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

July 29, 2005

SECRETARY

COMMISSION VOTING RECORD

DECISION ITEM: SECY-05-0052

TITLE: PROPOSED RULEMAKING FOR "RISK-INFORMED CHANGES TO LOSS-OF-COOLANT ACCIDENT TECHNICAL REQUIREMENTS"

The Commission (with Chairman Diaz and Commissioners Merrifield and Lyons agreeing) approved the subject paper as recorded in the Staff Requirements Memorandum (SRM) of July 29, 2005. Commissioner Jaczko disapproved the paper.

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

Annette L. Vietti-Cook
Secretary of the Commission

Attachments:
1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Diaz
Commissioner Merrifield
Commissioner Jaczko
Commissioner Lyons
OGC
EDO
PDR

VOTING SUMMARY - SECY-05-0052

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. DIAZ	X				X	4/22/05
COMR. MERRIFIELD	X				X	7/6/05
COMR. JACZKO		X			X	6/29/05
COMR. LYONS	X				X	5/10/05

COMMENT RESOLUTION

In their vote sheets, Chairman Diaz and Commissioners Merrifield and Lyons approved the staff's recommendation and provided some additional comments. Commissioner Jaczko disapproved the paper. Subsequently, the comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on July 29, 2005.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: CHAIRMAN DIAZ

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

subject to edits

Approved XX Disapproved _____ Abstain _____

Not Participating _____

COMMENTS:

See attached comments.

SIGNATURE

April 22, 05

DATE

Entered on "STARS" Yes ✓ No ___

Chairman Diaz' Comments on <u>SECY-05-0052</u>

The development of new risk-informed requirements for the emergency core cooling system (ECCS) is a challenging and promising regulatory activity directed at increasing the safety of light water reactors. Significant improvements in safety can be achieved by revising the ECCS requirements, including making them more risk-informed and more performance-based. More safety focused regulations and more objective processes have been Commission goals dating back to SECY-98-300, "Options For Risk-Informed Revisions to 10 CFR Part 50 - 'Domestic Licensing of Production and Utilization Facilities.'"

I approve the staff recommendations contained in SECY-05-0052 and offer the following additional comments for the Commission's consideration. I also approve the draft *Federal Register* notice subject to the staff making specific modifications detailed below, prior to issuance for public comment.

<u>General Comments:</u>

I recognize that the staff has devoted significant effort in and attention to developing a proposed rule for Commission consideration. The staff has proposed a workable alternative to the current 10 CFR 50.46. Many of the concepts embodied in the draft, proposed rule are well founded. I agree with allowing inconsequential increases in risk without NRC approval and small increases in risk with NRC approval as the Commission approved in Regulatory Guide 1.174. Additionally, I believe an integrated, risk-informed change process, based on the key principles from RG 1.174 (i.e., small changes in risk, safety margin, defense-in-depth, and performance measurement) should be codified in this rule. Still, aspects of the proposed approach are unnecessarily prescriptive and would distract licensee attention from the most safety significant issues. Significant resources would be expended by both the licensees and the staff on addressing very unlikely events.

There are two areas where revisions would improve the proposed rule to fulfill its potential to allow, encourage, and facilitate safety enhancements. The two areas are: the level of prescription for low probability, beyond design basis LOCAs; and the unnecessarily complicated change process. Each of these areas is addressed below.

The Staff Requirements Memorandum (SRM) for 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," stated that the "level of regulatory oversight, including the required level of detail and conservatism of the supporting analysis, should be commensurate with the categorization (i.e., as design-basis events or beyond design-basis events)." However, the regulatory oversight being proposed for the analyses demonstrating capabilities for beyond design basis LOCAs is more than required for most design basis event analyses. As a result, the requirements associated with regulatory treatment of beyond design basis LOCAs should be revised to be consistent with the low frequency of these events (see item 1 below and attached edits).

