a detailed analysis on every job in the country to determine whether it will cause an injury. OSHA's proposed draft of the regulation would require companies to implement an ergonomics program for manufacturing or manual lifting jobs or jobs where a WMSD has been reported. The draft excludes the construction, agriculture, and maritime industries. OSHA includes six program elements in this process:

1. management leadership and employee participation;
2. hazard identification and information;
3. job hazard analysis and control;
4. training;
5. medical management; and
6. program evaluation.[8]

The following is a summary of these elements as defined in the draft standard.

Management leadership and employee participation consists of defining the expectations for both the employer and the employee under the program. This element establishes a communication line that encourages employees to report injuries and submit

recommendations while management provides a response to employee input. The company must also allocate resources and authority to those responsible for the program.

The **hazard identification and information** element requires management to identify jobs within the company that the standard covers and provides information to employees who are involved in those jobs. This information covers both how to recognize a WMSD and the procedure for reporting a problem or submitting recommendations to management.

Job hazard analysis and control requires companies to determine if a certain job is causing or is likely to cause a WMSD and implement the appropriate changes to that job. This requires analyzing the physical demands of the job, the workstation layout, the handling of equipment and objects, the environmental conditions, and the work organization. The changes may include engineering controls such as improved processes, equipment, or facilities; administrative controls such as job rotation, alternate tasks, or rest breaks; or personal protective equipment, which is designated as a temporary control against WMSDs.

The fourth element is **training**. Both the persons responsible for creating and maintaining the program and the employees affected by it must have an understanding of their roles and responsibilities. Employees are responsible for recognizing WMSDs, reporting them early, and making recommendations. They must also learn and understand the ergonomic controls in place. Program leaders must be able to identify hazards, generate and implement solutions to those hazards, and evaluate the solutions. The training must begin as soon as an employee takes either of these roles and be repeated periodically.

The **medical management** provision details the procedure when an employee has developed a WMSD. A health care professional must evaluate the extent of the injury, determine the activities that may have caused it, treat the injury, and provide a written opinion,

such as work restrictions or activities to avoid. The provision also mandates the procedure for handling work restrictions and workers compensation claims.

The final element, **program evaluation**, requires the program to be periodically reviewed and updated. The employer must measure the progress and effectiveness of the program and make corrections if necessary. Aside from the program elements, the proposed regulation details the record-keeping requirements, the timetable for implementation, provides directions for finding more information, and defines the key terms of the standard.

The proposed standards represent many years of work on OSHA's part to create a regulation that encompasses the key aspects of successful ergonomics programs without being too prescriptive. The issue here is one of philosophical differences about government regulation as well as the relationship between workers and their employees. Many question OSHA's capability to handle these historically sensitive subjects. Furthermore, the regulation intends to protect workers against an illness whose causes are cumulative in nature and not immediately noticeable. The implications of these standards are much farther-reaching than just the safety of people who assemble automobiles or cut meat for a living. It is a regulation that could affect a company's productivity and profit. Safety and medical experts, engineers, business owners, and workers will all shape the scope and effect of the regulation, and ultimately, its political viability.

Background

The history of ergonomics goes back to the early part of this century when people began to study the relationship between people and their working environment. The name comes from the Greek: *ergo*, meaning work and *nomics* meaning laws. By the middle of this century, the field included experts from medicine, psychology, and engineering. Ergonomists have developed new ways for people to perform their tasks more comfortably and productively by

studying the effects of force, posture, vibration, and repetition on the human body. Individual programs have resulted in increased productivity, lowered workers compensation claims and absenteeism, and increased job satisfaction.[9] Despite these gains, many people each year develop disorders that OSHA believes are preventable by applying the basic principles of ergonomics.

History of OSHA regulatory action on ergonomics

Under the General Duty Clause, Section 5(a)(1) of the OSH Act, employers must provide a safe workplace; that is, "…free from recognized hazards that are causing or are likely to cause death or serious physical harm…" OSHA interprets this clause to include ergonomic hazards and issued the first citation for this reason in 1987 at an automobile manufacturing plant. Similar citations at other auto plants resulted in several multi-million dollar settlements, prompting agreements between OSHA, the United Auto Workers (UAW), and each of the Big Three automakers to begin ergonomics programs. Similarly, OSHA cited many members of the meatpacking industry. In 1990 the agency published a set of ergonomics guidelines for the red meatpacking industry[10] and has been working with several companies to reduce WMSDs. OSHA has been compiling the results of these programs and plans to release a report later this year.

