DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 10, 1997

TO: G. W. Cunningham, Technical Director
FROM: R.F. Warther, M.T. Sautman
SUBJECT: RFETS Activity Report for Week Ending January 10, 1997

The following table summarizes liquid risk reduction activities completed this week at RFETS.

Task Initiated or Completed	Comment
Drained approximately 740 liters of Pu solution from Tank 55A in B371.	See paragraph 3
Completed hydroxide processing for approximately 46 liters.	See paragraph 4

1. **Residue Containers:** Sandia has been testing the RFETS TRUPACT-II Residue Pipe Payload container, a 304L stainless steel pipe that fits into a fiberboard-packed, 55-gallon drum. The pipe bottom and flange cap are welded in accordance with NUREG 3019 guidance. NRC is in the process of certifying that each pipe container can contain 200 g of Pu in a fully-loaded TRUPACT-II. RFETS also wants to show that the pipe is equivalent to a Type B shipping container in order to exempt the contents from material-at-risk calculations for accident scenarios (e.g., seismic event involving dispersible residues). Personnel from the nuclear safety group requested that container drop, IAEA dynamic crush, and 30-minute fire tests be performed. although the pipe is vented, it has met the same leakage criteria (10-7 cc/min) that hermetically sealed Type B containers must meet. A computer simulation of a forklift collision is also being considered. The site representatives are concerned that since sequential tests (e.g., a crush test followed by a fire test) were not performed, they have not established whether the container would withstand a plane crash followed by a pool fire, especially since the crush test reduced the drum's height by 5 inches. Based on discussions with the Boards staff (Bamdad), it appears that this situation may be similar to the plane crash issue at Pantex. The tech staff believes that it should be assumed that some pipes are breached during a plane crash and their contents released in a fire

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2. **Residue Stabilization.** One option for stabilizing sand, slag, and crucible (SS&C) residues is to ship them to SRS to have the Pu separated from the matrix in F-Canyon. The RFETS and SRS site representatives discussed SRS packaging and material form acceptance criteria required for shipment of RFETS SS&C. Based on the restrictions listed below, it appears that all of the SS&C would have to be repacked and possibly segregated by size before shipment to SRS:
   a. 10CFR71 requires double containment for shipping more than 20 Ci of nonmetallic Pu. Therefore, RFETS would have to use SRS 9968/75 shipping containers rather than DOT 6Ms. Whereas there are about 100 DOT 6Ms at RFETS, there are reportedly only about 20 to 30 SRS 9968/75s in existence. In addition, EM-76 needs to approve an amendment to allow SS&C to be shipped in a SRS 9975.
   b. SRS estimates that as many as 90 percent of the cans containing SS&C at RFETS would be too large for a shipping container and would have to be repacked into smaller cans.
   c. F-Canyon is not designed to dissolve stainless steel cans. All SS&C in RFETS stainless steel cans would have to be repacked into aluminum, tin, or carbon steel containers.
   d. All cans in plastic bags would have to be rebagged in nylon bags because F-Canyon cannot process high concentrations of plastic.
   e. The SS&C will have to be segregated by size because of different processes for dissolving fines

and chunks. This could be done either at RFETS or at SRS.

f. There is a debate whether the reactive metals in the SS&C would have to be stabilized before the SS&C could be shipped. SRS has performed tests on RFETS SS&C, which was already at SRS, and believes that pre-processing is not required.

3. **CWTS Processing.** Approximately 740 liters of plutonium solution were drained from Tank 55A in B371 this week. So far, more than 500 liters of solution have been processed in the Caustic Waste Treatment System. Unfortunately, it was discovered Friday that between 200 and 300 liters of solution from an unsampled waste collection tank had been processed. Tank 49D had been drained into three waste collection tanks, but only two of the three tanks had been sampled. The procedure requires that the solution in each waste collection tank be sampled before processing.

4. **Hydroxide Processing.** Personnel have completed processing 46 liters of Pu solutions in three batches as of 1/8/97. More significantly, the rate for processing has increased from about 1.5 liters per day to about 4.5 liters per day. This increase in processing rate is a result of several changes:
   a. Doubled the filtration area for the processing
   b. Resolved chemistry precipitation issues with LANL, LATA and SSOC personnel
   c. Increased the amount of overtime for the workers
   d. Qualified additional process specialists.

   SSOC personnel stated that one additional procedure change will be required for batch 7. NaOH will be added in addition to $Mg(OH)_2$ because of the anticipated high normality and buffering capacity of this batch.

5. **Metal and oxide.** RFETS completed thermally stabilizing their entire backlog of reactive plutonium oxide this week. The original Recommendation 94-1 milestone committed to a completion date of October 31, 1996.

6. **B771 Basis For Operation and Recommendation 95-2.** The BFO for Building 771 was approved by the B771 Convened Group this week. Based on discussions with B771 personnel, implementation will require cost $3-5 million. Most of this cost will be incurred to upgrade procedures and train personnel. However, approximately 75% of the upgrades associated with the BFO were required under the existing authorization basis. Therefore, the new 771 BFO will serve as a catalyst for upgrades to building procedures and training.

cc: Board Members