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Regulatory Analysis of OSHA's Safety and Health Program Rule

Prepared on behalf of

U.S. Small Business Administration

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by

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I. INTRODUCTION

A. Background

The Occupational Safety and Health Administration (OSHA) is planning to propose a Safety and Health Program[1] Rule which would require nearly all employers in private industry to implement comprehensive safety and health programs in their workplaces. The purpose of such programs is to enhance compliance with existing OSHA standards and the General Duty Clause of the Occupational Safety and Health Act[2], in order to prevent workplace injuries and illnesses. Each employer's safety and health program is required to include the five core elements of the Safety and Health Program Rule. These elements are: (1) Management Leadership and Employee Participation; (2) Hazard Identification and Assessment; (3) Hazard Prevention and Control; (4) Information and Training; and, (5) Evaluation of Program Effectiveness[3]. More specifically, the rule requires that employers:

- Establish responsibilities for managing safety and health at the workplace;
- Provide employees with opportunities for participation in establishing, implementing, and evaluating the workplace safety and health program;
- Undertake the systematic identification and assessment of workplace hazards covered under the OSH Act and to which an employee is reasonably likely to be exposed;
- Provide for the systematic control of those hazards;
- Ensure that each employee covered by the rule is provided with information and training about the workplace safety and health program and about the serious hazards to which the employee is exposed;

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[1] Throughout this report safety and health programs are not referred to generically, but rather refer either to establishment specific plans which incorporate the core elements of the proposed rule, to state regulations which require such plans at business establishments, or to the proposed rule itself.

[2] The General Duty Clause states that, "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

[3] Source: Draft Proposed Safety and Health Program Rule, 29 CFR 1900.1, Docket No. S&H-0027, October 19, 1998. In contrast, the cost methodology presented by OSHA lists six major cost elements, and does not include the most costly element, Hazard Control. Thus, there are effectively seven core elements rather than five.

- Evaluate the workplace safety and health program to ensure that it is effective and appropriate to workplace conditions; and
- Ensure that appropriate information about hazards, controls, safety and health rules, and emergency procedures is provided to all employers at multi-employer workplaces.

These requirements are similar to those of State safety and health programs as well as OSHA's Voluntary Protection Program. OSHA cites the success of such programs as the impetus for proposing this rule.

This report, prepared by Policy Planning & Evaluation, Inc. on behalf of the Small Business Administration (SBA), Office of Advocacy, examines OSHA's regulatory alternatives for the Proposed Safety and Health Program Rule for their impact on small entities. The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) requires OSHA to consider the economic impact of rules on small businesses and to identify alternatives to the proposed rule that address the regulatory burden on small businesses[4]. Furthermore, OSHA is required by statute to provide reasons if it chooses not to adopt these alternatives.

The main body of this report is divided into two parts. The first deals with the regulatory alternatives and flexibility options, whereas the second analyzes the cost and benefit methodologies presented by OSHA. The two regulatory alternatives are recommended in this report and each is supported by quantitative data. The first alternative is to forego promulgation of the rule altogether, based on a lack of evidence that such programs are effective at the state level. The second alternative is to provide exempt status or other flexibility to small businesses in low-hazard industries, based on data demonstrating that such businesses experience few, or no, work-related injuries or illnesses. The second part of this report is divided into cost and benefit subsections. The cost subsection addresses OSHA's understatement of costs which is caused by OSHA's arbitrary estimates of hours spent by employers to implement the program. The cost subsection also discusses OSHA's refusal to account for the costs of Hazard Control even though

[4] This report analyzes the Safety and Health Program Rule only as it affects private industry and not as it may or may not pertain to state and local government agencies and establishments.

it includes the benefits of Hazard Control. The benefits subsection analyzes the several miscalculations included in the benefits methodology, and discusses the appropriate measure of the lost worker output that may be avoided by the proposed rule.

B. Limitations on the Analysis

In its Initial Regulatory Flexibility Analysis, OSHA rejected three viable alternatives to the rule, providing little data to support this rejection. Not until 22 days into the 60-day SBREFA Panel process, did OSHA provide data regarding the methodologies used to develop its estimates of the costs and benefits of the proposed rule. Furthermore, some of this information was inconsistent or incorrect. OSHA also did not fully identify and explain the underlying assumptions and background data used to develop its methodologies. After meeting with OSHA in an attempt to cure these problems, we prepared this report to examine the adequacy of OSHA and SBA alternatives to the proposed rule, and provide recommendations on the preferred alternatives.

There are several issues regarding the data, or lack thereof, presented by OSHA in support of the proposed rule. One of the major issues involves state injury and illness incidence rates. Reductions in incidence rates in states with safety and health programs has been cited by OSHA as the primary evidence that the proposed Safety and Health Program Rule will be effective. However, OSHA provided no actual data on injury and illness incidence rates at the state level. OSHA has stated that the 25 states with state safety and health programs have experienced a 17.8% reduction in incidence rates in the five years after the program's implementation. However, OSHA did not provide an accurate list of these 25 states. In addition to providing such a list, OSHA should have provided the injury and illness incidence rates in each state over a period of roughly 11 years (for each year), from five years before the implementation of the state program to five years after the implementation of the state program. Furthermore, as a means of comparing states with safety and health programs to those without, OSHA should have provided a list of the 25 states not covered by state safety and health programs as well as the incidence rates in each of these states over the past 11 years. In order to compare all individual states to the nation as a whole, OSHA should have provided the national average injury and illness incidence

rates for as many years as possible. OSHA also should have included in the supporting documents a discussion of the other regulations, programs or other factors (i.e. change in industry mix) which may have contributed to the 17.8% decrease in incidence rates. A discussion of why some states may have chosen to implement safety and health programs and others may not have chosen to do so would have been useful. OSHA should make it clear that all establishments in certain states will not be expected to achieve reductions in injuries and illnesses, and should specify for which states this will be the case. Some of this information has been gathered for this report and is presented in later sections.

In addition to state incidence rate data, OSHA should have provided information on the distribution of injuries and illnesses among individual establishments and among various establishment sizes. This would have facilitated the analysis of regulatory flexibility options; which is the purpose and the goal of the SBREFA Panel process. This information allows the validity of claims made by OSHA to be tested. The Bureau of Labor Statistics makes this information available, and it will be presented and discussed later in this report.

Another major informational lack lies in the written cost and benefits methodologies presented by OSHA. Both methodologies are missing descriptions of some of the major assumptions upon which the calculations are based. For example, in both the cost and benefit methodologies, OSHA should have explicitly stated its estimate of the initial number of injuries and illnesses used to make the calculations. This information is absolutely crucial if one is to assess the accuracy and validity of the methodologies. OSHA should also have explicitly stated the number and percentage of injuries and illnesses occurring in industries not included within the scope of the rule[5]. Similarly, the methodologies lack an explicit description of the number and percentage of injuries and illnesses occurring in establishments not covered by the scope of the rule because they have already implemented state mandated safety and health programs. In addition, OSHA should have provided the number of establishments involved in the Voluntary Protection Program (VPP) and the Safety and Health Achievement Recognition Program (SHARP), as these establishments should not be expected to achieve any greater reductions than

[5] This includes the construction industry, most of the mining industry, the agricultural production sector, several maritime industry sectors, and railroad transportation.

they have already achieved. Furthermore, the number of injuries and illnesses resulting from incidents that will not be prevented by the proposed rule should be separated from other injuries and illnesses (this would include some percentage of transportation accidents and some percentage of violent acts).

The methodologies do not specify the total number of establishments in which injury and illness reductions are expected to occur; nor do they state the total number of employees affected by the proposed rule. Each of these elements of data are crucial in estimating the costs of the proposed rule. The total (nationwide) number of hazards expected to be assessed and identified by this rule is not stated in the cost methodology even though it is used to calculate several cost elements. Likewise, the total (nationwide) number of near misses assumed to be avoided by the proposed rule and the number of fatalities expected to be avoided by the rule are not stated in the cost methodology. One of the cost elements accounts for time spent to review Materials Safety Data Sheets; however, the number of MSDS's expected to be reviewed has not been specified. The cost methodology also does not explicitly state the average total compensation per hour for workers or for management employees, even though these figures are used to calculate every element of the costs.

The major problem with the benefits methodology presented by OSHA deals with the mean number of days missed per injury/illness. A description of why the median number of days missed was presented rather than the mean should have been included in the methodology. An explanation of why the BLS does not generally present the mean number of days missed and only presents the median number of days missed would have clarified much of OSHA's benefits estimates. OSHA should also have included discussion of how the number of days missed corresponds to the cost of the workers' compensation claims used to calculate all elements of the benefits estimates. A discussion of the skewed distribution of the number of days missed was needed to clarify whether extreme cases (i.e. a large number of days missed) are as likely to be prevented by the proposed rule as are more normal cases. This report provides a discussion of these issues and why the median number of days missed is actually the more appropriate measure to use in estimating the benefits of this rule.

