# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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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

96/1640

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

March 27, 1996

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** William White

**SUBJECT:** Revalidation for the Nuclear Explosive Safety Studies of B61-3/4/10 Operations at the Department of Energy (DOE) Pantex Plant

1. **Purpose:** This report documents a review by Defense Nuclear Facilities Safety Board (Board) staff member William White of the revalidation of the 1989 B61-3/4 and the 1990 B61-10 Nuclear Explosive Safety Studies (NESS). The revalidation was conducted at Pantex from March 12-15, 1996. The revalidation continued March 19, 1996.

2. **Summary:** The B61-3/4/10 revalidation was the second revalidation conducted according to draft DOE Order 5610.11A and interim guidance from DOE/DP-20. The first revalidation was for the W76 NESS and was conducted at Pantex from January 30 to February 1, 1996. Board staff observations for this revalidation are in Cynthia Miller's trip report dated March 5, 1996.

   The B61 revalidation suffered some of the same problems as the W76 revalidation. Although there were improvements in the deliberations of the Nuclear Explosive Safety Study Group (NESSG), the proposed NESS Revalidation Report still did not provide rationale for the determinations made by the group. The group did not evaluate the impact on safety from the changes since the previous NESS. Therefore, it appears that the additional guidance from DOE/DP-20 did not add substance to the process.

3. **Background:** DOE draft Order 5610.11A states the purpose of a NESS revalidation is "to determine whether a nuclear explosive operation has significantly changed from the approved NES Study." The order invokes the draft DOE-STD-YYYY-95, *Nuclear Explosive Safety Study Process*, to provide guidance on the conduct of a NESS revalidation. This standard requires the NESSG to reach one of two conclusions: the NESS remains valid (requires unanimous NESSG agreement), or a new NESS is required. Additional guidance provided in an August 1995 DP-20 memorandum directed NESSG members to review changes in nuclear explosive characteristics, tooling, and nuclear explosive operating procedures since the last NESS; the status of NESS study recommendations; and the disassembly/reassembly process flow to "ensure that the original operation as studied by the NES study has not deviated as a result of subsequent approved changes to the extent that a new NES study is required."

   To resolve deficiencies noted during the W76 revalidation, DOE/DP-20 provided additional guidance to DOE's Albuquerque Operations Office (DOE/AL) for conducting the B61

revalidation. This guidance required the NESSG to document suggested improvements to nuclear explosive operations, consider the results of surveillance and reliability testing reports, and provide rationale and justification to support NESSG conclusions. The NESSG chairman for the B61-3/4/10 revalidation began the NESSG meetings with an explanation of this new guidance.

4. **Discussion:** The revalidation for the B61-3/4/10 operations was an improvement over the revalidation for W76 operations. The NESSG attempted to follow the additional DP-20 guidance that addressed several of the same concerns mentioned in the Board's staff trip report on the W76 revalidation. The report for the B61 revalidation, however, did not contain rationale for the conclusions that the NESSG made. Adherence to the new guidance was enhanced by the NESSG chairman, who conducted this NESS revalidation in a manner which promoted discussion among NESSG members. Rather than evaluate the impact of the operational changes on the safety of the operation, the group made a determination that, since the changes to the operation were considered "safety enhancements," they posed no adverse affect on nuclear explosive safety.

   No recommendations were made in the report although the NESSG suggested the use of General Instructions in nuclear explosive operations and the use of trained technicians in conducting demonstrations for the NESSG. Other recommendations that were discussed but not adopted included: incorporation of results from the detonator study recommended in the B61-0/2/5 NESS, removal of special nuclear material (SNM) from the bay before conducting insensitive high explosive (IHE) depotting operations (which were not studied in the 1989 and 1990 NESSs), and mandatory attendance by design agency representatives during disassembly of command disabled units (attendance, although traditional, is not required).

   a. Changes. As noted by the NESSG most, if not all, of the changes in B61 operations and B61 design characteristics were deemed to be "safety improvements." Examples of these include: new actuators less sensitive to electrostatic discharge, additional procedure steps for electrical bonding, additional verification of gas transfer system integrity, tester changes to provide current limiting features, and improvements in the trajectory sensing signal generator.

      Although there was significantly more discussion of the safety impact of these changes than during the W76 revalidation, not all changes were discussed in detail by the NESSG members. Many changes could undoubtedly have been dismissed as insignificant by NESSG members who had considerable experience in the systems affected by the changes; however, not all NESSG members had the same level of experience in all areas. As unanimous consent is required for revalidation, it might have been beneficial to provide a level of discussion on all changes that would have allowed even the least experienced NESSG member to make an informed conclusion on the safety significance of the changes.

   b. DOE Guidance. There were several operations (such as depotting of the IHE) that were not covered under the previous NESSs but are required to be covered under the draft DOE Order

5610.11A. These are operations involving collocated high explosive and SNM. Although these operations were mentioned during the Mason & Hanger (M&H) presentation to the NESSG, they were not discussed in any more detail than other nuclear explosive operations reviewed by the NESSG. DOE has provided no guidance to NESSG members on handling this situation.

Although the changes discussed above are considered safety enhancements, they still represent significant changes to the B61 characteristics and operations as studied in 1989 and 1990. DOE guidance does not distinguish between changes intended to improve NES and those which can negatively impact NES. This presents another possible problem with DOE guidance.

The additional guidance provided by DOE/DP-20 required additional rationale and justification supporting the conclusions of the NESSG. These are not apparent in the draft report.

c. Presentations to the NESSG. The design agencies (Los Alamos National Laboratory and Sandia National Laboratories) only presented changes to the NESSG which the design agencies decided might affect nuclear safety. This contrasts with the presentations by M&H that were not filtered to remove changes not considered insignificant by M&H.

In general, presentations to the NESSG during revalidations do not have the same quality and depth of information as presentations made during traditional NESSs. Since the revalidations authorize continuation of nuclear explosive operations, similar to NESSs, it is not clear why a lesser level of quality and depth is satisfactory. This potential conflict was noted by the NESSG chairman during the B61 revalidation, but was not included in the revalidation report.