DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 2, 2004

TO: K. Fortenberry, Technical Director
FROM: D. Grover and M. Sautman
SUBJ: Activity Report for the Week Ending April 2, 2004

Waste Treatment Plant: As a result of recent research peer review panel comments that the hydrogen mitigation strategy was too conservative, Bechtel hosted a 2-day workshop to review the parameters used in the safety analysis and identify which ones potentially had excess safety margins that could be reduced. The review focused on those which could change equipment safety classification, eliminate safety equipment redundancy, or increase the calculated time for a vessel to reach the lower flammability limit such that intermittent mixing becomes more viable. The participants concluded that instantaneous gas release and headspace volume assumptions were too conservative. The team recommended that the analysis examine accident durations that require no recovery actions, non-Newtonian release fractions, alternate explosion models, and the use of 4% H_2 for anticipated/ unlikely events (i.e., deflagration) and 8% H_2 for extremely unlikely events (i.e., detonation). The team felt that Bechtel should consider using only intermittent air spargers (i.e., no pulse jet mixers) during accident response, even if that meant the bottom of the vessel was unmixed and accumulating hydrogen. Emergency modes of operation and safety control activation may now be required for relatively more frequent and less significant process upsets. Full sparging is needed if one of the Pretreatment non-Newtonian vessel recirculation pumps fails. The concurrent failure of 2 pumps (especially if leaching operations were ongoing) may require the switch from continuous to intermittent mixing due to vessel vent process system capacity limitations. Engineering also discussed using a headspace volume that was not based on the overflow tank level, but rather the height (taking into account instrument uncertainty) at which ITS (for a different scenario) interlocks trip. However, this level is below both the design guide's hi and hi-hi operator response levels which would imply that minor operator errors during filling would involve activating safety controls or invalidating the headspace volume assumption. For many months, Engineering has also been discussing their technical basis for intermittent mixing, but the technical basis for this approach still has not progressed beyond the use of illustrative values. (III)

Plutonium Finishing Plant (PFP): PFP exceeded a Limiting Condition of Operation (LCO) completion time (2 hours) for returning a Continuous Air Monitor (CAM) to service or to provide for equivalent alternative monitoring. The critique identified that potential causes of the LCO violation included confusion about the procedure, less than adequate prejob planning, and less than adequate procedures or training on the expectations regarding complying with facility management direction involving compliance with Safety Basis requirements. (II)

Spent Retrieval and Disposition Project (SRDP): The 90 percent design review for sludge consolidation in K-East Basin was conducted this week. The process design estimates that approximately 3,000 curies of cesium-137 will be released from the sludge to the basin water. This is likely to pose a significant challenge to the water treatment system's ability to maintain water quality and prevent further degradation of the radiological conditions for workers. (II)