DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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October 2, 2001

The Honorable Jessie Hill Roberson
Assistant Secretary for
Environmental Management
Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0113

Dear Ms. Roberson:

The enclosed report prepared by members of the staff of the Defense Nuclear Facilities Safety Board (Board) documents the staff's latest observations concerning the Department of Energy's (DOE) activities at the Idaho National Engineering and Environmental Laboratory (INEEL). The staff found that authorization basis upgrades for high hazard facilities are on schedule to meet the April 2003 date required by 10 CFR 830 Subpart B, *Nuclear Safety Management,* but some lower hazard facilities are at risk because of potential budget shortfalls in fiscal year 2002.

The staff observed that emergency preparedness at the INEEL site is organized, staffed, and equipped to perform effectively. The primary group responding to emergencies is the INEEL fire department. However, if the site area incident response teams are to be disbanded as proposed at the Idaho Nuclear Technology Engineering Center, due consideration ought to be given to ensuring that arriving fire department teams are provided with current facility-specific information and conditions.

The Board believes the information in the enclosed staff report will be useful to DOE in its continuing pursuit of improved safety at INEEL.

Sincerely,

John T. Conway
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

August 9, 2001

MEMORANDUM FOR: J. K. Fortenberry, Technical Director

COPIES: Board Members

FROM: R. Daniels

SUBJECT: Review of Facility Evaluation Board Findings, Emergency Preparedness, Waste Processing, and Spent Fuel Movement, Idaho National Engineering and Environmental Laboratory

This report documents a review performed by the staff of the Defense Nuclear Facilities Safety Board (Board) at the Idaho National Engineering and Environmental Laboratory (INEEL). This review addressed authorization basis documents; disposition of findings from the Facility Evaluation Board (FEB) review of the Radioactive Waste Management Complex (RWMC) in January 2001; progress in characterizing, packaging, and shipping transuranic waste to the Waste Isolation Pilot Plant (WIPP); emergency preparedness; and progress in waste processing and movement of spent fuel at the Idaho Nuclear Technology Engineering Center (INTEC). This review was conducted by staff member R. Daniels and outside expert D. Boyd on June 4–8, 2001.

Authorization Basis Documents. Representatives of Bechtel BWX Idaho, LLC (BBWI), the management and operating contractor for INEEL, and the Department of Energy's Idaho Operations Office (DOE-ID) presented a summary of the status of the authorization basis documents for all nuclear facilities at INEEL. All nuclear facilities are scheduled to have Safety Analysis Reports (SARs) compliant with DOE Order 5480.23, *Nuclear Safety Analysis Reports*, and DOE-STD-3009, *Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports*, in accordance with 10 CFR 830 Subpart B, *Nuclear Safety Management*, by April 2003. At RWMC, all activities related to meeting the Idaho Settlement Agreement with regard to characterizing, packaging, and shipping 3100 cubic meters of transuranic (TRU) waste to WIPP by December 31, 2002, are scheduled to be compliant with the new safety rule by January 2002. At INTEC, where all the site's spent fuel and high-level waste are stored, high hazard facilities are scheduled to be compliant in fiscal year 2002, with new or upgraded SARs. CPP-651, the Unirradiated Fuel Storage Facility, which contains a large quantity of enriched uranium, is scheduled to be compliant this fiscal year. The remaining lower hazard nuclear facilities are at some risk of not meeting the planned schedule because of a short fall in the proposed DOE budget for fiscal year 2002.

Disposition of Facility Evaluation Board Findings Regarding RWMC. The Board's staff observed the FEB's review of RWMC in January 2001. Numerous deficiencies were noted in this first self-assessment of an INEEL facility by the FEB, although an acceptable overall

rating was given. In particular, the FEB issued 11 findings related to authorization basis documentation, audits, administrative storage limits, the effectiveness of the independent safety review committee, SAR assumptions, system descriptions, hazard identification and mitigation, Unreviewed Safety Question (USQ) determinations, training for screeners and evaluators, and implementation of authorization basis requirements. In addition, a finding concerning training and certification of fissile material handlers was issued.

