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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



June 20, 2013

The Honorable Ernest J. Moniz
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Moniz:

The Defense Nuclear Facilities Safety Board (Board) congratulates you upon your appointment as Secretary of Energy. The Board is looking forward to a positive and productive working relationship with you as the Department of Energy (DOE) carries out its important and challenging national security missions. As you assume your duties, the Board would like to provide you with a brief summary of its views on the current challenges DOE faces in the area of safety at DOE's defense nuclear facilities. In particular, the Board draws your attention to the Plutonium Facility at Los Alamos National Laboratory that analysis shows may be vulnerable to collapse as a consequence of design basis seismic earthquake and the many challenges awaiting resolution regarding the storage and disposition of legacy waste at the Hanford site. A summary of the Board's oversight priorities on these and other major issues is provided as an enclosure to this letter.

The Board looks forward to providing you with independent analysis, advice, and recommendations in support of your role as the operator and regulator of DOE's defense nuclear facilities. The Board is committed to work with you towards our common goal of providing adequate protection of the public health and safety.

Sincerely,

Peter S. Winokur, Ph.D.
Chairman

Enclosure

c: Mrs. Mari-Jo Campagnone

OVERSIGHT PRIORITIES OF THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD AT THE DEPARTMENT OF ENERGY'S DEFENSE NUCLEAR FACILITIES

Earthquake Hazard at Los Alamos National Laboratory: Continued dialogue with the Department of Energy (DOE) is necessary to fully resolve issues regarding adequate protection of public health and safety in the event of an earthquake affecting the Plutonium Facility. The design basis seismic accident scenario results in unacceptably large offsite radiation dose consequences to the public. The Defense Nuclear Facilities Safety Board's (Board) Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, identified the need to improve the safety posture of the facility.

The National Nuclear Security Administration (NNSA) has completed several actions to reduce consequences and has developed a plan for longer-term upgrades. Subsequent Los Alamos National Laboratory analysis concluded that seismic events result in worse damage than previously believed. As currently configured, facility collapse is credible in the design basis earthquake. As a result, NNSA is pursuing structural upgrades and additional seismic analysis.

In its January 3, 2013, letter to Secretary Chu, the Board encouraged DOE to take additional short-term measures such as removal of excess material-at-risk, robust containerization of material-at-risk, and improving emergency preparedness. Secretary Chu responded to the Board on March 27, 2013, and NNSA subsequently briefed the Board on May 17, 2013. The Board is evaluating the information provided in Secretary Chu's letter and the NNSA brief.

Broader safety issues stemming from the Plutonium Facility's documented safety analysis resulted in the issuance of Board Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers*. This recommendation focused on improvements in DOE's regulatory framework, which serves as a fundamental underpinning of protecting the public and workers. DOE is revising DOE-STD-3009, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, as called for in the Recommendation 2010-1 implementation plan. The Board hopes the revised preparation guide will strengthen requirements at existing facilities whose offsite dose consequences cannot be easily mitigated.

Longevity and Continued Operations of High-Level Waste Storage Systems: Complex-wide stabilization and disposition of the remnants of nuclear weapons production activities enhances public health and safety near DOE sites. The cleanup of legacy waste at Hanford presents the most significant challenge in this regard. DOE stores more than 50 million gallons of high-level radioactive waste in 177 underground tanks at the Hanford site. Many of the old single-shell tanks have been known to leak. In addition, Hanford's double-shell tanks are aging and are expected to be in use well beyond their design life. DOE identified a slow but continuing leak from the primary (inner) tank of double-shell tank AY-102 in August 2012. The Board has been closely following DOE's response to the leak, including DOE's evaluations of other tanks containing similar waste and the potential impact on the overall waste retrieval and treatment strategy.

At the Savannah River Site (SRS), operations at H-Canyon, HB-Line, Defense Waste Processing Facility, and the Saltstone Production Facility have permitted steady progress in immobilizing

radioactive materials in 47 high-level waste tanks. However, factors such as budget constraints and facility aging continue to complicate the disposition of legacy waste at SRS. The Board's oversight will continue to focus on the on-going high-level waste operations and the completion of the Salt Waste Processing Facility.

