

[DNFSB LETTERHEAD]

March 28, 1995

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

Dear Dr. Reis:

The Defense Nuclear Facilities Safety Board (Board) issued Recommendation 94-4, *Deficiencies in Criticality Safety at the Oak Ridge Y-12 Plant*, on September 27, 1994, after the Board's staff identified deficiencies in nuclear criticality safety administrative controls and conduct of operations at the Y-12 Plant. Shortly after that event, the contractor at Y-12, Martin Marietta Energy Systems (MMES), curtailed operations in all nuclear facilities at Y-12. During the fall and winter of 1994, the Board's staff made ten trips to the Y-12 Plant to evaluate the Department of Energy's (DOE's) progress in correcting the identified deficiencies and preparing to resume operations. The enclosed staff report provides information on the Board's assessment of those efforts. The information will be useful in executing the Implementation Plan for Board Recommendation 94-4.

Additionally, during the above time period, the Y-12 Plant received a shipment of highly enriched uranium (HEU) from Kazakhstan (i.e., Project Sapphire). While the Board welcomes this effort to bring fissile materials under improved safeguards and security, it appears that the material is insufficiently characterized to conclude that it complies with Y-12 Plant standards for storage of HEU. The Board notes that DOE has developed a technically rigorous sampling plan to characterize the material, but has not yet developed any plans to actually conduct the sampling. The Board will be interested in reviewing DOE's plans to sample the material when they are available.

Please contact Mr. Steve Krahn of the Board staff at (202) 208-6580 if you require any additional information or assistance.

Sincerely,

John T. Conway
Chairman

c: The Honorable Tara O'Toole, EH-1
Mr. Joe Lagrone, Manager, DOE Oak Ridge Operations Office
Mr. Mark Whitaker, EH-9

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 17, 1995

MEMORANDUM

FOR: G. W. Cunningham, Technical Director
COPIES: Board Members
FROM: J. J. McConnell, Oak Ridge Program Manager
SUBJECT: Y-12 Plant: Staff Observations of Department of Energy (DOE) and Martin Marrietta Energy Systems' (MMES's) Actions Subsequent to Recommendation 94-4

1. **Purpose:** This memorandum provides Defense Nuclear Facilities Safety Board (Board) staff observations during ten trips to the Oak Ridge Y-12 Plant during the period September 22, 1994, to December 31, 1994. The staff made these trips after MMES curtailed operations at the plant and the Board issued 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) and DOE's and MMES's preparations for restart. The reviews included:
 - a. Review of DOE and MMES efforts to analyze and respond to issues identified subsequent to the 9/22/94 criticality safety violation [September 23-29, 1994 - McConnell, Andrews].
 - b. Review of DOE and MMES actions post-shutdown, preparation of special operations requests, and preparations for restart [October 24-28, 1994 - Andrews, OE: West].
 - c. Staff support for the Board's public hearing and post-shutdown followup [October 31 - November 2, 1994 - McConnell, Krahn].
 - d. Review of special operations requests [November 7-11, 1994 - Moury, OE: Boyd].
 - e. Project Sapphire preparations and execution that included:
 1. Review of preparations for accepting foreign nuclear material [November 16-18, 1994 - McConnell, Krahn].
 2. Observation of arrival of foreign nuclear material [November 22-23, 1994 - McConnell].
 3. Review of unloading and storage of foreign nuclear material [November 28 - December 2, 1994 - Moury, Andrews].
 4. Random reviews ~McConnell, Andrews].
 - f. Participation in Plan of Action development workshop [Andrews].
2. **Background:** On September 22, 1994, several members of the Board's staff identified a violation of a nuclear criticality safety approval (CSA) for a special nuclear material (SNM) storage vault at Y-12. When the staff identified this deficiency to on-site personnel, including a senior MMES manager, an MMES nuclear criticality safety

specialist, and one of DOE's facility representatives, appropriate immediate corrective actions, required by Y-12 procedures, were not taken. In fact, proper corrective actions were not put in place until the Board's staff identified the condition to the DOE Y-12 Site Office (YSO) Manager. MMES management made a decision to curtail Y-12 activities performed under CSAs. MMES also began a comprehensive site-wide review of compliance with all CSAs that eventually identified 1344 violations.

3. Discussion:

- a. Senior management from both DOE and MMES have attempted to heighten the Conduct of Operations (COOP) awareness at Y-12. However, during each staff visit, numerous COOP discrepancies were identified. These deficiencies (such as operators failing to follow procedures and supervisors failing to identify incorrect actions) occurred even during special operations under increased scrutiny and attention. To accelerate corrective actions and achieve a state where line management is ready to resume operations, YSO has recently dedicated a staff of 20 personnel (mostly support contractors) to focus on restart. YSO has added six new facility representative billets and is filling them with technically qualified personnel. MMES has also reorganized to place all nuclear operations under one line manager. The new Manager of Nuclear Operations appears to be well-suited for the task.
- b. The staff noted improvements in the rigor and formality of evidence files supporting Special Operations Requests over the period. However, the files still lack the level of completeness, accuracy, and rigor that DOE described in the procedure for reviewing these packages. For example, one package contained a copy of an Operational Safety Requirement (OSR) surveillance with an out-of-tolerance reading that was not identified by any MMES or DOE line management review.
- c. For Project Sapphire, staff reviews prior to Y-12 receipt of materials identified that the material was insufficiently characterized. The special operation preparation and approval process also had some deficiencies; for example, an OSR for a fire protection system that had been removed from the warehouse several years ago was still in effect. These deficiencies were quickly and satisfactorily corrected after the staff brought them to senior managers' attention. In response to the concerns regarding characterization, DOE developed a sampling plan and is evaluating approaches to process the material, probably at a commercial facility. Ultimate disposition of the material will require DOE to negotiate a contract with a processor, satisfy NEPA requirements, and improve characterization of the material.
- d. Both the DOE and MMES have developed Plans of Action (POAs) for resuming operations in the Receipt, Storage and Shipment mission area. Although clearly a step in the right direction, the plans focus almost exclusively on fixing the causal factors associated with the events of September 22, 1994. The POAs do not focus enough on general COOP, training and qualification, adherence to safety requirements, and other important aspects of general readiness to proceed

identified in the Board's report dated December 21, 1994. For example, the POAs do not include a review of the staffing, training, or readiness of technical support organizations such as the Training, Criticality Safety, Facility Safety, or Quality Assurance functions.

4. **Future Staff Actions:** The staff will continue to observe resumption activities at Y-12 and execution of the DOE Implementation Plan for Board Recommendation 94-4.