

**Report of the Small Business Advocacy Review Panel
On the Draft OSHA Standards for
Silica**

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1. Introduction

This report has been developed by the Small Business Advocacy Review Panel (the Panel) for the draft OSHA standards for silica. The Panel included representatives of the Occupational Safety and Health Administration, the Office of the Solicitor of the Department of Labor, the Office of Advocacy of the Small Business Administration, and the Office of Information and Regulatory Affairs of the Office of Management and Budget. On October 20, 2003, the Panel Chairperson, Robert Burt of OSHA, convened this Panel under section 609(b) of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) (5 U.S.C. 601 *et seq.*). A list of the panel members and staff representatives with their affiliations is included in Appendix A.

This report consists of four parts, including this introduction as Part 1. Part 2 provides background information on the development of the draft proposal. Part 3 summarizes the requirements of the draft proposal and the oral and written comments received from the small-entity representatives (SERs); a list of the SERs is included in Appendix B of this report, and a complete copy of the written comments submitted by the SERs is included in Appendix C of this report. Part 4 presents the findings and recommendations of the Panel.

2. Reasons Why Action by the Agency is Being Considered

Silicosis is an often fatal fibrotic lung disease caused by the inhalation and deposition of crystalline silica particles. A worker may develop one of three types of silicosis, depending on the airborne concentration of respirable crystalline silica: (1) chronic silicosis, which usually occurs after 10 or more years of exposure at relatively low concentrations; (2) accelerated silicosis, which develops 5 to 10 years after the first exposure; or (3) acute silicosis, which develops after exposure to high concentrations of respirable crystalline silica and results in symptoms within a few weeks to 4 or 5 years after the initial exposure.

Chronic silicosis often does not produce symptoms in the early stages. Until the disease is fairly advanced, effects on pulmonary function may be minimal to moderate. Restricted pulmonary function or x-ray changes are delayed because of what is called the long "latency period" (the time between exposure and seeing signs of disease). In fact, silicosis frequently occurs after leaving work (e.g., upon retirement). In chronic silicosis, the characteristic x-ray finding is the silicotic nodule. Fusion of the nodules in the silicotic lung is referred to as complicated silicosis or progressive massive fibrosis. Shortness of breath with exertion is the most common symptom of chronic silicosis and is usually of gradual onset and slow progression. Shortness of breath may become disabling if progressive massive fibrosis develops due to the severe constriction, loss of lung compliance, and a reduced amount of oxygen in the blood. Complicated silicosis

may be accompanied by tuberculosis or other mycobacterial infections. Epidemiologic studies of South African gold miners, granite quarry workers in Hong Kong, and metal miners in Colorado have shown that chronic silicosis may develop or progress even after occupational exposure to silica has been discontinued.

Accelerated silicosis develops 5 to 10 years after the initial exposure to high concentrations of crystalline silica. The symptoms, x-ray findings, and other measurements of disease resemble those found in cases of chronic silicosis. Acute silicosis typically is associated with a history of high exposures from performing occupational processes that produce small particles of airborne dust with a high silica content, such as during sandblasting, rock drilling, or quartz milling.

Acute silicosis is said to be a different disease than accelerated or chronic silicosis. Lung fibrosis may not be present in acute silicosis. In this type of silicosis a different kind of lung damage called alveolar lipoproteinosis usually occurs. The symptoms are shortness of breath, weakness, and weight loss. Acute silicosis progresses rapidly to respiratory failure.

It has also been determined that there is an increased risk of lung cancer development with exposure to crystalline silica. In 1996, the International Agency for Research on Cancer classified crystalline silica (occupational exposure to quartz or cristobalite) as a known human carcinogen. There have been numerous epidemiologic studies that have demonstrated this increased risk of lung cancer development. These studies have looked at workers exposed to silica in many different occupations. A recent epidemiological study “pooled” ten of the best studies together and determined that there was an increased risk of lung cancer mortality with exposure to crystalline silica [Steenland *et al.*, 2001].

Exposure to silica has also been associated with increased risks of developing autoimmune diseases, such as scleroderma, rheumatoid arthritis, systemic lupus erythematosus, hemolytic anemia, sarcoidosis, and dermatomyositis. Renal (kidney) diseases have also been associated with silica exposure, including end-stage renal disease, glomerulonephritis, chronic renal disease, Wegener’s granulomatosis, and subclinical renal changes. It is thought that these diseases may be due either to a direct toxic effect of silica on the kidney or be the result of an autoimmune reaction.

Based on OSHA’s current risk assessment for silicosis, the Agency estimates a lifetime mortality risk of 12.6 per thousand for workers exposed at 100 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) for a 45-year work-life. The lung cancer risk model predicts a lifetime mortality risk of 27.2 per thousand for workers exposed at 100 $\mu\text{g}/\text{m}^3$ for a 45-year work-life. For these workers, this means 12.6 per thousand are projected to die sometime from silicosis and 27.2 per thousand are projected to die sometime from lung cancer.

OSHA believes that the mortality risk estimates for silicosis and lung cancer reflect distinct and separate risks based on how the underlying studies were conducted. The risk estimates come from two analyses published by the same group of researchers. The lung

cancer risk estimates were based on the results of 10 epidemiological studies of lung cancer in silica-exposed worker cohorts; deaths were counted where the singular underlying cause of death (i.e., the principle cause of death) was recorded in the death record as lung cancer. For the silicosis mortality study, these same researchers used 6 of the same cohort studies as were used in the lung cancer study; thus, the silicosis study was based on many of the same death records as was the lung cancer study. The researchers counted only those deaths where the death record reported silicosis as the singular underlying, or principle, cause of death. It is important to note that deaths were not counted if silicosis was indicated as a contributing, but not principle, cause of death. As such, if silicosis was a contributing factor for a lung cancer death, that death would not have been counted to calculate the silicosis mortality rates, and therefore is not reflected in the silicosis mortality risk estimate. Because of the way that silicosis deaths were counted, and because the same group of researchers examined the same death records for both lung cancer and silicosis mortality, OSHA believes that there is little reason to suspect that the same death would have been counted as both a silicosis death and a lung cancer death. Consequently, the preliminary risk estimates, and the preliminary estimates of benefits described below that are derived from the risk estimates, reflect distinct risks and benefits.

The Agency estimates that ensuring that no employees are exposed above $100 \mu\text{g}/\text{m}^3$ would prevent 183 silicosis fatalities over a working lifetime in general industry and maritime. Additionally, it would prevent 58 fatal lung cancers over a working lifetime in these industries. This is the equivalent of an average of 4 silicosis cases and 1 lung cancer case avoided annually. The Agency estimates that setting a permissible exposure limit (PEL) at $75 \mu\text{g}/\text{m}^3$ would prevent 388 silicosis fatalities over a working lifetime in general industry and maritime. Additionally, it would reduce the incidence of fatal lung cancer by 145 cases over a working lifetime. This is the equivalent of an average of 9 silicosis and 3 lung cancer fatalities avoided annually. Alternately, the Agency estimates that setting a PEL of $50 \mu\text{g}/\text{m}^3$ would reduce fatal silicosis by 677 cases over a working lifetime. Additionally, this would prevent 309 lung cancer fatalities over a working lifetime. This translates into an average of 15 fatal silicosis and 7 fatal lung cancer cases avoided annually.

The Agency estimates that ensuring that no employees are exposed above $100 \mu\text{g}/\text{m}^3$ in the construction industry would prevent 343 silicosis fatalities over a working lifetime. Additionally, it would reduce the incidence of fatal lung cancer by 108 cases over a working lifetime in construction. This is the equivalent of an average of 8 silicosis and 2 lung cancer cases avoided annually. The Agency estimates that setting a PEL at $75 \mu\text{g}/\text{m}^3$ would prevent 710 silicosis fatalities over a working lifetime in construction. Additionally, it would reduce the incidence of fatal lung cancer by 264 cases over a working lifetime in construction. This is the equivalent of an average of 16 silicosis and 6 lung cancer cases avoided annually. Alternately, the Agency estimates that setting a PEL of $50 \mu\text{g}/\text{m}^3$ in construction would prevent 1,181 silicosis fatalities over a working lifetime. Additionally, this would reduce the incidence of lung cancer by 529 cases over a working lifetime. This translates into an average of 26 silicosis and 12 lung cancer cases avoided annually.

Taken together, the Agency estimates compliance with the draft silica standards for general industry, maritime, and construction are estimated to result annually in 15 prevented fatalities (12 from silicosis and 3 from lung cancer) with a PEL of 100 $\mu\text{g}/\text{m}^3$, 34 prevented fatalities (25 from silicosis and 9 from lung cancer) with a PEL of 75 $\mu\text{g}/\text{m}^3$, and 60 prevented fatalities (41 from silicosis and 19 from lung cancer) with a PEL of 50 $\mu\text{g}/\text{m}^3$.

3. Summary of the Draft Standards and Comments from Small Entity Representatives (SERs)

a. General Industry and Maritime

General/Need for Standard

OSHA is proposing to issue a comprehensive standard governing employee exposure to respirable crystalline silica in general industry and maritime. The proposed standard would include a (PEL) for respirable crystalline silica and other requirements such as conducting exposure assessment, health screening of exposed employees, employee training, hygiene facilities, and respirator use. OSHA has had PELs for various forms of respirable crystalline silica since 1971, but no other specific requirements.

Two SERs from the industrial sand industry stated: “We support OSHA’s efforts to promulgate a substance-specific silica standard that is protective of workers’ health, scientifically and technically justified, reasonable in its implementation for industry, with particular consideration of small industry, and economically efficient in concentrating appropriate resources on a hazard without distorting safety and health priorities or diverting capital investment beyond what is necessary.” [Cole/Stark, p. 1.] These SERs thought that it is both possible and economically feasible for a small business to implement silicosis prevention programs to protect workers’ health, but they cautioned against complicated standards.

One SER stated that the draft proposed standard was understandable, but that the question of compliance had not been established.

A SER from a maritime facility stated that abrasive blasting was their only silica-related issue and that they were already doing much of what was reflected in the draft.

Some SERs commented that they found the rule confusing; one SER remarked that it was difficult to understand all of the paperwork requirements. Another SER expressed concern that the standard was vague and subject to differing interpretations by OSHA compliance officers.

A number of SERs questioned the need for a standard and reported that they had not, in their personal experience, seen any cases of silicosis arise among their employees. For example, one SER stated that his company adopted the American Society for Testing and

Materials (ASTM) recommended standard for crystalline silica 13 years ago and have never seen a case of silicosis. He also referred to NIOSH mortality data showing that the annual number of deaths attributed to silicosis dropped from 1,000 in 1968 to 187 in 1999. Two SERs stated: “Both of our companies have managed silicosis prevention programs and have over 47 years experience without having a silicosis case among our workers.” [Cole/Stark, p. 1.]

Many other SERs also referred to the declining trend in silicosis mortality as evidence that the current PEL was adequate. One SER from the brick industry discussed one case of silicosis experienced at his company; the employee was reassigned to a low-exposure job and has since been placed on a respirator. Several SERs stated that the current PEL is working and that no new rules are needed. One SER suggested that OSHA’s risk information should be interpreted carefully, because of potential confounding with other respiratory risk factors.

Several SERs stated that there is strong scientific evidence that if silica increases the risk of occupational lung cancer, it is only in those individuals who first contract silicosis. Thus, they stated, silicosis prevention will prevent increased rates of related lung cancers. These SERs also commented that OSHA should provide more compliance assistance and enforce the current standard more strongly. In addition, these SERs suggested that silica-related deaths are about as rare as lightning-caused deaths and do not warrant the type of comprehensive rulemaking proposed by OSHA. These SERs suggested that instead of rulemaking, OSHA should pursue compliance assistance and effective enforcement for those few employers violating the existing PEL.

A SER from a foundry quoted from the two risk assessment studies provided by OSHA to the SERs and wondered how the studies could be used to justify lowering the PEL for foundries in the United States. He felt that the data did not justify changing the PEL and that it was not scientifically sound. Also, he noted that silica sand used in the process of making molds is coated with bentonite (clay) and water and, therefore, foundries do not have the same exposures as mining, granite, or industrial sand plant operations.

Three SERs from brick companies said that the current standard should be enforced, suggesting that silicosis fatalities and lung cancers may be located in industries with the greatest non-compliance with the existing PEL. They commented that the draft proposed standard seemed more appropriate for large businesses: “The Draft Proposed Rule for Crystalline Silica reflects the format used by OSHA for standards that primarily affect large businesses. Requirements of the standard that are routinely addressed by large business are virtual obstacles to small business for reasons of either technical feasibility or crippling economic costs.” [See, e.g., Sims, p. 2.]

A SER from a dental laboratory suggested that if OSHA broke down its rules into more “defined business categories,” they would be more specific and easier to understand.

Scope and Application

The draft proposed standard would apply to all workplaces where there is occupational exposure to respirable crystalline silica within the general and maritime industries.

The SERs generally agreed that the scope of the proposal was clear, and that most provisions would apply in their particular industry.

A SER in the foundry industry expressed concern that the foundry industry was being categorized with dangerous industries, and that the foundry business had improved with respect to health and safety.

One SER was confused about the extent to which the proposal would cover the customers who used their products. Another SER said that the areas of concern in his facility were shakeout, sand mixing, and floor sweeping.

One SER from a dental laboratory was interested in whether OSHA had actual data that demonstrated that there were cases of silicosis in the dental laboratory industry. The SER also thought the proposal should be specific to each industry affected.

Some SERs questioned the meaning of the terms “crystalline-silica containing blasting agents” and “silica sand alternatives,” as they related to the Hazardous Communication standard (the 0.1% by weight of a recognized carcinogen). These SERs also stated that NIOSH has recommended that materials containing more than 1% free silica be prohibited.

A SER from the non-ferrous foundry sector stated that there have been no silicosis cases in his industry since 1985. Another SER from the same industry stated that there was no justification for applying the draft standard to foundries since the sand used is clay-coated and there are no current studies showing problems in foundries. One of these SERs said OSHA should be focusing on the agriculture and construction industries.

Definitions/Competent Person

The definitions section explains important terms used in the draft proposed standard, such as “competent person,” “health care professional,” “regulated area,” “employee exposure,” “action level,” and others. Many SERs had comments on the definition and responsibilities of the competent person. Under the draft proposed standard, the employer would have to designate a competent person at each worksite who would be capable of recognizing silica-related hazards and who would have the authority to take corrective measures, including the temporary stoppage of work, to ensure that employees are not exposed above the PEL and that the requirements of the standard are being met. The draft standard does not contain any specific training requirements for the competent person.

Two SERs thought the definition of competent person was clear.

A few SERs were confused about the role and duties of the competent person. Two SERs suggested clarifying the responsibilities of the competent person as follows:

The role and qualifications of the “competent person” are not clear. It is not clear if there can be one person for multiple facilities, one person per shift, or what the qualifications would be. This needs to be more defined if it is to remain so prescriptive. We would suggest a change from “competent person” to “responsible person”. Let the owner/operator assign a “responsible person” that could identify how to meet the requirements of the standard. [Cole/Stark, Issues attachment, p. 4.]

These SERs also provided suggested wording for a definition of “responsible person.”

Another SER stated that the “definition of Competent Person is too vague and open to interpretation.” [Buesing, p. 2.]

A few SERs stated that they did not have personnel within their firms with the capabilities of the defined competent person. Many of the SERs interpreted the draft proposed standard as requiring the competent person to be an industrial hygienist. One of these SERs, a brick manufacturer, stated he had only two supervisors who could serve as the competent person. Referring to the various potential responsibilities of the competent person, three brick manufacturers stated in their written comments:

These [responsibilities] are the professional activities of a journeyman industrial hygienist. Even our larger companies cannot and, do not, employ a full-time hygienist and most of these activities are well beyond the capacity of our workers to do without full-time education for an extended time period and full-time devotion to these activities after acquiring the education and training. [See, e.g., Sims, p. 4.]

One SER in the maritime industry stated that the OSHA maritime rules require an individual with the training and experience of a marine chemist. He also asked if the competent person had to be designated in writing, as is the case in maritime. In addition, he stated his firm had implemented effective programs using competent person(s).

Another SER thought that the competent person provisions were workable if they could be applied to a foreman with some additional training.

Other potential problems identified by some SERs with the competent person provisions include: (1) resource constraints such as facilities being located in remote areas; (2) industrial hygiene or safety contractual support being difficult to obtain; and (3) a limited number of supervisors -- who would need additional training -- available to become competent persons.

Two SERs in the industrial sand industry believed that the definition of competent person(s) needed to be broad enough to encompass many decentralized operations. These SERs did not want to have to designate one centralized competent person, but to designate a large number of “responsible persons.” They stated:

We have a different management approach than most businesses. We operate under a Team Management Style with the use of self directed work teams. Under this management style we would consider every associate to meet the definition of a competent person. Every associate has the responsibility to address any safety hazard that they identify. This responsibility includes the authority to shut down any process at any time if necessary to take corrective action. Associates presently help in all areas of safety and health, and have taken responsibility for the dust monitoring, dust control equipment operation and maintenance, and respirator fit testing. [Cole/Stark, Issues attachment, p. 4.]

One SER stated:

In many work places, only the supervisory personnel have authority to control a work site and take corrective measures with respect to safety issues. Considering the burden already placed on many supervisory personnel, employers would have to hire additional personnel to perform this duty. [Ollier attachment, p. 29.]

One SER stated that having a competent person can probably be implemented in a General Motors foundry, but not in small foundries.

Permissible Exposure Limit (PEL)

The draft reflects three alternative PELs being considered by the Agency: 50, 75, and 100 $\mu\text{g}/\text{m}^3$ measured as an 8-hour time-weighted average (TWA) concentration of respirable crystalline silica. The PEL is the highest average concentration of respirable crystalline silica in the air to which an employee may be exposed over an 8-hour workday. Since the PEL represents an 8-hour TWA, employees may be exposed to short-term concentrations above the PEL so long as the 8-hour TWA does not exceed the PEL.

A SER from an aluminum foundry stated that their silica exposures in shakeout operations are around 85 $\mu\text{g}/\text{m}^3$. He also stated that their foundry has installed a lot of ventilation for cooling and general hygiene, but that this has created problems for dust capture, particularly for a job shop that casts different sized products on different days. He reported that mold sizes at his facility can range from 2 to 800 cubic feet, with most falling between 20 to 40 cubic feet. The SER remarked that dust collection equipment could not deal with huge variations in mold size, that it would be very costly to put extensive dust collection in place, and it would be expensive to heat make-up air.

A SER from a non-ferrous foundry stated that they used the same kinds of controls as the aluminum foundry above; from a recent OSHA inspection, their exposures were reported

to be 77 and 99 $\mu\text{g}/\text{m}^3$ in molding, and 87 $\mu\text{g}/\text{m}^3$ in core preparation. This SER commented that they could maintain exposures below 100 $\mu\text{g}/\text{m}^3$.

Another foundry SER reported that they started installing improved engineering controls for silica in early 2001 and that it took more than a year to achieve compliance with the current PEL. The SER described their facility as being a newer plant, and he stated that dust controls did not initially meet the PEL. After retrofitting at a cost of between \$200 and \$250K, they were able to meet the current PEL. He stated that everyone could meet 50 $\mu\text{g}/\text{m}^3$ if enough money were spent to do so, but that he was unable to get any estimates of what it would take to achieve that level of exposure.

