

April 5, 2004

Ms. Leah Morrell
Licensing Officer
BWX Technologies, Inc.
Nuclear Products Division
P.O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING BWX
TECHNOLOGIES, INC., REQUEST TO AMEND CHAPTER 4 OF THE LICENSE
APPLICATION (TAC NO. L31783)

Dear Ms. Morrell:

We have reviewed your request to amend Materials License SNM-42 transmitted by letter dated October 9, 2003. Our review has identified that additional information is needed before final action can be taken. The additional information, specified in the enclosure, should be provided within 15 days from the date of this letter. Please reference the above TAC No. in future correspondence related to this request.

If you have any questions regarding this letter, I can be reached at (301) 415-5848 or by e-mail at bcg@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

William C. Gleaves, Project Manager
Fuel Manufacturing Section
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket 70-27
License SNM-42

Enclosure: Request for Additional Information

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Enclosure: Request for Additional Information

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**REQUEST FOR ADDITIONAL INFORMATION
BWX TECHNOLOGIES, INC.
REQUEST TO AMEND CHAPTER 4 OF THE
LICENSE APPLICATION**

The staff has referred to the methodology given in NUREG/CR-6698, "Guide for Validation of Nuclear Criticality Safety Calculational Methodology," dated January 2001, for guidance during this review.

1. Approximately 6 percent of the experiments included in NCS-2003-288, Tables 10 and 13, and approximately 2.5 percent of the experiments included in NCS-2003-288, Table 12, involve uranium isotope 235 enrichments significantly less than the system being evaluated. Justify the acceptability of including the lower assay experiments.
2. Approximately 16 percent of the experiments included in NCS-2003-288, Table 10, approximately 66 percent of the experiments in NCS-2003-288, Table 11, and approximately 13 percent of the experiments included in NCS-2003-288, Table 12, involve [REDACTED] significantly different from that of the system being evaluated.
 - a. Justify the acceptability of fuel types different from that being evaluated.

In addition, the [REDACTED] associated with the experiments described as "Reference 3" in the tables is not described in sufficient detail to demonstrate applicability to the system being evaluated.

- b. Describe the "Reference 3" experiments in sufficient detail to demonstrate applicability to the system being evaluated.
3. The [REDACTED] of the experiments included in NCS-2003-288, Tables 10 through 13 are not provided. Provide the [REDACTED] of the experiments indicated in Tables 10 through 13. Justify the acceptability of the [REDACTED] significantly different from the system being evaluated.
4. The experiments included in NCS-2003-288, Tables 10 through 13 involve fuel moderation significantly different from that of the system being evaluated.
 - a. Justify the acceptability of fuel moderation different from the system being evaluated.

In addition, the fuel moderation associated with the experiments described as "Reference 3" in the tables is not described in sufficient detail to demonstrate applicability to the system being evaluated.

- b. Describe the "Reference 3" experiments in sufficient detail to demonstrate applicability to the system being evaluated.

5. NCS-2003-288, Table 14, identifies nine experiments involving [REDACTED] significantly different from that of the system being evaluated.

a. Justify the acceptability of [REDACTED] significantly different from the system being evaluated.

In addition, the [REDACTED] associated with the experiments described as "Reference 3" in NCS-2003-288 Tables 10, 12, and 13 are not described at all.

b. Describe the "Reference 3" experiments in sufficient detail to demonstrate applicability to the system being evaluated.

6. NUREG/CR-6698 states that calculations made for actual criticality safety analysis should not use code options (e.g., albedo, biasing, boundary conditions, etc.) that are dissimilar from that used in the validation. Unless these options are also validated, NUREG/CR-6698 states that their use is not appropriate.

a. NCS-2003-104, Appendix B, contains KENO input files for processing cross section data using the infinite homogeneous option, but does not contain KENO input files for processing cross section data using Dancoff factors. Enclosure 1 to the applicant's October 9, 2003, submittal identifies a worst-case KENO calculation result which relies on the use of Dancoff factors to determine the probability of neutron escape and interaction due to [REDACTED] configuration. Provide the KENO input files using Dancoff factors.

b. The October 9, 2003, submittal states, "the most reactive [REDACTED] submerged in water with no fixture installed has a k-effective of [REDACTED] (ref. NCS-2003-104, Table 13, [REDACTED], Dancoff factor of [REDACTED])." The experiments included in NCS-2003-288, Tables 10 through 13 are not described in sufficient detail to demonstrate validation of KENO code options, including use of Dancoff factors. Describe the experiments in sufficient detail to demonstrate applicability to the system being evaluated.

c. According to NCS-2003-104 KENO calculations, Dancoff factors vary with [REDACTED] dimensions, and must be less than 0.7 to ensure that resulting k-effectives do not exceed the proposed 0.975 k-effective limit. Justify how the 0.7 Dancoff factor will be maintained for future [REDACTED] designs.