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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 25, 1995

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

Dear Dr. Reis:

The Defense Nuclear Facilities Safety Board (Board) sent you a letter on April 14, 1995, that identified concerns with the Department of Energy's (DOE's) implementation of the Board's Recommendation 93-1, *Standards Utilization in Defense Nuclear Facilities*. One concern addressed in that letter was the extent to which previously excluded DOE nuclear facility safety Orders will be applied to nuclear explosive activities. On May 22, 1995, we officially received draft versions of the revised DOE nuclear explosive safety Orders 5610.10, *Nuclear Explosive and Weapon Surety Program*, and 5610.11, *Safety of Nuclear Explosive Operations*, with a request to delay finalization of the Orders and associated implementation guide and standards for one month, because of additional work required. On June 30, 1995, we received preliminary drafts of the guide and standards. The Board accepts the request for a one-month delay in producing the final Orders, guide, and standards.

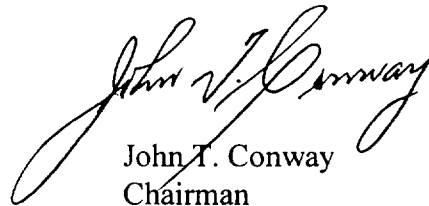
Based on the Board's preliminary review of the current draft revisions of the 5610-series Orders only, we are pleased to note that many of the objectives of Recommendation 93-1 appear to have been satisfied. The draft Orders clearly invoke a number of previously excluded Orders, such as those on quality assurance, maintenance, and criticality safety. However, some of the concerns that prompted our April letter persist, as indicated in the enclosure to this letter.

Our preliminary review of the draft Orders has identified one item of particular concern. The draft Orders eliminate the existing requirement to perform quantitative risk assessments for nuclear explosive operations. Although the estimates of the absolute value of risk may be doubtful in this application, the Board believes that quantitative risk assessment is a valuable tool for identifying relative risk contributors in a decision-making process and efforts should continue to use this technology. By this use, the quantitative risk assessment methodology will develop and add significantly to nuclear explosive safety, as experience is gained. Therefore, the revised 5610-series Orders and associated guides should institutionalize a balanced quantitative and qualitative risk assessment approach similar to the one that was successfully demonstrated by the

Stockpile Stewardship Pilot Demonstration Project for the B-61-0 dismantlement process at Pantex, while development efforts continue for improved quantitative methods and data.

Please address the above concerns and those in the enclosure when preparing the final drafts of the revised Orders, implementation guide, and standards in response to Recommendation 93-1 and the NESS Corrective Action Plan. If you require additional information or assistance, please contact Mr. Steve Krahn of the Board's staff at (202) 208-6580.

Sincerely,

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

John T. Conway  
Chairman

c: The Honorable Tara O'Toole  
Mr. Mark Whitaker

Enclosure

## ENCLOSURE

### Summary of Comments on the May 22, 1995 Draft Revisions to DOE 5610.10 and DOE 5610.11

The Board's staff conducted a preliminary review of the draft DOE Orders 5610.10 and 5610.11, dated April 26, 1995, that were submitted with the latest bimonthly report for Recommendation 93-1, *Standards Utilization in Defense Nuclear Facilities*. The Board plans a more comprehensive review now that we have received the supporting documents.

The review, to date, has identified several key issues with the draft Orders. Most notably, as part of Recommendation 93-1 implementation, DOE committed to "adopt by reference," eight nuclear facility Orders for use at nuclear explosive facilities. In the Board's April 14, 1995 letter to DP-1, the interpretation of "adopt by reference" was reiterated: *"The 5610-series of Orders will be modified to require that relevant functions be completed in accordance with the eight adopted Orders. If mandating a requirement from an adopted Order would be detrimental to nuclear explosives safety, then the 5610-series Order (or a standard) would exempt nuclear explosives facilities from that specific requirement."*

The draft Orders do not adequately integrate facility safety analysis (e.g., analysis of bounding accidents and mitigation systems) with safety analysis of the specific operations conducted within the facility. In part, this is due to a failure to adopt some of the essential analytical requirements of key nuclear facility safety Orders, such as Order 5480.23, *Safety Analysis Reports*, and Order 5480.22, *Technical Safety Requirements*. One example is the failure to adopt requirements for quantitative analysis of operational risks. For another example, the draft Orders propose to create a new category of operating requirements called "Operational Safety Controls," or OSCs, that would be derived from qualitative analysis of nuclear explosive operations. Technical Safety Requirements (TSRs) as described in DOE Order 5480.22 integrate operational safety requirements into the facility safety authorization basis. The OSCs appear to serve the same function. For clarity, consistency, and simplicity, all "Operational Safety Controls" should be TSRs and should be developed in accordance with DOE Order 5480.22.

A key recommendation of the 1994 independent Nuclear Explosive Safety Study (NESS) review stated that DOE, the operating facilities, and the weapons laboratories, *"should continue to develop and demonstrate the means of performing standardized and time-efficient quantitative risk assessments ... As such processes become available, they should be incorporated into the NESS studies."* The NESS review team properly emphasized that the results of these quantitative assessments should not be used as "pass-fail" criteria for approving the conduct of nuclear explosive operations. DOE has made significant advances in "developing and demonstrating" effective risk assessment involving both quantitative and qualitative methods. The Stockpile Stewardship Pilot Demonstration Project (SS-21), when it was applied to the B-61-0 weapon dismantlement process, achieved dramatic safety gains using risk assessment as a tool to identify and eliminate dominant risk drivers. The revised DOE 5610-series Orders suffers from failure to

institutionalize a balanced quantitative and qualitative risk assessment similar to that which was successfully used in the SS-21 Pilot for the B-61-0. We suggest that further development to improve quantitative methods and data should continue, as recommended by the NESS review team. These methods could be profitably applied to the spectrum of hazards encountered at nuclear explosive facilities, at both Pantex and the Nevada Test Site.

It would appear that for clarity, two other modifications could be incorporated into the revised Orders. First, the draft Orders could avoid confusion by strictly adopting the "shall/should/may" convention for specifying requirements that is used in American National Standards Institute standards. Secondly, the requirements that are adopted, but not specifically cited, in the new Orders could be clearly defined by explicitly referencing the adopted versions of the existing 5480-series Orders, by specific revision date.