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Proprietary Notice
This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 1, the balance of this letter may be considered non-proprietary.

MFN 06-297 Supplement 8

Docket No. 52-010

June 21, 2007

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-4 S02 and 4.4-5 S01

Enclosure 1 contains GHNEA's response to the subject NRC RAIs transmitted via the Reference 1 letter.

Enclosure 1 contains GHNEA proprietary information as defined by 10 CFR 2.390. GHNEA customarily maintains this information in confidence and withholds it from public disclosure. A non-proprietary version is provided in Enclosure 2.

The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GHNEA. GHNEA hereby requests that the information of Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,



James C. Kinsey
Project Manager, ESBWR Licensing

DOGB

MLO

Reference:

1. MFN 06-288, Letter from U. S. Nuclear Regulatory Commission to Mr. David H. Hinds, *Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application*, August 16, 2006.

Enclosures:

1. MFN 06-297, Supplement 8 - Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-4 S02 and 4.4-5 S01 – GE Proprietary Information
2. MFN 06-297, Supplement 8 - Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-4 S02 and 4.4-5 S01 – Non-Proprietary Version
3. Affidavit – James C. Kinsey – dated June 21, 2007

cc: AE Cabbage USNRC (with enclosures)
DH Hinds GHNEA Wilmington (with enclosures)
BE Brown GHNEA Wilmington (with enclosures)
eDRF 0000-0062-2891/R1 and 0000-0069-1323

Enclosure 2

MFN 06-297 Supplement 8

Response to Portion of NRC Request for

Additional Information Letter No. 53

Related to ESBWR Design Certification Application

RAI Numbers 4.3-4 S02 and 4.4-5 S01

Non-Proprietary Version

This is a non-proprietary version of Enclosure 1 of MFN 06-297 Supplement 8, which has the proprietary information removed. Portions of the document that have been removed are indicated by white space inside open and closed bracket as shown here [[]].

NRC RAI 4.3-4 S02

From Amy Cabbage email dated 03/14/07.

In the supplemental response, fission density calculations for Limerick GE11 lattices were provided. Verify whether the [[]] correspond to the lattice averaged void fraction or in-channel void fraction in the standard production method. Provide the power density assumed in the depletion analysis. Verify if this power density is the same used in all standard production calculations. The fission density RMS differences calculated by the provided spread sheets include the water rods. The fission density differences in the water rods is zero and the inclusion of the water rods in the fission density RMS differences for the Limerick lattices under-estimates the actual fission density RMS difference between [[]]. The fuel design for the ESBWR includes part length rods; therefore, there are several lattices with vanished and empty rods. Verify that the fission density difference RMS values between [[]] and MCNP for all 10x10 lattices shown in Tables 1.4, 1.5, and 1.6 of NEDC-33239P exclude all rods that do not include fuel, or update NEDC-33239P such that the RMS differences exclude rods that do not include fuel.

For one of the [[]] ESBWR lattices [[]] provide the RMS difference in fission density between [[]] and MCNP as a function of exposure for the 40% and 70% void and control depletions, ensuring the water, vanished, and empty rods are not included in the RMS difference determination. Not every exposure point is required, only 0 GWD/ST, 65 GWD/ST and an exposure near the peak reactivity [[]]. Depletion should be [[]].

Provide this information in the form of two tables (one for each control state with two void histories in each table). Verify that the fission density RMS difference at the limiting void and exposure point between [[]] results with and without the [[]] option is on the order of [[]].

GE Response

Item 1: Verify whether the [[]] correspond to the lattice averaged void fraction or in-channel void fraction in the standard production method.

Response to Item 1:

The moderator densities contained in Column B of Sheet 1 of the Limerick 1 GE11 lattices fission density analysis spreadsheet were approximate lattice average moderator densities (gm/cc). The label of "relative moderator density" was incorrect and should have been "lattice average moderator density (gm/cc)". Table 1 contains the correct relative and absolute moderator density values for the specific Limerick GE11 lattices. The reference value for moderator density for the purpose of creating the "relative moderator density" value is 0.73749 gm/cc. The corrected spreadsheets are being transmitted separately for completeness to this RAI request.

