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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 51 Related to ESBWR Design Certification Application –
Classification of Structures, Systems and Components – RAI
Numbers 3.2-3 S01 and 3.2-7 S01**

Enclosure 1 contains supplemental responses to the subject RAIs resulting from a November 20, 2006 e-mail request from the NRC. GE's original responses were 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
Project Manager, ESBWR Licensing

References:

1. MFN 06-308, Letter from David Hinds to U.S. Nuclear Regulatory Commission, *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*, September 8, 2006
2. MFN 06-308, Supplement 1, Letter from David Hinds to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Number 3.2-19 S01*, March 22, 2007
3. MFN 06-308, Supplement 2, Letter from David Hinds to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – RWCU System – RAI Number 3.2-34 S01*, March 26, 2007

Enclosure:

1. MFN 06-308, Supplement 3 – Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Numbers 3.2-3 S01 and 3.2-7 S01

cc: AE Cabbage USNRC (with enclosures)
DH Hinds GE (with enclosures)
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eDRF 0000-0065-5157

Enclosure 1

MFN 06-308, Supplement 3

Response to Portion of NRC Request for

Additional Information

Related to ESBWR Design Certification Application

Classification of Structures, Systems and Components

RAI Numbers 3.2-3 S01 and 3.2-7 S01

Original Responses previously submitted under MFN 06-308 are included without DCD updates to provide historical continuity during review.

NRC RAI 3.2-3

Revise Section 3.2.2.2 Quality Group B discussion

This section provides no discussion of significant safety systems described in RG 1.26 and Standard Review Plan (SRP) 3.2.2 for Quality Group B systems, such as those which provide reactor shutdown, emergency core cooling, post-accident containment heat removal, post-accident fission product removal, or decay heat removal. Please revise the Section 3.2.2.2 discussion to add these important system functions to the Quality Group B description.

GE Response

After reviewing all the RAIs on Section 3.2, GE decided to update Table 3.2-1 in its entirety to replace Safety Designation with Safety Class. This was done because it was not possible to determine from the table the proper Safety Class for components that were assigned a Safety Designation of Q and a Quality Group of "—". This situation arises for non-pressure-retaining components that in GE's viewpoint are not addressed in RG 1.26. Safety class for these types of components was defined in the revised table on the same basis that was applied for the ABWR design certification.

The requested discussion has been added to a new Subsection 3.2.3.2, which discusses the types of functions and systems that are considered to be in Safety Class 2. GE considers Safety Class 2 to be essentially equivalent to Quality Group B for pressure-retaining portions of systems and their supports.

Systems and functions that primarily fall into Safety Class 2 (and Quality Group B) for ESBWR include the Control Rod Drive system, containment isolation functions in various systems, the Gravity-Driven Cooling System (GDCS), the Isolation Condenser System (ICS) and the Passive Containment Cooling System (PCCS).

DCD Impact

Markups of the DCD were provided in MFN 06-308.

NRC RAI 3.2-3 S01

Email from Jim Gaslevic on 11/20/06

Item 3.2-3 a.

In the response to RAI 3.2-3, certain systems that perform a safety function identified in RG 1.26 as Quality group B were reclassified from Quality Group C to Quality Group B. For example, the GDCS was previously classified as Quality Group C and after further review is now classified as Quality Group B. However, Section 3.2.2.2 was not revised to include quality classification criteria for systems that provide an Emergency Core Cooling function such as the GDCS. The applicant is requested to submit a revision to Section 3.2.2.2 and Section 3.2.2.3 that includes the classification criteria for systems that perform an emergency core cooling function and other applicable safety functions to be consistent with revised Table 3.2-1 and RG 1.26.

Item 3.2-3 b.

In the response to RAI 3.2-3, safety classifications based on ANS 58.14 were identified and included in Table 3.2-1. DCD Section 3.2.3.1 defines Safety Class 1 as applicable to components of the reactor coolant pressure boundary (as defined in 10 CFR 50.2) and their supports whose failure could cause a loss of reactor coolant at a rate in excess of the normal makeup system. GE is requested to clarify the maximum size of the piping connected to the RCPB that is excluded from Safety Class 1 on the basis of reactor coolant makeup capability. Also, ANS 58.14 is currently withdrawn and has not been endorsed by the NRC. Until this standard is updated and submitted for endorsement, this remains an open item and safety class is subject to further review during the COL application.

GE Response

Item 3.2-3a

GE agrees with this request and has modified DCD Tier 2 Sections 3.2.2.2 and 3.2.2.3 in Revision 3 based on Regulatory Guide 1.26 to provide a more complete discussion of the criteria used to assign components to Quality Groups B and C.

Item 3.2-3b

The maximum diameter of piping connected to the RCPB that is excluded from Safety Class 1 on the basis of reactor coolant makeup capability is 25-mm (1-inch) piping. This is already stated in DCD Tier 2 Subsection 3.2.3.2 as Item (5) of the second list in the subsection.

This is the same value that was applied for the ABWR design and is somewhat conservative for application to ESBWR. For ABWR, a reactor coolant makeup capability of 182 m³/hr (800 gpm) provided by the Reactor Core Isolation Cooling (RCIC) System was considered to establish this value. For ESBWR, a reactor coolant makeup capability of no less than 3920 liters/minute (1036 gpm) is provided by the high pressure makeup flow of the Control Rod Drive System (see DCD Tier 2 Table 4.6-1). Thus, the ABWR value for the maximum diameter of piping connected to the RCPB that is excluded from Safety Class 1 is conservatively applicable to ESBWR because ESBWR has a higher reactor coolant makeup capability than ABWR.

