Building and Construction Trades Department

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RE: Docket No. HS-RM-10-CBDPP

Submitted by:

The Building and Construction Trades Department, AFL-CIO
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Washington, DC 20006
Pete Stafford, Director, Safety and Health
301-578-8500

Dear Ms. Rogers:

The Building and Construction Trades Department, AFL-CIO (hereafter referred to as "BCTD") is pleased to submit comments on the Department of Energy's (DOE) Chronic Beryllium Disease Prevention Program as requested in the Federal Register notice dated December 23, 2010.

Construction workers are employed intermittently throughout the DOE complex, on new construction as well as on maintenance, renovation, repair and demolition of structures in place. This work is normally performed by subcontractors who hire workers from building trades unions on a temporary basis.

We do not think it is possible to separate out the DOE Beryllium Rule [10 CFR 850] from the occupational safety and health rules [10 CFR 851]. They go hand-in-hand. When the DOE Beryllium Rule was developed in the 1990s, little was known about beryllium risks to construction workers. In fact, in most DOE facilities it was assumed that construction workers could not be at risk for beryllium disease. At that time, construction workers were also neglected in DOE's occupational safety and health rules, something the updated rule [10 CFR 851] attempted to correct by including construction as a new "Functional Area" [§851.24, as elaborated on in Appendix 851.A.1].

Today, we know much more. Based on findings from the Building Trades National Medical Screening Program (www.btmed.org), a part of the DOE-funded Former Worker Program, we know that (1) construction workers from most DOE facilities have tested positive on the BeLPT test and are at risk for beryllium exposure, there is growing evidence that (2) skin contact is as likely contributor to exposure as is inhalation, and (3) that this exposure most likely has occurred primarily during maintenance, renovation, repair and demolition in work areas that have not been, or have been poorly, characterized for beryllium dust in place, such as in rafters, above ceiling tiles, in crawl spaces, behind wall board, etc.

Thus, there is a very great need to extend and strengthen 10CFR850 as well as to cover construction subcontractors and workers employed by subcontractors, particularly when work involves maintenance, renovation, repair and demolition. In addition, 10CFR851 needs to be strengthened, to eliminate the bifurcated structure of delivery of occupational safety and health services to in-plant workers vs. subcontractor workers, in which subcontractor workers receive what appears to be sub-optimal protection, including industrial hygiene and occupational medicine support. Therefore, we submit these comments to DOE with the intent that they be considered for revising and strengthening DOE's Chronic Beryllium Disease Prevention Program for application to all workers on DOE sites, including Federal employees, the employees of prime contractors and subcontract workers.

DOE has requested that comments follow the outline in the Federal Register Notice (Docket No. HS-RM-10-CBDPP). Therefore the responses below correlate with the question numbers in the notice.

Response to Questions 1 and 2:

With regard to questions 1 and 2, BCTD encourages the DOE to adopt the more current, scientifically based and protective occupational exposure limit of 0.05 ug/m^3 recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) as the DOE allowable exposure limit. The current general industry and construction OSHA permissible exposure limit (PEL) of 2 ug/m^3 as an 8 hour time weighted average (TWA) - at 40 times current recommended limits- is grossly outdated.

OSHA acknowledges that the PEL is 30 years old and provides the ACGIH TLV on their web site (http://www.osha.gov/dts/hib/hib_data/hib19990902.html). OSHA is currently in the "pre-rule" stage of a new beryllium standard and the rule has not yet been published for public comment. According to documents circulated to a review panel required under the Small Business Regulatory Flexibility Act (SBREFA), OSHA is considering a range of PELs between

0.1 to 2.0 ug/m^3 for the new standard. Assuming OSHA establishes a revised PEL within this range, the BCTD views neither the current nor revised PEL as adequately protective.

ACGIH reviewed literature through 2008 when updating the TLV, a number of which document cases of beryllium sensitization (BeS) and/or chronic beryllium disease (CBD) among workers whose exposure to beryllium are at levels which fall below or within the range of PELs proposed by OSHA. (ACGIH; 2009)

Kelleher et al (2001) found that 10 out of 27 workers at a beryllium precision machining plant that had become sensitized to beryllium had lifetime weighted (LTW) exposures below 0.2 ug/m^3. Seven of these 10 had mean exposures between 0.05 and 1.0 ug/m^3 with 3 having exposures between 0.1 and 0.2 ug/m^3. Newman et al (2001) reports on the same population of workers and found that no BeS or CBD was found at LTW exposure levels below 0.02 ug/m^3. Of particular relevance when considering workers with transient employment patterns such as construction workers, Newman et al (2001) also reports that 4 of the workers with BeS or confirmed CBD were employed at the plant for less than 3 months and described no previous beryllium exposure.

