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DEC 27 1999 16:07
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DOCKET NUMBER
PROPOSED RULE PR 50
(64FR53270)

December 15, 1999

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Rulemakings and Adjudications Staff

SUBJECT: Transmittal of Comments on Proposed Change to 10 CFR Part 50, *Emergency Core Cooling System Evaluation Models (64 Fed. Reg. 53270) Request for Comments*

PROJECT NUMBER: 689

Dear Sir or Madam:

The Nuclear Energy Institute has received comments from a number of licensees on the proposed rulemaking to 10 CFR Part 50, *Emergency Core Cooling System Evaluation Models*, issued for public comment on October 1, 1999. The purpose of this letter is to forward these comments and recommended changes to the NRC for consideration prior to finalizing the proposed rule.

In general, the industry comments received by NEI were in favor of the proposed rulemaking. There were a number of comments requesting clarification of the language in the proposed rule and several responses to the section entitled, "Issues for Public Comment." The comments received by NEI have been consolidated and are included in an enclosure. NEI supports the proposed rulemaking and is encouraged to see the NRC pursue changes, such as this one, that offer relief from unnecessarily burdensome regulation.

Response to these comments and any other questions regarding this letter or the enclosure should be directed to Jim Riley at NEI (202-739-8137 or jhr@nei.org).

Sincerely,

David J. Modeen

JHR
Enclosure

PDR PR 50 64FR53270

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**Comments on Proposed Rulemaking on
Emergency Core Cooling System Evaluation Models**

1. **Issue for Public Comment #1:** “The current rule states that the required 2-percent analysis margin is to account for “*such* uncertainties as instrumentation error. ” (Emphasis added). This suggests that the 2-percent margin was intended to account for other sources of uncertainty in addition to instrumentation error. However, explicit documentation of the basis for the value of the margin does not appear to be contained in the rulemaking record for the original 1974 ECCS rulemaking. The Commission is interested in whether there are other sources of uncertainty, relevant to sources of heat following a LOCA, that should be considered when licensees seek to reduce the margin in the Appendix K requirement for assumed power. If other contributors are suggested, a clear technical justification should accompany the suggestion.”

Response: NEI has not identified any additional uncertainties that should have been covered in the 2% Reactor Thermal Power (RTP) uncertainty in addition to normal power measurement instrument uncertainties. We interpret the 2% RTP allocation to be only power measurement instrument uncertainties.

2. **Issue for Public Comment #2:** Are there rulemaking alternatives to this proposed rule that were not considered in the regulatory analysis for this proposed rule?”

Response: NEI has not identified any other rulemaking alternatives to this proposed rule that would better reduce the unnecessarily burdensome regulatory requirements or avoid unnecessary exemption requests.

3. **Issue for Public Comment #3:** “What criteria should be used for determining whether a proposed reduction in the 2 percent power margin has been justified, based upon a determination of instrumentation error? For example, should a demonstrated instrumentation error of 1 percent in power level be presumptive of an acceptable reduction in assumed power margin of 1 percent?”

Response: The criteria to use in determining whether a proposed reduction in the 2% power margin has been justified should be based on instrument error. It has already been concluded that margin exists elsewhere in LOCA to allow avoiding an unnecessary 2% power measurement uncertainty. Therefore, no

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additional margin is warranted, and assumed power level should be based solely on rated power level with instrument uncertainty.

ECCS evaluation models use conservative codes applied conservatively. Licensees should be allowed to approach the power margin associated with the Appendix K criteria on a safety neutral basis. The overall impact on safety should be considered and the result should either be neutral or demonstrate additional safety benefit. For example, a straight 1 percent "even trade" should be allowed if the probability of exceeding the current appendix K analytical safety limit of 1.02 does not increase. This would prevent a condition that is less safe than the present operating condition allows.

4. **Issue for Public Comment #4:** "How should the proposed rule address cases in which licensees determine that power measurement instrument error is greater than 2 percent?"

Response: The Appendix K LOCA should be performed at the rated thermal power level plus power level measurement uncertainties, whether they are 1% of RTP or 3% of RTP. Licensees are required to maintain the validity of their Safety Analysis regardless of the proposed rule. Should a licensee find that its uncertainty analysis does not support the required margin assumed in its Safety Analysis, it is incumbent upon the licensee to limit operation of its plant (derate if necessary) in order to maintain the validity of its Safety Analysis. For example, if the plant is rated at 3411.00 MWt, and if the LOCA analysis is done at 3479.22 MWt ($1.02 * 3411.00$), then the allowable rated thermal power level should be derived from the revised power measurement uncertainties. If the uncertainty is found to be 3% of RTP, then the reactor should be derated. The increase in measurement uncertainties from 2% to 3% would result in a derating of 0.97% RTP ($(3377.88 - 3411.00) / 3411$). This assumes that the measurement uncertainties have not increased due to the reduced rated thermal power level. If they are found to be higher at this reduced power level, then the revised RTP should be adjusted downward accordingly or the facility should demonstrate that the amount of the power measurement uncertainty greater than 2% can be accounted for in existing PCT margin to 2200 degrees F. Alternatively, the increase in instrument measurement uncertainties could be offset by the identification of other conservatisms in the Appendix K methodology that can be credited without a reduction in the margin of safety of the facility.

