Department of Energy
Washington, DC 20585

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Mr. John Linehan, Director
Repository Licensing and Quality
Assurance Directorate
Division of High-Level
Waste Management
Office of Nuclear Materials
Safety and Security
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Linehan:

At the July 7, 1988, meeting on Quality Assurance the DOE committed to provide the NRC with a summary of the DOE approach to planning and implementing rock mechanics experiments (Open Item QA-E-2). Enclosed, in response to that commitment, is the document "Approach to Experiment Planning and Data Management". It describes the approach to planning and implementing experiments at Sandia National Laboratories (SNL) and the flow of the resultant data through the Yucca Mountain Project data base.

When reviewing this summary, note that:

- The summary is applicable not only to rock mechanics data, but also to all technical data collected at SNL for Yucca Mountain Project.
- Although much of the process detailed in the summary is common to all Yucca Mountain Project participants, some steps are unique to SNL.
- The explanation presented in the summary defines the steps followed in the collection of QA Level 1 or 2 data.
- The appropriate formats and procedures for the writing of documents and the operation of data bases described are specified in SNL Yucca Mountain Project Department Operating Procedures (DOPs).

A listing of the relevant DOPs is also enclosed.

Questions regarding this correspondence should be addressed to myself, 586-1462.

Sincerely,

Gordon Appel, Chief
Licensing Branch
Office of Civilian Radioactive
Waste Management

Enclosure

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Approach to Experiment Planning and Data Management

Data acquisition activities are assigned by the NNWSI Project to SNL through the Work Breakdown Structure (WBS). SNL then assigns these activities to Task Leaders who work with management to define, in general terms, the experiments be be conducted. Closely related experiments are grouped into studies. Experiments are assigned to Principal Investigators (PIs) who are responsible for planning the experiments and acquiring the necessary data.

Each individual study is outlined at the Activity level within the Site Characterization Plan (SCP) for the Yucca Mountain site. In an SCP Activity section, the relevant data parameters required by site characterization, design, and/or performance assessment concerns are defined, and an experiment or series of experiments which will provide the requisite data are described in general terms. The description includes an explanation of sampling approach, experiment methods, data collection, and data reduction.

Study Plans provide more detail about the SCP data collection activities. A Study Plan includes the purpose of the study, the regulatory-based rationale for the study, a description of the chosen and alternative experiment methods, the application of the resultant data, and an outline of the planned schedule. Decisions concerning the nature of experiments and the types and numbers to be conducted are made based on the generation and review of the SCP and the Study Plans. At SNL a review meeting for a study is held before the Study Plan is written to provide early decisions of scope.

Further details about a specific experiment or set of experiments (usually a sub-set of the study detailed by the Study Plan) are contained in an SNL NNWSI Project Experiment Procedure (EP). The EP describes the management and conduct of the experiments. Records control, personnel training, quality assurance requirements, etc. are specified. The SNL NNWSI Project Quality Assurance Program Plan (QAPP), and associated DOPs and Quality Assurance Procedures (QAPs) prescribe these and other QA requirements for the planning, conduct, and data flow for experiments.

SNL NNWSI Project Technical Procedures (TPs) contain the specific, step-by-step procedures for individual tasks that are part of an experiment. As an example, some TPs specify the set-up and use of particular instruments or equipment. Others describe detailed preparations of samples to be tested. A TP can be applicable to any number of EPs (specific to one or generally applicable to many EPs). The relevant and necessary TPs are referenced in each EP. In general, EPs and associated TPs are the specific implementing documents that are to be followed by the people actually conducting an experiment.

The above discussion summarizes the planning and implementing documents for data-gathering activities, while the following paragraphs provide a brief overview of the flow of technical data at SNL. The data are generated by the PIs responsible for conducting the technical activities and are processed through the data and information bases that support the technical activities of the NNWSI Project.

All technical data and associated planning, implementing, and reporting documents are initially placed by the PI in a branch of the SNL NNWSI Project Local Record Center (LRC), titled the Data Records Management System (DRMS). DRMS personnel organize the technical data and supporting documentation (data records) into Data Sets which are given unique identifiers. When a Data Set is completed, a data report (an SNL "SAND" report) is written which contains data reduced to a usable form. A Data Catalog of all Data Sets is issued quarterly to the DOE/WMPO.

Following technical, editorial, and management review of a Data Report by SNL personnel, the data in the report are released by the SNL Technical Project Officer (TPO) for entry into the NNWSI Project Technical Data Base (TDB). Data reports are organized so that pertinent data are compiled into data compilation forms that are consistent with the format of the TDB. The TDB is made up of two parts:

(1) The Site and Engineering Properties Data Base (SEPDB) which contains the reduced numerical data, and

(2) The Interactive Graphics Information System (IGIS) which is used for the presentation of SEPDB data that are particularly useful in graphical form.

The TDB makes the data available for support of other technical activities of the NNWSI Project.

In response to the technical needs of the NNWSI Project, some of the data from the SEPDB will be distilled into products that will be included in the baselined NNWSI Project Reference Information Base (RIB). The RIB was established to maintain and control the flow of interpreted technical reference information for use by NNWSI Project design and performance-assessment activities. Processing of SEPDB data for inclusion in the RIB involves a thorough review by NNWSI Project technical staff and approval for baselining by the appropriate change-control authority.

In summary, experiments defined by SNL personnel are outlined in the SCP and described in greater detail in Study Plans. The implementation details for an experiment or set of experiments are specified in EPs and associated TPs. All of the technical data and supporting documents are organized and saved in the DRMS, with the relevant data being subsequently submitted to the SEPDB and the RIB to make the data available for use by other NNWSI Project activities. We are confident that these procedures provide an organized approach to the planning, acquiring, archiving, and synthesizing of technical data and supporting information to meet the needs of the NNWSI Project.

SNL NNWSI Project DOPs

Number	Title
DOP 2-2	Study Plan Requirements
DOP 3-7	Technical Data Base
DOP 3-8	Reference Information Base Change Control
DOP 3-11	Requirement for Submitting Data to the NNWSI Project Site and Engineering Properties Data Base (SEPDB)
DOP 5-2	Technical Procedure Requirements
DOP 8-1	Sample Identification and Handling Requirements
DOP 11-1	Experiment and Equipment-Test Procedure Requirements
DOP 11-2	Requirements for Experiment and Equipment-Test Logbooks
DOP 11-3	Data Records Management System Interaction Requirements
DOP 17-1	Records Management System
DOP 17-2	Data Records Management System (DRMS)