

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 13, 2015

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 November 13, 2015

A headquarters team conducted the third phase of their review of the nuclear criticality safety programs at H-Canyon and HB-Line.

SRNS Operations: Recent actions and events include:

- The tritium facilities and the Savannah River National Laboratory exited deliberate operations.
- During annual fire system testing at HB-Line (a Technical Safety Requirement surveillance), SRNS identified that a smoke detector was missing from the test procedure. It appears that this detector was also missing from last year's surveillance procedure although it is listed in a procedure for a different surveillance.

Defense Waste Processing Facility (DWPF): An operator was refilling the Formic Acid Feed Tank with 90% formic acid when she reported that the distributed control system would not respond to her commands to either close two valves or stop the transfer pump. The pump continued to fill until the hi-hi interlock activated, closing the two valves before the tank overflowed. A short time later, another operator informed the shift operations manager (SOM) of a strong smell on the third level of DWPF. Suspecting it was formic acid, the SOM sent another worker to sample the air with Draeger™ tubes. When sampling confirmed that the air concentration was ≥ 5 ppm (the SRR trip point), the SOM ordered the evacuation of DWPF and called the SRS Hazardous Material (HazMat) team. After a prejob briefing, the HazMat team entered the area, detected formic acid in the air that maxed out their sampling tubes (i.e., 15 ppm or greater), found a puddle on the floor (estimated size 12 ounces), and confirmed it was acid with pH paper. As soon as the spilled solution was neutralized with a sodium bicarbonate solution, airborne concentrations dropped to 2.35 ppm. Subsequent entries by SRR personnel have identified a pinhole leak site and found that some of the formic acid contacted nearby pipes and started corroding them until the acid was neutralized. It is not known why this stainless steel pipe failed and limited non-destructive examinations have not identified thinning in accessible sections of the formic acid piping. The failed pipe is in an area that is very congested with other piping, which is making its repair challenging. Repair of this pipe is critical to ongoing DWPF operations since formic acid is used as the reductant. SRR is also investigating why the DCS screen apparently froze in the middle of a solution transfer.

Tritium Extraction Facility: The cutter head for the Tritium Producing Burnable Absorber Rods (TPBARs) requires periodic repair/replacement to provide optimum cutting during the processing of the TPBARs. To complete this maintenance, the operator must move the cutter head from its normal location into the remote handling area using one of the 1-ton monorail hoists that are attached to the 30 Ton Remote Handling Cane. To place the hoist in position the crane operator was traversing the crane across the room and attempting to lower the eastern hoist. The lowering of the eastern hoist was a blind movement for the first several seconds since none of the cameras were positioned in a way that they would allow viewing of that hoist. The crane operator incorrectly lowered the western hoist that had not yet cleared the shield wall. This action resulted in the anti-fouling device located on top of the hook catching on the top of a shield wall. A sideward force was applied to the cable and the hoist as it traversed the room and the cable was bent and sustained damage to the wire fibers. Also, the hook sustained damage and possibly the hoist as well. Once the operator understood that he had lowered the wrong hoist, he immediately stopped the pull and called a time out. Supervision was notified, and the crane and hoist were returned to the crane maintenance area for inspection.