

## Voluntary Risk-Informed Alternative Pressurized Thermal Shock Limits

Lead Office/Division: NRR/DPR

Supporting Offices/Divisions: NRO/DE, NRR/DCI, NRR/DRA, RES/DFERR

### Description

The proposed rule would amend the Commission's regulations (§ 50.61) that protect against brittle fracture of reactor vessels during severe cooldown events. The existing regulations establish screening limits that were developed based on what NRC believed to be a conservative probabilistic fracture mechanics analysis. Several licensees will exceed the screening limits in the current rule during their license renewal periods. The staff proposes to provide alternate fracture toughness requirements which reflect the updated technical basis in the proposed rule.

The NRC has been engaged in a research program to reevaluate and update the technical basis of the risk of throughwall cracking due to PTS, and recommends that the regulations be amended to reflect the updated technical basis. Revising the PTS requirements would permit some reactor vessels that are approaching the current maximum permissible level of embrittlement to postpone permanent shutdown. Current regulations allow licensee to avoid shutdown if they perform a safety analysis to show that operation with a PTS higher than the screening criteria is safe, or that they anneal the reactor vessel.

The staff issued SECY 07-0104 "Proposed Rulemaking — Alternate Fracture Toughness Requirements for Protection against Pressurized Thermal Shock Events (RIN 3150-AI01)" on June 25, 2007. On September 11, 2007, the Commission approved publication of a proposed rule, 10 CFR 50.61a, "Alternative Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," for a 75-day public comment period. The staff published the proposed rule for public comments in the Federal Register on October 3, 2007 (72 FR 56275). During the development of the PTS final rule, the staff determined that several changes to the proposed rule may be needed to adequately address issues raised in stakeholder's comments. The staff published a supplemental proposed rule for public comment on proposed modifications that may not represent a logical outgrowth from the October 2007 proposed rule's provisions in the Federal Register on August 11, 2008 (73 FR 46557). The comment period for the supplemental proposed rule closed on September 10, 2008. The staff completed the final rulemaking package and as of May 27, 2009, one vote (Commissioner Lyons) had been received from the Commission on the rule. The staff is awaiting the remaining votes and SRM.

The SECY may be found at:

<http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2007/secy2007-0104/2007-0104scy.pdf>

The related staff requirements memorandum (SRM) may be found at:

<http://www.nrc.gov/reading-rm/doc-collections/commission/srm/2007/2007-0104srm.pdf>

Additional information on this proposed rule may be found on the NRC external website at:

<http://www.nrc.gov/reading-rm/doc-collections/news/2008/08-147.html>