A SER from a grey-iron foundry stated that they are achieving the PEL in all operations except shakeout and cleaning. He stated that workers in both areas are furnished with supplied air respirators and that his foundry is currently working on engineering controls. This SER stated that they have two facilities, one that is 30 years old and another that is five years old. With regard to the possibility of complying with the lower PELs, he stated:

If it were possible to engineer a ventilation system to comply with the 50 or the 75 PEL it would require many more pick up points, hoods, tubing and a larger dust collector. In addition, it would require much more make up air to replace the air being filtered. These items would render our existing equipment obsolete. Start up costs to engineer, purchase and install the equipment would be approximately \$268,190.00. [Pomeroy, p. 1.]

This SER also supplied attachments detailing these costs. He expressed the belief that his foundry and many other foundries could not comply with a lower PEL and remain in business.

An aluminum casting SER reported that they are meeting the current PEL and use baghouses.

A SER from a brick manufacturing facility commented that they use water in crushing and grinding operations, but that the amount of water used needs to be controlled. They also rely on dust collection and ventilation systems. The SER described the transferring of materials from a dump truck into hoppers as dusty and that not much could be done to control dust emissions during this activity. The SER also said that using recycled water led to higher silica exposures, and, therefore, they had discontinued the use of recycled water. He also stated that he knew of facilities that had spent hundreds of thousands of dollars and still were unable to meet the current PEL.

Another SER from the brick industry stated that they were still trying to achieve the current PEL, and will have spent between \$600 and \$700K in improved dust controls. Their first dust control system was installed around 1995 at a cost of \$250K for two areas of the plant. A new system has been ordered and they spent close to \$200K for that

system. He has achieved what he described as limited success using water and baffles, and that lowering the PEL would affect operations in the whole plant.

A third SER in the brick manufacturing industry reported that they have spent over \$200K in dust collection but that he did not know where they stood in relation to the current PEL. He stated that their controls include 3 process-specific systems, one for compliance with clean air requirements, and two for comfort.

Another SER stated that the steps in brick manufacturing include grinding of raw materials, forming, firing, coatings preparation, and packaging. He said that they are struggling to meet the current PEL in the processes leading up to the firing process. If the PEL were lowered, he believed that the whole plant would be affected.

A SER from a refractory concrete manufacturing facility stated that they produce high-purity silica-containing products in isolated rooms, where they have added dust control pick-up points over time. He believed isolation of dusty processes was a good idea, and reported that they have only two points where respirators are needed. He believed that a lower PEL would make this system of controls obsolete and that he would need a full engineering study to determine what would be involved in a new system. He also reported that there have been no health problems in their facility attributable to silica exposures.

A SER from a dental laboratory reported that they have no appreciable exposures to silica, based on an OSHA site visit. He said his facility relies on ventilation systems and performs blasting operations in cabinets. He also stated that, while they are among the larger dental laboratories with 13 employees, the average size in the industry is two employees.

A SER from an industrial sand products manufacturing facility reported that they spent \$350K for dust controls.

A SER from a pre-cast concrete manufacturing facility stated that they recently spent \$3 million to move their abrasive blasting operations indoors in one plant; he also stated that their other plant is unable to invest this amount of money for such a move. The SER reported that they enclosed the blasting operation to minimize dust levels in the production plant, which were close to the current PEL. At the other plant, blasting is done outside; according to the SER, use of water blasting systems did not work well and alternative blasting media were considered too expensive. This SER stated: "Engineering controls for outside work that changes locations would be extremely costly. I don't feel that those costs have been considered in OSHA's analysis. Reducing the PEL would require substantial addition to those costs. To move the work indoors and provide ventilation would also involve more expense than most plants could absorb." [Buesing, p. 1.]

Two SERs commented that there was merit in implementing some form of the ancillary provisions, particularly exposure assessment and health screening, and that this would be more effective than lowering the PEL.

A SER from a non-ferrous foundry commented that while the requirements of the PEL and Methods of Compliance are clear, the costs and feasibility to achieve those requirements are “impractical and unrealistic.” [Iannettoni, p. 2.] This SER noted that he has implemented dust-capturing controls where necessary. Other practices he has used are: wetting the floor prior to sweeping, separate lunch rooms, showers, uniforms and monitoring operations that may create dust. He said that they do not use respiratory protection. He also mentioned several substitutes for silica that could be used in some processes, but felt that they were more expensive and in many cases not applicable.

One SER was from a new foundry that started production in January 2001. He provided information on the cost of engineering controls, his foundry’s compliance with the current PEL and possibly the proposed PELs, as well as commenting on his belief that older, less modern facilities would not be able to “bring their operations up to speed in order to meet the new PEL unless they also spent enormous sums of money that would be better spent on capital projects that improve productivity.” [Pohlman, p. 2.]

Three SERs from brick companies stated that there are no product substitution options to reduce or eliminate silica in their plants. They also stated: “The primary engineering controls typically employed in the industry include water sprays and dust collection systems. Both have been found to have limited effectiveness.” [See, e.g., Sims, p. 2.] With respect to OSHA’s estimates of risk, these SERs stated: “For our industry...we do not believe that OSHA’s projections of silicosis and lung cancer are realistic, supportable or based on data pertinent to the brick industry.” [See, e.g., Sims, p. 3.] These three SERs also questioned the requirement in the draft proposed standard that employers must still use all feasible engineering and work practice controls even when supplementing with respiratory protection. They remarked: “Why require the utilization of very expensive controls and then the use of a respirator, as well? The employee must wear the respirator regardless of the presence of controls when the respirator alone will do the job of meeting the PEL, if it is properly selected. We understand that OSHA considers the respirator as the lowest level on the hierarchy of controls, but the required installation of engineering controls that will not meet the PEL or are cost prohibitive is unrealistic.” [See, e.g., Sims, p. 4.] These three brick company SERs also stated that they “need the ability to use personal protective equipment, and apply administrative controls (i.e., respirators, rotation, etc...) to achieve the PEL when engineering controls are technically or economically infeasible.” [See, e.g., Sims, p. 4.]

Two SERs from the industrial sand industry remarked:

We are confident that compliance with the current Permissible Exposure Limit, or its gravimetric equivalent of $100 \mu\text{g}/\text{m}^3$, coupled with ancillary provisions of control of exposures, exposure monitoring, medical assessment, education and training of employees, and involving employees in the goal of eliminating

silicosis can be successful in protecting workers from the development of silicosis. Both of our companies have managed silicosis prevention programs and have over (47) years experience without having a silicosis case among our workers. As small businesses, we both believe it is possible and economically feasible for small businesses to implement silicosis prevention programs to protect workers' health. However, in our opinion these programs do not have to be as difficult or involved as some of the provisions in the draft standard. [Cole/Stark, p. 1.]

These SERs from the industrial sand industry also stated: "If the PEL is reduced, the new standard will be extremely burdensome for us and our largest customer base, the foundry industry. Major capital costs for installation of new dust control systems, along with increased operating costs, will cause many of our smaller foundry customers to reconsider their future." [Cole/Stark, Issues attachment, p. 1.] They stated further: "It has been our experience, and that of the National Industrial Sand Association, that maintaining dust exposures below the existing PEL will prevent silicosis. We believe that some provisions of the proposed standard are necessary but that a reduction in the PEL is not only burdensome, but unnecessary." [Cole/Stark, Issues attachment, p. 1.]

Several SERs from foundries stated that the proposed PELs and action levels are not technically feasible. They remarked:

The new action and enforcement levels under consideration are not technically feasible based on these facts alone. If 30-50% of industry can not comply with the current PEL, how is it feasible to comply with reductions of 50-75% in the new PELs and action levels, to avoid the massive adverse impact of restricted areas, medical exams, respirator programs, and the other mandates of this rule? And when even larger percentages of compliance samples are determined to be above the action levels or new PELs, how will industry or OSHA be able to respond? [Ollier attachment, p. 25.]

Methods of Compliance

The draft proposed standard would require that the employer use engineering controls and work practices to maintain exposures to or below the PEL, unless such controls are not feasible or employees are exposed above the PEL for fewer than 30 days per year. Respirators must be used to supplement engineering controls and work practices only after all feasible engineering and work practice controls have been implemented. When an employee has work duties that involve only intermittent exposure to respirable crystalline silica (i.e., less than 30 days per year, such as for occasional maintenance operations), the compliance hierarchy above does not apply; however, where employees are exposed above the PEL for fewer than 30 days per year and the employer chooses not to implement engineering controls or work practices, the employer must provide appropriate respiratory protection. The draft proposed standard would also prohibit the use of compressed air, brushing, or dry sweeping to clean floors and close surfaces where crystalline silica-containing material has accumulated.

Some SERs stated that the provision prohibiting dry sweeping and brushing was too stringent. A brick industry SER commented that sweeping is a work practice required for cleaning brick. Another SER from the maritime industry commented that dry sweeping/brushing is necessary in order to not contaminate waterways since most of the dust containing matter generated in maritime is not only contaminated with silica but by other health and environmental hazards as well, such as lead.

SERs from the brick industry expressed concern about how OSHA arrived at the 30-day per year exposure cut-off. The SERs wanted to know if this was a risk-based requirement. The SERs stated: “What is the risk for 30 days of exposure at each of the PEL options? The impact of engineering controls and work practices on our members is overwhelming.” [See, e.g., Sims, p. 3.]

The SERs further stated:

The nature of the raw materials we use and the open layout of our facilities can make achieving the current PEL unreachable and cost prohibitive through engineering controls. We do not have the option, given our processes, to totally enclose areas to provide the dust collection necessary. Lowering the PEL and requiring engineering controls as the primary alternative when such controls have been demonstrated to be incapable of achieving the PEL, will not allow many facilities to continue to operate. We need the ability to use personal protective equipment and apply administrative controls ... to achieve the PEL when engineering controls are technically or economically infeasible. [See, e.g., Sims, p. 4.]

One of the SERs told OSHA that substitutes like olivine, glass, carbon sand, chromite, and zircon can be used in some processes, but said these substitutes are “more expensive and in many cases not applicable.” [Iannettoni, p. 2.]

Some SERs stated that “[s]ilica is a very cost effective product and we believe that it is a safe product if exposure levels are maintained below the existing PEL.” [Cole/Stark, Issues attachment, p. 3.] They further stated that: “Engineering controls are used whenever feasible to reduce exposure levels. All associates are required to wear respiratory protection when in respirator required areas no matter how infrequently they may be exposed.” [Cole/Stark, Issues attachment, p. 4.]

Some of the SERs said they followed the methods of compliance outlined in ASTM E 1132-99a. In addition, the SERs provided suggested wording for OSHA to use in the methods of compliance section of the draft proposed standard.

Regulated Areas

To minimize any unnecessary employee exposures, the draft standard would propose that the employer ensure the competent person establish a regulated area around operations

where respirable crystalline silica concentrations exceed or could reasonably be expected to exceed the PEL. The regulated area would be demarcated to limit entry to employees working in the area and other authorized persons. An employer at a multi-employer worksite would be required to communicate the location and access limitations of regulated areas to other employers at the site. Respirators would be required for each authorized person who enters the regulated area. Eating, drinking, or the use of tobacco would be prohibited in regulated areas. Where dry silica sand is used as a blasting medium outside of enclosures, the draft proposed standard contains an optional provision being considered that would require the effectiveness of the regulated area be evaluated under the supervision of a Certified Industrial Hygienist (CIH) or a Certified Safety Professional(CSP) to ensure the protection of nearby workers.

One SER commented that he isolates high exposure areas and requires his employees to wear respiratory protection in those areas. One SER stated that he was having some success with mesh barrier screens in decreasing exposures in operations containing high amounts of silica dust.

Many SERs described their facilities as “open areas.” The SERs were concerned that their entire facilities would be “regulated areas” under the draft proposed standard. These SERs were uncertain how to demarcate an open space. One SER questioned whether if an entire plant were a regulated area, would they have to move the water fountains and the containers of Gatorade outside?

One SER was concerned with drivers who come into the plant to pick-up or deliver products, and the extent to which they must be protected from exposure to silica. A SER representing the brick industry asked whether the draft proposed standard required visitors to wear respiratory protection in regulated areas.

One SER in the maritime industry commented that their blasting is performed outdoors and explained that if barricades or screens were necessary to demarcate regulated areas, they would have to move these barriers every time the wind changed directions.

Several SERs said that it would take a great deal of time for the competent person to maintain the boundaries of the regulated areas.

Another SER was concerned that the requirements of the regulated area seemed to prohibit the use of silica sand for blasting outdoors. He stated that many employers sand blast outdoors and any prohibition on this practice would increase the cost of his product well beyond what OSHA estimated.

A couple of SERs thought the draft proposed standard was too vague in its description of when a regulated area should exist. They also questioned what OSHA would require in terms of checking the regulated area daily. Specifically, would OSHA require regulated areas to be checked once a day or once a shift?

Abrasive blasting

The draft proposed standard addresses the use of abrasive blasting media containing crystalline silica and operations where abrasive blasting, using any media, is conducted on substrates that contain crystalline silica. Employers must follow the respiratory protection requirements of 29 CFR 1910.94 (Ventilation) and 1910.134 (Respiratory Protection) for employees engaged in abrasive blasting operations. The draft proposed standard would prohibit the practice of using silica sand in dry or unventilated systems where abrasive blasting operations are being conducted within enclosures such as tanks, boilers, rooms, sheds and tarped enclosures because of the extremely high exposures that could result.

One SER stated that they liked the quality of silica sand used during abrasive blasting operations, and that they are in compliance with the current PEL.

A SER from the maritime industry said he reduced the need for using sand during blasting to approximately two percent of the time. He said that he uses hydroblasting a large portion of time; however, he still uses silica sand in order to obtain a desired “profile” on steel. He said that hydroblasting does not prepare the substrate for paint products in the way that silica sand does.

A SER from the brick industry uses a process that involves using pressurized air to blow sand onto the surface of extruded clay to impart color and surface texture. This process does not remove anything and the SER questioned if this process would be considered “abrasive blasting” under the draft proposed standard. The SER requested a clear definition of abrasive blasting.

One SER conducted most abrasive blasting on a certain time schedule and blasted only on days when most employees are not present.

A SER from dental laboratories said they use cabinets and hoods for blasting operations. Most, he said, have exhaust vents.

Several SERs questioned the CIH/CSP requirement. A SER from the maritime industry asked that OSHA allow a marine chemist to perform the same duties. Another SER mentioned how he would prefer OSHA allow a “competent person” to perform the duties. Another SER said OSHA should add to the provision people with a 4-year health or safety degree.

A SER from the concrete industry said there were two disadvantages to the use of CIHs/CSPs: (1) they need to be scheduled ahead of time, and (2) their services are very expensive.

A SER stated that most of the products they sandblast are very large; they often perform this blasting outdoors. Further, the SER stated that work done outdoors is not always performed in the same location. Thus, he stated that, “[e]ngineering controls for outside

work that changes locations would be extremely costly”, as would be moving the work indoors.

Some SERs questioned the meaning of the terms “crystalline-silica containing blasting agents” and “silica sand alternatives”, as they related to the Hazardous Communication standard (the 0.1% by weight of a recognized carcinogen). These SERs also stated that NIOSH has recommended that materials containing more than 1% free silica be prohibited.

One SER in the foundry industry said that “shot blasting is more common than sand blasting.” [Iannettoni, p. 3.]

Respiratory Protection

The draft standard makes reference to OSHA’s Respiratory Protection standard (29 CFR 1910.134), which must be complied with when employees must use respirators for protection against crystalline silica. This program includes written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators. The standard would require the use of respirators in four situations:

- 1. Within regulated areas;*
- 2. During work operations where feasible controls are not sufficient to reduce exposures to or below the PEL;*
- 3. While engineering controls and work practices are being installed, repaired, or developed; and*
- 4. Whenever the employee requests a respirator.*

For employees engaged in abrasive blasting operations (including helpers), the employer would need to provide and ensure the use of Type CE continuous flow respirators, as required by 29 CFR 1910.94.

One SER from the foundry industry reported that silica sand is still used in coremaking and that exposures over the current PEL still exist at the shakeout and cleaning operations. The SER also said that all of his employees in these areas wear respiratory protection.

Another SER said he is in compliance with the current PEL, with the exception of his shakeout operations, where his employees wear respiratory protection.

A SER said that he provides water within the work area to his workers who use respiratory protection due to the added heat stress of wearing a respirator; this necessary practice would be prohibited by paragraph (e)(7).

Several SERs stated that, “the administration of an appropriate and effective respirator program is a very challenging and expensive technical task.” They further stated that respirators are not “an easy out option” and that the company would need to devote an

employee to this task, which would be a significant portion of the employee's work time. [See, e.g., Sims, p. 7.]

Exposure Assessment

The draft proposal contains provisions that address methods for evaluating employee exposures to respirable crystalline silica. Exposure assessment is not required to evaluate exposures of employees engaged in abrasive blasting operations provided the employer is complying with 29 CFR 1910.94, 1910.134, paragraph (d) of the draft standard, and the employee is using a type CE abrasive blasting respirator. The draft proposal contains two options for periodic monitoring. The first option would require employers to repeat personal monitoring at least biannually for operations where exposures are above the action level and quarterly where exposures are above the PEL. The second option is a more performance-based provision that would require the employer to perform periodic monitoring as needed to adequately characterize employee exposures and to ensure that engineering controls and work practices are maintaining exposure at or below the PEL and, if not, that appropriate respiratory protection is being used. The second option also permits the employer to supplement personal sampling for crystalline silica with other exposure assessment approaches, such as use of direct-reading particulate samplers. The draft proposed standard would also require the employer to perform monitoring if there has been a change in a production process, control equipment, personnel, or work practices that may affect employee exposures.

Some SERs said they were using the proposed ASTM crystalline silica standard for exposure monitoring at their facility.

Some SERs said they favored the performance-based alternative rather than the fixed frequency monitoring alternative.

A SER from the brick industry commented that he does not have a problem with frequent exposure monitoring as long as it makes sense. He further stated that the fixed frequency provisions are sometimes a waste. He also expressed concern over the performance-based alternative in the draft standard and how it would be interpreted by OSHA compliance officers.

Another SER stated that he uses insurance companies and state agencies to perform exposure monitoring. The SER stated that the provisions in the draft proposed standard would force him to have to purchase equipment and be responsible for calibration in order to adequately assess his employees' exposures. Furthermore, the SER said he has a high turnover rate at his company and he sometimes has to use temporary hires and this causes a problem for determining the need for sampling due to their short work duration.

One SER suggested that OSHA should change the provision in the draft standard to require task-specific sampling instead of individual sampling due to large turnover rates.

One of the SERs stated that the provision requiring the use of direct reading instrumentation is not possible for assessing silica exposure for compliance purposes.

A couple of the SERs stated that they use direct reading instruments for evaluating the effectiveness of their engineering controls in operations generating crystalline silica. Another SER stated that direct reading instruments would only provide data for total dust, not free silica dust. One SER commented that he/she uses direct reading instruments to validate a change in operation and for assessing cleanliness.

A SER that follows the exposure monitoring program outlined by ASTM questioned the accuracy of the laboratory analytical method at $50 \mu\text{g}/\text{m}^3$. Another SER commented on the difficulty in obtaining data on every job in an open plant, especially if the PEL is set at $50 \mu\text{g}/\text{m}^3$. Another SER said that a PEL of $50 \mu\text{g}/\text{m}^3$ might require exposure monitoring on every employee since most work operations in an open general industry plant would be greater than $50 \mu\text{g}/\text{m}^3$. A SER commented to the panel that, at $50 \mu\text{g}/\text{m}^3$, the accuracy of the analytical method is $\pm 28\%$ and at $75 \mu\text{g}/\text{m}^3$ the accuracy is $\pm 23\%$.

