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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 12-047

Docket number: 05200010

July 25, 2012

Attn: David Misenhimer
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: NRC Requests for Additional Information 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 3.9-275

Reference:

1. MFN 12-037 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

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 5200010, please find attached the draft response for RAI 3.9-275.

Enclosure 1 contains proprietary information. The proprietary information is contained within brackets [[]] and is designated in red font with dotted underline to assist in identification. This RAI contains proprietary information identified by GE Hitachi Nuclear Energy, Americas LLC., and 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.

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NRD

Designate as original
David Misenhimer, PM
07-26-12

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

Sincerely,



Jerald G. Head
Senior Vice President, Regulatory Affairs

Commitments: No commitments are made.

Enclosures:

1. Draft Response for RAI 3.9-275 – Proprietary version
2. Draft Response for RAI 3.9-275 – Public version
3. Affidavit for MFN 12-047

cc: Glen Watford, GEH
Peter Yandow, GEH
Patricia Campbell, GEH
Mark Colby, GEH
Scott Bowman, GEH
Draft eDRF Section 0000-0146-9760

Enclosure 2

MFN 12-047

Draft Response for RAI 3.9-275

Public 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.

NRC RAI 3.9-275

GEH Response

In order to support the Grand Gulf Nuclear Station (GGNS) power uprate licensing submittal, GEH has provided responses to a series of questions related to the fatigue crack that was discovered on the Susquehanna Steam Electric Station (SSES) Unit 2 replacement steam dryer (see Table 1). GEH has maintained that the fatigue crack was not the result of a deficient analysis. The information provided to the NRC staff in RAI responses has been supplemented and assimilated in Reference 1, which is summarized here in order to respond to the staff's request.

[illegible]

DRAFT RESPONSE – FOR REVIEW ONLY

Detailed Response:

]] This analysis used the same PBLE acoustic pressure loads from the on-dryer measurements as the Reference 2 analysis. The results of these analyses were used in subsequent evaluations. [[

11.

DRAFT RESPONSE – FOR REVIEW ONLY

Global Model Evaluation (Load Basis)

For this evaluation, the global model analysis provides the transient boundary conditions used to drive the more detailed submodel for the seismic block and skirt region. Highlights of the analysis include the following:

- The structural Finite Element (FE) model used in the global analysis was upgraded to be consistent with improvements and lessons learned from other projects. [[

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- The PBLE-based analysis [2] was used in the seismic block analysis because there was less uncertainty in the loads. It was based on actual on-dryer measurements (test condition 3D) instead of the more remote main steam line measurements, and the [[

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- The PBLE-based analysis takes into account bias and uncertainty terms developed during benchmarking against the SSES on-dryer instrumentation; therefore, it represents bounding predicted dryer stresses. [[

DRAFT RESPONSE – FOR REVIEW ONLY

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Figure 1 Strain gage measurement versus model prediction

Detailed Submodel Evaluation

A submodel of the seismic block region was developed for the analysis. [[

]] The submodel is shown in Figure 2.

DRAFT RESPONSE – FOR REVIEW ONLY

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Figure 2 Submodel of the seismic block area

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DRAFT RESPONSE – FOR REVIEW ONLY

The submodel results were benchmarked to the global model results in order to determine if the [[

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The results of the as-built submodel analysis are provided in Table 2. [[

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Table 2 Stress intensity in the as-built skirt and seismic block weld

Load Case / Location	Weld Factor	Raw FIV Stress (psi)	Scaled Stress (psi) ¹
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¹ Includes methodology bias and uncertainty, EPU extrapolation, and VPF

DRAFT RESPONSE – FOR REVIEW ONLY

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Fracture Mechanics Evaluation

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DRAFT RESPONSE – FOR REVIEW ONLY

Conclusions

Several conclusions can be drawn from the Reference 1 evaluation, which have been summarized in this response:

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References

1. GEH Technical Report 0000-0136-8710P, *Replacement Steam Dryer Analysis of Skirt Crack Indication*, Class III, Revision 2, February 2012.
2. GEH Technical Report 0000-0099-0973-P-R0, *Susquehanna Replacement Steam Dryer Fatigue Stress Analysis Using PBLE Methodology*, Class III, Revision 0, August 2009.
3. GEH Technical Report 0000-0095-2113-P-R0, *Susquehanna Replacement Steam Dryer Updated Stress Analysis at Extended Power Uprate Conditions*, Class III, Revision 0, February 2009.
4. Engineering Report GE-NE 0000-0085-2413 P-R0, *Susquehanna Unit 1 Replacement Steam Dryer Vibration Instrument Program NRC Summary Test Report*, Class III, Revision 0, July 2008.

DCD/LTR Changes:

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

Enclosure 3

MFN 12-047

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **Jerald G. Head**, state as follows:

- (1) I am the Senior Vice President, Regulatory Affairs 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 12-047, J. Head (GEH) to D. Misenhimer (NRC), "NRC Requests for Additional Information 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 3.9-275," dated July 25, 2012. The GEH proprietary information in Enclosure 1 of MFN 12-047, is identified by a [[dark red, 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.
- (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 and its protection is important to the design certification process.

- (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 25th day of July, 2012.



Jerald G. Head
GE-Hitachi Nuclear Energy Americas LLC