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MINUTES

U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY

BI-MONTHLY MANAGEMENT MEETING

SEPTEMBER 21, 1994

On September 21, 1994, Staff from the U.S. Nuclear Regulatory Commission met with representatives of the U.S. Department of Energy (DOE) at NRC headquarters for a bi-monthly management meeting. These management meetings provide an opportunity for items of mutual concern in the high-level waste repository program to be discussed by NRC and DOE management in an open public forum. Representatives of the United States Nuclear Waste Technical Review Board, the Nuclear Energy Institute, the publication Radioactive Exchange, NRC and DOE contractors, the State of Nevada (NV), and Clark County, NV, also attended the meeting. The other Affected Units of Local Government were notified of the meeting, but did not attend. An attendance list is included as Attachment 1.

The first topic discussed was DOE's proposed program approach (PPA) for the high-level waste repository program. NRC staff concerns with the PPA's strong focus on site suitability and the potential for adverse affects on licensing were discussed. The DOE representatives explained that DOE is attempting to run a balanced program and that the PPA equally applies to all three major aspects of DOE's program: site suitability, the National Environmental Policy Act process, and licensing. Staff concerns were also raised with the way in which assessments for the 10 CFR Part 960 high-level findings and guidelines would be conducted. The staff had questions about how information related to the component parts of the findings and guidelines would be aggregated. Concerns regarding the treatment of potentially adverse and favorable siting conditions (PACs and FCs) were also raised by the staff. The DOE representatives explained that PACs and FCs would not be addressed on an individual basis for site suitability, but that they would be addressed in the license application. The DOE representatives also stated that more information would be available in the specific planning and implementation information on the PPA which had been originally scheduled for delivery to the staff by September 1994. However, it was noted that this information would be delayed for at least one month. (See Attachments 2-4)

There was also a discussion of the effect of the PPA on study plans and a DOE plan to consolidate SCP and Study Plan work. The DOE representatives reported that DOE plans to transfer and/or aggregate work scopes into study plans that are natural homes and that already are DOE-approved, or those that are still to be developed. These plans are discussed in Attachment 5. Attachment 6 provides specific details at the individual study plan level. The NRC staff will be prepared to review and comment on these plans when they appear in a Site Characterization Plan Progress Report.


The DOE representatives described an ambitious program for development and submittal of requests for certification of multi-purpose canisters (MPC's) for storage, transportation, and disposal. The NRC staff raised concerns with several areas, particularly with the need to ensure that an MPC for disposal was compatible with the other aspects of the repository system. Furthermore,

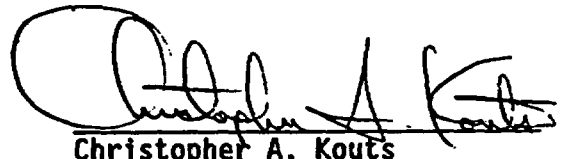
the staff explained that DOE's schedules for certification of certain casks did not account for the time necessary for the rulemaking process required for storage casks under 10 CFR Part 72.

The DOE representatives proposed that more flexibility be provided in scheduling NRC/DOE meetings. The staff noted that it supported this idea. The staff did note that existing NRC/DOE agreements to ensure adequate participation and noticing should still be honored but that exceptions were permitted. The NV representative reminded the participants that the procedures were instituted for a good reason and that care needed to be taken that flexibility did not lead to abuse. DOE also suggested that expanded use of video-conferencing could be a way of allowing greater participation by NRC and DOE staff. It would also provide a vehicle for increased access for NV, the Affected Units of Local Government, and the public at large. It was noted that NRC does not yet have video-conferencing facilities available, but DOE and NV do. The DOE representatives offered the use of their facilities for meetings until NRC's facilities are available. It was also agreed that an attempt would be made to develop a six-month calendar of all high-level waste program-related meetings. An attempt would be made to determine if compatible software existed which both organizations could use.

Finally, NRC and DOE documents, priorities, and products were discussed. See Attachments 7-10 for the details. One area in which both organizations agree that communications need to be improved is the topical report process. It was agreed that a meeting/video-conference would be held on October 7, 1994, at which the NRC staff would explain the reasons it requested additional comments on the Erosion Topical Report and rejected the Seismic Topical Report. This will be followed, on or before December 6, 1994 (the date of the next management meeting) with a "lessons learned" session at which the NRC and DOE participants would discuss how to improve communication and coordination in the topical report process.

A list of the commitments made by the NRC staff and DOE representatives is included as Attachment 11.¹⁰


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 Christopher A. Kouts
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cc List for R. Milner Lettter dated November 16, 1994

R. Loux, State of Nevada
T. J. Hickey, Nevada Legislative Committee
J. Meder, Nevada Legislative Counsel Bureau
R. Nelson, YMPO
M. Murphy, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO
P. Niedzielski-Eichner, Nye County, NV
B. Mettam, Inyo County, CA
V. Poe, Mineral County, NV
F. Mariani, White Pine County, NV
R. Williams, Lander County, NV
L. Fiorenzi, Eureka County, NV
J. Hoffman, Esmeralda County, NV
C. Schank, Churchill County, NV
L. Bradshaw, Nye County, NV
W. Barnard, NWTRB
R. Holden, NCAI
E. Lowery, NIEC
S. Broccum, YMPO

LIST OF ATTACHMENTS TO ENCLOSURE

- 1. Sign-In Sheet for NRC/DOE Management Meeting**
- 2. DOE Slides: Explanation of Draft Site Suitability Evaluation Process**
- 3. DOE Slides: Update on Five-Year Plan**
- 4. DOE Slides: Favorable and Potentially Adverse Conditions**
- 5. DOE Slides: SCP/Study Plan Work Scope Consolidation**
- 6. DOE Slides: SCP/Study Plan Actions**
- 7. DOE Slides: Review of Past Actions Items**
- 8. DOE Documents and Priorities Slides**
- 9. DOE Slides: Status of DOE Products**
- 10. Commitments Reached at 9/21/94 NRC/DOE Mgt. Meeting**

9/21/94

NRC/DOE MANAGEMENT MEETING

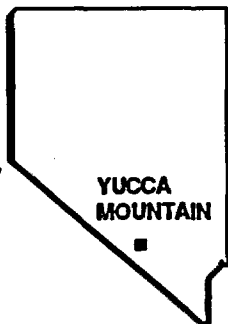
NAME	ORG	Phone
MARK DELLEGATTI	DWM/NMSS/NRC	(301) 415-6620
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Tom Byrstedt	DOE/YMP	(702) 794-7590
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RONALD MILNER	DOE/HQ	(202) 586-9694
Late Barrett	DOE/RLW	702 586-6850
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Stephen Brown	DOE/H2	(702) 794-7971
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MALCOLM KNAPP	DWM/NMSS/NRC	(201) 415-7437
RALPH ANDERSEN	NEI	(202) 739-8111
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Robert L. Johnson	DWM	(301) 415-7282
PHILIP JUSTUS	NMSS/DWM/ENGB	301 415 6715
DAVID BROOKS	NMSS/DWM/PRRT	301 415 7284
Keith McConnell	NRC/OCM/IS	301 504 1750
DAN FEHRINGER	NWTRB	703 235 4473
DON LOOSLEY	NMSS/PMBA	301 415-7809
JOHN L. RUSSELL	CNWR	702/416-1129
Jean Yunker	M30/TRW	702 794 7650
JAN DOCKA	Weston	202 1646-6420
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Karen Younisk	Radioactive Exchange	202-223-8949

((OVER))

<u>Name</u>	<u>Org</u>	<u>Phone</u>
Bill Reemer	NRC	504-1640
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Chris Einberg	DOE/RW-36	(202) 586-8869
Dave Fenster	M&O/Woodward-Clyde	(301) 204-8866 (202) 488-2303
NORMAN SIMMS	M&O/DKKE	(702) 794-2324
Sophia Angelini	DOE/GC-52	(202) 586-0319
E.V. TIESSENHUSEN CLARK COUNTY		702 453-5175
Steve Frushman	State of NV	702-687-3744
Bill Lake	DOE/RW-46	202-586-2840

U.S. DEPARTMENT OF ENERGY

**DOE
M**



YUCCA MOUNTAIN

SITE CHARACTERIZATION

PROJECT

EXPLANATION OF DRAFT SITE SUITABILITY EVALUATION PROCESS

**PRESENTED TO
DOE-NRC MANAGEMENT MEETING**

**PRESENTED BY
DR. THOMAS W. BJERSTEDT
ACTING LICENSING TEAM LEADER**



**SEPTEMBER 21, 1994
ROCKVILLE, MD**

TOPICS

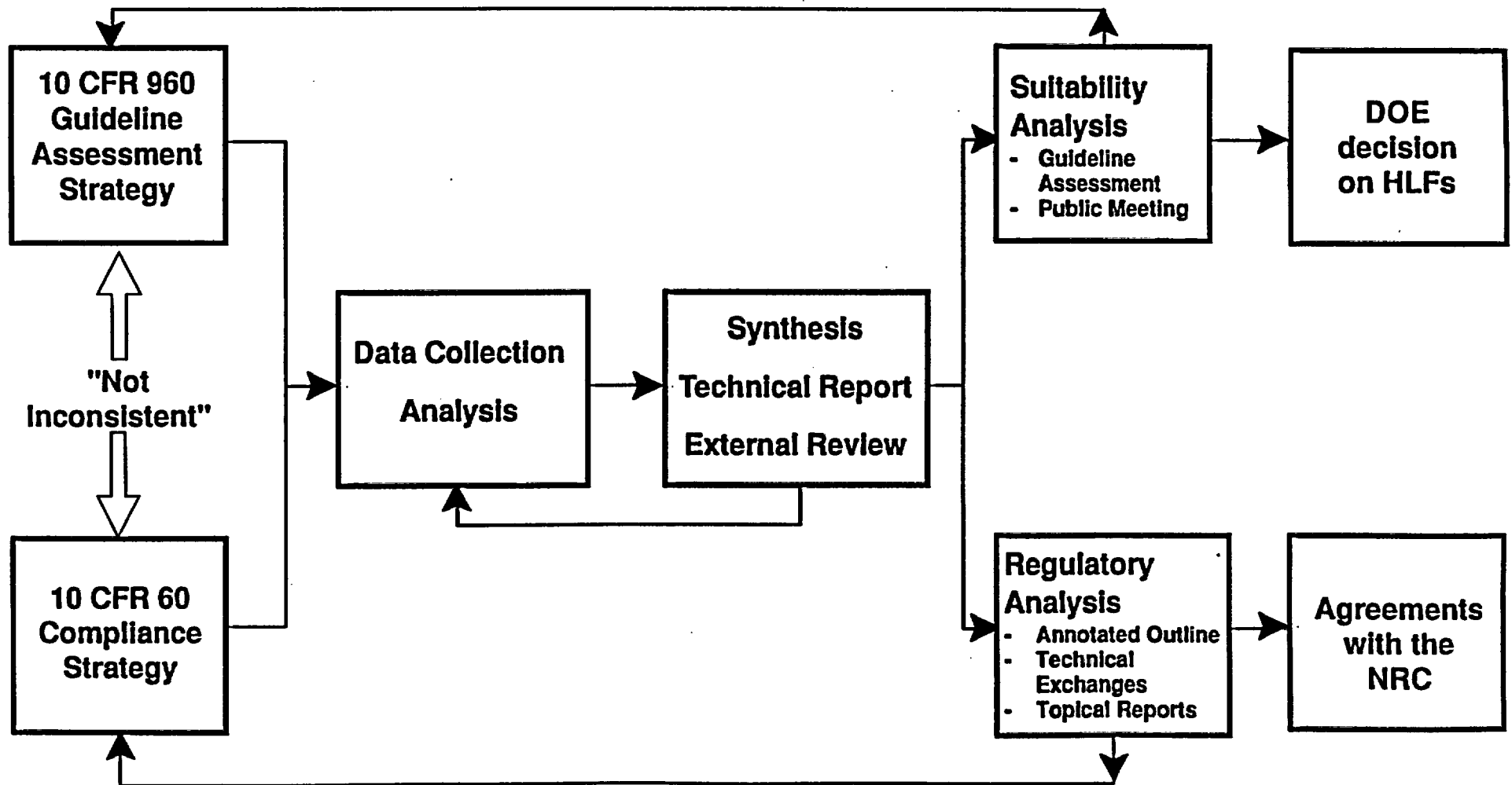
- **Background**
- **Siting Guidelines**
- **Stakeholder Interactions**
- **Process Overview**