Throughout this decade, OSHA has attempted to use its previous experience to develop ergonomics standards for general industry. After an effort by OSHA to produce a regulation early this decade, Congress voted to cut funding for the program in 1995. This prevented any further research on ergonomics until the funding was restored in 1996. OSHA then began to develop the current version. After stakeholder meetings last year, OSHA released a draft for public comment on their web site early this year. The agency will continue to make adjustments in the regulation and has submitted the regulation and the estimated economic impact to the

Office of Management and Budget (OMB) for approval. The final regulation is scheduled for release in 2000, following stakeholder meetings around the country this fall.

Reports from Federal agencies

There are several studies that OSHA has used to support the need for an ergonomics standard. In July 1997, the NIOSH released a report on the link between working conditions and MSD's. In reviewing over 600 studies, NIOSH found that "a substantial body of credible epidemiologic research provides strong evidence of an association between MSDs and certain work-related physical factors when there are high levels of exposure and especially in combination with exposure to more than one physical factor."[11] When a person is exposed to forceful exertions, vibration, and/or awkward positions as a significant part of his or her job, the person is likely to develop an MSD. The study also notes the need for further research on the subject.

Also in 1997, the General Accounting Office (GAO) released a study entitled *Private Sector Ergonomics Programs Yield Positive Results* that discusses several benefits of ergonomics programs, stating "…positive results can be achieved through an approach incorporating certain core elements that are implemented in a simple, informal, and site-specific manner."[12] The suggested core elements are identical to those in the proposed regulation.

In August 1998, the National Academy of Science (NAS) sponsored the Workshop on Work-Related Musculoskeletal Injuries. The purpose of the workshop was to answer questions from Congress concerning the state of the evidence for WMSDs and their cause and prevention. The study concluded:

1. Musculoskeletal disorders are a serious national problem…
2. These problems are caused by work and non-work activities.
3. There are interventions that can reduce the problem.[13]

However, the workshop did not determine the level of exposure required to cause a WMSD or the extent to which non-work related activities contribute to MSDs. The following November, Congress appropriated $890,000 to NAS to fund a comprehensive review of all of the relevant studies. The new report will attempt to provide a greater understanding of the causes of MSDs and techniques for intervention. The study was approved with the understanding that OSHA would continue to work on an ergonomics regulation[14] during the 18-24 months required for research.

Legislative Action

On March 4, 1999 Rep. Roy Blunt (R-MO) introduced H.R. 987, the "Workplace Preservation Act." According to the bill, both the NIOSH report and the previous NAS studies "showed that there is insufficient evidence to assess the level of risk to workers from repetitive motions." The bill also claims that "such disorders have often increased in workplaces and industries in which OSHA has focused ergonomics-related enforcement actions…while such disorders have been decreasing in workplaces generally." The language in this legislation is in stark contrast to OSHA's claims. The legislation passed the House Education and the Workforce Committee by a vote of 23-18 on June 23, 1999 and passed 217-209 on August 3, 1999 on the floor. Voting was mostly along party lines.

Sen. Christopher Bond (R-MO) introduced the Senate bill, S. 1070, which he labels the "Sensible Ergonomics Needs Scientific Evidence (SENSE) Act." In his introductory remarks, Sen. Bond, Chairman of the Senate Committee on Small Business, does not deny that the application of ergonomics has improved the workplace. However, he wants to "ensure that the requirements of any ergonomics program proposed by OSHA are based on sound science and are effective to improve workplace safety and health." Thus, Sen. Bond and his supporters wish to

delay the standards until the NAS reports a causal relationship between MSD's and work activities. There has been no vote on this bill.

