

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001



SECRETARY

August 10, 2007

COMMISSION VOTING RECORD

DECISION ITEM: SECY-07-0082

TITLE: 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"

The Commission (with Chairman Klein and Commissioners McGaffigan and Lyons agreeing) approved the Staff Requirements Memorandum (SRM) on the above subject issued on August 10, 2007.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

A handwritten signature in black ink, appearing to read "Annette L. Vietti-Cook".

Annette L. Vietti-Cook
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Klein
Commissioner McGaffigan
Commissioner Jaczko
Commissioner Lyons
OGC
EDO
PDR

VOTING SUMMARY - SECY-07-0082

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. KLEIN		X			X	6/22/07
COMR. McGAFFIGAN	X				X	5/22/07
COMR. JACZKO		X			X	6/29/07
COMR. LYONS		X			X	6/20/07

COMMENT RESOLUTION

In their vote sheets, Chairman Klein and Commissioner Lyons approved Option 1, continue to consider the rule to be high priority and delay other work as necessary to expeditiously address ACRS recommendations and issue a final rule, with comments; Commissioner McGaffigan approved Option 3, postpone FY 2007 rulemaking activities other than work by the Office of Nuclear Regulatory Research (RES) to publish final study reports and resume other activities in FY 2008, with comments; and Commissioner Jaczko approved Option 2, withdraw the proposed rule and terminate the rulemaking, with comments. Subsequently, Chairman Klein and Commissioners McGaffigan and Lyons approved a modified Option 3. Commissioner Jaczko recognized the majority. The comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on August 10, 2007.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

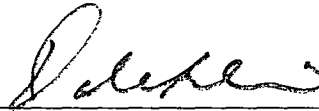
FROM: CHAIRMAN KLEIN

SUBJECT: SECY-07-0082 - 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"

Approved _____ Disapproved X Abstain _____

Not Participating _____

COMMENTS: Below _____ Attached X None _____



SIGNATURE

6/22/07

DATE

Entered on "STARS" Yes No _____

Chairman Klein's Comments on SECY-07-0082

I appreciate the Advisory Committee for Reactor Safeguards (ACRS) for providing their independent voice on the draft final rule, §50.46a, "Alternative Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." I believe we will have an improved final rule if many of their recommendations are incorporated. I also appreciate the fact that the ACRS comments have brought forward the core substantive issues, and stimulated further debate on these issues for which there are wide-ranging opinions. As Commissioner McGaffigan alluded to in his vote, vigorous debate is not only healthy, but is also essential to make an informed decision, especially for a challenging rulemaking as this one. I have carefully considered the differing views on the various issues raised by the ACRS, and the staff, and have decided to approve Option 1. Therefore, the staff should consider the rule to remain a high priority and issue a final rule, subject to addressing the issues in the manner I have addressed below.

Recommendation #1: Strengthen the assurance of defense in depth for breaks beyond the transition break size

Notwithstanding the Commission's 1995 Probabilistic Risk Assessment (PRA) policy language which balances the promotion of using PRA technology with ensuring that state-of-the-art PRA methods and data are used to complement the traditional deterministic approach, the previous Commission direction to consider defense-in-depth from a risk-perspective is consistent with another element of the PRA policy which states that PRA should be used to reduce unnecessary conservatism associated with current regulatory requirements and staff practices. Since this vote represents my first formal opportunity to comment on this rulemaking effort, I will state, for the record, that I support making our regulatory requirements more risk-informed and I also support the previous Commission direction set for this rulemaking. With respect to the set of recommendations to strengthen the assurance of defense-in-depth, however, I believe that adopting some of the recommendations would be prudent. Therefore, I support incorporating some of the specific recommendations in the final rule, and not others, as described below.

I approve requiring licensees to submit the thermal hydraulic codes used for analyses of breaks beyond the transition break size for NRC review and approval. Likewise, I also approve requiring licensees to justify that the generic results in the revised NUREG-1829, "Estimating Loss-of-Coolant Accident Frequencies Through the Elicitation Process," are applicable to their individual plants. The staff should develop regulatory guidance that will provide a method for establishing this justification. Additionally, I approve the alternate recommendation for expressing the fuel cladding acceptance criteria in general terms, such as a high degree of confidence in maintaining a coolable geometry and retaining some ductility in the cladding, and then placing the specific criteria in the associated regulatory guide when the results of the ongoing review of the fuel cladding acceptance criteria for loss-of-coolant accidents become available.

