

November 12, 2002

MEMORANDUM TO: Richard J. Barrett, Director
Division of Engineering
Office of Nuclear Reactor Regulation

FROM: Michael E. Mayfield, Director */RA/*
Division of Engineering Technology
Office of Nuclear Regulatory Research

SUBJECT: TRANSMITTAL OF NUREG/CR-6607, "GUIDANCE FOR PERFORMING
PROBABILISTIC SEISMIC HAZARD ANALYSIS FOR A NUCLEAR
PLANT SITE: EXAMPLE APPLICATION TO THE SOUTHEASTERN
UNITED STATES"

This memorandum transmits the subject report, NUREG/CR-6607, "Guidance for Performing Probabilistic Seismic Hazard Analysis for a Nuclear Plant Site: Example Application to the Southeastern United States," for your use. The report is also listed as a Lawrence Livermore National Laboratory (LLNL) document, UCRL-ID-133494. The research results described in this report are based on a trial use of the guidance developed by a committee of experts, namely, the Senior Seismic Hazard Analysis Committee (SSHAC), formed to address the differences between LLNL and utility-sponsored studies in the area of Probabilistic Seismic Hazard Analysis (PSHA). This research program was self-initiated by RES and involved trial application of the guidance. It tested the guidance for the elicitation of the seismic zonation and seismicity models for two nuclear plant sites, Watts Bar and Vogtle.

From 1981 to 1989, LLNL developed a PSHA method for the eastern United States (NUREG/CR-5250) and in 1993, followed up by improvements in the handling of the uncertainties (NUREG-1488). Differences between these results and those of a utilities-sponsored study (Electric Power Research Institute, 1989) led to the development of a program to identify the sources of differences and give guidance on how to address them. To accomplish this, the NRC and the Department of Energy, which had the Electric Power Research Institute as a partner, jointly formed the SSHAC to evaluate these different seismic hazard estimates and to develop guidance on performing a state-of-the-art PSHA (NUREG/CR-6372, 1997) with particular emphasis on elicitation of expert opinion data.

As part of the current project, additional guidance was developed for performing a PSHA. The trial implementation project tested the development of the seismic zonation and seismicity models for the two sites. It was found that the uncertainty generated by disagreements among experts could be considerably reduced through interaction and discussion of the data, and by concentrating on the elements common to all experts' interpretations. The present study includes analyses of the differences between results from the trial implementation study on Watts Bar and the corresponding results documented in NUREG-1488.

Lessons Learned

My staff has identified two pivotal lessons learned from this trial implementation process that reinforce the elicitation guidance provided by the SSHAC report:

1. It is important that materials for use by the expert panel members be complete and available prior to the meetings, and
2. The feedback interactions between the expert panel members and the technical facilitator integrator must be thorough and in-depth.

Regulatory Implications

The attached NUREG/CR documents the results of a trial implementation of the SSHAC guidance for conducting a state-of-the-art PSHA. The trial implementation exercised the SSHAC guidance by eliciting seismic source zone and ground motion attenuation data for two nuclear plant sites. The tested guidance and its documented application contribute to the agency's Performance Goal of improving the efficiency, effectiveness, and realism of the NRC's activities and decisions. The tested guidance are available to the NRC staff and industry analysts for siting of nuclear facilities. The tested guidance will enable the license applicants to develop more realistic PSHAs that meet NRC's requirements and guidance. For the staff, the review process will be more efficient and effective.

Dr. Ernst Zurflueh (retired) and Sada Pullani were the Program Managers for this effort, with technical assistance from Dr. Andrew Murphy, RES. If you have any questions, please call me (415-5678), or S. Pullani (415-6843) or Dr. A. Murphy (415-6011) of my staff.

Attachments: As Stated

cc: Savy, LLNL

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