

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 28, 1997

**TO:** G. W. Cunningham, Technical Director  
**FROM:** R.F. Warther, M.T. Sautman  
**SUBJECT:** RFETS Activity Report for Week Ending March 28, 1997

**Waste Management.** In response to a Board letter to Mr. Alm last July, RFETS has been venting transuranic waste drums. This project was initially expected to be completed by September 30, 1996, but repeated shutdowns in B776 and several criticality infractions had delayed work considerably. The last 598 drums were completed this week.

**Recommendation 94-1. Pit Shipments to Pantex.** The first two pit shipments to Pantex were completed. However, shipments will stop in the near future for approximately six weeks unless Pantex accelerates recertification of the Mod-FL shipping containers to the new DOT leak test criteria. In addition, LLNL is requesting that all of their pits at RFETS be leak tested before shipping them to Pantex, where they will be leak tested again. LLNL is concerned that unless their pits are leaks tested at RFETS, a breached pit could be shipped to Pantex where it could cause a contamination problem when the shipping container is opened. So far, LANL is willing to accept just a visual inspection and contamination swipe at RFETS for their pits. DOE-AL is allowing a specific number of pits to be shipped without being leak tested at RFETS. RFFO expects DOE-AL to issue guidance by the end of April on the need for future leak testing at RFETS. If leak testing at RFETS is required, this could prevent shipping LLNL pits until mid-1998 because RFETS does not have any operable leak testing equipment. Some leak testing equipment is being installed in B777 to support the crimp and seal program, but its throughput would be small.

**Metal and Oxide.** Last December, SSOC discovered 100 plutonium metal items suspected to be in contact with plastic. To date, eleven items have been inspected and no plastic has been found. SSOC is significantly behind their original plan to inspect all 100 items by the end of April. They have developed a recovery plan, but the plan shows that the inspection rate must increase by nearly an order of magnitude beginning immediately.

**Residues.** At RFFO's request, LANL developed a model to compare the failure frequency for residues stored in May 1994 with the current failure rate based on current storage conditions. Their calculated drum failure rates showed a 95 percent decrease in failure frequency due to energetic events (e.g., drum overpressurization) and a 15 percent increase in the rate of chronic failures (e.g., corrosion, radiolytic degradation). The Site Reps reviewed the model logic, parameters used, and assumptions made. The model does not provide any substantial new information about residue risks. It overanalyzes limited qualitative data to come up with questionable quantitative results. First, although there are approximately eleven failure parameters for each residue group, most of the values were the same for all groups. As a result, differences in the results appear to be dominated by a few known inputs: unvented drums can build up hydrogen and overpressurize, higher plutonium loadings increase radiolytic degradation, CCl<sub>4</sub> can cause filter degradation, and salts are hygroscopic and corrosive. Thus, the results of the study match exactly the previously known hazards and provide no new information. Second, the absolute risks have little technical basis. Many parameter values are educated guesses based on known qualitative differences (e.g., salts are more corrosive than glass) with little or no characterization data to justify the actual values chosen (e.g., 50 percent of acid-contaminated gloves are shock-sensitive). Third, the study did not take advantage of all the available data on headspace gas samples, vent testing, past occurrences, etc. Fourth, any failure rates based on container age are of limited value. Since some drum dates in the site database are question able, the model randomly assigned a date of generation rather than using process knowledge or batch logs to come up with a realistic estimate of the generation date. Fifth, although the

calculated failure rates are presented to two significant digits, when questioned, the LANL personnel admitted that the uncertainty could be plus or minus an order of magnitude. Some of the other attendees shared the Site Reps' skepticism. RFFO has directed K-H to consider using the results to make recommendations on processing priorities, surveillances, and safety controls. The Site Reps will thoroughly review any actions taken based on this study to ensure they are justified.

**Site Risks From Am-241.** SSOC has determined that off-site doses following an earthquake and building collapse may be higher than estimated in previous safety analyses as a result of reassessing americium content of RFETS material. RFETS has about 35 - 40 kg of Am-241 on site. The dose to the bone per unit mass inhaled is about two orders of magnitude higher than Pu-239. SSOC has calculated that the dose to the maximally exposed offsite individual could range from over 5 Rem to several hundred Rem following a seismic event and building collapse. SSOC emphasized that these are preliminary calculations. The Site Reps had discussed this issue with Dr. Kouts and the Board staff about two weeks ago. All agreed that until SSOC and K-H have completed their calculations, no course of action could be established. Preliminary action alternatives include accepting a short term increase in risk or moving drums with high Am content into buildings with a higher seismic resistance than the current storage buildings. Moving drums would decrease risk associated with seismic collapse and Am release, but could adversely impact 94-1 risk reduction activities. SSOC must also weigh long term risk reduction against increased worker risk from movements, staging on docks, and increased worker doses. K-H originally stated that they would be prepared for a brief during the week of March 31. However, this date has slipped. K-H stated that they will be in a position to conduct a video conference during the week of April 7.

**B440 ORR.** The K-H Operational Readiness Review for B440 began this week also and will be completed next week. Startup of operations in B440 is critical if K-H is to satisfy the performance measure for removing 85 percent of containerized waste from the Protected Area.

cc: Board Members