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<u>Proprietary Information Notice</u>
This letter forwards proprietary information in accordance with 10CFR2.390. The balance of this letter may be considered non-proprietary upon the removal of Enclosure 1.

MFN 08-085 Supplement 1

Docket No. 52-010

September 2, 2008

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

Subject: **Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1**

Enclosures 1 and 2 contain the GE Hitachi Nuclear Energy (GEH) revised response to the subject NRC RAI originally transmitted via the Reference 1 letter, and supplemented by an NRC request for clarification in Reference 2. The revised response is the result of discussions between GEH representatives and the NRC Staff held on April 18, 2008.

Enclosure 1 contains proprietary information as defined in 10CFR2.390. 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 proprietary information in Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Enclosure 2 is the non-proprietary version of the RAI response, which does not contain proprietary information and is suitable for public disclosure.

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

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

References:

1. MFN 07-054, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application*, January 19, 2007
2. E-Mail from Shawn Williams, U.S. Nuclear Regulatory Commission, to George Wadkins, GE Hitachi Nuclear Energy, dated June 12, 2007 (ADAMS Accession Number ML071630437)

Enclosures:

1. MFN 08-085 Supplement 1 - Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1 - GEH Proprietary Information
2. MFN 08-085 Supplement 1 - Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1 - Non-Proprietary Information
3. Affidavit - David H. Hinds - dated September 2, 2008

cc:		
	AE Cubbage	USNRC (with enclosures)
	BE Brown	GEH/Wilmington (with enclosures)
	GB Stramback	GEH/San Jose (with enclosures)
	eDRF	0000-0077-7672R1

Enclosure 2

MFN 08-085 Supplement 1

Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application

Emergency Core Cooling Systems

RAI Number 6.3-65 S01 Revision 1

Non-Proprietary Information

For historical purposes, the original text of RAI 6.3-65, and the GEH responses (including supplements) is included. The attachments included in the original responses (if any) are not included here to avoid confusion.

NRC RAI 6.3-65:

Show the elevation, diameter and maximum break area of the standby liquid control system (SLCS) injection line (which may be included in response to RAI 6.3-47). Evaluate the consequences of a break in the SLCS line with the worst single failure.

GEH Response:

The Standby Liquid Control System (SLCS) line at the reactor pressure vessel (RPV) penetration is a 2 inch Schedule 160 line with an ID of 42.85 mm and a cross-sectional area of 1.45x10-3 m^2. Following a postulated SLCS line break, choking is possible at several locations along the piping line. However, the flow rate is determined by the minimum area along the piping which is the area corresponding to the nozzle at the shroud penetration, 4.53x10-4 m^2. The elevation of the penetration into the RPV is 9.709 m from vessel zero. The consequences of the SLCS line break were evaluated using TRACG code. The predicted downcomer and chimney collapsed levels are shown in Figures 6.3-65-1 and 6.3-65-2. The break flow was at least an order of magnitude smaller than the isolation condenser (IC) flow into the vessel. Therefore, the collapsed liquid level in the downcomer did not drop to the Level 1 (L1) elevation and the Automatic Depressurization System (ADS), Gravity Driven Cooling System (GDCS), and the SLCS were not initiated during the 2000 s simulation period. The level in the chimney did not drop following the initial rise and the minimum chimney collapsed level corresponded to the initial level of 8.64 m above vessel zero. Since ADS, GDCS, and SLCS were not initiated, the failure type will not have an effect on this transient.

NRC RAI 6.3-65 S01:

This RAI asked GE to evaluate the consequences of the standby liquid control system line break. The response states that the break flow was at least an order of magnitude smaller than the isolation condenser (IC) flow into the vessel, well under that of the isolation condenser system (ICS) and that none of the other emergency core cooling systems actuate.

How many isolation condensers (ICs) were available during the analysis of this event? Since the passive containment cooling system does not operate, describe the long-term (i.e. 72 hour) plant response for this event. What happens after the ICS drains? Is the break size small enough for the reactor water cleanup to provide sufficient make-up?

NRC RAI 6.3-65 S01 Revision 1:

The GEH response to RAI 6.3-65 S01 was provided to the NRC in MFN 08-085 on March 25, 2008. The NRC requested the following clarifications and corrections in a teleconference on 4/18/2008.

Provide an explanation for the sudden and relatively steep drop of total Passive Containment Cooling System (PCCS) power at 55 hours and recovery at about 65 hours shown on Figure A-1b, "Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)," in the response to RAI 6.3-65 S01 in MFN 08-085.

