

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 1998

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
**FROM:** J. Kent Fortenberry / Joe Sanders  
**SUBJECT:** SRS Report for Week Ending March 6, 1998

**Pu Storage at K-Reactor** - The APSF vault will be used to store about 1390 containers of Pu metal and oxide from SRS (including Np oxide), 2100 containers from Hanford, and 288 containers from RFETS. In addition, DOE plans to utilize K-Reactor to store another 2800 containers of Pu from RFETS (1900 of oxide and 900 of metal) starting in January 2000. All of the metal would be shipped in food-pack cans within a 6M shipping container. At least half, if not all, of the oxide would be shipped in food-pack cans and packaged within the 9975 shipping container. Receiving and storing Pu at K-Reactor starting in January 2000 depends on the following:

*Shipping packages will not be opened:* This project relies on the safety provided by the shipping package. The need to open shipping packages could come from assay or inspection requirements. This material will likely be under IAEA inspection, which could require opening the packages.

*Safety analysis and any required facility modifications are satisfactorily completed:* Safety analysis must address long term storage in shipping packages as well as hazards associated with storage at K-Reactor. Some modifications to address hazards have already been identified, such as removing a portion of the facility stack and removing equipment that might fall onto stored packages.

*Disassembly, decontamination, and construction activities are completed:* Construction schedules require some removal/decon work to start prior to a supplemental ROD. DOE is also considering receiving material while some construction is still in progress.

*NEPA activities are completed:* A supplemental Storage and Disposition ROD must be issued prior to starting construction, and the Material Disposition ROD must be issued prior to shipment.

**U-233 Disposition (Recommendation 97-1)** - Uranium-233 material high in U-232 is being considered for disposition at SRS using H-Canyon. This potential disposition would dissolve the material and transfer it to HLW tanks containing depleted uranium-bearing sludge for ultimate vitrification at DWPF. The material involved includes >400 welded stainless steel containers of  $U_3O_8$  and 140 aluminum containers of  $UO_x$  powder, both currently stored at ORNL. Two significant technical uncertainties exist. First, the stainless steel containers cannot be charged directly to the dissolver; at a minimum, a remotely-operated system would need to be developed to open the container exposing the  $U_3O_8$ , and the empty hulls would need to be removed. Second, criticality safety limits need to be preserved both in the canyon and during transport and storage in the tank farms. At a minimum, the material will need to be diluted below the safeguards and security limit (12 wt% for U-233). It remains to be determined whether and to what extent additional dilution with depleted uranium or other neutron poisons will be needed. This option becomes less desirable if significant amounts of material need to be added because of the increasing number of glass-filled canisters requiring disposal in the repository.