DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 21, 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 July 21, 2017

Tritium Extraction Facility: Tritium Extraction Facility (TEF) personnel performed a system check on an induction heating system that resulted in smoke and the evacuation of TEF. Although TEF personnel developed a work package and hazards analysis for the electrical set up of the power source, they failed to perform any documented work planning or hazards analysis associated with the actual system check. TEF personnel did, however, discuss the plan and hazards during the pre-job brief. A TEF engineer directed the system check be set up on a painted piece of steel in the cask decontamination area which was posted as a contamination area. The TEF engineer determined that the paint on the steel piece had a smoking point of 250°F above the expected maximum temperature of the system check, 200°F. The thermocouple that measured the temperature during the test was not properly seated and read approximately 160°F when the smoke alarm actuated. TEF personnel immediately halted the test.

Savannah River National Laboratory (SRNL): SRNL personnel performed a systems check on an electrolytic dissolution experiment. After completion one of the principal investigators (PI) noticed that the clips on the electrical leads connecting a new power supply (capable of 36 volts and 40 amps) to the electrodes were melted and discolored. SRNL personnel later determined that the current used exceeded the amperage capacity of the electrical leads. Before beginning the system check, the PIs requested a final acceptance inspection of the system. The evaluators deemed the system satisfactory for normal operations, pending an electrical evaluation of the new power supply. However the PIs believed the electrical evaluation was only required before beginning the actual experiment and did not recognize that this was intended to preclude performing the system check. Additionally, the hazard analysis (HA) for this experiment was improperly completed. The new power supply is not approved by a Nationally Recognized Testing Laboratory, but the HA was completed as if it had been. If the corresponding HA question had been answered appropriately it would have directed the PIs to ensure that a qualified person performed an Electrical Safety Evaluation per an SRNL procedure. The SRNL procedure includes a recommendation to evaluate all electrical connections to the equipment.

H-Area New Manufacturing (HANM): A HANM control room operator (CRO) inadvertently blew a rupture disk when performing loading activities. The CRO checked off each valve listed in the procedure but failed to actually open one of the six valves listed when performing the step via the distributed control system (DCS). The CRO did not notice they missed a valve before turning on the compressor that eventually pressurized the system and blew the rupture disc. Although it is the expectation of HANM management that CROs perform a "walkdown" of the path via the DCS prior to initiating any gas transfers, one was not performed in this instance. A similar event occurred as recently as March 2017 when a CRO incorrectly assumed the system was correctly aligned prior to transferring waste gas. HANM management has now implemented a temporary requirement for CROs to discuss task previews and expected system response with management or designee prior to initiating all transfers.