Public Interest Comment

The Occupational Safety And Health Administration's
Proposed Ergonomics Program Standard[1]

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of regulations and their impacts on society. As part of its mission, RSP produces careful and independent analyses of agency rulemaking proposals from the perspective of the public interest. Thus, the program's comments on the Occupational Safety and Health Administration's proposed ergonomics program standard do not represent the views of any particular affected party or special interest group, but are designed to protect the interests of American citizens.

RSP analyzed OSHA's draft standard in June 1999. That analysis formed the basis for a monograph, published by the National Legal Center for the Public Interest, which reviewed the proposed standard that OSHA published in November 1999.[2] Rather than repeating the important issues raised there, we have enclosed the monograph, and urge OSHA to consider the recommendations made therein. The analysis provided here is intended to supplement our earlier comments. It focuses on the economic analysis OSHA prepared for the proposal and the benefits and costs the rule may be expected to confer on American citizens.

This comment first summarizes OSHA's proposed ergonomics program standard, and reviews the concerns raised in RSP's earlier work, that neither scientific knowledge nor market experience support the proposed approach. Sections III and IV examine OSHA's estimates of the benefits and costs of the proposal and highlight key assumptions underlying those estimates. These sections also examine the sensitivity of OSHA's benefits and costs to these key assumptions to develop a range of plausible benefit and cost estimates. This analysis reveals that key OSHA assumptions are seriously flawed. The resulting estimated net benefit figure of $4.9 billion per year is very sensitive to the assumptions in OSHA's economic analysis, and plausible alternative assumptions suggest that the rule would actually impose significant net *costs* on Americans of as much as $11.9 billion per year. Based on this analysis, RSP recommends that OSHA reject its proposed approach in favor of alternatives that address the fundamental reasons for MSDs in the workplace – lack of information on their causes and remedies.

I.   OSHA's Proposed Standard Would Require a Six-Element Ergonomics Program.

The goal of OSHA's proposed ergonomics program rule is to "address the significant risk of work-related musculoskeletal disorders (MSDs) confronting employees in various jobs in general

---

[1] Prepared by Susan E. Dudley, Senior Research Fellow, and Hayden G. Bryan, Consulting Economist, Regulatory Studies Program, Mercatus Center, George Mason University.

[2] Regulatory Studies Program, Mercatus Center, George Mason University, Susan E. Dudley and Diana Rowen, "Overstressing Business: OSHA and Ergonomics," *Briefly… Perspectives on Legislation, Regulation, and Litigation*, James V. Delong, ed. National Legal Center for the Public Interest. Vol. 3, Number 10. (1999).

industry workplaces."[3] It would apply to all industries except the construction, agriculture, and maritime industries. OSHA proposes a "tiered" approach, which would require employers whose employees are engaged in manual handling or manufacturing operations to implement a "basic program." If an "OSHA recordable MSD" were identified at any establishment (whether or not it involves manual handling or manufacturing jobs), it would trigger a "full program."

The full ergonomics program comprises six elements, as described in Table 1.

For establishments with manual handling or manufacturing jobs that have not experienced an OSHA recordable MSD, the basic program entails only the first two of these six elements. The proposal also offers a "quick fix" exception to the full program requirement, if an employer can "eliminate MSD hazards" by implementing controls that are effective within 120 days after the MSD is identified, and remain effective for 36 months. If the quick fix controls are effective, the employer would not have to implement a full ergonomics program.

OSHA defines MSDs as "[i]njuries and disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs." It lists 12 examples of MSDs:

1. Carpal tunnel syndrome;
2. Rotator cuff syndrome;
3. De Quervain's disease;
4. Trigger finger;
5. Tarsal tunnel syndrome;
6. Sciatica;
7. Epicondylitis;
8. Tendinitis;
9. Raynaud's phenomenon;
10. Carpet layers knee;
11. Herniated spinal disc;
12. Low back pain.

Inquiries to OSHA reveal that it has no description or definition of these conditions. Nonetheless, Appendix 2 of the enclosed monograph attempts to identify and describe common MSDs, and offer possible causes, and commonly recommended preventive measures and treatments.

OSHA also lists the following symptoms that indicate an employee may be developing an MSD. These include:

1. Numbness;
2. Burning;
3. Pain;
4. Tingling;
5. Cramping; and
6. Stiffness.

An MSD is an OSHA recordable MSD when "exposure at work caused or contributed to the MSD or aggravated a pre-existing MSD," and results in either a diagnosis by a health care practitioner, a positive physical finding, or a symptom (as listed above) combined with medical treatment, lost work day, restricted work activity, or transfer or rotation to another job**.**

---

[3] Preamble to proposed rule, 64 FR 65768.

Table 1: OSHA's Six-Element Ergonomics Program

Management leadership and employee participation:	Employees must have means to report problems, and must be involved in hazard analysis and control. Managers must be informed that they have responsibilities. Someone must be the point person to respond to problems. Communications with employees must be established.
Hazard identification and information:	There must be a system for employees to report signs and symptoms of MSDs. Reports must be checked. Records must be reviewed for indications of hazards. Employees must be informed of hazards.
Job hazard analysis and control:	Problem jobs must be analyzed and MSD hazards eliminated or controlled to the extent feasible.[4] Jobs that are similar to the problem job must also be analyzed, and the ergonomics program extended to them. In controlling the hazards, engineering controls are the preferred method, followed by work practice and administrative controls. Any combination may be used. Personal protective equipment may be used to supplement other controls. It may not be used alone unless other approaches are not feasible. Engineering controls include modifications in work stations, tools, equipment, materials, or processes. Administrative controls include employee rotation, changing the task, or changing the pace. The definition of work practice controls is "procedures and methods for safe work," as exemplified by training in proper postures or appropriate tools, or "employer-authorized micro breaks."
Training:	Employees in problem jobs and their supervisors must receive training at least every three years.
MSD management:	Any employee with an MSD must be provided with access to prompt and effective evaluation, treatment and follow-up by health care providers. MSD management also includes any work restrictions recommended by the health care provider. All must be supplied at no cost to the employee. Work restrictions must be provided until the employee recovers, the job is re-engineered, or six months have passed. Workers on restricted duty must receive full pay; workers removed from the workplace must receive 90 percent of full pay. Both must get full benefits. Workers' compensation payments can be deducted.
Program evaluation:	The program must be evaluated at least every three years, based on specific measures of activities and outcomes.

---

[4] The meaning of "feasible" in OSHA rules is *not* necessarily "practical" or "reasonable." In previous rulings, the word has been interpreted to mean all measures short of actually bankrupting the employer. *See, e.g.*, International Union, UAW v. OSHA, 938 F.2d 1310, 1317 (D.C. Cir. 1991).

II. Neither Scientific Knowledge nor Market Experience Justify the Proposed Approach.

As discussed in the enclosed monograph, OSHA's evidence supports the conclusion that employers and employees already have strong incentives to provide protection against MSD hazards. OSHA's analysis suggests that MSDs impose very large costs on employers and workers. It also notes that many employers are taking voluntary initiatives to reduce MSDs, and in fact—BLS statistics reveal that MSDs are declining, lending empirical support to the expectation that market incentives will drive a decline in these disorders. The great hindrance to employer efforts to reduce MSDs is not lack of motivation or willingness, but lack of knowledge about the causes of and solutions to MSDs. Yet, lack of knowledge is not addressed at all by OSHA's regulatory approach. Instead, the proposal would mandate certain procedural activities without either contributing to the body of knowledge about the causes and solutions for MSDs or reducing the uncertainties that permeate the field.[5]

Ergonomic injuries have been declining since 1994, primarily due to reforms in state workers' compensation programs and industry initiatives (driven by accident costs, and better information on workplace remedies).[6] In its notice of proposed rulemaking, for example, OSHA relies upon a report from a U.S. General Accounting Office study of voluntary programs to bolster its case for regulation:

> The General Accounting Office found that successful programs were based on a core set of elements: management commitment and employee involvement, identification of problem jobs, development of solutions, training and education, and medical management. Programs based on these elements showed reductions in injuries, illnesses, lost work days, and associated worker compensation costs. Qualitative evidence from these case studies showed improvements in worker morale, productivity and product quality.[7]

While the GAO report offers evidence that *voluntary* programs are rational and cost-effective, it does not follow that mandatory requirements on all of general industry will be cost-effective. In fact, the GAO concludes:

> Our work also found that these facilities' programs included all of the core elements highlighted in the literature and by experts as key to an effective program–management commitment, employee involvement, identification of problem jobs, analyzing and developing controls for problem jobs, training and education, and medical management–*with the elements customized to account for local conditions*. Uncertainties continue to exist about particular aspects of MSDs that may complicate regulatory action

---

[5] See enclosed NLCPI *Briefly…* for a fuller discussion.
[6] Hugh Conway & Jens Svenson, "Occupational Injury and Illness Rates, 1992-1996: Why They Fell, *Monthly Labor Review,* Nov. 1996, at 36-58.
[7] 64 FR 65874.

by OSHA, and *our analysis does not allow us to draw any conclusions about whether a standard for MSDs is merited* [emphasis added].[8]

In drafting its notice of rulemaking, OSHA has cited many cases of successful ergonomic interventions for MSD injuries in the private sector. These too, however, are examples of voluntary initiatives in cases where specific types of interventions made economic sense at that site and at that time given the information available to management, workers, and their consultants. These same interventions may not be practical under all circumstances.

Mistakenly, OSHA relies on examples of voluntary programs "customized to local conditions" to support the need for centrally directed solutions. The agency uses proof of the functioning of the market in producing economically sound and cost-effective solutions to support a regulation that may not be economically feasible for all firms in general industry.

