GE-Hitachi Nuclear Energy Americas LLC

James C. Kinsey
Project Manager, ESBWR Licensing

PO Box 780 M/C J-70
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057
jim.kinsey@ge.com

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 06-492 Supplement 1

Docket No. 52-010

June 20, 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. 66 Related to ESBWR Design Certification Application – RAI Number 4.2-12 S01**

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

Enclosure 1 contains GNF proprietary information as defined by 10 CFR 2.390. GNF 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 GNF. 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 06-377, Letter from U. S. Nuclear Regulatory Commission to Mr. David H. Hinds, *Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application,* October 10, 2006.

Enclosures:

1. MFN 06-492, Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – RAI Number 4.2-12 S01 – GNF Proprietary Information
2. MFN 06-492, Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – RAI Number 4.2-12 S01 – Non-Proprietary Version
3. Affidavit – Jens G. M. Andersen – dated June 20, 2007

cc:	AE Cubbage	USNRC (with enclosures)
	DH Hinds	GHNEA Wilmington (with enclosures)
	BE Brown	GHNEA Wilmington (with enclosures)
	eDRF	0000-0064-6570 and 0000-0069-6316

Enclosure 2

MFN 06-492 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 66

Related to ESBWR Design Certification Application

RAI Numbers 4.2-12 S01

Non-Proprietary Version

This is a non-proprietary version of Enclosure 1 of MFN 06-492 Supplement 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by white space inside open and closed bracket as shown here [[ ]].

NRC RAI 4.2-12 S01

Received by e-mail from Martha Barillas

Comments on MFN-06-492, Partial RAI Response to RAI Letter 66

Comments on response to RAI 4.2-12

The response states that the pin power uncertainty established in NEDC-32964P-A is applicable for the ESBWR. The uncertainty referred to in the response is a combination of the [[ ]] uncertainties. The staff accepts that similarities to current fuel products justify the application of the [[ ]] uncertainty. However, the staff does not accept the basis for applying the [[ ]] or [[ ]] uncertainties. The [[ ]] uncertainty should be increased to [[ ]] (see NEDC-33173P). The [[ ]] uncertainty was based on [[ ]] data for fuel types ranging from [[ ]] and were not representative of the [[ ]] for the ESBWR. The response should be modified to adopt a [[ ]] uncertainty based on a [[ ]] or [[ ]] for expanded operating domain BWRs. The staff does not find any justification for a smaller [[ ]] uncertainty for the ESBWR. However, the improvement in the PANAC11 methodology over PANAC10 supports reducing the [[ ]] uncertainty to [[ ]].

The [[ ]] uncertainty is derived from gamma scan data from the K5 plant. Were the barium concentrations predicted in the adapted core simulations based on the PANAC11 isotopic model? If so, justify the use of this model (see RAI 21.6-95). If another off-line technology was used, describe the interface with the PANAC11 calculational engine and the method for determining the barium concentration. Provide the discharge exposure for the scanned fuel. The basis for the [[ ]] uncertainty is an RMS difference in Table 7A-4 of the DCD; provide the standard deviation in [[ ]] based on the gamma scan data from the K5 plant. Reevaluate the [[ ]] uncertainty based on a [[ ]] uncertainty that is twice the standard deviation or justify the use of the RMS difference.

Verify that the K5 gamma scan data were for modern fuel designs, specifically designs that include [[ ]]. If the gamma scan data did not include bundles with [[ ]] justify the [[ ]] uncertainty by providing TGBLA06AE5/PANAC11AE8 predictive calculations and comparisons to absolute adapted 3D MONICORE [[ ]] power calculations that illustrate there is no degradation of the accuracy of the nuclear methods to predict [[ ]] power for these modern fuel designs over the course of a cycle. This analysis should be performed for plant E cycle 9 or cycle 10 in the experience database detailed in Table 1-14 of NEDC-33239 rev. 0.