However, with respect to the idea that non-safety-related equipment needed to mitigate breaks beyond the transition break size be required to have some special treatment and control, I agree with the staff's position that the risk significance of breaks beyond the transition break size is too low to warrant such additional requirements. I also agree with the staff that licensees should not be required to demonstrate that they meet the deterministic requirements currently used to allow credit for leak-before-break, for reactor coolant piping having a diameter larger


than the transition break size. In addition to recognizing that large diameter piping fabricated, inspected, maintained, and operated under existing regulations should demonstrate increased leak-before-break tolerance, the requirement for licensees to justify that NUREG-1829 results are applicable to their plants should ensure that each specific plant retains this tolerance without requiring specific leak-before-break calculations for piping equivalent to or larger than the transition break size.

Recommendation #2: NUREG-1829 should be completed before the revised rule is issued.

I agree that the revision of NUREG-1829 should be completed before the rule is finalized. The staff should incorporate, as appropriate, the changes resulting from the resolution of public comments to the final rule.

Recommendation #3: Acceptability of changes in risk should be consistent with existing guidance

I agree that the final rule should ensure that any changes made at the plant that would allow for operational flexibility should be restricted to "very" small increases in risk. The addition of the word, "very" in section (f)(2)(ii) of 50.46a should make this provision consistent with the existing guideline provided in Regulatory Guide 1.174, "An Approach for Using PRA in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."


Dale E. Klein 6/22/07
Date Date

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

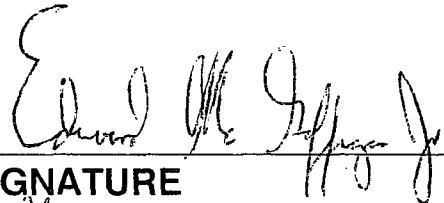
FROM: COMMISSIONER MCGAFFIGAN

SUBJECT: SECY-07-0082 - RULEMAKING TO MAKE
RISK-INFORMED CHANGES TO LOSS-OF-COOLANT
ACCIDENT TECHNICAL REQUIREMENTS; 10 CFR
50.46a, "ALTERNATIVE ACCEPTANCE CRITERIA FOR
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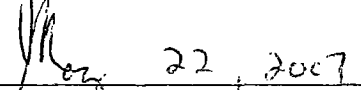
Approved Disapproved _____ Abstain _____

Not Participating _____

COMMENTS: Below _____ Attached None _____



SIGNATURE



DATE

Entered on "STARS" Yes No _____

Commissioner McGaffigan's Comments on SECY-07-0082

I support the staff recommendation ("Option 3") to reduce the scheduling priority for proceeding with this rule and to defer rulemaking activities to revise 10 CFR 50.46a into FY 2008, with a schedule to be proposed to the Commission in FY 2008. Additionally, I support the ACRS recommendation that defense-in-depth considerations should be expanded for this rule.

I was deeply skeptical that the Commission was ready to risk-inform 10 CFR 50.46 when the initiative was first proposed in 2004 (SECY-04-0037). In fact, I likened it to "A Bridge Too Far", in which Operation Market Garden turned out to be too ambitious, too complex, and too tightly scheduled to be viable. I opposed proceeding with the as-proposed rule in 2005 (SECY-05-0052), in part, because I remained unpersuaded that an adequate factual foundation had been developed to support the far-reaching changes proposed. Since the Staff Requirements Memorandum for SECY-05-0052 was issued during the period between my second and third terms as a Commissioner, my vote did not become part of the formal voting record and so I am attaching it to this vote to ensure that it is part of the overall Commission record. As I stated in that previous vote, the existing requirements have served us well, and provide large safety margins in the operating plants. I saw little safety benefit in the proposed rule and that what safety benefits there might be (e.g., modifications to containment spray system activation settings) could be achieved within the existing framework. The reliance on expert solicitation and risk calculations was such that I feared then - and am still concerned now - that the rule relied upon beyond the state-of-the-art PRA methods and data.

