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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 07-613
Supplement 1

Docket No. 52-010

July 3, 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. 137 Related to ESBWR Design Certification Application – RAI Number 7.2-59 Supplement 2**

Enclosure 1 contains GEH's response to the subject NRC RAI transmitted via Reference 1. The responses to RAIs 7.2-59 and 7.2-59 Supplement 1 were submitted to the NRC via References 2 and 3, respectively. NRC RAIs 7.2-59 and 7.2-59 Supplement 1 were transmitted to GEH via References 4 and 5, respectively.

Enclosure 1 contains GEH proprietary information. 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,

Richard E. Kingston
Vice President, ESBWR Licensing

References:

1. MFN 08-027, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 137 Related To ESBWR Design Certification Application*, January 10, 2008
2. MFN 07-162, Letter from James Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 78 Related to ESBWR Design Certification Application – Gamma Thermometers - RAI Numbers 7.2-5 through 7.2-18 and 7.2-52 through 7.5-65*, May 14, 2007
3. MFN 07-613, Letter from James Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter Nos. 76, 100, and 105 Related to ESBWR Design Certification Application - RAI Numbers 7.1-53, 7.2-59 Supplement 1, 7.3-11, and 7.9-16 Supplement 1*, November 21, 2007
4. MFN 06-392, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 78 Related To ESBWR Design Certification Application*, October 10, 2006
5. MFN 07-460, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 105 Related To ESBWR Design Certification Application*, August 16, 2007

Enclosures:

1. MFN 07-613 Supplement 1 - Enclosure 1 - Response to Portion of NRC Request for Additional Information Letter No. 137 Related to ESBWR Design Certification Application – RAI Number 7.2 59 Supplement 2 - GEH Proprietary Information
2. MFN 07-613 Supplement 1 - Enclosure 2 - Response to Portion of NRC Request for Additional Information Letter No. 137 Related to ESBWR Design Certification Application – RAI Number 7.2 59 Supplement 2 Non-Proprietary Version
3. MFN 07-613 Supplement 1 - Affidavit

cc: AE Cabbage USNRC (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
GB Stramback GEH/San Jose (with enclosures)
eDRF Section No. 0000-0080-1860

**MFN 07-613
Supplement 1**

Enclosure 2

**Response to Portion of NRC Request for Additional
Information Letter No. 137 Related to ESBWR Design
Certification Application –
RAI Number 7.2-59 Supplement 2**

Non-Proprietary Version

For historical purposes, the original text of RAI 7.2-59 and RAI 7.2-59 Supplement 1 and their GEH responses are included preceding the RAI 7.2-59 Supplement 2 response.

NRC RAI 7.2-59

Provide the reference for the [[]] shown in Table 4-1 of NEDE-33197P. If these values were measured or calculated provide details of these measurements or calculations. Include this information in the LTR.

GEH Response:

The [[]] and the constants in Table 4-1 were based on ANSI/ANS-5.1-1994, Decay Heat Power in LWRs, Table 9: parameters for U235 thermal fission (alpha and lambda in 23 groups). [[

[[]] Extensive comparisons were performed during transient power operation, comparing LPRM to GT responses as described in NEDE-33197P Section 7.2.6. The [[]] significantly improved the response of the gamma thermometers under transient conditions.

However, as discussed in the response to RAI 7.2-18, the GTs will be used only to calibrate the LPRMs and not be used for core monitoring under transient conditions (the LPRMs will be used for core monitoring during transient conditions). Therefore the [[]] is not likely to be needed.

If GTs are chosen as AFIPs for the BWR and the [[]] is utilized, its uncertainties will be factored into the total uncertainty analysis.

DCD/LTR Impact:

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

The following changes will be made in the next revision of LTR NEDE-33197P:

Below Table 4-1, insert the following text – [[

]]

This LTR will be submitted to the NRC by September 28, 2007.

NRC RAI 7.2-59 S01:

The staff will not review the [[]]] as part of the ESBWR application. and any determination by the staff regarding the acceptability of the topical report will not constitute a regulatory decision regarding this model.

Please augment the update to the LTR to additionally include the following text below Table 4-1 taken verbatim from the RAI response:

"GTs will be used only to calibrate the LPRMs and not be used for core monitoring under transient conditions (the LPRMs will be used for core monitoring during transient conditions). Therefore the [[]]] is not likely to be needed.

If GTs are chosen as AFIPs for the ESBWR and the [[]]] is utilized, its uncertainties will be factored into the total uncertainty analysis."

GEH Response:

As a result of on-going, detailed engineering work, GEH has decided that the [[]]] will be utilized for core monitoring so that "slow" non-steady state core power changes can be monitored with GTs. The [[]]] should not be significant for LPRM calibration since LPRM calibration is performed only during steady-state conditions. However, the non-steady state response of the GTs is important for core monitoring during relatively "slow" core power changes. A [[]]] was developed to compensate for

the time lag in the GT response during non-steady state conditions and is documented in Section 4.5 of the Licensing Topical Report (LTR) NEDE-33197P, Rev. 1, September 2007, "Gamma Thermometer System for LPRM Calibration and Power Shape Monitoring."

Additionally, the [[]] was utilized in the in-plant Tokai 2 test for the following non-steady state conditions: startup, flow change, control blade movement, and power down at End Of Cycle. Section 7.2.6 of the LTR documents the results of these non-steady state core conditions. As documented in this section, the utilization of the [[]] resulted in substantially reducing the time lag in the GT response. Additionally, as shown in Figures 7-55 through 7-58 of the LTR which graphs the uncompensated and compensated GT signals compared to the LPRM readings, the compensated GT readings tracked the LPRM reading much closer for both "slow" core power changes and steady state conditions.

