

John T. Conway, Chairman
 A.J. Eggenberger, Vice Chairman
 John W. Crawford, Jr.
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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
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September 10, 1993

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

Dear Dr. Reis:

Defense Nuclear Facilities Safety Board (DNFSB) staff members have continued to review preparations by the Los Alamos National Laboratory to process $^{238}\text{PuO}_2$ for the Cassini Project in the existing $^{238}\text{PuO}_2$ line at the TA-55 Plutonium Facility. It is noted that the Principal Deputy Assistant Secretary for Facilities, Defense Programs, has recently requested (August 16, 1993) that the Albuquerque Operations Office focus increased management attention on control of nuclear material at TA-55. The Board commends this action. However, in light of maintenance and procedural problems that have led to recent personnel contamination occurrences in TA-55, DOE management may also wish to consider conducting an enlarged review of the readiness of TA-55 to proceed with production for the Cassini Project. A detailed DNFSB staff report concerning TA-55 operations is enclosed for consideration in your deliberations.

If you need any further information, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "A. J. Eggenberger", with a horizontal line extending to the right.

A. J. Eggenberger
 Vice Chairman
 and for the Chairman

Enclosure

c: Peter N. Brush, Acting ASES&H
 Bruce Twining, Manager, ALO
 Mark Whitaker, Acting DR-1

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 9, 1993

MEMORANDUM FOR: G.W. Cunningham, Technical Director

COPIES: Board Members

FROM: Albert G. Jordan

SUBJECT: Los Alamos National Laboratory (LANL): Observations from Reviews of the Plutonium-238 Processing Operation at the TA-55 Plutonium Facility

- 1. Purpose:** This report documents observations based on follow-up reviews of glovebox integrity and related topics at the $^{238}\text{PuO}_2$ operation in the TA-55 Plutonium Facility at LANL. The reviews included a visit by Defense Nuclear Facilities Safety Board (DNFSB) technical staff (AG Jordan, F Bamdad, RW Zavadoski) on July 6 and 8, 1993, subsequent conversations with DOE and LANL, and consideration of related documents and DOE directives.
- 2. Summary:** The Principal Deputy Assistant Secretary for Facilities, Defense Programs, recently requested the Albuquerque Operations Office to place special management attention on radiological contamination control at TA-55. The DNFSB staff considers it desirable that DOE management action include a review to assure that all potential hazards have been identified and addressed and that TA-55 is ready to proceed with the fabrication of $^{238}\text{PuO}_2$ pellets.
- 3. Background:** In support of the Cassini mission, LANL will perform two steps in the manufacture of the Radioisotope Thermoelectric Generators: Pelletization of $^{238}\text{PuO}_2$, and encapsulation of the pellets in iridium.

DOE, in reviewing the readiness of TA-55 for Cassini production, requested that LANL conduct an Unreviewed Safety Question Determination to determine whether any unreviewed safety questions would result from using the existing $^{238}\text{PuO}_2$ line for Cassini production. As a result of LANL's determination of no Unreviewed Safety Question, DOE considered that no Operational Readiness Review (ORR) was required. DOE, however, did perform a limited-scope Operational Readiness Review/Operational Readiness Evaluation (ORR/ORE), completing the bulk of the review, exclusive of

closure of open items, in late 1992. Subsequently, concerns about the control of radiological contamination including the maintenance of glovebox integrity have surfaced.

The work at LANL in support of the Cassini Project will be performed within gloveboxes by operators who wear no respiratory protection. Although airborne contamination monitoring equipment is in place, the integrity of the gloveboxes is vital to the safety of the operators. On June 21, 1993 the Board (Reference a.) provided DOE with DNFSB staff observations and comments concerning the inspection plan for glovebox gaskets and penetrations. In a letter to the DNFSB (Reference b.) of August 4, 1993, DOE identified initiatives to inspect and maintain glovebox gaskets and penetrations. In a memo of August 9, 1993 (Reference c.), DOE informed LANL of actions it elected to require prior to commencement of production line operations. The actions relate to inspection of glovebox gloves and gaskets and to radiological controls. In addition, a memo (Reference d.) of August 16, 1993 from the Principal Deputy Assistant Secretary for Facilities, Defense Programs to the Manager, Albuquerque Operations Office requested special management attention to radiological contamination control.

