

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 17, 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 April 17, 2015

Mercury (Hg) in Liquid Waste System: SRR has been evaluating the impacts of mercury to safety, processing, and equipment. Recent analysis of Tank 50 waste indicated significantly higher than expected concentrations of monomethyl mercury (MeHg). Last week, SRR declared a Potential Inadequacy in the Safety Analysis for Saltstone and this week upgraded this issue to a positive Unreviewed Safety Question. The chemical accident analysis considered all Hg as volatile (including the MeHg salts that have been detected). When the increased MeHg concentration is applied, the Protective Action Criteria-3 is exceeded. SRR is trying to develop a technical basis to justify treating MeHg salt as non-volatile. SRR is also investigating whether the high percentage of MeHg (rather than elemental Hg) in Saltstone leachate is responsible for the significant increase in Hg found in Toxicity Characteristic Leaching Procedure (TCLP) tests of Saltstone grout. Resolution of these two issues may impact Saltstone processing for several months. (See 1/9, 1/16, 2/6 and 4/10/15 weekly reports)

Meanwhile, SRR is sampling waste from several locations including waste tanks in order to determine the sources of Hg and understand how its speciation may change as waste moves through the liquid waste system (e.g., Modular Caustic Side Solvent Extraction Unit, Defense Waste Processing Facility recycle water, evaporators). While industrial hygiene monitoring has not detected any airborne Hg concentrations that would be harmful to facility workers, SRR is conducting testing of gloves to ensure they protect the workers since MeHg is a dermal exposure hazard. Finally, SRR is also working with the Savannah River National Laboratory and other laboratories to have Hg subject matter experts review their path forward.

H-Canyon: The Head End process is used to decontaminate and clarify dissolved spent fuel solutions for subsequent solvent extraction processing. This week, SRNS conducted the Head End process for the first time in several years. The process went smoothly although there was a last minute decision to add some water to the strike tank due to the amount of evaporation that had occurred during the last few months.

Tritium: During a monthly functional check of the oxygen (O₂) monitor for Glovebox-RA, the oxygen level read lower than expected. SRNS entered a Limited Condition of Operation (LCO) for the defective monitor and placed it out of service. SRNS personnel are performing hourly glovebox O₂ measurements, using the alternate monitoring equipment, in compliance with the requirements of the LCO and have written a work request to repair the O₂ monitor. There are numerous monitors throughout the tritium facilities and the failure rate is known to be higher than desired. The site has a program in place to upgrade the monitoring systems by moving the monitoring equipment (except the sensors and the sample pump) outside the gloveboxes. The first of those systems is scheduled to be in place within a month and the next should begin operation early next fiscal year. SRNS will replace the remainder of the systems as budget and schedule allow.