Seismic Hazard Requirements Draft ANS Standard

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August 16, 2001
SMIRT - 16
Washington, D.C.

- Overall Approach
- High Level Requirements
- Comments - Areas of greatest concern/controversy

Overall Approach

- "Middle Column" Approach
- Address Two Situations

  - Existing Studies (LLNL, EPRI, Plant-Specific)

  - New Studies
- "SSHAC" Guidance - Level, Slope, Uncertainty, Elicitation
- Refer Draft ANS 2.29 & 2.27
- Propagation of Uncertainty

High Level Requirements

1. Scope - reflects composite distribution of the informed community

2. Data Collection - geological, seismological, geophysical, geotechnical, regional and local - Reg. Guide and ANS 2.27 and 2.29

3. Source / Source Characterization - consider all credible sources of potentially damaging earthquakes

4. Ground Motion Characterization - all credible mechanisms influencing estimates of ground motion that can occur at a site given the occurrence of an earthquake of certain magnitude at a certain location

High Level Requirements

5. Local Site Effects: - topography, surficial geologic deposits, site geotechnical properties

6. Aggregation and Quantification - hazard curves, UHS, uncertainties, source and magnitude - distance de-aggregation

7. Spectral Shape - site-specific, broadband, UHS, screening and quantification

8. Use of Existing Studies - data and interpretations still valid or update as necessary

9. Other Seismic Hazards - fault displacement, landslide, soil liquefaction, settlement, etc.

10. Documentation - scrutable, updating, peer review

Use of Existing Studies

- For most eastern US plants, LLNL and EPRI results are available
- Other sites - plant-specific results are generally available
- Guiding Principle - any new information which has significant impact on the hazard must be addressed
- LLNL and EPRI are considered to meet the overall requirements subject to the above requirement

Spectral Shape

- Disparity between design and our current understanding of Eastern U.S. ground motion

- Two Implications
  - screening
  - quantification

- Screening Guidance
  "For screening purposes, the spectral shape used should have amplification factors such that the demand resulting from the use of this shape is higher than that based on the design spectra."

- Quantification Guidance
  "In the quantification.... of final risk results.... - use as realistic a shape as possible,... the UHS may also be appropriate...."

What is Next ?

- Address comments - No unsurmountable challenges
- 3-Column Approach ?
- New Hazard Study ?