

John T. Conway, Chairman  
A.J. Eggenberger, Vice Chairman  
John W. Crawford, Jr.  
Joseph J. DiNunno  
Herbert John Cecil Kouts

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004  
(202) 208-6400

97-0003280



October 15, 1997

The Honorable Victor H. Reis  
Assistant Secretary for Defense Programs  
Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585-0104

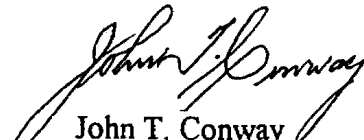
Dear Dr. Reis:

The Defense Nuclear Facilities Safety Board (Board) and its staff have been following the Department of Energy's (DOE) efforts during the last several months to resolve safety issues concerning dynamic balancing operations involving nuclear warheads in Building 12-60 at the Pantex Plant. These issues were identified as a result of a safety walkdown at Pantex by DOE Headquarters personnel and a subsequent review led by the DOE Amarillo Area Office in December 1996. Several nuclear explosive operations, including dynamic balancing operations, were suspended as a result of those reviews.

The Board is pleased to note that DOE chose to address the resolution of dynamic balancing safety issues as a project using a team comprising experts from DOE, the weapon design agencies, and the Pantex operating contractor. This Project Team has developed a safety basis and a set of controls for the hazards associated with dynamic balancing that represent a substantial step toward the ultimate goal of integrated safety management at Pantex.

On September 10-11, 1997, the Board's staff observed discussions between the Project Team and DOE Headquarters personnel regarding technical safety issues related to dynamic balancing operations. Additional safety issues previously identified by the Board and its staff were also addressed during these discussions. The Board is pleased to note that these discussions resulted in DOE development of a path forward for resolution of these issues. This path forward, with a recent update, is provided in the enclosure. The Board notes, however, that the DOE approval letter did not delineate in detail outstanding actions defined in the path forward. The Board believes satisfactory completion of the actions defined in the enclosed path forward is necessary to resolve the outstanding safety issues associated with dynamic balancing of nuclear warheads at Pantex, and allow for resumption of these operations with adequate protection to the public and workers.

Sincerely,

  
John T. Conway  
Chairman

c: Mr. Mark B. Whitaker, Jr.  
Mr. Bruce G. Twining

Enclosure

## Enclosure

### Path Forward Resulting from the Dynamic Balancer Project Team Meeting at Pantex September 10-11, 1997

The following represents the understanding of the staff of the Defense Nuclear Facilities Safety Board with regard to the path forward that resulted from discussions between the Department of Energy (DOE) Headquarters and Project Team personnel concerning several technical issues that must be resolved prior to restart of dynamic balancing operations.

*(1) Safety improvements to be implemented prior to authorization of W87/W88 operations via a Justification for Continued Operations (JCO) and verification of readiness to proceed by the Independent Review Team (under the DOE Albuquerque Operations Office [DOE-AL]) include the following:*

- Dynamic Balancer protective features in Table C-13 of the draft Basis for Interim Operations (BIO) change (except the drive motor thermostat and the drive belt) will be upgraded to safety controls and will be added to Table C-16, "Summary of Controls," of the draft BIO change. This in turn will trigger further required follow-on actions, such as revisions to Manual 37, additions to the preoperational check/facility status board, and supplemental training.
- The nuclear explosive operating procedure will be revised to ensure that the production technicians verify that applicable nuclear explosive safety rules/strong link checks have been satisfied prior to dynamic balancing. Requirements on use of the hoist isolation strap will be clarified.
- All bolts whose failure could cause the unit to separate from the Dynamic Balancer will have appropriate safety controls on quality. All such bolts that can be removed with a "reasonable effort" (e.g., without damaging hydraulic seals) will be replaced with bolts of known quality. If possible, other structural members, such as the shaft itself, will be evaluated for quality.
- The *Critical Safety Systems Manual* will be checked and/or revised to ensure that the building structure, including the walls, is controlled as safety class. The basis for controls for the lightning protection system and hoist isolation strap will also be clarified.
- The Project Team will verify (and the Independent Review Team will confirm) that a unit cannot be placed within 1 foot of the rear wall.
- Forklifts will be allowed in Building 12-60 Bay 2 only when the bay is in REPAIR mode.
- The material limit for the bay will be one unit.

- The Dynamic Balancer (including the hydraulic power plant) will be placed under configuration control. The Project Team will resolve deficiencies with hydraulic plant maintenance. The Independent Review Team will review the configuration documentation for the Dynamic Balancer, as well as the adequacy of the maintenance program.
- The Project Team will develop a draft Authorization Agreement that clearly defines conditions under which the Dynamic Balancer can be operated, and that includes, among other things, a comprehensive list of the controls relied upon for safe operation. Note that this Authorization Agreement will be finalized and signed prior to release of the Dynamic Balancer for *unrestricted* operations.

(2) *The JCO will include the following key elements:*

- Only W87 and W88 operations will be authorized.
- The time for which the JCO will be valid will be limited to the shorter of:
  - The time reasonably required to complete the current backlog of W87 and W88 program work.
  - The time reasonably required to complete the additional safety improvements (see item 3 below).
- The DOE-Headquarters JCO approval letter will include a requirement to address the following site-wide (generic) issues, which will not necessarily be resolved prior to resumption of dynamic balancing operations:
  - On-site transportation
  - Natural phenomena hazards (specifically, seismic and tornado hazards)
  - Airplane crashes

(3) *Following the additional safety improvements below, satisfactory completion of an appropriate readiness review, and execution of the final Authorization Agreement, approval of unrestricted Dynamic Balancer operations on W76, W78, W87, and W88 can be authorized:*

- A comprehensive analysis of failure modes leading to the unit separating from the Dynamic Balancer or the shaft seizing (e.g., due to thrust or radial bearing failure) shall be completed.

- Weapon response to the worst-case Dynamic Balancer accident identified through the above analysis shall then be analyzed.
  - A comprehensive analysis of the hazards of a bay fire shall be completed.
  - In parallel with these analytical efforts, Pantex shall design and implement an engineered safety control to mitigate scenarios involving weapon separation from the Dynamic Balancer.
- (4) *Two follow-up items will be discussed following resumption of Dynamic Balancer operations:*
- The critical characteristics/surveillance frequencies for the Building 12-60 Lightning Protection System will be defined.
  - DOE will initiate a lessons learned effort.

(Update: The JCO approval letter was approved on September 30, 1997, with some modifications to the above. Specifically, the scope has been expanded to authorize dynamic balancing operations on W76 and W78 units along with W87 and W88 units. In addition, the BIO is approved for use through March 1998, but all post-resumption actions in this plan are required to be completed by the end of December 1997.)