Labor involvement

Labor unions have been instrumental in pushing for ergonomics standards. They would like to see OSHA take a very proactive approach to eliminating ergonomic hazards focusing on early hazard recognition and prevention.[15] Franklin E. Mirer, Ph.D., Director of the United Auto Workers (UAW) Health and Safety Department, states that "the principal need over the next decade is abatement of exposure to physical stresses".[16] He believes the best way to meet this need is for OSHA to pass a regulation that holds employers responsible for seeking out and eliminating ergonomic hazards while encouraging employees to participate in the process. As noted above, the UAW has already negotiated programs with industry and OSHA. According to a UAW ergonomist, the UAW will continue to participate in the process by arranging testimony to Congress and by bringing union members and corporations together in stakeholder meetings to provide input for the regulations.[17]

The American Federation of Labor—Congress of Industrial Organizations (AFL-CIO) has also been an active supporter of ergonomics standards. The "Stop the Pain!" campaign is directed at eliminating Repetitive Strain Injuries (RSIs) and back injuries at work. Demands include:

1. Action by employers to fix hazardous jobs that cause crippling back injuries and RSIs.
2. An OSHA ergonomics standard that requires employers to identify and correct hazards, involve workers and provide proper medical care for injured workers.
3. Fair compensation for workers crippled by back injuries or RSIs. Insurers and employers must recognize work-related RSIs and provide speedy compensation to injured workers.[18]

AFL-CIO members work in a variety of industries and one representative suggests that the

standard, including agriculture, construction and maritime workers, should cover all workers.[19]

Industry Positions

Under the Small Business Regulatory Enforcement Fairness Act of 1996, a review panel must convene to discuss the economic impact that any new regulations have on small businesses. The Small Business Advocacy Review Panel (SBARP) consisted of representatives from OSHA, the Office of Advocacy, the Small Business Administration, and the Office of Information and Regulatory Affairs of the OMB. The panel issued a report to OSHA, summarizing the concerns and comments about the regulations from 20 Small Entity Representatives, representing a variety of industries. The SBARP report also discusses the economic impact of the regulation and offers suggested changes.[20]

The National Coalition on Ergonomics (NCE) represents the interests of many trade groups who support the legislation to postpone OSHA's standards. This group includes a variety of associations, from the American Trucking Association to the U.S. Chamber of Commerce. The Coalition is concerned that an ergonomics regulation will be costly to industry and will not prevent injuries. NCE believes that although some companies have used ergonomic principles to improve the workplace, there is not enough scientific understanding about WMSDs for OSHA to issue a regulation. Furthermore, OSHA should wait for a consensus opinion from the medical and technical community before proceeding.[21]

Other Organizations

Another group that has reviewed this document thoroughly is the American Society of Safety Engineers (ASSE). On June 4, 1999, ASSE submitted a letter and revised draft to OSHA. The group "supports the concept of a federal standard addressing ergonomics" and "believes there is science justifying the creation of such a standard". ASSE offered three criteria of a

federal ergonomics standard in a letter to OSHA: "The standard should (1) be performance based and not use a one-size-fits-all approach to ergonomics. (2) …emphasis should be placed on improvement verses overly detailed specifications…; and (3) be created through private/public sector partnership…" The letter also addresses several key points and offers proposed changes.[22]

Other organizations who have come forward on this issue include the National Association of Manufacturers (NAM) and the Center for Office Technology (COT). NAM supports H.R. 987 and S. 1070 and shares NCE's position on the cost of the regulations to industry and the lack of available evidence for WMSDs.[23] COT is an organization of office employers and computer equipment manufacturers concerned with improving the safety and health of the office environment. The organization believes that the draft needs improvement and will not effectively address WMSDs in its current form.[24]

Key Conflicts and Concerns

There are several conflicts on this issue because of the variety of opinions on whether or not OSHA should impose regulation on industry with respect to ergonomics. The major areas of conflict include the extent of the problem of WMSDs, the science behind the regulation, the extent of the regulation, and the impact the regulation will have on business. Partisan politics also plays a role in this debate.

Extent of the problem

The BLS is the agency responsible for collecting data on, among other things, workplace and safety data. Their results are based on the OSHA 200 logs that employers use to record injuries and illnesses in the workplace. Refer to the Appendix for relevant data on WMSDs.

