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Proprietary Notice

This letter transmits proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 1, the balance of the letter may be considered non-proprietary.

MFN 08-604
July 30, 2008

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

Subject: Transmittal of Response to NRC Request for Additional Information - NEDC-32906P, Supplement 3, "Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients," (TAC No. MD2569)

In Reference 1, the NRC requested additional information (RAI) to support the review of NEDE-32906P, Supplement 3. GEH has completed its responses to all RAIs other than RAI 32. The response to RAI 32 is enclosed.

Enclosure 1 contains proprietary information of the type that GEH maintains in confidence and withholds from public disclosure. The information has been handled and classified as proprietary to GEH as indicated in the affidavit. The affidavit, contained in Enclosure 3, identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GEH. GEH 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 me.

Sincerely,

R. E. Brown
Robert E. Brown
Senior Vice President, Regulatory Affairs

Project No. 710

D065
NRR

References:

1. Letter from M. Honcharik (NRC) to R.E. Brown (GEH), *Request for Additional Information RE: General Electric Nuclear Energy (GENE) Topical Report (TR) NEDE-32906P, Supplement 3," Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients*," (MFN 07-144) March 5, 2007.

Enclosures:

1. GEH Response to NRC RAI 32 - NEDC-32906P - Proprietary
2. GEH Response to NRC RAI 32 - NEDC-32906P - Non-Proprietary
3. Affidavit – Richard E. Kingston – dated June 30, 2008

cc: M Honcharik, NRC
eDRF Section 0000-0059-4157

ENCLOSURE 2

MFN 08-604

GEH Response to NRC RAI 32 - NEDC-32906P

Non-proprietary Version

IMPORTANT NOTICE

This is a non-proprietary version of Enclosure 1 to MFN 08-604, from which the proprietary information has been removed. Portions of the enclosure that have been removed are indicated by an open and closed bracket as shown here [[ ]].

NRC RAI 32

TRACG04 is coupled with PANAC11 for neutronic feedback. Specifically, the TRACG04 steady state power distribution is initialized using the PANAC11 predicted power distribution. PANACEA uses the Findlay-Dix void fraction correlation, while the TRACG thermal-hydraulic analysis relies on the interfacial shear model to predict the void fraction. The NRC staff evaluated the Findlay-Dix correlation and determined that the database supporting the Findlay-Dix correlation is not well supported.

a. The NRC staff is concerned that the uncertainties associated with the correlation will result in additional uncertainty in the void coefficient model. Explain how the uncertainty in this correlation is accounted for in the TRACG04 analyses performed in the methodology described in Reference 3.

b. Propose a means of calculating the initial TRACG04 power and void distribution using the interfacial shear model (i.e., using PANAC11 cross sections but void and power distribution not initialized to the PANAC11 solution) and provide a code to code comparison of the "independent" TRACG04 solution to the TRACG04 solution initialized to the PANAC11 conditions (i.e., using Findlay-Dix void correlation).

c. Provide the data range used to develop the Findlay-Dix correlation and demonstrate that the experimental data covers the range of steady state, transient, EPU and expanded operating domains for which Reference 7 applies.

NRC References

3. NEDE-32906P, Revision 2, "TRACG Application for Anticipated Operational Occurrences (AOO) Transient Analyses," February 2006.

7. NEDE-32906P, Supplement 3, "Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients," May 2006.

GEH Response

It is true that the PANAC11 and TRACG04 models have different bases; however, both must match the same data. It is evident that PANAC11 must be reasonably successful in predicting the steady state void fraction distribution in the core because otherwise it would not be able to predict the power amplitude or shape and the exposure distribution with time. Such empirical evidence refutes the hypothesis that limited support for Findlay-Dix will translate into some deficiency in the ability of TRACG04 to analyze AOO transients. Admittedly, the question remains as to the consistency between the TRACG04 and PANAC11 void distributions. The NRC concern as we understand it is that the initialization process used in TRACG04 could mask the impact of a mismatch in the void distribution. The concern is not the void distribution per se; rather it is the impact that the steady state void distribution may ultimately have on the axial power shape transient response.

