DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 2, 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 2, 2011

H-Canyon/HB-Line: DOE directed SRNS to immediately initiate preparations to begin processing the Sodium Reactor Experiment (SRE) used nuclear fuel (UNF) by May 31, 2012 and to discard the resultant solution to the liquid waste system. The SRE fuel consists of decladded thorium/uranium metal fuel, which could react with water if its storage can leaked (see 6/10/11 report). To avoid forming a non-Newtonian solution during waste transfers, SRNS will need to dilute the dissolved SRE fuel with dissolved high aluminum content UNF and depleted uranium. The letter only addresses preparations; DOE will authorize the start of processing later. In addition, DOE wants the previously requested H-Canyon resumption plan (see 7/1/11 report) to focus on unit operations like first cycle, second uranium, and second plutonium solvent extraction which are not needed to support the SRE and plutonium processing missions (see 10/28/11 report). Finally, DOE wants SRNS to conduct several additional vacuum salt distillation runs at SRNL and HB-Line to prove that it can remove fluoride from plutonium.

Transuranic (TRU) Waste: SRNS briefed the site reps on their preparations for remediating very difficult TRU waste. This waste poses several challenges: resizing remote-handled filters; opening unvented, stainless steel boxes that are welded shut; handling deteriorated casks full of poorly characterized hot cell waste; and remediating drums with 400 – 1160 grams fissile Pu-239 equivalent. SRNS will remediate this waste in E-Area, F- and H-Canyons, and HB-Line.

Defense Waste Processing Facility: The site rep began a review of issues that could affect the reliability of process safety equipment. Topics include equipment with persistent calibration issues, impaired alarms, fire impairments, maintenance (corrective maintenance backlog and deferred, delinquent, or canceled preventive maintenance), activation of process alarms and interlocks, and disposition of nonconformance reports (NCR). The review is ongoing, but some preliminary observations and potential issues include:

- The corrective maintenance backlog increased 27% over a 12-month period. Cause(s) being investigated.
- 3% of preventive maintenance is deferred, but justifications were usually reasonable.
- Currently both the melter glass level hi and hi-hi alarms are impaired. Annunciation of the latter alarm would normally require both melter feed pumps to be stopped. Implications under review.
- 48% of NCRs dispositioned "use-as-is", but justifications made sense. Some open NCR actions extended up to 12 times with little to no justification provided.

Savannah River National Laboratory (SRNL): SRNL personnel explained their current plans for replacing hot cell windows that are leaking mineral oil. This job has the potential for elevated radiation exposures and difficult contamination control. An engineer also showed the site reps ventilation equipment deficiencies identified as part of the Board's Recommendation 2004-2, *Active Confinement Systems* and showed where they plan to upgrade existing equipment.

Site Level Procedures: The site rep identified two proposed procedure changes that could have broader implications than intended. In the first case, the definition of radiation monitoring equipment (RME) was expanded to include instrumentation used to protect the public. Since RME is not subject to nuclear quality assurance (QA) requirements, this could weaken the applicable QA requirements for this instrumentation. In the second case, an ill-defined "safety professional" would be allowed to overrule the personal protective equipment chosen during a team assisted hazards analysis without conferring with the team. In both cases it appears that the potential deficiencies were just poor wording that needed more thorough review by management.