

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 21, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: R. T. Davis/ T. D. Burns
SUBJECT: SRS Report for Week Ending December 21, 2001

HB-Line Phase II: On Friday, DOE-SR authorized resumption of HB-Line Phase II activities to calibrate facility instruments and begin stabilization of H-Canyon plutonium solutions. Based on current schedules, WSRC will actually begin solution stabilization in January 2002. Facility operations were suspended to resolve issues associated with the presence of Cesium-137 in the plutonium solution (site rep weekly 11/23/01). WSRC has confirmed that the cesium does not appreciably impact Authorization Basis assumptions; however, the cesium does impact operation of the Sodium Iodide detectors that help ensure several criticality scenarios are incredible. WSRC has revised these scenarios to ensure they remain incredible.

On December 13, 2001, DOE-SR requested WSRC to verify that an appropriate basis was identified for a criticality scenario involving inadvertently eluting plutonium from the column to a non-geometrically favorable canyon tank. On Friday, WSRC responded and identified five elements (3 administrative and 2 engineering) that prevent this scenario. DOE-SR has agreed that this forms an adequate basis and authorized facility operations; however, DOE-SR also requested further evaluation of alternate engineering and administrative features to further improve the facility safety posture. Although the controls identified to prevent this scenario appear adequate, the site representatives believe this scenario should be identified as a credible scenario with identification of appropriate double contingency controls. The staff and site representatives continue to review the WSRC criticality safety program.

DWPF Sludge Batch 2: Equipment realignments supporting the transfer of sludge batch 2 from Tank 40 to DWPF have been completed and the first introduction of sludge batch 2 feed occurred last weekend. Sample analyses of the feed are complete and processing is underway in the Sludge Receipt and Adjustment Tank. Contrary to original expectations, the noble metal (Ag, Pd, Rh, Ru) concentrations in sludge batch 2 are actually lower than those of the previous sludge batch. It had been postulated that plate out of an increased noble metal inventory in sludge batch 2 would increase the probability of a short circuit in the melter, thereby accelerating its failure. The curie content of sludge batch 2 (~6000 Ci/can) is greater than that the previous batch (~5000 Ci/can), though again to a lesser degree than expected. Pouring of the first cannister from this batch is expected prior to Christmas.

Tritium Consolidation & Modernization: During operation of the recently restarted Z-bed recovery system, spurious activation of the water trap high-high level interlock led to system shutdown. This Safety Significant interlock prevents explosions in the downstream magnesium bed due to excessive carryover of water from the trap. Troubleshooting indicated that improper calibration of the level detectors (radio-frequency admittance type) as the cause of the problem. After being re-calibrated the detectors were tested in a lab mock-up without incident. Restart is expected this weekend pending successful installation of the re-calibrated detectors.