In addition, consider the following corrections and clarifications to the information provided in that response:

1. *Correct the unit on the abscissa ordinate in many of the figures (from second to hour).*
2. *In Figure A-1a, confirm if the delta MW (total versus PCCS) goes to the SP.*
3. *In Figure A-1b, explain what is happening between 55-hour to 65-hour span.*
4. *In Figure B-4a, explain the oscillation of drywell pressure from 500 to 1500 seconds.*

GEH Revised Response:

This revised RAI response contains two parts. Part 1 provides the revised response to RAI 6.3-65 S01. The revised response is based on the updated analysis results using the current TRACG PC version and DCD Revision 5 basedeck. The updated results are presented in Appendix A and Appendix B.

Part 2 provides responses to the additional teleconference questions from the NRC. The GEH response for each specific question is provided following each NRC question (in *Italic* text).

Part 1

The original response for RAI 6.3-65 was based on DCD Tier 2, Chapter 6.3, Revision 2 assumptions, where Isolation Condenser System (ICS) heat transfer was credited. Evaluation results showed that the Automatic Depressurization System (ADS) and Gravity-Driven Cooling System (GDCS) were not initiated during the initial phase of the event (within 2000 seconds).

The original response to RAI 6.3-65 Supplement 1 (MFN 08-085, dated March 25, 2008) was based on analysis performed under the DCD Revision 4 TRACG model assumptions, except that the ICS heat transfer was credited in Case A, and the analyses were extended to 72 hours. However, an interim personal computer (PC) version of TRACG was used at the time for preparing the response to overcome a numerical difficulty that was unique for Case B.

Since then, code and model improvements have been implemented into TRACG. Also, a few design changes have been implemented into the DCD Revision 5 input decks. Cases A and B are re-analyzed to include the design changes with the current TRACG PC version (V5711). This revised RAI response, discussed in the following paragraphs, is based on the updated analysis results.

A. *How many isolation condensers (ICs) were available during the analysis of this event?*

There are four isolation condensers (ICs) associated with an ESBWR; however, the analysis of this event takes credit for only three of them.

It is noted that in DCD Tier 2, Chapter 6, Revision 5 cases, ICS heat transfer is not credited. For large and medium breaks, depressurization valves (DPVs) open after Level 1 (L1) setpoint is reached, and potential non-condensable (NC) gas could get into the ICS and degrade the heat transfer. However, for very small breaks such as Standby Liquid Control System (SLCS) line breaks, the reactor pressure vessel (RPV) pressure remains high after main steam isolation valve (MSIV) closure, limiting the potential for NC gases to be entrained in the ICs before L1 (which takes a long time to reach for this case, > 6000 seconds). The ICs function to reduce the RPV pressure without operating the safety relief valves (SRVs).

Therefore, two cases are analyzed for the SLCS line break:

- Case A: ICS heat transfer is credited
- Case B: ICS heat transfer is not credited

B. *Since the Passive Containment Cooling System (PCCS) does not operate, describe the long-term (i.e., 72 hour) plant response for this event.*

<u>Case A results: ICS heat transfer is credited</u>

Figure A-1a through Figure A-8 show the plant responses for Case A within 72 hours (plots with the initial 20000-second period are presented as well). Prior to the L1 setpoint being reached, the RPV is depressurized mainly by the ICs (Figure A-4a), which condenses the steam from the RPV and returns the condensate back into the RPV (Fig. A-7a). This results in a slower decrease in reactor inventory, and the L1 setpoint is not reached until [[ ]]. At this point, the ADS actuates to rapidly depressurize the RPV and the GDCS flow can inject into the RPV afterwards.

<u>Case B results: IC heat transfer is not credited</u>

Figure B-1a through Figure B-7b show the plant responses for Case B within 72 hours (plots with the initial 6000-second period are presented as well). After the closure of the MSIVs, the RPV pressure rises and reaches the SRV Safety Mode setpoint at about [[ ]] (Figure B-4a). For the next 1000 seconds, the RPV steam (and inventory) is discharged through the SRVs into the suppression pool. The RPV water level drops faster in this case, when compared to that of Case A. As a result, the L1 setpoint is reached sooner at [[ ]]. Shortly after that, ADS actuates and the GDCS flow recovers the water level afterwards.

C. *What happens after the ICS drains?*

<u>Case A results: ICS heat transfer is credited</u>

Table A-1 lists the Emergency Core Cooling System (ECCS) events for this case. The results indicate that the initial inventory of the ICs drain lines is depleted at around [[ ]]. However, the ICs condensate continues to flow to the RPV until the L1 setpoint is reached (Figure A-7a). The steam flow to the ICs (and therefore the condensate flow) reduces significantly after the ADS actuation (Figure A-6a). L1 setpoint is reached at [[ ]], ADS starts at [[ ]], and the GDCS starts to flow to the vessel at [[ ]].