As shown in Table 1, repeated trauma accounted for 64% of all workplace illnesses in 1997. Even though the number of cases has decreased every year since 1994, repeated trauma

still remains a constant proportion of the total. Table 2 breaks down the 1997 illness data by employer category. Manufacturing is the largest contributor to repeated trauma, followed by durable and nondurable goods. Tables 3 and 4 show that sprains and strains are responsible for the majority injuries and illnesses resulting in days away from work and that while the number of incidents has declined, the sprains and strains are a constant portion of the total. Supporters of the regulation use these statistics to show that a standard is necessary to address the large number of illnesses due to WMSDs and that manufacturing and manual lifting should be targeted specifically.

On the other hand, WMSDs appear to be much less of a problem when compared to the total number of injuries and illnesses. The 276,600 repeated trauma cases represent only 4.5 percent of the 6.1 million injuries and illnesses in 1997.[25] This, coupled with the fact that the number of WMSDs are decreasing along with the total number of injuries and illnesses, implies that MSDs are not a major safety concern and that regulation is unnecessary.

Another complicating factor is the number of back injuries, which are sometimes reported as injuries, and other times as repeated trauma illnesses. Back injuries usually represent about half of all sprains and strains, so this is a significant distinction.[26] OSHA claims that back injuries, while appearing to be a discrete event, are actually the result of cumulative "microtrauma" that contribute to an injury over time, and thus should be included in the WMSD data. Others do not classify back injuries this way and could argue that better safety in lifting training is required, not an ergonomics standard.

Science behind regulation

Supporters of the regulation believe that the evidence for WMSDs is substantial and that the current legislation is simply a delay tactic. Ergonomists have no doubt that workplace

conditions do contribute to MSDs and firmly believe there are real solutions available. The Human Factors and Ergonomics Society, who does not have an official position on draft, but support the science behind the regulation and believes engineers need to stand up for science behind ergonomics.[27]

Those opposing the regulation doubt that there is such a clear link between work and MSDs. They argue that there are too many causes for MSDs to hold employers responsible for providing worker's compensation and free medical treatment. Risk factors aside, it is difficult to predict who will develop an MSD. According to the 1998 NAS study, there are a number of non-biomechanical factors that may contribute to the development of a disorder, such as age, previous medical conditions, nutrition, and activities outside of work.[28] Employers should not have to pay for disorders caused by factors external to the workplace.

For this reason, both sides are willing to dedicate resources to discover exactly which activities at work are causing the problem, e.g., the new NAS study. Researchers will continue to study the effects of loads on the body and the best way to design a workstation. Regardless, the depth of understanding of MSDs necessary to issue a regulation will be debatable.

Scope of regulation

Another concern is whom the study should cover. As noted above, certain labor groups would like the regulation to cover all workers, including construction, agriculture, and maritime. Labor representatives claim these workers experience the very same injuries as those in other industries, so OSHA should address problems in those industries as well.

Others, such as the Center for Office Ergonomics, complain that it is unfair to exclude construction, agriculture, and maritime for other reasons. Under the proposed standard, employees in offices will be covered by the regulation if an employee reports a WMSD. P.J.

Edington, COT Executive Director, says in a letter to OSHA that "it makes no sense to exclude these occupations while including industries such as office work, which are far less physically demanding and where the incidence of claimed work-related disorders are much lower."[29]

The medical management section of the proposed standards is also a concern for many groups. The regulation requires "prompt access to health care professionals (HCPs) for effective evaluation, treatment and follow up…" In addition, employers must "maintain the employee's total normal earnings, seniority, rights, and benefits when work restrictions are recommended by the HCP or voluntarily provided…" while the employee is away from his or her job. This medical removal protection (MRP) can last up to six months.

The COT argues that the regulation provides no incentive for employees to return to work, conflicts with state workers' compensation programs, and provides opportunities for workers' compensation fraud.[30] Likewise, the Small Business Advocacy Review Panel states, "an ergonomics program standard with an MRP provision will affect substantially more workplaces, trigger more MRP coverage, and have more overlap with workers' compensation than MRP provisions in OSHA's other health standards."[31]

ASSE suggests that the medical management provision is unnecessary because it "circumvents existing state laws/regulations; it will create a new class of ADA [Americans with Disabilities Act] victims; creates additional liability exposures for employers, equipment manufacturers, and government safety and health entities; will generate significant resistance to the proposal; and the standard should concentrate on preventing ergonomic injuries, and not address medical management issues."[32] Despite these arguments, OSHA maintains that medical management is an integral part of the program.[33] This measure exists to ensure that the injury is treated by a medical professional, protects the employee from further injury, and allows the

worker to maintain employment while he or she heals and/or the job is fixed.

