



HITACHI

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Proprietary Notice

This letter forwards proprietary information in accordance with 10 CFR 2.390. Upon the removal of Enclosure 1, the balance of this letter may be considered non-proprietary.

MFN 12-059

Docket number: 05200010

October 9, 2012

US Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Subject: NRC Requests for Additional Information (RAI) Related to the Audit of the Economic Simplified Boiling Water Reactor (ESBWR) Steam Dryer Design Methodology Supporting Chapter 3 of the ESBWR Design Control Document – Draft Response for RAI 3.9-288

In regard to the Requests for Additional Information transmitted in your May 1, 2012 Letter, Reference 1, to support the NRC ESBWR Steam Dryer Methodology Audit conducted March 21–23, 2012, Docket 05200010, please find attached the draft response for RAI 3.9-288.

Enclosure 1 contains the complete draft response, with proprietary information identified within brackets [[]], and designated in red and dotted underline text, to assist in identification. The proprietary information, as identified by GE Hitachi Nuclear Energy, Americas LLC, should be protected accordingly.

Enclosure 2 contains the draft response with the proprietary information redacted, and is acceptable for public release. Enclosure 3 provides an affidavit which sets forth the basis for requesting that Enclosure 1 be withheld from the public.

D 068
NRD

If you have any questions concerning this letter, please contact Peter Yandow at 910-819-6378.

Sincerely,

A handwritten signature in black ink, appearing to read "Jerald G. Head". The signature is stylized and cursive.

Jerald G. Head
Senior Vice President, Regulatory Affairs

Commitments: None

Reference:

1. Letter from USNRC to Jerald G. Head, GEH, Subject: Request for Additional Information Letter No. 414 related to ESBWR Design Certification Application (DCD) Revision 9, received May 1, 2012

Enclosures:

1. Draft Response for RAI 3.9-288 - Proprietary Version
2. Draft Response for RAI 3.9-288 - Public Version
3. Affidavit for MFN 12-059

cc: Scott Bowman, GEH
Peter Yandow, GEH
Patricia Campbell, GEH
Mark Colby, GEH
Tim Enfinger, GEH
Gerald Deaver, GEH
eDRF Section: 0000-0147-3915

Enclosure 3

MFN 12-059

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Edward D. Schrull, PE**, state as follows:

- (1) I am the Vice President, Regulatory Affairs, Services Licensing of GE-Hitachi Nuclear Energy Americas LLC (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's letter, MFN 12-059, Mr. Edward D. Schrull to U.S. Nuclear Regulatory Commission, entitled "NRC Requests for Additional Information (RAI) Related to the Audit of the Economic Simplified Boiling Water Reactor (ESBWR) Steam Dryer Design Methodology Supporting Chapter 3 of the ESBWR Design Control Document –Draft Response for RAI 3.9-288," dated October 9, 2012. The proprietary information in enclosure 1, entitled "Draft Response for RAI 3.9-288 - Proprietary Version," is delineated by a [[dotted underline inside double square brackets^{3}]]. GEH proprietary information in figures and tables is 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.

GEH does not consider this document to be transmitted to the NRC as a record. Rather, the document is provided solely for purposes of facilitating NRC/GEH discussions in a timely manner. GEH will submit final responses using its normal process and include a separate affidavit accordingly. Providing this affidavit to cover proprietary information that the NRC may have in its possession for purposes of performing a review of information during said discussions is consistent with NRC guidance (see NRC MC 0620).

- (3) In making this application for withholding and determination of proprietary information of which it is the owner or licensee, 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 qualifies 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, 975 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (DC Cir. 1983).

- (4) The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a and (4)b. Some examples of categories of information that 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 GEH and/or other companies.
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
 - c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, that may include potential products of GEH.
 - d. Information that discloses trade secret and/or potentially patentable subject matter for which it may be desirable to obtain patent protection.
- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to the 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, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary and/or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this information as proprietary information and the subsequent steps taken to prevent its unauthorized disclosure are as set forth in the following paragraphs (6) and (7).
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited to 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 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 and/or confidentiality agreements.

- (8) The information identified in paragraph (2) above is classified as proprietary because it communicates sensitive business information regarding commercial communications, plans, and strategies associated with future actions related to GEH's extensive body of ESBWR technology, design, and regulatory information.
- (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 and obtaining 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 9th day of October 2012.



