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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 09-087

Docket No. 52-010

February 10, 2009

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

Subject: Submittal of Task Analysis Bridge Document - Chapter 18 - Human Factors Engineering - RAI Number 18.5-5 S04

The purpose of this letter is to submit the ESBWR Task Analysis Bridge Document in response to a request made by the U.S. Nuclear Regulatory Commission (NRC) during a telecon held on November 6, 2008. This transmittal is being sent under the Request for Additional Information (RAI) number 18.5-5 S04 for tracking purposes.

Response to RAI 18.5-5 S03, was previously provided via Reference 1 in response to Reference 2. Response to RAI 18.5-5 S02, was previously provided via Reference 3 in response to Reference 4. Reference 5 provided the supplement 1 response as requested by NRC in Reference 6. The original RAI response was submitted to the NRC via Reference 7 in response to NRC Request for Additional Information Letter No. 64, Reference 8.

Enclosure 1 contains GE Hitachi Nuclear Energy (GEH) proprietary information as defined by 10 CFR 2.390. GEH customarily maintains this information in confidence and withholds it from public disclosure. A non-proprietary version is provided in Enclosure 2.

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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 08-662 - *Submittal of Response to Portion of NRC Request for Additional Information Letter No. 211 Related to ESBWR Design Certification Application Chapter 18 - Human Factors Engineering – RAI Numbers 18.5-5 S03 and 18.5-26 S02*, dated October 9 2008
2. MFN 08-502 - Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request for Additional Information Letter No. 211 Related to ESBWR Design Certification Application*, dated June 3, 2008
3. MFN 07-624 - *Response to Portion of NRC Request for Additional Information Letter No. 113 Related to ESBWR Design Certification Application – Human Factors Engineering - RAI Numbers 18.5-5 S02, 18.5-19 S01, 18.5-26 S01, 18.5-27 S02, and 18.5-30 S02*, Dated January 18, 2008
4. MFN 07-557 - Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 113 Related To ESBWR Design Certification Application*, dated October 16, 2007
5. MFN 07-334 - Submittal of “*ESBWR DCD Chapter 18, Human Factors Engineering - RAI to DCD Roadmap Document*” dated June 27, 2007
6. Email from AE Cabbage to DL Lewis, *List of Chapter 18 RAIs for Roadmap Request*, dated 5/18/07
7. MFN 06-401, *Response to Portion of NRC Request for Additional Information Letter No. 64 – Human Factors Engineering – RAI Numbers 18.5-1 through 18.5-32*, dated October 28, 2006
8. MFN 06-352, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 64 Related to ESBWR Design Certification Application*, dated September 25, 2006

Enclosures:

1. MFN 09-087 – Chapter 18.5 Human Factors Engineering – Task Analysis Bridge Document- RAI Number 18.5-5 S04 – GEH Proprietary Information
2. MFN 09-087 - Chapter 18.5 Human Factors Engineering – Task Analysis Bridge Document- RAI Number 18.5-5 S04 – Non-Proprietary Version
3. MFN 09-087 - Affidavit

cc: AE Cabbage USNRC (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)
eDRF 0000-0095-4591

Enclosure 2

MFN 09-087

Chapter 18.5 - Human Factors Engineering

Task Analysis Bridge Document

RAI Number 18.5-5 S04

Non-Proprietary Version

NRC RAI 18.5-5 S04

On 11/6/2008 a telecon was held between GEH and the NRC concerning RAI 18.5-5 S03 (Task Analysis) response. During this telecon the NRC stated that the RAI response was very detailed, however, there was some difficulty mapping the RAI response to the TA implementation plan (NEDO-33221). The NRC requested that GEH map the RAI response details to the implementation plan.

Note: No Letter or E-mail was received for this supplement. It is being internally generated to track the bridge document for Task Analysis with the NRC.

GEH Response

The System-Level and Plant-Level Task Analyses are conducted using internal work instructions. The Work Instructions are performed in conjunction with data structures and are written to follow the input to these data structures not the flow of NEDO-33221. The data structure is ultimately utilized to document the results of the analyses.

The attached bridge document requested by the NRC takes each section/step of NEDO-33221 and identifies the Work Instruction steps that implement the section/step.

DCD Impact/LTR Impact

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

No LTR NEDO-33221 changes will be made in response to this RAI.

The following is the Implementation section of the Task Analysis Implementation Plan NEDO-33221, for the System-Level Task Analysis and Plant-Level Task Analysis. The applicable portions of these work instructions, that describe each of the analyses in detail, are inserted and highlighted after the portion to which it applies.

[All highlighted text below is pulled directly from the work instructions and as such, reflects the instructions as currently written. Although the overall processes will continue to implement NEDO-33221, these instructions are subject to minor changes including, but not limited to, format, sequence, and outline number changes. These instructions are internal GE documents and as such are to be treated as proprietary]

4. IMPLEMENTATION

4.1 SYSTEM-LEVEL TASK ANALYSIS

The TA process is illustrated in Figure 3.

4.1.1 Assumptions

System level assumptions include:

- Tasks required to start-up and shutdown the ESBWR automation
- Common sequence, priority, and logic are employed by the SOPs and each system's automatic control

4.1.2 Inputs

Task analysis inputs include:

- System configurations from SFRA
 - Configuration changes from SFRA
 - SFRA function flow data structure
 - Functions allocated during AOF
 - HRA/PRA
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4.1.3 Process

4.1.3.1 *Task Identification*

Convert functions and configuration changes identified in the SFRA into tasks.

