

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 7, 2011

**TO:** T. J. Dwyer, Technical Director  
**FROM:** W. Linzau and R. Quirk, Hanford Site Representatives  
**SUBJECT:** Hanford Activity Report for the Week Ending October 7, 2011

Tank Farms: Last week, the contractor concluded that the Potential Inadequacy in the Safety Analysis (PISA) related to plutonium metal and oxide fines larger than 10  $\mu\text{m}$  (see Activity Report 2/18/11) was an unreviewed safety question (USQ) because the probability for a nuclear criticality accident in the affected tanks had increased. The criticality safety evaluation report (CSER) for the Tank Farms assumed that only a small portion of the fissile material fines were large enough to result in segregation from the less dense neutron absorbers. The contractor has prohibited all sludge disturbing activities in the nine affected waste tanks.

Double-shell tank (DST) AN-101 is one of the affected tanks, and next week the contractor plans to decant supernatant waste from this tank to another DST. The site rep questioned what controls would be in place to ensure the sludge would not be disturbed during this decant. Safety analysts for the Office of River Protection (ORP) then reviewed the plan and concluded that additional controls are needed to ensure the distance between the transfer pump suction and sludge layer remains sufficiently large to ensure the transfer will not disturb the sludge layer. Later this month, the contractor plans to retrieve waste from single-shell tank (SST) C-112 into AN-101. The contractor will need to issue a CSER for AN-101 that demonstrates the waste retrieval can be completed safely, and ORP will have to approve it.

Last week, the contractor expanded the scope of the PISA related to safety-significant waste transfer piping being exposed to temperatures below their design temperatures to include additional issues, such as the freezing of safety-significant pressure-relief valve discharge lines (see Activity Report 9/23/11). If the contractor concludes this is a USQ, ORP will have to approve a justification for continued operation (JCO) for continuing transfers when temperatures are below 32° F. This week ORP extended the required completion date of the associated USQ evaluation and JCO to November 4, 2011. This extension is beyond the hours or days, not weeks, noted in DOE Guide 424.1B and contractor procedures, but was granted because of the large workload of both the contractor and ORP engineering and nuclear safety organizations.

Last week, during the startup of equipment for retrieving waste from SST C-107, facility representatives noted that waste was being transferred to DST AN-106 earlier than planned. The valve which controls the hydraulic fluid to the hydraulically-driven waste transfer pump was prematurely opened. The transfer was not a Technical Safety Requirement (TSR) violation because the TSR controls for a waste transfer were in place. Operators stopped the transfer within minutes of the problem being detected. The hydraulic control valve opened prematurely because the contractor made an apparently incorrect modification to the control circuitry during pre-operational testing. This week the contractor continued to troubleshoot and repair several Mobile Arm Retrieval System (MARS) problems, but was unable to restart waste retrieval. Given the extensive testing of the MARS prior to and after installation in C-107, it is unclear if the testing was inadequate or perhaps there are issues with configuration management.

Probabilistic Seismic Hazard Analysis (PSHA): DOE is starting a PSHA for the site and expects the analysis to be completed in approximately three years (see Activity Report 7/1/11).