DEFENSE NUCLEAR FACILITIES SAFETY BOARD
Washington, DC 20004-2901

September 29, 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) acknowledges the National Nuclear Security Administration's (NNSA) approval of the Critical Decision-1 milestone for the Transuranic (TRU) Waste Facility (TWF) project. This milestone establishes the selected alternative and cost range for an enduring TRU waste management capability at Los Alamos National Laboratory.

The TWF project is a continuation, with reduced scope, of an earlier TRU project whose conceptual design was abandoned in late 2008 so mission need and alternatives could be further evaluated. As a result of that evaluation, NNSA eliminated two functions from the project: TRU waste processing (unpacking, decontamination, repackaging, size reduction), and preparation of final TRU waste shipments for offsite disposal. The project scope still includes long-term storage, staging, and characterization for TRU waste generated by the laboratory's future operations. The Board identified several safety issues associated with the TWF project in a March 18, 2009, letter to NNSA. As a result of the changes in project scope, these issues are no longer germane.

The Board and its staff reviewed the revised conceptual design and safety strategy for the TWF project and noted two key safety issues:

- The project team adopted nonconservative accident analysis parameters from Department of Energy Standard 5506, *Preparation of Safety Basis Documents for TRU Waste Facilities*, for modeling TRU waste drum impacts in the seismic evaluation. For example, the evaluation limited the material at risk to impact from building collapse to the top drum tier, instead of all drums in inventory as recommended by the standard.

- The project team did not identify any controls for the aircraft crash design basis accident, which had unmitigated offsite consequences in excess of the Department of Energy's Evaluation Guideline.

The Board commends the Los Alamos Site Office (LASO) for capturing resolution of these issues as conditions of approval in the TWF Conceptual Safety Validation Report. The Board further believes the project team's decision to relocate the facility to an alternative site where the aircraft crash event is incredible is appropriate and consistent with safety-in-design principles. The enclosure to this letter outlines the Board's understanding of the project's conceptual design and safety strategy.

The Board is aware that LASO directed the TWF project to refine the safety analysis during preliminary design, in part by reducing conservatism inherent in key assumptions. The Board wishes to emphasize the importance of maintaining an adequate safety margin in the TWF design throughout all project phases. The Board is particularly mindful that important safety decisions made during conceptual design, such as the 10 rem threshold for identification of safety-class controls, are predicated on maintaining a high degree of conservatism in the safety basis. The Board and its staff will therefore closely follow preliminary design activities and efforts to refine the safety analysis to ensure that adequate conservatism and safety margins are maintained.

Sincerely,

Peter S. Winokur, Ph.D.
Chairman

Enclosure

c: Mrs. Mari-Jo Campagnone

ENCLOSURE

TRANSURANIC WASTE FACILTY PROJECT SUMMARY

The Transuranic (TRU) Waste Facility (TWF) is a Hazard Category 2 nuclear facility that will provide storage, staging, and characterization for TRU waste generated after 1999 by operations at Los Alamos National Laboratory (LANL). LANL will not process waste at the new facility because planned improvements in waste management at generator sites will eliminate the production of non–Waste Isolation Pilot Plant (WIPP) compliant waste. Preparation and shipping of TRU Package Transporter containers will continue at the Radioassay and Nondestructive Testing facility.

The TWF project will be capable of storing 1,240 drum equivalents of TRU waste containing up to 27,300 plutonium 239 equivalent curies of material-at-risk (MAR). The facility's conceptual design distributes the MAR among six independent steel-framed storage buildings (Seismic Design Category 2, Limit State B) to reduce offsite dose consequences and preclude the need for a safety-class fire suppression system and building structure. Confinement is provided by safety-significant Type A waste storage drums. The drums will not be opened at the facility. The conceptual design identifies additional safety systems to protect the stored drums during accidents:

- The storage buildings and fire suppression system are safety-significant to prevent and mitigate fire impacts, respectively.
- A safety-class seismic electrical isolation switch is proposed to prevent a seismically induced fire involving all storage buildings.
- A safety-class stand-off distance is maintained around the buildings to prevent wildland fire impacts.
- Safety-class vehicle barriers and site features (slope, curbs, berms) protect the MAR from direct vehicle impacts and potential fuel pool fires.
- The safety-significant waste drums are vented to prevent drum pressurization and potential accumulation of flammable gases.

With these safety systems, potential insults to the drums are limited. The project team has therefore not credited the waste storage buildings with an additional confinement function.

Characterization activities required for WIPP certification are performed in mobile trailers provided by the Carlsbad Field Office's Central Characterization Project. The trailers will be located on an outdoor pad adjacent to the storage buildings. Characterization activities include nondestructive assay (neutron and gamma counting) and radiography. Waste drums will be transferred one at a time to the characterization area using an electric forklift. Headspace and flammable gas sampling and analysis will be performed in one of the six storage buildings.