

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 1, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B.P. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 1, 2010

Material Disposal Area (MDA)-B: Project personnel resumed excavation operations in all active enclosures, including Enclosure 1 where several weeks ago the material-at-risk (MAR) limit corresponding to the facility's less-than-hazard-category 3 status was exceeded. Prior to resuming excavation operations, LANL personnel implemented enhanced radioactive material detection capabilities to increase confidence that soil and debris involving higher levels of contamination can be identified and managed in compliance with the existing limit of 0.52 plutonium-equivalent (PE)-Ci for each excavation dig face.

Separately, LANL safety basis personnel are preparing a revised final facility hazard categorization, per DOE-STD-1027, that seeks to increase the less-than-hazard category 3 threshold from 0.52 PE-Ci to some larger value based on material dispersibility characteristics and energy sources associated with MDA-B.

Plutonium Facility – Fire Protection: Six fire-rated safes have been installed in the Plutonium Facility basement. These safes have been qualified to survive bounding Plutonium Facility accident scenarios and have been credited with a damage ratio of zero, meaning that material contained in these safes do not contribute to accident source terms.

LANL management has also submitted an evaluation documenting test results to support dramatically reducing the damage ratios of two types of special nuclear material storage containers commonly used in the Plutonium Facility. An outside laboratory performed furnace, open flame and drop tests on Conflat containers, often used to store plutonium metal, and a container sometimes referred to as an "espresso container," used to store Pu-238-enriched heat source plutonium. The tests used cerium oxide as a surrogate material for plutonium and containers were weighed before and after tests to determine how much material was released as a result of the test insult. The fraction of material released corresponds to the damage ratio of the container. Tests results indicate that both the Conflat and "espresso" containers have damage ratios very close to zero.

Plutonium Facility – Safety Basis: On Wednesday, LANL declared a Potential Inadequacy of the Safety Analysis (PISA) based on the use of non-conservative assumptions associated with calculation of dose conversion factors for plutonium chloride salts. Earlier this year, a PISA was identified at Hanford due to the use of Class-S (in accordance with ICRP-66) for plutonium materials subject to fire release scenarios. The Hanford PISA noted that the use of Class-S may not be conservative in all cases. Based on the information from Hanford, LANL safety basis engineers evaluated the assumptions used at LANL facilities and the Plutonium Facility in particular. Plutonium chloride salts are produced as part of pyrochemical metal production and purification processes used in the Plutonium Facility. For the Documented Safety Analysis approved in 2008 that is currently being implemented, the plutonium materials associated with certain pyrochemical processes are assumed to be molten plutonium metal that would oxidize during a fire with S-Class material type. LANL personnel concluded that the assumptions related to material class made in the safety basis may not be appropriately conservative in this case.