

July 29, 2005

MEMORANDUM TO: Luis A. Reyes
Executive Director for Operations

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

SUBJECT: STAFF REQUIREMENTS - SECY-05-0052 - PROPOSED
RULEMAKING FOR "RISK-INFORMED CHANGES TO
LOSS-OF-COOLANT ACCIDENT TECHNICAL
REQUIREMENTS"

The Commission has approved publication of the proposed rulemaking for risk-informed changes to loss-of-coolant accident technical requirements, subject to the comments noted below and the specific changes provided in the attachment.

(EDO)

(SECY Suspense:

10/28/05)

General Comments

1. The requirements of the proposed 10 CFR 50.46a should be edited to remove the overly prescriptive regulatory treatment of beyond design basis LOCAs to be consistent with the low frequency of these events. (These changes, as well as those of other comments, are reflected in the attachment. The staff should make conforming changes, as needed, throughout the notice.)
2. The rule language should be simplified so that the change processes can be implemented in a straight-forward manner. The risk-informed change process in this rule should be based on the key principles of RG1.174. The NRC change processes in 10 CFR 50.59 and 50.90 are well understood and tested, and the proposed rule should rely on them as much as possible. For some changes, it may be difficult to distinguish between changes permitted under 50.46a and changes permitted under other sections. As a result, for licensees that use 50.46a, the integrated, risk-informed change process should be used for *all* changes made under 50.59 or 50.90. The proposed rule should be revised to address these points regarding the change process.
3. The Advisory Committee on Reactor Safeguards (ACRS) should review any final rule and Regulatory Guide proposal, following changes proposed as a result of the public comment period.
4. The staff should examine the other regulations and guidance to be sure there are no conflicts inadvertently introduced by the proposed rule, and if any are found should propose a resolution to the Commission.
5. The staff should update the Statements of Consideration to appropriately address the

issue of seismic loading of degraded piping and should solicit public comments on the subject. The staff should plan for a 90 day public comment period and make appropriate documents available to the public to inform the rulemaking effort.

6. The staff should include the following questions or comments in the *Federal Register* notice and specifically seek public comments on these issues. These items should be listed together.
 - A. The Commission instructed the staff not to make 50.46a available to future reactors. However, future light water reactors may benefit from 50.46a. As a result, comments should be solicited in the *Federal Register* regarding whether 50.46a should be made available to future light water reactors.
 - B. The proposed 50.46a includes an integrated, risk-informed change process to allow for changes to the facility following reanalysis of the beyond design basis LOCAs. However, the current regulations already have requirements addressing changes to the facility (10 CFR 50.59 and 50.90). It may be more efficient to include the integrated, risk-informed change requirements, for plants that use 50.46a, under our existing change processes. As a result, the staff should solicit comments on whether to revise 50.59 and 50.90 to accommodate changes enabled by 50.46a.
 - C. This rule will rely on risk information and the staff has included PRA requirements in the rule. However, there are other regulations that also rely on risk information (e.g. maintenance rule and alternative special treatment requirements). It may be more effective to describe the PRA requirements, consistent with the Commission policy on a phased approach to PRA quality, in one location in the regulations so that the PRA requirements are consistent among all regulations. As a result, the staff should solicit comments on the most effective way to include PRA requirements (e.g., contents, reporting, and changes) in the regulations.
 - D. The staff proposal includes specific “Operational Requirements” for operating configurations included in the analysis of beyond design basis LOCAs. Historically, operational restrictions have not been contained in 50.46 but were controlled through other requirements (e.g., technical specifications and maintenance requirements). It may be more practical to control equipment credited in the beyond design basis LOCA analysis in a more consistent manner with other operational restrictions. As a result, the staff should solicit comments on the most effective means and location for controlling appropriate operational restrictions for beyond design basis LOCAs.
 - E. The ACRS noted that “a better quantitative understanding of the possible benefits of a smaller break size is needed before finalizing the selection of the transition break size.” The break size to be included in the final rule should be selected to maximize the potential safety improvements. The staff should specifically solicit comments on the relationship between the maximum design basis break size and potential safety improvements in the *Federal Register* notice.
 - F. Given the Commission’s intent (ref: SRM for SECY-04-0037) that plant changes made possible by this rule should be constrained in areas where the current design requirements “contribute significantly to the ‘built-in capability’ of the plant to resist security threats,” the Commission seeks examples on either side of this threshold (changes allowed vs. changes prohibited), and additionally any examples of changes

that could enhance plant security and defense against radiological sabotage or attack. The Commission also solicits comments on whether the rule should explicitly include this requirement or otherwise rely on separate rulemaking being considered to more globally address this issue (e.g., changes to 50.59 and 50.90). Any examples that involve Safeguards Information should be marked and submitted using the appropriate procedures.

