

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 12, 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 June 12, 2015

T. Davis, C. Beaty, M. Forsbacka, and A. Nigh were onsite to review the adequacy of the L-Area Documented Safety Analysis.

H-Canyon: SRNS inserted another robotic crawler into the H-Canyon exhaust air tunnel in order to retrieve the previous crawler, which had flipped onto its side, and continue the video inspection of the tunnel's condition. The new crawler was able to rotate the previous crawler into the upright position, but the old crawler tipped over again. SRNS was able to maneuver the new crawler around the old one though and managed to inspect several previously uninspected parts of the tunnel, although a duct still blocked some of the view. (See 1/6/12, 9/6/13, and 6/6/14 reports).

Mercury: SRR believes that methyl mercuric hydroxide and nitrate will be the most likely monomethyl mercury species in liquid waste (see 4/17 report). SRR expects these species to behave like a salt (i.e., are not volatile) due to their low vapor pressures, low Henry's Law coefficients, and water solubility. Furthermore, SRR expects that elemental and dimethyl mercury will have much lower concentrations than the monomethyl mercury species. In their Evaluation of the Safety of the Situation for Saltstone, SRR stated that treating monomethyl mercury as a non-volatile solid versus a volatile liquid allows the concentration of monomethyl mercury to be significantly increased without exceeding the protective action criteria-3 threshold value during an accident. SRR is planning to revise the Saltstone Waste Acceptance Criteria to require the periodic sampling of dimethyl and total mercury. SRR also resumed operation of the Modular Caustic Side Solvent Extraction Unit (MCU) after data indicated that it is unlikely that MCU is generating methyl mercury.

Defense Waste Processing Facility: SRNL testing indicates that the antifoam agent can degrade into flammable compounds like hexamethyldisiloxane (HMDSO) and to a lesser extent trimethylsilanol (TMS) and methoxytrimethylsiloxane (MOTS) (see 5/14 and 5/22 reports). HMDSO has been found in the Sludge Receipt and Adjustment Tank (SRAT) and Slurry Mix Evaporator offgas and low concentrations of HMDSO and TMS may be present in the condensate phase. The applicability of SRNL test data to DWPF is uncertain since the SRNL test involved an antifoam addition rate ~60X faster. SRR and SRNL are investigating data that suggest the HMDSO peaks may depend on how fresh the antifoam is, whether the antifoam was added before boiling began, and the impact of dumping versus pumping the antifoam. SRR is also evaluating whether their current purge rates are adequate to handle any HMDSO peaks. DWPF operations remain on hold due to mercury and antifoam concerns.

HB-Line: SRNS is adding spiked solution to tanks to demonstrate that recirculation/agitation is providing proper mixing. A comparison of the initial and final plutonium concentrations and molarities in a concentrate tank showed that the final values were consistent with the calculated values and statistically different from the initial sample results (see 4/24/15 report).