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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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June 26, 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:


During the past year, numerous issues have arisen with regard to the authorization bases for defense nuclear facilities at Lawrence Livermore National Laboratory (LLNL). These issues include insufficient analysis of the fill quantity of material at risk, lack of analysis of potential accident scenarios, violations of Technical Safety Requirements that were not recognized or addressed sufficiently, and misuse of the Unreviewed Safety Question process. Often when these issues were identified, they were not addressed in a timely manner and with sufficient technical basis. Updates of Safety Analysis Reports typically have been late by many months and sometimes years. The situation appears to result from the lack of an adequate understanding of authorization basis requirements on the part of both the laboratory and the Department of Energy (DOE) officials responsible for them.

We have recently been briefed by both DOE Headquarters and Oakland staff on these matters. It appears that many of the authorization basis issues we have identified are currently being addressed, and there is an effort to significantly improve the overall authorization basis program at LLNL. During the past year, the Livermore Site Office of DOE's Oakland Operations Office has been actively engaged with LLNL in addressing authorization basis issues and improving the authorization bases of the nuclear facilities at LLNL.

The enclosed issue report prepared by the staff of the Defense Nuclear Facilities Safety Board (Board) presents the staff's observations regarding the authorization basis issues at LLNL. This report is forwarded for your information and use in DOE's initiatives to improve the authorization bases of defense nuclear facilities. The Board believes that the actions under way at the laboratory are consistent with the intent of the letter from Deputy Secretary of Energy T. J. Glauthier to the Board dated May 3, 2000.

The Board encourages LLNL and DOE to continue their efforts to improve LLNL's authorization basis program.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Conway". The signature is written in a cursive style with a large, sweeping flourish at the end.

John T. Conway
Chairman

Enclosure

c: Dr. C. Bruce Tarter
Mrs. Camille Yuan-Soo Hoo
Mr. Mark B. Whitaker, Jr.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

May 30,2000

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
COPIES: Board Members
FROM: F. Bamdad
SUBJECT: Status of Authorization Bases at Lawrence Livermore
National Laboratory

This report documents observations made by members of the staff of the Defense Nuclear Facilities Safety Board (Board) during meetings held at Lawrence Livermore National Laboratory (LLNL) on May 15–18, 2000. These meetings were attended by staff members F. Bamdad, J. Deplitch, and A. Hadjian.

Background. Recent Occurrence Reports from LLNL and actions by the Department of Energy (DOE) Livermore Site Office (LSO) indicate that some nuclear safety practices at LLNL defense nuclear facilities may not be adequate. There are eight hazard category 2 or 3 defense nuclear facilities at LLNL:

Facility	Hazard category
Building 332, Plutonium Facility	2
Building 331, Tritium Facility	3
Building 334, Special Purpose Facility	3
Building 251, Heavy Element Facility	3
Building 23 1V, Storage Vault	3
Hazardous Waste Facilities	
Bldg. 233, Container Storage Unit	3
Area 514, Waste Management Facility	3
Area 612, Waste Management Facility	3

The authorization bases of these facilities vary in format and content because they were prepared during the last 7 years using a variety of standards and guidance documents.

Discussion. The Board's staff reviewed authorization basis documents, met with representatives from DOE-LSO and LLNL to discuss the authorization bases of hazard category 2 and 3 defense nuclear facilities, walked down the facilities to observe the operations, and reviewed the hazards and implementation of controls. The staff observed that, overall, the facility managers are familiar with the safety envelopes of their facilities and have implemented the identified controls. The staff noted some inconsistencies and deficiencies, but **did not identify** any imminent hazards. For example, LLNL does not have an authorization basis for

on-site transportation activities. Transportation activities are performed using the guidance provided in the LLNL *Packaging and Transportation Safety Manual*, which meets DOE requirements for packaging and transportation. However, a systematic hazard analysis has not been performed and documented to address the hazards and identify the necessary controls for this nuclear activity consistent with the guidance provided in the attachment to DOE Order 5480.23, *Nuclear Safety Analysis Reports*.