The Commission's 1995 PRA policy statement contained carefully balanced language, including the following key sentence:

"The Commission believes that the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach."

As I said in that attached vote, although it has been three decades since WASH-1400, the Commission has never found a way to require that all power reactor licensees have an up-to-date, high quality internal- and external-initiating event all-mode PRA. (That has been corrected for new plants in the Part 52 final rule.) In the absence of such PRAs, and the experience gained in creating, reviewing, using, checking, and revising them, I consider it premature to rely upon calculations of risk significance to reduce or remove capabilities that provide defense-in-depth. Therefore, I support the ACRS that defense-in-depth considerations should be expanded for this rule.


Based on my previous vote not to proceed with this rulemaking, I seriously considered supporting the termination of this rule ("Option 2") and, indeed, a good case can be made for that decision. If my vote to oppose had been part of the record in 2005, the proposal to proceed to develop the rule would have been approved by a 3 - 2 vote. The two members of the Commission still present (Commissioners Merrifield and Lyons) who participated in that narrow majority both expressed reservations and caution in their votes concerning the eventual final rule and sought enhanced public participation and ACRS involvement in the rule's development. Those concerns seem to have been borne out in that the proposed delays that are part of the current staff recommendation are due to the need to expend additional time and resources to address questions and issues raised by ACRS review.

Nonetheless, I support continuing this rulemaking effort on the slower schedule proposed by the staff, because the concerns of the ACRS that the staff will attempt to address mirror my own. I commend the ACRS for the technical breadth that their efforts have added to this rulemaking process and trust that they will ensure the issues are satisfactorily resolved.

I also commend the staff for the recommendation that they have made, which gives me confidence that they, too, will approach the finalization of the rule soberly and on its intrinsic merits with full public and ACRS participation.

I am not opposed to risk-informed regulation. I strongly supported the implementation of the mitigating systems performance index, the elimination of requirements for hydrogen recombiners (10 CFR 50.44), the use and aggressive updating of NRC SPAR models for all plants, the revision to the Maintenance Rule (10 CFR 50.65), and other risk-informed initiatives upon the maturity of their development and review. I have, however, been skeptical of proposals based more on hopes and theories than on demonstrated facts and practicality, as evidenced by my disapproval of the proposed "Special Treatment" rule (10 CFR 50.69). In my vote (SECY-04-0109), I predicted that the Commission approval of the rule in that form would result in a voluntary rule that would not be used and, to date, that remains the case.

I respect Mr. Holahan's non-concurrence. I think the non-concurrence process dialogue in Enclosure 3 (to SECY-07-0082) attests to a very strong NRC where very senior staff feel free to express dissent and where vigorous technical debate is encouraged. This debate, by the way, virtually replicated the debates that I engaged in with former Chairman Diaz on this topic throughout much of our long joint service together on the Commission.


Edward McGaffigan, Jr. 5/22/07
(Date)

Attachment: As stated

Commissioner McGaffigan's Comments on SECY-05-0052

I do not support proceeding with this proposed rule (and even more so, the Chairman's edits to the proposed rule package). This rule would make profound changes in the Commission's long-standing deterministic requirements for emergency core cooling systems (ECCS). The existing requirements have served us well, and provide large safety and security margins in the operating plants. I see little safety and no security benefit in the proposed rule. What safety benefits there might be (e.g., modifications to containment spray system activation settings) could be achieved within the existing framework. Clearly, PWR licensees would benefit from the rule as they make numerous changes, such as large power uprates, to take advantage of the reduced ECCS margins for large break loss of coolant accidents (LOCAs). With the plants aging and security issues paramount since 9/11/01, I do not believe now is the time to enable such significant changes.

This is the third time I have dissented on a major risk-informed initiative in the past 13 months. Previously I voted against the final rule on 10 CFR 50.69 and against the Commission-directed phased approach to improving PRA quality. I do not regard myself as an opponent of risk-informed power reactor regulation. I was not on the Commission when the Commission adopted the 1995 PRA policy statement, but have never found problems with its carefully balanced language.

