

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 18, 2000

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending August 18, 2000

Tank 8 Waste Removal: WSRC recently completed tank 8 slurry pump operations to mobilize sludge for transfer to tank 40. The combined sludge will be processed in H-Tank farm and will feed DWPF beginning in 2001. Authorization Basis documents and readiness activities to support the interarea transfer are in progress. The transfer is scheduled to begin next month.

During waste mobilization, the WSRC pump-run strategy and tank ventilation limited hydrogen concentration in the vapor space to below 40 ppm (i.e., 0.1 % LFL). Preliminary comparison of the hydrogen release data versus safety basis assumptions indicates that the gas void fraction retained in the sludge appears to have been much less than the 30% identified in the safety evaluation. However, the hydrogen concentration appears to have been significantly higher (potentially by a factor of 2) than predicted. Therefore, hydrogen retained in the sludge may have been as high as 3%, which is below the safety basis assumption of 9%. WSRC is evaluating this information and will publish a summary report.

Salt Processing Project: This week, the Tank Focus Area (TFA) and the Technical Working Group met at SRS to discuss the status of research and development activities for the salt processing alternatives. The TFA continues to focus on resolving the technology risks for the three alternatives (CST Ion Exchange, Caustic Side Solvent Extraction, and Small Tank TPB Precipitation) and for alpha removal techniques (e.g., MST adsorption). Notably, preliminary feedback from solvent extraction research has been positive. All planned R&D activities are scheduled to be complete by April 2001 to support a technology selection next Summer.

2H Evaporator: The 2H evaporator was shutdown in October 1999 because of ongoing lift problems. Subsequent video inspections identified significant solid deposits (sodium aluminosilicate and sodium diuranate) in the evaporator pot. In January 2000, WSRC identified a Potential Inadequacy in the Safety Analyses because analysis of these solids indicated a higher ratio of uranium to sodium than assumed in the nuclear criticality safety evaluation (site rep weekly 1/21/00). The solids formation appears to be caused by higher concentrations of silicon in the DWPF recycle waste stream. WSRC has developed a chemical cleaning flowsheet to remove the solids using a nitric acid wash. Depleted uranium will be added with the acid to ensure criticality control. To prevent corrosion issues for the carbon steel waste tanks, the acid will be neutralized in the pot prior to transfer. Authorization Basis documents are being developed and chemical cleaning is expected to begin next month. An operating strategy to address the solids issues after the pot is cleaned is still being developed.

DWPF Sludge Batch 2: WSRC had planned to decant the tank 40 sludge wash water to tank 32 for processing in the 3H evaporator system. However, sample analysis indicates higher concentrations of silicon than expected. WSRC is evaluating options and performing additional samples to determine if this material can be processed in the 3H system without depositing solids. Resolving this issue and potential issues with subsequent sludge wash water may have impacts on tank space management and DWPF feed.