The Issues Management Office at INEEL maintains evidence files for closure of findings designated as significant and adverse to quality. All of the above findings fall in this category and were entered in the noncompliance tracking system. Causal analysis was performed, and 6 issues and 30 corrective actions were defined to resolve the root and contributing causes of the 11 findings. The staff reviewed evidence files and found that they contain references or documentation to close the corrective actions, although a direct linkage to the findings was not apparent. All of these issues are scheduled to be closed by December 7, 2001.

Shipment of Transuranic Waste to WIPP. As a result of detailed briefings by DOE-ID and BBWI managers, the staff concluded that the Settlement Agreement milestone of shipping at least 3100 cubic meters of TRU waste to WIPP by December 31, 2002, appears achievable. However, the achievement of intermediate goals that are not milestones is less certain.

The status report for this project of May 29, 2001, showed that for October 1, 2000, through May 29, 2001, 673 cubic meters of waste was due to be shipped, and 288 cubic meters was actually shipped. Upgrades to the waste characterization system intended to increase production and imminent startup of a second TRUPACT (Transuranic Packaging Transporter) loading line should aid in recovery from the present shortfall.

During the staff's visit to RWMC, progress on the construction of the Advanced Mixed Waste Treatment Project was observed. During the past winter, construction progressed under a heated air suspension tent, with all of the concrete slab being poured and walls erected to the height of the enclosure. The staff observed continued progress in steel and concrete construction, with novel techniques being used whereby steel forms for concrete walls were erected without the use of plywood. Project management personnel will relocate to Idaho Falls from Boise this summer, and completion of construction is scheduled for fall 2002.

Emergency Preparedness Program. The Board's staff received an overview of the emergency preparedness program at INEEL from experienced DOE-ID and BBWI managers. The general observation was that the emergency preparedness function at the central and site-wide levels is organized, staffed, and equipped to perform effectively.

The Emergency Operations Center (EOC), located in the DOE-ID South building, is an impressive complex of rooms with computer, communications, and display capabilities and other support for decision making, status reporting, and recommendations in response to potential or actual conditions. Near the EOC is a Warning Communications Center. This facility is staffed continuously and has capabilities for monitoring video and radio broadcasts and for communicating on various voice radio and telephone channels with individuals, fire and security departments, and other government agencies.

An additional resource available at INEEL is the National Oceanographic and Atmospheric Administration (NOAA) field office in Idaho Falls, which has performed meteorological dispersion research in support of the earlier nuclear reactor testing activities at the site. The NOAA field office receives meteorological data from 32 towers located around INEEL, processes the data, and forecasts plume characteristics following a release to the atmosphere. At present, the field office responds unofficially to activation of the EOC by providing a representative to operate the plume forecast program as a member of the EOC support team. If the presence of a NOAA representative is important for effective emergency operations, this arrangement ought to be formalized by a memorandum of agreement or some other means.

The primary group responding to an emergency is the INEEL fire department, whose personnel, in addition to being trained to fight fires, are trained to handle hazardous materials, radiological, and emergency medical tasks. The leader of the fire department's response team is in charge at the scene, but it was not clear from the overview provided to the staff that a formal process is in place for the site area incident response team (IRT) or other facility presence to transfer information on facility conditions and otherwise support the fire department. If IRTs are disbanded, as is proposed for INTEC, there will need to be an on-site duty position whose assigned responsibility is to meet and support the fire department with facility-specific information.

An independent assessment of the emergency preparedness program conducted by BBWI's Independent Oversight Department in June 2000 at 7 facilities or site areas resulted in 1 finding and 6 concerns, and concluded that the overall program was well developed and implemented.

Status of Spent Nuclear Fuel and Waste Processing at INTEC. The staff's review resulted in the following observations with regard to INTEC.

