

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 28, 1997

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
**FROM:** J. Kent Fortenberry / Joe Sanders  
**SUBJECT:** SRS Report for Week Ending November 28, 1997

**Americium-Curium Vitrification** - Recall that the second Am-Cm test melter failed due to excessive temperatures (8/2/96 weekly report). The third melter failed from fatigue at the bus-bar connection welds (10/31/97 weekly report). The fourth melter, during initial heat-up this month, pressurized, causing the melter to bulge and deform. The estimated 10 psi pressurization is believed to have resulted from the formation of a sintered frit 'cap' that did not allow expanding air to escape as the temperature was increased. Although surrounding fiberboard insulation was broken, inspections revealed no significant wall thinning or weld cracks in the melter itself. The melter has been re-insulated and a re-start plan is being prepared.

Prior to this pressurization event, DOE-SR put a hold on design and construction, asking WSRC to provide a detailed study of alternatives to Am-Cm vitrification. WSRC is expected to provide a response next week. This assessment of alternatives is driven as much by storage uncertainties at ORNL as it is by development problems with the vitrification project. DOE has not been able to establish a firm commitment from ORNL to store the Am-Cm material.

**Tritium Loading Lines Dynamic Overpressurization Condition** - The 9/5/97 weekly report discussed a scenario for Loading Line 6 (LL6), scheduled to become operable in Spring 1998, in which a pressure transient could develop in the loading manifold which might overpressurize and rupture the reservoirs being loaded. As a result, an orifice was installed in LL6 to maintain peak dynamic pressures below reservoir design pressures. At the time, interim administrative controls were established for the four operating loading lines until this condition could be assessed. This assessment is nearing completion and it has been determined that each of the operating loading lines will have an orifice installed, similar to LL6. In addition, a rupture disc of lower rated pressure (22,500 vs. 27,000 psi) will be installed at the outlet of each compressor train. These modifications have been determined to maintain the peak analyzed transient pressure below the reservoir design pressure and are scheduled to be installed in December 1997.

**DOE-SR Guidelines for Safety Analysis** - In a March 6, 1997 letter to WSRC, DOE-SR noted that "although the DOE Order 5480.23 and its accompanying Standard 3009 define the technical content of a SAR, there are many areas which are quite open to interpretation." DOE-SR also noted that "personal preferences and opinions of both DOE-SR and WSRC personnel, impacts of funding allocations and reductions, and other variables drive these interpretations to significantly different practices among SRS line divisions." WSRC and DOE-SR are preparing guidance to clarify the intent, content, and appropriate methodologies for authorization basis development at SRS. This guidance is expected to be completed by the end of next month and would be followed by an WSRC implementation plan. A tentative outline is attached.

Attachment to 11/28/97 SRS Weekly Report

**Tentative Outline for Authorization Basis Process Guidance Document**

**General Requirements**

- 001 Safety Class and Safety Significant - Design Criteria
- 002 Safety Class and Safety Significant - Operations and Maintenance Program Requirements
- 003 Changes in Functional Classification of SSC's
- 004 AB Linking Document
- 005 AB Hazardous Material Inventory
- 006 AB Documents and Safety Basis Documents
- 007 Analytical Methods

**Safety Class Requirements**

- 101 Safety Class Controls

**Safety Significant Requirements**

- 201 Safety Significant - Defense-In-Depth
- 202 Safety Significant - Worker Protection

**Non-Safety Class / Safety Significant Defense-In-Depth Requirements**

- 301 Selection of Non-Safety Class / Safety Significant Defense-In-Depth Controls

**Criticality**

- 401 Criticality Controls