Paragraph (a) of the RAI expresses a concern with how void fraction uncertainty propagates into the void coefficient uncertainty. The uncertainty in void coefficient originates from the uncertainty in the change in reactivity to a specified change in void fraction as calculated in the lattice physics methods. [[

]] Again the concern is not with void coefficient per se; rather it is with how a void fraction uncertainty manifests itself as an uncertainty in the calculated change in power. The void coefficient simply acts as a gain on the void fraction uncertainty. The void fraction uncertainty is evaluated entirely relative to the TRACG04 model. Examples of these assessments were provided in the response to RAI 31. A potential non-conservative bias in the void coefficient due to assumptions regarding how the void fraction impacts the neutron spectrum (void history effects) is addressed separately in the response to RAI 30.

Paragraph (a) of this RAI deals with uncertainty; paragraph (b) deals with a postulated bias. To assess the impact of a potential bias the TRACG04 initialization process was modified [[

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For the modified initialization, the initial reference fluid density distribution is different and thus the initial power distribution is potentially different from the distribution obtained in PANAC11. To assess this difference, the modified initialization process was applied to the same EPU core used to produce the demonstration calculations in Chapter 8 of the LTR submittal. The set of initial conditions are at the EPU uprated power and increased core flow (ICF) at end-of-cycle (EOC). For this particular case the modified initialization process produced the same total power for the initiation of the transient as the original initialization process [[

]]. At the end of the null transient the original and modified initialization processes produce the steady state relative axial power shapes in the limiting channel that are compared in Figure 32-1. The associated steady state axial void profiles for this same limiting channel are compared in Figure 32-2. These comparisons show that any postulated bias that might be inherent to the Findlay-Dix void model relative to the TRACG04 void model [[

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The comparisons in the previous paragraph provide only an indirect indicator of the potential impact on the transient response. Based on the direct assessments against transient plant data provided previously in Chapter 7 of NEDE-32177P, Rev. 3, any adverse impacts from the original initialization process cannot be very significant or one would not expect all the comparisons with transient data to have turned out so well. Nevertheless, the impact of the initialization process on the transient response was directly quantified by performing a specific calculation with the modified initialization and comparing it to the identical calculation made using the original initialization. Such a comparison is made for the transient power responses from a turbine trip with no bypass (TTNB) in Figure 32-3. [[

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The TTNB event was chosen because it tends to be one of the most limiting transient events for purposes of evaluating the change in CPR. For AOO transients the key parameter is the change in CPR (ΔCPR) over the initial CPR (ICPR). The comparison of ΔCPR/ICPR between the results from the original and modified initialization procedures is shown in Figure 32-4 for the most limiting channel. [[

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A minor part of the effort to assess a potential bias due to differences in TRACG04 and PANAC11 was to add a new edit in TRACG04 as illustrated in Table 32-1. This edit allows any potential bias to be assessed for each application. The values in Table 32-1 are for the particular case described above. [[

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Paragraph (c) of the RAI is concerned (in part) with the range of application for the Findlay-Dix model. The range-of-application concern for Findlay-Dix was addressed in the RAI responses resulting in the SER for the interim methods LTR NEDC-33173P.

The range-of-application concern for the TRACG04 model is addressed in the response to RAI 31. The conclusion from the assessment provided in the response for RAI 31 was that even the hottest channel for EPU and MELLLA+ conditions remains within the qualification range of TRACG04 because the limiting channel must operate with about the same margin as quantified by its critical power ratio. The other part of the NRC concern is that any mismatch in the calculated PANAC11 versus TRACG04 void distribution resulting from the initialization process could be amplified for conditions that produce a higher average core void fraction. This concern is based on the observation that, unlike the conditions for the limiting channel that were addressed specifically in RAI 31, the feedback mechanisms that drive the transient power and flow responses are determined by the conditions of the entire core. For example, at EPU/MELLLA+ conditions more channels may be operating with higher powers and hydraulic conditions similar to those of the limiting channel; so, even if the limiting channel conditions has not changed appreciably the core environment has. To address this point, the calculations presented for rated EPU/ICF condition were repeated (using the same process) for the high-flow and low-flow corners of the power/flow map corresponding to the rod line for the EPU/MELLLA+ boundary.

