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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 09-457

Docket No. 52-010

July 8, 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. 341 - Related To ESBWR Design Certification Application – RAI Number 21.6-119 Supplement 2**

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 21.6-119 Supplement 2 is addressed in Enclosures 1, 2, 3 and 4.

Enclosures 1 and 3 contain 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 public version of Enclosure 1, which does not contain proprietary information and is suitable for public disclosure.

The affidavit contained in Enclosure 4 identifies that the information contained in Enclosures 1 and 3 has been handled and classified as proprietary to GEH. GEH hereby requests that the information in Enclosures 1 and 3 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 10 CFR 9.17.

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

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

DO68
NRO

Reference:

1. MFN 08-360, Letter from U.S. Nuclear Regulatory Commission to Jerald G. Head, *Request For Additional Information Letter No. 341 Related To ESBWR Design Certification Application*, dated May 20, 2009.

Enclosures:

1. MFN 09-457 – Response to Portion of NRC Request for Additional Information Letter No. 341 – Related To ESBWR Design Certification Application – RAI Number 21.6-119 S02 – GEH Proprietary Information
2. MFN 09-457 – Response to Portion of NRC Request for Additional Information Letter No. 341 – Related To ESBWR Design Certification Application – RAI Number 21.6-119 S02 – Public Version
3. MFN 09-457 – Response to Portion of NRC Request for Additional Information Letter No. 341 – Related To ESBWR Design Certification Application – RAI Number 21.6-119 S02 – CD of Data Files
4. MFN 09-457 – Response to Portion of NRC Request for Additional Information Letter No. 341 – Related To ESBWR Design Certification Application – RAI Number 21.6-119 S02 – Affidavit

cc: AE Cubbage USNRC (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
eDRF 0000-0099-9702

Enclosure 2

MFN 09-457

Response to Portion of NRC Request for

Additional Information Letter No. 341

Related to ESBWR Design Certification Application

RAI Number 21.6-119 S02

Public Version

NRC RAI 21.6-119 S02

CFD modeling analyses

The staff needs specific geometry details and TRACG results in order to complete its CFD analyses. The following information is requested from GEH regarding our IC operation CFD model:

- *Location of 4 IC nozzles relative to feedwater nozzles. (Elevation and azimuthal location relative to feedwater nozzles.)*
- *Geometry of 4 IC nozzles. (Pipe diameter and any nozzle design values available.)*
- *Incoming flow and temperature from the separators. (Mass flow and temperature histories at 18 (all) locations representing the exit from the separators.)*
- *Incoming mass flow and temperature from the feedwater inlets/spargers. (Mass flow and temperature histories for 6 (all) feedwater nozzles.)*
- *Incoming IC mass flow and temperature history. (Mass flow and temperature history at each of 4 (all) nozzles.)*
- *Mass flow and temperature at the bottom of the downcomer. (For each of 6 (all) cells in lowest downcomer ring, provide the downward mass flow and temperature history.)*
- *Geometry of downcomer rings. (For each of 6 cells in the downcomer ring, provide the flow area, azimuthal locations, and elevation.)*
- *Mass flow exiting the lower plenum into the CRD side entry orifice. (Mass flow and temperature history at each of 18 (all) locations.)*

GEH Response

IC nozzle locations and geometry are as follows:

[[

]]

The boundary conditions requested by NRC are extracted from the TRACG base case described in RAI21.6-119 S01, part 2 response, which is the Inadvertent isolation condenser initiation (IICI) case being incorporated in DCD Rev.6. Table 21.6-119 S02-1 lists all the file names that are provided in this RAI response package, and the

description for each file. Table 21.6-119 S02-2 provides description for each parameter name shown in the attached file. The location of the cell number can be found in Reference 1, Figure 1. Geometry information of azimuthal rings at the exit of downcomer is provided in Table 21.6-119 S02-3.

Table 21.6-119 S02-1
Description of Each File Provided with this RAI Response

File Name	Description
IICI injection.csv	Mass flow rate and temperature of IICI injection
FW-to-VSSL.csv	Feed water flow rate and temperature
Downcomer-Exit.csv	Axial mass flow rate and temperature at the exit of downcomer
Separator-Drain-Flow.csv	Mass flow rate of the separator return flow
Separator-Drain-Temperature.csv	Liquid temperature of the separator return flow
SEO-flow-by-VSSL-CELL.csv	SEO flow at each of the [[ ]] sectors
SEO-Temperature.csv	Flow temperatures on VSSL level 3, which feed the SEO flow for each of the [[ ]] sectors.

Table 21.6-119 S02-2
Description of Each Parameter Shown in the Attached Files

Parameter Names	Parameters Requested by NRC
Isolation Condenser injection	
[[	
	]]
Feedwater mass flow and temperature	
[[	
	]]

Table 21.6-119 S02-2
Description of Each Parameter Shown in the Attached Files

Parameter Names	Parameters Requested by NRC
Downcomer Exit mass flow and Temperature	
[[	
	]]
Separator return flow mass flow and temperature	
[[	

Table 21.6-119 S02-2
Description of Each Parameter Shown in the Attached Files

Parameter Names	Parameters Requested by NRC
	]]
CRD Side entry Orifice mass flow and temperature	
[[	

Table 21.6-119 S02-2
Description of Each Parameter Shown in the Attached Files

Parameter Names	Parameters Requested by NRC

Table 21.6-119 S02-2
Description of Each Parameter Shown in the Attached Files

Parameter Names	Parameters Requested by NRC
	]]

Table 21.6-119 S02-3
Geometry Of Downcomer Rings At Downcomer Exit

Elevation (m)		[[
Flow area (m^2)		
	]]

Note: The azimuthal nodalization can be found in Figure 1 of Reference 1. The cell numbering in the above table is consistent with that of Reference1, Figure 1.

REFERENCE

1. GEH Letter *MFN 07-168 Supplement 1* dated July 2, 2008.

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 4

MFN 09-457

Response to Portion of NRC Request for

Additional Information Letter No. 341

Related to ESBWR Design Certification Application

RAI Number 21.6-119 S02

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 enclosures 1 and 3 of GEH's letter, MFN 09-457 Mr. Richard E. Kingston to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letter No. 341 – Related to ESBWR Design Certification Application – RAI Number 21.6-119 Supplement 2,*" dated July 8, 2009. The proprietary information in enclosure 1, which is entitled "*MFN 09-457 – Response to Portion of NRC Request for Additional Information Letter No. 341 – Related to ESBWR Design Certification Application – RAI Number 21.6-119 S02 – GEH 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. All of the information in the data files in enclosure 3 is GEH Proprietary Information.

(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 8th day of July 2009.

Larry J. Tucker
GE-Hitachi Nuclear Energy Americas LLC