The key sentence in the policy statement is: "The Commission believes that the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach." I fear the new rule would supplant, rather than complement, NRC's deterministic approach to ECCS requirements. I also fear that we are going beyond the state-of-the-art in PRA methods and data. I supported the mitigating systems performance indicator because it appeared to be a way to leverage modest baseline PRA quality improvements for the existing reactor fleet. I find it amazing, as I have said before, that three decades after WASH-1400, the Commission has never found a way to require that all power reactor licensees have an up-to-date, high quality internal- and external-initiating event all-mode PRA. Indeed, in the MSPI case, some licensees apparently do not have PRAs of the quality needed to implement that PI by January 2006.

It could be argued that this rule would finally provide the PRA quality we should have had long ago for those licensees who implement it. But I am by no means confident of that. Our staff has very little depth when it comes to assessing PRA quality and using PRA as a tool with a real practitioner's understanding. Nor, frankly, does the industry as a whole.

One of the things I find most disturbing about this paper is its very superficial treatment of how security matters will be handled (on pages 51, 71-72 of the *Federal Register* notice). PRAs do not model terrorist-caused initiating events, nor can they. Current ECCS capabilities provide a large margin for mitigating the consequences of terrorist-caused events. The proposed rule says only that we will examine the potential security impacts in licensee amendments to ensure the proposed change "does not significantly [emphasis added] reduce the 'built-in capability' of the plant to resist security threats."

I do not know what the adverb "significantly" means in this context. Moreover, the Commission has recognized in its voting on SECY-05-0048 that our current change processes in Parts 50 and 73 do not adequately deal with safety/security interface issues. The CRGR in a June 13, 2005 memorandum to the EDO identified safety/security interface issues resulting from the change process used to implement the NFPA 805 Rule. I would far rather put rulemaking resources into solving the safety/security interface problem than into eroding security (and safety) margins.

I also am by no means persuaded that we have the factual foundation in hand to make the far-reaching changes proposed. A single "expert elicitation" is providing us with guesstimates about large-break LOCA frequencies due to safety initiating events. In addition to terrorist-induced events, that expert elicitation specifically did not consider heavy-load drops, power uprates and water hammers. Professor Hochreiter and his students at Penn State have looked at the available safety data and come to different conclusions about the drop-off in pipe-break events due to safety initiating events with the size of pipes. When we find new materials degradation mechanisms regularly as plants age, we should be modest about our ability to make large extrapolations of rare phenomena.

If a majority of the Commission decides to proceed with this proposed rule, at a minimum we should ask the public to comment on the adequacy of the intellectual underpinnings for the rule. Normally, for example in potentially revising the pressurized thermal shock rule, we are very careful to get a broad international consensus about those underpinnings before we launch a rulemaking. I would urge our foreign scientific, technical and regulatory colleagues to actively participate in this rulemaking if it goes forward.

I am about to end my second term on the Commission. I have been present for most of the "risk-informed" regulatory era. With the exception of the June 1999 amendment to the maintenance rule, I have not seen what former Chairman Jackson called the "sharp edge of the risk-informed sword" fall on licensees. Even when we have staff and ACRS consensus, as I thought we had on GSI-189 (providing reliable power to hydrogen igniter at ice condenser and BWR Mark III plants during station blackout), we do not let the sharp edge of the sword fall. We instead look to voluntary industry actions years later (as outlined in Mr. Reyes' June 14, 2005 memorandum to the Commission). I regret that I voted for relaxing the 50.44 hydrogen control requirements in 2002 (SECY-02-0080) without resolving the GSI-189 issue at the same time. It never occurred to me that in 2005, with additional security rationales having become clear, the staff would back off from rulemaking after complaints from a small number of licensees, and instead rely on voluntary industry actions.

