DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 16, 2011

TO: T. J. Dwyer, Technical Director
FROM: M. T. Sautman and D. L. Burnfield, Site Representatives
SUBJECT: Savannah River Site Weekly Report for Week Ending December 16, 2011

Fire Protection: A recent fire system test in H-Area not only started up the electric fire pump, but also the two diesel fire pumps. The SRS Operations Center (SRSOC) did not acknowledge this signal nor inform Utilities Operating Services (UOS) that the diesel fire pumps were still running when the test was completed. It took 9.5 hours and two alarms in the SRSOC, a low level (<90% full) firewater tank alarm and a trouble alarm, before UOS discovered that the diesel fire pumps were operating and depleting the firewater (to cool the pumps). SRNS is implementing corrective actions to improve alarm response and the interface between the SRSOC, UOS and the tritium facilities (which requires a minimum of 250,000 gallons firewater).

Tritium Facilities (TF): SRNS planned to eliminate a known hazardous condition by performing corrective maintenance (CM) on equipment near a high voltage transformer in December 2010. Since this CM required an outage, SRNS decided to delay it. TF personnel entered the condition of the equipment in the database and hung a tag on the equipment identifying the required CM. During the past year however, the condition of the tag deteriorated until it was essentially detached. This month, a UOS planner planned an unrelated preventative maintenance (PM) on the transformer, after being told TF personnel had not performed the necessary planning. However, the planner did not know of the required CM, failed to see the tag or otherwise account for the remaining hazardous condition, and did not specify the correct controls. During a pre-job walk-down of the job site on the morning the job was to be completed, an alert first line manager identified the hazardous condition. He paused the job until the correct planning could be accomplished, thus delaying the PM. As with the fire protection item above, strengthening the interface between UOS and tritium will also reduce the recurrence of this type of event.

L-Area: At DOE's request, SRNL and L-Area Engineering developed augmented surveillance plans for the storage of spent nuclear fuel in L-Area. One plan recommends selecting nine aluminum-clad fuel assemblies for visual inspections using underwater video cameras to identify corrosion or degradation of the fuel. For fuel stored in isolation cans, another plan proposes compiling historical information about the fuel, using a literature search to evaluate fuel corrosion, conducting thermodynamic and kinetic corrosion evaluations, and modeling the expected fuel can contents. SRNS would develop and test protocols for using a radiation field detector and ultrasonic testing to indirectly examine the isolation cans and look for water intrusion in sealed cans. Ironically, the fuel being inspected (i.e., Al-clad) is the fuel whose initial condition and corrosion behavior is well known, which is in direct contact with the basin water controlled to minimize corrosion, and which is the most likely to be processed. Meanwhile the stainless-steel clad fuel in isolation cans is often old, failed or sectioned fuel whose initial condition is not well known and whose disposition path is highly uncertain. The fuel in some of these isolation cans is in contact with the same water present when it was packaged decades ago when water chemistry was not as tightly controlled. In other cases, the metal fuels in sealed cans could react with water if the old seals failed. Trying to accurately predict the current condition of these stainless steel clad fuels and their suitability for continued storage without any inspections will be a challenge (see June 10, 2011 report).

Defense Waste Processing Facility: SRR operators failed to close the nitric acid addition valve to the Slurry Mix Evaporator Condensate Tank (SMECT) upon completion of an acid addition. When the next shift started operations, they added nitric acid to the Sludge Receipt and Adjustment Tank (SRAT) and unexpectedly transferred acid to the SMECT as well as the SRAT. The operator noticed that a problem had occurred when the nitric acid feed tank reached its low-level point. The procedures did not adequately specify that the operators verify the valve line-ups and no interlock was installed to prevent both the SRAT and SMECT addition valves from being open at the same time.