



Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
Las Vegas, NV 89193-8608

OCT 31 1995

Joseph J. Holonich, Chief
High-Level Waste and Uranium
Recovery Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

U.S. DEPARTMENT OF ENERGY (DOE) TOPICAL REPORT, "SEISMIC DESIGN
METHODOLOGY FOR A GEOLOGIC REPOSITORY AT YUCCA MOUNTAIN"
(YMP/TR-003-NP) (SCPb: N/A)

References: (1) Ltr, Milner to Holonich, dtd 8/22/94
(2) Ltr, Bell to Milner, dtd 11/3/94
(3) Ltr, Milner to Holonich, dtd 1/26/95
(4) Ltr, Bell to Milner, dtd 2/14/95
(5) Ltr, Holonich to Shelor, dtd 2/28/94

Enclosed for review by the U.S. Nuclear Regulatory Commission (NRC) is the DOE topical report, *Seismic Design Methodology for a Geologic Repository at Yucca Mountain* (YMP/TR-003-NP). This topical report describes the design methodology and criteria that DOE intends to use to accommodate vibratory ground motion and fault displacement hazards during preclosure at a potential repository at Yucca Mountain, Nevada. This is the second of three topical reports that together describe DOE's seismic design process for Yucca Mountain. A previous topical report, *Methodology to Assess Fault Displacement and Vibratory Ground Motion Hazards at Yucca Mountain* (YMP/TR-002-NP), described the probabilistic seismic hazard assessment methodology that DOE will use at Yucca Mountain. A third topical report will document DOE's determination of design basis vibratory ground motions and fault displacements.

The seismic design methodology and criteria described in this report are founded on DOE's safety performance goal-based seismic design methodology. Four safety performance categories have been established for surface and subsurface structures, systems, and components (SSCs) of a potential geologic repository

YMP-5

9511030314 951031

PDR WASTE

WM-11

PDR

102-8
WM-11
NH03

OCT 31 1995

at Yucca Mountain, according to their functional performance requirements and public safety consequences of failure. Each category has a corresponding safety performance goal that is expressed as a probability of unacceptable performance (or failure) for the SSC being designed. For the highest safety performance category, the performance goal is comparable to the performance that has been estimated for safety-related SSCs of nuclear power reactors, as determined from probabilistic risk assessments. For SSCs that have no radiological safety significance, the safety performance goals are consistent with the performance provided by established building codes for noncritical facilities.

The DOE submitted an annotated outline of this topical report to the NRC by a letter dated August 22, 1994 (Reference 1). The NRC staff performed a scoping review of the annotated outline and transmitted review comments on November 3, 1994 (Reference 2). In response to the NRC staff's review comments, the DOE submitted a revised annotated outline of the report on January 26, 1995 (Reference 3). The NRC staff notified the DOE on February 14, 1995 (Reference 4) that a report written to the revised outline would qualify as a topical report, which can be submitted to the staff for formal review.

Certain changes have been made in the report relative to the revised annotated outline that was provided on January 26, 1995 (Reference 3). A new Section 8 addresses seismic design considerations for the waste package (that material was formerly covered in Section 7). A new Appendix C has been added to discuss the relationship between the Yucca Mountain design criteria and the NRC design criteria for nuclear power plants. Finally, a new Appendix F provides example applications of the Yucca Mountain methodology to the design of surface and subsurface SSCs. Since these changes are primarily organizational in nature and do not affect the scope of the report, it was not considered necessary to further revise the annotated outline that was provided on January 26, 1995.

The DOE requests that the NRC review this methodology for acceptability for referencing in a license application for the potential geologic repository at Yucca Mountain. It is anticipated that the NRC will provide its review in a Staff Evaluation Report in accordance with the NRC's Division of High-Level Waste Management Topical Report Review Plan, as provided to the DOE by letter dated February 28, 1994 (Reference 5).


Joseph J. Holonich

-3-

OCT 31 1995

The NRC staff's letter dated November 3, 1994 (Reference 2), expressed four concerns with the topical report annotated outline. As noted in the letter transmitting the revised annotated outline of the report (Reference 3), the DOE has addressed these concerns in the topical report. The DOE anticipates that additional questions and concerns may arise during the NRC review of the report.

If you have any questions, please contact Robert G. Hawe at (702) 794-7967.


Stephan J. Brocoun
Assistant Manager for
Suitability and Licensing

AMSL:RGH-208

Enclosure:
Topical Report YMP/TR-003-NP



OCT 31 1995

cc w/encl:

L. H. Barrett, HQ (RW-2) FORS
R. A. Milner, HQ (RW-30) FORS
A. B. Brownstein, HQ (RW-36) FORS
C. E. Einberg, HQ (RW-36) FORS
Samuel Rouso, HQ (RW-40) FORS
M. S. Delligatti, NRC, Washington, DC
W. D. Barnard, NWTRB, Arlington, VA
R. R. Loux, State of Nevada, Carson City, NV
Robert Price, State of Nevada, Carson City, NV
Cyril Schank, Churchill County, Fallon, NV
D. A. Bechtel, Clark County, Las Vegas, NV
J. D. Hoffman, Esmeralda County, Goldfield, NV
Eureka County Board of Commissioners, Eureka, NV
B. R. Mettam, Inyo County, Independence, CA
Lander County Board of Commissioners, Battle Mountain, NV
Jason Pitts, Lincoln County, Pioche, NV
V. E. Poe, Mineral County, Hawthorne, NV
L. W. Bradshaw, Nye County, Tonopah, NV
Florindo Mariani, White Pine County, Ely, NV
P. A. Niedzielski-Eichner, Nye County, Chantilly, VA
William Offutt, Nye County, Tonopah, NV
P. M. Dunn, M&O, Vienna, VA
C. L. Sisco, M&O, Washington, DC
R. I. Holden, National Congress of American Indians,
Washington, DC
Elwood Lowery, Nevada Indian Environmental Coalition,
Reno, NV
D. F. Fenster, M&O, Vienna, VA
J. C. Stepp, M&O, Austin, TX
Q. A. Hossain, M&O, Livermore, CA
L. D. Foust, M&O, Las Vegas, NV
J. L. Younker, M&O, Las Vegas, NV
T. C. Geer, M&O, Las Vegas, NV
R. D. Snell, M&O, Las Vegas, NV
M. A. Lugo, M&O, Las Vegas, NV
S. E. LeRoy, M&O, Las Vegas, NV
S. P. Nesbit, M&O, Las Vegas, NV
R. M. Nolting, M&O, Las Vegas, NV
S. P. Nesbit, M&O, Las Vegas, NV
S. E. LeRoy, M&O, Las Vegas, NV
P. R. Hammond, M&O, Las Vegas, NV
J. L. King, M&O, Las Vegas, NV
C. T. Statton, M&O, Las Vegas, NV
R. C. Quittmeyer, M&O, Las Vegas, NV

OCT 31 1995

cc w/encl: (continued)

M. P. Hardy, Agapito & Associates,
Grand Junction, CO

R. P. Kennedy, RPK Structural Mechanics
Consulting, Inc., Yorba Linda, CA

W. E. Barnes, YMSCO, NV

J. R. Dyer, YMSCO, NV

S. J. Brocoum, YMSCO, NV

R. V. Barton, YMSCO, NV

A. V. Gil, YMSCO, NV

R. G. Hawe, YMSCO, NV

S. B. Jones, YMSCO, NV

J. T. Sullivan, YMSCO, NV

R. L. Craun, YMSCO, NV

J. M. Replogle, YMSCO, NV