If a majority of the Commission decides to issue this proposed rule, I would urge that comments be solicited on both the staff's original proposal and the Chairman's alternative language. I believe that the Chairman's alternative is worse than the staff's language in several respects, e.g., treatment of LOCAs that are beyond the transition break size, the modification of the change processes built into the staff's proposed rule, etc. I would also urge that the public comment period be extended to at least 120 days (from the staff's proposed 75 days) and I believe 180 days could easily be justified. These are profound changes that are being proposed. The Commission's decision on the final rule needs to be fully informed, not rushed on a schedule. I would also urge that several category 2 and/or 3 public meetings be held during the comment period to explain the rule and solicit comments.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER JACZKO

SUBJECT: SECY-07-0082 - 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"

Approved _____ Disapproved X Abstain _____

Not Participating _____

COMMENTS: Below _____ Attached X None _____



SIGNATURE

6/29/07

DATE

Entered on "STARS" Yes ✓ No _____

**Commissioner Jaczko's Comments on SECY-07-0082
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"**

Consistent with my previous vote on SECY-05-0052, "Proposed Rulemaking for Risk-informed Changes to Loss-of-coolant Accident Technical Requirements," I disapprove of the proposed rule; therefore I endorse Option 2 to withdraw the proposed rule and terminate the rulemaking. I commend the staff for seeking Commission clarification on its direction regarding defense-in-depth consideration concerning this important rule as well as providing comprehensive recommendations. I also commend Gary Holahan for his willingness to openly voice his nonconcurrency with the staff's position. I firmly believe the Commission is best served when it can consider a variety of proposals and engage in a robust debate when establishing policy.

As I considered the options presented by the staff in this paper, I was guided by one underlying principle: what has changed since I originally disapproved moving forward with the proposed rule on 50.46a. At that time, I disapproved the rule, because the rule, in my view, was not consistent with the Commission's policy statement on risk informed regulations. In particular, the rule did not appear to complement the defense-in-depth regulatory principle, as the policy statement required. Instead, the rule simply eliminated defense in depth for loss of coolant accidents involving potential pipe ruptures for pipes with diameters larger than the transition break size determined in the rule. While this argument could be justified if the rule were to achieve an improvement in safety for other areas that compensated for this loss in defense in depth, I simply am not convinced that this case has been made in a rigorous manner.

For the Commission to modify such a fundamental component of power reactor regulations, the staff and other proponents of this rule change need to provide much more evidence to support this change. At this time, it appears to me that the rule change is driven by the fundamental *belief* that the loss of coolant accident involving the double rupture is overly conservative and has forced licensees to minimize their focus on the more likely loss of coolant accidents involving smaller pipe breaks. The safety benefits in this case need to be an obvious signal above the noise of the uncertainties of the probabilistic analysis for pipe ruptures of any size.

As with all risk analysis activities, it is crucial to have a thorough determination of the probabilities of the scenarios under consideration. I am unconvinced that there is enough information to make a reasonable interpretation of the probabilities involved. It is still the case that with comparable information experts generally should agree on the probabilities involved. Based on the results of the expert elicitation, the staff analysis, and the rule requirement to periodically update the transition break size, I do not believe that the probability determination of the pipe rupture frequency has sufficient certainty to completely override engineering judgement and defense in depth principles regarding the consideration of the large break loss-of-coolant accident as a design basis accident.

This concern notwithstanding as Kaplan and Garrick state, "[R]isk cannot be spoken of as acceptable or not in isolation, but only in combination with the costs and benefits that are attendant to that risk." (S. Kaplan and B.J. Garrick, "On the Quantitative Definition of Risk," *Risk Analysis* 1, 11-27 (1981)) This aspect of the analysis for 50.46a is in my view most sorely lacking. The regulatory analysis prepared for the proposed rule was only able to quantify the proposed financial benefit to licensees. Furthermore the staff indicated in the current paper

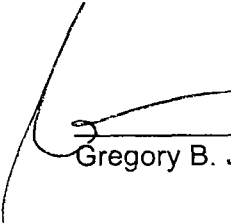
that:

“To a large extent, this [expedited] schedule was based upon potential safety benefits that industry representatives *suggested could* result from plant changes allowed under this rule.” (p. 4) (emphasis added).

The efforts to quantify those safety benefits resulted in showing little if any risk reduction from the allowable plant changes. And as the staff indicates, (and I indicated in my vote on the proposed rule), “many of the benefits of the revised ECCS rule may be obtained under current regulations by performing best-estimate (realistic) thermal-hydraulic analyses.”

