The Secretary of Energy
Washington, D.C. 20585

February 10, 2011

The Honorable Peter S. Winokur
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004-2901

Dear Mr. Chairman:

This is in response to your December 17, 2010, letter, which provided Defense Nuclear Facilities Safety Board (Board) Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant.* Mr. Dale E. Knutson will be the responsible Manager for this Recommendation.

The Department of Energy (DOE) agrees with the Board that more testing and analysis should be completed to provide additional confidence that pulse jet mixing (PJM) and transfer systems for the Waste Treatment and Immobilization Plant (WTP) will achieve their design and operating requirements. DOE has previously made commitments to address the concerns raised by the Board in its Recommendation 2010-2. These commitments were made by the Federal Project Director in August 2010 during an internal project management meeting; in the October 7-8, 2010, public hearing on WTP; and in our supplement to the public hearing record submitted to the Board in January 2011. At each point, full disclosure of DOE plans, with identified timelines for further details and schedules for testing and analysis, was included. The implementation of these commitments is on-going as part of WTP project plans that supports scheduled testing to begin in 2012.

The Board acknowledged in its letter that DOE has taken and continues to take steps to increase the confidence that the PJM mixed vessels will comply with their designed operating requirements. As outlined in your letter:

- DOE contracted an independent technical review team, Consortium for Risk Evaluation and Stakeholder Participation (CRESP), that presented DOE with 13 recommendations. DOE is continuing to take actions addressing the CRESP recommendations.

- On October 7-8, 2010, DOE publicly committed to large-scale testing and to complete relevant portions of the testing before installing remaining process vessels in the WTP Pretreatment Facility. As part of that commitment, the testing objectives and summary schedule for the large-scale testing was included in the WTP Project's January 2011 update to the public record.

We believe the Board's concerns regarding PJM at the WTP will be addressed by DOE's current direction related to resolving PJM and transfer system uncertainty. Accordingly, DOE accepts Recommendation 2010-2.

The Board's Recommendation includes specific sub-recommendations that it believes needs to be addressed as part of the DOE's pulse jet mixed vessel testing program. There are certain specific details of the Board's Recommendation that require clarification and are summarized below. We believe our intended actions should satisfy the Board's concerns.

- Sub-recommendations 1 and 2: Wording in both sub-recommendations calls for "*testing that envelope the complete range of physical properties for the high-level waste stored in the Hanford Tank Farms.*"

  DOE intends to conduct large-scale testing with simulants selected to represent the vast majority of the waste in the tank farms, consistent with the approach used in WTP's pulse jet mixing test program conducted to date. The WTP design and planned operations approach is intended to address residual uncertainty with other actions and design features. These include (1) waste feed pre-qualification activities; and (2) specific design features, including the ability to inspect vessels and equipment for vessel heel dilution and cleanout, that would enable waste particles that may not be mixing with the bulk of the waste to be moved forward to the melters.

- Sub-recommendation 3: This sub-recommendation calls for "*...verification and validation of any computational models used by the WTP project team (e.g., Low Order Accumulation Model and FLUENT) based on the results from the 'large-scale testing.'*"

  The verification and validation effort is expected to be completed prior to the "large scale testing." The WTP project intends to compare the results from the "large scale testing" with the computational models.

- Sub-recommendation 4: This sub-recommendation calls for "*...including demonstrating that representative samples can be obtained even if the assumed WTP design particle size or density is exceeded. This will ensure that the sampling system does not exclude large, dense particles and artificially bias the measured particle size and density distribution.*"

  The vessel testing activities will include determining the acceptability of vessel sampling in conditions where sampling may be challenged by mixing performance, i.e., solids-containing vessels. There may be cases where the sample system operation during normal vessel operations does not retrieve some large dense particles for analysis. As noted above, this is planned to be accommodated by the feed-prequalification process and by the ability to pull a sample during the heel dilution and cleanout process, when larger, denser

particles would be retrieved into the sample system. Consequently, the large-scale testing program is not intending to demonstrate that normal sampling activities can retrieve all waste particles.

DOE is committed to the safe design and operation of its nuclear facilities, consistent with the principles of Integrated Safety Management, and values input on how DOE can improve its activities. We look forward to working further with the Board and its staff on preparation of the DOE's Implementation Plan for Recommendation 2010-2 so that the WTP project can complete its design and construction activities while promoting nuclear safety for the life of WTP operations.

If you have any further questions, please contact me or Inés R. Triay, Assistant Secretary for Environmental Management, at (202) 586-7709.

Sincerely,

Steven Chu