



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

APR 03 1985

Dr. J. Carl Stepp
Electric Power Research Institute
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P. O. Box 10412
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Dear Carl:

In response to your March 18, 1985 request for comments on your minutes of our February 27, 1985 meeting, I am enclosing an annotated version of your minutes which reflects my understanding of that meeting. I believe that the meeting was worthwhile and that subsequent meetings and the LLNL, EPRI and USGS studies will be very useful in helping the NRC make decisions in this highly complex area.

I recently participated in the first meeting of a National Academy of Science/National Research Council panel on Seismic Hazard Analysis. The panel Chairman indicated great interest in the LLNL and EPRI studies and I "volunteered" LLNL and EPRI sending copies of the results and comparative reports to the 15 panel members. The panel was also very interested in attending the proposed NRC sponsored, USGS coordinated, workshop/conference on Seismic Hazard Analysis which we are planning to hold in November 1985. If there is any problem with EPRI sending their May 1985 and subsequent reports, please let me know.

Sincerely,

Leon Reiter, Acting Chief
Geosciences Branch, DE

Enclosure:
As stated

cc: w/enclosure
D. Bernreuter, LLNL
J. Savy, LLNL
J. King, EPRI
J. J. Taylor, EPRI
W. Loewenstein, EPRI
I. B. Wall, EPRI
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#18

Minutes
and
Meeting with NRC/LLNL
1
February 27, 1985
Westin St. Francis
San Francisco, CA

The meeting was begun at 9:00 AM.

Present

Leon Reiter (NRC)
Jean Savy (LLNL)
Donald Bernreuter (LLNL)

Carl Stepp (EPRI)
Jerry King (EPRI)

Purpose

To ~~form a schedule and preliminary~~ ^{discuss} plans for comparative evaluations of the NRC/LLNL and EPRI seismic hazard methodologies at nine test sites. ^{and results}

Schedule for coordination of comparative evaluations

~~Coordination~~
~~The comparative evaluations~~ will be initiated with an information exchange ~~workshop~~ ^{meeting} on May 23, 1985. The following key milestones were established.

- May 23, 1985 ^{Meeting} discuss planned and existing comparative evaluations ^{workshop} to accomplish technical review of the ~~NRC/LLNL~~ and EPRI seismic hazard methodologies and ~~finalize scope of comparative evaluations~~. LLNL will present results of initial comparisons at 9 joint test sites
 - ~~May 26, 1985~~ ~~Final comparative evaluation plan~~
 - June 3, 1985 to September 3, 1985 ^{bulk of} Perform comparative evaluations.
 - September 3-27, 1985 ^{LLNL and EPRI} Prepare ~~draft~~ comparative evaluation reports.
 - ~~October 2, 1985~~ ^{Meeting} Workshop on comparative evaluations.
 - ~~November 13, 1985~~ ~~Complete comparative evaluation report.~~
 - • November, 1985 ^{Presentation of studies as part of US63/NRC conference on Seismic Hazard Investigation}
 - General Structure of ~~Workshop~~ ^{May Meeting}
- (1) EPRI presentation of methodology including proposed parametric analyses.

- (2) LLNL presentation of ~~results~~ initial comparison of LLNL and EPRI results at a joint test site
- (3) NRC/LLNL presentation of methodology including proposed parametric analyses.
- (4) Discussion of additional comparative evaluations
- ~~(2) Finalise scope of comparative evaluation report.~~

-- General Structure of ~~Workshop 2~~ September meeting

- (1) EPRI presentation of draft comparative evaluations.
- (2) NRC/LLNL presentation of ~~draft~~ comparative evaluation report.
- (3) USGS presentation of initial evaluation
- ~~(3) Resolution of comparative evaluation issues.~~

An issue to be resolved prior to ~~Workshop 2~~ the September meeting is to what extent and form of the comparative evaluation report and the procedure for making it a part of the permanent record. How LLNL and EPRI evaluations will be combined in a possible joint report.

Role of ~~USGS~~ NRC funded USGS studies

- ~~• USGS staff is expected to participate in the two workshops and to provide comments on both the EPRI and LLNL reports and proposed parametric analyses.~~
- The USGS has done some parametric analyses based on alternative tectonic models (perhaps other considerations(?)). Leon Reiter will ~~determine the scope of this effort and assess whether it can be included as part of the comparative evaluation effort.~~ provide copies of these studies to LLNL and EPRI.

Preliminary Parametric Analysis Proposed by LLNL

1. Test lower bound magnitude cut-off.
 - EPRI ground motion model will be used for this comparison.
2. Test impact of different earthquake catalogs used by EPRI and LLNL.
 - Determine differences in catalogs.
 - Perform computations to test impact on final hazard estimates.
3. Perform independent calculations of seismicity model parameters a and b using a statistical model to be developed by LLNL. Both EPRI catalog and LLNL catalog will be used.
4. Use EPRI's seismicity parameter evaluation method to estimate a and b values for LLNL source zones, then assess the implications of the EPRI approach on seismic hazard estimates
5. Perform sensitivity on site corrections.
6. Assess importance of confidence levels assigned by LLNL panel members to zones
7. Test significance of assumptions with respect to the complimentary zone.

10 Assess differences between the EPRI (discrete) and the LLNL (continuous) approaches to treating uncertainty.

86. Perform sensitivity on source zone uncertainties.

97. Perform sensitivity on distance and magnitude^{bin} parameters.

8. ~~Test key sensitivity of the simulation approach (LLNL) versus the logic tree structure (EPRI) for aggregating source zones. Appropriate test cases need to be identified.~~

9. ~~Test sensitivity on assuming no, partial, full correlation between a and b parameters of the seismicity model.~~

Preliminary Parametric Analysis Proposed by EPRI

1. Comparisons to test essential differences between the ~~logic~~ discrete structure approach (EPRI) and the ~~expert opinion simulation~~ continuous approach (LLNL).

-- Specific isolation of sources.

-- Specific isolation of seismicity parameters.

2. Comparisons to test details of the methodologies.

-- Method for truncating upper bound magnitude.

-- Methods for determining seismicity parameters, a and b.

-- Methods for determining activity rates and establishing appropriate constraints.

-- Impact of site-specific versus general regional interpretations.

-- Upper bound magnitude.

-- Different seismicity models.

3. Specific evaluations to assess key elements of the EPRI methodology.

-- Scientific uncertainty matrix.

-- Data uncertainty matrix.

The final methodology should be site independent. The NRC feels that this should include interpretation of source zones. The scope of comparative evaluations will be ~~finalized~~ ^{defined} at the May 23 workshop.

The meeting was adjourned at 11:30 AM.

so as to avoid inconsistencies at different sites. EPRI indicated that it will be assessing the effect of additional site-specific zonation upon their original results at the 9 test sites.