TESTIMONY OF

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ON BEHALF OF THE

AFL-CIO

BEFORE ADMINISTRATIVE LAW HEARINGS

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

U.S. DEPARTMENT OF LABOR

SUBMITTED FOR THE RECORD

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My name is Ruth Ruttenberg and I appear before you on behalf of the AFL-CIO, providing economic response to OSHA's *Preliminary Economic Analysis* of the proposed rule for occupational exposure to crystalline silica. I have appeared before OSHA, on behalf of the AFL-CIO, and other union groups, over the last 40 years, and served briefly as a senior economist at OSHA. For nearly 30 years, I have been President of Ruth Ruttenberg & Associates, a consulting firm with a major focus on economic issues related to regulation. For many years I have also been a professor at the National Labor College.

I applaud you for issuing your proposed rule. All who are exposed to silica at work and all who represent and work on behalf of those workers welcome increased regulatory protection from the potentially deadly effects of silica exposure. It is heartening also to see that OSHA has found every aspect of its proposed rule economically and technologically feasible. I urge you to issue this rule expeditiously. As you yourselves say, it will save nearly 700 lives every year and save almost 1,600 more from crippling disease.

This testimony reviews methods and assumptions that OSHA used in performing its *Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis*, (PEA). My review of OSHA's economic analysis on this proposed silica rule finds that OSHA has been conservative in many of its assumptions and projections, leading the Agency to overestimate costs and underestimate benefits.

The conclusions to be drawn from my testimony are that OSHA could reasonably require more in its proposal for no increase in cost, or require what it proposes for less money than it currently estimates. Additional significant benefits, beyond those identified currently by OSHA, will come to workers, employers, and taxpayers once the rule is implemented – and these too are discussed below.

First a backdrop issue of both economics and ethics. We all know that there is a fundamental paradigm conflict when conventional economics and industry costs dominate the debate. The domination of economics, in health and safety workplace decisions, poses a problem. Social regulatory policy, such as occupational safety and health policy, is in the public domain precisely because the economic system/marketplace has failed to achieve an adequate solution to the problems of workplace hazards. Built into the economic analysis that leads to management decisions are the costs industry is likely to incur and the income that is likely to accrue. If industry does not pay for (or pays little for) a degraded environment or for sick or injured or dead workers, these problems are likely to be ignored. If a business incurs no consequences for the pain and suffering of an individual worker and his/her family; if a business continues to have a ready supply of labor; if a business incurs no additional costs despite increases in public expenditures for hospitals, research, and transfer payments; then all these issues remain external to business decision-making, and are treated as if they are zero. Businesses have been getting valuable goods for free. But when asked to clean up or prevent the negative consequences of their actions, they often respond as if the burden should not be theirs. All economic theorists, regardless of political persuasion, agree that externalities should be incorporated into the economic decision making process.

While the burden on industry would not be high, as estimated by OSHA, the burden on silica-exposed workers and their families is extraordinarily high. In construction and shipyards, for example, at current PELs, workers face 37-653 deaths per 1,000. (PEA, p. I-3) According to OSHA's assessments, in general industry more than 150 out of 1,000 silica-exposed workers currently die from their exposure. Based on the discussion below, costs may actually be many millions of dollars lower and benefits billions of dollars higher than the OSHA PEA suggests.

OSHA'S ESTIMATED COSTS ARE TOO HIGH

Since the beginning of the Occupational Safety and Health Administration, over forty years ago, OSHA analyses have overestimated costs and underestimated benefits. This has been documented in the literature and further corroborated by a number of OSHA 610 lookback reviews. Methodology and analytic techniques at OSHA have improved considerably over the years and the results of more recent studies are far more credible than they were previously, but overly conservative assumptions and evaluation of data continue to dominate economic and technological feasibility work. Below are just some examples:

1. OSHA Overestimates Costs When It Makes Estimates Based On Current Level Technology Only. Technological improvements – both engineering and scientific – are constantly occurring, especially when the pressure of a pending or existing regulation provide a strong incentive to find a way to comply at a lower cost. There is consistent and constant evidence of scientists and engineers developing more effective and efficient controls when there is the reality, or even the threat, of regulation.[1] These improvements are well-documented following the promulgation of rules for vinyl chloride, coke ovens, lead, asbestos, lock-out/tag-out, ethylene oxide, and a host of others.