BACKGROUND

Major components of the Repository Program

- **Site Evaluation (10 CFR 960)**
- **NEPA Compliance (10 CFR 1021, 10 CFR 51)**
- **Licensing (10 CFR 60)**
- **Site Recommendation (NWPA)**
- **Repository/EBS Design**

Conceptual Model of Suitability/ Licensing Interface



SITING GUIDELINES

(CONTINUED)

- **Decision by OCRWM Director to use the guidelines as they are currently written**
- **Subject to the programmatic changes and reconfiguration provided in the Nuclear Waste Policy Act (NWPA), as amended**
- **Consistent with approach discussed in Site Characterization Plan (SCP)**

STAKEHOLDER INTERACTIONS

Department of Energy (DOE) has held extensive discussions and interactions with a broad range of stakeholders about DOE's policy, plans and process for determining the suitability of Yucca Mountain as a repository site, including:

- Strategic Principles Workshops (December 1990, January 1991, April 1991, and October 1991)**
- Early Site Suitability Evaluation (January 1992)**
- Stakeholder Forum held by the Director of OCRWM (May 8, 1992)**

STAKEHOLDER INTERACTIONS

(CONTINUED)

- **Meetings with the Affected Units of Government (October and December 1993 and February and March 1994)**
- **Public workshop in Las Vegas (May 1994)**
- **Public workshops in Las Vegas and Washington (August 1994)**

PROCESS OVERVIEW

Development of this process is subject to public review through written comments, meetings and workshops and to revision on the basis of that review

PROCESS OVERVIEW

(CONTINUED)

Characteristics of the process

- **Open and sequential**
- **Documents evidence and rationale for DOE decisions**
- **Evaluation of individual guideline conditions or groups of guideline conditions as the relevant data, analyses and facility designs become available**
- **Clear separation between technical information and an assessment of adequacy to support DOE decisions**
- **Predecisional public involvement at key points in the evaluation sequence**

PROCESS OVERVIEW

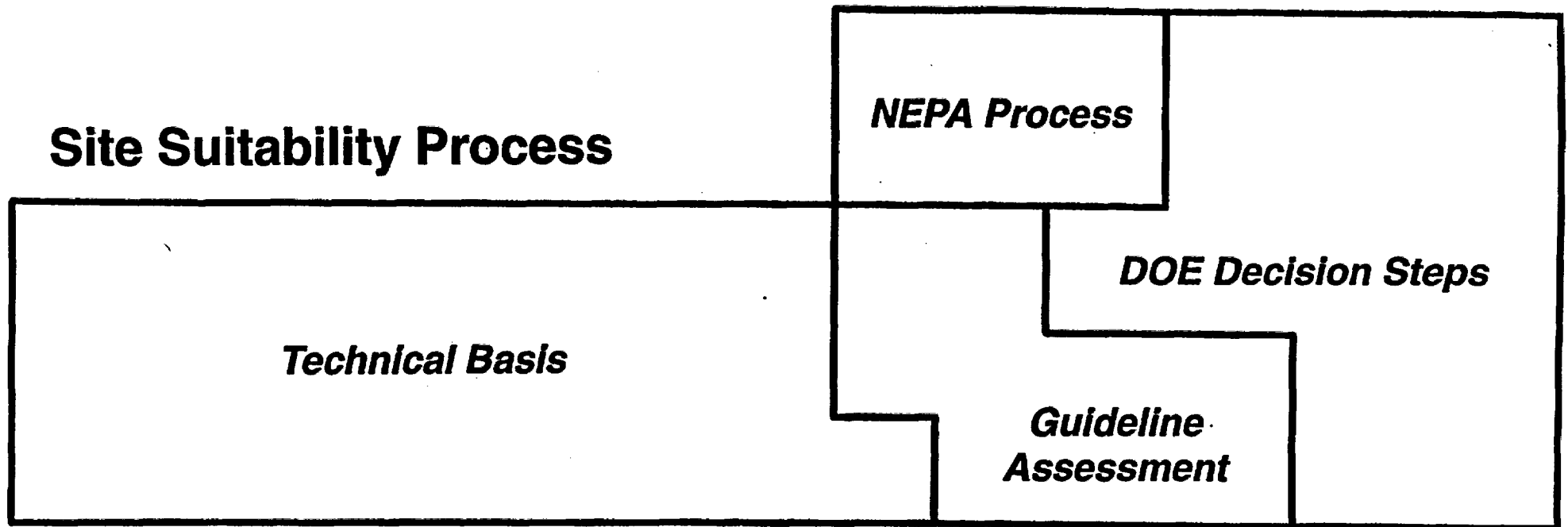
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Proposed process has three main elements:

- 1. Development and review of the technical basis for DOE decision-making**
- 2. Development and review of assessments of conformance with the siting guidelines and**
- 3. DOE decisions on higher-level findings, technical site suitability (TSS) and overall suitability**

Interface with the NEPA process (technical information and guideline assessments on environmental quality, transportation and socioeconomics)

Site Suitability Process



Site Suitability Process

The process is divided into two main sections: **Technical Basis** and **Guideline Assessment**.

Technical Basis:

- Starts with **Prepare Data (Site Design)**.
- Followed by **Analysis: Contaminant Assessments**.
- Then **Prepare Draft Technical Basis**.
- Then **Internal DOE Review**.
- Decision: **Draft Technical Basis Adequate?**
 - If **NO**, loop back to **Prepare Data (Site Design)**.
 - If **YES**, proceed to **External Peer Review**.
- Then **DOE Evaluation Peer Review Results**.
- Decision: **Issue Forward?**
 - If **NO**, loop back to **Prepare Data (Site Design)**.
 - If **YES**, proceed to **NEPA Process**.

Guideline Assessment:

- NEPA Process** (includes **Technical Information and Guideline Assessments on Environmental Quality, Transportation and Socioeconomics**).
- Decision: **NEPA on SLP**.
 - If **YES**, proceed to **Technical Basis Adequacy?**.
 - If **NO**, proceed to **SLP Position?**.
- Decision: **Technical Basis Adequacy?**.
 - If **YES**, proceed to **Overall Suitability?**.
 - If **NO**, proceed to **Higher Level Finding?**.
- Decision: **SLP Position?**.
 - If **YES**, proceed to **Higher Level Finding?**.
 - If **NO**, proceed to **Overall Suitability?**.
- Decision: **Higher Level Finding?**.
 - If **YES**, proceed to **DOE Recommendations Further Action**.
 - If **NO**, proceed to **Overall Suitability?**.
- Decision: **Overall Suitability?**.
 - If **YES**, proceed to **DOE Recommendations Further Action**.
 - If **NO**, proceed to **Recommend Site?**.
- Decision: **Recommend Site?** (includes **Other Information**).
 - If **YES**, proceed to **DOE Recommendations Further Action**.
 - If **NO**, loop back to **Higher Level Finding?**.

DOE Decision Steps:

1. Attendance to Task Force (if necessary)
2. Final Guideline Assessment and Recommendation
3. Discussion of Comments

Public Workshop and **Comment Period** are also part of the Guideline Assessment phase.



TECHNICAL BASIS FOR EVALUATING SITE SUITABILITY

GENERAL CONSIDERATIONS

- **Data needs for technical basis reports derived from the guidelines**
- **Focused primarily on guidelines covered in the SCP, which are the basis for the DOE TSS decision**
 - **Postclosure guidelines related to waste isolation; and**
 - **Preclosure guidelines related to radiological safety and technical feasibility**
- **Separate development and review of the technical basis facilitates a purely technical review**

TECHNICAL BASIS DOCUMENTATION

Technical basis reports will:

- **Discuss the available data and analyses**
- **Present a current understanding of the subject area, including evaluations of:**
 - **uncertainties**
 - **credible alternative models or interpretations permitted by the data**
 - **bounds on conditions and processes consistent with the current understanding**
- **Contain Executive Summary written for the layperson**

EXTERNAL REVIEW

- **The National Academy of Science (NAS) will determine the scope for peer reviews considering DOE's recommendations**
- **DOE will use peer review to ensure the quality of our technical work, build scientific consensus, and help improve public trust and confidence**

EXTERNAL REVIEW

MANAGING THE PEER REVIEW PANEL

Questions for peer reviewers:

- **Have the data been collected and analyzed in a technically acceptable manner?**
- **Do the data, given the associated uncertainties, support the interpretations and conclusions made within the report?**
- **Are there credible alternative interpretations that would significantly alter the conclusions reached?**
- **What testing, if any, would discriminate between alternative interpretations and how effective would it be in reducing uncertainties?**



GUIDELINE ASSESSMENTS

GENERAL CONSIDERATIONS

- **For each qualifying and disqualifying condition, the DOE must ultimately make a higher-level finding**
- **A higher-level finding requires an assessment of a qualifying or disqualifying condition, and a conclusion that the assessment is not likely to change**

DEVELOPMENT OF THE GUIDELINE ASSESSMENT

- **DOE will determine whether the evidence is sufficient to support a higher-level finding with respect to a particular guideline condition based on:**
 - **Technical basis**
 - **External review of the technical basis**
 - **Other information as appropriate**

DEVELOPMENT OF THE GUIDELINE ASSESSMENT

(CONTINUED)

- **A guideline assessment will document the results of DOE's evaluations:**
 - **Present an analysis of the technical basis**
 - **Present compliance arguments**

DEVELOPMENT OF THE GUIDELINE ASSESSMENT

(CONTINUED)

- **Guideline assessments:**
 - **Present DOE staff analyses of the available information relevant to a particular guideline condition**
 - **Comprise a part of the basis required for making a decision by the Director of OCRWM**
 - **Contain recommendations to the OCRWM Director for guideline findings**

EXTERNAL REVIEW OF THE GUIDELINE ASSESSMENT

- **DOE will publish a Federal Register Notice of the draft guideline assessment availability for public review and comment**
- **DOE will hold public workshops on the guideline assessments during the public comment period to:**
 - **Provide an open forum to discuss the technical basis and the draft guideline assessments**
 - **Provide for active predecisional public involvement**

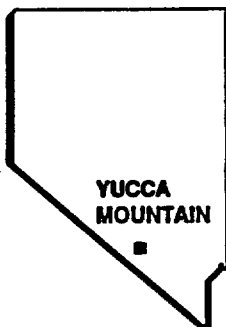
EXTERNAL REVIEW OF THE GUIDELINE ASSESSMENT

(CONTINUED)

- **The draft guideline assessment may be revised based on comments received**
- **An external review summary will be part of the record developed in the suitability process**