Cost as well as effectiveness will dictate a variety of solutions for problem jobs, yet variety is not fostered in a regulatory or legalistic environment. The need for conformity will eventually drive the ergonomics rule to limited numbers of solutions. In fact, OSHA has already previewed its concerns in this regard. In discussing the possibility of other programs approved outside the proposed rule, OSHA notes:

> [Not permitting them] will also avoid the administrative and compliance problems that would arise if OSHA permitted employers to establish programs that differ from the one in the standard even after the effective date.[9]

Moreover, this tendency toward on-size-fits-all, no doubt, eventually will affect even those ergonomics programs grandfathered-in by the proposed rule.

III. OSHA's Benefit Estimates Benefits are Very Sensitive to Key Assumptions and Significantly Overstate Most Likely Benefits.

OSHA has prepared a preliminary economic analysis (EA) to estimate the benefits and costs of implementing the proposed ergonomics program rule. The EA provides a point estimate of the average annual benefits ($9.1 billion) and costs ($4.2 billion) of the proposal over the next ten years. These estimates are based on assumptions about the number of cases expected over the period and the benefits and costs of controlling those cases.

To test the sensitivity of those point estimates presented by OSHA, we have carefully reviewed the underlying analysis and assumptions. Where available information permitted, we have substituted what we consider more plausible assumptions, and we conducted sensitivity analysis on those assumptions. This evaluation and sensitivity analysis has produced a range for both costs and benefits, as well as best estimates[10] of the benefits and costs of implementing the ergonomics program standard which differ significantly from OSHA's.

---

[8] GAO, p. 41.
[9] 64 FR 65792.
[10] "Best estimate" refers to the most likely outcome.

A. Review of OSHA's approach

OSHA assumes that the annualized benefits of its proposed ergonomics program standard over the next 10 years will be $9.1 billion per year.[11] This benefit estimate actually reflects OSHA's estimates of MSD-related *costs* that would be avoided by the rule. OSHA does not estimate the benefits (or avoided costs) associated with individual program elements required by the rule, but rather assumes that the rule will eliminate over 3 million MSDs over 10 years at an avoided cost of $22,546 per MSD.[12]

Thus, the two key components of OSHA's benefit estimate are (1) number of workplace MSDs avoided by the rule and (2) the value per MSD avoided. To estimate the potential effectiveness of an ergonomics regulation at eliminating workplace MSDs, OSHA has relied on case studies and success rates from actual ergonomics programs and workplace interventions. Its benefits analysis assumes approximately 1.9 million workplace MSDs per year in the absence of the rule. This figure would decline each year as a result of the rule, giving a 26 percent reduction in cases (or over 3 million MSDs) over 10 years of implementation.

OSHA derives the $22,546 per MSD figure by summing four categories of avoided cost: lost production, medical costs, insurance administration costs, and indirect costs. Each of these four components is based on an estimate that the average workers' compensation claim for an MSD is $8,000.[13]

- OSHA's estimate of the **lost production category** of benefits from the proposed regulation includes

    (1) the value of workers' compensation indemnity payments (61.5 percent of the $8,000);

    (2) the difference between the value of the indemnity payments and the worker's after-tax income, based on studies comparing workers' compensation payments with after-tax income;

    (3) the estimated value of taxes, based on the typical value of taxes as a percentage of after-tax income (30 percent); and

---

[11] OSHA estimates $69.6 billion over 10 years by simply summing expected annual avoided costs in each year. It then calculates an annualized cost ($9.1 billion) using a discount factor that it reports is based on a discount rate of 7 percent per year.

[12] A more informative approach would be to examine the incremental benefits of each component of the rule, because that would identify for policy-makers and the public which components are expected to offer net benefits, and which are not.

[13] OSHA, "Preliminary Economic and Regulatory Flexibility Analysis," (EA) Chapter IV. OSHA bases this $8,000 figure on Webster and Snook, 1994, who used data from 1989 for both low back pain-related injuries and upper extremity repetitive strain injuries. Barbara S. Webster, BSPT, and Stover H. Snook, Ph.D., "The Cost of Compensable Upper Extremity Cumulative Trauma Disorders," JOM 36, Number 7, July 1994. (OSHA Docket No. S777, Ex. 26-1286).

---

(4) the value of fringe benefits, based on data on employer costs for employee compensation (39 percent of pre-tax income).[14] OSHA estimates lost productivity to be $14,763 per MSD.

- **Medical costs** are the medical share of payments paid out by workers' compensation, which OSHA estimates at 31.5 percent of $8,000, or $3,080 per MSD claim.

- The agency estimates the **administrative cost** for insurers to administer claims would be 23.4 percent of the total value of claims, or $1,872 per MSD claim.

- **Indirect costs** are the costs of work-related injuries that are borne by employers but not included in workers' compensation costs, including sick leave for periods shorter than the workers' compensation waiting period, losses in productivity for other workers, losses in production associated with the injured worker's return to work, and administrative costs other than those borne directly by the workers' compensation insurer. Based on a study of the indirect costs of injuries in the construction industry, OSHA estimates that these costs constitute 35.4 percent of the value of workers' compensation claims or $2,832 per MSD.

B. RSP's lower bound estimate recognizes that MSDs are declining in the absence of OSHA's ergonomics program requirements.

A key variable in OSHA's estimate is the number of MSDs prevented by the rule, which depends on OSHA's assumptions regarding the baseline rate of MSDs in each SIC group, and the effectiveness of the proposed program rule at reducing those MSDs. OSHA implicitly assumes that, in the absence of its mandatory program standard, employers would undertake no further actions to reduce MSDs, and the level of MSDs would remain at the level reflected in 1996 BLS statistics. Yet, this contradicts the evidence OSHA presents throughout the preamble that voluntary efforts have reduced, and continue to reduce, MSDs in the workplace.

It also contradicts Bureau of Labor Statistics (BLS) data, which reveal that reported MSDs (using "repeat motion and over-exertion illness and injuries" as a proxy) have declined from 705,800 in 1994 to 626,000 in 1997 – an average decline of close to 4 percent per year. This decline probably reflects an increased attention on the part of employers to MSDs, as well as increased awareness as to their possible causes and remedies. As more information on ergonomic solutions becomes available, we would expect to see a continued decline in reported MSDs in the absence of the proposed rule.

Because it ignores the declining trend in MSDs, OSHA's baseline for the benefits analysis is likely to overstate the incidence of future MSDs in the absence of a standard.

Interestingly, OSHA predicts that the rule will reduce MSDs at an average rate of less than 3 percent per year (ranging from 7 percent in the first year to 1 percent in later years). This is a slower rate of decline than the historic trend. Reported MSDs have declined on average 4 percent per year since 1994, and they declined 3.2 percent between 1996 and 1997. If we assume that the market-induced decline in MSDs continues at 3 percent per year, which is slower

---

[14] OSHA, "Preliminary Economic and Regulatory Flexibility Analysis," Chapter IV, p. 11.

than the rate observed since 1994, the market-based solution to resolving MSDs appears *more* effective than OSHA's regulatory solution.

These statistics reinforce our earlier observation that market forces are more likely to respond effectively to the legitimate and real costs of MSDs than OSHA's proposed program rule. They suggest that, while the program rule could impose significant costs (discussed in the next section), it is unlikely to produce any benefits beyond those that will occur without the rule, as employers and employees respond to market incentives.

Therefore, our lower bound, and best estimate, of the gross benefits of the program rule (over and above the benefits one would observe in the absence of the rule) is zero.

C. RSP's upper bound estimate reflects sensitivity analysis on the number of MSDs and value per case.

Projecting a decline in the rate of MSDs absent OSHA intervention is admittedly uncertain (though no more uncertain than predicting a decline with OSHA intervention). While our assumption that current trends will continue (at a slower rate) is more realistic than OSHA's assumption that we would see no further progress at reducing the incidence of MSDs absent the rule, for the upper bound of our sensitivity analysis we have accepted OSHA's assumption that baseline rates will remain at 1996 levels. However, OSHA's benefit estimate is still sensitive to other assumptions, which we address in this section.

OSHA estimates that for every MSD avoided by the rule, society will save $22,546. This figure is OSHA's estimate of the full cost of MSDs that are serious enough to warrant workers' compensation benefits. It then applies the $22,546 figure to an estimated number of MSDs that is three times the number of MSDs actually reported as resulting in a lost day of work in 1996.

Because OSHA's benefit estimate depends on its assumptions regarding (1) number of cases that will be avoided, and (2) the costs avoided per case, we examine its sensitivity to those assumptions.

1. Increased reporting under the rule could reflect two situations.

OSHA assumes for both its benefit and cost analyses that the reported incidence of MSDs that result in lost days of work (as reported in BLS surveys – 647,000 in 1996 and 626,000 in 1997) understates the actual rate of MSDs in the workplace. It adjusts the 1996 rate by a factor of three, which reflects the ratio of total workplace illnesses and injuries to workplace illnesses and injuries that result in a lost day of work. In making this adjustment, OSHA recognizes that the number of MSDs affected by the rule will greater than the figure reported to BLS for several reasons. MSDs that do not result in any lost work will be reported and monitored. Also, OSHA believes that MSDs are currently underreported,[15] and that the rule will encourage reporting.

---

[15] OSHA's support for the notion that MSDs are underreported, however, depends heavily on data from the early 1980s, and the reporting of MSDs has increased exponentially since then.

In our cost and benefit estimates, we assume that OSHA's estimate of approximately 1.9 million MSDs is correct. We distinguish between two types of errors in MSD reporting, however. The first type, which we will call "false negative reports," occurs currently, when legitimate workplace MSDs go unreported. The second type, which we will call "false positive reports," occur when non-workplace MSDs or non-MSDs are reported as workplace MSDs.

For its benefit-cost analysis, OSHA implicitly assumes that current reporting of workplace MSDs (as captured in BLS statistics) reflects a significant amount of the first type of error, false negatives. Its benefit and cost analyses implicitly assume that false negative reports are the reason that BLS statistics are under-reported by a factor of 3. It also predicts that the proposed ergonomics rule, which will facilitate and encourage action to reduce MSDs (regardless of whether they are reported as having lost days of work), will correct for this error.