A SER from the brick industry expressed concern about exposures to bystanders and whether or not it would be necessary to conduct exposure monitoring on a person if they were near an operation that is in excess of the PEL. The SER said he was concerned with the possible high exposure his drivers were obtaining while transporting, driving near manufacturing operations, and driving near production of silica-contaminated materials.

Another SER commented on the discomfort a worker would experience during sampling and how being sampled affects the attitude of the worker. This SER commented that the performance-oriented alternative would better suit him in his industry (maritime).

Several SERs provided specific comments on OSHA's exposure monitoring provisions. One of the provisions they commented on was the requirement for laboratories to use a qualified method and one that is considered "proficient" through the AIHA Proficiency Analytical Testing (PAT) program. They stated that the designation of "proficiency" should not be a qualifying matter, in that the designation is calculated to always include at least 95% of the laboratories participating in the PAT program. They also stated that a proficient laboratory could underestimate the silica on a sample by 50%, or overestimate the silica on a sample by 50%, and still be able to participate in the PAT program under the draft proposed standard. They further stated: "Obviously, such wild inaccuracy is absurd, and should not be accepted as the 'reliable' measurement by OSHA. Instead, OSHA should come up with another manner in which to measure silica that allows both regulators and the regulated community some confidence that sample results may not miss the mark by 50 percent and still be used as so-called 'valid' samples." [Ollier attachment, p. 27.] They also provided comments on direct reading instruments and how they relate to exposure monitoring. They stated that direct reading instruments do not provide accurate measurements of personal respirable silica exposures and that the provisions in the draft proposed standard gave the false impression that personal monitoring could be achieved by direct reading or instantaneous measurement.

A couple of the SERs currently use the exposure assessment guidelines put forth by the NIOS Occupational Health Program for assessing dust exposures. The SERs stated "This program is very prescriptive and works very well for us." [Cole/Stark, Issues attachment, p. 7.] These SERs said they utilize direct reading instruments to evaluate dust levels during maintenance activities in addition to measuring how effective engineering controls are working. They further stated that information is mostly obtained through pre-shift inspections and routine dust monitoring. The direct reading instrument that these SERs are referring to is called a Realtime Aerosol Monitoring 1 (RAM1).

Several SERs from the brick industry recommended OSHA add the following provision in the exposure monitoring section of the draft: "the employer may rely on existing exposure monitoring data 'when there have been no changes to the process, product or raw materials which could be reasonably expected to change the original exposure data.'" [See, e.g., Sims, p. 5 (Emphasis omitted).] They stated that the way the provision is worded makes one believe that initial monitoring would have to be performed every 12 months, unless there were objective data to prove otherwise. The SERs from the brick industry preferred Option 2 of the draft standard. The SERs stated:

Option 2 presumes that, once the initial monitoring has shown the levels to approach the PEL, the company will take action to reduce the exposure through engineering or work practices. The possible alternatives to reducing or eliminating the exposure have proven in our industry to be costly and require time periods of six months to two years. Conducting additional monitoring during that time will serve no purpose. [See, e.g., Sims, p. 5.]

With regard to analytical protocols, a SER provided documentation from a laboratory director who analyzes silica samples. The laboratory director stated that: "OSHA's draft silica standard is based on sound analytical protocol and is virtually the same as AIHA's recommendation other than the quantification and identification of silica using multiple diffraction peaks." [Schott, p. 3.]

Hygiene Facilities and Practices/Housekeeping/Protective Work Clothing

These provisions of the draft standard would require employers to provide clean change rooms if disposable protective clothing is not provided to employees who are exposed above the PEL; the change rooms must have separate storage facilities for street clothes and work clothes. An optional requirement for shower facilities is being considered. Two options are included in the draft regarding lunch rooms in workplaces where there are exposures above the PEL. The first option would require lunchrooms to be supplied with a filtered air supply so as to maintain a positive pressure. The second option would require employers to ensure that lunchroom facilities are maintained clean enough so that any contamination would not contribute to an employee's airborne exposure to respirable crystalline silica. There is also a proposed requirement to provide a HEPA-filtered vacuum cleaner so that employees working in regulated areas could remove contamination from clothing before entering the lunchroom, change room, or shower room.

The proposal would require clean up of accumulations of crystalline silica-containing material that, if disturbed, could contribute significantly to an employee's exposure. OSHA is proposing the use of a HEPA-filtered vacuum cleaner, or equally effective filtration or dust collection methods. Water contaminated with crystalline silica would have to be cleaned before it dries if the dried residue could significantly contribute to employee exposure to respirable crystalline silica.

For employees who are exposed to respirable crystalline silica above the PEL and thus work in regulated areas, the employer would have an option of either providing disposable protective clothing (such as Tyvek) or providing non-disposable full-body work clothes and clean change rooms where employees can remove contaminated clothing and change into clean clothes before leaving the worksite. With regard to removal and storage of contaminated non-disposable work clothing, the draft contains two options. The first option would require the employer only to ensure that employees remove non-disposable crystalline silica-contaminated clothing in change rooms. The second option contains additional requirements, similar to those in other OSHA health standards, for laundering, replacement, and maintenance of work clothing. This option would require the employer to clean, launder, repair, or replace non-disposable work clothing and to inform persons responsible for laundering non-disposable contaminated work clothing of the hazards associated with exposure to crystalline silica. The draft standard also would prohibit the removal of crystalline silica contamination on clothing by blowing or shaking.

One SER stated that all of his employees are provided with uniforms and a laundering service every day. His facility also has showers and changing rooms, but no vacuum.

One SER asked if they would have to stop people from washing their own clothes under the draft proposed standard. Another SER stated that they supply employees their uniforms, but some of their employees are allergic to the cleaning fluid.

One SER stated that they have showers now, and people do not use them. He questioned whether employers were going to have to monitor shower use and how OSHA would enforce it.

One SER commented that use of protective clothing should be tied to exposures over the PEL. One SER stated that they provide a cotton smock and the employee is responsible for washing it.

One SER questioned why the PPE/shower/change room requirement is not included in the draft proposed standard for construction.

Several SERs said they currently provide a shower room, but questioned what to do with the contaminated waste water. Another SER asked whether the standard would prohibit employees from taking their clothes home.

One SER estimated that adding showers would take at least two weeks per employee per year, resulting in lost production. Another SER commented that showers are huge costs and that a 15-minute shower would take up 3% of each employee's working day. The SER stated that he could not afford to lose that production time.

Another SER asked about the employer's responsibility for towels and soap.

Several SERs stated that "respirable silica has not been demonstrated to be a take-home hazard or a dermal hazard." [Ollier attachment, p. 30.] They said that OSHA has fallen short of identifying the risks encountered in shaking silica-contaminated clothes or how others might be affected by respirable silica above the permissible exposure level (PEL) when cleaning clothing. In addition, they stated that the use of HEPA-equipped vacuums to clean contaminated clothing as well as cleaning stations near regulated areas is needless and overly burdensome. They stated: "OSHA has failed to consider how difficult it will be to establish, equip, and maintain such facilities." [Ollier attachment, p. 30.]

The brick industry SERs stated that change rooms and lunchroom facilities are not used in the brick industry. The SERs said that "protective clothing is feasible," but the facility requirements in the draft proposed standard would require them to perform facility construction to most of their companies. [See, e.g., Sims, p. 7.] The SERs said that the protective work clothing provisions are being motivated by a "'one size fits all' carcinogen policy at OSHA and not by the hazard or disease experience for silica." [See, e.g., Sims, p. 7.] The SERs further stated that it is necessary to "hand-shovel and sweep in and around some equipment that mechanical vacuums cannot reach." [See, e.g., Sims, p. 9.] The SERs said that dry sweeping and hand shoveling should not be prohibited.

Another SER stated that they tried disposable protective work clothing, but found it to be not durable enough to last the workday.

A SER representing a foundry stated that: "Taking into consideration that silica is an inhalation hazard not an ingestive hazard, the need for changing rooms and protective clothing seem not to be necessary." [Pomeroy.]

Another SER wrote that his facility discourages dry sweeping and requests areas of possible silica exposure be wetted prior to clean up.

Employee Health Screening

This section contains requirements for the employer to offer health screening to all affected employees who are occupationally exposed to respirable crystalline silica at or above the action level (or PEL if the PEL is 50 µg/m³). Health screening includes pre-placement health screening, periodic health screening, and at termination of employment. The content of the silica-related health screening includes an occupational and health history by a health care professional (HCP) with special emphasis on exposures to respirable crystalline silica, a physical examination with special emphasis

on exposures to respirable crystalline silica, and a chest x-ray, to be interpreted and classified according to the International Labor Organization (ILO) guidelines by a board certified radiologist or a NIOSH-certified "B" reader, or an equivalent diagnostic study, and any other tests deemed appropriate by the HCP. Additionally, the draft standard would require pulmonary function tests at the time of the pre-placement screening. A provision to provide for referral to a pulmonary specialist, if necessary, is included.

One SER stated he had one employee with silicosis, who was addressed through the workers' compensation system. In response to being asked if the employee was returned to work, this same SER stated that the employee was moved to a job with low silica exposure, then after some time he had trouble in the winter and left work and is now on a respirator.

Several SERs reported that they currently are doing some sort of employee health screening for silicosis. One SER stated that he has done screening for 30 years and has never had an issue with silicosis. Regarding pre-placement screening, at least two SERs reported not hiring individuals because of either x-ray or other findings on examination. One of these stated that his company provides their own exams including an x-ray, for the purpose of screening new hires. His company also has a no-smoking policy, and employees have to certify that they are not smoking, and a baseline x-ray is also a pre-condition of employment at his company. He explained further that they do a baseline physical, and if the potential employee fails the screening, he does not get hired. He is currently doing health surveillance on all their employees, including pulmonary function tests and respirator fit-testing. He also stated that if an employee developed any problems (related to silica exposure) that the employee would be moved.

Another SER reported offering medical evaluations every 1 to 2 years, with the x-ray and pulmonary functions test (PFTs) being mandatory. He said he also offers wellness programs due to the rising cost of health insurance. Another SER does x-rays and PFTs. One SER stated that only his blasters, of which there are two, receive medical surveillance every year.

Two SERs stated that OSHA had underestimated the time involved in doing health screening. One of them provided an estimate of not less than 4-6 hours to screen employees, including an x-ray, and travel both ways, while the other thought it would take "most of the day."

Many SERs commented on the availability of qualified x-ray technicians, NIOSH-certified B-readers, and pulmonary specialists. One of these said that the closest doctors to him were 25 to 40 miles away. Another SER said that the closest HCP qualified to do health surveillance was 40 miles away from him. He said that he called them and was told they have no one on staff who would be able to do the tests included in the draft proposed standard, but would be able to get someone if they needed to, noting that it would be difficult enough to find one pulmonary specialist, not to mention three pulmonary specialists. Another SER said that some in the industry that are located in

remote areas cannot get access to the specialized HCPs identified in the draft proposed standard.

A SER who currently provides health screening said he uses certified radiologists and PFT technicians that are certified.

On the cost of providing health screening, one SER stated he was already doing everything outlined in OSHA's draft standard and that it cost him \$300 per pre-placement and \$150 per annual exam. Another SER stated that it would really be upsetting to spend \$300 on all the tests included in the draft proposed standard only to have an individual not show up to work at all after receiving the tests or only showing up for work for a couple of days before quitting the job. Many SERs said that it was common for them to have workers (1) not show up for work after being hired, or (2) quit their jobs shortly after being hired.

Two SERs offered the following extensive and detailed comments on this section:

Comment: (k) Employee health screening. This section should be renamed "medical surveillance" to be consistent with the asbestos standard (1910.1001) or more appropriately "respiratory medical surveillance" to be more descriptive and technically accurate. Medical surveillance is accomplished by performing screening examinations, which are not the same as diagnostic tests. The key distinction is that surveillance is performed on a worker because the worker is at risk from a specific occupational exposure, whereas a diagnostic test is performed on a patient because of a specific medical complaint or finding. On the other hand, public health screening, such as hypertension or cholesterol, is done on a random group without specific knowledge of risk or complaint.

* * *

Comment: (k)(2)(ii). Delete the last of the sentence requiring exams whenever an employee reports symptoms that could be related to silica. The principal occupational finding of the x-ray exam will be radiographic silicosis since periodic x-rays do not have the sensitivity and are not useful for the detection of early lung cancer. The primary symptom of silicosis is shortness of breath, which occurs most often after simple silicosis has progressed to complicated silicosis. Shortness of breath occurs with many respiratory ailments and is non-specific for silicosis. For a silicotic to experience shortness of breath from silica related fibrosis, conglomerate silicosis (complicated silicosis) with large opacities would normally be expected. Since the workers will be periodically x-rayed with an ILO pneumoconiosis classification, simple silicosis should be detected before conglomerate lesions appear. Therefore, any shortness of breath would not be expected to be related to silica exposure. Any worker experiencing newly recognized symptoms of shortness of breath should be advised to see his/her personal physician.

* * *

Comment: (k)(3)(i)(A). Explain why the occupational and health history should not be self-administered as opposed to being administered by the HCP. Explain for not specifically requiring a smoking history.

Suggested Wording [for paragraph (k)(3)(i)(A)]: (A) Medical and occupational history to elicit information on respiratory symptoms, smoking history, and prior exposures to dusts and other agents affecting the respiratory system.

* * *

Comment: (k)(3)(i)(B). The text as written uses keywords that would indicate the HCP is a physician. The term “physical examination” may have distinct connotations within the medical community that might imply “hands on” examination by a physician. Likewise, if the HCP has knowledge, skills and “course work emphasizing clinical evaluation and diagnosis of silica-related disease” it seems the HCP is more than any medical technician.

* * *

Comment: (k)(3)(i)(C). Give reason for allowing only 14 x 17 inch chest films. At least one medical surveillance provider uses 16 x 17 inch films to reduce the number of unacceptable films due to important details of the parenchyma being cutoff on obese workers by the radiology technician. Give good reason for accepting a reading by a board certified radiologist. Many radiologists are practicing techniques other than conventional imaging and never interpret films for the pneumoconioses. The paragraph should reference the complete title for the ILO guideline.

Suggested Language [for paragraph (k)(3)(i)(C)]: (C) A posterior-anterior (PA) chest roentgenogram on a film no less than 16 by 17 inches at full inspiration. The roentgenogram shall be classified according to the 2000 Guidelines for the Use of ILO International Classification of Radiographs of Pneumoconiosis by NIOSH certified “B” readers.

* * *

Comment: (k)(3)(i)(D). We recommend that spirometry be an option for and not a requirement for medical surveillance. Experience has shown that most abnormalities on screening spirometry are not due to work-related disorders. Smoking, non-occupational pulmonary disease, and other variables are more common causes of alterations in pulmonary function. Serious obstacles have hindered the widespread use of spirometry in the industrial setting. Many technicians, nurses, and physicians have been inadequately trained and perform or analyze tests incorrectly. Certain spirometers have been demonstrated to be

technically unsatisfactory. Test methodology and procedure have lacked standardization, rendering difficult the comparison of results obtained at different facilities. Surprisingly, physicians without adequate training lack the necessary knowledge to interpret the results of pulmonary function tests properly. Surveillance information obtained under these circumstances can be worse than no information at all. For these reasons, OSHA should make spirometry an optional part of the medical surveillance provision.

* * *

Comment: (k)(3)(ii)(A). Give good reason for requiring an annual update of occupational and health history, and an annual physical examination by the HCP. The chest x-ray is the most sensitive screening test for detecting early changes consistent with silicosis and the history update and physical exam tests separately would seem to provide no useful information with regards to silica-related disease for action that would be taken to positively affect worker health. To require an annual history update and physical examination will do nothing more than place a costly burden on the employer. Recommend the update of histories and exam be required every two years or at the time of the x-ray exam.

* * *

Suggested Wording [for paragraph (k)(3)(ii)(A)]: (A) Every two years update the medical and occupational history to elicit information on respiratory symptoms, smoking history, and prior exposures to dusts and other agents affecting the respiratory system.

* * *

Comment [on paragraph (k)(3)(ii)(B)]: OSHA would be well advised to ask the opinion and recommendation of both the American Thoracic Society and the American College of Chest Physicians before publishing a proposed rule. Unnecessary radiation from medical imaging tests is not without risks and annual examinations for those with over 20 years exposure under Option 2 may be too frequent for the yield of detecting silicosis a year earlier.

* * *

Comment: (5)(ii). This requirement should be deleted since it is duplicative of the requirement in paragraph (5) above that requires that the employer provide a copy of the HCP's written opinion to the employee within 15 days.

* * *

Comment: (6)(iii). The requirement to obtain a written opinion from the pulmonary specialist within 30 days from the completion of the examination is outside the control of the employer and should be deleted.

Suggested Wording [for paragraph (k)(6)(iii)]: (iii) The employer must provide the employee and the HCP a written opinion from the pulmonary specialist within 15 days of receiving it. The written opinion must include:

* * *

Comment: (7). Provide the complete address for the NIOSH Screening and Surveillance Branch.

[Cole/Stark, Regulatory Text attachment, pp. 26-35.]

On the cost of medical exams, several SERs stated:

The cost of medical exams mandated by the draft rule is seriously underestimated by OSHA's consultant and over- "annualized." Reality is that the costs are massive, and must be paid in the first year, again every third year, and again every year for each new employee, temporary employee, and contractor and subcontractor employee coming onto a particular job site. Further, these medical costs will be imposed every day, every year, not "annualized" based on a fictional estimate of how much it costs for a medical exam and X-Rays. [Ollier attachment, p. 7.]

Two SERs provided the following information about their practices:

Medical Surveillance is completed following the guidelines in NISA's Occupational Health Program (OHP). We contract with local service providers for these services, and the x-rays are sent off to certified B-readers. [Cole/Stark, Issues attachment, p. 9.]

Another SER submitted the following comment:

Additionally, Massachusetts General Hospital has provided me with a quotation for the requisite costs of pre-employment testing and this regulation will add \$388 to our existing medical examination fees. Given that we hire 4 people and retain only an average of one, our per capita expense prior to getting an employee that will be with us 120 days after the hire date is an additional \$1552.00. The expenses associated with annual testing and monitoring are also completely new and will be at least \$500 per employee annually. This expense is levied on a 53 year old foundry without a single case of silicosis on record and with current average employee's years tenure in excess of 15 years. Please reconsider the state of our manufacturing community and the current trend that indicates a sharp

decline already taking place in the incidence rate of this occupational disease.
[Dahlgren email, p. 1.]

Hazard Communication

This paragraph of the draft proposed standard is a cross-reference to OSHA's Hazard Communication standard, and requires that employers include crystalline silica in their hazard communication program covering labels, material safety data sheets, and information and training.

A SER remarked that it is alarming to post signs stating that “silica causes cancer and lung disease,” and that it was adequate to state in regulated areas that respirators must be used/worn.

