

March 5, 2001

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - FRAMATOME ANP RICHLAND
INC., TOPICAL REPORT EMF-2361(P) REVISION 0, "EXEM BWR-2000 ECCS
EVALUATION MODEL" (TAC NO. MB0574)

Dear Mr. Mallay:

Framatome ANP, Richland, Inc. submitted Topical Report EMF-2361(P) Revision 0, "EXEM BWR-2000 ECCS Evaluation Model" on November 7, 2000, for staff review. The staff is reviewing the topical report and additional information, as discussed in the enclosure, is requested in order for the staff to complete its review.

The enclosed request was discussed with your staff on March 1, 2001. A mutually agreeable target date of 30 days from the date of this letter was established. If circumstances result in the need to revise the target date, please call me at the earliest opportunity at 301-415-1480.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV and Decommissioning
Division of Licensing Project management
Office of Nuclear Reactor Regulation

Project No. 702

Enclosure: Request for Additional Information

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Director, Nuclear Regulatory Affairs
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REQUEST FOR ADDITIONAL INFORMATION

TOPICAL REPORT EMF-2361(P), REVISION 0, 'EXEM BWR-2000

ECCS EVALUATION MODEL"

PROJECT NO. 702

1. It was stated in the report that RELAX is a one-dimensional homogeneous equilibrium code which overpredicts the amount of condensation in volumes where large amounts of subcooled liquid are injected. This results in a non-realistic pressure suppression in that volume. It was further stated that a so-called "enthalpy injection model" has been added to RELAX to manage this aspect of a one-dimensional homogeneous equilibrium model. The staff requests the applicant to provide an assurance based on physical reasoning and test validations that this modification, which has been arbitrarily added to RELAX in order to compensate for a code limitation,
 - (a) will consistently predict conservative results, and
 - (b) under no permissible reactor operating condition, a non-conservative result will be predicted.
2. In Figure 3.1 of the report, the effect of drift flux models on void fraction was presented for steady-state conditions. The staff requests the applicant to submit comparisons of void fraction distribution predicted by EXEM BWR-2000 with other approved code and test results at intermediate and low pressures also. The pressure should include values typically encountered during refill/reflood phase.
3. Is there any potential for introducing human error while transferring data from RELAX to FLEX in the current evaluation model EXEM BWR? If there is, then does the proposed model EXEM BWR-2000 completely eliminate this potential source of error while using the code?
4. It was stated in the report that results from the EXEM BWR-2000 code, and FIST and TLTA tests, which are single channel results, will always give conservative PCT compared to large tests with multiple parallel channels of varying power; or the actual BWR behavior during LOCA. This is because spray coolant can easily bypass hot assemblies and reach lower plenum through colder peripheral assemblies resulting in faster refill and reflood. It was further stated that single channel test and code results do not reflect this phenomenon. The staff requests the applicant to provide an estimated value of PCT reduction due to this phenomenon.
5. On page 2-10 of the report, it was stated that "A minor change was made to the critical flow model in RELAX." Please elaborate.
6. In order to verify the code performance and to be able to reproduce some of the results presented in the subject topical report, the staff requests the applicant to supply the following items: source code, executable, user code document, and specific input decks that should include one large-break and one small-break LOCA decks.