Therefore, it is requested that NRC review the [[]] for acceptability as it is to be utilized for "slow" non-steady state conditions in the ESBWR.

DCD/LTR Impact:

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

No changes to LTR NEDE-33197P are required by this response.

NRC RAI 7.2-59 S02:

This RAI pertains to the GEH Licensing Topical Report NEDC-33197P, Gamma Thermometer (GT) System for LPRM and Power Shape Monitoring.

The response to RAI 7.2-59 S01 indicates that GEH is pursuing approval of the [[]] model to use the AFIPs to monitor core power evolutions during "slow" transients.

The staff has been reviewing the application for the use of AFIP to replace the Transverse In-Core Probe (TIP) system for core power shape measurement and Local Power Range Monitor (LPRM) calibration. The staff has not been reviewing this application for direct core monitoring.

GDC 13 requires instrumentation be provided to monitor variables (such as core power level and distribution) over their normal operating range. The

LPRMs fulfill the requirements of GDC 13 by providing local indications that are directly proportional to local flux and are regularly calibrated.

The use of AFIPs to monitor core power during transient conditions requires [[]]. The [[]] is calculated by assuming a [[]].

In response to RAI 7.2-59 GEH stated that "If GTs are chosen as AFIPs for the ESBWR and the [[]] is utilized, its uncertainties will be factored into the total uncertainty analysis."

The staff finds that without consideration of the [[]] the GTs cannot meet the requirements of GDC 13 because they [[]].

Therefore, the staff cannot begin review of the use of the [[]] until GEH uses all applicable experimental data to:

- (1) clearly and concretely define what is meant by the term "slow,"
- (2) assess the uncertainties in the [[]] model for the stipulated conditions in (1), and
- (3) include an Operating Limit Minimum Critical Power Ratio (OLM CPR) penalty that is demonstrated to be adequately conservative to protect 99.9% of the fuel rods from boiling transition

The staff must clarify that the use of GT signals to automatically initiate safety systems will not meet the requirements of GDC 20. The GTs do not [[]], as required by GDC 20.

GEH Response:

Upon further review, GEH has elected to defer the [[]]

]]

The system functionality and requirements of the Automated Fixed In-Core Probe (AFIP) system utilizing GTs is essentially identical to the Traversing In-Core Probe (TIP) system in existing Boiling Water Reactors (BWR). That is, (1) to provide measurements for calibrating the Local Power Range Monitor (LPRM) sensors and (2) to adapt (improve) the power distribution for Core

Monitoring Systems used for calculating thermal/hydraulic parameters. The following discussion applies to both functions.

The GT data acquisition process averages the GT signals typically for up to one minute to provide a statistical average. One significant advantage of the AFIP system is that the signals from the GTs are accessible at all times.

[[

]] As with the TIP system, the AFIP system does not automatically initiate functions of any safety or protective system. Therefore, it is not a protective system or safety-related and is not utilized [[

]]

[[

The table above provides guidance that is [[
]] With the TIP system, there are to be no control rod position changes or power changes or APRM adjustments during a TIP run. Establishing and maintaining the core in xenon equilibrium and quasi-steady state conditions is a bounding condition to ensure core wide power and power distribution is stable. [[

]]

Following the guidelines in the table above ensures data gathered from the AFIP system accurately represents the core conditions within the uncertainties listed in the LTR. Therefore, consistency is ensured with the uncertainty analysis already performed. Thus, no penalties or additional uncertainties are required during MCPR calculations.

Conclusion:

- (1). [[
-]]
- (2). Based on (1), consistency is ensured with the uncertainty analysis already performed in the LTR. Therefore, no additional penalties and uncertainties are required.
- (3). Based on (1) and (2), no additional penalties or uncertainties are required for OLMCPR or other thermal limit calculations.
- (4). As with the TIP system, the AFIP system does not automatically initiate functions of any safety or protective system. Therefore, it is not a protective system or safety-related and is not utilized [[

]]

DCD/LTR Impact:

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

Licensing Topical Report (LTR) NEDE-33197P, Rev. 1, September 2007, "Gamma Thermometer System for LPRM Calibration and Power Shape Monitoring" Section 4.5 will be updated as part of Revision 2 to add the following text:

"[[

5.

6.

7.

II"

**MFN 07-613
Supplement 1**

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 07-613 Supplement 1, Mr. James C. Kinsey to U.S. Nuclear Regulatory Commission, "Response to Portion of NRC Request for Additional Information Letter No. 137 Related to ESBWR Design Certification Application – RAI Number 7.2 59 Supplement 2," dated July 3, 2008. GEH Proprietary Information is identified in Enclosure 1, "Response to Portion of NRC Request for Additional Information Letter No. 137 Related to ESBWR Design Certification Application – RAI Number 7.2 59 Supplement 2 – 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 2, "Response to Portion of NRC Request for Additional Information Letter No. 137 Related to ESBWR Design Certification Application – RAI Number 7.2 59 Supplement 2 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 the detailed GEH ESBWR methods, techniques, information, procedures, and assumptions related to its gamma thermometer system.

The development of the models and methodologies along with their application 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 3rd day of July 2008.



David H. Hinds
GE Hitachi Nuclear Energy