DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 13, 2017

TO: S. A. Stokes, Technical Director
FROM: M. T. Sautman and Z. C. McCabe, Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending January 13, 2017

H-Canyon Exhaust Tunnel: In a letter dated 12/16/15, the Board raised an issue concerning the unjustified use of a 20% increase in concrete compressive strength in the structural analysis of the safety class H-Canyon exhaust (HCAEX) tunnel. In response, SRNS is taking concrete cores from the personnel tunnel in order to determine the compressive strength of concrete exposed to the HCAEX air and backfilled soil. The personnel tunnel shares its northern wall with the HCAEX crossover tunnel, which has the same environment as the HCAEX Tunnel. The other side of the southern wall of the personnel tunnel is backfilled with soil. SRNS has removed and tested 20 cores from the southern wall and 11 cores from the northern. The southern wall cores yielded results consistent with SRNS expectations. However, the northern wall (HCAEX air side) core tests have revealed an average concrete compressive strength of approximately 2200psi, which is significantly lower than the assumed strength of 3000psi. At this time SRNS does not consider this new information to invalidate the assumption that the concrete compressive strength of the HCAEX tunnel has increased to 3000psi since the initial placement in the 1950s. SRNS personnel are now planning to remove and test additional concrete cores from the northern wall at varying heights in attempt to better understand the cause of the low strength. Additionally, SRNS is planning to perform a non-linear analysis of the HCAEX tunnel assuming the worst case conditions. It should be noted that SRNS personnel have not yet taken concrete cores through the entire thickness of the north wall, leaving approximately 12 inches of concrete between the personnel tunnel and the HCAEX crossover tunnel which is exposed to the HCAEX environment. SRNS plans to remove the remaining 12 inches for testing once the proper radiological control and fire protection measures are taken. These remaining test results will provide additional data on the concrete compressive strength as well as be used to characterize the effects of the HCAEX air on the concrete and the depth of those effects.

Fire Protection: The H-Area Old Manufacturing Technical Safety Requirements (TSR) include a surveillance requirement to perform a visual inspection of the sprinkler heads visible from the floor for each fire suppression system. This requirement is derived from NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.* SRNS declared a TSR violation after identifying that the surveillance procedure said seven sprinkler heads were located in a room when the actual number was eighteen. An investigation identified that the number was not updated when modifications were made in 2008. In addition, the numbers listed for several rooms were incorrect, but a procedure note stated that the number of sprinkler heads was only provided as a general guideline of how many were visible. Based on reviews of past surveillance datasheets, inspectors were not consistently inspecting the same number of sprinkler heads each year. SRNS will be conducting comparisons of the field, system drawings, and surveillance procedures to ensure the correct number of sprinkler heads is listed for each safety system within SRNS.

Defense Waste Processing Facility: SRR conducted an emergency preparedness drill that simulated a Low Point Pump Pit sludge pump tank deflagration with a filter fire. What was unusual about this scenario is that it took place 18 hours after a simulated tornado damaged the ventilation system and nitrogen purge, allowing flammable gases to accumulate. The scenario revealed that some shift managers were not familiar with operational emergencies, which are used for events that do not align with an emergency action level.