



Department of Energy  
National Nuclear Security Administration  
Washington, DC 20585



June 30, 2010

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

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DNF SAFETY BOARD

Dear Mr. Chairman:

Consistent with the Deputy Secretary's June 10, 2010 letter to you, enclosed are the National Nuclear Security Administration's (NNSA) responses to the three questions from the 60-day reporting requirement in the Defense Nuclear Facilities Safety Board's (Board) letter of March 15, 2010, regarding the implementation of DOE-STD-3009, *Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*.

NNSA is committed to improving the quality of its Documented Safety Analyses (DSAs) and considering actions to reduce the frequencies and consequences of accident scenarios with mitigated consequences above the Department of Energy's (DOE) Evaluation Guide (EG). While several of these facilities are to be replaced, NNSA remains committed to seeking ways in which to improve facility function and safety. We remain open to discussing these aspects with you and your staff as we seek reliable solutions.

If you have any questions on the enclosure, please contact Mr. James J. McConnell, Assistant Deputy Administrator for Nuclear Safety and Operations, Office of Defense Programs, at (202) 586-4379.

Sincerely,

Donald L. Cook  
Deputy Administrator  
for Defense Programs

Enclosure



## Enclosure

Responses to Defense Nuclear Facilities Safety Board (DNFSB) 60-Day Reporting Requirement Questions from the Vice Chairman's March 15, 2010 Letter

### **DNFSB Question 1:**

*"Which defense nuclear facilities do not have a set of safety class controls that reduce the mitigated dose consequences to the public below the Evaluation Guideline?"*

### **Answer:**

Only the following National Nuclear Security Administration (NNSA) nuclear facilities have evaluated accident scenarios in their safety bases that do not have a set of existing safety class controls to reduce the mitigated dose consequences to the public below the Evaluation Guideline (EG):

1. Los Alamos National Laboratory (LANL) Area G;
2. LANL Chemistry and Metallurgy Research (CMR) Facility;
3. LANL Plutonium Facility (PF-4);
4. LANL Radioassay and Nondestructive Testing (RANT) Facility; and
5. LANL Waste Characterization, Reduction, and Repackaging (WCRR) Facility.

Three caveats apply to this list, regarding 1) aggregation of accident scenarios, 2) identification of beyond design basis accidents, and 3) use of preventive controls.

First, some existing NNSA facilities are comprised of multiple structures with varying degrees of connectivity. Some safety bases report consequences and establish controls for each portion of the facility rather than providing aggregate consequence values. Facilities where the approved safety analysis does not report aggregate values that exceed the EG are not included on the above list.

Second, NNSA safety analyses generally evaluate and establish safety controls for a suite of accidents that are considered "derivative design basis accidents" for existing facilities, as defined in DOE-STD-3009, *Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*. Accidents of greater severity, termed "beyond design basis accidents," are also evaluated but do not result in the selection of safety class controls. Consequently, beyond design basis accidents were not considered when selecting facilities for inclusion on this list.

Finally, some facilities primarily rely upon layers of preventive controls for certain accident scenarios to reduce their likelihood. The most significant preventive controls are classified as safety class where warranted. Additional safety significant controls may

be identified as defense in depth, and may provide some mitigative functions. When sufficient controls exist for the safety basis approval authority to conclude that an accident is reliably prevented, mitigated consequences are not calculated. Accident analyses that rely on effective prevention were not evaluated when selecting facilities for inclusion on the list above.

