DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 23, 2008

TO: J. K. Fortenberry, Technical Director
FROM: W. Linzau and R. Quirk, Hanford Site Representatives
SUBJECT: Hanford Activity Report for the Week Ending May 23, 2008

Waste Treatment Plant (WTP): The site rep met with personnel from the Office of River Protection (ORP) and the contractor to discuss the requirements for safety-related instrumentation and controls (I&C). The safety-class I&C is required to comply with tailored versions of the key IEEE standards recommended in DOE Guide 420.1-1 as well as ISA S84.01. Safety-significant I&C will also comply with ISA S84.01 but will not have to meet single failure criteria. The site rep noted that ORP needs to approve the contractor-proposed criteria for determining the required reliability of the safety instrumented systems (SIS). The contractor is still developing the procedure for calculating the reliability of the SIS, but indicated that they will permit the use of non-safety equipment in demonstrating that the SIS reliability requirement is met. In a subsequent discussion with contractor management, the site reps were told that although WTP plans to take credit for non-safety equipment in meeting the reliability requirement, at least one layer of protection will be a safety-related instrument. Follow-up discussions are planned to address the tailoring of these and other standards that impact I&C.

The project is considering design modifications of evaporators to be installed in the Pretreatment Facility due to problems discovered in the stress calculations. The procurement was initiated years ago and the design calculations were being revised to account for the changes in seismic ground motion criteria. It was discovered during this reanalysis that stresses from thermal loads at some of the nozzle piping connections are beyond allowable limits prescribed in the ASME code. The evaporator vessels are in fabrication at the vendor's shop. The WTP contractor is planning to meet with the design subcontractor early next month to discuss the interpretation of the code requirements and possible design changes that will ensure code compliance.

DOE EM provided ORP with comments from their review of the regulatory approach being used at WTP. The comments include: the Decision-to-Deviate process needs to be strengthened by formally indentifying and documenting risks; although the PSAR meets STD-3009 requirements, grading of key safety standards and orders is not an acceptable practice for a project that must meet 10CFR 830; there is a potential erosion of the safety basis by the contractor not considering cumulative effects of changes between PSAR updates; and there is a question if facility changes are properly evaluated considering the Criticality Safety Evaluation Report.

Tank Farms: The contractor initiated the leak assessment process for single-shell tank SX-104 because the quarterly reading of interstitial liquid level in the tank showed a noticeable difference from the previous quarter. The tank is already an assumed leaker. The assessment team will evaluate existing data and request the collection of new information to determine if a leak exists or if other factors caused the indicated level change, such as instrumentation error, the effect of barometric pressure changes on the waste, or a release of gas from the waste.

K Basin Closure: The project experienced a number of equipment problems during the dry runs for the restart of spent nuclear fuel operations. The contractor believes some are the result of repetitive reuse of training multi-canister overpacks. Richland Operations Office will have to evaluate the contractor's proposal to simulate some operations during the upcoming contractor and DOE operational readiness reviews because of these problems.