

February 23, 1995

Mr. Ronald Milner, Director  
Office of Program Management  
and Integration  
U.S. Department of Energy  
1000 Independence Avenue SW  
Washington, DC 20585

SUBJECT: SUMMARY OF THE JANUARY 26, 1995, TECHNICAL EXCHANGE/VIDEO  
CONFERENCE ON SEISMIC HAZARD ASSESSMENT AND SEISMIC DESIGN

Dear Mr. Milner:

The purpose of this letter is to transmit the summary for the January 26, 1995, U.S. Nuclear Regulatory Commission/U.S. Department of Energy (DOE) Technical-Exchange/Video-Conference on Seismic Hazard Analyses and Seismic Design Methodology topics. The video conference was held jointly at two DOE facilities--the Forrestal Building in Washington, D.C., and the Bank of America Building in Las Vegas, Nevada. The purpose of the technical exchange was to discuss NRC's response to DOE's letter of November 9, 1994, on Seismic Hazard Assessment Methodology Topical Report (TR#1), and to discuss NRC's concerns on Annotated Outline for Seismic Design Methodology Topical Report (TR#2). A brief summary of the technical exchange is enclosed. The technical exchange ended with one action item--DOE would respond to NRC's letter of January 12, 1995, on TR#1. The discussions during the technical exchange were useful to all the attendees.

If you have any questions regarding this letter or the technical exchange summary, please contact Banad Jagannath of my staff at (301) 415-6653.

Sincerely,



Michael J. Bell, Chief  
Engineering and Geosciences Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated

cc: Attached list

**DISTRIBUTION:** w/ Encl.

Central File	DWM r/f	JHolonich	JAustin	RJohnson	MWeber	JThoma
NMSS r/f	ENGB r/f	PUBLIC	LSS	ACNW	CNWRA	
MDelligatti	OSR					

DOCUMENT NAME: S:\DWM\ENGB\BNJ\SEISVIDE.TE2

OFC	ENGB	ENGB	ENGB	ENGB	ENGB	ENGB
NAME	BJagannath/eb	A Ibrahim	MNataraja for KMcConnell		MBell	
DATE	2/23/95	2/23/95	2/23/95		2/23/95	

OFFICIAL RECORD COPY

9503030117 950223  
PDR WASTE  
WM-11 PDR

1022  
WM-11  
Mile 1/1

DOE Distribution List for letter to R. Milner dated: March 23, 1995

cc: R. Loux, State of Nevada  
J. Meder, Nevada Legislative Counsel Bureau  
R. Nelson, YMPO  
C. Einberg, DOE/Wash, DC  
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  
W. Cameron, 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. Brocoum, YMPO  
R. Arnold, Pahrump, NV

**SUMMARY OF THE U.S. NUCLEAR REGULATORY COMMISSION AND  
THE U.S. DEPARTMENT OF ENERGY TECHNICAL EXCHANGE/VIDEO CONFERENCE ON  
SEISMIC HAZARD ANALYSES AND SEISMIC DESIGN METHODOLOGY**

On January 26, 1995, representatives of the U.S. Nuclear Regulatory Commission, U.S. Department of Energy (DOE), and other interested parties participated in a technical exchange/video-conference on the Seismic Hazard Assessment Methodology Topical Report (TR#1) and on the Annotated Outline for Seismic Design Methodology Topical Report (TR#2). Attachment 1 presents the agenda for this technical exchange. Attachment 2 is the list of attendees, which also includes the other interested parties participating in the exchange. Copies of DOE handouts are included as Attachment 3.

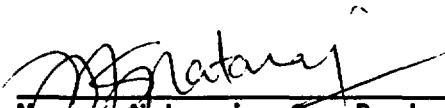
A. Ibrahim of the NRC started the exchange by summarizing NRC's January 12, 1995, letter from M. Bell to R. Milner. Based on the information submitted by DOE and the conference calls with DOE, Dr. Ibrahim summarized the staff's understanding of what to expect from DOE in TR#1 on seismic hazard analyses. The DOE responded by explaining its approach to the seismic hazard analyses. There was no clear understanding that the DOE approach to evaluating seismic hazard deterministically as a part of the third seismic topical report would be sufficient for the NRC purposes. DOE requested NRC to initiate the review of TR#1. NRC stated that it would not begin the review of TR#1 until DOE responded in writing to the January 12, 1995, NRC letter by confirming or clarifying the NRC understandings.

