JH/INTERACTION FOR FY91

MAY 31 1990

NOTE TO: Ronald L. Ballard, HLGP

Joseph O. Bunting, HLEN

Mel Silberberg, RES

SUBJECT: INTERACTIONS FOR FISCAL YEAR (FY) 1991

The purpose of this note is to request that each branch provide a list of interactions that it believes are necessary for FY91. For your information, a list of those interactions agreed upon by the staff and DOE and scheduled through September 1990 are provided in Enclosure 1 along with a status. Enclosure 2 contains the March 12, 1990 letter to DOE that provided the information for the last meetings. Some of the interactions proposed by the staff were scheduled and are in Enclosure 1 and some were not.

In preparing the proposed list for FY91, please identify the preferred month for the interaction as well as the type of interaction desired. Keep in mind that DOE is attempting to limit the number of interactions to one per month with priority given to those interactions dealing with site characterization. If any new interactions other than those in Enclosure 2 are being suggested or, if the discussion area has changed since the original write-up was proposed to DOE in the March 12, 1990 letter, the short paragraph describing the topic needs to be provided or revised.

The next scheduling interaction meeting is scheduled for July 31, 1990. Therefore, in order to coordinate all of the information and to be able to provide DOE with a copy two weeks prior to the meeting, it will be necessary to receive your updates by June 23, 1990. Please provide all of the information to Joe Holonich by that date.

/s/

John J. Linehan, HLPD

cc: HLWM SLs

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Enclosure 1

Scheduled Interactions

Date	Interaction	Type	Status
April 2-4, 1990	Center for Nuclear Waste Regulatory Analysis Workshop on Substantially Complete Containment	Workshop	Complete
April 6, 1990	Nuclear Waste Technical Review Board (TRB) visit to N-Tunnel	Site Visit	Complete
April 7, 1990	DOE Briefing to the TRB on the ESF Alternatives Study with follow-up discussions between the NRC, DOE, et. al.	TRB/Technical Exchange	Complete
April 12-13, 1990	TRB meeting on Seismic hazard Analyses	TRB	Complete
MAY 1990	Trip to the Defense Waste Processing Facility	Site Visit	To be scheduled
May 15, 1990	Seismic Hazards Investigations Technical Position	Technical Exchange	To be scheduled
May 30, 1990	Regulatory Strategy	Management Meeting	To be scheduled
June 12-13, 1990	Significant Faulting, Midway Valley study, and Site Visit including the Technical Assessment Review	Technical Exchange/ Site Visit	Scheduled
June 19, 1990	Design Control of the ESF	Technical Exchange	To be scheduled
July 18-19, 1990	Performance Assessment Integration into site Characterization	Meeting	O.K.
July 31, 1990	Interactions Scheduling Meeting	Meeting	O.K.
August 15-16, 1990	Unsaturated/Saturated Zone Hydrochemical Testing	Technical Exchange	O.K.
September 11, 1990	Prioritization of Surface-Based Testing	Technical Exchange	O.K.
September 12, 1990	ESF Alternatives	Technical Exchange	O.K.

ENCLOSURE 2

Meetings Proposed

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 12 1990

Mr. Ralph Stein, Associate Director
for Systems Integration and Regulations
Office of Civilian Radioactive Waste Management
U.S. Department of Energy, RW-30
Washington, D.C. 20545

Dear Mr. Stein:

SUBJECT: INTERACTIONS TO BE DISCUSSED AT THE MARCH 20, 1990 INTERACTIONS SCHEDULING MEETING

The purpose of this letter is to provide you with a proposed list of interactions that the staff believes should be discussed at the upcoming March 20, 1990 interactions scheduling meeting. A list of the proposed interactions and a revised summary of what the staff believes should be covered at each interaction is provided in Enclosure 1. The staff believes that the list will serve as a good starting point for scheduling the interactions. As has been the case in previous interactions scheduling meetings, interactions for the next five months, April through August 1990, should be scheduled with specific dates. Meetings beyond that time can be agreed upon; however, specific dates need not be established.

In addition to providing the proposed list of interactions, the staff has also identified a number of areas where it believes an Appendix 7 visit, as defined by the "Procedural Agreement Between the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy Identifying Guideline Principles for Interface During Site Investigation and Site Characterizations," may be useful. A general overview of those proposed visits is provided in Enclosure 2. More details on these Appendix 7 visits will be provided prior to the time of the visit; however, for planning purposes, the staff believes that the information in Enclosure 2 should be discussed at the March 20, 1990 meeting.

