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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 08-685

Docket No. 52-010

September 9, 2008

U.S. Nuclear Regulatory Commission

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Subject: Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S02

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 21.6-39 S02 is addressed in Enclosures 1, 2 and 3.

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 in Enclosure 1 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

DOB
NR0

References:

1. MFN 08-462, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, GEH, *Request For Additional Information Letter No. 191 Related To ESBWR Design Certification Application*, dated May 6, 2008

Enclosures:

1. MFN 08-685 – Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S02 – GEH Proprietary Information
2. MFN 08-685 – Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S02 – Non-Proprietary Version
3. MFN 08-685 – Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S02 – Affidavit

cc: AE Cabbage USNRC (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)
eDRF 0000-0090-5960

Enclosure 2

MFN 08-685

**Response to Portion of NRC Request for
Additional Information Letter No. 191
Related to ESBWR Design Certification Application
RAI Number 21.6-39 S02
Non-Proprietary Version**

NRC RAI 21.6-39 S02

Identify the ATWS event considered in the previous response; explain the predicted flow pattern; provide the documentation for the GEH CFD study.

- a. *Identify the specific non-isolation ATWS event considered in the response to response to RAI 21.6-39 Supplement 1 (MFN 06-232, Supplement 1). Is the limiting scenario with respect to boron injection the MSIV Closure event or the Loss of Condenser Vacuum event?*
- b. *Provide an explanation for the predicted downflow natural circulation pattern in the core periphery for the non-isolation ATWS event. Is it artificially [[
TRACG model?]]* in the
- c. *Provide a discussion of the GEH CFD study, including transients modeled, assumptions, and results, with a comparison to TRACG results.*

GEH Response

- a. The non-isolation ATWS event considered in the response to RAI 21.6-39 S01 is Shutdown Without Control Rods. The limiting scenario with respect to boron injection was neither the MSIV closure event nor the loss of Condenser Vacuum event; it was Shutdown Without Control Rods.
- b. During a Shutdown Without Control Rods event, the water level in the reactor remains at the nominal level. The flow path is downward through the down comer and then upward through the channels and bypass to the chimney, and then to the separator. When the cooler boron solution is injected into the peripheral bypass region, the change in density of the mixture creates a downward drive. The boron also acts to reduce core power and in doing so reduces the water level in the core creating less pressure head in the bypass and allows boron to naturally circulate downward in the peripheral bypass. The predicted down flow natural circulation pattern is not produced artificially by the [[
]] in the TRACG model. The [[
]] in the ATWS non-isolation events with and without [[
]]. Table 21.6-39S02-1 shows ATWS events with their respective hot shutdown times. The [[
]] produces a conservative shutdown time for both isolation and non-isolation events.

Table 21.6-39S02-1

ATWS Event	Boron Injection Timing After Initiation of Event (s)	Time of Hot Shutdown After Initiation of Event (s)
Non Isolation ATWS with [[]]	[[]]	
Non Isolation ATWS without [[]]		
Main Steam Isolation Valve Closure ATWS Base Analysis]]

- c. A discussion of the GEH CFD study can be found in the responses to RAI 21.6-44 S01 (MFN 08-659 dated September 4, 2008) and RAI 21.6-90 MFN 08-660 dated September 4, 2008).

DCD Impact

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

Enclosure 3

MFN 08-685

Response to Portion of NRC Request for

Additional Information Letter No. 191

Related to ESBWR Design Certification Application

RAI Number 21.6-39 S02

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 1 of GEH’s letter, MFN 08-685, Mr. Richard E. Kingston to U.S. Nuclear Energy Commission, entitled “*Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S02,*” dated September 9, 2008. The proprietary information in enclosure 1, which is entitled “*MFN 08-685 – Response to Portion of NRC Request for Additional Information Letter No. 191 – Related to ESBWR Design Certification Application – RAI Number 21.6-39 S01 – 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.
- (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 Anticipated Transients Without Scram (ATWS) response 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 ATWS response evaluations for the ESBWR 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 9th day of September 2008.



David H. Hinds
GE-Hitachi Nuclear Energy Americas LLC