

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 18, 2000

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 February 18, 2000

HEU Blend-down Program: As discussed last week, the outlook for the DOE-TVA agreement is mixed. DOE previously informed the Board that, if no agreement is reached, DOE plans to oxidize the blended down solution in either FA-Line or at an off-site commercial vendor. In December 1999, WSRC provided estimates of the time and resources required to pursue these alternatives.

Based on an FA-Line tour last week, the site representatives doubt FA-Line is viable to support this program. While portions of the facility are still in use, nearly all the systems required to support this program have not been operated in about 9 years. Key systems have not been maintained due to lack of funding. Many systems and structures exhibit acid damage and corrosion. Few systems have freeze protection. The roof and basement leak. The building also now operates under positive pressure and has unfiltered exhaust (key systems do have filtered exhaust). Several areas have depleted uranium dust contamination, which would also complicate modifications. (3.a)

Spent Nuclear Fuel Storage Basins: The site representatives met with DOE-SR and WSRC to discuss the basin water chemistry control program. Mark 16/22 fuel assemblies stored in K and L basins have seen more than 12 years of underwater storage, much of that time with poor chemistry control. In the mid-1990s, continuous deionized makeup water systems were installed in these basins, resulting in dramatic improvement in water quality (e.g., conductivity was greater than 100 $\mu\text{S}/\text{cm}$ but is now less than 10 $\mu\text{S}/\text{cm}$).

Test coupons periodically removed from the basins show no significant corrosion. The site representatives observed that these coupons may not adequately represent spent fuel assemblies because they lack the scratches typically present on actual assemblies. Such scratches remove the protective oxide layer and become initiating sites for pitting corrosion. The coupons typically see about 4 years of basin storage time and, therefore, do not appear to capture the effect of pre-existing damage that may have occurred during the earlier years with poor water chemistry. The first indications of a severe clad failure would probably be elevated water activity measurements made during infrequent deionizer outages. Continued emphasis on stabilizing these fuel assemblies appears appropriate. (3.a)

High Level Waste Tank Farms: Tank 49 contains waste water from the 1983 demonstration of the In-Tank Precipitation process. In late 1998, higher than expected benzene generation rates resulted in an Unreviewed Safety Question and associated Justification for Continued Operations (JCO).

This week, WSRC began slurry pump operations to deplete benzene as a part of resolving this JCO and returning tank 49 to waste service. Benzene release rates were higher than expected during initial pump runs but within bounding calculations. Benzene concentration peaked at 1330 ppm and 1160 ppm for the first two runs, respectively. WSRC expects to continue these pump runs until the benzene is depleted. (3.a)