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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 08-350

Docket No. 52-010

April 14, 2008

U.S. Nuclear Regulatory Commission

Document Control Desk
Washington, D.C. 20555-0001

Subject: Response to Portion of NRC Request for Additional Information Letters No. 115 and No. 137– Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 Supplement 2 and 4.6-38, Respectively

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 and 2 NRC letters. GEH response to RAI Numbers 4.6-23 Supplement 2 and 4.6-38 is addressed in Enclosures 1, 2, 3 and 4.

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. A non-proprietary version is provided in Enclosure 2.

The affidavit contained in Enclosure 4 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 10 CFR 9.17.

Verified DCD changes associated with this RAI response are identified in the Enclosure 3 DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markups may not be fully developed and approved for inclusion in DCD Revision 5.

D068
NRO

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

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

References:

1. MFN 07-637, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 115 Related To ESBWR Design Certification Application*, dated November 20, 2007
2. MFN 08-027, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 137 Related To ESBWR Design Control Document Revision 4*, dated January 10, 2008

Enclosures:

1. MFN 08-350 – Response to Portion of NRC Request for Additional Information Letters No. 115 and 137 – Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 S02 and 4.6-38 – GEH Proprietary Information
2. MFN 08-350 – Response to Portion of NRC Request for Additional Information Letters No. 115 and 137 – Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 S02 and 4.6-38 – Non-Proprietary Version
3. MFN 08-350 – Response to Portion of NRC Request for Additional Information Letters No. 115 and 137 – Related to ESBWR Design Certification Application – DCD Markups from the Response to RAI Numbers 4.6-23 S02 and 4.6-38
4. MFN 08-350 – Response to Portion of NRC Request for Additional Information Letters No. 115 and 137 – Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 S02 and 4.6-38 – Affidavit

cc: AE Cubbage USNRC (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)

eDRF 0000-0081-8212

Enclosure 2

MFN 08-350

Response to Portion of NRC Request for

Additional Information Letters No. 115 and 137

Related to ESBWR Design Certification Application

RAI Numbers 4.6-23 S02 and 4.6-38

Non-Proprietary Version

NRC RAI 4.6-23 S02

Control Rod Drop Accident

The staff has considered GEH's control rod drop event frequency evaluation provided in response to RAI 4.6-23 S01. Based upon the potential consequences of an unrestricted reactivity excursion and to ensure compliance with 10 CFR 50 Appendix A GDC 28, the staff concludes that the ESBWR design must demonstrate reactor coolant pressure boundary integrity and acceptable radiological consequences for the control rod drop accident. More detailed regulatory criteria and guidance is provided in SRP Section 4.2 Appendix B. This regulatory position necessitates updates to ESBWR DCD Tier 1 Section 2.2.2, Tier 2 Section 4.6, and Tier 2 Section 15.4.6. Please provide these revised DCD sections.

GEH Response

Compliance with GDC 28 in Appendix A of 10 CFR 50 for a control rod (blade) drop accident (CRDA) is ensured if reactivity is controlled to the extent that the fuel rod cladding is not breeched. Standard Review Plan (SRP) Section 4.2[1] Appendix B provides a conservative limit for deposited energy in the fuel below which the integrity of the cladding can be assumed. The GEH approach to demonstrate compliance with GDC 28 is to show that the calculated energy depositions during CRDAs in the ESBWR do not surpass the conservative limits established in Revision 3 to SRP Section 4.2 Appendix B.

The ESBWR nominal startup sequence was evaluated for both the initial and a projected equilibrium core. For every step in the control blade withdrawal sequence every control blade that had previously been moved was assessed to determine its static reactivity worth as if it had been stuck at the full-in position rather than being withdrawn as expected, had somehow become decoupled from its drive, and at that point in time dropped from its fully-inserted position to the current location of the drive mechanism. Although control blades are usually moved in banks, the assessment for a dropped blade is performed individually because the postulated accident scenario is for an individual control blade failure.