- G. Given the potential impact to the licensee (i.e. the backfit rule not applicable) of the staff's periodic potential for re-evaluation of estimated LOCA frequencies, should the rule require licensees to maintain the capability to bring the plant into compliance, with an increased transition break size (TBS), within a reasonable period of time?
- H. Is the rule sufficiently clear as to be "inspectable?" That is, does the rule language lend itself to timely and objective NRC conclusions regarding whether or not a licensee is in compliance with the rule, given all the facts? In particular, are the proposed requirements for PRA quality sufficient in this regard?

The following questions or comments are already included in the *Federal Register* but are listed or paraphrased here to ensure the list is complete and that it accurately captures the staff's intended solicitations.

- I. The acceptability of combining 50.46a related and unrelated changes to meet 50.46a risk acceptance criteria (a.k.a. "bundling"). (I through M from pages 45-46 of FRN)
- J. Whether 50.46a(f)(2)(iv) should allow unrelated changes to be bundled, or whether the rule should limit the consideration of risk impacts to only those changes related to the proposed rule.
- K. Whether changes unrelated to 50.46a proposed by a licensee that meet the proposed high-level criteria for preventing creation of risk outliers should be included in determining the 50.46a change in risk estimate regardless of whether they are risk decreases or increases.
- L. If bundling should be allowed, are the proposed high-level criteria for preventing creation of risk outliers adequate or should additional high-level criteria be imposed on what can and cannot be bundled, and if so, what specific high-level criteria should be utilized and incorporated into the final rule?
- M. Whether there are circumstances that would favor bundling of changes that have already been implemented or the risk impacts of existing plant features when calculating the 50.46a change in risk estimates, in order to facilitate or enable safety improvements.
- N. Whether there is an alternative to tracking the cumulative risk increases that is sufficient to provide reasonable assurance of protection to public health and safety and common defense and security. (pg 48 of FRN)
- O. Whether the rule itself should include high-level criteria and requirements for the risk evaluation process and acceptance criteria described in Reg Guide 1.174, as currently proposed. (pg 51 of FRN)

- P. Whether there are less burdensome, or more effective, ways of ensuring that the cumulative impact of an unbounded number of “minimal” changes remains inconsequential. (pg 71 of FRN)

Attachment: Changes to the *Federal Register* Notice in SECY-05-0052

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

Changes to the Federal Register Notice in SECY-05-0052

1. On page 102, paragraph (a)(1), revise line 2 to read ‘ ... postulated **design basis accident** loss-of-coolant’
2. On page 103, paragraph (2), add the following at the end of the paragraph: “LOCAs involving breaks at or below the Transition Break Size (TBS) (see definition below) are considered design basis accidents. LOCAs involving breaks above the TBS are considered beyond design basis accidents.”
3. On page 104, paragraph (c), revise line 4 to read ‘ ... analysis methods **for LOCAs involving breaks at or below the TBS** must meet’ Revise line 6 to read ‘ ... for evaluation models ~~and analysis methods~~ **for LOCAs involving breaks at or below the TBS. The analysis methods for LOCAs involving breaks above the TBS must be maintained, available for inspection, and include the analytical approaches, equations, approximations, and assumptions.**
4. On pages 104-105, paragraph (2), revise line 1 to read ‘ ... **ECCS analyses** ~~evaluation for LOCAs~~’ Revise lines 3 and 4 to read ‘ ... satisfied. The ~~evaluation model or~~ analysis method’ Revise lines 8 and 9 to read ‘ ... supporting justification, **including the methodology used,** must be **available** ~~provided~~ to show that’ Delete the last sentence (When the calculated ... be exceeded.)
5. On pages 107-112, Paragraph (f) “Changes to the facility, technical specifications, and procedures,” replace paragraphs (f)(1), (2), and (6) with the following:

(1) *Submission and approval process.* A licensee may request to make changes to its facility, technical specifications or procedures by submitting an application for a license amendment under 10 CFR 50.90. The application must contain the following information:

- (i) The information required under 10 CFR 50.90 and;
- (ii) A discussion of the method and a demonstration that the criteria in paragraph (c) and (f)(2) of this section have been met,

(2) *Risk-informed Integrated Safety Performance (RISP).* A licensee who wishes to make changes to its facility, technical specifications or procedures must perform a risk-informed integrated safety performance assessment which demonstrates that the following criteria associated with the change are met.

(i) For changes reviewed and approved by the NRC under 10 CFR 50.90, the total increases in core damage frequency and large early release frequency are small and the overall risk remains small. For changes that do not require prior NRC approval under 10 CFR 50.59, any increases in the estimated risk are minimal compared to the overall plant risk profile.

