UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

May 17, 1999

The Honorable Shirley Ann Jackson
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Jackson:

SUBJECT: PROPOSED FINAL RULE - REVISIONS TO 10 CFR PARTS 50 AND 72 CONCERNING CHANGES, TESTS, AND EXPERIMENTS

During the 462nd meeting of the Advisory Committee on Reactor Safeguards, May 5-8,1999, we met with representatives of the NRC staff and the Nuclear Energy Institute (NEI) to discuss the proposed final revisions to 10 CFR 50.59 and related requirements in 10 CFR Parts 50 and 72 concerning changes, tests, and experiments. We previously met with the staff and NEI in March 1999 to discuss SECY-99-054 and issued a report to the Commission on March 22, 1999. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATIONS

1. We recommend issuance of the proposed final rule and conforming changes subject to resolution of our comments and concerns.

2. We recommend that criterion (vii) be modified to state "result in a fission product barrier being altered by a change in its design basis limit or a likely reduction in the margin between the design basis limit and the failure point."

3. We recommend that the "substantial review" criterion regarding escalated enforcement be deleted from the proposed final rule.

4. We are concerned that the current wording in criterion (viii) could result in a "zero increase" constraint for departure from a method of evaluation. We recommend that the rule language be changed to "a minimal departure from a method of evaluation."

DISCUSSION

The staff and industry are continuing discussions to simplify, clarify, and restore stability to the 10 CFR 50.59 process and its implementation. Progress is being made on resolving issues identified in our March 22, 1999 report.

Significant changes to 10 CFR 50.59 proposed by the staff since our meeting in March 1999 are the addition of the following two new criteria:

(vii) result in a design basis limit for a fission product barrier being exceeded or altered;

(viii) result in a departure from a method of evaluation described in the FSAR [Final Safety Analysis Report] (as updated) used in establishing the design bases or in the safety analyses.

The new criterion (vii) requires prior NRC review of any change that would result in a design basis limit related to the fission product barrier being exceeded or altered. We note that the margin provided by the fission product barrier is the margin between its design limit and its failure point. This margin can be reduced not only by a change in the design limit, but also by a change in the failure point. The installation of a hardened vent in a containment is an example of the containment design limit not being changed, but the containment barrier capability being reduced by introducing the ability to open the containment barrier before reaching its failure pressure. It is appropriate for the NRC staff to review such a possible reduction in capability before it is implemented by a licensee. Criterion (vii) should be revised to preclude such actions from being carried out under 10 CFR 50.59. To do this, criterion (vii) should be modified to state "result in a fission product barrier being altered by a change in its design basis limit or a likely reduction in the margin between the design basis limit and the failure point."

The new criterion (viii) requires prior NRC review of any change in a methodology or evaluation method that "results in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses." We agree with the staff that it is important to clearly define what is a method of evaluation and what are input parameters to the methods to ensure consistent implementation of new criterion (viii). To avoid introducing a "zero increase" constraint, this criterion should be revised to state "a minimal departure from a method of evaluation." It is important that the staff and the industry work closely to develop guidance on the specific elements and examples of the evaluation methods that would require prior NRC review. They should also work closely in developing guidance for input parameters.

In criterion (ii) of the Statement of Considerations, under "Guidance for likelihood of occurrence of malfunction," the staff states that "Changes that would invalidate requirements for redundancy, diversity, separation, and other such design characteristics, would be considered as 'more than a minimal increase in likelihood of malfunction,' and thus would require prior NRC approval." We agree that such changes should require prior NRC approval. We disagree that such changes are automatically more than a minimal increase in likelihood of malfunction. We are concerned about forcing the outcome of what should be a probability determination in order to fit the need for NRC review of design basis commitments. In our February 18, 1999 report, we questioned whether the reference to probability could be deleted from the definition of minimal changes.

In the discussion section on enforcement, the staff states that "a failure to submit an amendment as required would be considered a Severity Level III violation if either a) a substantial review is needed by the NRC before it could conclude that the licensee's actions were acceptable or b) NRC would not have found the licensee's actions acceptable...." We agree with the industry concern that it is unduly subjective to base the decision to issue a Severity Level III violation on

whether a "substantial review" was needed to determine that the licensee had performed a proper evaluation. We also agree that the "substantial review" criterion is inherently subjective and that the extent of NRC review needed to verify the adequacy of a licensee's 10 CFR 50.59 safety evaluation is a function of the complexity of the change and the skill of the NRC reviewer.

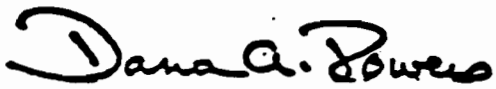
In criteria (iii) and (iv) of the Statement of Considerations, the staff states "no more than a minimal increase in consequences if the increase is less than or equal to the more limiting of either 10 percent of the difference between the existing calculated value and the regulatory guideline value (10 CFR Part 100 or GDC [General Design Criteria]19 as applicable), or has reached the SRP [Standard Review Plan] guideline value for the particular design basis event." The rationale for the 10 percent incremental value lacks sufficient justification even though both the staff and industry agree to this approach. We believe there is a need to expand the discussion to clearly justify why 10 percent is the appropriate criterion and how the management of incremental changes will ensure that margins are not adversely reduced by frequent use of this criterion. Some ACRS members feel that because the increase in consequences for either an individual change or the cumulative changes is limited by the SRP guideline value, there is sufficient assurance that adequate margins are maintained. Some ACRS members feel that the concern over the particular choice of 10 percent is overwrought.

During our discussions of minimal increases in the likelihood of malfunction, the staff agreed to delete the words "for clarity" from the discussion of "likelihood" as substituted for the term "probability" in criterion (ii) of the Statement of Considerations. The staff also agreed to delete the words "frequency of" from the rule language in 10 CFR 72.48 to make it conform with the proposed rule language in 10 CFR 50.59.

