

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 13, 2018

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman and Z. C. McCabe, Resident Inspectors
SUBJECT: Savannah River Site Activity Report for Week Ending April 13, 2018

Savannah River National Laboratory (SRNL): A SRNL scientist exceeded their radiological work permit suspension guide for extremity dose after an evolution involving an acidic solution with high mercury and strontium (Sr) content. As part of the process, the scientist dripped the sample solution into 50% sodium hydroxide, which caused the Sr to precipitate and concentrate at the bottom of the container. Initially, the homogeneity of the solution and the shielded container shielded the dose rate from the Sr-90 content, which was originally measured at approximately 30 mRem/hr on contact. After completion of the evolution, the solution was in an unshielded container with the Sr concentrated at the bottom, which resulted in a significant increase of the radiological dose to 14000 mRem/hr on contact at the bottom of the container. The scientist bagged out the container from the radiological hood without surveying. Afterwards, a radiological protection inspector measured the dose rate and determined that the suspension guide of 1500 mRem/hr had been exceeded.

The resident inspector has several concerns regarding how this event investigation occurred so far. During the week between the issue review (IR) and event, SRNL personnel held an internal investigation, a preliminary causal analysis, and determined immediate corrective actions. While performing the investigation, SRNL personnel seemingly did not ask probing questions regarding the evolution and were unable to answer fundamental questions when asked during the IR. For instance, was the precipitation of the Sr an expected result of the process? Or have they had similar results previously? Additionally, it was not until DOE-SR representatives asked during the IR if this evolution had been put on hold that SRNL personnel determined it was necessary to put it on hold until they fully understood the issue and put the appropriate controls in place. Further, when the resident inspector inquired about the hazard analysis for this evolution it was evident that the SRNL team that investigated the event had not reviewed it. These issues appeared to be exacerbated by the fact that the SRNL personnel involved in the evolution were not present and the applicable documents were not provided or discussed in detail at the IR. Following the IR, DOE-SR has raised several concerns to SRNL personnel who have determined they will re-perform the IR next week.

Defense Waste Processing Facility: The Resident Inspector (RI) observed several training sessions related to implementation of Technical Safety Requirements (TSRs). As part of remediation training for the individuals involved with the TSR violation last month, trainers conducted five tabletop scenarios involving the implementation of Limiting Conditions for Operation (LCO). Next, the individuals went through a 6-hour evaluated demonstration where they conducted a shift turnover (where they needed to identify a discrepancy in a LCO entry time) and then had to respond in the simulator to three scenarios involving equipment issues and LCO entries. Finally, the RI observed portions of a day-long continuing training session to a shift crew on general LCOs and surveillance requirements and a detailed discussion on how a purge LCO works. The crew was also going to split into teams to answer several scenario questions on the purge LCO.