



HITACHI

GE Hitachi Nuclear Energy

Richard E. Kingston
Vice President, ESBWR Licensing

PO Box 780 M/C A-65
Wilmington, NC 28402-0780
USA

T 910 819 6192
F 910 362 6192
rick.kingston@ge.com

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 09-479

Docket No. 52-010

July 17, 2009

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. 334 Related to ESBWR Design Certification Application – Engineered Safety Systems – RAI Number 6.2-201

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 6.2-201 S01 is addressed in Enclosure 1.

Enclosure 1 contains GEH proprietary information as defined by 10 CFR 2.390. GEH customarily maintains this information in confidence and withholds it from public disclosure. Enclosure 2 is the non-proprietary version, which does not contain proprietary information and is suitable for public disclosure.

The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GEH. GEH 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, please contact me.

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 09-274, Letter from U.S. Nuclear Regulatory Commission to Jerald Head, *Request for Additional Information Letter No. 334 Related to ESBWR Design Certification Application*, April 16, 2009

Enclosures:

1. MFN 09-479 - Response to Portion of NRC Request for Additional Information Letter No. 334 Related to ESBWR Design Certification Application – Engineered Safety Features – RAI Number 6.2-201 S01, GEH Proprietary Information
2. MFN 09-479 - Response to Portion of NRC Request for Additional Information Letter No. 334 Related to ESBWR Design Certification Application – Engineered Safety Features – RAI Number 6.2-201 S01, Non-Proprietary Version
3. MFN 09-479 - Response to Portion of NRC Request for Additional Information Letter No. 334 Related to ESBWR Design Certification Application – Engineered Safety Features – RAI Number 6.2-201 S01, Affidavit

cc: AE Cabbage USNRC (with enclosures)
JG Head GEH (with enclosures)
DH Hinds GEH (with enclosures)
eDRF 0000-0104-0036

Enclosure 2

MFN 09-479

**Response to Portion of NRC Request for
Additional Information Letter No. 334
Related to ESBWR Design Certification Application
Engineered Safety Features
RAI Number 6.2-201 S01**

PROPRIETARY INFORMATION NOTICE

This is a non-proprietary version of MFN 09-479, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[]].

NRC RAI 6.2-201 S01

The staff needs additional information on parts (A) and (E) of the GEH's response to RAI 6.2-201, Supplement 1.

Part (A):

-Explain what is meant by the statement that the "reactor vessel insulation is not modeled in the current annulus pressurization analysis."

-Confirm whether the analysis assumed that the insulation remains in place or it would crush during pressurization.

-Confirm whether the calculated volumes of the control volumes used in the GE pressurization analysis accounted for the volume of the insulation.

-Confirm whether the calculated volumes of the control volumes include the regions inside and outside the mirror insulation, or they represent the regions only inside or only outside of the insulation.

-The annulus pressurization analysis should reflect the responses to all the bulleted items.

Part (E): The response references GEH's response to RAI 6.2-23 in MFN 06-159, which states that "Sensitivity study of geometric input has been performed as described in the response to RAI 6.2-19. This information will be provided in a proprietary licensing topical report for reference in the DCD." Provide report for the staff's review and incorporate in by reference in the ESBWR DCD.

GEH Response

Part (A):

In this response a "control volume" encompasses the fluid volume in a TRACG node. The calculated volumes of the control volumes are based on the annulus inner radius of 3.738 meters and the outer radius of 4.646 meters. This means that the insulation is not included in the TRACG nodalization. However, a 10% reduction on the calculated fluid volumes was applied in the annulus pressurization analysis to account for various pipings, support structures and insulation. A sensitivity study has been performed with a 20% volume reduction instead of the 10% reduction in the calculated fluid volumes. Results show [[]] in calculated peak pressure for both the feedwater line break and reactor water clean up line break scenarios. The [[]] in the calculated peak pressure is within the 20% margin added to the calculated peak pressure to support the structural integrity evaluation.

The 20% reduction on the calculated fluid volumes in the TRACG input model is equivalent to simulating an insulation thickness of greater than 6", more than a typical insulation thickness used in the BWR plant.

The following response addresses the items in Part A.

- 1) Insulation is not directly modeled in the TRACG annulus pressurization analysis. However, a 10% reduction of the calculated volumes was applied in the annulus pressurization analysis to account for various pipings, support structures and insulation.
- 2) Constant control volumes are assumed during the whole transient period in the annulus pressurization analysis. No damage or deformation on the insulation is modeled during the analyzed time period.
- 3) A 10% reduction of the fluid volumes was applied in the annulus pressurization analysis to account for various pipings, support structures and insulation. A 20% reduction on the fluid volumes was applied in a sensitivity study to account for various pipings, support structures and insulation.
- 4) The volume in the TRACG input model represents the volume between the reactor pressure vessel and the reactor shield wall less the volume of the mirror insulation.
- 5) All bulleted items in the RAI are covered by the TRACG original analysis (response to RAI 6.2-23 S02, MFN 08-270 dated March 20, 2008), and by the sensitivity analysis for this RAI as discussed above for the annulus pressurization scenario.

Part (E):

- Response to RAI 6.2-19 was incorporated into NEDE-33440P Revision 0 which was submitted in MFN 09-215 dated March 31, 2009. NEDE-33440P is referenced in DCD Tier 2 in Chapter 6 as Reference 6.2-11.
- Additional nodalization sensitivity cases are analyzed increasing the number of cells for the feedwater line break scenario by a factor of 4, doubling the number of nodes in both the azimuthal direction and axial direction at the location of the break. In addition, a 20% volume reduction is applied in the calculated fluid volumes, consistent with the sensitivity case in the Part (A) response. Also, the total break flow rate entering the annulus is based on the value determined in a detailed TRACG study, which was included in the response to RAI 6.2-194 S01, MFN 08-927 S01 dated May 28, 2009. Results show that the calculated peak pressure from the analyzed sensitivity cases for the feedwater line break are [[
]] the previously submitted result in the response to RAI 6.2-23 S02, MFN 08-270 dated March 20, 2008. It is concluded that the results submitted in MFN 08-270 remain conservative and bounding.

DCD Impact

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

LTR Impact

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

Enclosure 3

MFN 09-479

**Response to Portion of NRC Request for
Additional Information Letter No. 334
Related to ESBWR Design Certification Application
Engineered Safety Features
RAI Number 6.2-201 S01
Affidavit**

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Larry J. Tucker**, state as follows:

- (1) I am Manager, ESBWR 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 09-479 Mr. Richard E. Kingston to U.S. Nuclear Energy Commission, entitled “*Response to Portion of NRC Request for Additional Information Letter No. 334 – Related to ESBWR Design Certification Application – Engineered Safety Features – RAI Number 6.2-201 S01,*” dated July 17, 2009. The proprietary information in enclosure 1, which is entitled “*MFN 09-479 – Response to Portion of NRC Request for Additional Information Letter No. 334 – Related to ESBWR Design Certification Application – Engineered Safety Features – RAI Number 6.2-201 S01 – GEH Proprietary Information,*” 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 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, 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) is classified as proprietary because it contains details of GEH's design and licensing methodology. The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost to GEH.
- (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.

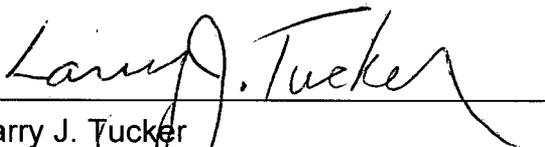
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

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 17th day of July 2009.



Larry J. Tucker
GE-Hitachi Nuclear Energy Americas LLC