As noted by the Advisory Committee on Reactor Safeguards (ACRS) in its review of the staff proposed rule, "it is not clear why the process of accepting the changes to the licensing basis that will be possible due the changes in 10 CFR 50.46 should be specified in the rule itself when it is already in RG 1.174." I agree with this assessment and believe that 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. Also the SRM for SECY-04-0037 stated, the "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)." 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. Moreover, an integrated, risk-informed change process, using the key principles in RG 1.174, will significantly improve safety and improve implementation of the rule. For some changes, it may be difficult to distinguish between changes permitted under 50.46a and changes permitted under other sections. As a result of the above arguments, I propose that, for licensees that use 50.46a, the integrated, risk-informed change process be used for *all* changes made under 50.59 or 50.90. This will allow all changes to a plant that has implemented 50.46a to follow a consistent application of the regulatory process. The proposed rule should be revised to address these points regarding the change process (see item 2 below).

Included below are also a few additional minor changes to add clarity and to avoid duplication.

<u>Specific Edits to *Federal Register* Notice:</u>

I approve the staff recommendations contained in SECY-05-0052 subject to making the following modifications prior to issuing the proposed rule in the *Federal Register.*

1. The proposed 10 CFR 50.46a should be edited to remove the overly prescriptive treatment of beyond design basis LOCAs (edits in the Attachment).

2. Paragraph (f) "Changes to the facility, technical specifications, and procedures," should be revised to employ 10 CFR 50.59, 50.90 and the key principles of RG 1.174. Revise (f)(1), (2), and (6) as follows:

(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 demonstrating 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 implemented under 10 CFR 50.90, any increases in risk are small. For changes implemented under 10 CFR 50.59, any increases in risk are inconsequential.
(ii) Defense-in-depth is maintained.
(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.

(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.

3. 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.

4. There are a number of topics in the rule that could benefit from public discussion. After reviewing the staff proposal, I believe that additional changes may improve the rule. As a result, the staff should specifically solicit comments on the following topics;

- The Commission instructed the staff not to make 50.46a available to future reactors. However after reviewing the rule, I believe that 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.

- 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). I believe 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.

- 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.

- 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). I believe 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.

- 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." I agree with this assessment. 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.

5. The proposed rulemaking package, including the *Federal Register* notice should be modified to reflect the above wording changes and seek public comments on the issues identified.

Attachment

(a) *Definitions.* For the purposes of this section:

(1) *Evaluation model* means the calculational framework for evaluating the behavior of the reactor system during a postulated design basis accident loss-of-coolant accident (LOCA). It includes one or more computer programs and all other information necessary for application of the calculational framework to a specific LOCA, such as mathematical models used, assumptions included in the programs, procedure for treating the program input and output information, specification of those portions of analysis not included in computer programs, values of parameters, and all other information necessary to specify the calculational procedure.

(2) *Loss-of-coolant accidents (LOCAs)* means the hypothetical accidents that would result from the loss of reactor coolant, at a rate in excess of the capability of the reactor coolant makeup system, from breaks in pipes in the reactor coolant pressure boundary up to and including a break equivalent in size to the double-ended rupture of the largest pipe in the reactor coolant system. 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.

(c) Each nuclear power reactor subject to this section must be provided with an ECCS that must be designed so that its ECCS calculated cooling performance following postulated LOCAs conforms to the criteria set forth in paragraph (d) of this section. The evaluation models and analysis methods for LOCAs involving breaks at or below the TBS must meet the criteria in this paragraph, and must be approved for use by the NRC. Appendix K, Part II, 10 CFR Part 50, sets forth the documentation requirements 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.