4. Discussion/Observations:

- a. Operational Readiness Review / Operational Readiness Evaluation. When the ORR/ORE was begun, DOE considered that the $^{238}\text{PuO}_2$ activities had been ongoing at TA-55 and that the facilities and equipment were active. Thus, the scope of the ORR/ORE performed in late 1992 was limited to modifications and process changes that were new and implemented in support of production for the Cassini Project. The ORE did not address, for example, order compliance, fire protection or emergency preparedness and was allotted three days for the on-site portion of the review.
- b. Safety Documentation. DOE's conclusion that LANL will be ready to process $^{238}\text{PuO}_2$ upon resolution of the ORE findings did not reflect DOE review of a hazard analysis. The 1978 Final Safety Analysis Report, which is part of the authorization basis for this facility, contains no such analysis. A preliminary hazard analysis, however, was done in 1991. Had this hazard analysis been upgraded and the Operational Safety Requirements (OSRs) revised to address the significant items necessary to prevent or mitigate potential consequences of hazards determined in the upgraded hazard analysis, there would be a more clear identification of necessary Limiting Conditions for Operation. In addition, Surveillance Requirements and remedial actions, including conditions under which operations would be terminated, would be more clearly identified. A preliminary hazard analysis that LANL did perform was based on DOE-STD-1027-92. Hazards assessments performed to this standard are superficial since they are done only for the purpose of hazard categorization of the facility. Thus, LANL

had not completed a formal assessment (including chemical hazards) which could be used by the facility operations personnel to make preventive or mitigative changes for management of these hazards. A proper hazards assessment would have identified the need to inspect and maintain glovebox gaskets and penetrations.

- c. Glovebox Integrity. LANL's draft inspection plan for glovebox gaskets and penetrations on the $^{238}\text{PuO}_2$ line, as presented to the staff on July 6 and 8, 1993 following receipt of Board comments (Reference a), did not address all potential leak paths for $^{238}\text{PuO}_2$. For example, flat service panel gaskets and electrical penetrations were not included in the plan because of LANL concerns that they were too difficult to inspect. However, during a tour, DNFSB staff noticed that an electrical penetration had been replaced on the glovebox having the most deteriorated connecting-ring gasket. DNFSB staff asked if the old penetration was still available. It took only a few minutes for LANL personnel to locate it in an adjacent glovebox and inspect it.

Subsequently LANL has revised its draft inspection plan and appears to be moving toward a more proactive approach to management.

- d. Radiological Occurrences. There has been a high frequency of occurrences due to radiological events. For example, during 1993 and prior to July 26, 1993, there were 23 occurrences at TA-55, of which 22 involved radiological contamination. In all of calendar year 1992, 29 radiological occurrences were reported. Typically, 10-day reports have been late. In addition, only 4 final reports for occurrences discovered during 1993 have been issued. A high frequency of occurrences was also noted by DOE in References c. and d.

On August 30, 1993, four workers in TA-55 were exposed to gaseous plutonium fluoride. As a result, LANL chose to place TA-55 in a standdown condition until a thorough self-evaluation has been conducted and appropriate corrective actions taken. While this occurrence did not involve the $^{238}\text{PuO}_2$ line, it again raises the question of appropriate control of radiological contamination and, in this case, work control procedures in TA-55.

- e. DOE Mentoring Program. DOE has implemented a "Management Assistance (Mentor) Program Plan" (Reference e.) to provide direct assistance to LANL for improving facility management and operation. When instituting the mentoring program, Defense Programs requested that the Assistant Secretaries for Environment, Safety and Health, for Environmental Restoration and Waste Management, and for Nuclear Energy, as well as the Directors of the Offices of Energy Research, and of Nuclear Safety postpone any new environmental safety and health assessment and audit activities from April until October, 1993 to permit the assistance program to be unencumbered.

- f. DOE Special Management Attention to TA-55. Because of concerns with radiological protection including glovebox integrity which have occurred following the limited-scope ORR/ORE, and in view of the suspension of reviews during the mentoring program, it appears advisable that the management attention requested in Reference d. include an additional independent DOE review to assure that all potential hazards have been identified and addressed and that LANL is ready to proceed with the Cassini Project.

5. Future Staff Actions:

- a. DNFSB staff plans to continue to monitor operations at TA-55.

6. References:

- a. Letter from Mr. John T. Conway, Chairman, DNFSB to Dr. Everet H. Beckner, Acting Assistant Secretary for Defense Programs, (June 21, 1993).
- b. Letter from Dr. Everet H. Beckner, Acting Assistant Secretary for Defense Programs, to Mr. John G. Conway, Chairman, DNFSB, (August 4, 1993).
- c. Memo on "Cassini Operational Requirements" from Jerry L. Bellows, Manager, Los Alamos Area Office to Eugene M. Wewerka, Associate Director, Chemistry & Materials, LANL, (August 9, 1993).
- d. Memo on "Radiological Contamination Control at the Los Alamos National Laboratory Plutonium Facility," from Victor Stello, Jr, Principal Deputy Assistant Secretary for Facilities, Defense Programs, to Manager, Albuquerque Operations Office, (August 16, 1993).
- e. Memo on "Management Assistance Program for Los Alamos National Laboratory," from Victor Stello, Jr, Principal Deputy Assistance Secretary for Facilities, Defense Programs, to Managers, DOE Albuquerque Field Office and DOE Los Alamos Area Office, (April 9, 1993).