

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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TO: K. Fortenberry, Technical Director
FROM: M. Sautman, Hanford Site Representative
SUBJ: Activity Report for the Week Ending January 2, 2004

Waste Treatment Plant: Both Newtonian and non-Newtonian wastes overflow into the High-Level Waste facility's Plant Wash and Drains Vessel (RLD-VSL-8). However, in most cases, the waste does not overflow directly into the tank, but is collected in a sump and then transferred with steam ejectors. For non-Newtonian waste, this provides an opportunity where the waste could be sufficiently diluted before transfer since it has not been demonstrated that the 4 pulse jet mixers (PJM) in RLD-8 would provide the necessary mixing to avoid gas retention during abnormal conditions. However, the concentrate receipt vessels (CRV) receive non-Newtonian waste from the Pretreatment facility at ~140 gpm and overflow directly into RLD-8. Bechtel is already evaluating the elimination of the CRVs as part of the PJM optimization study which would make this issue moot. Other options that Bechtel will be evaluating are allowing the CRVs to overflow to the cell floor or relying on Important-to-Safety equipment to shut down the feed into the CRV when the high-high alarm activates. (III)

The Office of River Protection (ORP) has concurred with Bechtel's approach for demonstrating that much of the structural steel does not require fireproofing. Bechtel believes that automatic fire suppression systems will protect the horizontal structural beams and upper portions of the structural columns from the effects of fire by activating well before the steel can reach 1000° F. This would be demonstrated through a qualitative analysis based on the room height, sprinkler activation set point, and multiple fire magnitudes. For lower portions of the columns, Bechtel would perform "realistic but conservative" heat transfer calculations to ascertain if a representative fire can raise the temperature of the column to 1000° F, taking into account heat conduction up the column as well as heat transfer to the surrounding air via radiant and convective medium. If the column has the potential to yield, complex calculations are required, or the results are uncertain, then additional fire protection measures would be taken. These could include dropping additional sprinkler heads along the structural column or encasing the column in gypsum board. The success of this approach will depend on the methodology to be used for the qualitative analysis and how "reasonable" is defined. Furthermore, it is not known how the analysis will address fires when the sprinkler suppression system is inoperable. (III)

Tank Farms: There are a number of "improvements" that ORP is planning to make that assume the tank gas release behavior is well understood and predictable. One action is to revise the waste group definitions by replacing the construct of an instantaneous release of the retained gas to the tank headspace with one where the rate of retained gas release is rapid with respect to the tank ventilation rate. In addition, the need for induced and spontaneous gas release event (GRE) controls would be dependent on whether the activity could induce a release fast enough to reach the lower flammability limit (LFL) or if the expected volume of released gas in a buoyant displacement GRE would reach the LFL. Furthermore, they want to exempt the existing Waste Group A tanks from spontaneous GRE controls since they believe those tanks' historical buoyant displacement GREs indicate that 100% of the lower flammability limit would not be reached in the headspace. (IV)