Department of Energy
Washington, DC 20585

February 2, 1999

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

This is in response to your letter of December 1, 1998, to Under Secretary Moniz, forwarding the DNFSB Staff Issue Report, "Review of Electrical, Control, Fire Protection, and Ventilation Systems for the Cold Vacuum Drying Facility at the Hanford Spent Nuclear Fuel Project." The enclosure to this letter provides the Department of Energy's response to the issues raised in that report. We will keep your staff informed of any further developments.

The Department appreciates the Board's interest in the Hanford Spent Nuclear Fuel Project. If you have any further questions, please contact me or have a member of your staff contact Brad Nelson at 301-903-4393.

Sincerely,

James M. Owendoff

James M. Owendoff
Acting Assistant Secretary for
Environmental Management

Enclosure

cc:
Mark Whitaker, S-3.1

RESPONSE TO

DNFSB STAFF DESIGN CONCERNS ON COLD VACUUM DRYING

FACILITY

January 15, 1999

INTRODUCTION

The purpose of this report is to provide the response to the concerns raised by the DNFSB staff regarding the design of the Cold Vacuum Drying Facility (CVDF). The concerns are identified in the Staff Issue Report dated October 21, 1998. The Staff Issue Report was transmitted to DOE via DNFSB letter to Ernest J. Moniz, Acting Deputy Secretary of Energy, from John T. Conway, Chairman, DNFSB, dated December 1, 1998.

The DNFSB staff concerns, observations, and comments centered on the electrical, control, fire protection, and ventilation systems for the CVDF. These concerns were derived from review of documents, and discussions with DOE and contractor personnel, during September 28 through October 1, 1998.

The response to the DNFSB staff items, generically identified as concerns, is provided below. For convenience and traceability, the DNFSB staff concern is first stated, followed by the response regarding that concern.

ELECTRICAL SYSTEMS

DNFSB Staff Concern

The system components are to be coordinated for short-circuit capability, interrupting duty and capability, insulation levels, protective relaying, reliability, interchangeability, transformer and line drop, stability under normal conditions, and restart on power dips and outages. Because most of these calculations and studies have not been performed, the Board staff could not verify that the electrical distribution system would provide safe and reliable power. It is important that the Spent Nuclear Fuel Project complete these analyses prior to procurement and installation activities,

Response

Since the DNFSB staff visit, the Project has completed the coordination study from the source to the distribution panels using the CAPTOR/DAPPER software, as suggested by the DNFSB staff. The completed study is a controlled document, and can be made available for review during the next DNFSB staff visit to Hanford. The results have been reconciled with CVDF procurement and installation to ensure equipment safety. The results of the analysis indicate a possibility that one or two distribution circuits may

require minor modifications. The Architect/Engineer is reviewing the affected circuits and will make any necessary changes to ensure that the electrical distribution system provides safe and reliable power.

LIGHTNING PROTECTION SYSTEM

DNFSB Staff Concern

The existing building design does not include a lightning protection system. The staff believes that a lightning protection system in accordance with NFPA-780 would be appropriate for this facility.

Response

Lightning protection analysis in accordance with NFPA-780 was completed October 30, 1998. The results indicated that the category of risk for the stack was high enough to justify a Lightning Protection System for the stack. The calculated risk value for the building resulted in the lowest risk index, so no protection for the building was provided in the design. As a result of the DNFSB staff comment, the Project has reconsidered the matter of lightning protection, and has decided to expand the lightning protection to include the process building. Lightning protection will be in accordance with NFPA-780.

FIRE PROTECTION SYSTEM (FPS)

DNFSB Staff Concern

Compliance with NFPA- IO 1 could not be verified because the Fire Hazard Analysis (FHA) is being thoroughly revised. The staff observed the installation of the wet pipe fire sprinklers in the control room, and that the control room has many computers and items of electronic equipment that could become disabled during spurious operation of a sprinkler system. It would be prudent to have a dry-pipe sprinkler system or a dry-type FPS.

Response

The Final FHA for CVDF is currently scheduled for completion in March 1999. The RL Fire Protection Engineer has reviewed the issue concerning the wet-pipe sprinkler system, and he supports the choice of the wet-pipe sprinkler system. Wet-pipe sprinkler systems are highly reliable, do not leak or actuate under normal conditions, and they rarely operate in a "spurious" mode. These systems are used in the DOE complex, Department of Defense facilities, and commercial industry electronic equipment areas. The rationale for using wet-pipe sprinkler system will be documented in the FHA.

INSTRUMENTATION AND CONTROL SYSTEM

DNFSB Staff Concern

Adequate water must be present in the cask annulus to ensure sufficient heat transfer. The safety class I&C system provides a water level alarm that requires operators to take appropriate action, but the existing alarm system may not be able to withstand a seismic event. Additionally, the operator response to this alarm is not well-defined, and may require that the cask be isolated and filled from a local water source.

The set point for the annulus high-temperature trip is currently expected to be only 0.9'C above the normal operating temperature. This set point could result in numerous process upsets because of instrument error and small temperature fluctuations.

The staff noted that the current mockup of the non-safety control system may provide too many alarms and could confuse operators during a major upset.

Response

The components in the Tempered Water System that could lead to loss of annulus water are seismically qualified. For recovery purposes following a seismic event, a safety class function means being able to verify water level in the annulus. These requirements are included in the procurement specifications.

The concern regarding the potential for false trip on high annulus water temperature is being worked through testing to establish alarm settings. Establishing the normal operating temperature, LCO and alarm set points for the CVD process is being monitored on a project action list as part of the CVDF critical path schedule.

The project continues to work on the number of alarms, their set points, and the assignment of alarm priorities. The Monitoring and Control System will provide rapid access to necessary alarms, mimic screens, and separation of alarms based on the priority for operator response. The contractors working on the design and fabrication of the system have been informed of the issue raised by the DNFSB staff.

SAFETY-RELATED VENTILATION SYSTEM

DNFSB Staff Concern

Each process bays and the process water tank room have an exhaust ventilation system that is classified as a safety-significant system. The staff observed that the exhaust fan motors and the power supplies are classified as non-safety general service systems, which is not consistent with the safety-significant designation. It is essential that the safety analysis for the CVDF provide justification for the existing design, or that the safety-significant classification include the exhaust fans and their power supply.

Response

As a result of a recent Hazards Analysis planned prior to the DNFSB staff visit in September 1998, the project has concluded that the facility will have a stand by power system to maintain local and general exhaust flow in the event of a power failure. These exhaust systems, including the exhaust fans and their power supply, have been classified as safety significant.