An exhaustive study was conducted to determine the maximum control blade worths for the initial ESBWR core and a projected equilibrium ESBWR core. For each exposure and each temperature condition in each of the two cores, over 10,000 control blade worths were calculated with PANACEA[3]. For control blade worths that result in prompt criticality, the power response and thus the calculated enthalpy rise in the fuel are correlated to blade worth as suggested in Figure 1. (Figure 1 is discussed in more detail later.) From all the control blade patterns that were evaluated, the cases with the highest control blade worth were chosen at each of three cycle exposures corresponding to beginning, middle and end of cycle. The six selected cases are presented in Table 1.

The rows in Table 1 have been labeled so they can be referenced in the discussion that follows. Rows 1 through 5 describe the limiting cases. As shown in row 4 of Table 1, the highest blade worth cases were usually at 286 C. For an adiabatic evaluation (such as the one performed here), it is very conservative to select the highest blade worth cases without regard to the moderator temperature because no credit is taken for the strong negative feedback that results from void production when heat transfer is considered. An adiabatic calculation is also conservative because the calculated change in fuel rod enthalpy does not credit the energy that would be transferred to the coolant for a realistic calculation. In other words, the limiting condition in a realistic calculation that credits heat transfer typically occurs for a lower moderator temperature where the production of voids that turns around the power increase is delayed. But for a conservative adiabatic calculation the moderator temperature is only relevant with regards to how it influences the control blade worth and the initial fuel temperature.

Row 5 in Table 1 contains the maximum blade worth case. The location of this control blade is used to perform a search of the four bundles surrounding the control blade to determine the peak pellet exposure (PPE) anywhere in the four bundles. It is this peak pellet exposure that is reported in row 6 of Table 1. The peak pellet exposure is used to determine the local hydrogen content for the cladding that is needed to determine the acceptable enthalpy rise in the fuel. It is conservative to use the peak pellet exposure without regard to its exact location within the four bundle array because a higher exposure results in higher hydrogen content (Figure 2) and a lower acceptance criterion (Figure 3). It is conservatively assumed that the calculated maximum nodal enthalpy rise occurs at the location of the peak pellet exposure without regard to the fact that the bundle in the four-bundle grouping with the lower exposure tends to produce the highest power rise and associated enthalpy rise. Similarly, the maximum power location axially in the bundle typically occurs above the axial node where the peak pellet exposure occurs and not at the same location as conservatively assumed for this evaluation.

The correlation of hydrogen content to peak pellet exposure shown in Figure 2 was used to obtain the values in row 7 of Table 1. This correlation was previously provided to the NRC staff as slide 15 of Reference [2]. Using these hydrogen values the maximum acceptable fuel enthalpy rise at this location in the core was determined using Figure B-1 from Revision 3 of SRP 4.2. The acceptance curve is plotted here in Figure 3. The digital values for the acceptable fuel enthalpy rises for each of the evaluated cases are provided in row 8 of Table 1. The corresponding calculated enthalpy rises using a conservative adiabatic calculation are provided in row 9. These values are plotted versus static blade worth in the lower left corner of Figure 1. They are also plotted versus hydrogen content in Figure 3 together with the acceptance limit. Note that even the maximum control blade worths in the ESBWR are only about half the amount needed to cause prompt criticality during a postulated CRDA; consequently, the calculated enthalpy rises are quite low and are not correlated to the blade worths.

It is evident from a comparison of the calculated enthalpy rises in row 9 of Table 1 to the acceptance criteria in row 8 that both the initial and equilibrium ESBWR cores have a substantial amount of margin. No clad failures are anticipated for a postulated CRDA even when the maximum expected control blade worths are evaluated using a conservative adiabatic calculation.

The results from the conservative adiabatic evaluation of the ESBWR cores are plotted in the lower left corner of Figure 1. The figure shows how static and dynamic control blade worths are typically related to each other. The dynamic blade worth is defined from a transient calculation as the maximum change in reactivity during the CRDA. The static blade worth is based on the difference between the core eigenvalue for two steady state calculations where one case is with the control blade fully withdrawn and the other case is with the control blade fully inserted.

