DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 16, 2015

TO: S. A. Stokes, Technical Director
FROM: D. L. Burnfield, Site Representative
SUBJECT: Savannah River Site Weekly Report for Week Ending January 16, 2015

Tank Farms: SRR personnel were operating the purge ventilation for H-Area Diversion Box 2 (HDB-2) as part of a limiting condition of operation (LCO). One of the conditions associated with this LCO precludes transfers into the diversion box. While assisting in the performance of rounds, a field operator requested permission to empty an H-Area Pump Pit (HPP-3) sump. Recognizing that this action would violate the conditions of the LCO, the lead control room operator (CRO) denied permission to empty HPP-3. Neither the lead CRO nor the field operator used the required communications protocol and the field operator inappropriately emptied the HPP-3 sump. The site rep discussed this event with the facility manager and believes that appropriate actions are being taken to correct this situation.

Engineering is reviewing the safety basis as part of a Safety Basis Improvement Plan (SBIP). As part of this review, site personnel found that a previous revision of the analysis had failed to properly account for the collocated worker dose in at least three instances. While the projected dose does not exceed the evaluation guideline of 100 rem TED, it is nevertheless greater than 0 rem TED and therefore results in a Potential Inadequacy in the Safety Analysis (PISA).

- Section 3.4.2.3 of the documented safety analysis (DSA), *Evaporator Overflow Leaks and Spills,* contains multiple sub-accidents associated with evaporator overflows, leaks, and spills. The analysis states that the mitigated onsite consequences for the bounding event in the 2-H evaporator cell are zero because the event is prevented. However, the credited controls for the transfer jumper leak/break do not prevent other sub-accidents documented in the DSA.
- Section 3.4.2.4.4 *Consequence Analysis for the Evaporator Overpressure accident* has similar statements for the overpressure accident in the 3-H evaporator and eliminating the bounding accident does not take the mitigated consequences to zero because there are other energy sources assumed present in the scenario progression that are not mitigated.
- Section 3.4.2.13 Waste Tank / Pump Tank Overheating also contains multiple sub-accidents associated with waste tank / pump tank overheating accident that are not precluded by the controls that eliminate the bounding accident.

The site rep has reviewed these events with tank farms management. The discovery of events such as these, while unfortunate, does indicate that engineering is taking a hard look at the current inputs and assumptions. Engineering is continuing with the SBIP effort

Tank Farms personnel declared a PISA when an excessive quantity of mercury was found to be in the 3-H evaporator mercury removal tank. (See 1/9/15 report.) The current SRR procedures require frequent draining of the evaporator mercury removal tank (MRT) in order to preclude more than 1.3 L of mercury being present since they have only analyzed this amount of material in the safety analysis. On January 7, they found nearly 6 L of mercury in the MRT. SRR has taken appropriate compensatory measures to limit the potential for fire and preclude large volumes of mercury in the MRT to allow evaporator restart.

Tank Farms personnel have determined that there is a leak in either the 2-H evaporator gravity drain line (GDL) jacket or the associated clean out line. While SRR has not yet found the source of the leak, the initial indications are that it may be in the clean out line. SRR will attempt to perform further troubleshooting to find the source and either repair the leak or plug the clean out line since it is not required. In the meantime, the GDL is plugged and must be hydrolanced by a subcontractor. Also, the tube-bundle requires de-salting and de-scaling before the evaporator can resume operation.