



# **Near-term Task Force Recommendation 2.1 (R2.1) Seismic Hazard Evaluation**

Arizona Public Service  
Palo Verde Nuclear Generating Station  
Public Meeting  
June 9, 2015

# References and Logistics

- NRC Presentation Slides – ML15159B297
- NRC Technical Focus Area Questions -ML15147A068
- Licensee Presentation Slides – ML15156B331
- Licensee Hazard Report and Supplement –  
ML15076A073; ML15105A076
- Screening and prioritization results –  
ML15113B344
- Meeting Feedback Form (request from  
[fgv1@nrc.gov](mailto:fgv1@nrc.gov) or [njd2@nrc.gov](mailto:njd2@nrc.gov))
- Meeting Summary to be issued within 30-day

# Meeting Purposes

- Gather additional information based on early identification of areas where additional technical information will support the staff's review
- Gain a better understanding of how the licensee conducted their evaluation

# Outline

- Overview of Recommendation 2.1 – Response to NRC 50.54(f) letter
- Screening and Prioritization results
- NRC approach to seismic hazard characterization reviews for Western US (WUS) sites
- Review schedules and timeline

# Seismic R2.1 Process Ensures Clarity, Consistency, and Risk-Informed Regulatory Decisions

## PHASE 1

### INFORMATION GATHERING

#### STAGE 1

Interact with Industry on Hazard and Risk Evaluation Guidance

CEUS Licensees submit Site Response (9/2013 & 3/2014)

Licensees submit Hazard Reevaluations and Interim Evaluations, as needed (CEUS:3/2014,WUS:3/2015)

#### STAGE 2

Screen and prioritize plants for Risk Evaluation. Review Interim Evaluations, as needed (CEUS:5/2014; WUS:5/2015)

Screened-in plants complete Expedited Interim Evaluation (CEUS:12/31/2014;WUS:1/2016) and Risk Evaluation (Group 1: 6/2017)

NRC reviews Risk Evaluation

## PHASE 2

### DECISION-MAKING

NRC makes Regulatory Decisions as Needed

- \* Safety Enhancements
- \* Backfit Analysis
- \* Modify Plant License

# Seismic Screening and Prioritization results

- NRC Letter issued for WUS sites on  
May 13, 2015 (ML15113B344)
- Palo Verde has been conditionally screened-in  
for seismic risk evaluation and limited scope  
evaluations
  - Review Group 3 plant
- No immediate safety issues identified
- Information supports safety assurance allowing  
additional time to complete the seismic risk  
evaluation

# **NRC Review of SSHAC Studies for WUS Sites**

- Did SSHAC process follow NRC guidance?
- How effective was the peer review panel?
- Have all applicable data been considered?
- Were data uncertainties identified and considered?
- Was an appropriate range of applicable models considered?
- How were models selected and weighted in the analysis?
- How were models assembled into the PSHA?

# NRC Review of Source Models for WUS Sites

- How were seismic sources identified?
  - Geologic mapping
  - Geophysical observations
  - Earthquake catalog
- How were seismic sources characterized?
  - Geometry (location, length, dip)
  - Range of magnitudes
  - Faulting style (normal, reverse, strike-slip)
  - Slip rate and recurrence models
  - Complex rupture scenarios



# **NRC Review of Ground Motion Models and Site Response for WUS Sites**

- Do final ground motion models capture a reasonable range of alternative models?
- How were sources of uncertainty captured in model development?
- How were ground motion models adjusted for local site geology?
- Does site response analysis cover a reasonable range of alternative soil/rock properties?
- How was uncertainty in site response analysis incorporated into final probabilistic hazard curves?

# WUS Hazard Staff Review Timeline

- ✓ March 2015: WUS Hazard Submittals
- ✓ May: Screening and prioritization letter
- ✓ June: Public meetings
- Late summer/early fall: Staff questions
- Fall: NRC final screening letter including ESEP response
- December: GMRS suitability Letter
- Summer/Fall 2016: Document Hazard review
- December 2020: Risk Evaluation submittal (Grp 3)

# Break for NRC Staff Alignment

- 5 – 10 minute planned break for NRC staff alignment to support meeting wrap-up



# Opportunity for Public Questions or Comments

- Additional Questions?

