DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 28, 1992

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Dermot M. Winters

SUBJECT: DNFSB Staff and Outside Experts (MITRE Corporation) WIPP Site Visit; July 27-30, 1992

1. **Purpose:** The DNFSB staff and outside experts met with DOE Headquarters, DOE WIPP Project Integration Office (WPIO), DOE WIPP Project Site Office (WPSO), Westinghouse Waste Isolation Division (WID) and Sandia National Laboratories (SNL) personnel at the WIPP site during the period July 27, 1992 through July 30, 1992. The purpose of the visit was (1) for outside experts (MITRE) to identify, request, and collect pertinent documents describing WIPP's safety requirements and procedures in support of an initial standards review and (2) for DNFSB staff to investigate the quality of the scientific data collection program and to follow up on certain electrical and fire protection issues identified during a prior site visit.

2. **Summary:** Discussions led by MITRE were held on the status and content of documents describing policies, requirements, and procedures in various subject areas. Some preliminary observations that will require follow-up and review were identified.

   DNFSB staff investigated the quality of the scientific data collection program and followed up on certain electrical and fire protection issues identified during a February 1992 site visit.

3. **Background:** This initial MITRE visit to the WIPP site was made to initiate work on the review and evaluation of safety documentation prepared by WID and SNL. The visit included a tour of the WIPP surface and underground facilities, and discussions with WPIO, WPSO, WID, and SNL staff on the status and content of documents describing policies, requirements, and procedures in the following subject areas: DOE directives, resolution of Operational Readiness Review (ORR) findings, safety analysis, quality assurance, configuration management, waste management, design standards, maintenance, radiation protection, and training. Additional discussion sessions on fire protection and quality assurance, held primarily by DNFSB staff were also attended by MITRE. During this trip DNFSB staff focused on reviewing activities affecting quality associated with the collection of scientific and technical data. Primary emphasis was placed on the procedures used to collect experimental data and the processes in place to ensure data integrity, retrievability, and traceability. The review consisted of briefings by SNL and

WID, a tour of the facility including data acquisition facilities and the core library, and a system walk-down of typical experiment data acquisition components.

The principle purpose for the stringent quality controls on the collection of scientific data collected in the experimental program is to provide accurate data to support a credible and defensible prediction of the WIPP performance for the next 10,000 years as required by 40 CFR 191, Subpart B. As such the requirements of ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities* are imposed through DOE Order 5700.6B, *Quality Assurance* (DOE Order 5700.6C, *Quality Assurance*, has yet to be implemented at WIPP).

The division of responsibilities for WIPP site testing is defined in a Memorandum of Understanding and incorporated in the Test Phase Management Plan. In general, SNL, as the Scientific Program Manager at WIPP has the responsibility for design, development, fielding and maintenance of the WIPP Experimental Program as well as developing models to interpret the experimental data, and applying this information to the experimental models in the Performance Assessment. WID assists SNL by supplying support personnel from the Experimental Operations Work. SNL and WID perform independent QA for their areas of responsibility.

SNL is responsible for design of the experiments in support of the Performance Assessment. The Principle Investigator is responsible for the design of the experiment including defining the data needed for the Performance Assessment, the conceptual method to obtain the data and development of the Experimental Test Requirements (ETR) documents. For TRU Waste tests, WID has the primary responsibility for development and installation of the experimental data acquisition equipment. For Non-TRU Waste test, SNL will be the lead for this activity. SNL is responsible for the collection, reduction and analysis of all data. An experimental Program Work Request is used to document and detail the installation procedures.

During a previous site visit in February an initial DNFSB staff review of electrical and fire protection issues was begun. That review was completed during this visit.

4. **Discussion/Observations:**

   a. **MITRE Observations**--Some observations made by MITRE in its draft trip report of August 13 are as follows:

      1. WID operating procedures that have been developed so far focus primarily on activities related to the experimental bin-scale tests and do not yet fully reflect many of the more recently-issued DOE Orders.

