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MFN 06-308
Supplement 20

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Subject: **Partial Response Revisions to NRC RAI Letter No. 51 Related to ESBWR Design Certification Application – DCD Tier 2 Section 3.2 – Classification of Structures, Systems and Components; RAI Numbers 3.2-19 S02 Rev 1 and 3.2-40 Rev 1**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) partial response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) letter number 51 sent by NRC letter dated March 8, 2006 (Reference 1). Revisions to RAI Numbers 3.2-19 S02 and 3.2-40 are addressed in Enclosure 1.

The previous response to RAI 3.2-19 S02 was submitted to the NRC via Reference 4 in response to Reference 2 (RAI 3.2-19 S02). The initial request was received from the NRC via Reference 1 (RAI 3.2-19), to which GEH responded via Reference 3. RAI 3.2-40 was transmitted to GEH by Reference 1 and responded to by Reference 3.

The need to revise RAI responses to 3.2-19 S02 and 3.2-40 was identified internally by GEH as an inconsistancy between DCD Chapter 3 and Chapter 10 in Rev 5. In DCD Rev 5 there is an inconsistency between Chapter 3 and Chapter 10 with regard to the seismic classification of the Turbine Bypass Valves and downstream piping to the main condenser and the Main Steam Lines drains piping downstream of the last isolation valve to the main condenser.

GEH advised the staff of this inconsistency during a teleconference held on March 24, 2009 and our plans to correct this inconsistency. The DCD changes contained in Enclosure 1 represent the agreed to resolution of this issue. Verified DCD changes associated with these RAI responses are identified in the enclosed DCD markups by enclosing the text within a black box.

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

Sincerely,

Richard E. Kingston

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Vice President, ESBWR Licensing

Reference:

1. MFN 06-277 Letter from U.S. Nuclear Regulatory Commission to David Hinds, GEH, *Request For Additional Information Letter No. 51 Related to ESBWR Design Certification* dated August 8, 2006

2. E-mail from Chandu Patel, U.S. Nuclear Regulatory Commission to GEH, (RAI 3.2-19 S02), comment on response to RAI 3.2-19, Supplement 1 . (MFN 06-308 Supplement 1), dated June 13,2007.

3. MFN 06-308 Letter from D. H. Hinds *Response to NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Numbers 3.2-1 through 3.2-62* dated September 8, 2006

4. MFN 06-308 Supplement 12 Letter from James C. Kinsey *Response to Portion of NRC Request for Additional Information To ESBWR Design Certification Application -- Classification of Structures, Systems and Components -- RAI Number 3.2-19 S02* dated January 23, 2008

Enclosure:

1. Response Revisions to NRC RAI Letter No. 51 to NRC Request for Additional Information Related to ESBWR Design Certification Application DCD Section 3.2 - Classification of Structures, Systems and Components RAI Numbers 3.2-19 S02 and 3.2-40 – Revised Responses

cc:	AE Cubbage	USNRC (with enclosures)
	JG Head	GEH/Wilmington (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	eDRF Section	0000-0100-6873
		(RAIs 3.2-19 S02 R1 and 3.2-40 R1)

Enclosure 1

MFN 06-308 Supplement 20

Response to NRC Request for Additional Information

Related to ESBWR Design Certification Application

Classification of Structures, Systems and Components

RAI Numbers 3.2-19 S02 and 3.2-40 – Revised Responses

NRC RAI 3.2-19 S02 – Original Response from MFN 06-308, Supplement 12

Comment on response to RAI 3.2-19 S01 (MFN 06-308, Supplement 1):

GE's response to RAI 3.2-19 S01 identified that there is a second normally closed valve that is in series with and upstream of the orifice in the bypass line that is not reflected in the simplified schematic in DCD Figure 3.2-1, but does appear on the detailed Nuclear Boiler System P&ID. This normally closed valve is important to the classification and should be shown on the simplified diagram. The applicant is requested to submit a revised DCD Figure 3.2-1 to show this normally closed valve in the main steam drains.

GEH Response

This RAI was received by GEH prior to the submittal of DCD Tier 2, Revision 4. Therefore, the response to this RAI is based upon the current DCD, Revision 4.

Figure 3.2-1, which is a schematic diagram of the Power Conversion System, was revised, in DCD Tier 2, Rev. 4, to accurately depict the correct valve and piping relationships.

In addition, Items 12, 13 and 18 for System B21 in Table 3.2-1 were revised in DCD Tier 2, Rev. 4, to define the correct classifications for the steam drains.

