GE ENERGY

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.

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MFN 06-481
December 5, 2006

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

Subject: **Responses to RAIs 7, 8, 9, 10, and 11 - NEDC-33173P (TAC No. MD0277)**

In Reference 1, GE submitted NEDC-33173P (Methods LTR), which documents the applicability of GE's analytical methods to expanded operating domains. During recent phone calls, the NRC requested that GE provide additional information to support their review of NEDC-33173P. The requested information is enclosed.

Please note that Enclosure 1 contains proprietary information of the type that GE maintains in confidence and withholds from public disclosure. The information has been handled and classified as proprietary to GE as indicated in the affidavit, also included in the report. The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GE. GE hereby requests that the information in Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Enclosure 2 is a non-proprietary version of Enclosure 1.

If you have any questions, please contact, Mike Lalor at (408) 925-2443 or myself.

Sincerely,

George Stramback for

Robert E. Brown
General Manager, Regulatory Affairs

D065

Project No. 710

References:

1. MFN 06-056, Letter from Louis Quintana (GE) to NRC, *GE Licensing Topical Report NEDC-33173P, Applicability of GE Methods to Expanded Operating Domains* February 10, 2006

Enclosures:

1. Responses to RAIs 7, 8, 9, 10, and 11 - Proprietary
2. Responses to RAIs 7, 8, 9, 10, and 11 - Non-proprietary
3. Affidavit, George B. Stramback, dated December 5, 2006

cc: FT Bolger (GE/Wilmington)
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eDRF 0000-0055-0354

ENCLOSURE 2

MFN 06-481

Responses to RAIs 7, 8, 9, 10, and 11 - Non-proprietary

Non-Proprietary Version

IMPORTANT NOTICE

This is a non-proprietary version of Enclosure 1 to MFN 06-481, which has the proprietary information removed. Portions of the enclosure that have been removed are indicated by an open and closed bracket as shown here [[ ]].

NRC-RAI 7.0, AOO Axial Power Profile

Currently, the ODYN transient calculations assume hard bottom burn operating history from BOC to MOC, which yield top peaked power shape. From MOC to EOC, the transient analyses are performed assuming both HBB and UB. The HBB assumption from BOC to MOC yield axial power profile that is conservative in terms of the scram reactivity worth. However, for EPU and expanded operating domains, it is not apparent that the currently assumed axial power shapes with exposure (E.g., HBB from BOC to MOC and MOC to EOC and UB for MOC to EOC) will be conservative relative to the nominal or planned operating control rod and core flow strategies. Specifically, considering the impact of TVAP, the LTR did not discuss why bottom and middle peaked or double hump power profile early in the cycle will not result in higher transient response.

For ODYN, justify why the conservatism associated with the scram worth, the control rod patterns assumed in the power history envelops and bounds the impact of axial power peaking the plant will experience at different exposure ranges. Include in your assessment the impact of TVAP that would result from the scram during power profiles other than top peaked.

GE Response

Pressurization events are most limiting at EOC where control rods are full out and scram reactivity is minimized. As stated in the methods LTR (NEDC-33173P), the EOC condition is evaluated using a variation in the axial power shape at EOC through two burn strategies – a Hard Bottom Burn (HBB) and an Under Burn (UB). The main reason UB power shapes are considered is the potential effect from the Time Varying Axial Power Shape (TVAPS). The principal factors controlling the severity of the TVAPS transient CPR effect are: (a) initial axial shape, (b) initial flow, and (c) plant specific MCPR timing. Cases with a more bottom peaked initial power shape will show a more severe TVAPS effect. However, the resulting operating limit is usually insensitive to the initial power shape because of the compensating effect of the increase in scram worth. However, earlier in the cycle or when the UB is more bottom peaked, the UB will be non-limiting (or at least very similar to the HBB result) due to the increased scram reactivity. The system response becomes much more mild with the UB, and although the TVAPS effect is high, the heat flux change is mild, which limits the severity of the transient ΔCPR.

Table 7-1 below shows a comparison of the limiting transient ΔCPR result for the HBB and UB power shapes for several plants. In some instances the UB is a more limiting condition, but as seen from Table 7-1 below when the UB is very bottom peaked (indicated below by a higher value for the Axial Peaking at Node 4), the HBB is more limiting. In these conditions the axial power is so much more toward the bottom that the scram reactivity is improved and this more than offsets any effect of time varying axial power shapes.

Pressurization analyses covering BOC to "MOC" are actually analyzed at a condition near EOC, approximately 75% to 85% through the cycle. The "MOC" condition is at an exposure prior to EOC to assure adequate control rod density in the core such that the transient response is significantly improved with partially inserted control rods.