[[ ]] gamma TIP uncertainties are known to [[ ]] with increasing power to flow ratios. RMS differences have been shown to [[ ]] by approximately [[ ]] (see MFN-05-029). Provide a basis for not taking into account the difference in power to flow ratio between K5 and ESBWR in the gamma thermometer [[ ]] uncertainty calculation. Provide the core thermal power and flow rate for K5 during

the period of operation when the scanned fuel was in-core. Describe the adaption technique used in the K5 core follow analysis (absolute or shape). Verify that the core follow analysis was performed with TGBLA06/PANAC11.

Update Figure 7.2-8 in DCD Tier 2 to indicate the axial elevation of the seven GTs per instrument tube relative to the bottom of active fuel.

Verify that the adaption technique for ESBWR is based on gamma thermometer readings as opposed to LPRM readings. Update DCD Tier 2, Section 7A.3.2 to include the specific adaption technique and the specific means for LPRM calibration for the ESBWR.

Justify the [[ ]] uncertainty adder in NEDC-33173P for a seven GT configuration. Verify that sufficient GTs are included in the ESBWR design such that extrapolation of the GT signal is not necessary to determine the nodal power in every group of four non-peripheral or blanket nodes (assuming that only one instrument is needed for every four quadrant symmetric groups). If the instrument reading calculation is not based on the contribution from the [[ ]] surrounding bundles, [[ ]], specifically address the contribution of the extrapolation technique on the [[ ]] uncertainty for power shapes with multiple local axial peaks (i.e. double humped).

If the [[ ]] in PCGEN (or equivalent module in 3D MONICORE) has been updated for ESBWR GT calculations, provide the update and a discussion of any uncertainties that may have been introduced as a result of the update. Verify that [[ ]] calculations have been performed for the specific lattices used in the ESBWR. Verify that these [[ ]] calculations include any differences between gamma TIP instruments and gamma thermometers that may impact the calculated [[ ]]. Verify that the statistical uncertainty for these [[ ]] calculations is sufficiently small that it does not contribute to the uncertainty (i.e. less than [[ ]]). If [[ ]] has been internally qualified through a [[ ]], provide the basis for the qualification.

The calibration accuracy for the GT system is reportedly [[ ]] (see NEDC-33197P) describe the component of the [[ ]] uncertainty that accounts for the calibration accuracy. If this uncertainty is to be included in the [[ ]] uncertainty, justify an [[ ]] uncertainty of [[ ]]. Update NEDC-33197P to include this information. If the [[ ]] uncertainty is greater than [[ ]], then revise NEDC-33242P accordingly.

Overview of GE Response

Because of the broad scope of this RAI, the response is broken into segments.

RAI Part 1

The response states that the pin power uncertainty established in NEDC-32964P-A is applicable for the ESBWR. The uncertainty referred to in the response is a combination of the [[ ]] uncertainties. The staff accepts that similarities to current fuel products justify the application of the [[ ]] uncertainty. However, the staff

does not accept the basis for applying the [[ ]] or [[ ]] uncertainties. The [[bow{3}]] uncertainty should be increased to [[ ]] (see NEDC-33173P).

GE Response to Part 1

NRC RAI 4.3-2 Supplement 1 requests a reevaluation of the R-factor uncertainty. This will be provided in the responses to RAI 4.3-2 Supplement 1.

RAI Part 2

The [[ ]] uncertainty was based on [[ ]] data for fuel types ranging from [[ ]] and were not representative of the [[ ]] for the ESBWR. The response should be modified to adopt a [[ ]] uncertainty based on a [[ ]] or [[ ]] for expanded operating domain BWRs.

GE Response to Part 2

NRC RAI 4.3-2 Supplement 1 requests a reverification of the bundle power calculational uncertainty. This will be provided in the responses to RAI 4.3-2 Supplement 1.

RAI Part 3

The staff does not find any justification for a smaller [[ ]] uncertainty for the ESBWR. However, the improvement in the PANAC11 methodology over PANAC10 supports reducing the [[ ]] uncertainty to [[ ]].

GE Response to Part 3

We concur with the application of the [[ ]] uncertainty of [[ ]], as documented in NEDC-33173 Table 2-11.

RAI Part 4

The [[ ]] uncertainty is derived from gamma scan data from the K5 plant. Were the barium concentrations predicted in the adapted core simulations based on the PANAC11 isotopic model? If so, justify the use of this model (see RAI 21.6-95).