(2) *ECCS* analyses ~~*evaluation*~~ *for LOCAs involving breaks larger than the TBS.* ECCS cooling performance for LOCAs involving breaks larger than the TBS must be calculated and must demonstrate that the acceptance criteria in paragraph (d)(2) of this section are satisfied. The ~~evaluation model or~~ analysis method must address the most important phenomena in analyzing the course of the accident. The evaluation must be performed for a number of postulated LOCAs of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated LOCAs larger than the TBS up to the double-ended rupture of the largest pipe in the reactor coolant system are analyzed. Sufficient supporting justification must be available ~~provided~~ to show that the analytical technique reasonably describes the behavior of the reactor system during a LOCA from the TBS up to the double-ended rupture of the largest reactor coolant system pipe. These calculations may take credit for the availability of offsite power and do not require the assumption of a single failure. Comparisons to applicable experimental data must be made. ~~When the calculated ECCS cooling performance is compared to the criteria set forth in paragraph (d)(2) of this section, there must be a reasonable level of probability that the criteria would not be exceeded.~~

(f)(4) *Requirements for Risk Assessment other than PRA.* To the extent that risk assessment methods other than PRAs are used to develop quantitative or qualitative estimates of changes to CDF and LERF to demonstrate compliance with paragraph (f)(2) of this section, a licensee shall justify that the methods used produce ~~realistically conservative~~ realistic results.

(f) 5) *Monitoring and Feedback.* Upon implementation of a change to the facility, technical specifications, or procedure under this section, the licensee shall periodically re-evaluate and update its risk assessments required under paragraphs (f)(3) and (f)(4) of this section to address subsequent changes to the plant, operational practices, equipment performance, plant operational experience, changes in the PRA model, revisions in analysis methods, model scope, data, and modeling assumptions. The re-evaluation and updating must be completed in a timely manner, but no less often than once every two refueling outages. The updated risk assessments must continue to meet the requirements in paragraphs (f)(3) and (f)(4) of this section. Based upon the risk assessments, the licensee shall take appropriate action to ensure that ~~all changes accomplished under this section~~ facility design and operation continue to be consistent with the PRA assumptions used ~~continue~~ to meet the acceptance criteria in paragraph (f)(2) of this section. The re-evaluation and updating required by this section, and any necessary changes to the facility, technical specifications or procedures as a result of this re-evaluation and updating, shall not be deemed to be backfitting under any provision of this chapter.

(h) *Reporting.*
(1) Each licensee shall estimate the effect of any change to or error in evaluation models or analysis methods or in the application of such models or methods to determine if the change or error is significant. For LOCAs involving pipe breaks at or below the TBS, f~~F~~or 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 temperature calculation, 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. 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. (no additional changes in this section)
(h)(1)(ii) 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.~~
(h)(2) As part of the PRA update under paragraph (f)(5) of this section, the 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 1x10⁻⁶ per year or more, or the cumulative change in LERF increases by 1x10⁻⁷ 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. (no additional changes in this section)

Appendix K
D. 5. General Standards for Acceptability - Elements of evaluation models and analysis methods reviewed will include technical adequacy of the calculational methods. For models covered by § 50.46(a)(1)(ii), the review of technical adequacy will include compliance with required features of section I of this appendix K; and for models covered by § 50.46(a)(1)(i),

assurance of a high level of probability that the performance criteria of § 50.46(b) would not be exceeded. For models covered by § 50.46a(c)(1), the review will include either compliance with the required features of section I of this appendix K, or assurance of a high level of probability that the performance criteria of § 50.46a(d)(1) would not be exceeded. ~~For analysis methods covered by § 50.46a(c)(2), the review will include whether there is a reasonable demonstration that the criteria of § 50.46a(d)(2) would not be exceeded.~~

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER MERRIFIELD

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

Approved ✓ Disapproved _____ Abstain _____

Not Participating _____

COMMENTS:

See attached comments.

SIGNATURE

7/6/05

DATE

Entered on "STARS" Yes ✓ No ___

Commissioner Merrifield's Comments on SECY-05-0052 - Proposed Rulemaking for "Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements"

I remain a strong proponent of providing a risk-informed alternative for our regulations governing nuclear power reactors. Risk-informing NRC regulations can provide a net safety benefit by reducing regulatory oversight of low risk contributors while enhancing regulatory oversight of higher risk contributors. I commend the staff for attempting to tackle this risk-informed rulemaking effort in the absence of probabilistic risk assessment quality standards, and I look forward to the day when these standards are promulgated.

