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<u>*Proprietary Notice*</u>
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 06-350 Supplement 3 Docket No. 52-010

June 15, 2007

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-2 S01 and 4.4-39 S01**

Enclosure 1 contains GHNEA's response to the subject NRC RAIs transmitted via the Reference 1 letter.

Enclosure 1 contains GHNEA proprietary information as defined by 10 CFR 2.390. GHNEA 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 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GHNEA. GHNEA hereby requests that the information of Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

D068

NRO

Reference:

1. MFN 06-288, Letter from U. S. Nuclear Regulatory Commission to Mr. David H. Hinds, *Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application,* August 16, 2006.

Enclosures:

1. MFN 06-350, Supplement 3 - Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-2 S01 and 4.4-39 S01 – GE Proprietary Information
2. MFN 06-350, Supplement 3 - Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-2 S01 and 4.4-39 S01 – Non-Proprietary Version
3. Affidavit – James C. Kinsey – dated June 15, 2007

cc:	AE Cubbage	USNRC (with enclosures)
	DH Hinds	GHNEA Wilmington (with enclosures)
	BE Brown	GHNEA Wilmington (with enclosures)
	eDRF	0000-0064-6570 and 0000-0068-6206

Enclosure 2

MFN 06-350 Supplement 3

Response to Portion of NRC Request for

Additional Information Letter No. 53

Related to ESBWR Design Certification Application

RAI Numbers 4.3-2 S01 and 4.4-39 S01

Non-Proprietary Version

NRC RAI 4.3-2 S01

Comments on response to RAI 4.3-2

Part (a) of the response states that the in-channel void fraction expected for the ESBWR is similar to those in-channel void fractions of those plants included in NEDC-33239P as an update to the experience database. These in-channel void fraction ranges, depicted for the ESBWR are within the same range as those experienced for high power density fuels in extended power uprated (EPU) plants, labeled as A through E in NEDC-33239P. These plants form the experience database for validation of the lattice depletion and core simulator codes, as applied to the ESBWR. Part (d) of the response indicates that core follow data from plants A through E are applicable to the expected conditions for the ESBWR core and fuel design. Part (b) of the response indicates that the associated biases and uncertainties remain valid for the ESBWR.

The uncertainty analyses applied in NEDC-33237P is based on NRC-approved methodologies in NEDC-32694P-A. The staff does not find this methodology acceptable for application to EPU plants, or plants with normal conditions of operation similar to currently operating BWRs with expanded operating domains. Therefore, the staff does not find that the response adequately justifies the current uncertainty analyses based on the database referenced.

Per the conditions of NEDC-32601P-A, the following actions must be taken to apply the approved methodology for power distribution uncertainties for SLMCPR determination. The TGBLA fuel rod power calculational uncertainty should be verified when applied to new fuel designs. The effect of the correlation of rod power calculation uncertainties should be reevaluated to insure the accuracy of the R-factor uncertainty when the methodology is applied to a new fuel lattice.

The 3D-MONICORE bundle power calculational uncertainty should be verified when applied to new fuel and core designs The uncertainty analysis in NEDC-33237P references a power peaking uncertainty of [[ ]] *value quoted in NEDC-33239P. This value is inconsistent with the value of [[ ]] referenced in NEDC-33173P, based on the* [[ ]].

Explain this inconsistency. Provide the value for local (pin) peaking factor uncertainty based on the MCNP and TGBLA06 calculations provided in NEDC-33239P using the [[ ]] *as described in Section 2.2.1.2 of NEDC-33173P, taking into account manufacturing and channel bow uncertainties.*

FLN 2001-017 dated October 1, 2001, details the applicability of the R-factor methodology in NEDC-32505P-A to GE14 fuel lattices. Provide an explanation for the applicability of the methodology for the same lattice with reduced flow conditions relative to currently operating BWRs with GE14 fuel. Evaluate the R-factor uncertainty based on the local (pin) power peaking uncertainty calculated based on the [[ ]].

