

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 21, 1998

MEMORANDUM FOR: G. W. Cunningham, Technical Director
FROM: J. Kent Fortenberry / Joe Sanders
SUBJECT: SRS Report for Week Ending August 21, 1998

Secretary of Energy - Secretary of Energy Bill Richardson will be on site Tuesday, August 25. The Secretary will tour DWPF and the Tritium facilities, as well as meet with community leaders. The Secretary will also be given a drive-by tour of other site facilities.

Tritium Facilities Safety Analysis Report (SAR) - A draft Tritium Facilities SAR has been issued for DOE-SR review. This document will replace the existing authorization basis, contained in several facility-specific documents, by consolidating and revising them according to DOE Orders 5480.22 and 5480.23 and DOE Standards 1027-92 and 3009-94. DOE-SR expects to provide comments by October 31, 1998. The DNFSB staff has received copies for review.

Incorrect Position of HLW Conductivity Probes (CP) - There are over 100 CPs associated with Leak Detection Boxes (LDB) in the Tank Farms. These CPs are used to detect leakage of HLW from valves and transfer lines. These CPs are classified as safety significant and are required to be able to detect 1½ liters within a LDB. The LDB will overflow at approximately 2½ gallons. While verifying the detection value for a sampling of the probes, WSRC determined that the majority were unable to detect 1½ liters of liquid. WSRC declared all CPs associated with LDBs inoperable. WSRC has conditionally increased the detection quantity to 2 gallons to evaluate whether the CPs would detect the presence of liquid before the LDB would overflow (precluding detection). Of the 31 probes inspected so far, six have failed. It is disappointing to note that all of the probes were installed over the last three years as safety significant equipment. This puts into question the effectiveness of the work packages and post-maintenance testing.

Status of Americium-Curium (Am/Cm) Vitrification Safety Documentation - Am/Cm safety documentation was initiated in 1996 but was suspended in early 1998 when the bushing melter design was abandoned to pursue the Cylindrical Induction Melter (CIM). The draft safety documentation has not been updated and reflects the bushing melter system design. Draft documentation includes Preliminary Hazards Analysis (PHA) for both pretreatment and vitrification, Interim Functional Classification (FC) for both pretreatment and vitrification, initial accident analysis calculations, and Technical Safety Requirements. In addition to needing to revise these documents to support the current CIM system design, several open issues (some already identified in the draft documentation) will need to be resolved. Examples include:

- General issues concerning the functional classification of melter related equipment
- Integrity of the hot cells and manipulator penetrations during explosions
- Heat removal from Tank 17.3 (vessel containing concentrated Am/Cm during pretreatment)
- Heel removal and preventing heel from drying out in Tank 17.3, given its conical bottom
- Potential for and prevention of formic/nitric acid reactions
- Potential for and prevention of curium partitioning-induced criticality events (Cm-245 is highly fissile)