U.S. DEPARTMENT OF ENERGY

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YUCCA MOUNTAIN

SITE CHARACTERIZATION

PROJECT

UPDATE ON 5-YEAR PLAN

PRESENTED TO

DOE-NRC MANAGEMENT MEETING

PRESENTED BY

STEPHAN J. BROCOUM

**ASSISTANT MANAGER
SUITABILITY AND LICENSING**



**SEPTEMBER 21, 1994
ROCKVILLE, MD**

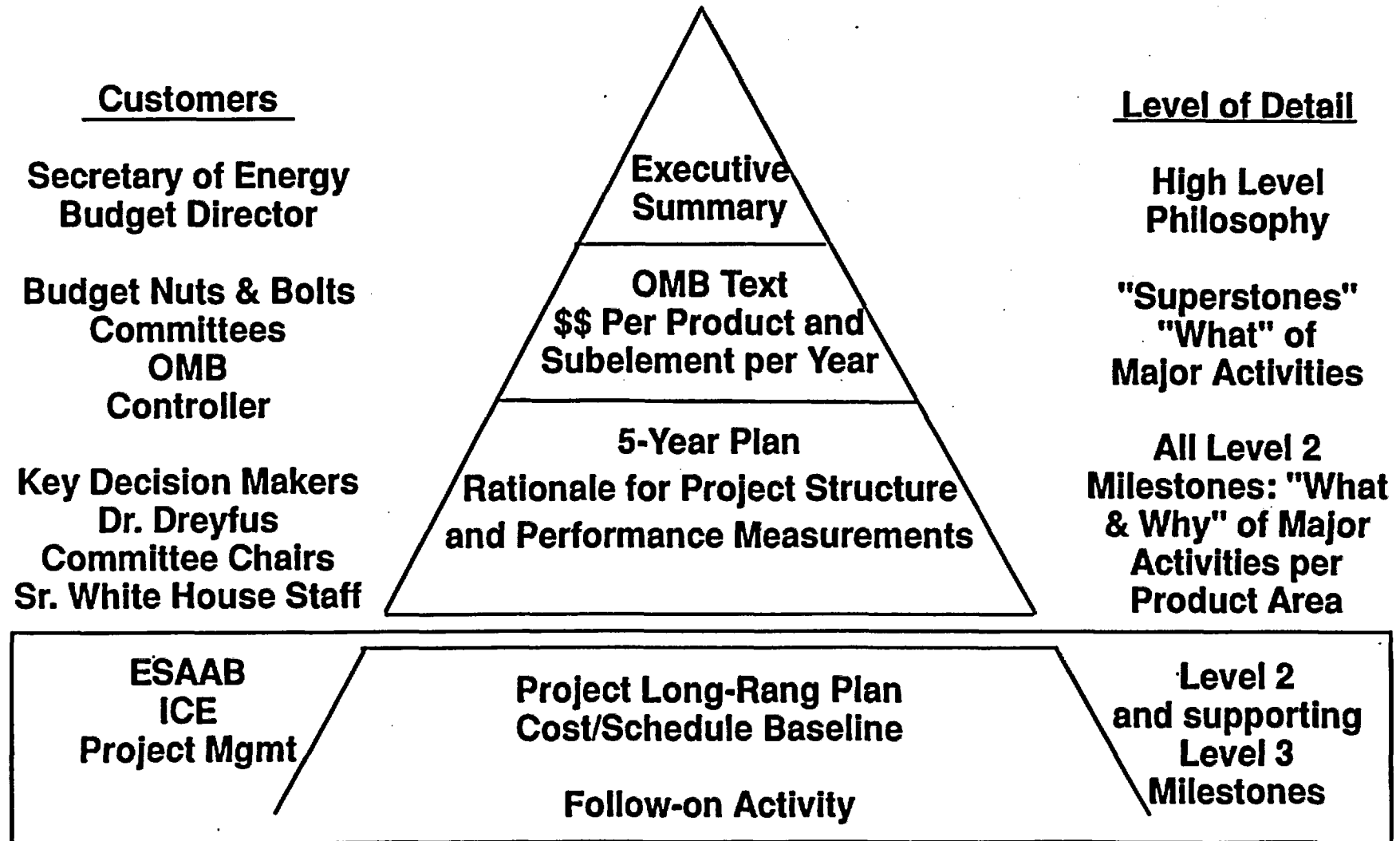
OUTLINE

- **Background**
- **Key features of plan**
 - **Site suitability**
 - **NEPA**
 - **Licensing**

BACKGROUND

- **Plan initiated to support FY96 OMB budget submission**
- **Further elaboration of proposed program approach**
- **Traditional 15-element WBS submission restructured to reflect the four major product areas:**
 - **Site suitability**
 - **National Environmental Policy Act activities**
 - **Licensing**
 - **Management and compliance**
- **Plan is currently undergoing OCRWM review**
- **Plan will form the basis for more detailed long-range planning to be conducted in FY95**

Organization Of 5-Year Submission



KEY FEATURES OF PLAN

Proposed Site Suitability Decision Schedule

PRECLOSURE RADIOLOGICAL SAFETY

- Report
- Peer Review

HLF Reg. Assessment

SURFACE PROCESSES

- Report
- Peer Review

HLF Reg. Assessment

PRECLOSURE ROCK CHARACTERISTICS

- Report
- Peer Review

HLF Reg. Assessment

TECTONICS

- Report
- Peer Review

HLF Reg. Assessment:

Postclosure Tect DSQ & Precl Tect QC and DSQ

REASONABLY AVAILABLE TECHNOLOGY:

HLF Reg. Assessment

GEOCHEM/POSTCLOSURE ROCK CHARACTERISTICS

- Report
- Peer Review

HLF Reg. Assessment: DSQS Human Intrusion/Nat. Resources

GEOHYDROLOGY/TRANSPORT

- Report
- Peer Review

HLF Reg. Assessment: Ground Water Travel Time DSQ

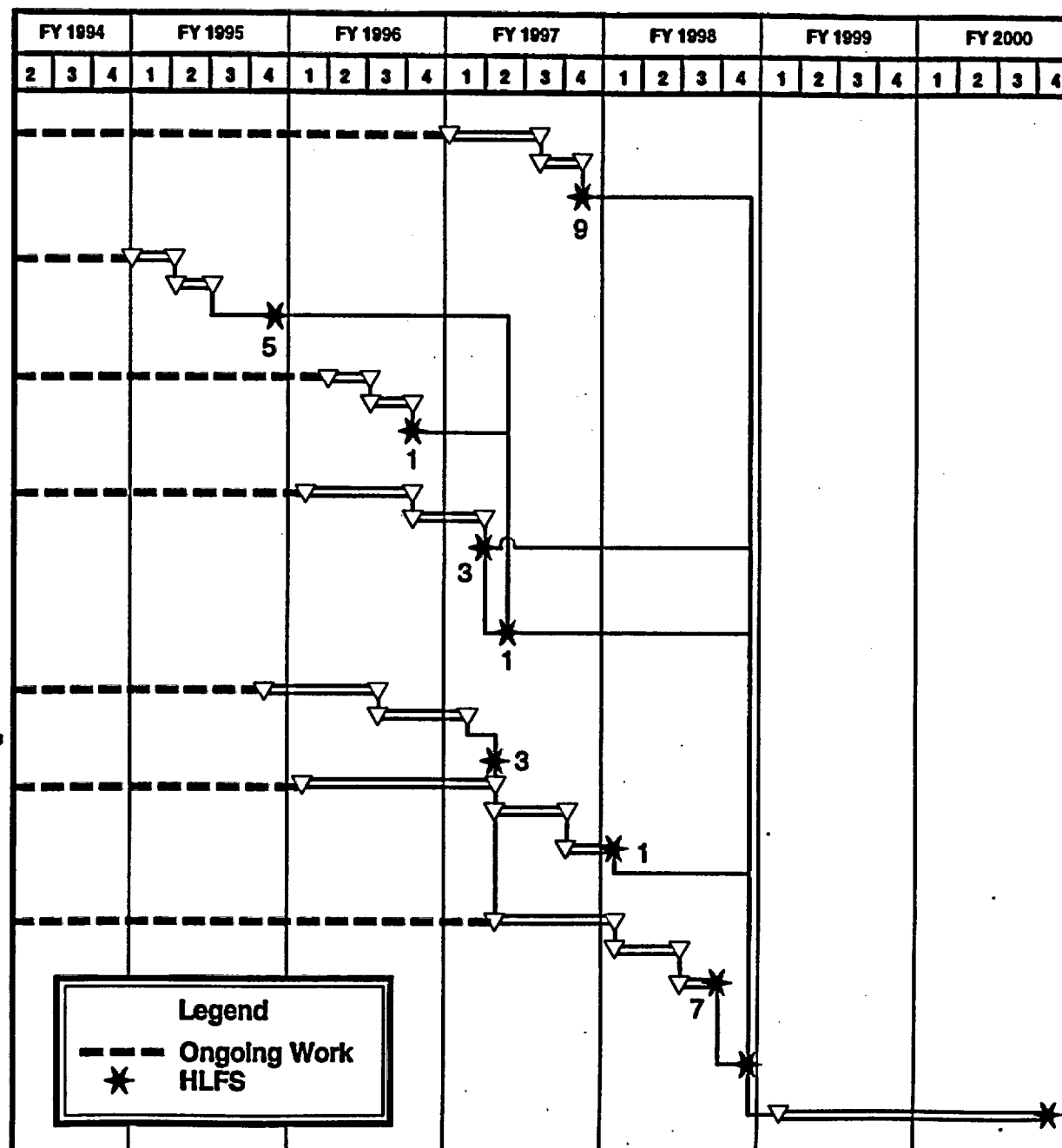
TOTAL SYSTEM PERFORMANCE ASSESSMENT

- Report
- Peer Review

HLF Reg Assmnt on Postclosure Syst. & all remaining Postclosure QCs (Geohyd, Geochem, Rock Char, Climate, Tect)

TECH. SITE SUITABILITY EVALUATION

**PREPARE SITE RECOMMENDATION REPORT
& AFFIRM PREVIOUS FINDINGS**



KEY NEPA MILESTONES

<u>Date</u>	<u>Milestone</u>
Mar 1995	Publish Notice of Intent and conduct public scoping
Jan 1996	Issue EIS Implementation Plan
Oct 1997	Issue baseline data reports
Apr 1998	Issue Preliminary Draft EIS
Sep 1998	Issue draft EIS
Nov 1999	Issue comment response document
Sep 2000	Complete final EIS, publish record of decision

KEY LICENSING ASSUMPTIONS/FEATURES

- **A new EPA standard (and associated Part 60 revisions) will be available in a timely manner**
- **Repository Title I (preliminary) design will include both a high and low thermal loading, with an appropriate range selected as the basis for the LA**
- **Two years of heater test data will be available for LA**
 - **Tests may be conducted in alcove off North Ramp rather than North Ramp extension**
- **Waste Package Title II (final) design will be available for LA**

KEY LICENSING MILESTONES

- FY1996 • LA Annotated Outline, Rev. 1 (full implementation)**
 - Seismic Design Input Topical Report**
 - Initial Burn-up Credit and Long-term Criticality Topical Report**
 - GWTT Methodology Topical Report**

- FY1997 • LA Annotated Outline, Rev. 2**
 - Process Models Topical Report**
 - Interim Burn-up Credit and Long-term Criticality Topical Report**
 - LSS development completed**

- FY1998 • LA Annotated Outline, Rev. 3**
 - Postclosure Tectonics Hazard Assessment Topical Report**
 - Subsystem Models Topical Report**
 - Final Burn-up Credit and Long-term Criticality Topical Report**

KEY LICENSING MILESTONES

(CONTINUED)

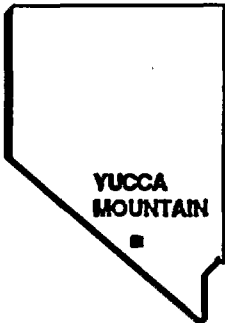
- FY1999**
 - **LA Annotated Outline, Rev. 4**
 - **Dose Assessment/Radiological Release Methodologies Topical Report**
 - **TSPA Model Topical Report**
 - **DOE requests certification from LSS Administrator**

- FY2000**
 - **LA Annotated Outline, Rev. 5**
 - **Waste Package Production Technology Topical Report**
 - **DOE requests NRC's preliminary sufficiency comments for SRR**

- FY2001**
 - **License Application submittal**

U.S. DEPARTMENT OF ENERGY

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SITE CHARACTERIZATION

PROJECT

FAVORABLE AND POTENTIALLY ADVERSE CONDITIONS

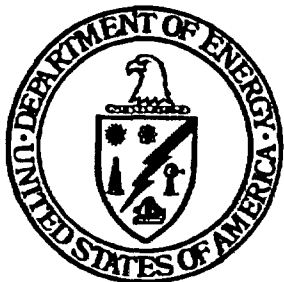
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STEPHAN J. BROCOUM

ASSISTANT MANAGER FOR SUITABILITY AND LICENSING



**SEPTEMBER 21, 1994
ROCKVILLE, MD**

NRC SITING CRITERIA, 10 CFR 60.122

- **Specifies favorable and potentially adverse conditions (FCs and PACs) that must be explicitly evaluated in DOE's license application**
- **DOE fully intends to satisfy this requirement**
 - **Discussed in SCP**
 - **Reflected in LA Annotated Outline**

DOE SITING GUIDELINES, 10 CFR 960

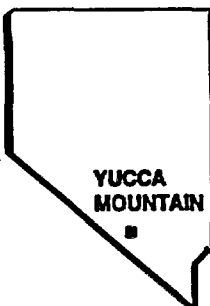
- **FCs and PACs in 10 CFR 960 were intended to be used primarily during site screening**
 - Provide preliminary indications of system performance
 - Help determine most effective use of available resources
 - FCs and PACs were evaluated in Environmental Assessment (1986)
- **Explicit evaluations of FCs and PACs are not required at site recommendation stage**
 - Sufficient information will be available to directly evaluate site performance against qualifying and disqualifying conditions
- **Specific findings relative to FCs and PACs are not required**
- **DOE will make findings only on the qualifying and disqualifying conditions**

