DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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December 19, 1995

The Honorable Victor H. Reis
Assistant Secretary for Defense Programs
Department of Energy
Washington, D.C. 20585-0104

Dear Dr. Reis:

On September 27, 1994, after the Defense Nuclear Facilities Safety Board's (Board) staff identified deficiencies in nuclear criticality safety administrative controls and conduct of operations at the Y-12 Plant, the contractor at Y-12 curtailed operations in all nuclear facilities. Subsequently, the Board issued Recommendation 94-4, *Deficiencies in Criticality Safety at Oak Ridge Y-12 Plant*.

Over the past year, the Board's staff made a number of visits to Y-12 to assess the Department of Energy's (DOE) and its contractor's progress in resuming operations in those facilities which support the Receipt, Storage, and Shipment (RSS) of the Special Nuclear Materials mission area. The enclosed report provides information on the Board's staff assessment of the efforts.

The Board is encouraged by the successful startup of the RSS mission area on September 21, 1995; however, the upgrading of conduct of operations will require continuing effort by the DOE and its contractor. Please consider the enclosed observations as you continue to assess progress in operational formality at Y-12 to report on deliverables due to the Board over the next few months.

Please contact me or Mr. Wayne Andrews of the Board's staff if you need additional information.

Sincerely,

John T. Conway
Chairman

c: Mr. Mark Whitaker

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 3, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: W. L. Andrews, Jr.

SUBJECT: Y-12 Plant: Staff Observations of Department of Energy (DOE) and Lockheed Martin Energy Systems' (LMES) Preparations for Receipt, Storage, and Shipment Restart

1. **Purpose:** This memorandum provides Defense Nuclear Facilities Safety Board (Board) staff observations during five trips to the Oak Ridge Y-12 Plant during the period April through September 1995. These trips were made to follow DOE's and LMES's progress in implementing the Board's Recommendation 94-4, *Deficiencies in Criticality Safety at the Oak Ridge Y-12 Plant*. The staff observed day-to-day and "special" operations (e.g., Project Sapphire, weapon component receipts, etc.) and DOE's and LMES's preparations for Receipt, Shipping, and Storage (RSS) mission area restart. The reviews included:

   a. Review of preparation of special operations requests and preparations for restart efforts [April 10 - 13, 1995 - McConnell, Owen, Krahn, Miller, OEs: West, Drain].

   b. Review of DOE's and LMES's actions in preparation for restart of the RSS mission area [May 30 to June 2, 1995 - Andrews, OE: West].

   c. Review of progress toward the RSS Readiness Assessment (RA) during a joint meeting with DP-20 [June 6 - 9, 1995 - Krahn, McConnell].

   d. Review of LMES RA for RSS [August 14 - 18, 1995 - Moury, OE: Drain]

   e. Review of DOE RA for RSS [August 27 - September 8, 1995 - Andrews, McConnell, OEs: West, Boyd]

2. **Summary**: The following summarizes the staff's observations during this time frame.

   a. Progress to change the safety culture at Y-12 continues under Recommendation 94-4, but at a slow pace. This is primarily due to the contractor's reluctance to change out personnel. A number of quality individuals have been hired, but more are needed to continue necessary improvements. Senior management from both DOE and LMES continue efforts to heighten the Conduct of Operations (COOP) awareness at Y-12. However, during each staff visit, and during each readiness review, several COOP discrepancies were identified. These deficiencies (e.g., operators failing to follow procedures, procedures being non-executable as written, and supervisors failing to identify incorrect actions) occurred even during special operations

conducted with increased scrutiny and attention. It appears that the root cause of this issue has not been identified and addressed. Recent COOP assessments present an opportunity for DOE and LMES to take additional action in this area.

b. The DOE RA for RSS was thorough and properly characterized the status of the facility. Correction of the noted findings should provide assurance for adequate protection of the workers and public for the restart of RSS operations. Despite the thoroughness of the DOE RA, problems with the new procedure for Technical Procedure Process Control (which was placed into effect during the RA) and the performance of the Y-12 Site Office Restart Team (YSORT) were not addressed adequately.