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5. **Uncertainties from Additional Heat Sources:** Utilities will be able to use this rule to reduce their decay heat input to Appendix K evaluations by performing a 50.59 evaluation that uses their power measurement uncertainty to ensure that the expected decay heat bounds the full rated plant power plus the uncertainty value. This uncertainty value should include the effects of uncertainty in feedwater flow, feedwater temperature measurement, blowdown flow, blowdown temperature, feedwater pressure, etc.

Recommended Change: If there are any specific calculation requirements (i.e. allowance for RCP heat, letdown flow losses, etc.) the final rule should contain reference to or guidance on the expected treatment of these types of considerations.

6. **Consistency Among NRC Documents:** Besides the proposed § 50.46 rule change, there are other NRC documents that provide NRC staff positions relative to heat balance uncertainty and reactor power level. For example, it is assumed that the basis for the 1.02 multiplier in Reg. Guide 1.49, *Power Levels of Nuclear Power Plants*, is also heat balance uncertainty. In addition, some plants may not be committed to Reg. Guide 1.49 and others may have non-LOCA analyses which place a two percent uncertainty on assumed power level.

Recommended Change: Conforming changes to Regulatory Guide 1.49 are necessary to replace the 1.02 power level requirement. NRC staff should ensure that other conforming changes are not overlooked.

7. **Requirement for Upgrade to Feedwater Flow Measurement:** The proposed rule discusses the fact that the current Appendix K requirement for margin on assumed power level can be reduced as long as justified by a power level uncertainty analysis. However, under the sections "Conservatism in Appendix K ECCS Evaluation Model" and "Calorimetric Uncertainty and Feedwater Flow Measurement," it is implied that the basis for the proposed rule is application of upgraded feedwater flow technology.

Recommended Change: The rule language or associated implementing guidance should make it clear that even licensees utilizing a venturi-based system for feedwater flow measurement may apply the provisions of the final rule if supported by the appropriate uncertainty analyses.

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8. **Reportability Under 10 CFR 50.46(a)(3):** In the section entitled "Section-by-Section Analysis – Appendix K to Part 50--ECCS Evaluation Models (I)(A) - Sources of heat during the LOCA," the NRC mentions the subject of reportability pursuant to 10 CFR 50.46(a)(3). Therein the NRC states:

"Estimated changes in ECCS performance due to revised analysis inputs are reported under Sec. 50.46 (a)(3), at least annually."

This statement may be misleading and needs further clarification. Our understanding is that 10 CFR 50.46(a)(3) does not apply to changes in peak clad temperature (PCT) resulting from plant specific analysis input parameter values (i.e., plant specific design information). The industry, and we believe the NRC, has always interpreted this requirement as relating to ECCS Evaluation Model input parameters not plant design input parameters; which can be inferred from the above statement.

Recommended Change: NEI believes that the wording should be clarified in the publication of the final rule to assure that the intent is clear. NEI suggests the following language:

"Estimated changes in ECCS performance due to revised Evaluation Model inputs are reported under Sec. 50.46 (a)(3), at least annually. Changes resulting from plant specific design parameter changes, including cycle-to-cycle reload fuel parameters, are not reportable under 10 CFR 50.46(a)(3)."

We base our interpretation on two sources. First, from the Statement of Consideration (SOC) for the 1988 change to 10 CFR 50, Appendix K rulemaking (53 FR 35996). The SOC sheds some light on the question of reportability for PCT changes due to input parameters, whether caused by reload cycles or other facility changes. The NRC explained in response to a commentor:

"One commentor interpreted the use of the words 'or in the application of such a model' as requiring reporting when facility changes" ... "resulting in model input changes, occur."

"The regulatory language referred to is intended to ensure that APPLICATIONS OF MODELS to areas not contemplated during initial REVIEW OF THE MODEL do not result in errors by extending a MODEL beyond the range that it was intended."(Emphasis added.)

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In its response, the NRC clarified its intent for the word "application" to distinguish it from application in the sense of the execution (i.e., running) of computer cases using plant-specific input parameters which may change due to cycle-to-cycle reload fuel or facility modifications. The NRC response indicates that its reportability interest is with the Evaluation Model itself, both overall and its individual component models. The NRC reviewed various models and correlations and approved their makeup, ranges of applicability, degree of inherent conservatism and so on. Undoubtedly, the NRC knows that cycle-to-cycle reload fuel differences or facility modifications would occur over a plant's operating life. Such design parameter changes would in turn affect the input parameters which drive an evaluation model to generate the plant and cycle specific result documented in the Safety Analysis Report or Reload Analysis Report. Therefore, we conclude that changes in PCT caused by plant specific input parameter changes to design information fall outside the scope of reportability under 10 CFR 50.46(a)(3). We believe that the NRC's intent for the word "application" is rightly connected only to the application of the approved models in a proper manner and within their proper ranges of applicability; as originally reviewed and approved by the NRC.

The second source of information regarding the applicability of 10 CFR 50.46(a)(3) comes from direct feedback from a former NRC staff reviewer from the Reactor Systems Branch. During meetings related to a vendor's evaluation model, a member of the vendor's staff received verbal confirmation from the then cognizant Reactor Systems Branch reviewer that PCT changes resulting from input changes to facility design parameters are not encompassed by 10 CFR 50.46(a)(3). Rather, the reporting requirement was applicable only to changes to the Evaluation Model itself, including changes to input parameters that controlled how a particular model functioned relative to what had been originally reviewed and approved by the NRC.