

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 4, 2016

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman, D. L. Burnfield, and Z. C. McCabe Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending March 4, 2016

H-Canyon Criticality Safety: During recent fissile operation of the H-Canyon second uranium cycle solvent extraction process (2nd U), H-Canyon personnel failed to implement a criticality safety control (see weekly report dated 2/19/2016). As part of the corrective actions following an issue review on the event, H-Canyon personnel identified two additional criticality safety controls that were also never implemented during the same operation. Each of the additional failed controls were credited in two separate criticality scenarios involving the blockage of weirs which leads to a uranium flow reflux in a 2nd U mixer-settler bank. In both scenarios the failed control was paired with two other implemented and independent controls, thus double contingency was maintained and no single control failure could have led to an inadvertent criticality.

Savannah River National Laboratory (SRNL): On Sunday, SRNL personnel were performing a load test in the general service diesel generator. Prior to the load test SRNL personnel stopped all operations in the potentially affected labs and barricaded them to prevent personnel from entering. Although the diesel started, a breaker switch failed to close which resulted in a loss of power and ventilation to portions of Building 773-A. Among the ventilation systems affected were the Central Hood Exhaust (CHEX) and the Off-Gas Exhaust (OGE) systems. The loss of ventilation systems resulted in a loss of plenum pressure in the CHEX and OGE, which activated the safety significant low plenum pressure alarms. SRNL personnel entered the appropriate limiting condition for operations (LCO).

Tank Farms: SRR estimates that 3000 gallons of salt waste leaked from the 3H Evaporator pot (see 2/19 and 2/26/16 reports). Initial dose rate surveys measured 126 rem/hour approximately 10 feet off the evaporator cell floor. In order to reduce the dose rates for future activities, SRR is planning to add water directly to the evaporator cell next week, let it sit for a day, and then transfer the brine to Tank 32 and then later try to wash off the salt from the exterior of the pot with a low pressure water lance. SRR is developing their plans for inspecting the interior and exterior of the pot to help identify the location and possible cause of the leak. Inspections of the pot's exterior will be difficult because the stainless steel shell is welded and information on the insulation is limited. The water that was added to the pot two weeks ago has been slowly leaking – about an inch a day which corresponds to ~100 gallons/day. Since the water has already drained to 81” without stabilizing, the leak is below the top of the steam tube bundle, which means that trying to operate the evaporator at a level below the leak is not feasible. One team is reviewing possible repair techniques while another team is developing the technical specifications for a new pot. The fabrication and installation of a new pot is expected to take a few years. Meanwhile, SRR is having a team perform a hazards analysis for operating the evaporator with a leaking pot and identify what controls would be needed to operate the evaporator and deal with any liquid waste that accumulates on the evaporator cell floor. Based on the cost and time to implement these controls, SRR will decide whether this option is worth pursuing.