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Proprietary Notice
This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 2, the balance of this letter may be considered non-proprietary.

MFN 09-333

Docket No. 52-010

June 8, 2009

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

Subject: **Partial Response to NRC RAI Letter No. 320 Related to ESBWR Design Certification Application – DCD Tier 2 Section 3.9 – Mechanical Systems and Components; RAI Numbers 3.9-138 S02 and 3.9-144 S02**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) partial response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) letter number 320 sent by NRC letter dated March 18, 2009 (Reference 1). RAI Numbers 3.9-138 S02 and 3.9-144 S02 are addressed in Enclosure 1. Enclosure 2 contains the DCD changes and changes to NEDE-33313P as a result of GEH's response to these RAIs. Verified DCD changes associated with these RAI responses are identified in the enclosed DCD markups by enclosing the text within a black box.

Enclosure 2 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 3 is the non-proprietary version, which does not contain proprietary information and is suitable for public disclosure.

The affidavit contained in Enclosure 4 identifies that the information contained in Enclosure 2 has been handled and classified as proprietary to GEH. GEH hereby requests that the information in Enclosure 2 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

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NRO

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

Reference:

1. MFN 09-135 Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 320 Related to ESBWR Design Control Document* dated March 18, 2009

Enclosures:

1. Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD Tier 2 Section 3.9 – Mechanical Systems and Components; RAI Numbers 3.9-138 S02 and RAI 3.9-144 S02
2. Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD and LTR Markups RAI Numbers 3.9-138 S02 and RAI 3.9-144 S02 - Proprietary Version
3. Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD and LTR Markups RAI Numbers 3.9-138 S02 and RAI 3.9-144 S02 - Public Version
4. Affidavit

cc:		
	AE Cubbage	USNRC (with enclosures)
	JG Head	GEH/Wilmington (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	eDRF Section	0000-0101-6098 (RAI 3.9-138 S02 & RAI 3.9-144 S02)

Enclosure 1

MFN 09-333

Response to Portion of NRC Request for

Additional Information Letter No. 320

Related to ESBWR Design Certification Application

DCD Tier 2 Section 3.9 –

Mechanical Systems and Components;

RAI Numbers 3.9-138 S02, 3.9-144 S02

NRC RAI 3.9-138 S02

GEH has not submitted the final instrumentation plan for the prototype ESBWR dryer, stating that the final instrumentation types and locations will be determined following their stress analysis of the dryer, which has not yet been completed. GEH is requested to submit the actual instrumentation types and locations, or provide alternate additional information to resolve this issue such as the criteria and methods that will be used to determine instrument types and locations and corresponding ITAAC to verify that the instruments have been installed at appropriate locations.

GEH Response

Sections 2.3.2 and 4.4.2 of NEDC-33408P and Sections 4.4.3.1 and 4.4.4 of NEDC-33408P Supplement 1 provide the criteria and methods that will be used to determine the number and locations of pressure instruments. Appendix 3L of the DCD will be revised to reference these documents and to provide non-proprietary information related to strain gages and accelerometers. NEDE-33313P will be revised to describe the criteria and methods that will be used to determine the number and locations of strain gages and accelerometers. In addition, ITAAC will be added to Tier 1 of the DCD to verify that the instruments have been installed at appropriate locations.

DCD Impact

DCD Tier 1 Section 2.1.1 and Table 2.1.1-3, DCD Tier 2 Appendix 3L and NEDC-33313P will be revised as noted in the attached markups.

NRC RAI 3.9-144 S02

In response to RAI 3.9-144 (a) and (b), the applicant states that a proper distribution of the steam dryer pressure instrumentation is selected to provide a good measure of the acoustic loading through the frequency range of interest. However, the evaluation of the layout of the steam dryer pressure instrumentation locations using the RPV acoustic FEA model is not submitted. Similarly, the applicant states that the strain gages and accelerometers are mounted in locations that provide measurements that are strongly coupled with projected high stress locations. The applicant further states that the specific information utilized to verify the flow-induced vibratory load definition during startup testing will be described in a revision to Topical Report NEDE-33312P. "Steam-Dryer-Acoustic Load Definition." The applicant is requested to submit the following:

(i) Layout of the steam dryer pressure instrumentation locations or additional information on how the instrument locations will be determined and verified;

(ii) Specific information regarding the strain gage and accelerometer mounting locations or additional information on how the instrument locations will be determined and verified; and

(iii) Revised Topical Report NEDE-33312P providing specific information to be used for verifying the FIV load definition during startup testing.

