

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 8, 2010

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending January 8, 2010

Plutonium Facility: On December 29, 2009, the report from the critique of the bulging bottles was issued (see weekly report dated November 27, 2009). The report identified the apparent cause of the bulging to possibly be radiolysis-induced gas generation and noted concerns with the basis and language applicable to this hazard in the Facility Safety Plan (FSP). The source of the leaked solution was postulated to be the result of a pressurized release through either the container threads or micro-cracks in the body of the bottle. The report also identified an issue that the fissile material handler did not stop work as required when he encountered the unexpected situation. Corrective actions were developed to revise the Operational Safety Plan (OSP) for the impacted workstation, improve the guidance in the FSP for storage of solutions, discuss expectations for responding to unexpected situations with the workforce, and consider revising the FSP regarding those expectations.

The overall response to this incident seems to have missed three elements in need of further consideration. First, the OSP controls will be updated to reflect the hazards associated with radioactive solutions as a response to this event; however, there are no actions planned to identify and correct the weaknesses in the OSP development process that contributed to initially missing the hazards. Second, the timeline in the critique acknowledges that concerns were raised in September regarding the hazards and controls associated with radioactive liquid storage in a 3-gallon water jug; however, issues management processes did not result in formal changes to acknowledge these hazards and identify controls in the FSP or the OSP. Third, the critique report identified language applicable to stop work situations in the FSP and the work control manual, as well as the lack of related language in the conduct of operations manual. The language for the stop work criterion in the two manuals is different—"imminently dangerous" compared to "a new hazard or one that has not been evaluated." Management's recent emphasis on the stop work policy is likely undermined by these inconsistent written expectations. In this case, the bulging bottles should have been recognized as a hazard that had not been evaluated since it was not described or analyzed in any of the work control documents; however, the handler did not initially perceive the bulging bottles to be dangerous and proceeded to open the first bottle before stopping.

Nuclear Material Packaging: Currently, the FSP for the Plutonium Facility provides a list of approved containers and lists several controls for storage of radioactive materials in the facility. In addition to the bulging bottles discussed above, the facility experienced at least two other events during 2009 involving the choice of inappropriate packaging resulting from confusion with the FSP. Given that each work activity may have unique material forms, anticipated storage times, and other considerations, determination of appropriate packaging may be better placed in an activity level work document (i.e., OSP). This type of approach would shift decision making to subject matter experts rather than put fissile material handlers in a position of interpreting the FSP. This approach would also ensure sufficient input to the work control process so that the hazards associated with packaging (e.g., ergonomics of handling and transferring solutions from a 3-gallon jug) are identified and controlled.