

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 23, 2001

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers / R. T. Davis
SUBJECT: SRS Report for Week Ending March 23, 2001

Staff members Bamdad, Coones, Duncan, Graham, Gwal, and Troan were on site this week reviewing preparations to start up HB-Line Phase II (site rep weekly 3/9/01).

HLW Tank 5 Rewet: On Friday, WSRC began transferring approximately 100,000 gallons of DWPF recycle waste from tank 22 to tank 5 in F-Tank Farm (site rep weekly 3/16/01). WSRC plans to wait 30 days and verify primary wall integrity of tank 5 prior to additional transfers.

Americium-Curium (AmCm) Stabilization: On Monday, WSRC submitted the vitrification project rebaseline to DOE (site rep weekly 2/16/01). DOE will evaluate it during the next month. The schedule is unchanged – vitrification in F-Canyon by December 2005 per the Recommendation 94-1 commitment. However, WSRC now estimates the total project costs at \$197M. This is \$68M (53 percent) higher than the last baseline, established in January 2000. The new baseline includes \$20M and \$26M increases in FY 02 and FY 03, respectively. Roughly half of the overall increase appears to be due to vitrification design issues.

The rebaseline does not include the reliability improvements for tank vapor space purge discussed in the recent Board letter, nor does it include product qualification for a geologic repository, a requirement imposed by DOE headquarters last July (site rep weekly 12/22/00). WSRC did estimate that the latter would add \$17M to \$26M in cost and incur about a year delay.

In July 2000, DOE designated the F-Canyon Tank 17.1 AmCm material as “excess.” WSRC considers this a shift in a major program driver and observes that plans and funding to store, package, and ship the vitrified product have never been established. Given the increased costs, the lack of long-range plans, and the lack of identified need for the Tank 17.1 material, WSRC is proposing a two-prong approach: (a) increase staffing, pursue scope reduction, and proceed rapidly with the vitrification design; and (b) confirm the material is no longer required and reexamine transferring it to the tank farms for vitrification later in DWPF as part of a sludge batch (i.e., the HLW option). DOE has set an objective of vitrification by 2007 for the HLW option. WSRC plans to make a recommendation by May 1st on which course to pursue.

The site reps observe that the HLW option has been studied before, but only pre-conceptually (site rep weekly 7/23/99). It would likely require several dozen dilution runs and transfers from F-Canyon to the tank farm. A similar process has been used in H-Canyon following the Low-Assay Plutonium (LAP) campaign and is being used now in F-Canyon to address two tanks with alkaline plutonium solutions (site rep weekly 2/25/00). Challenges include ensuring the actinides are captured in the HLW tank sludge, managing the additional waste volume in tank farms, and addressing the increased alpha activity in the tank farms before the sludge is vitrified. Other considerations are that the canyon provides more robust confinement than the tank farms. Also, tank farm infrastructure problems may impact when the material is finally vitrified in DWPF.

Furthermore, the 65 Mark-18A targets in RBOF contain isotopes similar to those in Tank 17.1, but so far their disposition has not been considered. In January, DOE decided that these targets contain isotopes that are a “national resource material.” At this time, it appears likely that the F-Canyon facility required to

vitrify the Tank 17.1 solution (MPPF) may also be the best option for extracting the desired isotopes from the Mark-18A targets. There may be commonalities in disposition of these materials that should be exploited.

F-Canyon: F-Canyon completed a readiness assessment (RA) and began charging a dissolver this week with Rocky Flats scrub alloy. Other than the Tank 17.1 AmCm solutions, the scrub alloy is the dominant source term in F-Canyon due to the assumed 5 to 7 percent Am-241 in-growth in this weapons grade plutonium. Also, F-Canyon has not completed the Mark-42 campaign, which was to be finished last month. WSRC now intends to dissolve Mark-42 remnants and scrub alloy in parallel, finish the scrub alloy campaign by end of August, and complete all PUREX operations by March 2002. The extended Mark-42 campaign may become a concern because this material has a potential to pressurize its storage containers, now in FB-Line (site rep weekly 11/10/00). An SRTC evaluation indicates this material should be safe for one year from the time it was repackaged in crimp-sealed containers.

During the recent WSRC RA, F-Canyon personnel had difficulties demonstrating manual unpackaging and charging operations. These problems are similar to those previously seen elsewhere (site rep weekly 1/19/01). On Wednesday, DOE-SR requested the WSRC separations division to provide a path forward on improving the process by which functional area managers declare readiness. F-Canyon also continues to have work control issues, including an inadvertent transfer of process water last week and a mechanic shutting down argon to the FB-Line bagless transfer system, in mid weld, this week (site rep weeklies 3/2/01, 1/26/01). F-Canyon management is taking action. An independent review by the WSRC Facility Evaluation Board is scheduled in late April and should determine if these actions are effective.

9975 Shipping Containers: Last Friday, DOE issued a Certificate of Compliance for shipping plutonium metal in 9975 containers – after exhaustive study (site rep weeklies 10/6/00, 6/30/00). SRS now expects the first shipments from Rocky Flats to K-Area Material Storage (KAMS) in June or later. DOE and WSRC continue to pursue certification of the 9975 containers to ship oxides.