Early Integration of Safety in Design: The Board believes early integration of safety in large, complex design projects and timely resolution of safety-related issues is key to providing adequate protection of public and worker health and safety. DOE has struggled with the early integration of safety into its large, complex design projects and the timely resolution of safety-related issues.

At Hanford's WTP, the most critical technical issues are unresolved. DOE's implementation plan for Board Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant*, is in a state of uncertainty. In 2012, Secretary Chu undertook a comprehensive review of the plant's design. In a letter dated November 8, 2012, Secretary Chu informed the Board that this review may result in further changes to DOE's approach to resolve the mixing issues. Since then, DOE has not revised its implementation plan for Recommendation 2010-2 to reflect a new approach. The Board encourages development of a revised plan as soon as possible.

The Board previously expressed its concern that safety was not adequately integrated into the design of the Uranium Processing Facility at the Y-12 National Security Complex. The Board's concern was documented in a project letter dated April 2, 2012, and discussed in the Board's public meeting and hearing on October 2, 2012. The Uranium Processing Facility project team has made recent progress in this area.

Nuclear Explosive Safety at Pantex: The Board's letter to NNSA dated March 2, 2012, expressed concern that certain nuclear explosive operations had exceeded authorized bounds and were continuing despite the objections of local safety experts. The Board's public meeting and hearing in Amarillo, Texas, on March 14, 2013, highlighted concern that NNSA management has failed to adequately address safety-related findings by nuclear safety experts, maintain up-to-date nuclear explosive safety (NES) authorizations, and support a sufficient number of NES experts. NNSA has responded by committing to restructure the NES program to add oversight independent of line management, hire more NES personnel, and revise NES directives to improve the clarity of the requirements. The Board's continuing oversight will be focused on NNSA's efforts to strengthen NES and meet improved safety commitments.

Safety Culture: The Board encourages DOE to achieve and reinforce a safety conscious work environment throughout the defense nuclear complex. The Board issued Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*, following an investigation into the safety culture of the WTP project at the Hanford site.

DOE's Office of Health, Safety and Security (HSS) subsequently assessed safety culture at Hanford WTP and at other locations across the complex. The HSS assessments consistently found safety culture problems of significance. Problems found at the Pantex Plant are of particular concern due to the nature of the work there.

The Board believes your leadership in this area is vital to establishing a strong safety culture throughout DOE and understands that progress in changing any organizational culture is historically slow. DOE has committed to conducting a follow-up assessment of the safety culture at WTP within the next few months to evaluate the effectiveness of ongoing efforts to improve its safety culture. The Board looks forward to the results of this review.

Activity-Level Work Planning and Control: The Board's Technical Report 37, *Integrated Safety Management at the Activity Level: Work Planning and Control*, and accompanying Board letter issued on August 28, 2012, outlined challenges in the safe performance of work at DOE's defense nuclear facilities. DOE responded by proposing new implementation and oversight guidance and is in the process of enhancing oversight of activity-level work planning and control by headquarters, field offices, and contractors. The Board's future review efforts will assess the need for additional DOE requirements to support improved work planning and control.

Maintaining Robust Federal Oversight: The Board encourages continued vigilance in safety oversight to assure public and worker protection. The security incident last July at the Y-12 complex has been attributed in part to confusion over contractor assurance systems and a corresponding reduction in independent Federal oversight for security. The Board monitors the contractor assurance systems in the safety arena and will promptly bring any issues to your attention.

In closing, more in depth discussions of the Board's oversight activities can be found in its numerous reports to Congress, including the Board's Annual Report, Quarterly Reports on the Status of Significant Unresolved Issues with the Department of Energy's Design and Construction Projects, and semi-annual Reports to Congress on Significant Safety-Related Infrastructure Issues at Operating Defense Nuclear Facilities.