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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 07-015
Supplement 1

Docket No. 52-010

May 15, 2007

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

Subject: **Response to NRC Request for Additional Information Email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006 Related to ESBWR Design Certification Application - Instrumentation and Control - RAI Number 7.2-36, Supplement 1**

Enclosures 1 and 2 contain GE's response to the subject NRC supplemental RAI transmitted via the Reference 1 email. The original RAI response was submitted to the NRC in Reference 2.

Enclosure 1 contains proprietary information as defined in 10CFR2.390. 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 proprietary information in Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Enclosure 2 contains a non-proprietary version.

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

Reference:

1. Email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006, Subject "*Sample Request For Additional Information*"
2. MFN 07-015 - *Response to Portion of NRC Request for Additional Information Letter No. 76 Related to ESBWR Design Certification Application - Instrumentation and Control - RAI Numbers 7.1-43, 7.2-33, 7.2-34, 7.2-36, 7.2-41 through 7.2-49, 7.3-3, through 7.3-6, 7.3-8, 7.3-9, 7.7-2, 7.7-5, and 7.9-15*, dated February 12, 2007

Enclosures:

1. Response to NRC Request for Additional Information Email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006 Related to ESBWR Design Certification Application Instrumentation and Control, RAI Number 7.2-36, Supplement 1 – GE Proprietary Information
2. Response to NRC Request for Additional Information Email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006 Related to ESBWR Design Certification Application Instrumentation and Control, RAI Number 7.2-36, Supplement 1 – Non-Proprietary Version
3. Affidavit – James C. Kinsey – dated May 15, 2007

cc:	AE Cubbage	USNRC (with enclosures)
	GB Stramback	GE/San Jose (with enclosures)
	RE Brown	GE/Wilmington (with enclosures)
	eDRF	0000-0064-4305

Enclosure 2

MFN 07-015, Supplement 1

Response to NRC Request for Additional Information
Email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006
Related to ESBWR Design Certification Application
Instrumentation and Control

RAI Number 7.2-36, Supplement 1

Non-Proprietary Version

NRC RAI 7.2-36

DCD, Tier 2, Revision 1, Table 7.2-2 and Table 7.2-3 listed "Typical Analytical Limit For Trip Setpoint (Note 1)." Note 1 stated that values in this table are typical, instrument accuracy will be considered based on the instrument setpoint methodology. It is the staff's understanding that the analytical limit should be based on the ESBWR's accident analysis, therefore, it is not a "typical" value. The trip setpoint will be determined based on plant-specific instrument selected that will be specified in the plant technical specification. Clarify "Typical Analytical Limit" in Tables 7.2-2 and 7.2-3.

GE Original Response

ESBWR DCD, Tier 2, Chapter 7, Section 7.2, Tables 7.2-2 and 7.2-4 (was Table 7.2-3 in Revision 1) will be revised in Revision 3 to delete the word "Typical". The analytical limit values in these tables are confirmed by the final ESBWR accident analysis. Note 1 of Tables 7.2-2 and 7.2-4 will also be revised to delete first sentence and for clarification that the analytical limit is based on the ESBWR accident analysis.

NRC RAI 7.2-36 Supplement 1

To support NRC assessment of the acceptability of the LAR in regard to setpoint changes, please provide the following for each setpoint to be added or modified:

1.) *Setpoint Calculation Methodology: Provide documentation (including sample calculation) of the methodology used for establishing the limiting setpoint (or NSP) and the limiting acceptable values for the As-Found and As-Left setpoints as measured in periodic surveillance testing as described below. Indicate the related Analytical Limits and other limiting design values (and the sources of these values) for each setpoint.*

