

J. Nataraja, NMS



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

NOV 15 1983

WM Record File
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WM Project 1E
Docket No. _____
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MEMORANDUM FOR: Andrew J. Murphy, Section Leader
Seismology Section
Earth Sciences Branch, RES

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FROM: Thomas J. Schmitt, Geologist
Seismology Section
Earth Sciences Branch, RES

SUBJECT: TRIP REPORT: DOE/NRC WORKSHOP ON REPOSITORY DESIGN
IN SALT - COLUMBUS, OHIO, OCTOBER 25-26, 1983

On October 25-26 I attended the DOE/NRC workshop on repository design in salt. This trip report concentrates on the research issues raised at the meeting.

Three issues were raised that have research implications; that is, some confirmatory research needs to be conducted to develop a decision methodology so that a licensing decision can be made. Those issues are: (1) uncertainties in geotechnical site characterization with limited boreholes; (2) the reliability of performance assessments made with uncoupled thermal-hydraulic-mechanical-chemical models; and (3) the effect of a temporary shaft seal on the permanent sealing of a repository.

Uncertainties in geotechnical site characterization

NRC must make a licensing decision on an incomplete geotechnical data base. DOE decided to blind drill the exploratory shaft rather than use conventional drill and blast. Much geotechnical information is lost because the rock can not be inspected. DOE indicated that they would drill five boreholes at the site and that would more than compensate for the loss of information from the shaft. The issue rose again in concerning the limitations of the information from the restricted tunneling on borings at the bottom of the test facility.

The issue is how much test drilling and boring is enough to characterize the site well enough that there is confidence in the performance assessment. This issue is complicated because test drilling at the site has a potential for compromising the site due to borehole sealing problems. There is a dilemma, drill more and get more information and perhaps fail the site due to sealing problems.

Industry faces a similar problem in characterizing sites for tunneling. They must know how many test borings are necessary to characterize a site adequately. With sufficient borings, the design can be fine tuned, but beyond a certain level the drilling is a wasted effort. Probabilistic methods are used routinely in industry to address the specific issue.

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It is likely that a methodology to meet NRC needs can be developed from the industry methodologies. The methodology could be expanded to address not only the issue of construction characterization but also performance characterization.

Thermomechanical Processes

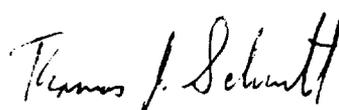
NRC will most likely be required to make a licensing decision based on an incomplete description of the thermomechanical processes at the repository. The assessment of the performance of a repository will depend on predicting the mechanical, thermal, hydraulic, and chemical responses of the system. These processes are strongly coupled. At present there is no fully coupled model to address this response, nor is there likely to be a coupled model in the foreseeable future. There is an inadequate understanding of the coupling processes. NRC will most likely be required to make a licensing decision based on an incomplete description of the system. The critical issue is which processes can be conservatively bounded by uncoupled or partially coupled models. The significance of the coupled processes will vary with site and design. If DOE assigns much "credit" to the engineered barriers then the processes that affect the mechanical response will be very important.

The research issue is to develop an understanding of the coupling processes that is adequate to allow NRC to specify which process DOE must address in detail in a testing program.

There is inadequate time and resources to do this through in situ testing. The information must be gained by laboratory tests, natural analogues, and by sensitivity studies.

Temporary Shaft Sealing

DOE decided to seal the test shaft with a temporary seal and defer the design of the permanent seal until a later date. NMSS expressed concern about the effect of that temporary seal or permanent sealing.



Thomas J. Schmitt
Earth Sciences Branch
Office of Nuclear Regulatory Research

cc: F. Costanzi, RES
M. Nantaraja, NMSS

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MEMORANDUM FOR: Those on Attached List
 FROM: Hubert J. Miller, Chief
 Repository Projects Branch
 Division of Waste Management

SUBJECT: CURRENT SCHEDULE OF DOE/NRC TECHNICAL MEETINGS

Attached is the current list of Technical Meetings which have been firmly established with DOE on repository licensing. This list consists only of the approved meetings; however, several additional meetings are in the process of organization and scheduling. Also, schedules shown are subject to change. This schedule is being updated and distributed at least bi-weekly to reflect changes.

"ORIGINAL SIGNED BY"

Hubert J. Miller, Chief
 Repository Projects Branch
 Division of Waste Management

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NAME	: C. Pittiglio	: S. Coplan	: RL Johnson	: RJ Wright	: HJ Miller	:	:
DATE	: 83/11/03	: 11/ /83	: 11/ 4 /83	: 11/ 4 /83	: 11/ /83	:	:

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Addressees - Memorandum dated NOV 1983

- R. Browning
- M. Bell
- J. Bunting
- M. Knapp
- P. Justus
- J. Greeves
- R. Boyle
- R. Wright
- S. Coplan
- R. Johnson
- M. Logsdon
- D. Fehringer
- M. Kearney
- F. Arsenault
- P. Comella
- R. Conti
- J. Wolf
- C. Cameron
- H. Lowenberg
- J. Treby
- D. Ross
- L. Pittiglio

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SCHEDULE FOR HLW
LICENSING MEETING*

ITEM	LEAD	LOCATION	DATE
I. Site Technical Meeting			
1. BWIP	Wright		
Underground Testing (Pre Meeting (11/14))	Greeves	BWIP Silver Spring, MD	11/28/83
Hydrology Test Results (Pre Meeting Nov.)	Knapp/Verma	BWIP Silver Spring, MD	Nov./Dec.
Geochemistry (Pre Meeting 11/18)	Justus	BWIP Silver Spring, MD	1/9/84
Design (Pre Meeting 1/17)	Greeves	BWIP Silver Spring, MD	1/23/84
Waste Package (Pre Meeting 1/17)	Greeves/Wick	BWIP Silver Spring, MD	2/27/84
Geology (Pre Meeting 2/14)	Justus	BWIP Silver Spring, MD	3/12/84
2. Salt	Johnson		
Geology (Pre Meeting 1/10/84)	Justus	Columbus, Ohio Silver Spring, MD	1/24/84+
Hydrology (Pre Meeting 1/14/84)	Knapp/Verma	Columbus, Ohio Silver Spring, MD	2/28/84+
Geochemistry (Pre Meeting 3/13/84)	Justus/Corrado	Columbus, Ohio Silver Spring, MD	3/27/84+
WIPP/Visit			6/84

ITEM	LEAD	LOCATION	DATE
3. NTS	Coplan		
Waste Package (Pre Meeting 10/12)	Greeves/Wick	Dublin, CA Silver Spring, MD	10/18/83
Performance Assessment (Pre Meeting TBD)	Knapp	Silver Spring, MD Silver Spring, MD	10/13/83**
Geochemistry (Pre Meeting 10/17/83)	Justus	Los Alamos, NM Silver Spring, MD	10/25/83**
Design (Pre Meeting 11/1/83)	Greeves	Albuquerque, NM Silver Spring, MD	11/8/83**
Performance Assessment (Pre Meeting __)	Knapp	Albuquerque, NM Silver Spring, MD	TBD ⁺
Geochemistry (Pre Meeting __)	Justus	Los Alamos, NM Silver Spring, MD	TBD

II. Generic Technical Meetings

Coupled Processes
(Pre Meeting __)

In-Situ Testing
(Pre Meeting __)

Q.A.
(Pre Meeting __)

Performance Assessment/Reliability
(Pre Meeting __)

* These are only the meetings which have been firmly established with DOE.

** These meetings have been postponed by DOE.

+ Meetings not established with DOE.