DCD Impact

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

NRC RAI 3.2-19 S02 – Revised Response

Comment on response to RAI 3.2-19 S01 (MFN 06-308, Supplement 1):

GE's response to RAI 3.2-19 S01 identified that there is a second normally closed valve that is in series with and upstream of the orifice in the bypass line that is not reflected in the simplified schematic in DCD Figure 3.2-1, but does appear on the detailed Nuclear Boiler System P&ID. This normally closed valve is important to the classification and should be shown on the simplified diagram. The applicant is requested to submit a revised DCD Figure 3.2-1 to show this normally closed valve in the main steam drains.

GEH Response

This RAI was received by GEH prior to the submittal of DCD Tier 2, Revision 4. Therefore, the original response to this RAI was based upon the then current DCD, Revision 4.

Figure 3.2-1, which is a schematic diagram of the Power Conversion System, was revised, in DCD Tier 2, Rev. 4, to accurately depict the correct valve and piping relationships.

In addition, Items 12, 13 and 18 for System B21 in Table 3.2-1 were revised in DCD Tier 2, Rev. 4, to define the classifications for the steam drains.

DCD Tier 2 Table 3.2-1 was modified in Revision 4, as part of the original response to RAI 3.2-19 S02, to add Item 18 to System B21 and to assign it to Seismic Category II. However, detailed NRC reviews of the main steamline drains as part of DCD Tier 2 Chapter 10 have accepted GEH's position to classify the portion of the drains downstream of the seismic restraint as Seismic Category NS, provided that they are analyzed to demonstrate structural integrity under SSE loading conditions. DCD Tier 2 Figure 3.2-1 was updated in Revision 5 for consistency with the accepted Chapter 10 position.

In order to make DCD Tier 2 Table 3.2-1 consistent with Chapter 10 and Figure 3.2-1, DCD Tier 2 Table 3.2-1 will be revised to indicate that System B21 Item 18 is Seismic Category NS and analyzed to demonstrate structural integrity under SSE loading conditions.

DCD Impact

DCD Tier 2 Table 3.2-1, System B21 Item 18, will be revised in Revision 6 as noted in the attached markup.

NRC RAI 3.2-40 – Original Response from MFN 06-308

Table 3.2-1, Components N37: The Table note for the TBS states that only TBS lines equal to or larger than 63.5 mm (2.5 inches) are designed to ASME Section III, Class 2. However, the SRP 3.2.2 guidance states that all piping in the TBS lines up to the turbine bypass valves should be ASME Class 2 (Quality Group B). Beginning at the turbine bypass valve and downstream to the condenser, the line may be Quality Group D, as provided in SRP 3.2.2. Also, since the TBS is seismically analyzed, it should be designated at least as Seismic Category II. Please revise the Table accordingly.

GE Response

The references to 63.5 mm (2.5 inch) will be removed for compliance to Regulatory Guide 1.26, Section C and Table 1. The wording will be revised to reflect Regulatory Guide 1.29 Section C, specifically item "1e", piping 2.5 inches and larger will be analyzed to withstand SSE loads. Quality Group and Seismic Classification will be shown in Figure 3.2-1.

See attached Figures 3.2-1 and 3.2-2. These Figures were added to the DCD Section 3.2 as shown in the markup attached to GE Letter MFN 06-308, dated September 8, 2006.

DCD Table 3.2-1 for components in N37 was revised as noted in the markup attached to GE Letter MFN 06-308.

[Note – The above response has been editorially modified from the original to refer to the original transmittal letter for the accompanying DCD markups.]

NRC RAI 3.2-40 – Revised Response

Table 3.2-1, Components N37: The Table note for the TBS states that only TBS lines equal to or larger than 63.5 mm (2.5 inches) are designed to ASME Section III, Class 2. However, the SRP 3.2.2 guidance states that all piping in the TBS lines up to the turbine bypass valves should be ASME Class 2 (Quality Group B). Beginning at the turbine bypass valve and downstream to the condenser, the line may be Quality Group D, as provided in SRP 3.2.2. Also, since the TBS is seismically analyzed, it should be designated at least as Seismic Category II. Please revise the Table accordingly.