In response to RAI 3.9-144 A (c) and (d), the applicant states that the main steam lines are instrumented to measure the acoustic pressures in the piping. These measurements, along with the steam dryer pressure measurements, are used as input to an acoustic model for determining the pressures acting on the steam dryer. The applicant plans to use this load definition in performing confirmatory structural evaluations. The applicant is requested to provide a detailed description of how the pressures acting on the steam dryer will be determined using the measured acoustic pressures in the main steam lines and on the steam dryer. In addition, the applicant needs to explain how it will account for, (i) the plant noise and the electrical noise, which may be present in the instrumentation system, in determining the acoustic pressure acting in the main steam lines, and, (ii) any circumferential variation in the wall thickness of the main steam lines.

GEH Response

Response to *(i)*: See the response to RAI 3.9-138 S02.

Response to *(ii)*: See the response to RAI 3.9-138 S02.

Response to *(iii)*: Topical Report NEDE-33312P will not be revised to provide specific information to be used for verifying the FIV load definition during startup testing. Instead, the methodology described in NEDC-33408P and NEDC-33408P, Supplement 1, will be used. The DCD will be revised to replace the reference to NEDE-33312P with a reference to NEDC-33408P and NEDC-33408P, Supplement 1. DCD Tier 2 Appendix 3L Section 3L-4.6 describes that pressure strain and accelerometer data will be monitored during startup testing to assure that the dryer stress is maintained within acceptance limits and that following power ascension the dryer FIV loads will be regenerated with test data and the calculated dryer response and stress are reconciled against the measured data. The commitment to revise NEDE-33312P was made in the revised responses to RAIs 3.9-62, 3.9-63, 3.9-135 and 3.9-144 (MFN Letter 08-322) and is superseded by this response.

Determining Steam Dryer Pressures Using Main Steamline and Dryer Acoustic Pressures

NEDC-33408P, Supplement 1, describes the methodology for determining the pressures acting on the steam dryer using measured acoustic pressure in the main steam lines. NEDC-33408P describes the methodology for determining the pressures acting on the steam dryer using measured acoustic pressure on the dryer, and NEDC-33408P and NEDC-33408P Supplement 1 benchmark the methodology against plant data. DCD Tier 2 Appendix 3L will be revised to reference these documents. Note that although measured data from both steam dryer and main steam line instrumentation may be available for some plants, only the data judged to be most accurate will be used to calculate steam dryer pressure loads.

Accounting for Electrical and Plant Noise

Zero volt excitation data will be captured to determine the electrical noise present at the plant. The averaged 0-volt power spectral density (PSD) data will be plotted for each strain gage ring and compared with the bridge excitation data to separate the electrical sources from the acoustical ones. Noise associated with recirculation pump vane pass frequency is not an issue since the ESBWR does not use recirculation pumps. Plant noise (other than potentially the 60 Hz line noise) is typically not significant. DCD Tier 2 Appendix 3L will be revised to provide this additional information.

Accounting for Circumferential Variation in the Wall Thickness and Diameter

Variations in pipe wall thickness and diameter will be accounted for as described in NEDC-33408P, Supplement 1 [Reference 3L-9]. At MSL strain gage installation locations, pipe thickness and diameter measurements are taken to determine the local dimensions, variation in dimensions, and minimize uncertainty due to dimensional tolerance. DCD Tier 2 Appendix 3L will be revised to provide this additional information.

DCD Impact

DCD Tier 2 Sections 3L.4.6 and 3L.6 will be revised as noted in the attached markup. Note that References 3L-1, 3L-5, 3L-6 and 3L-8 will be revised to change "General Electric Company" to "GE Hitachi Nuclear Energy."

Enclosure 3

MFN 09-333

Response to Portion of NRC Request for

Additional Information Letter No. 320

Related to ESBWR Design Certification Application

DCD and LTR Markup for RAI Numbers:

3.9-138 S02 and 3.9-144 S02

Public Version

determined by the hammer test are used to validate the finite element modal analysis and determine the uncertainty in the finite element model predictions of the modal response.

The impact hammer test is performed following final assembly of the steam dryer. The tests are performed with the steam dryer resting on simulated support blocks similar to the way the steam dryer is seated inside the reactor vessel.

Two types of impact tests are performed on the steam dryer: a (1) Dry hammer test, and a (2) Wet hammer test with the steam dryer skirt and drain channels partially submerged in different water levels (to approximate in-reactor water level). Both tests are conducted in ambient conditions. Temporary bondable accelerometers are installed at predetermined locations for these tests. An instrumented hammer is used to excite the steam dryer at several pre-determined locations and the hammer impulse force and the structural responses from the accelerometers are recorded on a computer. The data is then used to compute experimental mode shape, frequency and damping of the instrumented steam dryer components using appropriate software. The temporary sensors are then removed and the steam dryer is cleaned prior to installation in to the reactor vessel.