Cost to industry

The cost of the regulation is difficult to predict because of the many factors involved. The regulation would allow OSHA to fine companies for hazards contributing to WMSDs without having to justify the citation under the General Duty Clause. Past settlements have cost some companies hundreds of thousands of dollars.[34]

Companies may need to make significant investments to meet the conditions of the regulation. This could require hiring a consultant to assess the working conditions, purchasing new equipment and/or tools, or providing specialized training courses. Managing the ergonomics program is another added cost, in terms of person-hours and added paperwork.

Recently, OSHA has submitted a cost analysis to the OMB, a report which will not be available until this fall. Past OSHA estimates put the national cost at $3.5 billion, a number which some consider being very conservative. According to the Small Business Advocacy Review Panel, "OSHA's preliminary cost estimates may have underestimated costs, perhaps materially."[35]

Expected benefits

The benefits of ergonomics programs at individual companies are well documented.[36] There are many ways to measure the success of programs, from increased quality, productivity, and job satisfaction to decreased absenteeism and workers' compensation claims. Logic dictates that workers will perform best when their tasks are within their physical capabilities and do not have to work in awkward or uncomfortable positions.

Hal W. Hendrik, in his 1997 address to the Annual International Occupational Ergonomics and Safety Conference, offers his take on the benefits of ergonomic programs. "Put

simply, when there is a true managerial commitment to effectively applying ergonomics to the design or modification of work systems and environments, not only are improvements in health and safety possible, but considerable cost benefits usually can be realized as well."[37] He goes on to offer many examples of how employers have collaborated on projects with their workers to bring ergonomic principles into the workplace.

On the other hand, increased employee participation is not popular with everyone—some may see workers using the ergonomics regulations to manage the business and trying to get out of hard work. There is also an issue of violating the National Labor Relations Act, which prohibits employers from choosing labor representatives. Furthermore, there is no guarantee that OSHA's programs will pay off in the same manner as private programs have. As the GAO report indicates, success depends on how the company carries the company carries out the program.

As a note, the regulation may benefit engineers as market opportunities open for ergonomics consultants and specialty designers. Engineering controls are the preferred method for controlling WMSDs because they reduce the stress on the worker's body, thus reducing the risk of injury. Engineers who have knowledge of human factors will be assets to their companies to design processes that do not endanger the worker and to design products with the user in mind. Moreover, expanded design liability may leave engineers without a choice but to adopt the principles of ergonomics.

Partisan politics

Because of the issues of government regulation and workforce protection, this discussion has been a highly political debate, with Democrats taking the traditional side of labor and the Republicans against increasing the power of the federal government. This is apparent in the

House's voting on H.R. 987, which was mostly along party lines. Of course, both sides claim that the medical and technical experts should lead the debate on ergonomics.

Regardless of the success of H.R. 987, there will be opposition from the White House. In a letter to Workforce Protections Subcommittee chairman Cass Ballenger (R-NC), Labor Secretary Alexis Herman states she would recommend a veto if the bill were presented to the President.[38] Moreover, the status of the regulation is moving faster than the current legislation. On the other hand, OSHA's enforcement of the standard depends on Congressional support for funding in the future. OSHA will need to find substantial political support for the regulation to be effective.

Policy Alternatives

Alternative 1: Concentrate on consultation, guidelines, and voluntary compliance

OSHA should form partnerships with state safety agencies, health care providers, technical experts, universities, and labor groups in various regions across the country to promote ergonomics in the workplace. The program can begin before passing regulation (or in place of it), acting as a support network for companies who wish to begin ergonomics programs and promote programs for those who are not acting on ergonomics. The centers would build upon OSHA's existing consultative services, outside of OSHA's regulatory authority. Centers would help in setting up programs, identifying risks, providing solutions, training employees and management, and providing expert treatment. OSHA would gain practical experience in a variety of industries, be able to track progress, and gain industrial support.