2. The local DOE process for reviewing and evaluating WID's response, and implementing DOE directives is not formalized.

3. It is not clear what actions will be taken to address the differences in design standards invoked in DOE Order 6430.1A, *General Design Criteria*, and those used for WIPP (WIPP was designed and built prior to issuance of Order 6430.1A).

4. There is no formal DOE requirement placed on WID for self-assessments directed towards Order Compliance Verification.

5. The interfaces among WPIO, WPSO, WID, and SNL are, in many instances, not clearly defined in a formal manner.

6. With regard to the resolution of findings from the 1991 EM-ORR, a process to close-out ORR findings is in place, but there is no documentation available that describes the process and establishes the authorities and responsibilities for WPSO, WPIO, DOE-EM, WID, and SNL.A copy of a preliminary report from MITRE is attached below.

b. Quality of Scientific Data Collection Program--

1. **Data Collection and Storage**: Staff review indicated that the procedures for ensuring correct experiment construction and data acquisition are detailed and well controlled. The equipment installation, including any required boring and sensor installation, is completed using a work request that includes necessary design drawings and detailed procedures.

   Sensor locations are referenced to a relative position in the underground test room or alcove. This reference position is then referenced to another position at the surface. This allows traceability of all collected data to a common reference point. Sensors are calibrated using a secondary standard. SNL maintains the primary standards in Albuquerque. For the most part, sensors are industry standard off-the-shelf sensors.

   The data acquisition system is a general purpose system designed in the early 1980's for oil shale experiment data collection. The system, although relatively antiquated, is a proven, highly reliable and flexible system that is easily adapted to the various experiments conducted at WIPP. Although the DAS software does not meet the requirements of "High Impact" software, changes are controlled using a configuration management process and a password access system. Software documentation was not reviewed during this trip.

Data is collected and stored in an ANSI standard format on tapes in raw form prior to data reduction or conversion to engineering units. Three copies of the data are maintained - WIPP, the Principle Investigator and one copy in NQA-1 storage in Carlsbad. At the SNL WIPP Data Reduction Center the data tapes are loaded into a VAX data reduction system. The data is reduced and stored in a database, where it is available for analysis. The raw and reduced data are periodically downloaded to optical disk for long term storage. As many of the processes for the control of the data are new it is not evident that all older data necessary to support the Performance Assessment are retrievable.

As part of this review DNFSB staff visited the WIPP rock core storage library. This library contains boxed, sequenced, drill cores from site geologic investigatory drilling. Appropriate physical security and records management activities were in place. All cores can be accounted for at all times as the result of the formal sign-out procedure for any core removed for examination or testing. Labeled wooden spacers are found in core boxes indicating places where sections of cores have been removed for examination and testing. Core logs are maintained at the library with backup copies at SNL in Albuquerque.

2. Data interpretation and incorporation into the Performance Assessment

Integration into the Performance Assessment is performed in Albuquerque by SNL. There the data in raw or reduced form is analyzed and used to develop models and inputs for the Performance Assessment. This area was not reviewed during this trip and should be reviewed on a future staff visit.

c. Fire Protection and Electrical Systems

The DNFSB staff reviewed the status of all the electrical modification projects and diesel generator systems. Alternate methods for hoist operations during station blackout scenarios were also discussed. A detail review of the Conceptual Design Report to install permanent alternate electrical service for the WIPP was performed to verify the adequacy of the conceptual design. This electrical service will provide a second independent power source to the WIPP substation. A walkdown of fire detection and protection equipment was performed. The existing fire protection system was reviewed. Specifically, fire pump/motor design data (cable size, overload protection, layout) was reviewed. A complete review will be performed after receipt of the additional required documentation. Fire hazard analysis (FHA) discussed in brief and a complete review of FHA will be performed after the receipt of the documents. The details will be discussed in a forthcoming detailed trip report being prepared by A. Gwal of the DNFSB staff.

5. **Future Staff Action:** Additional periodic staff review visits to the WIPP Site will be made to track progress of the WIPP program.