Two SERs suggested that the sign: “DANGER, CRYSTALLINE SILICA CAUSES CANCER AND LUNG DISEASE” should be changed to “CANCER AND LUNG DISEASE HAZARD” as is used in the asbestos standard. They said that this terminology was more accurate as well as being consistent with previous OSHA regulations. They further commented:

This section suggests that the OSHA Hazard Communication Standard will continue to direct crystalline silica container labeling and material safety data sheets. Among the generic requirements of the hazard communication standard is the reporting threshold provision of 0.1 % (weight percent) for OSHA designated carcinogens. For several reasons we believe the reporting threshold for crystalline silica should be fixed a 1% (weight percent). Consistent with the Environmental Protection Agency's definition of an asbestos containing material, OSHA has adopted a 1% reporting threshold in its own asbestos standard. Though generally considered an inherently lower risk than asbestos, crystalline silica shares important chronic lung disease endpoints and mechanisms of disease with asbestos. It would therefore be difficult to justify a 10 fold lower reporting threshold for a ubiquitous naturally occurring mineral such as crystalline silica (second most abundant in the earth's crust) than for a relatively uncommon mineral such as asbestos. If the 0.1% threshold is to be maintained for crystalline silica, data supporting this should be presented. Further, the burden placed on industry (small industry especially) to reasonably determine the absence of crystalline silica below 0.1% is greater than the benefit. An issue involving the validity of analysis below 1% and the potential of very minor crystalline silica containing products posing a realistic airborne dust exposure risk is most key to selecting this extremely important reporting threshold. The lower threshold applied to very minor crystalline silica containing products dilutes the impact of the warning for much higher, more significant potential exposures. [Cole/Stark, Regulatory Text attachment, pp. 35-36.]

Employee Information and Training

The proposed draft includes provisions that would provide employees who are exposed at or above the action level (or PEL if the PEL is $50 \mu\text{g}/\text{m}^3$) with important information on operations that could result in exposures exceeding the PEL, and principles of safe use and handling of crystalline silica-containing materials in the workplace. The specific content of this training is intended to be more comprehensive and workplace-specific than the hazard information training now required by OSHA's Hazard Communication standard (29 CFR 1910.1200).

One SER said that most of his employees were minorities or foreign and that training was done on the job. He stated that communication is done through fellow workers who explain job-related tasks and requirements, including safety practices and work rules. He said that periodic safety meetings are held and that supervisors and experienced workers monitor the performance of new workers.

One SER stated that some plants, such as his, are in remote areas and training competent persons would add to their costs.

Two SERs stated that training is provided in-house on an annual basis. They said that training includes information on the respiratory system, respiratory protection, silicosis, silica related disease, hazard communication, and any other current topics relative to silica. They added that they were members of NISA and used their training aids, and attended their annual Health and Safety Seminar for additional updates on training information and best practice ideas. They said they constantly revised their training program, and the biggest barrier is ensuring that information is communicated, understood, and transferred to the work setting. They said they have a training position on staff to assist with furthering communication. They said that training in other languages is completed by ensuring that printed material, videos, etc. are in the native language of the associate being trained and that a translator is present when necessary.

These same SERs said that they had a very low turnover rate, but that all new employees are provided training when hired. They said that retraining needs are identified through the normal training schedule, as well as through interaction with the Coaches, Associates, through accident or incident investigations, and through behavior-based safety observations. Regarding other employers performing work at their establishments, they said that all visitors and contractors are provided with site-specific hazard awareness training at each location. They said that between two hours and four hours per year is a reasonable amount of training time -- the less experienced the associates are, the more training it will take to bring them up to speed.

Recordkeeping

The employer would be responsible for maintaining a record of employee exposure measurements, employee health screening results, respirator fit testing results, and employee training. Exposure and health records must be maintained in accordance with

29 CFR 1910.1020, and fit test and training records must be maintained until a more current record is created.

Several SERs said that the proposed requirements were cumbersome, time-consuming, and generated too much paperwork.

A SER said that the recordkeeping burden would be increased if his company had to ensure that everybody on site had received pre-placement examinations and was undergoing medical surveillance. This SER asked how general contractors could be expected to distribute various records to all of the subcontractors on a particular site.

Most SERs said they kept computerized records.

Two SERs said they keep their own exposure records, and have no arrangements with trade associations, labor unions, or other organizations regarding recordkeeping. Regarding recordkeeping requirements related to exposure assessment and health screening, they felt that the section relating to the paperwork requirements will need some clarification (for example, the company must provide a copy of the HCP's report to the associate, and the HCP must sign a statement and provide it to the company (who must provide a copy to the associate) stating that the results of the examination were reviewed with the associate by the HCP). They said they keep records electronically of all employee training, and do not want more requirements imposed by OSHA.

Several SERs from the brick industry said that the high employee turnover rate in their industry would require the hiring of professional records retention services under this provision, and suggested that temporary employees be excluded because of the long-term nature of the onset of silicosis.

b. Construction

General/Need for a Standard

OSHA is also proposing to issue a comprehensive standard governing employee exposure to crystalline silica in the construction industry. Like the general industry and maritime standards, the proposed standard would include a PEL for respirable crystalline silica and other requirements such as conducting exposure assessment, health screening of exposed employees, employee training, hygiene facilities, and respirator use.

Some SERs questioned how OSHA's health and risk data compare to current exposure conditions. Several SERs stated that 90% of the construction industry would not comply with the draft proposed standard, particularly on small jobs, and that others will have specifications written into contracts. One SER said that OSHA has a "fundamental misunderstanding of the residential construction industry and its operations." [Colaizzo, p. 2 (Emphasis omitted).]

Another SER questioned the need for regulation by citing the declining silicosis mortality rate.

A SER reported that, out of over 1,000 workers hired over the past 20 years (with a current workforce of 110), he has seen only one case of accelerated silicosis and no acute cases; he also believed that the number of silica-related deaths reported annually was much lower than for many other hazards, and that many employers would not comply with the standard as drafted. He said that better enforcement of the current PEL would make a greater impact than the draft proposed standard. Other SERs agreed with this position. One SER felt that the adoption of the proposed standards would put him in the position of “knowingly defying” an OSHA standard in order to keep his company in business.

Several SERs stated that the standard had to be kept simple, practical, and easy for employers to understand. One SER stated that the first step OSHA should take is to communicate to workers what to do to minimize silica exposures. He recommended that OSHA should develop best practices guidance and that insurance companies would ensure that employers comply with the best practices.

Several SERs stated that education and sharing of data would be more effective than the draft proposed standard. One SER commented that protecting employees and preventing silicosis could be advanced by a three page list of recommendations for controlling silica dust – as is done in Table 1 – and use of proper personal equipment on the job site.

One SER stated that OSHA should rethink the whole rule and that, as drafted, the draft proposed rule would put the entire industry out of business. This SER stated that no one has been diagnosed “with silicosis at my company, or from our industry, which began in California in the early 1950’s.” [Hollingsworth, p. 2.] Moreover, this SER stated that the regulation is relying on studies of non-construction industries. The SER stated further that “OSHA’s own data shows the onset of silicosis has been rapidly falling for the past 10 years which indicates that education, increased awareness, improved respiratory protection, and implementation of engineering controls ... have already impacted silicosis onset.” [Hollingsworth, p. 8.] This SER urged OSHA to educate about and enforce the current PEL. The SER urged OSHA to implement the Special Emphasis Program to complete studies relevant to construction.

Another SER commented that their company did not have one reported case of an illness associated with silica dust or silicosis since their incorporation in 1957. One SER commented that in 30 years of business, they had never encountered a case of silicosis. Another SER commented that OSHA has not demonstrated there is a significant risk of exposures on residential construction sites.

Another SER commented that recruitment of employees is already difficult and the draft proposed standard would make it more so.

Another SER commented that “the silica exposure standard OSHA is proposing is absolute overkill ... many companies ... may go out of business.” [McDonnell, p. 1.]

Scope and Application

The draft contains two options for the scope of the proposed rule. Under Option 1, the rule would apply wherever there is occupational exposure to airborne respirable crystalline silica in construction workplaces. Under Option 2, the standard would apply whenever employees perform a list of activities that involve the application of certain forces to concrete, brick, block, mortar, rock, soil or other material containing crystalline silica, and to abrasive blasting operations where there is potential for exposure to crystalline silica.

Some SERs asserted that the draft proposed standard reflects OSHA’s misunderstanding of construction operations, and a flawed analogy to asbestos, lead, and similar hazardous substances covered by specific OSHA standards. They said that the combination of these two factors resulted in an exponential increase in the compliance burden. They pointed out that construction operations are highly variable, interdependent, constantly changing, and occur on overlapping schedules on the same and adjacent sites, and they mentioned factors such as climate changes, variations in the surrounding infrastructure (e.g., the availability of a water supply, electric power, washing/changing facilities, advanced medical facilities), and a high employee turnover in some positions. They said that requirements appropriate in a traditional fixed manufacturing environment simply would not work in construction operations.

These SERs also pointed out that, unlike asbestos and lead, crystalline silica is ubiquitous on the Earth’s surface and could not be worked around or encapsulated or removed as could asbestos and lead. The SERs declared that it was infeasible to impose the same controls on activities involving exposure to crystalline silica, because it is found everywhere in rocks and soil, and is a major component of concrete, brick, rock and stone, ceramics, etc. These SERs also noted that it was important to first identify significant exposures, and they felt that OSHA had not done the critical field work necessary to do this.

Some SERs said that while asbestos or lead abatement work uses a single contractor, today, with respect to silica in new housing or commercial work, a site may have 50 subcontractors, so it is infeasible to try to distinguish high exposures to respirable silica on such a diverse and large worksite.

A SER asked if the scope of the draft proposed standard would include a utility contractor cutting a concrete sidewalk outside.

Some of the SERs commented that proposed Option 2 of the draft proposed standard was not helpful because the phrase “disturbing silica materials” includes all materials on most

worksites. They remarked that neither of the options is appropriate, and they are not really distinguishable.

Some SERs said that any rule needed to clearly define the term “respirable silica” in a way that incorporates the gravimetric sampling protocol, is readily understandable, and ensures consistent and reproducible sampling results.

One SER stated that understanding the standard may be difficult for some small contractors and subcontractors, due to some vague language. Also, this SER stated that Option 2 is better because it reads directly and does not refer to another document.

Definitions/Competent Person

The definitions section explains important terms used in the draft proposed standard, such as “competent person,” “health care professional,” “regulated area,” “employee exposure,” “action level,” and others. Many SERs had comments on the definition and responsibilities of the competent person. Under the draft proposed standard, the employer would have to designate a competent person at each worksite who would be capable of recognizing silica-related hazards and who would have the authority to take corrective measures, including the temporary stoppage of work, to ensure that employees are not exposed above the PEL and that the requirements of the standard are being met. The draft standard does not contain any specific training requirements for the competent person.

A few SERs were confused about the role and duties of the competent person. One SER, who said he was knowledgeable concerning safety issues, did not think he was qualified as a competent person as he cannot measure or analyze air samples. Another SER also interpreted the definition of a competent person to require that person conduct “testing” so as to evaluate silica exposures at each site. Another SER stated that it would be better to call this a “responsible person” who can get someone else to do the testing.

Another SER stated:

As a small subcontractor, I do not per se have a “competent person” with the knowledge, skills and training OSHA may require for monitoring and evaluating workplace exposures, establishing regulated areas, etc. at every job site, every day. I do, however, have competent staff with specific knowledge about scaffolding, sawing brick, mixing mortar and other specialized tasks and they generally use common sense when it comes to situations requiring the use of respiratory protection, wet cutting or other appropriate engineering controls and work practices to limit exposure to silica. [Painter, p. 1.]

A SER stated that: (1) the role and responsibilities of the competent person in the draft are not clear; (2) most firms will have to identify and train at least one and possibly more competent persons; (3) OSHA should specify this training and account for its associated

cost; and (4) the competent person will need real-time monitors to help demarcate and maintain regulated areas.

A few SERs thought that the implied responsibility of the competent person included continuous environmental monitoring. One of these SERs stated:

Without monitoring, it is anyone's guess when and if the PEL would or could be exceeded. A competent person would be required to set up a regulated space, monitor to find out the perimeter of the regulated space, place signs of the hazards, communicate and warn other trades at the job site, and hand out particulate dust masks or respirators as needed to anyone adjacent to our work space. [Hollingsworth, p. 3.]

Many SERs said they did not have the resources in terms of personnel, time or the additional costs to provide a competent person at each worksite. A SER who was a general contractor with many different sites said he would need a full time competent person and an industrial hygienist at every site for monitoring according to his interpretation of the draft proposal. A SER who operated a plant and construction company stated he operated 24 hours a day and that he would need three or four competent persons.

Another SER stated that he interpreted the requirement as mandating a Certified Industrial Hygienist to perform the duties of the competent person. Another point made by the same SER was that on complex jobsites "there could be as many as a dozen or more" competent persons on a jobsite at once.

Another SER mentioned time constraints. He stated that the competent person would not be able to measure effectiveness and promptly fix deficiencies without being onsite all the time.

Other SERs focused on the cost. One SER specialty contractor, whose employees operate in one or two man crews, estimated that she would need to hire another 18 trained personnel to cover 50 worksites per day at the cost of one million dollars. (She also noted that her crews were well trained, generally were exposed below the PEL, and used wet procedures in all their cutting operations.)

Another SER stated there would be a significant cost as he operated 10 to 12 sites at a time. Yet another SER who generally sent one man crews to construction sites was also concerned by the increased cost of the competent person provisions. She stated:

As a supplier who does warranty work on concrete on a jobsite we would have authority over our own employee but we would not always be in a position to tell the General Contractor that he has to remove the other trades from our work area or require them to wear respiratory protection (and all that encompasses, to comply). It has not usually been necessary to send a supervisor with our skilled finishers to do patching.... It is not clear to me whether that competent person

would have to be an additional supervisory employee present at the jobsite while our patcher/finisher was working. We usually send only one person. So if the competent person had to be a supervisor the cost would be three times not just twice as much. [Jewell, p. 3.]

Some SERs also raised the following questions: (1) Do you need a competent person to say when trucks can drive down a road with changing wind conditions? (2) Would you need a competent person all day at each worksite? Can a supervisor be a competent person for more than one site? (3) Would you need more than one competent person for sites scattered over several states? (4) Do you need to provide a competent person if you are a subcontractor at a site?

A SER working in residential construction stated that OSHA should not require a competent person in residential construction as there is either no or limited exposures to silica.

Some SERs commented that: (1) the coordination of compliance with the requirements of the rule would be assigned to a competent person; (2) the competent person(s) would require very specific knowledge, skills and training in silica; (3) only a CIH could meet the implied requirements of the position; (4) the definition is incomplete and “understates” the person’s duties; and (5) requiring each covered employer to have a competent person at each worksite appears to be completely infeasible. They further stated:

It would be completely unrealistic for each small employer who sends one or a small number of employees out to a job site to hire and send along an additional person with industrial hygiene training to perform the tasks this draft standard would assign to the “competent person”. Employers on a multi-employer site are unlikely to find it feasible to share a competent person to perform this function because of liability concerns. They are also not likely to be in a position to jointly retain a certified industrial hygienist (CIH) for the site. [Painter attachment, p. 18.]

Permissible Exposure Limit (PEL)

The draft reflects three alternative PELs being considered by the Agency: 50, 75, and 100 ($\mu\text{g}/\text{m}^3$), measured as an 8-hour time-weighted average (TWA) concentration of respirable crystalline silica. The PEL is the highest average concentration of respirable crystalline silica in the air to which an employee may be exposed over an 8-hour workday. Since the PEL represents an 8-hour TWA, employees may be exposed to short-term concentrations above the PEL so long as the 8-hour TWA does not exceed the PEL.

One SER commented that he has tried many environmental engineering processes to control dust. He reported some exposure monitoring results and obtained readings of $177 \mu\text{g}/\text{m}^3$ and $<100 \mu\text{g}/\text{m}^3$ for mortar mixing, and readings of $1,360 \mu\text{g}/\text{m}^3$ and $2,000 \mu\text{g}/\text{m}^3$ for cutting and sawing operations. He stated that they cut wet at all possible times, work

100% of the time with brick, and when it was not possible to cut wet, use 36-inch agricultural fans. However, he also expressed concern about bystander exposure working downwind from the fans.

One SER stated that they, with few exceptions, meet the current PEL during wet cutting of concrete. Another SER stated that they have never had an exposure over 100 $\mu\text{g}/\text{m}^3$ while using wet saws, but that they would not be in compliance with the 50 $\mu\text{g}/\text{m}^3$ PEL.

A SER from a stone facility referred to Australia's exposure limit of 0.2 mg/m^3 for crystalline silica as evidence of the difficulty in achieving a PEL of 100 or 50 $\mu\text{g}/\text{m}^3$. This SER reported that they had no exposure data for their construction operations, and that, for their stone crushing operations, they use a combination of water sprays and locating the crushers away from other workers. He also stated that hauling material on unpaved roads was very dusty.

Two SERs remarked that using cabs with A/C on earthmoving equipment could pose a safety risk because, unlike drilling rigs, earthmoving equipment is mobile and cabs can interfere with communications between workers. In addition, they said that severe duty experienced by these kinds of equipment leads to broken windows and makes it difficult to keep cabs in good working order. One of these SERs commented that the cost of retrofitting a cab on existing equipment would be about \$30K. Another SER also stated that retrofitting cabs on forklifts would cost \$30K.

A SER whose company performs masonry repairs stated that dust control was difficult. He reported that they have tried vacuum systems but that the equipment makes it difficult for the operator to see his work. In addition, dust from masonry repair work can blow three blocks away, making control of that dust difficult, he said. He did not believe that it was feasible to use vacuum systems for these kinds of operations. Another masonry SER stated that they have used a lot of dust controls and did not see the need for stiffer controls since the silica problem was declining.

Another SER stated that OSHA "has not made its case that lowering the PEL, especially cutting it by a quarter to a half with an even lower action level, is justified." [Wolfe, p. 3.]

Methods of Compliance/Table 1/Unacceptable Practices

The draft proposed standard offers employers two alternatives for complying with the exposure control requirements. The first alternative reflects OSHA's traditional approach of requiring employers to use engineering controls and work practices to maintain exposures to or below the PEL, unless such controls are not feasible. The second alternative would permit the employer to implement specific engineering and work practice controls for specified high-risk operations, and supplement use of these controls with respiratory protection, when required. The required controls and level of respiratory protection, if required, are contained in Table 1 of the draft standard. Under this alternative, employers would not need to take periodic exposure measurements to

evaluate employee exposures. OSHA also identifies three unacceptable practices that shall not be used: employee rotation and the use of dry sweeping and compressed air.

A few SERs said that the 40-45 year lifetime, 8-hour exposure risk estimate was not representative of construction exposure. They requested a provision similar to the general industry and maritime rules that dismissed certain requirements if the employee had less than 30 days of exposure.

Another SER expressed concern that OSHA's compliance staff may not have adequately assessed compliance with the ancillary provisions associated with prohibited activities. The SER assumed that compliance officers would make their judgments based on visual inspections and the SER was concerned that these judgments may not be consistent from site to site.

A SER raised the following issue of the OSHA hierarchy of controls:

This requirement appears to negate the opportunity of an employer to offer respiratory protection as an option when engineering controls and work practices are demonstrably not technically or economically feasible.

* * *

The employee must wear the respirator regardless of the presence of controls when the respirator alone will do the job of meeting the PEL, if it is properly selected. We understand that OSHA considers the respirator as the lowest level on the hierarchy of controls, but the required installation of engineering controls that will not meet the PEL or are cost prohibitive is unrealistic. [Richardson, p. 3.]

The same SER also stated:

Work is constantly changing on such sites: source locations and strengths are in constant flux. Because of this, exposures are constantly changing. One's exposure today can be significantly different from their exposure on another day.

For this reason we recommend the utilization of the Best Available Control Technology (BACT) approach, including work practices, as the OSHA approach to airborne free silica exposures at construction sites. [Richardson, p. 3.]

