

May 15, 2000

Brigadier General Thomas F. Gioconda
Acting Deputy Administrator for
Defense Programs
Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0104

Dear General Gioconda:

The Department of Energy (DOE) and its contractor at the Oak Ridge Y-12 Plant have been working for several years to address safety-related requisites for restarting hazardous but vital national security operations at Y-12. The Defense Nuclear Facilities Safety Board (Board) has highlighted a number of safety issues requiring attention, including those described in the enclosed reports: (1) delays in stabilizing fissile materials in Building 9206, (2) deficiencies in the implementation of consensus safety standards and contractual requirements in activity-level procedures that control work, (3) prolonged reliance on cursory or limited-scope safety analysis documents for nuclear facilities, and (4) deficiencies in emergency management.

These reports are provided for your information. The topics identified have been included among those discussed by the Board with your senior staff and staff of the Y-12 contractor during a trip to the Y-12 Plant in April 2000. The Board will continue to advise you on our observations as we continue our oversight efforts.

Sincerely,

John T. Conway
Chairman

c: Ms. G. Leah Dever
Mr. Mark B. Whitaker, Jr.

Enclosures

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

February 29, 2000

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

COPIES: Board Members

FROM: W. Andrews
R. West (OE)

SUBJECT: Enriched Uranium Operations Furnace

This report documents a review performed at the Oak Ridge Y-12 Plant by members of the staff of the Defense Nuclear Facilities Safety Board (Board). Staff members W. Andrews, W. White, and D. Moyle and outside expert R. West met with representatives of Lockheed Martin Energy Systems (LMES) to review the safety of Y-12 Enriched Uranium Operations (EUO) furnaces. Specifically, the Board's staff reviewed actions taken to address the previously identified deficiencies in the flowdown of safety requirements from the LMES Standards and Requirements Identifications Documents (S/RIDs) to plant procedures.

Background. The Holden natural gas furnace was included in the EUO Phase A2 restart. The Building 9212 Basis for Interim Operation (BIO) relies explicitly on the proper construction and testing of gas system components and the proper operation and surveillance of a flame management system to prevent a gas explosion in the furnace area. The BIO credits conformance with industry standards to ensure this protection. LMES personnel identified National Fire Protection Association (NFPA) Standard 86, *Ovens and Furnaces*, and NFPA 54, *National Fuel Gas Code*, as applicable (these standards are also listed in the Y-12 S/RIDs).

In September 1998, the Board's staff performed a review of the identification and implementation of safety basis controls for Phase A2 furnace operations. That review revealed a number of issues related to the application of the requirements of these two NFPA standards to the Holden gas furnace. These issues ranged from improper design of control circuit components to improper testing procedures. A letter from the Board, dated October 8, 1998, requested that the Department of Energy (DOE) provide information on further actions to be taken to ensure the safety of operations with the Holden gas furnace.

In a letter dated December 15, 1998, DOE forwarded a response to the Board's letter from DOE-Oak Ridge (OR) that reported the following information and actions relative to issues involving the Holden gas furnace.

- The identification of the root cause for failure to adequately flow down requirements as the failure of LMES management to recognize the necessary level of rigor and to

require a detailed review of the applicable NFPA codes for the Holden furnace.

- Identification of the fact that the flowdown of standards to plant command media (e.g., procedures) was not specific.
- A description of actions taken or being taken to ensure that the Holden furnace would meet the appropriate code safety requirements.
- A commitment to conduct reviews and take the appropriate actions for other EUO furnaces.
- The establishment of an approved corrective action plan to address the generic problems with the flowdown of requirements, beginning at the site level (in particular NFPA and the American National Standards Institute codes).

At the time of the DOE-OR response, the above appeared to be an adequate set of corrective actions if effectively implemented.

Flowdown of Standards. As a result of this review the staff found that previously identified deficiencies with the flowdown of safety requirements from the LMES S/RIDs to plant procedures have not been corrected.

The staff reviewed a recently issued independent LMES management review report, *Holden Furnace Modification Design Implementation of National Codes* (Y/MA-7471, January 5, 1999), which was written in partial response to the Board's letter of October 8, 1998. This LMES independent review was to address the failure to adequately flow down the requirements from the NFPA and other industry standards into Y-12 work authorization documents. Instead, the review focused on where along a gas supply piping system the NFPA code became applicable and on the need to provide documentation of the engineering judgements and other decisions made that might be in conflict with the NFPA requirements.

In addition, information provided to the staff concerning local technical standards and training indicates that no actions have been taken to make them consistent with the applicable industry standards. The review of the Holden gas furnace conducted by the staff in September 1998 revealed that the site's *Engineering Technical Specification Master Manual* did not contain proper guidance and was inconsistent with NFPA 54 requirements. The engineer who discussed the use of the codes indicated that changes required to ensure the proper flowdown of NFPA 54 safety requirements have not been made.

Finally, an LMES Readiness Assessment was performed in September 1999 in preparation for restart of the reduction furnace. One of the prestart findings of the readiness assessment was as follows:

Pressure vessels, which were not stamped in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, were planned to be used in applications where code-stamped vessels were required by the Code and local directives. Adequate actions had not been taken to ensure the implementation of measures to provide equivalent protection and ensure safety equal to or superior to the intent of the ASME Code as required by local directives, if the ASME Code was considered to be not applicable.

This finding is another example of the lack of flowdown of industry safety standards (required by the S/RIDs) to a process. This finding was made a year after the Board and its staff had identified the issue of standards flowdown to DOE and LMES.

In summary, DOE and LMES have not fixed the problem of contractual safety requirements, in the form of national consensus standards, not flowing into various plant installation, maintenance, testing, surveillance, and training documents. The failure to revise local technical standards and training development to make them consistent with the applicable industry standards indicates that DOE and LMES did not adequately address the systemic issues.