Finally, the staff has provided to you in Enclosure 3 a copy of its letter to Mr. Leo Duffy, Director, Office of Environmental Restoration and Waste Management. In that letter, the staff highlights the areas where it believes interactions can be held in response to Mr. Duffy's concerns expressed during the December 20, 1989 Commission Briefing. The staff has already identified the need for an interaction on regulatory strategies, and has proposed it for April 1990. In addition, the points contained in the staff's February 26, 1990 letter should be factored into other interactions as they are planned and scheduled.

(21)

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If you have any questions on the upcoming meeting or the information provided here, please feel free to contact Mr. Joe Holonich of my staff. Mr. Holonich can be reached at FTS 492-3403 or (301) 492-3403.

Sincerely,

John J. Linehan, Director
Repository Licensing and Quality
Assurance Project Directorate
Division of High-Level Waste Management

Enclosures: As stated

cc: R. Loux, State of Nevada
C. Gertz, DOE/NV
S. Bradhurst, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO

ENCLOSURE 1

LIST OF PROPOSED INTERACTIONS

Enclosure 1
List of Proposed Interactions

Date	Interaction	Type	Status
Apr 2-4, 1990	Substantially Complete Containment	NRC Workshop	Previously Suggested
Apr 6, 1990	Trip to N Tunnel	Nuclear Waste Technical Review Board (TRB)	New
Apr 7, 1990	Exploratory Shaft Facility (ESF) Alternatives Study Report	TRB	New
Apr 8, 1990	Subject not yet determined	TRB	New
Apr 12-13, 1990	Seismic Considerations 10 CFR Part 100, Appendix A	TRB	New
Apr 17-18, 1990	Performance Assessment Integration into Site Characterization	Meeting	Scheduled
Apr 19-20, 1990	Seismic Hazards Investigations	Exchange	New
APR 1990	Regulatory Strategy	Meeting	New
	ESF Integration with Repository Design	Meeting	Previously Suggested
MAY 1990	Scenario Development and Construction of a Complementary Cumulative Distribution Function (CCDF)	Exchange	Scheduled
	Defense Waste Processing Facility	Site Visit	New
JUN 1990	Waste Form Spent Fuel	Exchange	Previously Suggested
	Unsaturated and Saturated Zone Testing	Meeting/Exchange	Scheduled
JUL 1990	Radionuclide Retardation Testing and Modeling	Meeting/Exchange	Scheduled
	ESF Integration with Repository Design	Meeting	Previously Suggested

AUG 1990.	Discussion of Design Drawings	Site Visit	New
AUG 1990	Natural Resources	Exchange	Scheduled
SEP 1990	Significant Faults - Setback Distance	Exchange	New
	Greater-than-Class-C Wastes	Exchange	New

Attachment A
Unscheduled Interactions

1. Engineered Barrier System Performance Assessment Modeling
2. Formal Use of Expert Judgment
3. Waste Form - Glass
4. Underground Mapping Methods
5. Thermal Effects of Emplaced Waste on Hydrologic System
6. Groundwater Travel Time
7. Geochronologic Methods

Attachment B
Meetings

Technical Area: Licensing

- Regulatory Strategy

  See Enclosure 3, Letter from Robert M. Bernero (NRC) to Leo Duffy (DOE); untitled letter on areas needing early interactions, February 26, 1990. (April 1990)

Technical Area: Rock Mechanics Design

- Exploratory Shaft Facility Design Alternatives

  The purpose of the meeting would be to discuss requirements for coordinating ESF design with repository design and planning surface based testing in coordination with the repository design. The scope should include discussion of: (i) DOE's strategy for demonstrating compliance with 10 CFR Part 60 requirements; (ii) repository and ESF design alternatives consideration; (iii) potential construction-to-test and test-to-test interference; (iv) exploratory drilling coordination with repository design, and planned clustering of boreholes in the southwest area outside of repository block; (v) seismic design basis for repository, and sub-surface standoff distance of emplacement holes from faults; (vi) potential need to clarify, reinforce, and/or modify certain portions of existing Memorandum of Understanding between the U.S. Department of Energy (DOE) and the Mine Safety and Health Aministration (MSHA); and (vii) considerations of sealing and retrievability in the conceptual stages of the repository design. (April 1990)

