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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 08-119, Supplement 1

Docket No. 52-010

September 10, 2008

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated May 28, 2008. GEH responses to RAI Number 7.1-86, Supplement 1 are addressed in Enclosures 1, 2, 3, and 4.

Enclosure 3 contains GEH proprietary information. GEH customarily maintains this information in confidence and withholds it from public disclosure. A non-proprietary version is provided in Enclosure 4.

The affidavit contained in Enclosure 5 identifies that the information contained in Enclosure 3 has been handled and classified as proprietary to GEH. GEH hereby requests that the information of Enclosure 3 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

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NRO

If you have any questions or require additional information, please contact me.

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

Reference:

1. MFN 08-499, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 201 Related To ESBWR Design Certification Application*, dated May 28, 2008

Enclosures:

1. Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1
2. ESBWR DCD Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86 , Supplement 1
3. NEDE-33304P, "GEH ABWR/ESBWR Setpoint Methodology," Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1 - GEH Proprietary Information
4. NEDO-33304, "GEH ABWR/ESBWR Setpoint Methodology," Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1 - Non-Proprietary Version
5. Affidavit

cc:

AE Cubbage	USNRC (with enclosure)
RE Brown	GEH/Wilmington (with enclosure)
DH Hinds	GEH/Wilmington (with enclosures)
eDRF Section	0000-0089-3839 (RAI 7.1-86, Supplement 1)

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Enclosure 1

Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application

RAI Number 7.1-86, Supplement 1

NRC RAI 7.1-86, Supplement 1

GEH's Setpoint Methodology, NEDE-33304P, will be referenced by the setpoint control program in the Technical Specification requirements. NEDE-33304P provides a setpoint methodology for nonsafety-related instrumentation which departs from approved methods in RG 1.105. This alternative setpoint methodology for nonsafety-related instrumentation is outside the scope of the technical specifications and will not be reviewed by the staff. Since NEDE-33304P is incorporated by reference into the DCD and referenced by Technical Specification, please remove the discussion of non-safety instrumentation from NEDE-33304P.

GEH Response

NEDE-33304P has been revised, as shown in Enclosure 3, to address only the scope of all safety-related automatic protective device settings as well as all automatic protective device settings that meet the requirements of 10CFR 50.36(d)(1) for Technical Specification required limiting safety system settings.

Changes as a result of this response to this RAI supplement revise some of the DCD and NEDE-33304P text in the original RAI 7.1-86 response, as noted in Enclosures 2 and 3.

DCD / Licensing Topical Report Impact

DCD changes will be reflected in Revision 6 as shown on the markup in Enclosure 2.

LTR NEDE-33304P, Revision 0 will be revised as noted in Enclosure 3.

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Enclosure 2

ESBWR DCD Changes in Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application

RAI Number 7.1-86

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box.

Ideally, the actual settings are determined by operating experience. However, in cases where operating experience is not available, settings are determined by conservative analysis. The settings are far enough from the values expected in normal operation to preclude inadvertent initiation of certain actions and far enough from the analyzed values to ensure that appropriate margins are maintained between the actual settings and analyzed values. The margin between the limiting system settings and the actual limits includes consideration of the maximum credible transient in the process being measured.

The periodic test frequency for each variable is determined from historical data on setpoint drift and from quantitative reliability requirements for each system and its components. ~~A formal process is followed to establish key N-DCIS setpoints (Reference 7.1-9).~~

7.1.5.2 N-DCIS Description

The N-DCIS is segmented into parts that can work independently of one another if failures occur. The segments are not visible to the operator during normal operation. The N-DCIS uses hardware and software platforms that are diverse from the Q-DCIS. The N-DCIS network is dual redundant and at least redundantly powered so no single failure of an active component can affect power generation.

The individual N-DCIS segments are the:

- GENE network,
- PIP A network,
- PIP B network,
- BOP network, and
- PCF network.

Managed network switches are redundant per segment and provide monitoring and control of the N-DCIS networks while transmitting, data, alarms, recording and display information, and operator control information between segments and components. Managed network switches monitor and transmit data acquisition and control messages and displays associated with that segment. Each managed network switch has the capability to monitor and control unexpected and excessive traffic on its respective N-DCIS network segment. Each network switch can have up to several hundred "nodes" and several "uplink" ports that are connected to the other switches; all connections to these switches are through the fiber optic cable network. Fiber optic cables used for nonsafety-related applications are sheathed in material meeting IEEE Std. 383 that addresses fire propagation mitigation.

The switches allow the various controllers, data acquisition and displays associated with a segment to communicate with each other by almost instantaneous virtual connections that end when the communication is finished. The switches' "backbone" capacity determines how many simultaneous two-way connections can be made, but the capability is much higher than actually required.

7.1.6.6.1.21 Capability for Testing and Calibration (IEEE Std. 603, Section 6.5)

The operational availability of the protection system sensors can be checked by perturbing the monitored variables, by cross-checking between redundant channels that have a known relationship with each other and that have read-outs available, or by introducing and varying a substitute input to the sensor of the same nature as the measured variable. The four-division RTIF, NMS, and SSLC/ESF logic provides at least two valid divisions for crosschecking of monitored variables. The third division also has the capability to be available for crosschecking, depending on the maintenance bypass status. When one division is placed into maintenance bypass mode, the condition is alarmed in the MCR and the division logic automatically becomes a two-out-of-three voting scheme. Most sensors and actuators are provisioned for actual testing and calibration during power operation with the exceptions described in Sections 7.2 through 7.8.

