DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 10, 1999

MEMORANDUM FOR: G. W. Cunningham, Technical Director
J. Kent Fortenberry, Deputy Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending September 10, 1999

High Level Waste Salt Processing Alternatives: The DOE Independent Project Evaluation (IPE) team was at SRS this week to review salt processing research and development. WSRC plans to recommend a preferred technology to DOE-SR by September 17, 1999. The IPE team should publish their report in early October 1999. Test results for the small tank Tetraphenylborate (TPB) precipitation process have not identified any significant issues and appear to confirm the process baseline. However, WSRC identified several new uncertainties for the crystalline silicatitanate (CST) ion exchange process, including: (1) loaded CST columns appear to quickly release cesium during a temperature excursion (i.e., within hours), which may require additional temperature controls; (2) the engineered CST form does not appear to be compatible with the DWPF sample system (WSRC is considering grinding the CST, but transferring the ground material may be difficult); (3) gas generation testing indicates that gas disengagement equipment may be required between columns; (4) testing indicates that the CST/sludge glass form is durable, but the models will need to be reworked and glass re-qualification for the repository may be required. (III.A.2)

FB Line Personnel Contamination: Preliminary bioassay results indicate that 4 workers involved in last week's occurrence have internal contamination, and the dose to 3 workers may exceed 5 Rem CEDE. No doses have been assigned. WSRC is systematically investigating this occurrence, using appropriate contamination controls, and plans to enter the vestibule and vault next week. This appears to have been a puff release of weapons grade oxide powder. The source is still unknown, but circumstantial evidence favors a ruptured container rather than legacy contamination. (III.A.1)

Plutonium Stabilization and Storage: On September 3, WSRC submitted to DOE-SR a study on increasing storage capacity and thereby meeting the Hanford de-inventory schedule. DOE has had no means to meet this schedule since suspending the Actinide Packaging and Storage Facility (APSF) project (site rep report, 2/5/99). The options focused on K-Area Material Storage (KAMS) and 235-F. The WSRC preferred option is to triple-stack 9975 containers in KAMS; to install racks for 3013 containers in 235-F; and to install a 3013 outer can welder in FB-Line to expedite transfers to KAMS. WSRC requested DOE-SR direction by September 24 in order to integrate with the separate 235-F stabilization effort and support a combined project decision in December 1999.

While a 235-F/KAMS option may be the best that can be done within existing facilities, material flow appears sub-optimal and operator intensive, leading to slower processing and higher worker exposure compared to a new facility designed for this purpose, such as APSF. It is unclear that DOE has fairly compared the costs. DOE recently informed the Board that APSF would cost $440M. This is a third higher than the estimate when the APSF project was suspended ($330M). The earlier estimate was based on a completed design, construction bids received and evaluated, a 29 month construction schedule, and facility startup in October 2001. The new, higher estimate ($440M) has less pedigree. It also assumes no FY 00 funding, project remobilization in FY 01, a 29 month delay in construction start, a 21 month longer construction schedule to level expenditures (i.e., 50 months total), and a 50 month delay in facility startup (i.e., December 2005). (III.A.1)