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MFN 07-225, Supplement 2

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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional Information Letter Number 67 Related to ESBWR Design Certification Application - Special Topics for Mechanical Components - RAI Number 3.9-14 S01**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) originally transmitted via the Reference 1 letter and supplemented by an NRC request for clarification in Reference 2. The GEH response to RAI Number 3.9-14 S01 is addressed in Enclosure 1.

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

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

References:

1. MFN 06-378, Letter from U.S. Nuclear Regulatory Commission to Mr. David H. Hinds, Manager, ESBWR, General Electric Company, *Request For Additional Information Letter No. 67 Related To ESBWR Design Certification Application*, dated October 10, 2006.

2. E-Mail from Chandu Patel, U.S. Nuclear Regulatory Commission, to John Leatherman, GE, dated June 13, 2007 (ADAMS Accession Number ML071650452).

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter Number 67 Related to ESBWR Design Certification Application - Special Topics for Mechanical Components - RAI Number 3.9-14 S01

cc:	AE Cubbage	USNRC (with enclosure)
	DH Hinds	GEH/Wilmington (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF	0000-0076-7161

Enclosure 1

MFN 07-225, Supplement 2

Response to Portion of NRC Request for

Additional Information Letter No. 67

Related to ESBWR Design Certification Application

Special Topics for Mechanical Components

RAI Number 3.9-14 S01

For historical purposes, the original text of RAI 3.9-14 and the GEH response is included, except for any attachments or DCD mark-ups.

NRC RAI 3.9-14

For each of the components listed in DCD Tier 2, Section 3D, provide the computer program that was used to evaluate the stresses for determining that the American Society of Mechanical Engineers Code Section III, Appendix F, limits were met.

GE Response

The following 4 computer programs listed in DCD Tier 2 Appendix 3D will determine stresses:

- ANSYS, but hand calculations are used to evaluate the stresses for determining if ASME Code Section III, Appendix F, limits were met.

- ASHSD2, FEMFL, ABAQUS, but only Elastic Analysis as defined in ASME Code Section III, Appendix F F1321.3 requirements is designed within this computer program when used to evaluate the stresses for determining if ASME Code Section III, Appendix F, limits were met.

DCD Impact

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

NRC RAI 3.9-14 S01

Comment on response to RAI 3.9-14 (MFN 07-225):

a. *Regarding the response dated April 18, 2007, provide a description of the method, based on hand calculations, that is used to evaluate the stresses obtained from ANSYS for determining if ASME Section III, Appendix F, limits have been met.*

b. *Regarding the response dated April 18, 2007, provide clarification of the statement, "only Elastic Analysis as defined in ASME Code Section III, Appendix F, F1321.3 requirements is designed within this computer program when used to evaluate the stresses for determining if ASME Code Section III, Appendix F, limits were met," when referring to the programs ASHD2, FEMFL, ABAQUS.*

c. *DCD Tier 2, Section 3.9.1.4, "Considerations for the Evaluation of Faulted Conditions," lists systems and components, such as Fine Motion Control Rod Drive (FMCRD), Hydraulic Control Unit, Reactor Pressure Vessel (RPV) Assembly, Core Support Structures and Other Safety Related Reactor Internal Components, RPV Stabilizer and FMCRD and In-Core Housing Restraints (Supports), Main Steam Isolation Valve, Safety/Relief Valve and Other ASME Class 1 Valves, Fuel Storage and Refueling Equipment, Fuel Assembly (Including Channel), ASME Class 2 and 3 Vessels, ASME Class 2 and 3 Pumps, ASME Class 2 and 3 Valves, and ASME Class 1, 2 and 3 Piping. For each of these systems and components, provide the computer program that was used to evaluate the Service Level D stresses for determining that the ASME Code Section III, Appendix F, limits were met.*

GEH Response

a. The ASME Boiler & Pressure Vessel Code, Section III, Appendix F provides non-mandatory rules for evaluation of components and supports subjected to loads for which Level D service limits are specified by the design specification. When the rules of Appendix F are applied, component stresses will be calculated by ANSYS, and hand calculations will be performed to verify the calculated stresses meet the acceptance criteria in Appendix F. In some cases, for example configurations and loading conditions that are simple, hand calculations may be used in place of ANSYS. The specifics of the hand calculations will depend on component geometry, model detail and analysis methodology followed.

b. The purpose of this statement was to point out that the computer programs ASHD2, FEMFL and ABAQUS only perform elastic analyses.

c. The table below summarizes the computer programs used to evaluate the Service Level D stresses for determining that the ASME Code Section III Appendix F limits were met.

Systems and Components	Computer Program Used
Fine Motion Control Rod Drive (FMCRD)	ANSYS
Hydraulic Control unit (HCU)	ANSYS
Reactor Pressure Vessel (RPV) Assembly	ASHSD2, FEMFL and ABAQUS
Core Support Structures and other Safety Related Internal Components	ANSYS
RPV stabilizer and FMCRD and In-Core Housing Restraints (Supports)	ANSYS
Main Steam Isolation Valve, Safety Relief Valve and Other ASME Class 1 Valves	*To be performed by supplier*
Fuel Storage and Refueling Equipment	ANSYS
Fuel Assembly (Including Channel)	ANSYS
ASME Class 2 and 3 Vessels	ANSYS
ASME Class 2 and 3 Pumps	*To be performed by supplier*
ASME Class 2 and 3 Valves	*To be performed by supplier*
ASME Class 1, 2 and 3 Piping	ANSI7

DCD Impact

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