**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

March 21, 2003

**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 March 21, 2003

Staff members F. Bamdad, J. Contardi, R. Kasdorf, C. March, and S. Mortenson were on-site this week reviewing activities related to storage of plutonium material at the Savannah River Site. The staff reviewed safety basis and operational activities for the K-Area Material Storage facility, the 235-F facility, and the FB-Line facility.

**HB-Line:** WSRC continues to dissolve plutonium scrap materials in the phase I dissolvers. Safety basis controls require WSRC to perform an engineering evaluation of materials to ensure the dissolver head space will not exceed 25% of the Lower Flammability Limit (LFL). Based on the current flow rates established by the glove box exhaust system, several batches of plutonium materials will exceed this safety basis limit. WSRC has developed a Justification for Continued Operations (JCO) that supports dissolution of these materials. The JCO requires operators to ensure the charge chute cover is removed thus providing a higher purge flow rate. However, this will eliminate the capability for operators to monitor differential pressure from the dissolvers to the glove box to ensure adequate purge flow. Engineering analysis will ensure that batches will not exceed 25% LFL during normal operating conditions and 100% LFL if the safety significant glove box exhaust system fails.

**H-Canyon:** The H-Canyon safety basis analyzes a tributylphosphate (TBP), nitric acid uncontrolled reaction in a canyon evaporator as a potential accident scenario. Safety class controls identified for this accident include control of solvents to the evaporator and a temperature interlock. Earlier this month, the safety class steam isolation valve that interlocks steam to an evaporator failed in the full open position (site rep weekly 3/7/03). As previously noted, the same valve that controls steam to the evaporator is also used for steam isolation. Therefore, failure of this valve can initiate the accident sequence (i.e., heat up the evaporator) and prevent the safety class interlock from functioning.

The H-Canyon safety basis identifies that this accident scenario will breach the canyon wall if greater than 3000 lbs of TBP is present. Based on the size of the canyon evaporators, greater than 8.5% TBP solutions is required to exceed 3000 lbs. Although 30% TBP is stored in H-Canyon, it is not currently used for any process operations. The 30% TBP is only used for 2$^{nd}$ product cycle. There are no current plans to operate this cycle. WSRC has committed to removing this material from the canyon by mid-April to eliminate the potential for the more significant accident scenario.

In addition to the automatic interlock, the safety basis requires that operators close a manual valve within 30 minutes of the high temperature alarm. However, WSRC analysis this week indicates that the runaway reaction initiation temperature (130°C) may be challenged prior to 30 minutes. Therefore, WSRC identified a Potential Inadequacy in the Safety Analysis (PISA). Compensatory measures for this PISA include isolation of the tank that contains 30% TBP and requirements to use decanters to reduce the amount of TBP that reaches the evaporators.