DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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

March 14, 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:

On August 29, 1996, the Defense Nuclear Facilities Safety Board (Board) received a copy of Interagency Engineering Procedure EP401110/Revision B, *Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons*. EP401110 is the basis for the formal process known as Seamless Safety 21 (SS-21) and is recognized as a key element of the Pantex integrated safety management system. Accordingly, the Board and its staff conducted a comprehensive review of EP401110 within the context of the Board's observation of implementation of the formal SS-21 process.

The Board has closely followed the evolution of the SS-21 process for several years; overall, the process has resulted in significant safety enhancements and ensured that formal, disciplined reviews of assembly and disassembly operations are performed. However, the Board's review identified three issues with the SS-21 process as described in EP401110/B. The enclosure to this letter provides comments on these issues. The Board staff is available to discuss these issues and prospective actions that would address them.

Sincerely,

John T. Conway
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

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Comments on the Application of Interagency Engineering Procedure EP401110/B, *Integrated Safety Process for Assembly and Disassembly of Nuclear Weapons*, to the Seamless Safety Process

1. **Comment:** It is not clear that all organizations with a role in developing a weapon process and its safety basis are represented on the SS-21 project/task teams or at the Milestone Reviews. It is also not clear how the process will ensure that all appropriate organizations provide institution-level commitment to, rather than simply representation during, the process.

   Discussion: One of the fundamental strengths of the SS-21 concept is that all agencies with knowledge of the weapons and facilities are involved in the development of dismantlement/ disassembly and inspection processes. While Table 1 of the EP requires representation from each of these agencies on the various SS-21 teams, representation does not in itself ensure commitment to or concurrence with task team products on the part of the agency as a whole. Given the significance and complexity of weapons operations and the exodus of knowledgeable personnel from DOE, the design agencies, and the production agencies, it is imperative that the *entire* collective expertise (management, research and development, engineering, quality, and risk analysis departments) of the agencies be brought to bear on the development, review, and implementation of SS-21.

   Equally fundamental to the SS-21 process is the integration of hazard analysis, development of controls, and management of work planning and authorization. The DOE Albuquerque Field Office (DOE-AL) Office of Technical Management and Operations, specifically the Nuclear Safety Division, should be a required participant in the Milestone Reviews, especially considering their responsibility for operations hazard analysis and facility safety analysis.

2. **Comment:** The EP appears to obscure the ultimate purpose of the Hazard Analysis Report (HAR), which is to develop the safety basis for those aspects of a weapon operation not covered by an approved Safety Analysis Report(s). The EP does not clearly state that an expectation of the hazard analysis is to provide data that would allow line management to make informed decisions on the development of controls, such as tooling and equipment design and procurement requirements.

   Discussion: The EP describes a process for developing and refining a hazard assessment of a nuclear explosive operation. This assessment culminates in the production of a HAR. The EP states that the HAR is issued through the Single Integrated Input Document, which is prepared to support the Nuclear Explosive Safety Study (NESS). While it is true that the Nuclear Explosive Hazard Assessment subset of the HAR has a secondary function as part of the input to NESS deliberations, the primary function of the HAR is to provide a major component of the safety basis for the operation. Because of the significance of the information in the HAR, the decisions regarding what analyses and controls should be

included *or excluded* should be made by the project team and eventually approved by the management representatives. The process described in the EP does not ensure that the expectations for interim steps of the HAR (i.e., Milestone Review requirements) are clearly defined so that the project team and management representatives can make informed decisions.

The hazard analysis as depicted in the EP is an iterative process conducted concurrently with the other tasks of SS-21. It does not appear that the interactions and dependencies between the hazard assessment and other aspects of the seamless safety process are adequately addressed. For example, the EP does not describe how or at what point the hazard assessment should identify systems and equipment important to safety such that the proper design, procurement, construction, and surveillance requirements and controls can be identified and incorporated into the process.

3. **Comment:** Provisions for independent review in Revision A of the EP have been deleted or significantly weakened in Revision B. Consistency among all of the documents that address SS-21 requirements is critical as DOE and its contractors attempt to develop programmatic guidance while concurrently implementing SS-21 activities.

   Discussion: The EP states that the Safety Evaluation Core Team (SECT) will attend each Milestone Review to identify issues and raise them to the project team. It states that resolutions for these issues must be approved (acknowledged) by the SECT in writing. It is unclear how, in this process, the SECT will retain the independence needed to perform a final review, given that the same team is required to provide input at each Milestone Review and concur that the safety criteria have been met. It is also unclear how, in this arrangement, the project team (the line management group responsible for design, development, and implementation of the activity) retains sole accountability for safety during the process development phases.

   With Revision B, the EP now describes the point in the process and the method by which the design agencies will issue a Conditional Engineering Release (CER) to commence work on war reserve weapons. This process had previously been outside the scope of the EP and is presently covered in other requirements documents—the Development and Production Manual (D&P Manual) and DOE-AL Supplemental Directive AL SD 5610.11A, *Safety of Nuclear Explosive Operations.* These documents are in conflict with the guidance of the latest revision of the EP. The EP now describes an intended process for achieving approval to begin war reserve operations. The process includes the CER described above and DOE approval, which is to be obtained as the result of a successful Milestone 3 Review. This process violates a fundamental tenet of the readiness process described in the Board's Recommendation 92-6, *Operational Readiness Reviews;* the deficiency with this process is that it does not include an independent readiness review after line management has asserted readiness to proceed and before operations on war reserve weapons are allowed to commence.

This issue is not solely one of independence. The process to review a proposed nuclear explosive operation and authorize startup as described in the D&P Manual and AL SD 5610.11A includes requirements for prerequisites, review criteria and objectives, and composition of the review team. This type of guidance, necessary to ensure a thorough and effective readiness review, is not included in the EP.