The EPU/MELLLA+ calculations were performed at end-of-cycle (EOC) for the same core and exposure condition analyzed in the first part of this response and the same EPU core used to produce the demonstration calculations in Chapter 8 of the LTR submittal. The EOC exposure was selected because it is generally most limiting in terms of ΔCPR/ICPR.

The key digital values for all three power/flow state points are summarized in Table 32-2. For convenience they are labeled "A", "B" and "C". The figures pertaining to state point "A" corresponding to EPU/ICF at EOC have already been discussed. State points "B" and "C" correspond respectively to the upper and lower flow bounds on the EPU/MELLLA+ rod line. Table 32-2 will be discussed first before mentioning some key points from the figures that have been added for the calculations for the "B" and "C" state points that define the EPU/MELLLA+ boundary.

The upper part of the Table 32-2 simply repeats the information from the edit shown in Table 32-1 for state point "A". A different format is used so that the values can be easily compared to the similar information for the other two state points.

Table 32-2 also contains the calculated values for the nodal void fraction uncertainty. The nodal uncertainty for the mismatch in relative moderator density (u) has been transformed into an uncertainty in nodal void fraction (α) using the relationship

$$\Delta\alpha = \frac{\Delta u \cdot \rho_{ref}}{\left(\rho_g - \rho_\ell\right)}$$

where ρ_{ref} is the constant reference density used by TGBLA and PANAC for all conditions, ρ_g is the density of saturated steam evaluated at the core average pressure, and ρ_ℓ is the density of saturated water evaluated at the core average pressure.
For all three analyzed state points the tabulated nodal void fraction uncertainty is less than the value used in the transient statistical analyses as pointed out previously for state point "A". This observation is simply an acknowledgement that the determination of the [[ ]] void fraction uncertainty is largely due to data measurement uncertainty and uncertainty in fitting the data and that these uncertainty elements and the actual data is common to the development of both the PANAC and the TRACG models; so, this magnitude of uncertainty is expected when comparing all the differences in nodal values between PANAC and TRACG. This observation should not be construed to imply a requirement for the following reasons: (a) the nodal void fraction uncertainty reported in Table 32-2 is a conservative estimate of the standard deviation from a set of point-by-point differences in two populations that is a factor of $\sqrt{2}$ larger than the standard deviation for each population (if the differences are random as they appear to be in these applications); (b) the void fraction uncertainty of [[ ]] as determined from TRACG04 comparisons to separate effects test data has conservatively been assigned entirely to modeling uncertainty in interfacial shear whereas the compounded void fraction uncertainty for AOO analyses has larger components due to uncertainties in other parameters such as flow, pressure, heat input, etc. that get treated separately in the transient statistical analyses and thus to some extent are accounted for twice; (c) the steady state uncertainties for initial conditions are already accounted for entirely in the SLMCPR process so the transient analyses for ΔCPR/ICPR needs only to account for how initial conditions will impact the transient response but again many of these component uncertainties are considered twice in determining the OLMCPR uncertainty; (d) the uncertainties given in Table 32-2 increases when fewer CHAN groups are used but such an increase is not correlated to a change in the calculated ΔCPR/ICPR since it is the change in moderator density or void fraction during the transient that is dominant and initial conditions are much less important (one reason for continued successful application of the historically approved single-channel, one-dimensional models). The fact that a coarser CHAN grouping does not significantly change the transient response is demonstrated in Figures 32-7, 32-8, 32-11 and 32-12 that are discussed later.

Table 32-2 also contains other key digital values. The core average void fractions and average in-channel void fractions have been listed to make the point that the lower-flow corner on the MELLLA+ line (state point "C") produces essentially the same average void fraction values as for the higher-flow point on the same rod line (state point "B"). The higher-flow point on the MELLLA+ rod line does have a higher void fraction value than the rated power at ICF (state point "A") simply because the power-to-flow ratio increases as power is maintained and flow decreases. Additional reactivity must be provided by withdrawing control blades (or some other means) to maneuver from state point "A" to state point "B". By contrast, movement from point "B" to point "C" is accomplished entirely with flow without control blade movement so power decreases so that the net reactivity due to voiding in the core does not change. No net change in the total reactivity due to voids simplistically means that the average void fraction values cannot change in any appreciable way when moving from point "B" to point "C".