2.) *Safety Limit (SL)-Related Determination: Provide a statement as to whether or not the setpoint is a limiting safety system setting for a variable on which a safety limit (SL) has been placed as discussed in 10 CFR 50.36 (c)(1)(ii)(A). Such setpoints are described as "SL-related" in the discussions that follow. In accordance with 10 CFR 50.36(c)(1)(ii)(A), the following guidance is provided for identifying a list of functions to be included in the subset of LSSS's specified for variables on which SLs have been placed as defined in Standard Technical Specifications (STS) Sections 2.1.1m Reactor Core SLs and 2.1.2 Reactor Coolant System pressure SLs. This subset includes automatic protective devices in TSs for specified variables on which SLs have been placed that: (1) initiate a reactor trip; or (2) actuate safety systems. As such these variables provide protection against violating reactor core safety limits, or reactor coolant system pressure boundary safety limits.*

   Examples of instrument functions that might have LSSSs included in the subset in accordance with the plant-specific licensing basis, are pressurizer pressure reactor trip (pressurized water reactors), rod block monitor withdrawal blocks (boiling water reactors), and end of cycle recirculation pump trip (boiling water reactors). For each

setpoint, or related group of setpoints, that you determine not to be SL-related, explain the basis for this determination.

3.) *For setpoints that are determined to be SL-related, the NRC letter to the NEI SMTF dated Sept. 7, 2005 (ML052500004) (Reference 1), describes setpoint-related Tech Specs (SRTS) that are acceptable to the NRC for instrument settings associated with SL-related setpoints. Specifically, Part "A" of the enclosure to the letter provided LCO notes to be added to the TS, and Part "B" includes a check list of the information to be provided in the TS Bases related to the proposed changes.*

   a. *Describe whether and how you plan to adopt the suggested SRTS, then explain how you will ensure compliance with 10 CFR 50.36 by addressing items 3b and 3c, below.*

   b. *As-found setpoint evaluation: Describe how surveillance test results and associated TS limits are used to establish operability of the safety system. Show that this evaluation is consistent with the assumptions and results of the setpoint calculation methodology. Discuss the plant corrective action processes (including plant procedures) for restoring channels to operable status when channels are determined to be "inoperable" or "operable but degraded." If the criteria for determining operability of the instrument being tested are located in a document other than the TS (e.g. plant test procedure), explain how the requirements of 10 CFR 50.36 are met.*

   c. *As-left setpoint control: Describe the controls employed to ensure that the instrument setpoint is, upon completion of surveillance testing, consistent with the assumptions of the associated analyses. If the controls are located in a document other than the TS (e.g. plant test procedures), explain how the requirements of 10 CFR 50.36 are met.*

4.) *For setpoints that are not determined to be SL-related: Describe the measures to be taken to ensure that the associated instrument channel is capable of performing its specified safety functions in accordance with applicable design requirements and associated analyses. Include in your discussion information on the controls you employ to ensure that the as-left trip setting after completion of periodic surveillance is consistent with your setpoint methodology. Also, discuss the plant corrective action processes (including plant procedures) for restoring channels to operable status when channels are determined to be "inoperable" or "operable but degraded." If the controls are located in a document other that the TS (e.g. plant test procedure), describe how it is ensured that the controls will be implemented.*

GE Response

Each response is numbered corresponding to the RAI above numbering.

1.) Table 1 included with this response provides a definition for the setpoint related terminology used in the GE methodology, as well as including reference to nominal and limiting trip setpoints.

ESBWR setpoints are calculated by NRC approved GE setpoint methodology (Reference 4) that uses ISA S67.04.2, Method 2 Plus. The calculation methodology, which accommodates the new NRC instrument performance requirements (RIS 2006-17), is described below, and shown in Figure 1:

1) Determine Analytical Limit (AL).

   This is the instrument setting value used in the safety analysis which demonstrates and assures that the Safety Limit is protected. In the safety analysis, the AL is typically determined with no allowances made for instrument uncertainties.[1]

2) Determine Allowable Value (AV).

