



United States Nuclear Regulatory Commission

Status of the Proposed 10 CFR 50.46a Risk-Informed ECCS Rulemaking

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Risk-Informed ECCS Presentation Outline

- Overview and outline of rule structure
- History and status of rulemaking effort
- Recommendations made by Advisory Committee on Reactor Safeguards (ACRS)
- NRC plans to address ACRS issues



Rule Change Objectives

- Focus NRC and licensee resources on more risk significant issues
- Enable licensees to enhance overall safety by modifying plant designs to increase design emphasis on more likely (smaller) pipe breaks
- Increase flexibility to make other cost-effective design changes
- Prevent plant changes that might result in unacceptable risk increases, loss of safety margin or loss of defense-in-depth



Draft Rule Structure (§ 50.46a)

- LOCA break spectrum divided into 2 regions by “transition” break size (TBS)
 - based upon frequency and other design considerations
- Breaks in smaller break region must meet current § 50.46 analysis/acceptance criteria
- Breaks in larger break region to meet less stringent analysis criteria and assumptions, but mitigation capability must be demonstrated up to full DEGB



Plant Changes Under § 50.46a

- After new ECCS analysis, some plant designs no longer limited by DEGB of largest pipe
- Allows changes to plant operations or design until limited by another required accident analysis parameter
- Licensee changes must be risk-informed
 - Meet criteria consistent with RG 1.174 (defense-in-depth, safety margins, monitoring program, **and acceptable risk**)
 - Meet PRA quality and scope requirements



TBS Selection

- TBS in the proposed rule uses expert elicitation estimates of LOCAs at 1E-5/R-Y frequency as a starting point.
- Adjustments made to account for uncertainties and sensitivities with respect to elicitation.
- Other considerations to accommodate failure mechanisms not explicitly considered in elicitation such as seismic loads.
- Consideration of actual pipe sizes.



TBS Selection

- **PWR TBS** - The size of the largest attached safety injection or pressurizer surge line, typically 12 to 14 inches nominal diameter (or 10.13 to 11.19 inches ID)
- **BWR TBS** - The size of the largest attached feedwater or residual heat removal line inside containment, typically 18 to 24 inches nominal diameter (or 16.12 to 21.56 inches ID).



Rulemaking Status

- Proposed rule published for public comment on November 7, 2005 (70 FR 67598)
- Comment period ended March 8, 2006
- 13 commenters, 11 from nuclear industry
- Most felt the overall process was too burdensome to be cost-effective



Rulemaking Status (Cont.)

- NRC held 3 public meetings; worked with commenters to resolve comments and reduce rule burden; posted revised rule language on public website
- Provided draft final rule to ACRS on October 16, 2006
- Staff met with ACRS subcommittee (Oct. 31) and full committee (Nov. 1)
- ACRS letter of November 16, 2006 provided Committee's views on the draft final rule



ACRS Recommendations

- ACRS recommended that the rule to risk-inform 10 CFR 50.46 should not be issued in its current form.
- The recommendations raise significant issues that will delay a final rule.
 - Insufficient mitigation for pipe breaks larger than the TBS
 - Concerns with risk-informed assessment process
 - Concerns with plant specific applicability of results from Expert Elicitation and seismic analysis



Staff Evaluation of ACRS Recommendations

- Staff believes implementing ACRS recommendations will take several years and substantial FTE
- Staff preparing Commission paper with recommended approach