Effectiveness

The help centers give a more direct interaction between OSHA and the companies, allowing for programs tailored to the situation. Companies would have access to expert help at little or no cost. However, if OSHA depends on voluntary compliance, it gives all the power to employers. Since companies may not see the need for an ergonomics program, it would appear to be an additional cost of doing business. If companies do participate and realize benefits, such as increased safety and productivity, it would help OSHA's case for passing regulation.

Efficiency

Although OSHA bears the initial cost of setting up the support network, it is more efficient in the long run because employers would not have to seek out their own experts. If the program were not a success, OSHA risks a backlash from employers, making ergonomics regulation unpopular. Although, if few companies participate and the centers go to waste,

OSHA would still gain some insight on how to implement programs in a variety of industries, which would be useful in writing future regulations.

Equity

Under this alternative, OSHA takes on some of the companies' responsibilities under the proposed regulation, such as identifying risks and establishing medical support. In the short term, companies who do not choose to participate may have an economic advantage because they would not invest resources in ergonomics programs. At the same time, companies who do participate may experience "bugs" in the program. However, if a company's competitor gains economic advantage because of the long-term benefits of ergonomics, it may force the company to join the program as well. Under this alternative, employees of companies without programs would still be without protection from ergonomic hazards and must wait for their company to join the program.

Flexibility

This alternative decentralizes OSHA's ergonomic coverage somewhat, so regional differences can be taken into account, e.g., areas of the country with fewer labor unions. As discussed above, the situation at each company is different, and the solutions would reflect that. Employers would be free to try different solutions without fear of citation.

Implementability

This recommendation is easy to implement because it is not initially a regulation and serves to test OSHA's ability to administer ergonomics to a variety of employers. Also, the program can start small, perhaps with test regions in different parts of the country. This way funding can be gradually increased, instead of all at once, as would be the case under a regulation. Because participation is voluntary, there should not be much opposition from

employers, although labor groups may see this as insufficient. It does bring more voices into the discussion as more medical and technical professionals share their expertise with those without experience in ergonomics.

Alternative 2: Phase in program by type of employer

Sections of the proposed regulation currently provide a timetable for implementation, categorized by the deadlines for sections of the regulation. One alternative is to also phase in the program by the type of employer: first the federal contractors, then large companies, and finally the "small entities". This would allow a progression into the standard requiring those with the most resources to bear the initial costs (assuming costs are passed off to government by contractors).

Effectiveness

Companies who seek government contracts must already comply with many standards, and establishing an ergonomics program could be considered another qualification for suppliers to meet. In the short term, the regulation only affects a small segment of the workforce, but would eventually expand to cover everyone under the proposed regulation. This alternative gives OSHA a chance to prove the effectiveness of its program before administering it to general industry.

Efficiency

This option is may cause some employers to argue whether they should be forced to comply. Many employers who contract with the U.S. government have several other operations that are not government jobs, which could cause confusion as to how to implement the procedures and where the companies' responsibility lies. Furthermore, as OSHA implements the program more broadly, employers may perceive it as a punishment.

Equity

This alternative may be unfair to contractors because they must act as the guinea pigs and bear the burden of more paperwork. Those who do not contract with the government have a short term advantage because they avoid the initial investment. Employees of small companies must wait longer for ergonomics programs and may experience additional injuries in the meantime.

Flexibility

The government contractors are somewhat varied, but mainly represent construction and manufacturing, making it more difficult to draw conclusions on the effectiveness of the regulation. OSHA could propose a revised regulation for each phase of the implementation, adjusting for new insights from the previous phase.

Implementability

This alternative is still a regulation that must follow the same procedure for approval as OSHA's general regulation. OSHA would still have central control over the regulation. There is also a legal issue as to whether OSHA has the power to single out employers. The contractors, labor groups, and legislators may all oppose this option.

<u>Alternative 3: Alter the regulation to make it more acceptable to the opposition</u>

There are several changes OSHA could make to the proposed regulation that would improve its political viability.