The bundle power calculational uncertainty in NEDC-33237P is based strictly on the value quoted in NEDC-32601P-A. The justification for this uncertainty is that the calculated bundle uncertainties from NEDE-33197P are reportedly lower. Table 9-14 in NEDE-33197P quotes a bundle power uncertainty of [[ ]] *for the gamma thermometer configuration proposed for the ESBWR core. Explain why* [[ ]] *is used in NEDC-33237P, while* [[ ]] *is* *calculated in NEDE-33197P. NEDE-33197P recommends the use of the [[ ]] value in safety limit analyses, explain this discrepancy. Describe the components of the [[ ]] in terms of the [[ ]] uncertainty, the [[ ]] uncertainty, the [[ ]] uncertainty, and the additional uncertainties arising from the use of [[ ] discrete gamma thermometers instead of continuous TIP instrumentation for power shape monitoring, calibration, and adaption within 3D-MONICORE. Specifically describe the determination of the GT to nTIP Bundle Uncertainty. Provide an analysis showing the bundle power calculational uncertainty applying the [[ ]] for the [[ ]] uncertainty. The value of the [[ ]] uncertainty of [[ ]] in NEDC-33173P is inconsistent with the value of [[ ]] shown in Table 9-14 of NEDE-33197P.*

Provide an evaluation of the exposure dependent OLMCPR based on uncertainty analyses consistent with the prescriptions in NEDE-33197P.

NEDC-33242P does not describe how local power peaking uncertainties are taken into account for the MLHGR limit. Provide an evaluation of the exposure dependent MLHGR limit including local (pin) power peaking uncertainties that are consistent with the procedures quoted in Section 2.2.1.2 of NEDC-33173P. Update NEDE-33197P, NEDC-33237P, NEDC-33239P, NEDC-33242P, and the DCD accordingly.

GE Response

Paragraph 5: *Explain this inconsistency.*

The [[ ]] uncertainty for the peak rod power uncertainty quoted in NEDC-33239P is appropriate and has been confirmed to be slightly conservative relative to the nominal value of [[ ]] calculated for the specific ESBWR lattices used for the DCD analyses. The [[ ]] value predates the interim methods. [[

]] GE reserves the right to apply lower values consistent with the recent data once the NRC staff has had time to review that data and agree that it confirms that uncertainties historically used for licensing purposes are actually conservative and concur that use of the conservative interim process is unnecessary. If the interim process as defined in NEDC-33173P is applied to the specific ESBWR lattices used in the DCD calculations, a maximum value of [[ ]] for the peak rod power uncertainty is obtained that bounds all the lattices. This is lower than the generic [[ ]] rod power uncertainty that was conservatively determined for the operating BWR fleet following the interim methods process. How these values impact the R-factor uncertainty is discussed in subsequent paragraphs.

Paragraph 6: *Provide an explanation of the applicability...with reduced flow conditions*

The peak rod power uncertainty value of [[ ]] quoted in the previous paragraph for the specific ESBWR lattices was calculated considering only the lattice evaluations at [[ ]] voids to allow the number to be compared to the NEDC-32601P-A value of [[ ]] that has been obtained from a much larger dataset for the operating BWR fleet. The specific ESBWR lattices were also evaluated at [[

]]. Inclusion of the specific ESBWR lattice evaluations at [[ ]] Consequently, the [[ ]] value calculated using only lattice evaluations at [[ ]] is conservative with respect to higher power to flow conditions expected in the ESBWR.

<u>Paragraph 6: *Evaluate the R-factor uncertainty*</u>

The [[ ]] peak rod power uncertainty specific to the ESBWR lattices was obtained by applying the interim process. This value, together with the additional [[ ]] random uncertainty due to manufacturing, results in a total random uncertainty of [[ ]]. The higher uncertainty value of [[ ]] was used to calculate the R-factor uncertainty together with a manufacture uncertainty of [[ ]], a bow uncertainty of [[ ]] and a gradient uncertainty of [[ ]]. These inputs produce an R-factor uncertainty lower than the conservative [[ ]] generic R-factor uncertainty that was used in SLMCPR analysis for the ESBWR.