What OSHA does not consider in its analysis is that the program standard will also increase the other type of reporting errors – false positives. The increase in false positive reports could also be significant, due to the language of the rule:

- The rule defines OSHA-recordable MSDs broadly. For example, if shoveling snow on a weekend caused some pain or stiffness, those symptoms would be an OSHA recordable MSD if a job "aggravated" them and they resulted in restricted work activity.[16]

- The current checks on fraudulent reports (implicit in the workers' compensation system) will be largely eliminated. Employers, faced with a broad definition of MSDs, and a prohibition against "policies or practices that discourage employees from reporting MSDs signs or symptoms,"[17] would find it difficult to distinguish legitimate MSDs from false claims.

- As the economic consequences of developing an MSD are reduced, employees may become more careless and take less individual responsibility to avoid motions and activities that could lead to lost days of work and (in the absence of the rule) lost pay.

The concept of different types of errors has implications for both the costs and benefits of the proposal. On the cost side, if false positive reports are as significant as false negative reports (and OSHA's estimate of the percentage of false negative errors is correct), we would expect to see an additional 67 percent increase in the costs of the proposal. On the other hand, while correcting for false negatives will result in social benefits (because previously unreported workplace MSDs will be addressed), expenditures on false positives will not. (At best, they would result in transfers from employers and consumers to the employees who receive the benefits required by the rule.)

We attempt to correct for OSHA's neglect of the possibility of false positives in our benefit and cost estimates. We have no information on the likely magnitude of each type of error. It is possible that the 1.2 million MSDs that OSHA assumes currently go unreported in the BLS data all reflect false negative reports, or that some of them reflect false positives. If they all reflected false negatives (i.e., they are real workplace MSDs that, for various reasons discussed in the preamble and RIA, have not to date been reported as resulting in at least one lost day of work),

---

[16] Proposed rule, 64 FR 66077.
[17] *Ibid.* 64 FR 66070.

then we would expect an additional increase in reporting as a result of false positive reports elicited by the rule. This would increase the cost of the rule.

For our sensitivity analysis, we assume that OSHA's estimated three-fold increase in reporting reflects both a correction of false negative reporting errors and an increase in false positive reporting errors. We have no data with which to distinguish between the two in our benefits analysis.[18] For simplicity, we assume that half of OSHA's estimated 200 percent increase reflects reporting of workplace MSDs (as opposed to non-workplace MSDs or non-MSDs). In other words, we estimate a 100 percent increase in reporting of MSDs (over 1996 BLS statistics) upon implementation of the rule, due to correction of false negatives. This would suggest 1.2 million reported cases per year.

It is this 1.2 million figure that we use to derive our upper bound estimate of benefits. We assume that OSHA's prediction that reported MSDs will increase by a factor of three is correct, and that this factor reflects both (1) a reduction in false negatives and (2) an increase in false positives, in equal amounts. We do not attribute benefits to what we have labeled false positive reporting errors.

2. OSHA's value per case overstates average values.

The expected value per case avoided depends on the number and severity of cases that will be controlled under the rule. While there is no doubt that finding and fixing MSDs that have previously gone unreported has value, it is unlikely that the average value of those previously unknown MSDs is $22,546 per case, as OSHA assumes. Indeed, this value per case is about equal to average annual income in the United States.[19] Thus, OSHA suggests that experiencing an MSD (which, as defined, could be muscle pain or stiffness) is equivalent to losing a whole year of work. To understand why OSHA's estimated value per case seems so high, we examined the assumptions and data behind it.

OSHA's approach of estimating the gross income of employees who cannot work due to an MSD as a proxy for lost productivity appears reasonable. This value, as well as the other values

---

[18] We did examine a study OSHA cites of workers' compensation claims, which found that for every ten percent increase in benefits, the number of workers' compensation claims increased by seven percent and the duration of claims increased by 16.8 percent. (Alan B. Krueger, "Incentive Effects on Workers' Compensation Insurance," *Journal of Public Economics*, 41 (1990), pp. 73-99.) One could assume that, due to the checks and balances implicit in the workers' compensation system, and based on OSHA's review of studies that indicate a small degree of fraudulent reporting on the part of employees in such claims, this percentage increase reflects a correction for false negatives. Data in OSHA's cost analysis suggest that the work restriction protection benefits offered by the rule would provide a 37 percent increase in wages over the indemnity portion of workers' compensation programs. Applying the 0.7 elasticity figure to this percentage increase implies that 26 percent more MSDs would be reported as a result of the increased compensation offered by the rule. If this reflects the universe of false negative reporting errors that would be eliminated by the proposal, it suggests a total universe of 815 thousand MSDs per year. This approach to distinguishing between workplace MSDs and non-workplace MSDs or non-MSDs is appealing because it is based on observed behavior in the workplace, however it may understate the frequency of false negative errors in the current system.

[19] The $22,546 is based on a 1989 study of workers' compensation claims. Mean income (total wages and salaries divided by total employed) in 1989 was roughly $25,200 (i.e., $2.65 trillion in 1989 wages and salaries payments divided by 105.2 million employed in 1989).

OSHA combines to estimate total costs of $22,546 per MSD, all hinge on an average worker compensation claim of $8,000. This figure is from a 1994 study by Webster and Snook.[20] Webster and Snook examined claims handled by Liberty Mutual Insurance Company in 45 states for upper extremity cumulative trauma disorders in 1989. They excluded claims not requiring medical or indemnity payments. They found that the mean cost per case for these upper extremity cumulative trauma disorders was $8,070, however, they noted that the median cost per case was only $824. They observe:

> The large discrepancy between the mean and median indicates that upper extremity cumulative trauma costs are not evenly distributed, i.e., a few cases account for most of the costs. In this study, 25% of the cases accounted for 89% of the costs.[21]

The workers' compensation system currently focuses on the more severe workplace injuries, and these data illustrate that of those, the $8,000 mean is dominated by the few most expensive cases. Seventy-five percent of the claims in the sample had mean costs of $2,690 – or one-third of the mean OSHA uses, and fifty percent of the claims cost less than $824 – one tenth of OSHA's estimate.

Even if the 6,067 workers' compensation cases covered by the study accurately reflect the distribution of costs associated with the 626,000 cases that are currently reported to BLS, the mean cost of one end of the distribution would not accurately reflect the mean costs associated with the larger number of MSDs that would benefit from the rule.[22] Extrapolating the Webster and Snook distribution to the larger number of MSDs suggests that the mean will likely be even lower than the median observed in the sample. Because the ultimate distribution of MSDs that may benefit from the rule is uncertain, however, we conservatively use a mean of $3,000 (which is higher than the mean of 75 percent of the Webster and Snook sample) for our sensitivity analysis.

3. RSP's Upper Bound Benefit Estimate

To be conservative in our benefits estimate, we substitute the $3,000 per case mean workers' compensation figure in OSHA's calculations, to estimate a value per MSD avoided of $8,455. Note that this figure accepts all of OSHA's other assumptions with which we might take issue in a more detailed analysis.[23] Applying this to our estimate of 1.2 million MSDs per year, and

---

[20] Webster & Snook, *ibid.*

[21] *Ibid.* p. 714.

[22] Two-thirds of OSHA's estimated cases, and one-half of ours, are not currently reported as missing a single day of work. It is not plausible that avoiding these cases will offer the same benefits as avoiding cases serious enough to receive the highest workers' compensation claims.

[23] To calculate the $22,546 figure, OSHA assumes that indirect costs to employers associated with filing workers' compensation claims and insurance and public costs of administering contribute 35.4 percent and 23.4 percent, respectively to the avoided costs. OSHA's assumption that indirect costs add another 35.4 percent is based on a study conducted of the construction industry, which is not subject to this rule. One might expect very different estimates of indirect costs, particularly in percentage terms, if workers' compensation claims in the construction industry are higher or lower than the claims expected due to MSDs, or if productivity and other indirect costs are not comparable across industries. We have no basis for altering these percentage figures; however, we question

relying on OSHA's assumptions regarding the effectiveness of the program at reducing those MSDs, we derive an annualized upper bound benefit estimate of $2.3 billion.

D. Conclusion–OSHA's Estimate Overstates Likely Benefits.

Our adjustments reveal that OSHA's estimate of $9.1 billion per year in benefits is very sensitive to two questionable assumptions. Simply recognizing that current trends induced by market forces will continue to reduce MSDs in the absence of this program rule suggests no incremental benefits from the rule. Thus, our best estimate of the benefits for the proposed program rule is zero. For our upper bound estimate, we accept OSHA's assumption of no further decline in MSDs in the absence of OSHA rulemaking, but alter assumptions regarding the nature of increased reporting, and the appropriate value per case, to derive an annualized benefit of $2.3 billion, or less than one-third of OSHA's estimate.

OSHA notes that its benefit estimate does not take into account the avoided pain and suffering that reducing workplace MSDs would achieve. This is true; however, other variables are also missing from this analysis. Not factored into this sensitivity analysis, and not considered by OSHA, are the opportunity costs of the regulation. The rule requirements will divert capital expenditures and management skills and time to dealing with regulators and away from productivity-enhancing endeavors, including controlling costs and effectively managing injuries of all types. For example, considering that OSHA will require fixes for "same jobs" in the same establishment once an MSD occurs (on an average of six for one injury), the use of the "one MSD trigger" under the full program essentially means the correction of problems that do not exist for many workers. This requirement alone will reduce the net benefits ascribed by OSHA simply through the diversion of resources from other uses and thereby reduce productivity.

IV. OSHA's Estimates of the Costs of the Proposal are Very Sensitive to Key Assumptions and Likely to Understate True Social Costs.

