



NTTF Recommendation 3: Seismically Induced Fires and Floods

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Background

- Seismic events have the potential to cause:
 - multiple failures of safety-related SSCs;
 - induce separate fires or flooding events in multiple locations at the site; and
 - degrade the capability of plant SSCs intended to mitigate the effects of fires and floods.



Background

- The NTTF recommended, as part of the longer term review, evaluation of potential enhancements to the capability to prevent or mitigate seismically induced fires and floods
 - Scope includes internal seismically induced fires (e.g., breakers, transformers) and floods (e.g., tanks, piping systems)
 - External seismically induced fires and floods are considered to be outside the scope of this issue
- Prioritizes as Tier 3 in SECY 11-0137
 - Commission agreed with Tier 3 Prioritization, but
 - Directed the staff to initiate development of PRA method to evaluate potential enhancements as part of Tier 1 activities



Background (con't)

- PRA Method Challenges:
 - hazard definition & characterization
 - seismic fragilities for SSCs, including fire protection components
 - modeling concurrent and subsequent initiating events
 - treatment of systems interactions
 - human reliability analysis methodologies suitable for seismically induced hazards
 - multiunit risk considerations



Current Status

- Staff developed an initial plan for PRA method development in SECY 12-0025.
- PRA pre-planning activities include:
 1. Define objectives of method
 2. Identify relevant stakeholders
 3. Information gathering
 4. Coordination with other ongoing initiatives
 5. Resource and schedule estimate



Current Status (con't)

- Key Considerations
 - Limited number of staff with required knowledge, skills, and abilities
 - No current consensus state-of-practice methods exist for seismically induced fires and floods for NPPs
 - ASME/ANS Joint Committee on Nuclear Risk Management recently formed a working group to address multiple concurrent events
 - Other Tier 1 activities will provide substantial information relevant to this issue



Staff Assessment

- Results from several Tier 1 recommendations will better inform the this issue:
 - 2.1 Seismic and flooding hazard evaluation
 - 2.3 Seismic and flooding vulnerability walkdowns
 - 4.2 Mitigation Strategies
 - 5.1 Containment venting
 - 7.1 Spent fuel pool
- More efficient to wait until sufficient information becomes available from these efforts.



Staff Assessment (con't)

- Some work can be done now:
 - Standards development organization engagement
 - Assess results from NTTF Recommendations 2.1, 4.2, 5.1, 7.1 and other activities
 - Continue PRA method development activities



Staff Recommendation

- Continue development of PRA methodology
 - Engagement with PRA standards development organizations
 - Feasibility study to assess approaches for evaluating multiple concurrent events
- Assess results from Tier 1 activities and other related work
- Future re-evaluation of Recommendation 3