

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2012

**MEMORANDUM FOR:** T. J. Dwyer, Technical Director  
**FROM:** B.P. Broderick and R.T. Davis  
**SUBJECT:** Los Alamos Report for Week Ending February 3, 2012

**Plutonium Facility:** The Plutonium Facility safety basis credits the criticality alarm system as a safety significant control for worker protection. Plutonium Facility TSRs require a quarterly channel function test to ensure the system will produce an alarm when detector heads in the vault indicate radiation levels at or below 75 mR/hr. A quarterly channel function test of the criticality alarm system was performed in December. During this test all four detector channels in the vault were recorded as producing alarms at 80 mR/hr. Personnel performing the test and subsequent reviewers did not recognize that these results failed to meet the acceptance criteria and documented the surveillance as being completed satisfactorily. This week, the cognizant system engineer for the criticality alarm system was reviewing completed surveillance documentation and recognized the error. Plutonium Facility management declared a TSR violation based on this discovery. Facility personnel have reperformed the channel function test and all four vault detector heads were found to produce alarms at or below 75 mR/hr, as required.

**Weapons Engineering Tritium Facility (WETF):** Personnel at WETF measure the composition of gas mixtures using a Hot Inlet System that contains piping to route gas samples through various diagnostic instruments. In October 2010, facility operators discovered that small amounts of oxygen were leaking into the Hot Inlet System where under uncontrolled conditions it could potentially mix with hydrogen isotopes to form a combustible atmosphere. Since this situation presented a deflagration hazard that had not been analyzed in the WETF safety basis, facility management declared a Potential Inadequacy of the Safety Analysis (PISA) and in July 2011 implemented a Justification for Continued Operations that contained controls to prevent a deflagration from Hot Inlet System oxygen in-leakage.

After successfully operating under this JCO for approximately one month, facility personnel discovered another oxygen in-leakage pathway that affected the safety-significant Tritium Waste Treatment System (TWTS). This discovery prompted another PISA and the JCO was revised to include new controls to address the TWTS in-leakage. Before the revised JCO was implemented, facility management submitted a safety basis page change package that updated the WETF Final Safety Analysis Report and TSRs to include oxygen in-leakage hazards and controls. In the Safety Evaluation Report approving this package, the NNSA site office explicitly identified the Hot Inlet System as a safety significant control. In response, LANL management submitted another safety basis page change that was intended to present a technical justification to remove the Hot Inlet System as a safety significant control.

This week, the NNSA site office disapproved the proposed safety basis change concluding that the entire Hot Inlet System serves a safety significant function by protecting workers from tritium releases and deflagrations. In response, WETF personnel are preparing a revision to the oxygen in-leakage JCO for NNSA review and approval that will address the Hot Inlet System until the functional classification issues are resolved. The facility remains in warm standby mode with programmatic tritium gas handling operations suspended pending approval and implementation of the revised JCO.