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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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March 15, 2010

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) is engaged in a safety review of the preliminary design of the Uranium Processing Facility (UPF) at the Y-12 National Security Complex (Y-12). The review by the Board's staff of geotechnical and structural engineering activities for the main building indicates the need to resolve effectively several outstanding technical issues to enable the project to proceed expeditiously.

The geotechnical and structural engineering effort is organized into three distinct areas: geotechnical characterization and seismic response evaluation, structural and seismic analysis, and structural design. As discussed in the enclosed report, several issues identified by the Board's staff should be addressed. These issues relate to (1) ensuring that the site seismic response methodology is appropriate for addressing high frequency ground motion and the need to remove additional weathered shale, (2) determining whether to directly incorporate ground motion incoherence into seismic design and the resulting impact on structural response, (3) taking action to confirm the adequacy of the structural analysis and design for all members, (4) assessing the adequacy of building spacing considering seismic ground motions, and (5) addressing the effects of an accidental internal blast. UPF project personnel recently proposed approaches to address some of these issues. The Board's staff does not believe that sufficient detail has been provided to fully understand the approaches to be utilized and is continuing discussions with UPF project personnel.

The Board believes that some of these issues stem from the lack of a systematic plan and documented methodology that effectively integrates the technical aspects of the geotechnical and structural engineering activities. This plan would identify the technical interdependencies between the UPF project office and its engineering firms, the technical details of the structural and seismic analysis and design strategies, and the required content and scope of the project deliverables. The Board's staff reviewed the latest UPF project plan and concluded that it does not contain sufficient detail to assure proper integration and implementation of the structural analysis and design effort.

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In addition, the Board is concerned that the National Nuclear Security Administration's (NNSA's) civil/structural oversight team is understaffed and has not been chartered to independently review the civil/structural design of the UPF project. Given the importance of UPF to future operations at Y-12, it would be prudent for a review team to be chartered to review the overall technical strategy, approach, and implementation for the structural analysis and design to provide a sound basis for improving safety and project execution. The primary peer review effort would best be performed by an NNSA-chartered team with the appropriate technical resources to provide adequate independent oversight of the development of the civil/structural engineering design of UPF.

The Board requests a briefing regarding NNSA's strategy for developing and implementing an independent, self-directed peer review process for the UPF civil/structural analysis and design.

Sincerely,

John E. Mansfield, Ph.D.
Vice Chairman

Enclosure 1

Enclosure 2

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

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