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MFN 08-651

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U.S. Nuclear Regulatory Commission
Document Control Desk
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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 152 - Related to ESBWR Design Certification Application – RAI Number 4.3-14**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by the Reference 1 NRC letter. GEH response to RAI Number 4.3-14 is addressed in Enclosure 1.

Enclosure 2 contains a compact disc (CD) that is entirely proprietary information as defined in 10 CFR 2.390. The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 2 has been handled and classified as proprietary to GEH. GEH hereby requests that the proprietary information in Enclosure 2 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. A non-proprietary version is not available because the contents of the CD are entirely proprietary.

If you have any questions or require additional information, please contact me.

Sincerely,

Charles W. Bagnal for

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 08-121, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 152 Related to the ESBWR Design Certification Application*, dated February 11, 2008.

Enclosure:

1. MFN 08-651 – Response to Portion of NRC Request for Additional Information Letter No. 152 - Related to ESBWR Design Certification Application – RAI Number 4.3-14
2. MFN 08-651 – Response to Portion of NRC Request for Additional Information Letter No. 152 - Related to ESBWR Design Certification Application – RAI Number 4.3-14– GEH Proprietary Information – Compact Disk "TRACG Output File"
3. MFN 08-651 – Response to Portion of NRC Request for Additional Information Letter No. 152 - Related to ESBWR Design Certification Application – RAI Number 4.3-14- Affidavit

cc: AE Cubbage USNRC (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)
eDRF 0000-0089-3199

Enclosure 1

MFN 08-651

Response to Portion of NRC Request for Additional Information Letter No. 152

Related to ESBWR Design Certification Application

RAI Number 4.3-14

NRC RAI 4.3-14

(New RAI from LTR NEDO-33338)

Calculate bypass voiding

Provide the results of a detailed analysis to confirm that the bypass void fraction during normal operation at any point in the feedwater temperature power operating domain remains below 5 percent. If a bounding analysis is provided, describe those features of the analysis that are bounding. During operation at off-normal points in the operating domain, describe the behavior of the in-core nuclear instrumentation such as the LPRM and GT instruments. Describe any requirements to address potential changes in sensitivity during these operating conditions.

GEH Response

The results of a bounding analysis are provided, and the reasons why they are bounding are discussed below.

TRACG bypass voiding calculations have been performed for the ESBWR initial core at SP0 (100% power and 420F FWT), SP2 (85% power and 486F FWT), and SP1 (100% power and 320F FWT). SP2 conditions resulted in the highest bypass voiding at the level-D Local Power Range Monitors (LPRMs). Although the power is less, the reactor water enthalpy is higher and less energy is required to generate steam within fuel channels. Where the highest bypass voiding occurs, the vapor generated in the fuel channels flows up through the channel, then downward into the bypass.

Sensitivity studies were performed to assess the limiting exposure, which was determined to be the end-of-cycle.

Sensitivity studies were also performed on numerous TRACG Phenomena Identification and Ranking Table (PIRT) parameters. The PIRT parameters that had the greatest impact were combined to come up with the limiting bypass voiding value. Values were chosen to be at both high and low ends of the uncertainty range or in some cases conservatively outside of the range. With the most limiting combination of TRACG PIRT parameters, the highest void fraction at level D was calculated to be 4.7%.

The results of this bounding analysis (TRACG steady-state calculation at SP2, EOC, with limiting PIRT parameters) are contained in the file, "SS_COLR_3X3IC_EOC_SP2_C04gx.OUT." The file contains GEH Proprietary Information and is provided in electronic form (CD).

The detector design specifications for nuclear instrumentation limits the bypass voiding to 5 percent at LPRM levels during steady-state operations. This ensures instrumentation reliability. Limiting void fraction values are less than 5% at off-normal conditions within the operating domain; therefore, instrument accuracies for Gamma Thermometers (GTs) and LPRMs are acceptable and no changes are recommended.

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.

Enclosure 2

MFN 08-651

Response to Portion of NRC Request for

Additional Information Letter No. 152

Related to ESBWR Design Certification Application

RAI Number 4.3-14

GEH Proprietary Information

PROPRIETARY INFORMATION NOTICE

This enclosure contains proprietary information of GE-Hitachi Nuclear Energy (GEH), and is furnished in confidence solely for the purpose(s) stated in the transmittal letter. No other use, direct or indirect, of the document or the information it contains is authorized. Furnishing this enclosure does not convey any license, express or implied, to use any patented invention or, except as specified above, any proprietary information of GEH disclosed herein or any right to publish or make copies of the enclosure without prior written permission of GEH. The header of each page in this document carries the notation "GEH Proprietary Information." Proprietary information of GEH is indicated as the content contained between opening double brackets ([[ ) and closing double brackets ( ]]), and the text is red in color. [[This sentence is an example.{3}]] Figures and large objects are contained between opening double brackets and closing double brackets. The superscript notation, e.g., {3}, refers to Paragraph (3) of the enclosed affidavit, which provides the basis for the proprietary determination. Specific information that is not so marked is not GEH proprietary.

[[Compact Disk "TRACG Output File"{3}]]

Enclosure 3

MFN 08-651

Response to Portion of NRC Request for

Additional Information Letter No. 152

Related to ESBWR Design Certification Application

RAI Number 4.3-14

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

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 2 of GEH's letter, MFN 08-651, Mr. Richard E. Kingston to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letter No. 152 Related to ESBWR Design Certification Application – RAI Number 4.3-14,*" dated August 26, 2008. The proprietary information in enclosure 2, which is entitled "*Response to Portion of NRC Request for Additional Information Letter No. 152 Related to ESBWR Design Certification Application – RAI Number 4.3-14 – GEH Proprietary Information,*" Compact Disk "TRACG Output File" is delineated by a [[dotted underline inside double square brackets.$^{\{3\}}$]] The contents of the compact disk are entirely proprietary. 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, 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 the results of TRACG analytical models, methods and processes, including computer codes, that GEH has developed and applied to ESBWR evaluations. GEH has developed this TRACG code for over fifteen years, at a significant cost. The reporting, evaluation and interpretation of the results, as they relate to the ESBWR was achieved at a significant cost.

(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

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 26th day of August 2008.

David H. Hinds
GE-Hitachi Nuclear Energy Americas LLC