

# SNC's Graded Approach to Evaluating Updated Seismic Hazards Enhances Risk-Informed Decision Making



Insights from Seismic Probabilistic Risk Assessments (SPRAs) play a key role in supporting risk-informed decisions at nuclear plants. When new information becomes available that could affect those insights, teams need to determine how it might change the plant's understanding of seismic risk.

After the original SPRA was completed for Southern Nuclear Operating Company's (SNC) Plant Vogtle Units 1 and 2, new seismic hazard data emerged. Because this information differed significantly from the data used in the initial model, SNC had to determine whether it would alter the risk insights for those two units. To do this, the team followed guidance from EPRI's Risk and Safety Management program. This approach allowed SNC to assess the new information without rebuilding the entire SPRA model—preserving its integrity and ensuring continued support for risk-informed applications.

## Benefits

By following EPRI's guidance, SNC was able to evaluate the updated seismic information in a focused and efficient way, avoiding a full SPRA model overhaul. This approach saved the company as much as \$5 million USD and two years of work while maintaining regulatory confidence and supporting sound decision-making. In addition to cost savings, the process improved efficiency, created a repeatable method for other utilities, and strengthened overall industry resilience. SNC's collaboration with EPRI and project contractors offers a practical example for other nuclear operators facing similar challenges.

## Application

A full SPRA update can require extensive reevaluation of seismic hazards, plant response, seismic fragilities, and the overall risk model – a time- and resource-intensive effort. Instead, SNC applied EPRI's framework, supported by its own expert judgment, to determine how the new hazard information might influence SPRA results for Plant Vogtle Units 1 and 2. EPRI conducted workshops that helped SNC staff apply the framework effectively. This graded, cost-effective approach let the team focus on key areas such as the dominant risk contributors and cliff edge failures that could change abruptly, impacting overall risk insights.

An SPRA sensitivity study showed some changes in the calculated seismic risk, but no new significant insights. SNC also went beyond EPRI's guidance by performing an additional confirmatory study, which verified that the 10 CFR 50.69 risk-informed categorization results for Plant Vogtle Units 1 and 2 remained unchanged despite the new seismic hazard information.

The two EPRI reports used in this project were:

- Seismic Hazard Research: Simplified Risk Impact Assessment for an Updated Seismic Hazard, 3002020749
- Seismic Probabilistic Risk Assessment Model Maintenance Guidance, 3002029334

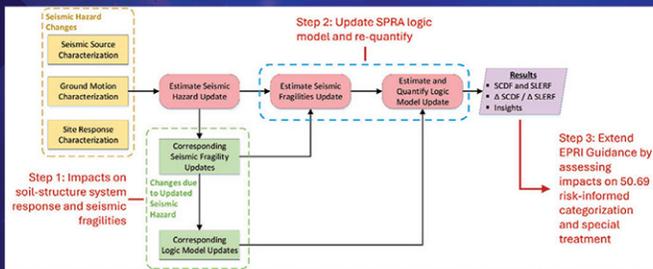


Figure 1

Outlines the three main elements of the SPRA—seismic hazard, seismic fragilities, and the PRA logic model (red boxes)—and how seismic hazard changes (yellow boxes) contribute to updated hazard estimates, which then influence seismic fragilities and the logic model (green boxes). It also highlights where SNC performed its three impact assessments (steps 1–3).

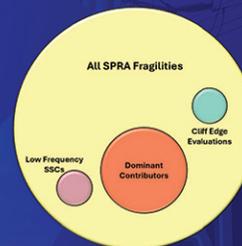


Figure 2

Compares all structures, systems, and components (SSCs) modeled with fragilities in the SPRA to the subsets that are dominant risk contributors, low-frequency sensitive hazards, or potential cliff-edge items. By focusing on these critical groups, the updated assessment addresses the most important SSCs while greatly reducing the effort required.

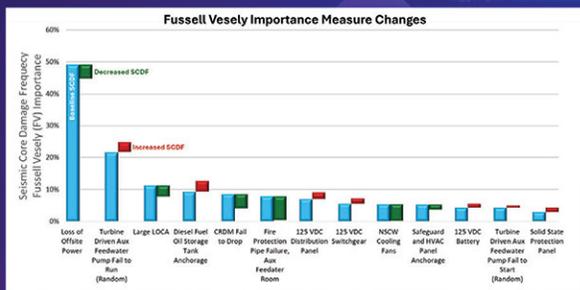


Figure 3

Identifies how the Fussell-Vesely importance measures for 13 SPRA dominant risk contributors changed after the seismic hazard update. While some items showed small increases or decreases, no new significant contributors emerged, and none of the changes affected the 10 CFR 50.69 risk-informed categorization results for Plant Vogtle Units 1 and 2.



Figure 4

Shows Vogtle Units 1 and 2, the units covered by this assessment.