



Industry Response Status to Near Term Task Force Recommendations 2.1 & 2.3 – Seismic

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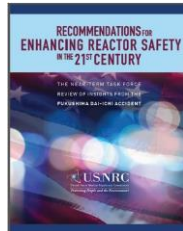
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EPRI

Regulatory Information Conference
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US Regulatory Actions Following Fukushima

- NTTF Recommendations July 12, 2012
- Request for Information (50.54(f) letter) March 13, 2012
- Recommendation 2 (seismic)
 - 2.1 Reevaluate seismic hazard and, if necessary, update design basis and SSCs
 - 2.2 Confirm seismic hazard every 10 years
 - 2.3 Perform seismic walk-downs of sample of equipment



Objectives for Recommendation 2.3 – Seismic Walkdowns

- Objectives Stated in 50.54(f) Letter:
 - Identify and Address Degraded or Non-Conforming Conditions to the Seismic Design Basis
 - Apply lessons learned from:
 - Fukushima Dai-ichi and Daini and Onagawa – 2011 Events
 - North Anna - Mineral VA earthquake of August 23, 2011
 - Prompt walkdown review of all US Plants followed by documentation of results
- Status of 2.3 Seismic Walkdowns
 - Criteria Document Completed for Walkdowns (with NRC approval), EPRI 1025286
 - EPRI Training conducted across US
 - Walkdowns completed at all US NPPs
 - Plant-specific submittals to NRC completed

Results from 2.3 Seismic Walkdowns

- On the order of 100 components reviewed at each plant
- Limited issues identified at most plants
 - “Housekeeping” type issues
 - Some seismic interactions found
 - Differences in plant drawings and actual configuration
- Corrective Action Programs (CAP) typically used to resolve issues
- NRC currently reviewing submittals

50.54(f) 2.1 Requested Information - Seismic

- Site specific seismic hazard
- Site specific performance based ground motion response spectrum (GMRS)
- Licensing basis safe shutdown earthquake (SSE) spectrum
- If GMRS > SSE, then perform risk evaluation
- Plant Risk Evaluation
 - Seismic PRA
 - Risk based Seismic Margin Assessment
- Spent Fuel Pool evaluation

Industry Response to 50.54(f) Seismic

- **Seismic Evaluations Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic**
- Expert Team Assembled to Develop Seismic Process
 - John Richards, Bob Kassawara, Jeff Hamel, Stuart Lewis (EPRI)
 - Kimberly Keithline (NEI)
 - Greg Hardy and Kelly Merz (SGH)
 - Robert Kennedy (RPK SMC)
 - Divakar Bhargava (Dominion Resources)
 - Robin McGuire (Lettis Consultants)
 - Walt Silva (Pacific Engineering)
 - Don Moore (Southern Company)
 - Bob Whorton (South Carolina Electric and Gas)
 - Doug True (ERIN Engineering and Research)

Screening, Prioritization, & Implementation (SPID) Details

EPRI Report 1025287, November 2012 (Draft)

1. Purpose and Approach
2. Seismic Hazard Development
3. GMRS Comparisons and Screening of Plants
4. Seismic Hazard and Screening Report
5. Prioritization (Schedule)
6. Seismic Risk Evaluation
7. Spent Fuel Pool Evaluation

Four appendices to SPID with detailed guidance on special topics

Key SPID Positions – PSHA/GMRS, Screening, High Frequency

- PSHA and GMRS Calculations
 - Updated GMPEs
 - Guidance for site amplification methods
 - Clarified positions on the SSE control point
- Screening
 - SSE to GMRS screening
 - Screening evaluation focused on 1 to 10 Hz range
 - Guidance for special cases (narrow banded exceedances and low frequency exceedances)
 - IPEEE capacity to GMRS screening
 - Criteria for “quality” of the IPEEE
- Separate high frequency “confirmation” based on EPRI research

Key SPID Positions – SPRA Implementation Guidance

- Structural and SSI Response
 - Structure modeling
 - Seismic response scaling
 - Fixed-based analysis criteria for sites previously defined as “rock”
- Fragility/Capacity Calculations
 - Hybrid approach for fragility calculations
 - High frequency capacities
 - Capacity-based SSC selection
- Additional Guidance
 - Large Early Release Frequency (LERF)
 - Comparison to ASME/ANS Standard
 - Peer Review
 - SPRA Documentation

SPID - Current Status

- NRC endorsed 2/15/2013
 - Clarifications on 4 items
- NRC endorsement starts the clock for the utility 60-day responses
- Number of plants that will screen out of full risk evaluations is unknown but expected to be less than half
- 50.54(f) schedules were judged to be unachievable unless new hazards are much lower than expected

Industry Proposed Augmented Approach

- Described approach to NRC in public meetings Nov. 14 and Dec. 13.
 - Primary benefit: Enables safety enhancements sooner
 - Additional near-term work means some SPRAs will be completed later
- Reviewed draft guidance document in public meeting Feb. 14
 - General agreement on criteria
 - Working to resolve remaining comments

Augmented Approach - Plan

- Develop new hazard curves and GMRS as requested in 50.54(f) letter
- Perform an additional interim evaluation (limited scope, simplified deterministic evaluation) and make appropriate plant modifications.
- Perform a number of “early SPRAs” to develop a more consistent set of implementation expectations and share lessons learned throughout the industry
- Perform all of the activities required under the 50.54(f) letter, consistent with the SPID guidance, but on a more attainable schedule

Proposed Augmented Approach for Seismic

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|--|-------------------------|----------------------------|--|----------------------|---|------|------|
| Expedited Seismic Evaluation Component (ESEL) WUS | | Seismic Hazard Development | ESEL Seismic Evaluation | ESEL Seismic Modifications | ESEL Seismic Modifications | ESEL Mods w/ Outages | | | |
| | | Seismic Hazard Development | ESEL Seismic Evaluation | ESEL Seismic Modifications | ESEL Seismic Modifications | ESEL Mods w/ Outages | | | |
| Seismic Risk Evaluations CDUS & WUS | | Early Seismic Risk Evaluations & Lessons Learned | | | | | | | |
| | | | | | Second Group of Seismic Risk Evaluations | | | | |
| | | | | | | | Third Group of Seismic Risk Evaluations | | |

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ESEP - Scope of Equipment

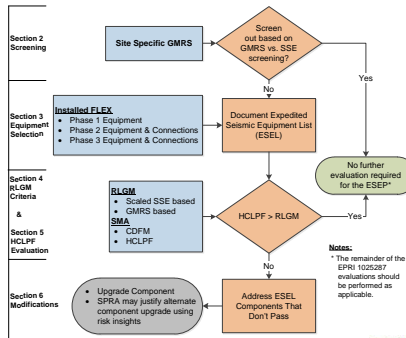
- Include a subset of installed plant equipment needed for FLEX
 - Will typically include tanks and mechanical and electrical equipment
- Structures, other SSCs (e.g., piping, cable trays, NSSS), and some two-over-one interactions would be deferred to the complete SPRA/SMA under the 2.1 resolution

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Industry Proposed Expedited Seismic Evaluation Process (ESEP)



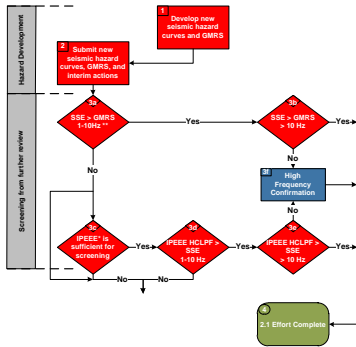
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Recommendation 2.1 Assessment Process



Recommendation 2.1 Assessment Process