Please ask us at:

*JLD\_Public.Resource@nrc.gov*

# List of Acronyms

- CEUS – Central and Eastern United States
- ESEP – Expedited Seismic Evaluation Process (for Interim Evaluation)
- GMRS – Ground Motion Response Spectrum
- NRC – U.S. Nuclear Regulatory Commission
- NPP – Nuclear Power Plant
- NTTF – Near-Term Task Force
- PSHA – Probabilistic Seismic Hazard Analysis
- SFP – Spent Fuel Pool
- SMA – Seismic Margins Analysis
- SPID - Screening, Prioritization, and Implementation Details SPID
- SPRA – Seismic Probabilistic Risk Assessment
- SSC – Structures, Systems and Components
- SSHAC – Senior Seismic Hazard Analysis Committee
- SSE – Safe Shutdown Earthquake
- SPID – Screening, Prioritization, and Implementation Details
- WUS – Western United States

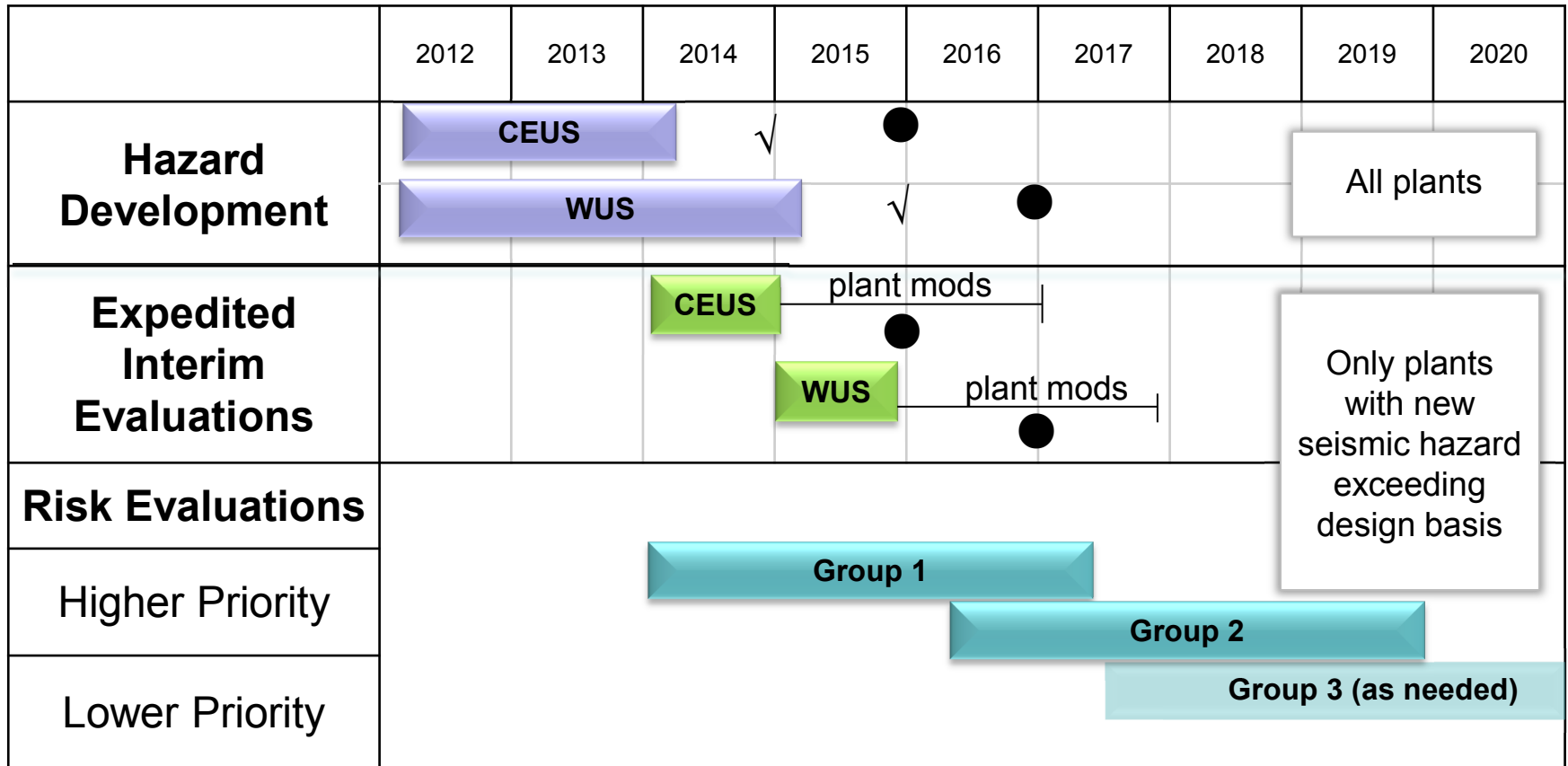


# Backup Slides

# Guidance Documents

- Two main guidance documents proposed by industry and endorsed by the NRC
- Screening, Prioritization, and Implementation Details (SPID)
  - Submitted by EPRI on November 2012
  - Endorsed by NRC on February 15, 2013
  - [EPRI-1025287 \(ML12333A170\)](#)
- Seismic Evaluation Guidance: Augmented Approach (aka Expedited Approach)
  - Submitted by EPRI on April 9, 2013
  - Endorsed by NRC on May 7, 2013
  - [EPRI-3002000704 \(ML13102A142\)](#)

# Schedule for Seismic Hazard and Risk Evaluations



 Hazard Analyses

 Expedited Interim Evaluations

 Risk Evaluations

√ Staff acknowledgement to use GMRS for risk evaluation

● Staff Assessment or response