Item 6: For one of the [[]] ESBWR lattices [[]], provide the RMS difference in fission density between [[]] and MCNP as a function of exposure for the 40% and 70% void and control depletions, ensuring the water, vanished, and empty rods are not included in the RMS difference determination. Not every exposure point is required, only 0 GWD/ST, 65 GWD/ST and an exposure near the peak reactivity [[]]. Depletion should be [[]]. Provide this information in the form of two tables (one for each control state with two void histories in each table).

Response to Item 6

The dominant zone ESBWR lattice 81903 was used for the evaluation to support this RAI. The lattice was depleted in both the uncontrolled and controlled conditions of 40% in-channel void fraction and 70% in-channel void fraction. The fuel rod isotopic inventory was then placed in MCNP and the fission density distribution was determined. The comparison of the RMS of the fission density distribution differences between the MCNP results and the TGBLA6E5 results can be seen in the Table 5 below.

Table 5:TGBLA/MCNP Fission Density RMS Comparison (Lattice 81903)				
	Uncontrolled		Controlled	
	In-channel Void Fraction		In-channel Void Fraction	
Exp	40VF	70VF	40VF	70VF
0.2	[[
15				
65]]

Item 7: Verify that the fission density RMS difference at the limiting void and exposure point between [[]] results with and without the [[]] option is on the order of [[]].

Response to Item 7

Since the limiting void and exposure point is not a clearly defined point, the impact of the removal of the lumped fission product inventory of the fission density is shown below for all “standard production” exposures and void conditions. The [[

]]. As can be seen, the maximum impact of the removal on the lumped fission products does not occur until the highest analyzed exposure (65.0 GWd/st) and does not exceed [[]] at the highest impact point.

[[

]]

Affected Documents

No changes to the Tier 2 DCD or to NEDC-33239P are required as a result of the RAI response.

The modified spreadsheets to update the data as identified in Items 1 and 4 are being transmitted separately.

NRC RAI 4.4-5 S01

The explanation provided in the response for the applicability of referenced Topical Report NEDO-10958-A for bundle critical power performance prediction is acceptable. However, the response refers to NEDC-33237P to address applicability to GE14E fuel for the ESBWR. The NRC Staff is currently evaluating this Topical Report, and cannot complete its assessment until the revision is submitted and confirmatory analyses have been performed. The proposed response includes a reference to revision 1 to DCD Reference 4.4-12. The phrase 'scheduled October 2006' should be updated to reflect the actual publication date.

GE Response

Reference 4.4-12 of Subsection 4.4-8 of DCD Tier 2, Revision 3, already provides the actual publication date of NEDC-33237P, Revision 1, as December 2006.

DCD Impact

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

Enclosure 3

MFN 06-297 Supplement 8

Response to Portion of NRC Request for

Additional Information Letter No. 53

Related to ESBWR Design Certification Application

RAI Numbers 4.3-4 S02 and 4.4-5 S01

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **James C. Kinsey**, state as follows:

- (1) I am Project Manager, ESBWR Licensing, GE-Hitachi Nuclear Energy Americas LLC (“GHNEA”), 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 GHNEA’s letter, MFN 06-297 Supplement 8, Mr. James C. Kinsey to U.S. Nuclear Energy Commission, entitled “*Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-4 S02 and 4.4-5 S01*”, dated June 21, 2007. The proprietary information in enclosure 1, which is entitled “*Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-4 S02 and 4.4-5 S01– GHNEA Proprietary Information*”, is delineated by a [[dotted underline inside double square brackets.^{3}]] Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation ^{3} 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, GHNEA 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 GHNEA's competitors without license from GHNEA 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 GHNEA customer-funded development plans and programs, resulting in potential products to GHNEA;

- 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 GHNEA, 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 GHNEA, 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 GHNEA. Access to such documents within GHNEA 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 GHNEA 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 GHNEA'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 GHNEA asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GHNEA's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GHNEA'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 GHNEA.

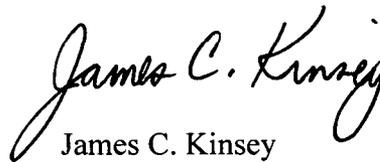
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GHNEA's competitive advantage will be lost if its competitors are able to use the results of the GHNEA 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 GHNEA 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 GHNEA 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 21st day of June 2007.



James C. Kinsey
GE-Hitachi Nuclear Energy Americas LLC