



The Secretary of Energy

Washington, D.C. 20585

February 2, 2010

The Honorable John E. Mansfield
Vice Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004

Dear Mr. Vice Chairman:

The Department of Energy (DOE) acknowledges receipt of Defense Nuclear Facilities Safety Board (Board) Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, issued on October 26, 2009, and I accept the recommendation.

In December 2008, the National Nuclear Security Administration (NNSA) Los Alamos Site Office (LASO) approved a new Documented Safety Analysis (DSA) for the Plutonium Facility at Los Alamos National Laboratory (LANL), the first major upgrade to the Plutonium Facility's Safety Basis since 1996. The DSA conservatively describes potentially high mitigated consequences to the maximally exposed off-site individual (i.e., the public) from a first-floor fire following a seismic event, approximately two orders of magnitude higher than our evaluation guideline for selecting safety class controls. Approval of the DSA included recognition of weaknesses in the facility's control set and the need to upgrade a number of safety systems in order to meet DOE nuclear safety policies. As a result, Los Alamos National Security (LANS) has initiated a number of improvements to address safety issues identified in the DSA, including transitioning to an active confinement ventilation strategy.

LANS recently submitted to LASO an update of the facility's DSA that includes revised seismic accident scenarios to more accurately, but conservatively, evaluate the consequences of such scenarios. The DSA annual update, to be reviewed and approved by LASO, includes about a factor of 15 reduction from the previous DSA of the mitigated consequences to the maximally exposed off-site individual from a post-seismic fire. This proposed reduction is accomplished by establishing stricter limits to the overall material at risk allowed in the facility and by defining specific material quantity limits for various forms of material such as liquid, metal, and oxide and for heat-source plutonium. However, additional upgrades will be needed in order to meet DOE nuclear safety policies.

A significant number of actions have been completed recently or are planned in the near future that improve the safety posture of the facility. For example, in the near-term, NNSA will incentivize LANS to accomplish the following in FY 10:

- Install an automatic seismic shutdown capability for non-vital laboratory room electrical loads that provides an engineered control to reduce laboratory room electrical ignition sources;
- Develop conceptual designs for potential seismic upgrades to key active confinement ventilation subsystems and to the fire suppression system;



- Robustly package or otherwise disposition greater than 250 kilograms of plutonium-equivalent material;
- Reduce first floor material at risk limit by 40 percent; and
- Complete safety class encapsulation of the existing inventory of heat-source plutonium currently stored in Russian Product Containers (RPCs) that will subsequently be stored in the vault water baths.

NNSA has also provided additional funding to LANS for FY 10 to support the repackaging and disposition of material, risk reduction activities, and new generation container development. Also, for FY 10, LASO and LANS have developed performance-based incentives of about \$1.3M for materials repackaging and disposition, updated seismic analyses, and safety upgrades to the Plutonium Facility. These actions in FY 10 build upon actions taken by LANS in FY 09 and early FY 10, including the following:

- Removed nearly 11 tons of combustible material from the facility, primarily first-floor laboratory rooms;
- Repackaged 60 existing RPCs with pressure safety concerns into new safety class containers;
- Replaced 195 high efficiency particulate air (HEPA) filters with 500°F-rated HEPA filters; and
- Developed a hydraulic model of the Fire Suppression System that identified weaknesses that are being addressed and will be used to inform decision-making for making this system safety class.

A more comprehensive summary of key actions is provided in the enclosure to this letter.

As noted above, the changes to the DSA currently under review would reduce the potential consequences at the site boundary due to a post-seismic fire event by a factor of 15. Approving updates to the DSA and Technical Safety Requirements is the binding mechanism by which DOE directs changes to the nuclear safety posture of its facilities. DOE is expediting its review of the updated DSA to achieve its implementation at the earliest feasible date.

I have assigned Mr. James J. McConnell, Acting Assistant Deputy Administrator for Nuclear Safety and Operations, Office of Defense Programs, NNSA, to be the Department's responsible manager for developing the Implementation Plan. He can be reached at (202) 586-4379.

Sincerely,



Steven Chu

Enclosure

LANL Plutonium Facility Key Recent and Near-Term Actions that Improve Facility Safety

FY09 and Early FY10 Accomplishments:

- Repackaged 60 Russian Product Containers (RPCs) of heat-source plutonium that had pressure safety concerns into new safety class containers
- Retrieved and safely vented 40 legacy non-safety class heat-source plutonium containers
- Replaced 195 high efficiency particulate air (HEPA) filters with 500°F-rated HEPA filters
- Upgraded selected hardware and software of the Facility Control System that ensures proper ventilation flow and differential pressures between ventilation zones
- Developed fire department pre-plans that contain the emergency response guidelines for the fire department and other first responders
- Developed a model of the existing ventilation system that can be used to evaluate system modifications for migrating to a safety class active confinement strategy
- Developed a hydraulic model of the fire suppression system which identified weaknesses that are being addressed and will be used to inform decision-making for making this system safety class
- Relocated the forklift charging station (an ignition source) away from safety-related equipment
- Replaced vault sprinkler heads with lower-actuation-temperature heads that will respond sooner and limit the development of a vault fire
- Improved ground attenuation model for seismic ground motion, which reduced seismic loads
- Completed implementing combustible control program procedure, and the removal of nearly 11 tons of combustible material from the facility, primarily from first floor laboratory rooms
- Submitted the annual update of the Documented Safety Analysis for NNSA approval on December 1, 2009

Funding Adjustments in FY10:

- Provided additional \$700K of Container funding for new generation container development
- Provided additional \$6M of Material Recycling and Recovery funding for repackaging and disposition of material

FY10 Physical Objectives:

- Install an automatic seismic shutdown capability for non-vital laboratory room electrical loads to provide an engineered control to reduce laboratory room electrical ignition sources (incentivized by NNSA)
- Accelerate seismic upgrades to about 90 glovebox support stands, with the objective of achieving near-complete designs in FY10; Upgrades target gloveboxes that contain significant heat-generating devices, ignition sources, or plutonium
- Install and begin to use for part of the facility's material inventory a new safety class nuclear material storage system using fire-rated safes and containers (incentivized by NNSA)
- Develop conceptual designs for potential seismic upgrades to key active confinement ventilation subsystems and to the fire suppression system (incentivized by NNSA)
- Address National Fire Protection Association (NFPA) deficiencies and achieve safety class fire suppression

**LANL Plutonium Facility Key Recent and
Near-Term Actions that Improve Facility Safety**

- Implement a fire wall surveillance and maintenance program, assess and repair the facility's main fire wall, and assess and develop conceptual designs to achieve two-hour fire rated separation between the facility's four primary operating areas (incentivized by NNSA)
- Complete an engineering study focused on installing glovebox fire suppression or inerting systems (incentivized by NNSA)
- Complete safety class encapsulation of the existing inventory of heat-source plutonium currently stored in RPCs that will subsequently be stored in the vault water baths (incentivized by NNSA)
- Submit for approval a new, more robust special nuclear material container design (i.e., the Special Nuclear Material Container) and prepare to quickly initiate procurement; these containers will be designed to provide increased assurance of confinement in a seismically-initiated fire when stored in environments not susceptible to direct flame impingement, such as the vault or fire-rated safes.

Additional Actions for FY10:

- Robustly package or otherwise disposition greater than 250 kg of plutonium-equivalent material (incentivized by NNSA)
- Address high-priority deficiencies identified in the new facility fire hazard analysis and address identified gaps with NFPA code requirements (incentivized by NNSA)
- Implement ignition source control program