II. REGULATORY ALTERNATIVES AND FLEXIBILITY

A. Introduction

Several regulatory alternatives have been suggested for OSHA's proposed Safety and Health Program Rule. These include: 1) non-regulatory guidance; 2) phased implementation of the rule; 3) exemption of small or very small businesses; 4) exemption of low-risk industries; and, 5) exemption of small businesses in low-risk industries. The non-regulatory guidance alternative recommends that no Federal Safety and Health Program be promulgated, and that OSHA increase funding for its free consultations and provide greater outreach for both the VPP and SHARP programs. Phased implementation of the rule would involve instituting federally mandated safety and health programs in a single industry or group of industries, evaluating the successes and failures of these programs, and only then implementing a more carefully planned or customized rule nation-wide. This could be accomplished either by initially targeting large businesses or by focusing only on high hazard industry sectors. An exemption of all small businesses is based on data suggesting that small businesses generally do not have a significant level of risk in the workplace as compared to larger businesses. Exempting low-hazard industries would mean targeting only those industry sectors with injury and illness incidence rates above a certain limit. Finally, exemptions for small businesses in low-risk industries incorporates the concerns of the previous two alternatives and would produce a rule that is even more focused on workplaces in which a substantial number of injuries and illnesses occur. Two regulatory alternatives are recommended in this report: non-regulatory guidance, and an exemption of small businesses in low-hazard industries.

B. Non-Regulatory Guidance

The primary recommendation of this report is that OSHA not promulgate the proposed Safety and Health Program Rule and instead rely on increased outreach and funding for its existing free consultation and existing voluntary programs such as VPP and SHARP. This recommendation is mainly based on a lack of data demonstrating the effectiveness of state

regulations mandating safety and health programs. There is also no evidence to suggest that any state-level successes would translate to nation-wide success. More importantly, there is no evidence suggesting that the level of efficacy presumed by OSHA is at all possible. In fact, there is substantial evidence to the contrary.

OSHA has provided no rationale for its estimates of 20% to 40% reductions in injuries and illnesses as a result of the proposed rule. The OSHA has stated that in the 25 states with acceptable safety and health programs, injury and illness rates "were 17.8% lower five years after the implementation of rules requiring these programs"[6]. Assuming that safety and health programs are solely responsible for the 17.8% reduction cited by OSHA, then safety and health programs in general have been proven to reduce injuries and illnesses by 17.8% **at most**. This is below the lower end of the range of reductions expected by OSHA. OSHA contends that it is likely that the federal Safety and Health Program Rule will be more than twice as effective as the average state-implemented safety and health program. Of course, it should be noted that state safety and health programs are specifically tailored to the individual state, its sources of workplace hazards, and its mix of industries.

OSHA has stated that the grandfather clause included in the proposed rule will exempt the 25 states that already have acceptable safety and health programs from any further requirements under this rule. This effectively means that the 20% to 40% injury and illness reductions are to be achieved only by the 25 states without any acceptable safety and health program. In other words, assuming an equal amount of injuries and illnesses in the two groups, the 25 states without programs are expected to achieve 40% to 80% reductions in injuries and illnesses while the remaining 25 states are not expected to achieve any reductions. This holds true unless OSHA actually expects additional 20% to 40% reductions in states that already have acceptable safety and health programs. Expecting such additional reductions in states with acceptable programs would assume that current state safety and health programs are completely ineffective when compared to the proposed federal rule. That is, that the federal Safety and Health program can

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[6] Source: Initial Regulatory Flexibility Analysis, Oct. 23, 1998. p. 2.

achieve an additional 20% to 40% reductions in states which have already achieved 17.8% reductions through state programs (i.e., for a total of 37.8% to 57.8% reductions).

OSHA apparently believes that all of the 17.8% reductions by the states were achieved solely by the safety and health programs. In order for this to be true, one would have to ssume that:

- no federal rules or programs achieved any reductions in injury and illness rates uring the five years after each state implemented its program.
- no state regulations or programs other than the safety and health programs hieved any reductions during the five year period after the state implemented its program.
- there was no change in the mix of industries within these states.
- no voluntary efforts or programs on the part of industries or establishments had any effect on injury and illness rates.
- no managerial, technological, environmental, or other process changes took place in any industry that might have affected injury or illness rates.
- injury and illness rates in states without safety and health programs remained constant or increased.
- either the level of enforcement of workplace safety regulations remained constant or that any increased enforcement was prompted by the safety and health program only.
- the reductions were permanent and that injury and illness rates have never returned and will never return to their original, higher, level.
- not only have the injury and illness rates in these states have never been lower than they were five years after the implementation of the program but that they have always been equal to or greater than they were in the year of implementation.
- the difference between two non-consecutive individual years is perfectly representative of the trend of a five year period and that a five year decrease constitutes a trend.

Table 1 presents the incidence rates in seven states selected randomly from among those that have implemented safety and health programs. The incidence rates in bold represent the year in which that state promulgated its safety and health program. The second column shows that the incidence rate in California did indeed decrease by nearly 30% between 1991, when the plan was promulgated, and five years later in 1996. However, the table also shows that Hawaii experienced a 35% drop in incidence rates over the same period, even though Hawaii had promulgated its safety and health program a full 14 years earlier in 1982 and had experienced a return to pre-program incidence rates in the interim. OSHA cannot attribute the drop in Hawaii's incidence rate between 1991 and 1996 to the state safety and health program. Furthermore, the fourth column in Table 1 shows that although Minnesota also promulgated its safety and health program in 1991 when the incidence rate was 8.1, the incidence rate in Minnesota has been higher than 8.1 in every year since the promulgation of the safety and health program. By OSHA's logic, this would suggest that the safety and health program in Minnesota actually caused injuries[7]! Table 1 also indicates that incidence rates in North Carolina dropped 16% in the three years after the implementation of its safety and health program; however, OSHA has made it a point to clarify that North Carolina's program affects only 10% of employers in the state and is thus not representative of a solid safety and health program.

[7] OSHA has suggested that a temporary increase in incidence rates after the implementation of a safety and health program may occur as the reporting of injuries increases. Thus, by OSHA's logic, if the incidence rates decrease after implementation, this proves that the programs are working, and; if the incidence rates increase after implementation, this also proves that the programs are working.

TABLE 1

Incidence Rates in States with Safety and Health Programs 1980 - 1996

Year	CA	HI	MN	NE	NC	OR	WA	National Average
1980	10.1	11.5	9	9.1	7.3	11.3	**10.5**	8.7
1981	9.7	11.1	8.2	8.4	7.1	10.4	9.9	8.3
1982	9.1	**11.4**	7.7	8.1	6.8	9.5	9.6	7.7
1983	9.1	10.6	7.3	8.4	6.8	9.8	9.7	7.6
1984	9.3	10	7.7	8.8	7.2	10.6	9.9	8
1985	9.1	9.6	7.6	7.9	7.4	10.5	9.4	7.9
1986	8.9	9.5	7.3	8.1	7.2	10.7	9.8	7.9
1987	8.8	9.8	7.8	9.1	8.1	10.9	10.6	8.3
1988	9	10.4	8.1	10	8.2	11.1	11.1	8.6
1989	8.8	11.4	8.3	10	8.2	10.6	11.3	8.6
1990	9.4	11	8	10.6	8.1	10.1	11.6	8.8
1991	**9.4**	10.6	**8.1**	11.4	7.8	**9.1**	11.1	8.4
1992	9.3	10	8.6	11	8.2	9.1	11.8	8.9
1993	9	9.8	8.6	**10.4**	**7.7**	9	11.2	8.5
1994	8.1	8.7	8.6	10.2	7.5	8.7	10.3	8.4
1995	7.4	8	8.4	9.5	6.8	8.8	10.5	8.1
1996	6.6	6.8	8.3	9.7	6.5	7.8	10.3	7.4
mean	8.89	10.01	8.09	9.45	7.46	9.88	10.51	8.24

[1] Washington State actually implemented its safety and health program in 1973.

Table 2 shows the incidence rates of three States with safety and health programs and three States without safety and health programs, covering a 12 year period. The fifth column in Table 2 shows that incidence rates in Florida decreased 16% in just the three years from 1993 to 1996; even though Florida has no safety and health program. Even more remarkable, incidence rates in Montana dropped 11% in just one year! However, Montana also has no state safety and health program. These data make it abundantly clear that incidence rates alone can neither prove nor disprove the effectiveness of state safety and health programs. Thus, OSHA has presented no reliable data that would indicate that state safety and health programs have been successful in reducing injuries and illnesses. This non-existent "success" should not provide the basis for mandating such programs at a federal level where they will not be as well targeted to state specific hazards and industry mixes, or as sensitive to employer and employee concerns.

TABLE 2

Total Incidence Rates in States With and Without State Safety and Health Programs 1985 - 1996

Year	State Plan States[1]			Non-State Plan States			National Average
	MN	NC	WA[2]	FL	MT	OK	
1985	7.6	7.4	9.4	8.8	8	9.5	7.9
1986	7.3	7.2	9.8	8.8	8.25	8.1	7.9
1987	7.8	8.1	10.6	8.5	9	8.3	8.3
1988	8.1	8.2	11.1	8.4	9.2	8.7	8.6
1989	8.3	8.2	11.3	8.3	8.6	8.7	8.6
1990	8	8.1	11.6	8.2	9.5	8.9	8.8
1991	**8.1**	7.8	11.1	7.8	8.7	9.3	8.4
1992	8.6	8.2	11.8	8.2	9.7	9	8.9
1993	8.6	**7.7**	11.2	8.2	9.2	9	8.5
1994	8.6	7.5	10.3	8	9	8.8	8.4
1995	8.4	6.8	10.5	8.1	10.1	8.3	8.1
1996	8.3	6.5	10.3	6.9	8.9	7.8	7.4

[1] Bold numbers indicate the year in which the State program became effective.

