DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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

April 19, 1996

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

Dear Dr. Reis:

The Defense Nuclear Facilities Safety Board's (Board) staff recently observed the first two applications of the revalidation of the Nuclear Explosive Safety Study (NESS) process for Pantex operations. In the Board's view, this process does not appear to provide sufficient assurance that the nuclear explosive operation, as it currently exists, can be executed safely. Revalidation, as presently implemented, does not provide a technical review of the potential impact of changes that have occurred since the last NESS and does not appear to consistently require resolution of potential safety issues before operations are authorized to continue.

Enclosed for your information are two Board staff trip reports. The trip reports provide observations of the revalidation studies conducted to date and may be of use at the May meeting of Department of Energy (DOE) Headquarters and DOE Albuquerque, which has been scheduled to discuss issues associated with full implementation of the NESS process corrective actions and the Seamless Safety program.

The Board would like to be informed of the actions that DOE decides are necessary to improve the NESS revalidation process. If you need any further assistance or have questions on this subject, please contact Ms. Cynthia Miller of the Board's staff at (202) 208-6580.

Sincerely,

John T. Conway
Chairman

c: Mark Whitaker
Bruce Twining

Enclosures

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 5, 1996

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Cynthia A. Miller

SUBJECT: Report on the Revalidation for the Nuclear Explosive Safety Studies of W76 Operations at the Department of Energy (DOE) Pantex Plant

1. **Purpose:** This report documents the review made by Defense Nuclear Facilities Safety Board (Board) staff members Cynthia Miller and William White of a "revalidation" (defined below) for the 1989 W76 Nuclear Explosive Safety (NES) Study. The revalidation was conducted at the Pantex Plant from January 30 to February 1, 1996.

2. **Summary:** According to the currently approved DOE Order 5610.11, *Safety of Nuclear Explosive Operations,* the Department of Energy can extend a NES Study (NESS) up to five years. DOE incorporated into the new draft Order 5610.11A a review process called "revalidation" as a way to add a limited scope safety review to extension of expired or soon to be expired NESSs. The W76 was the first use of the NESS revalidation concept. After observing the revalidation, which included the review of several changes to the W76 operation, it was unclear to the staff how the NESS group came to the determination that the changes were insignificant and that a new NESS was not required.

3. **Background:** Draft Order 5610.11A states that "a NESS Revalidation is conducted to determine whether a nuclear explosive operation has significantly changed from the approved NES Study," and it invokes the draft standard DOE-STD-YYYY-95, *Nuclear Explosive Safety Study Process.* The standard requires that the revalidation reach one of two conclusions: either the NES Study remains valid (by unanimous agreement of NES Study group members), or a new NES Study is required. Further guidance on conduct of the revalidation was provided in an August 1995 DP20 memorandum. The direction given in the memorandum is that NESS Revalidation members are required to review the changes in nuclear explosive characteristics, tooling, and Nuclear Explosive Operating Procedures since the last NESS; the status of NESS Recommendations; and the disassembly/reassembly process flow to "ensure that the original operation as studied by the NESS has not deviated as a result of subsequent approved changes to the extent that a new NESS is required."

   Revalidation was proposed as an improvement over the administrative extension of NES Studies that have no safety review. DOE Albuquerque's Seven Year NESS Plan proposes to use this revalidation process for nine of the ten weapons in the enduring stockpile surveillance program.

4. **Discussion:** The revalidation process assumes, as an initial condition, that the previous NESS was sound. Observed weaknesses in NES Studies conducted during the late 1980s and early 1990s, however, resulted in several Board actions, including Recommendation 93-1, *Standards Utilization in Defense Nuclear Facilities,* and a Board reporting requirement regarding NESSs (dated December 8, 1993). The staff reviewed the 1989 W76 NESS Report and input document (which were submitted as the input documents for the revalidation). These documents did not present the rationale used by the NESS Group in 1989 to make its determination of adherence to the nuclear safety standards (i.e., positive measures in place to meet the safety standards were not reported).

   During the review by the NESS Revalidation team, potential safety issues were raised during discussion of each of the areas listed below (areas of required review per the DP-20 guidance document). It appeared, however, that these potential safety issues were not explored in enough detail to either be resolved or dismissed.

   a. Changes in Nuclear Explosive Characteristics Since 1989: A number of changes have occurred since 1989 with respect to the W76, specifically, and weapons attributes in general. The possibility of a stuck pit at disassembly has been incorporated into the revised procedure. A number of findings have occurred regarding aging of the type of High Explosive (HE) used in this system.

   b. New Procedures Since 1989: DOE quality assurance procedures have changed since 1989. Other procedural changes include: the inclusion of radiographic inspection of all units; modification of reservoir removal procedures to accommodate the possibility of component actuation; bonding of neutron generators (to bond or not to bond was the subject of a long internal Sandia discussion concerning whether bonding defeats the intent of electrical isolation); and the addition of new procedures such as D5 Release Assembly removal and the addition of ballast to the unit's aft shell.

   c. New Tooling Since 1989: Numerous tooling changes have been made since the 1989 NESS. The work stand has been redesigned; a newly designed radiography cart has been put into operation and new vacuum tooling is used during separation of the HE. Electronic test equipment in use, designed by Sandia and Mason & Hanger, is of a new design; configuration control of both sets of equipment was questioned.

      Per the criteria in the DP20 guidance, the sheer number of these changes should have caused serious consideration about whether the 1989 NESS was still valid. It is not the staff's intent to indicate that the changes were substantial enough to constitute a "significant deviation" from the operations in 1989, but simply that the deliberation of the NESS Revalidation group did not appear sufficient to draw a conclusion of "no significant changes."

5. **Future Staff Actions:** It is the staff assessment that the revalidation process conducted for the W76 at Pantex was an incomplete review of potential safety issues; the staff intends to follow closely the DP-20 Headquarters review of the W76 Revalidation Report. In addition, the staff plans to observe the revalidation scheduled for March 12, 1996, on the B61 Mods 3, 4, and 10.