

## **Staff Testimony – Emergency Response/Nuclear Operations**

Good afternoon Mr. Chairman and Members of the Board. For the record, my name is David Campbell. I am a member of the Board's technical staff responsible for oversight of defense nuclear facilities at the Y-12 National Security Complex.

In this session of the public hearing, the Board is considering the state of the emergency preparedness and response capabilities at Y-12, as well as the safety of nuclear operations, including the National Nuclear Security Administration, or NNSA, and contractor oversight of high-hazard enriched uranium operations. In my testimony, I will provide an overview of Y-12's emergency response program, including a discussion of areas where current capabilities, in the Board's staff's opinion, could be enhanced. I will also discuss concerns with the execution of nuclear operations, and in particular, weaknesses related to conduct of operations and activity-level work planning and control, and the actions taken by NNSA and B&W to address these weaknesses.

The Department of Energy, or DOE, established specific programmatic requirements for all DOE and NNSA elements related to

## Staff Testimony – Emergency Response/Nuclear Operations

emergency planning, preparedness, response, recovery, and readiness assurance. DOE Order 151.1C, *Comprehensive Emergency Management System*, details these requirements to help ensure that DOE and NNSA can effectively and efficiently respond to emergencies, and thus protect workers, the public, and the environment. The Board's staff reviewed Y-12's Emergency Management Program and found that it generally meets DOE requirements and is implemented according to DOE guidance documents. When compared to a number of other sites across the defense nuclear complex, Y-12 has a fairly mature program.

In 2011, following the earthquake and tsunami in Japan and the subsequent reactor accident at the Fukushima Dai-ichi plant, the Secretary of Energy issued a Safety Bulletin that directed DOE elements to evaluate facility vulnerabilities with respect to events that fall outside the design basis for the facility. The design basis refers to the complete set of bounding accidents, including the operational and natural phenomena events that are analyzed when developing the set of safety controls for a facility. B&W's response discussed its analysis of Beyond

## **Staff Testimony – Emergency Response/Nuclear Operations**

Design Basis Events; the site's ability to manage a total loss of power; the maintenance and operability of safety systems; and the state of emergency plans, procedures, and equipment. Most significantly, B&W reported that the primary command and control facilities used at Y-12 to manage emergency response are not seismically qualified and would not be habitable or accessible following many events involving hazardous materials.

Subsequently, in February 2012, the DOE Office of Health, Safety and Security, or HSS, issued a report documenting their independent review of Y-12's preparedness for severe natural phenomena events. This review identified opportunities for improvement related to site response and short-term recovery planning for severe events. The Board's staff notes that, in general, the identification of emergency response resources at Y-12 is based on the analysis of events that affect only one facility at a time; multiple-facility events and events that cascade in consequence have not been analyzed. For certain severe events, this lack of comprehensive analysis may complicate triage

## Staff Testimony – Emergency Response/Nuclear Operations

activities and may fail to provide emergency response coordinators with information needed to prioritize and allocate limited resources.

Addressing the infrastructure vulnerabilities of emergency response facilities and analyzing multiple-facility events would improve the overall capability of Y-12 personnel to respond to severe events.

Likewise, the site would benefit from expanding the exercise program to test capabilities for responding to and recovering from such severe events. Although Y-12 personnel have begun to strengthen their program in these areas, these capabilities have not yet been fully incorporated into Y-12's planning efforts.

I'll turn now to the safe performance of nuclear operations. Generally speaking, nuclear operations must be conducted according to a number of fundamental principles. Work planning must include a comprehensive analysis that clearly identifies the hazards posed by the work activity or work environment and must derive the appropriate controls for these hazards. Successful work planning is an iterative process and requires input and coordination from many personnel such

## **Staff Testimony – Emergency Response/Nuclear Operations**

as work planners, craft workers, field work supervisors, subject matter experts, system engineers, etc. The resulting procedures or work packages must provide clear direction, be executable, and incorporate controls into work steps in a logical manner. The required system conditions must be properly established prior to, during, and following the work. In order to ensure that work is performed in the manner planned, the workers, in turn, must strictly adhere to the procedures and work packages. These are a few elements central to the principles of Integrated Safety Management and Conduct of Operations. Weaknesses in the implementation of these principles can contribute to operational accidents that could jeopardize the safety of workers, and possibly the public and the environment.

At Y-12, the necessity of strictly implementing the principles of Integrated Safety Management and Conduct of Operations is further amplified due to the challenges presented by aging nuclear facilities. Fewer engineered controls are available, which results in heavier reliance on administrative controls and personal protective equipment to

## **Staff Testimony – Emergency Response/Nuclear Operations**

reduce the safety risk to the workers and public. Workers' strict adherence to procedures and work packages is essential to ensure reliable implementation of these administrative controls.

