



RIC 2006-Session W4F Current Seismic Issues & Associated Research

Updating Probabilistic Seismic Hazard Assessment (PSHA) Guidance

by

J. Carl Stepp, PhD

Earthquake Hazards Solutions

March 8, 2006



Scope of Presentation

- Current PSHA guidance
- Early site permit (ESP) application experience
- Updating PSHA Modeling



Current PSHA Guidance

- Regulatory Guide 1.165
 - Establishes hazard reference probability
 - Hazard-consistent ground motion across sites
 - Accepts EPRI or LLNL PSHA
 - Requires updating of seismotectonic information in site region
 - Assessment to determine if new data require updating of PSHA for the site



Current PSHA Guidance

- Senior Seismic Hazard Analysis Committee (SSHAC) Guidance
 - Guidance on uncertainty and expert assessment of inputs to hazard computation
 - Guidance for four levels of study depending on complexity of assessments and use of results



ESP Application Experience

- New data likely to require updating of PSHA for many sites
 - SSHAC Level 2 assessment
 - Significant changes in definition of seismic sources
 - Significant increase in rate of large earthquakes in New Madrid and Charleston seismic zones
 - Significant advances in ground motion modeling



ESP Application Experience continued

- Hazard reference probability-based approach lacks critically needed regulatory stability across sites



Updating PSHA Modeling

- New Plant Seismic Issues Resolution Program under technical direction of EPRI with oversight by NEI Seismic Issues Task Force
- Update hazard reference probability guidance to risk-informed guidance
 - Consistent risk across sites
 - Achieves regulatory stability
- Update modeling parameters
 - Cumulative Absolute Velocity (CAV)-based distribution on lower bound magnitude for hazard integration



Updating PSHA Modeling continued

- Develop consensus Central and Eastern United States (CEUS) ground motion model
 - Incorporates significant advances in ground motion modeling for the CEUS during past 15 years
 - Provides strong information base for development of consensus composite CEUS ground motion model including epistemic and aleatory uncertainty
 - SSHAC Level 3 assessment process
 - Obtain NRC acceptance for generic application



Updating PSHA Guidance

THANK YOU