

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 9, 2005

**TO:** J. Kent Fortenberry, Technical Director  
**FROM:** R. Todd Davis/Donald Owen, Oak Ridge Site Representatives  
**SUBJECT:** Activity Report for Week Ending September 9, 2005

Mr. Davis was out of the office on Thursday and Friday.

A. Oxide Conversion Facility. During system testing with hydrogen fluoride (HF) over the last two months, BWXT identified numerous instrumentation problems (see 7/1/05, 8/26/05 and 9/2/05 site rep. reports). Erratic signals from a flow instrument for the dock scrubber also occurred this week causing a system shutdown/isolation when attempting to drain and purge HF from the system back to the HF cylinder. On Thursday, YSO and BWXT management met to discuss the instrumentation problems. BWXT intends to complete draining/purging of HF from the system back to the HF cylinder early next week and proceed with troubleshooting and repairs.

B. Furnace Reduction Operations. As noted on January 14<sup>th</sup>, a new reactor vessel for operations to chemically reduce uranium tetrafluoride to uranium metal has been designed to meet the ASME Boiler and Pressure Vessel Code. These reactor vessels are subject to significant internal pressures and temperature gradients. The new reactor vessels are made of Haynes Alloy 230 in lieu of stainless steel and incorporate new pressure sensing and pressure relief capabilities. Authorization basis (AB) changes for use of the new vessel have been developed by BWXT and were approved by YSO late last week. Credited controls/equipment include the new reactor vessel, use of a new internal vessel liner for each operation, pressure relief piping, and furnace high-temperature cutout and interlock controls. As a result of the new vessel and pressure relief capability, the prior AB control that restricted personnel in the area during furnace operations is no longer required. A BWXT Implementation Validation Review (IVR) of the AB changes and a BWXT Readiness Assessment (RA) are planned to confirm readiness for use of the new vessel. The IVR and RA are expected to start within the next few weeks.

C. Criticality Safety/Conduct of Operations. As reported on June 3<sup>rd</sup>, BWXT developed short-term and long-term actions to address procedural and conduct of operations issues associated with storage of several over-mass containers in Warehouse tube vaults. Many of the long-term actions call for further evaluation before specific correction actions are identified later this year. In recent discussions with the site reps. on overall progress, YSO and BWXT management noted that analysis to support simplifying tube vault criticality mass limits is nearing completion. Container labeling that ensures inclusion of all parameters important for criticality safety (as called for by ANSI/ANS standards) was discussed as being part of a long-term effort to use new technology to monitor and move fissile material containers. The site reps. noted that there may be need for interim actions regarding labeling of containers being moved and stored. The site reps. will continue to follow these efforts.

D. Purification Facility Startup Preparations. The new Purification Facility will perform processing of a special material using acetonitrile. This week, the BWXT RA was completed and results briefed to Y-12 management. Several prestart findings were identified but the RA team noted that operations personnel performance was generally satisfactory. The RA team's report is to be available early next week. Resolution of the findings is expected to take a few weeks. YSO line management verification efforts are expected to be completed in late September and the NNSA RA is now scheduled to start October 3<sup>rd</sup>.