

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 10, 2002

**TO:** K. Fortenberry, Technical Director  
**FROM:** D. Grover and M. Sautman, Hanford Site Representatives  
**SUBJ:** Activity Report for the Week Ending May 10, 2002

Spent Nuclear Fuel Project (SNFP): Multi-Canister Overpack (MCO) 63 failed the leak test of the Safety Class containment boundary following cold vacuum drying. This MCO was identified as having an insufficient torque on the closure seal similar to MCO 40, the previous MCO to fail this leak test. However, unlike that MCO, the leak in MCO 63 could not be corrected by increasing the torque to the required amount. The project has developed a plan to safely seal the MCO within the shipping cask and transfer the cask and MCO to one of the two spare bays at the Cold Vacuum Drying Facility. The MCO will be stored there while a decision is made to either return it to the K-West basin allowing disassembly to examine the seal components or put it into an inerted overpack tube at the Canister Storage Building until closure welding is available. This will also allow supporting safety documentation and procedures to be developed without impeding efforts to remove additional fuel. The benefits of conducting a systematic analysis of the sealing process to identify potential upsets which could lead to the observed failure were discussed with DOE-Richland and SNFP management. This analysis could aid in determining where existing controls in the current sealing process could be improved as well as provide input into an evaluation of the likelihood of determining valuable information by disassembling the MCO. (III-A)

Tank Farms: The Site Rep met with the CH2M Hill Hanford Group (CHG) Chief Engineer to discuss their systems engineering program. CHG is developing System Description Documents (SDD) for 25 Vital Safety Systems (VSS) this year and hopes to finish SDDs for all double shell tanks and selected other systems (e.g., single shell tank ventilation system) next year. In addition, CHG is updating their Safety Equipment List, which had not been maintained for several years. CHG has developed criteria to determine the safety classification for each part of their VSSs that consider whether the part is fail safe, passive, easily replaceable, etc. The safety classifications of approximately 1000 parts have been downgraded by this effort and authorization basis changes, but between 600 and 700 have been upgraded. They are also developing criteria for qualifying equipment already installed. (I-C)

Plutonium Finishing Plant (PFP): Testing has determined that polycubes could have been 150/C hotter than what the furnace thermocouple, which controls the heat up rate, was indicating. The reason for this is that increasing the off-gas flow rate from 2 to 3 scfm to support polycube direct oxidation exacerbated the difference in temperature between the boat (which is close to the heating element) and air (which is what is measured) passing through the furnace to remove combustible gases. (Normally the boat is only about 20/C warmer for oxide thermal stabilization). Polycubes are heated at 5/C/min up to 350/C, but then this rate is reduced to 1/C/min between 350/ and 550/C to minimize combustible off-gas generation during the critical charring temperature range. Therefore, it is likely that during the first batch, polycubes were exposed to a 5/C/min or higher heat up rate when the boat was in the charring temperature because the controls indicated that the furnace was still below 350/C. This probably caused excessive organic gases to be generated which led to problems maintaining the required airflow and ultimately to operators shutting the furnace down. The staff will continue to follow PFP's resolution of this issue to make sure several safety issues are addressed.(III-A)