



Department of Energy
National Nuclear Security Administration
Washington, DC 20585

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DNF SAFETY BOARD



January 7, 2011

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

Dear Mr. Chairman:

This letter is to notify you that the Department of Energy has completed Deliverable 5.1 of the Department's Implementation Plan (IP) for Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*. Deliverable 5.1 is documented completion of near-term actions to reduce the consequences of a seismically-induced fire. Specifically, the enclosure documents steps taken in 2010 to complete actions from section 4 of the Implementation Plan.

If you have any questions, please contact me at (202) 586-4379.

Sincerely,

James J. McConnell
Assistant Deputy Administrator
for Nuclear Safety, Nuclear Operations,
and Governance Reform
Office of Defense Programs

Enclosure

cc: M. Campagnone, HS-1.1
K. Smith, LASO



SEPARATION

PAGE

memorandum

National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, New Mexico 87544

DATE: **DEC 13 2010**
REPLY TO:
ATTN OF: Kevin W. Smith
SUBJECT: Plutonium Facility Seismic Safety – Recommendation 2009-2, Deliverable 5.1

TO: James J. McConnell, Assistant Deputy Administrator, Nuclear Safety and Operations, NA-17


Reference:

- 1.) U.S. Department of Energy – Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2009-2, July 2010.
- 2.) LANS letter AD-NHHO:10-350 from R. McQuinn, AD-NHHO, LANS, to C. Keilers, FO, LASO, Subject: "Submittal of Evidence for Early Completion of Milestone 5.1 of DOE Implementation Plan for DNFSB 2009-02, FY11 PBI 7.4.2 and 7.4.3", dated October 29, 2010.

Deliverable 5.1 of Reference (1) is competed and included near-term actions to reduce the consequences of a seismically-induced fire.

The attachments document completion of the near-term actions. Attachment (1) summarizes the specific commitments and the actions taken. Attachment (2) is the Los Alamos National Security, LLC, cover letter that provides further information on the completed actions.

Contact C. Keilers at (505) 665-6352 if you have any questions.



Kevin W. Smith
Manager

Attachments

cc: See Page 2

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cc w/attachment:

D. Nichols, CDNS, HQ/FORS

A. Delapaz, NA-171.2, HQ/FORS

R. Snyder, OOM, LASO

C. Keilers, AMFO, LASO

J. Vozella, AMSO, LASO

J. Griego, AMNSM, LASO

T. Forker, SO, LASO

E. Christie, FO, LASO

R. McQuinn, AD-NHHO, LANS, MS-K778

Records Center, LASO

Official Contract File, LASO

FO:26CK-307614

Attachment 1: Summary of Near-term Actions Taken for Recommendation 09-2, Deliverable 5.1

Reference:

1. U.S. Department of Energy – Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2009-2, July 2010.

Milestone 5.1 of Reference (1) is for near-term actions to reduce the consequences of a seismically-induced fire. The deliverable is documented completion of the following near-term actions from Reference (1), Section 4:

- Develop the design for an automatic seismic shutdown of laboratory room process electrical power to reduce electrical ignition sources.

Action Taken: Los Alamos National Security, LLC, (LANS) developed the design and released it for construction in September 2010.

- Remove, lock-out or render inoperable, glove-box ignition sources that are no longer needed.

Action Taken: LANS inventoried glove-boxes with heat generating devices, locked out those that are no longer required, and implemented a program to manage installation of any new heat-generating devices. LANS also conducted an operational assessment to verify that unneeded heat sources have been isolated.

- Procure and install six safes with manufacturer-backed fire ratings, to be used for special nuclear material storage. The safes will be anchored to Performance Category 3 requirements, and a safety basis page change will be submitted recommending a damage ratio to be assumed for containers in safes.

Action Taken: LANS installed six fire-rated safes, anchored to seismic requirements, and submitted the safety basis change to reflect the fire rated safes and containers.

- Fire test at least one existing container design to establish a damage ratio, based on a LANS proposed and LASO [Los Alamos Site Office] accepted test plan establishing fire temperatures and durations.

Action Taken: LANS fire tested two container designs using a LASO approved test plan. The testing appears to support a damage ratio of 1 % for commonly used containers.

- Establish scope for seismically upgrading fire suppression. This includes delivering a component upgrade list, anchorage calculations, and fragility calculations to support conceptual design in FY-11.

Action Taken: LANS has submitted a seismic equipment list, seismic walk-down data, anchorage and fragility calculations, a seismic capacity evaluation, and upgrade recommendations for the fire suppression system.

- Establish scope for seismically upgrading key active confinement ventilation subsystems, similar to the fire suppression system, to support conceptual design in FY-11.

Action Taken: Similar to the fire suppression system, LANS has submitted a seismic equipment list, seismic walk-down data, anchorage and fragility calculations, a seismic capacity evaluation, and upgrade recommendations for confinement ventilation.

- Correct an identified set of 16 fire hazard analysis deficiencies.

Action Taken: LANS has addressed, at least, 16 deficiencies from the 2009 fire hazard analysis and is the process of updating the fire hazard analysis to support documented safety analysis updates.

