



SECRETARY

**UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001**

July 15, 2025

MEMORANDUM TO: Michael F. King
Acting Executive Director for Operations

FROM: Carrie M. Safford, Secretary

SUBJECT: STAFF REQUIREMENTS – SECY-22-0019 – RULEMAKING
PLAN FOR THE REVISION OF EMBRITTLEMENT AND
SURVEILLANCE REQUIREMENTS FOR HIGH-FLUENCE
NUCLEAR POWER PLANTS IN LONG-TERM OPERATION

The Commission has approved the staff's recommendation (Alternative 2) to initiate a rulemaking to amend the reactor pressure vessel embrittlement and surveillance requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." This alternative would revise Appendix H, "Reactor Vessel Material Surveillance Program Requirements," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities" to include additional surveillance testing requirements for long-term operation and revise the fluence function fit through appropriate updates to 10 CFR 50.61, "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," and guidance, including Regulatory Guide 1.99, Rev. 2, "Radiation Embrittlement of Reactor Vessel Materials."

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.

The staff should assess and 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. Other correlations to set safety margins may be more appropriate for new designs, and to the extent applicants elect to use more refined correlations where appropriate justification and data gathering support them, the regulatory framework should facilitate that.

To support effective embrittlement modeling and surveillance, the staff should develop options with input from stakeholders for revising the fluence fit function. The staff should ensure 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.

In addition to this rulemaking, staff should explore the potential for artificial intelligence to analyze existing data on embrittlement as a supplement to future coupon sampling and analysis.

Consistent with Executive Order (EO) 14300, "Ordering the Reform of the Nuclear Regulatory Commission," and in accordance with NRC's principles of good regulation, the staff should work with the Office of the General Counsel to identify rulemaking efficiencies, where appropriate, and ensure that this rulemaking is coordinated with any efforts to revise NRC's regulations pursuant to Section 5 of EO 14300.

cc: Commissioner Caputo
Commissioner Crowell
Commissioner Marzano
OGC
CFO
OCA
OPA
ODs, RAs, ACRS, ASLBP
PDR