January 30, 1998

Mr. J. J. Kelly, Manager
B&W Owners Group Services
Framatome Technologies, Inc.
P.O. Box 10935
Lynchburg, VA 24506-0935

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR TOPICAL BAW-2241P, "FLUENCE AND UNCERTAINTY METHODOLOGIES" (TAC NO. M98962)

Dear Mr. Kelly:

By letter dated May 14, 1997, the Babcock and Wilcox Owners Group (B&WOG) submitted topical BAW-2241P for NRC review. The staff has reviewed the report and determined a need for additional information. The enclosure to this letter identifies the information required. NRC requests that the B&WOG provide a response to these questions by February 27, 1998. You should address your response to the NRC Document Control Desk and reference B&WOG Project No. 693.

If you wish to meet with the staff to accelerate the information transfer, the staff would welcome such a meeting at a mutually convenient time. If you have any questions on this matter, I may be contacted by phone, 301/415-2829, or by email, jlb4@nrc.gov.

Sincerely,

Original Signed By:

Joseph L. Birmingham, Project Manager
Generic Issues and Environmental
Projects Branch
Office of Nuclear Reactor Regulation

Enclosure: Questions on topical BAW-2241P

cc: Mr. R. B. Borsum, Manager
Rockville Licensing Operations
Framatome Technologies, Inc.
1700 Rockville Pike, Suite 525
Rockville, MD 20852-1631

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NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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METHODOLOGY (BAW ADDITIONAL INFORMATION REQUIRED FOR THE REVIEW OF THE FRAMATOME TECHNOLOGIES FLUENCE AND UNCERTAINTY 2241 P)

1. The topical report states that the B&W owners will revalidate the analytical monitoring of the pressure vessel by performing vessel fluence analyses and benchmark comparisons to cavity measurements. How will the results of these analyses be used and will they be submitted in separate topical reports?

2. Provide a detailed description of the dosimeter, capsule and structural support geometry and how the modeling of this detail was validated.

3. Describe how the effect of increased Pu in the high burnup fuel is included in the source calculation. Does this treatment allow for the cycle-specific variations?

4. Do the internals of the B&W plants include core shroud former plates and, if so, how is the effect of these plates included in the calculations?

5. Are there differences between the calculation and measurement methods used for Davis Besse and the methods used for the other plants included in the Appendix-A data base? For example, were the methods used to determine the dosimeter corrections for the Appendix-A measurements the same as used for Davis Besse?

6. Will the BAW-2241-P methodology be applied to cores with partial length fuel assemblies and, if so, how will the (r,z) source of Section-3.1.2.2 be determined?

7. The Model-C (r,z) calculation results in negative fluxes and an unacceptable solution. Can this error in the Model-C calculation affect the results of the Model-B calculation? For example, what is the sensitivity of the Model-B calculation to the albedo boundary conditions?

8. Please provide Reference-21.

9. In view of the large variation in fuel burnup between assemblies and the dependence of the number of neutrons produced per fission (v) on fuel burnup, what uncertainty is introduced by neglecting this dependence in Equation (4.1)?

10. The core neutron source spectrum is determined by a neutron production weighting of the individual assembly neutron spectra. What uncertainty is introduced by the Equation (4.2) power weighting of the assembly spectra?

11. Describe in detail how the dependence of the dosimeter response on the axial separation between the vessel support beams and the dosimeters is included. Is the method used for including the effect of the support beams at Davis Besse also used for ANO-1?

12. Does the dissolution process used in the measurement of the powder fissionable dosimeters introduce more uncertainty than the process used to measure the wire dosimeters? Is the C/M bias and standard deviation for the powder dosimeters different than for the dosimeter wires?

Enclosure

13. How does the NIOBIUM prediction compare with the analytic result of Equation (5.1) for the limiting geometry?

14. The photo-fission corrections for the U-238(n,f) and Np-237(n,f) dosimeters appear low compared to the results of other investigators. Have the predictions used to determine these corrections been compared to calculations made with the BUGLE-93 library? Also, what photo-fission cross sections were used for U-238 and Np-237 and what is the basis for these values?

15. What is the effect on the dosimeter response of Pu build-up, U-235 content and impurities? Why aren't dosimeter response corrections required for these effects?

16. Do the dosimeter response measurements conform to the applicable ASTM standards? If not, justify any differences.

17. Why isn't a NIOBIUM calculation required for determining geometry and self-absorption corrections for the non-fissionable dosimeters?

18. Provide Table B-2.2-1 including the SSTR measurement results.