3. Background:

a. In September 1994, in response to numerous violations of CSAs and disciplined operations, the Board issued Recommendation 94-4, *Deficiencies in Criticality Safety at the Oak Ridge Y-12 Plant.* The recommendation discussed weaknesses in operator discipline, criticality safety programs including procedures, and adequacy of DOE and contractor experience, training, and performance.

b. Since DOE's acceptance of Recommendation 94-4, the contractor and DOE have engaged in a number of initiatives to prepare the Y-12 facilities for resumption, in accordance with the DOE Implementation Plan for Recommendation 94-4. DOE's course of action for resumption of operations was to take immediate steps to correct safety deficiencies and then validate them through a formal restart process in accordance with Order 5480.31, *Startup and Restart of Nuclear Facilities.* Additional assessments to review the Y-12 criticality safety program and implementation of COOP are also planned in response to Recommendation 94-4.

4. Discussion:

a. Progress in improving the conduct of operations at Y-12 has been made slowly. The slow progress appears to be a lack of commitment and attention to adopting the COOP principles by some of LMES management. In each readiness review for RSS operations (contractor line management, independent contractor, DOE line management, and independent DOE) significant discrepancies were noted in COOP and procedures. It appears that the root cause of this issue has not been identified and addressed.

b. A contributing cause of the Y-12 shutdown in September 1994 was the quality and implementation of operating procedures. LMES expended significant effort toward making procedures more useable and executable, but more work needs to be done. Achieving improved procedural compliance relies on accurate procedures that can be executed as written. One of the actions taken has been to attempt to track Operational Safety Requirements (OSRs) and Limiting Conditions of Operation (LCOs) into the procedures and to present them in a manner to cause attention of the operator. Another major area of

potential improvement, which is in the beginning stages, is to incorporate Criticality Safety Approvals (CSAs) into the procedures to which they apply. Currently, the CSAs are only referenced by the procedure, and require the operator to find the applicable CSA, as needed, to ensure the CSA requirements are met.

c. Several deficiencies previously identified by the line management self-assessment, LMES RA, and YSORT assessment with the technical procedure development process were reviewed by the Board's staff. Deficiencies noted included: 1) administrative errors, 2) inconsistent completion of associated documentation for technical review and approval, 3) inconsistent completion of change documentation, inconsistent class categorization, 4) inconsistent documentation of changes, 5) awkward method for change entry, 6) inadequate review of reference documentation during procedure/change review, and 7) multiple procedure systems for different types of procedures. A new procedure control system went into effect during the DOE RA. The DOE RA team considered that it addressed many of these concerns, but its implementation could not be assessed during the DOE RA.

d. The DOE RA of RSS, conducted August 28 - September 7, 1995, consisted of document reviews, operational observations, and personnel interviews in seven functional areas where weaknesses were noted to have caused the September shutdown of operations. The RA identified 13 prestart findings, 20 post-start findings, and five observations. There were three primary areas of concern noted during the RA. These were:

1) The process for controlling technical procedures was determined to be inadequate to support safe operations. This condition existed despite having been identified during the contractor's Management Self-Assessment (MSA) and the LMES RA. A revision to the process for controlling technical procedures was not yet implemented during the RA and could not be evaluated. An RA finding regarding procedures required correction of all procedures required to support the RSS mission area prior to their actual use.

2) There was insufficient evidence that the prestart findings from the LMES RA had been closed. Also, it was noted that the findings from the RA had not been analyzed for root causes, generic implications, and lessons learned.

3) Deficiencies noted with the safety envelope documentation required correction prior to restart. Problems were noted with CSAs and the OSRs. For example, surveillance requirements did not include all requirements described in the OSR bases or ensure compliance with LCOs. In addition, Unreviewed Safety Question Determinations were not performed for changes to CSAs.

The RA team concluded that RSS operations could be safely started following correction of the remaining contractor and DOE readiness review prestart findings. The team considered material condition of the facility to be satisfactory and personnel performance and training to be adequate.

e. Although, in general, the YSORT organization had a positive influence on the RSS readiness review process, several review areas lacked rigor and will require strengthening for upcoming readiness reviews. Specifically, the team did not ensure that LMES prestart findings were closed by requiring formal closure packages and ensuring that generic and root cause problems were addressed. Despite identification of problems with safety envelope documentation and procedures by other assessments, the YSORT did not ensure adequate correction of these issues as evidenced by the significant findings made by the DOE RA. This shortcoming was not the subject of any comment by the DOE RA.

4. **Future Staff Actions:** The Board's staff will continue to observe resumption activities at Y-12 for other mission areas including review of the new procedure control system, LMES and DOE management attention to improving conduct of operations at Y-12, and other efforts in implementing the Board's Recommendation 94-4.