OSHA estimates that 5.9 million establishments, employing 93 million workers, would potentially be covered by the rule. Of these 93 million workers, 11.7 million are engaged in manufacturing and 10.4 million perform manual handling operations. OSHA estimates that 1.9 million establishments would be required to implement the full program in the first year that the standard is in effect, and address 7.7 million jobs. It estimates annual compliance costs to employers to be $4.2 billion, or $900 per establishment and $150 per job fixed. OSHA's estimated total annualized cost to society is $3.4 billion. The difference between social cost and employer cost is that OSHA estimates that $875 million in costs would be transferred from employees, who are currently paying for injuries in the form of lost wages, to employers, who would pay under the work restriction protection provision of the standard.

This section first summarizes OSHA's approach to estimating the costs of the proposed ergonomics program rule, examines the assumptions behind OSHA's element-by-element cost analysis, and offers plausible alternative assumptions to determine the sensitivity of OSHA's

---

their validity, and note that these two components comprise over 20 percent of the total benefits OSHA attributes to the proposed rule.

total cost estimate to key variables. We provide a range of costs, and our own best estimate of the likely costs of the proposal.

A. Summary of OSHA's Element-by-Element Approach.

OSHA estimates the total costs of the proposal by calculating the cost of each provision on an industry-by-industry basis for over 300 three-digit SIC industry groups. This involves four steps: (1) determining the applicability of different components of the rule to different portions of general industry; (2) determining the number of employees and/or establishments in each portion of the industry to which each component of the rule would apply; (3) estimating the unit costs of each provision of the rule per affected establishment or employee; and (4) multiplying the estimated unit costs of each provision by the number of affected employees or establishments to which the provision would apply.

The agency assumes (1) employers required to do so will implement full programs (including the job control provisions of the proposal) by the end of year one; (2) employers will continue to implement full programs for two years instead of the three years required by the proposed standard before they can resume the basic program; and (3) all covered establishments will fully comply with the standard but will not implement programs that go beyond the program required by the proposal. OSHA makes these simplifications for both its cost and benefit calculation.

OSHA's cost estimates reflect annualized costs over a ten-year period, reported in real 1996 dollars.[24] Both costs and benefits are measured assuming that the affected industries are as they are today: OSHA notes that the analysis does not account for any changes in the economy over time, possible adjustments in the demand and supply of goods, changes in production methods, investment effects, or the macroeconomic effects of the standard.

The analysis also assumes that the number of MSDs occurring in the absence of the rule would remain at 1996 levels (which OSHA assumes is roughly three times the BLS figure of 647,000) over the next ten years.[25] OSHA assumes that 25 percent of problem jobs could be addressed using what the rule calls a "quick fix."   The quick fix estimate was based on the judgement of the OSHA ergonomics advisory panel based on their experience with voluntary programs.

OSHA relies on responses from a 1993 OSHA ergonomics survey of thousands of general industry employers to estimate the extent to which establishments within the scope of the standard already have implemented ergonomics programs involving the control of jobs. This current industry baseline was taken into account in calculating industry-by-industry cost estimates. Costs were calculated at the 3-digit SIC code level for all industries in order to account for differences among industries in terms of wage rates, turnover, baseline rates of compliance, and MSD rates.

---

[24] This annualized figure is calculated using the standard OMB discount rate of 7 percent.
[25] While OSHA had access to 1997 figures that showed a three percent decline from 1996, its analysis uses 1996 figures because the detailed breakdown necessary for the analysis was not available for the 1997 data.

B. OSHA's Cost Estimate is Sensitive to Key Assumptions.

OSHA's cost estimates are sensitive to assumptions regarding the unit costs of individual provisions of the rule, and the number of MSDs or establishments to which each provision would apply. To examine how sensitive the total cost estimate is to key assumptions, we substitute plausible alternative assumptions regarding the resource requirements reasonably expected under the circumstances faced by the establishments being regulated.

The following sections review the types of costs identified by OSHA and then measure how sensitive those costs are to changes in assumptions. This sensitivity analysis substitutes plausible assumptions in an attempt to reflect not only what we know about markets in general but also the other information currently available in the government statistics. We assume, as OSHA does, that firms will comply with the requirements imposed by the rule. For each element, we present our conservative best estimate of likely costs, as well as lower and upper bounds. Table 3 of this comment presents a table, patterned after Table V-1 of OSHA's Preliminary Economic Analysis, which compares OSHA's and RSP's assumptions and results.

1. Baseline MSDs and Quick Fixes

As it does in the benefit analysis, OSHA assumes that, in the absence of this regulation, employers would undertake no actions to reduce MSDs, and the level of MSDs would remain at the level reflected in 1996 BLS statistics (increased by a factor of three to account for those that go unreported as lost-workday injuries to BLS). This assumption regarding the baseline level of MSDs is inconsistent with observed historical trends and the evidence OSHA has presented on successful voluntary efforts to reduce workplace MSDs. As more information on ergonomic solutions to workplace becomes available, we would expect to see a continued decline in reported MSDs in the absence of the proposed rule.

By ignoring the declining trend in MSDs, OSHA's baseline is likely to overstate the incidence of future MSDs in the absence of a standard, and overstate the costs of the standard. Assuming a continued decline of 3 percent per year over the 10-year time frame used in OSHA's analysis, as we did in our benefit analysis, results in a 24 percent decline in MSDs in the absence of the rule. Interestingly, this is consistent with OSHA's estimate that 25 percent of problem jobs can be remedied at little or no cost, under the "quick fix" option allowed by the rule. It is reasonable to assume that these obvious fixes would be made voluntarily without OSHA requirements.

As we did in our benefit calculations, therefore, our lower bound and best estimates of the cost of the ergonomics program rule reflect a continued decline in workplace MSDs of 3 percent per year. This is consistent with OSHA's assumption that addressing one-quarter of all problem jobs will impose little, if any, costs attributable to the rule.[26]

---

[26] OSHA assumes that employers will avoid employee training and program evaluation costs for MSDs that can be eliminated with the quick fix option.

2. Familiarization with the OSHA Requirement

OSHA assumes that all establishments in general industry would have to understand the standard's requirements, and determine whether they applied. It estimates this category as the time (labor costs) required to review the standard and determine whether any jobs could be classified by the rule as a "job with a musculoskeletal disorder." The agency estimates that each establishment (5.9 million) would invest one hour to become familiar with the rule, and determine whether the requirements of the rule apply. OSHA's "Preliminary Economic Analysis" puts those costs at $25 million dollars on an annualized basis.

The rule proposed by OSHA covers 20 pages of fine print in the *Federal Register*, and the full notice occupies 312 pages. Even at a relatively fast pace of three minutes per page, reading just the rule would take a full hour. Reading the whole notice would take over 15 hours. If our own efforts to read and understand the proposed standard are any indication, the amount of time required would be closer to 32 hours. This does not include the time required to review the workplace to determine whether any potential MSDs were present. Furthermore, outside legal or ergonomic advice might be required at a cost of at least $125 per hour.[27] The participants in the advisory panel jointly established by OSHA and the U.S. Small Business Administration suggested that 40-60 hours would be needed for familiarization.[28]

For our sensitivity analysis, we assume that, on average, establishments would invest at least 4 hours (for our lower bound) and as much as 32 hours (for our upper bound) to understand the requirements of the rule and determine their applicability. To be conservative, our best estimate is 8 hours per establishment. This results in a range for the familiarization requirement of between $100 million and $800 million. Our best estimate is $200 million on an annualized basis.[29]

3. Investigate Whether MSDs are Covered by Standards

OSHA's cost estimate also includes the requirement that establishments with manufacturing or manual handling jobs, and other general industry establishments that have identified an MSD evaluate MSDs to determine whether they are covered MSDs, as defined by the standard. It assumes this investigation will require 15 minutes of manager time, and 15 minutes of employee time per *recordable* MSD, and that the total annualized cost will be $83 million.

---

[27] The SBREFA panel created by OSHA and the Small Business Administration (SBA) raised the need for outside consultants. "Report of the Small Business Advocacy Review Panel on the Draft Proposed Ergonomics Program Rule," April 1999, p. 10. The hourly cost figure for a consultant is from OSHA, "Preliminary Economic Analysis," Chapter 5, p. 9.

[28] OSHA has made clarifications to the rule in response to the panel's concerns, which OSHA believes "will make the extensive review envisioned unnecessary. The Agency also plans to have expert system software available on-line to aid employers in following the standard when it becomes effective." EA, Chapter 5, p. 6.

[29] Note that this, like all OSHA's costs, is an annualized cost. The actual first year cost would be significantly higher. For example, reading and understanding the rule in-house at 8 hours per firm alone would cost $2.8 billion the first year.

This may understate the frequency of the investigation, if the universe of MSDs that require examination is larger than the universe that is recordable under OSHA's definition. Also, while there may be some MSDs that require no more than 15 minutes of attention to determine whether they are recordable MSDs, there may be many that take more than that. For our sensitivity analysis, we attempt to account for both these uncertainties by using OSHA's estimate of 15 minutes for each recordable MSD as the lower bound cost; 30 minutes per MSD as a best estimate; and 1 hour per MSD as an upper bound. Our resulting cost estimates for the approximately 2 million establishments that OSHA predicts will be subject to this requirement range from $83 million to $332 million, with a best estimate of $166 million.

4. Establishing the Basic Program

All general industry establishments with manufacturing operations or manual handling jobs, and all general industry establishments in which an MSD is reported would be required to implement at least the basic program. The basic program would involve management and employee time for program implementation, including allocation of resources, establishing an employee reporting system, and providing employees with information on MSD symptoms and hazards.