Technical Area: Performance Assessment

- Performance Assessment Integration into Site Characterization

  The U.S. Nuclear Regulatory Commission (NRC) staff has raised concerns about how and when performance assessments will be integrated into the site characterization program in the Site Characterization Analysis (SCA) Comment 1, bullets 3 through 5. A formal technical meeting focused on these concerns could serve the purpose of clarifying them and providing DOE with the opportunity for feedback. Specific issues to be discussed include: (1) how site characterization data and performance analyses based on them will be used to modify performance allocation goals; (2) how periodic performance assessments will be used during site characterization to aid in understanding the value of the data collected; and (3) how performance assessment will be used to resolve issue 1.8, the NRC siting criteria. (April 17, 18, 1990)

- Formal Use of Expert Judgment

  The staff has raised concerns about the criteria the DOE will use to determine whether the formal use of expert judgment is appropriate in a particular instance. A formal meeting focused on these concerns could

serve the purpose of clarifying them and providing DOE with the opportunity for feedback. It is expected that the NRC legal staff would participate. (Unscheduled)

Attachment C
Technical Exchanges

Technical Area: Material Science

- Waste Form - Glass

  Although much work has been done on possible glass waste forms for radioactive waste from reprocessing spent fuel, certain questions remain. An important one impacts the decision on when the waste producers plan to begin hot operations. The issue here is the nature of the pour canister and its compatibility with the environment of the Yucca Mountain geologic repository and the material of the disposal container. In this regard, site characterization studies may not have begun and the canister material may not have been selected by DOE before the start of hot operations. Other questions involve product specifications (e.g. the relationship between the waste form release rate specification in the Waste Acceptance Preliminary Specifications to the Site Characterization Plan (SCP)) and performance assessment, process control, validation of predictions of long term behavior, glass leaching characteristics, and hot glass sampling. (unscheduled)

- Waste Form - Spent Fuel

  The technical exchange should involve a number of issues pertaining to the topics listed below. The exchange could cover all of the topics or a number of exchanges could be held to discuss the topics in detail.

  1. Types of spent fuel, especially assemblies with defective rods that may affect performance allocation assigned to waste form.

  2. Internal corrosion of fuel rods

  3. Scenarios for waste package environment/materials interaction over time

  4. Need for long-term corrosion data

  5. Carbon-14 releases

  6. Spent fuel leaching

  7. Oxidation of UO_2 in the Yucca Mountain environment

  At the very least, the discussions should produce statements of specific technical needs. (June 1990)

- Engineered Barrier System (EBS) Performance Assessment Modeling

  These interactions should include the ongoing efforts by DOE to develop performance assessment models for the EBS, including the waste package and waste form, to demonstrate compliance with 10 CFR 60.113. These discussions will also include the methodologies and models to be used by

DOE to make long-term predictions (i.e., up to 10,000 years) based on short-term measurements and data. Such predictions will have to be based on models which are actually simplified representations of actual processes affecting those materials. Validation of the predictions will have to be based on indirect techniques such as comparison with archaeological analogs.

There should be periodic interactions at the technical staff level, again in small groups, to permit intensive discussion for the bases being developed for the models, and predictions, and the validations. A consensus is developing in the technical community that the models should incorporate as much mechanistic understanding of the operative processes as possible. (Unscheduled)

- Waste Package In-Situ Testing Program

  The purpose would be to interact with DOE on its plan on a waste package in situ test program. Discussions would be held with DOE or whether it intends to run any in situ waste package experiments to collect data to support waste package performance analysis. If no such experiments are planned, what program would DOE use to relate laboratory collected data to the repository processes? Discussions on DOE's planned strategy would include NRC, DOE, and the DOE contractors. (Unscheduled)

- Greater-than-Class-C (GTCC) Waste

  The DOE has expressed concerns about GTCC waste volumes, indicating the possible need for a second repository. The staff would like to better understand the basis for DOE's concerns related to GTCC waste, including the data based on information on GTCC waste volumes, types and characteristics. The staff would also like to discuss how GTCC waste considerations have been (or will be) incorporated into the repository program. (September 1990)

