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NUCLEAR REGULATORY COMMISSION

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MEMORANDUM FOR: Document Control Desk  
Document Management Branch  
Division of Information Support Services  
Office of Information Resources Management

FROM: Robert L. Dennig, Acting Chief  
Generic Communications Branch  
Division of Operating Reactor Support  
Office of Nuclear Reactor Regulation

SUBJECT: DOCUMENTS ASSOCIATED WITH THE PROPOSED GENERIC LETTER  
REGARDING LONG-TERM SOLUTIONS AND UPGRADE OF INTERIM  
CORRECTIVE ACTIONS FOR THERMAL-HYDRAULIC INSTABILITIES IN  
BOILING WATER REACTORS

The Reactor Systems Branch has prepared the subject draft generic letter. The Committee to Review Generic Requirements (CRGR) has reviewed and endorsed this draft generic letter. The enclosure is the disposition of public comments received on the proposed generic letter. This material is relevant to the subject generic letter and should be made available to the public. By copy of this memorandum we are providing the enclosure to the Public Document Room.

We request that you provide us with the Nuclear Documents System accession number for this memorandum. This information can be provided to the listed contact by telephone or by E-Mail.

A handwritten signature in dark ink, appearing to read "R. L. Dennig".

Robert L. Dennig, Acting Chief  
Generic Communications Branch  
Division of Operating Reactor Support  
Office of Nuclear Reactor Regulation

Enclosures: As Stated

CONTACT: Peter C. Wen, NRR  
504-2832

9406280068 940628  
PDR ORG NRRB  
PDR

GH01 /

Enclosure

DISPOSITION OF PUBLIC COMMENTS ON PROPOSED GENERIC LETTER 94-XX,  
"LONG-TERM SOLUTIONS AND UPGRADE OF INTERIM CORRECTIVE ACTIONS  
FOR THERMAL-HYDRAULIC INSTABILITIES IN BOILING WATER REACTOR"  
(FEDERAL REGISTER VOL. 58, NO. 138, PAGE 39044, JULY 21, 1993).

The original 30 day period for public comment was extended at the request of the BWR Owners' Group (BWROG) and expired on September 19, 1993.

In response to the Federal Register notice, the NRC received on September 13, 1993 a letter from BWROG dated August 30, 1993, and on September 28, 1993 received a letter from Carolina Power & Light Company dated September 24, 1993. Comments on both of these letters are addressed here although the latter was provided after expiration of the comment period.

BWROG Comments Related to Action #1:

1) The comment states that Requested Action 1a is inconsistent with the discussion in Item 1 and should be clarified. The staff agrees with the BWROG understanding that the scram requirements defined in NRC Bulletin 88-07 Supplement 1 should not differentiate between plant types for Interim Corrective Actions. (Note that "Interim Corrective Action" (ICA) has been changed to "Interim Operating Recommendations" in the final version of the generic letter.)

In response to this comment, Requested Action 1a has been modified to remove the stated exceptions and discussion item (1) has been modified to remain consistent with the change. Also, a sentence has been added to Requested Action 1a to clarify (for consistency with item 1) that the manual scram is not required after implementation of an approved long term solution.

2) BWROG proposes that Requested Action 1a be modified to require a scram at natural circulation only if operating above the 70% flow control line (FCL); the basis for the request is a reduced likelihood of power oscillations at the lower flow control line and claimed simplification of training and procedures.

The proposed modification to the interim action is not consistent with the intent of the original NRCB 88-07, Supplement 1 to provide reliable procedural protection to avoid power oscillations for plants without effective automatic scram protection for regional oscillations. The staff does not accept the argument that prohibited operation (scram) in natural circulation will complicate training and procedures for controlled operations with pumps running.

The staff has taken no action in response to this comment.

3) BWROG is developing updated ICA guidance which may be referenced by individual owners when responding to the GL requested actions. BWROG suggests that the GL requested action 1b should indicate the acceptability of the BWROG guidance with regard to procedural controls. It is also suggested that the wording of action 1b should be less specific to assure consistency with BWROG ICAs to be proposed.

As subsequently discussed with BWROG, a new boiling boundary parameter is being proposed in BWROG guidance for procedural stability control. It must be reviewed by the staff but will be acceptable if it is technically sound. The wording of Requested Action 1b has been revised slightly to provide more flexibility, but cannot accept the BWROG guidance in advance of its review.

BWROG also proposes that action 1b provide for an alternative to the monitoring of stability parameters by avoiding operation within the "controlled entry" region. This comment misses the entire point to monitoring of stability parameters; i.e., stability regions can not be reliably defined without control of stability sensitive parameters. No action was taken in response to this comment.

4) The last sentence of Requested Action 1b points out that procedural operation controls implemented for the interim corrective actions may be needed to complement some of the long-term solution approaches. The BWROG comments that this instruction is not necessary and should be deleted. It is stated that the administrative controls explicitly required for a given long term solution have been described in the BWROG LTS submittals and will be discussed further in hardware specific licensing submittals. For Options III and III-A, administrative controls would be retained at the discretion of the plant owners.