[2] Washington's program became effective in 1973

OSHA also supports its contention that the proposed rule will be successful by pointing to the success of its Voluntary Protection Program (VPP). This voluntary implementation of a safety and health program has indeed been successful in some establishments. However, the VPP is designed to assist those individual businesses whose employees and employers have displayed a voluntary commitment to improving workplace safety. OSHA either does not concede that this commitment is vital to the success of the safety and health program, or does not feel that there may be other businesses that do not share this commitment. That is, in order for the proposed rule to be as successful as the VPP, either all businesses must share the same commitment and enthusiasm, or such a commitment is not crucial to the success of the VPP. There may be reasons why most employers choose not to enlist in the Voluntary Protection Program. It may not be economically feasible at the time; there may not be enough free consultation resources available, or; there may not be any injuries or illnesses to be prevented in a given establishment. This reasoning is supported by the fact that only 387 business establishments[8], out of roughly 6 million nation-wide, have chosen to participate in the Voluntary Protection Program. Nevertheless, OSHA does not agree that there is any viable reason for a business not to implement a safety and health program. Instead, OSHA contends (as will be shown later in this report) that implementing these programs is not only feasible, but is profitable in almost every instance. If this were the case, employers would implement safety and health programs for the sake of profitability alone. They do not. OSHA has suggested no cause for this market failure.

OSHA has stated that it does not plan to hire any more consultants or provide any additional resources to the Consultation Program, even though several Small Entity Representatives indicated that such consultation was vital to the success of a safety and health program among small businesses. If it is true that free consultation is crucial or even extremely helpful in the implementation of a safety and health program, the costs of the proposed rule may be greatly underestimated, or the proposed rule may simply be infeasible for some businesses. This assertion is maintained by those Small Entity Representatives who have implemented their own safety and health programs and who are strong supporters of OSHA's VPP initiative.

C. Exempt Small Businesses in Low-Hazard Industries

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[8] OSHA Website: http://www.osha.gov/oshprogs/vpp/groups.html

The second regulatory option recommended by this report is the exemption of those small businesses in low-hazard industries. This recommendation is based on Bureau of Labor Statistics (BLS) data showing that 75% of all establishments in private industry have no measurable incidence rates of injuries and illnesses. Table 3[9] presents all private industry establishments divided by quartile distributions based on incidence rates. The table is also broken down into five size categories. Table 3 clearly shows that even though the average incidence rate for private industry is 7.4, 75% of these establishments have incidence rates of zero. It follows that the average incidence rate of the remaining 25% of the establishments is 29.6. Thus, most injuries and illnesses occur in establishments whose incidence rates are four or more times greater than the average incidence rates. There are a very few, very hazardous businesses which account for all of the injuries and illnesses nation-wide, while the remaining businesses are essentially risk-free.

Table 3 also demonstrates that all of the injuries and illnesses in the 1 to 10 size category occur in only 25% of the establishments. Thus, some small and very small businesses do have significant levels of risk; however, the vast majority of such establishments have incidence rates of zero. Because the large majority of businesses are small or very small the nation-wide distribution of incidence rates very closely reflects the distribution among small businesses. That is, the fact that 75% of all businesses have incidence rates of zero does not mean that 75% of large businesses do not have significant number of injuries and illnesses. This is confirmed by the last three rows of Table 3. Thus, even though some small businesses experience significant incidence rates (presumably those in high-risk industries), the majority of all businesses nation-wide are small businesses with incidence rates of zero. The benefits of the Safety and Health Program Rule will be realized in only a small portion of businesses, while the burden of the rule will be shared by all. This inequity will be borne disproportionately by small businesses because a greater percentage of small businesses have low, or no, injury and illness rates[10]. Small businesses in low

[9] The information contained in Table 3 is derived directly from BLS data with the exception of column five which was calculated by PP&E.

[10] Despite the BLS data, OSHA has repeatedly stated that there is no such thing as a no-hazard workplace, and that this table dramatically understates incidence rates in small businesses due to under-reporting (source: meeting with OSHA, Dec. 10, 1998). However, OSHA has not provided any information to support this claim nor has it stated how greatly the incidence rates are underestimated. OSHA has not suggested that there is any under-reporting among establishments of other sizes. Whatever under-reporting may exist is likely not very

hazard industries experience few, if any, injuries and illnesses, and should not be asked to bear the burden of a rule which cannot possibly benefit them.

TABLE 3

Quartile Distribution of Injury and Illness Incidence Rates in Private Industry

Establishment Size	Avg. rate	50% of Establish. have a rate lower than	75% of Establish. have a rate lower than	Mean Rate of the 4th quartile[1]
All Sizes	7.4	0	0	29.6
1 - 10	2.8	0	0	11.2
11 - 49	6	0	8	16
50 - 249	9.3	6.3	13.4	16
250 - 999	9	6.9	13.3	13.3
1,000 +	8.7	6.3	11.3	14.7

[1] These means are accurate only for private industry as a whole and for establishments with fewer than ten employees. Means of the 4th quartile for other size categories are conservative and represent the absolute minimum possible mean.

The recommendation to exempt small businesses in low hazard industries is further supported by data demonstrating very significant differences in injury and illness incidence rates based on industry sector as categorized by SIC code[11]. Table 4 shows the fifteen most hazardous industries, their respective SIC codes, and the incidence rates in these industries. As the table shows, the incidence rates in these industries are roughly three to four times higher than the private industry average of 7.4. Furthermore, Table 4 indicates that each of these industries is in the manufacturing sector. In fact, although it is not indicated on Table 4, only one of the 27 most hazardous industries in the nation is <u>not</u> in the manufacturing sector. In short, no industry sector is as hazardous as the manufacturing industry sector. Given that the manufacturing sector is the

significant in any case; therefore, this report does not take such under-reporting into account. It is unclear how the proposed rule will prevent injuries and illnesses that are not reported.

[11] OSHA has stated that SIC codes are not reliable indicators of workplace risk (Source: Initial Regulatory Flexibility Analysis). Nevertheless, OSHA has itself separated industries by SIC code in order to calculate several elements of their cost estimates, and has exempted various industries from the requirements of the rule based on their SIC code.

most hazardous industry sector in the country, there must also be an industry sector which is the least hazardous. Based on incidence rates, that sector is the Finance, Insurance, and Real Estate sector. Nevertheless, OSHA has specifically stated that, "there is a significant level of risk in these workplaces. Further, this risk can be reduced with safety and health programs"[12].

OSHA's response to the data in Table 4 is that many of the establishments in these industries already implement safety and health programs and there is an inherent level of risk in such industries beyond which no reductions in incidence rates are likely to occur [13]. Despite the data in Table 3, OSHA does not concede that there may be industries or even individual firms at which there is an inherent level of risk that is negligible. Thus, according to OSHA, an inherent and unimprovable level of risk can be reached at an incidence rate of 30.3 (meat packing plants); however, an incidence rate of 0.6 (security and commodity brokers) is neither inherent nor unimprovable and is both "significant" and "can be reduced".

[12] Source: Initial Regulatory Flexibility Analysis

[13] Source: Meeting with OSHA, December 10, 1998

TABLE 4

Industries with the Highest Total Incidence Rates

Industry	SIC Code	Incidence Rate
Meat Packing Plants	2011	30.3
Metal Sanitary Waste	3431	29.4
Ship Building & Repairing	3731	27.4
Steel Foundries	3325	26.4
Mobile Homes	2451	26.2
Motor Vehicles	3711	26.1
Gray & Ductile Iron Foundries	3321	25.8
Automotive Stampings	3465	23.2
Steel Springs	3493	22.7
Secondary Nonferrous Metals	334	21
Truck & Bus Bodies	3713	21
Public Building & Related Furniture	253	20.6
Structural Wood Members	2439	20.5
Aluminum Die Castings	3363	19.9
Motor Homes	3716	19.8
Private Industry Average		**7.4**

D. Conclusions

Safety and health programs can be effective in specific establishments with high incidence rates, a high degree of employee and employer commitment to workplace safety, and the personnel and financial wherewithal to successfully implement such a plan. However, no proof has been provided that the regulatory mandate of safety and health programs actually reduces injury and illness rates on a state-wide level. In addition, OSHA has provided no evidence to support its claim that the proposed rule will reduce injuries and illnesses by at least 20% and by as much as 40%. This report suggests that small businesses are less able to implement safety and

health programs and that such programs cannot be effective in small businesses without extensive outreach and consultative assistance. OSHA has not indicated that either outreach or consultation resources will be increased in response to the promulgation of the proposed rule. Therefore, given that the majority of American businesses are small businesses, this report recommends that the proposed rule not be promulgated. Thus, a reliance upon existing voluntary programs and an increase in outreach and assistance as the best regulatory alternative to the proposed Safety and Health Program Rule.

