

Mr. Anthony R. Pietrangelo
Senior Director, Risk Regulation
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, D.C. 20006-3708

**SUBJECT: 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**

Dear Mr. Pietrangelo:

I am responding to your letter of September 6, 2001, which submitted a petition for rulemaking to amend 10 CFR Part 50, Appendix K, "ECCS Evaluation Models." Your letter stated that the 1994 American Nuclear Society (ANS) decay heat standard incorporates more precise results and uses a statistical approach to address uncertainty. Your letter also stated that the amendment would (1) allow licensees to gain operating margin for emergency core cooling system (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.

The Nuclear Regulatory Commission (NRC) published a notice of receipt of PRM-50-74 on October 11, 2001. The public comment period ended on December 26, 2001. Five letters of public comment were received, four from industry favoring the proposal and one from an individual opposed. The opposer argued that the entire body of ECCS evaluation models should be reviewed rather than a piecemeal approach of selecting only those aspects that may be unduly restrictive.

The NRC agrees with the nuclear energy industry'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. The recommendation would have allowed the voluntary adoption of the 1994 standard in Appendix K ECCS evaluation models, if certain user-selected options required to implement the standard were approved by the staff. 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 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.

Based on these factors, the NRC denies the petition (PRM-50-74). Further details are discussed in the enclosed Notice of Denial of Petition for Rulemaking, which will be published in the *Federal Register*.

Sincerely,

Annette L. Vietti-Cook
Secretary of the Commission

Enclosure: *Federal Register* Notice of Denial of
Petition for Rulemaking

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