The calculated limiting ΔCPR/ICPR digital values for both the original and modified initialization processes are provided (as requested) in Table 32-2 along with the changes due to changing the initialization procedure. It is most important to note that the calculated changes in the most limiting values of ΔCPR/ICPR that are shown in the bottom row of Table 32-2 are [[

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The corresponding transient responses for power/flow state points "A", "B" and "C" in Table 32-2 are shown in Figures 32-4, 32-8 and 32-12, respectively. The figures will be discussed later. For now it is sufficient to point out that the "C" state point is very far from being the most limiting point for purposes of transient ΔCPR/ICPR.

Figures 32-1 through 32-4 corresponding to the calculations at state point "A" were discussed previously in response to part (b) of the RIA. No further discussion is needed.

Figures 32-5 through 32-8 pertain to state point "B" and Figures 32-9 through 32-12 pertain to state point "C". Both groups of figures follow the same format and order that was used for state point "A". The conclusions previously made for state point "A" also apply for state points "B" and "C"; however, there is some additional information in the figures for state points "B" and "C" that warrants additional discussion.

One point worth mentioning is that the impact on the initial axial power shape of the change in the initialization process [[

]] To put this impact into the proper perspective, the one-sigma uncertainty has been shown in these figures. The nodal power uncertainty value already accounted for in the SLMPCR is at least [[ ]] obtained by considering only the component values due to σ_{mdl} and σ_{ran} on page 2-9 of NEDE-32601P-A, revision 0. Even with this smaller value, the changes in the axial power shape due to initialization are essentially within the one-sigma band already addressed in the SLMCPR.

Figures 32-6 and 32-10 show how the steady state void distribution in the limiting channel corresponds to the small change in axial power shape. At the channel exit, the void fractions are essentially the same for the "B" and "C" state points. This observation further supports the argument that was made in RAI 31 regarding the fluid conditions for the limiting channel. A comparison with the results from Figure 32-2 reveals that the exit void fraction in the limiting channel for MELLLA+ has [[ ]] relative to the value for the highest flow at ICF.

Figures 32-5, 32-6, 32-9 and 32-10 show that any postulated bias that might be inherent to the Findlay-Dix void model relative to the TRACG04 void model [[

]] at EPU/MELLLA+ conditions. This is the same conclusion that was made previously for the EPU/ICF case corresponding to state point "A".

Next consider the transient power responses shown in Figure 32-7 for state point "B" and Figure 32-11 for state point "C". Compare these power responses to the power response for state point "A" that is shown in Figure 32-3. It is clear from such a comparison that the transient power change becomes significantly less severe as the total core flow decreases. This is a typical trend for pressurization events in operating BWRs. Figures 32-7 and 32-11 also show results of a sensitivity study to the number of CHAN groups. These results are in addition to the comparisons between the original and modified initialization processes. The solid lines correspond to the calculations performed with [[ ]] CHAN groups whereas the open symbols correspond to calculations performed with only [[ ]] CHAN groups. [[

]] the core average response dominates all the limiting AOO transient events. This is the reason that the historically approved one-dimensional models that typically model a single channel have continued to be used. The main point is that the initial uncertainty in moderator density (or voids) is largely irrelevant because the dominant influence is the transient change in moderator density and the initial absolute value contributes only in a very minor way.
Figures 32-7 also 32-11 also support the conclusion that [[

]] This is the same conclusion that was reach for the evaluations at state point "A".

The final objective of these evaluations is to compare the calculated ΔCPR/ICPR responses and values. Digital values at the limiting point have previously been presented in Table 32-2. The transient responses are shown in Figures 32-8 and 32-12 for state points "B" and "C", respectively. Sensitivity to the CHAN grouping is shown as well as the impact due to changing the initialization process. The legends are the same as those previously described for the transient power responses in Figure 32-7 and Figure 32-11. All the ΔCPR/ICPR responses for state point "B" that are shown in Figure 32-8 [[
]]. For state point "C" the curves in Figure 32-12 show
[[

]] This point was also made previously in discussing the precise digital values shown in Table 32-2. The transient results shown in Figures 32-8 and 32-12 for state points "B" and "C" [[

]] This is the same conclusion that was previously supported for state point "A".

