

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 27, 1999

TO: G. W. Cunningham, Technical Director
K. Fortenberry, Deputy Technical Director

FROM: M. T. Sautman

SUBJECT: RFETS Activity Report for Week Ending May 27, 1999

Conduct of Operations. Listed below are some recent conduct of operations occurrences.

- There have been 16 criticality infractions since April 1, mostly in B707 and B371. Eleven of these were due to personnel error.
- During CWTS operations, 70 liters of acid solution was accidentally transferred into a tank containing approximately 600 liters of caustic solution.
- During installation of the B771 size reduction "birdcage," workers removed exhaust dampers from the glovebox exhaust system. This unauthorized work caused the exhaust system differential pressure to drop from 5 inches to 1 inch of water.
- The B777 O₂ analyzer system, which is supposed to monitor several stations continuously, was found to be just monitoring one system in manual mode. This was a TSR violation.

As a result, RMRS shut down B771 for approximately 24 hours and buildings 776/777 and 779 for a short period to conduct briefings on these recent problems. In addition, SSOC is having a series of building and project meetings that discuss the causes of the infractions (e.g., inattention to detail, inadequate work control) and efforts to address them (e.g., more effective pre-evolutionary briefs).

Building 771 Deactivation. The technical staff reviewed the ventilation engineering package for the first generation B771 size reduction process or birdcage. The Site Rep also toured the second generation birdcage mockup to see how its design was progressing. The technical staff continues to observe weaknesses in systems engineering and the integration of safety disciplines in the designs. Examples of this include:

- Various quality assurance and procurement requirements were not followed for the first birdcage. The vendor started fabrication of tooling before receiving a statement of work or drawings. A contractor evaluation identified several deviations from applicable codes and site requirements. Engineering was not involved at all in the early stages of development.
- In order to accelerate schedule, procurement is starting for the second generation birdcage without performing any cold demonstrations, system operational tests, or hot work with the first design. As a result, any resulting design improvements will have to be retrofitted.
- Rather than defining what boxes need to be size reduced and designing a system to handle them, the process has been to design a system and then determine which boxes can be handled by the system.

The staff's review of the ventilation package found little integration between the ventilation and radiological engineers. Although the radiological engineers expected the capture velocity to be high

enough to allow the use of respirators, the ventilation engineer assumed that the workers would be in supplied air. This was why the design package stated that 100 ft/min was just a goal, not a requirement. The staff questioned whether this goal was adequate to capture contaminants released by nibblers, sawzalls, and other saws. For example, 100 - 200 ft/min is usually only used for contaminants released at low velocity into moderately moving air. In addition, radiological engineering has just started developing testing and operating criteria for ventilation. However, the face velocity and flow rate criteria have not only been established, but the birdcage is already installed in B771. The planned ventilation system operational test also did not address the effect of bodies and gloveboxes on the air flow patterns since the test only involved an empty birdcage.

The Site Rep had an encouraging meeting with K-H Closure Projects and RMRS Engineering personnel. They admitted that they had not been very systematic and that their design package was weak. Engineering stated their intention to take a more active role in this process. They are rewriting the design package to strengthen the system operational test and establish face velocity requirements. In addition, they are now working with radiological engineers to make sure airborne radioactivity requirements are incorporated into the design. Engineering is also revising the glovebox size reduction procedure to include ventilation and other engineering requirements. Finally, K-H committed to develop a Program Execution Plan so that a more systematic approach would be taken for future B771 deactivation activities. (III-B.1.a)

Wet Combustible Residues. The technical staff had a conference call with RFETS to discuss previously identified staff concerns with gas generation testing (GGT) and repacking of Ful-Flo residues. SSOC has developed an adequate technical position for why their process meets or is equivalent to Interim Safe Storage Criteria requirements for sealed containers and free liquids. In addition, the 46 wet combustible drums that passed GGT had little or no detectable carbon tetrachloride in the headspace and did not include any drums with prior filter failures. SSOC also intends to use Oil-Dri treated with sodium carbonate to absorb and neutralize acids during repacking. Since repacking will start before this treated Oil-Dri is available, the contractor agreed to either 1) delay repacking of those containers with significant liquids until it was available or 2) mix some sodium carbonate with normal Oil-Dri to neutralize the acids in the interim. The contractor is discontinuing the use of PVC bags to minimize radiolytic generation of HCl and planning to air out combustibles during repacking to volatilize CCl_4 . LANL testing indicates that the base-treated granulated activated carbon (GAC) pads should have enough capacity to prevent any breakthrough. This will be confirmed by monitoring the headspace concentration in drums that have had GAC pads added. (III-A.1.a)

cc: Board members