Edward D. Schrull, PE
Vice President, Regulatory Affairs
Services Licensing
GE-Hitachi Nuclear Energy Americas LLC
3901 Castle Hayne Rd.
Wilmington, NC 28401

Enclosure 2

MFN 12-059

Draft Response for RAI 3.9-288

Public Version

Non-Proprietary Version

This is a non-proprietary version of Enclosure 1, from which the proprietary information has been removed. Portions of the document that have been removed are identified by white space within double brackets, as shown here [[]].

IMPORTANT NOTICE REGARDING CONTENTS OF THIS DOCUMENT

Please Read Carefully

The information contained in this document is furnished solely for the purpose(s) stated in the transmittal letter. The only undertakings of GEH with respect to information in this document are contained in the contracts between GEH and its customers or participating utilities, and nothing contained in this document shall be construed as changing that contract. The use of this information by anyone for any purpose other than that for which it is intended is not authorized; and with respect to any unauthorized use, GEH makes no representation or warranty, and assumes no liability as to the completeness, accuracy, or usefulness of the information contained in this document.

DRAFT RESPONSE FOR REVIEW

RAI 3.9-288

NEDE-33313P, Rev 2, does not directly address how the modal properties of the ANSYS global shell model of the steam dryer will be evaluated to ensure that the mesh is sufficiently refined to produce an acceptably accurate response up to the highest frequency of interest. On page 10, NEDE-33313P discusses a mesh sensitivity study to ensure that the design-basis response to the dynamic loading has no more than a 5 percent error. This maximum 5 percent error is then applied to the results as a “bias”. While the [[]], ensuring that the structural model can adequately respond to the highest dynamic input frequency is equally necessary. On page 14, NEDE-33313P identifies this frequency to be [[]]. During the audit, GEH presented preliminary results of a hand calculation based on the Grand Gulf ANSYS shell model, and indicated that the ESBWR steam dryer shell model would have comparable mesh refinement. The staff requests GEH to submit its proposed technical approach to ensure that the ESBWR steam dryer shell model has a sufficiently refined mesh to accurately respond at the highest loading frequency of interest [[]].

GEH Response:

The ESBWR steam dryer structural analysis methodology [1] does not directly address how the steam dryer ANSYS global shell model is sufficiently refined to produce an accurate response up to the highest frequency of interest. [[

]] In order to investigate the degree of mesh refinement associated with the dryer’s dynamic response characteristics, a mesh sensitivity study has been performed. The study uses two main dryer assemblies – the hood assembly and the skirt assembly as shown in Figure 1. Modal analyses up to the highest frequency of interest [[]] were conducted to evaluate the mesh density effects on the modal properties of steam dryer shell model. Three element sizes were selected: [[

]] Figures 2 and 3 illustrate the FE models used in the mesh sensitivity study.

Table 1 lists the modal analysis results for the hood assembly with the three mesh sizes. The difference in frequency obtained between the [[

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Table 2 lists the modal analysis results for the skirt and drain channel assembly with the three mesh sizes. The skirt and drain channels are large and simply supported thin panels that are dense in structural modes. These panels present more challenges for demonstrating the adequacy of the mesh refinement. The difference in frequency response obtained between the
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The skirt results show that, above [[

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In conclusion, [[

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References

1. NEDE-33313P-A, ESBWR Steam Dryer Structural Evaluation, Class III, Revision 2, October 2010.
2. Letter from Jerald Head, (GEH), to NRC, "NRC Requests for Additional Information (RAI) Related to the Audit of the Economic Simplified Boiling Water Reactor (ESBWR) Steam Dryer Design Methodology Supporting Chapter 3 of the ESBWR Design Control Document – Draft Version of RAI 3.9-290", dated May 10,2012
3. 26A6642AB, ESBWR Design Control Document, Tier 2, Section 3.L.4.1, Revision 9, dated November 2010.

DCD or LTR Changes

No change is proposed for the DCD or referenced License Topical Reports.

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Figure 1

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Figure 2 - Hood Assembly FE Model Used in Modal Analyses

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Figure 3 – Skirt Assembly FE Model Used in Modal Analyses

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Figure 4 - Mode Shape for the Highest Frequency

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Figure 5 - Mode Shape for the Second Highest Frequency

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Figure 6 - 4th Mode Shape for Skirt Assembly

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Figure 7 - 77th Mode Shape for Skirt Assembly

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Figure 8 - 92th Mode Shape for Skirt Assembly

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Figure 9 - Mode Shape for Drain Channel at Frequency Greater than [[]]

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Figure 10 - [[

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Figure 11 – [[

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Enclosure 2

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