

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 30, 2001

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
**FROM:** R. T. Davis/ T. D. Burns  
**SUBJECT:** SRS Report for Week Ending November 30, 2001

**HB-Line Phase II:** On Monday, WSRC transferred the first batch of plutonium solution into the HB-Line facility consistent with the facility startup plan (site rep weekly 11/23/01). During this evolution, operators noted a higher than expected increase in radiation rates (radiological work permit limits were not exceeded). Operators and management responded appropriately to investigate the cause of this unexpected dose rate increase. WSRC subsequently identified that the higher rates were caused by gamma emitting isotopes contained in the solution (mainly Cesium-137). Although cesium was identified in these solutions previously, HB-Line personnel were apparently not aware of this condition. Therefore, safety analyses, facility dose estimates, and facility design did not include the impacts of having Cs-137 in the plutonium solution.

WSRC has developed a path forward to evaluate and resolve facility impacts. Samples from the H-Canyon tanks containing plutonium will be analyzed to appropriately characterize the solutions. An initial evaluation of the safety analysis by WSRC indicates that the solutions will likely be within the bounds of the analysis (e.g., consequence and hydrogen generation analyses). However, the facility uses sodium iodide (NaI) detectors to monitor plutonium concentration during the process. The gamma radiation from the Cs-137 renders these instruments unusable in parts of the process. Several criticality scenarios were identified as incredible based, in part, on the use of the NaI detectors. WSRC is evaluating whether other controls may be available in lieu of these detectors.

On Friday, DOE-SR issued a letter to WSRC concerning this issue requesting a formal root cause analysis and corrective actions with scheduled completion dates. DOE-SR plans to validate the implementation of corrective actions, as appropriate, prior to resumption of HB-Line Phase II operations. As of Friday, WSRC had not issued an occurrence report for this event.

**Evaporator Feed Pump Failures:** Recently, WSRC has had difficulty sustaining operability of the 2F and 2H evaporators. After addressing issues regarding incorrectly credited vent paths and hydrogen build-up in feed line Leak Detection Box (site rep weekly 11/23/01), these evaporators were restarted on November 22. Subsequently, failure of both evaporator feed pumps led to shutdown after only 26 and 17 hours of operation for 2H and 2F, respectively.

Only one spare feed pump is currently available on-site; therefore, restart of both evaporators requires either procurement of a new feed pump or a rebuild of the failed units. Long procurement lead times make the rebuild option more attractive. However, decontamination capabilities required for pump repair are hampered by space constraints in Tank 43. This tank is both the 2H feed tank and the decontamination solution receipt tank. The current path forward is to replace the failed 2H pump with the available spare, operate the 2H evaporator to gain requisite decontamination space in Tank 43, and then rebuild a pump for 2F. WSRC expects to restore 2H to operation next week. Restart of 2F is now expected in late December.