One SER said that Table 1 would make it easier to comply with the draft standard. Another SER stated that Table 1 was very helpful. This SER further mentioned to the panel that OSHA should develop another Table 1 that excludes work operations where exposures are low. Some SERs also commented that the provisions in Table 1 requiring closed cabs were not practical because most of the construction vehicles used in their respective industries do not come with closed cabs and if they needed to retrofit the cabs, the costs of such modifications would put them out of business.

A SER stated:

While the agency is to be commended for introducing the concept of implementing specified practices as an alternative means of compliance, the need for all of the specified control measures under the alternative approach has not been established. Additional field studies are needed to make these determinations. Where compliance can be achieved without the use of a respirator, this alternative approach is far more promising. Construction employees generally would strongly resist the full-shift use of half-mask respirators, especially in the warmer months and climates.

Furthermore, if the Table 1 approach is to be successful, we believe the scope of the standard must be limited to Table 1 activities rather than limiting Table 1 to the more common high-risk activities and having all other activities default to the traditional approach. We also believe the scope of the standard should be limited to those activities that are appropriately placed in the category of “high risk” operations. Otherwise, even if the Table 1 approach were employed for the eleven or possibly twelve categories of activities it covers, the employer would default to the “traditional approach”, for all of the other diverse and overlapping activities that fall within the broadly stated scope provision of the draft standard.

Given the diverse and dynamic nature of construction sites, we urge OSHA to pursue a modified and more expansive version of the Table 1 concept that, if practically implemented, should go a long way toward reducing the burden of compliance while providing construction workers with any protections that further field tests show to be justified.

* * *

More specifically, we urge OSHA to sponsor, coordinate and fund the comprehensive development and publication of this type of objective data for the broad variety of tasks, materials, controls, practices and conditions found in construction sites across this country.

[Painter attachment, pp. 13-14 (Footnote omitted).]

A few SERs cited Table 1 as a good, yet possibly incomplete, framework.

One SER, operating a structural concrete job shop, stated:

[U]sing various methods to finish concrete, architecturally, a regular maintenance schedule for each system is pointless. We might use a piece of equipment every day for a month, then not need it for six months. Therefore we rely on constant inspection by the Superintendent and forepersons and the safety committee to report equipment that needs attention. Nothing is taken to a job site without being

inspected first (since we aren't at the job site all that often) and it is totally non-productive to send a finisher out with defective equipment. [Jewell, p. 3.]

On the topic of rotating employees, one SER stated that in her experience it is beneficial to rotate employees so that they are doing different things during the day and do not get bored. The SER stated:

Employee rotation is something we have written into our contract with the GMP (Molders Union) 25+ years. In a small manufacturing environment there are many reasons:

- a) When times are slow, we want to keep our key employees, so we cross-train them and they can perform many different functions. Our definition of a journey person incorporates a certain level of skills in several different "trades". We want to be sure that each employee does some of the lighter work during the day.
- c) We offer many methods and finishing techniques to our customers. We have from 5 to 15 jobs of all sizes and types running simultaneously at our plant. Some times there is no sandblasting work, because all the jobs have a smooth sanded finish, or an acid washed finish.

[Jewell, p. 3.]

Another SER noted that you cannot rotate employees doing specialized jobs like tuckpointing. Yet another SER stated that he likes to rotate his employees to keep them happy and added that you cannot rotate union employees.

Some SERs disagreed with OSHA's prohibition on employee rotation, citing the Benzene decision. They also stated that they use employee rotation for other reasons, such as to control noise exposure, "what are often referred to as ergonomic hazards," and to provide variety in work tasks. [Painter attachment, p. 24.]

Other SERs also supported the use of employee rotation, stating: "OSHA interference with an employer's ability to assign personnel, or find the least costly method of reducing exposure of people, does not make sense and seems contrary to its protective goals." [Ollier attachment, pp. 28-29.]

A few SERs stated:

The blanket prohibition against any use of compressed air, brushing or dry sweeping ... which is not limited to exposures above the PEL ... has no scientific or legal basis under the OSH Act, which, as previously noted, permits OSHA to regulate only where there is a significant risk of harm. Benzene. Beyond being legally invalid, the provision would establish an infeasible standard of performance. [Painter attachment, p. 24.]

They provided the following reasons for this: (1) unavailability of water to wet down or electric power for vacuum cleaning; (2) introduction of water could present a mold issue or damage building materials; and (3) introduction of water may delay painting or the installation of components, such as sub-flooring, until the area dries.

Some SERs stated that “businesses use dry sweeping and compressed air to keep work areas clean of accumulated debris and material. In many cases this method of cleaning work areas is the only feasible method available to employers.” [Ollier attachment, p. 28.]

One SER stated: “I believe that OSHA has not demonstrated that there is any risk associated with any of these activities. If this provision were ever become law, it would be impossible to clean up any jobsite.” [Colaizzo, p. 28.]

One SER stated that the use of “[d]ust suppressants (other than water) are discouraged/prohibited in areas where there are drinking water aquifers close to the surface (many areas of Western Washington).” [Jewell, p. 2.]

Regulated Areas

To minimize any unnecessary employee exposures, the draft standard would propose that the employer ensure the competent person establish a regulated area around operations where respirable crystalline silica concentrations exceed or could reasonably be expected to exceed the PEL. The regulated area may be physically demarcated to limit entry to employees working in the area and other authorized persons. When the type of operation requires frequent relocation of boundaries of the regulated area, the employer can use other methods to communicate to employees the boundaries of the regulated area. An employer at a multi-employer worksite would be required to communicate the location and access limitations of regulated areas to other employers at the site. Respirators would be required for each authorized person who enters the regulated area. Eating, drinking, or the use of tobacco is prohibited in regulated areas. Where dry silica sand is used as a blasting medium outside of enclosures, the draft proposed standard contains an optional provision being considered that would require the effectiveness of the regulated area be evaluated under the supervision of a Certified Industrial Hygienist or a Certified Safety Professional to ensure the protection of nearby workers. This requirement would not apply where abrasive blasting was being conducted with alternative blasting media, wet methods, or with containment.

A SER commented that heavy construction contractors have trouble controlling access. The SER also expressed concern that while regulated areas may be clear in a controlled environment, outside, where there is a cloud of dust behind a truck, regulated areas are difficult if not impossible to demarcate or control.

One SER said that demarcating in the precast concrete industry is impossible because of the large size of worksites. Another SER explained that it would be extremely difficult to create a regulated area on a multi-employer worksite.

A SER representing the brick industry told the panel that maintaining a regulated area in the shop and brick yard, depends a great deal on the direction the wind is blowing.

Another SER commented that they do 50 jobs per day for 275 days per year and a regulated area requirement may cost her \$218,000. She posed a question that asked how she could restrict a highway where the work zone could be miles long. Another SER told the panel that regulated areas cannot be established without continuous monitoring and a competent person.

A SER representing the masonry industry told the panel that performing an activity like mixing concrete in a stairwell is not a problem in establishing a regulated area.

Another SER said that it is clearer to understand how regulated areas could be established indoors, but that establishing them outdoors was difficult. Many SERs kept expressing concerns about how windy conditions would turn the entire site into a regulated area.

One SER expressed concerns about customers and architects, visitors who enter a regulated area and whether or not they would be required to wear respiratory protection. One SER also asked whether or not she would be required to provide subcontractors with respiratory protection.

Another SER commented that OSHA modeled the regulated area provisions in the draft standard after lead and asbestos. The SER then said that silica is less hazardous than lead and asbestos.

One SER said it would be difficult to establish a regulated area when work is performed 20 stories high.

One SER from the brick industry said the provisions in the regulated area section of the draft standard would cause him to have to alter tasks to avoid exposing other workers on the worksite.

Abrasive Blasting

The draft proposed standard addresses the use of abrasive blasting media containing crystalline silica and operations where abrasive blasting, using any media, is conducted on substrates that contain crystalline silica. Employers must follow the respiratory protection requirements of 29 CFR 1926.57 (Ventilation) and 29 CFR 1926.103 (Respiratory Protection) for employees engaged in abrasive blasting operations. The draft proposed standard would prohibit the practice of using silica sand in dry or unventilated systems where abrasive blasting operations are being conducted within

enclosures such as tanks, boilers, rooms, sheds and tarped enclosures because of the extremely high exposures that could result.

One SER stated that blasting involving silica may have to be conducted during off shifts, which, in turn, would delay projects and result in missed deadlines. Several of the SERs told the panel that the abrasive blasting operations are subcontracted.

One SER spoke about the use of green diamond abrasives (nickel slag) and believed it to be better (hygienically) than silica sand. However, the SER stated that nickel slag presents a disposal problem and it is more expensive than silica sand. The SER stated that black beauty is used, but also poses a disposal problem.

This same SER stated that their concrete block manufacturing facility has been able to regularly maintain exposure levels at or below the 30 µg/m³ using a wet blasting method outdoors. She further stated: "It is much more practical to use wet blasting in temperate climates and in a manufacturing environment where the runoff can be managed." [Jewell, p. 4.] She said they have used wet blasting successfully for 20 years at the manufacturing facility, but have not tried it on a jobsite because it "makes a mess" and requires large volumes of water. [Jewell, p. 3.]

Respiratory Protection

The draft proposed standard makes reference via 29 CFR 1926.103 to OSHA's Respiratory Protection standard (29 CFR 1910.134), which must be complied with when employees must use respirators for protection against crystalline silica. This program includes written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators. The draft standard would require the use of respirators in four situations:

- 1. Within regulated areas;*
- 2. During work operations where feasible controls are not sufficient to reduce exposures to or below the PEL;*
- 3. While engineering controls and work practices are being installed, repaired, or developed; and*
- 4. Whenever the employee requests a respirator.*

For employees engaged in abrasive blasting operations (including helpers), the employer would need to provide and ensure the use of Type CE continuous flow respirators, as required by 29 CFR 1926.57.

One SER utilized ventilation engineering controls along with wet methods and said that exposures to his workers are still high. The SER then said that most of his workers are not in respiratory protection. Another SER who works in the rock crushing industry mentioned that his employees in addition to utilizing wet methods use nuisance dust masks during work operations. One SER commented that the use of respiratory

protection requires frequent hydration. A SER remarked that no one will want to work with respiratory protection on.

One SER commented how her employees would be in respiratory protection continually if OSHA promulgated the draft proposed standard. The SER continued that she has never had a case of silicosis in the 31 years she has owned the business. The SER expressed concern how her employees do not like wearing safety glasses and respirators, due to their effect on production and performance -- for example, safety glasses becoming foggy making it difficult to see. One SER commented that if he has to put his employees in respiratory protection that it would decrease his workers' productivity, which in turn would most likely cause them to leave his business.

Another SER said that beards and mustaches are a problem and that we are trying to use the lead and asbestos standard to write the silica rule. A SER inquired to the panel whether or not visitors would have to wear respiratory protection on site.

Some SERs stated that:

Draft Section (g)(2)(iv) would appear to require the employer to provide a respirator of unspecified design to any employee that requested it. We do not believe it is appropriate to place this burden on the employer where respiratory protection is not required to meet the PEL if this would be interpreted to go beyond simply supplying an inexpensive dust mask subject to requirements such as those in Appendix D to 1910.134. An employee should not be able to require an employer to provide a respirator subject to all of the requirements (e.g., fit testing, medical exam and training) of OSHA's respiratory protection standard. [Painter attachment, p. 28.]

Another SER stated:

On page 14, the draft regulates employers to provide at no cost to observers clothing or protective equipment as needed when observing the monitoring of employees. So, if we have an obligation to protect observers surely we have the obligation to protect workers in or adjacent to our work area. [Hollingsworth, p. 4 (Emphasis in original).]

Exposure Assessment

The draft proposal contains provisions that address methods for evaluating employee exposures to respirable crystalline silica. Exposure assessment would not be required to evaluate exposures of employees engaged in abrasive blasting operations provided the employer is complying with 29 CFR 1926.57, 1926.103, paragraph (d) of the draft standard, and the employee is using a type CE abrasive blasting respirator. Employers opting to implement the controls specified in Table 1 also do not need to take exposure samples. The draft proposal contains two options for periodic monitoring. The first option would require employers to repeat personal monitoring at least biannually for

operations where exposures are above the action level and quarterly where exposures are above the PEL. The second option is a more performance-based provision that would require the employer to perform periodic monitoring as needed to adequately characterize employee exposures and to ensure that engineering controls and work practices are maintaining exposure at or below the PEL and, if not, that appropriate respiratory protection is being used. The second option also permits the employer to supplement personal sampling for crystalline silica with other exposure assessment approaches, such as use of direct-reading particulate samplers. The draft proposed standard would also require the employer to perform monitoring if there has been a change in a production process, control equipment, personnel, or work practices that may affect employee exposures.

Two SERs said the particle size of silica is so small that you cannot see elevated exposures and therefore monitoring is needed.

One of the SERs commented on what OSHA means by “objective” data. The SER stated: “exposure data doesn’t spoil” and “why in (A) does it need to be obtained within the last 12 months.” [Jewell, p. 4.] The SER stated that when tasks are performed in a good manner, they would continue performing in that manner for many years. The SER wrote that according to a CIH, direct reading instrumentation is not a feasible way of assessing personal exposures at the current time.

A SER stated that the sampling strategy OSHA is proposing would not ensure employee exposure below any of the PEL options due to the changing environment of a construction site. The SER further stated that dust dispersion changes throughout the day.

A SER representing construction of residential homes stated that subcontractors are not on jobsites long enough to provide exposure assessment results. The SER stated that the typical period of time a subcontractor is on a worksite ranges from two days to one week. The SER stated:

According to the accredited laboratories that can perform x-ray diffraction analysis, the results may take one to two weeks to receive. This is well after any potential exposure to the trade subcontractor, whom has now relocated to a new jobsite performing another series of tasks. [Colaizzo, p. 7.]

A SER stated that it would be a rare situation for an employer to be able to monitor an employee’s exposure to silica without compounding contributions from other activities performed by employees of other employers on a jobsite. This monitoring would thus be “meaningless and misleading.”

Several SERs stated the exposure monitoring provisions are ambiguous and misleading. They stated that the draft provisions make one believe that quarterly monitoring is the maximum frequency required. The SERs further stated that in order to achieve compliance with the rest of the draft standard, one would have to continuously monitor.

Several SERs were also unclear on how a sample could be “representative” on a worksite that is constantly changing environmentally as well as the constantly varying materials and effects of adjacent work performed by others on the worksite.

Furthermore, the SERs stated:

OSHA severely and inappropriately constrains the use of objective data under draft Section (f)(2)(ii)(B). First, its use appears to be inappropriately limited to the “initial monitoring” obligation. Where determined to be representative, it should also be acceptable to satisfy periodic or additional monitoring requirements. Second, there appears to be a severe and inappropriate bias against the effective use of objective data. Under draft Section (f)(1)(i), it appears that the employer could appropriately determine that, for a variety of sound reasons (e.g., the effectiveness of existing control measures), an employee is not reasonably expected to be exposed to crystalline silica in excess of the action level. However, under draft Section (f)(2)(ii)(B), objective data could be used to support that determination only if it were to “demonstrate that crystalline silica is **not capable of being released in airborne concentrations** at or above the action level or PEL under expected conditions of processing, use or handling [emphasis added].” In other words, if the silica is physically or chemically bound in such a way that it is no longer a hazardous chemical and presents only the potential for de minimis and harmless exposure, monitoring would not be required. [Painter attachment, pp. 26-27 (Emphasis in original).]

The SERs further stated that the provisions requiring additional monitoring where there has been a change in production, process, control equipment, personnel or work practices may be valid to general industry but not to construction due to the constantly changing work environment.

Protective Work Clothing/Hygiene Practices/Housekeeping

For employees who are exposed to respirable crystalline silica above the PEL, and thus work in regulated areas, the employer would be required to provide either disposable protective clothing (such as Tyvek) to be worn each day or a HEPA-filtered vacuum or equivalent dust collection method to clean contaminated work clothing. The standard would also prohibit removing dust from clothing by blowing or shaking.

The draft proposed standard would require that accumulations of crystalline silica-containing debris be cleaned up with HEPA-filtered vacuums or equally effective dust collection method if such accumulations could contribute significantly to an employee’s exposure to respirable crystalline silica. Silica-contaminated water must also be cleaned to prevent accumulations of dried residue that could contribute significantly to employee exposure to respirable crystalline silica.

One of the SERs, who is a caulking specialist, claimed that tuck pointing operations would require him to replace the HEPA filter once per month and the vacuum cleaner

once per year. The same SER stated concern about how OSHA has overlooked the disposal of respirable silica-contaminated items. The SER stated that the current practice for his employees after finishing a tuck pointing job is to vacuum the debris off of the clothing and dispose of it in a waste bin/trash receptacle. The SER stated: “When this issue was broached during the SBREFA panel conference call, the agency participants seemed to ignore concerns about disposal, which is particularly disturbing given the severity of the emphasis placed on exposure limits and the high mortality rate in industry which OSHA seems convinced exists.” [McDonnell, p. 3.]

With regard to protective work clothing, a SER stated concerns about monitoring proper employee disposal when removing protective clothing. The SER stated “[e]ach crew on each job site will need to have their own HEPA vacuum and haul it to where they are working on the building[.]” [Jewell, p. 5.] At the current time, the SER stated that her company does not have any change rooms. She claimed that if she was to build such a facility that there would be space constraints, as well as having to provide additional facility-related items for female employees. When her employees clean up and are subjected to dust, she said she instructs them and bystanders to wear dust masks.

With regard to HEPA vacuums, a SER stated:

OSHA’s assumption about the longevity and durability of a hand-held HEPA vacuum was challenged by several commenters. One said such equipment would last about a day on a construction site and then stolen; another ventured that OSHA shouldn’t count on such equipment holding up under the rough environment of a construction worksite for more than about a year. [Wolfe, p. 6.]

With reference to housekeeping and hygiene practices, a SER claimed that it would be impossible to follow the requirement in the draft standard to “prevent the presence and accumulation of crystalline silica-contaminated water that could dry and result in a residue that could contribute significantly to employee exposure to airborne respirable crystalline silica.” The SER further stated that he will provide scientific evidence that re-entrainment of respirable silica is not easy to attain and that if re-entrainment did occur that it would not be a major source of exposure.

Employee Health Screening

This section contains requirements for the employer to offer health screening to all affected employees who are occupationally exposed to respirable crystalline silica at or above the action level (or PEL if the PEL is 50 µg/m³). Health screening includes pre-placement health screening, periodic health screening, and screening at termination of employment. The content of the silica-related health screening includes an occupational and health history by an HCP with special emphasis on exposures to respirable crystalline silica, a physical examination with special emphasis on exposures to respirable crystalline silica, and a chest x-ray, to be interpreted and classified according to the International Labor Organization (ILO) guidelines by a board certified radiologist or a NIOSH-certified “B” reader, or an equivalent diagnostic study, and any other tests

deemed appropriate by the HCP. Additionally, the draft standard would require pulmonary function tests at the time of the pre-placement screening. A provision to provide for referral to a pulmonary specialist if necessary, is included.

In general, the SERs articulated concerns about costs and feasibility of pre-placement, periodic and termination examinations, and about the availability of B-readers and other qualified health care professionals. Concerns of liability were also expressed. Others questioned either the value of or the need for health screening for silicosis.

