

October 1, 2001

Dr. George E. Apostolakis  
Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

SUBJECT: FEASIBILITY STUDY ON RISK-INFORMING THE TECHNICAL  
REQUIREMENTS OF 10 CFR 50.46 FOR EMERGENCY CORE COOLING  
SYSTEMS

Dear Dr. Apostolakis:

Your letter of July 25, 2001, discussed the staff's recent work on the above subject feasibility study. As a result of this feasibility study, the staff made recommendations for Commission consideration on risk-informed changes to 10 CFR 50.46, as described in SECY-01-0133. Your letter provided several observations and recommendations on the staff's work. As indicated below, the staff agrees with the Committee's observations and recommendations:

ACRS Recommendation 1: The ACRS recommends that the Commission approve the staff's request to proceed with rulemaking to modify the existing 10 CFR 50.46 to replace the prescriptive emergency core cooling system (ECCS) acceptance criteria with a performance-based requirement and to modify the 10 CFR Part 50, Appendix K evaluation model. In addition, the staff should consider a performance-based requirement for a heat generation model that includes the effects of cladding oxidation, irradiation, and the potential for cladding spallation rather than a prescriptive requirement. If implementation of the Appendix K option proves to be more challenging than anticipated, then the staff should proceed with a rulemaking that includes only the update of the decay heat curve to the 1994 ANS standard.

Staff response: The staff notes the ACRS recommendation. While SECY-01-0133 is before the Commission, the staff is continuing the technical work to support a rulemaking that will modify the existing 10 CFR 50.46, by replacing the prescriptive ECCS acceptance criteria with a performance-based requirement, and will modify the Appendix K evaluation model. In addition, the staff is pursuing the possibility of moving the Appendix K heat generation model (i.e., the oxidation kinetics model) to a regulatory guide, as well as the ballooning and rupture correlations, because the model and the correlations depend on the level of burnup and the specific alloy. Burnup effects like fluence, corrosion, and oxide spallation are currently under investigation at Argonne National Laboratory, but it will be several years before the staff will be in a position to address them fully. Changes may then be appropriate in the regulatory guide. The staff intends to construct a performance-based rule which would allow use of new research or vendor information without the need for additional rulemaking.

If implementation of the Appendix K option proves to be more challenging than anticipated, a decision will be made as to whether to proceed with a rulemaking that includes only the update of the decay heat curve to the 1994 ANS standard. However, if the staff proceeds with a rulemaking that includes only the update of the decay heat curve, consideration will still be given to the recognized nonconservatisms and model limitations to ensure that the updated Appendix K models retain some overall level of conservatism.

ACRS Recommendation 2: The ACRS recommends that the Commission approve the staff's request to proceed with the development of a voluntary risk-informed alternative to 10 CFR 50.46, Appendix K, and General Design Criterion (GDC) 35 of 10 CFR Part 50, Appendix A.

Staff response: The staff notes the ACRS recommendation. While SECY-01-0133 is before the Commission, the staff is continuing the technical work to support development of a voluntary risk-informed alternative to 10 CFR 50.46, Appendix K, and GDC 35.

ACRS Recommendation 3: The ACRS recommends that the staff continue to develop the technical bases and requirements for redefining the large-break loss-of-coolant accident (LBLOCA).

Staff response: The staff notes the ACRS recommendation. While SECY-01-0133 is before the Commission, the staff is continuing the technical work to determine the feasibility of additional changes to 10 CFR 50.46, potentially including rulemaking to allow the licensee to use an alternative maximum pipe break size.

As the staff continues the technical work to support these changes to 10 CFR 50.46 and other regulations related to ECCS performance (Appendix K and GDC 35), it will continue to meet regularly with the ACRS and the public to obtain input on this technical work.

Sincerely,

**/RA/**

William D. Travers  
Executive Director  
for Operations

cc: Chairman Meserve  
Commissioner Dicus  
Commissioner McGaffigan  
Commissioner Merrifield  
SECY

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*/RA/*

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Executive Director  
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cc: Chairman Meserve  
Commissioner Dicus  
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SECY

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Dr. G.E. Apostolakis

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DATE: 08/22/01

LETTER TO: George Apostolakis

FROM: W. Travers

SUBJECT: FEASIBILITY STUDY ON RISK-INFORMING THE TECHNICAL REQUIREMENTS OF 10 CFR 50.46 FOR EMERGENCY CORE COOLING SYSTEMS

ORIGINATOR: ALAN KURITZKY (415-6255) - RM T10-C24

Patty Nielsen PHONE NO.: 415-6189

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<u>SIGN AND/OR</u>	<u>CONCUR</u>	<u>DATE</u>
1. AKuritzky	<u>AKuritzky</u>	<u>8/23/01</u>
2. MDrouin	_____	<u> / /</u>
3. MCunningham	_____	<u> / /</u>
4. TKing	_____	<u> / /</u>
5. MMayfield	_____	<u> / /</u>
6. SNewberry	_____	<u> / /</u>
7. AThadani	_____	<u> / /</u>
8. TECH ED	_____	<u> / /</u>
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AS REQUESTED:	NOTE & RETURN:	PREPARE REPLY:
COORDINATION:	PER CONVERSATION:	