Case B results: IC heat transfer is not credited

Table B-1 lists the ECCS events for this case. The results indicate that the initial inventory of the ICs drain lines is depleted at around [[ ]] (Figure B-7a). The steam flow to the ICs reduces to zero after that time because there is no condensation inside the ICs (Figure B-6a). L1 setpoint is reached at [[ ]] (which is sooner when compared to that of Case A). The ADS starts at [[ ]] and the GDCS starts to flow to the vessel at [[ ]]. The SRV flow stops shortly after the DPV opening (Figure B-6a).

D. *Is the break size small enough for the reactor water cleanup to provide sufficient make-up?*

The Reactor Water Cleanup/Shutdown Cooling (RWCU/SDC) System is a closed circulation loop that takes suction from and discharges to the RPV, does not perform any safety-related functions, and makeup from this system is not credited in the loss-of-coolant accident (LOCA) analyses.

Part 2 (Responses to Additional Questions from NRC Staff During Teleconference on 4/18/2008):

Provide an explanation for the sudden and relatively steep drop of total Passive Containment Cooling System (PCCS) power at 55 hours and recovery at about 65 hours shown on Figure A-1b, "Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)," in the response to RAI 6.3-65 S01 in MFN 08-085.

In addition, consider the following corrections and clarifications to the information provided in that response:

3. *In Figure A-1b, explain what is happening between 55-hour to 65-hour span.*

These two questions are related. Figure A-1b shows the comparison of the decay heat power and the total PCCS condensation power. This figure shows a sudden drop of total PCCS condensation power at around 60 hours and recovery at about 66 hours.

For Case A, the ICS heat transfer is credited in the analyses. The ICs condense a portion of the total steam flow generated in the RPV by the decay heat. Figure A-6c shows the IC steam flow and total DPV flow. Starting at around 60 hours and ending at around 66 hours, the ICs receive and condense a portion of the total steam generated in the RPV. As a result, the PCCS condenses a lesser amount of steam (and smaller heat load) during this time period. Figure A-1d shows the comparison of the decay heat power and the total (PCCS + IC) condensation power. This figure shows that, during this time period, the total (PCCS + IC) condensation power matches well with the decay heat.

The total DPV steam flow shows appreciable oscillations starting at around 40 hours (Figure A-6c). The DPV flow is the main source of steam that pressurizes the drywell (DW). Consequently, these DPV flow oscillations cause oscillations in the DW pressure

(Figure A-4b) and condensation powers (Figure A-1b and Figure A-1d). The initiation and continuation of DPV flow oscillations can be attributed to the downcomer (DC) flow oscillations.

Figure A-3b shows the transient DC water levels. From [[ ]], the DC level drops from the elevation of DPV nozzle to the elevation of the steam separator discharge (bottom of separator skirt, simulated in the TRACG model as the side-arm of the TEE-separator). During this time period, the DC and separator form a closed loop for the circulating DC and core flows. Figure A-8 shows the DC and separator flows. The total separator inlet flow is the same as the DC flow. The steam flow exits at the top of the separator and becomes the source for the DPV flow. The remainder portion (major portion) discharges through the separator skirt (side-arm of the TEE) and returns to the DC. Starting at [[ ]], the DC level drops below the separator skirt elevation. The DC and core flows change from steady, circulation flow pattern to U-tube type, oscillatory flow pattern. Consequently this generates oscillations in the DC and DPV flows.

1. *Correct the unit on the abscissa ordinate in many of the figures (from second to hour).*

The figures in Appendix A and Appendix B have been revised with the corrected unit on the abscissa.

2. *In Figure A-1a, confirm if the delta MW (total versus PCCS) goes to the SP.*

Figure A-1d shows a small gap between the reactor decay heat and the total (PCCS + IC) condensation power. This gap corresponds to the reduction in the RPV steaming rate, and there is no significant amount of energy going to the suppression pool during this time period. This reduction is due to the small portion of the decay heat that is used to heat up the incoming cooler GDCS water. Paragraph A1.3 in Response to RAI 6.2-98 S01 (MFN 08-011, dated January 9, 2008) provides additional discussion of the GDCS pool level and RPV steaming rate.