7.1.6.6.1.22 Operating Bypasses (IEEE Std. 603, Sections 6.6 and 7.4)

Operating bypasses are implemented in the Q-DCIS. One example of such operating bypasses is associated with the trip function dependence on reactor operating mode. The requirements of IEEE Std. 603 are met by the safety-related I&C operating bypass design. Specific descriptions of safety-related system operating bypasses are included in Subsections 7.2.1.5 and 7.3.5.2. Operating bypasses are automatically removed as described in Subsections 7.2.1.5 and 7.3.5.2.

7.1.6.6.1.23 Maintenance Bypass (IEEE Std. 603, Sections 6.7 and 7.5)

Maintenance bypass capability is incorporated in the design of the Q-DCIS. This permits equipment maintenance, testing, and repair of one individual division with the plant operating and without initiating any protection functions. The single failure criterion is met under this bypass condition. Although it is possible to bypass only one division at a time, the Q-DCIS design is able to supply its safety-related functions even with a two-division failure. Maintenance bypass is always alarmed or indicated in the MCR. Maintenance bypass for safety-related I&C systems is typically applied through a joystick bypass switch with exclusive logic that allows only one division, out of four, to be bypassed at any given time. Maintenance bypasses are initiated manually by the plant operator per administrative control. Specific descriptions of safety-related system maintenance bypasses are included in Subsections 7.2.1.5.2.2 and 7.3.5.2.

7.1.6.6.1.24 Setpoints (IEEE Std. 603, Section 6.8)

For automatic protective devices, safety-related setpoints and setpoints used for maintaining design limits described in the Technical Specifications ~~Instrument setpoints~~ are determined by the methodology described in Reference 7.1-9. This methodology~~, which~~ is based on the previously NRC approved GE Setpoint Methodology, NEDC 31336P-A (Reference 7.1-11), as updated to reflect ~~a graded approach as provided in BTP HICB-12 and~~ information contained in Regulatory Information Summary (RIS) 2006-017, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels." The GEH setpoint methodology uses plant-specific setpoint analyses to ensure that the instruments' range, accuracy, and resolution meet the performance requirements assumed in the safety-related analyses in Chapter 15 for the

Table 7.1-1

I&C Systems Regulatory Requirements Applicability Matrix

Applicable Criteria Guidelines: SRP NUREG-0800, Section 7.1	Reference Standard	System																											
		RPS (Q)	NMS (Q)	SPTM Function (Q)	ADS (Q)	GDCS (Q)	LD&IS (Q & N)	CRHS (Q)	SSLC /ESF (Q)	VB Isolation Function (Q)	SLC (Q)	RSS (Q & N)	RWCU /SDC (N)	ICS (Q)	PAM (Q & N)	CMS (Q &N)	PRMS (Q &N)	ARMS (N)	Interlock Systems (N)	NBS (Q & N)	RC&IS (N)	FWCS (N)	PAS (N)	SB&PC (N)	NMS (N)	CIS(N)	DPS(N) ATWS/SLC (Q)	Q-DCIS (Q)	N-DCIS (N)
1.75	IEEE Std. 384	X	X	X	X	X	X	X	X	X	X	X		X		X	X		X	X							X	X	
1.89	IEEE Std. 323	X	X	X	X	X	X	X	X	X	X			X						X							X	X	
1.97	IEEE Std. 497		X	X											X	X	X	X										X	X
1.100		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X			X							X	X	
1.105	ANSI/ISA S67.04.01	X	X	X	X	X	X	X	X	X	X			X		X	X		X	X							X	X	
1.118	IEEE Std. 338	X	X	X	X	X	X	X	X	X	X	X		X		X	X		X								X	X	
1.151	ANSI/ISA S67.02.01@					X					X		X	X		X			X	X		X				X	X		
1.152*	IEEE Std. 7-4.3.2	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	X
1.153	IEEE Std. 603	X	X	X	X	X	X	X	X	X	X	X		X		X	X			X							X	X	
1.168*	IEEE Std. 1012 IEEE Std. 1028	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.169*	IEEE Std. 828	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.170*	IEEE Std. 829	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.171*	IEEE Std. 1008	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.172*	IEEE Std. 830	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.173*	IEEE Std. 1074	X	X	X	X	X	X	X	X	X	X			X		X	X			X							X	X	(1)
1.180	IEEE Std. 1050	X	X	X	X	X	X	X	X	X	X	X††	X††	X	X††	X††	X††	X††	X††	X	X††	X††	X††	X††	X††	X††	X††	X	X††
1.204	IEEE Std. 1050	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.209	IEEE Std. 323	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X			X							X	X	
Branch Technical Positions (BTP)																													
BTP HICB-1	IEEE Std. 603					X													X									X	
BTP HICB-3	IEEE Std. 603	N/A																											

RG 1.100, Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.100.

RG 1.105, Setpoints for Safety-Related Instrumentation:

- Conformance: The safety-related portions of the LD&IS design conforms to RG 1.105. Reference 7.3-2 provides detailed description of the GEH setpoint methodology.

RG 1.118, Periodic Testing of Electric Power and Protection Systems:

- Conformance: The LD&IS design conforms to RG 1.118.

RG 1.152, Criteria for Digital computers in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.152.

RG 1.153, Power Instrumentation & Control Portions of Safety Systems:

- Conformance: The LD&IS design conforms to RG 1.153.

RG 1.168, Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.168.

RG 1.169, Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear power Plants:

- Conformance: The LD&IS design conforms to RG 1.169.

