DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 3, 1998

MEMORANDUM FOR: G. W. Cunningham, Technical Director
FROM: J. Kent Fortenberry / Joe Sanders
SUBJECT: SRS Report for Week Ending April 3, 1998

H-Canyon Phase II Re-Start - Resolution is being pursued for three remaining issues from the DNFSB staff review of H-Canyon 1st cycle solvent extraction operations (reference Board letter of March 11, 1998). The three issues are (1) verification of adequate purge flow to canyon process vessels, (2) the potential for single-point or common-mode failure of a new programmable logic controller, and (3) functional classification of instrumentation used in preventing criticality. The staff will brief the Board on the status of these issues on April 9, 1998. Currently, the H-Canyon Phase II Readiness Assessment is scheduled to recommence April 13, 1998.

Am-Cm Vitrification - The newly installed Cylindrical Induction Melter (CIM) successfully melted and poured a batch of glass frit. This first melt contained no Am-Cm surrogate material. A problem encountered during this first operation was the formation of an unmelted 'cap' or 'bridge' at the top of the melter that had to be manually pushed down into the hotter portion of the melter.

Additional Am-Cm related tests are being conducted to characterize swelling and bubble formation of the frit bed, thought to be caused by reduction of CeO_2 (Cerium is being used to simulate the Americium and Curium). Removing the Cerium eliminates the swelling. The swelling is observed in Drain-Tube-Test-Stand tests and is unique to the batch melting of oxalate feed.

Accelerator Production of Tritium (APT) Hazard Analysis (HA) Development - The APT team is developing the HA in parallel with the design. The results of the HA will be included in Chapter 3 of the APT SAR. The HA will serve as the basis for identifying those safety-significant (SS) controls which will protect the onsite worker. Furthermore, the HA will also identify those hazards which could significantly impact offsite receptors. For these scenarios, a Design Basis Accident (DBA) analysis will be performed which will identify the necessary safety-class (SC) and (SS) controls. Since APT, if selected, will be constructed at SRS, the site's Functional Classification Methodology will likely be used.

For purposes of hazard categorization, the APT facility is being segmented into four pieces with the expected hazard categories as follows:

- Accelerator (less than HC-3)
- Target/Blanket and Tritium Separation Facility (HC-2)
- Beam Stop (HC-3)
- Balance of Plant (less than or equal to HC-3)

The most severe postulated accident scenario involves a loss-of-cooling accident (LOCA) with failure to shutdown the beam. It is expected that the unmitigated offsite dose for this event will exceed the SRS evaluation guidelines (25 rem for an extremely unlikely event). This event will be analyzed as a DBA in the SAR and will have SC and SS controls.