

John T. Conway, Chairman
A.J. Eggenberger, Vice Chairman
Joseph J. DiNunno
Herbert John Cecil Kouts
John E. Mansfield

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004-2901
(202) 694-7000



December 21, 1999

The Honorable T. J. Glauthier
Deputy Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Mr. Glauthier:

Enclosed is a report providing an analysis by the staff of the Defense Nuclear Facilities Safety Board (Board) of the fourth quarter, fiscal year 1999, status report for the Implementation Plan for the Board Recommendation 97-2, *Criticality Safety*. As noted in the status report, the Board's staff acknowledges the satisfactory completion of two commitments in the Implementation Plan: Commitment 6.5.2, Milestone 1, on development of a department guide for reviewing criticality safety evaluations, and Commitment 6.6.3, Milestone 2, on issuance of guidance for site-specific criticality safety training and qualification programs.

With regard to Commitment 6.6.1, Milestone 1, the Board's staff had the opportunity to observe the Pilot Advanced 5-Day Criticality Safety course conducted at Los Alamos National Laboratory (LANL) on August 23-27, 1999. Operating restrictions at LANL prevented a hands-on approach to criticality by those attending the class, and the course fell short of providing a realistic assessment of factors relevant to the preparation of criticality safety evaluations. A path forward was discussed with the attendee from the Department of Energy (DOE)-Headquarters that included establishing a committee to oversee the course curriculum with complex-wide instead of just LANL input. The Board's staff has observed positive efforts toward the future effective execution of the Advanced 5-Day Criticality Safety course; however, the staff believes it would not be prudent to declare the closure of this important milestone until the upgraded course has been successfully upgraded and effectively executed.

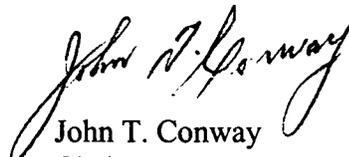
The Board is pleased that DOE has made significant progress with regard to the Implementation Plan for Recommendation 97-2, but recent events at LANL's Technical Area 18 (TA-18) appear to threaten the robust execution of the critical experiments program. Given that many elements of the Implementation Plan are dependent on the competent operation of the critical assemblies at TA-18, any loss of this capability would have a deleterious impact on the criticality safety infrastructure of the DOE nuclear weapons complex. Any interruption in the activities performed at the Los Alamos Critical Experiments Facility (LACEF) would have a serious impact on the conduct of training and other commitments associated with Recommendation 97-2. Therefore, the Board wishes to be kept informed of any plans for

relocating LACEF activities that could affect the timely performance of criticality safety program objectives.

In the enclosed report, the Board's staff notes the initiative adopted by DOE to provide recovery plans for overdue commitments. These recovery plans should be amplified to enable a more detailed understanding of the work remaining to complete each milestone. Furthermore, emphasis should be placed on completing the qualification of key federal employees engaged in criticality safety as soon as possible.

Finally, the Board is aware of a perennial problem that has plagued the criticality safety program in the past: the uncertainty of funding support from DOE program offices. The Board is aware that a Memorandum of Understanding is currently in place that is intended to preclude this problem in the future. The Board requests prompt notification if funding for the nuclear criticality safety program is reduced or delayed, or otherwise hinders the effective execution of this important safety program.

Sincerely,



John T. Conway
Chairman

c: Dr. Gilbert G. Weigand
Mr. Mark B. Whitaker, Jr.

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

December 2, 1999

MEMORANDUM FOR: G. W. Cunningham, Technical Director
J. K. Fortenberry, Deputy Technical Director

COPIES: Board Members

FROM: M. Forsbacka, T. Burns, J. Roarty

SUBJECT: Recommendation 97-2, *Criticality Safety*

This report documents a review by the staff of the Defense Nuclear Facilities Safety Board (Board) of the Department of Energy's (DOE) fourth quarter, fiscal year (FY) 1999, status report regarding the Implementation Plan for the Board's Recommendation 97-2, *Criticality Safety*.

Background. According to the status report, three milestones in the Implementation Plan for Recommendation 97-2 were completed during the quarter:

- Commitment 6.5.2, Milestone 1—Develop a departmental guide for reviewing criticality safety evaluations.
- Commitment 6.6.1, Milestone 1—Expand the Los Alamos Critical Experiments Facility (LACEF) training course.
- Commitment 6.6.3, Milestone 2—Issue guidance for site-specific criticality safety training and qualification programs.

Staff Assessment. DOE has proposed closure of the above three milestones. The staff concurs with closure of the milestone on development of a guide for reviewing criticality safety evaluations, as well as that on issuance of guidance for site-specific criticality safety training and qualification programs. The staff had numerous interactions with DOE on these matters and provided substantive comments on the technical depth and breadth of draft inputs, which were incorporated in the resulting DOE standards.

The staff does not, however, believe the intent of Commitment 6.6.1, Milestone 1 to expand the Los Alamos Critical Experiments Facility (LACEF) training course was adequately accomplished with the conduct of a Pilot Advanced 5-Day Criticality Training course at Los Alamos National Laboratory (LANL) in August 1999. Operating restrictions at LACEF prevented a hands-on approach to criticality by those attending the class, and the course fell

short of providing a realistic assessment of factors (e.g., hazards, energy sources) relevant to the preparation of criticality safety evaluations. The staff discussed with the attendee from DOE-Headquarters a path forward that included establishing a committee to oversee the course curriculum, with complex-wide instead of just LANL input. A more formal protocol for the course is now being developed, and the Board's staff is routinely apprised by staff from DOE-Headquarters regarding progress on course improvements. It appears prudent to keep this commitment open until the modified course syllabus has been applied, and a hands-on criticality training exercise has been adequately performed in a follow-on class.

The Board's staff notes the initiative adopted by DOE to provide recovery plans for overdue commitments. The staff believes these recovery plans should be amplified to enable a more detailed understanding of the work remaining to complete each milestone. Furthermore, the staff thinks emphasis should be placed on completing the qualification of key federal employees engaged in criticality safety as soon as possible.

Associated Issues. A perennial problem that has plagued the criticality safety program in the past is a lack of funding support from DOE program offices. The Board's staff is aware of a Memorandum of Understanding currently in place that is intended to preclude this problem in the future. The staff believes that DOE should notify the Board promptly if there is any lack of funding for the criticality safety program in the future.

An important issue not discussed in the status report is the uncertainty of future operation of critical experiment assemblies at LACEF. This uncertainty is the result of a possible transfer of the critical assemblies to an as yet undetermined location to alleviate potential concerns regarding physical security at LACEF. Any interruption in the activities performed at LACEF would have a serious negative impact on the conduct of training and other commitments associated with Recommendation 97-2. In addition, a lengthy shutdown resulting from relocation activities conducted without a proper systems engineering approach including appropriately defined objectives, could lead to the permanent loss of experienced personnel. The staff believes DOE should keep the Board informed as definitive plans are developed that could adversely affect or delay the accomplishment of the objectives of the Recommendation 97-2 Implementation Plan.