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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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September 22, 2006

The Honorable Linton Brooks  
Administrator  
National Nuclear Security Administration  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0701

Dear Ambassador Brooks:

The Device Assembly Facility (DAF) at the Nevada Test Site is being modified to accommodate training and criticality experiments to be conducted for the National Nuclear Security Administration (NNSA). A letter to you from the Defense Nuclear Facilities Safety Board (Board) dated March 27, 2006, identified deficiencies in the design criteria and safety basis of this Critical Experiments Facility (CEF) project. The issues raised by the Board in its March letter and enclosures to that letter encompass the full spectrum of project activities, including design requirements, hazard identification and analysis, and identification and classification of safety controls.

The Deputy Administrator for Defense Programs responded to the Board's letter on June 2, 2006, stating that all major issues had been fully deliberated and resolved. The response also stated that the resolution of the safety issues raised by the Board would be documented in the revision to the Preliminary Documented Safety Analysis (PDSA) and other project documents.

The Board has now received and reviewed the revised PDSA and other project documents. The majority of the issues raised by the Board are not resolved or not addressed in these documents. Moreover, several project documents referenced in this revised PDSA, such as the Preliminary Fire Hazard Analysis and Criticality Safety Evaluation reports, have not yet been prepared by the contractor and thus are not available to support NNSA's declaration. For example:

- Neither the PDSA nor the design criteria documents demonstrate how the fundamental design requirements of Department of Energy (DOE) Order 420.1A, *Facility Safety*, such as multiple layers of protection for prevention or mitigation of unintended release, are fulfilled.
- The PDSA does not address the impact of an explosion in the facilities adjacent to DAF and the resulting ground acceleration on the critical experiment assemblies. This external hazard, as well as a seismic event, could have a severe impact on the support and stability of these assemblies.

- A fire suppression system has not been designed to prevent small incipient fires from spreading and resulting in a release from the facility. The revised PDSA discusses the alternatives for addressing this issue and recommends an INERGEN<sup>®</sup> fire suppression system for compatibility with the criticality experiments; however, the design and implementation of such a system have not been determined despite the advanced stage of the project activities.

Since December 2005, the Board has been trying to raise DOE's awareness of the need to incorporate safety into the design of new defense nuclear facilities from the early stages of design. At public meetings, DOE has emphasized the importance of incorporating safety into facility design and resolving safety-related design issues early in a project's life cycle. DOE is taking actions to integrate this emphasis into its directives system. The Board notes that the CEF project is in the process of preparing for its Critical Decision (CD)-3 milestone, which indicates that final design activities have largely been completed, and procurement and construction activities will begin following NNSA approval. As noted above, major safety-related design issues raised by the Board, remain unresolved in spite of assurances otherwise. It should also be noted that safety-related design issues raised by the Nevada Site Office's safety basis review team remain unsatisfied as well.

The Board believes such fundamental design issues ought to have been addressed before CD-2 was granted. As evidenced by several other recent DOE projects, continuing the design process without satisfactory resolution of safety-related design issues increases the potential for delays, cost increases, and associated pressure to accept nonoptimal safety solutions when the issues finally are resolved.

Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a report, to be submitted at the time when the CD-3 approval request package is submitted by the project, that describes how the safety-related issues identified by the Board in its March 27, 2006, letter are being addressed. This report should include a detailed description of the issues and their resolution.

Sincerely,



A. J. Eggenberger  
Chairman

c: The Honorable J. Clay Sell  
Mr. Thomas P. D'Agostino  
Dr. Jay H. Norman  
Mr. Mark B. Whitaker, Jr.