

## **Develop the technical basis to revise the PTS rule**

(RES/DFERR)

In 1986, the NRC established the pressurized thermal shock rule (10 CFR 50.61) in response to an issue concerning the integrity of embrittled reactor pressure vessels in pressurized-water reactors. The NRC staff has completed their re-evaluation of the technical basis of this rule in light of the results of subsequent extensive research on key technical issues underlying the rule. Analyses performed as part of this research suggest that the agency can reduce unnecessary conservatism in the rule while still maintaining safety. The staff's approach to reevaluating the screening criteria that 10 CFR 50.61 prescribes for reactor pressure vessel material characteristics is described in SECY-00-0140, "Reevaluation of the Pressurized Thermal Shock Rule (10 CFR 50.61) Screening Criterion," dated June 23, 2000, and subsequent periodic status reports (SECY-01-0045, SECY-01-0185, and SECY-02-0092, dated March 16, 2001, October 5, 2001, and May 30, 2002, respectively). In March of 2005 ACRS provided a favorable review of RES reports detailing the technical basis for PTS rule revision, and in June of 2005 these draft reports were issued to NRR for review. These reports integrated sequence frequency, thermal-hydraulic, and fracture mechanics analyses (using the probabilistic fracture mechanics code FAVOR) to calculate the frequency of vessel failure due to PTS. This report presented the bases for possible changes to the PTS rule. NRR completed review of the RES reports and revised reports and calculations were performed to address NRR comments. The final technical basis reports were prepared in December 2006. On September 11, 2007 the Commission directed the staff to proceed with public comment on the draft rule. The staff completed its evaluation of the public comments.

The staff completed the final rulemaking package that would amend the regulations in Title 10 of the Code of Federal Regulations Part 50.61 that describe the fracture toughness requirements for protection against pressurized thermal shock (PTS) events for pressurized water reactors. Revising the PTS requirements would permit some reactor vessels that are approaching the current maximum permissible level of embrittlement to postpone permanent shutdown. 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.