Probabilistic Seismic Hazard Analysis

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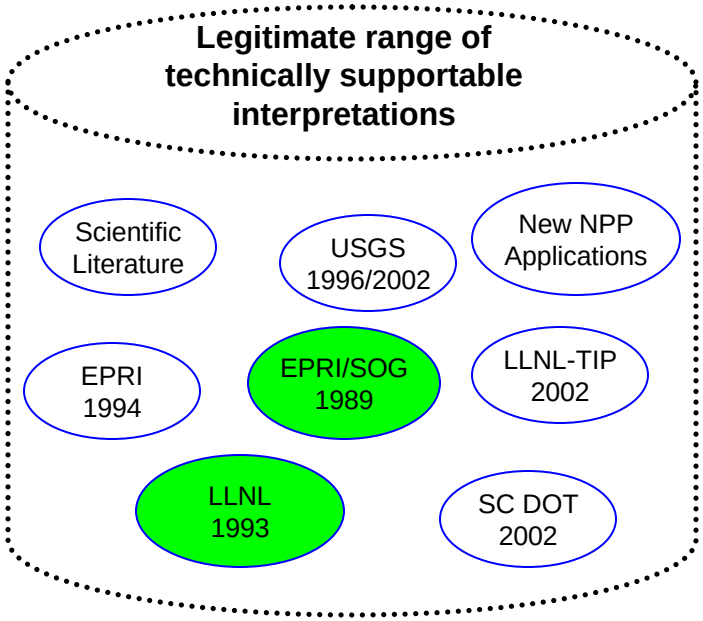
Implementation of performance based design requires that the PSHA is conducted with up-to-date interpretations of earthquake sources, earthquake recurrence and strong ground motion estimation

To be considered accurate the PSHA must represent the legitimate range of technically supportable interpretations among the technical community and the relative importance or credibility should be given to the differing hypotheses among the range.

Without this approach there is little confidence that the mean PSHA is supportable.



The PSHA language provided in RG 1.208 requires that all information be considered when developing the PSHA; this forces an applicant to explicitly consider multiple sources of information to ensure that the mean PSHA is accurate. If certain information sources are not explicitly considered then that means they are not viewed as representing the legitimate range of technically supportable interpretations. In CEUS, RG 1.208 allows either EPRI/SOG (1989) or LLNL (1993) PSHAs to be used as starting point.

For RG 1.208 to work properly an applicant should be able to start with either "Accepted PHSA Model" and arrive at similar mean PSHA. Given known significant differences in mean PSHA results between these two studies, this fundamental premise is questionable. Without explicit demonstration (starting with either LLNL or EPRI) the premise behind RG 1.208 may not be valid.

RG 1.208 and PSHA "tension" – starting with "Accepted PSHA Model"

- The regulatory stability of implementing performance based design critically depends on the stability of mean PSHA estimates.
- EPRI/SOG (1989) and LLNL (1993) pre-date SSHAC. RG 1.208 implies that they meet SSHAC, but in reality they caused SSHAC. While both studies have their merits, so much time has passed that neither study should be considered as good starting points in terms of representing the legitimate range of technically supportable interpretations today.
- Much of CEUS PSHA is "regional" in character – applicants are required to perform site-specific investigations. If one applicant changes a "regional" seismic source parameters it affects other locations as well.
- What to do with the USGS PSHA work (national seismic hazard map)? Too much focus is on the numbers; the basic input to the national seismic hazard map must also be considered as representing the informed scientific community, given that the USGS is clearly part of that community. It is legitimate "data" or "information" in the context of RG 1.208.

Near Term PSHA Consensus Needed – NRC Should Lead and Form An Independent Technical Advisory Panel to Rapidly Provide Recommendations for Defining CEUS Regional Seismic Source Interpretation