The other regulatory alternative recommended in this report is the exemption of all small businesses within low-hazard industries. The majority of all businesses in the country are small and the majority of these small businesses have little or no risk of workplace injury or illness. The minimal amount of risk found in small businesses is primarily limited to those establishments in medium-hazard, or high-hazard industries. Low-hazard industries can be easily distinguished from higher-risk industries[14], and the small businesses in these low-hazard industries should not be forced to bear the financial and time burdens of a rule which will not benefit them in any way. This option specifically targets the least hazardous business establishments in the nation and provides a high degree of small-business-specific regulatory flexibility[15]. Therefore, at a minimum, OSHA should exempt small businesses in low-hazard industries from the requirements of the proposed Safety and Health Program Rule.

The other regulatory alternatives mentioned in the introduction of this section have not been specifically recommended for various reasons. Phased implementation of the Safety and Health Program Rule is not recommended in this report because the initial target group would most likely be comprised of establishments with high rates of injuries and illnesses. Success in implementing a federally mandated Safety and Health Program Rule among industries or businesses with high incidence rates does not ensure, or even suggest, that such a rule would be

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[14] In fact, OSHA has already done so, separating industries into low-, medium-, and high-hazard categories based on incidence rates in establishments with the same SIC code.

[15] This alternative is termed "flexibility" because it does not significantly reduce the assumed efficacy of the rule but it eliminates a very substantial portion of the burden and cost of the proposed rule.

successful among industry sectors or establishments with very low rates. Such success would not even guarantee success in other high hazard industries and workplaces.

The data from the Bureau of Labor Statistics demonstrates that there are small businesses with excessively high injury and illness incidence rates; although there are very few of these. An exemption of all small businesses from the requirements of the proposed rule (assuming the rule has any effect at all) would leave some small business employees, albeit relatively few of them, subject to above average levels of risk. Thus, a comprehensive exemption of all small businesses is not the best alternative for the proposed rule.

The BLS data presented in the Tables above suggest that although incidence rates are substantially below average in most establishments, there are a few large businesses with significant levels of risk that account for the majority of injuries and illnesses. That is, the larger businesses within any given industry sector account for the majority of injuries and illnesses, even though they do not represent the majority of establishments within these industry sectors. The data suggest that the injury and illness incidence rates of low-hazard industries would most likely be even lower if the given industry sectors contained only small businesses. Thus, the exemption of all businesses in low-hazard industries is not specifically recommended in this report.

III. COST AND BENEFIT METHODOLOGIES

A. Introduction

The cost and benefits methodologies presented by OSHA are unclear, misleading and inaccurate. In some cases, OSHA does not explain its underlying assumptions and does not present the initial figures used to make its calculations. In other cases, the underlying assumptions are presented but are not supported by evidence or logic. Occasionally, the methodologies describe certain calculations, but the actual numbers presented are not derived using these calculations. There are also arithmetic errors in several places throughout the methodologies. This chapter of the report discusses the reasons for these inaccuracies and presents more accurate, appropriate, and unambiguous estimates of the costs and benefits of the proposed Safety and Health Program Rule.

B. Cost Methodology

The cost methodology provided by OSHA half-way into the SBREFA Panel process is unclear, possibly inaccurate, and lacking any description of its underlying assumptions. Table 5 presents the costs of the proposed rule disaggregated by core element. The costs in the second column are the costs presented in OSHA's cost methodology, whereas the costs in the third column were actually derived in the manner described in that same methodology. Differences between the two estimates may be the result of different underlying assumptions. The underlying data used to derive OSHA's cost estimates are not provided in the written methodology OSHA. The basic assumptions used to derive the numbers in the third column of Table 5 have been taken from various OSHA documents and are described below. The actual derivations of these cost estimates are presented in flowcharts in Appendix A. Using the assumptions described below, Table 5 shows that the actual costs obtained by using the methodology presented by OSHA, are roughly double the costs that OSHA claims (see the Subtotal in Table 5). It should be stated unmistakably that the figures in the third column of Table 5 are the best possible estimates of the costs of this rule *given the information provided in OSHA's written methodology*, and that any

inaccuracies in these estimates are due entirely to inconsistencies in the methodology, the lack of data in the methodology, and lack of specificity in the methodology.

TABLE 5

Costs of the Proposed Safety and Health Program Rule

Core Element	Annual Cost - OSHA Estimate	Actual Annual Cost[1]
Management Leadership[2]	$357,000,000	$668,377,474
Employee Participation	$45,000,000	$776,420,250
Hazard Identification & Assessment	$379,000,000	$408,041,668[3]
Information & Training	$1,012,000,000	$2,012,636,324
Program Evaluation & Updates	$422,000,000	$769,366,069
Multi-Employer Worksites[4]	$111,000,000	$96,127,284
Subtotal	$2,326,000,000	**$4,740,969,069**
Hazard Control[5]		$2,670,431,688
Total	$2,326,000,000	**$7,411,400,757**

[1] These costs are derived in the manner described in the cost methodology provided by OSHA. These derivations are displayed graphically in Appendix A.

[2] Management Leadership costs estimated based on an average establishment size of 16 employees.

[3] Does not include the costs of reviewing MSDS's

[4] Estimated assuming all establishments have fewer than 100 employees.

[5] Estimated assuming only 20% reductions in injuries/illnesses.

OSHA did not specify the original number of injuries and illnesses used in its cost calculations. The number of injuries and illnesses used for the purposes of this report is 3.25 million and was derived from OSHA's written benefits methodology. In its benefits methodology, OSHA estimates that 1.3 million injuries and illnesses will be avoided if the proposed rule achieves 40% reductions. This figure was multiplied by 2.5 (100% / 40%) to obtain the total number of injuries and illnesses affected by the proposed rule. Using 3.25 million the total number of injuries and illnesses affected by the proposed rule provides consistency between the cost estimates and the benefits estimates.

More importantly, OSHA does not include the costs of Hazard Control as part of the costs of this rule even though it willingly attributes the benefits of Hazard Control to the proposed rule. The actual avoidance of injuries is entirely dependent upon the control of hazards in the workplace; thus, OSHA has presented the full benefits of this rule without accounting for the full costs. OSHA has stated that, "the costs associated with fixing the hazards identified by the program are treated differently (not included) because these hazards should already have been corrected"[16]. Then, by the same token, the benefits associated with fixing hazards identified by the program must be treated differently from program related benefits because the injuries and illnesses avoided by controlling hazard should already have been avoided through compliance with an existing OSHA standard or the General Duty Clause. However, the presumed need for this regulation arises from the fact that although these hazards **should** have been controlled, they **have not** been controlled. If OSHA believes that hazards are, or can be, controlled through compliance with existing regulations, then the benefits associated with that hazards control are, or can be, achieved through compliance with existing regulations. If this is true, it negates any need to promulgate the proposed Safety and Health Program Rule.

The Safety and Health Program Rule is specifically designed to ensure the control of hazards that are not currently being controlled by existing rules. OSHA contends that the benefits of hazard control will accrue as a direct result of the proposed rule, but that the costs will not be incurred as a direct result of the rule. OSHA contends that the costs of hazard control will be incurred coincidentally at the same time as the implementation of the proposed rule, but that they are attributable to other OSHA standards and not to the Safety and Health Program rule. Generally speaking, there are no benefits without incurred costs. Either the benefits associated with hazard control are not be attributable to the rule, or the costs associated with hazard control must be included. OSHA cannot include or exclude one without the other.

For the reasons stated above, the estimates of the total cost of the rule presented in this report include the costs of hazard control. Hazard control costs vary depending upon the level of injury and illness reductions assumed to take place (i.e. from 20% to 40%). As shown in Table 7,

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[16] Source: Costs of Compliance. November 9, 1998. p. 1.

the addition of hazard control costs to the other six cost elements roughly doubles the total costs of the rule even at 20% reductions. Similarly, the total cost of the rule at 30% reductions is more than $8 billion, and is roughly $9 billion at 40% reductions. Thus, at 40% reductions, the actual cost of implementing this rule (according to the methodology provided by OSHA) is nearly four times greater than the estimate provided by OSHA. This does not account for the other significant underestimates of cost described below.

OSHA has not included any costs for those establishments which already have safety and health programs. OSHA has stated that "Any costs that employers have already incurred to set up and maintain a safety and health program, whether as a result of State mandate, an insurance program, or the employer's voluntary action, are not attributed to this rule because they reflect the current (pre-rule) situation."[17] OSHA has also suggested that all establishments enrolled in the VPP or SHARP programs will be exempt from any incremental costs. These assumptions exclude a large number of employers who, notwithstanding their current programs, will change their programs to comply with this rule. For example, they may have to develop management training programs, institute procedures to ensure employee participation, prepare employee participation reports and formal hazard identification reports, change capital budgeting processes to correct noted deficiencies, and institute procedures to evaluate their programs. It can be assumed that almost every establishment will incur such costs. Furthermore, many businesses may need legal advice to determine whether or not their existing programs are in compliance with the proposed rule. For these reasons, OSHA's cost estimates are understated.

