

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 4, 2000

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending August 4, 2000

Staff members J. Troan and D. Ogg were on site this week reviewing facility transition and disposition planning. Tours included 235-F (PuFF - Plutonium Fuel Form Facility), 320-M (the former target manufacturing facility), and R-Reactor.

Inadequate Hazard Analysis and Controls: Last week, a radiological controls inspector discovered slightly higher than expected gamma radiation levels on a drained spent fuel cask containing Mark-42 targets to be shipped on-site to F-Canyon. Subsequent investigation found neutron levels of 60 mrem/hr at 1 foot. These were unanticipated, even though the site had past experience with elevated neutron levels from Mk-42s. Appropriate precautions had not been taken. Dose assessments indicate that involved individuals received neutron doses of 52 mrem or less (i.e., no adverse health effects). DOE-SR and WSRC are taking action to prevent recurrence.

HLW Tank Closure Preparations: WSRC plans to begin heel removal in tank 19 in early September, to support closing that tank in 2003. Tank 19 contains about 283,000 gallons of supernate (88%), salt (5%), zeolite (5%) and sludge (2%). WSRC will use 3 mixers and 2 transfer pumps to move this material to tank 18. A crawler may also be deployed to help remove the heel. Because of the small amount of waste, little hydrogen is expected to be released. WSRC is pursuing safety-related issues associated with the potential for aerosolizing waste during operations.

Spent Nuclear Fuel: An independent review team was on site this week reviewing the status of the melt-and-dilute technology. SRS plans to demonstrate melt-and-dilute on single assemblies in the L-Area Experimental Facility (LEF), starting late next year (site rep weeklies 2/25/00, 7/21/00). Construction starts this October. The 3-man review team consisted of two consultants who contributed to the National Academy of Science 1998 report on research reactor aluminum spent fuel and one former head of the Savannah River Technology Center (SRTC). Each has 30 to 40 years experience. Their letter-report is expected in a few weeks. A site rep provided the team members with copies of the DNFSB TECH-22 report on SRS spent fuel.

While SRTC has done considerable research in this area, it is still uncertain that melt-and-dilute will work for all the fuel types now being considered (e.g., aluminum-uranium alloys, silicides, and oxides), as well as for future fuel types beyond 2008 when the full-scale facility starts up. Several presentations addressed nominal instead of worst-case conditions (e.g., cool-down times). Neutron poisons are also likely to be required by the repository. Meanwhile, WSRC continues to pursue completing the LEF design in September. LEF and other parallel studies are intended to reduce the uncertainties with melt-and-dilute. From a safety standpoint, the LEF design is based on functional classification and accident analyses that are still being finalized. Some design challenges are the off-gas system, contamination control, remote operations, and response to upset conditions.

Fissile Material Disposition: Sterling Franks reported aboard this week as the NN-60 on-site representative. A DNFSB site rep discussed with Mr. Franks some observations and concerns identified during the last year with the HEU blend-down and plutonium disposition programs.