



**HITACHI**

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MFN 06-442, Supplement 6

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U.S. Nuclear Regulatory Commission  
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Subject: **Second Revised Response to Portion of NRC Request for Additional Information Letter No. 342 Related to ESBWR Design Certification Application - RAI 19.1-144 S04**

Enclosure 1 contains a second revision to the GE Hitachi Nuclear Energy (GEH) response to Request for Additional Information (RAI) Number 19.1-144 S04 from the U.S. Nuclear Regulatory Commission (NRC) sent by NRC letter dated May 14, 2009 (Reference 1).

If you have any questions about the information provided, please contact me.

Sincerely,

Richard E. Kingston  
Vice President, ESBWR Licensing

DB68  
NRC

Reference:

1. MFN 09-332, Letter from the U.S. Nuclear Regulatory Commission to Jerald G. Head, GEH, *Request for Additional Information Letter No. 342 Related to ESBWR Design Certification Application*, dated May 14, 2009

Enclosure:

1. Second Revised Response to Portion of NRC Request for Additional Information Letter No. 342 Related to ESBWR Design Certification Application – Probabilistic Risk Assessment – RAI 19.1-144 S04.

cc: AE Cabbage      USNRC (with enclosure)  
J G Head          GEH/Wilmington (with enclosure)  
DH Hinds          GEH/Wilmington (with enclosure)  
Charles Bagnal    GEH/Wilmington (with enclosure)  
eDRF Section      0000-0107-4118

**Enclosure 1**

**MFN-06-442, Supplement 6**

**Second Revised Response to Portion of NRC Request for**

**Additional Information Letter No. 342**

**Related to ESBWR Design Certification Application**

**Probabilistic Risk Assessment**

**RAI Number 19.1-144 S04**

**RAI 19.1-144 S04**

The staff has reviewed GEH's response to RAI 19.1-144 S03 and requests the following additional supporting information to resolve the ICS functionality and operability issues during Mode 5 conditions:

- a. Provide additional information in the description of ICS in the DCD regarding the ability of the IC stub tube and IC steam line to clear itself as the water level lowers in the vessel.
- b. Provide additional information in the PRA concerning the reactor head vent, including the size of the head vent, status of head vent (opened or closed), the discharge path of the head vent, and the duration of time that the head vent can be opened and not impact ICS operation.
- c. Provide clarification in Technical Specifications regarding (1) operability of the ICS during reactor vessel high water level (flooded stub tube), and (2) the impact of the Action Statements that allow ICS inoperability for an indefinite period of time.

**GEH Response**

a. DCD Tier 2 Subsection 5.4.9 is being revised to provide additional information in the description of ICS regarding the ability of the IC stub tube and IC steam line to clear itself as the water level lowers in the vessel.

b. NEDO-33201 Section 16 is being revised to provide additional information concerning the reactor head vent, including the size of the head vent, status of head vent (opened or closed), the discharge path of the head vent, and the duration of time that the head vent can be opened and not impact ICS operation.

Thermal-hydraulic analyses using MAAP have shown there is over 64 hours to isolate the head vent if ICS starts automatically and the minimum CRD purge/cooling flow is credited, 32 hours if ICS is started manually without credit for CRD and 14.5 hours if ICS starts automatically without credit for CRD flow.

The operators in the Main Control Room (MCR) can diagnose an open head vent line because the isolation valves leading to the Equipment and Floor Drain Sump have open and closed indication and downstream temperature indication in the MCR. In this scenario, a significant rise in line temperature would be an obvious indicator of an open vent path. To successfully mitigate this condition, the operators would have to isolate at least one of two RPV head vent line isolation valves. Thus, failure to isolate the RPV head vent line is considered to be unlikely.

c. The GEH response to RAI 16.2-188 addresses the revision to the ESBWR GTS 3.5.5, Isolation Condenser System (ICS) – Shutdown, and GTS 3.5.5 Bases to provide clarification regarding (1) operability of the ICS during reactor vessel high water level (flooded stub tube), and (2) the impact of the Action Statements that allow ICS inoperability for an indefinite period of time.

**DCD Impact**

DCD Tier 2 Subsection 5.4.9 is revised as shown in the attached mark-up.

NEDO-33201 Section 16 is revised as shown in the attached mark-up.

NEDO-33201 Section 16 will be revised to reflect updated RAI response as shown in the attached mark-up.