There is one final point to emphasize that has already been stated briefly several times. The digital values for ΔCPR/ICPR at the limiting point that are presented in Table 32.2 indicate that there is substantial margin at the low-flow MELLLA+ condition corresponding to state point "C". This margin is independent of other substantial process conservatisms described in the RAI 33 response that may be construed to be *reserved* to accommodate flexibility in how the core is operated. The margin described here is attributed to a milder transient power response at lower power/flow conditions that is characteristic of how BWRs respond to pressurization events. The point is made dramatically by the ΔCPR/ICPR responses that are shown in Figure 32-13. Only the results for the preferred original initialization process are shown [[

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Non-proprietary Version

Table 32-1 Example of New Edit for Rated EPU/ICF Conditions

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Table 32-2 Summary for Three EPU/MELLLA+ Calculations

power/flow state point →	A	B	C
Total Core Power (%rated)	100	100	77.6
Total Core Flow (%rated)	104.5	85	55
[[			]]
[[			]]
[[			]]
[[			]]
[[			]]
[[			]]
[[			]]
AVG Core Void Fraction	[[		]]
AVG In-channel Void Fraction	[[		]]
Limiting Transient D/I CPR (original initialization)	[[		]]
Limiting Transient D/I CPR (modified initialization)	[[		]]
Change in Limiting D/I CPR due to initialization	0.0015	0.0010	0.0121

Non-proprietary Version

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Figure 32-5 Steady State Relative Axial Power Shapes in Limiting Channel for 100% Power, 104.5% Flow

Non-proprietary Version

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Figure 32-6 Steady State Axial Void Fraction Profile in Limiting Channel for 100% Power, 104.5% Flow

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Figure 32-7 Total Power Responses for Turbine Trip without Bypass from 100% Power, 104.5% Flow

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Figure 32-8 ΔCPR/ICPR Comparison for the Limiting Channel for a TTNB from 100% Power, 104.5% Flow

Non-proprietary Version

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Figure 32-5 Steady State Relative Axial Power Shapes in Limiting Channel for 100% Power, 85% Flow

Non-proprietary Version

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Figure 32-6 Steady State Axial Void Fraction Profile in Limiting Channel for 100% Power, 85% Flow

Non-proprietary Version

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Figure 32-7 Total Power Responses for Turbine Trip without Bypass from 100% Power, 85% Flow

Non-proprietary Version

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Figure 32-8 ΔCPR/ICPR Comparison for the Limiting Channel for a TTNB from 100% Power, 85% Flow

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Figure 32-9 Steady State Relative Axial Power Shapes in Limiting Channel for 77.6% Power, 55% Flow

Non-proprietary Version

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Figure 32-10 Steady State Axial Void Fraction Profile in Limiting Channel for 77.6% Power, 55% Flow

Non-proprietary Version

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Figure 32-11 Total Power Responses for Turbine Trip without Bypass from 77.6% Power, 55% Flow

Non-proprietary Version

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Figure 32-12 ΔCPR/ICPR Comparison for the Limiting Channel for TTNB from 77.6% Power, 55% Flow

Non-proprietary Version

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Figure 32-13 ΔCPR/ICPR Responses for the Limiting Channel for TTNB from Varying Powers and Flows

ENCLOSURE 3

MFN 08-604

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, Robert E. Brown, state as follows:

(1) I am Senior Vice President, Regulatory Affairs, GE-Hitachi Nuclear Energy Americas LLC ("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 GEH letter, MFN 08-604, *Transmittal of Response to NRC Request for Additional Information - NEDE-32906P, Supplement 3, "Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients*," dated July 30, 2008. The proprietary information in Enclosure 1 entitled, "*GEH Response to NRC RAI 32*," is identified by a dotted underline inside double square brackets.. [[This sentence is an example.{3}]] In each case, the superscript notation {3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without license from GEH constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;

d. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. above.

(5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GEH, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist, or other equivalent authority for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results including the process and methodology for application of TRACG to the performance of AOOs for GEH BWRs. This TRACG code has been developed by GEH for over sixteen years at a total cost in excess of three million dollars. The reporting evaluation and interpretations of the results, as they are applicable to the BWR, was achieved at a significant cost to GEH.

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

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply

the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GEH.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 30th day of July 2008.

R. E. Brown

Robert E. Brown
GE-Hitachi Nuclear Energy Americas LLC