   This is the value at which the setpoint can be found during calibration that ensures that the protective action will occur before exceeding the AL, and therefore assures that the instrument is operable. The GE setpoint methodology provides margin between the allowable value and the AL based on all instrument errors except drift, so that if the setpoint is found during calibration to have drifted to this value, the AL is protected. [[

   ] Accounting for these errors assures that a setpoint found at the AV during calibration has adequate margin to protect the AL thereby protecting the Safety Limit. This represents the limiting as-found setpoint value which meets the definition of operability (i.e., capable of performing its specified safety function) as defined in RIS 2005-20, RG 1.105 Rev 3, and therefore is the limiting condition of operation (LCO) value used in the BWR Technical Specifications.

3) Determine Final Nominal Trip Setpoint ($NTSP_F$).

   The determination of $NTSP_F$ is basically a two-step process. In accordance with the statistically comprehensive GE setpoint methodology (Ref. 4), the setpoint has to meet margin requirements to both AL and AV. Because of the differences in the requirements, the application of statistics for each step is different.

   3.1) Determine first Nominal Trip Setpoint ($NTSP_1$).

   $NTSP_1$ is the setpoint that gives the minimum required margin from the setpoint value to the AL. [[

   ]] The $NTSP_1$ is

[1] Some safety analyses do provide some allowance for instrument error, and for these, the AL value used for setpoint calculations is conservative.

equivalent to what is referred to as limiting trip setpoint (LSP in RIS 2006-17), because it has the minimum required margin to the AL. However, $NTSP_1$ is not the final setpoint because it does not include the proper margin to the AV to minimize the probability of operability evaluations and Licensing Event Reports (LER). The $NTSP_1$ is an interim setpoint for calculation purposes only, and is used to determine the final NTSP, which is equal to or more conservative than $NTSP_1$.

3.2) Determine final NTSP ($NTSP_F$).

$NTSP_F$ is generally more conservative than $NTSP_1$, and provides margin to the AV. [[

]] For ESBWR the margin between $NTSP_F$ and the AV satisfies the instrument "performance limit" requirement in the NRC communications (RIS 2006-17, Ref. 7), so this margin can also be considered the same as the as-found tolerance (AFT).

[[

]]

Sample Calculation

A sample calculation using this methodology is shown below for the reactor vessel high steam dome pressure setpoint.

Inputs:

The process measurement error (PMA) and primary element error (PEA) are:

PMA = [[ ]]
PEA = [[ ]]

The pertinent instrument loop Accuracy (A), Drift (D) and Calibration (C) errors for the loop, are as follows: [[

]]

[[

]]

The Analytic Limit input to the setpoint calculation is:

AL = 1105 psig

The setpoint calculation is described below:

[[

]]

To address the issues identified in this RAI and the guidance in RIS 2006-17 (Reference 7), the ESBWR as-found and as-left tolerances will be derived as described below.

As Found Tolerance (AFT)

Guidance from the NRC (RIS 2006-17) defines AFT as the value within which the calibration data is expected to fall assuming the instrument is performing as expected. Thus AFT represents a "performance limit" for instruments in the loop. Instruments with as-found values beyond this tolerance are placed in a special category for evaluation to assure they are performing within the values assumed in the setpoint calculation. Based on RIS 2006-17, it is interpreted that the as-found tolerance allowance is equal to [[

]] Moreover, in accordance with GE setpoint methodology, setpoints found outside the AV are already placed in a special category for evaluation. Thus for ESBWR:

[[

]]

Note that AFT will be applied on a 2-side basis around the actual instrument setpoint, which for ESBWR is $NTSP_F$.