The steam dryer vibration sensors consist of strain gauges, accelerometers and dynamic pressure sensors, appropriate for the application and environment. A typical list of vibration sensors with their model numbers is provided in Table 3L-3. The selection and total number of sensors is based on past experience of similar tests conducted on other BWR steam dryers. These sensors are specifically designed to withstand the reactor environment. The pressure instrument locations are selected to provide a good measure of the acoustic loading through the frequency range of interest. A proper distribution of the steam dryer pressure instruments facilitates accurate assessments of FIV loads. The layout of the steam dryer pressure instrument locations ~~are~~is evaluated using the RPV acoustic FEA Model. The distribution of steamline instruments ~~are~~is determined using the Plant Based Load Evaluation model (Reference 3L-8) to provide an adequate measure of the acoustic loading through the frequency range of interest. The instrument layout permits steam dryer load development with steam dryer data alone, steamline data alone, or a combination using both sets of data. The approach used to determine the number and locations of pressure instruments is described in Subsections 2.3.2 and 4.4.2 of Reference 3L-8 and Subsections 4.4.3.1 and 4.4.4 of Reference 3L-9.

The steam dryer startup test and monitoring power ascension limits are developed on a similar basis as the monitoring limits used for recent extended power uprate replacement steam dryers. The power ascension limits are based on the final FIV analysis performed for the as-built steam dryer. Strain gages and accelerometers are used to monitor the structural response during power ascension. Accelerometers are also used to identify potential rocking and to measure the accelerations resulting from support and vessel movements. The approach used to determine the number and locations of the strain gages and accelerometers is described in Section 9.0 of Reference 3L-6.~~The strain gage and accelerometer instruments are mounted in locations that provide measurements that are strongly coupled with projected high stress locations. Additional strain gauges and accelerometers are used as needed to provide an overall validation of the structural finite element model.~~ Specific information utilized to verify the FIV load definition during startup testing ~~will be~~is described further in ~~a revision to~~ Reference 3L-8~~5~~ and 3L-9.

Each of the sensors are pressure tested in an autoclave prior to assembly and installation on the steam dryer. An uncertainty analysis is performed to calculate the expected uncertainty in the measurements.

Prior to initial plant start-up, strain gauges are resistance spot-welded directly to the steam dryer surface. Accelerometers are tack welded to pads that are permanently welded to the steam dryer surface. Surface mounted pressure sensors are welded underneath a specially designed dome cover plate to minimize flow disturbances that may affect the measurement. The dome cover plate with the pressure transducer are welded to an annular pad that is welded permanently to the steam dryer surface. The sensor conduits are routed along a mast on the top of the steam dryer and fed through the RPV instrument nozzle flange to bring the sensor leads out of the pressure boundary. Sensor leads are routed through the drywell to the data acquisition area outside the primary containment.

Pressure transducers and accelerometers are typically piezoelectric devices, requiring remote charge converters that are located in junction boxes inside the drywell. The data acquisition system consists of strain gauges, pressure transducers and accelerometer signal conditioning electronics, a multi-channel data analyzer and a data recorder. The vibration data from all sensors is recorded on magnetic or optical media for post processing and data archival. The strain gauges, accelerometer and pressure transducers are field calibrated prior to data collection and analysis. The temporary vibration sensors are removed after the first outage.

In addition to the instrumentation on the steam dryer, the main steamlines are instrumented in order to measure the acoustic pressures in the main steamlines. The main steamline pressure measurements with the steam dryer pressure measurements are used as input to an acoustic model for determining the pressures acting on the steam dryer in order to provide a pressure load definition for use in performing confirmatory structural evaluations. Reference 3L-9 describes the methodology for determining the pressures acting on the steam dryer using measured acoustic pressure in the main steam lines. Reference 3L-8 describes the methodology for determining the pressures acting on the steam dryer using measured acoustic pressure on the dryer. Zero volt excitation data is captured to determine the electrical noise present at the plant. The averaged 0-volt power spectra density (PSD) data is plotted for each strain gage ring and compared with the bridge excitation data to separate the electrical sources from the acoustical ones. Noise associated with recirculation pump vane pass frequency is not an issue since the ESBWR does not use recirculation pumps. Plant noise (other than potentially the 60 Hz line noise) is typically not significant. For MSL strain gage locations, uncertainty due to variations in pipe wall thickness and diameter are accounted for as described in Reference 3L-9. At piping installation, pipe thickness and diameter measurements are taken to determine the local dimensions and variations in dimensions and to minimize uncertainty due to dimensional tolerances.