4. *In Figure B-4a, explain the oscillation of drywell pressure from 500 to 1500 seconds.*

Figure B-4a shows the RPV pressure, DW and WW pressures for Case B. After the closure of the MSIVs, the RPV pressure rises and reaches the SRV Safety Mode setpoint at about [[ ]]. For the next 1000 seconds, the SRVs are cycling between opening and closing, corresponding to the RPV pressure at opening and closing setpoints. The RPV pressure oscillations lead to slight fluctuation in the SLCS line break flow and break void fraction (Figure B-5a), and finally lead to slight fluctuation in the DW pressure. It is noted that the total SRV flow curve (Figure B-6a) and steam line flow (Figure B-5a) are modified to include the total SRV flow rate so that it is consistent with the RPV pressure response (Figure B-4a).

Appendix A: Case A, SLCS Line Break with ICS Heat Transfer Credited

Table A-1.
Operational Sequence of ECCS for a SLCS Line Break with Failure of One GDCS Injection Valve (Nominal Case), with ICS Heat Transfer Credited

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Table A-1. (continued)
Operational Sequence of ECCS for a SLCS Line Break with Failure of One GDCS Injection Valve (Nominal Case), with ICS Heat Transfer Credited

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Figure A-1a. Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-1b. Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-1c. Reactor and total PCCS & ICS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-1d. Reactor and total PCCS & ICS Power, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-2a. Chimney Water Level, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-2b. Chimney Water Level, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-3a. Downcomer Water Level, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-3b. Downcomer Water Level, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-4a. System Pressures, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-4b. System Pressures, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-5a. Steam Line and Break Flow, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-5b. Steam Line and Break Flow, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-6a. ADS Flows, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-6b. ADS Flows, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-6c. ADS Flows, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-7a. Flows into Vessel, SLCS Line Break ((ICS Heat Transfer Credited), 1 GDCS Valve Failure (20000 seconds)

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Figure A-7b. Flows into Vessel, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

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Figure A-8. Separator and Downcomer Flows, SLCS Line Break (ICS Heat Transfer Credited), 1 GDCS Valve Failure (72 hours)

Appendix B: Case B, SLCS Line Break with ICS Heat Transfer Not Credited

Table B-1.
Operational Sequence of ECCS for a SLCS Line Break with Failure of One GDCS Injection Valve (Nominal Case), with ICS Heat Transfer Not Credited

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Table B-1. (continued)
Operational Sequence of ECCS for a SLCS Line Break with Failure of One GDCS Injection Valve (Nominal Case), with ICS Heat Transfer Not Credited

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Figure B-1a. Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-1b. Reactor and PCCS Power, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-2a. Chimney Water Level, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-2b. Chimney Water Level, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-3a. Downcomer Water Level, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-3b. Downcomer Water Level, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-4a. System Pressure, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-4b. System Pressure, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-5a. Steam Line and Break Flow, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-5b. Steam Line and Break Flow, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-6a. ADS Flows, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-6b. ADS Flows, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

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Figure B-7a. Flows into Vessel, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (6000 seconds)

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Figure B-7b. Flows into Vessel, SLCS Line Break (ICS Heat Transfer Not Credited), 1 GDCS Valve Failure (72 hours)

DCD Impact:

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

Enclosure 3

MFN 08-085 Supplement 1

AFFIDAVIT

GE- Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, David H. Hinds, state as follows:

(1) I am the 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 letter MFN 08-085 Supplement 1, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, *Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1,* dated September 2, 2008. GEH proprietary information is identified in Enclosure 1, *MFN 08-085 Supplement 1 - Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1 - GEH Proprietary Information,* by a dotted underline inside double square brackets. The electronic version includes a dark red font inside the brackets. For black-grayscale printed copies, the red font and dotted underline appears similar to normal text. [[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 of the proprietary determination. Specific information that is not so marked is not GEH proprietary. A non-proprietary version of this information is provided in Enclosure 2, *MFN 08-085 Supplement 1 - Revised Response to Portion of NRC Request for Additional Information Letter No. 85 Related to ESBWR Design Certification Application - Emergency Core Cooling Systems - RAI Number 6.3-65 S01 Revision 1 - Non-Proprietary Information.*

(3) In making this application for withholding of proprietary information of which it is the owner, 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 2.790(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, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, 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 identifies the models and methodologies GEH will use in evaluating the

consequences of design basis accidents (DBAs) for the ESBWR. GEH and its partners performed significant additional research and evaluation to develop a basis for these revised methodologies to be used in evaluating the ESBWR over a period of several years at a significant cost.

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 GEH asset.

(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 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 2nd day of September 2, 2008.

David H. Hinds
GE- Hitachi Nuclear Energy Americas LLC