

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 2, 2008

TO: J. Kent Fortenberry, Technical Director
FROM: R. Todd Davis/David Kupferer/Donald Owen, Oak Ridge Site Representatives
SUBJECT: Activity Report for Week Ending May 2, 2008

DOE Headquarters Assessment: This week, the DOE Office of Health, Safety and Security (HSS) completed a factual accuracy review of their assessment of environment, safety and health programs at Y-12, including the adequacy of integrated safety management systems, and provided a final out-brief and draft report to YSO and B&W management. While the HSS team noted several areas of improvement since their review in 2005, the team stressed the need for YSO and B&W to ensure that established processes are always followed with sufficient rigor. Specifically, the HSS team found that while design and quality control specifications are consistently and strictly followed, the same level of attention to detail was not as consistent and rigorous in analyzing hazards and implementing hazard controls. The HSS team noted that although no instances of actual unsafe conditions were observed, a significant number of technical quality deficiencies were identified in a relatively small sampling of analyses, procedures, and other documentation relating to safety structures, systems, and components, which could compromise facility safety. The team also highlighted that YSO and B&W are not ensuring consistent, effective management of safety issues to correct identified deficiencies in a timely manner.

Enriched Uranium Material – Unexpected Thermal Reaction - Update: A month ago in the Enriched Uranium Operations Building, operators identified a uranium chip briquette storage can that had experienced a thermal reaction (see the 3/28/08 site rep. report). This week, facility personnel concluded their investigation of this incident and briefed the Management Review Board (MRB). The briquettes in three similar cans have been inspected during the last few weeks. Moisture and uranium oxide were identified in briquettes that were stored in two of the three cans, but no evidence of any pyrophoric reactions was present and no reaction was observed when material samples were exposed to air. In addition, no radiological material or contamination was found outside of the can that experienced the thermal reaction.

Facility personnel noted that the chip cleaning and drying process, performed prior to briquetting, is not removing all of the moisture from the chips (a new chip cleaning fluid was introduced in mid-2007). This moisture is causing some uranium oxidation and potentially some hydriding. Facility personnel believe a significant reaction associated with this material is unlikely and would be localized. Facility personnel recommended to the MRB that briquette processing be resumed (including briquette production, storage and feed to casting) following development of an Abnormal Operating Procedure and additional operator training for responding to any pyrophoric reactions. B&W is evaluating possible process changes to reduce moisture in the chips (e.g., chip cleaning fluid chemical additive, increased drying temperature) on a priority basis. The MRB approved the recommendation to resume briquette processing. In discussion with the site reps., B&W management noted that backlog reduction of briquettes is also a priority.

During the MRB deliberations, it was noted that operators had observed moisture during briquetting late last year and again earlier this year. However, B&W evaluated the presence of moisture only for implications to criticality safety. The MRB noted that this unusual condition did not get full evaluation of potential implications.