I understand that developing this proposed rule has been a difficult task for the staff and has taken a considerable amount of time and attention from senior management as well. This proposed rule raises some challenging questions concerning plant changes, including the bundling of related or non-related risk increases or decreases, tracking of cumulative small risk increases over time, and proposing to include the high level criteria for a risk evaluation process for plant changes and acceptance criteria described in Regulatory Guide 1.174, "An approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." I believe the public comment period, which is an integral part of the rulemaking process, will enable all stakeholders to present their views on these questions and other sections of the proposed rule. At the end of the day, this public feedback will ensure that the Commission is fully informed when considering the merits of a final rule.

I agree that risk-informing the LOCA technical requirements in the rule can result in significant safety improvements to individual plants. However, it is not clear to me that the currently proposed rule will ensure that a licensee will use the resources saved from reducing efforts in areas of low safety significance to focus on other areas of higher safety significance to improve the overall safety of the plant, or at a minimum, ensure that a change to the plant that slightly increases risk will result in a concomitant change that decreases risk, so that the net effect is a safety neutral change to the plant. I believe this is a potential shortcoming of the proposed rule, particularly for those plants whose overall risk profile is in the range of 10^{-4} per reactor year.

I also understand that there is a fine line between writing rule language that is at too high a level to be efficiently implemented, and language that is so prescriptive it affords little or no flexibility to the staff or the licensee on how it is to be implemented. For this rule, the staff must find the right level of language to be included, while leaving the implementation details to be fleshed out in a regulatory guide to explain to licensees how the rule can be implemented. As written, I believe that the rule still contains too much detail in addressing beyond design basis LOCAs and the licensing basis change process, which would be better left to the as yet unwritten regulatory guide. After weighing the public comments on this proposed rule and the subsequent regulatory guide, I believe the Commission will strike the right balance to ensure the final rule can be implemented without imposing undue burden on either the regulator or the licensee.

I approve issuing the proposed rule for public comment, and I agree that the questions posed by the staff, as well as the additional questions proposed by Chairman Diaz and Commissioner Lyons will ensure a full and fair debate of the significant issues raised in the proposed rule.

Attached are some additional comments for the Commission's consideration.

Additional Comments by Commissioner Merrifield on SECY-05-0052 for Commission Consideration

In general, I agree with all of the changes to the Federal Register Notice proposed by Chairman Diaz with the inclusion of the following edits:

1. 50.46a©)(2)... Sufficient supporting justification, including the methodology used, must be available to show that the analytical technique reasonably describes the behavior of the reactor system during a LOCA from the TBS up to the double-ended rupture of the largest reactor coolant system pipe.

2. I agree with the changes to 50.46a(f)(2) proposed by Chairman Diaz, but I offer the following alternative to the proposed subparts I, ii, and iv -

> 50.46a(f)(2)(I) For changes ~~implemented~~ reviewed and approved by the NRC under 10 CFR 50.90, ~~any increases in risk~~ *the total increases in core damage frequency and* large early release frequency are small compared to the overall plant risk profile. For changes that do not require prior NRC approval ~~implemented~~ under 10 CFR 50.59, any increases in risk are inconsequential compared to the overall plant risk profile.
>
> 50.46a(f)(2)(ii) Defense-in-depth is maintained 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.
>
> 50.46a(f)(2)(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.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER JACZKO

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

Approved _____ Disapproved X_____ Abstain _____

Not Participating _____

COMMENTS: See attached comments.

SIGNATURE

6/29/05

DATE

Entered on "STARS" Yes ✓ No ___

Commissioner Jaczko's Comments on SECY-05-0052
Proposed Rulemaking for Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements

I commend the staff for delivering a comprehensive proposal on a very ambitious schedule that aligns well with the Commission direction. I also commend Chairman Diaz for encouraging the staff to bring this important discussion before the Commission. This proposed rule will foster further necessary policy discussion on the appropriate use of risk information derived from probabilistic risk assessments in NRC regulatory matters. I disapprove, however, the issuance of the proposed rule for public comment, because I do not believe that the proposed changes to 10 CFR 50.46, Loss of Coolant Accident Technical Requirements, properly utilize probabilistic risk assessment to enhance safety and security at nuclear power plants.

The effort to enhance the use of risk information in regulatory matters has become synonymous with the enhanced use of risk information *obtained* from probabilistic risk assessments. The Commission developed guidelines to enhance the role of probabilistic risk assessments in agency actions and decisions in the 1995 Policy Statement, "Use of Probabilistic Risk Assessment (PRA) Methods in Nuclear Regulatory Activities." This policy statement provides the following three principles to guide the agency in utilizing probabilistic risk assessments: PRA technology should be supported by the state-of-the-art in PRA methods and data, PRA technology should complement the NRC's deterministic approach, and PRA technology should support the NRC's traditional defense-in-depth philosophy.

The basic premise of the rule, that loss-of-coolant-accidents involving pipe ruptures beyond a certain size, the transition break size, no longer must meet all the elements of the design basis accident, is not in alignment with these three principles.

With regard to the first principle, that PRA technology should be supported by state-of-the-art in PRA methods and data, the proposed rule relies more on the expert opinion of the staff and of external experts than PRA. Specifically, the proposed rule focuses on an expert elicitation to determine the appropriate transition break size. This expert elicitation process makes an important assumption that "all U.S. nuclear plant construction and operation is in accordance with applicable codes and standards." This assumption alleviates the need to incorporate complicated factors such as pipe degradation and human performance failures, significant factors in determining the frequency and risk of pipe failure. In addition, the staff did not rely on the determination of the expert elicitation for the transition break size, but utilized additional non-PRA risk insights to develop the final transition break size. This clearly indicates the PRA methods are not mature enough to determine the transition break size. In addition, the analysis of the transition break size fails to consider the potential for initiating events that are caused by terrorist events. Together these omissions indicate that the primary risk-informed change to the loss of coolant rule is neither based on state-of-the-art PRA methods nor fully supported by the data, whether confirmatory or contradictory.

With regard to the second principle, that PRA technology should complement the NRC's deterministic approach, the proposed rule again fails to meet this standard. Instead of focusing on ways to utilize risk information to enhance the ability of a nuclear power plant to withstand a design basis accident for *any* postulated loss of coolant accident up to and including the loss of coolant from a double ended guillotine break of the largest pipe (the deterministic basis for the existing rule), the new rule exempts the license from mitigating large pipe break accidents under many of the deterministic conditions of the design basis accident. This does not compliment the deterministic approach but effectively dismantles it for the most severe postulated design basis event.

Similarly, with the need to support defense-in-depth, the rule undermines rather than enhances the defense-in-depth for the large break LOCA's for a similar reason.

Because of these issues regarding the use of PRA in this rule, I have concerns that the net safety benefits from this proposed rule do not outweigh the erosion of margins that will likely occur as the result of its implementation. The Advisory Committee on Reactor Safeguards discussed the merits of the proposed rulemaking in its December 17, 2004, memorandum to the Executive Director for Operations. It stated that the proposed rule would be an enabling rule. It will permit licensees to make changes that *may* decrease risk by optimizing system responses to accidents that are more likely to occur, and changes such as power uprates that *will* result in risk increases (emphasis added). The safety benefits that could occur through this proposed rule such as delayed diesel generator start times, containment spray and refueling water storage tank optimization, and accumulator setpoints appear marginal and do not justify relaxing the current deterministic parameters. I consider it very likely that whatever small benefit is gained will be offset by other modifications, such as power uprates, that will erode the margins gained by the reanalysis of the design basis loss-of-coolant-accident. Additionally, nearly all of the safety and operational benefits that have been identified could be achieved through application of the best estimate option of the existing 50.46 or through other analytical methods.