- (ii) Defense-in-depth is maintained, in part by, assuring that:
 - reasonable balance is provided among prevention of core damage, prevention of containment failure (early or late), and consequence mitigation;
 - system redundancy, independence, and diversity are provided commensurate with the expected frequency of postulated accidents, the consequences of those accidents, and uncertainties; and
 - independence of barriers is not degraded.

- (iii) Adequate safety margins are retained to account for uncertainties.
- (iv) Adequate performance-measurement programs are implemented to ensure the RISP assessment reflects actual plant design and operation. These programs shall be designed to:
 - detect degradation of the system, structure or component before plant safety is compromised;
 - provide feedback of information and timely corrective actions;
 - monitor systems, structures or components at a level commensurate with their safety significance.

(6) *Facility and procedures changes not requiring NRC review and approval.* A licensee may make changes to its facility or procedures under § 50.59 without prior NRC review and approval and, provided the requirements below are met.

(i) *Submission and approval process.* A licensee who wishes to make changes to its facility or procedures without prior NRC review and approval must submit an application under § 50.90 to request NRC approval of a process for evaluating the acceptability of such changes. The application must contain the following information:

(A) A description of the licensee's PRA model and risk assessment methods for demonstrating compliance with paragraphs (f)(3) and (f)(4) of this section;

(B) A description of the methods and decisionmaking process for evaluating compliance with the risk criteria, defense-in-depth criteria, safety margin criteria and performance measurement criteria in paragraph (f)(2) of this section; and

(C) A description of the analysis to be performed for demonstrating compliance with paragraph (c) of this section.

(ii) *Acceptance criteria.* The NRC may approve a licensee's process for making changes to its facility and procedures without prior NRC review and approval, and a licensee may make such changes following such NRC approval if the process ensures that:

(A) The acceptance criteria in paragraphs (d) and (f)(2) of this section will be met; and

(B) The change is permitted under 10 CFR 50.59.

The Statements of Consideration should reflect the Commission's continuing support of the RG 1.174 guidelines as an acceptable approach for evaluating proposed changes. The Statements of Consideration should reflect consideration of other elements of defense-in-depth if and when they are relevant, as indicated by the words "in part by" in section (f)(2)(ii). The Statements of Consideration also should provide a discussion of what is meant by the "overall risk remains small."

6. On page 108, the requirements for maintaining containment integrity for realistically calculated pressures and temperatures for beyond design basis LOCAs for plants that adopt 10 CFR 50.46a should be moved from 50.46a(f)(2)(i)(B) and incorporated into GDC 50.
7. On page 110, paragraph (4), revise line 4 to read ' ... used produce ~~realistically conservative~~ realistic results.'
8. On page 111, paragraph (5), revise line 10 to read ' ... that ~~all changes accomplished under this section continue~~ facility design and operation continue to be consistent with the PRA assumptions used to meet'
9. On page 113, paragraph (h)(1), revise line 3 to read ' ... significant. For LOCAs involving pipe breaks at or below the TBS, f-For each change' Insert the following after the period in line 7: 'For LOCAs involving pipe breaks above the TBS, for each change to or

error discovered in an ECCS evaluation model or analysis method or in the application of such a model or method that affects the result, the licensee shall report the nature of the change or error and its estimated effect on the limiting ECCS analysis to the Commission at least annually as specified in § 50.4.'

10. On page 114, revise paragraph (ii) to read: For LOCAs involving pipe breaks larger than the TBS, one which results in a **significant reduction in the capability to meet the requirements of (d)(2) of this section**—calculated peak fuel cladding temperature different by more than ~~300°F~~ from the temperature calculated for the limiting transient using the last acceptable analysis method, or is a cumulation of changes and errors such that the sum of the absolute magnitudes of the respective temperature changes is greater than ~~300°F~~.
11. On page 114, paragraph (2), revise lines 1 through 9 to read ' ... licensee shall compare the revised values of baseline CDF and LERF to those calculated under the last PRA model required by paragraph (f)(5) of this section; determine the cumulative changes in CDF and LERF for changes in the facility, technical specifications and procedures implemented under this section using the updated PRA model; and compare the revised values to the CDF and LERF values calculated under the previous PRA model required by paragraph (f)(5) of this section. If the baseline CDF or LERF increases by 20 percent or more, the cumulative change in CDF increases by 1×10^{-6} per year or more, or the cumulative change in LERF increases by 1×10^{-7} per year or more, the licensee shall report the change to the NRC **if the change results in a significant reduction in the capability to meet the requirements in (f)(2) of this section.**
12. On page 120, delete the last sentence (For analysis methods ... be exceeded.)