Technical Area: Hydrologic Transport

- Testing of the Saturated and Unsaturated Zones at Yucca Mountain

  The staff has raised concerns about plans to characterize saturated and unsaturated zone hydrologic boundaries, flow directions and magnitudes, and flow paths (i.e., SCP comments 12, 14, 16, 19, 20, 21, and 22, of the SCA). A technical exchange focusing on hydraulic and hydrochemical testing of the unsaturated and saturated zone at Yucca Mountain could serve the purpose of clarifying staff concerns and providing the DOE with an opportunity for feedback. (June 1990)

- Groundwater Travel Time

  SECY-88-285, "Regulatory Strategy and Schedules for the High-Level Waste Repository Program," identified groundwater travel time as a potential candidate for rulemaking and established a schedule of rulemaking milestones. This technical exchange will provide an opportunity to discuss technical aspects of groundwater travel time. (Unscheduled)

- Radionuclide Retardation Testing and Modeling

  The NRC staff has raised concerns about the use of Kd's in modeling retardation in assessments of radionuclide releases to the accessible environment (refer to comment 96 of the SCA). A technical meeting focusing on retardation modeling could serve the purpose of clarifying staff concerns and providing DOE with an opportunity for feedback. (July 1990)

- Thermal Effects of Emplaced Waste on Hydrologic System

  The NRC staff has raised concerns about the thermal effects of emplaced waste on the hydrologic system (refer to comment 11 of the SCA). A technical exchange focusing on the thermohydrologic aspects of the Yucca Mountain site could serve the purpose of clarifying staff concerns and providing DOE with an opportunity for feedback. (Unscheduled)

- Geochronologic Methods

  The purpose of this interaction is to discuss issues related to DOE's strategy for determining the age of geologic samples. The scope should encompass all the dating techniques that will be used to characterize the proposed site at Yucca Mountain. These techniques will be used in various studies including those dealing with groundwater travel time, tectonism, and volcanism. The techniques discussed should include uranium-series disequilibrium, uranium trend, electron spein reasonance, potassium-argon, argon-argon, helium-helium, carbon-14, chlorine-36, tritium, fission track, rock varnish, and thermoluminescence. Uncertainties arising from sampling and analytical procedures should be discussed. Assumptions required for the application of geochronologic information to modeling efforts should be explained. (Unscheduled)

Technical Area: Performance Assessment

- Scenario Development and Screening and Construction of a CCDF

  The NRC staff has raised concerns, in SCA Comments 1, 95, 100, 103 about the underlying methodology used to develop and screen scenarios, used to help guide the site characterization program. A technical meeting focused on these concerns could serve the purpose of clarifying them and providing DOE with the opportunity for feedback. Specific issues to be discussed include: (1) the current operational definition of scenarios; (2) how scenarios are to be generated from elemental events and processes; (3) what initial set of scenarios or elemental events and processes are to be screened for the purposes of site characterization; and (4) appropriate methods for screening scenarios and how such methods should be implemented and documented.

The staff has raised concerns about how DOE intends to construct a CCDF and how this methodology relates to the site characterization program in SCA Comments 95, 98, and 99. Focusing on these concerns could serve the purpose of clarifying them and providing DOE with the opportunity for feedback. Specific issues to be discussed include: (1) use of a definition of scenarios consistent with the logic used to construct the CCDF; (2) inclusion of human instruction scenarios in the CCDF; and (3) use of Expected Partial Performance Measures to guide site characterization. (May 1990)

Technical Area: Geology

- Significant Fault - Setback Distance

DOE has been unsuccessful in describing what constitutes a significant fault with sufficient accuracy to satisfy the staff. As a result, the staff has raised concerns with the approach taken to significant faults that was described by DOE in the Consultation Draft SCP, SCP and Study Plan on the Location and Recency of Faulting Near Prospective Surface Facilities. Because of its significance to the siting and design of major repository elements, an agreed upon definition of what constitutes a significant fault is necessary. The staff is considering developing a technical position on the concept of significant fault and, in the process, has developed a strawman definition of the term. This technical exchange is proposed to gather comments on the strawman definition of significant fault from the DOE, State of Nevada, and other interested professionals.