The staff has modified the last sentence of Requested Action 1b to emphasize that procedural operation controls implemented for the interim corrective actions will no longer be required for plants that implement fully automatic long-term solutions such as Options III and III-A.

5) The BWROG has requested that the first sentence of Requested Action 1 be clarified to request that licensee plans for modification of procedures and training programs be provided within 60 days, since the BWROG guidance may be issued too late to allow actual completion of the modifications on that schedule.

The BWROG is scheduled to issue generic modified ICAs in December, 1993; staff comments are expected in January, 1994. The staff expects that review and processing of the generic letter cannot be completed before January, 1994. The existing reporting requirements of the GL provide for licensees to describe plans and status with respect to the actions requested within 60 days of the date of the generic letter. Since the progress that can be made toward implementation of revised ICAs is tentative, the staff has deleted the completion schedule from both requested actions and will rely on the reporting requirements to define the completion status after 60 days.

BWROG Comments Related to Action #2:

1) BWROG requests assurance that ICAs need not be maintained in plant procedures following implementation of the long-term solution.

This is similar to BWROG comment 4 on action #1 and the staff has responded as suggested by BWROG for plants that implement Options III or IIIA. Some of the other long term solutions require retention of some administrative controls to make them reliable.

2) The BWROG has requested that licensees be given a minimum of 60 days to respond to Requested Action #2 in lieu of the January 31, 1994 fixed date.

The BWROG request is consistent with the original intent of the staff and the schedule statement has been deleted in deference to the 60 day reporting requirement. Revised wording has also been inserted to recognize the acceptability of referencing generic BWROG submittals when individual licensees respond to action #2.

BWROG General Comments

BWROG had three general comments suggesting wording changes of an editorial nature. The staff has no objection and incorporated all of the suggested changes except that the word "administrative" in the first sentence of Requested Action #1 has not been deleted as suggested. The staff wants to assure that the action request clearly differentiates between the interim administrative provisions that are to be modified and the automated hardware LTS components that are to be installed later.

Carolina Power & Light Comments

Carolina Power & Light Company (CP&L) endorses the comments submitted by BWROG on August 30, 1991 and has provided additional comments that they believe to be pertinent to the proposed Generic Letter.

The CP&L letter summarizes the history of BWR stability evaluation and control since the Vermont Yankee stability tests and the Caorso out-of-phase instability experience. BWROG/GE response to the LaSalle instability event in 1988 with Interim Corrective Actions (ICAs) and the evolution and effectiveness of the ICAs are discussed. Major points of the discussion are:

- (1) Exclusion regions identified in the ICAs are based on GE fuel and GE methodology and the applicability for non-GE fuel design must be confirmed.
- (2) BWROG guidance was provided to the licensees to warn of identified non-conservatisms in the ICAs subsequent to both the Cofrentes and WNP-2 instability events.
- (3) The WNP-2 instability was due principally to insufficient attention to BWROG guidance available prior to the event and to monitoring capability (e.g., stability monitor) that was available but not used during the startup leading to the instability event.
- (4) CP&L points out that not all of the parameters that influence thermal hydraulic stability performance can be directly monitored or controlled by the operator. CP&L argues that the sensitivity studies and exclusion regions developed by BWROG as reported in NEDO-31960 (the LTS study providing the basis for the proposed generic letter) considers the factors that influence stability, and that the conservative manual actions defined in conjunction with conservative power/flow based exclusion regions compensate for the parameters that are not directly monitored and controlled during operations.
- (5) CP&L indicates that BWROG has been investigating a means to allow a meaningful and reliable measure of stability performance that is directly impacted by both power distribution and feed water temperature. CP&L expects that revised BWROG corrective actions will specify manual means to provide reliable prevention of thermal hydraulic instability based on quantitative measures of parameters that can be directly monitored and controlled during operation. CP&L suggests that the improved monitoring during an approach or entry into an exclusion region combined with retention of immediate actions upon entry into an exclusion region would be highly reliable in preventing a challenge to the safety limits and obviate the expense of plant modifications for instability events that will not be recognized by the operator.
- (6) CP&L suggests that incorporation of the revised BWROG ICAs into an appropriate technical specification would assure an adequate level of instability prevention and suppression with manual responses and should be considered an acceptable LTS to

meet the requirements of GDC 10 and 12 of 10 CFR 50, Appendix A.

The staff has reviewed the CP&L letter, which concludes that BWROG improved ICAs and technical specifications should be accepted as a long-term solution in addition to those proposed and endorsed by BWROG. The CP&L proposal relies on arguments that out-of-phase instabilities are highly unlikely and that the industry is now cognizant of all stability sensitive operating parameters and is unlikely to make design and operating errors of the type that have contributed to past instabilities. The staff does not concur in these arguments and finds them contradictory to past experience. Therefore, no actions have been taken and revisions to the Generic Letter have not been proposed by the staff in response to these comments.