



## Department of Energy

Washington, DC 20585

May 29, 2013

Dr. Charles F. McMillan, President  
Los Alamos National Security, LLC  
Los Alamos National Laboratory  
Mailstop A 100, Drop Point 03140071S  
Bikini Atoll Road, TA-3  
Los Alamos, New Mexico 87454

WEL-2013-01

Dear Dr. McMillan:

The Office of Health, Safety and Security's Office of Enforcement and Oversight evaluated the circumstances surrounding a work evolution performed at Los Alamos National Laboratory (LANL) Technical Area 3, Building 141, Beryllium Technology Facility (BTF), on July 11, 2012. The work evolution resulted in a worker exposure to beryllium in excess of the Department of Energy (DOE) action level of 0.2 micrograms per cubic meter for an 8-hour, time-weighted average. Los Alamos National Security, LLC (LANS), which manages and operates LANL under a contract with the National Nuclear Security Administration (NNSA), is subject to the provisions of DOE's Worker Safety and Health Program rule (10 C.F.R. Part 851) and Chronic Beryllium Disease Prevention Program (CBDPP) rule (10 C.F.R. Part 850). Based on our evaluation of the circumstances surrounding this event, LANS did not collect and control personal exposure assessment air samples according to site-specific procedures and the recognized testing and analysis methodology selected by LANS. In addition, LANS did not meet the requirements of Parts 850 and 851 to establish complete and accurate records associated with the hazard assessment and exposure controls for this work evolution. Collectively, these deficiencies indicate that LANS is not accurately quantifying and consistently controlling worker exposures to beryllium at BTF.

The exceedance occurred when a machinist was performing wet beryllium machining operations using a Hardinge T-51 lathe. The lathe has a self-contained exhaust system designed to control emissions generated from inside the machine. LANS used historical industrial hygiene air sampling to establish that this was a routine operation performed in a well controlled beryllium area and did not warrant respiratory protection. Accordingly, the machinist performed this work evolution wearing booties, coveralls/scrubs, gloves, and safety glasses. LANS provided on-the-job training for the machinist to operate air sampling equipment for collecting airborne beryllium samples, which qualified him to perform his own personal monitoring on the day of the event.



The Office of Enforcement and Oversight evaluated documentation that LANS prepared to govern the work activity and concludes that LANS did not use existing hazard assessment information to select controls to abate all potential hazards. In addition, LANS did not establish a complete and accurate worker exposure assessment and control record for the beryllium machining event, and did not follow the National Institute for Safety and Health (NIOSH) analytical method selected to quantify beryllium air samples. For example:

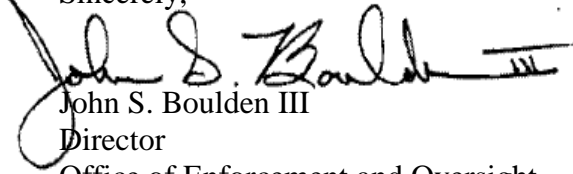
- The LANS worker exposure assessment and control record for the July 11, 2012, beryllium milling work evolution lacked the information necessary to conclusively identify the cause of the beryllium action level exceedance in order to develop appropriate corrective actions to prevent recurrence. The personal breathing zone air monitoring form and the worker's log did not provide sufficient information about the employee's sequential actions or shop environment conditions during the 306 minutes that he donned an air sampling pump on July 11, 2012. Neither record contained any notation that the employee had been splashed with machining fluid or that he had opened the door of the lathe before the machining operation was completed. As a result, LANS had to rely on post-event employee observations to establish the likely key event factors contributing to the machinist's mode of exposure to airborne beryllium.
- The *LANS Beryllium Hazard Assessment Form* (Z Number 186281), dated August 18, 2010, and the referenced *Hazard Assessment Survey Report* (QL0904167), along with Procedure STO-OP-016, *Working with Beryllium in the Beryllium Technology Facility*, revision 0.1, dated February 24, 2011, do not define data quality objectives and constraints on data collection. As a result, the historical data set referenced in the sampling plan has limitations on its suitability to support conclusions regarding occupational exposures during machining operations at the BTF.
- LANS did not train BTF employees performing air sampling to verify the calibration of the primary flow meters during pre- and post-calibration of air sampling pumps. BTF machinists have previously used out of calibration primary flow meters to calibrate air sampling pumps.
- The beryllium hazard assessment and the workplace procedure for wet beryllium machining operations using the Hardinge T-51 lathe did not identify administrative controls or personal protective equipment other than safety glasses to mitigate facial exposure to mists or splashes. During the LANS event critique, the machinist stated that he was splashed with machining fluid. The *Beryllium Hazard Assessment Form* for beryllium machining using milling machines equipped with process exhaust ventilation identifies "inhalation, dermal, and contamination spread" as likely modes of exposure to beryllium. LANS *Integrated Work Document* PF-DO-IWD-0037, revision 1, states that these operations could cause mists or splashes containing beryllium.

