Department of Energy
National Nuclear Security Administration
Washington DC 20585

OFFICE OF THE ADMINISTRATOR

August 15, 2013

The Honorable Peter S. Winokur
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

Your July 15, 2013, letter to the Secretary of Energy requested a report and briefing regarding conduct of operations and the implementation of criticality safety controls at the Los Alamos National Laboratory (LANL) Plutonium Facility (PF-4). On June 27, 2013, the LANL Director paused all PF-4 programmatic operations because of shared laboratory and federal concerns with the program, as a precautionary measure. The pause will continue until the National Nuclear Security Administration (NNSA) is fully satisfied with the actions taken by LANL management. NNSA will be closely monitoring the implementation, completion, and verification of corrective actions being directed by LANL senior management.

As requested by your letter, the enclosure provides information on corrective actions, commitments to complete on-going casual analysis, and other needed improvements. This enclosure reflects work-in-progress. By December 6, 2013, NNSA will provide you with a fully developed plan and an updated status of our progress.

NNSA will schedule a briefing on the enclosed report as soon as is mutually convenient.

Sincerely,

E. B. Held

Edward Bruce Held
Acting Administrator

Enclosure

cc: D. Poneman, S-2
M. Campagnone, HS-1.1

Responses Regarding Criticality Safety Controls At Los Alamos National Laboratory

The following provides National Nuclear Security Administration (NNSA) response to the Defense Nuclear Facility Safety Board (DNFSB) letter and reporting requirements dated July 15, 2013. The specific requests and responses are as follows:

(a) Any corrective actions NNSA is taking to incorporate criticality safety controls into procedures, and to improve procedures, procedure use, criticality safety postings, and criticality safety support of operations

The Los Alamos National Lab (LANL) Director has paused all Plutonium Facility (PF-4) programmatic operations as a precautionary measure until corrective actions are completed, management verification is performed, and resumption is authorized by either the LANL Director or his designated senior manager. Specifically, operations will be resumed on a procedure-by-procedure basis after documented management reviews and approval. Operations involving high fissile material mass or aqueous solutions will receive an independent verification.

LANL has defined a formal resumption release process and developed a corrective action plan that defines specific actions, reviews, and approvals that will be performed to methodically and deliberately resume PF-4 programmatic operations. The plan includes:

- Actions that will be completed within 30 days to ensure PF-4 operability and compliance and significantly reduce the potential for programmatic operations to challenge criticality safety controls.
- Actions that will be completed by September 30, 2013, to rapidly expand the pool of qualified criticality safety analysts and control the deliberate resumption of activities with low potential to challenge criticality safety controls but have a high programmatic impact.
- Actions that will be completed by December 31, 2013, to further expand the pool of qualified criticality safety analysts and control the deliberate resumption of activities with low potential to challenge criticality safety controls but have a high programmatic impact. Opportunities will be identified for continuous improvement of criticality safety in PF-4.
- Longer-term actions to resume remaining operations, continue comprehensive operational improvement, and provide an independent evaluation of the state of criticality controls and PF-4 conduct of operations.

Prior to authorizing resumptions, LANL will:

- Review and include in PF-4 procedures those controls and limits significant to nuclear criticality safety.
- Evaluate criticality-safety related procedures for designation as "Use Every Time."

- Validate procedures function as written.
- Ensure criticality safety documents and procedures are available to the operators.
- Validate postings against criticality safety limits, eliminate unclear or inconsistent presentation on postings, and place postings under configuration management.
- Ensure appropriate fissile material labels that specify material identification and parameter limits that are subject to procedural criticality controls.
- Provide criticality safety refresher training for fissile material handlers.

LANL has also committed to ensuring that qualified criticality safety analysts spend more than 85 percent of their time providing on-floor support for fissile material operations and assisting with review of PF-4 operations. LANL is reviewing fissile material handler training and recertification requirements for improvement opportunities.

