

John T. Conway, Chairman
A.J. Eggenberger, Vice Chairman
John E. Mansfield
R. Bruce Matthews

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004-2901
(202) 694-7000



January 20, 2004

The Honorable Spencer Abraham
Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Abraham:

The Defense Nuclear Facilities Safety Board (Board) has followed closely events surrounding the recent discovery of cracked high explosive during a weapon dismantlement at the Pantex Plant. When damaged, the response of this particular conventional explosive is difficult to predict, but it is known that the explosive becomes more sensitive. Also, the configuration of the partially dismantled weapon and the nature of the cracks appear to have increased the opportunities for dropping all or part of the explosive during handling, and hence increased the potential for a violent reaction.

In such a case, one expects the most careful scrutiny and deliberate decision-making process in determining the best way to proceed. The Department of Energy has established mechanisms to ensure that this deliberate process takes place. These include the Unreviewed Safety Question (USQ) process, the Nuclear Explosive Safety (NES) review process, and review by the appropriate design agency of Nuclear Explosive Engineering Procedures (NEEP). In this case, however, inappropriate conclusions degraded the effectiveness of these mechanisms:

- The USQ evaluation incorrectly concluded that the situation was bounded by existing safety analyses. Had the evaluation established the need for a more formalized hazard analysis and weapon response from the design agency, a USQ would have been declared, and processes would have been initiated to ensure a more thorough and measured analysis of the hazards involved.
- The NES review incorrectly concluded that the cracks observed and the actions being taken to address them constituted a “trivial” change. Taping and moving cracked explosive is not addressed in the current NES Study for this system. Had the NES review found this to be a “nontrivial” change, NES processes would have been initiated to ensure a more thorough and measured analysis of the hazards involved.
- The design agency did not fully identify the potential safety concerns associated with the NEEP or with the condition of the explosive. The design agency does not appear to have consulted with the developer of the explosive regarding its potential hazards when damaged. The conclusion of the design agency that the taped explosive introduced no new hazards may have contributed to the inappropriate conclusions from the NES and USQ processes.

In addition, the recovery procedure and associated training appear to have been inadequate:

- The NEEP, a one-time-use procedure developed to provide special handling instructions and complete the dismantlement, required clarification to the production technicians, did not anticipate potential behavior of the cracked explosive, and could not be completed. Further, the NEEP provided no cautionary notes to the production technicians regarding the condition of the explosive or the potential for dropping pieces of explosive.
- The training established for performing the NEEP did not require hands-on demonstration prior to execution. As a result, the required taping of the explosive was not performed as intended.
- Personnel responsible for developing the NEEP were not present to supervise its execution. The uncertainties and abnormalities of this situation would appear to have called for the presence of at least the process engineer.

The prudent response of the production technicians as they saw unexpected behavior of the explosive provided the only effective barrier preventing a drop of explosives with potentially unacceptable consequences. However, the significance of the failures that preceded the technicians' actions raises questions about the effectiveness of the mechanisms put in place to ensure safe nuclear explosive operations. The Pantex Site Office and the Pantex contractor are moving forward with plans to address many of these questions; however, the Board would like to be informed of the analysis and corrective measures that will be taken. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a comprehensive report within 30 days of receipt of this letter documenting a root-cause analysis of each of the failures that led to this situation, and including commitments for their resolution.

Sincerely,


John T. Conway
Chairman

c: The Honorable Linton Brooks
The Honorable Everet H. Beckner
Mr. Mark B. Whitaker, Jr.