GEH performs these calculations with PANAC11. The expected change in peak pellet enthalpy can be correlated to either the static or dynamic control blade worth as shown from the population shown in the upper part of the Figure 1 for three operating BWRs at four moderator temperatures and three cycle exposures. This population was evaluated based on realistic dynamic calculations performed with TRACG04. It is the same population previously presented to the NRC staff as slide 10 of Reference [2]. For the initial and equilibrium ESBWR cores, similar realistic TRACG04 dynamic evaluations are not necessary because the control blade worths are so low that it is possible to demonstrate that they do not exceed the limit using a conservative adiabatic calculation performed with PANAC11 (as shown in the lower left part of the figure). Typically, the adiabatic calculations with PANAC11 overestimate the change in enthalpy [[ ]].

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Summary

Compliance with GDC 28 was demonstrated for the initial and an equilibrium ESBWR core by showing that the conservatively-calculated fuel enthalpy rises during CRDAs remain well below the lower bound clad failure limits in Appendix B of Revision 3 to SRP Section 4.2. Below these limits the integrity of the cladding can be assumed so assessment of hypothesized fuel dispersal and consequential energetic pressure pulses in the fluid are not required. The calculated enthalpy rises are conservative because they are based on adiabatic calculations that do not credit the reduction in enthalpy increase due to heat transfer or the negative feedback due to voiding in the coolant. These calculations were performed using the largest expected static control blade worths for a range of temperatures and exposures that span the expected domain for which CRDAs have been postulated. The control blade worth is the single most-important parameter that influences the calculated enthalpy rise. The control blade worths for ESBWR cores are substantially lower than those for operating BWRs. No clad failures are anticipated for a postulated CRDA in the ESBWR even when the maximum expected control blade worths are evaluated using a conservative adiabatic calculation.

For use in assessing ESBWR reload cores, GEH has developed a conservative criterion for the maximum static control blade worth below which the enthalpy rise curve in Appendix B of Revision 3 to SRP Section 4.2 would not be exceeded. This criterion will be applied to future ESBWR reload cores to determine whether additional calculations are needed. Only if necessary, will the enthalpy rises be calculated using either a conservative adiabatic methodology or a best-estimate methodology that has been approved by the NRC.

If necessary, conservative adiabatic calculations will be performed and if the conservatively-calculated enthalpy rises are above the acceptance criteria for fuel rod failure, then realistic calculations that credit heat transfer to the fluid will be performed. The goal of these evaluations will be to demonstrate that the calculated enthalpy rises remain below the criteria curve at which fuel cladding perforations are conservatively presumed to occur. By demonstrating that no cladding failures are predicted, the issues related to release of radioactive materials, presumed fuel dispersal and hypothesized consequential pressure pulses in the fluid do not need to be considered. GEH reserves the right to develop for future usage a method to evaluate the consequences of cladding failure, fuel dispersal and presumed consequential pressure pulses. If such a model is needed, it will be documented and submitted for NRC review and approval prior to its application.

References

[1]. USNRC Standard Review Plan (NUREG-0800), Section 4.2: "Fuel System Design", Revision 3, March 2007.

[2]. NRC Workshop on RIA/RDA; November 9, 2006; GEH/GNF presentation titled "BWR Control Rod Drop Accident (CRDA)".

[3]. Steady-State Nuclear Methods, NEDE-30130-P-A and NEDO-30130-A, April 1985, and for TGBLA Version 06 and PANACEA Version 11, Letter from S.A. Richards (NRC) to G.A. Watford (GE) Subject: "Amendment 26 to GE Licensing Topical Report NEDE-24011-P-A, GESTAR II Implementing Improved GE Steady-State Methods," (TAC NO. MA6481), November 10, 1999.

DCD Impact

DCD Tier 1 Section 2.2.2 deals with the FMCRD hardware. No changes are needed as a result of this RAI response.

For DCD, Tier 2 a new Subsection 4.6.2.1.5 titled "Control Rod Drop Potential Consequences" will be added in DCD Revision 5 as shown in the DCD markups in enclosure 3.

DCD Tier 2 Subsections 15.4.6.5 and 15.4.6.6 will be revised in DCD Revision 5 as shown in the DCD markups in enclosure 3.

