

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 30, 1998

MEMORANDUM FOR: G. W. Cunningham, Technical Director
FROM: J. Kent Fortenberry / Joe Sanders
SUBJECT: SRS Report for Week Ending October 30, 1998

Gallium Stabilization of Plutonium Metal Buttons in FB-Line - WSRC has converted two metal buttons to δ -phase by adding gallium and remelting them in the FB-Line induction furnaces (see 9/25/98 weekly report). This demonstration is to provide a contingency for plutonium metal storage in APSF in the event DOE is unable to demonstrate that the α - β phase change will not rupture the 3013 container system. The preliminary results of this demonstration was of mixed success. The first button did not appear to have undergone full conversion to δ -phase; the button thickness did not increase as much as expected and bright silvery spots, indicative of uncombined gallium, were observed on the button surface. The explanation for this condition was that the material was held at the melting temperature ($\sim 700^\circ\text{C}$) for only 30 minutes, not a long enough period to provide adequate mixing and conversion. The second button was maintained at the melting temperature for 100 minutes and appears to have achieved full conversion. Samples are being taken from both buttons and density, x-ray diffraction, and aqueous analyses will be performed. Depending on the results, the first button will probably be remelted to achieve full conversion.

Plutonium Metal Phase Change Testing at LANL - In preparation for conducting α - β phase change testing, LANL received plutonium metal from SRS and was in the process of casting it into specified shapes. Unexpectedly, a significant amount of slag formed, indicative of impurities. LANL and SRS are evaluating how these impurities were introduced (i.e., whether it existed in the process equipment or whether it was introduced in the metal received from SRS). This will likely result in a multi-week schedule slip in this testing.

Replacement High-Level Waste Evaporator (RHLWE) - Construction of the RHLWE has been completed and the facility has been turned over to operations. Start-up testing is well underway and DOE-SR and WSRC hope to start hot operations, following an Operational Readiness Review, by the end of September 1999. Several observations from a recent walkthrough of the RHLWE were provided to DOE-SR. (1) Several leaking valves were noted for which no deficiency had been identified by operations. This could be indicative of a lack of facility ownership by operations. (2) A test engineer was observed manipulating a manual steam valve. This activity is clearly not authorized and is indicative of a lack of operations control and ownership. (3) Discussion with the control room supervisor indicated a lack of awareness of recent distributed control system (DCS) related occurrences at SRS that had resulted in mis-transfers, loss of safety equipment, and other inadvertent operations. The RHLWE control room is a DCS based control room that will provide control for not only the new RHLWE, but also for many safety related operations in the tank farm such as transfers, monitoring, etc. These observations are being addressed by DOE-SR and WSRC.