[1] Ruttenberg, R. *The Incorporation of Prospective Technological Changes into Regulatory Analysis Which is Used in the Planning of Occupational Safety and Health Regulations*, unpublished Ph.D. dissertation, University of Pennsylvania, 1981.

It is cost inflating to rely on current level technology only. When there is no economic or legal incentive to develop a safe product or to develop a process that protects workers, consumers, or the environment, then such a product or process is far less likely to be developed. Once, however, the incentive exists – either through a rule or the threat of a rule -- development potential increases significantly.

OSHA does, in fact, admit that new technology is likely to emerge: "…the costs presented here do not take into account the likely development and dissemination of cost –reducing compliance technology in response to the proposed rule." (PEA, pp. V-211-212). Still, the Agency, choosing to err on the side of being conservative, does not take this likelihood into account in its calculations – leading to higher estimated costs

In fact, OSHA has already predicted what several technological and cost-saving advances with silica might be, even though the Agency refuses to incorporate such likely cost savings into its analysis. These savings include: (PEA, p. V-214)

- Expanded use of automated processes, which would allow workers to be isolated from the points of operation that involve silica exposure
- Further development and use of bags with valves that seal effectively when filled, thereby preventing product leakage and worker exposure
- Integration of compliant control technology into production equipment as standard equipment.

Still OSHA analysis does not cost out these savings, saying (PEA, p. V-214) that "Of course, all the possible technological advances in response to the proposed rule and their effects on costs are difficult to predict." Technological improvements are as sure a reality – based on past experience and academic research[2] -- as overestimation of cost and underestimate of benefits are in an OSHA regulatory analysis. More than 40 years of OSHA history bear this out.

In the future, if OSHA knows that new technology will emerge and that it will be at a lower cost, it should acknowledge this in its analyses.[3] OSHA should include a "technological improvement" scenario in future analyses.

2. Controls in a Non-Silica Industry May Be Easily Adaptable to Control of Silica, Thus Lowering the Cost of Compliance. While OSHA does not aggressively go out and identify technologies from non-silica industries that could be easily adapted at low cost to control of silica, in its own reports it does identify some examples. Applying these

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[2] Ruttenberg, *Incorporation of Prospective Technological Changes into Regulatory Analysis…*

[3] The Agency even provides a clear example of where this happened:

"A dramatic example from OSHA's 610 lookback review of its 1984 ethylene oxide (EtO) standard is the use of EtO as a sterilant. OSHA estimated the costs of add-on controls for EtO sterilization, but in response to the standard, improved EtO sterilizers with built-in controls were developed and widely disseminated at about half the cost of the equipment with add-on controls." (PEA, p. V-214)

examples in its cost estimation efforts, would reduce overall cost. In discussing rotary hammers, in a 2009 report, for example, OSHA talks about techniques used in asbestos control that could be adapted to silica control techniques:[4]

> "One simple dust control method involves inserting the drill bit through a barrier, which is then pressed against the working surface during drilling. The dust exiting the hole collects against the barrier. If the barrier is damp, it forms a better seal against the working surface and also moistens the dust, thus capturing more dust and reducing the amount that can escape when the employee removes the barrier. For example, employees sometimes drill through shaving cream in an upside-down waxed paper cup or through a damp sponge to minimize exposure to asbestos."

OSHA acknowledges that adaptations from these hazardous substances to silica would make compliance even more affordable. When discussing the hydraulic fracturing industry, it states:

> "OSHA calculated that, if the control technologies that have been used in other industries can be successfully transferred to the hydraulic fracturing setting, the compliance costs would equal less than one percent of average revenues and less than five percent of average profits…" (PEA, p. A-67)

This indicates there is a strong likelihood that existing controls will be adapted for silica-generating industries and result in a cost-savings. OSHA's decision not to include these potential savings is another example where OSHA has been conservative in its approach to estimating costs and benefits.

