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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. 224 Related to ESBWR Design
Certification Application - Design Basis Accident Engineered
Safety Feature Materials - RAI Number 6.1-17**

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the subject NRC RAI transmitted via the Reference 1 letter. DCD Markups related to this response are provided in Enclosure 2.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 08-576, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 224 Related to ESBWR Design Certification Application*, July 10, 2008

Enclosures:

1. MFN 08-717 - Response to Portion of NRC Request for Additional Information Letter No. 224 Related to ESBWR Design Certification Application - Design Basis Accident Engineered Safety Feature Materials - RAI Number 6.1-17
2. MFN 08-717 - Response to Portion of NRC Request for Additional Information Letter No. 224 Related to ESBWR Design Certification Application - Design Basis Accident Engineered Safety Feature Materials - RAI Number 6.1-17 - DCD Markups

cc: AE Cubbage USNRC (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
eDRF 0000-0091-0946

Enclosure 1

MFN 08-717

**Response to Portion of NRC Request for
Additional Information Letter No. 224
Related to ESBWR Design Certification Application**

Design Basis Accident Engineered Safety Feature Materials

RAI Number 6.1-17

NRC RAI 6.1-17:

During the staff's review of the ESBWR DCD, Rev. 5, the staff noticed that the applicant modified DCD Tier 2, Section 3.8.1.6.4 to include ASTM A-709 HPS 70W for use as a containment liner material. Table 6.1-1 does not however list this material as a containment liner material. The staff notes that ASTM A-709 HPS 70W is not listed in ASME Section III, Division 2, CC-2510. The staff understands that the applicant is currently pursuing an ASME Code Case which would allow the use of this material for containment liners. The staff will consider the use of ASTM A-709 HPS 70W once proposed Code Case N-763 is approved by ASME Code and staff RAI 3.8-120 is resolved. The staff requests that the applicant modify Table 6.1-1 to be consistent with the materials listed in Section 3.8 for liner materials. The staff also requests that the applicant include a reference to proposed Code Case N-763 in Table 6.1-1.

GEH Response:

The material specifications for the Containment material types in DCD Tier 2, Table 6.1-1, will be deleted and replaced with a reference to the appropriate DCD Tier 2, Section 3.8 Subsections. This resolves the inconsistencies between Table 6.1-1 and Section 3.8.

Additionally, ASME Code Case N-763 has been approved by the ASME Boiler and Pressure Vessel Standards Committee (ASME Code Case Record Number 06-1528).

DCD Impact:

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

Enclosure 2

MFN 08-717

**Response to Portion of NRC Request for
Additional Information Letter No. 224
Related to ESBWR Design Certification Application**

Design Basis Accident Engineered Safety Feature Materials

RAI Number 6.1-17

DCD Markups

ESBWR

26A6642AT Rev. 06

Design Control Document/Tier 2

Table 6.1-1
Containment System Including PCCS, and ECCS Component Materials

Component	Applicable ASME Code Section III,	Form	Material	Specification (ASTM/ASME)
Containment				
Containment Vessel Liner +	Div 2, Subsection CC	Plate ≤ 64 mm (2.5 in)	Carbon Steel	SA-385 Gr ASA-516 Gr 60 or Gr 70 See Subsection 3.8.1.6.4
	Div 2, Subsection CC	Plate > 64 mm (2.5 in)	Carbon Steel	SA-516 Gr 60 or Gr 70
	Div 2, Subsection CC	Plate	Stainless Steel	SA-240 Type 304L See Subsection 3.8.1.6.4
Penetrations	Div 1, Subsection NE	Plate	Carbon Steel	SA-516 Gr 60 or Gr 70 SA-537 Class 1 See Subsection 3.8.2.6
	Div 1, Subsection NE	Pipe	Carbon Steel	SA-333 Gr 6 See Subsection 3.8.2.6
GDCS and Suppression Pool Liner	Div 2, Subsection CC	Sheet/Plate	Stainless Steel	A-240 Type 304L or A-167 Type 304L See Subsection 3.8.1.6.4 and Subsection 3.8.3.6.5
Drywell Head, Personnel Lock, Equipment Hatch				
		Plate	Carbon Steel	SA-516 Gr 70 or SA-537 Class 1
Structural Steel	Div 1, Subsection NE	Shapes	Carbon Steel	A 36, A 572 Gr 50
Vent Pipe	Div 1, Subsection NE	Plate	Stainless Steel	SA-240 Gr 304L
PCCS				
Condenser	Div 1, Subsection NC	Forging	Stainless Steel	SA-182 Gr F304L
		Tube	Stainless Steel	SA-213 Gr TP304L
		Pipe	Stainless Steel	SA-312 Gr TP304L
Piping	Div 1, Subsection NC	Pipe	Stainless Steel	SA-312 Gr TP304L
Flanges	Div 1, Subsection NC	Forging	Stainless Steel	SA-182 Gr F304L
Nuts and Bolts	Div 1, Subsection NC	Bar	Stainless Steel	SA-194 Gr 8, SA-193 Gr B8