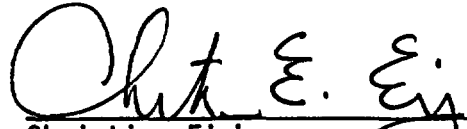
NRC and DOE discussed the NRC concerns with the original annotated outline for TR#2, as transmitted to the NRC by letter of August 22, 1994. DOE had revised the original annotated outline to address the NRC concerns and to reflect changes in the organization of the report. The draft revised annotated outline was discussed, and NRC stated that the revision appeared to address the NRC concerns. NRC will respond to the formal DOE submission of the revised annotated outline (transmitted by letter of January 26, 1995), and NRC expects to find the subject and scope of the report to be acceptable for a TR.

One area of *discussion* in TR#2 was on the design to accommodate seismic hazards in the postclosure time frame. NRC is concerned that postclosure seismic hazards should be addressed in the TR. DOE stated that postclosure seismic issues are primarily performance-related, not design-related, and that they will be addressed in other parts of the program, including performance assessment. NRC maintained that the design and performance issues are linked, and, therefore, should be considered together to the extent that the preclosure design impacts on postclosure performance issues. NRC referred to the issues of seal design, EBS design, and thermal load considerations as examples which necessitate an iterative design approach that includes the postclosure performance considerations. DOE stated that TR#2 will expand on the rationale for handling preclosure and postclosure seismic design separately. DOE noted that TR#2 will indicate how postclosure seismic design considerations are addressed within the overall repository design program.

Enclosure

NRC participants stated that the technical exchange provided an opportunity to discuss DOE's approach to seismic design for the Yucca Mountain project. In closing, DOE thanked the participants for their input and discussion during the technical exchange.

  
Mysore Nataraja, Sr. Project Manager  
The U.S. Nuclear Regulatory Commission  
Engineering and Geosciences Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

  
Christian Einberg  
The U.S. Department of Energy  
Regulatory Integration Division  
Office of Civilian Radioactive  
Waste Management

January 26, 1995

AGENDA

NRC/DOE TECHNICAL EXCHANGE  
SEISMIC HAZARD ASSESSMENT AND SEISMIC DESIGN

<u>TIME</u>	<u>TOPIC</u>	<u>LEAD</u>
1:00pm EST	Welcome/Protocal/Opening Remarks	DOE, NRC, AULG
	NRC Response to DOE letter of November 9, 1994, on the Review of Seismic Topical Report I	NRC
	NRC Concerns with the Annotated Outline for Seismic Topical Report II	NRC
	Break	
	Annoated Outline for Seismic Topical Report II	DOE
	Closing Comments	DOE, NRC AULG
4:30p.m. EST	Adjourn	

# Seismic Hazard Assessment & Seismic Design Technical Exchange

January 26, 1995  
(Las Vegas, NV & Washington, DC)

## ATTENDANCE LIST

Name:	Organization:	Telephone No.:
Chris Einberg	DOE/HA RW-36	202-586-8869
Bakr Ibrahim	NRC	301-415-6651
Leon Reiter	NWTRB	703-285-4473
MICHAEL BELL	NRC/DWM	301-415-7286
John S. TRAPP	NRC	301-415-8063
John L. Russell	CNWRRA	703/416-1129
MARK LANG	Mt O/VIRADA	703-204-8866
Bob Gamble	MtO/PMD-LV	702-295-9663
HOMI MINWALLA	WESTON/JACOBS	202-646-6710
Dave Fenster	H2O/WCFS	<del>202</del> (703) 204 8866
RAM B. MURPHY	DOE - RW 3.1	202-586-1239
BANAD JAGANNATH	NRC / DWM	301-415 6653
STAN ECHOLS	WINSTON & STRAWN	202 371-5777
Jake Philip	USNRC	(301) 415 6211
Sui-Min Hsiung	CNWRRA	(210) 522-5209
Asadul H. Chowdhury	CNWRRA	(210) 522-5151
PHILIP S. JUSTUS	USNRC	301 415 6745 PSJ@NRC.GOV
Steve McDuffie	NRC	301-415-6684

Mysore Nataraaj a  
Ray Wallace

USNRC  
USGS

301-415-6695  
202 586-1244

Department of Energy - Nuclear Regulatory Commission Technical Exchange  
Seismic Hazard Assessment and Seismic Design

January 26, 1995  
Videoconference: Las Vegas, NV, and Washington, DC

Attendance List (Nevada)

