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Proprietary Notice

This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 1 and Enclosure 3 the balance of this letter may be considered non-proprietary.

MFN 09-621, Supplement 2

Docket No. 52-010

May 23, 2010

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

Subject: Supplemental Response Number 2 to NRC Report of the August 25, 2009, and September 9, 2009, Regulatory Audit of Reactor Pressure Vessel Internals of the Economic Simplified Boiling Water Reactor

Reference 1 transmitted GEH's original response to follow-up actions in *NRC Report of the August 25, 2009, and September 9, 2009, Regulatory Audit of Reactor Pressure Vessel Internals of the Economic Simplified Boiling Water Reactor*. Reference 2 transmitted GEH's supplemental response to address agreed to changes to LTR NEDE-33313P and DCD Tier 2 Section 3L.5.5.1.3. This letter transmits additional supplemental information to Reference 2 to address agreed to changes to NEDC-33408P Supplement 1. This letter supplements our responses in References 1 and 2. Please note that all Enclosures transmitted in References 1 and 2 still remain valid.

Enclosure 1 contains the GEH revised response to Audit comment number 16. This revision is the result of interactions with the staff to clarify and document the use in NEDC-33408P Supplement 1 of the narrow band (frequency dependent) bias and uncertainty during analysis of the ESBWR steam dryer. Enclosure 1 also contains minor changes being made to make the LTR consistent with the PBLE methodology that has been used to support the ESBWR steam dryer work.

Enclosure 3 contains the markups to NEDC-33408P Supplement 1 as a result of our revision to comment number 16 and the minor LTR changes. Enclosure 1 and Enclosure 3 are considered GEH proprietary information as defined by 10 CFR 2.390. Enclosure 2 and Enclosure 4 are nonproprietary versions of Enclosure 1 and Enclosure 3 respectively and are suitable for public disclosure. Changes in Enclosure 3 are highlighted with blue text additions and blue underlining and text deletions are highlighted with red strikethroughs. All changes are highlighted by rev bars in the right hand column. All verified changes associated with this

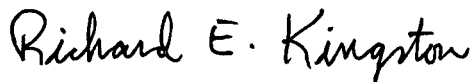
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revised response are identified in the enclosed LTR markups by enclosing the text within a black box.

The affidavit contained in Enclosure 5 identifies that the information contained in Enclosure 1 and Enclosure 3 has been handled and classified as proprietary to GEH. GEH hereby requests that the information in Enclosure 1 and Enclosures 3 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 09-621 from R. E. Kingston, GEH to the U.S. Nuclear Regulatory Commission (NRC) *Response to NRC Report of the August 25, 2009, and September 9, 2009, Regulatory Audit of Reactor Pressure Vessel Internals of the Economic Simplified Boiling Water Reactor* dated October 8, 2009
2. MFN 09-621 Supplement 1 from R. E. Kingston, GEH to the U.S. Nuclear Regulatory Commission (NRC) *Supplemental Response to NRC Report of the August 25, 2009, and September 9, 2009, Regulatory Audit of Reactor Pressure Vessel Internals of the Economic Simplified Boiling Water Reactor* dated January 26, 2010

Enclosures:

1. MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application DCD Tier 2 Section 3.9 – Mechanical Systems and Components NRC Staff Audit, August 25, 2009 - Proprietary Information
2. MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application DCD Tier 2 Section 3.9 – Mechanical Systems and Components NRC Staff Audit, August 25, 2009 - Public Version

3. MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application, Markups to NEDC-33408P Supplement 1 - Proprietary Information
4. MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application, Markups to NEDC-33408P Supplement 1 - Public Version
5. Affidavit

cc: AE Cubbage USNRC (with enclosures)
JG Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
HA Upton GEH/San Jose (with enclosures)
eDRF Section 0000-0118-2034 R0

Enclosure 4

MFN 09-621 Supplement 2

**Supplemental Response No. 2 to NRC Request for
Document Improvements and Specific Changes to DCD
Related to ESBWR Design Certification Application
Markups to NEDC-33408P Supplement 1**

Public Version

2.0 MODEL DESCRIPTION

Section 2.1 provides a brief overview of the PBLE model. Section 2.2 provides a summary of the steam dome acoustic model presented in detail in the [[]] PBLE report [1]. The steam dome acoustic model [[]] Section 2.3 develops the methodology for the [[]] formulation for the PBLE.

2.1 OVERVIEW

The PBLE can be [[

]] This is the methodology to be used in the ESBWR evaluation and is described in [1]. [[

]]

II

Figure 16 II

II
II

II

]]

Figure 20 includes the benchmark PSD comparisons between predictions using these [[

]]

Figure 21 depicts the benchmark predictions limiting the [[

]] are described in Figure 22 and

Figure 23. As shown in Figure 22, the [[

]]

[[

]]

Figure 23 [[

]]

3.1.3 Benchmark Presentation

The results presented below for the [[]] are all obtained using the
[[]] (Figure 22 and Figure
23). [[

]]

3.3.1]] Statistical Assessment

[[]]] The benchmarks include PBLE performance for [[

]]. The pressure load sources in [[]] are primarily associated with Safety Relief Valve (SRV) branch line resonances.

