



Department of Energy
Washington, DC 20585

SEP 16 1992

Mr. Joseph J. Holonich, Director
Repository Licensing & Quality Assurance
Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Holonich:

In the U.S. Nuclear Regulatory Commission's (NRC) Phase I review of the U.S. Department of Energy's (DOE) Study Plan 8.3.1.17.3.4, "Effects of Local Site Geology on Surface and Subsurface Motions," the NRC expressed a technical concern (enclosure 1). Enclosure 2 contains DOE's response to this comment.

DOE forwarded the comment to the U.S. Geological Survey for an assessment of potential impact on the planned study. The NRC comment concerns the use of a more appropriate model than proposed in the study plan. DOE agrees that a model that uses two-dimensional velocity structure, nonvertical incident waves, and linear and nonlinear behavior may be required. In fact, these modified models are intended to be developed and are described in the study plan.

With respect to the request for a not-readily-available reference (Lee and Finn, 1978), the citation to this publication will be deleted in a subsequent revision to the study plan. The reference was cited in conjunction with several other papers, all of which are given as examples. Deletion of this reference will have no impact on the technical basis for this study.

If you have any questions, please contact Mr. Chris Einberg of my office at 202-586-8869.

Sincerely,

John P. Roberts
Acting Associate Director for
Systems and Compliance
Office of Civilian Radioactive
Waste Management

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Enclosures:

1. Ltr, 6/8/92, Holonich to Roberts
2. DOE Response to NRC Comment

cc: w\enclosures

Alice Cortinas, CNWRA, San Antonio, TX

cc: w\enclosures

- C. Gertz, YMPO
- R. Loux, State of Nevada
- T. Hickey, Nevada Legislative Commission
- M. Baughman, Lincoln County, NV
- J. Bingham, Clark County, NV
- B. Raper, Nye County, NV
- P. Niedzielski-Eichner, Nye County, NV
- G. Derby, Lander County, NV
- P. Goicoechea, Eureka, NV
- C. Schank, Churchill County, NV
- F. Mariani, White Pine County, NV
- V. Poe, Mineral County, NV
- E. Wright, Lincoln County, NV
- J. Pitts, Lincoln County, NV
- R. Williams, Lander County, NV
- J. Hayes, Esmeralda County, NV
- M. Hayes, Esmeralda County, NV
- B. Mettam, Inyo County, CA
- C. Abrams, NRC



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

JUN 08 1992

Mr. John P. Roberts, Acting Associate Director
for Systems and Compliance
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Roberts:

SUBJECT: PHASE I REVIEW OF U.S. DEPARTMENT OF ENERGY STUDY PLAN, EFFECTS OF
LOCAL SITE GEOLOGY ON SURFACE AND SUBSURFACE MOTIONS

On December 4, 1991, DOE transmitted the study plan, "Effects of Local Site Geology on Surface and Subsurface Motions" (Study Plan 8.3.1.17.3.4), to the U.S. Nuclear Regulatory Commission for review and comment. NRC has completed its Phase I Review of this document using the Review Plan for NRC Staff Review of DOE Study Plans, Revision 1 (December 6, 1990).

The material submitted in the study plan was considered to be consistent, to the extent possible at this time, with the NRC-DOE agreement on content of study plans made at the May 7-8, 1986, meeting on Level of Detail for Site Characterization Plans and Study Plans.

Among the references listed for this study plan is one which has not been provided to NRC and is not readily available in the public domain. We therefore request that DOE provide the NRC with the document which is listed in the Enclosure.

A major purpose of the Phase I Review is to identify concerns with studies, tests, or analyses that, if started, could cause significant and irreparable adverse effects on the site, the site characterization program, or the eventual usability of the data for licensing. Such concerns would constitute objections, as that term has been used in earlier NRC staff reviews of DOE's documents related to site characterization (Consultation Draft Site Characterization Plan and the Site Characterization Plan for the Yucca Mountain Site). It does not appear that the conduct of the activities described in this study plan will have adverse impacts on repository performance and the Phase I Review of this study plan identified no objections with any of the activities proposed.

Although the staff has not identified any concerns with DOE starting site characterization activities described in this study plan, it considers that a more appropriate model than that proposed in the study plan would use at least two-dimensional velocity structure, non-vertical incident body waves, and linear and non-linear soil behavior.

Comment

After completion of the Phase I Review, selected study plans are to receive a second level of review, called a Detailed Technical Review, based on the relationship of a given study plan to key site-specific issues or NRC open

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ENCLOSURE 1

Mr. John P. Roberts

- 2 -

items, or its reliance on unique, state-of-the-art test or analysis methods. On the basis of these criteria, we have decided not to proceed with a Detailed Technical Review of this study plan.

If you have any questions concerning this letter, please contact Charlotte Abrams, of my staff, on (301) 504-3403.

Sincerely,



Joseph J. Holonich, Director
Repository Licensing and Quality
Assurance Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc: C. Gertz, DOE/NV
T. J. Hickey, Nevada Legislative Committee
R. Loux, State of Nevada
S. Bradhurst, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO
P. Niedzielski-Eichner, Nye County, NV
C. Thistlethwaite, Inyo County, CA
V. Poe, Mineral County, NV
F. Sperry, White Pine County, NV
R. Williams, Lander County, NV
P. Goicoechea, Eureka County, NV
L. Vaughan II, Esmeralda County, NV
C. Shank, Churchill County, NV

DOE Response to NRC Comment on Study Plan 8.3.1.17.3.4
"Effect of Local Site Geology on Surface and Subsurface Motions"

NRC Comment

"Although the staff has not identified any concerns with DOE starting site characterization activities described in this study plan, it considers that a more appropriate model than that proposed in the study plan would use at least two-dimensional velocity structure, nonvertical incident body waves, and linear and nonlinear soil behavior."

DOE Response

DOE agrees that the above comment is justified. Although perhaps not stated strongly enough in the study plan, all available techniques will be utilized during modeling of site effects. Modified models, for example, are intended to be developed and tested against the initial reference model, and it is anticipated that use of these more sophisticated models will result in an improved fit to the observations as compared to the initial very simple model.

In the current version of Study Plan 8.3.1.17.3.4 (second paragraph in Section 3.2.1, p. 3-4) it is stated that:

"The approach to modeling will be to construct the simplest model that predicts the first-order features of the observed site-response functions. The initial model will assume a one-dimensional velocity structure, linear response, and vertically incident body waves. More complexity (e.g., nonvertically incident body waves, surface waves, equivalent-linear site response, two-dimensional velocity structure, etc.) will be introduced as necessary."

The approach to modeling, therefore, includes more than the use of the "simplest" or "initial" model. A more complete discussion of modeling is included in Section 3.2.4 (p. 3-5) of the study plan.