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MFN 07-462
Supplement 1

Docket No. 52-010

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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. 93 Related to ESBWR Design
Certification Application – Classification of Structures,
Systems and Components – RAI Number 3.0-1 S01**

Enclosure 1 contains GEH's response to the subject NRC RAI transmitted via email on July 10, 2007. GEH's original response was provided in the Reference 1 letter.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 07-462, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 93 - Classification of Structures, Systems and Components - RAI Number 3.0-1*, dated August 23, 2007

Enclosure:

1. MFN 07-462, Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 93 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Number 3.0-1 S01

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eDRF 0000-0070-1548/3

Enclosure 1

MFN 07-462, Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 93

Related to ESBWR Design Certification Application

Classification of Structures, Systems and Components

RAI Number 3.0-1 S01

NRC RAI 3.0-1

For mechanical connections secured by threaded fasteners in ASME Code Class 1, 2, and 3 systems, the staff recently developed Standard Review Plan (SRP) Section 3.13, Revision 0, Threaded Fasteners - ASME Code Class 1, 2, and 3, as review guidance.

A. Provide an outline of the criteria for design, material selection, mechanical testing, and inservice inspection for bolting to ensure compliance with GDCs 1, 4, 14, 30, and 10 CFR 50.55a.

B. Identify any control of fabrication practices and/or special processes used to mitigate stress corrosion cracking or other forms of material degradation in the bolting during service.

C. Provide a discussion, based on past industry operating experience, that demonstrates how the bolting practices for ESBWR systems/components effectively implements the lessons learned from the numerous failures in high strength bolting in the mid-1960s through 1980s.

GE Response

10 CFR 52.47 (a)(1)(i) applies the 10 CFR 50 technical information requirements for construction permits and operating licenses to standard design certifications. 10 CFR 50.34(h) states "Conformance with the Standard Review Plan (SRP). (1)(i) Applications for light water cooled nuclear power plant operating licenses docketed after May 17, 1982 shall include an evaluation of the facility against the Standard Review Plan (SRP) in effect on May 17, 1982 or the SRP revision in effect six months prior to the docket date of the application, whichever is later." The ESBWR was docketed on August 24, 2005, and thus, the SRPs in effect on February 24, 2005 apply to the ESBWR. SRP 3.13 went into effect in March 2007, and, as shown by its absence from Tier 2 Table 1.9- 20, the ESBWR has not voluntarily committed to address the original draft of SRP 3.13. Therefore, SRP 3.13 is not part of the licensing basis for the ESBWR and the ESBWR DCD is not required to address that SRP.

A. Compliance with GDCs 1, 4, 14 and 30, and 10 CFR 50.55a is provided by adherence to the ASME code requirements for threaded fasteners as well as adherence to RG 1.65.

The ASME code requirements which provide the design, material selection, mechanical testing, and inservice inspection for bolting will be added as Tier 2, Subsection 3.9.3.9, as provided in the attached markup.

Compliance with RG 1.65 is provided in DCD Subsection 5.3.1.7.

Specific material selection for bolting within the reactor vessel internals will utilize materials as listed in Table 4.5-1 of the DCD. Bolting materials utilized in other areas of the plant for engineered safety features are outlined in section 6.1.1 and Table 6.1-1 of the DCD.

B. For austenitic stainless steel materials, Mitigation of stress corrosion cracking and other detrimental effects during fabrication is achieved in two ways: (1) Cold-worked bolting material is not permitted; and (2) the contact of detrimental materials with the components under

consideration is controlled. Sections 4.5.2.4 and 4.5.2.5 provide requirements placed on these materials for the reactor internals fabrication. For ferritic materials, the ultimate tensile strength and hardness are controlled, as discussed in DCD Subsection 5.3.1.7.

C. No NRC notices addressing high-strength bolting practices and that are applicable to the ESBWR design were found for the period mid 1960s through the 1980s.

For the high strength bolting in the ESBWR, the only significant degradation mechanism of concern is stress corrosion cracking of ferritic steel bolting. As discussed in the responses to (A) and (B) above, the material condition is controlled consistent with the requirements of RG 1.65.

DCD Impact

DCD Tier 2, Section 3.9.3.9 will be added as shown in the attached markup.

NRC RAI 3.0-1 S01

Revised RAI 3.0-1 (RAI Letter No. 93, January 31, 2007):

The NRC's original request in RAI 3.0-1, discussed in RAI Letter 93, requested the following:

For mechanical connections secured by threaded fasteners in ASME Code Class 1, 2, and 3 systems, the staff recently developed Standard Review Plan (SRP) Section 3.13, Revision 0, Threaded Fasteners ASME Code Class 1, 2, and 3, as review guidance.

A. Provide an outline of the criteria for design, material selection, mechanical testing, and inservice inspection for bolting to ensure compliance with GDCs 1, 4, 14, 30, and 10 CFR 50.55a.

B. Identify any control of fabrication practices and/or special processes used to mitigate stress corrosion cracking or other forms of material degradation in the bolting during service.

C. Provide a discussion, based on past industry operating experience, that demonstrates how the bolting practices for ESBWR systems/components effectively implements the lessons learned from the numerous failures in high strength bolting in the mid 1960s through 1980s.

In addition to the above, please provide response to the following additional items:

D. Justify use of lubricants and/or surface treatments in mechanical connections secured by threaded fasteners, and the compatibility of these materials with the threaded fasteners.

E. Include reference to Certified Material Test Reports.

GE Response

Items A, B, and C have been addressed in GE response to RAI 3.0-1.

Item D is addressed in DCD Tier 2, Section 3.9.3.9.2, Revision 4.

Item E is addressed in DCD Tier 2, Section 3.9.3.9.1, Revision 4.

DCD Impact

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