Table 1
Detailed Evaluation using Maximum Static Blade Worth Cases

1	DESCRIPTION	UNITS	initial BOC	initial MOC	initial EOC	eq. BOC	eq. MOC	eq. EOC
2	Cycle Type	none	initial	initial	initial	equilibrium	equilibrium	equilibrium
3	Cycle Exposure Point	none	BOC	MOC	EOC	BOC	MOC	EOC
4	Fluid Temperature	C	286	286	286	286	286	80
5	Max Static Blade Worth	%Δk/k	0.262	0.286	0.333	0.345	0.280	0.262
6	Peak Pellet Exposure	GWD/MT	0.0	14.0	24.0	34.0	47.1	57.4
7	Correlated H2 Concentration	ppm	18	46	47	48	69	120
8	Fuel Enthalpy Rise Limit	cal/gm	150	150	150	150	150	95
9	Calculated Fuel Enthalpy Rise	cal/gm	10	1	0	19	14	2
10	Beta	none	6.968E-03	5.809E-03	5.464E-03	6.096E-03	5.593E-03	5.226E-03

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Figure 1: Peak Pellet Enthalpy versus Control Blade Worth

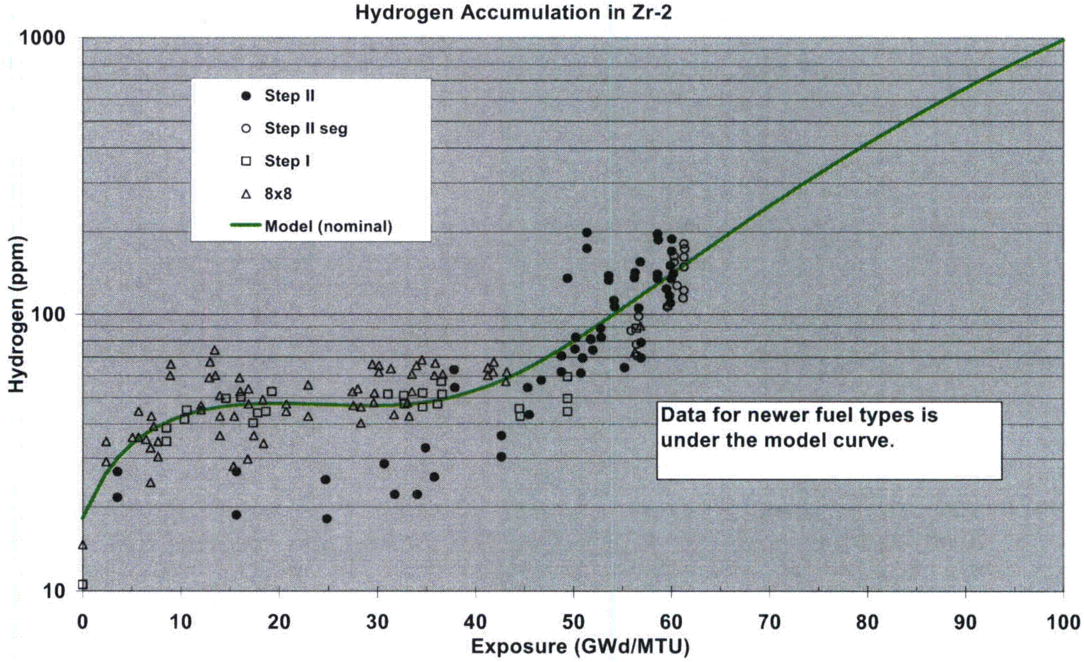

Figure 2: Correlation of Hydrogen Accumulation in Zr-2 Cladding versus Exposure[2]

