

John T. Conway, Chairman  
A.J. Eggenberger, Vice Chairman  
Joseph J. DiNunno  
Herbert John Cecil Kouts  
John E. Mansfield

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004-2901  
(202) 208-6400

99-0000546



March 3, 1999

Mr. James Owendoff  
Acting Assistant Secretary for  
Environmental Management  
Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0113

Dear Mr. Owendoff:

The Defense Nuclear Facilities Safety Board (Board) is pleased that thermal stabilization of plutonium-bearing oxides has resumed at the Plutonium Finishing Plant (PFP). This is an important first step in the stabilization of plutonium-bearing materials at PFP. However, the Board is concerned that line management may not be using a thorough and systematic approach in the readiness preparations. This concern is evidenced by problems encountered during the initial stabilization run on January 15, 1999, as discussed in Occurrence Report RL--PHMC-1999-0005.

The Board continually emphasizes Integrated Safety Management (ISM) and adequate operational readiness to ensure process safety. From an ISM perspective, this includes ensuring that readiness activities encompass steps to validate process controls through walkdowns and test runs that simulate all operating conditions to the extent practicable. While the Board recognizes that the failed furnace run was not an immediate safety concern, it is symptomatic of inadequate readiness preparations. Such inadequate preparations can lead to safety issues in other instances and therefore warrant improvement. The Board's staff will closely monitor future restart activities to ensure that readiness is adequately verified prior to hot operations.

A report by the Board's staff that addresses this issue is enclosed for your information and appropriate action. Please feel free to call if you have any questions concerning this matter.

Sincerely,

  
John T. Conway  
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD****Staff Issue Report**

January 27, 1999

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

**COPIES:** Board Members

**FROM:** D. Moyle

**SUBJECT:** Restart of Thermal Stabilization at Hanford Plutonium Finishing Plant

This report documents an issue reviewed by the staff of the Defense Nuclear Facilities Safety Board (Board) involving the flawed efforts to restart thermal stabilization of plutonium-bearing oxides at the Hanford Plutonium Finishing Plant (PFP).

**Failure To Implement Appropriate Controls.** Thermal stabilization of high-purity plutonium oxides was approved on January 14, 1999, following completion of Operational Readiness Reviews (ORRs) by both the site integrating contractor, Fluor Daniel Hanford, and the Department of Energy. On January 15, 1999, the PFP contractor, Babcock and Wilcox Hanford Company, initiated thermal stabilization of recycled plutonium oxide material. Early in the heating cycle, an unacceptable temperature deviation occurred, accompanied by the appropriate alarm. The operating procedure did not provide recovery actions for the specified furnace heat-up program, so the furnace was shut down and the operation suspended until corrective actions had been implemented. Further review revealed that the incorrect furnace control program had been specified by process engineering.

The failure to conduct a thorough engineering review with peer verification, which should have detected the selection of the incorrect operating program, was the main contributor to the flawed restart of thermal stabilization.

**Inadequate Readiness Preparations.** In addition to selection of the improper operating program, an underlying contributor to the flawed restart was inadequate plant readiness preparations. For example, only one control program was tested during the ORRs, and that program was the only one that had the correct stabilization temperature setpoint of 1000°C. At the time of process restart, all other programs still had an incorrect 950°C stabilization temperature setpoint. Neither the program that was used during the first stabilization run nor the correct program for the specific material class had been tested during or prior to the ORRs.

**Failure To Apply Integrated Safety Management (ISM).** This startup failure might have been avoided through proper application of the ISM control development function to ensure that controls had been adequately implemented by the line organization.

While no immediate safety risk was apparent during the unsuccessful furnace run, failure to verify proper control implementation during startup preparations could have significant safety implications for other plutonium stabilization applications. For example, the scope of work for thermal stabilization operations at PFP includes stabilization of a variety of material classes, including organic sludges. Prior to performing stabilization operations on plutonium-bearing material, it is prudent to test all programs in simulant runs to verify that the appropriate program has been selected, as well as to determine the adequacy of the procedure. Failure to perform this activity eliminates the opportunity for operator training and detection of any other errors in process controls.

The Board's staff recognizes that an ORR is not intended to test every foreseeable situation that may arise during an operation. However, readiness preparations failed to ensure that all procedures and process programs had been tested and verified for adequacy and/or appropriateness.