Schuler et al (2005) conducted a cross sectional study among workers in a copper-beryllium alloy plant and found that beryllium exposed workers with BeS or CBD had median beryllium exposures between 0.03-0.12 ug/m^3 . Conversely, they found no statistically increased risk for these outcomes where exposures were below 0.12 to 0.11ug/m^3. Madl et al (2007) conducted a more extensive exposure assessment of workers studied by Kelleher et al (2001) and found that LTW average exposures of 27 employees with BeS or sub-clinical CBD had the following median exposure levels: 1 between 0.02-0.05 ug/m^3 ; 6 between 0.05 and 0.1 ug/m^3; 8 between 0.1-0.2 ug/m^3; 5 between 0.2 and 0.4 ug/m^3; and 7 greater than 0.4 ug/m^3. These data clearly show potential for adverse health effects from beryllium well below the current OSHA PEL and below or within the range of the PEL likely to be proposed in a new OSHA beryllium standard. At least one study documents an absence of any statistical risk for beryllium related illness at average exposures less than 0.02-0.11 ug/m^3. (Schuler et al, 2005).

Response to Question 3

With regard to question 3 and whether or not DOE should establish an action level based on the ACGIH TLV, the BCTD encourages the DOE to adopt an action level of one half the ACGIH TLV, or 0.025 ug/m^3.

OSHA defines an "Action Level" as a concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10106, accessed on 1/31/11).

"Action Level" has also been defined as "the concentration or level of an agent at which it is deemed that some specific action should be taken. The action can range from more closely monitoring the exposure atmosphere to making engineering adjustments. In general practice the action level is usually set at one-half the TLV". (AIHA, 2003; P. 54)

Given the seriousness of CBD, that occupational exposures are variable, and that more recent research suggests that Be surface contamination and dermal exposure may contribute to beryllium related illness even when airborne exposures are low, an action level which triggers precautionary measures below the TLV is critical for an effective CBD prevention program. Given research which shows that surface contamination and dermal exposure may contribute to health risk even when airborne concentrations are well controlled, an action level of ½ the TLV or 0.025 ug/m^3 is warranted.

Occupational exposures are known to vary significantly, particularly in poorly controlled and non-routine operations such as construction. Examination of welding data collected by CPWR among four construction trades showed that even within a single trade group, exposures to welding fumes varied 10 fold depending on whether welding was done indoors or outdoors and whether or not exposure controls (e.g. ventilation) were used (Rappaport & Kupper, 2008). Analysis of the same data showed that exposures varied between six to 100 fold depending on the trade (Rappaport et al, 1999).

Given the limitations of exposure monitoring data (e.g. exposures are likely to vary substantially around single measurements) and the importance of hygiene and other hazard control and prevention measures independent of airborne beryllium concentrations, the BCTD encourages DOE to reduce their current action level to 0.025 ug/m^3 or as low as sampling and analytical methods allow, and that prevention program requirements currently required under 10 CFR Part 850.23 be initiated at these levels. Given DOE's familiarity with the ALARA (As Low As Reasonably Achievable) approach for minimizing radioisotope exposures, this may also be appropriate for Beryllium.

Response to Questions 4 and 5

With regard to questions 4 and 5, concerning wet vs. dry wipes, consistently sampling surface dust using wipe tests presents challenges but we should learn from methods used for lead based paint dust, such as EPA, HUD and ASTM E1728 - 10 Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination (http://www.astm.org/Standards/E1728.htm). In addition, NIOSH provided a useful overview of various consensus surface sampling methods including ASTM D6966 and ASTM E1792 (NIOSH, 2009), the former of which is in use at DOE facilities. Although there is limited peer reviewed data on beryllium surface sampling methods, it appears that wet wipes such as wet Ghostwipe and wet Smear Tab are more efficient and less variable than dry wipes (Dufay 2006). DOE should expand research to validate these highly variable surface wipe test methods (13.7%

to 106.2%) and reduce inter-rate variability. Based on experience with lead based paint in housing, this is not only a matter of the technical methods, but also a matter of avoiding conflict of interest by having assessment of residual contamination independent of the remediation contractor. Accurate sampling is also of limited value if difficult to decontaminate surfaces, such as rafters or ceiling plenums are not sampled. BCTD encourages DOE to work with NIOSH and other agencies to further refine wipe sampling methods to more accurately assess surface contamination levels.