3. Technology Will Often Routinely Be Built Into Equipment After a Standard Rather Than Added-On As a Retrofit. Built-In Compliance Technology is Usually Cheaper than Retrofits and Often Enhances Productivity. For silica, this is especially true for ventilation technology. It is cheaper to build controls into equipment than to retrofit that equipment. After the cotton dust standard, dust control was built into looms. After the lock-out/tag-out standard, places for locks were routinely built into the equipment. As a result, over time, with the manufacture and purchase of new equipment, the cost of compliance goes down.

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[4] U.S. GSA, Woods, and LBL cited in U.S. Department of Labor, Occupational Safety and Health Administration, *Controlling Silica Exposures in Construction*, OSHA 332-05, 2009, pp. 40-41.

4. There are Overlaps in the Proposed Silica Standard with Other Health and Safety Activities, But OSHA's Cost Estimates Generally Do Not Take These Overlaps Into Account. Taking them into Account Would Lower the Estimated Cost of Compliance with the Proposed Silica Rule. Below are just a few examples:

   a. Respirators. OSHA assumes that all those in general industry and the maritime sector, in need of a respirator as a result of the proposed silica standard, do not currently use one and, therefore, have not been fit-tested either. OSHA says that it: "expects that establishments in general industry do not currently use respirators to comply with the current OSHA PEL for quartz of approximately 100 ug/m3." (V-32) (This is in contrast with OSHA's assumptions that in construction, 56 percent of the affected workers are already wearing respirators. PEA, p. V-171)

   b. Exposure Assessment. From OSHA's question in the *Federal Register* (FR), (FR, p. 56286), asking for commenters to say if they are currently doing monitoring, it would imply that OSHA is using a zero-base for this monitoring, and thus overestimating costs of compliance. In fact, OSHA in its *Preliminary Initial Regulatory Flexibility Analysis* (PIRFA) had assumed 32.6 percent compliance with exposure monitoring, and admits that it "significantly increased the total costs of exposure sampling" in its 2013 PEA, that accompanies the proposed rule, because in the PEA it assumes zero compliance. (PEA, p. IX-62) OSHA offered no explanation for this change. The decision to lower the level to zero is another example of a conservative assumption by OSHA that increased the estimated cost of the proposed silica standard.

   c. Assumption of No Portability of Records. There should be universal portability of training and medical records, but currently there is some. If none is assumed, then there is an overestimation of cost for training (and medical surveillance), as "OSHA estimates that all new hires will receive the full silica training from the new employer." (PEA, p. 74)

   d. Investment in Ventilation Technology. When there is good ventilation in a work process, it helps with more than silica, particularly in general industry. (PEA, p. V-17) When fixing ventilation to reduce silica exposure, other exposures will often be reduced, but these cost savings are not reflected in OSHA's analysis.

5. OSHA Overestimated the Economic Impact on Small Business. OSHA makes an assumption about negative impact on small business in construction, even though it concluded that costs are not high relative to profit. Also, OSHA ignored the fact that other small businesses would be created to respond to the rule – those of the hazard abatement and pollution control industry. These small businesses might manufacture hoses or on-tool ventilation equipment. They might provide compliance services, recordkeeping, or training or medical services. These new small businesses create employment, pay taxes, and contribute to the overall U.S. economy.

6. OSHA Overestimated Cost by Using an Inflated Size of the Construction Workforce and the Number of Construction Establishments. OSHA, because it is using old data (Table III-2 of the PEA; p. III-10; III-53), uses numbers from the 2006 U.S. Census of 13,101,738 for total construction employment. It is hard to understand exactly what number this is, because the Census Bureau's *Statistical Yearbook* for 2007 reported construction employees for all establishments at 7,268,000,[5] a full 45 percent lower than the 13.1 million cited by OSHA. The Bureau of Labor Statistics number for that period (February 2006) was 7,218,000 for all construction workers, seasonally adjusted, and 5,413,000 as a preliminary number for February of 2007.[6] By December 2013, construction employment (seasonally adjusted) had only improved to a preliminary total of 5,833,000.[7] Assuming that the decline in silica-exposed construction workers is proportional to the decline in construction generally, the projected costs for the labor portion of compliance, would be 38 percent lower (84 percent of the 45 percent lower employment). If one uses the 2013 employment figure of 5,833,000 construction workers, that is a 55 percent decline in employment from OSHA's 13.1 million, suggesting construction labor compliance costs could be 44 percent lower than OSHA's projections. Critical to cost estimation is determining the number of workers exposed to silica at various exposure levels. OSHA, indeed, overestimated costs.

