

August 15, 1997

The Honorable Victor H. Reis  
Assistant Secretary for Defense Programs  
Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585-0104

Dear Dr. Reis:

The staff of the Defense Nuclear Facilities Safety Board (Board) recently completed an on-site review of the initial design stages for the Capability Maintenance and Improvement Project (CMIP) at the Los Alamos National Laboratory (LANL). Much of the focus of this review was on the Preliminary Hazard Analysis (PHA), which was still in draft at the time of the review. The staff notes in the enclosed report that the team responsible for preparation of the PHA appears to be technically strong.

On the other hand, the Board's staff observes that the ability of the management of the Chemistry and Metallurgy Research (CMR) facility to adequately support the safety upgrades that are part of the CMIP is problematic. For example, CMR is not adapting the safety management methodology developed at LANL's Plutonium Facility through an extensive initiative that involved mentoring by personnel external to LANL.

Since the staff completed its review, the Board has learned that the Department of Energy and LANL have taken the positive step of initiating an assessment of safety management at CMR. The Board requests that it be kept informed about the findings of this assessment and corrective actions to be taken.

Sincerely,

John T. Conway  
Chairman

c: Dr. Tara O'Toole  
Dr. Sigfried S. Hecker  
Mr. Bruce Twining  
Mr. Mark B. Whitaker, Jr.

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 24, 1997

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** M. V. Helfrich

**SUBJECT:** Review of Draft Preliminary Hazard Analysis (PHA) for the Capability Maintenance and Improvement Project (CMIP) at Los Alamos National Laboratory (LANL)

This memorandum documents a review by members of the staff of the Defense Nuclear Facilities Safety Board (Board) M. Helfrich, F. Bamdad, A. Jordan, and J. McConnell and Board outside expert J. Leary. This review focused on the development of the PHA and associated safety analysis documents for the CMIP at LANL, and included discussions with on-site personnel during June 18–19, 1997.

**Status of Draft Preliminary Hazard Analysis (PHA).** CMIP is in the early stages of design, with the PHA being developed to support the Conceptual Design Report, scheduled to be issued in late July 1997. It appears a technically strong team is responsible for preparing the PHA. The focus of the PHA development has been on identifying facility safety-class and safety-significant structures, systems, and components. Review of a draft working version of the PHA by the Board’s staff and discussions with LANL personnel yielded the following observations:

- The controls identified in the PHA are not prioritized: it is not clear which are the primary preventive or mitigative measures and which are secondary or defense-in-depth measures. Such prioritization is necessary to determine the adequacy of the protective measures. LANL personnel also could not provide preliminary or even historical information on design differences between systems designated safety class and safety significant.
- LANL personnel stated that their methodology for selecting controls is biased toward prevention over mitigation, which would seem to imply the development of controls at the process level (i.e., preventive engineered features); however, the PHA currently envisions “few if any process-related safety controls.” In fact, most of the controls currently identified are facility-related. It appears that the PHA relies heavily on hazard mitigation at the facility level, rather than prevention at the process level.
- The PHA does not identify controls that may be needed to prevent hazards associated with interaction of activities that may be conducted in the same area of the facility.

- It is not clear from the PHA and presentations which hazard control design features may or may not be required in the final design, as opposed to those features which definitely will be included in a yet-to-be-determined design specification (i.e., an integrated PHA).

The Board's staff believes that identification of all facility- and process-related preventive and mitigative measures, to the extent possible, is needed at this stage of the project to estimate realistically the cost and associated schedule for procurement.

**Capability of LANL Personnel Supporting the CMIP.** During a December 1996 review at LANL, the Board's staff expressed concerns about the ability of the Chemistry and Metallurgy Research (CMR) facility management to adequately support CMIP, and suggested that CMR involve Technical Area (TA)-55 facility management in planning and implementing changes. CMR personnel, however, have not significantly engaged TA-55's facility management in discussions related to CMR facility management. During this review, the Board's staff made the following observations regarding the capability of CMR personnel to support CMIP:

- It became apparent during the meetings that the CMR team (the Facility Manager, Deputy Facility Manager, and Authorization Basis Team Leader) had limited knowledge of the current authorization basis.
- Training of CMR facility management personnel is weak as compared with that of TA-55 management. CMR's recent facility management training appears to consist mainly of DOE courses on the Unreviewed Safety Question Determination process, Technical Safety Requirements, and DOE Standard 3009; TA-55 personnel are also trained by private industry in PHA, process safety management, and related topics.
- In a letter dated June 19, 1997, the Los Alamos Area Office noted that "...the CMR Facility Manager was approving USQ determinations without any formal training," which is in violation of DOE Order 5480.21, and directed that "...any personnel not qualified must be immediately removed from any preparation, review, or approval responsibility for the USQ process."

**Natural Gas Pipeline Hazard at CMR.** Over a year ago, the hazard analysis prepared in support of the draft Safety Analysis Report for the CMR facility identified a potential safety concern resulting from natural gas explosion, with estimated doses to a member of the public at the site boundary exceeding 100 rem. The facility management had taken only administrative initiatives to review the potential excavations around the building in response to this event. As a result of on-site discussions with the Board's staff, CMR management committed to the design and installation of an orifice in the pipeline by October 1997, which would reduce the natural gas flow in the pipeline and the consequences of a potential explosion.