Vibration due to mechanical excitation at recirculation pump vane passing frequencies (VPF) may also be present [[

]]

There were 27 pressure transducers used in the QC2 replacement dryer testing. Pressure transducers P1 through P25 and P27 were located on the dryer and were used in this benchmark. Sensor P26 was located on the instrumentation mast above the dryer and was not used. Sensor P15, located on the outer hood bank end plate was in a unique location: near enough to the hood face to be considered in the group with P17, but not actually on the hood face [[

]] The results from Table 8 and Table 9 have been compiled into the final recommended PBLE load regional bias and uncertainty values for the outer hoods, skirts and endplate regions and inner hoods for use in PBLE applications. The recommended values are presented in Table 10.

The bias and uncertainty values are defined as:

[[.

]]

For each test condition, the mean and standard deviation of the bias and uncertainty is calculated. These values provide a measure of the bias and uncertainty variation from test condition to test condition and from plant to plant. [[

]]

Table 8 PBLE [[

]] Benchmark Summary [[
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|

[[

]]

|

Table 9 PBLE Benchmark Summary

[[

]]

Table 10 Recommended PBLE Bias and Uncertainty Values by Region |

]]

3.4 STATISTICAL ASSESSMENT

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Figure 24. ||

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||

||

Figure 25. || _____ ||

|| _____ ||
Figure 26. || _____ ||

[[
Figure 27.]]
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3.5 BENCHMARK CONCLUSIONS

Overall the benchmarks are well balanced and validate the [[
]] The PBLE from [[
]] emerges as a viable tool for developing dryer load definitions. The frequency content and the spatial distribution as demonstrated by the bar charts and PSD plots in the Appendices are well matched, the amplitude predictions are generally conservative and pressures in all dryer regions are consistent with plant test data from other dryers.

[[.

]]

As shown in Table 10, [[

]]

The number of pressure transducers, strain gages and accelerometers that can be used is limited and each set of sensors provides just a small sampling of pressure loads and dryer response. With only a limited number of pressure sensors available, [[

]]

In the end-to-end PBLE / FE stress analysis benchmark included in Reference [28], [[

]]

]] Further information on the conversion of strain to pressure and strain gage accuracy is presented in Appendix I.

The distance between [[

]]

Dryer Instrumentation

[[

]] From benchmarks on the QC2 data, it was concluded that [[

4.4.4 Plant-Specific Load Definition

The following steps are involved in the calculation of dryer loads with the PBLE from MSL measurements: [[

APPENDIX K FREQUENCY DEPENDENT BIAS AND UNCERTAINTY <u>DATA</u>

Table 35. II

II

Table 36. II

II

Table 37.

II

II

Table 38. II

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Table 39.

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Table 40.

II

II

Table 41.

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Table 42.

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||

MFN 09-621 Supplement 2

Enclosure 5

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Mark J. Colby**, state as follows:

- (1) I am the New Plants Engineering Manager, ESBWR, 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 and Enclosures 3, of GEH letter MFN 09-621 Supplement 2, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, entitled *Supplemental Response Number 2 to NRC Report of the August 25, 2009, and September 9, 2009, Regulatory Audit of Reactor Pressure Vessel Internals of the Economic Simplified Boiling Water Reactor* dated May 23, 2010. The GEH proprietary information in Enclosure 1, which is entitled *MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application DCD Tier 2 Section 3.9 – Mechanical Systems and Components NRC Staff Audit, August 25, 2009 - Proprietary Information* and Enclosure 3, which is entitled *MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application, Markups to NEDC-33408P Supplement 1 - Proprietary Information* is delineated by a ~~[[dotted underline inside double square brackets.^{3}]]~~. Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination. A non-proprietary version of this information is provided in Enclosure 2, which is entitled *MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application DCD Tier 2 Section 3.9 – Mechanical Systems and Components NRC Staff Audit, August 25, 2009 - Public Version* and in Enclosure 4, which is entitled *MFN 09-621 Supplement 2, Supplemental Response No. 2 to NRC Request for Document Improvements and Specific Changes to DCD Related to ESBWR Design Certification Application, Markups to NEDC-33408P Supplement 1 - Public 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 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 design information. GEH utilized prior design information and experience from its fleet with significant resource allocation in developing the system over several years at a substantial cost.

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

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

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

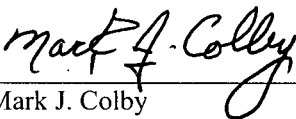
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

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

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing 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 23rd day of May 2010.



Mark J. Colby
GE-Hitachi Nuclear Energy Americas LLC