The analysis for "MOC" is based on the HBB with a conservative rod pattern as described below.

As described in GESTAR II (Appendix B, responses to GESTAR II, revision 5, REQUEST: Subsection 5.2.2.5 – Exposure Dependent Limits), when analyzing transient performance at exposures prior to the EOC, all-rods-out condition, it is necessary to consider the effect of the control rods on the transient parameters, because the scram reactivity and the dynamic void coefficient are sensitive to the control rod pattern. At any given exposure point, there are many control rod patterns which will render the core critical and within thermal limits. To ensure that conservative values of the important dynamic parameters are calculated, it is necessary to select special control patterns. Conservative values of both the scram reactivity and dynamic void coefficient result when "black-white" control patterns are used. A black-white control pattern is one in which control rods are either fully inserted (black), or fully withdrawn (white).

The scram reactivity is minimized with black-white patterns because:

4. the fully inserted control rods provide no contribution to the scram reactivity,
5. the fully withdrawn control rods begin their insertion in a region of zero power; thus, their impact during the early portion of the scram is minimized; and
6. there are no partially inserted control rods, which generally provide a major contribution during the early portion of the scram.

The assumption of the black-white control pattern adds significant conservatism to the results. The black-white rod pattern also results in a more bottom peaked state compared to the HBB nominal pattern, which increases the TVAPS effect for this state. Note, the HBB strategy normally produces a more bottom peaked power shape at MOC compared to the EOC exposure. Control rod configurations with rods in the core at MOC may produce double humped axial power shape. This situation is predominantly from local conditions near the partially inserted rods rather than the core average axial power distribution used with ODYN. From review of a number of cores, it was found that double humped axial power shapes occurred for conditions with partially inserted control blades. Potentially limiting double humped power shape bundles are those very near partially inserted rods where locally scram reactivity is maximized for transients. However, demonstration analyses have been performed where the partially inserted control rods are in the core and compared to the standard analysis where the "MOC" point uses the HBB with a black-white pattern. The difference in the ΔCPR between the standard analysis method and the nominal case with partially inserted rods was about 0.06 to 0.09. This study includes new analyses from a 120% uprated power plant with GE14 fuel to demonstrate the conservatism. Therefore, the standard process of using the HBB burn strategy with the black-white is very conservative compared to the smaller difference observed in Table 7-1 when and UB shape is potentially limiting. The process of analyzing exposure dependent limits is conservative.

Table 7-1 HBB and UB Limiting Pressurization Event Results

	HBB Node 4 Axial Peaking	HBB ΔCPR	UB Node 4 Axial Peaking	UB ΔCPR
Plant A	0.91	0.31	1.41	0.23
Plant B	0.86	0.11	1.29	0.07
Plant C	1.07	0.35	1.44	0.28
Plant D	0.85	0.30	1.22	0.28
Plant E	0.47	0.33	0.8	0.36
Plant F	0.67	0.37	1.09	0.35
Plant G	0.71	0.31	0.98	0.32
Plant H	0.64	0.30	0.89	0.30
Plant I	0.87	0.33	1.31	0.33

NRC RAI 8.0, ECCS-LOCA

The LTR cites the conclusions from recent sensitivity analysis in its discussion of the axial power shapes assumed in the ECCS-LOCA calculation. [[

]] For EPUs, the PCT for the small break increases. [[

]] If not, justify why this approach is acceptable for plants with high PCTs.

GE Response

The current GENE ECCS-LOCA methodology requires calculation of the [[

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NRC RAI 9
As part of the ESBWR design certification review, the NRC staff discovered a discrepancy in the GSTRM thermal-mechanical calculations, supporting the GE14 fuel designs. Specifically, the GSTRM UO_2 under-predicted the fuel temperature calculations in comparison to both FRAPCON-3 and PRIME calculations. It is possible that the observed differences are primarily due to GSTRM UO_2 fuel thermal conductivity model, which does not model exposure dependency compared to the other two codes. The potential non-conservatisms in GSTRM could be applicable to thermal-mechanical performance calculations for operating reactors as well the calculation of the associated limits.

a. Provide an assessment of the impact of the non-conservatism in GSTRM $U0_2$ fuel temperature calculation regarding the adequacy of the fuel rod thermal-mechanical performance for the GE13 and G14 fuel designs.

b. Evaluate the impact of the GSTRM UO_2 under-predictions on the fuel temperature, internal rod pressure, and TOP/MOP calculation during anticipated operational occurrences (AOOs).

c. Assess the impact of the GSTRM UO_2 non-conservatism (e.g., thermal conductivity model) on peak cladding temperature (PCT) for both the limiting small and large break loss of coolant accidents (LOCAs) at EPU conditions. This assessment should also include the most limiting axial power profile.

d. In MFN 06-207, RAI 1 contains thermal-mechanical performance results for along the linear heat generation rate (LHGR) envelope (e.g., internal rod pressures, fuel temperature, and cladding circumferential strain) for the UO_2 and the $UGdO_2$ rods. Discuss if the potential non-conservatisms will change the results for operation on the LHGR envelope or the related sensitivity analysis in RAI 1.

