



**HITACHI**

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**Proprietary Notice**

This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 2, the balance of this letter may be considered non-proprietary.

MFN 09-503

Docket No. 52-010

July 27, 2009

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

**Subject: Response to NRC Request for Additional Information Letter No. 349 Related to ESBWR Design Certification Application - Qualification of Batteries- RAI 8.3-64 S01**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to a U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) letter number 349 sent by NRC letter received June 9, 2009 (Reference 1). The GEH response to RAI Number 8.3-64 S01 is addressed in Enclosure 1. In addition, a new Licensing Topical Report, "ESBWR Qualification Plan Requirements for a 72-Hour Duty Cycle Battery," NEDE-33516P Revision 0, July 2009 has been issued and is enclosed (2.)

Enclosure 2 contains GEH proprietary information as defined by 10 CFR 2.390. GEH customarily maintains this information in confidence and withholds it from public disclosure.

The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 2 has been handled and classified as proprietary to GEH. GEH hereby requests that the information in Enclosure 2 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

DOB  
NRD

## Reference:

1. MFN 09-401 Letter from U.S. Nuclear Regulatory Commission to J. G. Head, GEH, *Request For Additional Information Letter No. 338 Related to ESBWR Design Control Document* received June 10, 2009

## Enclosures:

1. Response to NRC Request for Additional Information Letter No. 349 Related to ESBWR Design Certification Application - Qualification of Batteries- RAI 8.3-64 S01 and DCD Markup
2. Response to NRC Request for Additional Information Letter No. 349 Related to ESBWR Design Certification Application - Qualification of Batteries- Licensing Topical Report, "ESBWR Qualification Plan Requirements for a 72-Hour Duty Cycle Battery," NEDE-33516P Revision 0, July 2009, GEH Proprietary Information
3. Affidavit

cc:	AE Cabbage	USNRC (with enclosures)
	JG Head	GEH/Wilmington (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	eDRF Section	0000-0104-5175 (RAI 8.3-64 S01)
		0000-0104-5210 (LTR NEDE-33516P)

**MFN 09-503**

**Enclosure 1**

**Partial Response to Portion of NRC**

**Request for Additional Information Letter No. 349**

**Related to ESBWR Design Certification Application –**

**Qualification of Batteries –**

**RAI Number 8.3-64 S01 and DCD Markup**

**NRC RAI 8.3-64 S01**

*In the response to RAI 8.3-64, GEH presented a detailed qualification plan for the Vented Lead-Acid (VLA) batteries with extended duty cycles. During the teleconference held on April 23, 2009, GEH clarified its qualification plan for VLA batteries with extended duty cycles, and staff found the response acceptable subject to the documentation of the qualification plan.*

*This request is consistent with the clarification request posted in January 2009 in the IEEE Standards Committee website for IEEE Std 535, "Standard for Qualification of Class 1E Lead Storage Batteries for Nuclear Power Generating Stations," stated the following: "for duty cycles greater than 8 hours in duration that discharge ampere-hour greater than the 8-hour rating, IEEE Std 535-2006, 8.2.2h is not satisfied without further documentation to justify any extrapolation or inferences made for applications using the longer durations. Particular attention would be needed to demonstrate that no additional failure modes are introduced due to the additional energy delivered due to the longer durations." (emphasis added)*

*Since the duty cycle of the battery for the ESBWR designs exceeds the 8-hour duration, and given that this is a first-of-a-kind application for nuclear power plants, include the Qualification Plan in the DCD. The staff accepts adding it to the DCD or incorporating it by reference.*

**GEH Response**

GEH has incorporated by reference LTR, NEDE 33516P, that is titled "ESBWR Qualification Plan Requirements for a 72-Hour Duty Cycle Battery." The response to RAI 8.3-64 remains as shown in the changes to Section 3.11, with the reference to the NEDE being added per this RAI response.

**DCD Impact**

DCD Tier 2, Section 3.11 is revised as noted in the response above to reference NEDE-33516P.

LTR NEDE-33516P Rev 0 is issued as a proprietary document hard copy with this RAI response.

Note: GEH has not submitted a nonproprietary version of this document in accordance with NRC Information Notice 2009-07, Requirements for Submittals, (2): "In instances in which a nonproprietary version would be of no value to the public because of the extent of the proprietary information, the agency does not expect a nonproprietary version to be submitted."

ESBWR's equipment qualification type test process for batteries includes evaluation of significant aging mechanisms that are related to failure mechanisms from radiation exposure, time-temperature aging, and cycle aging; age testing for significant aging mechanisms for a 20-year qualified life; seismic test; and performance testing for the 72-hour duty cycle (see Reference 3.11-6).