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Design Control Document/Tier 2

Table 6.1-1
Containment System Including PCCS, and ECCS Component Materials

Component	Applicable ASME Code Section III,	Form	Material	Specification (ASTM/ASME)
ADS				
DPV Body	See Table 5.2-4			
Safety Relief Valve (SRV) Body	See Table 5.2-4			
SRV Discharge Piping Outside Suppression Pool	Div 1, Subsection ND	Pipe	Carbon Steel	SA-106 Gr B
SRV Discharge Piping Inside Suppression Pool	Div 1, Subsection ND	Pipe	Stainless Steel	SA-312 Gr TP316L ¹²
GDCS				
Check valve and downstream piping	Div 1, Subsection NB	See Table 5.2-4		
Piping-upstream of check valve	Div 1, Subsection NC	Pipe	Stainless Steel	SA-376 Gr TP304L or TP316L ¹² SA-312 Gr TP304L or TP316L ¹² SA-358 Gr TP304L or TP316L ¹⁸
Fittings	Same as mating pipe	Forging	Stainless Steel	SA-182 Gr F304L or F316L ¹⁸ SA-403 WP 304L or WP 316L ¹²
Flanges	Same as mating pipe	Forging	Stainless Steel	SA-182 Gr F304L or F316L ¹⁸
Valves				
Gate, Squib, Check	See Table 5.2-4			
(Deleted)				
(Deleted)				
(Deleted)				

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Design Control Document/Tier 2

Table 6.1-1
Containment System Including PCCS, and ECCS Component Materials

Component	Applicable ASME Code Section III,	Form	Material	Specification (ASTM/ASME)
ICS				
Condenser	Div 1, Subsection NC	Pipe	Nickel Base Alloy	SB-167 per ASME Code Case N-580-1
		Header	Nickel Base Alloy	SB-564 per ASME Code Case N-580-1
Steam Piping	See Table 5.2-4			
Condensate Piping	See Table 5.2-4			
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
Injection valve and downstream piping	Div 1, Subsection NB	See Table 5.2-4		
Piping- upstream of injection valve	Div 1, Subsection NC	Pipe	Stainless Steel	SA-312 Gr TP316L ³
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
Carbon Steel P1, G2	Same as the component being welded	Covered Electrodes or Filler Wire	SFA-5.1 SFA-5.18 SFA-5.28	E7018 ER70S-2 ER80S-D2
Low Alloy Steel P3, G3	Same as the component being welded	Covered Electrodes or Filler Wire	SFA-5.5 SFA-5.1 SFA-5.28 SFA-5.18	E8018-C3 E7018 ER80S-D2 ER70S-2
(Deleted)				

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Design Control Document/Tier 2

Table 6.1-1
Containment System Including PCCS, and ECCS Component Materials

Component	Applicable ASME Code Section III,	Form	Material	Specification (ASTM/ASME)
(Deleted)				
Stainless Steel Filler	Same as the component being welded	Covered Electrode or Filler Wire	SFA-5.4 SFA-5.9	E308L-16 E309L-16 E316L-16 ER308L ER309L ER316L
Nickel Alloy Filler	Same as the component being welded	Filler Wire	SFA-5.14	ERNiCr-3

~~1. All carbon plate is Gr 60 or Gr 70 regardless of thickness.~~

2. Carbon content not to exceed 0.020% for components exposed to reactor water that exceeds 93°C (200°F) during normal plant operation.