GE Response to Part 4

No, PANAC11 models were not used to calculate barium concentrations. The barium concentrations were calculated using a separate methodology, integrating the power distributions over the last several months of operation.

RAI Part 5

If another off-line technology was used, describe the interface with the PANAC11 calculational engine and the method for determining the barium concentration.

GE Response to Part 5

PANAC11 was not used in the evaluation. The core tracking for K5 was done with an earlier version of PANACEA and the interface would be the core tracking information. Nevertheless, note that Ba-140 distributions are not calculated in PANACEA, then the barium concentrations were evaluated using a separate program that uses lattice dependent yield data and integration of the nodal power shapes over some months of operation before the end of cycle. This process has been described to the staff in FLN-2005-034. The results of this process (analyses and calculations) are independently verified.

RAI Part 6

Provide the discharge exposure for the scanned fuel.

GE Response to Part 6

We currently do not have access to the discharge exposure data from K5 because the scans were run by Toshiba on non-GE fuel.

RAI Part 7

The basis for the [[ ]] uncertainty is an RMS difference in Table 7A-4 of the DCD; provide the standard deviation in [[ ]] based on the gamma scan data from the K5 plant.

GE Response to Part 7

The nodal power uncertainty shown in Table 7A-4 was calculated from the K5 data and is calculated at the one sigma level using the root mean square formula as follows:

$$\text{RMS} = \sqrt{\frac{\sum_{n}^{N} deviation(n)^2}{N}} \times 100$$

where *deviation(n)* is the difference between PANACEA calculated and gamma scan measured power for node *n*. The power distribution uncertainties are based on one standard deviation and that is why the RMS difference was used.

RAI Part 8

Reevaluate the [[ ]] uncertainty based on a [[ ]] uncertainty that is twice the standard deviation or justify the use of the RMS difference.

GE Response to Part 8

For justification of the RMS difference please see previous response. Please note that the power distribution uncertainty is evaluated as described by the interim methodology for ESBWR that is

based in the practice using one sigma (1σ) level to allow direct comparison with DCD references (e.g. Ref. 4.4-13: NEDC-32601P-A) and Monte Carlo calculations.

RAI Part 9

Verify that the K5 gamma scan data were for modern fuel designs, specifically designs that include [[ ]].

GE Response to Part 9

The core loadings were composed of 8X8 and 9X9 fuel. The gadolinia loadings ranged from 3.5% gadolinia to 5.5% gadolinia, consistent with the type of fuel cycle operation used for the K5 reactor. The 9X9 fuel includes part length rods, as do most modern fuel designs. The 9X9 fuel also includes Gd rods that are diagonal and face adjacent to vanished rods.

RAI Part 10

If the gamma scan data did not include bundles with [[ ]] justify the [[ ]] uncertainty by providing TGBLA06AE5/PANAC11AE8 predictive calculations and comparisons to absolute adapted 3D MONICORE [[ ]] power calculations that illustrate there is no degradation of the accuracy of the nuclear methods to predict [[ ]] power for these modern fuel designs over the course of a cycle. This analysis should be performed for plant E cycle 9 or cycle 10 in the experience database detailed in Table 1-14 of NEDC-33239 rev. 0.

GE Response to Part 10

The K5 on-line modeling used shape adaptation rather than absolute adaptation, consistent with the current 3D MONICORE process on domestic BWR's. Therefore there is no need to consider any impact of an absolute adapted 3D MONICORE calculation. Our considered opinion is that no additional insights would be provided by a TGBLA06AE5/PANAC11AE8 shape adapted simulation for Plant E, either Cycle 9 or Cycle 10.

RAI Part 11

[[ ]] gamma TIP uncertainties are known to [[ ]] with increasing power to flow ratios. RMS differences have been shown to [[ ]] by approximately [[ ]] (see MFN-05-029). Provide a basis for not taking into account the difference in power to flow ratio between K5 and ESBWR in the gamma thermometer [[ ]] uncertainty calculation.

GE Response to Part 11

Core operating conditions for the K5 plant are not available to GE/GNF and therefore no basis can be discussed at this point.

