

**NUCLEAR REGULATORY COMMISSION**

10 CFR Part 50

[Docket No. PRM-50-74]

Nuclear Energy Institute; Denial of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking: denial.

SUMMARY: The Nuclear Regulatory Commission (NRC) is denying a petition for rulemaking (PRM-50-74) submitted by the Nuclear Energy Institute (NEI or petitioner). The petitioner requested that the NRC amend its regulations regarding emergency core cooling systems to allow licensees the optional use of the 1994 American Nuclear Society (ANS) decay heat standard and to allow the use of any future NRC-approved revisions of the standard without additional rulemaking. The NRC is denying the petition primarily because an option to use best-estimate evaluation models is already available to its licensees, which would allow additional operational flexibility. Also, the requested rulemaking would reduce conservatism in an individual portion of NRC regulations without consideration of other potential overall non-conservatism within that portion of the regulations.

ADDRESSES: Publicly available documents related to this petition for rulemaking may be viewed electronically on the public computers located at the NRC's Public Document Room (PDR), O1 F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Documents may be copied by the PDR reproduction contractor for a fee.

These documents are also available electronically at NRC's Electronic Reading Room on the Internet at <http://www.nrc.gov/reading-rm/adams.html>. From this site, the public can gain entry into the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. For further information contact the PDR reference staff at 1-(800) 387-4209 or (301) 415-4737 or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

Selected documents, including comments, may be viewed and downloaded electronically via the NRC rulemaking web site at <http://ruleforum.llnl.gov>.

FOR FURTHER INFORMATION CONTACT: Peter C. Wen, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-2832, e-mail [pxw@nrc.gov](mailto:pxw@nrc.gov).

SUPPLEMENTARY INFORMATION:

Background

Section 50.46 specifies the performance criteria against which the emergency core cooling system (ECCS) must be evaluated. The criteria include the maximum peak cladding temperature, the maximum cladding oxidation thickness, the maximum total hydrogen generation, and requirements to assure a coolable core geometry and abundant long-term cooling. This regulation also states that the calculated ECCS cooling performance following postulated loss-of-coolant accidents (LOCAs) must be calculated in accordance with either a realistic (also called best-estimate) evaluation model that accounts for uncertainty or an evaluation model that conforms with the required conservative features of Appendix K evaluation models. The use of the 1971 ANS standard on decay heat calculation is one of the features required in the Appendix K ECCS evaluation models.

### The Petition

On September 6, 2001, the Nuclear Energy Institute (NEI) submitted a petition for rulemaking (PRM), designated PRM-50-74. NEI proposed a rulemaking to amend Appendix K to 10 CFR Part 50 to allow licensees the optional use of the 1994 ANS decay heat standard and to allow the use of any future NRC-approved revisions of the standard without additional rulemaking.

In PRM-50-74, the petitioner stated that the 1994 ANS decay heat standard incorporates more precise results and uses a statistical approach to address uncertainty. The petitioner proposed a rulemaking to amend Appendix K to 10 CFR Part 50 to allow licensees the optional use of this most current consensus decay heat standard. The petitioner indicated that the amendment would (1) allow licensees to gain operating margin for ECCS equipment based on the more realistic decay heat assumptions in the 1994 ANS standard; (2) result in more effective utilization of resources in operating and maintaining the ECCS equipment; and (3) result in the potential for higher extended power uprates.

### Public Comments on the Petition

The notice of receipt of the petition and request for public comment was published in the *Federal Register* (FR) on October 11, 2001 (66 FR 51884). The public comment period ended on December 26, 2001. Five letters of public comment were received in response to PRM-50-74. Four letters from industry (the Progress Energy Company, the Tennessee Valley Authority, Strategic Teaming and Resource Sharing, and the Nuclear Management Company) were in favor of the proposal, and one letter from an individual (Mr. Bob Leyse) was opposed. Mr. Leyse stated that "the entire body of ECCS evaluation models should be reviewed by the NRC rather than a piecemeal approach of selecting only those aspects that may be unduly restrictive."

### Reasons for Denial

The NRC is denying PRM-50-74 primarily because §50.46 already includes provisions for the use of best-estimate evaluation models by NRC licensees. In addition, the request would

reduce conservatism in an individual portion of NRC regulations without consideration of other potential overall non-conservatism within that portion of the regulations.

The provisions of §50.46 allow licensees use of “best-estimate” evaluation models to perform analysis of ECCS cooling performance during LOCAs. This approach provides licensees with a more accurate determination of their plants’ response to a LOCA, while allowing additional operational flexibility. The best-estimate evaluation represents improved and modern techniques in analyzing LOCA behavior. Thus, the NRC prefers the use of best-estimate models, rather than the piecemeal approach to updating the Appendix K evaluation models.

A concomitant factor that influenced the NRC’s position is the NRC’s awareness of a number of phenomena that are known to contribute non-conservatism to the Appendix K evaluation models. These phenomena include boiling in the downcomer annulus during reflood, downcomer entrainment and inventory reduction due to steam bypass, and fuel relocation following cladding swelling during the temperature transient. The NRC believes that if changes are made in the decay heat standard, then changes would also have to be considered in other models to ensure that an appropriate level of overall conservatism is retained in the ECCS evaluation model package.

In addition, the NRC has evaluated the advantages and disadvantages of the rulemaking requested by the petitioner with respect to the four NRC Strategic Performance Goals as follows:

1. Maintaining Safety: The NRC believes that the requested rulemaking would not make a significant contribution to maintaining safety because the overall conservatism provided by the Appendix K evaluation models may not be appropriately accounted for if the conservatism of using the 1971 ANS decay heat standard is individually removed.
2. Enhancing Public Confidence: The proposed rulemaking would not enhance public confidence without an overall assessment of ECCS evaluation model conservatism. The NRC believes that if changes are made in the decay heat standard, then changes would

also have to be considered in other models to ensure that an appropriate level of overall conservatism is retained in the ECCS evaluation model package.

3. Improving Efficiency and Effectiveness: The NRC staff believes that it would not be efficient and effective to modify the Appendix K evaluation model using a piecemeal approach when the “best-estimate” evaluation model is already available for licensees’ use.
4. Reducing Unnecessary Regulatory Burden: The NRC agrees that the proposed rule would reduce licensees’ regulatory burden. However, the NRC does not agree that the associated burden is “unnecessary” in the absence of a demonstration that overall conservatism retained in the Appendix K evaluation models would remain adequate.

For reasons cited in this document, the NRC denies the petition.

Dated at Rockville, Maryland, this 26<sup>th</sup> day of November, 2003.

For the Nuclear Regulatory Commission.

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J. Samuel Walker,  
Acting Secretary of the Commission.