

August 2, 2001

Mr. James F. Mallay
Director, Regulatory Affairs
Framatome ANP
2101 Horn Rapids Road
Richmond, WA 99352

SUBJECT: BREAK ORIENTATION ANALYSIS FOR SMALL BREAK LOSS OF COOLANT
ACCIDENT (TAC NO. MA9313)

Dear Mr. Mallay:

By letter dated December 10, 1998, Framatome Technologies, Inc., (FTI) now Framatome ANP, provided the results of a small-break loss-of-coolant accident (SBLOCA) break-orientation analysis. The analysis was performed in response to a commitment made by FTI during the NRC staff's review of Topical Report BAW-10168-P, Revision 2, "BWNT Loss-of-Coolant Accident Evaluation Model for Recirculating Steam Generator Plants."

The commitment addresses a potential phenomena for recirculating steam generator plants with small upper head spray nozzles (T_{hot} plants) where, for breaks in the top or side of the pump discharge piping, the loop seal can reform due to emergency core cooling system (ECCS) water backflow in the cold legs. Reformation of the loop seal would block steam venting through the loop, causing increased break flow, increased primary system pressure, and decreased ECCS flow. The result could be an extended period of core uncovering and an increase in fuel temperature.

Based on their analysis, Framatome concluded that: (1) the phenomena described above does not cause sufficient inventory loss to result in long term core heatup, (2) the SBLOCA at the bottom of the pump discharge piping, which causes the largest initial core uncovering and core heatup, is limiting, (3) a plant-specific break orientation analysis is not needed, and (4) T_{hot} plants do not need specific emergency operating procedures to address the phenomena.

The staff reviewed the analysis provided by Framatome. While the staff does not concur that the analysis fully resolves this issue, the staff notes that the phenomena of concern, should it occur, does not occur until approximately 6 hours after event initiation. The staff notes that the plant procedural guidance instructs operators to begin a timely depressurization of the primary system prior to the onset of the extended core uncovering discussed above. Therefore, the staff concludes that this issue is adequately addressed through plant procedural guidance, and a plant-specific break orientation analysis is not required. However, if it is determined that the analysis described in Framatome's December 10, 1998, letter is not applicable to a particular plant, then a plant-specific analysis shall be performed. In addition, each licensee that relies on this analysis will be required to verify that they have appropriate procedural guidance to provide for long-term management of the accident. Finally, Framatome must maintain approved SBLOCA methodologies to analyze the spectrum of breaks and locations, in accordance with 10 CFR 50.46.

Mr. J. F. Mallay

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If you wish to discuss the staff's review of this issue, please contact Stewart Bailey, Project Manager, at (301) 415-1321.

Sincerely,

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 693

cc: See next page

Mr. J. F. Mallay

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Framatome ANP

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