Response to Part a
Fuel rod thermal-mechanical design and licensing analyses are currently performed with the GESTR-Mechanical (GSTRM) code and its associated application methodology. The GSTRM model has been developed to provide best estimate predictions of fuel rod thermal-mechanical performance in order to provide an accurate estimate of the expected fuel performance, while also enabling a realistic assessment of design parameter performance uncertainties. The model development philosophy has been to (1) quantify and analytically describe each model component (such as fuel pellet fission product-induced swelling or cladding creep deformation) based on separate effects testing to the maximum extent possible, (2) assemble the model components, and then (3) qualify the assembled model to integral fuel performance measurements. The experimental qualification includes comparison of predictions to fuel temperatures, as obtained by placement of, and continuous measurement by, fuel thermocouples in the center of the fuel pellet column. This extensive qualification of the temperature prediction capability confirmed the GSTRM model to be a reliable best-estimate predictor of fuel rod thermal-mechanical performance while also providing quantification of the model prediction uncertainty, [[ ]]

At the time that the GSTRM experimental qualification was performed, thermal couple data existed only to ~30 GWd/MTU pellet exposure. The data was for UO_2 rods. [[ ]] the GSTRM model predicted this data very well, [[ ]] Specifically, for 2 rods that were recognized by the NRC as being representative of commercial BWR rods and operated at representative BWR conditions, the GSTRM predictions were excellent, with no indication of a bias in predictive capability with exposure.

Although these 2 rods had larger diameters than the current GE14 (10x10 lattice) fuel design, the rods had cross-sections geometrically similar to the GE14 design in terms of the ratio of initial pellet-cladding gap to initial fuel pellet diameter and the ratio of initial cladding outer diameter to initial fuel pellet diameter. Also, the initial helium fill gas pressure and initial pellet density were lower and the in-reactor densification was larger for these rods than for GE14 rods. Thus the thermal performance of these rods conservatively represents the performance of GE14 rods. Additionally, the measured temperatures for the 2 rods correspond to a single axial location and are primarily a function of the linear heat generation at that point. The active fuel length has only a small impact on the measured temperatures. Thus although the 2 rods were shorter than GE14 rods (rod length was, and is, limited by the test reactor core height), the data is considered applicable to the GE14 design. Finally, it is noted that differences in rod length, as well as the other differences discussed above, between the 2 test rods and GE14 rods are explicitly addressed in the GSTRM experimental qualification and the model uncertain applied in fuel rod thermal-mechanical licensing analyses.

Recently, during review of the GE14 fuel design for ESBWR, comparison of GSTRM and FRAPCON results indicated that GSTRM predicted significantly lower temperatures than FRAPCON for UO_2 rods at pellet exposures of ~18 GWd/MTU. [[ ]]

An important element of the GSTRM fuel rod thermal-mechanical design and licensing analysis methodology is the development and application of an envelope of allowable operating conditions (i.e. local linear heat generation rate as a function of local exposure). All fuel rod thermal-mechanical analyses are evaluated to ensure that operation within that power-exposure envelope will conform to the fuel rod thermal-mechanical design and licensing criteria. For fuel temperature considerations, the envelope and associated overpower limits are specified to assure that fuel melting will not occur for operation on the envelope, even for anticipated operational occurrences. [[ ]]

On the basis of the discussion above, GE concludes that there is sufficient margin to the UO_2 overpower limits to assure adequate performance for the GE13 and GE14 fuel designs, even considering the differences in results between FRAPCON and GSTRM.

Response to Part b

As noted in the response to RAI 9a above, an important element of the GSTRM fuel rod thermal-mechanical design and licensing analysis methodology is the development and application of an envelope of allowable operating conditions (local linear heat generation rate as a function of local exposure). [[

]] Additionally, the statistical analysis methodology used for the rod internal pressure analysis directly addresses the characterized uncertainty in the GSTRM pressure predictions. [

]] Furthermore, the difference in temperature predictions between GSTRM and FRAPCON noted for UO_2 rods is not observed for gadolinia rods. The GSTRM temperatures for the gadolinia rod for the comparison at 18 GWd/MTU noted above are slightly conservative relative to the FRAPCON temperatures.

