

**Enclosure 2**

**MFN 08-464**

**Response to Portion of NRC Request for**

**Additional Information Letter No. 162**

**Related To NEDE-33243P, Revision 1  
“ESBWR Control Rod Nuclear Design”**

**RAI Numbers 4.2-16, 4.2-17, 4.2-18, 4.2-19**

**Non-Proprietary Version**

**NRC RAI 4.2-16**

*MCNP input, (Related to NEDE-33243P, Revision 1, "ESBWR Control Rod Nuclear Design").*

*Please provide a sample input from one of the new MCNP runs.*

**GEH Response**

A proprietary sample input file is provided in the attached compact disk.

**DCD Impact**

No DCD changes will be made in response to this RAI.

No changes to the subject LTR will be made in response to this RAI.

**NRC RAI 4.2-17**

*ID tolerances*

*Per page 4, the capsule inner diameter (ID) tolerance is substantially less than the value reported in Rev. 0. What changes have been made to manufacturing or acceptance procedures to reduce the variation in capsule ID dimensions?*

**GEH Response**

Revision 0 of NEDE-33243P contains a typographical error. On page 10, it should state, "...absorber tube tolerances are of the order of [[ ]]" rather than [[ ]]. Note from the text that the tolerance on the capsule inner diameter (ID) is [[ ]], as shown by a nominal diameter of [[ ]], a minimum diameter of [[ ]], and a maximum diameter of [[ ]].

The value for the inner diameter tolerance for revision 1 of NEDE-33243P is correctly stated on page 4 as [[ ]]. Note that this value is actually larger than the correct value of [[ ]] from revision 0. The [[ ]] value is a  $\pm 3\sigma$  statistical tolerance, based on manufacturing data from Marathon-5S capsule body tubes, which have identical cross-sectional dimensions to the NEDE-33243P Rev. 1 ESBWR Marathon capsule body tube.

**DCD Impact**

No DCD changes will be made in response to this RAI.

No changes to the subject LTR will be made in response to this RAI.

**NRC RAI 4.2-18**

*Parametric studies (Related to NEDE-33243P, Revision 1, "ESBWR Control Rod Nuclear Design").*

*Rev. 0 of this report listed parametric studies based on dimensional uncertainties leading to limiting calculations of the nuclear lifetime. Although Rev. 1 on page 4 indicates that ID tolerances were performed, it is not clear if the results presented were based on the limiting dimensional values. Please include the results of these parametric studies or demonstrate that the most conservative dimensional variations were used to develop the presented conclusions.*

**GEH Response**

The results presented in NEDE-33243P Rev. 1 are for nominal dimensions, although parametric studies including the low and the high tolerance limits had been performed in the actual analyses.

During the process of researching for responses to this RAI, a typo was discovered in the last sentence of NEDE-33243P Rev.1 Section 6 Conclusions. The correct text, incorporating the results of parametric studies, is shown below:

**6 Conclusions**

The nuclear analyses for the Marathon blade, which is the current design of control equipment for the ESBWR initial core, estimate the EOL lifetime fluence as [[ ]] snvt. The average heat generation is [[ ]] W/g of B<sub>4</sub>C. The depletion fraction for the most limiting tube for a nominal axial burnup profile is [[ ]] local depletion. For the limiting axial burnup profile, the highest depleted absorber tube can reach up to [[ ]] quarter segment depletion.

**DCD Impact**

No DCD changes will be made in response to this RAI.

LTR NEDE-33243P, Rev 1 Section 6 will be revised as described above. The committed date of revision is July 11, 2008.

**NRC RAI 4.2-19**

*Dimensional discrepancy (Related to NEDE-33243P, Revision 1, "ESBWR Control Rod Nuclear Design").*

*The actual radius of curvature of the tie-rod is listed on page 4. It goes on to say that the analyses used a second radius, but Table 2-2 lists a third value. Please review and provide the value for the actual dimension (with tolerance if applicable) as well as the dimension used in the analyses.*

**GEH Response**

[[ ]] tolerance was used on the tie-rod radius dimension. Tolerance for the B<sub>4</sub>C tube inner diameter is [[ ]]. Table 2-2 as shown below is corrected to demonstrate dimensions consistent with the actual analyses.



**Enclosure 3**

**MFN 08-464**

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**Additional Information Letter No. 162**

**Related To NEDE-33243P, Revision 1  
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**RAI Numbers 4.2-16, 4.2-17, 4.2-18, 4.2-19**

**Affidavit**

# GE Hitachi Nuclear Energy

## AFFIDAVIT

I, **David H. Hinds**, state as follows:

- (1) I am General Manager, New Units Engineering, GE Hitachi Nuclear Energy ("GEH"), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in enclosure 1 of GEH's letter, MFN 08-464, Mr. James C. Kinsey to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letter No. 162 Related to NEDE-33243P, Revision 1 "ESBWR Control Rod Nuclear Design" – RAI Numbers 4.2-16, 4.2-17, 4.2-18 and 4.2-19,*" dated May 27, 2008. The proprietary information in enclosure 1, which is entitled "*Response to Portion of NRC Request for Additional Information Letter No. 162 Related to NEDE-33243P, Revision 1 "ESBWR Control Rod Nuclear Design" – RAI Numbers 4.2-16, 4.2-17, 4.2-18 and 4.2-19,*" – *GEH Proprietary Information,*" is delineated by a [[dotted underline inside double square brackets.<sup>{3}</sup>]] Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation <sup>{3}</sup> refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;

- b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
- c. Information which reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;
- d. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. above.

- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GEH, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist, or other equivalent authority for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information identified in paragraph (2) above is classified as proprietary because it contains details of GEH's evaluation methodology.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GEH asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GEH.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 27<sup>th</sup> day of May 2008.



David H. Hinds  
GE Hitachi Nuclear Energy