In 2010, several events occurred that pointed to weaknesses in B&W's work control processes. Subsequently, the Board conducted a series of focused reviews on technical procedures, conduct of operations, work planning and control, and training and qualification. The Board found that technical procedures were generally deficient, using unclear language and imprecisely coordinating actions between multiple procedures. On a number of occasions, workers performed steps out of sequence or skipped steps altogether. Work packages routinely incorporated vague steps that were not broken down to appropriate task-specific levels. Job hazards analyses failed to identify significant task-specific hazards and controls. NNSA and contractor oversight efforts had not been effective at identifying these issues without the help of outside organizations. As a result of these weaknesses, there was a heavy reliance on the first-line supervisors and workers to make up for

## Staff Testimony – Emergency Response/Nuclear Operations

the deficiencies in work packages and procedures. The Board communicated these issues in letters to NNSA in August and December 2011.

In response, B&W developed performance improvement plans to address the Board's concerns. The Conduct of Operations Performance Improvement Plan specifically targeted weaknesses within the Production Organization and in technical procedures. B&W implemented a more rigorous hands-on, situational training course and formalized management's expectations for procedural compliance. B&W instituted a Senior Supervisory Watch program to better integrate senior managers into field-based observations of nuclear operations and B&W's Procedure Improvement Plan drove a comprehensive review and re-write of many production procedures, beginning with higher-hazard operations that demonstrated the most significant weaknesses. Additionally, B&W's Work Planning and Control Performance Improvement Plan instituted a series of corrective actions to improve the Maintenance organization's implementation of integrated safety

## **Staff Testimony – Emergency Response/Nuclear Operations**

management at the activity level. B&W focused on improving subject matter expert engagement during the development of work packages and revising the process for analyzing job hazards.

Overall, B&W's corrective actions resulted in noticeable improvements in the implementation of conduct of operations within the Production organization. Instances of procedure non-compliances have been reduced. Technical procedure quality has improved. During a recent independent contractor assessment, B&W's Nuclear Safety Operations organization concluded that the desired results had been achieved by the Conduct of Operations Performance Improvement Plan. The Board's staff observed this B&W assessment and agrees with the conclusions.

In the area of work planning and control, however, performance gains have not been as evident. Work package quality continues to be an area of concern. Several recent worker exposure events reinforce the need for continued effort in this area. The B&W Nuclear Safety Operations assessment highlighted the lack of progress in the



## **Staff Testimony – Emergency Response/Nuclear Operations**

Maintenance organization toward addressing known work planning and control deficiencies. Again, the staff observed and agrees with the conclusions of the B&W assessment team.

B&W's senior management has been a driving force behind initial efforts to improve the performance of nuclear operations. The Board's staff believes that it is important for NNSA and B&W to now focus on sustaining the performance gains achieved in conduct of operations, while continuing to address known weak areas in work planning and control. This can be accomplished through a number of mechanisms, many of which are already underway. The Board's staff believes that training, in particular, is essential to sustain improvements. The Board discussed the importance of a coordinated and responsive continuing training program in a June 2012 letter to NNSA. Through a new Continuing Training Pilot Program, B&W is implementing a number of mechanisms that should enhance the quality of training for nuclear operators in the Production organization.

## **Staff Testimony – Emergency Response/Nuclear Operations**

Another key mechanism to sustain safety improvements is robust contractor and federal oversight. In August 2012, B&W conducted a Contractor Assurance System Effectiveness Review and identified a number of weaknesses. The Contractor Assurance System is the program by which the Y-12 contractor assesses its own performance and ensures that it can meet mission objectives. Of note, the review team identified that management assessments did not consistently support critical self-assessment or continuous improvement. Improving the effectiveness of self-assessments is a critical component to sustaining improvements in conduct of operations and further enhancing work planning performance.

The NNSA Production Office recently formalized its process for conducting targeted reviews of work planning and control. The development of specific review criteria and the implementation of an assessment schedule with a specific focus on field-based assessments will help identify negative performance trends and evaluate the effectiveness of contractor corrective actions.

## **Staff Testimony – Emergency Response/Nuclear Operations**

Y-12 management has placed considerable emphasis on improving the safety of nuclear operations during the last two years. While improvements have been realized in certain areas, continued effort is still needed in others.

This concludes my prepared testimony. I would be happy to answer any questions from the Board.