DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 18, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending May 18, 2001

Recommendation 94-1: This week, DOE authorized WSRC to proceed with further development of the HLW option for the F-Canyon americium-curium (AmCm) solution, while also making the best practical progress at minimum cost on the vitrification project. DOE expects to make a final decision on disposition path in the late August/early September timeframe. The site reps believe that WSRC will significantly curtail the vitrification project during the next 3 months. One of the key areas of technical uncertainty for the HLW option is curium solubility. F-Canyon plans on sampling the AmCm tank (tank 17.1) next week to help address this question.

Tank 38 Potential Inadequacy in the Safety Analysis (PISA): This week, WSRC declared a PISA for Tank 38 in H-Tank farm based on recent sample results that indicate the sodium to fissile material ratio is less than 150:1 as required in the Nuclear Criticality Safety Evaluation (NCSE). Tank 38 is the drop tank for the 2H evaporator and WSRC believes that the sodium diurinate and sodium aluminosilicate scale may have carried over from the pot and deposited at the top of the tank. Since 1996 the sodium to fissile material ratio has dropped from 40,000:1 to the current level of 35:1. WSRC considers this tank to be in a safe condition because of the significant amount of soluble sodium and other poisons that are not credited in the NCSE. Compensatory measures (i.e., transfer restrictions) have been implemented to maintain this condition while WSRC develops a path forward to resolve this issue.

Tritium Facility Modifications: Building 233-H capabilities are being upgraded as part of the Tritium Consolidation and Modernization Project. Part of these modifications include adding an extension to the Purge Stripper Glovebox to increase the capacity of the Z-Bed Recovery System. The extension includes several safety-significant features to keep excessive water out of the heated magnesium beds: a high capacity water-trap to permit a uniform steam flow to the Mg-beds; a water trap hi-hi level switch with hard-wired interlocks to bed heaters and isolation valves; and a line cooler upstream of the water trap to condense water in the process line. The modifications also include electrically separating the magnesium beds to allow concurrent operation, increasing the loop pressure, and adding automatic controls for bed heatup.

Installing the glovebox extension will involve purging and evacuating the Z-Bed Recovery System, constructing a confinement hut, and operating the Purge Stripper System in open glovebox mode for possibly four months or longer, since the Z-Bed Recovery and the Purge Stripper Systems share a common glovebox. The purge stripper needs to remain functional during this period for tritium scavenging and pressure and oxygen control of the facility gloveboxes. In the event of a system leak, the glovebox atmosphere is cleaned up first by two other strippers before passing through the purge stripper. Compensatory measures will be needed during this period, since the hut will impair safety systems, particularly the room air monitoring and the fire detection and sprinkler systems. Last week, WSRC submitted to DOE a Justification for Continued Operation (JCO) to permit operating in this mode for up to 7 months. Installation is likely to begin in June and be completed in the early Fall.