- Underground Mapping Methods

Recent interactions between the TRB and the DOE and its contractors have brought to light potential conflicts between data collection needs during ESF construction and the construction method used (i.e., tunnel boring machine or smooth wall blasting). The basic question behind the potential conflicts is what level of detail of geologic mapping is required to adequately characterize the ESF. The staff proposes that a technical exchange be held to exchange views on the level of detail of mapping efforts necessary to fulfill the requirements of 10 CFR 60 and on the adequacy of the mapping techniques using alternative construction methods. (Unscheduled)

- Seismic Hazards Consideration

In accordance with the proposed schedule for the completion of the Seismic Hazards Technical Position, a technical exchange is being proposed to discuss the disposition of the comments made on the Public Comment Draft. A final draft encompassing revisions subsequent to the Public Comment Draft and a formal statement of the disposition of the public comments will be provided to the respondents approximately three weeks prior to the interaction. (April 19-20, 1990)

NRC Worshop

Technical Area: Materials Engineering

- Substantially Complete Containment

  The staff is conducting a technical assessment of the feasibility of developing technical consensus on an approach and strategy for eliminating the regulatory uncertainty attendant in the language "Substantially Complete Containment." The feasibility assessment will include a public workshop to discuss the technical basis for the containment requirement, including what must be done to demonstrate compliance with the rule. (April 2-4, 1990)

Attachment 4
Site Visits

Technical Area: Materials Engineering

- Defense Waste Processing Facility (DWPF)

  The last technical exchange on the DWPF was approximately a year and a half ago (September 1988) and it has been almost 3 years since the staff toured the DWPF which is nearing completion in construction. The staff would like to meet at the DWPF to be briefed on the status of DWPF activities and schedules and to tour the nearly completed vitrification facility. Additionally, the staff would like to be briefed on what the DOE has learned from its following of foreign glass-making programs and experience. (May 1990)

Technical Area: Rock Mechanics Design

- Discussion of Design Drawings

  A site visit by NRC technical staff to the Sandia National Laboratories (SNL) is needed to observe repository and ESF design work (ESF design alternatives).

  The TRB has raised some important concerns on the repository (and ESF) construction methods, repository layout, and location, number and size of the openings. The ongoing work by SNL and its contractors on alternative ESF and repository designs, is addressing the staff's and TRB's concerns. It is of utmost importance to the staff to remain informed on major repository and ESF design issues as they may affect waste isolation, site characterization, and retrieval. The alternative ESF and repository designs, as described by SNL, include mechanical excavation of underground openings to limit the interference with testing and to limit the extent of the damaged zone around openings. The alternative layouts include new locations for repository (and ESF) access openings and determine the number of such openings. (August 1990)

ENCLOSURE 2

OVERVIEWS OF PROPOSED APPENDIX 7 VISITS

Topic: Thermohydrologic Behavior

Technical Area: Physical Modeling of Hydrologic Transport

The purpose would be to exchange technical information on laboratory and/or field-scale experimental approaches which may be used to determine the nature of heat and fluid flow in unsaturated media. Investigations of thermohydrological phenomena at scales varying from an individual waste package to the composite effect of all HLW in a geologic repository are of interest. Laboratory and field experiments would be discussed with a focus on design of experiments (including scaling relationships) to study liquid- and vapor-phase flow in variably saturated media. Instrumentation and techniques for measurement and visualization of heat and fluid content and flow in synthetic and natural media would also be discussed. Discussions of numerical modeling in the design of thermohydrologic experiments would be limited in this meeting with a planned subsequent meeting on this topic.

It is requested that the technical exchange include a tour of laboratories where examination of pertinent experimental apparatus would occur. This technical exchange would include discussions by the CNWRA's technical staff performing work on the Center's Thermohydrology Research Project and related technical assistance activities which are being conducted for NRC.

Topic: Waste Package Testing

Technical Area: Short-Term Test Methods

As a result of the scoping and literature studies performed by the NRC in the area of waste package experiments, several technical issues have come to focus. One of these issues that merits early discussion is short-term test methods.

Despite wide-spread industry application, the use, reproducibility, and interpretation of various techniques for measuring corrosion phenomena remains a question, particularly where extrapolation to long time periods is required. For example, potentiodynamic polarization techniques have been used by DOE and NRC contractors, but with different operating parameters and varying laboratory procedures. The resolution of technical issues related to this topic requires the involvement of technical experts in presenting and discussing the merits of the pertinent measurement techniques that are in use at the various laboratories. Also, there may be a need to develop new research concepts and test methods to resolve related technical uncertainties.

Discussions would focus on test methodology, including use of standard test procedures, sample preparation, and formulation of test solutions. Sensitivity of test results to operating parameters (such as scan rate) will also be discussed, based on experience to date. Data reproducibility, use of standardized samples for calibration, and related quality-control factors would also be considered. Discussions on data interpretation would be limited to direct evaluation of data collected from such short-term tests; projection or extrapolation of such data to longer times would be the subject of a separate meeting. This "mini-workshop" would provide an opportunity for indepth technical discussion among the key research staff from the NRC, DOE, and their principal contractors.

