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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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97-0003306



October 15, 1997

The Honorable Federico F. Peña  
Secretary of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585-1000

Dear Secretary Peña:

The staff of the Defense Nuclear Facilities Safety Board (Board) recently completed a review of the status of compliance with Board Recommendation 94-3, *Seismic and Safety Systems*, with regard to Building 371 at the Rocky Flats Environmental Technology Site (RFETS). This review focused on the completion of safety upgrades and the authorization basis document. A trip report is enclosed for your information and use as appropriate.

The Board is pleased that the Rocky Flats Field Office (RFFO) and its contractors are providing leadership as encouraged in the Board's letter of May 16, 1997, to Mr. Alm. The priority upgrades are on schedule for completion in the near future, and the initial authorization basis document is complete and planned for implementation in the next fiscal year.

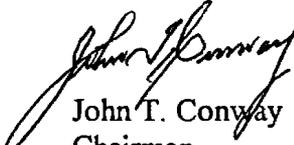
The Board notes, however, that current planning at RFETS is inconsistent with some of the commitments made by the Department of Energy (DOE) in the Integrated Program Plan (IPP) for Recommendation 94-3. The IPP stated that the need to complete safety margin upgrades was to be reassessed in September 1997, and that upgrades could be delayed or canceled based on firm evidence of progress toward implementation of an alternate approach to storage of material in the building. Since there is a possibility that material may be shipped off site in the future, RFFO is proposing to delay safety margin upgrades by 1 year and to not complete a more rigorous authorization basis document (Safety Analysis Report). While DOE stated its intent to ship material off site, firm actions needed to accomplish off-site shipment have not been completed. Most importantly, it is not evident that adequate storage capability to accommodate the Rocky Flats material is being prepared at other sites. Pursuant to the IPP, engineering work on the safety margin upgrades to Building 371 ought to begin now. The Board requests that DOE update the IPP, providing justification for the changes, specific dates and milestones, and contingency plans for accomplishing the safety margin upgrades should actions needed to ship material off site not occur in a timely manner.

The IPP commits to the implementation of safety measures to prevent or mitigate the consequences of accident scenarios if those consequences would exceed the evaluation guidelines of the IPP. However the authorization basis document has revealed that three of the

accidents analyzed would have consequences exceeding those guidelines unless further precautions were taken (a large fire on the loading dock, a hydrogen explosion in a waste drum, and an earthquake of the magnitude expected once in 2000 years). Yet the safety upgrades currently planned include no precautions to guard against the high consequences of these conceptual accidents. The reviews by the Board's staff indicate that reasonable precautions leading to the desired reductions are possible. The Board requests that the information requested above also include a plan for safety measures for the scenarios referred to, or the technical justification for not implementing such measures.

If you have comments or questions, please feel free to call me.

Sincerely,



John T. Conway  
Chairman

c: Mr. Al Alm  
Mr. Mark B. Whitaker, Jr.  
Ms. Jesse Roberson

Enclosure

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

September 9, 1997

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

**COPIES:** Board Members

**FROM:** F. Bamdad

**SUBJECT:** Review of the Authorization Basis for Building 371 at Rocky Flats Environmental Technology Site

This trip report documents the results of a review by the staff of the Defense Nuclear Facilities Safety Board (Board) of the Basis for Interim Operations (BIO) for Buildings 371 and 374 at Rocky Flats Environmental Technology Site (RFETS), and discussions held with the Department of Energy (DOE) and contractor representatives on September 2-3, 1997. The staff members participating in this effort were F. Bamdad, R. Kasdorf, R. Warther, and M. Sautman.

**Buildings 371 and 374 Authorization Basis.** The authorization basis (AB) for Buildings 371 and 374 is a BIO. The Board's staff reviewed the latest revision of this document. Most of the issues raised previously by the staff had been resolved, and significant improvement had been made in the hazard analysis and identification of facility-level controls needed for protection of the public. The BIO also provides a systematic approach for performing a process hazards analysis for activities in order to identify the controls needed for worker protection.

