HITACHI

GE Hitachi Nuclear Energy

James C. Kinsey
Vice President, ESBWR Licensing

PO Box 780 M/C A-55
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057

MFN 08-345

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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. 156 Related to ESBWR Design Certification Application - Engineered Safety Feature Materials - RAI Number 6.1-2 S03

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the subject NRC RAI originally transmitted via the Reference 1 letter and supplemented by an NRC request for clarification in Reference 2. DCD Markups related to this response are provided in Enclosure 2.

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

Sincerely,

James C. Kinsey

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Vice President, ESBWR Licensing

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NRO

References:

1. MFN 06-328, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 58 Related to ESBWR Design Certification Application*, September 13, 2006
2. MFN 08-138, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 156 Related to ESBWR Design Certification Application*, February 15, 2008

Enclosures:

1. MFN 08-345 - Response to Portion of NRC Request for Additional Information Letter No. 156 Related to ESBWR Design Certification Application - Engineered Safety Feature Materials - RAI Number 6.1-2 S03
2. MFN 08-345 - Response to Portion of NRC Request for Additional Information Letter No. 156 Related to ESBWR Design Certification Application - Engineered Safety Feature Materials - RAI Number 6.1-2 S03 - DCD Markups

cc:	AE Cubbage	USNRC (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	GB Stramback	GEH/San Jose (with enclosures)
	RE Brown	GEH/Wilmington (with enclosures)
	eDRF	0000-0082-6827

Enclosure 1

MFN 08-345

Response to Portion of NRC Request for Additional Information Letter No. 156 Related to ESBWR Design Certification Application

Engineered Safety Feature Materials

RAI Number 6.1-2 S03

NRC RAI 6.1-2 S03:

Staff reviewed GEH's response to RAI 6.1-2, Supplement No. 2, and the proposed DCD revision to Table 6.1-1.

A. The materials specifications for the isolation condenser (IC) identifies the header material as Alloy 600, as modified by NRC endorsed Code Case N-580-1. The applicant does not list the product form of the IC header. The staff requests that GEH revise Table 6.1-1 to include the product form. Previous versions of Table 6.1-1 have indicated that the IC header is fabricated from SB-564 (Forging) as modified by Code Case N-580-1 which is acceptable to the staff.

B. All pressure boundary material specifications used in the emergency safety feature systems are required to meet ASME Code, Section III or NRC endorsed Code Cases listed in Regulatory Guide 1.84. The IC tubing material listed in GEH's response, proposed Table 6.1-1, is SB-163 (Alloy 600) with a modified chemistry equal to that specified in Code Case N-580-1.

Code Case N-580-1 provides modified specifications for SB-166 (Bar), SB-167 (Pipe), SB-168 (Plate) and SB-564 (Forgings). However, Code Case N-580-1 does not include or permit modified versions of SB-163 (Tubing).

Given that the applicant's specification of the modified version of SB-163 tubing does not meet ASME Code, Section III or RG 1.84, the staff requests that the applicant provide a complete material specification, including design allowable stresses, for its modified version of SB-163 and a justification for its use. In addition, the staff expects that the applicant provide that same level of detailed information that would be required to be submitted to the ASME Code to have this material included in Code Case N-580-1.

GEH Response:

A. DCD Tier 2, Table 6.1-1 will be revised to indicate the Isolation Condenser (IC) heat exchanger header to be in accordance with SB-564 (Alloy 600), with modified chemistry equal to that specified in Code Case N-580-1.

B. The material of construction of the IC heat exchanger will be in accordance with SB-167 (Alloy 600) with modified chemistry equal to that specified in Code Case N-580-1. DCD Table 6.1-1 will be revised to incorporate this change.

In addition, the response to item (D) of RAI 5.4-20 S01 (MFN 06-479 Supplement 1, dated February 15, 2008) is revised by deleting the previous paragraphs and replacing with the following paragraph:

"(D) The material of construction for the IC heat exchanger tubes will be in accordance with SB-167 (Alloy 600) with modified chemistry equal to that specified in Code Case N-580-1. DCD Table 6.1-1 has been revised to incorporate this change."

DCD Impact:

DCD Tier 2, Table 6.1-1 will be revised as shown in the attached markup.

Enclosure 2

MFN 08-345

Response to Portion of NRC Request for Additional Information Letter No. 156 Related to ESBWR Design Certification Application

Engineered Safety Feature Materials

RAI Number 6.1-2 S03

DCD Markups

Table 6.1-1

Containment System Including PCCS, and ECCS Component Materials

Component	Applicable ASME Code Section III,	Form	Material	Specification (ASTM/ASME)
Nuts	Div 1, Subsection NB	Bar	Low Alloy Steel	SA-194 Gr 7 or 7M
ICS				
Condenser	Div 1, Subsection NC	~~Tube~~Pipe	~~Alloy Steel~~Nickel Base Alloy	SB-16~~3~~7 per ASME Code Case N-580-1~~(Inconel 600)~~
		Header	~~Alloy Steel~~Nickel Base Alloy	SB-564 per ASME Code Case N-580-1~~(Inconel 600)~~
Steam Piping	Div 1, Subsection NB	Pipe	Carbon Steel	SA-333 Gr 6
Condensate Piping	Div 1, Subsection NB	Pipe	Stainless Steel	SA-376 Gr TP304L/316L [2] SA-312 Gr TP304L/316L [2] SA-358 Gr TP304L/316L [2]
SLC				
Accumulator	Div 1, Subsection NC	Plate Forging	Low Alloy Steel with Stainless Steel Cladding	SA-533 Gr B Cl 2 SA-508 Gr 3 Cl 1
Piping-downstream of injection valve	Div 1, Subsection NB	Pipe	Stainless Steel	SA-312 Gr TP316L [2]
Piping-upstream of injection valve	Div 1, Subsection NC	Pipe	Stainless Steel	SA-312 Gr TP316L[2]
Weld Filler Metals				
Carbon Steel P1, G1	Same as the component being welded	Covered Electrodes or Filler Wire	SFA-5.1 SFA-5.18	E7018 ER70s-2 ER70S-3 ER70S-6