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Supplement 1

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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 54 –Auxiliary Systems– RAI Numbers 9.1-12 S01 and 9.1-16 S01**

Enclosure 1 contains GE's response to the subject NRC RAI transmitted via Reference 1 which is a supplemental request to the RAIs transmitted via Reference 2. The original GE response was submitted in Reference 3.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

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NRO

Reference:

1. E-mail request from L. Quinones (NRC) to P. Jordan (GE) dated May 3, 2007. Subject: Supplemental RAI request for section 9.1.
2. MFN 06-302, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 54 Related to the ESBWR Design Certification Application*, August 23, 2006.
3. MFN 06-309, Letter from David Hinds to the U.S. Nuclear Regulatory Commission, *Partial Response to NRC Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application – Auxiliary Systems - RAI Numbers 9.1-12 through 9.1-26 and Amended Response to RAI Number 2.4-23 from NRC RAI Letter No. 32,* September 8, 2006.

Enclosure:

1. MFN 06-309 Supplement 1– Response to Portion of NRC Request for Additional Information Letter No. 54 – RAI Numbers 9.1-12 S01 and 9.1-16 S01

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Enclosure 1

MFN 06-309
Supplement 1

Response to Portion of NRC Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application

Auxiliary Systems

RAI Numbers 9.1-12 S01 and 9.1-16 S01

For historical purposes, the original text of RAIs 9.1-12 and 9.1-16 and the GE responses are included. To avoid confusion, the original DCD markup pages are not included.

NRC RAI 9.1-12

DCD Tier 2, Section 9.1.3 states that pipes equipped with normally closed manual valves are provided for establishing flow paths from off-site emergency water supplies or the fire protection system (FPS) to refill the isolation condenser (IC)/passive containment cooling system (PCCS) pools and SFP following a design basis loss of coolant accident. DCD Table 3.2-1 indicates this piping is safety-related, Seismic Category I, and Quality Group C. DCD Tier 2, Section 1D.4 states that the COL applicant will identify other readily accessible and suitable volumes of water. However, the necessary characteristics of these water supplies are not specified. In addition, DCD Tier 2, Section 9.5.1 states that the FPS performs no safety-related function, and DCD Tier 2, Table 3.2-1 indicates that the fire protection piping is designed to Quality Group D or lower and the fire pump enclosure is non-seismic.

The quality and seismic design guidelines of SRP Section 9.1.3, Revision 1, July 1981 and RG 1.13 specify that the primary SFP makeup system be permanently installed and designed to Seismic Category I, Quality Group C standards. As the identified permanently installed emergency makeup system, describe how the FPS satisfies the guidance of SRP 9.1.3 and RG 1.13.

If not permanently installed, SRP Section 9.1.3 and RG 1.13 specify that the backup system be supplied from a seismic Category I source of water. Specify the design criteria for the water sources to be identified in resolving the COL action item.

GE Response

DCD Tier 2, Section 1D.1, Criterion B states that the Fire Protection System provides on-site makeup water capability from 72 hours to 7 days, after which time either on-site or offsite makeup sources can be used. This function of the FPS is considered to be RTNSS rather than safety-related due to it not being required in less than 72 hours. Thus, the statement in DCD Tier 2, Section 9.5.1 is correct when it says FPS performs no safety-related functions.

The components associated with providing makeup water from FPS were assigned to Quality Group D on the basis that this was a RTNSS function rather than a safety-related function. RG 1.26 indicates that Quality Group C applies to safety-related components. In accordance with Paragraph II.1.a of SRP 9.1.3, GE will modify the quality group classification for the Seismic Category I FPS components supporting the spent fuel pool makeup water function to Quality Group C. All other non-seismic FPS components will retain their current Quality Group assignment.

The skid-mounted SC I fire pumps (as well as their related piping and accessories) would all be mounted to the SC I concrete slab that forms the roof of the EBAS. The fire pump enclosures (FPEs) would therefore have nothing attached to them that are SC I. Thus, the FPEs themselves could be SC II, and could be standard insulated sheet-metal on metal frame buildings that are typical for these types of enclosures in commercial construction. DCD Table 3.2-1 will be modified to show the fire pump enclosures as SC II.

Paragraph C.8 of RG 1.13 states "Appropriate redundancy or a backup system for filling the pool from a reliable source, such as a lake, river, or onsite seismic Category I water-storage facility, should be provided." DCD Tier 2 Section 1D.4 will be modified as shown in the attached markup to require the COL applicant to ensure the backup makeup system uses a reliable water source as defined in RG 1.13.

Received by e-mail from L. Quinones (NRC) to P. Jordan (GE) dated May 3, 2007:

NRC RAI 9.1-12 S01

The response is not consistent with the response to RAI 9.1-16. The fire pump enclosure must also be tornado protected as required by GDC-2; a seismic II enclosure with standard sheet metal frame is not appropriate for this purpose. Provide a seismic I enclosure or adequate alternative.

In addition, the commitments made in response to RAI 9.1-12 have not been incorporated in Tier 1 nor Tier 2 of Rev. 3. (Table 2.16.3-1 and Table 3.2-1, respectively). A revised Rev. 2 version of Table 3.2-1 was included in the RAI response, but not reflected in Rev. 3.

