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U.S. Nuclear Regulatory Commission
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Subject: **Submittal of Response to Portion of NRC Request for Additional Information Letter No. 313 Related to ESBWR Design Certification Application Chapter 18 - Human Factors Engineering - RAI Number 18.5-34.**

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. 313, dated March 9, 2009 (Reference 1). RAI 18.5-34 was requested by Reference 1. Enclosure 1 provides the GEH response to the subject RAI as requested in Reference 1.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

References:

1. MFN 09-178 - Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 313 Related To ESBWR Design Certification Application*, dated March 9, 2009

Enclosures:

1. MFN 09-328 – Response to Portion of NRC Request for Additional Information Letter No. 313 Related to ESBWR Design Certification Application Chapter 18 - Human Factors Engineering - RAI Number 18.5-34

cc: AE Cubbage USNRC (with enclosures)
JG Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
RE Kingston GEH/Wilmington (with enclosures)

eDRF Section 0000-0099-5421 RAI 18.5-34

Enclosure 1

MFN 09-328

**Response to Portion of NRC Request for
Additional Information Letter No. 313
Related to ESBWR Design Certification Application
Chapter 18 - Human Factors Engineering
RAI Numbers 18.5-34**

NRC RAI 18.5-34

The MI may not be based on an appropriate list of risk important human actions (HAs). The ESBWR list of risk important human actions is determined in accordance with the NEDO-33267, ESBWR Human Factors Engineering Human Reliability Analysis Implementation Plan (HRA IP), Revision 3. However, the list of risk important HAs used for MI determination is specified in MFN 09-024, Att. A, Page 3 as DCD Chapter 19 Table 19.2-3. This appears to be an abbreviated list that doesn't meet the commitments of the HRA IP. It also doesn't contain all of the risk important HAs in the probabilistic risk assessment (PRA) tables (e. g., PRA Rev. 3, Table 17.1-3, ESBWR Risk Significant Operator Actions). Also pertinent to this RAI is Supplement 4 to RAI 18.7-7 (and the related GEH response) which raises the issue of what is the correct list of risk important HAs. Please clarify and/or correct the list of risk important HAs used for the MI determination.

GEH Response

DCD Chapter 19 is the Design Certification PRA and is the appropriate input for minimum inventory. For the development of the ESBWR Minimum Inventory, which facilitates the use of design acceptance criteria and Human Factors processes being implemented during detailed design, DCD Chapter 19 Table 19.2-3 was used to establish the alarms, displays, and controls necessary to carry out those human actions shown to be important in the ESBWR PRA.

A list of risk important human actions is determined in accordance with NEDO-33267, ESBWR Human Factors Engineering Human Reliability Analysis Implementation Plan, for the purpose of human reliability analysis (HRA) as specified in the plan. The HRA list of risk important human actions is derived from Section 17 of the NEDO-33201 as discussed in RAI 18.7-7 Supplement 4 and provided in Supplement 5 of the same. These risk important human actions receive individual HFE emphasis during functional allocation, task analysis, human system interface design, procedure development, and training to ensure that their risk impact is reduced to as low as practical. NEDO-33201, Section 17 includes the detail from which Table 19.2-3 is derived.

DCD Impact

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