SUMMARY

- **While explicit evaluation of FCs and PACs will not be conducted for 10 CFR 960 compliance, they will be evaluated for 10 CFR 60 compliance**

U. S. DEPARTMENT OF ENERGY

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SITE CHARACTERIZATION

PROJECT

SCP/STUDY PLAN WORK SCOPE CONSOLIDATION

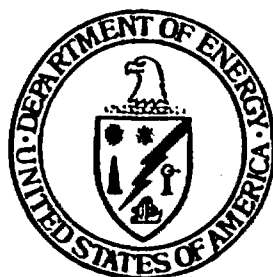
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PRESENTED BY

DR. THOMAS BJERSTEDT

ACTING LICENSING TEAM LEADER



**SEPTEMBER 21, 1994
ROCKVILLE, MD**

SCOPECON.1.PPT.125/9-21-94

BRIEFING PURPOSE

- **Provide NRC management with DOE's insights and rationale for how to achieve greater efficiencies in site characterization planning documentation as well as in the conduct of these investigations**
- **DOE has never stated what SCP sections warrant study plans, nor has NRC stated for what SCP sections study plans are expected**

DOE/NRC AGREEMENTS ON SCP STUDY PLANS

A DOE/NRC Management Meeting on May 7-8, 1986, and a subsequent agreement, defined what study plans were expected to be and their general level of detail

- **Amendments were made on December 1988**
- **A complete re-write took place in March 1994**

General Purpose for Study Plans:

- **Study Plans are meant to amplify and elaborate on the technical planning in the 1988 SCP**
- **Study Plans explain the tests, analyses, and syntheses that DOE undertakes for site characterization**

WRITE PLANNING DOCUMENTS vs. DOCUMENT WHAT WAS DONE

- **DOE is shifting from planning a site characterization program to conducting and completing that program and providing the documentation on how it was done**
- **NRC has the option to review the planning documentation for this work, in whatever form it is produced by YMSCO, (i.e. Test Planning Packages, Job Packages, Waste Isolation and Test Interference Analyses)**
 - **Good communication with the ORs is important in this respect**

A THOUGHTFUL LOOK AT SOME SCP SECTIONS SHOWS THEY ARE NOT AMENABLE TO STUDY PLANS

Many SCP sections in 8.3.1, for which study plans have yet to be prepared describe one, or a combination of the following things:

- 1) Compile, collect (collect paper not data), and reformat existing information from inside or outside the DOE's program;**
- 2) Analyze or synthesize work carried out under other site characterization studies to provide the basis for various recommendations;**
- 3) Describe work scopes that are very small; Some SCP sections identify small pieces of work which were not identified for study plans because the cost to write, review, approve, and administer a study plan would be more than to conduct the work**
- 4) There are SCP sections that appear for the sake of completeness, but that are not needed based on what we have learned at the site, or other changes in the program**
- 5) Describe management or coordination activities for which some type of management plan would be more appropriate**

LIST OF SCP SECTIONS FOR WHICH STUDY PLANS HAVE YET TO BE PREPARED

- 8.3.1.2.2.4 R4 - Activity 3 (Bulk Permeability) /USGS
- 8.3.1.2.3.1 RI - Activity 8 (Radioactive Tracers Throughout the Site)/ LANL
- 8.3.1.3.3.1 Natural Analog of Hydrothermal Systems in Tuff/LLNL**
- 8.3.1.3.3.3 Conceptual Model of Mineral Evolution/LANL
- 8.3.1.3.7.2 Demonstration of Applicability of Lab Data to Repository Trans Calc/LANL
- 8.3.1.3.8.1 Gaseous Radionuclide Transport Calculations and Measurements/LANL**
- 8.3.1.4.2.3 3D Geologic Model/USGS
- 8.3.1.5.1.5 Paleoclimatic-Paleoenvironmental Synthesis/USGS
- 8.3.1.6.1.1 Distribution and Characterization of Present and Past Erosion/USGS**
- 8.3.1.6.2.1 Influence of Future Climatic Conditions on Location and Rates of Erosion/USGS**

BOLD = SCP sections at issue this briefing

LIST OF SCP SECTIONS FOR WHICH STUDY PLANS HAVE YET TO BE PREPARED

(CONTINUED)

- | | |
|---------------------|--|
| 8.3.1.6.3.1 | Evaluation of the Effects of Future Tectonics on Erosion/USGS |
| 8.3.1.6.4.1 | Develop Topical Report on the Effects of Erosion/USGS |
| 8.3.1.8.5.3 | Investigate Folds in Miocene and Younger Rocks of the Region/USGS |
| 8.3.1.9.1.1 | Survivability of Surface Markers/M&O |
| 8.3.1.9.3.1 | Evaluation of Data to Assess Likelihood of Inadver Human Intrusion/M&O |
| 8.3.1.9.3.2 | Evaluate Effects of Exploitation of Natural Resources on Hydrologic Character/M&O |
| 8.3.1.15.1.6 | In-Situ Thermomechanical Properties/SNL |
| 8.3.1.15.1.7 | In-Situ Mechanical Properties/SNL |
| 8.3.1.15.2.1 | RI - Activity 1 (Anelastic Strain Recovery Experiments)/SNL |
| 8.3.1.16.2.1 | Location of Adequate Water Supplies/SAIC |

BOLD = SCP sections at issue this briefing

LIST OF SCP SECTIONS FOR WHICH STUDY PLANS HAVE YET TO BE PREPARED

(CONTINUED)

- | | |
|---------------|--|
| 8.3.1.16.3.1 | Determine Preclosure Hydrologic Conditions of UZ at Yucca Mtn/USGS |
| 8.3.1.17.1.1 | Potential for Ash Fall at the Site/LANL |
| 8.3.1.17.2.1 | Faulting Potential at the Repository/USGS |
| 8.3.1.17.3.2 | Underground Nuclear Explosion Sources/SNL |
| 8.3.1.17.3.6 | Probabilistic Seismic Hazard Analyses/USGS |
| 8.3.1.17.4.7 | Subsurface Geometry and Concealed Extensions of Quaternary Faults/USGS |
| 8.3.1.17.4.8 | Stress Field Within/Proximal to the Site Area/USGS |
| 8.3.1.17.4.9 | Tectonic Geomorphology of the Yucca Mountain Region/USGS |
| 8.3.1.17.4.11 | Characterization of Lateral Crustal Movements/USGS |
| 8.3.3.2.2.1 | Seal Material Properties Development/SNL |
| 8.3.1.20.1 | Characterization of the Altered Zone/LLNL
(new scope from 1988 SCP; not yet approved) |
| 8.3.3.2.2.3 | In Situ Testing of Seal Components
(new scope from 1988 SCP; not yet approved) |

BOLD = SCP sections at issue this briefing

HOW DOE WANTS TO PROCEED

The actions for each candidate SCP section would involve presenting a rationale for why a study plan need not be developed, such as:

- **Transfer and/or aggregate work scopes to study plans that are natural homes and that already are DOE-approved, or those that are still to be developed**
- **Report work that has already been completed in a participant report, DOE Technical Report or Working Paper to document this work**
 - **Reference: DOE's Technical Support Documentation Management Plan (Rev. 0; 1990); provided via ltr. (Shelor to Linehan, 4/30/91)**
- **Present other rationale for not developing a study plan**

DEFINITION OF A WORKING PAPER

“Technical documents specifically designed to focus discussion on selected topics in prelicensing interactions”

(p. 4: Technical Support Documentation Management Plan, Rev. 0, 1990)

THE NEXT STEPS

- **DOE to prepare the documentation to alter baseline documents,**
 - **Site Design and Test Requirements document, and**
 - **Site Characterization Program Baseline**
- **The explanations provided in the backup materials will be included in the "Forecast" sections for each affected SCP section in Site Characterization Progress Report 11**
 - **DOE will respond to comments and questions made by the NRC staff on the PR**

THE BACKGROUND MATERIALS CONTAIN 3 ATTACHMENTS

- **YMSCO actions on SCP sections/studies being consolidated**
- **Example for how YMSCO conducts planning for SCP section 8.3.1.4.1.2**
- **Explanation for YMSCO workscope consolidation between participant organizations (USGS, SAIC & EG&G)**

SCP/STUDY PLAN ACTIONS

**BACKUP MATERIAL FOR
DOE-NRC MANAGEMENT MEETING**

PREPARED BY
DR. THOMAS BJERSTEDT
U.S. DEPARTMENT OF ENERGY
SEPTEMBER 21, 1994

8.3.1.6 (Erosion Program)

Purpose: Identify rates and locations for erosion for post-closure assessment; design inputs for FITS and surface markers

- **There are 4 SCP sections that describe this program**

***ACTION:* No study plans to be developed**

RATIONALE FOR 8.3.1.6 ACTION:

Any additional work to be completed in response to NRC's comments/questions on the Extreme Erosion Topical Report will be performed under activity 1 of study plan 8.3.1.5.1.4 (Analysis of the Paleoenvironmental History)

- **No revision to study plan 8.3.1.5.1.4 needed**

8.3.1.3.3.1 (Natural Analog of Hydrothermal Systems in Tuff)

Purpose: Test EQ3/6 against selected hydrothermal systems to model natural altered mineral systems (zeolites and clays) in a system analogous to Yucca Mountain

- **There are no activities in this SCP section**

ACTION:

- **No study plan to be developed**
- **This work scope will be part of study plan 8.3.1.20.1 (Characterization of the Altered Zone)**
 - **8.3.1.20.1 is a new SCP study plan due at YMSCO on 10/1/94, for which baseline changes are now being made**

RATIONALE FOR 8.3.1.3.3.1 ACTION:

- **This work scope is a compilation exercise to select analog site(s) combined with a testing and/or calibration of EQ3/6**
- **It is not site characterization work, would not substitute for site-specific data, and has utility only in reducing uncertainties in EQ3/6 applications**

8.3.1.3.8.1 (Gaseous Radionuclide Transport Calculations and Measurements)

Purpose: Calculate the rates of transport of gaseous radionuclides species from the repository to the accessible environment

- **There are 2 activities in this SCP section**

ACTION:

- **No study plan to be developed**
- **If new work is needed, a new activity will be added to 8.3.1.3.6.1 (Dynamic Transport Column Experiments) or 8.3.1.3.6.2 (Diffusion)**

RATIONALE FOR 8.3.1.3.8.1 ACTION:

- **Until the NAS's report and subsequent rulemaking by EPA takes place, there is ambiguity regarding the need for greater attention than already exists for gaseous transport calculations**

Activity 8.3.1.4.1.1 (Development of an Integrated Drilling Program)

Activity 8.3.1.4.1.2 (Integration of Geophysical Activities)

Purpose: Integrate and prioritize surface-based drilling and geophysical surveys, identify information exchange

- **These SCP sections are defined as activities**

ACTION:

- **No study or activity plans to be developed**
- **No study or activity plans were ever intended to be developed**
- **An example of how YMSCO accomplishes the workscope in 8.3.1.4.1.2 is shown in the attachment by M.C. Tynan**

RATIONALE FOR 8.3.1.4.1.1 and 8.3.1.4.1.2 ACTIONS:

- **The need for, siting of, and planned applications in, boreholes and the types, and locations for geophysical surveys are planned with a management process that is visible**
 - **DOE's approach for activity 8.3.1.4.1.1 is the DOE's Borehole Catalog, which was just recently sent to NRC (ltr. Brocoum to Holonich, dtd. 8/26/94)**
 - **DOE's approach for activity 8.3.1.4.1.2 is the Geophysics Integration Team (Reference: June 8, 1993 technical exchange on geophysical test program)**

RATIONALE FOR 8.3.1.4.1.1 and 8.3.1.4.1.2 ACTIONS:

- **We provide for knowledge and oversight of this work through:**
 - **Technical exchanges and site visits**
 - **Briefings of impending field work during ESF technical meetings**
 - **On-Site Representative interactions**
 - **Site Characterization Progress Report discussion**
 - **YMSCO's Test Planning Packages and Job Packages for geophysical applications**
 - **NRC receives YMSCO participant monthly reports**
 - **OR's receive YMSCO's weekly interactions calendar containing a schedule for impending field testing**

8.3.1.8.5.3 (Investigation of Folds in Miocene and Younger Rocks in the Region)

Purpose: Establish the pattern, rate, amplitude and wavelength of post-Miocene folding in the region

- **There is 1 activity in this SCP section that relies on available data. No unique data to be acquired.**

ACTION:

- **No study plan to be developed**
- **Work scope transfer to study plan 8.3.1.8.2.1 (Tectonic Effects)**
 - **Revision 1 of study plan 8.3.1.8.2.1 (now in YMSCO review) will identify transfer**

8.3.1.9.1.1 (Evaluation of Natural Processes That Could Affect the Long-Term Survivability of the Surface Marker System)

Purpose: Identify candidate sites free of tectonic, seismic, volcanic, erosion, or depositional influences that would mitigate against survivability of surface markers

- **There are 2 activities in this SCP section that draw upon data collected from other studies. No unique data to be collected**

ACTION:

- **No study plan to be developed**
- **A DOE Working Paper will recommend candidate locations for surface markers, in the out-years**

RATIONALE FOR 8.3.1.9.1.1 ACTION:

- **Activity 1 extracts from 8.3.1.8.1.2 (Effects of a Volcanic Eruption Penetrating the Repository) and 8.3.1.8.2.1 (Analysis of Waste Package Rupture due to Tectonic Processes and Events), to perform the assessment for marker siting**
- **Activity 2 extracts from 8.3.1.6 Erosion Program, reported in the Extreme Erosion Topical Report and related work [e.g. surficial mapping and 8.3.1.5.14 (Paleoenvironmental History)]**

8.3.1.9.3.1 (Evaluation of Data Needed to Support an Assessment of the Likelihood of Future Inadvertent Human Intrusion at Yucca Mountain as a Result of Exploration and/or Extraction of Natural Resources)

Purpose: Stated in title

- **There are no activities in this SCP section. No unique data to be acquired.**

ACTION:

- **No study plan to be developed**
- **A DOE Working Paper will be developed to discuss input parameters for inadvertent intrusion**

RATIONALE FOR 8.3.1.9.3.1 ACTIONS:

- **Evaluating input parameters for the probability of inadvertent human intrusion for performance modeling is not as great an issue under the current program. Current assumptions for the probability of deliberate human intrusion in performance modeling are likely to be given as 1, or at least upper bounded at 1, based on WIPP experiences.**
- **A major input are results of study 8.3.1.9.2.1 (Natural Resource Assessment of Yucca Mountain)**
- **Other inputs to be acquired from existing study plans, or available data**

8.3.1.9.3.2 (Evaluation of the Potential Effects of Exploration for, and Extraction of, Natural Resources on the Hydrologic Characteristics at Yucca Mountain)

Purpose: Determine potential effect of future ground-water withdrawals on the hydrologic system, and identify non-credible human interference initiating events

- **There are 2 activities in the SCP dependent on the results from study plan 8.3.1.9.2.2 (Water Resource Assessment). No unique data to be acquired.**

ACTION:

- **No study plan to be developed**

RATIONALE FOR 8.3.1.9.3.2 ACTION:

- **Activity 1 applies a computer model to varying withdrawal assumptions. This work will be documented in the application of the computer model in a participant report or DOE Working Paper, which will include a series of input bounds for sensitivity analyses of the code.**
- **Activity 2 seeks to use a panel of experts to screen initiating events within the range of potential human interference. This work needs a management plan or other controlled process, but not a study plan.**

8.3.1.12 (Meteorology Program)

There are 4 investigations,

- 1) regional synthesis (1 SCP study)**
- 2) site-specific conditions (2 SCP studies)**
- 3) population distribution relative to winds (1 investigation)**
- 4) extreme weather phenomena (1 SCP study)**

ACTION:

- No study plans to be developed**
- The site-specific data-gathering aspect of this program has an NRC-accepted study plan (8.3.1.12.2.1; Meteorological Data Collection at the Yucca Mountain Site)**
- No study plans were ever intended to be developed for the remaining SCP sections in 8.3.1.12**

RATIONALE FOR 8.3.1.12 ACTION:

- **SCP section 8.3.1.12.1.2 calls for development of a plan to synthesize meteorological data and monitoring which will be expanded in scope to integrate the meteorology program's 4 studies/investigation**
- **The Management Plan for 8.3.1.12.1.2 will identify participant reports or DOE Working Papers to report the results of the analysis, synthesis, and compilation exercises that are described in the SCP**

8.3.1.15.2.1 (Characterization of the Site Ambient Stress Conditions)

Purpose: Determine horizontal stresses at Yucca Mountain and spatial variability of those stresses

- **There are 2 activities in this SCP section**

ACTION:

- **No further development to the existing study plan**
- **Scope of work to be transferred to study plan 8.3.1.15.1.5 (Excavation Investigations)**
 - **A revision to study plan 8.3.1.15.1.5 is not needed**

RATIONALE FOR 8.3.1.15.2.1 ACTION:

- **Activity 1: work scope is being deleted from the program. The proposed technique is not likely to work, would not be cost effective, and would be redundant with other planned approaches.**
- **Activity 2: NRC received revision 0 of activity 2 on 2/9/89, but did not review**
 - **The activity plan is outdated and will be decontrolled**
- **Scope of work for activity 2 has been transferred to 8.3.1.15.1.5**

8.3.1.16.2.1 (Location of Adequate Water Supply for Construction, Operation, Closure, and Decommissioning of a Mined Geologic Disposal System at Yucca Mountain)

Purpose: Under the premise that J-12 and J-13 are not sources for repository operations, determine where an alternative source(s) would be acquired

- **There are 2 activities in this SCP section that rely on existing data. No unique data to be acquired.**

ACTION:

- **No study plan to be developed**

RATIONALE FOR 8.3.1.16.2.1 ACTION:

- **Activity 1 seeks to compile what is known about the production histories of wells J-12 and J-13 from an extensive record**
 - **This work will be reported in a participant report or DOE Working Paper**
- **Activity 2 seeks to develop a primary water supply for repository operations that is closer to, and topographically higher than, FITS. The presumption is that J-12 or J-13 will not be used.**
 - **This work concerns repository construction and can be included as part of the work in support of a future design package for repository FITS as a standard engineering trade study**

8.3.1.17.1.1 (Potential for Ash-Fall at the Site)

Purpose: Design inputs for repository air-filter systems

- **There are 3 activities in this SCP section, all of which rely on data from other SCP studies, or available data**

ACTION:

- **No study plan to be developed**
- **This work has been completed and was documented in a 1987 LANL report which was referenced in the ESSE. Data are also discussed in the LANL Volcanism status report.**

8.3.1.17.2.1 (Faulting Potential at the Repository)

Purpose: Assess the stability of the site with respect to fault displacement and siting of FITS

- **There are 2 activities in this SCP section**

ACTION:

- **No study plan to be developed**
- **Work scope is to be transferred to study plan 8.3.1.17.3.6 (Probabilistic Seismic Hazard Assessment) and incorporated into revision 0**

8.3.1.17.3.2 (Underground Nuclear Explosion Sources)

Purpose: Assess the level of ground motion that could be experienced due to UNEs

- **There are 2 activities in this SCP section that rely on available data. No unique data to be acquired.**

ACTION:

- **No study plan to be developed**
- **This work is substantially complete and the results obtained need to be reported in a Sandia report or a DOE Working Paper**

8.3.1.17.4.7 (Subsurface Geometry and Concealed Extensions of Quaternary Faults)

Purpose: as stated

- **There are 8 activities in this SCP section**

ACTION:

- **No study plan to be developed**
- **Work scope to be carried out under existing studies**
 - **a revision to study plan 8.3.1.4.2.1 is needed**

RATONALE FOR 8.3.1.17.4.7 ACTION:

- **Field geophysical surveys critical to and analysis and assessment of the subsurface geometry and concealed extensions of Quaternary faults are to be carried out under study plan 8.3.1.4.2.1 (Characterization of Vertical and Lateral Stratigraphic Units)**
- **Geophysical surveys conducted for 8.3.1.4.2.1 will be examined as inputs for assessing concealed faults and subsurface geometries**
- **The implications of subsurface geometry and concealed extensions of Quaternary faults will be addressed as part of the sensitivity studies associated with study 8.3.1.17.3.6 (Probabilistic Seismic Hazard Assessment)**

8.3.1.17.4.9 (Tectonic Geomorphology of the Yucca Mountain Region)

Purpose: To document Quaternary uplift and subsidence and variation in the nature and intensity of Quaternary faulting in the Yucca Mountain region

- There are 3 activities in this SCP section

ACTION:

- No study plan to be developed
- Work scope has already been, or will be, carried out under
 - 8.3.1.5.1.4 (Analysis of the Paleoenvironmental History of Yucca Mountain),
 - 8.3.1.17.4.3 (Quaternary Faulting Within 100 km of Including Walker Lane), and
 - 8.3.1.17.4.12 (Tectonic Models and Synthesis)

RATIONALE FOR 8.3.1.17.4.9 ACTION

- **Activities 1 and 2 define a work scope documented in the Extreme Erosion Topical Report and that is still in progress through the surface mapping carried out under 8.3.1.5.1.4**
- **Revisions to 8.3.1.17.4.3 and 8.3.1.17.4.12 are needed to identify work scope transfer of activity 3**

8.3.1.17.4.11 (Characterization of Regional Lateral Crustal Movement)

Purpose: Evaluate rates and orientation of historical and current crustal strain in Basin Range and at Yucca Mountain

- **There is 1 activity in this SCP section, which will use available data. No unique data to be acquired.**

ACTION:

- **No study plan to be developed**
- **The scope of work is to be transferred to study plan 8.3.1.17.4.10 (Geodetic Leveling)**
- **A revision to study plan 8.3.1.17.4.10 is needed**

RATIONALE FOR 8.3.1.17.4.11 ACTION:

- **8.3.1.17.4.11 receives and evaluates information from 8.3.1.17.4.10**
- **8.3.1.17.4.10 is a natural home for this small work scope and is an outgrowth of this work**

