

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 20, 2012

TO: T. J. Dwyer, Technical Director
FROM: W. Linzau and R. Quirk, Hanford Site Representatives
SUBJECT: Hanford Activity Report for the Week Ending January 20, 2012

Waste Treatment Plant (WTP): The site rep observed testing conducted to provide confidence in the project's methodology for estimating spray release aerosol generation. The testing is being conducted by PNNL at their Applied Process Engineering Laboratory and is a result of questions raised by the Board and documented in an April 2011 letter. The test objectives were to quantify the droplet size distribution and concentration as a fraction of the total spray and determine if small breaches would always plug and therefore be excluded from the hazard analysis. The test results will be compared to the project's methodology, which is based on DOE Handbook 3010 methodologies. The testing was conducted by spraying various simulants through holes or slots cut into pipes. The size of aerosol generated and its rate of generation from the spray were measured using two types of laser diffraction particle analyzers. The tests were run at three fluid pressures (100 psi, 200 psi, and 380 psi) and with circular holes from 0.2 mm to 4.46 mm. Various sizes of rectangular breaches were also modeled and simulants ranged from water to non-Newtonian slurries. Preliminary observations include that plugging did not always occur even with the smallest holes, and that the project's methodology appears to bound the aerosol generation seen during the testing. All observations are preliminary and conclusions will be made after the data is analyzed. The report is scheduled to be completed by April.

The site rep observed an Office of River Protection (ORP) Safety Review Board for adding six safety-significant (SS) isolation valves to the demineralized water (DIW) lines for the Low Activity Waste submerged bed scrubbers (SBSs). The previously selected DIW valve will remain SS for another accident, but the old design had enough holdup in the isolated DIW lines to flood the SBSs enough to block the melter offgas flow. With a focus on plant operation, an ORP facility representative (FR) questioned if this was the best choice because the new valves will not be as accessible for maintenance and if the analysis had been completed to show there was adequate margin for the trip setpoint. Others at the SRB noted the new valves will still be accessible and the safety control function is greatly improved with these new valves. The ORP nuclear safety manager emphasized that the contractor will need to complete a design that is compliant with the revised safety basis, including determination of the final SS trip setpoint. It appeared that the Safety Evaluation Report will be approved after minor errors are corrected.

Plutonium Finishing Plant (PFP): The contractor proactively replaced the bearings on the motor for exhaust fan (EF)-2 after they heard a slight noise while checking vibration levels during a recently re-instituted preventative maintenance (PM) check. A Limited Condition for Operation (LCO) requires that at least four of the remaining six EFs be operating when D&D work is performed, but the two spare EFs can only be used for emergencies until weld repairs are completed (see Activity Report 9/23/11). The contractor significantly increased the frequency of the PM while they prepared the work package for replacing the bearings. They entered the associated LCO in a controlled fashion last weekend and replaced the motor bearings. Afterwards, they found a defect in one of the two-decade-old bearings and concluded that this was the cause of the noise. The site rep believes that the contractor's new approach to maintaining equipment that is important to worker safety is a significant improvement at PFP.