GE Response

GE concurs that the fire pump enclosure should be tornado protected as required by GDC 2 and therefore should be classified as Seismic Category I. GE also had recognized that Table 3.2-1 did not reflect the correct seismic classification (Seismic Category I) for the fire pump enclosure and previously submitted this DCD Table correction in response to RAI 3.2-48 S01 (Ref. MFN 06-308 Supplement 6 dated May 2, 2007). Consequently, no additional DCD change is required in response to this RAI request.

Additional GE Supplemental Response

Further investigation of RTNSS QA requirements determined that the ESBWR Fire Protection System (FPS) should be classified as Quality Group D as opposed to Quality Group C.

The ESBWR FPS does not perform any safety-related function. However, one source of primary fire water supply consisting of storage tanks, diesel fire pump, fire pump enclosures, and the fire water main leading to and including the standpipes and subsystems for areas containing safe shutdown equipment is analyzed to withstand the effect of a Safe Shutdown Earthquake (SSE). These components shall remain functional during and after an SSE. Therefore, these portions of the FPS are classified as Seismic Category I and Quality Group D.

DCD Tier 2, Revision 3, Appendix 19A.3, Criterion B, Subsection 19A.3.1.2, states that the FPS provides on-site makeup water capability beginning at 72 hrs through 7 days following postulated accidents. After 7 days, on-site or offsite makeup sources can be used. This function of the FPS is considered to be RTNSS rather than safety-related because it is not required until 72 hours following postulated accidents. Thus the statement provided in DCD Tier 2, Revision 3, Subsection 9.5.1.4 is correct in stating that the FPS does not perform any safety-related function.

Acceptance criterion II.1.a of SRP 9.1.3 delineates classification to Quality Group C for Fuel Pool makeup components. DCD Tier 2, Revision 3, Table 1.9-9 lists this classification deviation as Quality Group D.

Regulatory Guide 1.26 states that Quality Group C applies to safety-related components. The ESBWR FPS, including those components associated with providing makeup water from FPS to Fuel and Auxiliary Pools Cooling System (FAPCS), are not considered safety-related and do not serve a safety function. Therefore water-containing FPS SSCs are classified as Quality Group D. DCD Tier 2, Revision 3, Table 3.2-1 shows the seismic and quality Group classification of FPS components.

DCD Impact

Based on above, the subject ESBWR FPS SSCs are analyzed and reclassified as Seismic Category I and Quality Group D. DCD Tier 2, Subsection 9.5.1.4, Table 3.2-1 and Table 1.9-9 were revised in Revision 3 accordingly (except for the FP enclosure).

The DCD mark-up to change the seismic classification to Seismic Category I for the fire pump enclosure was previously submitted in response to RAI 3.2-48 S01 (Ref. MFN 06-308 Supplement 6 dated May 2, 2007). Therefore, no additional DCD changes are required in response to this RAI request.

NRC RAI 9.1-16

DCD Tier 2, Sections 3.3.2 and 3.5.2 state that safety-related structures, systems, and components listed in DCD Tier 2, Table 3.2-1 are protected within Seismic Category I structures from the effects of tornados. However, DCD Tier 1, Figure 2.6.2-1 indicates that the emergency makeup connections and isolation valves (F211 and F420) in the FAPCS for the SFP and IC/PCCS pools are located in the yard area of the plant outside of Seismic Category I structures. DCD Tier 2, Table 3.2-1 states that the piping and valves performing this function are safety-related. The FPS provides the alternate supply of water to these lines, but DCD Tier 2, Table 3.2-1 states that the FPS, including the water storage tanks and the fire pump house, are not safety-related, and therefore, not located where the components would be protected from the effects of tornados.

The requirements of GDC 2 specify that the safety-related SFP makeup water supplies and the water supplies to the IC/PCC pools be protected from the effects of tornados and other natural phenomena. Provide a detailed description of the features to protect safety-related makeup water lines from the effects of tornados.

GE Response

The only safety-related components of the FAPCS that exist outside of the reactor building are the emergency fill-up valves. These valves are attached to the Reactor Building structure, and are designed to Seismic Category I to withstand tornados and other natural phenomena.

In order to satisfy the requirements of GDC2, the FAPCS primary makeup source will be changed to the primary FPS storage tank. All FPS piping inside the Reactor Building is automatically protected from tornados and natural phenomena by the Seismic Category I structure. All FPS components located outside the Reactor Building that are needed for FAPCS makeup will be designed to Seismic Category I standards and will be designed to withstand tornados and other natural phenomena. By upgrading the source of makeup water to Seismic Category I, the requirements of GDC 2 are satisfied.

Additional information regarding this change, as well as the appropriate changes to the DCD are described in more detail in the responses to RAI 9.1-12 and 9.1-13.

No changes will be made to the DCD as a result of this RAI.

Received by e-mail from L. Quinones (NRC) to P. Jordan (GE) dated May 3, 2007:

NRC RAI 9.1-16 S01

This response is acceptable but is inconsistent with the response to RAI 9.1-12. The fire pump enclosures must also be designed to provide tornado protection. A standard insulated sheet-metal frame building is not adequate for this purpose. Clarify inconsistency.

GE Response

GE concurs that the previous response to RAI 9.1-16 was correct and inconsistent with the response to RAI 9.1-12 regarding tornado protection. The response to RAI 9.1-12 S01 addresses this inconsistency, and no supplemental information is required in this response.

DCD Impact

None.