OSHA assumes that the basic program will only involve internal personnel costs. The Economic Analysis assumes that implementing the basic program will involve minimal effort for each firm; initially only one hour would be needed to assign responsibilities and provide basic instructions, two hours for managerial training, one hour for developing an MSD reporting system, and one-half hour each for a manager and employee to provide information on MSD hazards and symptoms. OSHA assigns no costs for training materials, outside expert opinion or consultation within the establishment.[30]

The agency estimates the aggregate cost for this phase would be $107 million on an annualized basis. In contrast, the U.S. Small Business Administration estimates that the cost of establishing OSHA's basic program would be $8.45 billion (or higher).[31]

We expect that the rule would involve more resources for establishing the new program, enlisting outside expertise, and acquiring materials, as detailed below. Our low estimate reflects no costs for ergonomics expertise in the basic program, but our best estimate assumes that 20 percent of firms with manufacturing and manual handling will engage an outside consultant. Our upper bound assumes that half of firms with MSDs will engage an outside consultant. The resulting cost for the basic program ranges from $142 million to $526 million, with a best estimate of $264 million, on an annualized basis.

---

[30] The report of the *Small Business Regulatory Enforcement Fairness Act* advisory panel constituted from the business community suggested that outside consultants might be required at all phases of the process of complying with the standard. Small Business Administration (SBA), "Report of the Small Business Advocacy Review Panel on the Draft Ergonomics Program Rule," April 1999, p. 10.

[31] Small Business Administration, "Analysis of OSHA's Data Underlying the Proposed Ergonomics Standard and Possible Alternatives Discussed by the SBREFA Panel," Prepared by Policy Planning & Evaluation, Inc. September 22, 1999, p. 14.

Table 2: Basic Program Sensitivity analysis

Provision	Resource Required	RSP Sensitivity Analysis		
		Low	Best	High
Implement initial program	1 manager-hour	1 manager-hr	1 manager-hr	2 manager-hr
Provide Manager Training	2 manager-hours	2 manager-hr	3 manager-hr	4 manager-hr
Set up Reporting System	1 manager-hour	2 manager-hr	4 manager-hr	6 manager-hr
Provide Employee Information	.5 employee hour .5 manager-hour	.5 emp-hr .5 mgr-hr	.5 emp-hr .5 mgr-hr	.5 emp-hr .5 mgr-hr
Engage Ergonomist	0	0	20% mfrg. & manual handling	50% firms w/ MSDs
Training materials	0	$10/firm	$10/firm	$10/firm

5. Full Program

An employee report of an OSHA-recordable MSD triggers implementation of a "full program." If exposure at work either causes or contributes to an MSD, or if exposure at work aggravates a pre-existing MSD, then the MSD is as an OSHA-recordable MSD under the proposed rules.[32] The full program includes training for managers, training for employees, job hazard analysis, evaluation of appropriate job controls, management of MSDs, record keeping, program evaluation, and work restriction protection to prevent further injury.

We discuss OSHA's assumptions and our sensitivity for each element of the full program below. As discussed earlier, our lower bound and best cost estimates assume a declining rate of MSDs in the absence of the rule, which would lower costs relative to OSHA's baseline. Over the ten-year period, this is equivalent to OSHA's assumption that 25 percent of problem jobs would be addressed using what the rule calls "quick fixes." In other words, we assume that these obvious fixes are reflected in the declining baseline, and recognize that they would occur in the absence of the rule. For our upper bound, however, we accept OSHA's assumption that no MSDs would be reduced absent the rule, but we reject its assumption that quick fixes would eliminate 25 percent of cases as a result of the rule.[33]

a) Training for Managers

OSHA assumes that each affected establishment would provide one manager with 16 hours of training that would enable this person to understand the key elements of an ergonomics program. It estimates this training will cost $121 million on an annualized basis.

Given the complexity of understanding the causes of and cures for MSDs, managers may require more than 2 days of training. In addition, ergonomics experts and training materials are likely to

---

[32] CFR Part 1904.

[33] Specifically, for our upper bound, we adjust our estimates upward to reflect the lack of quick fixes in the employee training and program evaluation elements.

be required to train the managers, and OSHA has included no costs for these.[34] For purposes of our sensitivity analysis, we accept OSHA's estimate of 16 hours for one manager as the lower bound. For our best estimate and upper bound we assume that trainers and/or training materials will add 50 percent to the cost of training managers. This suggests that the cost of this component could range from $121 million to $182 million, with a best estimate of $182 million.

b) Training for Employees

The OSHA analysis estimates that employee training can be accomplished in one hour. Such training would be required for all employees working in problem jobs. To estimate the costs of employee training, the agency multiplies the cost of one hour of employee time by the number of affected employees. It assumes that one manager would provide the necessary training to all employees in the establishment's problem jobs in a single class, and that two hours of the manager's time would be required. The agency's aggregate annualized estimate for the employees' time cost of training is $136 million. The estimate for the manager's time is $11 million.

OSHA's estimate for the actual time spent in training may be reasonable, but some firms have difficulties in halting operations for training, multiple locations, multiple languages, or several shifts; and many will experience lost productivity surrounding training sessions. For our sensitivity analysis, we assume employees would incur an additional quarter-hour to account for movement to training and other sources of unproductive time associated with the training. It is also very plausible that managers' time to conduct the training would exceed two hours. For our lower bound, we assume that for every two hours devoted to training, managers incur an additional half-hour in unproductive time. For our best and upper bound estimates we assume managers must spend four hours in training, to account for multiple training sessions, etc. We have not added any costs for training materials, though they may be required. Under these alternative assumptions, employee training costs are $170 million in our lower bound and best case, and $227 in our upper bound.[35] The manager costs range from $14 million to $22 million, with a best estimate of $22 million (annualized).

c) Job Hazard Analysis and Job Control Evaluation

Job hazard analysis involves identifying the activities and conditions in problem jobs and determining the elements in that job that may cause, contribute to, or aggravate an MSD. This portion of the standard's requirements does not include the cost of remediating the condition that may be causing the problem. OSHA's cost estimate for job hazard analysis and job control evaluation is $454 million.[36] This assumes that 50 percent of all problem jobs would require four hours of employee time and two hours of supervisor time. Another 35 percent would require 16 hours of employee time, eight hours of supervisor's time, and eight hours of an ergonomics manager's time. The most difficult 15 percent would require the expertise of an

---

[34] SBA, *ibid*.

[35] The upper bound employee training cost assumes no declining baseline, and no quick fixes.

[36] Though OSHA separates the job hazard analysis element from the job control evaluation element in its assumptions table (V-1 of the EA), it does not present separate cost estimates for these.

ergonomics consultant, and involve 32 hours of employee time, 16 hours each from a supervisor and ergonomics manager, and 16 hours from an ergonomics consultant. This 15 percent estimate is the mid-point of a range provided by one of OSHA's ergonomic consultants, who estimated that professional ergonomists would be required for 5 to 25 percent of problem jobs.

OSHA's reliance on the mid-point of a range offered by one consultant makes the validity of the resulting estimate highly uncertain. There are several reasons to expect that OSHA's assumptions regarding the time and expertise involved in job hazard analysis and control may be underestimated. The Small Entity Representative (SERs) on the SBREFA panel suggested that some level of ergonomic expertise would be required at all phases of the program including the job hazard analysis and control process. According to the SBREFA report:

> "Many SERs were concerned that small firms would need to make use of expensive outside consultants in all phases of the program, from program set-up to hazard analysis to control."[37]

Further, the more difficult problem jobs will likely be the focus under the proposed standard. The experience of firms in voluntary programs and that of consulting ergonomists with voluntary programs are likely to understate costs in a mandatory program. In estimating costs for the mandatory MSD-reducing investments, whether labor or capital outlays, it is important to recognize that the easy solutions have been adopted already. Individual employees, their supervisors, and management in general will have found the easy solutions, whatever they may be, given the circumstances faced by each job and by each firm, simply because firms and their employees have economic and personal incentives to do so.

Thus, it is reasonable to expect that the cost of job hazard analysis and controls evaluation would include a greater participation by ergonomic specialists than the scenario posited by OSHA's consultant.[38] For our sensitivity analysis, we accept OSHA's estimates of the amount of time required to respond to easy, moderate, and difficult jobs, but we adjust the percentages of jobs that would fall into each category. Our lower bound is identical to OSHA's assumption (i.e., 50, 35 and 15 percent of jobs falling into the easy, moderate, and difficult control categories, respectively). For our upper bound, we assume that the upper bound of the consultant's range (25 percent of firms) must hire an ergonomist, and that 25 percent fall in OSHA's easy category, and 50 percent in the moderate category. For our best estimate we use percentages of 30 percent, 50 percent, and 20 percent, respectively, for the easy, moderate, and difficult job categories.[39]

The resulting cost for job hazard analysis and job control evaluation ranges from $454 million to $924 million, with a best estimate of $597 million.

---

[37] Small Business Administration (SBA), "Report of the Small Business Advocacy Review Panel on the Draft Ergonomics Program Rule," April 1999, p. 10.

[38] On a related issue, the cost of consultants has been estimated by OSHA to be about $2000 for 16 hours. While past experience is the basis for this estimate, no analysis should assume that the price for certified ergonomists would remain the same given the increased demand for their skills should the OSHA rule be adopted.

[39] Table V-5 of the EA presents the portion of OSHA's estimated $454 million attributable to ergonomists, ergonomics program managers, supervisors and employees. From this, and the hours assumed for each in Table V-7, we backed out the average per hour cost assumed for each of these, and used these to derive our estimates.

d) MSD Management

OSHA assumes that one hour of managerial time (ergonomist, team leader, safety or health professional) will be required to manage each individual MSD covered by the rule. Since most managers are already familiar with MSD management issues, OSHA believes that the actual administrative and managerial work associated with current MSDs will be one hour per MSD. OSHA puts the annualized national cost at $83 million.

