DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 5, 2014

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman and D. L. Burnfield, Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending December 5, 2014

Messrs. Sircar and Shrestha were on site reviewing the Defense Waste Processing Facility safety basis.

Tank 48: Tank farm personnel recently observed two apparently unrelated events. The first event involves a leak of chromate water from the cooling coils. Photographs from inside the annulus clearly indicate that the cooling coils are leaking from near the top of the tank. No liquids were observed in the bottom of the annulus. Independently, SRR personnel attempting to take a dip sample from the tank noticed that the radiation dose rate readings at the top of the riser were approximately 3 rem/hour in lieu of the normal 30 mrem/hr. A video of the tank interior indicates that a thin layer of solids resembling popcorn or oatmeal is floating on the surface of the tank. SRR took a turbidity measurement of the tank, which shows that a majority of the solids is still near the bottom of the tank. SRR also took a dip sample of the solids that was sent to SRNL for analysis. One theory for the increased dose rates is that the floating solids contain Cs-137, which is normally found in the precipitates at that bottom of the tank, however, the composition of the floating solids is not yet known. So far, SRR has not identified any immediate safety concerns such as a buildup of hydrogen or benzene in the tank.

Issue Reviews: The site rep observed two issue reviews this week. In the first, an unknown concrete duct containing a 13.8 kilovolt power line was unearthed during an excavation outside H-Canyon. The site maps and drawings did not indicate that this line was at this location and the ground penetrating radar also did not detect the duct. The line powered safety systems in HB-Line. The construction crew took the correct actions as soon as they discovered the duct and follow up actions were appropriate.

In the second, HB-Line management suspended processing when the flexible tube connecting the filtrate tank transfer pump to H-Canyon ruptured. The pump in this transfer system is a peristaltic (positive displacement) pump and it is isolated by two ball valves. Over the weekend, a mechanic replaced a broken valve handle on the downstream isolation valve. The design of the valve has a flat surface on the stem that allows the setscrew to hold the handle in place. However, the flat surface is not dramatically evident, and the handle is capable of being inserted incorrectly onto the stem. On ball valves, the handle of the valve is used to indicate whether the valve is open or closed. The mechanic turned the valve handle 90° during maintenance and then installed the handle incorrectly so that it was closed while indicating that it was open. Operation of the peristaltic pump while the downstream valve was closed caused the tube to over pressurize. HB-Line personnel correctly identified several issues to address during the issue review.

The conduct of both issue reviews could have been improved. For example, H-Canyon facility management could have included drawings, procedures, personal statements, and photographs to better show how the first event occurred. In the second one, the issue review team focused on corrective actions too early in the process and did not review technical manuals. Furthermore, they did not discuss how a revised valve design and weaknesses in the prejob brief contributed to the event.

Oral Boards: Some facilities would benefit by better defining the expected minimum level of knowledge for board questions because there appears to be a sizable gap between some candidate's responses, the answers in the oral board package, and the grades assigned by board members. Other weaknesses observed in recent oral boards include a lack of scenario based questions for those positions that fulfill a command function and ensuring that the candidates are adequately prepared for the board.