**DNFSB Question 2:**

*"For these facilities, what barriers exist to prevent DOE from meeting the Evaluation Guideline?"*

**Answer:**

Responses are provided for each of the five NNSA nuclear facilities. For these facilities, the consequence estimates are dominated by the 50 year committed effective dose equivalent, resulting from inhalation of radioactive particulates. Also, the consequence estimates are conservative and generally overestimate the dose that any member of the public would receive in an actual accident, sometimes by orders of magnitude. Lastly, the purpose of the consequence estimates resulting from accident analyses is to identify the need for, and to evaluate the effectiveness of, safety class controls to mitigate the consequences of postulated accidents:

1. LANL Area G: In the NNSA Los Alamos Site Office (LASO)-approved Documented Safety Analysis (DSA), there are four scenarios with mitigated consequences to the maximally exposed offsite individual (MEOI) that exceed the Evaluation Guideline. These scenarios are an airplane crash (1795 rem unmitigated and mitigated), seismic (919 rem unmitigated, 119 rem mitigated), external fire (352 rem unmitigated, 104 rem mitigated), and waste dome fire (622 rem unmitigated, 302 rem mitigated). Los Alamos National Security (LANS) plans to submit a complete revision of the Area G DSA and Technical Safety Requirements (TSR) to NNSA LASO soon. This submittal will include a reevaluation of these scenarios with mitigated consequences still expected to exceed the Evaluation Guideline, and no safety class structures, systems, or components (SSC) are expected. Area G is a limited-life facility and major facility upgrades to mitigate these scenarios are not anticipated.
2. LANL CMR Facility: Los Alamos National Security (LANS) submitted a revised CMR DSA and TSRs to LASO on April 29, 2010, that was approved by LASO on June 2, 2010. The mitigated dose consequences to the MEOI for a post-seismic fire with building collapse dropped from 219 rem in the previous analysis to 36 rem in the new analysis. This is the only accident in the CMR DSA which has mitigated consequences that exceed the Evaluation Guideline. The major contributor to this reduction is less material-at-risk. The CMR DSA and TSRs are planned to be fully implemented by December 31, 2010. The CMR is an old facility with a limited remaining life, and no major facility upgrades to further

reduce this consequence are anticipated. Future material-at-risk reductions are expected to further reduce this dose.

3. LANL PF-4: The December 2009 annual update to the PF-4 DSA lowered the post-seismic fire dose consequences to the MEOI from 7,150 rem (unmitigated) and 2,860 rem (mitigated) in the 2008 DSA to 472 rem (unmitigated) and 189 rem (mitigated). LANS submitted a new version of this scenario on June 18, 2010, that reduced the mitigated consequences to 110 rem. LANS plans to submit additional revisions to this scenario that will further reduce these consequences in September 2010 and May 2011 to the point that the Evaluation Guideline is no longer exceeded for the post-seismic fire scenario. These future reductions will reflect ongoing facility improvements, improved controls, and better modeling. Details about planned improvements are provided in the Department of Energy's (DOE) acceptance letter of DNFSB Recommendation 2009-2 dated February 2, 2010. Additional details will be provided in DOE's Implementation Plan for DNFSB Recommendation 2009-2, to be issued in July 2010. There are no other accident scenarios in the LASO-approved PF-4 DSA which have mitigated consequences that exceed the Evaluation Guideline.
4. LANL RANT Facility: LANS transmitted an update to the RANT DSA to LASO on May 13, 2010, that is currently being reviewed by LASO. The dose consequences to the MEOI for an airplane crash dropped from 295 rem in the current LASO-approved DSA to 36 rem in the update. The reduction was primarily due to modeling improvements. No controls are credited with mitigating the consequences of an airplane crash and major facility upgrades to mitigate an airplane crash are not anticipated. There are no other accident scenarios in the LASO-approved RANT DSA which have mitigated consequences that exceed the Evaluation Guideline.
5. LANL WCRR Facility: LANS submitted an annual update to the WCRR DSA on May 28, 2010, that is currently being reviewed by LASO. The mitigated dose consequences to the MEOI for an airplane crash are the same (47 rem) in the current LASO-approved DSA and the update. WCRR is a limited-life facility and major facility upgrades to mitigate an airplane crash are not anticipated. There are no other accident scenarios in the LASO-approved WCRR DSA which have mitigated consequences that exceed the Evaluation Guideline.

**DNFSB Question 3:**

*"Which of these facilities deviate from, or have been unable to meet, DOE's position in response to items 1 and 2 on the previous page, and to what extent?"*

**Answer:**

Responses to this question are included with the responses to DNFSB Question 2.