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MFN 06-365 Supplement 1

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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 58 - Engineered Safety Feature Materials - RAI Numbers 6.1-2 S01 and 6.1-4 S01**

Enclosure 1 contains GE's response to the subject NRC RAIs originally transmitted via the Reference 1 letter and supplemented by NRC requests for clarification.

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

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

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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

Enclosure:

1. MFN 06-365 Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 58 - Related to ESBWR Design Certification Application - Engineered Safety Feature Materials - RAI Numbers 6.1-2 S01 and 6.1-4 S01

cc: AE Cubbage USNRC (with enclosures)
BE Brown GE/Wilmington (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0000-0066-9771

Enclosure 1

MFN 06-365 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 58

Related to ESBWR Design Certification Application

Engineered Safety Feature Materials

RAI Numbers 6.1-2 S01 and 6.1-4 S01

NRC RAI 6.1-2 S01:

In GE's response to RAI 6.1-2 (GE Letter MFN 06-365), the applicant provided weld filler metal specifications and classifications for all filler materials except those used to weld carbon steel and low alloy steel. Given that the specifications listed allow a broad range of filler materials, the staff requests that the applicant be more specific and revise Table 6.1-1 of the DCD to list the specification and classification of filler materials used to weld carbon and low ally steel piping and components.

GE Response:

DCD Tier 2, Table 6.1-1, will be revised in Revision 4 to list the specification and classification of filler materials used to weld carbon and low ally steel piping and components.

DCD Impact:

DCD Tier 2, Table 6.1-1 will be revised in DCD Tier 2, Revision 4, as shown in the attached markup.

NRC RAI 6.1-4 S01:

In GE's response to RAI 6.1-4 (GE Letter MFN 06-365), the applicant indicates that for the standby liquid control accumulator, the minimum preheat recommendations of ASME Code, Section III, Appendix D, Article D-1000 will be applied. The staff expects that at a minimum, the preheat recommendations of ASME Code, Section III, Appendix D, Article D-1000 be applied to all Class 1, 2 and 3 carbon steel and low alloy steel components. Verify that the aforementioned Appendix D, Article D-1000 recommendations will be applied to all Class 1, 2, and 3 components in the ESBWR design.

GE Response:

The ASME Boiler and Pressure Vessel (B&PV) Code, Section III, Appendix D, Article D-1000 minimum preheat recommendations will be applied to all ASME B&PV Code Class 1, 2, and 3 components in the ESBWR design.

DCD Impact:

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

Table 6.1-1

Engineered Safety Features Component Materials

Component	Applicable ASME Code Section III	Form	Material	Specification (ASTM/ASME)
Containment				
Containment Vessel Liner [1]	Div 2, Subsection CC	Plate ≤ 64 mm	Carbon Steel	SA-285 Gr ASA-516 Gr 60 or Gr 70
	Div 2, Subsection CC	Plate > 64 mm	Carbon Steel	SA-516 Gr 60 or Gr 70
	Div 2, Subsection CC	Plate	Stainless Steel	SA-240 Type 304L
Penetrations	Div 1, Subsection NE	Plate	Carbon Steel	SA-516 Gr 60 or Gr 70 SA-537 Class 1
	Div 1, Subsection NE	Pipe	Carbon Steel	SA-333 Gr 6
GDCS and Suppression Pool Liner	Div 2, Subsection CC	Sheet	Stainless Steel	A 240 Type 304L or A 167 Type 304L
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,	Forging	Stainless	SA-182 Gr F304L

Table 6.1-1

Engineered Safety Features Component Materials

Component	Applicable ASME Code Section III	Form	Material	Specification (ASTM/ASME)
	Subsection NC		Steel	
Nuts and Bolts	Div 1, Subsection NC	Bar	Stainless Steel	SA-194 Gr 8, SA-193 Gr B8
ADS				
DPV Body	See Table 5.2-4			
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[2]
GDCS				
Piping downstream of check valve	Div 1, Subsection NB	Pipe	Stainless Steel	SA-376 Gr TP304L or TP316L [2] SA-312 Gr TP304L or TP316L [2] SA-358 Gr TP304L or TP316L [2]
Piping-upstream of check valve	Div 1, Subsection NC			
Fittings	Same as mating pipe	Forging	Stainless Steel	SA-182 Gr F304L or F316L [2] SA-403 WP 304L or WP 316L [2]
Flanges	Same as mating pipe	Forging	Stainless Steel	SA-182 Gr F304L or F316L [2]
Valves (Gate, Squib, Check)				
Body	Div 1, Subsection NB	Forging	Stainless Steel	SA-182 Gr F304L or F316L [2]
		Casting	Stainless Steel	SA-351 Gr CF3 or CF3M

Table 6.1-1

Engineered Safety Features Component Materials

Component	Applicable ASME Code Section III	Form	Material	Specification (ASTM/ASME)
Bolts	Div 1, Subsection NB	Bar	Low Alloy Steel	SA-193 Gr B7 or B7M
Nuts	Div 1, Subsection NB	Bar	Low Alloy Steel	SA-194 Gr 7 or 7M
ICS				
Condenser	Div 1, Subsection NC	Tube	Alloy Steel	SB-163 (Inconel 600)
		Header	Alloy Steel	SB-564 (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 ~~Filler~~ P1, G1	Same as the component being welded	Covered Electrodes or Filler Wire	~~Carbon Steel~~ SFA-5.1 SFA-5.18	~~SFA-5.1~~ ~~SFA-5.17 or SFA-5.18~~ E7018 ER70S-2 ER70S-3 ER70S-6

Table 6.1-1

Engineered Safety Features Component Materials

Component	Applicable ASME Code Section III	Form	Material	Specification (ASTM/ASME)
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 ~~Filler~~ P3, G3	Same as the component being welded	Covered Electrodes or Filler Wire	~~Low Alloy Steel~~ SFA-5.5 SFA-5.1 SFA-5.28 SFA-5.18	~~SFA-5.5 SFA-5.23 or SFA-5.28~~ E8018-C3 E8018-G E7018 ER80S-D2 ER70S-2
Low Alloy Steel P5A, G1 (2-1/4Cr, 1Mo)	Same as the component being welded	Covered Electrodes or Filler Wire	SFA-5.5 SFA-5.1 SFA-5.28 SFA-5.18	E9016-B3 E9018-B3 E9018-B3L E7018 ER90S-B3 ER90S-B3L ER70S-2
Low Alloy Steel P5C, G1 (2-1/4Cr, 1Mo)	Same as the component being welded	Covered Electrodes or Filler Wire	SFA-5.5 SFA-5.1 SFA-5.28 SFA-5.18	E9016-B3 E9018-B3 E9018-B3L E7018 ER90S-B3 ER90S-B3L ER70S-2

Table 6.1-1

Engineered Safety Features Component Materials

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