#### ***3.11.4.2 Mild Environment Qualification***

EQ safety-related equipment located in a mild environment is qualified as follows:

To assure EQ safety-related equipment located in a mild environment meets its safety-related functional requirements during normal environmental conditions and AOOs, the environmental design basis for normal environmental conditions and AOO requirements is specified in the design/purchase specifications. A qualified life is not required for equipment located in a mild environment that has no significant aging mechanisms.

For all EQ safety-related equipment, excluding EQ safety-related computer-based I&C systems, a Certificate of Conformance from the vendor of the safety-related equipment to be located in a mild environment needs to certify performance to the environmental design basis for normal environmental conditions and AOO requirements for the equipment location for the time that the safety-related function is required.

#### ***3.11.4.3 Computer-based Instrumentation and Control Systems***

EQ safety-related computer-based I&C systems comply with RG 1.209. For all EQ safety-related computer-based I&C systems, located in a mild environment, type testing is the preferred qualification method to demonstrate performance to the environmental design basis for normal environmental conditions and AOO requirements for the equipment location for the time that the safety-related function is required.

Type tests may be separate laboratory or manufacturer's tests that document performance to the applicable service conditions with due consideration for synergistic effects, if applicable.

When computer-based I&C systems type testing is performed:

- The system under test functions and performs with safety-related software that has been validated and verified and is representative of the software to be installed in the nuclear power plant.
- Testing demonstrates performance of safety-related functions at the specified environmental service conditions, including AOOs.
- Testing exercises all portions of the system under test that are necessary to accomplish the safety-related functions and those portions whose operation or failure could impair the safety-related functions.
- Testing confirms the response of digital interfaces and verifies that the design accommodates the potential impact of environmental effects on the overall response of the system.
- Testing of a complete system is preferred.

## Radiation Environment

EQ equipment is designed to perform its safety-related function when exposed to the normal operational radiation levels and accident radiation levels.

~~The operating dose rates are based on ABWR plant operating conditions and adjusted for ESBWR using appropriate scaling factors.~~

~~The accident dose rates are based on ABWR plant accident conditions and adjusted for ESBWR using appropriate scaling factors.~~ Dose rates and integrated doses of radiation that are associated with normal plant operation and the DBA condition for various plant compartments are presented in Appendix 3H; these parameters are presented in terms of time-based profiles where applicable.

### 3.11.7 COL Information

#### *3.11-1-A Environmental Qualification Document*

The COL Applicant will provide a full description and a milestone for program implementation of the environmental qualification program that includes completion of the plant-specific EQD per Subsection 3.11.4.4.

#### *3.11-2-H Environmental Qualification Records (Deleted)*

### 3.11.8 References

- 3.11-1 USNRC, Standard Review Plan, NUREG-0800, SRP 3.11, Revision 3, March 2007, "Environmental Qualification of Mechanical and Electrical Equipment."
- 3.11-2 USNRC, Code of Federal Regulations, Title 10, Chapter I, Part 50, Paragraph 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."
- 3.11-3 General Electric Co., "General Electric Environmental Qualification Program," NEDE-24326-1-P, Proprietary Document, January 1983.
- 3.11-4 Regulatory Guide 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants," March 2007.
- 3.11-5 NUREG 0588, USNRC, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," December 1979.

<p>3.11-6 GE Hitachi Nuclear Energy, "ESBWR Qualification Plan Requirements for a 72-Hour Duty Cycle Battery," NEDE-33516P Revision 0, Proprietary Document, July 2009.</p>
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**MFN 09-503**

**Enclosure 3**

**Affidavit**

# GE-Hitachi Nuclear Energy Americas LLC

## AFFIDAVIT

I, **Larry J. Tucker**, state as follows:

- (1) I am the Manager, ESBWR Engineering, GE Hitachi Nuclear Energy ("GEH"), 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 2 of GEH letter MFN 09-503, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, entitled *Response to NRC RAI Letter No. 349 Related to ESBWR Design Certification Application – Qualification of Batteries- RAI 8.3-64 S01 RAI Number 8.3-64 S01 dated July 27, 2009*. The GEH proprietary information in Enclosure 2, which is entitled Qualification of Batteries- Licensing Topical Report, "ESBWR Qualification Plan Requirements for a 72-Hour Duty Cycle Battery," NEDE-33516P Revision 0, July 2009, GEH Proprietary Information is delineated by a [[dotted underline inside double square brackets<sup>(3)</sup>]]. Figures and large equation objects are identified with double square brackets before and after the object. In each case, the superscript notation <sup>(3)</sup> refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (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 GE ESBWR design information. GE 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.

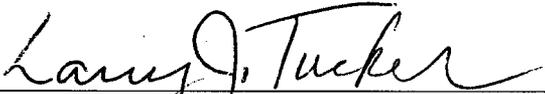
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

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 27<sup>th</sup> day of July, 2009.

  
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Larry J. Tucker  
GE-Hitachi Nuclear Energy Americas LLC