

A.J. Eggenberger, Chairman  
Joseph F. Bader  
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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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March 27, 2006

The Honorable Linton Brooks  
Administrator  
National Nuclear Security Administration  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0701

Dear Ambassador Brooks:

In response to a series of incidents related to conduct of operations at the Pantex Plant last year, the Pantex Site Office (PXSO) requested that BWXT-Pantex (BWXT) develop a path forward for improving conduct of operations at the site. The Defense Nuclear Facilities Safety Board (Board) is encouraged to learn that BWXT senior management has indeed been heavily involved in developing and implementing improvements in conduct of operations at Pantex. Maintaining intense management attention on formality of operations is an essential element in ensuring safe and successful operations.

The Board's staff has reviewed the progress made toward improving conduct of operations at Pantex. As documented in the enclosed report, which is provided for your use as appropriate, the Board's staff observed significant variation in the formality demonstrated by production technicians while conducting nuclear explosive operations. It is essential for all production technicians to have a clear understanding of plant-wide expectations for formality of operations. Key mechanisms for reinforcing these expectations are oversight and mentoring by the BWXT nuclear safety officers (NSOs) and the PXSO facility representatives (FRs). However, the assignment of NSOs to other tasks during the past several years has significantly reduced their available time for performing oversight of conduct of operations. The Board's staff noted that FRs also have been assigned other responsibilities during the past 2 years, again decreasing time spent on oversight functions. The reduced field presence of NSOs and FRs may have contributed to the uneven formality of operations observed by the Board's staff and recent deficiencies in conduct of operations.

The Board believes the importance of sustaining a consistent, high degree of formality while conducting nuclear explosive operations at Pantex cannot be overemphasized. The Board expects to see continued improvements in the formality of nuclear explosive operations at the site as the proposed corrective actions are implemented and the process matures.

Sincerely,

A handwritten signature in black ink, appearing to read "A. J. Eggenberger". The signature is fluid and cursive, with a large initial "A" and "E".

A. J. Eggenberger  
Chairman

c: The Honorable Jerald S. Paul  
Mr. Thomas P. D'Agostino  
Mr. Daniel E. Glenn  
Mr. Mark B. Whitaker, Jr.

Enclosure

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Staff Issue Report

February 3, 2006

**MEMORANDUM FOR:** J. K. Fortenberry, Technical Director

**COPIES:** Board Members

**FROM:** M. Moury

**SUBJECT:** Conduct of Operations at the Pantex Plant

This report documents a review by the staff of the Defense Nuclear Facilities Safety Board (Board) regarding the formality of operations at the Pantex Plant. Staff members A. Matteucci, M. Moury, outside experts D. Boyd and R. Lewis, and site representatives T. Hunt and D. Kupferer participated in discussions with site personnel and observed nuclear explosive operations during the week of December 5, 2005. This review was supplemented by a follow-up teleconferences with representatives of the contractor and the National Nuclear Security Administration's (NNSA) Pantex Site Office (PXSO) on December 14, 2005 and February 17, 2006.

**Background.** During the last several years, the Board has been closely following the formality with which operations are performed in defense nuclear facilities at the site. In a May 2, 2005, letter to NNSA, the Board described continuing deficiencies with conduct of operations at Pantex. At that time, the Board noted that evaluations conducted after the Board's October 2001 letter raising these issues indicated improvements had been made, particularly with respect to procedural compliance. However, numerous events during the March–April 2005 time frame renewed the Board's concern.

During summer 2005, in response to issues raised by the Board and similar issues identified by PXSO, BWXT-Pantex (BWXT) developed an improvement plan (IP) for conduct of operations and completed a causal analysis. The IP included the following corrective actions: Manufacturing Division management changes; redefinition of critique leadership and timeliness; more consistency in log book entries; revision of the Conduct of Operations Manual; and reemphasizing of management's expectations of production section managers (PSMs), the first-line supervisors.

**Conduct of Operations Continuous Improvement Plan (CIP).** The Manufacturing Division Manager and Deputy Division Manager demonstrated clear support for improving conduct of operations and presented a number of initiatives, under development or in the early stages of implementation, designed to address identified weaknesses. In September 2005, BWXT claimed completion of a number of the planned actions from the IP for conduct of operations and submitted the first iteration of the enduring CIP. The CIP captured remaining open items from the superseded IP and several corrective actions resulting from the causal analysis.

Key initiatives include the following:

- Establishment of a conduct-of-operations improvement team comprising various subject matter experts, and including participation by the production technicians (PTs).
- Assignment of roles and responsibilities to PSMs for overseeing the safety and quality of the PTs' work.
- Re-emphasis of the responsibility of nuclear safety officers (NSOs) for routine surveillance and coaching of PTs in conduct of operations.
- Implementation of an event fact sheet process to provide a first report of Manufacturing Division events within 2 hours of discovery, and subsequently to be shared with other Manufacturing Division personnel.
- Implementation of an operational concerns program to solicit reporting of issues, problems, suggestions, and concerns that affect production processes recently implemented.
- Training of PSMs on conservative decision making and authorization basis documentation, as well as hands-on training related to specific weapon programs.

