DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 18, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: M. T. Sautman, Resident Inspector
SUBJECT: Savannah River Site Activity Report for Week Ending July 19, 2019

Tank Farms: Prior to initiating saltcake interstitial liquid removal activities, a specific administrative control requires a determination if the activity will cause the waste tank to enter gas release mode (GRM). (GRM invokes special limiting conditions for operations for waste tank purge ventilation and hydrogen monitoring that include safety class interlocks). Tank 37 is the drop tank for the 3H Evaporator. Based on a May 2019 camera inspection, SRR assumed the bulk saltcake level in Tank 37 was 295 inches. Last week, during a supernate transfer out of Tank 37, SRR began a camera inspection when the tank level was ~297 inches to ensure the bulk saltcake layer was not uncovered. However, the camera inspection found that the bulk saltcake layer was already uncovered and thus interstitial liquid was being removed without SRR having performed the required without the GRM determination. Upon notification, the control room stopped the ongoing transfer and evaporator run. A subsequent camera inspection identified that the bulk saltcake layer extended to 337 inches. Evaporator operation subsequent to the May inspection likely resulted in the increased height of the bulk saltcake layer despite some flush water additions to Tank 37, which could have dissolved some salt. Performing the evaluation using the prescribed conservative methodology would have required them to enter GRM. Looking at the actual size of the exposed mound, SRR believes the estimated volume of hydrogen released was likely minor and routine measures of hydrogen did not detect an increase in concentration.

Salt Waste Processing Facility: As part of their process of achieving readiness, Parsons began their Management Self-Assessment-3 (MSA-3) review, which will consist of two weeks of field activities. The Resident Inspector (RI) observed an emergency preparedness exercise that Parsons conducted for the MSA-3 team. The exercise scenario simulated a release of trapped hydrogen gas from the Sludge Solids Receipt Tank that leads to a deflagration in the Process Vessel Ventilation Header and a breach of the high-efficiency particulate air filters. The scenario also included a maintenance worker inside a contamination area with a simulated head wound. Parsons is currently evaluating the performance of this exercise.

Savannah River National Laboratory (SRNL): The quarterly reading of a lab employee's thermoluminescent dosimeter (TLD) exceeded the site's 500 mrem administrative control limit. Tests indicate the TLD is functioning normally. The dose is much greater than what he would be expected to receive from his work and offsite activities. The dose amount and type (high energy gamma ray) is inconsistent with an extensive list of potential accidental exposure scenarios.

Recommendation 2012-1: The RI reviewed the technical basis for changes SRNS is proposing for recalculating the dose consequences of a seismic event and/or fire at 235-F. The changes reflect recent non-destructive assay results, DOE Handbook values, remediation experience, and what SRNL expects the properties and behavior of Pu-238 to be after extended storage and exposure to humidity. The RI noted that sample data could help confirm whether agglomeration and surface adhesion would reduce the damage ratio and respirable fractions as expected.