However, please note that Figure 25-19 in MFN-05-029 was used to bound power to flow ratio expected for EPU/MELLA+ operation conditions. For a proper discussion at ESBWR power to flow ratio (greater than 53), a cautious approach shall be taken and no commitment with the uncertainty value is made in this response.

RAI Part 12

Provide the core thermal power and flow rate for K5 during the period of operation when the scanned fuel was in-core.

GE Response to Part 12

Detailed power/flow history for the K5 is also not available to GNF / GENE.

RAI Part 13

Describe the adaption technique used in the K5 core follow analysis (absolute or shape).

GE Response to Part 13

Details of the adaption performed in K-5 model are not available, but the use of shape adaption was reconfirmed by GNF / GENE.

RAI Part 14

Verify that the core follow analysis was performed with TGBLA06/PANAC11.

GE Response to Part 14

As described above, T6-P11 codes were not used to simulate K-5 operation.

RAI Part 15

Update Figure 7.2-8 in DCD Tier 2 to indicate the axial elevation of the seven GTs per instrument tube relative to the bottom of active fuel.

GE Response to Part 15

The Figure 7.2-8 in revision 3 of the ESBWR DCD indicates the axial elevation of the seven GTs.

RAI Part 16

Verify that the adaption technique for ESBWR is based on gamma thermometer readings as opposed to LPRM readings.

GE Response to Part 16

The gamma thermometer system will replace the TIP system in the ESBWR. The adaption will employ collected information from gamma thermometers. This information will be used to calibrate the LPRM. Because the frequency of the adaptation will be higher in the gamma thermometer system than in the TIP system, the drift uncertainty component of the LPRM adaption would be smaller.

However, the decision on whether the gamma thermometer readings or the LPRM reading will be used in the 3D MONICORE process has not been finalized. Because of the longer time constant of the gamma thermometers, some pre-analysis of the gamma thermometer reading would be necessary to correct for any short term effect (i.e., slow transients over the course of 15

minutes or longer duration). This process is understood. However, for short-term transients, reliance on the LPRMs will be necessary. Thus, while the final decision as to the basis for the inputs (gamma thermometer or LPRM) to be used in 3D MONICORE, this question can not be resolved.

RAI Part 17

Update DCD Tier 2, Section 7A.3.2 to include the specific adaption technique and the specific means for LPRM calibration for the ESBWR.

GE Response to Part 17

The specific adaption technique to be used is currently under development. Therefore the DCD can not be updated at the present time.

RAI Part 18

Justify the [[ ]] uncertainty adder in NEDC-33173P for a seven GT configuration.

GE Response to Part 18

The [[ ]] was calculated in NEDE-33197P, Table 9-6. It is based on analysis of Tokai-2 data and the finding that nodal power uncertainty [[ ]]. In other words, an adder of [[ ]] that is statistically combined with the 9 GT uncertainty of [[ ]] would result in a 7 GT uncertainty of [[ ]]

RAI Part 19

Verify that sufficient GTs are included in the ESBWR design such that extrapolation of the GT signal is not necessary to determine the nodal power in every group of four non-peripheral or blanket nodes (assuming that only one instrument is needed for every four quadrant symmetric groups).

GE Response to Part 19

The specific adaption technique to be used is currently under development. Therefore this question can not be resolved at the present time.

RAI Part 20

If the instrument reading calculation is not based on the contribution from the [[ ]] surrounding bundles, [[ ]], specifically address the contribution of the extrapolation technique on the [[ ]] uncertainty for power shapes with multiple local axial peaks (i.e. double humped).

GE Response to Part 20

The specific adaption technique to be used is currently under development. Therefore this question can not be resolved at the present time.

RAI Part 21

If the [[ ]] in PCGEN (or equivalent module in 3D MONICORE) has been updated for ESBWR GT calculations, provide the update and a discussion of any uncertainties that may have been introduced as a result of the update.

GE Response to Part 21

PCGEN has not been revised at this point.