RG 1.170, Software Test Documentation for Digital Computer Software Used in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.170.

RG 1.171, Software Unit Testing for Digital Computer Software Used in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.171.

RG 1.172, Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.172.

RG 1.173, Developing Software Life Cycle Processes for Digital Computer Software used in Safety Systems of Nuclear Power Plants:

- Conformance: The LD&IS design conforms to RG 1.173.

RG 1.97 - Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants:

- Conformance: The CMS instrumentation design conforms to RG 1.97, which endorses (with certain exceptions specified in Section C of the RG) IEEE Std. 497 that establishes flexible, performance-based criteria for the selection, performance, design, qualification, display, and quality assurance of accident monitoring variables. IEEE Std. 497 identifies five types of variables for accident monitoring and the criteria for the selection of each type of variable.

RG 1.100, Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants:

- Conformance: The CMS design conforms to RG 1.100.

RG 1.105, Setpoints for Safety-Related Instrumentation:

- Conformance: The safety-related portions of the CMS design conforms to RG 1.105. Reference 7.5-2 provides a detailed description of the GEH setpoint methodology.

RG 1.118, Periodic Testing of Electric Power and Protection Systems:

- Conformance: The CMS design conforms to RG 1.118.

RG 1.151 - Instrument Sensing Lines

- Conformance: The CMS design conforms to RG 1.151.

RG 1.152, Computer Software Used in Safety-related Systems:

- Conformance: The CMS design conforms to RG 1.152.

RG 1.153, Criteria for Power, Instrumentation, and Control Portions of Safety Systems:

- Conformance: The CMS design conforms to RG 1.153.

RG 1.168, Verification, Validation, Reviews, and Audits For Digital Computer Software Used In Safety Systems:

- Conformance: The CMS design conforms to RG 1.168.

RG 1.169, Configuration Management Plans For Digital Computer Software Used In Safety Systems:

- Conformance: The CMS design conforms to RG 1.169.

RG 1.170, Software Test Documentation For Digital Computer Software Used In Safety Systems:

- Conformance: The CMS design conforms to RG 1.170.

RG 1.171, Software Unit Testing For Digital Computer Software Used In Safety Systems:

- Conformance: The PRMS design conforms to RG 1.47.

RG 1.53, Application of the Single Failure Criterion to Nuclear Power Protection Systems:

- Conformance: The PRMS design conforms to RG 1.53.

RG 1.75, Physical Independence of Electrical Systems:

- Conformance: The PRMS design conforms to RG 1.75 as described in Subsections 8.3.1.3 and 8.3.1.4.

RG 1.97, Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants:

- Conformance: The PRMS design conforms to RG 1.97.

RG 1.100, Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants:

- Conformance: The PRMS design conforms to RG 1.100.

RG 1.105, Setpoints for Safety-Related Instrumentation:

- Conformance: The safety-related portions of the PRMS design conforms to RG 1.105. Reference 7.5-2 provides a detailed description of the GEH setpoint methodology.

RG 1.118, Periodic Testing of Electric Power and Protection Systems:

- Conformance: The PRMS design conforms to RG 1.118.

RG 1.152, Computer Software Used in Safety-related Systems:

- Conformance: The PRMS design conforms to RG 1.152.

RG 1.153, Criteria for Power, Instrumentation, and Control Portions of Safety Systems:

- Conformance: The PRMS design conforms to RG 1.153.

RG 1.168, Verification, Validation, Reviews, and Audits For Digital Computer Software Used In Safety Systems:

- Conformance: The PRMS design conforms to RG 1.168.

RG 1.169, Configuration Management Plans For Digital Computer Software Used In Safety Systems:

- Conformance: The PRMS design conforms to RG 1.169.

RG 1.170, Software Test Documentation For Digital Computer Software Used In Safety Systems:

- Conformance: The PRMS design conforms to RG 1.170.

RG 1.171, Software Unit Testing For Digital Computer Software Used In Safety Systems:

- Conformance: The I&C design does not use innovative means for accomplishing safety functions.

7.6.1.3.2 General Design Criteria

GDC 1, 2, 4, 13, 19, 24 and 25:

- Conformance: Because the HP/LP interlock system does not involve reactivity control, GDC 25 is not applicable. The interlock system design complies with the remaining GDC listed above.

7.6.1.3.3 Regulatory Guides

RG 1.47, Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems:

- Conformance: The HP/LP interlock system does not have a bypass feature.

RG 1.53, Application of the Single Failure Criterion to Nuclear Power Protection Systems:

- Conformance: The HP/LP interlock system is nonsafety-related. RG 1.53 is not applicable to this system.

RG 1.75, Physical Independence of Electrical Systems:

- Conformance: The HP/LP interlock system is nonsafety-related. The physical and electrical separations maintained between safety-related and nonsafety-related systems conform to RG 1.75 as described in Subsections 8.3.1.3 and 8.3.1.4.

RG 1.105, Setpoints for safety-related Instrumentation:

- Conformance: The HP/LP interlock system is nonsafety-related. RG 1.105 does not apply to the HP/LP interlock system. ~~The nominal setpoints are calculated using the GEH setpoint methodology (Reference 7.6-1).~~

RG 1.118, Periodic Testing of Electric Power and Protection Systems:

- Conformance: The LPCI line isolation valves and check valves are stroke-tested only during low reactor pressure conditions due to the interlock.

RG 1.151, Instrument Sensing Lines:

- Conformance: The HP/LP interlock system design complies with RG 1.151.

RG 1.152, Criteria for use of computers in Safety systems of nuclear power plants.