**GEOPHYSICS INTEGRATION,
SITE CHARACTERIZATION
PLANNING PROCESS,
INITIATION OF FIELD ACTIVITIES**

**BACKUP MATERIAL FOR
DOE-NRC MANAGEMENT MEETING**

PREPARED BY
DR. MARK C. TYNAN
U.S. DEPARTMENT OF ENERGY
SEPTEMBER 21, 1994

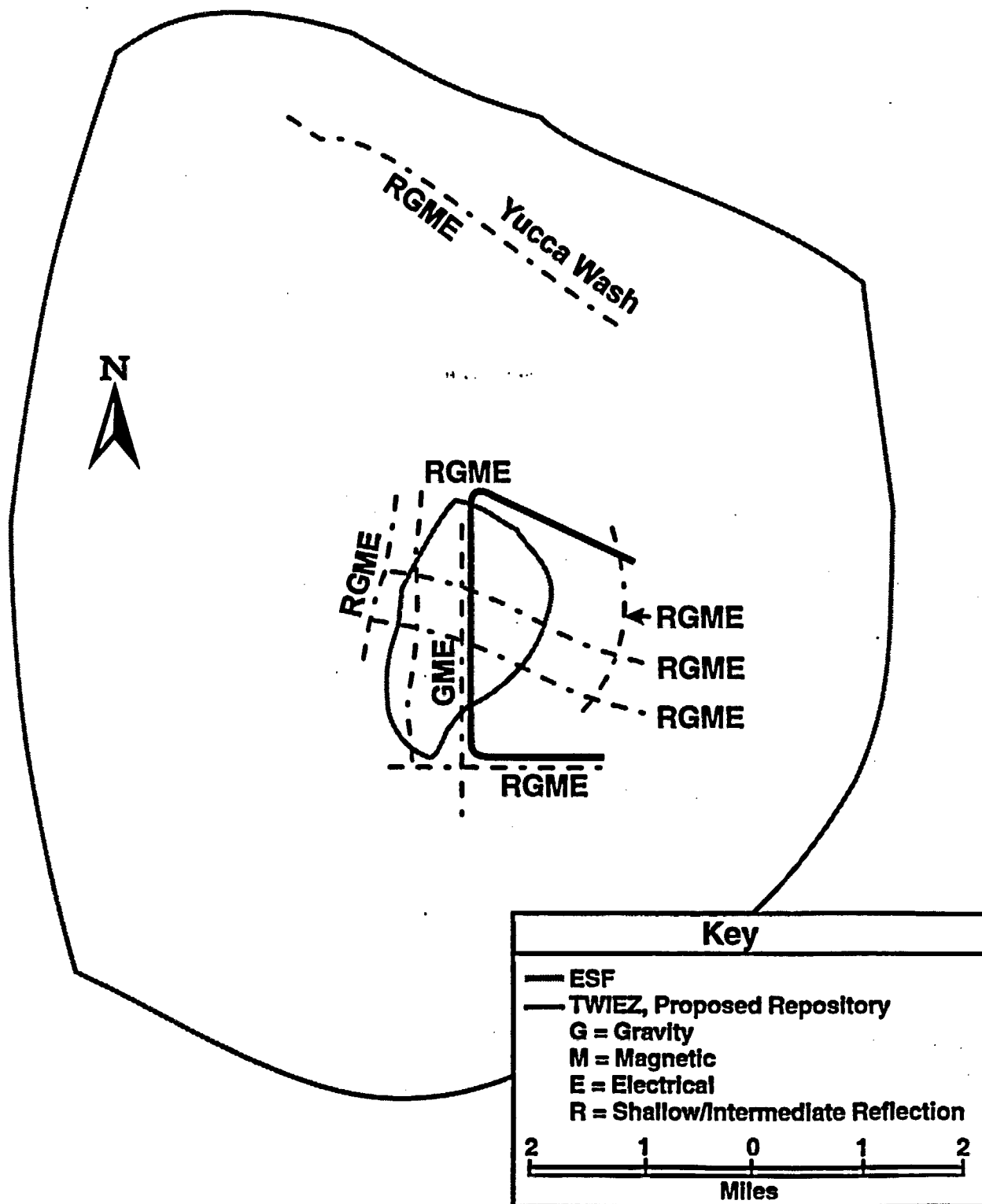
RESOLUTION

- INTEGRATED TESTING PROGRAM INITIATED, FY'93/94;
TO CONTINUE IN FY'95 AND BEYOND**
- STUDY PLAN 8.3.1.4.2.1 TO BE MODIFIED**
- TEST PLANNING AND JOB PACKAGES IN
PREPARATION: WILL CONSTITUTE PLANNING DOCUMENTS**
- NRC INFORMED OF PROPOSED TESTS AND SCOPE
CHANGES THROUGH THIS AND OTHER FORUMS
(Technical exchanges, Site Visits, Site Rep.; Semiannual
Reports, Other)**

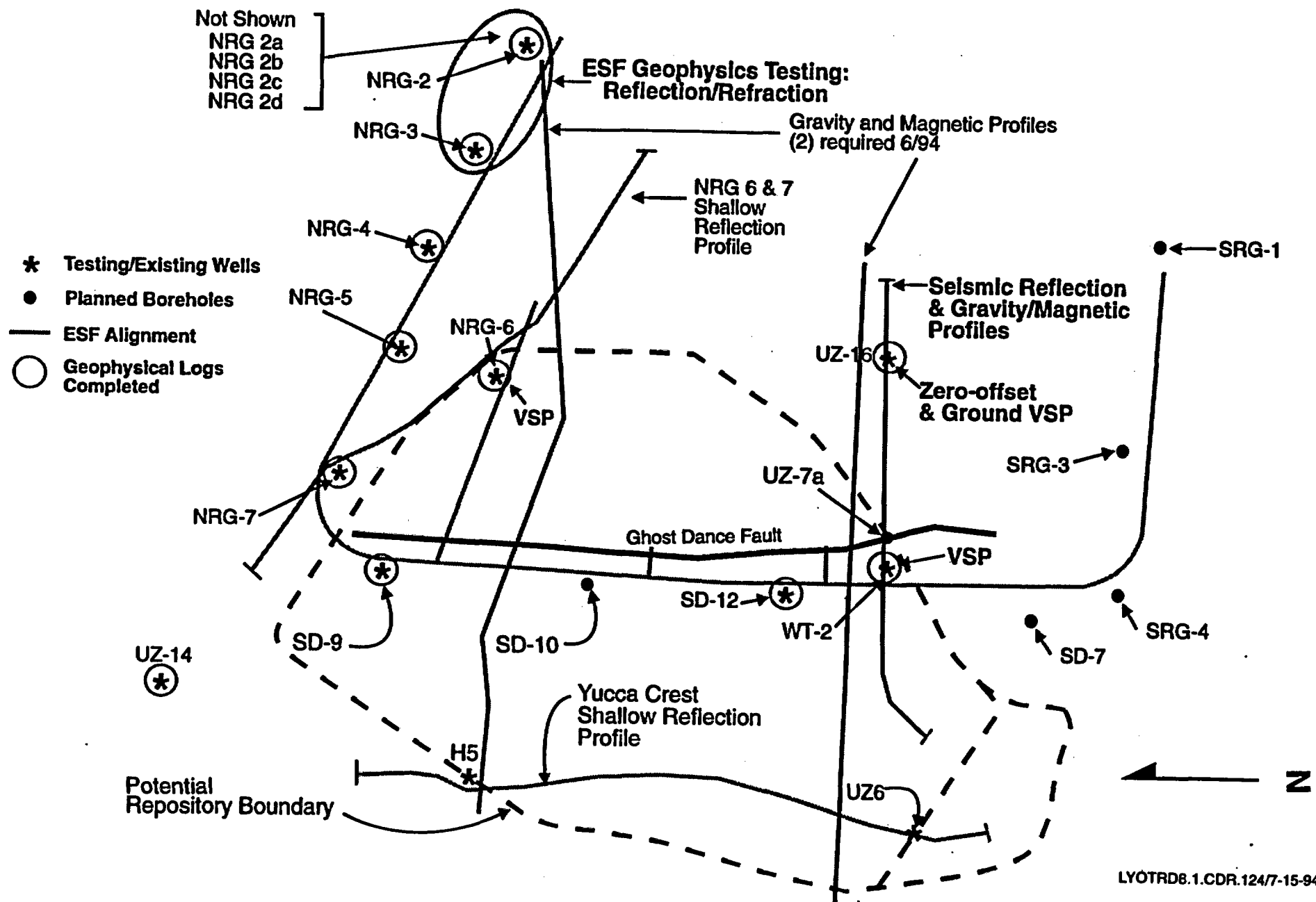
THE NUCLEAR REGULATORY COMMISSION

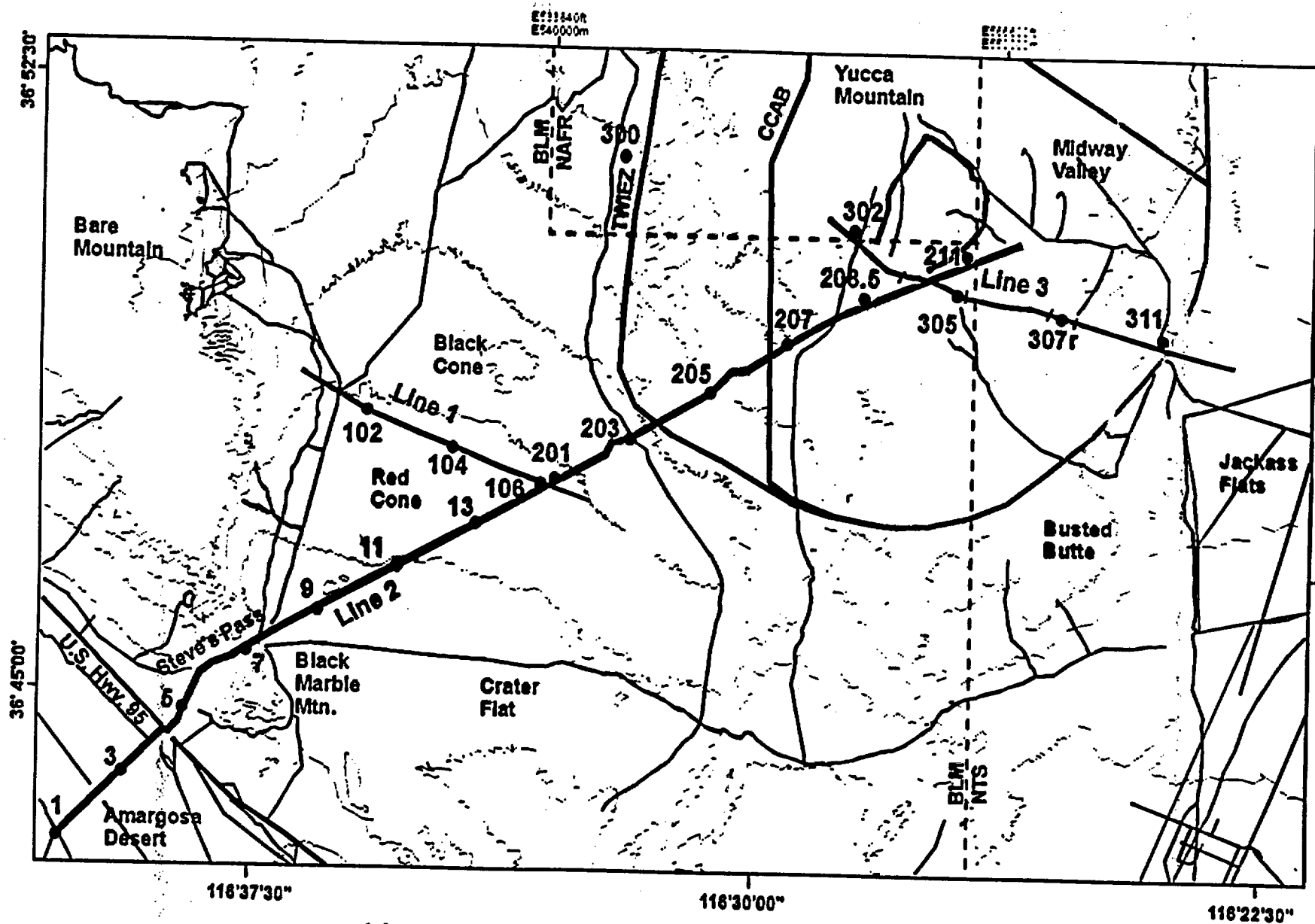
- HAS ACCESS TO ANY AND ALL DOE PLANNING DOCUMENTS**
- MONITORS FIELD TESTING, DATA ANALYSIS AND INTERPRETATION**
- HAS OPPORTUNITY TO VIEW AND DISCUSS ALL DATA**
- WILL BE INFORMED BY DOE CONCERNING ALL CHANGES IN PROPOSED TESTING**

SCHEMATIC MAP PROPOSED 1995 GEOPHYSICS PROGRAM

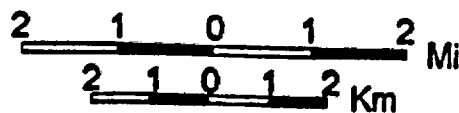


Completed FY93/94 Geophysics Testing Program





- LEGEND**
- Proposed Shothole
 - Reflection Line
 - Off Road



**YUCCA MOUNTAIN
SITE CHARACTERIZATION PROJECT
PROPOSED SEISMIC REFLECTION LINES**

Borehole Geophysical Logging in FY 95

Borehole # of Runs New/Workover

G-2	1	Workover
SD-3	1	New
SD-7	3	New
SD-9	1	New
SD-12	1	New
SRG-3	1	New
UZ-4	1	Workover
UZ-7	1	Workover
UZ-7a	1	New
UZ-9	1	New
WT-10	1	Workover
WT-11	1	Workover
WT-12	1	Workover
Nye County	2	New

14 Boreholes 17 Runs 8 New/6 Workover

Type of Log Use

4-Arm Caliper	rugosity
Density	density, lith, porosity
Gyro	deviation
Induction	fluid sat
Neutron	porosity, fluid sat
Video	image, fractures
GR/SGR	lithology
Geochem	elements, lithology
Mag Res (NMR)	free water, por
Sonic	matrix porosity
BHTeleViewer	fracture map below WT

Note: Log suites vary depending upon borehole type and depth.

