

July 1, 2004

MEMORANDUM TO: Luis A. Reyes
Executive Director for Operations

FROM: Annette L. Vietti-Cook, Secretary **/RA/**

SUBJECT: STAFF REQUIREMENTS - SECY-04-0037 - 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

The Commission has approved the development of a proposed rule, subject to the additional comments and clarifications noted below, to risk-inform the requirements addressing large break loss-of-coolant accidents (LOCA). The staff should provide the Commission with a proposed rulemaking package in six months. The staff should ensure that quality and safety are not compromised in order to meet the six-month schedule. The staff should keep the Commission fully and currently informed of any significant issues that arise and any delays in this schedule.

(EDO)

(SECY Suspense:

12/31/04)

The staff should use the initiating event frequencies from the expert elicitation process, supported by historical data and fracture mechanics analysis and other relevant information, to guide the determination of an appropriate alternative break size. In addition, the staff should use (or require licensees to use) the approach and guidance in Regulatory Guide (RG) 1.174 to assure that the selection of the maximum break size is risk-informed and conforms to the RG 1.174 safety principles. For example, a frequency of 1 occurrence in 100,000 reactor years is an appropriate mean value for the LOCA frequency guideline for selecting the maximum design-basis LOCA since it is complemented by the requirement that appropriate mitigation capabilities, including effective severe accident mitigation strategies, must be retained for the beyond design-basis LOCA category.

The proposed rule package should allow operational as well as design changes. However, the scope of changes should be constrained in areas where engineering margins should be retained to satisfy the safety principles of RG 1.174 (e.g., containment design pressure, and severe accident mitigation capability). Finally, this scope should be constrained in areas where the current design requirements contribute significantly to the "built-in capability" of the plant to resist security threats.

Licensees should be required, by regulation, to retain the capability to successfully mitigate the full spectrum of LOCAs for break sizes between the new maximum break size and the double-ended guillotine break of the largest pipe in the reactor coolant system. The mitigation

capabilities for beyond design basis events, and any changes to these capabilities, should be controlled by NRC requirements commensurate with the safety significance of these capabilities and not by voluntary means.

The low risk contribution of the large break LOCA, which allows removal of the large break LOCA from the design basis event category, should weigh heavily in the types of requirements that would be imposed in this area. Because of the low safety significance of the large-break LOCA, a high level criterion in the rule should include the requirement for the licensee to provide effective mitigation capabilities, including severe accident mitigation strategies directed at break sizes greater than the alternate maximum break size permitted by the rule, to maintain the core in a coolable geometry. Consistent with the approach taken in the 10 CFR 50.69 rulemaking on treatment and commensurate with the low safety significance of these capabilities, the staff should ensure that capabilities are provided in a performance-based manner and not in a prescriptive manner. Furthermore, to address the potential consequences from a beyond design basis LOCA, the staff should include a requirement for containment integrity.

The level of regulatory oversight, including the required level of detail and conservatism of the supporting analyses, should be commensurate with the categorization (i.e., as design-basis events or beyond design-basis events). For example, design-basis LOCA analysis should continue to meet the requirements of 10 CFR 50.46 (either the Appendix - K requirements or the 95th percentile of the realistic alternative), while the appropriate mitigation capabilities for beyond design-basis LOCAs need not meet the single failure criterion nor would the models used to demonstrate mitigation capabilities need to be 50.46 evaluation models.

A change process for proposed plant changes using the rule should follow existing regulations and guidance, (e.g., 10 CFR 50.59 and 50.90, and RG 1.174) and should ensure that the review mechanisms for such changes provide for adequate NRC oversight. If specific requirements to control changes are needed for this rule, including reversibility considerations, then an appropriate change process should be part of the rule.

The proposed rule should be structured such that a backfit analysis is not necessary for plant changes resulting from LOCA frequency increases identified by a periodic re-evaluation of LOCA frequencies. Backfit analyses should not be required where restorations to the design basis and other actions are necessary because the licensee is unable to maintain compliance with the relevant large break LOCA criteria as a result of changes in plant design and operating characteristics (or new information such as revised frequency estimates). The re-estimation of LOCA frequencies should build on the existing information at the time and should not involve a complete repeat of the expert elicitation process. Stability and reliability of the process should be important considerations. Additionally, licensees should be aware that changes or other adjustments may be necessary if estimated LOCA frequencies increase as a result of the re-estimation or review.

The proposed rule should encourage the use of realistic LOCA methods, but the safety benefits to be gained by the re-definition of the large-break LOCA should not be delayed by requiring that the implementation of the rule be coupled to other activities that might be desirable but are not critical to addressing the safety issues. Licensees should not be required to reanalyze small break LOCAs with best-estimate models. Since the existing analytical models for small breaks are adequate and conservative, there is no need to make those best estimate models a regulatory requirement for small break LOCA analyses.

The staff should continue to consider how future plant designs would be covered by the rule; however, the rulemaking for future plants should be pursued on a separate (and slower) path from rulemaking for existing plants. The rulemaking for future plants should not be constrained by the decisions made on the rulemaking for existing plants.

The Commission has approved the staff's recommendation to review the Boiling Water Reactor Owners Group (BWROG) pilot exemption request and subsequently proceed with rulemaking on loss-of-coolant accident/loss of offsite power. However, the staff should be ready to proceed with rulemaking if the BWROG efforts encounter significant delays (i.e., delays of six months or more). The BWROG should be informed of the potential impacts, consistent with staffing issues, that delays in submitting the pilot exemption request could have on the staff's ability to perform the review prior to completing the rulemaking.

cc: Chairman Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CFO
OCA
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Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR