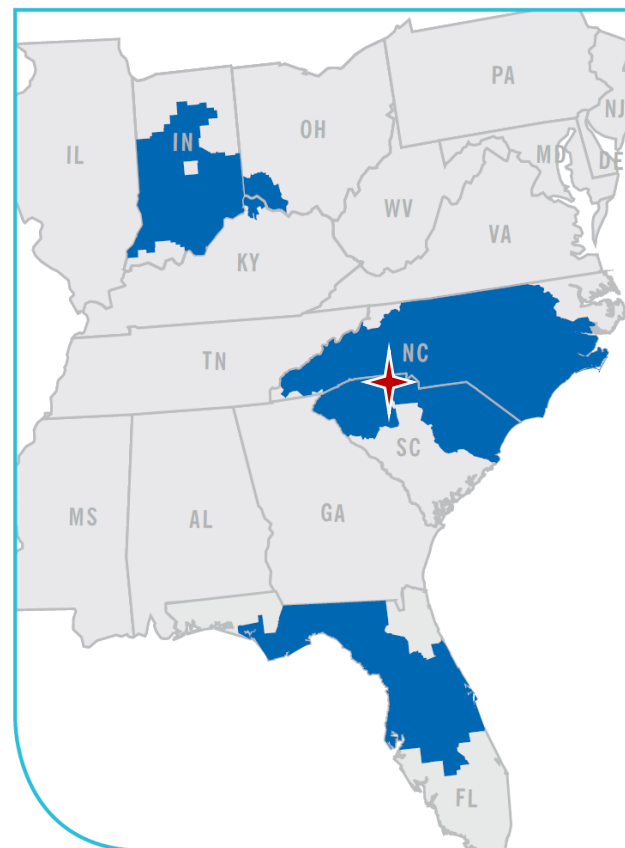


DUKE ENERGY Lee Nuclear Station



CEUS Response
Proposed Technical Audits
May 16, 2013

Agenda

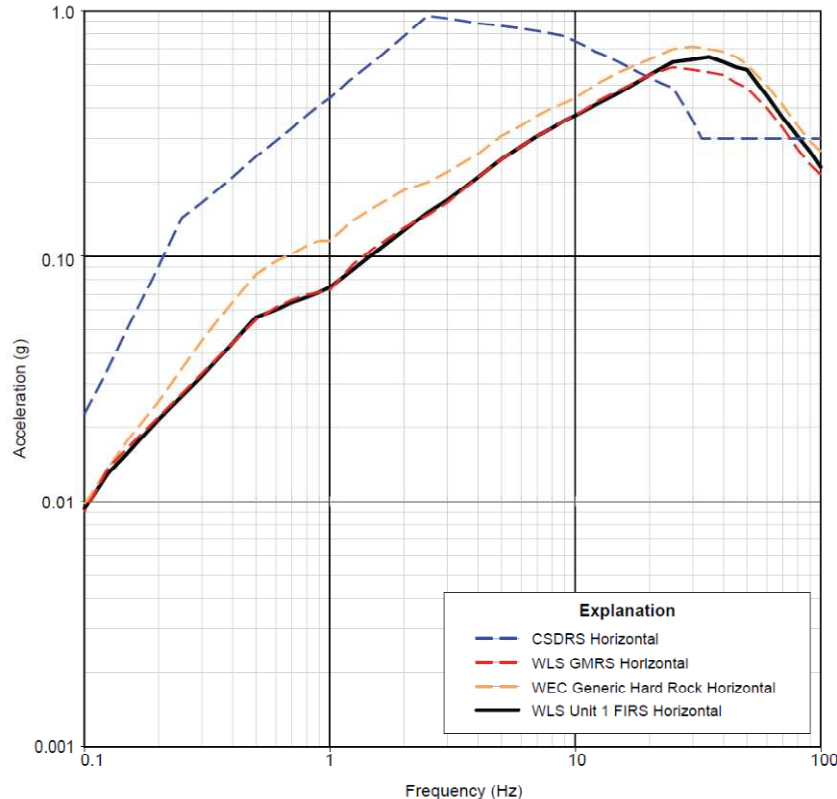
- Advantages of Technical Audits
- Two-Pronged Approach
 - Use most current GMM to define CEUS PSHA
 - Westinghouse demonstrates increased HRHF
- Proposed Technical Audit Timeframes
- Scope of Technical Audits
- Wrap-Up