   OSHA has failed to incorporate what many believe to be a profound paradigm change in the economy (the Great Recession), and does quite the opposite, it holds economic conditions constant for 60 years from the time of its analysis. (PEA, p. VII-27) Most economists would say that after the Great Recession, some things will never be the same. At a December 2013 conference on forecasting construction demand,[8] the conclusions of academics, owners, and labor alike, were that construction will not come back the way it was before the Great Recession. Work teams will be configured differently and the total number of workers is not likely to reach previous levels.

7. Oversimplification of Turnover Rates Inflates Cost. OSHA cites turnover rates of 64 percent for construction and 27.2 percent in general industry (FR, p. 56286) and uses these in assessing the costs of medical surveillance, training, etc. But, when individuals leave their jobs, it does not mean that they leave their industry. An abrasive blaster may well continue as an abrasive blaster on another job. A master craftsperson in drywall finishing, is more likely to stay in drywall finishing than not. Likewise with tuck-pointing or heavy equipment operating. Portability of training and medical surveillance will help avoid duplication of services.

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[5] U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract*, "Construction & Housing: Construction Industry, 2012.

[6] U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*, Vol. 54, No. 4, April 2007, p. 75.

[7] U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*, December 2013.

[8] Construction Economic Research Network, Conference on "Forecasting Construction Demand," December 13-14, 2013, Washington, DC.

8. As Processes and Controls are Upgraded, Exposure Levels Will Go Down, and These Reductions May Bring Exposures Below the Action Level, and Thus Decrease Compliance Costs. This is not reflected in OSHA's cost estimates.

9. OSHA Overestimates Costs When It Assumes a Low Level of Controls Currently in Place to Protect Exposed Workers. OSHA and its contractor, ERG, concluded that "the large majority of overexposed workers lack relevant controls," (PEA, p. V-16) that "overexposures occur due to the absence of suitable controls." (PEA, V-16) OSHA goes on then to rightly admit that "This assumption could, in some cases, result in an overestimate of costs where employers merely need to upgrade or better maintain existing controls or to improve work practices." (PEA, V-16)

10. An Assumption of a Negative Impact on Productivity Leads to an Overestimate of Costs. This is yet another example of OSHA erring on the side of being conservative in cost estimates. Despite the fact that some who were interviewed suggested there could be a positive impact on productivity, OSHA's PEA assessed anywhere from 0 percent to a 5 percent penalty in productivity loss as a result of OSHA compliance with the proposed silica rule. (PEA, p. V-123-124) The impact of an assumption of lost productivity can be profound, and OSHA acknowledges this: "…the magnitude of the productivity impacts can substantially change the estimate of the overall cost increase associated with controls." (PEA, p. V-131)

    Despite the fact that OSHA leaves likely productivity increases out of its calculations, it does point to opportunities to increase productivity with dust control. In the end, though still committed to negative productivity impacts, OSHA admits: "OSHA's estimates in this preliminary analysis reflect ERG's best professional judgment about the likely magnitude of these impacts. Some of the estimates may be conservative because under some scenarios for certain tasks, the productivity impacts could be significantly smaller… or even positive." (PEA, p. V-130)

    OSHA also admits that control costs are sensitive to the productivity impact estimates (PEA, p. 130) and "the magnitude of the productivity impacts can substantially change the estimate of the overall cost increase associated with the controls." (PEA, p. V-131)

    Limiting dust increases visibility for workers. (PEA, p. V-126) Vacuum systems speed up drilling because continuous removal of drill cuttings from the hole, reduce the need for workers to periodically stop and clean. (PEA, p. V-128) And the list goes on. OSHA's cost estimates are conservative, and high, when it comes to productivity impact.