An Implementation Plan (IP) for bringing the facility into compliance with the controls and requirements identified in the BIO has also been prepared. It identifies about 130 items that require additional work before the facility can be considered in compliance with controls identified in the BIO. The current schedule in the IP allows the facility to comply with the AB over a 15-month period.

**Compliance with Board Recommendation 94-3.** Preparation and implementation of the BIO for Building 371 is a DOE commitment made in the Integrated Program Plan (IPP) for Recommendation 94-3. The IPP states that a two-step AB development process is planned, with the initial AB in a BIO format and the final in either a Safety Analysis Report (SAR) or Basis for Operations (BFO) format. The contractor representatives attending the meetings stated that the BIO will constitute the near-term AB for the facility. The BIO, however, will be improved through annual updates to meet the intent of DOE Order 5480.23, *Nuclear Safety Analysis Reports*. The contractor did not believe developing a new SAR meeting Order 5480.23 was warranted given DOE's goal of decommissioning the building by 2006.

The IPP states that the AB will identify safety-related structures, systems, and components based on accident consequences exceeding evaluation guidelines. The BIO identifies several scenarios that do not meet the evaluation guidelines given in the IPP for protection of the public and workers. Additional controls to reduce the consequences of these scenarios, however, have not been identified (or proposed) in the BIO. Among these scenarios are a large fire on the dock, a hydrogen explosion in a drum, and a 2000-year seismic event. The Board's staff believes it would have been advisable to identify proposed controls (preventive or mitigative measures) for these scenarios in the BIO as committed to in the IPP. Specifically:

- A credible event analyzed in the BIO is a fire on the dock. Thousands of drums and containers will be moving into and out of Building 371 in the near future. The materials on the dock are separated from the outside environment by a roll-up door. The ventilation system for the dock was designed to maintain negative pressure with respect to the outside environment, but cannot do so because the ducts do not meet design requirements. The Board's staff believes that if the procedures were modified to close the roll-up doors in case of a fire on the dock, and the ducts were modified to provide negative pressure on the dock, the consequences of such a fire would be significantly reduced, potentially to an acceptable level.
- All the drums at RFETS have been vented to relieve the hydrogen potentially generated as a result of radiolysis and decomposition of the materials. These vents could be plugged over time, especially for drums containing carbon tetrachloride. This would result in an accumulation of hydrogen in the drums, which could lead to an explosion during their movement. Facility personnel stated that the vents on each drum can be checked before the drum is moved to prevent such scenarios. This preventative measure, however, is not planned because of the additional 15 minutes per drum required.
- One of the potential events analyzed in the BIO with significant consequences to collocated workers is a seismic event combined with fire. Recommendation 94-3 resulted in an evaluation of Building 371 and several modifications to confine hazardous material during an earthquake. A seismic event combined with fire, however, would defeat some of the facility's safety features (such as fire suppression and high-energy particulate air [HEPA] filters) and result in significant on-site consequences. No additional modifications to reduce those consequences to an acceptably low level have been proposed in the BIO.

Notwithstanding the above concerns, the Board's staff believes implementation of the BIO should commence and will improve the safety of operations performed in Building 371. It may be necessary to make additional modifications to improve safety, as committed to by DOE in the IPP for Recommendation 94-3, to resolve these concerns.

The Board's staff also reviewed the status of building upgrades. Priority upgrades are basically on track for completion by the end of the year; however, several ventilation system issues need to be resolved by DOE and the contractor. DOE intends to defer the safety margin

upgrades by 1 year. The IPP would have allowed this deferral had there been progress on building a new interim storage vault. This vault is no longer planned for construction; however, DOE believes it will be possible to start shipping material off site in the near future, which would obviate the need for the safety margin upgrades. This is a fundamental change in the IPP approach, and needs to be presented to the Board by DOE along with specific dates and milestones.

**Future Staff Actions.** The Board's staff discussed its findings with DOE Rocky Flats Field Office personnel attending the meeting, and will follow the resolution of the issues raised. Implementation of the controls identified in the BIO will also be followed by the Board's staff.