- Develop conceptual design information for glove-box inertion or fire suppression.

Action Taken: LANS submitted a project execution plan that constituted conceptual design information for glove-box fire protection.

- Assess the main PF-4 [Plutonium Facility] fire barrier penetrations and repair deficiencies that can be repaired using standard fire protection designs.

Action Taken: LANS has assessed and repaired the main Plutonium Facility fire wall (i.e., the H-wall) except for two penetrations that will require non-standard repair techniques.

- Assess and develop conceptual design information for creating two-hour fire-rated separation between the four main areas on the PF-4 main floor.

Action Taken: LANS submitted conceptual information, collected into a project implementation plan, for creating the fire-rated separation.

- Robustly package or otherwise disposition greater than 250 kg plutonium-equivalent material.

Action Taken: LANS repackaged or otherwise dispositioned 659 kg of plutonium-equivalent material in Fiscal Year 2010.

- Complete safety class encapsulation of the existing inventory of heat-source plutonium currently stored in RPCs [Russian Product Containers].

Action Taken: LANS over-packed the remaining 103 Russian Product Containers into safety-class over-packs. LASO approved the safety analysis report for the over-packs.

- Accelerate seismic upgrades to support stands for higher-risk glove-boxes, with the objective of achieving near-complete designs in FY-10; this targets glove-boxes that contain significant heat-generating devices, ignition sources, or plutonium.

Action Taken: LANS completed the design package for the first group of glove-box stand seismic upgrades.

- Implement a fire wall surveillance and maintenance program.

Action Taken: LANS implemented the fire wall surveillance and maintenance program by conducting a condition assessment, repairing, and established configuration management of the H-Wall, PF-4's main fire barrier; inventorying fire barrier penetrations; planning for further condition assessments; and initiating a monthly fire barrier inspection program.

SEPARATION

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**Associate Director
Nuclear & High Hazard Operations**

P.O. Box 1663, MS K778
Los Alamos, New Mexico 87545
505-665-6446/Fax 505-667-6440

Date: October 29, 2010
Refer To: AD-NHHO:10-350

Mr. Charles Keilers
National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, NM 87544

Subject: Submittal of Evidence for Early Completion of Milestone 5.1 of DOE Implementation Plan for DNFSB 2009-02, FY11 PBI 7.4.2 and 7.4.3

References:

1. U. S. Department of Energy, *Implementation Plan for Defense Nuclear Facilities Safety Board*, July 2010
2. ADNHHO:10-327, *Submittal of Evidence for Design of an Automatic Seismic Electrical Shutdown for PBI 17.1, Deliverable 5*, October 12, 2010
3. ADNHHO:10-314, *Submittal of Evidence for Installation of Fire Rated Safes for PBI 17.1, Deliverable 7*, September 30, 2010
4. ADNHHO:10-303, *Submittal of 2009 TA-55 Documented Safety Analysis Revision and Technical Safety Requirements, Revision 1.1 (TA55-TSR-2009-R1.1, TA-55 Technical Safety Requirements (TSRs) Revision 1.1)*, September 30, 2010
5. ADNHHO:10-295, *Submittal of TA-55 "Evaluation of Fire-Rated Containers" for PBI 17.1, Milestone 2*, September 28, 2010
6. ADNHHO:10-315, *Submittals for PBI 17.1, Deliverable 8*, September 30, 2010
7. ADNHHO:10-316, *Submittals for PBI 17.1, Deliverable 9*, September 30, 2010
8. ADNHHO:10-312, *Submittal of TA-55 Project Implementation Plan - Glovebox Fire Protection Conceptual Design*, September 30, 2010
9. ADNHHO:10-317, *Submittal of Evidence for Segregation Assessment of the PF-4 Areas 100, 200, 300 and 400 for PBI 17.1, Deliverable 3*, September 30, 2010

Dear Mr. Keilers:

LANS has committed to address DNFSB Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, by completing the LANS FY2011 commitments described in the 2009-2 Implementation Plan, as transmitted to the DNFSB on July 13, 2010 (1). FY11 PBI 7.4.3 deliverables are based on completing eight FY11 commitments at least 60 days, on average, early. Described below are the near-term actions required by milestone 5.1, due December 2010, and evidence of completion.

Develop the design for an automatic seismic shutdown of laboratory room process electrical power to reduce electrical ignition sources.

The evidence of completion of a design for an automatic system to shut down process electric power to TA-55 labs during a Design Basis Earthquake (DBE) was provided to NNSA by reference (2).

Remove, lock-out or render inoperable, glove-box ignition sources that are no longer needed.

In FY10, TA-55 performed a complete facility walkdown to verify the list of gloveboxes that contain ignition sources and removed/locked out those not required for facility mission. Installation of any new heat-generating devices in gloveboxes is managed through TA55-PLAN-038, R2, "Heat Generating Device Safe State and Operational Release Process". Completion evidence was provided to NNSA in FY2010 PBI Completion Documentation for PBI 17.1 (PCM-267).

Procure and install six safes with manufacturer-backed fire ratings, to be used for special nuclear material storage. The safes will be anchored to Performance Category 3 requirements, and a safety basis page change will be submitted recommending a damage ratio to be assumed for containers in safes.

