

Probabilistic Safety Assessment and Management Conference PSAM14

SPRA and Risk-Informed Decision-Making at a Crossroads PSAM14 Workshop Presentation

Which Way SPRA? PSAM 14 Workshop

Fernando Ferrante
Principal Technical Director

EPRI Risk and Safety Management

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Which Way SPRA? Current Trends and Needs

SPRA has come a long way...

- Pioneered approaches that are now common terms for external events PRA modeling
- Framework exists to provide insights for decision-making
- Challenges do not negate benefits gained from SPRAs

...but there are challenges ahead...

- Stability in seismic hazard estimates
- Continuous enhancements for seismic fragility analysis
- Better integration across hazard/fragility/plant response
- More is not always better: model size and complexity is becoming an issue across PRA applications



Current Trends – Ongoing Updated Criteria and Data

- EPRI is developing a single document that combines past fragility knowledge and key new developments
 - Updating methods and data
 - Consolidating the guidance
 - Including updated insights
- EPRI is issuing reports with updated equipment class capacities
 - Using more recent data from large ground motion earthquakes
 - Performing Bayesian updating to incorporate updates

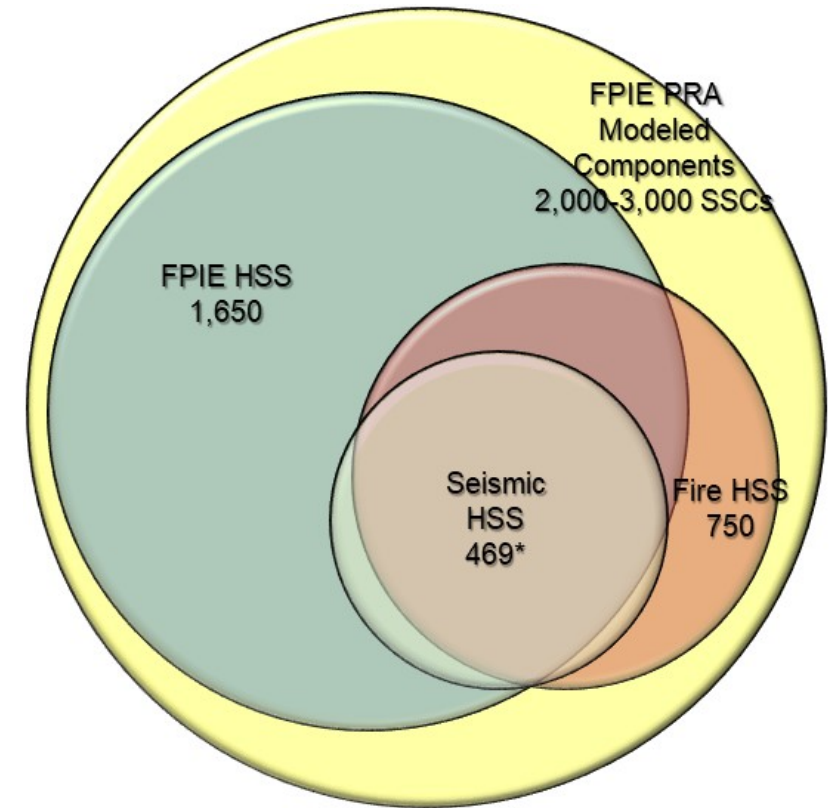


Current Trends – Sensitivity Studies for Risk Categorization

- Using high seismic ground motion plants with new SPRAs as test cases, determine how many and what kinds of SSCs would be categorized as high safety significance (HSS) due to different hazard PRAs
 - Using Full Power Internal Events (FPIE), Fire, and Seismic PRA models, identify HSS components based on importance measures for the PRA model types
 - Compare risk-significant (HSS) seismic components to those derived from internal events and/or fire models
- Performed studies for four plants with high seismic hazards and new Seismic PRAs

Current Trends – Insights from Risk Categorization

- Some components HSS exclusively from the FPIE or Fire PRA model
- All risk-significant seismic SSCs were also HSS from either the FPIE model, the Fire model (or both)
- No components are exclusively HSS from SPRA model (i.e. no unique HSS seismic components)