One SER said that if an employee develops silicosis, you cannot tell whether it is attributable to another employer. Another shared the same concern and noted that the ERG reports and OSHA draft document state that the earlier stages of silicosis may not be identified using pulmonary function testing and chest x-ray. The same SER said that employers bear the burden of the cost of a person's disability, even if the exposure occurred earlier. This same SER asked about the role of smoking and stated she thought that OSHA had not given enough thought to smoking as a confounder. Another SER stated that the draft proposed standard may lead to discrimination against older employees.

Three of the SERs questioned the practicality or the need for health surveillance in an industry where turnover is sometimes high and workers can be transient or short-term, particularly for a condition which takes years to develop. One SER stated that his company sometimes brings in people for as little as a day. Another added that these workers are not direct employees, that lots of them are hired without health examinations and that there is an increasing use of small contractors. One SER questioned the need for a pre-placement x-ray. Another SER stated that it would be very difficult to get employees to take an examination at termination of employment.

One SER provided an estimate for the cost of medical screening at \$195-395 and noted that in the Seattle area, the draft standard would cause both high costs for the screening and hiring delays.

On the subject of the availability of B-readers, one SER was concerned and stated that there are only three available in Indianapolis and ten in Cincinnati. Another stated: "According to NIOSH, there are only five doctors in Houston, TX qualified."
[Hollingsworth, p. 6.]

Another SER explained that the recordkeeping burden would be great, since his firm sometimes only uses workers for a single day.

Another SER stated that she offers health screening to her employees and that she has not seen any silicosis-related diseases and her family has had a history with the business since 1922:

The health screening we have offered is a) a general post employment physical which costs \$48/ person and b) a Respiratory Program evaluation/ physical. The cost estimates I got for the silica screening per the rule started at \$195 (US Healthworks) and went up to

\$325 for the occupational Medical Clinic at Harborview. Even in urban areas, allowance for travel time to the appropriate clinic, and down time while waiting for results, are not taken into account. Rural areas are going to be severely penalized by the HCP qualifications required in this rule. [Jewell, p. 5.]

On the cost of health surveillance, another SER stated:

One of my other concerns relates to the health screening required under the standard. The annual costs associated with these provisions alone could put my company out of business. In St. Louis, a physical examination costs \$150; x-rays are another \$150 and lab work is probably another \$100 or more. Yet under OSHA's proposal, without benefit of a prospective employee's work history or ethics, I would be required to absorb these medical costs before they could start work, regardless of critical need. By my calculation, that's an additional \$6,000 per year. St. Louis is a union town, so what impact will this health screening have on the collective bargaining agreement? If an employee does not comply with the health screening requirements or any of the other guidelines could we fire them in a union setting? I think not. [McDonnell, p. 2.]

Another SER also commented on the health screening provision:

Presently medical exams range from \$200 to \$400 dollars per employee on an annual basis. Because homes are built in remote areas of the country, finding physicians to perform pre-placement screening with the required level of medical expertise would be impossible. I believe that OSHA has underestimated the number of HCP's that understand silica. Overall, this would cause a significant delay for employers in hiring new employees. [Colaizzo, p. 8.]

Another SER said that he gets employees from the union hall for a few days, and asked who is responsible for the pre-placement screening for those employees. Another SER who has 40 employees said that his employees are unionized and the union handles health screening.

Three SERs raised the question of whether health screening would be required if the employer elects to use Table 1 instead of performing exposure monitoring. In addition, they stated that the language in the draft proposed standard mandating that the employer "offer" pre-placement screening appears inconsistent with the language stating that the employer "shall provide" the screening before initial assignment. They also stated:

Given the limited availability, in many areas of the country, of physicians with the required level of medical expertise, and the lack of established relationships with these distant medical experts, many employers are likely to find that the requirement to perform the screening prior to initial assignment will prevent them from meeting hiring needs without significant delays. Given the fact that the diseases of concern take many years to develop, it is unclear why the draft does not allow a reasonable period of time

after the initial assignment to obtain the required medical exam. [Painter attachment, p. 32.]

With respect to medical removal protection, these SERs stated:

For two reasons, we do not believe a medical removal provision is appropriate. First, given the fact that the diseases of concern take many years to develop, it would not be appropriate to impose the financial burdens of a medical removal provision on the current employer where it simply happened to be the employer at the time the disease manifested itself. Second, the workers compensation laws are designed to address these situations, and OSHA should not get involved in these state policy issues, particularly when it is highly unlikely that there would be a suitable alternative position that did not involve silica exposure, and where there is no expectation that the individual could ever go back to a job involving silica exposure. [Painter attachment, p. 33.]

Another SER added:

Recently-enacted rules fortifying limits on medical disclosure may impede the collection of some of the medical information OSHA requires in its draft proposed rule. A byproduct of a comprehensive silica rule will be an increase in the number of workers' compensation claims. To the extent OSHA's costs estimated are incongruent with the costs and assumptions made here, OSHA would need to adjust its figures accordingly. [Wolfe, p. 7.]

On the health screening provisions in the draft proposed standards, one SER commented:

In addition to finding a doctor qualified to perform an assessment, administering pulmonary function test and x-ray does not guarantee that disease is not present. Silicosis does not affect or present itself on a x-ray or in a pulmonary function test until the disease is well advanced. Other than not hiring a worker with an already advanced disease, this physical can not accurately gauge a workers health in regarding silica exposure. Because of the long latency period of silicosis, an employer who did not expose workers above the PEL will in fact bear the burden and cost of any employee who contracts silicosis from their exposures at previous employers. The pre-hire physical gives the employer and the worker a false sense of security. This would also add to the liability concerns, since if a worker subsequently contracted silicosis the presumption would be that the present employer caused the exposure. Has OSHA determined the impact of increased worker's compensation insurance and liability for 3rd party actions brought by families? Finally requiring a physical at termination places an undue burden and responsibility when the employer has no means to force compliance for a worker that is terminated for any reason. [Hollingsworth, pp. 6-7.]

One SER stated:

Then there is periodic health screening, which I assume is once a year, again at great employer expense. What's most troubling, however, is the possibility of post termination health screening. You've just fired an employee for poor performance yet you still have to pay for a full-scale medical examination to determine whether or not they've contracted silicosis. What does OSHA think will happen if that now former employee is found to have a serious respiratory problem? Will they call us and thank us for allowing them the privilege of working for the company? My guess is we'd be sued for permanent disability benefits regardless of whether or not it just may be that the disease happened to manifest itself on our watch. Again, the liability potential is enormous. [McDonnell, p. 3.]

Some SERs asked why OSHA is considering requiring an x-ray and pre-placement examination for a disease that is latent and takes years to develop. One SER stated that once you have silicosis, "you have it"; thus, medical monitoring is meaningless.

One SER wrote:

The MRP section again is a contingent liability with no end in sight. Since a diagnosis of silicosis is not reversible, finding alternate jobs for workers where the silica exposure would be nil, is impossible in construction. Walking across a job site on a windy day could impact an employee's medical status. This part of the draft, if implemented, would require the employer to maintain wages, benefits, and seniority, and if it were possible, to put an employee in a lower exposure job (page 14). The big question is when would MRP end since this disease is not reversible and is progressive? [Hollingsworth, p. 7.]

Another SER provided the following on the health screening provisions:

The health screening provisions contained in the draft proposed standard would not only be cost prohibitive for small businesses like mine, but would likely create substantial liability problems and increase workers compensation costs dramatically. In most parts of the country, workers compensation costs have more than doubled over the past three years. In my view, this is a critical cost issue which OSHA has not even begun to contemplate and an area in which they have absolutely no jurisdiction. What is even more appalling, however, is the fact that by OSHA's own estimates, the health screening costs would absorb 10-12 percent of a company's profits. I know of NO small business that could withstand that financial burden, particularly when coupled with larger insurance costs. [Painter, p. 2.]

Another SER expressed concerns as to whether employees would accept health screening, because they may not want to know if their health is impaired, may find the process inconvenient, or may suspect an "ulterior motive" by their employer.

Hazard Communication

This paragraph of the draft proposed standard is a cross-reference to OSHA's Hazard Communication standard, and requires that employers include crystalline silica in their hazard communication program covering labels, material safety data sheets, and information and training.

Some SERs said that the language in (l)(3)(ii) directing the employer to advise the affected employee of the quantity, location, manner of use, release and storage of crystalline silica and the specific operations that could result in exposure may be appropriate for highly hazardous chemicals under OSHA's PSM Standard, but does not make sense in the context of dirt, bricks, etc. found throughout a construction site.

A SER said that the sign "Danger, Silica causes cancer" is too blunt.

Another SER said that they have put hazard stickers on bags since the 1970's.

Another SER said there is no need for hazard communication for employees because "[t]hey know about silica." [Jewell, p. 6.]

Two SERs stated that there is potential for exposure when moving silica from the dumpster to the landsite. These SERs questioned OSHA about how this removal could be performed safely.

Employee Information and Training

The proposed draft includes provisions that would provide employees who are exposed at or above the action level (or PEL if the PEL is $50 \mu\text{g}/\text{m}^3$) with important information on operations that could result in exposures exceeding the PEL, and principles of safe use and handling of crystalline silica-containing materials in the workplace. The specific content of this training is intended to be more comprehensive and workplace-specific than the hazard information training now required by OSHA's Hazard Communication standard (29 CFR 1910.1200).

One SER said there is very little educational and outreach information on silica in the construction industry, so short and easy-to-read outreach materials would be helpful. The SER also said the materials should be in other languages, especially Spanish. Other SERs agreed that outreach, education, and training are needed, especially with non-English speaking construction workers.

Another SER said: "Training in Hazardous chemical exposures in general is part of our safety training. We don't take 2 hours specifically with silica, but it's one of the chemicals we spend the most time on." [Jewell, p. 6.] This SER thought that training on silica alone for two hours was unreasonable for her operation. She, the owner, got training, and then she trains the employees, she said. In her company, she said that English is an employee requirement as they cannot train those without it and when

employees are observed not following proper procedures, they are retrained, often one-on-one.

Employee turnover also creates a problem for training, said several SERs, greatly increasing the costs of the training required under the draft proposal. In addition, many felt that it was far too costly (in wages, travel time, and training costs) to go outside the company for training, especially for extensive training.

Many SERs said they already provided training. Several said that the trouble with training is the time necessary to do it. A high turnover rate compounds the problem, some SERs said. One SER said their company might train 10 employees, and of them, only one would stay. One said it seemed that OSHA assumed that employers could rely on training provided by previous employers to the employees; he said no employer could do that.

Some SERs said they provide training in several aspects of their business, including a hazard communication program, to all of their employees, however, they did not provide specific training in the hazards of crystalline silica exposure because it has never been a problem.

Another SER said his company provides training to only those people who potentially have exposure to crystalline silica.

Recordkeeping

The employer would be responsible for maintaining a record of employee exposure measurements, employee health screening results, respirator fit testing results, and employee training. Exposure and health records must be maintained in accordance with 29 CFR 1910.1020, and fit test and training records must be maintained until a more current record is created.

Many SERs stated that with respect to temporary employees and OSHA's recordkeeping section, that the 30 years maintenance of records after the employee has left was completely infeasible. One SER asked how he, as a general contractor, would distribute records (monitoring results) to all the subcontractors if they were exposed.

One SER asked how long the industry would get to phase in the recordkeeping provision.

Another said that his company already keeps some records and does not want or need more recordkeeping requirements. Another SER said her company kept records of employee training, but had no (recordkeeping/sharing) arrangements with any union, or trade association.

Several SERs said the recordkeeping requirements would necessitate the hiring of one or more employees to handle the paperwork alone, and to keep and maintain them for 30 years would be a completely unmanageable amount of paperwork. Many SERs

suggested that the measurements and monitoring records were the most problematic, and the maintaining of all records for 30 years. One SER said that nowhere in the PIRFA did OSHA address the costs for maintaining records, which could run to millions of dollars.

c. Costs and Economic Impacts

Comments Common to both General Industry and Construction

A SER believed sampling costs were underestimated, suggesting it takes 14 hours of IH time to do one sample, as opposed to the ERG report's assumption of one hour.

A SER believed medical monitoring costs were "seriously underestimated" by OSHA and that it was inappropriate to annualize them.

A SER believed OSHA "badly underestimated" labor costs. "OSHA's numbers are not only far too low, but OSHA (through ERG) alternates between two different information data sources to support its calculations, without any explanation." [Ollier attachment, p. 7.]

A SER believed that OSHA's economic analysis failed to consider a number of factors:

OSHA's analysis ignores that some small entities are more profitable than others (the range), or less profitable than their large business competitors (the unique impact on small business). OSHA ignores that an average percentage reduction in profits can mean bankruptcy for a large percentage of those struggling to stay afloat. OSHA ignores that the cost of credit is a massive factor in determining viability, and is not shared equally among small and large business. OSHA ignores that large and small businesses do not share equal economies of scale in trying to comply with these extensive rules. OSHA ignores reality in setting costs for this rule. OSHA ignores how many jobs will be lost by this rule. OSHA ignores how many jobs will be exported to other countries as a result of this rule. [Ollier attachment, p. 7.]

A SER maintained that the true costs of the standard would prove to be "between \$3-5 billion per year, if not higher." [Ollier attachment, p. 3.]

Comments on General Industry

The costs of complying with the draft standard as reported by the SERs varied considerably across industries, depending on the processes in each industry, on current exposure levels, and on the extent of already existing programs for ancillary provisions such as exposure monitoring and hygiene facilities (changing rooms and showers). The anticipated economic impact reported by SERs also varied depending on the long-term health of the industry and the degree of current compliance with provisions in the draft standard.

Costs of meeting lower PELs in foundries

Foundry SERs reported that the open layout of many small foundries would make meeting a lower PEL both difficult and very costly, if it were possible to do so with engineering and work practice controls. In addition, small foundries typically have considerable variability in their products, making specifically designed engineering controls unrealistic for their operations the SERs said.

Several SERs reported investing substantial amounts to install ventilation equipment to meet the current PEL in their dustiest operations. All SERs have extensive engineering controls to reduce silica exposures as well as for environmental regulations.

SERs said that some substitutes for dry silica sand are available for some applications. But as one SER said: “These would increase our costs significantly and also produce a lower quality product.” [SER, conference call.]

High exposures arise in shakeout and cleaning, mixing, and mold- and core-making. Meeting a lower PEL could entail erecting partition walls (in plants that are typically open) and extensive new dust collection systems. The cost of make-up air would also be significant, according to some SERs. Small foundries work on a variety of products that make construction of fixed walls between process areas disadvantageous, some SERs said.

SERs reported that meeting a lower PEL with engineering and work practice controls was unlikely in the operations that generate the most silica-containing dust. Four of the SERs from foundries reported meeting the current PEL in all operations, but the others reported being over the PEL in one or more operations and relying on respirators for additional protection.

One SER, whose foundry meets the PEL of 100 except in two operations, provided an estimate of \$280,000 for ventilation equipment to meet a lower PEL. Another foundry SER reported that after building a new facility, the company had to invest more than \$200,000 in additional ventilation systems to make the current PEL. Achieving a lower PEL would require an additional \$50,000 investment, the SER said.

Costs of meeting lower PELs in brick manufacturing

SERs from brick manufacturers noted several obstacles with meeting the draft standard’s lower PELs. One is that brick manufacturing facilities are large open processes and that there is no feasible substitute for silica-containing materials in the industry.

One SER reported significant investment in controls for silica dust in high exposure jobs in brick manufacturing (\$200,000), but still needing respiratory protection to meet the current PEL. Another SER reported an investment of \$600,000-700,000 to install several dust control systems, use of water, baffles, and other measures to meet the current PEL. Another reported spending \$200,000 in a new facility for three ventilation systems. In

sum, SERs reported that it would require significantly more investment to meet a lower PEL, if in fact it could be achieved. “The cost of meeting these lower PELs would be drastic,” as one SER put it. [SER, conference call.]

Costs of meeting lower PELs in other industries

A SER from a commercial dental lab reported that his facility had exposures well below the current PEL, employ considerable exhaust ventilation, and perform abrasive blasting in enclosed cabinets.

A SER from a shipyard reported that the only source of airborne silica in his industry was from abrasive blasting operations. Exposures to employees not involved in the blasting operation are avoided by blasting on weekends. Some shipyards are exploring using alternative blasting media, and the costs are higher, the SER said. According to the SER, except for some concerns about costs for ancillary provisions, the draft standard would not impose new costs, beyond the abrasive blasting provisions.

A SER from a manufacturer of refractory concrete products said that with isolation rooms and effective ventilation, his facility had exposures below the current PEL in 11 of 12 processes. Some employees wear respirators, based on the company’s internal guidelines. Lowering the PEL may make current engineering controls obsolete, the SER said, and entail considerable cost in redesigning and installing new systems. A main concern, according to the SER, is exposures to consumers of their products—foundries.

The main concern of a SER from a manufacturer of pre-cast concrete products is abrasive blasting of the cast products, although some grinding, drilling, and sawing is also done. His facility uses high-pressure water and sand to blast cast products. The SER said that providing engineering controls for these operations performed at many outside locations would be very expensive and are not reflected in the Agency’s cost estimates. Moving all such work indoors where engineering controls would be located would also cost considerably more than the cost estimates: “We spent \$3 million moving our abrasive blasting operations indoors. It’s not economical for smaller establishments.” [SER, conference call.]

A SER from an industrial sand manufacturer said that employee exposures at his facilities meet the current PEL, but that meeting a lower PEL would require significant investment in engineering controls.

Costs of ancillary provisions in foundries

Most of the SERs stated that they thought that the costs for these provisions had been substantially underestimated, even if they were already following the requirements in the draft proposed standard.

SERs from foundries stated that they already perform exposure monitoring although in some cases this may be done by insurance companies or state run programs. “To sample

as frequently as the standard requires, we would have to buy the equipment and do it ourselves,” one SER said. [SER, conference call.] Some foundries furnish work clothing and provide change rooms and showers, but not all do so. Some also provide employee health screening examinations but not to the extent required in the draft proposed standard. Pre-employment physicals especially were identified by SERs as a problem because there is high turnover of newly hired employees. One SER reported using a HEPA filtered vacuum for clean up but others said there was too much material to make it economical to forego mechanical sweeping. Most of the SERs have respiratory protection programs and many provide employee health screening and use B-readers for analyzing x-rays. Some SERs reported that they provide work clothing every day for their employees, along with showers and changing rooms. Other foundry SERs reported that they only provide changing rooms. The SERs said that showers are expensive to provide and require more than 15 minutes per employee. They will also incur costs and believe that OSHA has underestimated the time required of an IH or a technician to perform the monitoring. Foundries use steel shot for blasting in enclosed processes and most have respiratory protection programs, according to the SERs.

Costs of ancillary provisions in brick manufacturing

SERs from the brick manufacturing industry reported a range of current practices. Most already have a respiratory protection program and perform some exposure monitoring. The SERs reported that a few provide work clothing. One of the SERs provides change rooms and showers, but the others do not. None provide separate lunchrooms.

The SERs believed that OSHA has underestimated the costs for many of these provisions. Most brick manufacturing sites because of their size and necessary access to raw materials are located in rural areas. Considerable time is required for employees to travel for health screening and any consultants, such as industrial hygienists, also must be paid for the additional time and travel, according to the SERs. Some sites are so remote that any access to specialists and consultants is a problem. Some of the provisions such as showering, changing clothing, and travel for medical exams would require more time than estimated by the Agency, some SERs said. Pre-placement physicals in jobs with high turnover would be very costly as well, according to the SERs.

Costs of ancillary provisions in other industries

A SER from a commercial dental laboratory reported that although his facility's exposures were low, there would potentially be considerable cost for a competent person, exposure assessment, training, and so forth.