<u>Paragraph 7: *Explain why [[ ]] is used (for the bundle power uncertainty).*</u>

NEDE-33197P provided results for three in-plant tests of GT sensors, which are Limerick 2, Tokai 2 and Kashiwazaki-Kariwa 5 (K-5). Of these three, NEDE-33197P estimated the bundle power uncertainty based on the Tokai 2 and K-5 tests. Of these two, NEDE-33197P recommended use of the Tokai 2 results because it was more conservative relative to the K-5 results, which was a [[ ]] and [[ ]] bundle power uncertainty respectively. At the time, NEDE-33197P did not consider continued use of the historical [[ ]] bundle power uncertainty, as documented in Section 4 of NEDC-32694P-A. GE believes that the historical [[ ]] bundle power uncertainty is justified for GT sensors based on NEDE-33197P.

The Tokai-2 in plant test only utilized two GT strings while the K-5 in plant test utilized seven GT strings. In the following table, an estimation of the total bundle power uncertainty per GT string is obtained using the information reported as estimated total bundle power uncertainty from these two in-plant testing cases. Note that the K-5 uncertainty was increased from the value reported in Table 9-15 by including the "GT to n-TIP" Bundle Uncertainty [[ ]]. This change is justified because in both cases the comparison was made with respect to n-TIP instruments.

Table 4.3-2S01-1. Estimated Total Uncertainty per Gamma Thermometer String.

	Tokai-2	K-5	
Number of GT Strings	2	7	
n-TIP	Y	Y	
γ-TIP	N	N	
GT to n-TIP Bundle Uncertainty	[[ ]]	[[ ]]	
Estimated Total Uncertainty	[[ ]]	[[ ]]	
Estimated Total Uncertainty/ GT String	[redacted]		[[ ]]

The total uncertainty per GT string is less than the uncertainty of [[ ]] reported in NEDC-33237P. Therefore, GE considers that this uncertainty of [[ ]] can be applied to the ESBWR in order to maintain this historic value, which is based on a larger dataset instead of a lower value that is based on a smaller dataset.

Paragraph 7: *Describe the components of the* [[ ]]

NEDE-33197P Tables 9-14 and 9-15 list the TIP Integral (i.e. four bundle power), the Four Bundle Power Distribution (power allocation) along with the GT Integral Update and two failed GT mechanisms (update) uncertainties for the Tokai 2 and K-5 in-plant tests, respectively, based on use of [[4{3}]] discrete GT sensors per GT string. Because the K-5 bundle powers are based on gamma scan data, the gamma scan data provides the total bundle power uncertainties, which includes the TIP Integral and the Four Bundle Power Distribution uncertainties. Hence the gamma scan total bundle power uncertainty is listed in Table 9-15 as the TIP Integral uncertainty and the Four Bundle Power Distribution is noted as being included in the TIP Integral uncertainty.

Paragraph 7: *Specifically describe the determination of the* [[ ]].

NEDE-33197P Section 7.2.5.1 discusses the use of the differences between GT and n-TIP readings to determine the GT to n-TIP bundle uncertainty. The value of the GT to nTIP Bundle uncertainty is obtained from Tables 7-3 and 7-4 in NEDE-33197P as the maximum average of the standard deviations for the nine GT sensors and for near rated power cases (above 95%P).

Paragraph 7: *Provide an analysis showing the bundle power calculational uncertainty. Explain inconsistency in reported* [[ ]] *uncertainties.*

[[

]] When applied to the bundle power allocation uncertainty, the value of [[ ]] is increased to [[ ]]. Using this estimated bundle power allocation uncertainty of [[ ]], the estimated total uncertainty for the Tokai-2 testing becomes [[ ]] by using the same error dissipation method as in NEDE-33197P. Note that for K5 uncertainty analysis, the UTL approach is not applicable since the uncertainties are obtained through gamma scan comparisons. An update of the previous table provides the uncertainty analysis showing the bundle power calculational uncertainty applying the UTL approach for the bundle power allocation uncertainty when applicable. The result is still bounded by the [[ ]] proposed uncertainty for the ESBWR.