The staff made the following observations with regard to the authorization basis documents and the LLNL organizations responsible for their preparation and approval:

- . It appears that responsible LLNL organizations do not have sufficient understanding of the need for and the requirements of authorization bases and their correlation with Integrated Safety Management. This is evidenced by the following:

A disclaimer on the authorization basis documents (such as Safety Analysis Reports and Technical Safety Requirements [TSRs]) that states, “Neither the United States Government, nor the University of California, nor any of their employees makes any warranty. . . or assumes any. . . responsibility for the accuracy, completeness, or usefulness of any information, product, or process disclosed.” Such a statement is inappropriate for the contents of a document that establishes the safety bases of nuclear facilities and is subject to DOE review, approval, and enforcement.

- Deficiencies identified with the safety and hazard analyses, TSRS, and Unreviewed Safety Question (USQ) Determinations that have been prepared and submitted to DOE for review and approval. For example, external hazards were overlooked in some hazard analysis, and some USQ Determinations were declared negative on the basis of bounding consequences despite the introduction of new hazards.
- The nature and repetition of comments generated by DOE-LSO during review of authorization basis documents. In particular, DOE-LSO identified deficiencies that indicate a lack of in-depth knowledge of current DOE nuclear safety requirements among LLNL personnel.
- LLNL does not have a consistent and agreed-upon process for preparing, reviewing, and submitting authorization basis documents to DOE for approval. For example:
 - Authorization basis documents are prepared by different groups with varying levels of knowledge of safety and hazard analysis, leading to preparation of documents that vary in content and quality.
 - Documents are submitted to DOE without internal review and approval by appropriate laboratory officials.
 - Weaknesses in the authorization basis documents are repeated without the benefit of feedback and improvement or sharing of lessons learned among different organizations.

Consequently, the DOE review and approval process is excessively resource-intensive, repetitive, and uncoordinated. The result is delays in identification and implementation of necessary controls, and on occasion, suspension of operations.

The LLNL Assurance Review Office, an independent oversight organization reporting to the Deputy Director's Office, identified similar issues in 1997 and 1999:

“Performance with regard to the SAR development process was evaluated to be weak:

- Guidance was out of date and ambiguous.
- . There was no comprehensive, site-wide coordination.
- There was no system for consistent, timely, cost-effective SAR preparation.
- . The decentralized approach had led to a failure to meet institutional commitments.”

DOE-LSO has reorganized and improved its technical competence to provide adequate oversight of safety at LLNL during the past 2 years. In the past year, DOE-LSO has vigilantly reviewed and provided oversight of the authorization bases of defense nuclear facilities, and has identified authorization basis issues at the laboratory that resulted in the responsible organizations taking corrective actions.

As a result of recent activities, LLNL has prepared a **draft** Nuclear Facility Authorization Corrective Action Plan. This plan fundamentally addresses correction of the root cause of the laboratory's authorization basis issues. It includes establishment of a centralized authorization basis group, training on nuclear safety and authorization basis requirements, oversight and assessment of authorization bases, and coordination of interaction with DOE. The laboratory authorization basis group will be responsible for the central knowledge, preparation, and distribution of authorization basis requirements; uniform application of authorization basis requirements; concurrence on all authorization basis documents; and oversight of authorization basis activities.

While corrective actions are not scheduled to be completed expeditiously, the planned time may be realistic given the need to acquire knowledgeable **personnel** and more fully train the necessary LLNL nuclear facility personnel. LLNL has identified the need for several full-time equivalent (**FTE**) employees. LLNL could probably accomplish many of its corrective actions and develop and sustain an effective authorization basis program with fewer FTEs by acquiring a select group of technically proficient **personnel** for its proposed authorization basis group. The sooner the laboratory can establish and staff the authorization basis group, the sooner it will be able to develop an effective authorization basis program.