Name	Organization	Phone Number	Fax Number
RICHARD QUITMEIER	MEO/WCEFS	702-794-1964	702-794-5378
Tim Sullivan	DOE	" 4-7915	
Steve Nesbit	MEO/Duke Engineering	702-794-1910	-1822
Carl Stepp	MEO/WCEFS	512-338-0680	795-933X
ALI HAJANI	MEO/DUKE ENGINEERING	702-794-5752	
Jerry L. King	MEO/SAIC	703-794-7842	702-794-1872
John Misosky	Univ Nevada, Reno	702-784-1382	SAIC
JOHN BELL	UNR/NRMC	702-784-6661	702-784-1709
John Whitney	US Geological Survey	303-236-0516	303-236-5046
Craig deToto	NV. Bur. Mines & Geol.	702-784-6691	702-784-1709
Jean Yunker	MEO	702-794-7650	
E.V. TIESSEN-MUSEN	CLARK COUNTY	702-455-5125	702-455-5190
Phil Howard	MEO	702-794-6183	702-794-1822
Robert Kennedy	Struct. Mech. Council	714-777-2163	714-777-8298
Michael Hardy	Agipita Assoc Inc	303-242-4220	303-245-9234
Quazi A. Hossain	LLNL	510-425-2289	510-424-2195
DAVID TILSON	NEVADA CONSULTANT	801-363-4093	801-363-4093
CARL JOHNSON	NEVADA	702-687-3744	702-687-5272
THOMAS STAYTON	MEO		
APRIL GIL	YMP/DOE	(702)794-7622	-7207

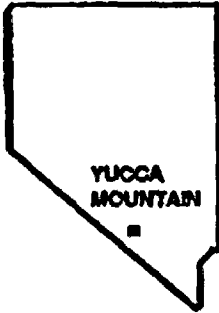




**Attachment 3**

U.S. DEPARTMENT OF ENERGY

**DOE  
M**



**YUCCA MOUNTAIN**

**SITE CHARACTERIZATION**

**PROJECT**

**DOE-NRC TECHNICAL EXCHANGE ON  
SEISMIC HAZARD ASSESSMENT AND SEISMIC DESIGN**

**RESPONSE TO NRC CONCERNS  
ON THE ANNOTATED OUTLINE  
FOR SEISMIC TOPICAL REPORT II**



*PRESENTED BY*  
**DR. J. CARL STEPP**

**JANUARY 26, 1995**

# Background

- **The DOE submitted the annotated outline (AO) for the topical report "Seismic Design Methodology for a Geologic Repository at Yucca Mountain" on August 22, 1994**
- **The NRC responded by letter of November 3, 1994**
  - **Four concerns expressed**
  - **Annotated outline "considered incomplete by the staff"**
- **DOE-NRC Management Meeting discussions on December 6, 1994**
  - **Level of detail in AO vs. topical report itself**
  - **Need to enhance communication**
- **DOE-NRC teleconference on January 5, 1995 to clarify how NRC concerns would be addressed**

# **Revised Annotated Outline for Seismic Topical Report II**

- **Outgrowth of the development of the report**
- **Shows changes in the organization of the report**
- **Indicates where NRC concerns from November 3, 1994 letter will be addressed**
- **Provided to NRC in draft form on January 23, 1995**

# NRC Concern #1: Use of Performance Goal-Based Design

- The proposed methodology is considered to be a natural, systematic extension of established seismic design practices *etc - method of SF with data base*
- Section 3.0 will describe the linkages between the performance goal-based design approach and accepted deterministic seismic design approaches for nuclear facilities *Integrating SSES with respect to safety, using seismic design code*
- New Appendix B will discuss the bases for risk reduction factors *based on lot of data/experience in Nuclear plants (App B is OK)*
- Section 6.0 and new Appendix C will discuss application of performance goal-based design to the seismic design of underground facilities

# **NRC Concern #2: Post-Closure Performance Objectives**

- **Seismic safety performance goals apply to the design to accommodate seismic hazards during the preclosure period**
- **Postclosure issues are primarily related to performance, not design**
- **Section 1.0 will address the linkages between the seismic design methodology and post-closure performance**

# **NRC Concern #3: Treatment of Fault Offsets**

- **Fault avoidance is the preferred approach, consistent with the NRC staff technical position NUREG-1494**
- **Design approaches and criteria will be developed to accommodate fault displacement when design is the appropriate mitigation action**
- **New Section 8.0 will provide a focused discussion of the treatment of fault displacement**

# **NRC Concern #4: Repetitive Seismic Loading Episodes**

- **Underground facilities will be designed and maintained to accommodate repetitive seismic loads**
- **Section 6.0 and new Appendix C will address this NRC concern**



# Summary

- **The DOE welcomes the technical input from the NRC**
- **It is not possible to resolve these NRC concerns with the annotated outline**
- **The NRC concerns will, as indicated, be addressed in the topical report**
- **The annotated outline has been revised to clarify where the NRC concerns will be addressed**
- **The DOE believes a continuing dialog on these and other technical issues is essential to an effective regulatory review process**