(b) *Any root causes NNSA has identified for recent criticality safety infractions*

An appropriate and deliberative review requires time. NNSA and Los Alamos National Security, LLC commit to a causal analysis of recent criticality safety infractions. NNSA will report the outcome of the causal analysis to the DNFSB in a subsequent status report.

(c) *Any improvements NNSA has determined are needed to the federal oversight and contractor assurance systems relative to criticality safety, conduct of operations, and effectiveness of corrective actions*

Since 2006, LANL has taken extensive actions to implement improved conduct of operations at the Laboratory in general and PF-4 in particular. In 2009, the site identified weaknesses in PF-4 operating procedures and LANL developed a corrective action plan. In 2012, LANL conducted a management self-assessment and independent effectiveness evaluation of PF-4 conduct of operations; LANL acknowledged then that a significant effort remained to mature the PF-4 conduct of operations safety management program. LANL is actively tracking and managing actions to mature the conduct of operations program using the Laboratory's issue management system.

Considering the site's criticality safety program, the Laboratory's criticality safety program was largely expert-based prior to 2005. The program has evolved to being more standards-based and its implementation has received substantial review since then:

- In 2006, NNSA identified non-compliances with the program, and LANL developed a criticality safety program improvement program.
- In 2007, LANL paused PF-4 operations and performed an augmented limit review to confirm the adequacy of existing criticality safety limits before resuming each unit operation. While significant improvements have since been

made, about one-fifth of the criticality safety evaluations still need to be updated, primarily for lower risk operations.

- In 2011, PF-4 fissile material handlers violated criticality safety controls while moving and photographing eight rods; as a result, LANL improved the rigor of fissile material handling training, and PF-4 fissile material handlers were required to recertify to stricter standards.
- In 2012, and again in March 2013, the Department's Criticality Safety Support Group reviewed the program and questioned the adequacy of institutional ownership and monitoring of the site's criticality safety program, and particularly, the impact of the declining number of qualified criticality safety staff. LANL has taken a number of actions as a result:
    - Issued a corrective action plan, which is being periodically updated.
    - Conducted seven extent-of-condition reviews.
    - Assessed level of confidence in criticality safety evaluations for more than 500 site fissile material operations. LANL submitted and received NNSA comments and concurrence in this assessment.
    - Assessed the criticality safety program at PF-4, Area G transuranic waste operations, and the Chemistry and Metallurgy Research Building
    - Developed program metrics.
    - Instituted quarterly self-assessments using these metrics and conducted three assessments.
    - Reviewed closure and effectiveness of prior corrective actions on criticality safety evaluations from August 2008 to January 2013.

Based on the results of these assessments, LANL has committed to establishing appropriate monitoring, audits, and assessments of the site's criticality safety program in accordance with applicable national consensus standards. LANL has also committed to strengthen the annual walk-down process required by ANSI/ANS 8.19, Section 7.5, including developing a walk-down checklist to ensure the quality of the walk-downs and subsequently updating the checklist to incorporate best practices and lessons learned from recent reviews at PF-4.

LANL plans to perform an effectiveness review of the criticality safety program corrective action plan in the Spring 2014.

Considering federal oversight, NNSA personnel performing oversight of PF-4 are trained and qualified in expectations for criticality safety and conduct of operations. NNSA is taking steps to improve their continuing training, such as ensuring facility representatives have attended the hands-on criticality safety course, and having headquarters criticality safety experts, with decades of experience, provide training to field personnel. This training will include background on near-misses and precursor events that have occurred in the complex, as well as information on nuclear criticality self-assessment expectations (i.e., DOE-STD-1158). These personnel will be closely involved in oversight of the resumption process identified by the Laboratory.

Among other actions, NNSA intends to work with the Laboratory to achieve a consistent, high-quality annual walk-down process which should improve operational awareness on criticality safety, conduct of operations, and the effectiveness of corrective actions relative to fissile material operations.

NNSA will further report upon this topic in a subsequent status report.