

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

TO: Timothy Dwyer, Technical Director  
FROM: Wayne Andrews and David Kupferer, Site Representatives  
SUBJECT: Oak Ridge Activity Report for Week Ending June 15, 2012

**Uranium Processing Facility (UPF).** This week, the Administrator of NNSA responded to YSO's request for clarification of DOE requirements related to several of the key changes in the Safety Design Strategy for UPF (see the 4/6/12 report).

- The Administrator concurred that all non-safety structures, systems, and components (e.g., the defense-in-depth active confinement system) need to only be designed to SDC-1 criteria.
- The Administrator concurred with the method used by the UPF project team to determine a site-specific deposition velocity and concluded that the calculated deposition velocity is acceptable. The Administrator also determined that the dispersion coefficient ( $\chi/Q$ ) proposed by the UPF project team,  $1.4E-4 \text{ sec/m}^3$ , has been extensively validated and provides a reasonably conservative value that is appropriate for use in the accident analysis for UPF.
- The Administrator concurred with the UPF project team's safety strategy of preventing a criticality accident following a seismic event by requiring that (a) design features for criticality safety be designed to SDC-2 criteria and (b) specific design features whose failure following a seismic event has the potential to directly result in a nuclear criticality accident be designed to SDC-3 criteria.

Also this week, the Deputy Secretary of Energy approved a revised Critical Decision-1 (CD-1) and associated Project Execution Plan (PEP) for the UPF project (see the 7/27/07 report). The revised CD-1 and PEP reflect a reduced scope in the project for a "capability-sized UPF" with a priority on transitioning capabilities from Building 9212 to UPF and deferring capabilities from Buildings 9215 and 9204-2E (see the 3/23/12 report).

**Criticality Safety.** This week the Building 9212 Operations Manager declared an occurrence due to the performance degradation of the Criticality Accident Alarm System (CAAS) enunciation system. This was the result of a failed horn circuit and Emergency Notification System Digital Message Recorder (DMR) that prevented satisfactory performance of its design function. The degradation was discovered during the annual Area 5 CAAS surveillance. The CAAS is a safety-significant system. The DMR was replaced allowing the successful completion of the annual Area 5 surveillance. A DMR also failed in 2008 (see the 8/1/08 report) but not during an annual CAAS surveillance.

**Holden Gas Furnace.** While conducting an annual surveillance on the Holden Gas Furnace (HGF), B&W discovered abnormally high pressures in the natural gas supply line and suspended operations (see the 5/4/12 report). A pressure of greater than 30 psig was observed whereas the normal range is less than 20 psig. B&W subsequently reported a positive Unreviewed Safety Question due to the possibility for high natural gas pressures to preclude the flame management system (FMS) from performing its safety-significant function. Specifically, the FMS has a credited ignition interlock that shuts off the gas supply within 15 seconds of starting up the HGF if the pilot has not yet ignited. This interlock ensures that the lower flammability limit (LFL) is not exceeded assuming that the natural gas supply pressure is less than 20 psig. B&W recently performed additional calculations that revealed potential scenarios where a high supply pressure could result in the LFL being exceeded prior to the credited interlock performing its safety function. B&W's path forward is to 1) revise the safety analysis, 2) develop and implement a passive design feature (orifice) to be added to the HGF system as a credited control, and 3) conduct an effectiveness review to verify the corrective action is effective.