- Conformance: The HP/LP interlock system is nonsafety-related. RG 1.152 is not applicable to this system.

RG 1.153, Criteria for Power, Instrumentation, and Control Portions of Safety Systems:

7.6.1.3.4 Branch Technical Positions

BTP HICB-1, Guidance on Isolation of Low-Pressure Systems from the High-Pressure Reactor Coolant System:Conformance: Because the MOVs are normally closed and are interlocked as described above, and the check valves are tested only when the reactor pressure is below the permissive setpoint for the interlock, the nonsafety-related HP/LP interlock system design conforms to BTP HICB-1..

BTP HICB-11, Guidance on Application and Qualification of Isolation Devices:

- Conformance: The HP/LP interlock system design conforms to BTP HICB-11.

BTP HICB-12, Guidance on Establishing and Maintaining Instrument Setpoints:

- Conformance: The HP/LP interlock system is nonsafety-related. BTP HICB-12 does not apply to the HP/LP interlock system. ~~The nominal setpoints are calculated using the GEH setpoint methodology (Reference 7.6-1).~~

BTP HICB-14, Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems:

- Conformance: The HP/LP interlock system is nonsafety-related so BTP HICB-14 does not apply.

BTP HICB-16, Guidance on the Level of Detail Required for Design Certification Applications Under 10 CFR Part 52:

- Conformance: The level of detail provided for the HP/LP interlock system conforms to BTP HICB-16.

BTP HICB-17, Guidance on Self-Test and Surveillance Test Provisions:

- Conformance: The HP/LP interlock system is nonsafety-related. The motor operated valves and testable check valves are stroke-tested only during low reactor pressure because of the interlock. No surveillance tests are conducted.

BTP HICB-18,- Guidance on the Use of Programmable Logic Controllers in Digital Computer-Based Instrumentation and Control Systems.

- Conformance: The HP/LP interlock system design conforms to BTP HICB-18.

BTP HICB-21,- Guidance on Digital Computer Real-Time Performance:

- Conformance: The HP/LP interlock system is nonsafety-related. BTP HICB-21 does not apply to the HP/LP interlock system.

7.6.1.3.5 Three Mile Island Action Plan Requirements

In accordance with NUREG-0800 Section 7.6 and Table 7.1-1, 10 CFR 50.34(f)(2)(v) (I.D.3) applies to the HP/LP interlock system and is addressed above. Three Mile Island (TMI) action plan requirements are generically addressed in Appendix 1A.

7.6.1.4 Testing and Inspection Requirements

HP/LP interlock system I & C functions are calibrated and tested during the preoperational testing program to confirm that the I & C is installed correctly and that the HP/LP interlock system functions as designed

Testing and inspection of the NBS system pressure instruments are described in Subsection 7.7.1.4.

The LPCI line isolation valves and check valves are stroke-tested during low reactor pressure conditions because of the interlock.

7.6.1.5 Instrumentation and Control Requirements

The following information is available to the reactor operator for the instrumentation and interlock system described in this subsection.

- The reactor pressure is indicated in the MCR and at four local racks in the Reactor Building outside the containment.
- HP/LP interlock system status is indicated in the MCR and is alarmed when any LPCI valve is open and the interlock system is active.
- The open and closed positions of the isolation valves and check valves are indicated in the MCR.

7.6.2 (Deleted)

7.6.2.1 (Deleted)

7.6.3 COL Information

None

7.6.4 References

~~7.6-1GE-Hitachi Nuclear Energy, "GEH ABWR/ESBWR Setpoint Methodology," NEDO-33304, Class I (Non-proprietary); and "GEH ABWR/ESBWR Setpoint Methodology," NEDE-33304P, Class III (Proprietary), Revision 0, October 2007.~~None.

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Enclosure 4

NEDO-33304, "GEH ABWR/ESBWR Setpoint Methodology," Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application

RAI Number 7.1-86, Supplement 1

Non-Proprietary Version

Verified NEDO changes associated with this RAI response are identified in the following markups by enclosing the text within a black box. The marked-up pages may contain unverified changes that are not related to this RAI in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in the subsequent Revision(s).

NON-PROPRIETARY INFORMATION NOTICE

This is a non-proprietary version of the document NEDE-33197P, Revision 2, from which the proprietary information has been removed. Portions of the document that have been removed are identified by white space within double square brackets, as shown here [[ ]].

1. INTRODUCTION

1.1 SCOPE AND PURPOSE

The purpose of this document is to establish the requirements and methodologies for determining and maintaining all safety-related automatic protective device settings ~~and other important instrument~~as well as all automatic protective device settings having significant safety functions that meet the requirements of 10CFR 50.36(d)(1) for Technical Specification required limiting safety system settings ~~setpoints~~ for the GEH Advanced Boiling Water Reactor (ABWR)~~,~~ and the ESBWR.

Instrument setpoints are determined ~~from safety analysis assumptions~~ ~~by setpoint and safety-related analyses~~ using this methodology, which is based on previously NRC accepted GE Setpoint Methodology, NEDC 31336P-A (Reference 2.2.2), as updated to reflect ~~a graded approach as provided in BTP HICB 12 (Reference 2.2.1) and~~ information contained in Regulatory Information Summary (RIS) 2006-017, "NRC Staff Position on the Requirements of 10 CFR 50.36, "Technical Specifications," Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels" (Reference 2.2.6). GEH has many years of experience applying this setpoint methodology ~~to safety related analyses performed~~ for operating plants.