Topic: Geochemistry Experimentation

Technical Area: Mineralogical Characterization

The purpose would be to begin a broad exchange of technical information on investigations pertinent to the HLW repository program which Los Alamos National Laboratories (LANL) is performing in geochemistry, mineralogy, petrography/petrology, sorption studies, and water-rock interactions, as a contractor to the DOE. Small-group discussions of recent work conducted at LANL, which represents the state-of-the-art in the mineralogical characterization of Yucca Mountain, would be the starting point of these exchanges. Such information will benefit the geochemistry research program at the CNWRA in both the modeling and experimental areas.

Discussions would focus on mineralogical compositions and associations, which are critical inputs to mass transfer and phase equilibrium modeling of the controls on the ambient and perturbed system chemistry, including groundwater chemistry. Experimental phase equilibrium studies among zeolites, which are proposed in a CNWRA geochemistry research project, would be discussed in the context of the ongoing LANL analyses of the paragenesis of these phases in the Yucca Mountain system. This information will help to define appropriate test conditions. An exchange of knowledge and an evaluation of the techniques used in mineralogical characterization would be obtained through interaction with LANL researchers.

Discussions of past and present LANL investigations in these technical areas would occur and the CNWRA's technical staff would describe laboratory studies performed in the Center's Geochemistry Research Project and related technical assistance activities which are being conducted for NRC. It is anticipated that a tour of appropriate LANL laboratories supporting investigations in these technical areas would be made.

Topic: Geochemical Modeling

Technical Areas: Mass Transfer Modeling of Water-Rock Interactions.

The purpose would be to begin a broad exchange of technical information on investigations pertinent to the HLW repository program which Lawrence Livermore National Laboratory (LLNL) is performing in geochemistry, mass transfer modeling of water-rock interactions, thermodynamic database development and validation, and waste package-groundwater interactions as a contractor to the DOE. Small group discussions regarding the EQ3/6 geochemical modeling software package, which has been under development for more than a decade at LLNL, would be the starting point of these exchanges. These discussions will be of benefit because the codes and database in this package are being evaluated, modified and utilized in the CNWRA geochemistry research program. Furthermore, the NRC has submitted a request to obtain formally the latest version of EQ3/6, and it is anticipated that it will be used in an NRC/CNWRA workshop on EQ3/6 modeling. Interactions with the developers of the codes and database will enhance the technical content of the workshop and improve use of EQ3/6 in the Center's geochemistry research program.

Aqueous speciation and solubility calculations which are being used by the CNWRA to design experiments for sorption and phase equilibrium studies would be discussed. Modifications which have been introduced by the CNWRA to the EQ6 code to enable equilibrium gas fractionation and nonisothermal kinetic mass transfer computations would also be a focal point of this exchange. A new version of this software package with a reorganized database, which is now under development at LLNL and will be available for release shortly, would be examined.

Discussions of past and present LLNL investigations in this technical area would occur and the CNWRA's technical staff would describe work performed in the Center's geochemistry research project and related technical assistance activities which are being conducted for the NRC. It is anticipated that a tour of LLNL experimental and computer modeling laboratories would be made, and would include examination of the equipment and techniques used in investigations of waste package-groundwater interactions and in the collection and storage of reference groundwaters.

Topic: Repository Design and Performance

Technical Area: Rock Mechanics Properties

The purpose of this exchange meeting would be to initiate discussions regarding the in situ properties of tuff, techniques for characterizing such properties, and the analytical models that DOE intends to use to evaluate the pre-closure and post-closure performance of underground openings.

This first exchange meeting would focus on the dynamic properties of tuff joints. Approaches to selection and collection of fracture samples, including techniques, equipment, and procedures used to date, as well as those currently under development, would be discussed. Laboratory methods in use by DOE, NRC, and their contractors to characterize and physically test such joints, including the use and/or adaptation of standard tests, are of particular interest. The discussions would also extend to include use of laboratory data in the formulation of joint deformation models. Discussions regarding the capabilities and limitations of currently available analytical models/computer codes that may be used to predict seismic performance of underground excavations will be deferred for a subsequent meeting.