Finally, the Commission policy statement on risk-informed regulation encourages the use of risk analysis as a complement – not a replacement – for the deterministic regulatory framework. This framework relies heavily on the use of engineering judgement and defense in depth principles. As the Advisory Committee on Reactor Safeguards pointed out in the review of the rule, the rule “should be revised to strengthen the assurance of defense in depth for breaks beyond the transition break size.” In my view, this only reinforces my concerns that this rule is being used to eliminate deterministic requirements rather than complement them.

Ultimately, this rule appears to me to be a shift of focus based not on rigorous risk analysis, but an updated engineering sense about the efficacy of basing the emergency core cooling requirements on the unlikely double-ended guillotine break of the largest pipe. While I share some of those views, there does not appear to me to be sufficient evidence to relax the current treatment of the large break loss-of-coolant accident. There are clearly benefits to the licensees from a cost perspective, but unfortunately the safety benefits have not been as clearly established. Without that, I do not believe that the staff should continue to pursue this rulemaking. If the Commission were to move forward, however, I would support Commissioner McGaffigan’s position to make this a low-priority activity and to ensure that the concerns of the Advisory Committee on Reactor Safeguards are resolved.



Gregory B. Jaczko 6/29/07
Date

NOTATION VOTE
RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER LYONS

SUBJECT: SECY-07-0082 - RULEMAKING TO MAKE
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Approved _____ Disapproved X Abstain _____

Not Participating _____

COMMENTS: Below ___ Attached X None ___


Peter B. Lyons

SIGNATURE

6/20/07

DATE

Entered on "STARS" Yes X No ___

Commissioner Lyons' Comments on SECY-07-0082

I appreciate Commissioner McGaffigan's longstanding interest in, and opinions on, this issue. In fact, I have expressed some of his same reservations in my previous vote on SECY-05-0052, as he notes. However, I am concerned that previous Commission guidance may have created some of the obstacles for the staff in its effort to create a usable rule that achieves the desired safety benefits, and, therefore, these obstacles might be remedied, in part, by new Commission guidance.

Therefore, in the vein of trying to resolve the principal obstacles as well as resolving my own reservations (and some of those expressed by my colleagues), I am proposing several recommendations as described below in order to resolve those key issues that appear to be at conflict. At the root of this proposal is my desire to see a final rule that, if applied by a licensee (and, potentially, applicants), actually achieves (not just hopes for) improved safety through optimization of safety system design, operation, testing, and maintenance commensurate with our best and continually improving understanding of relative risk contributions of the overall plant design. I acknowledge that the changes I propose would reduce the flexibility to modify an existing plant without prior staff approval and, in fact, may reduce it to a degree that comes close to what currently exists in our regulations. However, even if this rule is not attractive to current licensees, I believe it could encourage future designers to better target robust design margins and defense-in-depth to where they are most needed.

In the spirit of keeping the Commission moving forward with risk-informed regulation, I have no desire to terminate the rulemaking (Option 2). I also recognize the possibility that Option 3 could result in endless delays in finalizing the rule. I believe that unless we maintain progress in the development the final rule, we may lose most, if not all, consistency and knowledge of the technical bases and regulatory underpinnings of this rule. In reaching my decision, I have given much consideration to the staff resources needed to support the rule. Hopefully, by providing the guidance below, we can eliminate the major differences between the ACRS's recommendations and previous Commission directions, thereby reducing the amount of effort the staff would need to expend in trying to resolve these differences. In this manner, the staff can focus on developing a strategy to re-engage the ACRS, industry, public, and other stakeholders, as appropriate, in preparation of a final draft rule package.

Accordingly, I approve Option 1 subject to the following modifications:

1. Staff should strengthen the assurance of defense-in-depth for breaks beyond the transition break size (TBS) in the following manner. The rule, in consonance with other applicable regulations, should not permit removal of any existing mitigation equipment or alteration of mitigation capability without prior staff approval. However, equipment whose only function is to mitigate beyond TBS LOCAs should be permitted reclassification as non-safety, but should be retained in Technical Specifications using established risk-informed inspection and testing methods, as appropriate.

