

# **POLICY ISSUE (Notation Vote)**

September 11, 2003

SECY-03-0160

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations /RA/

SUBJECT: DENIAL OF PETITION FOR RULEMAKING (PRM-50-74) - AMEND  
APPENDIX K TO 10 CFR PART 50 TO PROVIDE A VOLUNTARY  
ALTERNATIVE WHICH WOULD REPLACE THE 1971 AMERICAN NUCLEAR  
SOCIETY DECAY HEAT STANDARD WITH THE 1994 AMERICAN NUCLEAR  
SOCIETY STANDARD

PURPOSE:

To request that the Commission approve the staff's recommendation to deny PRM 50-74 regarding the decay heat standard used in 10 CFR Part 50, Appendix K, "ECCS Evaluation Models."

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 American Nuclear Society (ANS) standard on decay heat calculation is one of the features required in the Appendix K ECCS evaluation models.

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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 Nuclear Regulatory Commission (NRC) approved revisions of the standard without additional rulemaking. 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 from industry favoring the proposal and one from an individual opposed.

#### DISCUSSION:

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 50 to allow licensees optional use of this most current consensus decay heat standard.

The staff agreed with the petitioner's view that the 1994 ANS decay heat standard represents a better technical understanding of decay heat calculation and that the 1971 ANS standard was conservative in its representation of decay heat generation. Thus, the staff initially included a recommendation to amend the Appendix K ECCS evaluation models in SECY-02-0057 as part of its proposals of risk-informed changes to 10 CFR 50.46 for Commission consideration. However, the staff was concerned that 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 selectively removed. In a July 23, 2002, memorandum to the Commission, the staff discussed a number of phenomena that are now 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. In this memorandum, the staff concluded 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. The staff has undertaken interactions with the industry to address these issues independently from the current 10 CFR 50.46 rulemaking efforts.

After considering many relevant factors such as the availability of the best-estimate evaluation models and the concern about the overall potential non-conservatism resulting from adjusting individual Appendix K features, the Commission disapproved the staff's proposal to provide a voluntary alternative to Appendix K which would replace the 1971 ANS decay heat standard with the 1994 ANS standard. In a March 31, 2003, staff requirements memorandum (SRM) in response to SECY-02-0057, the Commission indicated its preference for use of best-estimate models rather than the piecemeal approach to updating the Appendix K evaluation models.

The staff has also evaluated the advantages and disadvantages of the rulemaking requested by the petitioner with respect to the four NRC Strategic Performance Goals:

1. Maintaining Safety: The NRC staff 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 the conservatism of the ECCS evaluation model. The staff 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 staff agrees that the proposed rule would reduce licensees’ regulatory burden. However, the staff 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.

Based on this assessment, the staff has determined that PRM-50-74 should be denied.

COORDINATION:

The Office of the General Counsel has no legal objection to the denial of this petition.

RECOMMENDATION:

That the Commission:

- (1) Approve publication of the Federal Register notice announcing the denial:

The Commissioners

4

- (2) Inform appropriate Congressional committees; and
- (3) Note that a letter is attached for the Secretary's signature (Attachment 2), informing the petitioner of the Commission's decision to deny the petition.

***/RA/***

William D. Travers  
Executive Director  
for Operations

Attachments: 1. *Federal Register* Notice  
2. Letter to Petitioner

The Commissioners

- (2) Inform appropriate Congressional committees; and
- (3) Note that a letter is attached for the Secretary's signature (Attachment 2), informing the petitioner of the Commission's decision to deny the petition.

**/RA/**

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Ltr to Petitioner (Attach 2): **ML032320300**

\*See Previous Concurrence

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