

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 26, 2004

**TO:** K. Fortenberry, Technical Director  
**FROM:** D. Grover and M. Sautman, Hanford Site Representatives  
**SUBJ:** Activity Report for the Week Ending November 26, 2004

Tank Farms: The staff met with site nuclear safety and operations personnel and discussed their concerns with the credited control set for waste transfer misroutes. (See 11/19/04 report). The staff believes that if the authorization basis is going to credit two closed, general service waste transfer valves for limiting leakage to a level where a misroute leak is only a facility worker hazard, then the valves should be classified as safety significant. In addition, the staff believes the control set should emphasize engineered controls that prevent a misroute from ever occurring rather than the approved set of administrative controls, many of which try to detect a misroute as it is occurring and then mitigate the consequences of a leak. While there are physical limitations that prevent the testing of many valves, the staff believes the valves should still be credited and these limitations addressed when fleshing out the implementation details of the Technical Safety Requirements. This approach may also apply to other situations where administrative controls (e.g., configuration management, instrument calibration or functional tests) are used to address credited general service equipment in lieu of designating them as safety significant. The staff also encouraged the site to review their upcoming designs for tank farm upgrades and new facilities to see if provisions can be made to allow future valve testing and to make sure credited safety equipment is appropriately classified. Site personnel are reviewing the above issues and will be meeting with the staff shortly to discuss their proposed responses.

Waste Treatment Plant: Bechtel is evaluating options for addressing hydrogen buildup in the hot cell pump suction lines, dead legs, and pulse jet mixers (PJMs). For example, high point vents may be added to ultrafiltration vessel 12" pump suction lines, where 25-28 liters of hydrogen could be generated within 24 hours under stagnant conditions. Certain dead legs may simply be eliminated. The relatively large volume of waste inside a PJM tube can generate enough hydrogen so that flammable concentrations are reached within hours inside piping connected to the PJM. Much of the non-Newtonian waste inside the PJM tube will be an unmixed slug unless there is the occasional full discharge stroke to expel and mix this waste. The evaluation guidelines that have been developed for evaluating the hazards and identifying controls appear to be of only limited value. Practical guidance - such as how much TNT-equivalent is needed to damage the pipe, vessel, or nearby equipment - is still unavailable.

The Site Rep reviewed Bechtel's formal proposal for the Pretreatment Facility control room and it addresses several issues noted in the Board's July 21, 2004 letter. The control room will be removed from the steel frame construction Annex and will be housed in a separate concrete building. In addition, the emergency standby filtration system will be changed to a full-time system, which is important since an ammonia tank accident could cause short-term exposure limits to be exceeded in the control room in less than two minutes.  
cc: Board members