Geophysical Logging in FY 93 & FY 94

Boreholes

NRG-1
NRG-2
NRG-2a
NRG-2b
NRG-2c
NRG-2d
NRG-3
NRG-4
NRG-5
NRG-6
NRG-7/7A
UZ-16
WT-2
SD-12
SD-9
UZ-14

Type of Log

4-Arm Caliper	rugosity
Density	density, lith, porosity
Gyro	deviation
Induction	fluid saturation
Neutron	porosity, fluid sat
Video	image, fractures
GR/SGR	lithology
Borehole Gravimeter	density
Geochem	elements, lithology
Mag Res (NMR)	free water; por
Cooled Germanium	elements, lithology
Thermal decay	pulsed neut/ capt x-sect.
Dielectric	fluid saturation
Borehole radar	image
Mag field/suscept.	correlation
Nuclear Porosity	lith, por, fluid sat, dens

Use

RESOLUTION

- SCP ACTIVITY 8.3.1.4.1.2: INTEGRATION OF GEOPHYSICAL ACTIVITIES--**
 - **NO STUDY PLAN REQUIRED BY ACTIVITY; MANAGEMENT FUNCTION**
 - **DETERMINE METHOD/TEST ADEQUACY, PRIORITY, PERFORM INTEGRATION**
 - **ASSESSMENT OF TEST CONTRIBUTION TO LA REQUIREMENTS**
 - **REPORT CHANGES IN PLANNED ACTIVITIES IN SEMIANNUAL REPORTS**

- FY'93: GEOPHYSICS INTEGRATION TASK FORCE (GITF) FORMED TO IMPLEMENT INTEGRATION AND ASSESSMENT ISSUES DEFINED IN SCP ACTIVITY 8.3.1.4.1.2**

- FY'94: GEOPHYSICS ELEMENT WBS 1.2.3.11 CREATED**
 - » **ANALOGOUS TO DRILLING PROGRAM, I.e., PLAN AND MANAGE ACTIVITIES IN ONE PLACE; SEVERAL TESTS CONDUCTED**

- FY'95: CONTINUE SURFACE GEOPHYSICAL TESTING:**
 - » **MODIFY STUDY PLAN 8.3.1.4.2.1**

STATUS:

**DOE IS NOW PLANNING MULTIPLE
GEOPHYSICAL TESTS WITHIN AND ADJACENT TO
THE POTENTIAL REPOSITORY AREA INCLUDING:**

- » GRAVITY**
- » MAGNETIC**
- » ELECTRICAL**
- » REFLECTION SEISMIC**

PROGRAMMATIC DIFFICULTY

- PROPOSED TESTING IS NOT EXPLICITLY IDENTIFIED BY
ANY EXISTING STUDY PLAN**

WORKSCOPE CONSOLIDATION AND MODIFICATIONS

**BACKUP MATERIAL FOR
DOE-NRC MANAGEMENT MEETING**

PREPARED BY

DR. MARK C. TYNAN

U.S. DEPARTMENT OF ENERGY

SEPTEMBER 21, 1994

WORKSCOPE CONSOLIDATION AND MODIFICATION

Problem to resolve:

- **SCP activities and prior task assignments permitted:**
 - **Redundancy in funding and workscope**
 - **Schedule slippages in conduct of work and reporting of results**
 - **Duplication of efforts in areas where task definition was vague**
 - **Poorly sequenced scheduling and implementation of key tests**
 - **Bypassing of experienced staff**

WORKSCOPE CONSOLIDATION AND MODIFICATION

(CONTINUED)

Activities within several studies will be modified and/or consolidated in order to enhance:

- **Program management**
- **Productivity,**
- **Utilization of individual technical expertise, and**
- **Product quality**

WORKSCOPE CONSOLIDATION AND MODIFICATION

Traditional SCP study workscope participant assignments differ from established patterns. Teams are being formed as part of a plan to integrate and consolidate selected aspects of the geology program. This involves several testing programs including but not limited to:

- | | | |
|-----------------------------------|---------------------------------|--------------------|
| • Systematic Drilling | Study | 8.3.1.4.3.1 |
| • Soil and Rock Properties | | 8.3.1.14.2 |
| • Site Area Stratigraphy | | 8.3.1.4.2.1 |
| • Site Area Structure | | 8.3.1.4.2.2 |
| • 3-D Modeling | 8.3.1.4.2.3, 8.3.1.4.3.2 | |
| • Natural Resources | | 8.3.1.9.2.1 |

WORKSCOPE CONSOLIDATION AND MODIFICATION

(CONTINUED)

Impacted areas

- **Three D Model (framework and integrated)**
 - 8.3.1.4.2.1, 8.3.1.4.2.3, 8.3.1.4.2.4, 8.3.1.4.3.2
- **Borehole geophysical logging**
 - 8.3.1.4.2.1, 8.3.1.4.3.1, 8.3.1.2.2.3, 8.3.1.14.2
- **Surface geophysics**
 - 8.3.1.4.2.1, 8.3.1.14.2, 8.3.1.4.3.1, 8.3.1.2.2.3
- **Lithologic and structural logging**
 - 8.3.1.4.2.1, 8.3.1.4.3.1, 8.3.1.14.2
- **Borehole fracture investigations**
 - 8.3.1.4.2.1, 8.3.1.4.3.1, 8.3.1.2.2.3
- **Natural resource assessment**
 - 8.3.1.4.2.1, 8.3.1.9.2.1
- **Other**

RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS:

Consolidation of workscope:

- **Centralizes responsibilities**
- **Increases participant contractor accountability**
- **Enhances operational and DOE management efficiency**

RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS: (LITHOLOGIC AND STRUCTURAL LOGGING, AN EXAMPLE)

- **Participants will plan and manage the process of consolidation and product generation, review, archiving and product revision**
- **DOE will manage with respect to product and cost of product generation**

RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS:

In-house synthesis capability

- **Necessary for meeting TSS and LA schedule**
- **Assures interaction and technical integration in development of final products**
- **Assures development of coherent data sets for LA (example = lithologic and structural logs)**
- **Assures PI technical input, and commonality of data / source for all technical studies**

RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS: (LITHOLOGIC AND STRUCTURAL LOGGING, AN EXAMPLE)

Shift of resources and responsibilities to Las Vegas and test site:

- **Provides opportunity for better PMO management oversight and control**
- **Enhances technical integration by consolidation of lithologic and structural logging, and by co-location with geophysical logging operations and interpretation groups in Nevada**
- **Enhances community relations with LV-based employment**

RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS: (LITHOLOGIC AND STRUCTURAL LOGGING, AN EXAMPLE)

**Reduction in redundancy (labor, dollars) for
several technical areas**

- **Several groups currently provide lithologic,
structural, or other logs**
 - **USGS:**
 - 1) **Lithologic logging**
 - 2) **Fracture data**
 - 3) **Mineralization**
 - **SNL:**
 - 1) **Rock properties**
 - 2) **Soil and rock (design)**
 - 3) **Fractures/RAAX new work for FY'95**
 - **SAIC:**
 - 1) **Drilling support**

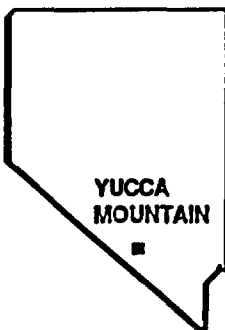
RATIONALE FOR PROPOSED WORKSCOPE MODIFICATIONS: (LITHOLOGIC AND STRUCTURAL LOGGING, AN EXAMPLE)

**DOE management and oversight groups' concern:
assure quality data collection interpretation,
and analyses**

- **“One set of eyes” to examine all core in the site characterization program**
- **Maintain access to, and assure development of a repository of knowledge and experienced staff; team work and integration with geophysical logging and petrophysics**
- **Assure expert input (USGS & SNL) and review for responsible PI (and others) for each borehole**

U.S. DEPARTMENT OF ENERGY

CRWMS



YUCCA MOUNTAIN

SITE CHARACTERIZATION

PROJECT

REVIEW OF PAST ACTIONS ITEMS

PRESENTED TO

DOE-NRC MANAGEMENT MEETING

PRESENTED BY

STEVE Le ROY

REGULATORY AND LICENSING

CRWMS/M&O



**SEPTEMBER 21, 1994
ROCKVILLE, MD**

1. **DOE to discuss the general timing and sequencing of those technical documents supporting 10 CFR 960 findings.**

Letter from Stephen Brocoum (DOE) to Malcolm Knapp (NRC) dated August 17, 1994. **CLOSED**

2. **Doe will provide NRC with copies of the public comments it has received on the site suitability workshop.**

Letter from Christopher Kouts (DOE) to Joseph Holonich (NRC), dated August 11, 1994. **CLOSED**

3. **DOE will provide NRC with its Technical Implementation Plans for FY 95.**

The Technical Implementation Plans should be available in November 1994. **OPEN**

4. **NRC will provide DOE with a copy of the galley proofs of the License Application Review Plan -- NUREG - 1323.**

Provided by NRC letter dated 9/12/94. **CLOSED**

5. **NRC and DOE will compare lists on the status of Site Characterization Analysis and study plan open items by the end of August 1994.**

DOE has initiated a transmittal to the NRC with the status of Site Characterization Analysis and study plan open items. **OPEN**

6. **NRC and DOE need to develop procedures to facilitate the exchange of information.**

DOE and NRC are currently exchanging information via the electronic network. **CLOSED**

7. **DOE will provide NRC with a copy of the EPA letter on the applicability of the Resource Conservation and Recovery Act to Naval Reactor Fuel.**

Letter from Christopher Kouts (DOE) to Joseph Holonich (NRC) dated September 13, 1994. **CLOSED**

8. **DOE will provide start-work-dates with all study plan transmittals.**

Needs further discussion. **OPEN**

- 9. DOE agrees with the NRC recommendation to conduct a technical exchange on the 10 CFR Part 60 SCC regulatory requirement.**

Proposed for November 17, 1994. **CLOSED**

- 10. NRC will determine the possibility of permitting DOE and other program participants to observe the CNWRA's volcanism workshop.**

DOE did not receive an invitation. **CLOSED**

- 11. DOE will keep NRC apprised of progress in its investigation of the so-called 'chilling effect' incidents.**

The DOE Nevada Inspector General's Office completed its investigation and recommends no further action.
CLOSED

- 12. DOE agrees to courier correspondence and deliverables to NRC. CLOSED**

- 13. NRC and DOE agree to expand the scope of future bi-monthly management meetings to include, as appropriate: multi-purpose canister status; mixed waste and greater-than-class C issues; and, other HLW items of interest. CLOSED**

- 14. Bimonthly management meetings will take place in the afternoon of the second Wednesday of the month in which the meeting is scheduled. CLOSED**
- 15. NRC and DOE to agree on a schedule for conducting the review of the License Application Annotated Outline.**

DOE and NRC agreed to March 1995. CLOSED

DOE DOCUMENTS AND PRIORITIES

**PRESENTED TO:
DOE/NRC MANAGEMENT MEETING**

**PRESENTED BY:
CHRISTOPHER A. KOUTS
ACTING DIRECTOR, REGULATORY INTEGRATION DIVISION**

**SEPTEMBER 21, 1994
ROCKVILLE, MD**

OCRWM ISSUES

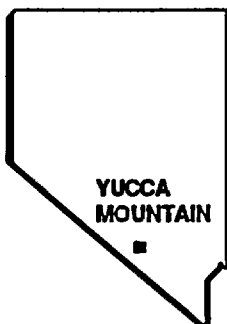
- 0 BURNUP CREDIT TOPICAL REPORT
(Planned submittal - Early FY 1995)

- 0 APPLICATIONS FOR CERTIFICATION OF GA-4 AND GA-9
TRANSPORT CASKS
(GA-4 actual submittal - August 1994)
(GA-9 actual submittal - July 1994)

- 0 DOE PETITION FOR RULEMAKING - DESIGN BASIS EVENTS AND
IMPORTANT TO SAFETY

U.S. DEPARTMENT OF ENERGY

CRWMS



YUCCA
MOUNTAIN

YUCCA MOUNTAIN

SITE CHARACTERIZATION

PROJECT

STATUS OF DOE PRODUCTS

PRESENTED TO
DOE-NRC MANAGEMENT MEETING

PRESENTED BY
STEVE Le ROY
REGULATORY AND LICENSING
CRWMS/M&O



SEPTEMBER 21, 1994
ROCKVILLE, MD

TOPICS

- **Issue Resolution**
- **License Application Annotated Outline**
- **Progress Reports**
- **Site Characterization Analysis (SCA) Open Items**
- **Study Plans**
- **DOE Priorities for NRC feedback**

ISSUE RESOLUTION

Substantially Complete Containment (SCC)

- **SCA comment no. 5 resolved**
- **SCA comment no. 46 resolved**
- **SCA comment no. 80 partially resolved**
- **SCA question no. 47 open**
- **Propose Technical Exchange in 11/94**
- **Transmit responses to resolve SCA comment no. 80 and question no. 47 following technical exchange**

Groundwater Travel Time Methodology

- **Transmitted GWTT letter to NRC 6/94**
- **Received NRC response 8/94**
- **Technical Exchange planned 11/94**

Type: Technical Exchange

Topic: Substantially Complete Containment (SCC) and Waste Package (WP) Design

Objectives: Shared understanding of the Department of Energy's (DOE's) interpretation and approach to demonstrating compliance with the Nuclear Regulatory Commission's (NRC's) SCC requirement and the current status of WP design and related activities.

