



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 04 1989

MEMORANDUM FOR: Raymond F. Fraley, Executive Director
Advisory Committee on Reactor Safeguards

FROM: James M. Taylor
Acting Executive Director for Operations

SUBJECT: 350TH ACRS MEETING (JUNE 8-10 1989)
FOLLOW-UP ITEMS

The following information is provided in response to those specific items in your July 2, 1989 memorandum on the subject follow-up items.

3. Proposed Generic Letter Regarding Service Water System Problems Affecting Safety-Related Equipment

In the ACRS letter from Chairman Remick to Chairman Zerk dated June 14, 1989, the ACRS stated that they were in general agreement with the need to issue a generic letter; however, the ACRS identified a number of comments they felt should be resolved prior to the issuance of the generic letter.

The staff reviewed the comments made by ACRS and incorporated them into the generic letter. Generic Letter 89-13, "Service Water System Problems Affecting Safety Related Equipment," was issued on July 18, 1989.

The resolution of specific comments was addressed by the staff as follows:

Comment: "...we do not believe that the blanket inclusion of closed-cycle systems in the generic letter is justified at this time."

Response: The staff now agrees with this position. Appropriate wording to direct attention primarily to open-cycle systems has been incorporated.

Comment: "...we believe that if any component in these systems, such as a heat exchanger, is found to be degraded on the raw water side and heat transfer cannot be restored sufficiently, then the clean water side of the component should be inspected."

Response: The staff agrees with this position and appropriate wording has been added.

Comment: "Although not included in the proposed letter, the staff discussed using the absence of an adequate water chemistry control program over any part of the operating history of a closed-cycle system as a basis for including that system within the scope of the letter. We do not agree that this would be a sufficient basis."

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Response: The generic letter states that closed-cycle loops do have potential for significant fouling. The need for testing has been considered unnecessary because of the assumed high quality of existing chemistry control programs. If the adequacy of these programs cannot be confirmed over the total operating history of the plant or if unexplained degradation of heat transfer occurs that can't be corrected by open-cycle maintenance, it may be necessary to selectively extend the test program and the routine inspection and maintenance program to the attached closed-cycle systems.

Comment: "...the letter should make clear that a heat transfer test, involving detailed flow and temperature measurements, is not the only means of determining the functional adequacy of such heat exchangers...."

Response: The staff agrees with this position and has clarified its intent in the generic letter.

Comment: "...the staff has stated that it means to use the original Licensing basis for the plant in question. We agree, and this should be clarified in the letter."

Response: The staff agrees with this position and has clarified its intent in the generic letter.

4. Boiling Water Reactor Core Power Stability

In the ACRS letter from Chairman Remick to Chairman Zech dated June 14, 1989, the ACRS stated that the general program outlined by the BWROG and the staff is sound and represents an adequate response to the issue; however, the ACRS stated that they believe it is important that considerable attention be given, in the longer term, to the development of an improved understanding of the conditions that can lead to an ATWS compounded by core power oscillations. The ACRS also noted that European BWR programs have taken an aggressive approach to studies of core power instabilities, with the incorporation of provisions for monitoring and controlling them.

The staff agrees that there is a need for an improved understanding of the initiating conditions and consequences associated with power oscillations, especially when associated with ATWS events. To that end, the Office of Nuclear Regulatory Research has formed a Technical Program Group (TPG) to review and coordinate research efforts to achieve this objective. Planned work includes benchmarking studies of existing stability analytical codes versus symmetric and asymmetric stability data from domestic and foreign reactors.

Efforts are also continuing to evaluate the impact of power oscillations in combination with ATWS in relation to previous safety analyses and ATWS procedure development. The primary areas of concern and the current status are as follows:

1. The potential effect of large oscillations on core average power.

Status. The NRC staff and its consultants have concluded that some increase in core average power will result from large oscillations. The degree of power increase is a function of oscillation amplitude and system effects.

2. Operator and system interaction with oscillation phenomena and instrument information while following ATWS procedures.

Status. BWROG studies using TRACG (GE) and RETRAN (EPRI) are continuing. Based on results to date, BWROG believes there is no impact on existing procedures and previous safety studies.