Thus for the reactor vessel high steam dome pressure setpoint example given above,

AFT = [[ ]]

Note for verification purposes for this example that

[[

]]

As Left Tolerance (ALT)

The ALT in GE methodology is the value to which the instrument is reset during calibration, and this is usually determined by the site specific calibration procedure. For ESBWR, the ALT is restricted to a value [[

]] The permitted value of ALT inferred from RIS 2006-17 is SRSS of A_C and the calibration tool errors. [[

]] Use of ALT in the setpoint calculation will remain consistent with the way it is defined and used in the GE methodology. [[

]] Thus for ESBWR:

[[

]]

For the reactor vessel high steam dome pressure setpoint example given above, the ALT value for the loop is

ALT = [[ ]]

Note for verification purposes for this example that:

RIS 2006-17 ALT Allowance = $(7.348^2 + 2.94^2)^{1/2} = 7.91$ psi.

[[ ]]

The GE setpoint methodology described in Reference 4 will be supplemented to include a graded approach for instrument setpoints, and this is described below:

GE Setpoint Methodology Graded Approach

A graded approach (prioritization) for calculating setpoints will be used for the ESBWR. The philosophy for this approach is based upon Section 4 of ISA-S67.04, Part I (Reference 5), which allows for various levels of rigor to be applied in setpoint determination methodology based on importance to safety, and BTP HICB-12 (Reference 6), which includes guidelines for a graded approach.

The graded approach to establishing setpoints utilizes different levels of safety importance for various setpoints based upon the level of safety significance. This approach is fundamentally dependent on the analytical basis of each independent setpoint. In order to apply the graded approach, it is necessary to identify the level of safety significance that is associated with each function.

The most important setpoints are associated with those functions that are utilized directly or indirectly in the plant safety analysis. These functions are listed in the plant Technical Specifications. Additional types of important instruments are also listed in the Technical Specification. These setpoint calculations should consider all errors presented in the Reference 5 and 6.

Abbreviated or less rigorous setpoint calculations may be performed for other functions, such as instruments used in support of safety related equipment, instruments that are important to plant operation, instruments which protect major pieces of equipment against significant damage, or instruments whose failure/improper setting could result in personnel or safety hazards. Examples of these functions are turbine building service water pump protection and automatic trips of the turbine generator. For functions not evaluated in the safety analysis, setpoint calculation will be based on an equipment design limit instead of an analytical limit; in this case only significant error contributors need to be considered. Instrument setpoints with minimal importance to plant safety may be set based on engineering judgment.

An overview of the graded categories of instrument setpoints is included in the following.

Graded Categories

Categories A through C defined below correspond to the various levels of rigor of the Computation Method in establishing instrument nominal trip setpoints (NTSPs) and allowable values (AVs). Category D defined below corresponds to the Engineering Judgment Method of establishing instrument NTSP.

Group A

Group A denotes those setpoints associated with automatic I&C functions and equipment on which reliance is placed for the achievement or maintenance of the nuclear safety function and are associated with an established Analytical Limit. These trips actuate systems necessary for the safe shutdown of the plant following an accident or transient and to mitigate the consequences of accidents. Examples include Reactor Protection system (RPS), Engineered Safety Features (ESF) and Containment Isolation functions.

There are two subcategories included in Group A, as follows:

A1: Safety Limit (SL)-Related Limiting Safety System Settings (LSSS):
Includes safety limit (SL) related LSSS included in Table 2 of this RAI response.

A2: Non-SL-Related LSSS:
Includes non-SL related LSSS included in Table 3 of this RAI response.

Group B

Group B denotes those setpoints associated with automatic I&C functions and equipment that are secondary to functions accomplished by Group A setpoints or that support those functions in the achievement or maintenance of a safety function. Based on the presence of Group A setpoint initiated systems to provide the required accident mitigation function, the integrity of the Group B setpoints need not be as high as that of Group A. Examples include those setpoints related to Technical Specification limiting conditions that are not included in Group A, or that establish the operability of a safety system or function.

Group C

Group C denotes those setpoints that have an auxiliary or indirect role in the achievement or maintenance of safety functions. Group C includes those setpoints that have some safety significance but are not assigned to Groups A or B. They are part of the overall response to an accident but are not the primary mitigation capability. Examples include alarms to alert the operator to abnormal operation of safety systems.