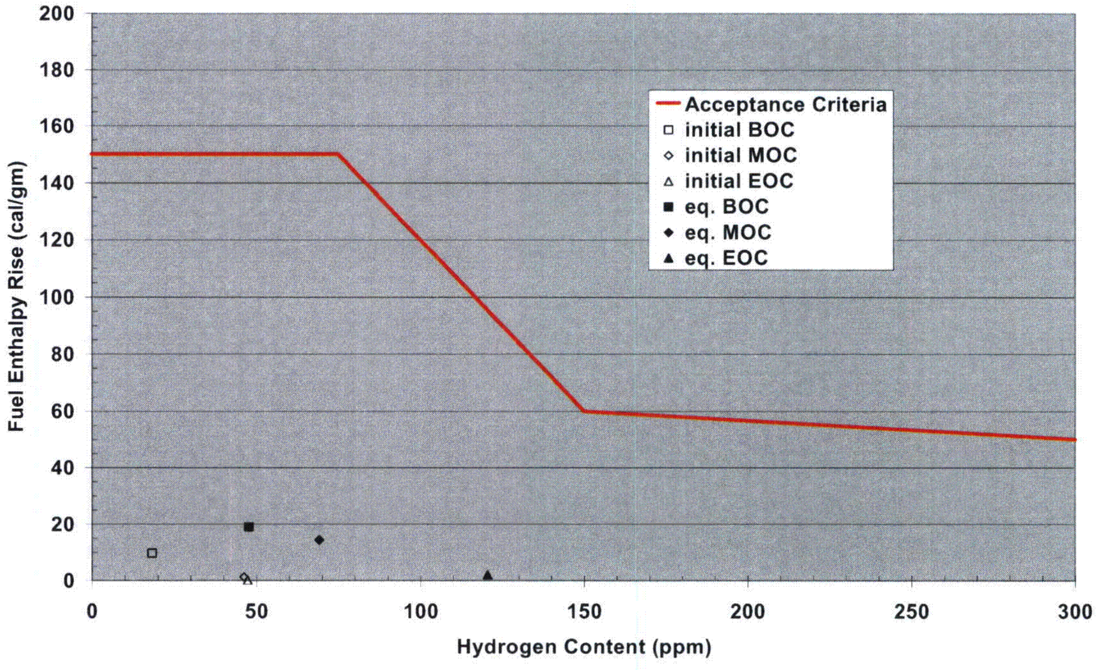

Figure 3: ESBWR Peak Enthalpy Rise versus Acceptance Criteria

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NRC RAI 4.6-38

Compliance with General Design Criterion 28, reactivity limits

Provide the results of a control rod drop accident analysis for the initial core to demonstrate compliance with GDC 28.

In RAI 4.6-23 S02 staff requested that a control rod drop accident analysis be performed for the ESBWR equilibrium core.

From the review of LTR NEDC-33326 staff requests that the same analysis be performed for the initial core. It is sensitive to banked position withdrawal sequence (BPWS), core design, and rod worth. These are core/cycle dependent parameters. It would not be possible to draw conclusions regarding the initial core from the equilibrium core analysis.

GEH Response

The response to RAI 4.6-23 S02 summarizes the results for the initial core as well as the equilibrium core. In addition, the response describes the core/cycle specific process to be used for other ESBWR cores.

DCD Impact

DCD changes made in response to this RAI are described in the response to RAI 4.6-23 S02 (included in this letter).

Enclosure 3

MFN 08-350

Response to Portion of NRC Request for

Additional Information Letters No. 115 and 137

Related to ESBWR Design Certification Application

DCD Markups from the Response to

RAI Numbers 4.6-23 S02 and 4.6-38

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markups may not be fully developed and approved for inclusion in DCD Revision 5.

4.6.2.1.5 Control Rod Drop Potential Consequences

- Even if a postulated Control Rod Drop Accident (CRDA) were to occur in the ESBWR, no clad failures are predicted based on conservative adiabatic calculations using the maximum expected control blade worths.
- Compliance with GDC 28 has been demonstrated for an initial and an equilibrium ESBWR core by showing that the conservatively-calculated fuel enthalpy rises during CRDAs remain well below the lower bound clad failure limits given in Appendix B of Revision 3 to SRP Section 4.2.
- Postulated secondary consequences associated with release of fission gases and fission products, fuel dispersal, flow blockage and energetic increases in coolant pressure do not need to be considered because no clad failures are predicted.
- Cycle-specific confirmatory evaluations will be performed for reload cores to ensure that all current and emerging requirements pertaining to a postulated CRDA are met.

4.6.3 Testing and Verification of the CRDs

4.6.3.1 Factory Quality Control Tests

The quality control specifications and procedures follow the general pattern established for such specifications and procedures in BWRs presently in operation.

