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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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99-0002950



December 1, 1999

Brigadier General Thomas F. Gioconda  
Acting Assistant Secretary for Defense Programs  
Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0104

Dear General Gioconda:

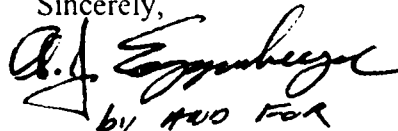
In response to Recommendation 98-2, *Safety Management at the Pantex Plant*, of the Defense Nuclear Facilities Safety Board (Board), the Department of Energy (DOE) has been attempting to improve and simplify the safety basis for nuclear explosive operations at Pantex. Two enclosed reports prepared by the Board's staff highlight issues that appear to indicate that DOE's efforts in this area have not been entirely successful.

Instead of becoming simpler, the safety basis at Pantex is actually becoming more complex. Significant issues associated with the integration and completeness of the various hazard analyses and associated controls are being observed. In some cases, voids exist in which one analysis depends on another to assess the activity, but it is later discovered that the follow-on analysis has not been completed or implemented. In other cases, there are inconsistencies in similar, if not identical, analyses. The most recent letter from the Board to DOE on this issue is dated July 30, 1999.

In addition, both enclosed reports highlight deficiencies with information on warhead response being provided to the Pantex contractor by the nuclear design laboratories for use in determining the hazards and resulting controls associated with nuclear explosive activities. Although the Pantex contractor is responsible for conducting the necessary safety analyses, only the nuclear design laboratories can provide the information with respect to warhead response to specific environments. This input must be of the highest fidelity possible, with a defensible technical basis and appropriate uncertainties, to be useful for safety basis development.

The Board is aware that DOE has been working to achieve improvements in both of these areas, and in another letter to you has offered its assistance in safely resolving such problems and similar ones at Pantex and the Y-12 Plant. The Board would like to be briefed on your plans and actions for resolution of the problems discussed in the enclosed memoranda when they are sufficiently well developed. If you have any questions on this matter, please do not hesitate to call.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Conway". The signature is written in a cursive style with a large initial "J".

by *AND FOR*  
John T. Conway  
Chairman

c: Mr. Richard E. Glass  
Mr. Mark B. Whitaker, Jr.

Enclosures

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD****Staff Issue Report**

October 1, 1999

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
J. K. Fortenberry, Deputy Technical Director

**COPIES:** Board Members

**FROM:** D. L. Burnfield

**SUBJECT:** Review of Status of W62 Disassembly and Inspection Program,  
Pantex Plant

This report summarizes the results of a review by the staff of the Defense Nuclear Facilities Safety Board (Board) in support of the Board's Recommendation 98-2, *Safety Management at the Pantex Plant*. Staff members F. Bamdad, D. Burnfield, M. Helfrich, and A. Matteucci, along with outside expert R. West, met with representatives of the Department of Energy (DOE) and Mason and Hanger Corporation (MHC) on September 7-10, 1999, to review the preparations for restarting the W62 Disassembly and Inspection (D&I) Program. This review included the final draft Hazard Analysis Report (HAR), the Activity-Based Controls Document (ABCD), and supporting documentation, as well as preparations for the upcoming Nuclear Explosive Safety (NES) review. Following a site review conducted September 10-23, 1999, detailed discussions were held between the Board's staff and DOE regarding the NES review preparations.

**Laboratory Support.** The supporting documentation for the HAR prepared by Lawrence Livermore National Laboratory's (LLNL) Defense Technologies Engineering Division (DTED) addresses the high explosive (HE) response to W62 HAR scenarios. The cover letter for this report contains the following statement: "HE response is not an exact science and thus requires considered judgment for each scenario, so this information should not be utilized for judgment by anyone other than LLNL/DTED." Thus, the LLNL documentation for the HAR explicitly says it should not be used in a HAR prepared by MHC. In addition, the report does not cite sufficient references to support the data presented. The lack of definitive data limits the ability of MHC to judge whether an operation can be performed safely. In Recommendation 98-2, the Board stressed the role of the contractor with regard to the HAR:

The Pantex contractor is responsible for the safety of operations conducted at the Pantex site. In reality, the HAR should be a submittal made by the Pantex contractor, with appropriate input and review by the weapons laboratories as defined by the DOE, in support of the conclusion that the operation in question will be conducted safely. The Pantex contractor must have agreed with its content and must be prepared to stand behind it.

During discussions with the Board's staff, however, MHC personnel were not always able to defend the assertions in the LLNL report.

**Performance of Hazards Analysis.** As indicated in two previous reports prepared by the Board's staff (dated January 22, 1999, and May 11, 1999) on the performance of the hazards analysis for the W62 D&I, the hazard analysis team did not do a thorough process hazard analysis as recommended by DOE Standard DOE-STD-3016-99, *Hazard Analysis Reports for Nuclear Explosive Operations*. However, the MHC project team did note the staff's comments and took actions aimed at improving the quality of the final draft of the HAR. Specifically, the project team reviewed the procedures for operations in the radiography and vacuum leak check bays.

**Integration of Various Hazards Analyses.** The HAR relies on other authorization basis documentation without fully integrating the physical and/or organizational interfaces. For example, the HAR identifies a Technical Safety Requirement (TSR)-like control requiring the shipping container to be inspected for functionality prior to shipment between bays, as well as upon receipt at the Zone 12 loading dock. This practice allows the shipping container to act as a Faraday cage and provide lightning protection to the weapon. However, no similar requirement is contained in the Transportation Basis for Interim Operations, which covers transportation of the weapon between Zones 4 and 12.

**NES Review Preparations.** In the Implementation Plan for Recommendation 98-2, DOE committed to compensatory measures specific to the W62 D&I that would include "implementation of selected tooling improvements, approval and implementation of a HAR and ABCD controls, contractor and DOE readiness reviews, and a NES review with complete process walk downs and a current assessment of whether the W62 controls satisfy the objectives of the NES Standards." Despite these commitments, DOE made preparations for performing a revalidation of the 1992 Nuclear Explosive Safety Study (NESS). The revalidation would differ from a standard revalidation in two respects:

- The review would incorporate a complete realistic demonstration of bay and cell operations.
- The new HAR and ABCD would be provided to the NESS Group.

Discussions between the Board's staff and DOE focused on the need to walk down all pertinent operations and to provide a current assessment of the D&I process (instead of simply reviewing the changes since the 1992 NESS). On October 1, 1999, the DOE Albuquerque Field Office agreed to address the concerns of the staff and provided a planning document that met the intent of the Recommendation 98-2 Implementation Plan. The W62 Project Plan states that the NESS revalidation and the DOE Readiness Assessment will be held concurrently. The performance of these two reviews simultaneously is expected to be difficult with significant numbers of people attempting to observe operations within the manning limits of the bays and cells.