During the startup testing of the first ESBWR unit the main steamline pressure measurements are benchmarked with the steam dryer pressure measurements. The acoustic model predictions at the steam dryer locations where stream dryer pressure instrumentation is installed are benchmarked to the actual measured data from the steam dryer installed pressure instrumentation. This allows ESBWR-specific uncertainty and bias values for the main steamline instrumentation based load definition to be developed. This information will then be applied to non-prototype ESBWRs, structural response, however, the instruments are located where the model most accurately predicts the strain and acceleration response and away from regions with high gradients where a small change in sensor location results in a large change in the measured response.

In areas away from discontinuities, the major contribution for prediction uncertainty from the structural model will be due to variations in the frequency response resulting from material tolerances and the steam dryer fabrication. The frequency response uncertainty is addressed by the varying time step analyses. This included nine load cases that replicate frequency response variation of 0%, ±2.5%, ±5%, ±7.5%, ±10%. For this uncertainty assessment the evaluation assumes the response predictions for each of the 9 cases had equal probility of occurrence. Therefore for each instrument locations there were 45 prredictions; 5 locations and 9 load cases.

The instrument loop uncertainty is used in this assessment. This bounds the strain gage and accelerometer loop uncertainties for the instruments and data acquisition equipment to be used during testing. This uncertainty was then combined with the standard deviation of the 45 predictions by the square root sum of the squares (SRSS) method. The acceptance limit was then defined as the SRSS of the standard deviation of the prediction and the measument uncertainty.

The fatigue analysis performed for the ESBWR steam dryer will use a fatigue limit stress amplitude of 93.8 MPa (13,600 psi). For all critical locations, including the outer bank hood component, which are subjected to higher pressure loading in the region of the main steamlines, the fatigue stress amplitude limit is 74.5 MPa (10,800 psi). The limit is justified because the steam dryer is a nonsafety-related component, performs no safety-related fuctions, and is only required to maintain its structural integrity (no loose parts generated) for normal, transient and accident conditions.

3L.6 REFERENCES

3L-1 G~~eneral~~ E~~lectric~~ ~~Company~~Hitachi Nuclear Energy, "ESBWR Reactor Internals Flow Induced Vibration Program", NEDE-33259P, Revision 1, Class III (Proprietary), December 2007, and NEDO-33259, Class I (Non-proprietary), December 2007.

3L-2 General Electric Company, "BWR Steam Dryer Integrity", SIL 644 Revision 2, August 30, 2006.

3L-3 ANSYS Engineering Analysis System User's Manual, applicable revision.

3L-4 Elements of Vibration Analysis, Leonard Meirovitch, McGraw Hill Book Co., 1975.

3L-5 G~~eneral~~ E~~lectric~~ ~~Company~~Hitachi Nuclear Energy, "Steam Dryer - Acoustic Load Definition," NEDE-33312P, Class III (Proprietary), November 2007, and NEDO-33312, Class I (Non-Proprietary), November 2007.

3L-6 G~~eneral~~ E~~lectric~~ ~~Company~~Hitachi Nuclear Energy, "Steam Dryer - Structural Evaluation," NEDE-33313P, Class III (Proprietary), November 2007, and NEDO-33313, Class I (Non-Proprietary), November 2007.

3L-7 (Deleted)

3L-8 ~~General Electric Company~~Hitachi Nuclear Energy, "ESBWR Steam Dryer – Plant Based Load Evaluation Methodology," NEDC-33408P, Class III (Proprietary), February 2008, and NEDO-33408, Class I (Non-proprietary), February 2008.

3L-9 GE Hitachi Nuclear Energy, "ESBWR Steam Dryer - Plant Based Load Evaluation Methodology Supplement 1," NEDC-33408P, Supplement 1, Class III (Proprietary), October 2008, and NEDO-33408, Supplement 1, Class I (Non-Proprietary), October 2008.

a3. The RPV and its components identified in Table 2.1.1-1 (shroud, shroud support, top guide, core plate, control rod guide tubes and fuel supports) as ASME Code Section III are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

(4) Pressure boundary welds in components identified in Table 2.1.1-1 as ASME Code Section III meet ASME Code Section III requirements.

(5) The components identified as ASME Code Section III retain their pressure boundary integrity at their design pressure.

(6) The sSeismic Category I equipment, including associated piping, identified in Table 2.1.1-1 can withstand seismic design basisCategory I loads without loss of safety-related function.

