

Rulemaking to Make Risk-Informed Changes to Loss-of Coolant Accident Technical Requirements; 10 CFR 50.46a, "Alternative Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors"

Lead Office/Division: NRR/DPR
Supporting Offices/Divisions: RES/DFERR; NRR/DRA

Description

On July 29, 2005, in response to SECY-05-0052, "Proposed Rulemaking for 'Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements,'" the Commission directed the U.S. Nuclear Regulatory Commission (NRC) staff to publish for public comment a proposed rule adding a new Section 50.46a, "Alternative Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors" to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities" to provide an alternative, risk-informed set of requirements for emergency core cooling systems (ECCS).

Current light-water reactor licensees could voluntarily adopt these requirements, which are intended to give licensees additional flexibility to change the designs of reactor ECCS. The proposed rule divides the current spectrum of LOCA break sizes into two regions. The division between the two regions is determined by a "transition" break size (TBS). The first region includes small breaks up to and including the TBS. The second region includes breaks larger than the TBS, up to and including the double-ended guillotine break of the largest reactor coolant system pipe. Pipe breaks in the smaller break size region are considered more likely than pipe breaks in the larger break size region. Consequently, each region is subject to ECCS requirements commensurate with the relative likelihood of breaks in that region. LOCAs in the smaller break size region will continue to be considered "design basis accidents" and will be analyzed by current design basis accident methods, assumptions, and acceptance criteria. LOCAs in the larger break size region must also be mitigated, but they may be analyzed with more realistic analytical methods and initial conditions without postulating the loss of offsite power or the worst case single failure.

The staff published the proposed rule in the Federal Register on November 7, 2005 (70 FR 67598). The public comment period ended on March 8, 2006. Of the 13 sets of comments received, 11 were from the nuclear industry. Many of these comments addressed the potential burden to licensees who implement the rule. While the staff was evaluating the comments, it posted revised draft rule language on the NRC Web site to facilitate stakeholder involvement as the issues were being resolved. The staff held two public stakeholder meetings to provide for enhanced public participation on this rulemaking. At each meeting licensees and industry representatives expressed concerns about the burden associated with implementing the rule. As a result of these interactions, the staff made changes to the draft rule language with the objective of reducing burden on licensees while maintaining adequate protection of public health and safety.

The staff also received public comments stating the rule should apply to new light water reactors that were similar in design to existing plants. As a result, the staff modified the rule to make it apply to new light water reactor designs that are determined by the NRC to be similar to existing light water reactors.

On October 16, 2006, the staff sent draft final rule language for risk-informing 10 CFR 50.46 and the draft Federal Register notice for the final rule to the ACRS for review. The staff met to discuss the rule with the ACRS subcommittee on October 31 and with the full committee on November 1, 2006. After these meetings the ACRS issued its letter dated November 16, 2006.

The ACRS letter recommends that the final 10 CFR 50.46a rule not be issued in its current form. The letter includes multiple recommendations for performing additional technical reviews and changing the draft final rule. It also contains a recommendation that appears to differ from the staff's interpretation of Commission guidance provided specifically for this risk-informed ECCS rule in the staff requirements memorandum (SRM) on SECY-04-0037, dated July 1, 2004, "Issues Related to Proposed Rulemaking to Risk-Inform Requirements Related to Large Break Loss-of-Coolant Accident (LOCA) Break Size and Plans for Rulemaking on LOCA with Coincident Loss-of-Offsite Power." Addressing the ACRS recommendations would require significant staff resources and could delay completion of the final rule by several years.

The staff issued SECY 07-0082 (<http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2007/secy2007-0082/2007-0082scy.pdf>) on March 16, 2007. The SECY informed the Commission of the impacts of the ACRS recommendations on the draft final rule, sought Commission clarification on its direction regarding defense-in-depth considerations for beyond transition break size LOCAs, and sought a decision on the staff's recommended option for proceeding with the rule.

The Commission issued its SRM on SECY-07-0082 (<http://www.nrc.gov/reading-rm/doc-collections/commission/srm/2007/2007-0082srm.pdf>) on August 10, 2007. The SRM directed the staff to address the ACRS issues and provided additional Commission guidance. The SRM also directed the staff to continue the rulemaking and provided information to be used to determine the appropriate schedule for completion. On April 1, 2008 the staff provided the Commission with its planned schedule for issuing the final rule (ML080370355). Following Commission approval, the staff issued the draft rulemaking package for public comment in early August 2009. The public comment period is through September 24, 2009. After reviewing public comments, and making any changes based on those comments, a final rulemaking package will be provided to the Commission.

Completed Milestones

- Complete expert elicitation for new LOCA frequencies (12/2004)
- Issue SECY 05-0052 forwarding proposed rule defining alternative risk-informed option ECCS evaluation criteria and risk-informed acceptance criteria for associated plant design and operational changes (03/2005)
- Issue draft NUREG report on expert elicitation results for LOCA frequencies for comment (06/2005)
- Issue proposed rule on risk-informing 50.46 for public comment (11/2005)
- Provide draft final rule to ACRS for review (10/16/2006)
- Meet with ARCS (11/2006)
- ACRS letter recommending changes be made to the Rule (11/16/2006)
- Issue SECY 07-0082 forwarding proposed resolution of ACRS recommendations to the Commission (5/16/2007)
- SRM on SECY 07-0082 (8/10/2007)
- Note to the Commission providing Plans And Schedule For The Rulemaking On Risk-informed Changes To Loss-Of-Coolant Accident Technical Requirements (04/01/2008)
- NUREG-1829, Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process published (04/2008)

Future Milestones

| Selected Major Milestones and Schedules | | | | |
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| Major Milestones | Original Target Date | Revised Date | Completion Date | NRC Responsibility |
| Issue final NUREG report on expert elicitation results for LOCA frequencies | December 2005 | April 2008 | April 2008 | RES/DFERR |
| Provide final rule on 50.46 to Commission for approval | October 2006 | June 2010 | | NRR/DPR |
| Provide a regulatory guide on 50.46a implementation | December 2006 | TBD | | NRR/DSS |