Spent Nuclear Fuel Operations—All 29 Three Mile Island fuel shipments from Test Area North were recently completed. The fuel has been placed in horizontal dry storage modules at INTEC, awaiting shipment to a geologic repository (the storage modules are licensed by the Nuclear Regulatory Commission). Eleven of 21 fuel shipments from the Naval Reactors Facility planned for this fiscal year, as well as 8 of 12 fuel shipments from the Advanced Test Reactor planned for this year, have been completed. Other accomplishments include performance of the semi-annual fuel inventory in April 2001, and removal of 49 of 50 fuel racks from the CPP-603 south basin and their transfer to the Inactive Site organization for deactivation/decontamination and disposal in underground vaults at RWMC.

Ongoing spent fuel-related efforts at INTEC include developing a plan for transfer of a generic fuel object in CPP-603 to CPP-666 for longer-term storage, resolving the extent of gamma scanning of the CPP-603 basin floors for fuel pieces, completing preparations for receipt of West Valley and foreign reactor fuel shipments scheduled for this summer, completing preparations to transfer Peach Bottom fuel from the fuel element cutting facility to the Irradiated Fuel Storage Facility (IFSF), and reviewing engineered safety features with respect to as-built conditions required as a result of positive USQ screens and occurrence reports. Examples of positive USQ screens and occurrence reports were improper modifications to fuel buckets for

storing foreign reactor fuel in IFSF (USQ); lack of documentation showing that crush pads are correctly placed in CPP-749 storage tubes; presence of alcohol in Rover Parka fuel storage tubes; fire, flooding, emergency egress, and seismic issues (USQs) for CPP-651; the vessel 106 sampling protocol; and IFSF seismic issues (USQ).

Waste Operations—A goal in the Site Treatment Plan (STP) is to leach and satisfactorily test 40 high-efficiency particulate air filters this fiscal year. As of June 6, 2001, 36 filters had been leached, and as of May 24, 2001, 24 had passed the sampling test. There have been no failures to date. The budgeted goal is to complete leaching and testing of 60 filters by September 30, 2001.

Another STP goal is to process 490,000 gallons of sodium-bearing waste in the high-level liquid waste evaporator (HLLWE) by September 30, 2001, with the budgeted goal of processing 600,000 gallons by September 30, 2001. As of June 7, 2001, 485,000 gallons had been processed. These goals are interim steps in achieving the objective of removing all wastes from the seismically vulnerable pillar and panel vault tanks by January 31, 2002. HLLWE operation is impacted by problems with essential support equipment. An example is the liquid effluent treatment and disposal evaporator, which has a failed bottom cooler in 1 of 2 trains, a possible leak in 1 or more reboiler tubes in 1 of 2 trains, and deterioration of stainless steel off-gas components.

Remote Analytical Laboratory—The Remote Analytical Laboratory (RAL) has the capability to receive and analyze high-level radioactive waste samples and perform treatment studies in its integral hot cells. In addition, it has the capability of analyzing for the presence of various hazardous materials. The laboratory's original mission was to support operation of the fuel reprocessing plant when it was in operation. Recent reevaluation of authorization basis documents has revealed discrepancies between the actual configuration of RAL and the information in plant safety documentation. These discrepancies concern fire protection and fire hazards, shielding modifications, modifications to the ventilation system, and changes over time in instrumentation used for radiation detection.

In May 2001, a supplement to the RAL facility safety document was issued. It incorporates the content of the USQ on fire protection issues and the determination of facility safety, which provides a justification for continued operation and interim controls. The facility manager for RAL stated that the focus of DOE's Office of Oversight on fire protection issues at RAL in October 2000 and the ongoing preparations for the FEB review in September 2001 had been beneficial in causing a major change in outlook from being merely a tenant to being the owner and operator of the facility. This attitude change resulted in the initiation of significant changes and upgrades to the safety analysis; writing of equipment operating procedures; performance of job task analyses of positions; identification of gaps in knowledge, skills, and abilities; and development of a training and qualification program.