3. Effects of 1 and 2 above on suppression pool temperatures and containment integrity.

Status. BWROG believes that previous safety analyses are not impacted. The staff has not reached a conclusion but believes that existing procedures for response to ATWS events are appropriate while studies continue.

It should be noted that European programs for studies of core power instability, with provisions for monitoring and controlling them, have been directed only toward conditions where ATWS is not a factor. Solutions for situations in which ATWS isolation events are a potential problem have not been provided. Both NRC and the BWROG have reviewed the European BWR stability approach since the LaSalle event, and are giving consideration to similar provisions for stability monitoring and control as part of the long term resolution for domestic BWRs.

We will keep you informed of the progress and conclusions of the continuing studies. Efforts will continue until uncertainties in problem areas are resolved. This program is expected to continue through most of 1990.

Original Signed By:
James M. Taylor

James M. Taylor
Acting Executive Director
for Operations

cc: Chairman Carr
Commissioner Roberts
Commissioner Rogers
Commissioner Curtiss
SECY

(DOCUMENT NAME: MEMORANDUM FOR FRALEY)
*SEE PREVIOUS CONCURRENCE

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PTSB/NRR	:PDTSS/PTSB	:PDTSS/PTSB	:NRR/SRXB	:C/OGCB/NRR	:PTSB
GKlingler*	:DPersinko*	:TCox*	:MHodges*	:CBerlinger*	:CThomas*
7/26/89kdj	:7/27/89	:7/27/89	:7/27/89	:7/27/89	:7/27/89

7/28 #5

D. P. M. S. NRR	:AD/NRR	:NRR	:A/EDO
Gilgespie	:FMaglia	:TMurley	:JMTaylor
7/26/89	:7/27/89	:7/31/89	:7/ /89



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

June 14, 1989

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: RELIABILITY AND DIVERSITY

During the 349th and 350th meetings of the Advisory Committee on Reactor Safeguards, May 3-6, 1989 and June 8-10, 1989, respectively, we discussed the implementation status of the anticipated transients without scram (ATWS) rule. Our Subcommittee on Instrumentation and Control Systems also met with representatives of the staff and the industry on April 21, 1989 to review the progress being made regarding this matter.

It appears that reasonable progress is being made, especially in light of some of the difficulties that have arisen in the interpretation and application of the rule. However, during the course of our discussions of compliance with the rule, two issues arose that we consider to have enough general significance to deserve further attention.

The first of these is the significance and application of diversity in systems that use redundancy to achieve high levels of reliability. The ATWS rule requires that diversity be used in an effort to further improve reliability. The staff interprets the rule to require diversity even if, in a particular application, there is no evidence that its use increases reliability. It appears, indeed, that this interpretation would be used even in situations in which, by virtue of commercial availability of components, maintenance considerations, or other relevant factors, diversity might reduce the reliability of a particular system. This seems to us to be contrary to the spirit of the ATWS rule which is aimed at increasing the overall reliability of the rapid shutdown system. Furthermore, we believe that in any situation in which diversity is considered as a means to increase reliability, it should be kept in mind that reliability is the objective, and not diversity per se. Thus, if diversity is to be required, effort should be made to ensure that it will contribute to increased reliability rather than making the system less reliable.

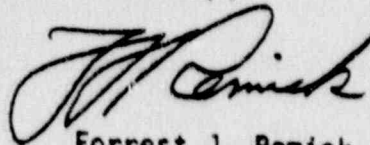
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June 14, 1989

The second issue, which also came up during the discussion of the use of diversity, has to do with the possible influence of aging on the occurrence of common mode failures. The staff reasoned that even if diversity were not important during the first forty years of plant life, it might avoid development of common mode failures from "wear out," that might occur if operation beyond the original forty-year license is approved. We believe such concern may arise from a misunderstanding. While it is true that "wear out" of components does cluster around some "mean-time-to-wear-out," this time should be well known from test or experience, and components should be replaced or overhauled early enough to avoid it. Time-in-service for components that have not been replaced should be far enough removed from "wear out" that failure due to wear out (i.e., "aging") should not be a contributor to common mode failures.

We believe some further consideration of these two issues by the staff is merited, not only as they may bear on the application of the ATWS rule, but because of their significance generally.

Sincerely,



Forrest J. Remick
Chairman