DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 31, 1997

MEMORANDUM FOR: G. W. Cunningham, Technical Director

FROM: J. Kent Fortenberry / Joe Sanders

SUBJECT: SRS Activity Report for Week Ending January 31, 1997

Sand, Slag & Crucible (SSC) Stabilization in F-Canyon - Starting about July 1997 SSC currently stored at SRS will be dissolved in the F-Canyon. The resulting plutonium solutions will be processed in FB-Line. About 102 cans of SSC from RFETS are stored at SRS in mild steel food pack cans. The cans were spray-lined with a food industry organic (a type of lacquer or varnish) and are packaged in a PVC bag for contamination control which is in turned sealed in a slightly larger food pack can (i.e., a typical can/bag/can configuration). Because the PVC bag and the can lining present difficulties during dissolution, this SSC will be repackaged into dissolvable mild steel containers without the sprayed plastic lining. The can/bag/can configuration will be achieved by using dissolvable nylon bags for contamination control. Once repackaged, the entire can/bag/can package can be placed in the canyon dissolver.

About 100 items of SSC originating from SRS are stored in taped stainless steel slip-lid cans which are in turn packaged in PVC bags for contamination control and stored in 5 gallon pails. Again, because the stainless steel will not dissolve and the PVC bags present difficulties during dissolution, this material will be repackaged into the dissolvable mild steel containers without the sprayed plastic lining and using the dissolvable nylon bags for contamination control.

The repackaging of SSC will take place in the finishing line of FB-Line. The activity is scheduled to start about mid-April 1997. Unfortunately, the SSC being produced from current FB-Line operations is still being packaged in the same manner as in the past, and so will require the same repackaging to allow subsequent stabilization in the F-Canyon. The reasons stated for not packaging newly generated SSC in the configuration needed for subsequent stabilization do not appear to be very compelling: can't fit a can sealer into the dumper station; can't find a slip-lid can with dissolvable tape to use in place of a food pack can; haven't re-evaluated criticality limits in the finishing line, etc.. SSC will be generated at FB-Line for several years as plutonium bearing material is stabilized. The obstacles to packaging newly generated SSC in the configuration suitable for canyon dissolution, and hence avoid the need to repackage, do not appear to have been seriously evaluated.

HLW Tank Closure - Two HLW tanks (Tanks 20 and 17) are slated for closure in FY97. Tank 20 has about 500 gallons of sludge remaining and is ready to be grouted. Tank 17 has about 2,500 gallons of sludge but also has about 300,000 gallons of tritiated water (from K-Reactor) which will need to be removed before grouting. DOE-SR hopes to grout both tanks in late

February. A vendor has been contracted at a cost of $1.2M.

In order to leave a high level waste residue in the tank after closing, this residue must be determined to be "incidental" waste. The NRC has issued guidelines on making this determination, and has been involved with DOE-SR in making the determination for SRS HLW tanks. There are essentially three criteria that should be met for the residue to be considered incidental.

(1) All reasonable effort and technology has been applied to remove as much waste as possible. This criteria is generally considered met for the residue in the HLW tanks.

(2) The residue must meet class "C" low level waste limits. This criteria is based on protection of individuals from inadvertent intrusion. The class "C" limit that causes problems here is the 100 nCi/gm alpha emitter limit. HLW tank residues generally exceed this limit. In a letter dated 12/20/96, DOE-SR requested NRC agreement with the use of "reducing" grout (which chemically bonds with the radionuclides in the sludge) to lower via dilution the radionuclide concentration and so meet class "C" limits. DOE-SR understands that the NRC staff will inform the Commissioners on this issue and hope to receive either explicit or tacit approval. Because of the higher concentrations involved, this dilution strategy does not work for high heat waste tanks. Closure of higher heat tanks (37 of the 51 tanks) will require either a more extensive cleaning process (which could include washing with oxalic acid to remove more sludge) or NRC relaxation of class "C" waste limits given the integrity of the encapsulated waste and the expectation that DOE will maintain control of the site in-perpetuity to preclude inadvertent drilling into the tank.

(3) The disposal of the waste must meet safety requirements comparable to 10CFR61 performance objectives. Part 61 would impose a 25 mrem limit for groundwater at 1 meter from the waste. This Part 61 performance objective can not be met, but DOE-SR is using the safety requirements defined by EPA and the State of S.C. which evaluates tank closure against a limit of 4 mrem for drinking water at the site boundary, assuming that DOE maintains control of the site in-perpetuity. Because of the distance to the site boundary, this 4 mrem limit is easily met even when all site source terms are taken together.

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