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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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January 29, 2008

The Honorable J. Clay Sell  
Deputy Secretary of Energy  
1000 Independence Avenue, SW  
Washington, DC 20858-1000

Dear Mr. Sell:

The Defense Nuclear Facilities Safety Board (Board) has reviewed *Status of the Department of Energy Nuclear Criticality Safety Program for Calendar Year 2006*, dated March 12, 2007. While the Board is pleased with progress made in many areas, concerns remain about the effectiveness of future Nuclear Criticality Safety (NCS) program reviews, as well as trending and analysis of criticality-related occurrences that are essential to identify weaknesses with NCS controls and control implementation. The Board believes it is necessary to modify the content of the DOE Annual NCS Report so that it does not mainly report on those issues where substantial and lasting progress has been made, but rather emphasizes ongoing NCS issues. These changes will help ensure continuous improvement in criticality safety across the DOE Complex.

The need to organize funding and improve stability for nuclear criticality safety research and instruction, identified in Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy*, has been adequately addressed. The National Nuclear Security Administration (NNSA) and DOE's Office of Environmental Management provide support for the DOE Nuclear Criticality Safety Program (NCSP). The NCSP funds many activities, including research and development, Criticality Safety Support Group (CSSG) taskings, and training courses for NCS engineers. The NCSP budget is well defined and appears stable for the foreseeable future. The NCSP website provides the latest information and activities of interest to the criticality safety community, including the Five Year Plan for the NCSP. Given the progress that has been achieved, the availability of this information, and the overall stability of the program, this data is no longer required as part of the DOE Annual NCS Report.

Criticality safety oversight and NCS program reviews are of ongoing interest to the Board. They should be an important element of the implementation of DOE Order 226.1A, *Implementation of Department of Energy Oversight Policy*. The limited-scope baseline reviews proposed by DOE in October 2005 have now been completed. In the future, DOE plans to monitor criticality safety as a component of the biannual Chief of Nuclear Safety (CNS) and Chief of Defense Nuclear Safety (CDNS) reviews. The Board is concerned that the CNS and CDNS reviews may not be of sufficient depth to accurately assess the health of NCS programs.

In a letter to NNSA dated September 10, 2007, the Board's staff identified a number of weaknesses in the NCS program at Los Alamos National Laboratory that were not uncovered during earlier reviews by DOE. DOE must either develop a strategy to ensure that NCS programs are examined in sufficient depth during the CNS/CDNS site reviews or consider separate reviews specifically targeting criticality safety.

Finally, several of the reporting requirements from the closure of Recommendation 97-2 were not addressed in the last Annual Report. The latest report did not include required information on the quality of contractor self-assessments for criticality safety, adequacy of NCS evaluations, and consistency of NCS programs across the complex. The CSSG performed a generic evaluation of complex-wide NCS occurrences and noted that: (1) site management is not kept aware of low-level NCS incidents and (2) a more uniform categorization for occurrence severity is needed. Specific trending and analysis of criticality related occurrences was not done; this analysis is essential to identify weaknesses with particular controls and/or control implementation, and to look for possible precursor events.

Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board modifies the annual reporting requirements established for closure of Recommendation 97-2, as listed in the enclosure to this letter, and grants DOE a one-time extension of 60 days beyond the January 31, 2008 deadline, established in the original August 3, 2003 reporting requirement, to provide this information.

Sincerely,



A. J. Eggenberger  
Chairman

c: The Honorable Clarence H. Albright, Jr.  
The Honorable Robert L. Smolen  
The Honorable William C. Ostendorff  
Dr. David H. Crandall  
Mr. Mark B. Whitaker, Jr.

Enclosure

**Enclosure**  
**Specific Subjects to be Addressed in the**  
**Department of Energy Annual Report on Nuclear Criticality Safety**

The Department of Energy's (DOE) annual report on nuclear criticality safety should address, at a minimum, the following items:

- A site-by-site evaluation of contractor nuclear criticality safety performance measured against established criticality safety performance metrics, including an evaluation of this performance and actions taken by DOE Field Element Line Management to improve nuclear criticality safety and address known nuclear criticality safety program deficiencies.
- The status of the contractor nuclear criticality safety engineer programs at each site, including staffing levels, plans to address vacancies, interim compensatory measures, and progress on training and qualification. This must include an analysis of the adequacy of each by DOE Field Element Line Management.
- The status of the federal nuclear criticality safety engineer programs at each site, including staffing levels, plans to address vacancies, interim compensatory measures, and progress on training and qualification. This must include an analysis of the adequacy of each by DOE Headquarters Line Management.
- A summary of the results and any lessons learned from federal assessments of criticality safety conducted throughout the year and the steps taken by the contractor and DOE in response to these assessments. This summary should highlight such factors as the quality of contractor self-assessments, the adequacy of criticality safety evaluations, and the consistency of sites' nuclear criticality safety programs.
- A summary of the results and lessons learned from contractor, federal, or independent reviews of proposed nuclear criticality safety controls and design requirements for new facility designs. Included with this is a description of how this information was used by the contractor and DOE Line Management Elements to improve facility designs and the design process.
- A summary of the results of trending and analysis of each site's reportable and nonreportable occurrences related to criticality.
- The results of follow-up reviews undertaken by DOE to assess and validate the effectiveness of corrective actions and improvements from the above activities for the previous year.
- The status of open issues identified in the previous year's annual report.