1. Developing voluntary guidelines for the construction, agriculture, and maritime industries would address OSHA's lack of coverage in these areas.
2. Increasing the number of reported WMSDs to two or more before enacting the regulation would address those that believe that a single WMSD does not indicate an

ergonomic problem.

3. Providing economic assistance to small entities for consultation and implementation and removing the worker's compensation language from the regulation would address concerns that the regulation would be too costly for some companies to implement.

Effectiveness

These changes do address the major arguments against the standard, but compromise its coverage. There is a possibility that the regulation may not make the impact it would have under a stronger provision.

Efficiency

The program is easier for companies to implement, but the benefits are fewer. These changes are less proactive and give fewer penalties for violation. However, if this standard passes, OSHA is successful in bringing the message of ergonomics to general industry.

Equity

This alternative does favor business demands in favor of labor groups, but it does give OSHA something to enforce. A specific regulation on ergonomics is more useful than trying to use the General Duty Clause. This option brings the main groups closer to consensus. However, it decreases coverage for employees.

Feasibility

This option is easier to accept initially, but OSHA will have to go through the entire regulatory process once again if there are any future changes.

Implentability

One of OSHA's goals with this regulation is to bring employers and employees together to discuss working conditions. These changes do not affect that goal. Individual companies may

still improve upon their programs and labor groups can still work to bring these changes about.

Recommendations

There are clear benefits from ergonomics programs, as shown in case studies of ergonomics programs throughout the country. The success of these programs depends on the uniqueness of the solution for the given problem. Creating a federal regulation to address all of the ergonomic problems that a company faces is difficult at best. It becomes even more difficult in light of the many conflicts and political arguments discussed above. Therefore, I have several suggestions that will help employers and employees to realize what they have to gain from embracing ergonomics.

1. NSPE should adapt this document to a policy statement indicating support for the science behind ergonomics. NSPE should inform its members about the benefits of ergonomics programs. The Workplace Safety subcommittee under the Legislative and Government Affairs Committee should investigate the market opportunities for engineers and the liability issues under the proposed regulation.
2. OSHA should publish its study on the effectiveness of ergonomic programs as soon as possible. It should include its own efforts in the automobile and meatpacking industries, as well as programs similar to the proposed regulation.
3. OSHA should promote its existing resources for ergonomics help, including guidelines, consultation services, training and education services.
4. OSHA should modify its record keeping procedures to improve tracking of MSDs and other cumulative disorders.
5. Congress should permit OSHA to continue working on the ergonomics regulation. Public forums on the standard are a better means to achieve effective regulation than

legislative action.

6. Safety professionals, ergonomists, and medical specialists should form a coalition to promote the evidence for existence of WMSDs and the benefits of ergonomics in the workplace. This may include organizations such as the Human Factors and Ergonomics Society, Institute of Industrial Engineers, the American Society of Safety Engineers, and the American Medical Association.
7. Labor unions should continue to encourage members to report discomfort at their jobs. This will help to increase awareness of the problems they face because of poor work design.

These actions, along with further research in the area of ergonomics and refinement of OSHA's proposed regulations will ensure the further decline in the number and severity of all types of injuries and illnesses in this country. Proper consideration of human factors principles will help to make the workplace a safer, more productive, and more comfortable place.

Appendix

Table 1: Nonfatal occupational illnesses by category of illness, private industry, 1993-97

	Number (000's)					Percent of total illness cases				
Category	1993	1994	1995	1996	**1997**	1993	1994	1995	1996	**1997**
Total illness cases	482.1	514.7	494.8	439	**429.8**	100	100	100	100	**100**
Skin diseases or disorders	60.2	65.7	64.2	58.1	**57.9**	12	13	13	13	**13**
Dust diseases of the lungs	2.7	2.7	2.7	3.5	**2.9**	1	1	1	1	**1**
Respiratory conditions due to toxic agents	24.2	25.3	24.4	21.7	**20.3**	5	5	5	5	**5**
Poisoning	7.6	7.2	7.5	4.8	**5.1**	2	1	2	1	**1**
Disorders due to physical agents	20.1	21.7	22.4	16.8	**16.6**	4	4	5	4	**4**
Disorders associated with repeated trauma	**302.4**	**332.1**	**308.2**	**281.1**	**276.6**	**63**	**65**	**62**	**64**	**64**
All other occupational illnesses	64.8	60	65.3	53	**50.6**	13	12	13	12	**12**