11. Annualized Costs Overestimate Actual Cost. OSHA analysis assumes that employment and production are held constant for 60 years. Then all non-annual costs are estimated to repeat over that 60 years, including one-time costs that recur because of changes occurring over time. (PEA, p. V-1) It is hard to understand how this is deemed realistic – especially given the paradigm changing impact on the economy of the Great Recession. And, adding further the conclusion of an overestimate in costs, OSHA states that "to the extent one-time costs do not recur, OSHA's cost estimates… will overstate the cost of the proposed standard." (PEA, p. V-1)

12. Labor Wage Rates are Estimated on the High Side of the Spectrum. The use of RSMeans wage estimates ensure that costs are on the high side of the spectrum. OSHA notes that: "BLS wage rates are significantly lower than the RSMeans." (PEA, p. V-167) OSHA relied on an accepted industry resource – one that did not try to low–ball the figures – another example of where the Agency used a reasonable approach and then embraced conservative figures to develop the cost estimates.

13. Fracking Appendix Underestimates Revenue, Thereby Overstating Corporate Burden. OSHA itself states, in its appendix of the PEA on Hydraulic Fracturing, "that the industry-wide average revenue estimate appears to underestimate the average revenues for hydraulic fracturing firms." (PEA, p. A-11) These higher revenues will reduce the burden of compliance to the hydraulic fracturing companies whose workers are exposed to silica.

OSHA'S ESTIMATED BENEFITS ARE TOO LOW

Under the Occupational Safety and Health Act, OSHA is required to show that there is a significant risk of harm and that a standard will reduce the risk and that the standard is technologically and economically feasible. OSHA is prohibited by Supreme Court decision from weighing the costs against the benefits in setting the standard. Yet, the agency conducts extensive analyses under Executive Order 12866 and in response to OMB directives that by law it is prohibited from relying upon in promulgating its standards. These comments on OSHA's benefits analysis should not be interpreted in any way as an endorsement of the use of cost-benefit analysis in OSHA standard setting, but simply as a review of why the benefit analysis conducted by OSHA underestimates the benefits of the proposed rule.

OSHA has made progress in including benefits in its economic analyses, but the methodologies of these analyses still fail to provide a full assessment and accounting of the benefits that will be derived from this and other OSHA's rules.

1. The Value of a Life Saved in the OSHA Analysis Appears to Be Forty Percent Less Than Some Established Values.[9] OSHA discusses a range of estimates for the statistical value of a life saved, including the work of Viscusi and Aldy in 2003, which pegged the statistical value of a human life at $7 million in 2000 dollars, or $8.72 million in the 2009 dollars OSHA uses. (It would be $9.47 million in 2013 dollars.)[10] (PEA, p. VII-13) Yet,

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[9] The discussion that follows in no way endorses the use of the willingness to pay (WTP) model for assessing benefits. There are many problems with the use of such a methodology. Using this approach, economists attempt to place a market value on the amount of money individuals would pay to reduce risks to life and health. Economists usually obtain WTP estimates by relying on labor market data on workers' wages to infer attitudes toward risk. Many economists are troubled by the WTP approach because they doubt that "risk premiums" exist and/or adequately compensate workers. WTP also raises ethical issues, since highly compensated workers are likely to have more funds available and be willing to spend more to avoid injury.

[10] Viscusi, W. K. and Aldy, J., The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World, *Journal of Risk and Uncertainty*, (27::5-76), 2003, cited in PEA, p. VII-13.

in Table SI-1 in the *Federal Register*, the apparent value used is far less, $4.75 million.[11] This $4.75 million is 46 percent less than the $8.72 million. If each of the 688 silica-related deaths avoided was statistically valued at the Viscusi and Aldy number of $8.72 million, net benefits would increase by $2.74 billion, [12] to $8.1 billion – a "real bargain" on a $637 million investment.

2. Many Benefits (Costs Avoided by Preventing Illness and Death) are Simply Left Out of the OSHA Economic Analysis. In order to assess the full social and economic costs of avoiding silicosis death, disability, and illness, one must account for the full costs of these health crises. One must also assess the degree to which taxpayers pay for health are of sick workers, an issue for which OSHA has specifically asked for information. (PEA, p. 11-7)