Table 4.3-2S01-2. Estimated Total Uncertainty per Gamma Thermometer String. UTL Approach used for bundle power allocation uncertainty.

	Tokai-2	K-5	
Number of GT Strings	2	7	
n-TIP	Y	Y	
γ-TIP	N	N	
GT to n-TIP Bundle Uncertainty	[[ ]]	[[ ]]	
Estimated Total Uncertainty	[[ ]]	[[ ]]	
Estimated Total Uncertainty/ GT String	[redacted]		[[ ]]

Paragraph 8: *Provide an evaluation of the exposure dependent OLMCPR.*

As presented in the previous paragraphs, the proposed ESBWR total bundle power uncertainty of [[ ]] is conservative relative to the total power uncertainty per GT string based on NEDE-33197P; therefore, the methodology for the determination of the exposure dependent OLMCPR for the ESBWR presented in NEDC-33237P remains applicable.

Paragraph 9: *Provide an evaluation of the exposure dependent MLHGR limit.*

The local (pin) peaking factor uncertainty of [[ ]] referenced in Section 2.2.1.2 of NEDC-33173 is included in the LHGR uncertainty in Table 2-11 of Section 2.4.2. The resulting revised total LHGR uncertainty was [[ ]] that is bounded by the licensing value of [[ ]].

Paragraph 9: *Updates*

Affected Documents

NEDE-33197P, Section 9: Revision 1 scheduled September 28, 2007

- Discussion in this section will eliminate the recommendation for the use of the total bundle power uncertainty based on the sole comparison with Tokai 2 In-plant testing case (page 178).
- Table 9-15 will be revised to present a total uncertainty calculated with the "GT to nTIP" uncertainty of [[ ]].
- A new summary table will be added presenting the total bundle power uncertainty for the in-plant testing cases and showing the number of GT string used in each case.

NEDC-33237P, Section 5.10: Revision 3 scheduled September 28, 2007

- The [[ ]] value in the second paragraph first sentence will be replaced with the revised value of [[ ]] due to including the [[ ]] GT to n-TIP Bundle Uncertainty

There are no changes to the ESBWR DCD as a result of this RAI.

NRC RAI 4.4-39 S01

It is not clear from the response if the TRACG calculations were performed based on a supplied PANACEA Wrap-up file. In which case, these calculations may not represent a fully independent analysis. The response should be modified to include a qualitative discussion of the mechanisms through which thermal hydraulic communication occurs through the liquid bypass, and subsequently ensures that the core outlet pressure is nearly uniform across the core. Provide a simple figure showing the liquid water level in the bypass relative to the top of the fuel bundles. Provide the height difference between the top of the bundle and the liquid water level.

GE Response

TRACG uses only the core neutronics information from the PANACEA wrap-up file to determine the bundle/channel power. The thermal hydraulics model of TRACG is much more rigorous and detailed, as discussed below, compared to that used for PANACEA.

Figure 4.4-39 S01-1 shows the typical 3-D TRACG vessel nodalization used for the steady state and transient (i.e., AOOs, ATWS, etc.) calculations. Here the VESSEL component has been divided into [[ ]] The reactor core is located between [[ ]] CHAN components represent all the fuel assemblies [[ ]] of the ESBWR. Each CHAN component is also divided into a large number of axial nodes or computational cells. The core bypass region is modeled by the 3-D vessel component between [[ ]], with reduced free volume because of the presence of the CHAN components. However, the fluid in the core bypass region can flow in all three, namely, vertical, radial and azimuthal, directions. The chimney region, including the partitions, starts from [[ ]]. Because of the partitions, the flow in the chimney is [[ ]]. Fluid mixes again in [[ ]] before entering the standpipes of the steam separators.