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4.1.3.2 *Sequence Tasks*

Order tasks logically considering:

- System requirements
 - System limitations
 - Industrial safety
 - Nuclear safety
 - Resource allocation (time, staff, and urgency)
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4.1.3.3 Parameters

Identify Parameters through:

- Assessing what information is necessary for task completion
- Determining how information is provided

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4.1.3.4 *Interdependency*

Identify Interdependency:

- Identify requirements not identified by the system

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- Identify criteria for successful task completion
 - Identify criteria for task termination
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4.1.3.5 *Operating Guidelines*

(1) Develop System Operating Guidelines

Generate system operations guidelines such as:

- Identify prerequisites and limitations

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- List subtask steps
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- Identify cues used by operators or automation to start, stop, or control plant equipment
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- Incorporate completion and termination criteria
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(2) Evaluate Operating Guidelines
Using system level simulation validate:

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- Prerequisites and limitations
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- Task sequence
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- Task timing
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- **Initiation, completion, and termination criteria**
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4.1.3.6 *Operator Workload*

Assess operator workload by addressing issues such as:

- Operator vigilance

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- Physical and cognitive workload
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- Crew-member skills, knowledge, and ability
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- Situational awareness during transients and abnormal operation
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- Meaningful work allocation
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4.1.4 Outputs

System-level task analysis outputs include:

- Communications requirements

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- HSI descriptors
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- Availability and arrangement of indicators
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- Display requirements
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- Control requirements
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- Alarm requirements
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- Data processing requirements

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- Access requirements
 - Workplace and workstation design considerations
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- Environmental considerations
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- Equipment requirements
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- Activities required for successful completion of tasks
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- Sequences that serve as both procedure outlines and automation logic
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- Task input to the training development

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- Task input to the staffing and qualification process

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4.2 PLANT-LEVEL TASK ANALYSIS

4.2.1 Assumptions

Plant level assumptions include:

- Tasks required to start-up and shutdown the ESBWR automation
- Common sequence, priority and logic are employed by the IOPs and plant automation

4.2.2 Inputs

Task analysis inputs include:

- Plant configurations from PFRA
- Configuration changes from PFRA
- PFRA function flow data structure
- Functions allocated during AOF
- HRA/PRA
- System level TA

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4.2.3 Process

4.2.3.1 *Task Identification*

Convert plant functions and configuration changes identified in the PFRA into tasks.

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4.2.3.2 *Sequence Tasks*

Order tasks logically considering:

- Plant and system level requirements
- Plant and system limitations
- Industrial safety
- Nuclear safety
- Resource allocation (time, staff, and urgency)

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4.2.3.3 *Parameters*

Identify parameters through:

- Assessing task requirements
- Determining how this is provided

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4.2.3.4 Interdependency

Identify interdependency:

- Identify requirements not identified by the system level task analyses
- Identify criteria for successful task completion
- Identify criteria for task termination
- Identify and coordinate system and plant level requirements and limitations

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4.2.3.5 *Operating Guidelines*

(1) Develop Integrated Operating Guidelines

Generate system-operating guidelines such as:

- Identify prerequisites and limitations

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- List subtask steps
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- Identify cues used by operators or automation to start, stop, or control plant equipment
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- Incorporate completion and termination criteria
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Enclosure 2

(2) Operating Guidelines

Using plant level simulation validate:

- Prerequisites and limitations
- Task sequence
- Task timing
- Initiation, completion, and termination criteria

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4.2.3.6 Operator Workload

Assess operator workload by addressing issues such as:

- Operator vigilance
- Crew members' physical and cognitive workload
- Crew members' skills
- Tasks and control room activities
- Situational awareness during transients and abnormal operation
- Monitoring and control tasks
- Meaningful work allocation

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4.2.4 Outputs

- Communications requirements

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- HSI descriptors
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- Availability and arrangement of indicators
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- Display requirements
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- Control requirements
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- Workplace and workstation design considerations
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- Environmental considerations
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- Equipment requirements

- Activities required for successful completion of tasks
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- Sequences that serve as both procedure outlines and PAS logic
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- Task input to the training development
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- Task input to the staffing and qualification process
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MFN 09-087

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, **David H. Hinds**, state as follows:

- (1) I am the Manager, New Units 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 1 of GEH letter MFN 09-017, Mr. Richard E. Kingston to U.S. Nuclear Regulatory Commission, entitled *Submittal of Task Analysis Bridge Document - Chapter 18 - Human Factors Engineering - RAI Number 18.5-5 S04*, dated February 10, 2009. The GEH proprietary information in Enclosure 1, which is entitled *MFN 09-087 - Chapter 18.5 Human Factors Engineering - Task Analysis Bridge Document- RAI Number 18.5-5 S04 - GE 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, entitled *MFN 09-087 - Chapter 18.5 Human Factors Engineering - Task Analysis Bridge Document- RAI Number 18.5-5 S04 - 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 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 process. 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 10th day of February 2009.



David H. Hinds
GE-Hitachi Nuclear Energy Americas LLC