The rule requires that managers, supervisors and employees be "held accountable for meeting their responsibilities," and "communicate periodically with employees about the program and their concerns with MSDs." This is an open-ended requirement, which would require managers to be responsive to employees concerns, and not "discourage employees from participating in the program or from reporting MSD signs or symptoms." As a result, it is unlikely that one hour of managerial time per MSD would protect an employer from charges that it was not adequately responsive or from litigation over whether it had met its obligations under the "management leadership and employee participation" element of the rule.

We accept OSHA's one-hour estimate for our lower bound, but substitute 1.5 hours and 2 hours of a manager's time per MSD for our best estimate and upper bound. This suggests a range of $83 million to $166 million, with a best estimate of $125 million.

e) Record Keeping

Firms larger than ten employees must keep the following records:

1. employee reports of MSDs, episodes of persistent symptoms and responses to those reports;

2. results of job hazard analyses;

3. hazard control records;

4. quick fix records;

5. ergonomic program evaluations; and

6. MSD management records.

OSHA assumes that it will take 15 minutes of a supervisory worker's time to handle these various records for each covered MSD reported. We test the sensitivity of this assumption by substituting 10 minutes for our lower bound estimate, accepting OSHA's 15 minutes in our best estimate, and substituting 30 minutes in our upper bound. Thus, our best estimate of $7 million is the same as OSHA's, but our lower bound estimate is $5 million, and our upper bound is $14 million.

f) Program Review

Workplaces with full programs are required to review their programs periodically (at least every three years) to ensure compliance with the standard. OSHA believes that this will take four hours of management time every year in establishments whose problem jobs cannot be fixed

through the quick fix option, and impose an annualized cost of $16 million. Our sensitivity analysis uses these assumptions.

g) Job Interventions

"Job interventions" must eliminate or materially reduce MSD hazards identified in the workplace. These may involve administrative changes or investments in new equipment or tools. Examples include use of power tools, lift tables, or wrist rests; movement of work surfaces closer to the worker; enlargement of jobs to increase variation in tasks; and providing short breaks. Establishments whose employees experience MSDs that are covered by the standard are required to institute controls for the problem job held by the injured employee as well as for other jobs in the establishment that involve the same physical activities or conditions, and to implement all feasible controls until the hazard is materially reduced.

OSHA anticipates general industry would incur $2.3 billion in annualized costs to comply with the job control requirement. This is a net cost, because OSHA assumes employers will achieve improved productivity with job controls that will provide offsetting savings to the costs of job control. The agency estimates productivity improvements from the job will amount to approximately $1.3 billion in annualized savings. OSHA argues that many ergonomic interventions improve productivity by relieving employee pain or because they involve automating portions of jobs in ways that can be expected to improve productivity.

A panel of three ergonomics consultants estimated the cost of implementing controls for problem jobs for each of 26 occupational groups. OSHA's economic analysis relies on the average of the three estimates for each group, multiplied by the number of MSDs expected in each group. Its estimate of gross annualized job control costs (without taking into account the offsetting effects of increased productivity) is $3.6 billion.

OSHA recognizes in the EA that "the job control cost estimates made by individual ergonomists sometimes varied substantially for the specific groups." In fact, EA Table V-11 reveals that estimates for some occupational groups were as low as 35 percent of OSHA's reported mean, or as high as 190 percent of the reported mean (used in OSHA's analysis). While OSHA notes that the individual consultant estimates averaged across all groups "were within 31 percent of each other," this is somewhat misleading.[40] It hides the fact that, on average, the lowest consultant estimate was 63 percent of the OSHA-reported average, and the high estimate was 145 percent. Our sensitivity analysis explicitly incorporates the range of estimates offered by OSHA's consultants, so that while our best estimate of job control cost matches OSHA's, our lower bound reflects only 63 percent of those costs, and our upper bound reflects 145 percent.

Neither OSHA's rule nor supporting documents make clear whether the costs estimated by the panel reflect just one control per problem job or several, although it appears that the costs reflect

---

[40] OSHA's 31 percent was derived by averaging each consultants estimates across all groups first, and comparing those averages across consultants. Because each consultant estimated higher than average costs in some groups and lower than average costs for others, this mathematical approach understates the variance in the estimates. We estimate an 82 percent range by first calculating the difference between the high and low consultant estimate and the mean, and then averaging those differences.

an assumption that one control will suffice to fix each problem job. The language of the proposed rule implies an open-ended requirement to experiment with controls until a job is fixed. If the first job fix doesn't work, an employer "must implement additional feasible controls to materially reduce the hazard further," and "must continue this incremental abatement process" as long as "other feasible controls are available" (1910.922). Such a requirement would be particularly costly in view of the need to control an average of 6.5 jobs for every MSD that develops. Some industries that have significant amounts of manual handling, for example, could be making repetitive fixes in large numbers.[41] Because the assumptions underlying OSHA's cost estimate are not transparent, we do not attempt to correct for the possibility that OSHA assumed only one job control per MSD in our lower bound or best estimate. We conservatively assume that 1.4 job controls are required to fix a problem job, on average, in our upper bound. Thus, we estimate that gross job control costs could range from $2.3 billion to $7.3 billion.

OSHA cites case studies of voluntary programs as evidence that job controls will result in significant productivity savings. To quantify these savings for each of the 26 occupation groups, it relies on scenarios prepared by OSHA as part of its technological feasibility analysis. However, OSHA's expert ergonomics panel rejected the controls in those scenarios as being more high-tech and expensive than would be necessary to fix job hazards, so OSHA has not used the cost estimates from this analysis. OSHA does use the *cost savings* from these high-tech controls to estimate productivity savings, which are then used to offset the *lower* costs developed by the expert panel of the low-tech controls assumed in this analysis. Specifically, OSHA uses the ratio of productivity savings to control cost (for the controls it rejected as too expensive) to estimate the productivity savings attributable to simpler controls. This ratio suggests that on average, OSHA expects that 36 percent of the costs of implementing job controls would be offset by increased productivity.

It seems doubtful that lower-cost, lower-technology job interventions will be as productivity-enhancing as more expensive, higher-technology controls which might involve more automation, etc. In fact, many of the controls envisioned by OSHA (carrying less heavy loads, and increasing the duration or frequency of break time) are more likely to decrease than increase productivity. We, therefore, conduct some sensitivity analysis on these estimated productivity savings. For our lower bound estimate, we apply OSHA's estimate of 36 percent productivity savings to our lower bound gross control cost of $2.3 billion to derive an estimate of $1.45 billion. For our best estimate, we assume that productivity gains would, on average, be offset by productivity losses, and assign a zero value to productivity savings to derive an annualized net cost of $3.6 billion. Our upper bound estimate of $7.3 billion also attributes no productivity savings to job controls.

---

[41] One industry group, Food Distributors International, asked for a consulting report on the cost of modifying its member's 800 distribution centers. The consultant's report provided cost estimates ranging from $1.2 to $26 billion. The most likely cost was estimated to be $5 billion for the membership of this trade association that represents only a small portion of one three-digit SIC group. Despite multiple fixes projected for this industry, the industry itself does not believe that the technology to totally eliminate MSDs is currently available. See Prime Consulting Group, inc., "The Economics of Compliance with the Proposed OSHA Ergonomics Program Standards: An Industry Analysis for Food Distributors," Food Distributors International, Government Relations Department, November 1999.

h) Work Restriction Protection (WRP)

Under the proposed standard, OSHA requires employers to provide temporary work restrictions for workers with MSD injuries when they are deemed necessary by management or are recommended by a health care professional. While on the WRP program, the employer must maintain the employee's current net take-home pay (90 percent of net take-home pay if the worker is absent from work) and benefits for a maximum of six months. OSHA states that although the costs of WRP are a cost to employers, they are not an additional cost to society, since employees are already bearing these costs. Thus, it does not include the estimated $876 million for WRP in the total costs to society of the rule.

OSHA bases its estimate of the cost of WRP on the average value of workers' compensation claims for MSDs from Webster and Snook. As discussed in the benefits section of this comment, the mean figure of $8,000, on which benefits and WRP costs are based, is likely to overstate the mean workers' compensation cost for the broader range of MSDs addressed by the rule. As in our benefits calculations, therefore, we adjust this figure to $3,000 to reflect a more likely mean for the larger distribution of cases.

OSHA adjusts its workers' compensation figure to account for the portion of the $8,000 that provides for indemnity (versus medical payments), and the fraction of workers' compensation claims that cover temporary disability for 6 months or more. It then adjusts this amount upward to reflect the fact that, under WRP, unlike some workers' compensation, employees would be eligible for up to 90 percent salary and full benefits. This results in an estimate of WRP costs of $1,884 per case. Substituting the lower workers' compensation figure of $3,000, but accepting all of OSHA's other assumptions, this would be $707 per case.

OSHA assumes that "most cases requiring WRP will be covered by workers' compensation"[42] and that individuals receiving WRP payments will be compensated first by workers' compensation. Thus employers will have to pay only the increment over and above workers' compensation payments necessary to offer the employee 90 percent of wages and full benefits. The economic analysis attributes no cost to the workers' compensation portion of WRP payments, implicitly assuming no increase in workers' compensation costs due to an increase in "OSHA recordable injuries" caused by the rule. Thus, it derives an average cost per WRP of $877 per case.

We conduct some sensitivity analysis on OSHA's implicit assumption that all WRP cases would be receiving workers' compensation benefits in the absence of the rule. Based on our lower value of $707 per case, we use OSHA's ratios and estimate a workers' compensation share of $469 per case, and an employer share of $238 per case. OSHA reports that 69 percent of OSHA recordable injuries receive workers' compensation.[43] For our lower bound estimate, we apply that 69 percent to OSHA's total estimated number of MSDs resulting in WRP (998 thousand cases), and assume the cost for that fraction of cases is only the employee share of $238. The remaining 31 percent of cases would either be new to the workers' compensation system or

---

[42] EA Chapter 5.
[43] This is based on one study of workers' compensation in the state of Wisconsin, and may not be robust nationwide.

would not receive workers' compensation payments, and thus the incremental cost attributable to this rule would be the full $707 per case.