RAI Part 22

Verify that [[ ]] calculations have been performed for the specific lattices used in the ESBWR. Verify that these [[ ]] calculations include any differences between gamma TIP instruments and gamma thermometers that may impact the calculated [[ ]]. Verify that the statistical uncertainty for these [[ ]] calculations is sufficiently small that it does not contribute to the uncertainty (i.e. less than [[ ]]). If [[ ]] has been internally qualified through a [[ ]], provide the basis for the qualification.

GE Response to Part 22

The [[ ]] program is only one of group of codes within GNF that have been used to calculate gamma transport from fuel rods and other structures within the core to the gamma thermometer or gamma TIP instrument location. All lattices currently in use for GNF supported reactors have been modeled in these GNF codes. The results of these calculations have been verified. This includes the lattice type that will be used in ESBWR core. 3D MONICORE models will be revised for the GT. Any effect produced by thermal energy is considered during calibration of the GTs. Monte Carlo results (MCNP) will be used to corroborate the applicability of current uncertainties.

RAI Part 23

The calibration accuracy for the GT system is reportedly [[ ]] (see NEDC-33197P) describe the component of the [[ ]] uncertainty that accounts for the calibration accuracy.

GE Response to Part 23

The data acquisition system and frequency of calibration are components of the site calibration and therefore, the calibration uncertainty can be considered part of the overall bundle power model uncertainty.

Please note that the GT calibration accuracy is estimated to a total uncertainty of [[ ]]. In the response to RAI 4.2-12, the calibration uncertainty is accounted for in the [[ ]] uncertainty compared to gamma scan results. Errors in the ability of the GTs to measure true

flux were reflected in the core simulator calculation of isotopics and comparison to gamma scan Ba-140 measurements.

RAI Part 24

If this uncertainty is to be included in the [[ ]] uncertainty, justify an [[ ]] uncertainty of [[ ]].

GE Response to Part 24

The calibration uncertainty is not considered part of the update uncertainty. Please see response to the previous part of this RAI.

The [[ ]] component was included in the response to RAI 4.2-12 to account for errors introduced as a function of instrument failure (LPRMs or GTs failing) and errors in accounting for LPRM sensitivity changes over time. The [[ ]] component is in addition to the GT calibration uncertainty.

RAI Part 25

Update NEDC-33197P to include this information

GE Response to Part 25

Based on above responses, an update is not considered at this point.

RAI Part 26

If the [[ ]] uncertainty is greater than [[ ]], then revise NEDC-33242P accordingly.

GE Response to Part 26

We concur that any increase in the power distribution uncertainty above [[ ]] would require a revision of the NEDC-33242P. At this point, the revision is not considered necessary since the power distribution uncertainty is not greater than [[ ]].

Affected Documents

No changes to the ESBWR DCD or to NEDC-33242P will be made in response to this RAI.

Enclosure 3

MFN 06-492 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 66

Related to ESBWR Design Certification Application

RAI Numbers 4.2-12 S01

Affidavit

Global Nuclear Fuel – Americas
AFFIDAVIT

I, Jens G. M. Andersen, state as follows:

(1) I am Consulting Engineer, Thermal Hydraulic Methods, Global Nuclear Fuel – Americas, L.L.C. ("GNF-A"), 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 MFN 06-492 Supplement 1, James C. Kinsey to Document Control Desk (USNRC), *Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – RAI Number 4.2-12 S01,* dated June 20, 2007. The proprietary information in Enclosure 1, *MFN 06-492, Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – RAI Number 4.2-12 S01 – GNF Proprietary Information,* is identified by [[dotted underline inside double square brackets{3}]]. Figures and other large 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, GNF-A 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 GNF-A's competitors without license from GNF-A 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 GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;

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 GNF-A, 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 GNF-A, 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 GNF-A. Access to such documents within GNF-A 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 GNF-A 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) is classified as proprietary because it contains details of GNF-A's fuel design and licensing methodology.

The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GNF-A or its licensor.

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

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.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A 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 GNF-A 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 GNF-A 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 20th day of June 2007.

Jens G M Andersen

Jens G. M. Andersen
Consulting Engineer, Thermal Hydraulic Methods
Global Nuclear Fuel – Americas, L.L.C.