Comments by Small Entity Representatives (SERs) who currently implement safety and health programs in their workplaces have indicated that OSHA estimates of costs are dramatically underestimated. Specifically, several SERs commented that the amount of time and money spent on the training of employees far exceeds the estimates made by OSHA. For example, OSHA estimates that periodic training of employees takes only 1 hour. However, Mike Fagel, Corporate Safety Director of Aurora Packing Company, operates a week long training period each year. Mr. Fagel says that this represents 55 hours worth of training annually for 400 employees. Mr. Fagel estimates that training for less than 100 employees takes 1 to 2 weeks. In addition,

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[17] Source: Costs of Compliance. November 9, 1998. p.2

according to OSHA hiring a consultant costs $500 for a two hour initial training session. Mr. Fagel spends $10,000 per year for 400 employees on a consultant for 55 hours of training. In addition, Ron Lyons of Stewart Brothers Paint Company, spends from $4,000 to $5,000 on a consultant for 16 employees, for a full day of training. It is apparent from the comments of Small Entity Representatives that OSHA's estimates of the time and financial resources required to conduct employee training is not consistent with actual industry experience.

According to OSHA assumptions, an employee trained initially will conduct the subsequent periodic training. However, this is not consistent with the experience of either Mr. Fagel or Mr. Lyons. OSHA also presumes that all small (less than 100 employees) businesses will send employees to community college training courses for periodic training. OSHA estimates that this will cost $300 regardless of the number of employees in such training courses. However, no consideration is given to the length of these courses or the travel time to and from these courses. In addition, OSHA has not stated where community colleges are to be found which provide courses to as many as 100 people for only $300 total, or $3 per person. More importantly, no consideration is given to the fact that the vast majority of all businesses nation-wide employ fewer than 100 employees. Thus, there cannot possibly be enough community colleges to offer such courses, or enough professors, seats, time, etc., to adequately train all of the employees in the nation working in establishments with fewer than 100 employees.

OSHA has also annualized the initial (or start-up) costs of various cost elements by dividing the estimated cost by a "capital recovery factor" of about 7.2. This annualization highly underestimates the costs that businesses will have to bear in the first year of the program. Therefore, in order to more accurately portray the costs of this rule, Table 6 presents the initial costs of the rule as separated from those that are actually annual costs (as opposed to "annualized" costs). The table clearly shows that the initial cost of this rule is dramatically higher than that presented by OSHA, especially for the cost of hazard control. Table 6 demonstrates that the first-year cost of this rule will be roughly seven times greater than the OSHA estimate.

TABLE 6

Separated Initial and Annual Costs of the Proposed Rule

Core Element	Initial Cost	Annual Cost
Management Leadership[1]	$454,761,288	$213,616,186
Employee Participation		$776,420,250
Hazard Identification & Assessment	$208,406,250	$379,256,275
Information & Training	$3,739,755,373	$1,496,345,200
Program Evaluation & Updates		$769,366,069
Multi-Employer Worksites[2]		$96,127,284
Subtotal	**$4,402,932,911**	**$3,731,131,264**
Hazard Control[3]	$11,353,333,618	$1,102,291,686
Total	**$15,756,266,529**	**$4,833,422,950**

[1] Management Leadership costs estimated based on an average establishment size of 16 employees.

[2] Estimated assuming all establishments have fewer than 100 employees.

[3] Estimated assuming only 20% reductions in injuries/illnesses.

C. Benefits Methodology

The benefits methodology presented by OSHA is more inaccurate and confusing than the cost methodology. The general premise of the benefits methodology is that OSHA's benefits estimates are based on costs which are avoided when employees avoid injury or illness. These benefits estimates are composed of four "cost-savings" elements, including: (1) lost output due to work-related injuries and illnesses; (2) medical expenses; (3) administrative costs of worker's compensation insurance; and, (4) indirect costs. The inconsistencies in the methodology and a discussion of the appropriateness of some of the underlying assumptions in the methodology are presented below.

OSHA has stated that, "(s)ome of the losses associated with lost time due to work-related injuries and illnesses stem from the lost output of the worker, measured by the value the market places on his or her time." In addition OSHA has stated that, "(t)his value is measured as the worker's total wage plus benefits."[18] In order to derive the total amount of lost-output due to

[18] Source: Cost Savings From Injuries and Illnesses. November 9, 1998. p. 2

work-related injuries and illnesses, OSHA could have simply multiplied the total number of missed workdays due to work-related injuries and illnesses by the average compensation of the workers. The Bureau of Labor Statistics estimates the average compensation at $18.50 per hour, or $148.00 per day, and the total number of lost workday injuries and illnesses at 2.6 million. Given the distribution of the number of days missed as a result of these injuries and illnesses, there are roughly 16.1 million days of work lost in establishments affected by the proposed rule[19]. These factors result in total lost compensation of roughly $2.4 billion. Thus, a 20% reduction in injuries and illnesses would produce benefits of $478 million by avoiding lost output. This is roughly one-eighth of OSHA's estimate of $3.7 billion at 20% reductions. Similarly 30% and 40% reductions would result in benefits of $716 million and $955 million respectively, whereas OSHA estimates are $5.87 billion, and $8.33 billion respectively. OSHA has not stated why the total amount of lost output was not derived in this way, or why the cost of worker's compensation payments was used as a proxy for lost output rather than using a more direct measure.

The number of injuries and illnesses expected to be prevented at 40% reductions should be double those expected to be prevented at 20% reductions. However, according to OSHA estimates, this is not the case. OSHA has instead used an algebraic formula to account for a difference between the incidence rates of workplaces with safety and health programs and workplaces without such programs. However, as mentioned above, OSHA has not established that such a difference in incidence rates exists on a broad scale. In addition, given that OSHA has not justified its claim of 20% to 40% reductions, there is no reason to be concerned with any potential difference in incidence rates among businesses with programs and businesses without programs[20]. The estimates used in this report reflect an assumption that a 20% reduction in injuries and illnesses nationwide is one-half of a 40% reduction. They are also based on 40% reductions and not 20% reductions; thus, if the estimates are incorrect, they are conservative in that they overestimate the benefits of the rule at 20% and 30% reductions.

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[19] Source:

[20] The fact that OSHA has defined an unrealistic range of reductions spanning from 20% to 40% of all injuries and illnesses indicates that OSHA has no definite idea how many injuries and illnesses will be prevented by the rule. The reductions estimates are arbitrary percentages based on guesswork, thus there is no reason to account for differences in incidence rates when estimating reductions except to further confuse an already bewildering methodology.

Table 7 presents the original estimates included in OSHA's written benefits methodology and are based on the mean cost per claim of $4,080. Of this mean cost per claim, 61.5%, or $2,509, is allocated to indemnity payments. These indemnity payments are estimated to replace 59% of lost after-tax wages in cases of permanent partial disability and 90% of after-tax wages in cases of temporary total disability. The remaining 38.5% of the cost of claims, or $1,570, is allocated to medical expenses. The combined average cost per claim of $4,080 is used to derive both administrative costs and indirect costs. The methods used to estimate these costs and the inaccuracies in various calculations are described in detail in Appendix B.

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TABLE 7

OSHA Original Estimates of the Value of Lost Output Associated with Injuries and Illnesses

	20%	30%	40%
Number of Injuries/ Illnesses Prevented	580,000	915,910	1,300,000
Lost Output from Temporary Total Disability[1]	$860,831,244	$1,359,519,689	$1,929,449,340
Lost Output from Permanent Partial Disability[2]	$2,855,939,199	$4,510,414,321	$6,401,243,032
Medical Costs[3]	$911,064,000	$1,438,852,800	$2,042,040,000
Administrative Costs[4]	$1,082,913,260	$1,710,256,114	$2,427,219,375
Indirect Costs[5]	$1,638,253,393	$2,587,310,531	$3,671,947,260
Total	$7,349,001,095	$11,606,353,454	$16,471,899,007

[1] See Appendix B TableB-1

[2] See Appendix B Table B-3

[3] Calculated as 38.5% of total claims. Total claims is calculated by multiplying the mean cost per claim ($4,080) times the total number of injuries/ illnesses prevented at 20%, 30%, and 40% reductions

[4] Derived as described in Appendix B using the mean cost per claim.

[5] Derived as described in Appendix B using the mean cost per claim.

OSHA has derived its estimates of lost output based on the *total* number of injuries and illnesses nationwide and not on the number of *lost workday* injuries and illnesses. It assumes that all of the productivity of every employee who experiences a work-related injury or illness is lost; even though more than half of all injured or ill employees do not miss any work at all. OSHA has not presented any justification for why they have assumed a total loss of output in cases where there is either no lost output or there is only a reduction in output.

