DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 12, 2021

TO: Christopher J. Roscetti, Technical Director
FROM: M. T. Sautman and Z. C. McCabe, Resident Inspectors
SUBJECT: Savannah River Site Activity Report for Week Ending March 12, 2021

Tank Farms: Processing recycle solutions from the Defense Waste Processing Facility (DWPF) in the 2H Evaporator results in the buildup of a sodium aluminosilicate scale. The evaporator is periodically cleaned and two samples are required before cleaning to determine U-235 enrichment and uranium loading. Typically the scale contains less than 8.9wt% uranium (although one 2017 sample showed 16.8wt% uranium). If fuel is dissolved in H-Canyon and transferred to Tank Farms without separating the fissile materials, the U-235 enrichment in sludge batches (and thus DWPF recycle) would increase. (Evaporator feed limit is 5.5% U-235 enrichment). To accommodate the anticipated increases in uranium, SRR is proposing to clean the evaporator scale using gadolinium nitrate to ensure the dissolved scale is poisoned before the solution is neutralized. SRR is not planning to change the 300 gallon scale limit.

Savannah River Tritium Enterprise (SRTE): The resident inspector observed operations in the control room at H-Area Old Manufacturing and reviewed the procedure for the ongoing fire patrol driven by the Technical Safety Requirements. The resident inspector noted that a procedure step to document the justification for reducing the frequency in the comments section had not been performed. The resident inspector also noted a conditional sub-step that is dependent on the first performance of the fire patrol under a step that directs the user to perform the sub-steps before beginning the first fire patrol. The resident inspector discussed these observations and others with SRTE management.

Savannah River National Laboratory (SRNL): A laboratory technician in B-Wing was preparing samples for analysis using a Meker Burner in a radiological hood. The technician began affixing the second set of radiological samples to steel plates for analysis when there was an unexpected flare up in the hood. The technician quickly removed their hands from the hood and turned off the propane supply to the hood which extinguished the flame. They then contacted shift management and exited the area. Investigation after the fact found that the hose that connected the Meker Burner to the propane inlet barb inside the hood was loose. No contamination was spread as a result of the event. SRNL personnel have since isolated the propane supply to the facility and suspended all propane activities until an investigation is completed. SRNL personnel have since determined that there is no SRNL specific requirement to use hose clamps for flammable gas hoses; however, it is a requirement for a fire protection code that is not yet fully implemented. SRNL personnel have secured flammable gas hoses with clamps that were identified during an extent of condition.

H-Canyon: H-Canyon declared a potential inadequacy in the safety analysis last week regarding the omission of a vessel deflagration contribution to the dose consequence calculation (see 3/5/21 report). H-Canyon personnel determined that this represented a positive unreviewed safety question. In doing their review, they also identified two additional non-conservatisms in the calculation. Specifically, a calculation error counted a tanks contribution to the dose as zero, and the bounding concentration for a 100 liter spill was not used.