Group D

Group D denotes those setpoints that have limited safety significance and include all non-safety related setpoints. This group includes setpoints associated with systems where limits are not stated or established by the design basis or safety analysis or where engineering judgment based on common industry practice or manufacturers guidance has been shown to be appropriate.

2.) The proposed ESBWR Tech Specs have identified the functions requiring LSSS, and presented settings for automatic protective devices related to these variables having significant safety functions. The LSSS functions that protect Technical Specifications Safety Limits (SL-related LSSS), except for mechanical devices, are shown in Table 2. The non-SL-related LSSS are provided in Table 3. They are associated with equipment operability, design basis accident, or infrequent event response.

3.)a.) GE will adopt the suggested setpoint-related Technical Specification Notes and Bases clarifications in Revision 4 of DCD Tier 2, Chapter 16 and Chapter 16B. The specific implementation will follow guidance more recent than the referenced Sept. 7, 2005 (ML052500004) NRC guidance. This more recent guidance is consistent with that reflected in RIS 2006-017 and Industry efforts to reach consensus with NRC on wording and level of detail. Specific details will be modified to reflect ESBWR specific standardized design and terminology.

b.) During the process of calibration and surveillance tests for the limiting safety system settings, there are four possible results for the as-found values. These results with corresponding procedural action are as follows:

1) The setpoint is found within the as left tolerance (ALT). For this case, the results are recorded as required by the plant surveillance procedure and no adjustments are required.

2) The setpoint is outside the ALT but within the as found tolerance (AFT). For this case, the setpoint is to be reset to within the ALT.

3) The setpoint is found conservative to the allowable value but outside the as found tolerance. For this case the setpoint is to reset to the nominal trip setpoint (within the ALT), and an evaluation of the channel functionality is required. For ESBWR the operating setpoint is $NTSP_F$ and the AFT is the margin between AV and $NTSP_F$. So in this case the setpoint cannot be found conservative to the allowable value and outside the AFT in the non-conservative direction.

4) The setpoint is found non-conservative to the allowable value; the channel is inoperable until the setpoint is reset to within the ALT, and evaluations necessary to return the channel to service are to be made.

For SL-related LSSS Functions (which are not based on mechanical devices), the footnote and related Bases changes referenced in response to 3.a above, will provide the controls to ensure compliance with 10 CFR 50.36 in accordance with the referenced NRC issued guidance.

c.) For SL-related LSSS Functions (which are not based on mechanical devices), the footnote and related Bases changes referenced in response to 3.a above, will provide the controls to ensure compliance with 10 CFR 50.36 in accordance with the referenced NRC issued guidance.

4.) For the non-SL-related LSSS Functions, plant surveillance procedures will implement controls similar to those imposed on the SL-related LSSS functions as described above in response to RAI question 3.a above. Any setpoint found beyond the AV (i.e., exceeding the AFT which is the AV/$NTSP_F$ margin) will be evaluated for operability from the performance point of view. Also all setpoints beyond the ALT will be reset to the $NTSP_F$. Using the AV and $NTSP_F$ developed by GE setpoint methodology to monitor operability will assure that Operability related to both safety and performance is assured for all LSSS.

DCD Impact

SL-related Functions will be identified in Revision 4 of the ESBWR DCD Chapter 16 by inclusion of a new Footnote addressing the Notes discussed in Item #3 of this RAI. The basis for determining whether a Function is a SL-related Function will be provided in the Bases for that Function. The instrumentation Table columns indicating "Setting Basis" will be revised to reflect "Allowable Value" and the Administrative Controls Program 5.5.11, "Setpoint Control Program," will be deleted.

Based on the scope of the changes to both Chapter 16 and Chapter 16B, specific DCD markups are not included in this response. A subsequent transmittal will provide the intended DCD Revision 4 markups. GE intends to provide this supplement by June 30, 2007.

