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U.S. Nuclear Regulatory Commission
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Subject: **Revised Response to Portion of NRC Request for Additional Information Letter No. 305 Related to the ESBWR Design Certification – Electrical Power – RAI Number 14.3-448 Revision 1**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC Letter No. 305 (Reference 1). The original GEH response to RAI Number 14.3-448 was provided in Reference 2. The response has been revised based on telephone conference calls between GEH and NRC on April 29, 2009 and May 7, 2009. The revised response is provided in Enclosure 1. DCD markups associated with this response are provided in Enclosure 2.

If you have any questions or require additional information, please contact me.

Sincerely,

Richard E. Kingston

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Vice President, ESBWR Licensing

Reference:

1. MFN 09-112, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 305 Related To ESBWR Design Certification Application*, dated February 3, 2009
2. MFN 09-241, Letter from Richard E. Kingston, GEH to U.S Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 305 Related to ESBWR Design Certification Application - Electrical Power - RAI Number 14.3-448*, dated April 22, 2009.

Enclosures:

1. Revised Response to Portion of NRC Request for Additional Information Letter No. 305 Related to ESBWR Design Certification Application – Electrical Power - RAI Number 14.3-448 Revision 1.
2. Revised Response to Portion of NRC Request for Additional Information Letter No. 305 Related to ESBWR Design Certification Application – Electrical Power - RAI Number 14.3-448 Revision 1.– DCD Markups

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Enclosure 1

MFN 09-241 Rev 1

Revised Response to Portion of NRC Request for Additional Information Letter No. 305 Related to ESBWR Design Certification Application

Electrical Power

RAI Number 14.3-448 Revision 1

NRC RAI 14.3-448

Provide an ITAAC associated with coordination of interrupting devises so that the interrupter closest to the fault opens before other devices.

The coordination study should include all voltage levels.

GEH Response

As requested by the Staff, GEH has added an ITAAC for coordination of interrupting devices to DCD Tier 1, Section 2.13.1, Revision 6. The added ITAAC was previously transmitted with the response to RAI 14.3-443 (MFN 09-117), as the new ITAAC helped ensure a complete answer to that RAI as well. No further ITAAC will be included with the response to this RAI, 14.3-448.

In accordance with the circuit protection philosophy described in DCD Tier 2, Subsection 8.3.1.1.6, interrupting devices at all voltage levels will be coordinated to ensure that the interrupter closest to a fault opens before other devices. Electrical analyses will be conducted as part of ESBWR detailed design to confirm proper coordination of interrupting devices.

DCD Impact

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

NRC RAI 14.3-448 Revision 1

During the telephone conference call of April 29, 2009 the Staff requested that the words "sized and coordinated" be added into the context of the ITAAC 13. 2.13.3 Direct Current power Supply and 2.13.5 Uninterruptible AC Power Supply. A follow-up telephone conference with the NRC Staff on May 7, 2009 concluded the final acceptable wording for subject ITAAC.

GEH Response

As requested by the Staff, GEH has revised the ITAAC for both 2.13.3 and 2.13.5 and the Design Descriptions for Item 13 to: "Protective devices for the safety-related 250 DC (or UPS) system are rated to interrupt analyzed fault currents and are coordinated to only trip the protective device closest to the fault", as is appropriate for both the inverters AC loads and the single DC load, the inverter (see F2.13.3-1 for clarification).

The final sizing of the fused disconnects indicated in the safety-related DC and AC power supply systems will be part of the detail design transient analysis when final component sizes are verified.

It is noted that the original wording for the subject ITAAC was approved as part of response to RAI 14.3-425 found in MFN letter 08-944, December 18, 2008. This RAI 14.3-448 Rev. 1 supersedes the response given in RAI 14.3-425 for the attached markups to DCD Tier 1.

DCD Impact

DCD Tier 1, Text and Tables 2.13.3-3 and 2.13.5-2 will be changed as noted in the attached markup.

Enclosure 2

MFN 09-241 Rev 1

Revised Response to Portion of NRC Request for

Additional Information Letter No. 305

Related to ESBWR Design Certification Application

Electrical Power

RAI Number 14.3-448 Revision 1

DCD Markups

(11) ~~Environmental qualification of the 250 V Safety-Related DC systems is addressed in Tier 1 Section 3.8.~~(Deleted)

(12) Electrical cables for the safety-related 250 VDC system are rated to withstand fault current for the time required to clear the fault from their power source.

(13) Protective devices for the safety-related 250 VDC system are rated to interrupt analyzed fault currents and are coordinated to only trip the protective device closest to the fault.

(14) Raceway for safety-related 250 VDC system circuits are sized in accordance with design requirements.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.13.3-3 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria for the Direct Current Power Supply.

Table 2.13.3-3

ITAAC For The Direct Current Power Supply

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13. Protective devices for the safety-related 250 VDC system are rated to interrupt analyzed fault currents and are coordinated to only trip the protective device closest to the fault.	Analyses of the as-built safety-related 250 VDC system will be performed to determine possible fault currents and the required size of protective devices to ensure that they are coordinated to only trip the protective device closest to the fault.	Report(s) for the as-built safety-related 250 VDC system exist and conclude that the protective devices for the safety-related 250 VDC system loads are sized to only trip the protective device closest to the fault.
14. Raceway for safety-related 250 VDC system circuits are sized in accordance with design requirements.	Analyses of the as-built safety-related 250 VDC system will be performed to determine required raceway sizing.	Report(s) for the as-built safety-related 250 VDC system exist and conclude that raceway sizing is in accordance with design requirements and raceway loading is within that assumed in the electrical analyses.

(13) Protective devices for the safety-related UPS system are rated to interrupt analyzed fault currents and are coordinated to only trip the protective device closest to the fault.

(14) Raceway for safety-related UPS system circuits are sized in accordance with design requirements.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.13.5-2 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria for the Uninterruptible AC Power Supply.

Table 2.13.5-2

ITAAC For The Uninterruptible AC Power Supply

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	ii. Type tests will be performed to confirm the safety-related utilization equipment functions properly at the established maximum and minimum terminal voltage tolerance limits.	ii. Report(s) exist and conclude the safety-related utilization equipment functions properly at the established maximum and minimum terminal voltage tolerance limits.
12. Electrical cables for the safety-related UPS system are rated to withstand fault current for the time required to clear the fault from their power source.	Analyses of the as-built safety-related UPS system will be performed to determine possible fault currents.	Report(s) for the as-built safety-related UPS system exist and conclude that electrical cables will withstand the analyzed fault currents, as determined by manufacturer's ratings for the time required to clear the fault from its power source.
13. Protective devices for the safety-related UPS system are rated to interrupt analyzed fault currents and are coordinated to only trip the protective device closest to the fault.	Analyses of the as-built safety-related UPS system will be performed to determine possible fault currents and the required size of protective devices to ensure that they are coordinated to only trip the protective device closest to the fault.	Report(s) for the as-built safety-related UPS system exist and conclude that the protective devices for the safety-related UPS system loads are sized to only trip the protective device closest to the fault.
14. Raceway for safety-related UPS system circuits are sized in accordance with design requirements.	Analyses of the as-built safety-related UPS system will be performed to determine required raceway sizing.	Report(s) for the as-built safety-related UPS system exist and conclude that raceway sizing is in accordance with design requirements and raceway loading is within that assumed in the electrical analyses.