OSHA has also included in its estimates all workplace injuries resulting from workplace violence and motor vehicle accidents. OSHA has not indicated how the Safety and Health Program Rule would prevent such injuries. OSHA has also not addressed the appropriateness of including these types of injuries given that: 1) States have already addressed these risks through

other legislation, and/or 2) the risks in question are the same risks already accepted by the general public outside of the workplace in everyday life. That is, it is not OSHA's place to regulate motor vehicle or airplane safety, nor is it within their power to prevent individuals from perpetrating violent assaults upon one another[21]. Transportation accidents and violent acts account for 5% of all injuries; however, they account for 60% of all fatalities expected to be prevented by the implementation of this rule.

In order to determine the amount of lost worker output avoided by implementing the Safety and Health Program Rule, OSHA has used the mean cost per worker's compensation claim to estimate the before-tax compensation of injured or ill workers. OSHA's estimate of the mean cost per claim is $4,080; although most workers' compensation claims are closer to $400 per claim. A very small number of these claims are extremely large; thus, the mean does not accurately reflect the average cost per claim. That is, the mean number of days missed per lost workday injury is 23, whereas the median is only 5. In fact, the Bureau of Labor Statistics does not present its estimate of the mean number of days missed because it is so skewed by a few extreme cases; instead, BLS presents only the median number of days missed. This is because, in a skewed distribution, the best measure of central tendency (the average) is the median and not the mean.

Because the distribution of claims of differing costs is so skewed, OSHA should be very sure that the proposed rule will have the same effect in reducing the number of extreme cases as it does in reducing the number of more normal cases. That is, 20% or 40% reductions in injuries overall may not result in 20% or 40% reductions in extreme cases[22]. OSHA has not addressed this issue. However, if the median number of days missed is used and, thus, the median cost per claim rather than the mean, then the benefits of this rule will be roughly one tenth that estimated by OSHA. The estimates presented in Table 8 are based on the median cost per claim of $415 and

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[21] The violent acts category of injuries and fatalities includes self-inflicted injuries and attacks by animals!

[22] This can be illustrated with a simple example of twenty numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 3, 4, 5, 6, 7, 4, 5, 6, 5, 56, and 135. The mean of this set of numbers is 14 while the median is 5. If we were to eliminate four numbers (20%) from this group at random, we would be far less likely to eliminate 56 or 135 than to eliminate one, or even two, of the 5's. OSHA must present a rationale for expecting a greater than normal (random) chance of avoiding extreme injury and illness cases.

not the mean cost per claim of $4,080. The derivation of the median cost per claim is presented in Appendix B. Furthermore, the estimates in Table 8 correct for several miscalculations made in OSHA's benefits methodology which are discussed in further detail in Appendix B.

TABLE 8

Corrected Estimates of the Value of Lost Output Associated with Injuries and Illnesses

	20%	30%	40%
Number of Injuries/ Illnesses Prevented	650,000	975,000	1,300,000
Lost Output from Temporary Total Disability[1]	$149,077,497	$223,616,246	$298,154,994
Lost Output from Permanent Partial Disability[2]	$329,676,082	$494,514,123	$659,352,164
Medical Costs[3]	$103,853,750	$155,780,630	$207,707,500
Administrative Costs[4]	$159,356,419	$239,042,880	$318,723,839
Indirect Costs[5]	$95,491,500	$143,237,250	$190,983,000
Total	$837,455,248	$1,257,191,129	$1,674,921,497

[1] See Appendix B, Table B-2

[2] See Appendix B, Table B-4

[3] Calculated as 38.5% of the total cost of claims. Total cost of claims is calculated by multiplying the median cost per claim ($415) times the total number of injuries/ illnesses prevented at 20%, 30%, and 40% reductions

[4] Derived as described in Appendix B using the median cost per claim.

[5] Derived as described in Appendix B using the median cost per claim.

D. Conclusions

OSHA's cost and benefits methodologies do not provide adequate information on their underlying assumptions; make faulty assumptions; and are fraught with inconsistencies, inaccuracies, and missing data. The major inappropriate assumptions and information gaps are described above, whereas inconsistencies and inaccuracies are corrected for in the appendices to this report. Table 9 presents the costs and benefits estimates developed by OSHA in the methodologies presented to the SBREFA Panel. OSHA's estimates suggest that, regardless of the

level of reductions in injury and illness rates, the benefits of the proposed rule far outweigh the costs. If this were actually the case, every employer in America should, theoretically, have already voluntarily implemented a safety and health program in order to realize these economic gains. The fact that this is not the case may suggest that none of the potentially benefited employers is aware that such gains can be made, and that the government must enlighten them as to how to make more money. Alternatively, one could assume that perhaps the OSHA estimates are not entirely accurate. Based on the faulty assumptions detailed in the previous two subsections, the estimates presented in Table 9 are not accurate.

Table 10 presents estimates of the costs and benefits of the proposed rule that correct for the miscalculations and inappropriate assumptions presented in the OSHA methodologies. The most important differences between the estimates in Tables 9 and 10 are that: (1) the benefits in Table 10 are calculated using the more appropriate median cost per workers' compensation claim rather than the mean cost per claim, and; (2) the costs in Table 6 include the costs of Hazard Control. The various other miscalculations, misleading data, and bad assumptions are discussed in detail in the costs section and benefits section of this report as well as in the two appendices.

TABLE 9

OSHA's Original Estimates of the Costs and Benefits of the Proposed Safety and Health Program Rule

	20% Reductions	30% Reductions	40% Reductions
Costs	$2,326,000,000	$2,326,000,000	$2,326,000,000
Benefits	$7,349,001,095	$11,606,353,454	$16,471,899,007

TABLE 10

Corrected Estimates of the Costs and Benefits of

the Proposed Safety and Health Program Rule

	20% Reductions	30% Reductions	40% Reductions
Costs[1]	$7,411,400,757	$8,195,470,758	$8,979,540,759
Benefits	$837,455,248	$1,257,191,129	$1,674,921,497

[1] These costs estimates are conservative and do not account for all possible underestimations.

The corrected estimates presented in this report account for many of the inaccuracies in both methodologies except for the number of hours spent by employers in program implementation. There were not enough resources to conduct a thorough survey of employers in order to develop more appropriate estimates of the number of hours that would be spent on each of the core elements of the proposed rule[23]. Nevertheless, the correction the other faulty assumptions and miscalculations yields cost and benefits estimates that are dramatically different from those presented by OSHA in its methodologies. The benefits of the proposed Safety and Health Program Rule do not outweigh the costs. In fact, costs outweigh benefits by as much as nine times. Of course, the corrected benefits estimates still maintain the assumption that 20% to 40% reductions are actually achievable by the proposed rule; an assumption which was proven in previous sections of this report to be entirely unfounded. The majority of the cost elements (with the notable exception of Hazard Control) will remain constant regardless of the actual level of injury and illness reductions. Thus, if the rule is promulgated and does not achieve the assumed levels of reductions, then the costs of the rule will outweigh the benefits by an even greater margin. Given that the corrected cost estimates are conservative in that they are low, and the corrected benefits estimates are conservative in that they are high, the costs of the rule, if promulgated, are likely to outweigh the benefits by a factor of 10 to 1 or more.

[23] It is recommended that OSHA reasses their estimates with the aid of SBA or industry associations.

APPENDIX A - Derivation of Costs

This appendix clarifies the calculations used to derive the cost estimates presented in this report and explicitly describes the underlying numbers used in these calculations. The major discrepancies between the cost estimates presented in this report and the estimates presented by OSHA are discussed in the main body of this report. Discussions of the underlying assumptions and numbers used in this report to calculate costs are presented below. In addition, the cost of each individual cost element is presented in table form while the derivations are presented in the form of flowcharts immediately following the table.

The number of total injuries and illnesses used in the cost and benefits calculations in this report is 3.25 million. This is based on the estimate of 1.3 million injuries and illnesses avoided at 40% reductions that was provided by OSHA. It is presumed that these figures account for those injuries and illnesses taking place in industries not covered by the rule as well as in establishments not covered by the rule because they have already implemented safety and health programs. However, OSHA does not state in its methodologies that this is the case, nor do they specify the percentage of injuries and illnesses not covered if this is the case, or the original number of injuries and illnesses used.

The total number of hazards affected by the proposed rule was used to calculate several of the cost elements in the OSHA methodology. This number has been estimated by OSHA to be equal to ten times the number of actual injuries and illnesses, and thus 32.5 million is the number used in the calculations in this report. Similarly the number of near misses and the number of reports made (both used in the calculation of employee participation costs) is also ten times the number of injuries and illnesses, or 32.5 million.

The number of establishments and the number of employees affected by the proposed rule are used to calculate several cost elements in the methodology. The numbers used in this report for this purpose are derived from OSHA's *Summary of the Economic Analysis*. They are based on the number of establishments and employees that are not currently covered by safety and health programs. The *Summary of the Economic Analysis* states that, "Based on data from (the

1993 OSHA) survey, OSHA estimates that only 23.4% of all establishments have such programs. OSHA also estimates that 51% of all employees covered by the scope of the proposed rule work in establishments that already have safety and health programs that contain the core elements." Also contained in the Summary of the Economic Analysis are data on the total number of employees and establishments in industries affected by the rule. Thus, the number of establishments used in this report is 4.487 million, or 76.6% of the total number of affected establishments. The number of employees used to estimate costs in this report is 44,732,689. This is equal to 49% of the total number of employees potentially affected by the rule. It is not stated in the methodology whether these percentages are the actual percentages used in OSHA calculation.