Thermal Overpowers (TOP) and Mechanical Overpowers (MOP) limits were developed to provide parameters that are easily evaluated in terms of LHGR and which can be used as computational limits during design of a core. TOP and MOP limits are intended to prevent exceeding actual licensing limits (SAFDLs) such as fuel melting (TOP) or [[

]] (MOP) due to a power increase and to provide an initial screen during design of a core or an upcoming cycle to indicate when more detailed analysis is required. Violation of TOP or MOP limits does not indicate violation of actual licensing limits. GE/GNF practice is to state TOP and MOP limits on the basis of the most limiting fuel rod type, [[

]] Additionally, the TOP and MOP limits are typically stated at the most limiting exposure, which is at the knee of the LHGR limits curve. As noted above, at this exposure, the GSTRM temperature qualification results are excellent.

For these reasons, GE/GNF concludes that the possible underprediction of temperature for UO_2 rods has negligible impact on the GE13 and GE14 fuel designs relative to compliance with SAFDLs.

Response to Part c

As for the case of TOP and MOP limits, which are most limiting at the knee of the LHGR limits curve, LOCA response is limiting at the knee of the LHGR limits curve. At higher exposures, the reduction in LHGR and the resulting reductions in stored energy and decay heat during the LOCA event result in lower PCT. The GSTRM qualification results are excellent at these exposures, indicating that GSTRM is not non-conservative for BWR fuel at these exposures. Even if GSTRM is non-conservative, and if the non-conservatism is converted to a stored energy increase, the increase in calculated PCT due to the increase in stored energy will be relatively small.

Response to Part d

If GSTRM is shown to be non-conservative, the non-conservatism is already explicitly addressed in the response to RAI 1. The values reported in the response to RAI 1 are nominal values. The GSTRM thermal-mechanical licensing methodology was developed to assure with at least 95% confidence that fuel rod SAFDLs are met. The impact of this requirement relative to rod internal pressure is demonstrated in Table 9-1 below. This table includes the nominal rod internal pressure results from Table 1.1-1 in the response to RAI 1 for the GE14 UO_2 rod operating on thermal-mechanical linear heat generation limits, but also includes the corresponding upper-95 rod internal pressure as determined by the GSTRM methodology. The impact relative to the fuel rod centerline temperature is demonstrated in Table 9-2 below. This table includes the nominal fuel centerline temperature at the knee of the thermal-mechanical linear heat generation limits for operation on the limits and the nominal and upper-95 centerline temperatures for an overpower at the knee for the GE14 UO_2 barrier rod and the GE14 10 w/o gadolinia non-barrier rod.

The upper-95 results in both tables are the values used to confirm compliance with rod internal pressure and fuel centerline temperature licensing requirements.

GE understands that the NRC's Safety Evaluation for the Methods LTR will contain a restriction to require the submittal of plenum fission gas and fuel exposure gamma scans for NRC review as part of the revision to the T-M licensing. GE considers the thermal-mechanical licensing process the appropriate venue to address these scans and finds the restriction acceptable.

Table 9-1
Rod Internal Pressure Results for GE14 UO2 Rod for Operation on LHGR Limits

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Table 9-2
Fuel Centerline Temperature Results for GE14 UO2 and 10 w/o Gd Rod for Overpower at Knee* of LHGR Limits

Rod Type	Overpower %	Fuel Centerline Temperature at Knee °F	Fuel Centerline Temperature for Overpower °F	
		Nominal	Nominal	U95
[[				

]]

NRC RAI 10

Clarify if the plant-specific thermal and mechanical overpressure analysis during AOOs includes an evaluation of the performance of the $UGdO_2$ rods. Provide the GE14 TOP and MOP limits for $UGdO_2$ rods based on the compliance to Amendment 22 analysis.

GE Response

As noted in the response to RAI 9b, [[

]] and are derived to assure compliance with Amendment 22 requirements. It is noted again that GSTRM results for gadolinia rods are conservative relative to FRAPCON.

NRC RAI 11, Transient LHGR

GESTAR II Class III NEDE–24011–P–A–14 states that GENE utilizes a number of criteria to ensure that loss of fuel rod mechanical integrity will not occur during AOOs. Two of these criteria are:

Loss of fuel rod mechanical integrity will not occur due to fuel melting.
To achieve this objective, the fuel rod is evaluated to ensure that fuel melting during normal operation and core–wide AOOs will not occur. As described in Subsection 2.2.2.5 for local AOOs such as rod withdrawal error, a small amount of calculated fuel pellet center melting may occur, but is limited by the 1% cladding circumferential plastic strain criterion.

