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Ms. Cindy K. Bladey
Chief, Rules, Announcements, and Directives Branch (RADB)
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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Subject: Draft Generic Letter on Seismic Risk Evaluations for Operating Reactors (Docket ID NRC-2011-0204)

Dear Ms. Bladey:

On September 1, 2011, the US Nuclear Regulatory Commission (NRC) issued the subject draft generic letter related to evaluating seismic risk at currently operating nuclear power plants. The NRC requested comments on the draft generic letter from interested parties. The Electric Power Research Institute (EPRI) has reviewed the draft letter and offers the following comments.

1. Quantitative results from seismic PRA studies can be subject to significant uncertainty, largely because of uncertainty in the seismic hazard and the fragility evaluations for both structures and components. EPRI has underway a multi-year program for improvement of seismic PRA data and processes. New efforts within this program began with the EPRI Seismic PRA Pilot effort and are planned for completion in the next few years. Several projects have been initiated in 2011 that have the potential to reduce uncertainties in seismic PRA results, as well as to reduce the time, effort and resources required to perform one. A more realistic and meaningful assessment of seismic risk can, in EPRI's opinion, be performed with these improved data and processes, but would require a somewhat longer response time than proposed in the draft letter.
2. The draft generic letter calls for the use of the new seismic source characterization being produced (i.e., for the Central and Eastern US). This model will be published in January 2012. The source model, by itself, is not sufficient to evaluate seismic risk at operating plants. The evaluation also requires assessments of the propagation of the ground motion to the plant sites, and evaluation of the response at the buildings on the site, taking into account site soil properties and conditions. Significant advances in technology have been made since plants performed their original site condition studies (soil profiles, shear wave velocities, etc.), enabling more complete and accurate data. Also, in the last twenty years the regulatory definition of hard rock (for which no local site amplification occurs) has changed from 2500 ft/sec to 9200 ft/sec. Several sites that were previously considered to be founded on hard rock

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Ms. Cindy K. Bladey
Chief, Rules, Announcements, and Directives Branch (RADB)
Office of Administration
U.S. Nuclear Regulatory Commission
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now would require an analysis of soil-structure interaction, which in turn would require a detailed site evaluation. From a technical standpoint, it would appear that a period of at least a year will be needed for all of the CEUS sites to develop suitable site soil profiles and to develop relevant seismic hazard curves and ground motion response spectra (GMRS). Sites that must modify the treatment of soil conditions will require recalculation of site amplification functions before seismic hazards or GMRS can be calculated using the recently completed CEUS Seismic Characterization Model. Developing this information is technically challenging and time consuming.

3. Any calculation of site seismic hazard requires not only the CEUS characterization model but also a seismic attenuation model. The most current such model is the EPRI 2004-2006 model (Ref 1). There is concern in the technical community that this model has inherent conservatism which would cause over-prediction of the seismic hazard (and therefore the GMRS). Under the schedule in the draft generic letter this is the only model that could be used. It would be prudent to allow time for research to examine and improve the EPRI 2004-2006 model or to wait for the completion of NGA East model. Using the EPRI 2004-2006 model without improvements to the EPRI 2004-2006 model or completion of the NGA East project would in all likelihood result in a need for utilities to re-perform the hazard and GMRS calculations at the completion of the NGA East project.
4. The draft generic letter indicates that, if a seismic margins assessment is performed, it should employ the PRA-based margins approach. This approach typically requires a level of effort comparable to that for a seismic PRA. EPRI has developed a seismic-margins approach that has proven to be useful in developing insights into seismic risk for operating plants (Ref 2.). An important aspect of that approach is that it requires identifying at least two success paths to safe shutdown for the plant, and evaluating the seismic margin for each path. Pilot studies have shown that this method produces reasonable results and it should be considered as an appropriate approach to evaluating seismic risk relative to resolving GI-199.

Sincerely,



Kenneth Canavan
Director, Plant Technology

Ms. Cindy K. Bladey
Chief, Rules, Announcements, and Directives Branch (RADB)
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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c: Mr. Patrick L. Hiland, NRR/DE, NRC
Mr. Kamal A. Manoly, NRR/DE, NRC
Mr. Nilesh C. Chokshi, NRO/DSEA, NRC
Mr. Clifford G. Munson, NRO/DSEA, NRC
NRC Document Control Desk

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