Visits to appropriate laboratory testing facilities and/or field collection sites would be part of the meeting, to the extent practical.

ENCLOSURE 3

FEBRUARY 26, 1990 STAFF LETTER

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 26 1990

Mr. Leo Duffy, Director
Office of Environmental Restoration
and Waste Management
Department of Energy, Forrestal Bldg.
1000 Independence Avenue, S.W
Washington, D.C. 20585

Dear Mr. Duffy:

On December 20, 1990, you briefed the Commission on the U.S. Department of Energy's (DOE's) restructured program and revised schedules described in DOE's November 30, 1989, "Report to Congress on Reassessment of the Civilian Radioactive Waste Management Program." The Chairman commented on the revised schedules in a January 25, 1990, letter to Secretary Watkins. In this letter, the Chairman emphasized that the U.S. Nuclear Regulatory Commission (NRC) is committed to supporting DOE's activities by conducting reviews and interacting with DOE as soon and as often as needed. To accomplish this, early interactions with DOE are needed to understand DOE's detailed schedules, the basis for them, and where NRC involvement might be needed. Then, as the Chairman suggested, DOE and NRC can develop consistent, detailed 1990 and 1991 milestones and schedules for those activities where the NRC staff's involvement will be necessary.

The primary purpose of this letter is to identify the areas, including milestone and schedule information, which should be the subject of early interactions between NRC and DOE (see Enclosure). These interactions should be discussed at the March 20, 1990, NRC-DOE meeting to schedule future interactions. The first four areas listed in the Enclosure (i.e., quality assurance, regulatory requirements and guidance, surface-based testing and ongoing testing, and exploratory shaft facility construction) are considered particularly important and were mentioned in the Chairman's January 25, 1990, letter to DOE.

In addition, supporting information is needed concerning your statements in the December 20, 1989, Commission presentation about the volumes and characteristics of greater-than-class-C (GTCC) low-level radioactive waste. A February 16, 1990, letter from John Linehan (NRC) to Ralph Stein (DOE) requested specific GTCC information and interaction that are needed soon, to determine the need and scope for a potential rulemaking in this area.

Finally, during the December 20, 1989, Commission presentation, you mentioned that the general reference schedule given in the November 30, 1989, report to Congress would be updated periodically. These updates are important to our planning, and we would appreciate receiving them when they are available.

9002270262

If you have any questions about this request, please call me (492-3352) or John Linehan, Director of the Repository Licensing and Quality Assurance Project Directorate (492-3387).

Robert M. Bernero, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

Enclosure

AREAS NEEDING FURTHER INFORMATION AND INTERACTION

1. Quality Assurance (QA)

The U.S. Department of Energy's (DOE's) report to Congress shows the U.S. Nuclear Regulatory Commission's (NRC's) acceptance of DOE's Office of Civilian Radioactive Waste Management QA program in September 1990. NRC acceptance of the QA program is based on a review of plans and procedures and observation of DOE audits, to make a determination of DOE's ability to implement the QA plans and procedures. During a February 15, 1990, meeting, DOE and NRC essentially agreed upon the steps needed for NRC to accept the DOE QA plans and procedures by September 1990. However, DOE and NRC also need to reach agreement on the specific actions needed, many of which may occur after September 1990, to determine implementation of the QA plans and procedures, to completely resolve NRC's Site Characterization Analysis (SCA) QA objection and to complete NRC's acceptance of DOE's QA program. Continued close coordination through frequent meetings between NRC and DOE is needed to help ensure that all NRC concerns are satisfactorily addressed, that additional changes in the DOE program are factored into the NRC review, and that any new problems are identified and promptly addressed.

2. Regulatory Requirements and Guidance

DOE's presentation to the Commission on December 20, 1989, suggested many changes to the "Regulatory Strategy and Schedules for the High-Level Repository Program" (SECY-88-285), including eliminating the subsystem requirements of 10 CFR Part 60, using collaborative interactions to prepare regulatory requirements, and using DOE topical reports to address important topics. DOE's presentation also summarized its concerns about some of NRC's specific potential rulemakings. One interaction should be scheduled to discuss DOE's general suggestions and comments. Other interactions should be scheduled for potential rulemakings where DOE has specific concerns or suggestions that need to be discussed with NRC.

