DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 12, 2004

TO: K. Fortenberry, Technical Director
FROM: D. Grover and M. Sautman
SUBJ: Activity Report for the Week Ending March 12, 2004

Waste Treatment Plant (WTP): Even if the recommended pulse jet mixer (PJM)/sparge tube configurations (see last week's report) work as anticipated, there are still significant impacts to the project that will be challenging to resolve. Additional research is needed to address several open technical issues and engineers are facing significant impacts to a design that has limited flexibility at this point. Sparging can lead to foaming and affect waste rheology by changing the pH and evaporating the waste. To counteract these concerns, engineers anticipate adding Important-to-Safety (ITS) lines to add anti-foaming agent, 5 M NaOH, and demineralized water. These controls will depend on new ITS waste level detectors, although the PJMs and spargers make it difficult to measure the level accurately. While the air introduced through the sparge tubes will allow the passive and forced air purges of the headspace to be eliminated, the current design of the vessel vent process system (parts of which are already being fabricated) is not sized to handle 2 tanks at full sparging at once, much less 5 tanks. Erosion will likely be increased as some recirculation pump jet nozzles have a J-hook design, the PJM velocity is now 12 m/s, and the PJM nozzles discharge only 6 inches from the tank surface. Furthermore, the PJM configuration is necessitating changing the location of the recirculation pump suction which will likely require steam ejectors be added to some tanks to reduce the volume of waste that could not be pumped from the bottom of the tank. Space needs to be found to store the new equipment (tanks, pumps, extra emergency generator?) and possibly larger equipment (air compressors, support equipment). Finally, additional research will be needed to develop a technical basis for intermittent operation of PJMs versus continuous operation, determining at which waste levels spargers and/or PJMs can be turned off, and how much aerosolization is caused by sparging. (III)

Spent Nuclear Fuel Project: This week a hoist fell off the end of the end of one of the K-West Basin monorails onto the basin grating, this reportedly occurred several minutes after a worker came into contact with the hoist and started walking away. The mechanical interlocked rail stops at the end of the monorail which should have prevented the fall were bent and stuck in the disengaged position. An inspection of the basin following the drop identified other bent rail stops in the K-West Basin and degraded rail stops in K-East Basin. The critique determined that a periodic inspection was performed on the monorail system in January 2004, with no identified deficiencies regarding the rail stops. Hanford requires this inspection to be performed by a qualified inspector and the inspection procedure requires that the rail stops be checked for looseness and alignment. The investigation into the cause of the equipment malfunction is ongoing. In response to this event, DOE-Richland (RL) transmitted a letter to Fluor Hanford (FH) expressing concern over the occurrence and immediate response. RL stated that these events may indicate a recurring breakdown of formality and discipline required to safely perform operations at K Basin and expects FH to provide assurance that the root causes for the Integrated Safety Management deficiencies have been identified prior to work activities being initiated. (II)