Reference 3 submitted evidence for the safe installation including anchoring to PC-3 requirements. A TSR page change was submitted for NNSA's approval to implement a damage ratio (DR) of 0 for fire-rated safes (4).

Fire test at least one existing container design to establish a damage ratio, based on a LANS proposed and LASO accepted test plan establishing fire temperatures and durations.

Two container designs were tested and results supported very little to no leakage from the containers. Results of the Fire Testing were submitted to NNSA (5). A TSR page change (4) was submitted for NNSA's approval to implement a damage ratio (DR) of 1% for SC fire-rated containers.

Establish scope for seismically upgrading fire suppression. This includes delivering a component upgrade list, anchorage calculations, and fragility calculations to support conceptual design in FY11.

Evidence for completion of this commitment was submitted to NNSA (6) in September. It consisted of a Seismic Equipment List (SEL) and Anchorage and Fragility Calculations for Fire Suppression System SSCs which provide a list of the components that require upgrade based on the results of the analysis.

Establish scope for seismically upgrading key active confinement ventilation subsystems, similar to the fire suppression system, to support conceptual design in FY11.

Evidence for completion of this commitment was submitted to NNSA (7) in September. It consisted of a Seismic Equipment List (SEL) and Anchorage and Fragility Calculations for the Key Active Confinement Ventilation SSCs which provide a list of the components that require upgrade based on the results of the analysis.

Correct an identified set of 16 fire hazard analysis deficiencies.

LANS proposed and NNSA approved the set of 16 out of 29 FHA deficiencies to be completed in FY10. In August 2010, NNSA change control removed 2 of the 16 deficiencies and added 4 other deficiencies to make a set of 18. Evidence of completion of this set of 18 deficiencies was provided to NNSA in the FY2010 PBI Completion Documentation for PBI 17.1 (PCM-267).

Develop conceptual design information for glove-box inertion or fire suppression.

The evidence for completion of the glovebox fire protection conceptual design was submitted to NNSA (8) in September.

Assess the main PF-4 fire barrier penetrations and repair deficiencies that can be repaired using standard fire protection designs.

Evidence for repair of the main PF-4 fire barrier penetrations was provided to NNSA in the FY2010 PBI Completion Documentation for PBI 17.1 (PCM-267).

Assess and develop conceptual design information for creating two-hour fire-rated separation between the four main areas on the PF-4 main floor.

The evidence package for completion of this commitment was submitted to NNSA (9) in September. LANS assessed the fire separation of the 100, 200, 300 and 400 areas and provided a Project Implementation Plan (PIP).

Robustly package or otherwise disposition greater than 250 kg plutonium-equivalent material.

The evidence of completion for this commitment was provided to NNSA in the FY2010 PBI Completion Documentation for PBI 7.5.1 (PCM-256) The total MAR risk reduction realized at LANL as of September 20, 2010 was 658.9 kg for this commitment.

Complete safety class encapsulation of the existing inventory of heat-source plutonium currently stored in RPCs.

The evidence of completion for this commitment was provided to NNSA in the FY2010 PBI Completion Documentation for PBI 17.3 (PCM-307).

Accelerate seismic upgrades to support stands for higher-risk glove-boxes, with the objective of achieving near-complete designs in FY-10; this targets glove-boxes that contain significant heat-generating devices, ignition sources, or plutonium.

Attached to this letter is evidence of accelerated seismic upgrades for higher risk gloveboxes in PF-4 (Attachment 1). Evidence provided for the Group I, higher risk, gloveboxes include:

- First three pages of the design package including the cover page, general design notes and the first page of design details. This design package is stamped and approved by the LANS project engineer on July 13, 2010 and the Design Authority on July 9, 2010.
- Cover page and table of contents of the fabrication specification for the "Glovebox Support Stand Upgrade - Group I", this document is approved by the LANS Design Authority and signed July 9, 2010.
- Design Basis Document for the Glovebox Stand Upgrades, including the Group I calculation log. The document is stamped and signed on July 21, 2010. A (UNCI) CD is attached containing these calculations (Attachment 2).
- An independent verification of the completion evidence signed on August 26, 2010.

Implement a fire wall surveillance and maintenance program.

Attached to this letter is evidence of completion for this commitment (Attachment 3). The evidence package consists of three procedures that define the program and mandates an inspection frequency. The procedures are TA55-AP-123, TA-55 Fire Barrier Program; TA55-AP-124, TA-55 Fire Barrier Through-Penetration Numbering and Labeling Control; and TA55-DOP-075, TA-55 Monthly Fire Barrier Inspections. AP-123 describes and defines the program to inspect, document and maintain TA-55 fire

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October 29, 2010

barriers. AP-214 defines the penetration labeling and documentation process. DOP-075 is the monthly inspection of the fire barriers.

If you have any questions concerning this evidence please contact Derek Gordon at 667-9451.

Sincerely,


Robert L. McQuinn,
Associate Director
Nuclear & High Hazard Operations

RLM:CRS:ec

Cys:

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