



AP1000



AP1000 DCWG

Bellefonte 3&4

Lee Nuclear 1&2

Summer 2&3

Vogtle 3&4

Harris 2&3



AP1000 Design-Centered Working Group

Seismic Discussions March 1, 2007

AP1000 COLA Seismic Activities

- **Purpose – Information Exchange**
 - What you can expect to see
 - in the AP1000 COL Applications
 - prior to the COL Applications
- **Agenda**
 - As posted
- **Terms**
 - NEI Letter of February 2, 2007

Meeting Agenda

- **Southeastern US - Geologic & Seismic Overview**
- **Hard Rock AP1000 Site Overviews**
- **PSHA Evaluation**
 - Development of Hard Rock Sites GMRS Envelope and Time Histories
- **Status of Industry Evaluations**
- **AP1000 Structural Evaluation of Hard Rock Sites GMRS Envelope**

Meeting Agenda

- **Progress Energy - Harris Seismic Design Status**
- **Southern Company - Vogtle Seismic Design Status**
- **Status of Dynamic Soil Testing**
- **Industry White Paper - High Frequency Motions**
- **Discussion of Need for Seismic Generic Presentation**
- **NRC Overview (NRC)**

Proposed Terms for Performance-based Spectra

■ Motivation

- Safe Shutdown Earthquake (SSE) was conceived in preparing Part 100, Appendix A to be an actual historic earthquake or an estimated earthquake determined following prescribed deterministic procedures
- Performance-based spectra are a significant evolution of the original SSE concept integrating site-specific ground motion hazard and seismic design criteria
- Revised regulatory guidance for performance-based implementation of Part 100.23 and Part 50 Appendix S should have well defined terms for derived site-specific performance-based spectra

Proposed Terms for Performance-based Spectra

- **Site-Specific Ground Motion Response Spectra (GMRS)**

The Site-Specific Ground Motion Response Spectra (GMRS) are characterized by site-specific horizontal and vertical response spectra determined as free-field motions on the ground surface or as free-field outcrop motions on the uppermost in-situ competent material defined by shear-wave velocity of 1000 fps or greater, using performance-based procedures described in Draft Regulatory Guide DG-1146. When the Site-Specific GMRS are determined as free-field outcrop motions on the uppermost in-situ competent material, only wave propagation in the materials below this elevation are included in the site response analysis.

GMRS are appropriate for performance-based implementation of the requirements of Part 100.23(d)(1) and satisfy the SSE Ground Motion requirement for performance-based implementation of Part 50 Appendix S(IV)(1).

Proposed Terms for Performance-based Spectra

- **Foundation Input Response Spectra (FIRS)**

The Foundation Input Response Spectra (FIRS) are characterized by site-specific horizontal and vertical response spectra derived at the foundation level of safety related structures such that the derived spectra are hazard-consistent with the Site-Specific GMRS. The FIRS are the Site-Specific GMRS transferred to the base elevations of foundations. FIRS are derived as free-field outcrop spectra; that is, only wave propagation in materials below the base elevation of a safety related structure are included in site response analysis.

The FIRS satisfy the requirements of Part 50 Appendix S(IV) as input for analysis of the soil-structure system.

Proposed Terms for Performance-based Spectra

- **Certified Seismic Design Response Spectra (CSDRS)**

The Certified Seismic Design Response Spectra (CSDRS) are site independent seismic design horizontal and vertical response spectra that have received Commission approval, issued pursuant to Subpart B of 10 CFR Part 52, as the seismic design response spectra for an approved certified standard design nuclear plant. The input or control location for the CSDRS is specified in the certified standard design.

AP1000 COLA Seismic Activities SUMMARY

- **Status of Industry and Site Specific Activities**
- **Hazards**
 - Updated where important
- **Methods**
 - ASCE 43-05
 - CAV
 - Sigma
 - Incoherency
 - Method 2A or 4
- **High Frequency**

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