DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 10, 2017

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman and Z. C. McCabe, Resident Inspectors
SUBJECT: Savannah River Site Resident Inspector Report for Week Ending March 10, 2017

Tritium Safety Basis: SRNS nuclear safety personnel briefed tritium managers on the potential facility modifications and analytical techniques that could be used to reduce the high calculated collocated worker dose, which will be included in the upcoming safety basis update (see 11/12/16 report and 1/7/16 Board report). Each of the potential reductions discussed are long-term efforts that would not be able to be put in place or acted upon until after the planned safety basis submittal this summer. SRNS will be briefing NNSA on their recommended path forward.

H-Canyon Exhaust (HCAEX) Tunnel: SRNS completed compressive strength testing of 16 additional concrete cores from the north wall of the personnel tunnel (see 1/13/17 and 1/20/17 reports). The test results yielded low compressive strengths similar to the north wall cores previously examined (average of roughly 2200 psi). SRNS personnel are still planning to remove concrete cores for compressive testing from one additional location, as well as remove the last 12 inches of concrete from the 6 core drills in the north wall separating the personnel tunnel and the H-Canyon crossover tunnel, which is exposed to the HCAEX air. Additionally, SRNS plans to have the concrete from the last 12 inches which have been exposed to the HCAEX air examined by SRNL and the US Army Corps of Engineers to better understand the degradation. Once all of the evaluations are complete, currently scheduled for June 2017, SRNS plans to evaluate what impacts this new information will have on the structural analyses of the H-Canyon structure and the exterior HCAEX Tunnel.

Safety Bases: The four Potential Inadequacies in the Safety Analysis discussed last week (L-Area, Tank Farms, Defense Waste Processing Facility, and Saltstone) were declared positive Unreviewed Safety Questions this week.

H-Tank Farms: Based on the configuration of the 3H Evaporator pot, visual inspections of the leak sites, and ultrasonic testing data for the walls, SRR believes the leaks were caused by erosion from the operation of the steam lance. The steam lance's nozzle is very close to the wall near the bottom of the pot's cone and the steam velocity of this lance is more than double previous designs. SRR's subcontractor has proposed sliding a ~3/8" thick Hastelloy G30 cone over the bottom several inches of the pot and welding it with a robot using powder-injection laser welding. (See 2/17/17 report).

Work Instructions: In response to several Technical Safety Requirement violations and other conduct of operations events (see 7/1/16 and other reports), SRNS Environmental Management Operations is implementing several initiatives. One will require the cognizant system/design authority engineer to include a safety system impact statement in the work instructions describing how the work scope could impact the features of safety systems. Another one will require that all lockout/tagout instructions and work instructions that require a shift manager to evaluate Limiting Condition for Operation (LCO) entry to include the applicable LCO numbers and titles. The shift manager would still be responsible for determining which specific LCO conditions to enter as well as other LCO conditions that may be applicable based on the current situation.

Tritium Extraction Facility: A resident inspector observed workers cutting up tritium-producing burnable absorber rods and their response to a rod gripper control drive fault and a failed recovery.