While it is important to give a full accounting of workplace accidents and illnesses, OSHA still has a long way to go to fulfill this need. Analysis of benefits is often limited to lives saved, lost work days averted, and sometimes productivity losses due to illness or injury. But, it is also important to include the full costs associated with becoming disabled permanently, which may include losing a home or car or family for lack of income. What about those who suffer chronic illnesses, and may need a family member or paid professional to serve as caregiver? (resulting in either loss of family income or expenditure of family resources, not to speak of the likelihood of a hospital atmosphere in the home) The costs of losing healthy and productive members of society are essential to include in any analysis. EPA officials, when ignoring a long list of unquantified social benefits in that agency's work, said that these social benefits "could overwhelm the benefits it does quantify."[13]

In its *Preliminary Economic Analysis*, OSHA says that it wants public input on the issue of valuing the cost to society of non-fatal cases of moderate-to severe silicosis, as well as the morbidity associated with other related diseases of the lung, and with renal disease. (PEA, p. VII-15) This is a key request because adding such societal costs can double the benefits of preventing these diseases. In an article by a lawyer and two economists looking at the social cost of dangerous products, Shapiro, Ruttenberg, and Leigh[14] argue that a large economic burden is borne by private insurance, government programs, the business community and the victims and their families. Those affected by occupational exposures, such as silica, may become eligible for a range of cash or in-kind assistance. Such programs may include unemployment compensation, food stamps, Medicaid, Medicare, State Children's Health Insurance Program (SCHIP), Temporary Assistance

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[11] $3,268,102,481 in silicosis mortality benefits for 688 lives saved = $4,750,149 per life saved.

[12] $4.72 million x 688 lives saved = $3.25 billion.

[13] EPA cited in Harrington, W., Morgenstern, R, and Nelson, P., "On the Accuracy of Regulatory Cost Estimates," Resources for the Future Discussion Paper No. 99-18, 1999, p.64.

[14] Shapiro, S., Ruttenberg, R., Leigh, P., "The Social Costs of Dangerous Products: An Empirical Investigation," *Cornell Journal of Law and Public Policy,* Vol. 18, No. 3, Summer 2009.

for Needy Families (TANF), Social Security Disability, and Old Age, Survivors and Disability Insurance. There are also costs for use of military hospitals and clinics.

And then there are the even less direct, but just as real, costs associated with programs for families in crisis:[15]

> "Less proximate costs might arise when affected families may need more community services such as emergency calls, ambulance services, tutoring programs, job training programs, and rehabilitation services. These families may also require community resources such as special programs for children, special programs for persons with disabilities, counseling services, and local social services and mental health services. Local school systems may experience an increase in their special education expenses, which may significantly increase with the addition of even one special education child, with emotional needs due to disability or death in the family."

Injuries, illnesses, and fatalities come with a high toll. Total direct and indirect costs for injuries range, according to OSHA, from $20,000 to over $300,000 – with indirect costs usually accounting for 50 percent or more of the total.[16] In years past, these indirect costs were rarely measured. OSHA has made progress in assessing benefits but there are other important costs of injury and illness that are still ignored.

There is another group of costs that can easily double, or even triple, the direct and indirect totals. These are social and economic impacts that are also caused by an incident. They often involve third-party payments, or stress on the victim or his/her family members. The financial pressures on a family can include the need for a caregiver, need for additional income from children or spouse to fill the gap between previous earnings and workers compensation, or psychotherapy for family members to cope with harsh new realities. When children lose their chance at college and higher future earnings, the impact can be hundreds of thousands of dollars. When an injured worker loses a career path and for the remaining years of working life is slated for a job earning less per hour, or a job with no retirement benefits, the results can also be hundreds of thousands of dollars.

Still other very real costs occur. Psychological trauma and physical suffering are just two examples of burdens that defy monetization.

3. Benefits to Third Parties Have Been Underestimated. The costs to third parties of accidents and illnesses are high, and have been estimated to be distributed across a wide spectrum of groups. The Department of Transportation estimated the distribution of third

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[15] Ibid.