A SER from a shipyard reported that his facility already follows most of the ancillary provisions, such as for examinations for employee health screening, protective clothing, respiratory protection, changing rooms (but not showers), exposure monitoring, training, etc. The SER did raise a concern that he believed the draft proposed standard required the competent person to be a CIH or CSP, which would impose a new cost. The shipyard has trained and experienced shipyard competent persons. Another SER from a shipyard

said that the estimated costs, or time, for several activities were “far too low,” including the time estimated for vacuuming clothing several times each day, management time for compliance, exposure monitoring, employee trips to clinics or doctors, and showering.

A SER from a manufacturer of refractory brick reported that they already perform examinations for health screening and have a respiratory protection program.

A SER from a manufacturer of powders used in molding processes reported that the draft proposed standard would cost \$350,000 to meet, mostly due to requirements of ancillary provisions. This facility with 15 employees already provides work clothing and change rooms, performs exposure monitoring and assessments, and pays for employee health screening.

A SER from a pre-cast concrete manufacturer stated that clean up with vacuums in their very large outside work areas was impractical. “We understand the ban on compressed air, but the mechanical sweeping ban is a problem. We cannot clean plant wide with vacuums.” [SER, conference call.] The SER said that even the large costs for sweeping the inside facilities were not reflected in the cost estimates. According to the SER, OSHA has underestimated time and costs for exposure monitoring, medical examinations, vacuuming and showering, and work clothing.

A SER from an industrial sand manufacturer said that his facility already follows most of the ancillary provisions with the exception of providing work clothing, change rooms, and showers. The company provides medical exams and training and hires a consultant industrial hygienist to perform exposure monitoring. The SER noted that following the draft proposed standard’s requirements would be more extensive and also that the Agency’s estimates of employee time for these activities was too low. Performing exposure monitoring more frequently would be costly and their analytical laboratories have said that the cost of analyzing samples at lower exposures would also increase from the current \$60 per sample to \$150.

Economic Impacts

SERs from foundries stated that there had been a long-run decline in the number of foundries in the United States, with the industry under continued pressure from foreign competitors and the need to meet new domestic regulations. The total expense of the draft standard and inability to meet lower PELs would pressure more U.S. foundries out of business, continuing an historical trend in this industry, SERs said. The variability in the foundry products and small open-area production plants would make meeting lower PELs difficult and costly. Many smaller foundries would be put out of business, the SERs said, and many jobs lost in the industry. “Twenty percent of profits is a great deal to spend on engineering controls with questionable results The economics of the foundry industry today are not pretty,” one SER said. [SER, conference call.] And another: “The cost of meeting the standard will be very difficult A PEL of 50 would put us out of business.” [SER, conference call.]

SERs from the brick industry stated that meeting the provisions of the draft proposed standard, particularly with a lower PEL, would be very tough for their competitive, low-margin industry. Similarly, a SER from the pre-cast concrete industry said, “The problem is not putting the company out of business, but that the price of products will increase.” [SER, conference call.]

Other SERs (industrial sand, molding powders, refractory concrete) noted that the impact of the standard on them, particularly if the PEL is lowered, would entail substantial costs, but indirect effects could be significant as well since their major customers (foundries) could be negatively impacted, too. “Refractory companies are going out of business with the foundries,” one SER said. [SER, conference call.]

Benefits

Only one SER in general industry stated that they have had an employee with silicosis. The other SERs also did not know of silicosis occurring in their industries. One SER expressed concerns that under the draft proposed standard, they would be asked “to do far more,” when, he said (1) the number of cases of silicosis is going down and (2) the current PEL is adequate. Comments by SERs generally reflect a view that there is little silicosis now occurring in the U.S. and that absent convincing data and science to show the risk, the expense of meeting the provisions of the draft proposed standard is not justified. Some SERs recommended a standard with ancillary provisions while maintaining the current PEL.

Many SERs attributed the existing cases of silicosis to non-compliance with the current PEL, often citing the fact that 30 percent of the samples recorded in the Agency’s IMIS data were overexposures. “We spent \$12 million in 1998 on a new facility to eliminate silica abrasive blasting as much as possible,” one SER said. [SER, conference call.] “We are concerned that we are being asked to lower exposures when 30 percent are non-compliant.” [SER, conference call.]

A SER from a dental laboratory also questioned the need for the standard: “How many employees in this industry have silicosis? It’s important to know how serious this problem is in my industry. There is little solid evidence that silicosis is a problem in our industry.” [SER, conference call.]

Comments on Construction

Most SERs indicated that OSHA had underestimated the costs of the draft proposal. One SER stated: “I believe OSHA has greatly underestimated the costs of compliance for this proposed regulation.... I estimate the costs of compliance for my company to be approximately 50% of my gross revenue or 3 million dollars.” [Hollingsworth, p. 2]

Costs of meeting lower PELs

Some SERs indicated that equipment does not last as long as OSHA assumed in its analysis. One SER indicated one year for the life of HEPA vacuums attached to work tools is more realistic than the two years OSHA assumed.

One SER commented that some of the engineering controls recommended for earth moving operations would be very expensive; they own their own equipment, and he estimated it would cost \$30,000 to retrofit. Most of their equipment does not have cabs because the operators do not like cabs. He indicated it was harder to monitor activities and communicate, since the cab blocks out a lot of sound. Also, he indicated that A/C systems are constantly breaking in the field, at which point the operators will either open the window or just get hot.

Several SERs commented on the ubiquitous nature of silica in construction, suggesting that as a result the standard could have a potentially large economic impact on their segment of the construction industry:

Because of the widespread natural occurrence of silica and the wide uses of the materials and products containing it, there is just no substitute for many products containing silica. If proposed, this standard could lead to the elimination of various types of construction methods and materials and would burden not only the small businesses in the residential construction, but have an massive negative impact on the entire industry. [Colaizzo, p. 2.]

Some SERs believed the calculation of the cost of engineering controls to be flawed in several ways:

- 1) The ERG calculations understate the actual cost because they are based on 1999 or 2000 data from RS Means Building Construction Cost Data 2000 rather than 2003 data from the RS Means Building Construction Cost Data 2004;
- 2) There is no information to suggest much less substantiate the premise that the exposure monitoring data in Tables 3-1 and 3-2 (even if they were properly performed) are in any way representative of current workplace exposures across the country;
- 3) There is no information to suggest much less substantiate the premise that the exposure monitoring data in Tables 3-1 and 3-2 (even if they were representative of current workplace exposures) are in any way representative of the **non-existent, theoretical jobs artificially created by the FTE analysis** so as to justify their use as the foundation for Table 4-12.
- 4) For purposes of discussion only, if we assume the grab bag of exposure monitoring described in ERG Tables 3-1, 3-2 and 4-12 is representative of actual exposures, it naturally functions to screen out those workers whose exposures are below the PEL based on the fact that they only perform the at-risk task for a small portion of the day. Having proceeded on the basis of the FTE (full-time equivalents) approach, we believe it would be far more logical and appropriate to

- assume that all FTEs would be exposed above the PEL in the absence of controls. In other words, we can find no justification, and substantial support to the contrary, for an approach that artificially condenses actual exposures into far more highly concentrated exposures (by condensing all at-risk task hours into FTEs) and then assumes that, despite the impact of this change, the grab bag of exposure monitoring described in ERG Tables 3-1, 3-2 and 4-12 represents these FTEs. The serial effect of first multiplying total project costs by the FTE percentage (from Table 4-8) and then by the “Percentage of Workers Requiring Controls” from Table 4-12 (and then by the average “Total Incremental Costs as % of Baseline Costs” by job category from Table 4-7) results in an unjustified double discounting of exposed workers in the incremental cost calculation.
- 5) The application of the FTE analysis to the additional equipment costs is based on the wholly unfounded assumption, contrary to actual experience, that this additional equipment could be used with perfect efficiency (i.e., never idle) so that it is only at a particular site during the time the at-risk tasks are being performed. [Painter attachment, pp. 35-36 (Emphasis in original) (Footnotes omitted).]

These SERs also voiced concerns over equipment costs included in the PIRFA:

We believe many of the costs estimates are based on outdated purchasing information and the improper use of the FTE approach. Furthermore, for example, as we previously noted, we believe OSHA has understated the unit cost of vacuums and the number of vacuums that would be needed. In addition, the vacuums, water pumps and a variety of other engineering controls would require generators to provide the necessary electric power. [Painter attachment, pp. 37-38.]

The same SERs further questioned an assumption built into OSHA’s economic analysis regarding silica-free joint compound:

Based on the availability of what appeared to be silica-free joint compound in some retail stores, ERG apparently made the following assumptions: that silica-free joint compound was readily available on a nationwide basis in quantities that would meet all future construction needs; that in all significant respects silica-free joint compounds exhibit the same performance characteristics as joint compound containing silica; and that manufacturers of joint compound would not be required to modify their raw material purchasing specifications, manufacturing process or quality assurance program to reliably ensure their product is silica-free in ways that would be likely result in a price increase for those products. It is not clear what is meant by “silica-free”. Does that mean a bulk sample concentration of less than 0.1%, below which the silica content would not be declared under OSHA’s Hazard Communication Standard, or does it mean a concentration below which the PEL would not be exceeded? [Painter attachment, pp. 38.]

Costs of ancillary provisions

A number of SERs expressed concern about the cost and accuracy of exposure monitoring. One SER complained that the costs of exposure monitoring were \$350/worker, as opposed to \$200, without including a cost for lost productivity or overtime pay.

A number of SERs indicated the health screening provisions would be quite costly, particularly given the industry's high rate of turnover. One SER stated that they spend \$225-395 per person for health screening of new hires.

A SER indicated that OSHA's cost estimates for training were unrealistically low for construction, due to the inability to document training received by a previous employer. Several SERs also maintained OSHA did not include all costs related to training.

Some SERs believed the alternative of vacuuming clothing as set forth in the PIRFA was unrealistically low. They indicated that it would take 5-6 minutes per person to complete the task, assuming that a vacuum was immediately available. They also took issue with the estimated cost of HEPA vacuums.

Some SERs indicated that the option of using disposable clothing, as set forth in OSHA's PIRFA was also unrealistic, in that it assumed only one suit was used a day, whereas in practice they would likely need to replace them every time they left the regulated area for any reason (e.g., lunch and any other break). In addition, it was indicated that in practice the suits were more expensive than OSHA estimated and that many of the suits would not "last through the day" because of the rough nature of construction work: "Unless you purchase \$8-\$12 suits, these cheaper paper suits tear very easily when you are just trying to put them over regular work clothes." [Colaizzo, p. 8.]

There was concern on the part of several SERs as to the cost implications of the competent person provisions. One concern raised by SERs was that it would require a CIH, which a number of them currently lacked. A related concern was that even in the absence of a formal CIH, there was not a person on a number of the job sites currently with the ability to satisfy even a minimalist interpretation of the draft proposed standard.

A number of SERs complained about recordkeeping costs, indicating that under their interpretation of the standard, they would have to hire additional people just to handle the paperwork related to other provisions of the draft proposed standard.

Liability/Economic Feasibility

Several SERs expressed concerns about what they viewed as potential liability related to exposure of 3rd parties. One SER suggested that the draft proposed standard would end

up boosting workers' compensation costs considerably and ultimately make the standard economically infeasible:

The health screening provisions contained in the draft proposed standard would not only be cost prohibitive for small businesses like mine, but would likely create substantial liability problems and increase workers compensation costs dramatically. In most parts of the country, workers compensation costs have more than doubled over the past three years. In my view this is a critical cost issue which OSHA has not even begun to contemplate and an area in which they have absolutely no jurisdiction. What is even more appalling, however, is the fact that by OSHA's own estimates, the health screening costs would absorb 10-12 of a company's profits. I know of NO small business that could withstand that financial burden, particularly when coupled with larger insurance costs. [Painter, p. 2.]

Several SERs indicated the cost of the standard would be very large in their industries, and put a number of companies out of business.

Analytical Issues

A SER suggested that the ERG analysis supporting the PIRFA ignored additional workers who might be affected by the standard, by employing a series of unjustified assumptions about the affected construction workers.

Benefits

A SER maintained that the benefits analysis associated with the PIRFA was inadequate as it was based only on an association between silica and disease and not a causal relationship.

Several SERs questioned OSHA's benefits analysis, in part because they had never had any cases of silicosis in their direct experience, or any known cases in their industry. One SER stated:

I have employees who have been with me since 1975. To my knowledge, no one has been diagnosed with silicosis at my Company, or from our industry, which began in California in the early 1950s. [Hollingsworth, p. 2.]

Other SERs pointed to data sources as raising questions about OSHA's risk assessment and benefits estimates:

It is clear that OSHA has not demonstrated that there is a significant risk of harm, or that or that exposures above any proposed Permissible Exposure Limit (PEL) are occurring, in residential construction. OSHA states in the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) "many construction workers can be considered to be exposed to respirable crystalline silica even though their

exposures **are not likely** to be near any of the alternative PELs or action levels” (emphasis added). As noted in the PIRFA, the Occupational Safety and Health Act of 1970 requires that OSHA eliminate significant risk of overexposure to the extent feasible. It is also stated in the PIRFA “BLS [Department of Labor’s Bureau of Labor Statistics] injury and illness statistics report **no lost workday cases of silicosis illness** outside the mining industry.” (emphasis added) My interpretation of these two statements concludes that there are only a very small number of workers exposed to harmful levels of silica dust in the construction industry and that there are no reported cases of silica related injuries in this industry, although the standard appears to impact every single construction workers exposed to any silica dust. [Colaizzo, p. 3 (Emphasis in original).]

4. Panel Findings and Recommendations

a. General

Most SERs felt that a new silica rule is not needed at this time. In general, the SERs felt that the existing problem does not warrant the expenditures that would be required by OSHA’s draft proposed standard. Many SERs questioned what a new standard, particularly one that would change the PEL, would accomplish. Many SERs felt that the major problem was with noncompliance with the existing standard. Given this view of the problem, these SERs felt that a new standard would simply force those already in compliance to spend more money, while doing nothing to end existing noncompliance.

As discussed below, the Panel recommends that OSHA give consideration to the alternative of improved enforcement of and expanded outreach for the existing rule rather than a new rule. In addition, the Panel recommends that OSHA carefully study the effects of existing compliance and outreach efforts, such as the Special Emphasis Program on silica, with a view to better delineating the effects of such efforts. This examination should include (1) a year-by-year analysis of the extent of noncompliance discovered in OSHA compliance inspections, and (2) the kinds of efforts OSHA made to improve enforcement and outreach.

The SERs, however, also had many specific issues concerning what OSHA should do if it chooses to go forward with a proposed rule. In order to reflect these specific issues, the Panel has made many recommendations concerning issues to be considered if the Agency goes forward with a rule. The Panel also recommends that OSHA take great care in reviewing and considering all comments made by the SERs.

b. Costs and Economic Impacts

General Comment

The SERs generally believed that OSHA had underestimated the costs of the draft proposed standard. Some SERs also asserted that small businesses are generally at a competitive disadvantage in complying with the rule, lacking economies of scale

available to larger businesses. OSHA is committed by law to develop its analyses using the best available evidence, and it will consider carefully the SER comments in light of this test.

The Panel recommends that OSHA revise its economic and regulatory flexibility analyses as appropriate to reflect the SERs' comments on underestimation of costs, and that the Agency compare OSHA's revised estimates to alternative estimates provided and methodologies suggested by the SERs. For those SER estimates and methodological suggestions that OSHA does not adopt, the Panel recommends that OSHA explain its reasons for preferring an alternative estimate and solicit comment on the issue.

Costs Associated with Achieving the PEL in General Industry and Maritime

In general, the SERs said that the current PEL, and in some cases lower PELs, could be met in many, if not all, operations in general industry facilities. The SERs were concerned that the cost of meeting a lower PEL would be both difficult and costly in several operations, and may not be possible with engineering controls and work practices for some operations. For example, small firms in the foundry industry indicated that they typically have considerable variability in their products that can make specifically-designed engineering controls difficult to apply. Maintaining flexibility in production processes is important in producing a variety of products, and thus, as reported by the SERs, the construction of walls between process areas would be disadvantageous. The SERs reported that adding further enclosure of areas generating dust would require the installation of new dust collection systems and would involve significant costs for supplying make-up air. One SER (a pre-cast concrete product manufacturer) pointed out that providing engineering controls for operations performed at many outdoor locations would be very expensive and that costs for these were not included in OSHA's cost estimates. This SER also noted that moving such operations indoors would involve large costs that would not be economical for smaller establishments.

The Panel recommends that prior to publishing a proposed standard, OSHA should carefully consider the ability of each potentially affected industry to meet any proposed PEL for silica, and that OSHA should recognize, and incorporate in its cost estimates, specific issues or hindrances that different industries may have in implementing effective controls.

Costs Associated with Exposure Monitoring in General Industry and Maritime

Some SERs raised issues with the cost estimates of the required exposure monitoring. One SER suggested that it would take 14 hours of an industrial hygienist's time for each hour assumed by OSHA. It was also suggested that small businesses would be at a disadvantage in terms of economies of scale.

The Panel recommends that OSHA carefully review the basis for its estimated exposure monitoring costs, consider the concerns raised by the SERs, and ensure that its estimates

are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Health Screening Provisions in General Industry and Maritime

Some SERs raised issues with the cost estimates of the health screening provisions. They indicated the cost of the screening was higher than estimated, in part because of high employee turnover after pre-placement physicals. Some SERs indicated other problems with the effective unit cost, both in terms of cost of the physical itself, as well as ample travel time required to meet with physicians with the required background.

The Panel recommends that OSHA carefully review the basis for its estimated health screening compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Hygiene Provisions in General Industry and Maritime

Several SERs complained that the costs would be greater than estimated by OSHA for provisions related to clothing and showers. One SER indicated the time for showering could be substantial, and others mentioned the labor costs associated with frequent breaks not factored into the analysis. Some mentioned travel time costs.

The Panel recommends that OSHA carefully review the basis for its estimated health screening compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with the Prohibition on Dry Sweeping in General Industry and Maritime

One SER indicated that the prohibition on dry sweeping had been ignored in OSHA's cost analysis. They indicated both that the prohibition was impractical and that, if accounted for in OSHA's cost analysis, the costs would be substantial.

The Panel recommends that OSHA carefully review the issue of dry sweeping in the analysis, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Economic Impacts in General Industry and Maritime

The SERs indicated that the standard could cause some smaller foundries to be put out of business. SERs in the foundry industry especially pointed out that the use of older economic data to profile the industry would underestimate economic impacts because the industry had declined dramatically in the last three years. SERs from other industries

(industrial sand, molding powders, refractory concrete) noted that the impact of the standard could involve indirect costs and impacts up and down the supply chain, as customers and suppliers of businesses that close would also be affected. One SER believed that OSHA had ignored the range of profitability among businesses, and thus did not adequately recognize that the average percentage reduction in profits could mean bankruptcy for those firms struggling to stay afloat. The SER also asserted that OSHA ignored the cost of credit and that this also varies across businesses. Finally, the SER implied that many jobs may be lost as a result of compliance with this rule.

The Panel recommends that OSHA thoroughly review the economic impacts of compliance with a proposed silica standard and develop more detailed feasibility analyses where appropriate. The Panel also recommends that OSHA, to the extent permitted by the availability of economic data, update economic data to better reflect recent changes in the economic status of the affected industries consistent with its statutory mandate.