(7) RPV surveillance specimens are provided from the forging material of the beltline region and the weld and heat affected zone of a weld typical of those adjacent to the beltline region. Brackets welded to the vessel cladding at the location of the calculated peak fluence are provided to hold the removable specimen holders and a neutron dosimeter in place.

(8) The RPV internal structures listed in Table 2.1.1-1 (chimney and partitions, chimney head and steam separators assembly, and steam dryer assembly) must meet the limited provisions of ASME Code Section III regarding certification that these components maintain structural integrity so as not to adversely affect RPV core support structure.

(9) The initial fuel to be loaded into the core will withstand flow-induced vibration and maintain fuel cladding integrity during operation.

(10) The fuel bundles and control rods intended for initial core load have been designed and constructed in accordance with the principal design requirements.

(11) The reactor internals arrangement will accommodate conform to the fuel bundle, instrumentation, neutron sources, and control rod locations shown on Figure 2.1.1-2.

(12) The number and locations of pressure sensors installed on the steam dryer for startup testing ensure accurate pressure predictions at critical locations.

(13) The number and locations of strain gages and accelerometers installed on the steam dryer for startup testing are capable of monitoring the most highly stressed components, considering accessibility and avoiding discontinuities in the components.

(14) The number and locations of accelerometers installed in the steam dryer for startup testing are capable of identifying potential rocking and measuring the accelerations resulting from support and vessel movements.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.1.1-3 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria for the Reactor Pressure Vessel Systemand Internals.

Table 2.1.1-3

ITAAC For The Reactor Pressure Vessel ~~System~~and Internals

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
12. The number and locations of pressure sensors installed on the steam dryer for startup testing ensure accurate pressure predictions at critical locations.	An analysis of the number and locations of pressure sensors installed on the steam dryer for startup testing will be performed.	Report(s) exist and conclude that the number and locations of pressure sensors installed on the steam dryer for startup testing ensure accurate pressure predictions at critical locations.
13. The number and locations of strain gages and accelerometers installed on the steam dryer for startup testing are capable of monitoring the most highly stressed components, considering accessibility and avoiding discontinuities in the components.	An analysis of the number and locations of strain gages and accelerometers installed on the steam dryer for startup testing will be performed.	Report(s) exist and conclude that the number and locations of strain gages and accelerometers installed on the steam dryer for startup testing are capable of monitoring the most highly stressed components, considering accessibility and avoiding discontinuities in the components.
14. The number and locations of accelerometers installed in the steam dryer for startup testing are capable of identifying potential rocking and measuring the accelerations resulting from support and vessel movements.	An analysis of the number and locations of accelerometers installed on the steam dryer for startup testing will be performed.	Report(s) exist and conclude that the number and locations of accelerometers installed in the steam dryer for startup testing are capable of identifying potential rocking and measuring the accelerations resulting from support and vessel movements.

9.0 STARTUP TEST INSTRUMENTATION FOR MONITORING DRYER RESPONSE

The ESBWR steam dryer is instrumented with temporary vibration sensors to obtain flow induced vibration data during power operation. The primary function of this vibration measurement program is to verify that the steam dryer can adequately withstand stresses from flow induced vibration forces for the design life of the steam dryer. Strain gages and accelerometers are used to monitor the structural response during power ascension and to validate the fatigue stress predictions in Section 7 for normal operation. Accelerometers are also used to identify potential rocking and to measure the accelerations resulting from support and vessel movements.

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MFN 09-333

Enclosure 4

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, David H. Hinds, state as follows:

(1) I am the Manager, New Units Engineering, GE Hitachi Nuclear Energy ("GEH"), 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 2 of GEH letter MFN 09-333, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, entitled *Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD Tier 2 Section 3.9 – Mechanical Systems and Components; RAI Numbers 3.9-138 S02 and 3.9-144 S02,* dated June 8, 2009. The GEH proprietary information in Enclosure 2, which is entitled *Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD and LTR Markups RAI Numbers 3.9-138 S02 and RAI 3.9-144 S02 - Proprietary Version* is delineated by an [[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. A non-proprietary version of this information is provided in Enclosure 3, *Response to Portion of NRC RAI Letter No. 320 Related to ESBWR Design Certification Application - DCD and LTR Markups RAI Numbers 3.9-138 S02 and RAI 3.9-144 S02 - Public Version.*

(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 2.390(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 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 detailed GE ESBWR design information. GE utilized prior design information and experience from its fleet with significant resource allocation in developing the system over several years at a substantial 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 8th day of June, 2009.

David H. Hinds
GE-Hitachi Nuclear Energy Americas LLC