This change would help resolve my own and others' concern that we may have moved beyond the previous Commission guidance in the 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" as I noted in my previous vote on SECY-05-0052. In addition, I see the retention of such capability as appropriate defense-in-depth for large earthquakes and other severe natural phenomena that

can simultaneously affect multiple systems, structures, and components. Finally, retaining such capability would provide appropriate additional safety margin should future experience result in the need to increase the TBS. Although I recognize that this approach may reduce the flexibility for licensees to modify their plant, I agree with the ACRS that some level of special treatment for equipment used to mitigate breaks greater than the TBS is needed to provide reasonable confidence in the reliability and availability of the equipment as well as for maintaining safety margins for breaks at or smaller than the TBS.

2. Staff should add the phrase “with an acceptable model” after the word “calculated” in the second line of section (e)(2) so that it reads, “ECCS cooling performance for LOCAs involving breaks larger than the TBS must be calculated with an acceptable model and must demonstrate that the acceptance criteria in (e)(4) of this section are satisfied.”

This change would require staff-approved best-estimate models to be used for changes permitted under the rule. This should also help resolve the ACRS issue regarding the adequacy of defense-in-depth for greater-than-TBS LOCAs.

3. In order to more closely follow the approach presented in Regulatory Guide 1.174, the staff should modify the proposed rule to ensure that any changes under this rule be further restricted to very small risk increases, notwithstanding the fact that they would otherwise be permitted under 50.59. Therefore, staff should add the word “very” before the word “small” in section (f)(2)(ii) so that it reads “...the total increase in core damage frequency and large early release frequency are very small and the overall risk remains small...” or make other changes as appropriate to achieve the above objective.

The proposed rule currently permits changes such as relaxation of simultaneous LOOP/LOCA and assumption of worst single failure as recommended by the ACRS, removal of automatic containment spray function, as well as reclassification of certain mitigation equipment to non-safety. Such changes, in combination, can have both a distinct safety benefit (i.e. risk reduction) as well as a reduction of unnecessary regulatory burden. However, in taking such a substantial key step toward greater risk-informed regulation as represented by this rule, I believe it is important that the safety benefit is emphasized over the burden reduction. The advocates in both industry and the staff insist this is the intent; therefore, I see no reason not to strengthen the rule in this regard. This should help resolve the ACRS issue that the current proposed rule would permit changes in risk up to $1.0 \text{ E}^{-5}/\text{yr}$ change in CDF without prior staff approval.

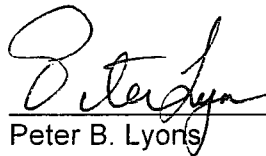
4. The staff should evaluate various approaches for enhancing the rule with requirements for improved leak detection methods and thorough diagnosis of observed defects for generic implications. Regulatory guidance for this rule should ensure that potentially significant defects are fully evaluated for generic implications. Staff should interact with the appropriate ASME codes and standards committees to explore ways to improve regulatory confidence that greater-than-TBS LOCAs remain an insignificant contributor to risk. Also, staff should continue research activities that lead toward an improved understanding of fracture mechanics in support of more accurately predicting the likelihood of pipe breaks.

In general, I am not enamored of expert elicitation processes. However, I understand and appreciate the fact that staff used other factors that resulted in additional conservatism in the selection of the TBS. I am willing to accept (based on collective experience and knowledge to date) that the frequency of breaks larger than the TBS is substantially less, in general, than the

frequency of breaks smaller than the TBS. By themselves, historical experience and existing knowledge may be sufficient to provide a technical basis for this rule today. However, I believe they are not sufficient, alone, to provide a continuing technical basis into the future. What is needed is additional assurance that we will detect in a timely manner any significant challenge to the assumption of low frequency for greater-than-TBS LOCAs. I am particularly interested in ensuring that potentially significant defects that can provide useful information are thoroughly analyzed, diagnosed, extracted and tested, using either non-destructive or destructive techniques, to glean every possible insight, generic or otherwise. Without such thorough diagnosis of identified defects, I will find it hard to support this final rule.

5. Staff should incorporate acceptance criteria for fuel cladding performance in terms of general requirements, such as a high degree of confidence in maintaining a coolable geometry and retaining some ductility in the cladding as recommended by the ACRS.

I believe that the ACRS provided a reasonable alternative to waiting until the fuel cladding research is complete before proceeding with a final 50.46(a) rule.


Peter B. Lyons 6/20/07
Date