Costs Associated with Achieving the PEL in Construction

The SERs were concerned that OSHA had not adequately recognized the extent and costs of engineering controls that would have to be implemented to meet the requirements of the draft proposed standard. For example, issues were raised regarding the life of engineering controls, the cost of retrofitting equipment, the availability of silica-free joint compound and the ubiquitous nature of silica in construction.

The Panel recommends that OSHA carefully review the basis for its estimated compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Several SERs in construction indicated that respirators posed a major productivity problem in construction, and as a result employers try to avoid putting employees in respirators if at all possible.

The panel recommends that OSHA re-examine its cost estimates for respirators to make sure that the full cost of putting employees in respirators is considered.

Costs Associated with Ancillary Provisions in Construction

A number of the construction SERs thought that OSHA underestimated the costs of the ancillary provisions, particularly because of such factors in the construction industry as high rates of labor turnover, constantly changing working conditions, and multi-employer worksites.

The Panel recommends that OSHA carefully review the basis for its estimated compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Exposure Monitoring in Construction

Some SERs indicated that the unit costs were underestimated for monitoring, similar to the general industry issues raised previously. In addition, special issues for construction were raised (i.e., unpredictability of exposures), suggesting the rule would be costly, if not impossible to comply with.

The Panel recommends that OSHA carefully review the basis for its estimated compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Health Screening in Construction

SERs raised cost issues similar to those in general industry, but were particularly concerned about the impact in construction, given the high turnover rates in the industry.

The Panel recommends that OSHA carefully review the basis for its estimated compliance costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Hygiene Provisions in Construction

Construction SERs raised cost issues similar to those in general industry. They also expressed concern about the time it would take to vacuum clothing, as well as raising questions about the cost of the vacuums themselves. In addition, there was concern that the hygiene provisions would prove either very expensive and/or impractical in the construction setting, due to the transitory nature of the work setting.

The Panel recommends that OSHA carefully review the basis for its estimated hygiene costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Costs Associated with Training in Construction

A SER suggested OSHA's cost estimates for training were unrealistically low for construction, due to the inability to document training received by a previous employer. Several SERs also maintained OSHA did not include all costs related to training.

The Panel recommends that OSHA carefully review the basis for its training costs, consider the concerns raised by the SERs, and ensure that its estimates are revised, as

appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Cost Analysis—Treatment of Labor Data

Some construction SERs raised two issues regarding the PIRFA's treatment of labor costs. One complaint was that the analysis relied upon Full Time Equipment (FTE) workers to calculate costs for various items, including engineering controls, and that this inherently underestimated costs. A second complaint related to using two different sources of labor wage data in the analysis; it was suggested again that the PIRFA underestimated labor costs because of this.

The Panel recommends that OSHA (1) carefully review the basis for its estimated labor costs, and issues related to the use of FTEs in the analysis, (2) consider the concerns raised by the SERs, and (3) ensure that its estimates are revised, as appropriate, to fully reflect the costs likely to be incurred by potentially affected establishments.

Economic Impacts in Construction

One SER believed that OSHA had ignored the range of profitability among businesses, and thus did not adequately recognize that the average percentage reduction in profits could mean bankruptcy for those firms struggling to stay afloat. The SER also asserted that OSHA ignored the cost of credit and that this also varies across businesses. Finally, the SER implied that many jobs may be lost as a result of compliance with this rule. Another SER asserted that the impact of the regulation would be "catastrophic" for the concrete cutting industry. One SER maintained that the rule would be both economically and technologically infeasible for the specialty trade concrete cutting industry.

The Panel recommends that OSHA thoroughly review the economic impacts, and develop a more detailed economic feasibility analysis for certain industries.

c. Benefits of and General Need for a Comprehensive Standard

The SERs generally felt that the current incidence of silicosis in the United States was low and declining, and that there were no convincing data to show that the current risks would justify the expense of meeting the provisions of the draft proposed standard. The SERs attributed existing cases of silicosis and the main source of remaining risk to employees to past and present exposures above the existing PEL and violations of other existing standards related to silica. A SER expressed doubt that the standard could be justified due to the low and declining number of current cases of silicosis, and what he believed (1) was the lack of a strong relationship between lung cancer and silica, and (2) was the current risk being due to continuing exposures above the existing exposure limits. A SER maintained that OSHA had only shown an association between silica and disease and that this did not demonstrate a causal relationship.

The Panel recommends that OSHA use the best scientific evidence and methods available to determine the significance of risks and magnitude of benefits for occupational exposure to silica. The Panel further recommends that OSHA evaluate existing state silicosis surveillance data to determine whether there are industry-specific differences in silicosis risks, and whether or how the draft standard should be revised to reflect such differences.

d. Specific Provisions of the General Industry and Maritime Standards

Permissible Exposure Limit (PEL)

Some SERs questioned their ability to reach PELs lower than the current PEL, based on their own experience in trying to control occupational exposure to silica; some argued that reaching a lower PEL would require extensive retrofitting of their existing controls. In general, the SERs were very concerned about the possibility that lowering the existing PEL might lead to serious problems of technical and economic feasibility.

The Panel recommends that OSHA carefully examine the technological and economic feasibility of the draft proposed standard in light of these SER comments.

Methods of Compliance

Some SERs were concerned that the prohibition on dry sweeping was not feasible or cost effective in their industries.

The Panel recommends that OSHA consider this issue and solicit comment on the costs and necessity of such a prohibition.

Regulated Areas

Several SERs were concerned about how the requirements for regulated areas could be complied with for their operations. In some cases, some SERs suggested that entire buildings may have to become regulated areas, but it was unclear to the SER what this would mean for drinking fountains and other facilities, given the draft proposed standard prohibits eating and drinking in regulated areas. A SER also questioned how the provisions would apply to vendors, customers, and visitors who enter the premises. Another SER stated that in outdoor situations, the regulated area provisions would involve several practical difficulties.

The Panel recommends that OSHA carefully consider whether regulated area provisions should be included in the draft proposed standard, and, if so, where and how regulated areas are to be established. OSHA should also clarify in the preamble and in its compliance assistance materials how compliance is expected to be achieved in the various circumstances raised by the SERs.

Exposure Assessment

Some SERs argued that existing monitoring methods may not achieve the accuracy required by the draft proposed standard. Others were concerned that the requirements on laboratories might not easily be met.

The Panel recommends that OSHA carefully examine the issues associated with reliability of monitoring and laboratory standards in light of the SER comments, and solicit comment on these issues.

Some SERs preferred the more performance-oriented Option 2 provision included in the draft exposure assessment requirements, stating that fixed-frequency exposure monitoring can be unnecessary and wasteful. However, other SERs expressed concern over whether such a performance-oriented approach would be consistently interpreted by enforcement officers.

The Panel recommends that OSHA continue to consider Option 2 but, should OSHA decide to include it in a proposed rule, clarify what would constitute compliance with the provision.

Some SERs were also concerned about the wording of the exposure assessment provision of the draft proposed standard. These SERs felt that the wording could be taken to mean that an employer needed to perform initial assessments annually.

The Panel recommends that OSHA clarify this issue.

Protective Work Clothing and Hygiene Facilities

While some SERs currently provide both protective clothing and hygiene facilities, others provide neither. Those SERs that do not currently provide either felt that these provisions were both highly expensive and unnecessary. Some SERs stated that these provisions were pointless because silica is not a take-home hazard or a dermal hazard. Others suggested that such provisions only be required when the PEL is exceeded.

The Panel recommends that OSHA carefully consider the need for these provisions, and solicit comment on the need for these provisions, and how they might be limited.

Employee Health Screening

The SER comments included several suggestions regarding the nature and wording of the health screening requirements. [See, e.g., *supra*, pp. 25-28.]

The Panel recommends that OSHA consider revising the standard in light of these comments, as appropriate.

Some SERs were also concerned about the availability of specialists (e.g., B-readers and pulmonary specialists) with appropriate backgrounds in their part of the country, or in rural areas.

The Panel recommends that OSHA explicitly examine and report on the availability of specialists called for by these provisions, and re-examine the costs and feasibility of such requirements based on their findings with respect to availability, as needed.

Hazard Communication

Though this provision simply repeats existing provisions for hazard communication, some SERs urged OSHA to use this opportunity to change the requirement so that warning labels would only be required of substances that were more than 1% (rather than the current 0.1%) by weight of silica.

The Panel recommends that OSHA consider this suggestion and solicit comment on it.

Some SERs also suggested that wording of the warning label be changed to follow that used for asbestos.

The Panel recommends that OSHA consider this suggestion and solicit comment on it.

Recordkeeping

Many SERs were concerned (1) with the amount of recordkeeping required by the draft proposed standard, (2) the lengths of time that paperwork had to be retained, and (3) that OSHA had underestimated the costs of the recordkeeping provisions.

The Panel recommends that OSHA carefully review the recordkeeping requirements with respect to both their utility and burden.

e. Specific Provisions of the Construction Standard

Scope and Application

Many SERs objected to scope Option 2 because it failed to achieve its apparent purpose of limiting the scope of the standard as it included such activities as disturbing silica-containing materials. These SERs argued that since such materials are ubiquitous on construction sites, the alternative failed to limit the scope in any useful way.

The Panel recommends that OSHA continue to evaluate the appropriateness of and consider modifications to scope Option 2 that can more readily serve to limit the scope of the standard.

Competent Person

Many SERs found the requirements for a competent person hard to understand. Many SERs took the competent person requirement as requiring a person with a high level of skills, such as the ability to conduct monitoring. Other SERs said this requirement would require training a high percentage of their employees as competent persons because they typically had many very small crews at many sites. In general, the SERs thought this requirement as written would be difficult to comply with and costly.

The Panel recommends that OSHA seek ways to clarify OSHA's intent with respect to this requirement and more clearly delineate the responsibilities of competent persons.

Permissible Exposure Limit (PEL) and Table 1

Many SERs did not understand that Table 1 was offered as an alternative to exposure assessment and demonstration that the PEL is being met. Some SERs, however, understood the approach and felt that it had merit. These SERs raised several issues concerning the use of Table 1, including:

- The Table should be expanded to include all construction activities covered by the standard, or the scope of the standard should be reduced to only those activities covered by Table 1;
- The control measures endorsed in Table 1 need to be better established, as necessary; and
- Table 1 should require less use of, and possibly no use of respirators.

The Panel recommends that OSHA carefully consider these suggestions, expand Table 1, and make other modifications, as appropriate.

Methods of Compliance and Unacceptable Practices

Some SERs requested that OSHA apply a 30-day exclusion for implementing engineering and work practice controls, as was reflected in the draft standard for general industry and maritime.

The Panel recommends that OSHA consider this change and request comment on the appropriateness of exempting operations that are conducted fewer than 30 days per year from the hierarchy requirement.

Several SERs commented that rotating employees among tasks was necessary to reduce exposure to hazards such as noise and physical stressors, and to provide variety in the employees' jobs. A few SERs stated that employee rotation could not be used for highly specialized jobs, such as tuckpointing, and where union workers were employed.

The Panel recommends that OSHA consider and seek comment on the need to prohibit employee rotation as a means of complying with the PEL and the likelihood that employees would be exposed to other serious hazards if the Agency were to retain this provision.

Some SERs questioned the scientific and legal basis for the draft prohibitions on the use of compressed air, brushing, and dry sweeping of silica-containing debris. Others raised feasibility concerns such as in instances where water or electric power was unavailable or where use of wet methods could damage construction materials.

The Panel recommends that OSHA carefully consider the need for and feasibility of these prohibitions given these concerns, and that OSHA seek comment on the appropriateness of such prohibitions.

Regulated Areas

Many SERs were troubled by the regulated areas provisions of the draft proposed standard. They were concerned with such issues as how to set up regulated areas for highway projects; the number of regulated areas they would need to set up; methods for establishing the boundaries of regulated areas; how to deal with transient movement through regulated areas (such as cars or trucks passing next to areas with possible exposure to silica); and what to do with work on the twentieth story of a building; etc.

The Panel recommends that OSHA carefully consider whether regulated area provisions should be included in the draft proposed standard, and, if so, where and how regulated areas are to be established. OSHA should also clarify in the preamble and in its compliance assistance materials how compliance is expected to be achieved in the various circumstances raised by the SERs.

Some SERs raised issues over site control on multi-employer worksites, questioning what would be the respective roles of general contractors and subcontractors with respect to establishing and controlling access to regulated areas. Other SERs presumed that each contractor would be responsible for his or her own employees.

The Panel recommends that OSHA clarify how the regulated area requirements would apply to multi-employer worksites in the draft standard or preamble, and solicit comments on site control issues.

Respiratory Protection

Many SERs were concerned with the extent to which they felt the draft proposed standard would require the use of respirators in construction activities.

The Panel recommends that OSHA carefully consider its respiratory protection requirements, the respiratory protection requirements in Table 1, and the PEL in light of this concern.

Exposure Assessment

As in general industry, many SERs were concerned with the issue of whether the exposure data could be accurately assessed, and with various aspects of the requirements for laboratories. In addition, construction SERs did not see how they could avoid constant exposure assessment as their jobs were constantly changing.

The Panel recommends that OSHA carefully address the issues of reliability of exposure measurement for silica and laboratory requirements. The Panel also recommends that OSHA seek approaches to a construction standard that can mitigate the need for extensive exposure monitoring to the extent possible.

Housekeeping, Protective Work Clothing and Hygiene Practices

As in general industry, many SERs were concerned about all of these provisions because, they contended, silica is not recognized as either a take-home or dermal hazard. Further, many said that these provisions would be unusually expensive in the context of construction work. Other SERs pointed out that protective clothing could lead to heat stress problems in some circumstances.

The Panel recommends that OSHA carefully re-examine the need for these provisions in the construction industry and solicit comment on this issue.

Employee Health Screening

As in general industry, construction SERs raised issues concerning the availability in all areas of the kinds of medical specialists (e.g., B-readers and pulmonary function specialists) the draft proposed standard specifies.

The Panel recommends that OSHA explicitly examine the issue of availability of specialists called for by these provisions, and re-examine the costs and feasibility of such requirements based on their findings with respect to availability, as needed.

In addition, construction SERs were concerned with the expense and need, in an industry with high turnover rates, of pre-placement physicals.

The Panel recommends that OSHA carefully consider the need for pre-placement physicals in construction, the possibility of delayed initial screening (so only employees who had been on the job a certain number of days would be required to have initial screening), and solicit comment on this issue.

Hazard Communication

Like the general industry SERs, construction SERs raised the issue that they would prefer a warning label with wording similar to that used in asbestos and lead.

The Panel recommends that OSHA consider this suggestion and solicit comment on it.

Some SERs questioned whether hazard communication requirements made sense on a construction site where there are tons of silica containing dirt, bricks, and concrete.

The Panel recommends OSHA consider how to address this issue in the context of hazard communication.

Recordkeeping

Some construction SERs were concerned with the length of time various records would have to be kept, and with the volume of records that might be needed in the construction industry because of the high turnover in the workforce.

The Panel recommends that OSHA carefully review the recordkeeping requirements with respect to both their utility and burden.

f. Description and Estimate of Potentially Affected Small Entities

SERs in general industry said that the data on which the description and estimate of potentially affected small entities were old, and that there had been significant declines in the number of affected facilities and employees, and that there was a worsening of the economic outlook for those that remained.

The Panel recommends that OSHA, to the extent permitted by the availability of economic data, update economic data to better reflect recent changes in the economic status of the affected industries consistent with its statutory mandate.

SERs in construction, and some in general industry, felt the estimate of affected small entities and employees did not give adequate consideration to workers who would be subject to exposure at a site but were not directly employed by firms engaged in silica associated work, such as employees of other subcontractors at a construction site, visitors to a plant, etc.

The Panel recommends that OSHA carefully examine this issue, considering both the possible costs associated with such workers, and ways of clarifying what workers are covered by the standard.

g. Duplicative, Overlapping, or Conflicting Regulations

Many SERs were concerned with the possible costs and other problems associated with disposing of silica-contaminated wastes. While no rules requiring special treatment of such wastes were specified, SERs were concerned that an OSHA rule could have impacts on the disposal of silica contaminated wastes.

The Panel recommends that OSHA clarify in any rulemaking action how its action is or is not related to designating silica-containing materials as hazardous wastes.

Some SERs also noted the issue that the use of wet methods in some areas may violate EPA rules with respect to suspended solids in runoff unless provision is made for recycling or settling the suspended solids out of the water.

The Panel recommends that OSHA investigate this issue, add appropriate costs if necessary, and solicit comment on this issue.

h. Significant Alternatives

No Rule

Many SERs saw no need for a new rule, and preferred strengthened enforcement of and enhanced outreach for the existing PEL. Several SERs and others commented that OSHA should provide more compliance assistance and enforce the current standard more strongly. One SER from a non-ferrous foundry stated: “I believe that the current PEL’s [sic] should be enforced knowing that current foundry practices may be able to meet them. Appoint a committee including several foundry societies to further investigate whether a real problem exists and verify the costs.” [Iannettoni, p. 1.] Other SERs agreed with the principle that better outreach would help. For example, three SERs from brick companies said that the current standard should be enforced, theorizing that silicosis fatalities and lung cancers avoided “may be greatest for those sectors with the greatest non-compliance.” [See, e.g., Sims, p. 3.] These three SERS also agreed with another commenter when he stated that “if motorists are exceeding a speed limit, the government doesn’t reduce the speed limit, they enforce harder against the existing limit.” [See, e.g., Sims, p. 3.]

The Panel recommends that OSHA (1) carefully consider and solicit comment on the alternative of improved outreach and support for the existing standard; (2) examine what has and has not been accomplished by existing outreach and enforcement efforts; and (3) examine and fully discuss the need for a new standard and if such a standard can accomplish more than improved outreach and enforcement.

Other Alternatives for Construction

To the extent that OSHA decides to go forward with a standard in construction, the SERs emphasized the need for a much simpler standard and for a standard that would not put large numbers of people in respirators. Some construction SERs suggested that a simple standard emphasizing reasonable and appropriate engineering controls and work practices might be the best approach if there is to be a standard at all. Construction SERs in general were very concerned about the costs and need for ancillary provisions, particularly the requirements for regulated areas; competent persons; hygiene facilities and protective clothing; health screening; and exposure monitoring and assessment.

Many emphasized that a substance that is a common constituent of dirt should not be regulated in the same way as hazardous substances like lead and asbestos.

The Panel recommends, if there is to be a standard for construction, that OSHA: (1) seek ways to greatly simplify the standard and restrict the number of persons in respirators; (2) consider the alternative of a standard oriented to engineering controls and work practices in construction; and (3) analyze and solicit comment on ways to simplify the standard.

Other Alternatives in General Industry

In general industry, SERs expressed the greatest concerns with any lowering of the PEL. Some SERs felt that further lowering of the PEL would either be technologically or economically infeasible. Some SERs were already doing many of the things that would be required by the ancillary provisions of the standard. However, many SERs objected to the provisions regarding housekeeping, protective clothing and hygiene facilities.

The Panel recommends that, if there is to be a standard, OSHA consider and solicit comment on maintaining the existing PEL. The Panel also recommends that OSHA examine each of the ancillary provisions on a provision-by-provision basis in light of the comments of the SERs on the costs and lack of need for some of these provisions.

Appendix A

Small Business Advocacy Review Panel Members and Staff Representatives for the Draft OSHA Standards on Silica

**Small Business Advocacy Review Panel Members and Staff Representatives for the
Draft OSHA Standards on Silica**

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William Perry	OSHA
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Wanda Bissell	OSHA
Loretta Schuman	OSHA
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Appendix B

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Appendix C

Written Comments Submitted by Small Entity Representatives