

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 23, 2011

TO: T. J. Dwyer, Technical Director
FROM: W. Linzau and R. Quirk, Hanford Site Representatives
SUBJECT: Hanford Activity Report for the Week Ending December 23, 2011

Tank Farms: The contractor cancelled the operational restriction related to sludge-disturbing activities for the remaining seven tanks with large plutonium-bearing particles (see Activity Report 11/25/11) after they issued a new criticality safety evaluation report (CSER) and modified the existing criticality prevention specification (CPS). The revised CPS allows relatively benign operations in these seven tanks, specifically: monitoring waste level and density (including flushing of the monitors), ventilation system condensate return, and drainage from pits. An Office of River Protection criticality safety engineer (CSE) reviewed the new CSER and determined that these operations are safe from a criticality standpoint, but this CSER had weaknesses similar to those recently identified by the site rep with the CSER for retrieving waste into double-shell tank AN-101. As a result, the CSE initiated a reactive surveillance.

Waste Treatment Plant: The site rep observed testing for determining a new value for the aerosol entrainment coefficient during normal air sparging operations in waste-containing vessels. The project changed the entrainment coefficient last year and the amount of aerosol calculated caused excessive loading of the HEPA filters in the vessel vent system. The tests, conducted by a subcontractor, utilize a tall cylindrical tank (two feet in diameter by 23 feet tall). Air is pumped below the surface of the waste simulant and the resultant aerosols are captured on metallic filters at various levels in the headspace. The change in the mass of the filters is then measured. A second, larger tank (seven feet in diameter by 25 feet tall) is being constructed with a prototypic sparger mounted at the centerline of the tank. This tank will be used to repeat the bounding tests in the smaller tank and evaluate the effects of the bubbling away from the tank walls. The data from these tests will be used to re-evaluate the ventilation system designs during normal operation and accident analysis but will not be used to evaluate the effects of overblows from pulse jet mixers. The testing should be completed in the next several months.

Mission Support Contractor (MSC): The contractor initiated a recurring occurrence report for repeated maintenance problems. The report addressed maintenance problems only at MSC facilities and not at Hazard Category (HC) -2 or -3 facilities in which they do maintenance but are operated by other contractors. An MSC senior manager agreed to the site rep's suggestion that reportable events involving MSC maintenance personnel at HC-2 and -3 nuclear facilities should be reviewed to ensure the identification of the maintenance problems is comprehensive.

Groundwater Treatment: The site rep was briefed by project personnel on the new groundwater treatment facilities being built in the 200 West Area. The site rep also completed a walkdown of its radiological facility that will remove radiological contamination from the plumes near two West Area tank farm complexes. The process will use ion exchangers to remove technetium-99 and may be modified to also remove uranium. The spent resin will be disposed in the on-site low-level waste landfill. The liquid discharge from the radiological facility will be pumped to an adjacent process building where nitrates, metals, and organic compounds will be removed.