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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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February 6, 2008

The Honorable Robert L. Smolen  
Deputy Administrator for Defense Programs  
National Nuclear Security Administration  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0104

Dear Mr. Smolen:

The Highly Enriched Uranium Materials Facility (HEUMF) will provide significant safety and security improvements for the storage of enriched uranium at the Y-12 National Security Complex. In a March 25, 2002, letter to the Deputy Administrator for Defense Programs, the Defense Nuclear Facilities Safety Board (Board) identified several major safety issues that needed to be addressed before detailed design activities for the HEUMF project were initiated. One of the issues raised was the need to identify clearly the boundaries for safety systems such that support systems would be appropriately identified and classified. The HEUMF project addressed this issue by revising the project's Design Criteria Document to state that a support system for a safety system should be classified consistent with the safety system's designation if the support system's failure would prevent the safety system from performing its safety function. The addition of this requirement to the Design Criteria Document is consistent with the expectation as described in the Department of Energy (DOE) Guide 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosives Safety Criteria Guide for use with DOE O 420.1, Facility Safety*.

The HEUMF Preliminary Documented Safety Analysis identifies the fire suppression system as safety-significant to control incipient fires. A water supply for the sprinklers is needed for the fire suppression system to perform its safety function. However, the system planned to supply the needed water is not classified as safety-significant, which is inconsistent with the HEUMF Design Criteria Document. The Board identified this inconsistency in its recent quarterly report to Congress, dated October 17, 2007, entitled *Status of Significant Unresolved Issues Concerning the Design and Construction of New DOE Defense Nuclear Facilities*. The Board notes that contractor personnel working on the Radioactive Liquid Waste Treatment Facility replacement project at Los Alamos National Laboratory have identified the same issue, and are working to resolve it.

Members of the Board and its staff have held several discussions with representatives of the Y-12 Site Office (YSO) and its contractor during the past few months in an effort to resolve this issue. In a letter to the contractor dated December 7, 2007, YSO identified near- and long-

term actions aimed at increasing the operational reliability of the water supply system. For the near-term, YSO directed that HEUMF include a new safety-significant water supply pressure monitor that provides an alarm upon loss of supply pressure. To address water supply flow, YSO directed the contractor to perform an evaluation of the supply flow paths to identify (1) any single valve positioning error or similar scenario that would adversely impact required flow, and (2) any new safety basis controls to ensure that sufficient flow is available. YSO provided no specific schedule for this future evaluation, however. For the long-term, YSO directed that by May 2008, the contractor must evaluate the option of connecting the HEUMF water supply to the safety-significant fire water tanks for the planned Uranium Processing Facility (UPF). The UPF tanks, with a new piping connection to HEUMF, would provide a safety-significant water supply system.

For the near-term, the Board believes that safety-related configuration controls on at least one flow path are needed to provide positive assurance that one reliable water supply flow path exists from the supply tanks to the HEUMF fire suppression system. The Board agrees with the use of a new safety-significant water supply pressure monitor and alarm to ascertain adequate water supply pressure.

For the long-term, the Board concludes that using the tanks planned for the UPF fire water supply should be a commitment since it provides acceptable reliability for the fire suppression system for the life of HEUMF, consistent with the requirements in the project's Design Criteria Document. This conclusion is based on the presumption that UPF will proceed as currently planned. If the UPF project is canceled or significantly delayed, another safety-significant water supply for HEUMF will need to be provided.

The Board believes that current plans do not adequately address the need for a safety-significant fire water supply system for HEUMF as specified by the HEUMF Design Criteria Document and the DOE Guide 420.1-1. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a report and briefing within 90 days of receipt of this letter that describe (1) the National Nuclear Security Administration's plans for improving the operational reliability of the water supply for HEUMF for the short-term, and (2) the long-term plans for providing a safety-significant water supply system, as required by the project Design Criteria Document and expected by DOE directives.

Sincerely,



A. J. Eggenberger  
Chairman

c: Mr. Theodore D. Sherry  
Mr. Mark B. Whitaker, Jr.