3. Surface-Based Testing and On-Going Testing

The schedules in DOE's report to Congress show that DOE plans to start new surface-based testing in January 1991. To do this, DOE's schedule indicates that all prerequisites for new surface-based testing will be completed in October 1990. Furthermore, the schedules show completion of study plans for major ongoing field activities in September 1990.

NRC acceptance and start-work reviews of study plans would need to be completed before new studies begin. Therefore, for NRC to plan its reviews and allow for potential interactions to support DOE's study plan and testing schedules, specific milestones and schedules (e.g., DOE study plan issuance and start of testing) need to be developed for each study plan that DOE plans on issuing to support the aforementioned general milestones. NRC also understands that DOE will be conducting a study to prioritize surface-based testing in 1990. NRC would like to know DOE's specific schedule for this activity and if DOE plans to request NRC review or interaction.

4. Exploratory Shaft Facility (ESF) Construction

DOE's report to Congress indicates that DOE will begin ESF construction in November 1992, and before this, DOE will conduct an ESF design alternatives study and complete the ESF design. DOE should give the specific schedule of activities to support the revised date, including points for NRC reviews and interactions. DOE should include how it specifically plans to interact with NRC early to assure that the points raised in NRC's SCA objection on the ESF are adequately considered in the evaluation of ESF design alternatives. Such early interactions will help resolve NRC's objection and thereby avoid additional work like the Design Acceptability Analysis, which could cause delays in DOE's schedule to begin ESF construction.

5. Repository and Waste Package Design

DOE's report to Congress indicates the deferral of major site-specific repository design activities until October 1992. Detailed plans to reevaluate the repository conceptual design or to integrate it with the ESF design and surface-based testing, were beyond the general level of detail in DOE's report to Congress. In a meeting with the Nuclear Waste Technical Review Board on January 31 and February 1, 1990, DOE indicated that many repository design alternatives are also being considered in conjunction with the ESF alternatives. Therefore, NRC would like to know what repository design activities, in addition to preparing a Repository Program Plan, will be conducted and when. Also, DOE's detailed plan and schedule for integrating ESF design and early surface-based testing with repository design activities is needed.

DOE also has deferred major waste package design activities until October 1992. NRC would like to know what waste package design and materials testing activities in addition to preparing a Waste Package Program Plan will be conducted, and when.

6. Performance Assessment

In its report to Congress, DOE states that it will follow an iterative scientific approach, using both surface-based and underground testing, combined with continuing evaluation of the data, to address site

suitability. This approach is generally consistent with NRC's SCA recommendation that DOE conduct early and iterative performance assessments to guide its site characterization activities. DOE's schedules in the report to Congress, however, do not show any schedules for performance assessments. NRC would like to know DOE's schedule for conducting early and iterative performance assessments including when DOE plans to issue its Performance Assessment Plan.

7. Alternative License Application Strategies

DOE's schedule indicates that alternative license application strategies will be prepared in 1990. NRC needs to know what these strategies are and discuss with DOE points for NRC review and interaction.

8. Glass-Making Activities

DOE's schedules do not include the glass-making activities at the West Valley Demonstration Project and the Defense Waste Production Facility (Savannah River), including when the QA programs for these activities will be in place. Moreover, the schedules do not show how activities at these two operations will be integrated into DOE's overall repository program. NRC would like to have this schedule information and discuss with DOE points for NRC review and interaction.

Items 9 and 10 are not important to NRC's near-term planning, but they are schedule concerns needing further DOE attention, possibly in amending the Mission Plan.

9. Performance Confirmation

DOE's schedule in its report to Congress does not show either surface-based or underground testing after submittal of the license application. Such performance confirmation testing is required by 10 CFR Part 60. This appears to be a change from the DOE schedule given in the Site Characterization Plan (SCP). DOE should clarify this apparent inconsistency with the SCP and provide its current performance confirmation schedules.

10. Review Period for License to Receive and Possess Waste

In DOE's reference schedule, approximately 21 months have been allotted for NRC's review and decision on DOE's application for a license to receive and possess waste at the repository. DOE scheduled NRC's review to begin approximately 18 months before completion of construction, and end about 3 months after construction is completed. This 21-month total period is longer than the 9 months provided in the June 1987 Mission Plan Amendment; however, the 3 months after construction is completed are less than the 9 months originally planned. NRC is concerned that this 3-month period is not enough unless the overall 21-month review period starts when DOE's

construction is substantially complete (see 10 CFR 60.41). Therefore, NRC would like to discuss the basis for DOE's change.