The industry has begun the process of developing changes to the guidance provided in NEI 96-07, "Guidelines for 10 CFR 50.59 Safety Evaluations," and is expected to request NRC endorsement in a regulatory guide. We plan to review the proposed NRC regulatory guide.

Additional comments by ACRS member Graham B. Wallis are presented below.

Sincerely,



Dana A. Powers
Chairman

Additional Comments by ACRS Member Graham B. Wallis

1. I am generally in favor of the objective of restoring 10 CFR 50.59 to the condition where it "worked well" in the past. However, once the revised rule is in place, licensees will adapt to it, so thought needs to be given to what the future might be. Neither the staff nor NEI had much to say about the consequences of implementing the revised rule, something that is surely an important part of the case that must be made for any rulemaking.

2. Likelihood and frequency have replaced probability in the rule. I don't see how this makes any difference. To conform to the criteria on page 118 of the proposed final rulemaking (Reference 1), the licensee has to assess these likelihoods and frequencies. The "qualitative standard" on page 31 appears to be asking for inconsistency in interpretation and I would expect that the regulatory guide will have to provide more specific guidance. A ca[illegible]s licensee will probably choose to calculate the probabilities of occurrence of an accident or malfunction and evaluate consequences, just as it would now do for use in a PRA. The basic problem of introducing probabilistic language into a deterministic rule has not gone away.

3. "Minimal increase" occurs four times in the criteria on p.118 of Reference 1. For criteria (i) and (ii), there is little guidance on interpretation. The argument that "minimal" subsumes the NEI language of "negligible" does not help. Once "minimal" is in place, licensees will have greater freedom than they asked for with "negligible" in NEI 96-07. This is not hypothetical; in its April 30, 1999 letter (Reference 2), NEI expresses a desire to take advantage of this greater flexibility.

4. What is a "minimal increase" in criterion (ii)? The examples on pages 36-37 do not help because no measure of "likelihood of occurrence" is used. Discussion of items such as "redundant motive force, quality, and other requirements" avoids assessment of likelihood of malfunction, which is not determined by these parameters. The key criterion for evaluation in the rule is still remarkably vague, with no indication of the scale on which it is to be measured.

   Since minimal is no longer negligible, is it 1 percent or 10 percent of the existing likelihood of malfunction? Is it perhaps 1000 percent if the particular item has very little safety significance? Is it some percentage change or arithmetical value of the resulting change in a more universal measure of importance to safety such as core damage frequency (CDF) or large, early release frequency (LERF)? In the absence of a definition for minimal within the context of criterion (ii), one might turn to the discussion of criteria (iii) and (iv) on pages 37-41 of Reference 1 where minimal is defined as less than 10 percent of the margin between calculated values and acceptance values. It would seem that a similar definition should apply, for want of any other, to criterion (ii). Then, for example, a plant with a low CDF compared to the acceptable CDF might have a good argument for increasing its CDF by 10 percent of that margin, eventually working up to the level of CDF where regulatory action is warranted.

   This is not a hypothetical issue. In its April 30, 1999 letter, NEI proposes criteria for use in defining minimal, one of which is "The effect of the change on frequency of an accident can be calculated and would not cause more than a 10 percent increase in the estimated (pre-change) accident frequency."

5. A succession of 10 percent (or any percent) incremental reductions in margin eventually effectively reduces that margin to zero. Perhaps it should be stated straightforwardly that the purpose of this rule is to allow incremental approach to acceptance values at a

manageable rate. This may be the right policy, but it appears significantly different in philosophy from the idea of minimal change.

6. The rule sets a precedent for progressive reduction of margins by specified increments. Now, margins were originally established because of uncertainties in predictions. One stayed a prudent distance away from limits to avoid (qualitative) probability of exceeding them. Reduction in margin makes sense if uncertainty has been sufficiently reduced, so that approach to the limit does not increase the likelihood of stepping over it. I know of no arguments having been presented to show that this uncertainty has actually been reduced.

7. The rule has an impact, however minimal, on public safety. I realize that there has been ample opportunity for public comment, most of which has come from the nuclear industry, to which the NRC has responded. I suggest that it would help relations with the broader public if, when a rule such as this is finally issued, the Statement of Considerations contained a preamble informing an independent observer of what the rule is designed to accomplish and what the expected consequences are.

References:

1. Memorandum dated April 27, 1999, from David B. Matthews, Office of Nuclear Reactor Regulation, to John T. Larkins, ACRS, Subject: Request for Review and Endorsement of Final Rulemaking to Revise 10 CFR 50.59 and Related Provisions Concerning "Changes, Tests, and Experiments."
2. Letter dated April 30, 1999, from Anthony R. Pietrangelo, Nuclear Energy Institute, to David Matthews, NRC, Subject: Issues Concerning the Pending Revisions to 10 CFR 50.59.
3. Report dated March 22, 1999, from Dana A. Powers, Chairman, ACRS, to Shirley Ann Jackson, Chairman, NRC, Subject: SECY-99-054, "Plans for Final Rule - Revisions to 10 CFR Parts 50, 52, and 72: Requirements Concerning Changes, Tests, and Experiments."
4. Report dated February 18, 1999, from Dana A. Powers, Chairman, ACRS, to Shirley Ann Jackson, Chairman, NRC, Subject: List of Questions to be Addressed for Possible Resolution of Key Issues Associated with the Proposed Revision to 10 CFR 50.59 (Changes Tests and Experiments).
5. Nuclear Energy Institute, NEI-96-07, Revision 0, "Guidelines for 10 CFR 50.59 Safety Evaluations," September 1997.