

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 10, 1997

TO: G. W. Cunningham, Technical Director
FROM: R. F. Warther, M. T. Sautman

SUBJ: RFETS Activity Report for Week Ending October 10, 1997

LANL and SRS Visit to RFETS. University of California and WSRC personnel visited RFETS to discuss options to more quickly remove SNM and residues from the site and accelerate site closure. The discussions were very productive. Two areas were discussed. First, how to accelerate shipment of residues, primarily salts, off site and second, how to accelerate removal of enriched uranium (contaminated and metal shells) from the site. Attachments 1 and 2 summarize the residue and uranium discussions respectively. The Board staff and Site Reps believe that shipment of material off-site could positively affect Recommendation 94-1 by providing multiple sites to process RFETS residue material. This approach could also have a positive effect on Recommendation 94-3 by obviating the need to complete the safety margin upgrades to B371 if site risk could be reduced more quickly through accelerated shipments. The discussions focused on the viability of these approaches, and also identified critical path issues that will require resolution from DOE-HQ.

Solutions. About 135 liters of plutonium solution from tank 931 in B771 were drained into plastic bottles this week. This tank contained 262 liters of 95 g plutonium/liter solution. The activity went well. The only anomaly was that they had to fix some contamination found on the tank's valve. Unfortunately, transfer of these bottles to B371 has been delayed because the CWTS was shutdown.

Residue Characterization. The technical staff has raised questions concerning the adequacy of using only a 80% confidence level that less than 15% of the residues exceed various acceptance criteria. In response, SSOC is trying to get funding for the extra samples needed to achieve a 95% confidence level that less than 5% of the "high risk" residues fail the criteria. The technical staff believes that this is adequate. In addition, SSOC is considering using the technical staff's list of "high risk" residues rather than previous lists of "high risk" residues generated by RFETS. The RFETS-generated "high risk" list did not include those residues stored only in cans and it included several residues which were no longer "high risk" once they were vented (e.g., ash).

SSOC Requalification. The Site Reps previously reported that SSOC has revised its SM qualification program to require an oral interview by the Facility Manager rather than a requalification board with three voting members. This policy was rescinded last week and the requalification process will continue to require an oral board. The facility work control process will be overhauled next month when SSOC initiates a program to replace Shift Managers and Shift Technical Advisors with Configuration Control Authorities (CCAs). The new CCAs will be expected to qualify to a higher standard and will be compensated at a higher level. These personnel will control the work for all facility activities.

cc: Board members

Attachment 1 Residues

Pyrochemical Salts. There are five salt categories (2150 kg bulk, 400 kg Pu) which are excluded from current or proposed safeguards termination limits (STL) variances since they have high plutonium concentrations on average. These salts will undergo pyro-oxidation, aqueous dissolution and/or salt distillation to separate the plutonium based on whether they are CaCl₂-based or not. The first process would be conducted at both RFETS and LANL, the others only at LANL.

The disposition of the remaining salts (~14,000 kg bulk, 600 kg Pu) will depend on the outcome of the STL variance requests:

- Those salts which are below the to-be-determined STL can be pyro-oxidized and disposed at WIPP. In addition, RFETS is pursuing characterization that may determine that some of these salts are not “high risk” and could be safely stored in a pipe overpack container (POC) without additional processing. This latter option has been briefed to the Board by the technical staff.
- Those salts which exceed the to-be-determined STL must be stabilized and then have their plutonium removed. Salts containing calcium chloride would be pyro-oxidized at RFETS if needed to meet shipping requirements and then dissolved at LANL. The other salts would be pyro-oxidized at either RFETS or LANL and then distilled at LANL. This is basically the same strategy as the rebaselined approach previously proposed by DOE except that some pyro-oxidation and all distillation would be performed at LANL.

The likely result will be a combination of the two approaches. Leaner salts will be disposed at WIPP in POCs, with or without processing. Richer salts will be processed at RFETS and LANL. This integrated strategy has the potential for both meeting the RFETS residue Implementation Plan milestones and beginning building decommissioning faster, but may extend distillation of stabilized salts past 2002. Although LANL reportedly is having some problems meeting some of their non-salt residue commitments, they claim they can perform this additional RFETS salt processing with no negative impacts to processing their own residues.

No off-site processing can begin for any residues until the residue EIS Record of Decision is issued. In addition, there are significant obstacles which must be resolved to make off-site processing achievable:

- Adequate numbers of shipping containers that are certified for residues
- Adequate numbers of SSTs available for transporting the containers
- Funding to allow LANL to increase the processing capability up to 400%
- Making storage space available in the LANL PF-4 vault and developing additional storage capacity in the PF-41 tunned, “icehouses,” and transportainers

Other Residues. RFETS will continue their current plans for vitrifying graphite fines. However, if they are not able to develop adequate vitrification parameters by December, they will either start calcining the graphite fines at RFETS or begin preparation to ship them to LANL for cementation. Off-site treatment was not considered practical for incinerator ash since the number of shipments required would overwhelm RFETS’s shipping capacity. This ash would either be stored in POCs or vitrified depending on whether the STL variance was granted.

Attachment 2

eU Shipments from RFETS

The Site Reps have previously reported that the eU hemishell decon process at RFETS has encountered problems, and processing rates continue to be slow. We also reported that personnel at Y-12 have indicated that they may not be able to receive shipments of eU metal from RFETS until May 1998 due to resource limitations and other priorities. The following summarizes technical discussions among K-H, SSOC, WSRC and LANL personnel.

eU Metal. Three disposition paths were proposed.

1. Continue shipments to Y-12 at a schedule acceptable to Y-12. The critical path for this option is the rate at which Y-12 accepts the shells.
2. Ship some of the metal shells back to LANL, who would work with Albuquerque personnel to replace some of the existing weapons stockpile shells with RFETS shells. Two critical path issues for this option were identified. First, Albuquerque would have to make a decision regarding strategic reserve material. Second, accelerated shipping schedules would require additional containers, trucks, and dock space. If LANL replaced existing shells with shells from RFETS, it would have to ship its existing shells to Y-12.
3. Ship the material to SRS. Use the material for Naval fuel or blend it down and use it for TVA fuel. The critical path for this option is the NEPA process. SRS's current Environmental Impact Statement will not allow this material to be processed into fuel.

Contaminated eU Hemishells. Three paths for this material also were proposed.

1. Continue to decontaminate the eU hemishells at RFETS and then ship the shells to Y-12. The critical path for this option is the rate at which RFETS can decontaminate the shells. If RFETS can accelerate the decontamination process, the critical path could become Y-12's ability to receive shells.
2. Ship contaminated hemishells to LANL for decontamination. LANL would decontaminate the shells and then ship to Y-12. The critical path for this option is availability of shipping containers and storage capacity at LANL.
3. Ship hemishells to SRS for dissolution in the canyons and then process the material into Naval fuel or blend down and process into TVA fuel. The critical path for this option is the NEPA documentation, as well as availability of shipping containers.

The critical path issues all require input from or resolution by DOE-HQ. The Site Reps observed a cooperative effort among the three contractors to resolve technical issues. The Site Reps also have observed that DOE-HQ's role in resolving these complex-wide integration issues appears to be minimal. Without DOE-HQ involvement, it is not clear how the critical path issues will be resolved.