Response to Question 6

"What is the best method for sampling and analyzing inhalable beryllium?" Because of continuing uncertainty related to critical routes of exposure for various forms of beryllium to trigger an immune response, no single sampling protocol or analytical method is likely to be adequate. Continuing research methods might include sampling of respirable, inspirable, and total airborne dust/fume/aerosol based on mass median aerodynamic diameter; measures of skin contamination and penetration, evaluation of specific surface area per gram or count median diameter based on electron microscopy, some measure of potential for ingestion including removable surface contamination using wipe or vacuum sampling methods, and bulk samples of soil or building demolition debris. Tasks involving potential beryllium exposures should be identified, the job or task hazard evaluated, and appropriate sampling and analytical methods identified based on the physico-chemical form of the beryllium and the nature of the task. One sampling method, such as an 8-hour TWA respirable breathing zone sample, is unlikely to be adequate for characterizing the hazard for every task involving some form of beryllium. The need for pre-task hazard assessment (i.e., before the worker is exposed to a sensitizer like beryllium) should also result in all or most sampling being planned so as to characterize the effective performance of exposure control measures.

Response to Question 7

Question 7 inquires with regard to beryllium exposure; "How should total fraction exposure data be compared to inhalable fraction exposure measurements?" The concepts of respirable, inhalable, inspirable, or total dust or aerosol fractions, are most relevant where routes of entry into the body and the target organ are well characterized. Solubility, specific surface area, physical and chemical properties of the aerosol to which workers are exposed, retention time at site of deposition, permeation or penetration through the skin, ingestion, ingestion of contaminated mucus following deposition in the nasopharnyx or cilliated airways, may all play a role in triggering hypersensivity and in determining absorbed dose. The traditional assumption is that only the deposited mass of the respirable fraction (based on MMAD) may not be appropriate (Kent 2001). Given the apparent uncertainty, an exposure registry and medical surveillance of exposed workers should be combined with several exposure assessment methods which consider traditional total dust mass, respirable dust mass, ingestion and GI tract absorption, specific surface area, and dissolution fraction (Stefaniak 2003, 2004). Task hazard analyses should also be used to characterize intermittent exposures and guide implementation of improved exposure controls. Work practices should be based on ALARA, rather than conformance to an eight-hour or 40-hour occupational exposure limit. The current OSHA permissible exposure limit of 2 ug/m3 based on mass, as an 8 hour time weighted average (TWA), is over 30 years old and is clearly inadequate. Further research to characterize specific surface area of beryllium containing aerosols associated with various work tasks are required to verify the adequacy of occupational exposure limits.

Response to Question 8. Question 8 seeks information regarding requirements for surface area action levels or if DOE should consider controlling the health hazard risk of surface levels by establishing a low airborne action level that precludes beryllium settling out on surfaces. DOE also seeks information on what surface action levels should be if they are to be established and what if any additional administrative controls should be required to prevent build up on surfaces.

For reasons previously stated, we believe an important source of beryllium exposure for construction workers is from surface contamination of areas not previously recognized as being contaminated with beryllium (e.g. above steel beams and in areas not commonly frequented by most employees) Therefore, clean up and re-testing triggered by surface contamination action-levels are essential to address these sources of exposure. We support inclusion of a surface action level *and* lower airborne exposure limits as components of a more extensive task hazard assessment. While the latter will help prevent future surface contamination it will do little to detect existing surface contamination. These sources of exposure must be considered in the context of a task hazard assessment because common construction tasks (e.g. welding, demolition, cutting) may re-suspend contaminants. We urge DOE to work with NIOSH in conducting research aimed at establishing more protective health based surface contamination action levels and sampling methods for measuring these lower levels more accurately. We further encourage DOE to periodically review and update surface action levels in response to the research.

Response to Question 9. Warning labels must be required to identify inventories containing beryllium. The further removed a worker is from employment directly by DOE (e.g. the employee of a sub of a sub to a general contractor to DOE, etc), the more likely verbal instructions and warning will be lacking. Warning labels will aid the communication of the hazard.

Response to Question 11. The BCTD supports the current practice that after the site occupational medicine director has determined that the beryllium worker should be medically removed from exposure to beryllium, the worker must consent to the removal. 10 CFR 850 permits an employer to medically remove a worker until a comparable position is found or for one year without losing income, benefits and/or seniority. The one year requirement should be extended to five years and all benefits and seniority should be maintained for the medically removed workers.

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