

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2015

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman, D. L. Burnfield, and Z. C. McCabe, Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending December 18, 2015

HB Line: Although normal Phase II plutonium operations will likely not resume until February, SRNS attempted to perform a single ion exchange column run this week to ensure that the nitric acid concentration in a column feed tank remained below the specific administrative control limit. This process consists of four phases: acid reconditioning, plutonium (Pu) loading, product decontamination, and Pu elution. In the first three phases, nitric acid or feed solution is pushed up through the ion exchange column with a pump while in the last phase, acid gravity drains through the ion exchange column. Normally, the entire process can be performed during a single shift. However, this time repeated open circuit detected (OCD) alarms were received from a colorimeter, which is only credited during elution. Normally, this indicates a problem with the measured plutonium concentration relative to the measured range. However, throughout these evolutions, air trapped inside the piping appears to have caused the OCD alarms. Workers repeatedly confirmed the presence of these air bubbles in the sight glasses. Prior maintenance on part of the piping likely resulted in some of this air becoming trapped, but this maintenance would not have affected the piping used for transferring the feed solution. That section of piping had not been used since last January and the source of that trapped air is under investigation. Each time the alarms started to occur, the operators would pause the operation until the shift operations manager, process/system engineers, safety analysts, and management could discuss what happened, identify potential causes, discuss likely hazards, and identify what changes were needed for the procedure and process software to allow processing to resume. In several cases, certain cycles were either shortened or skipped to allow acid solution to flow through the column and flush out trapped air. One concern that SRNS wanted to resolve before loading the column with plutonium was whether the trapped air could cause a vapor lock during elution, which relies on gravity flow. Now that this concern has been addressed and most of the trapped air has been removed, SRNS will reattempt the column run next week.

F-Area: Operations personnel were replacing 18 High Efficiency Particulate Air (HEPA) Filters in the F/H Lab. The site had procured an adequate supply of filters, but failed to store the filters in the required storage area. Some of the filters were damaged while in storage. When the first line manager determined that he did not have the correct number of filters he installed a filter that was not on the bill of materials. He did not bring this substitution to the attention of management or engineering although he had adequate opportunities to do so. Fortunately, engineering later evaluated the replacement filter and determined that it was acceptable for use as installed.

235-F: F-Area personnel conducted a facility walkdown to examine the maintenance side of the shielded cells in the Plutonium Fuel Form Facility after providing lighting for the cells. SRNS will need to use several of the glove-ports and bag-out ports on this side of the cells to reduce the material at risk (MAR). A number of these ports are currently unusable because of cracked glass, opaque windows, or contamination that has not been fixed. SRNS is developing a plan to correct the deficiencies before MAR reduction begins next year.