Since TRACG models the entire reactor vessel, the natural circulation flow rate through the reactor core is a result of the TRACG calculation. For PANACEA, however, the user has to provide the core inlet flow rate. This alone shows that the TRACG and PANACEA calculations are two independent and separate calculations. It should also be realized that the PANACEA and TRACG codes are used iteratively and consistently to obtain the final nuclear and thermal hydraulic results or information. PANACEA provides the nuclear information or wrapup to the TRACG, whereas TRACG provides the core inlet flow rate to the PANACEA.

The same reference TRACG case, used to prepare the response to the original NRC RAI 4.4-39 (Reference 4.4-39 S01-1), has been re-examined to respond to the other parts of this Supplemental RAI. Please note that the thermal hydraulic communication among the core channel, core bypass and the chimney occurs at the junction between [[ ]], and this communication ensures that the core outlet pressure is nearly uniform as discussed in Reference 4.4-39 S01-1. Further examination of steady state void fractions and axial upward liquid velocities in the core channel, core bypass and chimney indicates that no liquid water level is formed in the core bypass or the chimney. Figures 4.4-39 S01-2 and 4.4-39 S01-3 serve as examples of void fractions and axial liquid velocities computed by TRACG in one azimuthal sector (C1). Similar results were found in other azimuthal sectors.

[[

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Figure 4.4-39 S01-1 Typical TRACG Vessel Nodalization for ESBWR

[[

Figure 4.4-39 S01-2 TRACG Void Fractions in Core Channels, Core Bypass and Chimney in Three Radial Rings of the Vessel

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[[

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Figure 4.4-39 S01-3 TRACG Upward Liquid Velocities in Core Channels, Core Bypass and Chimney in Three Radial Rings of the Vessel

Note that in Figures 4.4-39 S01-1 and 2, BAF stands for "Beginning of Active Fuel" and TTG stands for "Top of Top Guide". At the TTG (junction of [[ ]]), thermal hydraulic communication occurs among the core channels, core bypass and the chimney. Also, the magnitudes of void fractions and liquid velocities are such that no water level is formed anywhere inside the core shroud (solid boundary between [[ ]]).

One interesting phenomenon is observed [[

]]

[[

]]

Figure 4.4-39 S01-4 Radial Liquid Velocity at Core Bypass at Various Vessel Levels

Affected Documents

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

References:

4.4-39 S01-1 GE Energy Letter # MFN 06-350 dated September 29, 2006, to USNRC, "Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – DCD Chapter 4 and GNF Topical Reports – RAI Numbers 4.3-2, 4.3-5, 4.4-25, 4.4-30, 4.4-35, 4.4-39, 4.4-51."

Enclosure 3

MFN 06-350 Supplement 3

Response to Portion of NRC Request for

Additional Information Letter No. 53

Related to ESBWR Design Certification Application

RAI Numbers 4.3-2 S01 and 4.4-39 S01

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, James C. Kinsey, state as follows:

(1) I am Project Manager, ESBWR Licensing, GE-Hitachi Nuclear Energy Americas LLC ("GHNEA"), 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 2 of GHNEA's letter, MFN 06-350 Supplement 3, Mr. James C. Kinsey to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-2 S01 and 4.4-39 S01*", dated June 15, 2007. The proprietary information in enclosure 2, which is entitled "*Response to Portion of NRC Request for Additional Information Letter No. 53 Related to ESBWR Design Certification Application – RAI Numbers 4.3-2 S01 and 4.4-39 S01 – GE 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, GHNEA 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 GHNEA's competitors without license from GHNEA 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 GHNEA customer-funded development plans and programs, resulting in potential products to GHNEA;

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 GHNEA, 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 GHNEA, 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 GHNEA. Access to such documents within GHNEA 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 GHNEA 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 GHNEA'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 GHNEA asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GHNEA's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GHNEA'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 GHNEA.

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.

GHNEA's competitive advantage will be lost if its competitors are able to use the results of the GHNEA 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 GHNEA 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 GHNEA 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 15th day of June 2007.

James C. Kinsey

James C. Kinsey
GE-Hitachi Nuclear Energy Americas LLC