

January 10, 2005

Mr. Jerald S. Holm
Director, Regulatory Affairs
Framatome ANP
3315 Old Forest Road
Lynchburg, VA 24501

SUBJECT: REQUEST FOR AMENDMENT OF SAFETY EVALUATION FOR "REPORT OF PRELIMINARY SAFETY CONCERN (PSC) 2-00 RELATED TO CORE FLOOD LINE BREAK WITH 2-MINUTE OPERATOR ACTION TIME"
(TAC NO. MA9973)

Dear Mr. Holm:

By letter dated September 26, 2000, Framatome ANP (FANP) provided the U.S. Nuclear Regulatory Commission (NRC) with a "Report of Preliminary Safety Concern Related to Core Flood Line Break with 2-Minute Operator Action Time." By letter dated April 10, 2003, the NRC notified FANP of its evaluation of PSC 2-00 and provided its related safety evaluation (SE). By letter dated September 21, 2004, Mr. James Mallay and the Babcock and Wilcox (B&W) Owners Group (B&WOG) requested the NRC to amend the SE issued April 10, 2003, to reflect additional information demonstrating that the M3 reactor coolant pump (RCP) degradation curve is conservative for all B&W plants.

The NRC SE dated April 10, 2003, addressed the Core Flood Line Break (CFLB) and operator action times needed to trip the RCPs. It also included a condition that each B&W plant licensee must demonstrate that the M3 pump degradation curve is conservative for modeling its RCPs under the conditions associated with CFLBs. Specifically, the NRC found that three degradation curves, designated as the M1 curve, the general use RELAP5-Default curve, and the M3-Modified curve, were used in evaluation model calculations to predict peak clad temperature (PCT) response to CFLBs. The NRC staff found the B&WOG conclusions, that using the M3-Modified curve generally resulted in a prediction of higher PCTs than the other curves, when assessing CFLBs with RCPs continuing to run following break initiation, acceptable. However, the NRC also found that the B&WOG provided no information to support a contention that the M3-Modified curve was actually conservative when used in these analyses. Consequently, the NRC stated in its April 10, 2003, letter to FANP that "the B&WOG did not establish that the M3 curve is conservative and the staff's acceptance of the analysis results is contingent upon each licensee establishing that the M3 curve is conservative for its plant. This should be accomplished through plant specific submittals."

The September 21, 2004, submittal provides additional information "to demonstrate that the M3 RCP degradation curve is conservative for all B&W plants" and it "requests that the NRC issue a new or revised safety evaluation" that acknowledges "the acceptability of the M3 RCP degradation curve for all B&W plants and remove the condition that each B&W plant licensee submit a justification to that effect."

The September 21, 2004, submittal also discussed test data obtained for pump types of the Bingham, Byron Jackson, and Lawrence designs, in addition to Massachusetts Institute of Technology small scale rotor tests. Evaluation of these data are stated to provide insight into

the important parameters that define similarity between the pumps and the conditions which are important for determining RCP performance. The important parameters were stated as being RCP similarity, fluid type, void fraction, and pressure. This information was used in conjunction with predicted conditions that exist in the CFLBs to conclude that the analysis conditions were within the ranges of the most appropriate test data.

The test pumps were evaluated with respect to the pumps used in each B&W-designed plant and it was concluded that the best RCP two-phase pump data was obtained from the Combustion Engineering (CE) 1/5 scale data. The CE 1/5 scale pump behavior over a range of pressure was compared to M3-Modified curves for Westinghouse, Bingham, and Byron-Jackson pumps. In all cases, the M3-Modified curves were shown to predict less degradation over most of the range of conditions encountered in the flood line breaks when compared to the CE pump. The September 21, 2004, submittal concluded that the M3-Modified curve provides a conservative PCT when the RCPs are in operation because it provides a conservative PCT prediction for operator action to trip the RCPs on loss of subcooling margin. It further concluded that the M3-Modified curve is applicable to RCPs in operation at the B&W plants. The NRC finds that these conclusions are appropriate for prediction of CFLB response with respect to determination of RCP trip times that reasonably ensure operation in compliance with 10 CFR 50.46.

Consequently, the NRC finds that use of the M3 RCP degradation curve is acceptable for all B&W plants when predicting time available for operator action to trip RCPs following loss of subcooling margin and the NRC, therefore, removes the condition that each B&W plant licensee must submit a justification to that effect.

The NRC performed a review of PSC 2-00 on its own initiative that resulted in a SE that was issued on April 10, 2003. In the future, the NRC will restrict its reviews under the topical report review program to topical reports that the B&WOG requests to be reviewed. Reviews of other documents and topical reports not requested to be reviewed by the B&WOG must meet the requirements necessitating NRC review under the regulations and/or NRC formal procedures.

In the event of any comments or questions, please contact Drew Holland at (301) 415-1436.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 693

cc: See next page

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ACCESSION NO: ML043550355 *See previous concurrence NRR-106

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B&W Owners Group

Project No. 693

cc:

Mr. Howard C. Crawford
AmerGen Energy Company
Route 441 South
P.O. Box 480
Middletown, PA 17057-0480

Mr. David J. Firth
Manager, B&W Owners Group Services
Framatome ANP
3315 Old Forest Road
Lynchburg, VA 24501

Mr. W. R. McCollum, Chairman
B&WOG Executive Committee
Duke Energy Corporation
Oconee Nuclear Station
MC ONO 1VP
7800 Rochester Highway
Seneca, SC 29672