

RIC 2020



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Seismic Safety Challenges and Approaches for Non-LWRs Reactors

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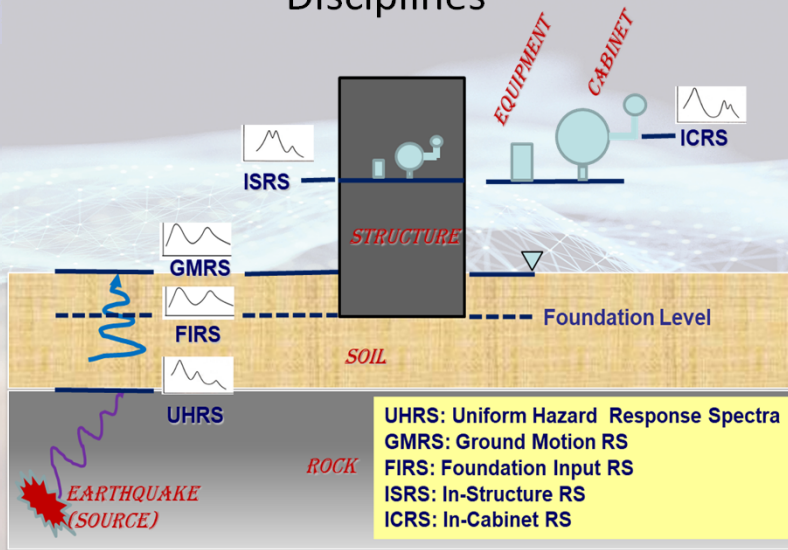
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Seismic Design Involves Complex Process and Multiple Technical Disciplines





Regulatory Framework for Seismic Safety

- Regulatory bases – 10 CFR Part 50, 52, 100, Appendix S, and General Design Criterion (GDC) 2
- Guidance – RG 1.208, SRP 2.5, 3.7, 3.8, 3.9, 19
- Aimed at preventing seismic induced core damage for large light water reactors (LWRs)
- Seismic design to withstand site-specific hazards (safe shutdown earthquake – SSE) for structures, systems, and components (SSCs)
- Seismic probabilistic risk assessment (SPRA) with surrogate metrics (CDF, LERF) to evaluate adequacy of seismic design
- Proven record for adequate seismic safety for LWRs
- Moving forward to risk-informed and performance-based (RIPB) approach



Challenges for Non-light Water Reactor Seismic Design

- Diverse designs for non-LWRs as opposed to LWR vintage
- Future reactor designs rely more on passive safety features
- Risk surrogates for LWRs may not be applicable to non-LWR designs
- Recognize that the current deterministic standard review plan (SRP) approach to seismic safety, although may still work, but would be effective for non-LWR seismic safety
- Alternative seismic design and regulatory approaches should be contemplated
- RIPB should be considered to better focus on safety while provide flexibility to accommodate diverse non-LWR seismic designs
- Role of seismic isolation technologies can be an important for enhancing seismic safety and simplifying design and construction process



Expectations for Session W28

- Expert's perspectives for continued improvement of seismic safety for future reactors
- How technology advancements contribute to our knowledge and appreciation of seismic risk, and consequently improving seismic design, analysis, and risk assessments for nuclear facilities, as well as regulatory effectiveness and efficiency
- Explore role of RIPB and seismic isolation technologies for enhancing seismic safety while affording flexibility for future non-LWR designs and constructions
- Solicit feedback from audience on innovative approaches going forward



Expert's Presentations

- “Enabling Innovation in a Regulated Industry,” Mr. Amir Afzali, Southern Company’s licensing and policy director and lead for the industry’s licensing modernization project (LMP)
- “Incorporation of RIPB Framework in Seismic Design,” Drs. Nilesh Chokshi and Biswajit Dasgupta, CNWRA (NRC contractor)
- “Seismic isolation of nuclear power plant buildings and equipment,” Dr. Andrew Whittaker, SUNY Distinguished Professor and Director of MCEER
- “History, current status and moving forward in research and development of seismic isolation systems suitable for nuclear facilities in Japan,” Dr. Satoshi Fujita, Professor and vice president of Tokyo Denki University