[16] U.S. Department of Labor, Occupational Safety and Health Administration, "OSHA's Safety Pays Program," http://www.osha.gov/dcsp/smallbusiness/safetypays/index.html.

party costs, due to accidents, for medical, emergency services, market productivity, and household productivity among others:[17]

Estimated Source of Payment of Injury Costs by Cost Category
Percent of Total Cost

	Federal	State	Sub-Total	Insurer	Other	Self	Total
Medical	14.4	9.8	**24.2**	54.9	6.4	14.6	**100.1%**
Emergency Services	3.9	75.8	**79.6**	14.7	1.7	3.9	**100.0%**
Market Productivity	16.2	3.1	**19.3**	41.1	1.6	38.1	**100.1%**
Household Productivity	--	--	**0.0**	41.1	1.6	57.4	**100.1%**

4. Some Diseases are Left Out of the Benefits Analysis, Leading to an Underestimate of Benefits. OSHA/ERG did not consider stomach cancer, autoimmune disease, and other cancer and non-cancer health effects of silica exposure. (FR, p. 56285) In addition, the costs from acute silicosis are also omitted from analysis, as well as latent TB. In the case of TB, there are also benefits beyond early treatment of the affected individual, as TB testing reduces "the risk of TB spreading to the population at large." (PEA, p. VII-9)

5. Monetized Benefits are Based on the Lowest Estimate for Morbidity. After discussing a range of dollar values for benefits, OSHA chose "the lowest estimate of lung cancer risk and the lowest valuation for morbidity." (PEA, p VII-16)

6. Good Housekeeping Increases the Useful Life of Equipment, Thus Increasing the Benefits of Controls. Dust clogs machines and reduces their useful life. (PEA, p. V-19) Regulating cotton dust, for example, was acknowledged to increase productivity (by reducing down time) and increasing the useful life of looms. The same is acknowledged, by OSHA, to be likely in the case of silica controls as well. (PEA, p. V-126) Also, there is a cost saving in housekeeping activities because less dust needs to be cleaned up when it is captured, instead, at the source.

7. OSHA Assumes that the Proposed Rule Will Eliminate the Large Majority of 1/0, 1/1, and 1/2 Silicosis Cases. But, If the Benefits from Avoiding These Illness are Not Counted, Benefits are Underestimated. "…the Agency has not included the elimination of these less severe silicosis cases in its estimates of the monetized benefits and net benefits

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[17] U.S. Department of Transportation, National Highway Traffic Safety Administration, "The Impact of Motor Vehicle Crashes 2000 59 table 22, 2002, available at http://lhsc.lsu.edu/OutsideLinks/EconomicImpact-1.pdf. In Shapiro, S., Ruttenberg, R., Leigh, P., "The Social Costs of Dangerous Products: An Empirical Investigation," *Cornell Journal of Law and Public Policy,* Vol. 18, No. 3, Summer 2009.

of the proposed rule." (PEA, p. VII-5,22) OSHA does not say how many cases are likely to be eliminated, nor does it say what the savings would be in medical costs, let alone absenteeism and other indirect impacts. It does not include other potential needs, such as the need for retraining and career change or for third party reimbursements. The Agency does say, however, that it "believes economic loss to individuals with less severe cases of silicosis could be substantial, insofar as they may be accompanied by a life of medical surveillance and lung damage, and potentially may require a change in career" (PEA, p. VI-22) -- an acknowledgement that the benefits of the rule have not been fully captured.

8. Taxpayers Will Benefit from Worker Protection from Silica. Billions of dollars are spent every year in the public sector as the result of death, injury, and illness associated with workplace exposures. Millions of those dollars are associated with silica exposure. Taxpayers take on a burden caused by the businesses that expose workers to silica. Economists, regardless of political persuasion, argue that these are externalities that should be reincorporated into the system, with those causing the harm, paying for it. Nearly half or more of every health care dollar is paid for by taxpayers through federally subsidized medical care. In 2011, the estimated percentage was 45.3 percent,[18] and with the Affordable Care Act and expansion of Medicaid, the percentage is likely higher. Many of the medical expenses from silica-related disease will rest with Medicare which pays 65 percent of the health care costs of those 65 years of age and older (significantly higher than the average of 45.3 percent mentioned above).