References

1.) Letter from Patrick L. Leland, NRC, to NEI Setpoint Methods Task Force, "Technical Specification for Addressing Issues Related to Setpoint Allowable Values," dated Sept. 7, 2005, available on the NRC public website in ADAMS, Accession No. ML052500004.

2.) Letter from Bruce A. Bolger, NRC, to Alex Marion, "ISA S67.04 Methods for Determining Trip Setpoints and Allowable Values," dated August 23, 2005, ADAMS Accession No. ML 051660447.

3.) Letter from James A. Lyons, NRC, to Alex Marion, NEI, "ISA S67.04 Methods for Determining Trip Setpoints and Allowable Values for Safety-Related Instrumentation," dated March 31, 2005, ADAMS Accession No. ML050870008.

4.) NEDC-31336-P-A, "General Electric Instrument Setpoint Methodology," September 1996.

5.) ANSI/ISA-67.04.01, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation".

6.) Branch Technical Position HICB-12, "Guidance for Establishing and Maintaining Instrument Setpoints," Sept, 1997.

7.) Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10CFR50.36, 'Technical Specification,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," August 24, 2006.

8.) TSTF-493 Revision 1, "Clarification of Setpoint Methodology for LSSS Functions," October 2, 2006.

TABLE 1: GE Setpoint Methodology Definitions

Term	GE Setpoint Methodology Definition
Safety Limit (SL)	Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity.
Analytical Limit (AL)	The value of the sensed process variable, established as a part of the design basis safety analysis prior to, or at the point which a desired action is to be initiated to prevent the safety process variable from reaching the associated safety limit.
Limiting Safety System Setting (LSSS)	Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded.
Limiting Trip Setpoint (LTSP)	This term is not used in GE setpoint methodology. However, based on the definitions, the limiting trip setpoint is essentially the same as the nominal trip setpoint ($NTSP_1$) with the required minimum margin to the AL.
Nominal Trip Setpoint ($NTSP_F$)	The nominal trip setpoint ($NTSP_F$) is the trip setpoint value based on methodology with appropriate margin to the AV for plant operations. The NTSP must be equal to or more conservative than the LTSP.

Term	GE Setpoint Methodology Definition
Allowable Value (AV)	The AV is the limiting value at which the trip setpoint might be found during surveillance which assures that the analytical limit is protected during operation. The Allowable Value is determined by providing margin to the analytical limit by the SRSS of the instrument accuracy under trip conditions (A_T), the calibration uncertainty, the primary element accuracy (PEA), and process measurement accuracy (PMA) to assure there is a 95% single sided probability that the analytical limit will not be exceeded.
As Found Tolerance (AFT)	This term is not used in GE setpoint methodology. However, AFT is the tolerance ensures that channel operation is consistent with the assumptions or design inputs used in the setpoint calculations and that there is a high confidence of future acceptable channel performance. [[ ]]
As Left Tolerance (ALT)	ALT is the tolerance within which a setpoint is set during calibration. The [[ ]]

Table 2
LSSS associated with Safety Limits
Associated with 2.1.2 RCS pressure SL
RPS Reactor Vessel Steam Dome Pressure – High
Associated with 2.1.1.3 RCS water level SL
RPS Reactor Vessel Water Level - Low, Level 3
IC Reactor Vessel Water Level - Low, Level 2
MSIV Reactor Vessel Water Level - Low, Level 2
Associated with 2.1.1.2 FCISL
RPS Reactor Vessel Water Level - High, Level 8
RPS Turbine Control Valve Fast Closure Trip Oil Pressure – Low
APRM Fixed Neutron Flux - High, Setdown
APRM Simulated Thermal Power – High
RPS Fixed Neutron Flux – High
OPRM {Period-Based Trip}
SRI/SCRRI FW temperature decrease
Associated with 2.1.1.1 Low pressure/power SL
MSIV Main Steam Line Pressure – Low