Quality control of welding, heat treatment, dimensional tolerances, material verification and similar factors are maintained throughout the manufacturing process to assure reliable performance of the mechanical reactivity control components.

Some of the quality control tests performed on the CRD mechanisms and HCUs are listed below:

- CRD Mechanism Tests
  - Pressure welds on the drives are hydrostatically tested in accordance with ASME codes.
  - Electrical components are checked for electrical continuity and resistance to ground.
  - Drive parts that cannot be visually inspected for dirt are flushed with filtered water at high velocity. No significant foreign material is permitted in effluent water.
  - Each drive is tested for shim (drive-in and -out) motion and control rod position indication.
  - Each drive is subjected to cold scram tests at various reactor pressures to verify correct scram performance.
- HCU Tests
  - Hydraulic systems are hydrostatically tested in accordance with the applicable code.
  - Electrical components and systems are tested for electrical continuity and resistance to ground.
  - Correct operation of the accumulator pressure and level switches is verified.

15.4.6.4 Core and System Performance

The performance of the separation-detection devices and the rod block interlocks virtually preclude the cause of a rod drop accident.

15.4.6.5 Barrier Performance

In the event of a postulated CRDA, no clad failures are predicted based on conservative adiabatic calculations using the maximum expected control blade worths. Analyses performed for an initial and an equilibrium ESBWR core demonstrate that the conservatively-calculated fuel enthalpy rises during CRDAs remain well below the lower bound clad failure limits given in Appendix B of Revision 3 to SRP Section 4.2. Postulated secondary consequences associated with release of fission gases and fission products, fuel dispersal, flow blockage and energetic increases in coolant pressure were not considered because no clad failures are predicted.~~An evaluation of the barrier performance is not made for this accident, because there is no circumstance for which this event could occur.~~

15.4.6.6 Radiological Consequences

No fuel clad failures are predicted for the CRDA because the control blade worths are too low to produce any substantial calculated increase in the fuel rod enthalpy. The radiological consequences for the CRDA are bounded by the assumed 1000 failed fuel rods described in Section 15.3.1.5.~~The radiological analysis is not required.~~

15.4.7 Feedwater Line Break Outside Containment

The feedwater line break containment response evaluation is provided in Section 6.2.

The feedwater line break ECCS capability evaluation is provided in Section 6.3.

The feedwater line break radiological evaluation is as follows:

The postulated break of the feedwater line, representing the largest liquid line outside the containment, provides the envelope evaluation for this type of break. ~~The break is assumed to be~~ An instantaneous, circumferential break of the feedwater line at a location ~~and~~ downstream of the high pressure feedwater heaters and upstream of the outermost containment isolation valve is conservatively assumed. This location corresponds to the highest temperature condition for the Feedwater System and is selected to maximize the fraction of radionuclides in liquid feedwater that become airborne as a result of a feedwater line break.

A more limiting event from a core performance evaluation standpoint (Feedwater Line Break Inside Containment) has been quantitatively analyzed and is presented in Section 6.3. Therefore, the following discussion provides only new information that is not presented in Section 6.3. All other information is cross-referenced to appropriate Chapter 6 subsections.

15.4.7.1 Identification of Causes

A feedwater line break is assumed without ~~the~~ an identified cause ~~being identified~~. The subject piping is designed to high quality~~, to~~ engineering codes and standards, and to seismic environmental requirements.

Enclosure 4

MFN 08-350

Response to Portion of NRC Request for

Additional Information Letters No. 115 and 137

Related to ESBWR Design Certification Application

RAI Numbers 4.6-23 S02 and 4.6-38

Affidavit

GE Hitachi Nuclear Energy

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 08-350, Mr. James C. Kinsey to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letters No. 115 and No. 137– Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 Supplement 2 and 4.6-38, Respectively,*" dated April 14, 2008. The proprietary information in enclosure 1, which is entitled "*Response to Portion of NRC Request for Additional Information Letters No. 115 and 137 Related to ESBWR Design Certification Application – RAI Numbers 4.6-23 S02 and 4.6-38 – 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 details of GEH's evaluation methodology.

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 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 14th day of April 2008.

David H. Hinds
GE Hitachi Nuclear Energy