In addition, consultants were expected to be hired to perform the initial training of employees. For an establishment in the medium hazard category, it was assumed that trainers would be hired for initial training sessions of 2 hours each in medium hazard establishments. However, OSHA stated that the initial training would last only 1 hour per session in a medium hazard business. It was estimated that *periodic* training sessions would last for half of the length of the initial training session. However, both periodic and initial training were presented as taking 1 hour. Because the periodic training estimate and the estimate of the time for trainers coincided with one another, it was assumed that the estimate for initial training of employees was presented incorrectly, and that the initial training of employees would actually last for 2 hours per session in a medium hazard establishment.

There are several other assumptions that needed to be made in order to estimate costs, due to the lack of specific information provided by OSHA in the methodology itself. Firstly, the costs of the Management Leadership core element are dependent upon the size of each establishment affected. Lacking this information, it was assumed that all establishments had 16 employees. This number is the average number of employees per establishment[24]. Furthermore, the costs of the Multi-Employer Workplace core element depends upon whether the establishment employs more or less than 100 employees. Lacking this information, it was assumed that all establishments

[24] Source: *Summary of the Economic Analysis* (pp. T-1).

employed fewer than 100 employees. Finally, in calculating the costs of investigations under the employee participation element, the number of fatalities used was 1,878. This was derived from the total number of fatalities in private industry by subtracting the number of fatalities in non-covered industries and the number of fatalities occurring in establishments which already have safety and health programs.

TABLE A-1
Elements of the Cost Estimates for the Proposed Safety and Health Program Rule

Core Element	Cost Element	Annual Cost
Management Leadership[1]		**$668,377,474**
	Establish Management Responsibility	$23,839,542
	Initial Training for Managers	$430,921,746
	Periodic Training	$213,616,186
Employee Participation		**$776,420,250**
	Reports	$143,487,500
	Investigations	$632,932,750
Hazard Identification & Assessment		**$408,041,668**
	Initial (not including MSDSs)	$28,785,393
	Periodic (not including MSDSs)	$121,448,720
	Prioritizing and Tracking	$257,807,555
Information & Training		**$2,012,636,324**
	Create a Training Program	$68,838,111
	Consultant costs	$180,772,350
	Initial Training	$266,680,663
	Training of Turnover	$193,076,800
	Periodic Training	$1,303,268,400
Program Evaluation & Updates		**$769,366,069**
	Evaluation	$615,492,855
	Updates	$153,873,214
Multi-Employer Worksites[2]		**$96,127,284**
	Host Employer Communication	$96,127,284
Subtotal		**$4,740,969,069**
Hazard Control[3]		**$2,670,431,688**
	Initial Hazard Control	$1,568,140,003
	Recurring Hazard Control	$1,102,291,686
Total		**$7,411,400,757**

[1] Management Leadership costs estimated based on an average establishment size of 16 employees.

[2] Estimated assuming all establishments have fewer than 100 employees.

[3] Estimated assuming only 20% reductions in injuries/illnesses.

SEE COST METHODOLOGY FLOW CHARTS
(Separate Volume of this Report)

APPENDIX B - Derivation of Benefits

This appendix will demonstrate that the benefits methodology presented by OSHA is both highly inaccurate and entirely misleading. In several instances, benefits estimates are incorrect simply due to arithmetic miscalculations. In other cases, the methodology claims to have calculated benefits estimates in a certain fashion, but the numbers do not correspond to the calculations described in the methodology. Finally, the benefits estimates are entirely incorrect due to the fact that they are based on the mean cost per workers' compensation claim rather than the median cost per claim. The reasoning behind using the median cost per claim is presented in the benefits section of the main body of this report, while the actual calculations used to derive this median cost per claim are presented at the end of this appendix.

Because OSHA calculated lost output backwards using the average cost per claim, it was forced to calculate the amount of lost taxes based on after-tax income in order to determine lost before-tax wages. The lost taxes were estimated to be equivalent to 30% of total before-tax income. However, OSHA figures are equal to 30% of after-tax income, thus causing an underestimation of lost tax value. This underestimated tax value was added to the estimated after-tax income to yield before-tax income. In reality, because taxes are equivalent to 30% of before tax income, the before-tax income *must* be calculated *before* the amount of lost taxes can be calculated. Unfortunately, OSHA has not presented an estimate of before-tax income, nor could it provide an accurate estimate given their miscalculation of taxes. The appropriate figure for before-tax income should be the total after-tax income multiplied by 1.43[25]. The same error was made in calculating lost fringe benefit value. OSHA calculated 39% of total after-tax income when it should have calculated 39% of total before-tax income. Again this creates a significant underestimate of lost fringe benefit value. *($2,413,599,779 * 0.39 =* ***$941,303,914*** *and not $658,912,753)* Correction of these errors increases OSHA estimates of the benefits of this rule, but it also further demonstrates that the benefits methodology provided by OSHA was inaccurate, inconsistent, and vague.

[25] 1.43 is equal to 100/ 70, given that after-tax income must be 70% of before tax income.

OSHA has presented a confused and misleading methodology for how it determined the benefits associated with avoided workers' compensation administrative costs. The methodology involves weighting the three components of the administrative costs by the value of benefits payments. However, it is never stated why the components of administrative costs should be weighted in any way. OSHA states its method and rationale for calculating administrative costs in a single unclear sentence. As further clarification OSHA presents a table with no supporting discussion of what the table means. OSHA goes on to state that the end result was that administrative costs were derived by multiplying the total cost of avoided compensation claims by 23.4%. OSHA's estimate of the total cost of avoided claims is $2.4 billion given a 20% reduction in injuries and illnesses. Thus, their estimate of the total administrative costs should be $553 million. However, OSHA has presented administrative costs in excess of $1 billion. Nevertheless, OSHA's estimate of more than $1 billion is correct. That is, the estimate was calculated correctly, but it was not calculated in the complicated manner in which OSHA claims to have calculated it. The reason is as follows. Benefits associated with avoided workers' compensation administration costs include: A) costs to private insurance companies; B) costs to State funds, and; C) costs to self-insured companies. Costs to private insurance companies were estimated to be equal to 35.8% of the average cost per claim, while costs to State funds were estimated to be equal to be equal to 17.8% of the average cost per claim. Costs to self-insured companies were estimated as comprising 11% of <u>benefits</u> paid. Using the un-weighted percentage estimates for private insurer and state fund administrative costs, the benefits of a 20% reduction in illnesses and injuries are $847 million and $151 million respectively. Self-insured administrative cost savings can be determined by multiplying their estimated percentage of fringe benefits (11%) by the amount of avoided fringe benefits losses at 20% reductions. Lost fringe benefits avoided by 20% reductions in injuries and illnesses are $1.2 billion. Eleven percent of this total is $135 million. Thus, the total of all avoided administrative costs associated with the rule at 20% reductions is $1.1 billion. This provides a total which is only slightly larger than OSHA's estimate due to OSHA's mis-estimation of the value of lost benefits.. In short, OSHA did **<u>not</u>** derive their total for administrative cost savings in the manner described in the methodology. The total was actually derived in a much more straightforward fashion. This is further proof that the benefits methodology is confused, inaccurate and misleading.

In addition, OSHA has not provided a great deal of information on how it derived its costs savings estimates for avoided indirect costs. Nevertheless, OSHA has indicated that indirect costs are equivalent to 35.4% of all claims costs. Therefore, by multiplying this percentage by the product of the average cost per claim ($4,080) and the total number of injuries/illnesses prevented, OSHA derives its estimate of the total value of avoided indirect costs. Thus, for 20% reductions:

$4,080 * 580,000 = $2,366,400,000;

$2,366,400,000 * 0.354 = **$1,638,253,393**

Of course, the actual product of $2,366,400,000 * 0.354 is **$837,705,600** or roughly one-half of OSHA's estimate of the total value of avoided indirect costs. Unfortunately, there is no way to ascertain where or how OSHA may have miscalculated because the Administration has provided no information describing how the estimate of 35.4% of claims costs was derived. In any event, OSHA's estimate of the total indirect costs was **not** derived by taking 35.4% of the total cost of claims. This again demonstrates that OSHA's benefits methodology misleads the reader by calculating the numbers presented therein in a different manner than is described within that methodology.

As described in detail below, the median cost per claim is derived from the mean cost per claim. This is done by dividing the total cost of claims (calculated using the mean cost per claim) by the median number of hours missed per injury and illness. This yields an average hourly compensation rate. The initial mean cost per claim estimate is then adjusted until it yields the average hourly compensation rate presented by the BLS of $18.50 per hour.

Given OSHA's estimate of the mean cost of disability indemnity payments of $2,509 we can accurately derive the mean compensation lost by injured and ill employees. Permanent partial disability payments replace 59% of after-tax wages and temporary total disability payments replace 90% of after-tax wages. Thus, the total after-tax wages of workers receiving these payments is:

- Permanent Partial = $2,509 * 1.695 = **$4,253** *(100/59=1.695)*

- Temporary Total = $2,509 * 1.111 = **$2,788** *(100/90=1.111)*

Taxes and fringe benefits must then be added to these totals to obtain the total compensation of employees receiving disability payments.

