



HITACHI

GE Hitachi Nuclear Energy

James C. Kinsey
Vice President, ESBWR Licensing

PO Box 780 M/C A-55
Wilmington, NC 28402-0780
USA

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

Proprietary Notice

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

MFN 08-119

Docket No. 52-010

March 12, 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. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86**

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 January 31, 2008. GEH responses to RAI Number 7.1-86 are addressed in Enclosures 1 and 2.

Enclosure 1 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 2.

The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GEH. GEH hereby requests that the information of Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 08-097, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 143 Related To ESBWR Design Certification Application*, dated January 31, 2008

Enclosures:

1. Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86 - GEH Proprietary Information
2. Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86 - Non-Proprietary Version
3. Affidavit – David H. Hinds – March 12, 2008

cc:

AE Cabbage	USNRC (with enclosure)
GB Stramback	GEH/San Jose (with enclosure)
RE Brown	GEH/Wilmington (with enclosure)
eDRF Section:	0000-0080-9497 (RAI 7.1-86)

MFN 08-119

Enclosure 2

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

RAI Number 7.1-86

Non-Proprietary Version

NRC RAI 7.1-86

This RAI refers to GEH submitted Licensing Topical Report (LTR) NEDO-33304, "GEH ABWR/ESBWR Setpoint Methodology."

The graded approach allows for various levels of rigor (i.e., probability and confidence) to be applied in setpoint methodology based on importance to safety. Provide specific information how the graded approach is applied in setpoint methodology and setpoint calculation based on the categories (A, B, C, D). Regulatory Guide 1.105 states that for normally distributed uncertainties, 95 percent of the population will have uncertainties between plus 1.96 and minus 1.96. Based on a normal error distribution, this corresponds to a 2 sigma value (1.96). Justify that the setpoint methodology can establish setpoints with the 95/95 tolerance limit for uncertainties for each of the categories.

GEH Response

NEDE-33304P, Section 4.2.2, discusses the application of the GEH setpoint methodology in meeting the Regulatory Guide (RG) 1.105 probability and confidence levels. This Section will be revised to clarify that the setpoint methodology can establish setpoints that achieve the 95/95 tolerance limit, as noted in the NRC Safety Evaluation Report for NEDC-31336P-A, Instrument Setpoint Methodology, dated November 6, 1995. [[

]]

DCD / Licensing Topical Report Impact

No DCD changes will be made in response to this RAI.

GEH ABWR/ESBWR Setpoint Methodology, NEDE-33304P, Rev 0 will be revised as noted below.

The revised Section 3.0, Definitions (Excerpt only) in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304), Revision 1, will read as follows:

Limiting Trip Setpoint (LTSP). The limiting value for the nominal trip setpoint so that the trip or actuation occurs 95% or greater (See Section 4.2.2 on uncertainty limits) of the time before the AL is reached, regardless of the process or environmental conditions affecting the instrumentation.

Based on the definitions, the limiting trip setpoint (LTSP) is interchangeable with the first nominal trip setpoint term (NTSP1) with the required minimum margin to the AL.

The revised Section 4.1.2 in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

4.1.2 Group B

Group B includes those automatic I&C functions 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, 1 degrees of probability and confidence applied to the calculated settings of the Group B functions are the same as need not be as high as that of those applied to 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.

The revised Section 4.1.5 in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

4.1.5 Additional considerations

1. 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 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 Group CD, or a setpoint implemented in nonsafety-related equipment may be Group B).

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.

The revised Section 4.1.6 in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

4.1.6 Setpoint 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.

4.1.6.1 Group A

The setpoint calculation will provide the required high probability that the setpoint will prevent its associated analytical limit from being exceeded. ~~In most cases this~~]]

4.1.6.2 Group B

The setpoint calculation will provide the required high probability that the setpoint will prevent any associated analytical limit from being exceeded. [[

~~]] 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.

4.1.6.3 Group C

Based on the existence of the Group A & B functions which provide more safety significant protective functions, the setpoint methodology can employ instrument uncertainty drift accuracy with lesser degrees of probability and confidence for Group C non-safety related 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.

4.1.6.4 Group 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.

The revised Section 4.2.2 in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

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% confidence intervals are bounded provided by the design allowances developed by this NEDE, 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 (95 percent confidence limits).~~ 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 (95 percent confidence limits). [[

]]

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).

The revised Section 4.2.4 (Excerpt only) in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

4.2.4. Allowable Value (AV)

[[

]]

The revised Section 4.2.5 (Excerpt only) in "GEH ABWR/ESBWR Setpoint Methodology" (NEDE-33304P), Revision 1, will read as follows:

4.2.5 Limiting Trip Setpoint (LTSP)

[[

]]

MFN 08-119

Enclosure 3

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 1 of GEH letter MFN 08-119, Mr. James C. Kinsey to U.S. Nuclear Regulatory Commission, "Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86," dated March 12, 2008. GEH Proprietary Information is identified in Enclosure 1, "Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86 – GEH Proprietary Information," in dark red font and a dashed underline inside double square brackets. ~~[[This sentence is an example.....]]~~ 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 2, "Response to Portion of NRC Request for Additional Information Letter No. 143 Related to ESBWR Design Certification Application - RAI Number 7.1-86 – 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 GE 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 12th day of March 2008.



David H. Hinds
GE Hitachi Nuclear Energy