GEH Response

The references to 63.5 mm (2.5 inch) lines not being designed to ASME Class 2 (equivalent to Quality Group B) were removed in DCD Revision 2 for compliance to Regulatory Guide 1.26, Section C item "1c" and Table 1. The wording was revised to reflect Regulatory Guide 1.29, Section C, specifically item "1e", which requires piping 2.5 inches and larger to be analyzed to withstand SSE loads. Quality Group and Seismic Classification are shown in Figure 3.2-1. Figures 3.2-1 and 3.2-2 were added to DCD Revision 2 as part of the original response to this and other related RAIs, and have been updated several times since then due to various RAI responses.

The original response to RAI 3.2-40 provided in MFN 06-308 modified DCD Tier 2 Table 3.2-1 to indicate that System N37 would be designed as Seismic Category II. However, detailed NRC reviews of the Turbine Bypass System (TBS) as part of DCD Tier 2 Chapter 10 have accepted GEH's position to classify the TBS as Seismic Category NS, provided that the system is analyzed to demonstrate structural integrity under SSE loading conditions. DCD Tier 2 Figure 3.2-1 was updated in Revision 5 for consistency with the accepted Chapter 10 position.

In order to make DCD Tier 2 Table 3.2-1 consistent with Chapter 10 and Figure 3.2-1, DCD Tier 2 Table 3.2-1 will be revised to indicate that the TBS is Seismic Category NS and analyzed to demonstrate structural integrity under SSE loading conditions.

DCD Impact

The DCD Tier 2 Table 3.2-1 listing for System N37 will be revised in Revision 6 as noted in the attached markup.

Table 3.2-1

Classification Summary

Principal Components[1]	Safety Class.[2]	Location[3]	Quality Group[4]	Quality ~~Req.~~ Class[5]	Seismic Category[6]	Notes
12. Piping (including supports) for main steam drains inboard of outermost MSL isolation valves from outermost containment isolation valves up to and including the seismic restraints	N	RB	B	~~B~~S	I	(5) a
13. Piping and valves (including supports) for main steam drains beyond outermost MSL isolation valves up to and including second drain isolation valve	N	TB	B	~~E~~S	II	(5) c
14. Piping (including supports) for instrumentation up to and including first instrument isolation valve	2	CV, RB	B	~~B~~Q	I	(7)
15. Piping and valves (including supports) for instrumentation downstream of first instrument isolation valve	N	CV, RB	D	~~E~~N	NS	(7)
16. Other mechanical modules with safety-related function	3	CV, RB, CB	—	~~B~~Q	I	
17. Other electrical modules, cable, and instrumentation with safety-related function	3	CV, RB, CB	—	~~B~~Q	I	
18. Components (piping, valves, fittings) for the above-valve-seat main steam drains piping from downstream of the seismic restraint, and also for the main steam low-point drains piping from the second drain isolation valve, to the condenser nozzle connection.	N	TB	D	~~E~~S	~~II~~NS	(5) c Analyzed to demonstrate structural integrity under SSE conditions.

Table 3.2-1

Classification Summary

Principal Components[1]	Safety Class.[2]	Location[3]	Quality Group[4]	Quality ~~Req.~~ Class[5]	Seismic Category[6]	Notes
1. TSVs, turbine control valves (TCVs) and main steam leads from the TSVs to the turbine casing	N	TB	D	N~~E~~	NS	(9)
2. All other system components	N	TB	—	N~~E~~	NS	
N32 Turbine Generator Control System (TGCS)	~~N~~	~~TB~~	~~—~~	~~E~~	~~NS~~	
1. Electrical modules and cables associated with diverse protection functions	N	TB	—	S	NS	(5) j
2. All other components	N	TB	—	N	NS	
N33 Turbine Gland Seal System (TGSS)	N	TB	D	N~~E~~	NS	
N34 Turbine Lube Oil System (TLOS)	N	TB	—	N~~E~~	NS	
N35 Moisture Separator Reheater (MSR)	N	TB	—	N~~E~~	NS	
N36 Extraction System	N	TB	—	N~~E~~	NS	
N37 Turbine Bypass System (TBS)	N	TB	D	S~~E~~	~~H~~NS	(5) c Analyzed to demonstrate structural integrity under SSE loading conditions. TMSS lines up to the turbine bypass valves are designed to ASME Section III Code, Class 2. Lines smaller than 63.5 mm (2.5 inches) are NS. Also see Figure 3.2-1.
N38 Turbine Hydraulics	N	TB	—	N~~E~~	NS	
N39 Turbine Auxiliary Steam System (TASS)	N	TB	—	N~~E~~	NS	
N41 Generator	N	TB	—	N~~E~~	NS	