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November 5, 2015

The Honorable David Michaels, Ph.D.
Assistant Secretary of Labor for Occupational Safety and Health
Occupational Safety and Health Administration
U.S. Department of Labor
Room N-2625
200 Constitution Avenue, NW
Washington, D.C. 20210

RE: Comments on the Notice of Proposed Rulemaking Regarding Occupational
Exposure to Beryllium and Beryllium Compounds
Docket: OSHA-H005C-2006-0870

Dear Assistant Secretary Michaels:

Thank you for the opportunity to submit comments in response to the Occupational Safety and Health Administration's (OSHA's) August 7, 2015 Notice of Proposed Rulemaking Regarding Occupational Exposure to Beryllium and Beryllium Compounds.

OSHA has proposed a comprehensive health standard for beryllium-exposed workers employed in general industry under 29 CFR Part 1910 which, amongst its provisions, reduces the Permissible Exposure Limit (PEL) from 2.0 $\mu\text{g}/\text{m}^3$ to 0.2 $\mu\text{g}/\text{m}^3$. The Notice (80 *FR* 47566) invites comments on whether OSHA should reduce the PEL and include shipyard industry workers under all or parts of the comprehensive the beryllium standard as part of 29 CFR Part 1915.

For reasons set forth below, I strongly urge OSHA to expand its proposed beryllium standard to cover all workers employed in the shipyard industry, including those who use grit blasting agents containing beryllium, so that this group of workers can also receive improved protections from exposure to beryllium, which is known to cause beryllium sensitization, chronic beryllium disease (CBD), and lung cancer.

Evidence of Airborne Beryllium From Abrasive Blasting Shows the Need for Shipyard Worker Coverage Under the Beryllium Standard

For general industry under Part 1910, OSHA has proposed a comprehensive program to protect workers from beryllium exposures that includes a requirement for a written

beryllium control plan, regular exposure monitoring, medical surveillance, medical removal protection benefits, and training. This comprehensive approach is necessary since low-level airborne and dermal exposures have been shown to result in adverse health outcomes and a reduction in adverse outcomes has been shown when a comprehensive program is put in place.

OSHA's proposal would leave hundreds of workers unprotected from beryllium exposures in excess of the proposed PEL, including employees at the Newport News Shipyard in Virginia. Potential exposures to beryllium at shipyards may occur during welding, abrasive blasting, metal machining, working with and handling non-sparking tools, and possibly during exposure to legacy materials.¹

Abrasive blasting with materials that contain beryllium (such as coal and copper slag) has the potential to affect the greatest number of shipyard workers. Use of these materials has increased in recent years as industry has looked for substitutes for silica sand blasting abrasives. OSHA estimates that 949 shipyard workers may be directly involved in abrasive blasting operations for removing paints, coatings, and rust from steel components prior to painting and coating. This estimate includes operators, pot tenders, and cleanup workers; however, it does not include bystanders who may be exposed to dust leakage from the containment around blasting (or for workers who may be working above the containment which is open at the top) or who may be exposed to dust from blasting conducted without a containment.² A US Navy study estimates that for ship building and repair, coal and copper slag account for 94 percent of blast media used in abrasive blasting.³ Coal slag – marketed under the trade name “Black Beauty” – is the most commonly used abrasive blasting material.⁴

While coal slag contains only small amounts of beryllium (less than 0.1% by weight) the nature of abrasive blasting operations results in significant levels of beryllium in the air. OSHA's analysis of exposures to beryllium during abrasive grit blasting (using coal and copper slag) from the Navy and one shipyard, found that potential exposures frequently exceeded the current PEL 2.0 $\mu\text{g}/\text{m}^3$ --which presents a significant risk.⁵

- Of the 57 samples available, the median exposure level was reported as 0.42 $\mu\text{g}/\text{m}^3$ (range of 0.03-66.5 $\mu\text{g}/\text{m}^3$) – a median that is greater than proposed PEL.
- Sixteen of the samples (28%) were greater than the current PEL.⁶

¹ *Navy Occupational Exposure Database*, Naval Environmental Health Center, Norfolk, VA, August 24, 2000.

² *OSHA Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis*, Chapter IV, Appendix C: Abrasive Blasting, 2014.

³ *Feasibility and Economics Study of the Treatment, Recycling and Disposal of Spent Abrasives*. The National Shipbuilding Research Program (NSRP), US Department of the Navy. NSRP 0529, N1-93-1.

⁴ *OSHA Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis*, Chapter IV, Appendix C, pp. IV-530; Abrasive Blasting, 2014.

⁵ *OSHA Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis*, Chapter IV, Appendix C: Abrasive Blasting.

⁶ *OSHA Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis*, Table IV-C4.

- Other studies support the conclusion that airborne concentrations of beryllium for abrasive blasting operations are in excess of the proposed PEL and in many cases in excess of the existing PEL.^{7,8,9}
- On December 6, 2013, OSHA reported on beryllium exposures in the construction industry to the Advisory Committee on Construction Safety and Health (ACCSH). OSHA reported that 70% of inspected abrasive blasting worksites have detectable beryllium levels, with a mean of 3.7 $\mu\text{g}/\text{m}^3$ and a median of 0.6 $\mu\text{g}/\text{m}^3$; moreover, 35% of abrasive blasting worksites were above the current PEL of 2.0 $\mu\text{g}/\text{m}^3$.¹⁰

Some have questioned whether OSHA should expand coverage for workers who may be exposed to beryllium from coal slag abrasive blasting materials because they contend there is limited health risk due to the low concentration and the chemical form of the beryllium in these materials. In communications with the Office of Management and Budget (OMB), Harsco, a coal slag manufacturer, wrote: "In over 80 years of manufacturing blasting abrasives, Harsco has not identified a single beryllium-related disease associated with coal-slag abrasives."¹¹ It should be noted, however, that medical surveillance has not been required for beryllium-exposed workers outside of the U.S. Department of Energy. The absence of evidence is not evidence of absence.

