

January 23, 2009

Dr. Mario V. Bonaca, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: TECHNICAL BASIS AND RULEMAKING STRATEGY FOR THE REVISION TO  
TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS* SECTION 50.46(b)  
LOSS-OF-COOLANT ACCIDENT EMBRITTLEMENT CRITERIA FOR FUEL  
CLADDING MATERIALS

Dear Dr. Bonaca:

I am responding to your December 18, 2008, letter regarding the technical basis and rulemaking strategy for the revision to Title 10 of the *Code of Federal Regulations* (CFR) Section 50.46(b) embrittlement criteria for fuel cladding materials. We appreciate the time and effort that the Advisory Committee on Reactor Safeguards (ACRS) has devoted to this important subject.

Your letter supported the staff's technical approach and rulemaking strategy for proceeding with an Advance Notice of Proposed Rulemaking (ANPR) for revising the 10 CFR 50.46(b) embrittlement criteria for fuel cladding materials. The letter contained three specific conclusions which are repeated below along with our responses:

1. There are sufficient data and understanding of the cladding embrittlement phenomena to justify and proceed with rulemaking.

We will proceed with the ANPR consistent with this recommendation.

2. The rule should include the proposed optional testing program to allow licensees to demonstrate compliance with post-quench-ductility (PQD) criteria on an alloy-specific and temperature-specific basis.

We will include the optional alloy-specific testing program consistent with this recommendation.

3. A round robin test program would be beneficial in the validation of the test procedures used to demonstrate compliance with PQD and breakaway-oxidation criteria.

Our contractor, Argonne National Laboratory, is now developing test procedures for demonstration of compliance with criteria for post-quench ductility and breakaway oxidation.

CONTACT: Richard F. Dudley, NRR/DPR  
(301) 415-1116

We agree that repeatability of test results is an important issue that could benefit from a round robin test program. We will explore this option further in the ANPR.

In addition, your letter included three issues for consideration in a proposed ANPR:

1. The need for the rule to address explicitly the phenomenon of breakaway oxidation rather than leaving this as a phenomenon to be addressed in evaluation models;
2. The test procedures needed to demonstrate compliance with the requirements of the rule; and
3. The need for periodic testing to ensure that manufacturing processes have not changed in a manner to increase susceptibility to breakaway oxidation.

We will include these issues in the ANPR. We are also working to formulate draft rule language and to complete the remaining research. In my memorandum dated December 19, 2008, (ML083440156) the staff informed the Commission of its planned schedule for completing the ANPR. We expect to publish the notice in August 2009.

Lastly, your letter noted that industry representatives are performing tests and analyses to demonstrate the acceptability of certain modifications to the staff's approach. We will continue to work with industry representatives to address these issues during the rulemaking process.

Sincerely,

***/RA Bruce Mallett for/***

R. W. Borchardt  
Executive Director  
for Operations

cc: Chairman Klein  
Commissioner Jaczko  
Commissioner Lyons  
Commissioner Svinicki  
SECY

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