2. APPLICABLE DOCUMENTS

2.1 CODES AND STANDARDS

1. ISA-S67.04.01, "Setpoints for Nuclear Safety Related Instrumentation," 2006
2. Nuclear Regulatory Commission Regulatory Guide (Reg. Guide) 1.105, Revision 3, "Instrument Setpoints for Safety Related Systems".

2.2 OTHER DOCUMENTS

1. Branch Technical Position HICB-12, "Guidance for Establishing and Maintaining Instrument Setpoints," Sept, 1997.
2. NEDC-31336-P-A, "General Electric Instrument Setpoint Methodology," September 1996.
3. ISA-S67.04.02-2000 "Methodologies for the Determination of Setpoints for Nuclear Safety Related Instrumentation"
4. ESBWR Design Control Document, Tier 2, Ch. 14, Initial Test Program, Rev 3
5. ~~ISA-TR67.04.09-2005, Graded Approaches to Setpoint Determination~~(Deleted)
6. Nuclear Regulatory Commission Regulatory Issues Summary 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, "Technical Specifications," regarding Limiting System Settings During Periodic Testing and Calibration of Instrument Channels"
7. Nuclear Regulatory Commission Regulatory Issues Summary 2005-020, Revision To Guidance Formerly Contained In NRC Generic Letter 91-18, "Information To

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~~The operability considerations inherent in the assumptions regarding AFT include:~~

~~a. At the beginning of each calibration interval, resetting an instrumentation channel setpoint to a value that is within the ALT of the associated NTSP~~$_F$

~~b. For Graded Approach Group A functions, when the as-found channel setpoint is outside the applicable AFT, evaluations are performed to consider whether the instrumentation channel is functioning as required (i.e., within the performance assumptions of the app~~licable setpoint calculations).

4.1 SCOPE~~GRADED CATEGORIES~~

~~A graded approach for calculating setpoints will be used for the GEH ABWR/ESBWR. The philosophy for this approach is based upon Section 4 of ISA-S67.04.01, (listed in Section 2.1), which allows for various levels of rigor to be applied in setpoint determination methodology based on importance to safety, and BTP 7-12, ISA-RP67.04.02-2000 and ISA TR67.04.09-2005 (listed in Section 2.2) which include guidelines for a graded approach.~~

~~The graded approach to establishing setpoints utilizes different levels of technical rigor (i.e., probability and confidence) for various setpoints based upon the level of safety significance of the instrument function. This approach is fundamentally dependent on the analytical basis of each independent function. 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 analyses, and the highest importance is provided to those setpoints that protect the safety limits. These functions are listed in the plant Technical Specifications. Additional types of important instruments are also listed in the Technical Specifications. These setpoint calculations should consider all errors presented in Computation Method (Section 4.2). Additionally, the scope of NEDE-33304 addresses all safety-related automatic protective device settings.

Abbreviated or less rigorous setpoint calculations, which are not within the scope of NEDE-33304, may be performed for other functions, such as:

- Instruments, without an automatic protective device setting, used in support of safety-related equipment
- Instruments that are important to plant operation
- Instruments which protect major pieces of equipment against significant damage
- Instruments that provide important alarm indications for post-accident monitoring
- Instrument setpoints 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 analyses there is no analytical limit (AL) but instead there may be a design limit (DL) that is based on other important requirements (such as equipment protection). ~~For these functions, the AV and NTSP will be calculated the same as if~~

~~the DL was the AL. For some functions with a DL instead of an AL, calculation of an Allowable Value will still be required. Some of the instrument setpoints may also be determined based on the methods described in the Engineering Judgment Method (Section 4.3), as discussed later. Instrument setpoints with minimal importance to plant safety may be set based on the methods in these sections.~~

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

4.1.1 Group A

Group A includes automatic Instrumentation and Control (I&C) functions that are Limiting Safety System Settings (LSSS) as defined by 10 CFR 50.36. This will include automatic RPS and ESF actuation functions, on which reliance is placed for the achievement or maintenance of the nuclear safety function. They are associated with an established Analytical Limit. These functions 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 of functions included in Group A, as follows:

- A1: Safety Limit (SL)-Related Limiting Safety System Settings (LSSS)

  ~~Includes Safety Limit (SL) related LSSS listed in a document controlled under 10 CFR 50.59.~~

- A2: Non-SL-Related LSSS associated with RPS, ESF actuation, and containment isolation.

  ~~Includes non-SL related LSSS listed in a document controlled under 10 CFR 50.59.~~

4.1.2 Group B

Group B includes those safety-related automatic I&C functions that may not already be addressed within the scope of the LSSS defined above. ~~and equipment that are secondary to functions accomplished by Group A functions or that support those functions in the achievement or maintenance of a safety function. In addition, Group B includes permanently installed instrumentation utilized to verify Technical Specification Surveillance Requirement acceptance criteria explicitly assumed in the safety analyses, unless adequate margin is justified. Based on the presence of Group A required accident mitigation functions, the degrees of probability and confidence applied to the calculated settings of the Group B functions need not be as high as that of Group A. Based on the Group A system's setpoint function to provide the required accident mitigation function, the supporting Group B setpoint may be of lower integrity. Examples include those automatic I&C functions related to Technical Specification limiting conditions that are not included in Group A.~~

For Group B functions, the AV determination, LER Avoidance Test and Spurious Trip Avoidance Test are not required. In other respects, the setpoint calculations for Group B are the same as Group A.