Loss of fuel rod mechanical integrity will not occur due to pellet–cladding mechanical interaction.
To achieve this objective, the fuel rod is evaluated to ensure that the calculated cladding circumferential plastic strain due to pellet–cladding mechanical interaction does not exceed 1% during AOOs. Further discussion of this evaluation is provided in Subsection 2.2.2.7.

a. Describe which NRC approved methods are used to evaluate these criteria.

b. Describe which licensing document contains the result (including specific calculated values) of these evaluations.

c State how the plant-specific EPU and MELLA+ applications will document the demonstration that these criteria are met for these operating conditions. If the plant-specific applications will not document these results, justify why this is acceptable.

GE Response

Response to Part a

The GESTR-M code cited in Reference 11-1 and the CHT code (Reference 11-2) are used to confirm that loss of fuel rod mechanical integrity due to fuel melting or pellet-cladding mechanical interaction does not occur during normal operation or core-wide AOOs.

Response to Part b

GE understands that the NRC's Safety Evaluation for the Methods LTR will contain a restriction to require that each EPU and MELLLA+ fuel reload will document in the Supplemental Reload Licensing Report the calculational results of the analyses to demonstrate compliance to transient thermal mechanical acceptance criteria. GE considers the SRLR an acceptable means to document the transient thermal mechanical results and accepts the restriction.

Response to Part c

The plant-specific EPU and M+ applications include Safety Analysis Reports (SAR), developed by GE. Future SARs that reference NEDC-33173P will document the results of the calculation results of the analyses to demonstrate compliance to transient thermal mechanical acceptance criteria. To account for the impact of the void history bias, plant-specific EPU and MELLLA+ applications will demonstrate margin to requirements for fuel centerline melt and that the calculated cladding circumferential plastic strain due to pellet–cladding mechanical interaction does not exceed 1% for the most limiting AOO transient events, including equipment out of service.

References

11-1 NEDE–24011–P–A–15, "General Electric Standard Application for Reactor Fuel", September 2005.

11-2 NEDC-32084P-A, Rev 2, July 2002, TASC-3A, A Computer Program for Tranisient Analysis of a Single Channel.

ENCLOSURE 3

MFN 06-481

Affidavit

General Electric Company

AFFIDAVIT

I, **George B. Stramback,** state as follows:

(1) I am Manager, Regulatory Services, General Electric Company ("GE") 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 to GE letter MFN 06-481, Robert E. Brown to U.S Nuclear Regulatory Commission, *Responses to RAIs 7, 8, 9, 10, and 11 – NEDC-33173P (TAC No. MD0277)*, dated December 5, 2006. The Enclosure 1 (*Responses to RAIs 7, 8, 9, 10, and 11*) proprietary information is delineated by a double underline inside double square brackets. Figures and large equation objects are identified with double square brackets before and after the object. In each case, the sidebars and 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, GE 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 General Electric's competitors without license from General Electric 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;

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 GE, 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 GE, 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. Access to such documents within GE 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 GE 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 detailed information about the results of SAFER-GESTR analytical models, methods and processes, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of loss-of-coolant accident events in the GE Boiling Water Reactor ("BWR"). The development and approval of the BWR loss-of-coolant accident analysis computer codes was achieved at a significant cost to GE, on the order of several million dollars.

The development of the dryer performance evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

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

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.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE 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 GE 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 GE 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 5th day of December 2006.

George B. Stramback

George B. Stramback
General Electric Company

ENCLOSURE 1

MFN 06-481

Responses to RAIs 7, 8, 9, 10, and 11 - Proprietary

GE Proprietary Information

PROPRIETARY INFORMATION NOTICE

This enclosure contains proprietary information of the General Electric Company (GE) and is furnished in confidence solely for the purpose(s) stated in the transmittal letter. No other use, direct or indirect, of the document or the information it contains is authorized. Furnishing this enclosure does not convey any license, express or implied, to use any patented invention or, except as specified above, any proprietary information of GE disclosed herein or any right to publish or make copies of the enclosure without prior written permission of GE. The header of each page in this enclosure carries the notation "GE Proprietary Information."

GE proprietary information is identified by a double underline inside double square brackets. 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 the affidavit provided in Enclosure 3, which documents the basis for the proprietary determination. [[This sentence is an example.{3}]] Specific information that is not so marked is not GE proprietary.