It appears that Harsco's primary argument is that the form of beryllium in coal slag is not readily bioavailable due to its relatively low solubility characteristics. However, studies have demonstrated that beryllium sensitization, an indicator of immune response to beryllium, can occur from both soluble and poorly soluble beryllium particles.¹² Attached is a white paper by Mark Griffon, an industrial hygienist and former member of the U.S. Chemical Safety Board, who concludes that "studies of airborne exposure levels during abrasive blasting along with studies looking at the behavior of similar chemical forms of beryllium in the body suggest that abrasive blasting with coal slag poses a significant risk

⁷ *Evaluation of Substitute Materials for Silica Sand in Abrasive Blasting*, NIOSH/KTA-Tator. NIOSH evaluated coal slags (including Black Beauty) with and without the addition of a dust suppressant compound and reported a geometric mean airborne concentration of 2.04 $\mu\text{g}/\text{m}^3$ for the entire coal slag category tested.

⁸ *Comparison of Occupational Exposures Among Painters Using Three Alternative Blasting Abrasives*, Journal of Occupational and Environmental Hygiene, Meeker, September, 2006. This study found beryllium in clean coal slag samples, and found task-weighted personal exposures outside of the blasters' personal protective equipment that ranged from 2.5-9.5 $\mu\text{g}/\text{m}^3$ of beryllium. The mean was 5 $\mu\text{g}/\text{m}^3$.

⁹ *Evaluation of Substitute Materials for Silica Sand in Abrasive Blasting*. Crouch et al. This NIOSH study found 8 hour TWA for abrasive blasters ranging from 0.029 to 2.1 $\mu\text{g}/\text{m}^3$ of beryllium.

¹⁰ US Department of Labor, Occupational Safety and Health Administration, Advisory Committee on Construction Safety and Health (ACCSH), December 5-6, 2013, transcript page 89.

¹¹ Harsco presentation from meeting with OMB, September 30, 2014.

¹² One study examined gemstone cutters with occupational exposure to beryls, and even though the solubility of the material was low, beryllium could be detected in urine. *Lung Function, Biological Monitoring, and Biological Effect Monitoring of Gemstone Cutters Exposed To Beryls*, Wegner et al., Occupational and Environmental Medicine, February 2000.

for adverse health outcomes, including beryllium sensitization and possibly chronic beryllium disease.”¹³

Recommendations Concerning Scope and Content of a Beryllium Standard for Part 1915 (Shipyard Workers)

Accordingly, OSHA should implement the following:

- *Amend* 29 CFR 1915.1000, Table Z (covering Shipyard Employment) to reduce the PEL to $0.2 \mu\text{g}/\text{m}^3$ from its current level of $2.0 \mu\text{g}/\text{m}^3$; and
- *Adopt* in 29 CFR Part 1915 the general industry requirements for beryllium contained in 29 CFR 1910.1024, including a beryllium control plan, engineering control requirements, personal protective equipment, airborne monitoring, medical monitoring, medical removal, training, and demarcation for activities using beryllium including welding, machining, grinding or polishing (such as non-sparking tools), ***except that where workers are engaged in abrasive blasting, the following should apply:***
 - a. Abrasive blasting shall be conducted within containments whenever feasible, and workers shall be provided with respiratory protection and personal protective equipment under the abrasive blasting standard (29 CFR 1915.34 (c));
 - b. Medical monitoring (LPT tests) shall be offered to abrasive blasters, pot tenders and cleanup workers, and to workers outside the containment or blasting area where measured exposures exceed the action level of $0.1 \mu\text{g}/\text{m}^3$ for each configuration over 30 days;
 - c. Area/personal monitoring for airborne beryllium particulate shall be routinely conducted around the abrasive blasting area if it is not within a containment, and if it is contained, routinely monitor airborne beryllium particulate where measured levels exceed the action level of $0.1 \mu\text{g}/\text{m}^3$ for each configuration;
 - d. Demarcation (through posting of warnings) if there abrasive blasting with beryllium containing materials; and
 - e. Medical removal protection benefits for workers who test positive for beryllium sensitivity or CBD.
- *Remove* any exclusions from the scope of the rule in 29 CFR Part 1915 for materials with less than 0.1% beryllium by weight. As noted above, quantities under 0.1% by weight can result in significant worker exposures.

¹³ *White Paper: Worker Exposure to Beryllium during Abrasive Blasting Operations using Coal Slag*, Mark Griffon, November 2015 (on file with Committee on Education and the Workforce and attached to comments on this rulemaking submitted by USW).

- *Amend* 29 CFR 1910.1024 (f)(2) to state “the employer shall institute feasible engineering and/or work practice controls to minimize employee exposure in beryllium work areas where operations generate airborne beryllium particulate.” For activities other than abrasive blasting, this provision should be included in Part 1915.

The changes to Part 1915 should apply to both permanent shipyard employees, as well as subcontracted, leased and temporary employees.

Thank you for your consideration of these views. Please contact Richard Miller of the staff of the Education and the Workforce Committee at 202-225-3725 with any questions or further communication.

Sincerely,



ROBERT C. “BOBBY” SCOTT

Ranking Member