   But the taxpayer consequences go far beyond medical expenses only. There is the tax deduction for health care expenses, in the hundreds of billions of dollars, and a portion of that is due to silica-related disease expenditures. There are tens of billions of dollars in earned income tax credit, and a portion of that is due to families qualifying as a result of silica-related disease expenditures. But even more far reaching the government often absorbs disability benefits, housing subsidies, TANF, unemployment insurance, food stamps VA care, and a host of other safety net programs. In addition, lost productivity poses a taxpayer burden because sick individuals missing work or not being as productive negatively affect personal and corporate income taxes. The total burden to the victims and their families (seen here as potential benefits for a disease prevented) can easily run into the millions of dollars per person.[19] Multiply this by the 1,585 serious illnesses prevented each year by this proposed rule plus the 688 lives save (that clearly started with severe illness), and benefits could probably increase by tens of millions of dollars or more.

10. Two important elements, when building incentives for better workplace safety and health, are to (1) demonstrate to employers that it is in their financial interest to protect workers and (2) to convince the general public that the burden on taxpayers and communities would be substantially reduced if fewer workers were injured or became ill. Documenting and understanding the full economic and social costs of not resolving

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[18] Ruttenberg, R., Cardi, J., Fenton, E., "The Taxpayers' Burden From Product-Related Harm," *The Kansas Journal of Law and Public Policy*, Vol. XXI, No. 1, Fall 2011, p. 78.

[19] See Shapiro, Ruttenberg, and Leigh.

safety and health hazards is a necessary step in a national effort at improving workplace safety and health.

"Remembering the worker" is a critical component of any and all plans for construction work. Too often, the health and safety of workers receives little if any attention as technologies are developed and workplace practices are put in place. If the full social and economic costs of accidents and illnesses were recognized and acknowledged, then design, practice, and daily decision making could change in favor of workers.[20]

Conclusions

OSHA has made a sound case for the economic and technological feasibility of the standard, even with under estimating benefits and over estimating costs. With greater benefits and fewer costs, as indicated throughout this testimony, OSHA could lower the PEL, tighten the exposure monitoring, have more frequent medical surveillance, and/or provide more significant training. New and less expensive control technology will emerge. The genius of U.S. scientists and engineers finds solutions when there is an incentive to do so. OSHA and its contractor, ERG, seemed to measure what was methodologically easy to measure, but what is hard to measure is just as important – and full measurement could very likely change the decision process.

It is unclear why OSHA did not choose a 25ug/m3 PEL. In fact, by OSHA's own estimates, there would be more than a $1.1 billion increase in benefits in 2009 dollars (FR, p. 56279), with the cost estimates of going from 25ug/m3 to 50 ug/m3 rising much less, by $670 million. Most importantly, a lower limit would, each year, save 335 additional lives and prevent 186 serious illnesses (over that 60 year time frame 20,100 lives 11,160 seriously ill individuals).

Many have died waiting for this standard. For decades, thousands of people each year have become sick and/or died from silica exposure. More than 500,000 workers each year are exposed to more than 100 micrograms of crystalline silica per cubic meter of air (ug/m3) despite a PEL of 100. (PEA, p. III-51) A delayed rule has saved industry the costs of protecting their workers. But in the OSHA equation, benefits outweigh the costs. These foregone benefits are not insignificant, at OSHA's estimate of annualized net benefits of $4.6 billion. Decades of endangering workers, has led to inordinate suffering and dying as well as hundreds of millions of dollars of taxpayer money to support the victims, while industry has foregone clean-up costs. "The expected outcomes of a regulation cannot possibly be understood without reference to what would have happened in its absence."[21] What happened in its absence: thousands of deaths and illnesses, millions expended by taxpayers to help the victims, and industry reaping increased profits by not compensating society for the harm it has caused.

Part of the health and safety decision making in the regulatory process, historically, has been industry "crying wolf," claiming a regulation put them in economic danger, when it really did not. Analysis for the 21st century needs to take this historic reality into account. OSHA look-

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[20] U.S. Department of Health and Human Services, National Institute of Environmental Health Sciences, *Anticipating Occupational Hazards of Cleanup Technologies: Remembering the Worker,* October 1996.

[21] Harrington, W., Heinzerling, L, and Morgenstern, L., "What We Learned," in Harrington et al., 2009, p. 222.

back studies have consistently found that the costs are not nearly as high as OSHA, and particularly, industry say they will be.

Thank you, OSHA, for this proposed rule. Please issue it quickly. This year another 688 workers will die and 1,585 will become seriously ill from not having a PEL of 50 ug/m3. Time is of the essence for them.

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