

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 2000

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending March 31, 2000

FB-Line: Staff members Burnfield, Kasdorf, Linzau, Ogg, and R. West (OE) were on site this week reviewing FB-Line status. FB-Line is preparing to restart the bagless transfer system in May. Quality assurance improvements are still under development, as are the operator training and acceptance criteria for weld inspections. SRS still needs to provide a technical basis for relying on bagless transfer containers as the single barrier protecting the workers (a finding in the DOE Type B investigation). Previously, SRS was depending on interim surveillance and a relatively short storage period until the Actinide Packaging and Storage Facility (APSF) was ready. (3.a)

F-Canyon Plutonium Solutions: On February 25, the site reps reported on a transfer of plutonium solution to a solvent recovery system tank (13.7) that had an alkaline heel instead of an acidic heel, contrary to assumed criticality controls. WSRC expects review and approval of resolution to take several more weeks. Meanwhile, a little more than one-third of the solution has evaporated. Analysis indicates that if the plutonium were to uniformly precipitate, no criticality would occur. However, as a precaution, the facility intends to borate this tank and restore solution volume, possibly as soon as this weekend. No other chemical additions or transfers will be made. (3.a)

H-Canyon Plutonium Solutions: This week, WSRC issued an engineering path forward for resolving the higher mass of solids identified in tank 16.3 (site rep weekly 3/3/00). The path forward to ensure adequate margin to criticality includes evaluating current tank conditions, increasing the number of samples, adding boron, evaluating tank mixing, and (longer term) re-evaluating the Nuclear Criticality Safety Evaluation.

Based on the results from two separate sample sets taken in February, WSRC believes that the current tank condition is static (i.e., no additional generation of solids). WSRC will confirm this position by taking 10 more samples this weekend and analyzing them during the next two weeks. Regardless of the results, WSRC plans to borate the tank when procedures and equipment are ready (estimated to take several months). WSRC also plans to revise the Double Contingency Analysis to improve the independence of controls identified for this criticality scenario. (3.a)

Spent Nuclear Fuel Environmental Impact Statement: On Wednesday, EH-1 approved the Final Environmental Impact Statement (EIS) for SRS Spent Nuclear Fuel. The site reps understand that it identifies the melt and dilute process as the preferred alternative for treating most of the aluminum based spent nuclear fuel (approximately 97% by volume). It responds to the Board's TECH-22 report, *Savannah River Site Spent Nuclear Fuel*. It also states that conventional processing capability (i.e., the canyons) will be maintained until DOE has "successfully demonstrated implementation of the Melt and Dilute technology."

This appears to be a different position than DOE communicated last Summer (i.e., maintain conventional capability until a new technology facility is operating). If so, it may result in a multi-year interruption in spent fuel processing capability at SRS, which would reduce the site's options and abilities to respond in the event failed fuel is discovered in the basins. Specifically, DOE expects

the L-Area Experimental Facility to demonstrate the technology by early 2002, but does not expect an operating facility to be available any sooner than 2008. Current planning indicates that primary F and H Canyon missions could be completed in 2004 and 2007, respectively. The AmCm mission would continue in F-Canyon through 2006. Canyon utilization plans continue to be in flux due to shifting priorities and disposition strategies for materials at SRS and elsewhere. (3.a)

Pit Disassembly and Conversion Facility (PDCF): The PDCF design is proceeding based on the most recent SRS PC-3 seismic spectrum (1060, rev 4, 9/99). SRS design procedures require a geotechnical investigation to confirm that the soil column properties fall within the range of those used to generate the SRS standard spectrum. For budgetary reasons, the decision has been made to contract out the geotechnical investigation. The PDCF Architect-Engineer (A-E) has prepared and obtained WSRC comments on a contract specification. As of Friday, it was not clear whether WSRC, as the design authority, would be required to formally concur on it and by when. The A-E plans to issue the specification imminently and hold a pre-bid conference at SRS in 2 weeks.

The site reps also observe that this project – now more than 6 months into design – lacks an approved Project Execution Plan that defines roles and responsibilities and communication and concurrence requirements across numerous organizational and contractual boundaries. Furthermore, discussions have continued for months on whether the PDCF requires a sand filter or a HEPA filter for final filtration, a fundamental decision affecting safety. Compared to a HEPA filter design, a sand filter may be more expensive to build, but less expensive to operate and much more effective at mitigating a major fire. The APSF design was based on accident source terms comparable to those for PDCF, and APSF experience strongly favors a sand filter for safety reasons.

The site reps consider that these observations are indicative of possible project management issues with safety implications. In varying degree, the PDCF project appears to be developing characteristics seen in some previous projects that have run into difficulties due to: (a) poorly defined roles and responsibilities; (b) an accelerated design schedule with insufficient design iteration; (c) concurrent technology demonstration\selection and facility design (e.g., ITP, pre-1999 AmCm, melt-and-dilute); (d) informal issue tracking and comment resolution; (e) slow feedback between design activities and safety analyses (e.g., the sand filter item); and (f) insufficient consideration early in design of how the facility will be safely started up and safely operated in a production mode. (1.c,3.a)

Tank 49 Benzene Depletion: WSRC continues intermittent slurry pump runs in Tank 49 in an effort to deplete the benzene and return this tank to waste service (site rep weekly 2/18/00). The tank is inerted with nitrogen during these operations. Benzene release rates continue to be higher than expected even after 29 pump runs. For the last two runs, WSRC revised their pump shutdown criteria from 800 ppm benzene (~ 6% CLFL) to 600 ppm (~4.5% CLFL) because benzene concentration was observed to increase by 400 ppm or more after stopping the pump. WSRC is now considering a revision to the Justification for Continued Operations to increase the benzene concentration limits. WSRC is also evaluating if the CLFL alarm set point can be increased. (3.a)

Public Interaction: On Tuesday, a site representative briefed the Citizens Advisory Board (CAB) on Recommendation 2000-1. The CAB requested that DOE provide a presentation in May on the implementation plan (expected in April) and that the DNFSB (via the site reps) concurrently provide an update on whether the implementation plan is acceptable.