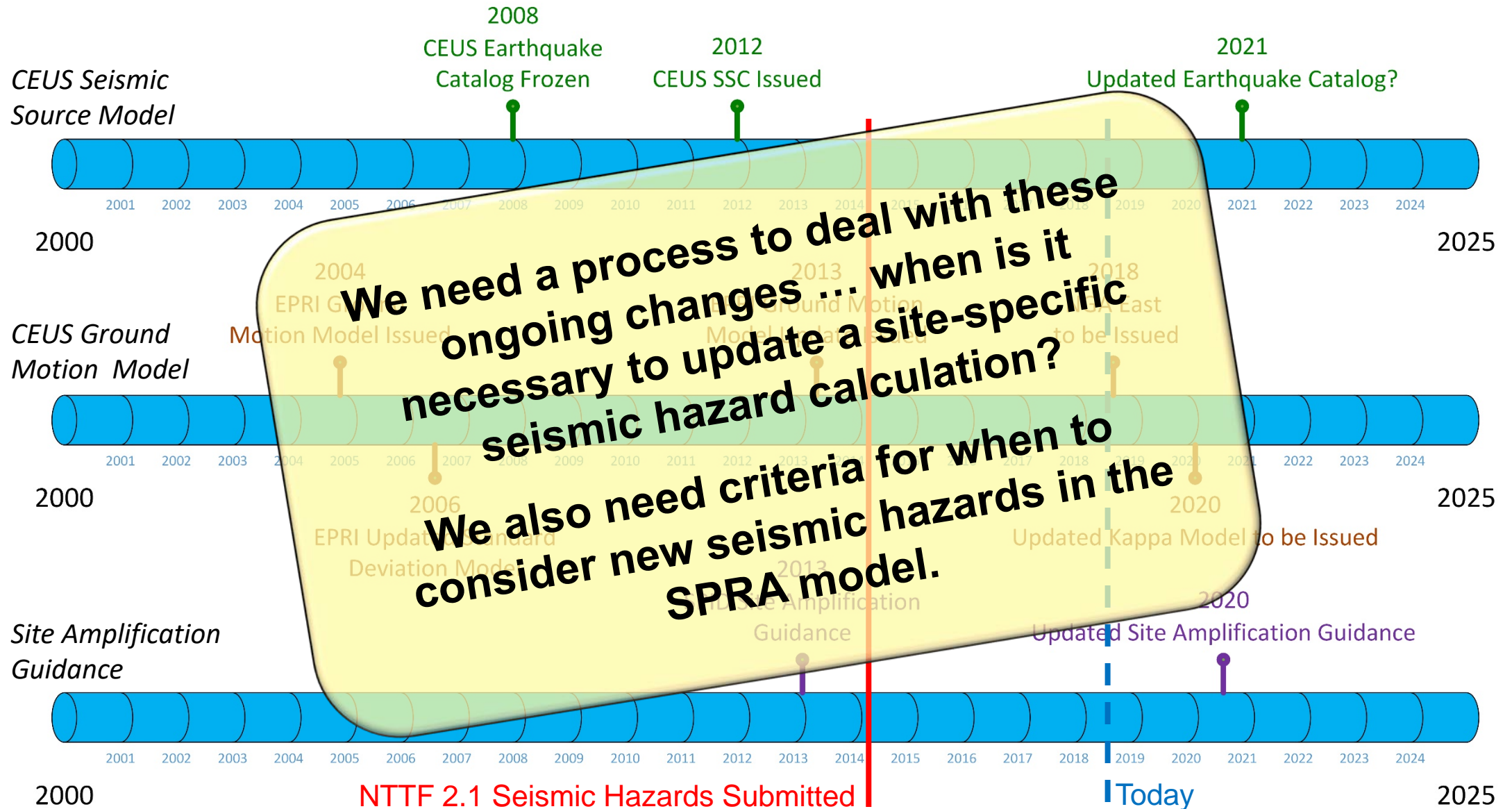
* SPRA HSS SSCs include 185 control rods and 185 hydraulic control units that are HSS

Current Trends – Managed Scope SPRA



- For sites with moderate seismic hazards, consider more active management of the SPRA scope by evaluating insights from:
 - Internal events PRAs to focus seismic efforts on more important functions and SSCs
 - Evaluations of in-structure response spectra to limit new finite element modeling
 - Available generic SSC capacity information that may provide adequate information to screen SSCs as low contributors at moderate seismic hazard sites
- Produce an SPRA that meets the PRA Standard for Capability Category II, applicable to any plant

Current Trends – Seismic Hazard Data and Model Updates



Which Way SPRA – Where Are We Going?

- SPRA is not the only player in risk-informed decision-making, need increased confidence/efficiency in integrated PRA models
- More complex models not necessarily better (significant opportunities for reducing scope and level of effort may exist for specific purposes)
- Changes in SPRA information need to be accounted for efficiently (e.g., how much effort to address new information is justified?)
- As we consolidate developments from the last 30+ years, which areas need to be refreshed, further evaluated?

SPRA has come a long way,

Let's make sure it doesn't become a victim of its own success...



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