DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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April 19, 2005

Mr. Paul M. Golan
Acting Assistant Secretary for
Environmental Management
U. S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0113

Dear Mr. Golan:

On April 1, 2005, the Department of Energy Office of River Protection (DOE-ORP) approved the Interim Seismic Criteria (ISC) for the Waste Treatment Plant (WTP). These criteria were prepared by the contractor, Bechtel National Incorporated (BNI), at the request of DOE-ORP, for use while final seismic criteria are being developed. These criteria are needed to address the recently updated seismic hazard at the Hanford Site.

The ISC criteria will be used to evaluate near-term design and construction efforts in the following manner:

- Seismic load cases will be increased by a factor of 1.4 to account for the increased seismic hazard.
- Load amplification factors will then be applied to design forces to compensate for issues associated with mesh density in the unrefined finite element analysis.
- The structure will be designed to maintain a predetermined margin of safety (design-to-capacity ratios).

Ultimately, final seismic design criteria will be developed once BNI's structural models have been revised to incorporate the updated seismic hazard (currently forecast for August 2005).

BNI and DOE-ORP believe that the ISC adequately bound the seismic hazard at the Hanford Site and address the modeling issues raised previously by the Board (e.g., those related to mesh density). However, the Board believes that uncertainties in the data used to develop the updated seismic spectra and in the proposed response to mesh density issues have not been fully addressed. For example, uncertainty remains in the new seismic spectra because of a lack of specific site characterization data, including deep hole borings (collection of additional data is currently under study), and the magnitude of the load amplification factors strongly suggests considerable error in the crude mesh refinement used in BNI's modeling approach.

Given these uncertainties and the remaining uncertainty inherent in the design-build process, it is the Board's view that:

- The desire to decrease structural design margins by increasing demand-to-capacity ratios does not appear to be technically justified.

- Long-term use of load amplification factors does not appear to be prudent in the WTP structural design given the complexity of the structural model (though their limited use can be acceptable under certain circumstances). The Board notes that DOE-ORP's Peer Review Team has made a similar observation and encourages DOE-ORP to accept the team's suggestion to use an appropriately refined structural model for analysis of the final forces.

The use of the ISC creates the potential for future design changes or rework. To minimize this risk, its use should be limited to as short a period as possible and every effort made to develop acceptable final design criteria. If you have any questions on this matter, please do not hesitate to contact me.

Sincerely,

A. J. Eggenberger
Acting Chairman

c: Mr. Roy J. Schepens
Mr. Mark B. Whitaker, Jr.