DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 2009

MEMORANDUM FOR: T. J. Dwyer, Technical Director
FROM: B. Broderick and R.T. Davis
SUBJECT: Los Alamos Report for Week Ending October 16, 2009

Staff member B. Rosen was onsite to attend a working group meeting on Nuclear Material Packaging.

Plutonium Facility: On Tuesday, a general evacuation alarm caused by a Criticality Alarm System (CAS) signal, a loss of all facility ventilation and failure of the Facility Control System (FCS) occurred at the Plutonium Facility. The CAS alarm was subsequently identified to be erroneous and troubleshooting efforts were able to restore ventilation and FCS after approximately 3 hours. The facility was in standby mode during this event due to previously identified issues with the fire suppression system and, therefore, limited personnel were in the facility. During the event, personnel responded appropriately to alarms/announcements and evacuated the facility. Subsequent activities this week have focused on investigation into the cause of the event and reentry and evaluation of the facility condition. One laboratory room was identified to have some spread of contamination based on a continuous air monitor alarm.

All of the systems that alarmed or failed (i.e., CAS, FCS and ventilation) have an interface with the facility Uninterruptible Power Supply (UPS). Just prior to the event, control room operators heard a noise that appears to have been caused by a failure of a power supply that is also supplied by the UPS. While investigation continues including discussions with the UPS vendor, initial indications are that a transient on the UPS bus likely caused the event.

Nuclear Material Packaging: The Nuclear Packaging Manual (DOE M 441.1-1) working group met to review the container design, test plans and overall status of the Standard Nuclear Material Container (SNMC) being developed at LANL. The SNMC is a new generation packaging system designed and tested to meet the more stringent requirements of the manual. Other NNSA sites that handle and store plutonium appear likely to adopt and use the LANL SNMC package rather than designing and qualifying their own manual-compliant containers.

Safety enhancements over the current generation package (i.e. the Hagan container) include a more corrosion and drop resistant stainless steel body, improvements to the filter and o-ring seal material and design, and an improved positive lid closure mechanism. The principal challenges to meeting containment requirements of the manual include thermal and radiation resistance of the o-ring seal and filter, corrosion resistance of the container, impact resistance of the package, and a surveillance program to validate the design criteria and package life.

Several sizes of prototype SNMCs have been tested and passed the post-drop release rate requirements of the manual. The Los Alamos Site Office has requested that the NNSA Packaging and Certification Division assist LANL in developing technically defensible nuclear material packaging and storage safety documents for review and approval by site office management. This additional independent review should provide greater confidence in the technical basis for the SNMC design, surveillance program, and safety documentation process.