Advantages of Technical Audits



- Lee will be one of the first hard-rock CEUS submittals
 - Effect of seismic source update (NUREG-2115, January 2012)
 - Effect of ground motion model update (EPRI GMM 2013 update)
- Additional AP1000 structural and component evaluations will address potential exceedances of HRHF (Similar to DCD effort with TR-115)
- Technical Audits enable in-depth reviews and face-to-face discussions of impacts and resolution methods
- Technical Audits enable NRC staff to:
 - Understand complexities introduced by CEUS at hard rock sites
 - Review actual application of EPRI GMM 2013 update
 - Complete initial reviews prior to seismic hazard submittals by licensees.

Two-Pronged Approach



WLS FSAR Figure 3.7-201
(Based on EPRI-SOG PSHA)

Current EPRI-SOG PSHA shows some margin to current AP1000 criteria.

- Ensure new CEUS PSHA is based on the most current GMM (use EPRI GMM 2013 update)
- Request Westinghouse demonstrate that AP1000 design is adequate for an increased HRHF

Two-Pronged Approach (Continued)



- EPRI GMM 2013 Update
 - NRC endorsement of Updated GMM 2013 expected in August 2013
- Westinghouse HRHF-CEUS Evaluation
 - Enhanced modeling of AP1000 Nuclear Island
 - Re-assessment of Critical Structures and Components
 - Updated Technical Report
- Interfaces involve variety of experts and reviewers
 - FSAR 2.5 Geology and Seismology (Seismic Inputs)
 - FSAR 3.7 Seismic Design (Structural)

Proposed Technical Audit Timeframes



- August 2013
 - Audit of Lee CEUS GMRS seismic update (based on EPRI GMM 2004/2006)
 - Audit of Westinghouse assessments and approach, and review preliminary results of HRHF-CEUS evaluations
- January 2014
 - Audit of Lee CEUS GMRS and FIRS seismic update (based on EPRI GMM 2013 update)
 - Audit of Westinghouse HRHF-CEUS evaluations and results