For our best estimate, we assume that only those cases reported as having lost at least one day of work would be eligible for workers' compensation indemnity payments in the absence of the rule. We apply the 69 percent to the 626,000 reported lost-workday MSDs reported to the BLS in 1997.[44] That fraction of total cases would cost $238 per case, while the remainder would cost $707 per case. While it is very possible that even fewer of these currently-reported 626,000 MSDs are currently receiving workers' compensation, we have no data on which to base further sensitivity analysis, so we use the same assumption for the upper bound. Thus, our estimated annualized cost for WRP ranges from $383 million to $500 million, with a best estimate of $500 million. Due to our correction of OSHA's extrapolation of the statistical mean from the Webster and Snook study, this range is less than OSHA's estimate of $876 million.

C. OSHA's Cost Estimate Is Likely to Understate True Social Costs.

Substituting alternative plausible assumptions for those relied on by OSHA, our sensitivity analysis suggests that the annualized total cost for the ergonomics program rule is likely to range from $3.0 billion to $11.0 billion. Our best estimate of the annualized cost of the rule is $5.8 billion. OSHA estimates total employer costs at $4.2 billion (which is within this range, though at the lower end) but argues that the cost of the work restriction program would simply be transfers from employers and consumers to employees, and thus, not a social cost. In fact, there are likely to be some real, dead-weight losses even in the WRP costs, particularly if false positives are significant. Nevertheless, if we accept OSHA's suggestion that the WRP costs all reflect transfers, we estimate social costs ranging from $2.6 billion to $10.3 billion with a best estimate of $5.3 billion. Since this estimate takes as given the framework and many of the assumptions inherent in OSHA's methodology, it should still be considered a rough estimate of expected actual costs.

Certain industries have attempted to estimate costs by examining the types of responses the rule would elicit, including the job controls that would have to be implemented to meet OSHA's goal of eliminating or materially reducing MSDs. The most notable of these studies was conducted by members of the food distribution industry, which estimated that costs would range from $1.2 billion, just to analyze job hazards in the industry, to $26 billion, if changes in equipment were necessitated for compliance.[45] This range is in sharp contrast to OSHA's estimated $72 million in annualized cost for the SIC code of which these establishments represent a small component.

---

[44] These injuries are not defined as MSDs, per se, but as "repeat motion and over-exertion illness and injuries."
[45] Food Distributors International, *ibid.*

Table 3: Comparison of OSHA and RSP Cost Estimates

Element	Sensitivity	OSHA's Estimate ($mil)	RSP Estimate ($mil)		
			Lower Bound	Best Estimate	Upper Bound
Baseline	For lower and best, assume 3% decline in MSDs without rule. No quick fixes caused by rule.				
Familiarization	More time required.	$ 25	$ 100	$ 200	$ 800
Investigate MSDs	More time required.	$ 83	$ 83	$ 166	$ 332
BASIC PROGRAM		**$ 107**	**$ 142**	**$ 264**	**$ 526**
Initial Program	More time required (U.B. only)	$ 15	$ 15	$ 15	$ 30
Manager Training	More time required.	$ 30	$ 30	$ 45	$ 60
Set up Reporting	More time required.	$ 15	$ 30	$ 60	$ 90
Employee Information	No change.	$ 47	$ 47	$ 47	$ 47
Engage Ergonomist	20% of manufacturing & manual handling firms (Best) and 50% of firms with MSDs (U.B.)	$ -	$ -	$ 77	$ 279
Training Materials	$10 per establishment	$ -	$ 20	$ 20	$ 20
FULL PROGRAM		**$ 4,008**	**$2.697**	**$5,218**	**$ 9,358**
Manager Training	Non-labor costs (U.B. only)	$ 121	$ 121	$ 182	$ 182
Employee Training	More time required.	$ 136	$ 170	$ 170	$227
Mgr. Trainer	More time required.	$ 11	$ 14	$ 22	$ 22
Job Hazard Analysis & Evaluation	Adjust percentages of "easy," "moderate," and "difficult" evaluations	$ 454	$ 454	$ 597	$924
MSD Management	More time required.	$ 83	$ 83	$ 125	$ 166
Record keeping	Less time required.	$ 7	$ 5	$ 7	$ 14
Program Evaluation	No change.	$ 16	$ 16	$ 16	$ 16
Gross Job Controls	Use range of OSHA's consultants.	$ 3,600	$2,268	$3,600	$7,308
Productivity savings	Use OSHA's percentage for L.B., half percentage for best case, and no savings for U.B.	$(1,296)	$ (816)	-	-
Work Restriction	Reduce mean worker's comp. cost. Explicitly account for employer and workers' comp. shares.	$ 876	$ 383	$500	$ 500
TOTAL COSTS		**$4,223**	**$3,022**	**$5,848**	**$11,016**

V. OSHA Should Address Key Questions Before Proceeding.

Our public interest comment on the draft program rule posed seven key questions that OSHA should address before proceeding with the rulemaking. We repeat those questions here, and strongly encourage OSHA to address them explicitly before moving forward with a final ergonomics program regulation.

1. What Market Failure Is OSHA Attempting to Remedy?

Regulatory actions that do not explicitly address market failures or systematic problems underlying the need for action, are bound to be less effective than actions that do. In the absence of a significant and generalized market failure that affects all firms within the ambit of the regulatory proposal, private solutions are likely to be more effective and socially beneficial than government actions. Therefore, OSHA must address the following questions:

- Why would private markets not be expected to respond appropriately to ergonomic hazards in the workplace?

- What significant externalities prevent profit-maximizing employers and utility-maximizing employees from achieving a socially optimal level of ergonomics protection?

2. Why Is a Federal Role Preferable to Private or State Actions?

Another axiom of our governmental system is that, except when necessary to guarantee rights of national citizenship or to avoid significant burdens on interstate commerce, effective public policy is most likely to evolve when individual states and communities are free to experiment with a variety of approaches than from a federal mandate that assumes that there is one best way. OSHA should have the information to answer the following:

- What role do state workers' compensation programs play in providing employers' incentives to mitigate ergonomic hazards?

- How will federal involvement affect those incentives?

- Since information on the causes and most effective remedies for MSDs is limited and sometimes conflicting, can state and private actions better target specific circumstances?

- What net benefits can federal actions offer over private and more local government initiatives?

3. What Alternative Approaches Could Meet OSHA's Goals?

Considering the above questions:

- What alternatives to OSHA's one-size-fits-all approach would provide more flexibility, be more adaptive to changing information, and encourage innovation to meet OSHA's objective of reducing the number and severity of MSDs?

- Which alternatives most effectively target the fundamental market cause of the problem? For example, if employer lack of knowledge on the cause of MSDs and how to address them inhibits remedies, what alternatives might facilitate the sharing of successful experiences and dissemination of new research?

- Could OSHA do more to reduce the risk of MSDs by facilitating continued research and disseminating the results of that research and experience to all employers?

- Would non-binding guidance targeted to sectors where certain MSDs are prevalent achieve the desired goals?

- How would "feasible" be defined—would cost-effectiveness criteria be more appropriate?

4. Do Reliable Estimates of Benefits and Costs Justify the Proposed Approach?

- How sensitive are estimated costs and benefits to key assumptions?

- What are the costs and benefits of viable alternatives?

- How does recognizing that MSDs will decline without the rule, if employers and employees are allowed to respond to existing incentives, such as workers' compensation costs and lost productivity affect OSHA's cost and benefit estimates?

5. Does Available Science and Technical Information Support the Proposal?

- What information does OSHA have on the prevalence of MSDs, as defined by the proposal?

- Is the definition supported by research that distinguishes work-related MSDs from non-work-related MSDs?

- Does available information support OSHA's hierarchy of control measures for all MSDs?

- Are the medical management provisions in the proposal justified by available information for all the symptoms covered by the draft?

6. What Are the Distributional Effects of the Proposal?

- Could the rule lead to discrimination against workers perceived to be more likely to have or to report an MSD, as the Small Business Advocacy Review Panel suggested?

- Would small businesses bear a greater proportionate burden associated with hazard identification and work restrictions?

- Would lower-wage workers suffer at the expense of high-wage workers?

7. How Will the Proposal Affect Employer and Employee Incentives and Individual Responsibility?

- What incentives do different elements provide employers and employees?

- Would the program trigger false reports of MSDs? How will it influence individuals' incentives to avoid non-workplace activities that might result in MSDs?

- How will employers distinguish legitimate work-related injuries from non-work-related injuries?

- How might the standard influence individual responsibility for safety in the workplace?

- Could the requirement that all known hazards trigger an ergonomics program reduce employer incentives to study and identify hazards in advance of an employee report?

VI. Conclusions and Recommendations

A. Private Incentives Are Driving Employer Efforts to Reduce MSDs.

Recognizing that MSDs impose real costs on employers and employees, OSHA has proposed a rule that would mandate the establishment of ergonomics programs to eliminate or control MSD hazards. However, OSHA's approach fails to address the fundamental problem of MSDs in the workplace, lack of information on causation and on viable, cost-effective solutions.

As discussed extensively in the enclosed Mercatus monograph, the costs associated with MSDs are real, but they are already being internalized by the private sector. OSHA offeres no evidence that employers and employees do not have adequate incentives to provide the optimal level of workplace protection against MSD hazards. On the contrary, OSHA provides evidence that (1) MSDs impose significant costs on employers, which should offer ample incentives to reduce their occurrence, (2) employers are, in fact, developing programs and other initiatives to reduce MSDs, and (3) MSDs are declining.

