DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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August 26, 2009

Gerald L. Talbot, Jr.
Assistant Deputy Administrator for
Nuclear Safety and Operations
National Nuclear Security Administration
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Mr. Talbot:

Pursuant to the certification mandate provided in Section 3112 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, the Defense Nuclear Facilities Safety Board's (Board) staff responsible for certification activities has reviewed design data for the Chemistry and Metallurgy Research Replacement (CMRR) Project provided to date by the National Nuclear Security Administration (NNSA). The Board's staff is focusing its review on topics previously raised regarding the nuclear safety strategy for CMRR, the Preliminary Documented Safety Analysis, and the design of safety-class and safety-significant systems. Those topics were provided electronically to NNSA on November 20, 2008. The staff has documented specific technical issues on a Findings Form. For purposes of the certification review, the staff considers a Finding a design topic related to an issue raised by the staff regarding the CMRR design that has not been adequately resolved and that could preclude certification by the Board.

Finding 2, Safety-Significant Active Ventilation System—Seismic Design of Active Confinement Ventilation System and Support Systems, was transmitted to your office on January 16, 2009. NNSA provided an initial response to Finding 2 on March 3, 2009, and a final response on August 14, 2009. The Board's staff has evaluated the NNSA final response and has determined that Finding 2 can be considered closed. Enclosed is the completed Findings Form that includes the Board's Final Resolution to Finding 2. Should you have any questions regarding this matter, please contact me at (202) 694-7128.

Sincerely,

Roy E. Kasdorf
Nuclear Facility Design and
Infrastructure Group Lead

Enclosure

c: Mr. Mike Thompson
Mr. James McConnell
Mr. Patrick Rhoads
Mr. Herman LeDoux
Mr. Mark B. Whitaker, Jr.

Board Findings Chemistry and Metallurgy Research Replacement Facility: Congressional Certification Review
Topic: Safety-Significant Active Ventilation System
Finding Title: Seismic Design of Active Confinement Ventilation System and Support Systems
Finding: The CMRR project should not proceed into final design until there is high confidence that the PC-3 portions of the active confinement ventilation system can be seismically qualified. The CMRR Nuclear Safety Design Strategy (CMRR-AP-0307, Rev. 1) states that it may not be economically feasible to seismically design and qualify some components of the active confinement ventilation system or its support system to PC-3 seismic design requirements. The structural response of CMRR to vertical design basis ground motions (see most recent SSI calculation) has led to the concern by the project that vertical accelerations are at or above the upper limit of those for which rotating equipment can be economically seismically qualified. It is not acceptable to downgrade PC-3 seismic design requirements for the active confinement ventilation system.
Basis for Finding: DOE O 420.1B Chapter I (3)(b)(7) Safety SSCs must be designed, commensurate with the importance of the safety functions performed, to perform their safety function when called upon; and Chapter IV (3)(a)(1)(a) Facility SSCs must be designed, constructed and operated to withstand NPH and ensure confinement of hazardous materials.
Suggested Resolution or Path Forward: NNSA should reconfirm its commitment to seismically design the active confinement ventilation system to PC-3 seismic design requirements. This reconfirmation should include: (1) Near-term studies to assess the potential conservatism in PC-3 vertical design basis ground motions, and revise PC-3 vertical design basis ground motions as appropriate. (2) An assessment of equipment seismic qualification related to both the safety-class fire suppression system and the safety-significant active ventilation system, and associated support systems. The assessment should document the approach to seismically qualify safety-related equipment to PC-3 design basis ground motions including the potential use of seismic isolation for this equipment.
NNSA Response: An initial NNSA response was provided on March 3, 2009, and a final response was provided on August 14, 2009. The final NNSA response attaches a letter from the Los Alamos Site Office providing supplement responses from the CMRR Project to each of the issues identified in the path forward. Technical Information provided by the CMRR Project was forwarded electronically to the Board separately.

DNFSB Final Resolution: The CMRR Project committed to seismically design the systems and components of the active confinement ventilation system to PC-3 seismic design requirements. An update to the seismic design ground motions for the CMRR facility was completed. The update of PSHA motions determined that PC-3 design response spectra now has a peak horizontal ground acceleration of 0.43g, with a peak horizontal spectral acceleration of 0.84g, and a peak vertical ground acceleration of 0.47, with a peak vertical spectral acceleration of 1.33g. The Board's staff determined that reductions in PC-3 horizontal and vertical seismic design ground motions are technically supportable.

The CMRR Project performed an independent evaluation of seismic equipment qualification. The engineering firm that completed this evaluation has significant experience in nuclear facility seismic equipment qualification, including high seismic regions such as California. The independent evaluation concluded that there is a high degree of confidence that safety-related equipment for the CMRR facility can be seismically qualified. The Board's staff has reviewed the independent evaluation of seismic equipment qualification and agrees with the conclusion that the uncertainty in seismic equipment qualification has been adequately addressed. As the CMRR project proceeds into final design, development of detailed seismic qualification plans for safety-related equipment should be prepared.

Finding #2 is considered closed.

DNFSB: Roy G. Kasdorf 8/25/09 Roy Kasdorf Date	NNSA: NNSA response signed by Gerald L. Talbot, Jr., NA-17 Date: August 14, 2009