



FRAMATOME ANP

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FRAMATOME ANP, Inc.

Proj 728

December 10, 2002
NRC:02:061

Document Control Desk
ATTN: Chief, Planning, Program and Management Support Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

10 CFR Part 21 Notification of an Error in Calculations of MCPR, LHGR, and MAPLHGR in the POWERPLEX Incore Monitoring System

This letter provides notification of a reportable defect in accordance with 10 CFR Part 21. This situation was reported to the NRC Operations Center by facsimile at 10:00 PST on December 10, 2002. Report No. 39435 was assigned to the notification by the Duty Officer.

The defect consists of an error in calculating the values of MCPR, LHGR, and MAPLHGR for comparison to limits in the POWERPLEX incore monitoring system. The error is the result of the use of incorrect orifice loss coefficients for BWR/6 reactors. An error related to the use of incorrect orifice loss coefficients was previously reported by GE (SC02-15, dated October 4, 2002). This same error was found in the input to the POWERPLEX incore monitoring system.

The affected utilities have been informed, and the planned actions and actions already taken to address the issue are provided in the attachment to this letter.

Very truly yours,

James F. Mallay, Director
Regulatory Affairs

Enclosure

cc: D. G. Holland
Project 728

*IEP
Add: D. Holland*

Reportable Defect

- (i.) *Name and address of the individual informing the Commission*

Jerald S. Holm, Manager, Product Licensing, Framatome ANP, 2101 Horn Rapids Road, Richland, WA 99352.

- (ii.) *Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.*

The calculation of the minimum critical power ratio (MCPR), linear heat generation rate (LHGR), and maximum average planar linear heat generation rate (MAPLHGR) by the POWERPLEX[®] incore monitoring system.

- (iii.) *Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.*

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- (iv.) *Nature of the defect or failure to comply and the safety hazard which is created or could be created by such a defect or failure to comply.*

A 10 CFR Part 21 notification prepared by GE (SC02-15 dated October 4, 2002) identified a problem with orifice pressure loss coefficients used as input to the GE core monitoring system for BWR/6 reactors. BWR/6 reactors have core plate support beams in the lower plenum that may affect the pressure drop at the inlet to a fuel assembly. Assemblies may be adjacent to zero, one, or two core support beams depending on core location. The GE Part 21 notification states that the orifice loss coefficient for an assembly adjacent to two beams will be 20% higher than the loss coefficient for one adjacent beam and 40% higher than the loss coefficient without any adjacent beams.

The GE core monitoring system uses average orifice loss coefficient values for all assemblies in the core with each orifice type. This was previously evaluated to be an acceptable assumption. A recent evaluation by GE for current fuel designs indicates that the assumption may be non-conservative by up to .01 in predicted MCPR.

Framatome ANP provides incore monitoring system input decks for two BWR/6 reactors in the United States. A uniform orifice loss coefficient has been used in the past for each orifice type. The input does not reflect the variations in the orifice loss coefficients due to adjacent core support structure. Therefore, the concern identified for BWR/6 reactors using a GE core monitoring system applies to BWR/6 reactors using the Framatome ANP POWERPLEX incore monitoring system.

Analyses have been performed to assess the impact of using position dependent orifice loss coefficients. Analyses were performed for the two BWR/6 reactors in the United States which use the POWERPLEX incore monitoring system. The analyses indicate for Grand Gulf that MCPR is non-conservatively over predicted by not more than 2% and that LHGR and MAPLHGR are non-conservatively under predicted by not more than 2%. The analyses indicate for River Bend that MCPR is non-conservatively over predicted by up to 1.2 %, that LHGR is non-conservatively under predicted by up to 0.7% and that MAPLHGR is non-conservatively under predicted by up to 0.6%.

- (v.) *The date on which the information of such defect or failure to comply was obtained.*

Condition Report 10154 was prepared on October 11, 2002, and identified as a deviation.

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- (vi.) *In the case of a basic component which fails to comply, the number and the location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.*

The POWERPLEX incore monitoring system in use at River Bend and Grand Gulf is impacted by this error.

- (vii.) *The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.*

The affected plants have all been notified. As a compensatory measure it was recommended that the affected plants apply an administrative penalty on the allowed values of MCPR, LGHR, and MAPLHGR until the POWERPLEX incore monitoring input decks could be corrected. The POWERPLEX incore monitoring input decks have subsequently been modified to include the correct orifice loss coefficients. The plants are currently operating with correct orifice loss coefficients in the POWERPLEX incore monitoring system.

- (viii.) *Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.*

See (vii) above.