

EPRI's Updated Seismic Fragility and Seismic Margin Guidance for Seismic Probabilistic Risk Assessments

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Seismic fragility methods have been evolving for more than four decades since the first seismic probabilistic risk assessments (SPRAs) were performed for the nuclear power industry. Advances in seismic engineering practice, computational tools, and the industry's understanding of earthquake effects have enabled the development of improved seismic fragility methods that provide better characterization of probabilistic capacities for structures, systems, and components (SSCs) at nuclear facilities. Over the years, Electric Power Research Institute (EPRI) has published numerous reports pertaining to various aspects of SSC seismic margin and seismic fragility, which together form the body of knowledge defining the current state of practice for applications to SPRAs.

This presentation introduces EPRI Technical Report No. 3002012994, *Seismic Fragility and Seismic Margin Guidance for Seismic Probabilistic Risk Assessments*, which EPRI published in September 2018 to synthesize the most relevant, state-of-the-art methods from EPRI's various past publications into a single, comprehensive resource for developing seismic fragilities in support of SPRAs. This new report supersedes several previous reports:

- *Methodology for Developing Seismic Fragilities* (TR-103959)
- Seismic Fragility Applications Guide (1002988)
- *Seismic Fragility Application Guide Update* (1019200)

It also incorporates relevant guidance from other related EPRI reports, including:

- *A Methodology for Assessment of Nuclear Power Plant Seismic Margin* (NP-6041-SLR1)
- *Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic* (1025287)
- *SPRA Implementation Guide* (3002000709)

The new report compiles guidance from these various prior reports into one place, updates methods that have changed or been replaced in contemporary practice, and corrects errors in the previous guidance. Consolidation of the guidance into a single report makes it substantially more user friendly by organizing all the relevant guidance into one, organized structure, and by using consistent technical symbols and nomenclature throughout. It also provides numerous relevant, updated example calculations. This presentation will provide an overview of the new report and highlight a few of the most significant methodology improvements and updates incorporated.