- Permanent Partial = $4,253 * 1.429(taxes) * 1.39(fringe benefits) = **$8,445**
- Temporary Total = $2,788 * 1.429 * 1.39 = **$5,536**

The total compensation received can then be divided by the average number of hours missed due to injury or illness to obtain the employee's hourly wage. OSHA has stated that the median number of days missed per injury/illness is 5. Thus, 40 hours are missed on average:

- Permanent Partial = $8,445 / 40 = **$211.13 per hour**
- Temporary Total = $5,536 / 40 = **$138.40 per hour**

Of course, the average total compensation per hour provided by the Bureau of Labor Statistics is **$18.50 per hour**. Thus, if the input of $2,509 per claim is adjusted until it results in an hourly compensation of $18.50, we obtain an average cost per claim of $220 for permanent partial disabilities and $330 for temporary total disability payments. The corrected benefits estimates for lost output as measured by permanent partial disability payments and temporary total disability payments are calculated using these figures. OSHA's original derivations of lost output are presented in Tables B-1 and B-3 below, while the corrected estimates are presented in Tables B-2 and B-4.

In order to find the average of these payments we must weight the above estimates by the percent of indemnity payments paid for each type of disability. OSHA estimated that permanent partial disability payments accounted for 68.5% of the total cost of claims while temporary total disabilities account for the remaining 31.5%. Thus, the average of these payments is actually $255. We must then account for the fact that these payments represent only 61.5% of the cost of workers' compensation claims. Thus, $255 must be multiplied by 1.63 (100/ 61.5) in order to arrive at the median cost per claim of $415. This median cost per claim was used to calculate the benefits associated with avoided medical costs, administrative costs, and indirect costs, as presented in Table 8 in the benefits section of the main body of this report.

TABLE B-1

OSHA Original Estimates of the Value of Lost Output Associated with Temporary Total Disabilities

	20%	30%	40%
Total number of lost work-day injuries and illnesses[1]	?	?	?
Number of temporary total disabilities prevented[2]	182,700	288,540	409,500
Total lost after tax income[3]	$509,327,000	$804,385,400	$1,141,595,000
Total lost before tax income[4]	$662,125,100	$1,045,701,020	$1,484,073,500
Total lost fringe benefits[5]	$198,637,530	$313,710,306	$445,222,050
Total lost compensation[6]	**$860,762,630**	**$1,359,411,326**	**$1,929,295,550**
Average hourly total compensation per injured/ill person[7]	**$117.78**	**$117.78**	**$117.78**

[1] The estimate of the total number of injuries in private industry used by OSHA to calculate preventable injuries and illnesses has not been provided. An estimate of 1.9 million is stated on Page 1 of the methodology, but OSHA did not use this figure.

[2] No information is provided as to where these figures came from. However, reductions at 20% should equal reductions at 40% when doubled. They do not.

[3] Calculated using OSHA's estimated average cost per claim of $4,080 multiplied by the number of injuries prevented and this total being multiplied by 1.111. 1.111 is used because permanent partial disability payments are estimated to replace 90% of after tax salary (100/ 90 = 1.111).

[4] Calculated incorrectly by adding taxes to after-tax income. Taxes were incorrectly calculated as 30% of after-tax income rather than 30% of before-tax income.

[5] Calculated incorrectly as 39% of after-tax income rather than 39% of before-tax income.

[6] Calculated by adding the incorrectly calculated before-tax income and the incorrectly calculated fringe benefits.

[7] Calculated by dividing total lost compensation by the total number of permanent partial disabilities prevented to obtain the lost compensation per injured person. This total was then divided by 40 hours to obtain the average hourly compensation of the injured/ ill. 40 hours are based on OSHA's estimate of the median number of days missed per injury of 5 days.

TABLE B-2

Corrected Estimates of the Value of Lost Output Associated with Temporary Total Disabilities

	20%	30%	40%
Total number of lost work-day injuries and illnesses[1]	3,250,000	3,250,000	3,250,000
Number of temporary total disabilities prevented[2]	204,750	307,125	409,500
Total lost after tax income[3]	$75,075,000	$112,612,500	$150,150,000
Total lost before tax income[4]	$107,249,998	$160,874,997	$214,499,996
Total lost fringe benefits[5]	$41,827,499	$62,741,249	$83,654,998
Total lost compensation[6]	**$149,077,497**	**$223,616,246**	**$298,154,994**
Average hourly total compensation per injured/ill person[7]	**$18.20**	**$18.20**	**$18.20**

[1] Estimated as (409,500 + 890,500) * 2.5

[2] Calculated as 31.5% of total injuries and illnesses

[3] Calculated using an average cost per claim of $330 multiplied by the number of injuries prevented and this total being multiplied by 1.111. 1.111 is used because permanent partial disability payments are estimated to replace 90% of after tax salary (100/ 90 = 1.111).

[4] Calculated by multiplying after-tax income by 1.43. After tax income = 70% of before tax income (100/70 =1.43).

[5] Calculated as 39% of before tax income

[6] Calculated as before tax income plus fringe benefits

[7] Calculated by dividing total lost compensation by the total number of permanent partial disabilities prevented to obtain the lost compensation per injured person. This total was then divided by 40 hours to obtain the average hourly compensation of the injured/ ill. 40 hours are based on OSHA's estimate of the median number of days missed per injury of 5 days.

TABLE B-3

OSHA Original Estimates of the Value of Lost Output Associated with Permanent Partial Disabilities

	20%	30%	40%
Total number of lost work-day injuries and illnesses[1]	?	?	?
Number of permanent partial disabilities prevented[2]	397,300	627,460	890,500
Total lost after tax income[3]	$1,689,519,879	$2,668,276,223	$3,786,854,901
Total lost before tax income[4]	$2,196,375,843	$3,468,759,089	$4,922,911,371
Total lost fringe benefits[5]	$658,912,753	$1,040,627,727	$1,476,873,411
Total lost compensation[6]	**$2,855,288,595**	**$4,509,386,816**	**$6,399,784,783**
Average hourly total compensation per injured/ill person[7]	**$179.67**	**$179.67**	**$179.67**

[1] The estimate of the total number of injuries in private industry used by OSHA to calculate preventable injuries and illnesses has not been provided. An estimate of 1.9 million is stated on Page 1 of the methodology, but OSHA did not use this figure.

[2] No information is provided as to where these figures came from. However, reductions at 20% should equal reductions at 40% when doubled. They do not.

[3] Calculated using OSHA's estimated average cost per claim of $4,080 multiplied by the number of injuries prevented and this total being multiplied by 1.695. 1.695 is used because permanent partial disability payments are estimated to replace 59% of after tax salary (100/ 59 = 1.695).

[4] Calculated incorrectly by adding taxes to after-tax income. Taxes were incorrectly calculated as 30% of after-tax income rather than 30% of before-tax income.

[5] Calculated incorrectly as 39% of after-tax income rather than 39% of before-tax income.

[6] Calculated by adding the incorrectly calculated before-tax income and the incorrectly calculated fringe benefits.

[7] Calculated by dividing total lost compensation by the total number of permanent partial disabilities prevented to obtain the lost compensation per injured person. This total was then divided by 40 hours to obtain the average hourly compensation of the injured/ ill. 40 hours are based on OSHA's estimate of the median number of days missed per injury of 5 days.

TABLE B-4

Corrected Estimates of the Value of Lost Output Associated with Permanent Partial Disabilities

	20%	30%	40%
Total number of lost work-day injuries and illnesses[1]	3,250,000	3,250,000	3,250,000
Number of permanent partial disabilities prevented[2]	445,250	667,875	890,500
Total lost after tax income[3]	$166,023,930	$249,035,894	$332,047,859
Total lost before tax income[4]	$237,177,037	$355,765,556	$474,354,075
Total lost fringe benefits[5]	$92,499,045	$138,748,567	$184,998,089
Total lost compensation[6]	**$329,676,082**	**$494,514,123**	**$659,352,164**
Average hourly total compensation per injured/ill person[7]	**$18.51**	**$18.51**	**$18.51**

[1] Estimated as (890,500 + 409,500) * 2.5

[2] Calculated as 68.5% of total prevented injuries/illnesses.

[3] Calculated using an average cost per claim of $220 multiplied by the number of injuries prevented and this total being multiplied by 1.695. 1.695 is used because permanent partial disability payments are estimated to replace 59% of after tax salary (100/ 59 = 1.695).

[4] Calculated by multiplying after-tax income by 1.43. 1.43 is used because taxes account for 30% of before-tax income. Thus, after tax income = 70% of before tax income (100/70 =1.43).

[5] Calculated as 39% of before tax income

[6] Calculated as before tax income plus fringe benefits

[7] Calculated by dividing total lost compensation by the total number of permanent partial disabilities prevented to obtain the lost compensation per injured person. This total was then divided by 40 hours to obtain the average hourly compensation of the injured/ ill. 40 hours are based on OSHA's estimate of the median number of days missed per injury of 5 days.