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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 134 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-156 and 16.2-160**

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) responses to the subject NRC RAIs transmitted via the Reference 1 letter.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 08-033, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 134 Related to ESBWR Design Certification Application*, January 14, 2008

Enclosure:

1. MFN 08-104 – Response to Portion of NRC Request for Additional Information Letter No. 134 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-156 and 16.2-160

cc:

AE Cubbage	USNRC (with enclosure)
DH Hinds	GEH (with enclosure)
RE Brown	GEH (with enclosure)
eDRFs	76-3361, 80-2945

Enclosure 1

MFN 08-104

Response to Portion of NRC Request for

Additional Information Letter No. 134

Related to ESBWR Design Certification Application

- Technical Specifications -

RAI Numbers 16.2-156 and 16.2-160

NRC RAI 16.2-156

In Revisions 3 and 4 of DCD Tier 2, Chapter 16, each background section of the generic technical specifications (GTS) bases for the instrumentation specifications describes how to determine the operability of an instrument channel with respect to its trip setpoint compared to the allowable value. "A channel is inoperable if its actual trip setpoint is non-conservative with respect to its required Allowable Value." Details are to be included in a Setpoint Control Program (SCP) proposed for Section 5.5 of the GTS administrative controls chapter. As of the issuance of Revision 4, the applicant had not formally stated what kind of setpoint values the GTS instrumentation function tables will state (i.e., Allowable Values, Trip Setpoints, Setting basis, etc.). Revision 4 retained the proposed SCP specification in the GTS. Please revise GTS limiting condition for operation (LCO) instrumentation function tables to include the type of setpoint value for each function that is consistent with the ABWR/ESBWR setpoint methodology (currently under staff review) and acceptable to the staff.

The various channel calibration surveillance frequencies are consistent with the STS for equivalent instrument functions. However, the technical basis for applying these frequencies to ESBWR instrumentation functions is an open issue pending NRC approval of {NEDO-33201, "ESBWR Design Certification Probabilistic Risk Assessment"}, which is referenced in the GTS bases. Revise the GTS Bases to state, or include as a numbered reference, the NRC-approved justification for the channel calibration surveillance frequencies.

GEH Response

GEH submitted MFN 07-015, Supplement 2, dated January 16, 2008, to address the appropriate type of setpoint value consistent with the ESBWR setpoint methodology. The ESBWR Technical Specification instrumentation tables provided in that submittal reflect Allowable Values, consistent with other BWR Standard Technical Specification presentations.

The ESBWR Technical Specification and Bases were also revised as shown in MFN 07-536, dated November 12, 2007, in response to RAIs 16.2-146 and 16.2-149 to reflect removal of the open issue (referenced in the RAI above). The changes clarify that the calibration frequencies are based on the setpoint analysis. The setpoint analysis methodology, supporting the Channel Calibration surveillance frequencies, is required by the ESBWR Specification 5.5.11, Setpoint Control Program (SCP), as was modified in MFN 07-536.

DCD Impact

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

NRC RAI 16.2-160

Reference: Chapter 16 Revision 3 to Revision 4 Change Item 19 In Revision 4 of the ESBWR DCD Chapter 16, the generic technical specifications (GTS), GEH changed the Applicability of GTS 3.3.1.1 Function 12, Main Condenser Pressure – High, by deleting MODE 2 to be consistent with DCD Subsection 7.2.1.5.2.1, which states,

> *Main steam TSV closure and steam governing TCV fast closure trip bypasses: These permit continued reactor operation at low-power levels when the TSVs or TCVs are closed. The main steam TSV closure and the steam governing TCV fast closure scram trip functions are automatically bypassed when the APRM simulated thermal power of the NMS is below 40% of the rated thermal power output.*

Revision 4 of the GTS Bases for this Function states,

> *The Main Condenser Pressure - High Function is provided to help ensure the fuel cladding integrity Safety Limit is not exceeded by reducing the core energy in anticipation that the high condenser pressure will also trip the main turbine and prevent bypass valve operation. The Main Condenser Pressure - High Function is the primary scram signal for the loss of condenser vacuum event analyzed in Reference 12. For this event, the reactor scram reduces the amount of energy required to be absorbed by the main condenser and helps to ensure the fuel cladding integrity Safety Limit is not exceeded by reducing the core energy prior to the fast closure of the turbine stop valves. The reactor scram at Main Condenser Pressure - High will initiate to shut off steam flow to the main condenser to protect the main turbine and to avoid the potential for rupturing the low pressure turbine casing.*
>
> *. . . The Analytical/Design Limit was selected to reduce the severity of a loss of main condenser vacuum event by anticipating the transient and scramming the reactor at a higher vacuum than the setpoints that close the turbine stop valves and bypass valves.*
>
> *. . . [This] Function is required in MODE 1 2 since, in this MODE, a significant amount of core energy can be rejected to the main condenser.*

Please clarify how DCD Subsection 7.2.1.5.2.1 justifies not requiring the Main Condenser Pressure – High RPS instrumentation function to be Operable in Mode 2, and correct the apparent editorial error in the third quote from the GTS Bases.

GEH Response

In DCD Revision 4, Subsection 7.2.1.5.2.1, the next-to-last bullet states "Condenser pressure high trip bypass (indicated operational bypass): The condenser pressure high trip function is automatically bypassed whenever the Reactor Mode Switch is in the Shutdown, Refuel, or Startup position. This bypass condition is alarmed in the MCR and is automatically removed if the Reactor Mode Switch is moved to the Run position." Because the trip on Condenser Pressure – High is only enabled when the Reactor Mode Switch is in the "Run" position, the Applicability of MODE 1 is appropriate. No change to the DCD is required for this portion of the RAI.

DCD Revision 4, Chapter 16B, Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Bases discussion titled "Applicable Safety Analyses, LCO, and Applicability," for Function 12, Condenser Pressure High, contains a typographical artifact left

from the Revision 4 development in the last paragraph. The reference to "MODE 1 2" will be corrected to read "MODE 1" in Revision 5.

DCD Impact

DCD Chapter 16B will be revised as described above in Revision 5.