~~4.1.3 Group C~~

~~Group C includes those automatic I&C functions that have an auxiliary or indirect role in safety functions. Group C includes those functions that have some safety significance but are not assigned to Groups A or B. These functions may allow for early automatic or manual operator response to an accident but are not the primary mitigation capability.~~

~~Group C also includes instrumentation that is required to support the credited availability of nonsafety-related/risk significant systems as defined in the Probabilistic Risk Analysis (PRA). For the ESBWR, the Regulatory Treatment of Non-Safety Systems (RTNSS) process covers these systems.~~

~~Examples include alarms to alert the operator to abnormal operation of safety systems.~~

~~Group C functions will include:~~

- ~~Functions with setpoints that start, stop, modulate or provide control actions (not including alarms) in systems that mitigate transients accidents and special events. In this context, mitigation includes functions in which the safety consequences (e.g., offsite doses, approach to safety limits) of the event are impacted by the setpoint.~~
- ~~Alarms which alert the operator to the approach to a TS LCO, which are related to operator action specifically credited in the safety analysis report, and which alert the operator that a safety system is not currently achieving or is incapable of achieving a safety function. Example – Standby Liquid Control Tank Level low water level alarm is intended to indicate the approach to a TS LCO. Therefore the setpoint is a Group C setpoint.~~
- ~~Functions with setpoints that are identified as risk significant;~~

  ~~Example: Feedwater Runback Logic initiation setpoints for the ESBWR supplements ATWS event mitigation~~
- ~~Remote Shutdown (RSD) Panel indications. This insures that the minimum set of instrumentation required for safe shutdown are covered by RG 1.105 calculations. It also insures that in the special event in which only RSD indication is available, i.e., where only limited cross-checks are available instrument accuracy is quantified.~~

~~4.1.4 Group D~~

~~Functions other than those addressed in Group A, B, and C above that are not safety-related, or risk significant, and thus have limited safety significance, are included as Group D functions. Group D includes those automatic I&C functions that have limited safety significance and include most nonsafety-related functions. This group includes functions associated with systems where limits are not stated or established by the design basis or safety analyses or where engineering judgment based on common industry practice or manufacturers guidance has been shown to be appropriate.~~

~~BWROG EPG/SAG action levels are not RG 1.105 setpoints, unless they perform another function that puts them in Category A, B or C. For example, Post Accident Monitoring (PAM) parameters will be Group B for those parameters evaluated as risk significant. The BWROG EPG/SAG symptom based procedures use nominal instrument readings except for specific parameters as described in the EPGs.~~

4.1.5Additional considerations

If a setpoint meets the definition of more than one category, it is assigned to the one with the most safety significance (and the most rigorous calculation requirement).

2.The category classification is based on the function of the setpoint, and not the safety classification of the instrument and hardware that execute the function (e.g., a setpoint implemented in safety-related equipment may be a Group B non-LSSSGroup D, or a setpoint implemented in nonsafety-related equipment may be Group B A LSSS).

3.In cases when use of the high confidence level instrument uncertainty does not provide an Allowable Value with acceptable margin, additional analyses are performed, to show that the safety limits or consequences are not violated with a given Allowable Value. In this way it's possible to demonstrate that the combination of instrument accuracy, and analysis margin provide the required high confidence that the safety limits or consequences are not violated.

4.1.6Setpoint Documentation

The setpoints for functions in all Groups will be listed in a setpoint list database. The basis for the grouping of functions and the calculations for Categories A, B and C will be documented in Setpoint Calculation documents, as addressed in the following paragraphs. The basis of setpoints for Group D will be subject to normal engineering verification as described below:

The graded approach to ESBWR/ABWR automatic I&C function setpoints consists of these four elements:

1.A defined classification scheme.

2.A definition of the variations in the rigor and conservatism of the instrument channel uncertainty used to establish the setpoint(s) in each Group.

3.Classification of each automatic I&C function into one of the classification groups.

4.Consistency with applicable regulatory requirements and industry standards, including Reg. Guide 1.105, HICB-12 and ISA-67.04.

The four Groups of automatic I&C functions (Groups A, B, C, & D) applied in the ESBWR and ABWR project vary in safety importance. The basis for assigning functions to different groups, and the differences in the process of determining the associated setpoints and associated level of rigor follows.

4.1.6.1Group A

The setpoint calculation will provide the required high probability that the setpoint will prevent its associated analytical limit or design basis limit from being exceeded. In most cases thisThis will be achieved by using loop accuracy calculations based on 95% probability and highwith 95% confidence (see as defined in sSection 4.2.2). In some cases the required confidence level will be provided by a combination of the instrument data confidence level and additional conservatisms which provide assurance that analytical limits will not be exceeded.

~~*4.1.6.2* **Group B**~~

~~Given that Group B functions do not directly protect Safety Limits, and the associated lesser safety significance, the setpoint methodology can employ drift accuracy with lesser degrees of probability and confidence, than are used in the determination of Group A functions. The basis for less rigor is that Group A setpoints cover all the plant Limiting Safety System Settings (LSSS), which will assure no safety or analytical limits are exceeded. Also, for Group B setpoints and interlocks without listed functions in ESBWR and ABWR Technical Specifications, the LER Avoidance Test and the Spurious Trip Avoidance Test are not required. In other respects the setpoint calculations are the same as Group A.~~

