

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 16, 2002

**TO:** K. Fortenberry, Technical Director  
**FROM:** M. Sautman, Hanford Site Representative  
**SUBJ:** Activity Report for the Week Ending August 16, 2002

Plutonium Finishing Plant (PFP): Since resuming polycube stabilization, furnace operations have been shutdown 4 times because the required off-gas flow rate could not be maintained due to filter plugging. This has happened twice during the char cycle (350 - 500°C) and twice during the thermal stabilization cycle (950°C). In half the events for each cycle, it appears that excessive condensation blocked the filters because the flow rate resumed while the furnace was cooling down. However, in the other cases, the polycubes are believed to have ignited which clogged the filters with soot. After the char cycle plugging events, the polycubes were moved to the front of the boat where it is cooler. While this appears to have slowed down the oxidation rate during the char cycle, it may have resulted in subsequent plugging during the thermal stabilization cycle since the polycubes may not have been fully charred before starting this cycle. PFP added a 30 minute dwell period to the char cycle to try to ensure the polycubes are fully charred before going to higher temperatures in the thermal stabilization cycle. If this is not successful, the batch size may have to be reduced. The wide variability in temperatures inside the furnaces with increased off-gas flows makes it harder to resolve this problem. (III-A)

Tank Farms: CH2M Hill Hanford Group (CHG) submitted a Justification for Continued Usage (JCU) for the BY/BX Farm Hose-in-Hose Transfer Line (HIHTL) and their technical position regarding potential failure mechanisms of the S/SX HIHTL. (See July 19, 2002 report). CHG also proposed performing a field inspection of the failed hose by October 2002 and completing a formal failure root cause by the end of December. The Site Rep observed portions of the 2-hour proof test of the BY/BX HIHTL at a minimum of 200 psig and 150°F that was conducted during graveyard shift Wednesday. The test was successful and the Office of River Protection approved waste transfers through this HIHTL. Based on the HIHTL design, proof test results, BY waste temperatures, and past BY/BX HIHTL flush temperatures, the Site Rep believes that the revised flushing controls adequately account for some of the uncertainty that still remains regarding the actual failure mechanism.

Although the February 2002 caustic addition to AN-107 brought the supernatant back within chemistry control limits, a second addition was planned to keep it within specification for a while. CHG decided to do the additions in 2 phases to avoid excessive solids precipitation that could lead to increased gas retention. However, based on recent precipitation results that show a sharp increase in solids precipitation above 86°F, CHG no longer believes it is prudent to make a second addition as planned. The tank's temperature is still elevated from the first addition and a second addition would further increase the temperature. Furthermore, the waste already has a neutral buoyancy of 1 and further precipitation would make the tank a candidate for gas release events. The tank is also running out of space for caustic additions. CHG is now looking at the possibility of transferring some waste out of AN-107, then transferring in dilute waste, followed by a caustic addition. The Site Rep agrees with CHG's decision to rethink their plans. One issue that came up during the Site Rep's discussion of this topic is that during the Phase 1 addition, the re-circulation transfer pump inlet plugged because of inadequate dilution of the concentrated caustic with waste. This dilution was one of the key controls in the process control plan. (III-A)

cc: Board Members