DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 6, 2017

TO: S. A. Stokes, Technical Director
FROM: P. Fox and D. Gutowski, Hanford Resident Inspectors
SUBJECT: Hanford Activity Report for the Week Ending October 6, 2017

PUREX Plant. The contractor completed preparatory work and commenced grouting of Storage Tunnel 1 during night shifts. On the first night, after unloading 15 grout trucks, the work crew noted that some of the backfill around the trench boxes which support the grout lances had subsided into the tunnel resulting in a shift in grout lance position and an open path to the tunnel airspace. They did not see any evidence of further support timber collapse. Radiation dose rate instrument readings did not show a detectible increase although handheld contamination survey instruments did show higher background levels. The grouting activity was paused. Contractor personnel evaluated whether they met the Emergency Action Limit for an alert level emergency and determined that they did not. They then used a work package contingency step to fill the subsidence and work was resumed. So far, approximately 781 cubic yards of grout have been placed into Storage Tunnel 1. This represents about 19 percent of the expected total.

Waste Treatment Plant. ORP approved revision 7 of the High Level Waste (HLW) Facility PDSA (see Activity Report 9/22/2017). The approval states that the revision supports closure of three legacy conditions of approval by providing design criteria for hydrogen in piping and ancillary vessels, identifying effective steam leak control strategies for HLW vital areas, and addressing concerns related to C5V and melter off-gas system HEPA filter capability and operability during various design basis events. ORP considers this revision sufficient for the current level of design and does not impose any new conditions of approval or directed changes. However, the approval states that future updates to the PDSA will be required as design progresses. Additionally, the attached Safety Evaluation Report (SER) states that the Fire Hazards Analysis and seismically induced flooding analysis will require updates and that DOE must finalize volcanic ashfall requirements. Additionally, the SER states that the Hazard Analysis, as a whole, requires validation and that Chapter 5 of the PDSA is insufficient to support the DSA (e.g., specific administrative controls require further development) and is potentially insufficient to support final design. Lastly, the SER notes that additional detail needs to be provided for safety system and component performance criteria.

ORP and the contractor briefed the Board's staff on the results of phase 3 pulse jet mixer (PJM) control system testing conducted to support verification of the Standard High Solids Vessel design and their engineering evaluation of potential structural impacts from PJM overblows.

Low Activity Waste Pretreatment System (LAWPS). ORP directed the contractor to convene an External Expert Review of the LAWPS. Objectives included evaluating engineered controls, the hazard categorization and seismic design criteria, and whether the design could be simplified. Following that review, ORP has directed the contractor to 1) provide a proposal for development of a technology demonstration of a tank-side cesium removal capability to provide low activity waste (LAW) feed to the LAW vitrification facility and 2) develop a system specification for an optimized LAWPS design strategy for both elutable and non-elutable ion exchange options along with a new cost and schedule estimate for the optimized strategy.