~~***4.1.6.3Group C***~~

~~Based on the existence of the Group A & B functions which provide more safety significant protective functions, the setpoint methodology can employ drift accuracy with lesser degrees of probability and confidence for Group C setpoints, than are used in the determination of Group A and B setpoints. Also, no Allowable Value, LER Avoidance Test, and Spurious Trip Avoidance Test calculations are performed for these functions. In other respects the setpoint methodology calculations are the same as Group A & B. Risk significant instrumentation is required for equipment not directly credited in the safety analysis, but does support "defense in depth." Increased uncertainty in the associated setpoints could lead to a delay in system actuation. This would have minimal impact on plant safety since these systems are not credited for DBE mitigation.~~

~~***4.1.6.4Group D***~~

~~Group D functions do not contain any SR or risk significant instrumentation. Increased uncertainty in the associated instrumentation will have no impact on plant safety. Setpoint methodology (described by the computation method in section 4.2) may be applied to Group D functions, but in most cases the less rigorous engineering judgment method in section 4.3 is justified and may be applied. Determination of these setpoints is covered by the ESBWR and ABWR GEH project design process.~~

4.2 COMPUTATION METHOD

The setpoint methodology Computation Method is based on a statistical, probabilistic approach. This approach is consistent with Regulatory Guide 1.105 (listed in Section 2.1) ISA-S67.04.01-2006 (listed in Section 2.1) and ISA-RP67.04.02-2000 (listed in Section 2.2). [[

]] The Square Root of the Sum of the Squares (SRSS) is the established and accepted technique for combining random and independent uncertainty terms.

The determination of a NTSP involves many factors. [[

The following bulleted items provide a sequence of requirements in the implementation of the setpoint methodology:

- The safety limits (SLs) are based on applicable regulatory and code requirements. These limits provide considerable margin to true public safety limits (e.g., uncontrolled release of radioactivity).
- Analyses are performed to establish protection system setpoints, which assure that appropriate safety limits (SLs) are not exceeded for design basis events (DBE). Trip setpoints used in the analyses are specified as ALs. Significant conservatism is built into the licensing basis analytical models and input assumptions. These models and assumptions have been reviewed and approved by the NRC staff. Instrument response time, transient overshoot, and modeling variability are considered in the analysis or shown to be negligible relative to modeling bias.
- [[

  ]]
- Instrument component accuracy requirements for each channel, which meet or exceed the uncertainties used in the setpoint determination are established for each channel. Rated accuracies for the purchased instruments are evaluated to assure that they are consistent with the instrument uncertainties used in the initial determination of the allowable values and nominal trip setpoints. Final calculations of AV and NTSP use the actual vendor performance specified values. For the Drift error, the value for drift for each device is obtained from vendor specification sheets, utility specified drift value, from an analysis of site "As-Found/As-Left" data, or an assumed value that would be replaced when better data is obtained.
- Upon instrument replacement, the instrument component accuracies must be identical to the original equipment. If not, the rated accuracies will have to be reevaluated to assure consistency with the instrument uncertainties in determination of the AV and NTSP, and associated AFT and ALT values.

4.2.2 Uncertainty Limits

Determination of trip setpoint and its associated allowable value uses tolerance limits for uncertainty terms that are appropriate ~~for the grade assigned~~ to the setpoint. The uncertainty limit provides a quantitative statement of the probability and confidence level of a measurement result. Regulatory Guide 1.105 states that the NRC has typically accepted a 95% probability limit for errors such that for the observed distribution of values (empirical data) for a particular error component, 95% of the data points will be bounded by the value selected. Based on a normal error distribution, this corresponds to a 2-sigma value (1.96). ~~By establishing that the 95%~~The confidence intervals are ~~bounded~~ provided by the design allowances developed by this NEDE, consistent with those established in NEDC-31336-P-A (Ref. 2.2.2). ~~for the highest group of setpoints, the results produced by the GEH setpoint methodology included in this document can be established with a high degree of confidence, as noted in the NRC Safety Evaluation Report for Reference 2.2.2~~As noted in the NRC Safety Evaluation Report for Reference 2.2.2, GE has shown that the GE setpoint methodology can produce results that achieve a high degree of confidence (i.e., 95 percent confidence limits). The 95/95-tolerance limit is applied to safety-related automatic actuation functions in graded categories Group A and Group B.

~~BTP HICB-12 (listed in Section 2.2) allows less rigorous tolerance limits for drift uncertainty terms in determination of trip setpoints that have a lower level of safety significance (lower graded categories). The uncertainty limits may be provided by a vendor or may be determined from test or historical data (Section 5).~~

4.2.3 Uncertainty Terms

Channel Instrument Accuracy (A_L). Channel Instrument Accuracy is combination of accuracies of the instrument modules in the loop, and the module accuracies are obtained from module performance specifications. [[

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The design allowance encompasses all instrumentation devices [e.g., sensors, analog to digital (A/D) converters, multiplexing components and temperature compensation] in the channel established for a subject trip function. [[

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[[ ]] (4-1)

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4.2.4 Allowable Value (AV)

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[[ ]]

[[ ]] (4-5)

[[ ]]

[[ ]] (4-6)

[[

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A representation of the Allowable Value is shown in Figure 7-1.

[[

]] This factor for a single sided distribution is described in Reference 2.2.2, section 1.2.3.2 as accepted by the associated NRC Safety Evaluation Report. This factor is also described in section 8 of ISA-RP67.04.02 (listed in Section 2.2).

4.2.5 Limiting Trip Setpoint (LTSP)

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[[ ]]

[[ ]] (4-7)

[[ ]]

[[ ]] (4-8)

[[

]] This correction for a single sided distribution is described in Reference 2.2.2, section 1.2.3.2 as accepted by the associated NRC Safety Evaluation Report. This correction is also described in section 8 of ISA-RP67.04.02 (listed in Section 2.2).

