

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 23, 2004

TO: J. Kent Fortenberry, Technical Director
FROM: Donald Owen, Oak Ridge Site Representative
SUBJ: Activity Report for Week Ending April 23, 2004

Staff members Bamdad, Dwyer, Gutowski, Nichols and outside expert West visited Y-12 this week to review progress on Building 9212 wet chemistry and Oxide Conversion Facility startup efforts.

A. Small Fire in Building 9995. Building 9995 is the main analytical chemistry laboratory at Y-12. On Thursday morning a small fire was observed in a Building 9995 laboratory microwave oven by a lab technician. Laboratory technical support and management personnel were notified, arrived, and made a decision to open the microwave door and extinguish the fire (after unplugging the microwave) with water using a small squirt bottle. About 50-75 ml of water was used and the fire was extinguished. The fire had consumed a portion of a plastic carousel used for holding vials in the microwave. The Y-12 Fire Department was not notified until more than 1 hour after initial observation of the fire. No surface or airborne radiological contamination was found outside the microwave (the microwave exhaust is routed to a laboratory exhaust hood).

Dissolution, termed "microwave digestion," of two depleted uranium machine turnings (0.2 grams and 0.13 grams, respectively) in nitric acid solution was in progress. Each turning was in a small plastic vial on the carousel. The vial with the 0.2 gram chip caught fire.

The lab technician operating the microwave had first attempted dissolution at a 70 °C microwave control setting (the microwave controls temperature with a liquid temperature probe) but saw that the chips were not dissolving. The operator then increased the setting to 100 °C, and then to 120 °C. No procedural guidance nor clear instructions on use of the successively higher temperature settings was provided to the technician. It is believed that after running the microwave at 120 °C (the nitric acid solution boiling point is 104 °C) that the solution boiled off and the machine turning arced thereby igniting the plastic vial.

Investigation of the fire is in progress by BWXT. Issues with lack of formal instructions/procedures and timely fire department notification have been identified. The site rep. discussed the lack of timely notification to the fire department with YSO and BWXT management, particularly in light of lessons-learned at Rocky Flats from a glovebox fire in May 2003 regarding timely fire department notification (among others). YSO management indicated that YSO review of this fire will address that issue.

B. Oxide Conversion Facility (OCF) Startup. The staff and site rep. reviewed overall OCF startup progress including progress in responding to the Board's December 31st letter as well as concerns raised during prior review of OCF instrumentation and control systems. Several questions were discussed in areas such as: safety designation of certain dock scrubber system (used to neutralize hydrogen fluoride) equipment; procedural hold points for the planned single-shift operations; potential for an electrical short to energize and open safety isolation valves during a seismic event; and formality of mass control for hydrogen fluoride at the dock.

Various "cold" practice operations continue by OCF personnel but main conversion cold operations have not yet started. The current OCF schedule calls for the start of the BWXT Operational Readiness Review in late May.