NOTE: Excludes farms with fewer than 11 employees.
Because of rounding, components may not add to totals.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor
OS TB 12/17/1998
http://stats.bls.gov/special.requests/ocwc/oshwc/osh/os/ostb0628.txt

Table 2: Number of nonfatal occupational illnesses by industry division and selected case types, 1997

Industry division	Total Cases	Total(1)	Lost workday cases		Total cases or disorders associated with repeated trauma
			With days away from work(2)	Cases without lost workdays	
Private industry(3)	429.8	183.6	86.9	246.2	276.6
Agriculture, forestry, and fishing(3)	-	2	1.5	-	1.4
Mining(4)	1.2	0.5	0.4	0.6	0.5
Construction	6.9	3.4	2.7	3.5	2.1
Manufacturing	259.3	116.6	40.7	142.8	198.6
Durable goods	164.8	67.9	27.2	96.9	121.9
Nondurable goods	94.5	48.7	13.5	45.8	76.7
Transportation and public utilities(4)	20.4	9.2	7.4	11.2	10.6
Wholesale and retail trade	43.8	21.3	12.7	22.5	23.1
Wholesale trade	12.9	6.2	4.3	6.6	7.2
Retail trade	30.9	15	8.4	15.9	15.9
Finance, insurance, and real estate	17.4	6.6	4.9	10.8	13.1
Services	75.2	24.1	16.7	51.1	27.1

1 Total lost workday cases involve days away from work, or days of restricted work activity, or both
2 Days-away-from-work cases include those which result in days away from work with or without restricted work activity.
3 Excludes farms with fewer than 11 employees.
4 Data conforming to OSHA definitions for mining operators in coal, metal, and nonmetal mining and for employers in railroad transportation are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor; and the Federal Railroad Administration, U.S. Department of Transportation. Independent mining contractors are excluded from the coal, metal, and nonmetal mining industries.

NOTE: Because of rounding, components may not add to totals.
- Indicates data not available.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor
OS NR 12/17/1998 News Release: Workplace injuries and illnesses in 1997
http://stats.bls.gov/special.requests/ocwc/oshwc/osh/os/osnr0007.txt

Table 3: Number of occupational injuries and illnesses (in 1,000s) involving time away from work by selected nature of injury and illness, 1993 - 1997

Type of Injury or Illness	1993	1994	1995	1996	1997
Sprains, strains	959.2	963.5	876.8	819.7	799
Bruises, contusions	211.2	212	192.1	174.9	165.8
Cuts, lacerations	169.9	164.6	153.2	133.2	133.6
Fractures	136.5	138.5	124.6	120.5	119.5
Heat burns	37.7	37.3	36.1	29	30
Carpal tunnel syndrome	41	38.3	31.5	29.9	29.2
Tendonitis	25	25.2	22.1	17.4	18
Chemical burns	15.7	16.5	13.9	11.6	12.2
Amputations	11.3	12.2	11.3	10.2	10.9
Total	2,252.60	2,236.60	2,040.90	1,880.50	1,833.40

Table 4: Injuries and Illnesses involving time away from work as a percentage of the total, 1993-1997

Type of Injury or Illness	1993	1994	1995	1996	1997
Sprains, strains	42.6%	43.1%	43.0%	43.6%	43.6%
Bruises, contusions	9.4%	9.5%	9.4%	9.3%	9.0%
Cuts, lacerations	7.5%	7.4%	7.5%	7.1%	7.3%
Fractures	6.1%	6.2%	6.1%	6.4%	6.5%
Heat burns	1.7%	1.7%	1.8%	1.5%	1.6%
Carpal tunnel syndrome	1.8%	1.7%	1.5%	1.6%	1.6%
Tendonitis	1.1%	1.1%	1.1%	0.9%	1.0%
Chemical burns	0.7%	0.7%	0.7%	0.6%	0.7%
Amputations	0.5%	0.5%	0.6%	0.5%	0.6%

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor
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