

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 4, 1998

**TO:** G. W. Cunningham, Technical Director

**FROM:** M. T. Sautman

**SUBJECT:** RFETS Activity Report for Week Ending December 4, 1998

**B771 Process Piping Removal (PPR).** Last week's report discussed radiological concerns with pipe cuts and flange disconnections. The Site Rep and Roy Kasdorf had discussions with K-H, RMRS, and RFFO that resolved some of the issues. The pipe cutting methodology was modified to reduce the probability of an accidental release of contamination. [Last week's report had an error. The operators, in fact, deliberately cut the pipe until they breach it and then cover the hole with tape.] A potential cause of the contaminated pipe cutter last week was that operators forgot to return the vacuum pressure to the normal operating level before performing the cut. RMRS has agreed to establish a minimum vacuum level since the previous criterion was just to have a vacuum. However, the technical basis for the 10" Hg criterion has not been provided yet and the vacuum gauges used are not calibrated. RMRS also agreed to incorporate the Site Rep's suggestion of using local exhaust ventilation when removing the potentially contaminated pipe cutter blade from the pipe.

All flange disconnections were also temporarily halted until a new method was developed. RMRS's preferred method for handling flanges is to cut the pipe either upstream or downstream of the flange and avoid unbolting the flange. The tradeoff with this method is that rather than having the pipe end with a blank flange, the end of the pipe will be covered with several layers of plastic sleeves and tape. This was adequate in B779 when the pipe was size reduced shortly afterwards, but the Site Rep is concerned whether the tape and plastic will prevent any contamination release for several years, especially in light of the leak discussed below. RMRS has already agreed to do periodic inspections and surveys to detect any degradation of the plastic or tape. RMRS is also investigating whether to incorporate the Site Rep's suggestion of installing a pipe plug beforehand to avoid direct exposure of the plastic to the radioactive materials and chemicals in the pipe. If the above method cannot be performed, the flange will be disconnected using a glovebag or ventilated hood. While the technical staff was able to get improved controls put in place, this is one of several recent incidents in B771 where the proper radiological hazards and controls were not identified by building personnel without extensive outside involvement. K-H and RFFO have helped resolve these two issues, but they only became involved after the technical staff had been raising the issues for a couple of days.

Even with these new controls, a pipe cutter blade was highly contaminated (i.e.,  $> 10^6$  dpm) during a cut Friday. In addition, some plutonium solution leaked from a taped and bagged pipe. This solution contaminated a wall and several workers. Two workers had highly contaminated booties (one reportedly as high as  $10^6$  dpm) and one worker had 24,000 dpm on his modesty clothing. Nasal smears and bioassays were taken from four workers. RMRS has terminated all tap and drain/PPR activities until a fact finding meeting is held Monday.

**Salt Residue Stability.** Fauske and Associates performed an assessment of the pyrophoricity potential for salt residues using differential thermal analysis (DTA) data, reported plutonium oxidation rate laws, and the Semenov ignition model. The assessment concluded that there is no pyrophoric risk for salt residues. Based on the DTA data and that oxidation of the plutonium in salts is limited by oxygen diffusion, the most reactive salt DTA sample was determined to require a sample temperature of at least 325°C to ignite. Salt DTA exotherms at elevated temperatures were believed to be indicative of rapid corrosion, but not burning. A subsequent peer review of the assessment by John Haschke concluded that the effective surface area of the metal and porosity of the salt matrix was insufficient to support self-sustained oxidation of the metal by oxygen and water. He also agreed that the sample exotherms resulted from rapid corrosion. He suggested that atmospheric water accumulated by the salt promoted metal oxidation when the residue was heated above 100°C. The technical staff and Joe Leary are performing a technical review of these reports.

**Residue Record of Decision (ROD).** DOE issued its ROD that sand, slag, and crucible (SS&C) residues; plutonium fluoride residues, and scrub alloy will be shipped to SRS and stabilized in F-Canyon. The first shipment of SS&C left this week. Unfortunately, the shipment rate will be limited until DOE finally issues the 9975 shipping container SARP. This has been delayed indefinitely again. The ROD also allows the disposal of direct oxide reduction salts and other residues (combustibles, glass, graphite and inorganic) at WIPP after performing any required stabilization. A second ROD will be issued for the remaining residues.

**Air Hose Disconnection.** During a supplied air entry into a highly contaminated B371 room (17,800 DAC), an operator caught her air hose on a railing and accidentally popped off the quick disconnect on the air hose. She exited the room using her emergency air bottle. Although her lapel sample indicated 163 DAC, her nasal smears were negative. This is the fifth time a quick disconnect has been accidentally disconnected under similar circumstances. It happened last year in B371 and twice in B779 late last summer. K-H has been investigating alternative designs to reduce the frequency of this occurring, but no changes have been made so far.

The Site Rep also informed the K-H RadCon Manager of allegations he had heard that B779 was using unapproved supplied air equipment. A subsequent K-H investigation discovered that:

- B779 was using 100' air hoses when the plant standard was 50',
- B779 was using couplings in the supplied air system that had not been approved for item equivalency, and
- B779 was developing (but had not ever used) an auxiliary compressed air system that had no engineered design, no drawings, or any approvals.

It appears these problems were not intentional, but oversights. B779 is resolving them.

cc: Board members