I also have concerns with the potential nonuniformity in design that the rule could result in an unnecessary impact on NRC resources. The rule requires that for breaks beyond the TBS, licensees maintain the capability to mitigate against such breaks. There are no parameters, however, through which this must be accomplished other than to maintain a coolable geometry and to maintain long term core cooling. The mitigative measures that licensees may develop to accomplish these objectives would likely be widely varied and lead to substantial nonuniformity. In terms on impact on NRC resources, I envision this rule burdening the staff with a large volume of license amendment requests to approve all the design and operational changes that the rule would enable. This is not the appropriate focus for limited NRC staff resources.

As stated, I am supportive of the agency's fundamental policy on the use of PRA in regulatory activities. Our 30 years of experience in preparing for the large break loss of coolant accidents through our risk-informed, deterministic and defense-in-depth framework for emergency core cooling systems has served us well and I do not support changing it in the manner proposed by this rule.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER LYONS

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

Approved __X__ Disapproved _____ Abstain _____

Not Participating _____

COMMENTS:

See attached.

Peter B Lyons
SIGNATURE

5/10/05
DATE

Entered on "STARS" Yes ___ No ___

Commissioner Lyons' comments on SECY-05-0052

Proposed Rulemaking for
"Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements"

I recommend that this draft rule and the accompanying draft Regulatory Guide be published for public comment. I do not object to the inclusion in this draft rule of the Chairman's proposed changes or the additional areas for which public comments are solicited.

However, my above recommendation should not be construed as indicating support for all provisions included in the current version or the Chairman's changes of this draft rule. In particular, I believe that further consideration and discussion is warranted to better understand the expected safety benefits of this rule using quantitative probabilistic risk analysis, including a full understanding of the influential assumptions upon which these expected benefits are derived. Furthermore, I believe that more complete consideration and discussion is needed on how a plant's defenses will be maintained against events that could affect multiple plant systems such as security, seismic, or severe weather events. For example, given that the likelihood of coincidental Loss-of-Offsite Power (LOOP) with LOCA is increased during postulated attacks or seismic events, the staff should address how the final rule could affect the risk margins against such events.

I request that the Advisory Committee on Reactor Safeguards (ACRS) review any final rule and Regulatory Guide proposal, following changes proposed as a result of the public comment period.

Further, I request that all specific issues or questions for which we seek public comment be listed together, and to include the following questions:

1. Given the Commission's intent (ref: SRM for SECY-04-0037) that plant changes made possible by this rule should be constrained in areas were 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 <u>enhance</u> 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.'

2. 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 TBS, within a reasonable period of time?

3. 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?

Below are listed the issues for which the staff's proposed rulemaking package already solicits specific public comments. They are listed or paraphrased here to ensure the list is complete and that it accurately captures the staff's intended solicitations. I suggest that all questions being solicited appear in a single list in the final FRN.

1. (pp 45-46 of the SECY attachment)

The acceptability of combining 50.46a related and unrelated changes to meet 50.46a risk acceptance criteria (a.k.a. "bundling").

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.

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.

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?

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.

2. 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 the SECY attachment)

3. 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 the SECY attachment)

4. Whether there are less burdensome, or more effective, ways of ensuring that the cumulative impact of an unbounded number of "inconsequential" changes remains inconsequential. (pg 71 of the SECY attachment)

Below are listed the issues for which the Chairman's notation vote solicits specific public comments. They are provided here for reference and convenience in assembling the full list of specific questions for which public comment is requested.

1. The Commission instructed the staff not to make 50.46a available to future reactors. However after reviewing the rule, I believe that 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.

2. The proposed 50.46a includes an integrated, risk-informed change process to allow for changes to the facility following re-analysis of the beyond design basis LOCAs. However, the current regulations already have requirements addressing changes to the facility (50.59 and 50.90). I believe 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 enable by 50.46a.

3. 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.

4. 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). I believe it may be more practical to control equipment credited in the beyond design basis LOCA analyhsis 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.

5. 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." I agree with this assessment. 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.