In general, the CIP appears to be a logical approach to addressing the deficiencies identified by the Board and NNSA. However; many of the corrective actions are not yet mature, and their effectiveness remains to be seen.

**Observations and Opportunities for Improvement.** Key observations resulting from the staff's review include the following:

- BWXT management is applying appropriate attention and resources to this issue. This focus must continue.
- Expectations for conduct of operations are not being consistently communicated or reinforced. The result is wide variation in the level of formality of nuclear explosive operations.
- Contractor and NNSA oversight of conduct of operations has been significantly reduced during the last few years because of competing priorities, with no compensatory measures having been taken.
- Validation and closure of corrective actions in the IP lack definition and rigor.

*Formality of Operations*—Ensuring a high level of formality during nuclear explosive operations is probably the single most important element in improving conduct of operations at Pantex. The staff evaluated the formality of operations at the site by observing several operations in which PTs utilized critical-use procedures to perform nuclear explosive disassembly operations during both day and graveyard shifts. The observed operations varied significantly in the formality demonstrated by the PTs. W76 day shift operations were characterized by crisp, formal communications and actions for directing, repeating back, performing, and reporting completion of each step. These characteristics contrasted with those of other operations. Expectations for acceptable conduct, or the desired level of formality, are not being applied consistently by the PSMs and the PTs throughout all shifts and programs.

*BWXT Line Management and Oversight*—BWXT management has assigned a significant amount of responsibility to the NSOs for providing oversight and technical support to production personnel in an effort to improve the formality of nuclear explosive operations. However, assignment of NSOs to other tasks during the past few years has significantly reduced the time available for them to observe and identify deficiencies in conduct of operations. According to Manual-00078, *Manufacturing Administrative Manual*, the primary role of NSOs is surveillance of conduct of operations and mentoring or coaching of PSMs and PTs through immediate feedback on issues or findings. In addition to their lack of observation time, it is not clear that all the NSOs have the necessary knowledge and experience to perform effective oversight of conduct of operations. The staff's review of NSO backgrounds indicated a wide variation in education and experience. A gap analysis would identify any additional training needed for the NSOs to adequately accomplish their responsibilities.

The PSMs monitor operations and are available to the PTs to resolve operational problems. Training and qualification of the PSMs are undergoing changes, with the goal of providing the PSMs with more hands-on experience and training sessions focused specifically on critical decision making and authorization basis controls. If the PSMs role as line managers is to be adequately supported, weapon-specific training for PSMs should also be a high priority.

*Trainer Units*—Mock-up weapon trainer units are used by production technicians during weapon disassembly and assembly training exercises. In addition, the trainer units are used to demonstrate proposed operations to both local and external review teams prior to the authorization of nuclear explosive operations. Poor fidelity of trainer units for several weapon systems is a long-standing issue at Pantex. BWXT and nuclear explosive safety review teams have repeatedly identified fidelity problems with trainer units. This weakness was identified again in the conduct-of-operations causal analysis. In a recent teleconference, BWXT presented the status of all trainers at Pantex. Some units are no longer adequate for training and testing of personnel on nuclear weapon operations. As an example, during the W87 Nuclear Explosive Safety study, demonstrations were halted several time due to badly worn and damaged parts that have no replacement spares. Barriers to improving the fidelity of trainer units include funding shortfalls, nonavailability of some parts, and unsuitability of some parts for continuous training use. While some actions are being taken to address this issue, many of the problems appeared to be accepted, with no identification of meaningful corrective actions being apparent.

*PXSO Oversight*—During the past 2 years, the PXSO facility representatives (FRs) have also been assigned responsibilities associated with verification of the implementation of authorization basis controls. These duties have apparently decreased the FRs' availability for observing operations in the field to less than 20 percent of their time. There appeared to be no compensatory measures instituted to offset this reduced presence of the FRs in the field. The reduced oversight presence of both the FRs and NSOs may have contributed to the observed degradation in formality of operations at Pantex. PXSO management committed verbally to developing plans to devote more NNSA resources to observing operations in the facilities at the site.

It was apparent during the staff's review that PXSO management has not been actively engaged in tracking the appropriateness or effectiveness of BWXT's corrective actions for deficiencies in conduct of operations. Subsequent to this review, PXSO management discussed with the staff both short- and long-term plans to resolve these deficiencies. PXSO committed to applying additional NNSA resources to evaluation of the effectiveness of the contractor's actions to improve conduct of operations.