

Sac

109.3  
108.2/BI/85/09/08

- 1 -

OCT 08 1985

DISTRIBUTION:  
 WM sf CGlenn, WMRP  
 WMGT rf SCoplan, WMRP  
 NMSS rf ABender, WMPC  
 RBrowning HMiller, WMRP  
 MBell  
 MKnapp  
 MBlackford  
 PJustus  
 Aibrahim & rf  
 PDR  
 JTrapp  
 JPearring, WMEG  
 DGupta, WMEG

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

FROM: Malcolm R. Knapp, Chief  
 Geotechnical Branch  
 Division of Waste Management

SUBJECT: ANNOTATED OUTLINE OF RATIONALE FOR SEISMO-TECTONIC  
 INVESTIGATIONS FOR LICENSING A NUCLEAR WASTE REPOSITORY

Attached please find points for discussion with DOE regarding the subject outline. We are forwarding them to you to be transmitted to DOE. These points represent a more structured format of the ones we discussed at the conference call of July 23, 1985. We expect to discuss them with DOE at a meeting to be scheduled in November.

151

Malcolm R. Knapp, Chief  
 Geotechnical Branch  
 Division of Waste Management

Enclosure:  
 As stated

WM Record File 109.3 WM Project 1  
 Docket No. \_\_\_\_\_  
 PDR \_\_\_\_\_  
 LPDR \_\_\_\_\_

Distribution: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 (return to WM, 623-SS)

WMGT *MB*  
 MBlackford  
 85/10/4

8511210574 851008  
 PDR WASTE  
 WM-1 PDR

DFC	: WMGT <i>MB</i>	: WMGT <i>MB</i>	: WMGT <i>MB</i>	:	:	:
NAME	: Bibrhim	: PJustus	: MKnapp	:	:	:
DATE	: 85/09/04	: 85/09/04	: 85/09/04	:	:	:



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

*Ticker John L  
D. Wallace  
cc Seth C*

OCT 08 1985

WM Record File  
109.3

WM Project 1  
Docket No. \_\_\_\_\_  
PDR   
LPDR \_\_\_\_\_

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

Distribution: \_\_\_\_\_  
\_\_\_\_\_  
(Return to WM, 623-SS)

FROM: Malcolm R. Knapp, Chief  
Geotechnical Branch  
Division of Waste Management

*conference not  
read*

*SAC*

SUBJECT: ANNOTATED OUTLINE OF RATIONALE FOR SEISMO-TECTONIC  
INVESTIGATIONS FOR LICENSING A NUCLEAR WASTE REPOSITORY

Attached please find points for discussion with DOE regarding the subject outline. We are forwarding them to you to be transmitted to DOE. These points represent a more structured format of the ones we discussed at the conference call of July 23, 1985. We expect to discuss them with DOE at a meeting to be scheduled in November.

Malcolm R. Knapp, Chief  
Geotechnical Branch  
Division of Waste Management

Enclosure:  
As stated

POINTS FOR DISCUSSION WITH DOE ON  
"RATIONALE FOR SEISMIC/TECTONIC  
INVESTIGATIONS FOR LICENSING A  
NUCLEAR WASTE REPOSITORY"

1. The outline provided by DOE is very general; more clarification and specification of the approaches and procedures to address the issues are needed. For example, it was not clear from the outline whether specific issues will be addressed deterministically or probabilistically.
2. The logic flow in the table of contents is not clear, e.g. the radio-nuclide release scenario chapter (VI) may have to be addressed before issue resolution chapter (V).
3. Section II.B; the application of some of the terms identified in the provisional list of definitions, is not clear; for example, Class I, II, III Structures, Design UNE I, II, and design earthquake I, II are not self explanatory.
4. Section III.A; how are the seismo/tectonic issues related to the performance objectives (considering favorable and adverse conditions)?
5. Section III.A and C; what is the distinction between seismic/tectonic processes, phenomena, and events?

6. Section III.A; what criteria are used to identify significant seismic/tectonic processes?
7. Section III.A states that pre-closure and post-closure performance objectives, with respect to near-surface and subsurface, will require recognition of different sets of seismic/tectonic processes and events. Identify these sets of processes and events.
8. Section IV.B; are the ground motion models and the distribution functions to be used in the analysis adequately well defined to provide representative probability estimates?
9. Section V.B; it is not clear what is meant by complementary earthquake approaches acceptable for other nuclear facilities.
10. Section IV.B; what is the difference between remnant and residual stress?
11. Section III.A states that for each relevant seismic/tectonic process, the potential impact on pre-closure and post-closure performance objectives will be evaluated. However those types of evaluations would generally require DOE to have information regarding the strength of facilities to resist a given magnitude event. Since such adequate information may not

become available at the conceptual design stage, the DOE should explain, in detail, the method proposed to evaluate the said impacts.

12. Section III.C states that post-closure issues will involve ground water travel time. This statement is not consistent with 10 CFR 60.113 (a)(2), which requires consideration of pre-waste-emplacment ground water travel time for locating the geologic repository. The DOE should consider including this requirement in its analysis.
13. Section VI.C states that the post-closure release scenarios should examine the effects of seismic/tectonic phenomenon on three things: the hydrology, integrity of waste package and integrity of engineered barrier system. However, these items do not include shafts, boreholes and their seals. The DOE should consider including these items on the list.
14. Section V.B; identify the specific structures, systems and components important to safety that would be vulnerable to the process and address the proposed method of fragility analysis that will be used to evaluate the impact based upon a pre-conceptual level of design of such structures, systems and components.
15. Section VII.B; will the conceptual design used in the study be of sufficient scope and level of detail to allow meaningful analysis?

16. Section III.C, is the construction of a Complementary Cumulative Distribution Function (CCDF) feasible, given the nature of seismic and tectonic processes?
17. Section IV.D; how can a consensus opinion reduce conceptual and numerical uncertainties?
18. Section IV.C; will thermal effects on tectonic processes be considered?