Scope of Technical Audits - Seismic

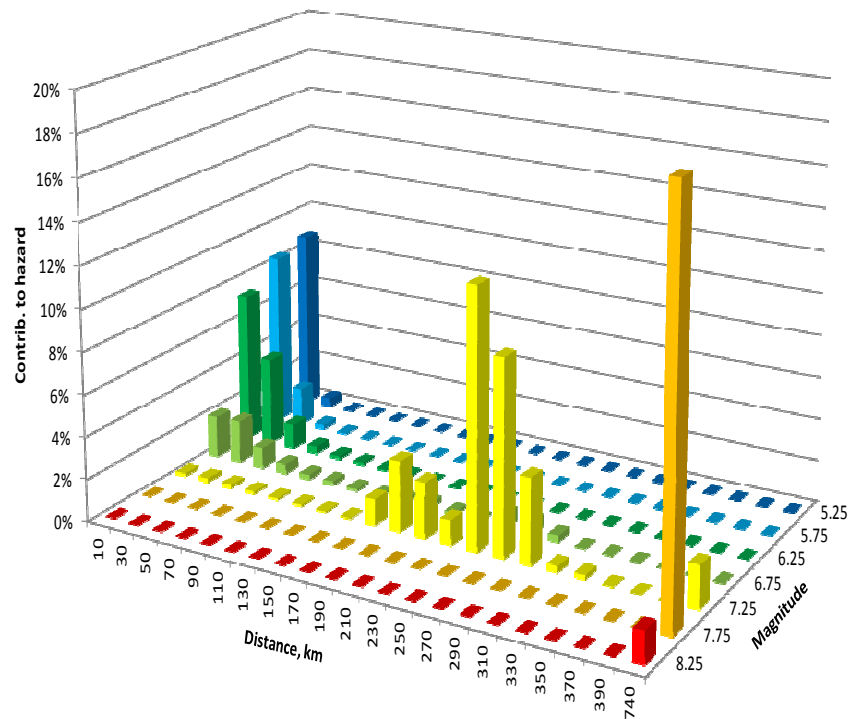


- August 2013 Audit
 - Review the effect of changing from EPRI-SOG sources to NUREG-2115 sources, maintaining EPRI GMM 2004/2006
 - Lee seismic hazard has contributions from
 - Repeated large magnitude earthquakes (Charleston, New Madrid)
 - Background sources - local moderate magnitude earthquakes
 - Review relative differences in contributions between EPRI-SOG sources and NUREG-2115 sources
 - Review Updated GMRS
- January 2014 Audit
 - Review the effect of maintaining NUREG-2115 sources, changing from EPRI GMM 2004/2006 to EPRI GMM 2013 Update
 - Review Updated GMRS and FIRS

Example - Deaggregation Comparison - LF, 10^{-5}

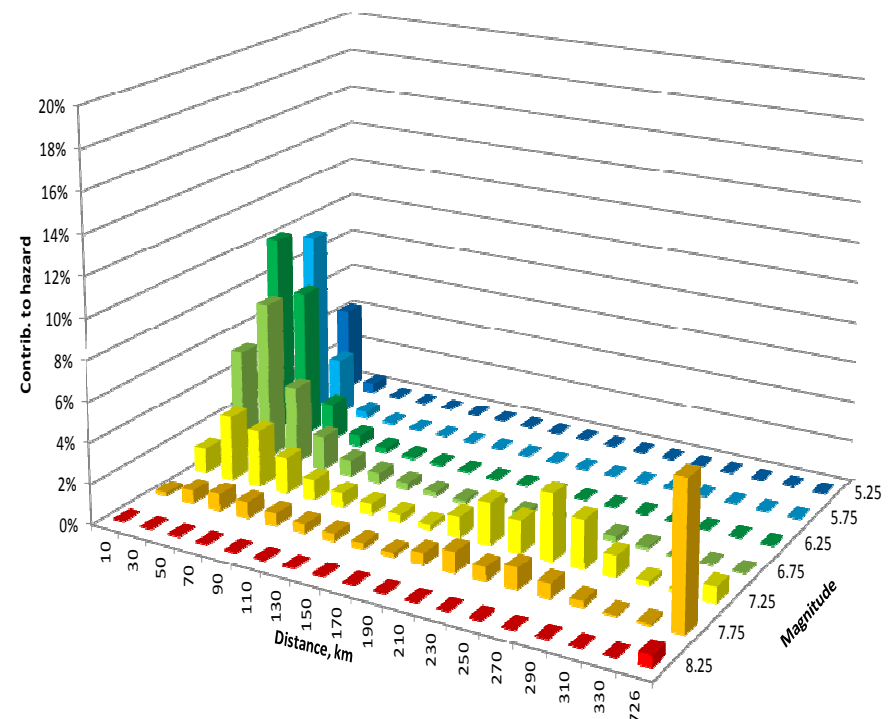


Low Frequency, 1.E-05 Hazard (see FSAR Fig 2.5.2-233)



FSAR Figure 2.5.2-233
(EPRI-SOG and EPRI 04/06 GMM)

Low Frequency, 1.E-05 Hazard (CEUS and EPRI 04/06)

