



PSHA Activities at the USNRC: Including Continuing Research



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Outline of Presentation

- NRC Message in Participation in Lyon Workshop
- Phase I - Development and Acceptance
 - LLNL & EPRI Methodology Implementation
 - Senior Seismic Hazard Analysis Committee (SSHAC)
- Phase II - Practical Implementation
 - Seismic Siting Criteria Revision
 - IPEEE
 - Regulatory Guidance
- Phase III - Continuing Enhancement and Implementation
 - Seismic Research Program Plan



Message on NRC Participation in Lyon Workshop



USNRC:

Finds Probabilistic Seismic Hazard Analysis is an acceptable and **preferred** technique for establishing seismic design parameters for NPPs and for characterizing their uncertainties

Conducts research to improve the use of PSHA in a regulatory environment



Phase I – Development of PSHA & Initial Implementation

- Methodology Development
 - Lawrence Livermore National Laboratory
 - Electric Power Research Institute
- SSHAC Guidance



Phase II – Practical Implementation



- Seismic Siting Criteria Revision
 - 10 CFR Part 100.23
 - Regulatory Guide 1.165
- Individual Plant Examination for External Events
 - Development of Review Levels
 - Implementation
 - SPRA
 - SMA
- US Nuclear Renaissance
 - Early Site permit Applications
 - Combined Operating License Applications

US Nuclear Renaissance Early Site Permit Applications



- Clinton *Issued*
- Grand Gulf *Issued*
- North Anna *Issued*
- Vogtle *Under Review*



US Nuclear Renaissance Combined Operating License Applications



- Bellefonte Nuclear Site Units 3 and 4
- Calvert Cliffs Unit 3
- Grand Gulf Unit 3
- North Anna Unit 3
- Shearon Harris Units 2 and 3
- South Texas Project Units 3 and 4
- William States Lee III Units 1 and 2



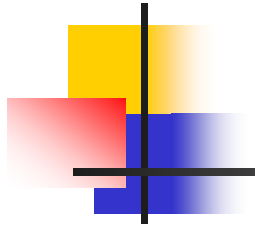
Phase III – Continuing Enhancements Seismic Research Program Plan

- Seismic Source Characterization
 - East Tennessee, New Madrid, Charleston, New England, etc.
 - Planned Cooperative Effort with DOE, EPRI, and others
- Next Generation Attenuation Relationship for the CEUS
 - Planned Cooperative Effort with others
- Development of a Time-History Database
- Stress Drop/Parameter
- Spectral Shape



Seismic Research Program Plan (Cont'd)

- Strong Ground Motion Simulation for Finite Sources
- Practical Procedures for Implementing the Guidelines of the Senior Seismic Hazard Analysis
- Instrumentation for Independent Monitoring of Seismic Activity in the CEUS through Expansion of the Advanced National Seismic System
- Multi-Dimensional Loading in Site Response Analyses
- Analyses of Extreme Ground Motion



Seismic Research Program Plan (Cont'd)



- Development of Recommendations for Shape of Minimum Response Spectrum at Foundation Level
- Analysis of Effect of the Cumulative Absolute Velocity (CAV) Filtering Approach on the Shape of the Probabilistic Hazard Curves
- Tsunami Hazard Characterization
 - East & Gulf Coasts