4.2.6 Nominal Trip Setpoint Determination

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4.2.9 As-Found Tolerance and As-Left Tolerance Determination

~~Safety-related and other important~~Automatic I&C function setpoints in Groups A and B shall be periodically tested to verify the equipment performs as expected. This may consist of one or more ~~verification~~ surveillance tests.

The acceptance criteria for the ~~performance test~~channel calibration of an instrument loop ~~is~~ are based on a prediction of the expected performance of the tested instrumentation under the test conditions, and is specified in terms of an acceptable value for the as-found tolerance (AFT). The acceptance criteria ~~is~~ are chosen to avoid masking equipment degradation. [[

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[[ ]]

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[[ ]] (4-16)

[[ ]]

[[ ]] (4-17)

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]] The ALT is a procedural tolerance chosen by the plant and documented in the plant calibration procedure. [[

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[[ ]] (4-18)

[[ ]]

4.3ENGINEERING JUDGMENT METHOD

The engineering judgment method (Figure 7-2) will be applied when the computation method is not practical, and the design limit is not established by accident analysis (AL is not applicable). The uncertainty limits are also not applicable or practical. A two-zone concept is used to determine nominal trip setpoint, as shown in Figure 7-2. The zones specify a range within which the trip value is adequate for its intended function and the range where there would be a violation of the design limit. The acceptable trip value zone is a portion of the instrumentation trip range that will have its midpoint at the nominal trip setpoint, and it should be wide enough to allow for normal instrumentation drift. Violation of acceptable trip value zone occurs when the trip value drifts into the portion of the instrumentation trip range beyond the calibration tolerance upper value. The larger acceptable design limit zone should be established so that when the maximum error has occurred, sufficient margin remains between the nominal trip setpoint and the design limit [not the same as Design Basis Analytical Limit (AL)].

Some setpoints have non-critical functions or are intended to provide trip functions related to gross changes in the process variable, for regulatory and/or operational requirements. Historical values determined to be acceptable for previous plants can only be used if the governing conditions for the intended application are confirmed to be no worse than those associated with past applications. One way of establishing the nominal setpoint is to establish the differential between the nominal setpoint and the design limit as the maximum drift permitted between surveillance intervals.

5. DETERMINING UNCERTAINTY LIMITS FROM TEST OR HISTORICAL DATA

Uncertainty values may be determined from test data or historical data in the event that a vendor has test data available (e.g., from qualification testing) but not uncertainty values ~~corresponding to the grade assigned to the setpoint~~, or uncertainty values need to be determined from plant drift historical data. Appendix E of ISA-S67.04.02-2000 (listed in Section 2.2) identifies methods of treatment for outliers and testing for normal distribution of data, and both Appendices E and J identify useful statistical reference documents.

This method calculates uncertainty values from an established mean of the data, a calculated sample standard deviation, and tolerance factors for the desired uncertainty (e.g., 95/95). Uncertainties may be expressed in engineering units, or in percentages (%) of span or range limit.

Throughout this section, 95/95 confidence/probability limits are used in the examples. ~~Other limits can be used as appropriate for the grade assigned to the setpoint and the uncertainty term being considered.~~

5.1 MEAN, TOLERANCE LIMIT AND TOLERANCE FACTOR

A normal distribution of sample data can be expressed by a tolerance limit:

$$\text{Tolerance Limit} = \overline{X} \pm ks \tag{5-1}$$

where

$\pm ks$ is the 95/95 uncertainty value

$\overline{X}$ is the mean of the sample data

s is the sample standard deviation

k is the tolerance factor at 95/95

Tables for tolerance factor (k) values can be found in general statistics textbooks, typically under "Tolerance and Confidence Intervals". Such a table will provide two-sided normal distribution tolerance factors for various sample sizes, probability limits and confidence levels. A larger number of data points (sample sizes) will decrease the value of tolerance factor.

5.2 SAMPLE STANDARD DEVIATION

Sample standard deviation (s) is calculated from the sample data by the following equation:

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n-1}} \tag{5-2}$$

~~Figure 7-2. Engineering Judgment Method~~

MFN 08-119, Supplement 1

Enclosure 5

Affidavit

GE Hitachi Nuclear Energy

AFFIDAVIT

I, **David H. Hinds**, state as follows:

(1) I am the General Manager, New Units Engineering, GE Hitachi Nuclear Energy ("GEH") 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 3 of GEH letter MFN 08-119, Supplement 1, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, "Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1" dated September 10, 2008. GEH Proprietary Information is identified in Enclosure 3, "NEDE-33304P, 'GEH ABWR/ESBWR Setpoint Methodology,' Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1 - GEH Proprietary Information," in dark red font and a dashed underline inside double square brackets. [[This sentence is an example.{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 of the proprietary determination. Specific information that is not so marked is not GEH proprietary. A non-proprietary version of this information is provided in Enclosure 4, "NEDO-33304, 'GEH ABWR/ESBWR Setpoint Methodology,' Changes in Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - RAI Number 7.1-86, Supplement 1 - Non-Proprietary Version."

(3) In making this application for withholding of proprietary information of which it is the owner, 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, 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 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 identifies detailed GEH ESBWR procedures and assumptions related to its setpoint methodology. The information is consistent in its scope of application with information in NEDE-33304-P, "ESBWR Instrumentation Setpoint Methodology," October 2007, 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 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 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 10th day of September 2008.

David H. Hinds
GE Hitachi Nuclear Energy