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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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May 30, 2008

The Honorable Thomas P. D'Agostino
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Mr. D'Agostino:

The Defense Nuclear Facilities Safety Board (Board) understands the vital role that the National Nuclear Security Administration (NNSA) has envisioned for the Plutonium Facility and the Chemistry and Metallurgy Research Replacement (CMRR) facility at Los Alamos National Laboratory. These facilities will likely provide much of the nation's enduring capacity for research, development, and manufacturing involving plutonium and other actinide materials. As a result, two of the Board's priorities are to ensure the development of a high-quality safety basis for the Plutonium Facility and a safe design for the CMRR. The Board's staff recently reviewed both of these efforts. The staff's observations are detailed in the attached reports, which include areas that could benefit from additional examination

The Board was encouraged that NNSA's review of the September 2007 Documented Safety Analysis for the Plutonium Facility largely identified the core deficiencies of the submission, and charted a course for an improved safety basis in the near term that explicitly identified necessary improvements for the future. In the first report, the Board's staff noted several issues and weaknesses that were not fully captured by NNSA's comments and warrant attention. These weaknesses dealt with hazards analysis, controls, software quality assurance, leak path factor calculations, and the criticality safety program. The Board reminds NNSA that the Plutonium Facility continues to operate using a safety basis that was approved more than a decade ago.

The CMRR project is discussed in the second attached report. The Board is encouraged that NNSA plans to complete a technical Independent Project Review before proceeding to the final design stage. This review should provide additional confidence in the nuclear safety strategy employed and the design adequacy of safety-related systems. The Los Alamos Site Office's review of the draft Preliminary Documented Safety Analysis is also important, particularly in addressing significant previously identified shortcomings.

While progress toward developing a robust safety strategy for CMRR continues, a number of design issues require increased attention. For example, the Board is aware that the current seismic structural design is particularly challenging because of the large vertical seismic motions. Also, the design adequacy of the safety-class fire suppression system will be the subject of continued in-depth scrutiny. Finally, further review of the control logic and conditions under which the active confinement ventilation system would maintain the facility at negative pressure during a fire scenario also need to be discussed. The Board remains committed to the early integration of safety into the design of the CMRR and the timely resolution of these design issues.

The Board has learned that the laboratory contractor is developing a plan to upgrade elements of the active confinement ventilation system for the Plutonium Facility to a safety-class designation. This effort is being driven by recognition of the significant benefits afforded by the upgrade, in terms of both improved reliability and availability to support the facility's programmatic mission and strengthening of its safety posture. Confinement upgrades are likely to include the addition of sand filters, which would provide a robust, low-maintenance confinement boundary. Sand filters have been used successfully for decades at the Savannah River Site and were chosen by NNSA for the Pit Disassembly and Conversion Facility. While NNSA's filtration design at CMRR is robust and meets applicable safety requirements, the designers did not consider the use of a sand filter. Given the importance and enduring nature of these collocated LANL facilities, there is merit to considering expansion of the sand filter effort at the Plutonium Facility to provide coverage at CMRR. In addition to the safety benefits, this approach could result in life-cycle cost benefits through initial economies of scale and reduced maintenance and surveillance burdens.

The Board will continue to closely follow the progress of these two critical facilities.

Sincerely,

A. J. Eggenberger
Chairman

c: The Honorable William C. Ostendorff
The Honorable Robert L. Smolen
Mr. Robert J. McMorland
Mr. Mark B. Whitaker, Jr.

Enclosure