GE is aware of the withdrawn status of ANS 58.14 and that it is not officially endorsed by the NRC. However, DCD Tier 2 Subsection 3.2.3 describes the basis used by GE to assign a safety class to ESBWR structures, systems and components (SSCs). While the description of safety classes in DCD Tier 2 Subsection 3.2.3 is based on ANS 58.14 (and its predecessor standard, ANS 52.1), the NRC can review this DCD section independently of the supporting ANS standards as a basis for assigning a safety class to ESBWR SSCs. This should allow any open items that might be identified with respect to safety class to be resolved during design certification.

DCD Impact

DCD Tier 2, Subsections 3.2.2.2 and 3.2.2.3 have been modified in Revision 3 to address Item 3.2-3a.

Item 3.2-3b has no DCD impact.

NRC RAI 3.2-7

The piping and instrument diagrams (P&IDs) which depict the configurations associated with the items listed in Table 3.2-1 are not sufficiently clear in all cases to adequately describe the limits of the applied quality groups, quality assurances, and seismic categories within the various systems. For example, in the Fuel and Auxiliary Pools Cooling System P&ID (Figure 9.1-1), the suppression pool return lines are not clearly identified, and the necessary termination points are not labeled. As another example, a P&ID which depicts the classification boundaries for the main steam and feedwater systems outside containment could not be found. Please provide information on the system P&IDs which clearly identifies system and component classification limits identified in Table 3.2-1. Also, please provide a COL action to provide complete, detailed P&IDs of all plant systems, including unique identification numbers for all system components, to ensure that the final design classifications and the classification boundaries are acceptable.

GE Response

GE agrees that some of the simplified P&IDs do not clearly describe the limits of the applied quality groups, quality assurances and seismic categories within the various systems. These will be corrected as they are discovered and updated in a future revision of the DCD. In the meantime, GE offers to provide NRC with detailed P&IDs in proprietary submittals for any system where questions exist as to the location of the classification boundaries.

Figures showing the classification boundaries for the main steam and feedwater piping outside containment will be added to the DCD as Figures 3.2-1 and 3.2-2. Markups of the DCD were provided in MFN 06-308.

GE does not believe the COL action requested by this RAI is necessary. As needed, sufficiently detailed P&IDs will be provided to the NRC by GE under proprietary submittals to resolve any NRC concerns with classification boundaries during the design certification process.

NRC RAI 3.2-7 S01

Email from Jim Gaslevic on 11/20/06

Simplified P&IDs included as schematics in the DCD do not show a level of detail that permits a detailed review of all the classification boundaries. In the response to RAI 3.2-7, GE agrees that some of the simplified P&IDs do not clearly describe the limits of the applied quality groups, quality assurance and seismic categories within the various systems. GE states that these will be corrected as they are discovered and updated in a future revision of the DCD. GE believes that a COL action is unnecessary to provide complete detailed P&IDs and that detailed P&IDs can be provided under proprietary submittals. The issue concerning level of detail for system diagrams has been addressed in various regulatory documents and the use of simplified diagrams rather than detailed P&IDs has been accepted in UFSARs for operating reactors. NUREG-0800 Section 14.3 also indicates that, in regard to ITAAC, the format for figures and/or diagrams will be simplified piping diagrams for mechanical systems and ASME code class boundaries are shown on the figure and form the basis for the basic configuration check (system) that is required in each individual system ITAAC. As stated in Section 14.3 of NUREG-0800, the generic Piping Design ITAAC is to include a verification of the design report to ensure that the appropriate code design requirements for the system's safety class have been implemented. Therefore, to provide assurance that systems and components important to safety that are later modified or are beyond the level of detail included in the DCD will be correctly classified according to the classification criteria in the DCD, it is requested that the specific version of the P&ID used for the DCD submittal be identified and a specific commitment be made to review the as-built configuration compared to the approved design shown on detailed P&IDs and simplified schematics submitted with the DCD. A "functional arrangement" inspection consistent with Section 14.3 of NUREG-0800 may be used to verify that the as-built facility conforms to the approved design and applicable regulations. This review/inspection will also assist the NRC reviewer during the COL phase and construction inspections. The commitment may be in the form of a clarification letter, COL related action item or other appropriate ITAAC commitment. For example, in Section 19.59.10.5 of the AP1000 DCD, the applicant identified a commitment that the Combined License applicant referencing the AP1000 certified design will review the differences between the as-built plant and the design used as the basis for the AP1000 seismic margins analysis.

GE Response

The P&IDs provided in the DCD contain a level of detail commensurate with requirements for design certification reviews. ITAAC commitments are provided in DCD Tier 1 for mechanical systems with safety-related and/or RTNSS functions to confirm that the as-built system configuration is consistent with the simplified P&IDs and Tier 1 descriptions of the system. In addition, DCD Tier 2 Subsection 19.5.6, Revision 2, already contains the same action for the COL applicant that the RAI statement describes from the AP1000 DCD.

GE considers the ITAAC commitments for each system and the COL applicant action item in DCD Tier 2 Subsection 19.5.6 to be sufficient to ensure the as-built system meets all the DCD commitments for the system.

DCD Impact

No DCD impact.