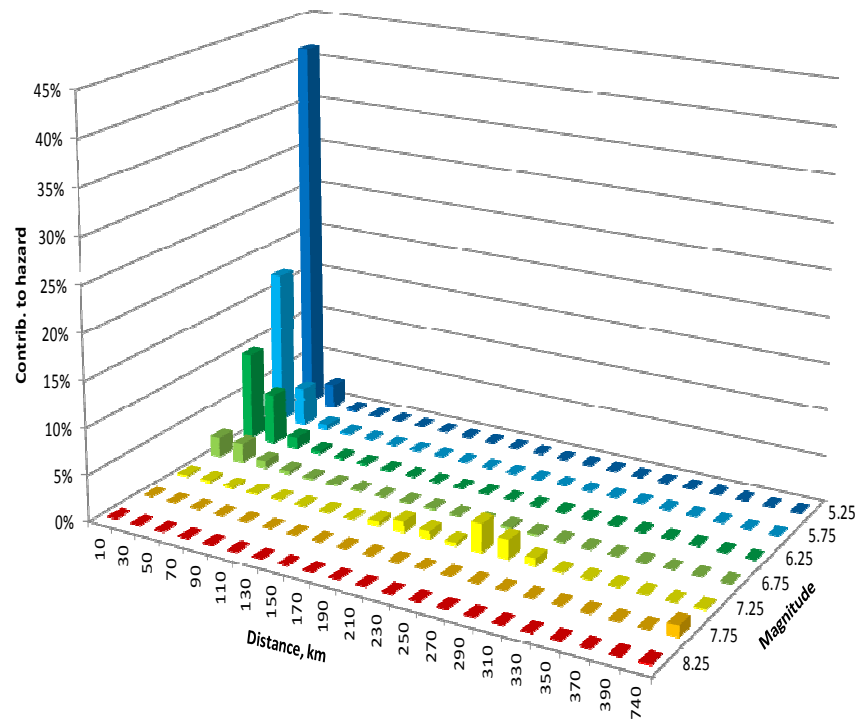


Preliminary CEUS
(NUREG-2115 and EPRI 04/06 GMM)

Example - Deaggregation Comparison - HF, 10^{-5}

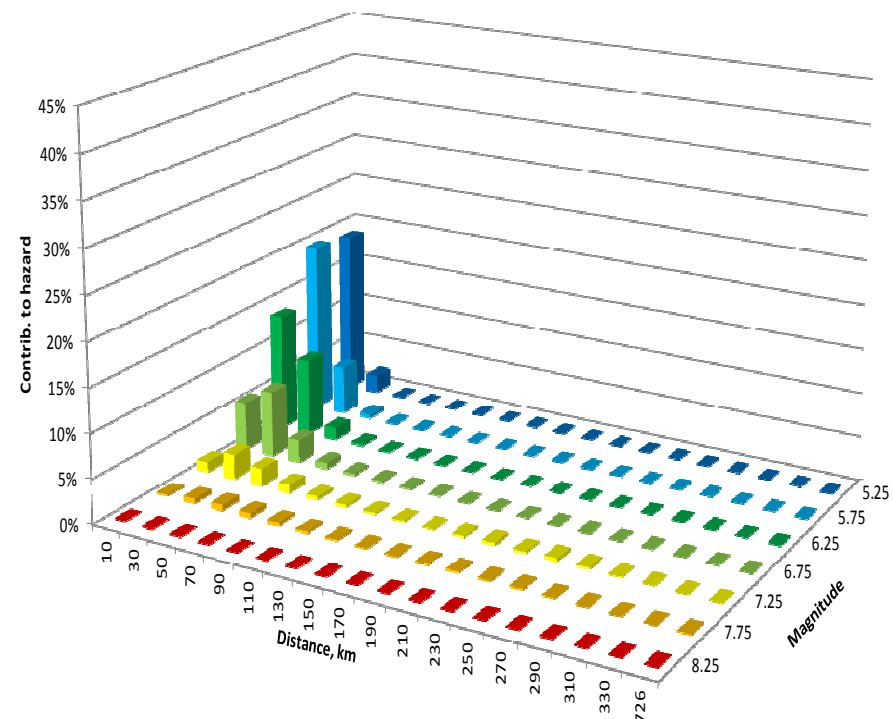


High Frequency, 1.E-05 Hazard (see FSAR Fig 2.5.2-234)



FSAR Figure 2.5.2-234
(EPRI-SOG and EPRI 04/06 GMM)

High Frequency, 1.E-05 Hazard (CEUS and EPRI 04/06)



Preliminary CEUS
(NUREG-2115 and EPRI 04/06 GMM) 9

Scope of Technical Audit - Structural

- August 2013 Audit
 - Review margin assessment and targeted increase of HRHF spectrum
 - Review evaluation methods and preliminary results
- January 2014 Audit
 - Review final structural and component evaluation results
 - Conclude that AP1000 CSDRS governs AP1000 design, even for HRHF-CEUS spectrum

Wrap-Up

- Advantages of Technical Audits
- Two-Pronged Approach
 - Use most current GMM to define CEUS PSHA
 - Westinghouse demonstrates increased HRHF
- March 2014 CEUS Submittal
- Duke follow-up with NRC for planning of audits
- Questions ??