- LANS cannot validate the absence of alteration, substitution, or change of condition of air sample 070912CZA16 during each state of the air sample's life cycle (e.g. collection, storage, shipment, and analysis). The *BTF ICP Analytical Laboratory Chain of Custody* (dated July 9, 2012) did not indicate the time the sample was submitted to the locked box by the machinist, the individual that took receipt of the sample, and the time the sample was removed from the locked box.
- The machinist who collected personal air sample 070912CZA16 on July 11, 2012, did not submit field blanks as required by the NIOSH 7300 analytical method. LANS requested a contract laboratory to analyze this sample using "NIOSH 7300/Beryllium" as the analytical method. The *BTF ICP Analytical Laboratory Chain of Custody* (dated July 9, 2012) lists 070912CZA26 as a blank of unknown origin, along with 11 air samples collected July 11-13, 2012. Blank 070912CZA26 did not fulfill the purpose of a field blank for samples taken on July 11, 2012. Without field blanks, LANS cannot reliably determine whether the machinist's air sample result represents a true occupational exposure or was due to contamination of the cassette during handling, storage, or shipment.
- The written notification sent to the machinist to inform him of the result of his personal air sample taken on July 11, 2012, identified a beryllium personal breathing zone air sample result and an analytical result for a blank cassette (070912CZA26). The written notification of monitoring results did not include a description of the corrective actions taken to reduce the worker's exposure to below the action level or identify the relationship of the blank's result to the machinist's personal air sample. The blank identified on the chain of custody form and referenced in the employee written notification was not submitted by the machinist on the day of sampling.

The Office of Enforcement and Oversight is issuing this enforcement letter to highlight concerns about LANS' methods for assessing and controlling beryllium hazards associated with BTF machining activities and to provide feedback on the related regulatory issues. The facts and circumstances indicate weaknesses in LANS' collection and documentation of industrial hygiene exposure assessment information and the application of that information to anticipate, identify, evaluate, and control beryllium hazards. These weaknesses may prevent LANS from establishing a definitive cause for an event and identifying appropriate corrective actions when occupational exposure limits are exceeded. Despite the deficiencies revealed by this event, the Office of Enforcement and Oversight is electing to exercise enforcement discretion at this time based on the compensatory actions immediately instituted upon identification of the action level exceedance. However, the Office of Enforcement and Oversight and the NNSA Los Alamos Field Office will continue to closely monitor LANS effectiveness in preventing worker exposures to workplace hazards and LANS' implementation of an industrial hygiene program that meets Part 850 and 851 requirements.

No response to this letter is required. If you have any questions, please contact me at (301) 903-2178, or your staff may contact Kevin Dressman, Director, Office of Worker Safety and Health Enforcement, at (301) 903-0100.

Sincerely,

A handwritten signature in black ink that reads "John S. Boulden III". The signature is written in a cursive style with a horizontal line at the end.

John S. Boulden III

Director

Office of Enforcement and Oversight  
Office of Health, Safety and Security

cc: Geoffrey Beausoleil, NA-00-LA  
Marjorie Gavett, LANS  
David Jonas, DNFSB