Reactor Pressure Vessel Embrittlement Rulemaking – Update

Jeff Poehler, NRR

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SECY-22-0019

- Staff submitted SECY-22-0019, "Rulemaking Plan for The Revision of Embrittlement and Surveillance Requirements for High-Fluence Nuclear Power Plants in Long-Term Operation," on March 8, 2022. The staff recommended Alternative 2 consisting of:
  - Revision of Appendix H to include additional surveillance testing requirements for long-term operation.
  - Inclusion of a revised fluence function fit (new ETC or update to existing ETCs) only for high-fluence RPV materials. Not specified what regulation or guidance would contain the revised ETC.

SRM-SECY-22-0019

- The Commission issued SRM-SECY-22-0019, "Rulemaking Plan for The Revision of Embrittlement and Surveillance Requirements for High-Fluence Nuclear Power Plants in Long-Term Operation," on July 15, 2025.
  - Endorsed "Alternative 2" from the SECY.
  - Additional direction from the Commission:
    - To the extent practicable, the staff should ensure the proposed rule is performance-based and includes appropriate provisions to ensure surveillance data is available to cover a plant's projected period of operation.
    - Directed staff to consider as appropriate, stakeholder interest in a regulatory framework that also permits voluntary adoption of alternative vessel embrittlement approaches for operating and new reactors as part of this rulemaking effort.
    - Directed staff to develop options with input from stakeholders for revising the fluence fit function, such that these options do not unnecessarily limit licensees to a single calculation or model as part of a technology-inclusive and performance-based approach to regulation.
    - Also directed staff to explore the potential for AI to analyze existing data on embrittlement as a supplement to future coupon sampling and analysis.

White Paper

- NRC staff recently issued a white paper, “Potential Changes to RPV Embrittlement and Surveillance Requirements for High-Fluence Nuclear Power Plants in Long-Term Operation under SRM-SECY-22-0019” (ML26148A431)
- Paper includes the NRC staff’s preliminary technical perspectives developed in response to the direction in SRM-SECY-22-0019

Rulemaking Schedule

- NRC has not yet established a schedule – will be coordinating with other high priority agency rulemakings. Refer to the NRC public website for further information: https://www.nrc.gov/reading-rm/doc-collections/rulemaking-ruleforum/active/ruleindex

Thank You