Table 3
LSSS which are not associated with Safety Limits
RPS Control Rod Drive Accumulator Charging Water Header Pressure – Low
RPS Main Steam Isolation Valve - Closure (Per Steam Line)
RPS Drywell Pressure – High
RPS Suppression Pool Temperature - High
RPS Turbine Stop Valve Closure Trip
RPS Main Condenser Pressure – High
RPS Power Generation Bus Loss
RPS Neutron Flux – High
RPS Neutron Flux - Short Period
MSIV Reactor Vessel Water Level - Low, Level 1
MSIV Main Steam Line Flow - High (Per Steam Line)
MSIV Condenser Pressure – High
MSIV Main Steam Tunnel Ambient Temperature – High
MSIV Main Steam Turbine Area Ambient Temperature - High
IC Reactor Vessel Steam Dome Pressure – High
IC Reactor Vessel Water Level - Low, Level 1
IC Main Steam Isolation Valve - Closure
IC Power Generation Bus anticipates L2
LDIS Reactor Vessel Water Level - Low, Level 2
LDIS Reactor Vessel Water Level - Low, Level 1
LDIS Drywell Pressure – High
LDIS Main Steam Line Pressure – Low
LDIS Main Steam Line Flow - High (Per Steam Line)
LDIS Condenser Pressure – High
LDIS Main Steam Tunnel Ambient Temperature - High
LDIS Main Steam Turbine Area Ambient Temperature - High
LDIS {RWCU/SDC System Differential Flow - High (Per RWCU/SDC subsystem)}
LDIS Isolation Condenser Steam Line Flow - High (Per Isolation Condenser)
LDIS Isolation Condenser Condensate Return Line Flow - High (Per Isolation Condenser)
LDIS Isolation Condenser Pool Vent Discharge Radiation - High (Per Isolation Condenser)
LDIS {Feedwater Line Differential Pressure - High
ECCS Reactor Vessel Water Level - Low, Level 1.
ECCS Reactor Vessel Water Level - Low, Level 0.5
CRHAVS Control Room Air Intake Radiation – High (per train)
CRHAVS Extended Loss of AC Power (per train)
CRHAVS Emergency Filter Unit (EFU) Air Flow - Low (per train)
CRHAVS EFU Outlet Radiation – High (per train)
CRHAVS Control Room Habitability Area (CRHA) Temperature High

Enclosure 3

MFN 07-015, Supplement 1

Affidavit

General Electric Company

AFFIDAVIT

I, James C. Kinsey, state as follows:

(1) I am Project Manager, ESBWR Licensing, General Electric Company ("GE") 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 GE letter MFN 07-015, Supplement 1, Mr. James C. Kinsey to U.S. Nuclear Regulatory Commission, entitled *Response to Portion of NRC Request for Additional Information email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006 – Related to ESBWR Design Certification Application - Instrumentation and Control – RAI Number 7.2-36, Supplement 1,* dated May 15, 2007. The proprietary information in Enclosure 1, which is entitled *Response to Portion of NRC Request for Additional Information email A. Howe (NRC) to D. Hinds (GE), Dated November 16, 2006 – Related to ESBWR Design Certification Application - Instrumentation and Control – RAI Number 7.2-36, Supplement 1* is delineated by a [[dotted underline inside double square brackets.{3}]]. Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation {3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner, 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 2.790(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;
c. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, resulting in potential products to General Electric;
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 identifies detailed GE ESBWR procedures and assumptions related to its setpoint methodology. The information is consistent in its scope of application with information in NEDC-31336P-A, September 1996, "General Electric Instrument Setpoint Methodology," which is maintained as proprietary.

The development of the evaluation process along with the interpretation and application of the regulatory guidance 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 15th day of May 2007.

James C Kinsey

James C. Kinsey
General Electric Company