Scope:

1. Review of the DOE's interpretation of the SCC requirement.
2. Status of DOE efforts to implement its approach - the WP Development/ Implementation Plan - to demonstrating compliance with the SCC requirement including:
 - current designs
 - information, including recent analyses of the potential for and implications of WP failure, submitted to NRC in response to its letter of 7/11/94, that provide support for the DOE's interpretation of the requirement
 - plans for testing container materials
3. Status of ongoing NRC materials evaluation programs
4. NRC feedback on the DOE's interpretation of the SCC requirement and on its approach to demonstrating compliance.

Date: November 17, 1994 (tentative)

Location: Rockville, MD

ISSUE RESOLUTION

Erosion Topical Report

- Reviewed NRC's response dated 8/22/94
- Developing an approach to respond to NRC concerns
- Will propose interaction to discuss NRC comments and DOE's approach to resolve the concerns

Seismic Topical Report I

- Reviewed NRC's response dated 9/7/94
- Developing an approach to respond to NRC concerns
- Will propose interaction to discuss NRC comments and DOE's approach to resolve the concerns

Seismic Topical Report II

- Provided NRC Annotated Outline 8/22/94
- Technical exchange if desired by NRC
- Topical Report to NRC 3/95

LICENSE APPLICATION ANNOTATED OUTLINE

- **Revision 0 (DOE document) to NRC - 3/95**

PROGRESS REPORTS

- **PR 10 In publication**
- **PR 11 Plan to publish 1/95**

SITE CHARACTERIZATION ANALYSIS (SCA) OPEN ITEMS

Closed	85
Open	113
DOE Preparation	19
NRC Review	32

STUDY PLANS

- **Transmitted 12 study plans to NRC for review**
- **Preparing 15 study plans for transmittal to NRC**
- **Transmitted responses to NRC for 92 study plan comments and questions**
- **Preparing responses to 58 study plan comments and questions for submittal to NRC**

DOE LIST OF PRIORITIES FOR NRC FEEDBACK

Study Plans

- **Characterization of YM ESF UZ Investigation
8.3.1.2.2.4 R 2 - submitted 6/27/94**
- **Physical Processes of Magmatism and Effects
8.3.1.8.1.2 - submitted 10/4/93**

Issue Resolution

- **Seismic Topical Report II Annotated Outline -
submitted 8/94**
- **Substantially Complete Containment - proposed
technical exchange 11/94**

BACKGROUND MATERIAL

STUDY PLANS: 12 pending NRC review

Study Plan Number	Date Submitted to NRC	Description
8.3.1.2.2.4 R 2	6/27/94	Characterization of YM ESF UZ Investigation
8.3.1.2.2.6 R 1	10/7/93	Characterization of Gas-phase Movement in UZ
8.3.1.3.1.1	5/20/94	Groundwater Chemistry Modeling
8.3.1.3.4.1/3	8/26/94	Batch Sorption Studies and Development of Sorption Models
8.3.1.3.5.1/2	9/17/93	Dissolved Species Concentration Limits and Colloid Behavior
8.3.1.5.1.1	8/25/94	Characterization of Modern Regional Precipitation
8.3.1.5.1.6	7/8/94	Characterization of Future Regional Climates and Environs
8.3.1.8.1.2	10/4/93	Physical Processes of Magmatism and Effects
8.3.1.12.2.1 R 1	8/16/93	Meteorological Data Collection at Yucca Mountain
8.3.1.15.1.3	6/21/91 Deferred	Laboratory Determination of Mechanical Properties of Intact Rock
8.3.1.15.2.1	2/9/89 Deferred	Characterization of Site Ambient Thermal Conditions
8.3.1.15.2.2	7/8/94	Characterization of Site Ambient Thermal Conditions

STUDY PLANS (15) IN PREPARATION FOR TRANSMITTAL TO NRC

Study Plan Number	Description
8.3.1.2.2.4 R 3	Characterization of YM ESF UZ Investigation
8.3.1.3.3.2	Kinetics and Thermodynamics of Mineral Evolution
8.3.1.3.6.1	Dynamic Transport Column Experiments
8.3.1.4.3.2	Three-dimensional Rock Characterization Modeling
8.3.1.8.2.1 R 1	Analysis of Waste Package Rupture Due to Tectonic Processes & Events
8.3.1.15.1.3 R1	Laboratory Determination of Mechanical Properties of Intact Rock
8.3.1.15.1.4	Laboratory Determination of Mechanically Propagated Fractures
8.3.1.17.3.1 R 1	Relevant Earthquake Sources
8.3.1.17.3.3 R 1	Ground Motion from Regional Earthquakes
8.3.1.17.4.1 R 1	Historical and Current Seismicity
8.3.1.17.4.12	Tectonic Models and Synthesis
8.3.4.2.4.1	Characterization of Chemical and Mineral Changes in Post Emplacement Environment
8.3.4.2.4.2	Hydrological Properties of Waste Package Environment
8.3.4.2.4.4	Engineered Barrier System Field Tests
8.3.4.2.4.5	Effects of Man-made Materials on Water Chemistry

STATUS OF STUDY PLAN COMMENTS

PENDING NRC REVIEW - 92

IN PREPARATION FOR TRANSMITTAL TO NRC - 58

Study Plan Number	Number of Comments	Status	Study Plan Description
8.3.1.2.1.2	2	Response sent 11/05/92	Regional Surface Water Run-Off and Streamflow
8.3.1.2.1.4	1	Response sent 7/23/92	Regional Hydrologic System Synthesis and Modeling
	5	Response sent 8/30/93	
8.3.1.2.2.6	1	Response sent 7/23/92	Characterization of Gas Phase Movement in the Unsaturated Zone
8.3.1.2.2.8	2	Response sent 5/27/93	Fluid Flow in Unsaturated, Fractured Rock
	5	In preparation	
8.3.1.2.2.9	6	In preparation	Site UZ Model and Synthesis
8.3.1.2.3.1.1-6	2	Response sent 9/14/92	Characterization of the Site Saturated Zone Ground Water Flow System
8.3.1.2.3.1.7	2	Response sent 9/14/92	Testing of the C-Hole Site with Reactive Tracers
8.3.1.2.3.3	7	In preparation	Site SZ Hydrologic System Synthesis and Modeling
8.3.1.3.2.1	6	Response sent 10/29/91	Mineralogy, Petrology and Chemistry Along Transport Pathways
8.3.1.3.6.2	1	Response sent 6/7/94	Diffusion
8.3.1.4.2.1	3	Response sent 3/22/93	Characterization of Vertical and Lateral Distribution of Stratigraphic Units within the Site Area
8.3.1.5.1.4	1	Response sent 9/16/92	Analysis of the Paleoenvironmental History of the Yucca Mountain Site
8.3.1.5.2.1	9	Response sent 12/19/90	Quaternary Regional Hydrology

Study Plan Number	Number of Comments	Status	Study Plan Description
8.3.1.5.2.1 R 2	3	Response sent 12/27/93	Quaternary Regional Hydrology
8.3.1.5.2.2	4	In preparation	Characterization of Future Regional Hydrology
8.3.1.8.1.1	13	Response sent 3/9/93	Probability of Volcanic Eruption Penetrating the Repository
8.3.1.8.2.1	9	In preparation	Analysis Waste Package Rupture Due to Tectonic Events
8.3.1.8.5.1	3	Response sent 7/24/91	Characterization of Volcanic Features
	16	In preparation	
8.3.1.8.5.2	3	In preparation	Characterization of Igneous Intrusive Features
	8	Response sent 6/13/94	Natural Resource Assessment of Yucca Mountain
8.3.1.9.2.2	1	Response sent 6/29/92	Water Resource Assessment of Yucca Mountain
8.3.1.14.2	1	Response sent 8/31/92	Studies to Provide Soil and Rock Properties for Potential Locations of Surface Facilities
8.3.1.15.1.1	3	In preparation	Laboratory Thermal Properties
8.3.1.15.1.2	4	In preparation	Laboratory Thermal Expansion Testing
8.3.1.15.1.5 R1	1	In Preparation	Excavation Investigations
8.3.1.17.3.1	1	Response sent 8/15/92	Relevant Earthquake Sources
8.3.1.17.3.4	1	Response sent 9/4/92	Effect of Local Site Geology on Surface and Subsurface Motion
8.3.1.17.3.5	1	Response sent 2/14/94	Ground Motion at the Site from Controlling Seismic Events

Study Plan Number	Number of Comments	Status	Study Plan Description
8.3.1.17.4.2	16	Response sent 12/19/90	Location and Recency of Faulting Near Prospective Surface Facilities
8.3.1.17.4.3	3	Response sent 8/10/94	Quaternary Faulting within 100 Km of Yucca Mountain
8.3.1.17.4.6	1	Response sent 12/16/91	Quaternary Faulting
8.3.1.17.4.10	2	Response sent 9/21/93	Geodetic Leveling
8.3.4.2.4.3	3	Response sent 9/3/93	Characterization of the Geomechanical Attributes of the Waste Package Environment

SCA OPEN ITEMS IN NRC REVIEW

SCA Number	Supplemental Response Date	SCA Description
43 C	July 1992	Adequacy of numerical goals in erosion, post-closure tectonics and preclosure tectonics performance tables.
42 C	July 1992	Adequacy of evaluation of escarpment retreat
31 Q	September 1992	Waste Package: Integrity of spent fuel cladding
22 C	January 1993	Saturated Zone: Hydrochemical samples
21 C	January 1993	Saturated Zone: Tc-199 and I-129 are not included to be characterized in the ground water flow and radionuclide analysis background concentrations.
53 C	February 1993	Adequacy of natural resource assessment; consideration of ore deposition models
57 Q	March 1993	Effects of drilling multipurpose boreholes
25 Q	April 1993	Heterogeneous air flow characteristics for seal program
115 C	May 1993	Adequacy of expanding of CCDF in terms of scenario classes appears to be deficient.
105 C	May 1993	Performance Assessment: Rationale for elimination of scenarios
95 C	May 1993	Performance Assessment: Logic used to develop and screen scenarios and its implementation
12 Q	May 1993	Rational for exclusion of lunar crater field as natural analog
47 C	June 1993	Waste Package: Relationship of postclosure tectonics to the waste package and the EBS requirements

SCA Number	Supplemental Response Date	SCA Description
3 C	July 1993	Reliance on Expert Judgment to supply licensing information
7 C	July 1993	Use of expert judgement versus peer review
38 Q	July 1993	Waste Package: Basis for 1 mm of thinning on canister due to impact or handling
45 C	July 1993	Volcanic rate calculations independent of underlying volcanic-tectonic processes
58 Q	January 1994	Flexibility of the ESF design to accommodate in situ testing of the waste package, if required
122 C	March 1994	Demonstration and acceptability of the dry coring method
22 Q	March 1994	Parameters related to repository construction and operation
80 C	March 1994	Performance goals consistent with interpretation and intent of substantially complete containment
56 Q	May 1994	Basis for 5 cm of fault displacement in the waste package environment
46 Q	May 1994	Waste Package: Basis for stricter containment of long half-life isotopes
5 C	May 1994	Waste Package: Interpretation of substantially complete containment
3 Q	May 1994	Repository Design: Rationale used for selecting the total repository area is not presented
47 Q	June 1994	Waste Package: Assumptions on breached waste containers
20 Q	June 1994	Repository Design: Discussion of vertical or horizontal emplacement

SCA Number		Supplemental Response Date	SCA Description
36	C	June 1994	Rationale for investigation 8.3.1.4.2 may not be accurate for the parameter drift defining lower concentrations of faults
5	Q	June 1994	Adequacy of vertical boreholes for evaluation of faults and fractures
35	Q	July 1994	Acceptance criteria for waste package helium leak test is consistent with performance requirements of 10 CFR 60.113 for engineered barrier system
51	Q	July 1994	Has DOE considered impacts to waste package design with respect to INEL and Hanford defense waste forms
45	Q	July 1994	What site characterization plans are in place to study waste package failure modes in the area of particulate source terms, retention factors, plate-out and gravitational settlement factors