

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 31, 2003

TO: K. Fortenberry, Technical Director
FROM: D. Grover and M. Sautman, Hanford Site Representatives
SUBJ: Activity Report for the Week Ending October 31, 2003

K Basins Sludge Project: The project believes that flow constriction problems in the supply regulators were primarily responsible for the testing problems for the Active Inert Venting System (AIVS) discussed in last week's activity report. The project plans to add a parallel flow path to increase the available flow rates. The AIVS is a Safety Significant system that is to provide an inert atmosphere in the sludge container to preclude a hydrogen deflagration accident. A site rep review of the system design has raised a concern with the control strategy for ensuring the AIVS is available to perform its safety function. The system contains manually operated valves between the argon supply and sludge container as well as between the sludge container and pressure indicator used to perform the Limiting Condition of Operation surveillance requirement for operability of the system. However, there is no safety basis function identified for these valves and no administrative controls governing their operation. (I-C)

Tank Farms: The new Documented Safety Analysis (DSA) was implemented Monday. (I-C)

Due to double shell tank (DST) space limitations, CH2M Hill Hanford Group (CHG) is facing the possibility that the upcoming S-102 retrieval could cause tank SY-102 to become a Category A tank (prohibited by the Authorization Agreement) and that evaporator runs could halt this year since further concentration would result in solids being formed (outside of DSA). CHG has to do something in order to allow waste retrievals to continue. Trying to maximize specific gravity, waste retrievals, and tank fill height is difficult because buoyant displacement gas release events (BDGRE) can occur when there is > 100 in. of solids and > 36 in. supernatant present. An option to make solids in the evaporator and then distribute them among the DSTs becomes operationally complex with all the required transfers. Another option would be to temporarily create a Category A tank for 4-6 months while post-evaporator waste cools down and solids settle and then transfer the supernatant to another tank. The BDGRE hazard would be addressed by mixing the waste or using other controls. The Site Rep intends to closely follow CHG's efforts to develop and evaluate various options for resolving these issues. (III-A)

Waste Treatment Plant: Bechtel National Inc. provided the staff an update on the cesium ion exchange column hydrogen mitigation system. The system is intended to initiate a flush of the line whenever approximately 5 in³ of gas has accumulated. Very preliminary calculations indicate that at peak Cs-137 loadings, hydrogen generation alone would result in a flush every 1.5 minutes. However, some data indicates that the total volume of gas generated could be more than 2 orders of magnitude larger than just hydrogen's. While this may reduce the hydrogen concentration in the accumulated gas, the total gas volume might overwhelm this system's ability to flush it out and lead to gas accumulations significantly greater than 5 in³. (I-C)

Cc: Board Members