Lack of knowledge on the causes of and remedies for MSDs, not lack of motivation, has hindered efforts to reduce MSDs. Yet, lack of information is not addressed at all by OSHA's regulatory approach. Instead, OSHA's proposal mandates certain procedural activities without contributing to the body of knowledge about the causes of and solutions to work-related MSDs. This improper targeting of federal regulatory efforts is aggravated by OSHA's definitions of MSDs and ergonomic risks. They are so broad that employers are likely to be held liable for injuries or symptoms that are out of their control, such as muscle aches or injuries resulting from non-work-related activities.

B. OSHA's Proposal is Likely to Impose Significant Net Costs on Employers, Workers, and Society.

OSHA estimates that its proposed ergonomics program rule will produce net benefits of $4.9 billion per year. This is based on an annualized cost estimate of $4.2 billion, and an annualized benefit estimate of $9.1 billion. Our sensitivity analysis suggests that the rule would produce annualized benefits ranging from $0 to $2.3 billion, and that annualized costs, conservatively estimated, could range from $3.0 billion to $11.0 billion. This suggests that the rule is likely to impose annualized net costs of $3 billion to $8.7 billion.[46] Our best (or most likely) estimate is that the rule will impose annualized net costs of $5.8 billion.

OSHA's benefit estimates assume, unrealistically, that market incentives will not encourage any further progress in reducing MSDs in the absence of the rule. In fact, MSDs, as reported in BLS statistics, have declined at a faster rate since 1994, driven purely by market forces, than OSHA predicts they will decline over the next decade with its extensive rule. If present trends continue, market forces are likely to produce better results than OSHA's proposal. Thus, our best estimate of the benefits of the rule over and above market forces is zero. Our upper bound estimate assumes that OSHA is correct that, in the absence of the rule, MSDs will remain at present levels, but adjusts the basis for OSHA's valuation of avoided MSDs and distinguishes between false negative and false positive reports of MSDs.

Our analysis reveals that OSHA's cost estimates are also very sensitive to key assumptions OSHA used. While we make no claim to precision in our range of between $3.0 billion and $11.0 billion in costs, we believe a range better reflects the uncertainty in expected costs than OSHA's point estimate. Further, this range relies on OSHA's methodology, and offers transparent, careful, and conservative modifications to OSHA's assumptions. Even this range is likely to understate true social costs, particularly the costs associated with the job control and worker restriction program elements of the proposed program standard. Our conservative best estimate of $5.8 billion in *net* social costs is more robust than OSHA's because it takes into account the effect of market forces, and more accurately interprets available evidence and statistics.

It is important to recognize that these costs are over and above any benefits expected from the rule, and that regulatory costs themselves affect public health. Implementation of these rules will make goods and services more expensive, causing disposable family income to decline. A mounting body of research indicates that serious health problems arise when a family's living standards decline. Whenever government actions reduce real family income levels, noted Supreme Court Justice Stephen Breyer, "that deprivation of real income itself has adverse health

---

[46] We estimate the range of net benefits by subtracting upper bound costs from upper bound benefits, and lower bound costs from lower bound benefits, because the assumptions for the upper and lower bound scenarios differ. (In other words, it would not be appropriate to deduct upper bound costs from lower bound benefits, since the baseline assumptions underlying those estimates are not comparable.)

effects, in the form of poorer diet, more heart attacks, ..."[47] Costly government regulations adversely affect productivity, which in turn dampens real income.[48]

Studies linking income and mortality find that every $15 million decline in income induces one statistical death.[49] Using this $15 million income-health relationship, OSHA's estimate (of $3.2 billion in social costs) would imply an increase in mortality of over 213 deaths each year. Our estimates suggest that the effect of this costly program could be as high as 733 deaths per year.

The result that the proposal will impose net costs is not surprising given the evidence that market forces already offer ample motivation to employers and employees to respond effectively to MSD hazards, and the fact that OSHA's proposal would not address the remaining problem of insufficient information on the causes and remedies for some disorders. Several considerations suggest that the net costs of this rule could be even greater than our revised estimates predict: (1) much of the effort required by this rule would go toward fixing problems that do not exist at individual workstations; (2) the benefits lost from the misdirection of talent and money will be considerable in view of the large number of establishments affected; (3) the number of jobs eliminated through substitution of capital for labor, or the closing of firms unable to comply, are not considered in the OSHA benefits calculation; (4) in some cases, MSD injuries would not be eliminated as rapidly as under the voluntary scenario due to the focus on the centralized direction implied by this regulation; and (5) many of the solutions implemented under centralized direction would be inappropriate and lacking benefits given the current understanding of the causes of MSD injuries.

C. OSHA Would Do More to Reduce the Risk of MSDs by Facilitating Research and Disseminating Knowledge.

Employers already have strong incentives to reduce MSDs, so OSHA's mandates to do so are, at best, redundant. More likely, the procedural requirements and hierarchy of control measures will discourage individual responsibility and hinder innovation into creative solutions. MSDs have declined in recent years, as high worker's compensation claims and a growing awareness among employees and employers have fueled ergonomics programs at many companies.[50] This is, in turn, stimulating research into the causes of MSDs, as well as leading to an explosion of ergonomic consultants.

Rather than mandating that all workplaces adopt a specified, generic framework, OSHA could do more to reduce the risk of MSDs by facilitating continued research and disseminating the results

---

[47] Stephen Breyer, *Breaking the Vicious Circle--Toward Effective Risk Regulation* (Cambridge, Mass: Harvard University Press, 1993), p. 23.

[48] See, for example, estimates of the adverse effect on GDP attributable to the 1990 Clean Air Act amendments in Dale Jorgenson and Peter J. Wilcoxen, "Impact of Environmental Legislation on U.S. Economic Growth, Investment, and Capital Costs," in *U.S. Environmental Policy and Economic Growth: How Do We Fare?* (Washington, DC: American Council for Capital Formation, 1992).

[49] Randall Lutter, John F. Morrall, III, and W. Kip Viscusi, "The Cost-Per-Life-Saved Cutoff for Safety-Enhancing Regulations", Economic Inquiry, Vol. 37, No. 4. 599-608, (October 1999). See also, Lutter & Morrall. *Journal of Risk and Uncertainty*, 8:43-66 (1994) and Keeney. "Mortality Risks Induced by Economic Expenditures," *Risk Analysis* 10(1), 147-159 (1990).

[50] Conway & Svenson, *Ibid.* at 36-58.

of that research and experience to all employers. Several states are experimenting with guidelines and standards to address these injuries, and OSHA could track and, possibly, report on those efforts.

OSHA could also make valuable contributions to the state of knowledge by developing a more reliable database on the nature and extent of MSDs, including a baseline of the current level of MSDs (work- and non-work-related) and the amount and types of ergonomic activity, including remedies, currently being undertaken by employers. Such a database could offer valuable insights into the causes of, and effectiveness of solutions to, MSDs, and provide valuable information about how to remedy problems. It would also allow OSHA and employers to target real workplace problems, rather than attempt to address the all-encompassing list of symptoms covered by the definition in the proposal.

Appendix I

RSP Checklist

OSHA's Proposed Ergonomics Program Standard

Element	Agency Approach	RSP Comments
1. Has the agency identified a significant market failure?	OSHA objective is "to address the significant risk of work-related musculo-skeletal disorders (MSDs) confronting employees in various jobs in general industry workplaces." **Unsatisfactory**	OSHA offers no evidence that employers and employees do not have adequate incentives to provide workplace protection against MSD hazards. In response to high costs (workers compensation costs and lost productivity), employers are taking initiatives to reduce MSDs.
2. Has the agency identified an appropriate federal role?	The proposed standard defines ergonomics program elements that all affected companies would have to incorporate in their ergonomics programs. **Unsatisfactory**	Lack of knowledge, not lack of motivation, has hindered employer efforts to reduce MSDs. OSHA's ergonomics program standard (which adds a stick to the carrot that the market already offers) would, at best, be redundant with private initiatives. It could also undermine current state efforts to address MSDs with other approaches.
3. Has the agency examined alternative approaches?	The preamble to the proposed rule does not discuss alternative approaches other than small modifications to the coverage or design of certain elements. **Unsatisfactory**	OSHA should consider a wider range of approaches before settling on the procedural requirements and hierarchy of control measures in the draft standard. It should consider approaches that seek to remedy the fundamental problem of lack of knowledge on the causes of, and solutions to, MSDs.

Element	Agency Approach	RSP Comments
4. Does the agency attempt to maximize net benefits?	The standard would not allow employers and employees to consider costs or benefits when establishing programs or selecting control measures. OSHA's benefit-cost analysis suggests annualized net social benefits of $5.7 billion. **Unsatisfactory**	OSHA's benefit-cost analysis contains fundamental flaws and assumptions that understate costs and overstate benefits. The proposed standard could have significant social costs that would be borne not only by employers, but employees and consumers as well. RSP's conservative estimate is that the proposed program rule will likely impose annualized net costs of $5.8 billion, over and above any benefits that will be gained.
5. Does the proposal have a strong scientific or technical basis?	Ergonomics programs are supported by anecdotal evidence from companies that adopted them voluntarily in response to private costs. A National Academy of Sciences report concluded that further research is needed on the causes of and interventions for MSDs. **Unsatisfactory**	OSHA's program elements and hierarchy of controls are not supported by scientific literature. Given the wide variations in MSDs, and the dearth of information on the most effective solutions to many of them, OSHA's standard could constrain innovation in a science still in its infancy.
6. Are distributional effects clearly understood?	OSHA conducted an analysis of the potential impacts on small businesses. **Unsatisfactory**	Larger companies may find the requirements easy to implement, while smaller companies could face heavier burdens associated with the hazard identification and medical management requirements. Employers may have incentives to discriminate against individuals perceived to be more likely to have or to report an MSD.
7. Are individual choices understood?	OSHA does not discuss the impact on property or individual decisions. **Unsatisfactory**	The proposal confers new rights on employees which could have a significant impact on some establishments. Several aspects of the standard reduce individual responsibility for safety in the workplace, and limit choices with respect to remedies for different symptoms.