

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 7, 2002

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
J. J. McConnell, Deputy Technical Director

FROM: R. T. Davis/ T. D. Burns

SUBJECT: SRS Report for Week Ending June 7, 2002

Safety Systems: Several weeks ago during a maintenance activity, an F-Canyon mechanic identified that there was no power to the control room push button used to activate the segregated cooling water diversion valves. These diversion valves perform a safety class function to divert cooling water when water monitors identify contamination in the cooling water system (e.g., as a result of a vessel coil failure). Subsequent investigation revealed that a breaker supplying power to this push button was in the off position. After verifying that no tag-outs existed for the breaker (e.g., for hazardous energy control), the breaker was energized. It is not clear how long the system was inoperable. WSRC appropriately identified this as a non-safe failure mode for this safety class system. F-Canyon surveillance procedures (i.e., operator rounds) have been modified to include a periodic verification that there is power to this push button. WSRC reviewed the similar system for H-Canyon and noted that current surveillance procedures do include verification of power to this system; however, this surveillance is not identified in the Technical Safety Requirements (TSR).

In May 2000, an Unreviewed Safety Question (USQ) was declared for the HB-Line facility for a similar issue where an active safety system was not fail-safe (occurrence report SR-WSRC-HBLINE-2000-008). As a result of this USQ, HB-Line personnel performed a systematic review of HB-Line active safety systems to identify failure mechanisms that are not fail-safe. Two additional deficiencies were identified and corrected. WSRC procedure E7 3.41, *Backfit Analysis Process*, was issued in June 2000 and provides a process for ensuring that existing equipment that is designated as safety class or safety significant can adequately perform its safety function, including fail-safe design. However, many systems at SRS were classified prior to this procedure and have not been reviewed per procedure 3.41. As a result of the recent issue at F-Canyon, WSRC is now evaluating failure mechanisms in H-Canyon, F-Canyon, and FB-Line.

3H Evaporator: In late 1999, scale deposition in the 2H evaporator pot led to concerns about the potential for an inadvertent criticality (site rep weekly 01/21/00). Subsequent efforts to understand scale deposition phenomena led to the realization that high concentrations of both aluminum and silicon were necessary for scale formation. To prevent similar problems in the 3H and 2F evaporator pots, a rather severe policy of feed segregation has been invoked. Waste feeds with high aluminum content traditionally received from the canyons are sent to the 3H and 2F evaporator systems, while high silicon DWPF recycle waste feeds are sent to the 2H evaporator system. This segregation approach has significantly limited operational flexibility in the tank farms.

Last week, DOE approved a JCO that replaces the feed segregation approach with defined concentration limits for aluminum and silicon in waste to be fed to the 3H and 2F evaporators. Baseline samples taken this week from the current waste in the 3H system indicated that the aluminum and silicon concentrations exceed the newly approved limits. In response, the 3H evaporator pot was emptied and camera inspections were performed. No scale deposits were observed. WSRC has commenced efforts to determine the cause of the unexpectedly high aluminum and silicon concentrations and identify potential impacts to future evaporator operations.