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MFN 08-366 Supplement 1

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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. 240 Related to the ESBWR Design Certification
Application – Inservice Inspection Requirements for ASME Code
Class 1, 2 and 3 Components — RAI Number 5.2-62 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) sent by NRC letter 240 dated August 8, 2008 (Reference 1).

Enclosure 1 contains the GEH response to RAI Number 5.2-62 S01. Enclosure 2 contains the associated DCD Tier 2 Markups.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

DDG
NRO

Reference:

1. MFN 08-632, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 240 Related To ESBWR Design Certification Application*, dated August 8, 2008

Enclosures:

1. Response to Portion of NRC Request for Additional Information Letter No. 240 Related to ESBWR Design Certification Application – Inservice Inspection Requirements for ASME Code Class 1, 2 and 3 Components – RAI Number 5.2-62 S01
2. Response to Portion of NRC Request for Additional Information Letter No. 240 Related to ESBWR Design Certification Application – Inservice Inspection Requirements for ASME Code Class 1, 2 and 3 Components – RAI Number 5.2-62 S01– DCD Markups

cc: AE Cabbage USNRC (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
eDRF 0000-0091-3179- RAI 5.2-62 S01

Enclosure 1

MFN 08-366 Supplement 1

**Response to Portion of NRC Request for
Additional Information Letter No. 240
Related to ESBWR Design Certification Application**

**Inservice Inspection Requirements
for ASME Code Class 1, 2 and 3 Components**

RAI Number 5.2-62 S01

NRC RAI 5.2-62 S01: (the red/blue text edit is as-presented in the RAI)

The staff reviewed the applicant's modifications to DCD Revision 5 related to RAI 5.2-62. The staff requests that the applicant modify the Tier 2 information in DCD Sections 5.2.4 and 6.6, as shown below, in order to make it clear that Class 1 and Class 2 components in the ESBWR will be designed so as to facilitate preservice and in-service examinations that will be practical to be performed during commercial operation of the plant.*

5.2.4.2 Accessibility

All items within the Class 1 boundary are designed to provide access for the examinations required by ASME Section XI, IWB-2500. Additional, considerations for accessibility are defined in IWA-1500 of Section XI. Items such as nozzle-to-vessel welds often may have inherent access restrictions when vessel internals are installed. Therefore, preservice examination shall be performed as necessary to achieve the required examination volume on these items prior to installation of internals, which would interfere with examination. Access is sufficient for the inservice examination of the volume described in Code Case N-613-1.

*~~[The process that is being used by GEH in the certified design of the ESBWR is to The ESBWR design require includes specific access requirements, in accordance with 10 CFR 50.55a(g)(3), to support the preferred UT or optional RT examinations, in the equipment procurement specifications that are in compliance with the ASME Section XI Code. The selection of which NDE method, UT or RT, that will be~~The design of each component and system takes into account the NDE method, UT or RT, that will be used to fulfill preservice inspection and in-service inspection examination requirements and will take into full consideration the operational and radiological concerns associated with the method selected to ensure that the performance of the required examination will be practical during commercial operation of the plant. - Additionally, the design procedural requirements for the 3D layout of the plant include acceptance criteria regarding access for inspection equipment and personnel. ~~Through these procedural requirements, no deviations in providing the required access are expected.]~~ * However, with respect to any design activities for components that are not included in the referenced ESBWR certified design, it is the responsibility of the COL Applicant to preserve accessibility to piping systems to enable NDE of ASME Code Class 1 austenitic and DM welds during in-service inspection (COL item 5.2-3-A).*

6.6.2 Accessibility

All items within the Class 2 and 3 boundaries are designed to provide access for the examinations required by IWC-2500 and IWD-2500.

~~[The process that is being used by GEH in the certified design of the ESBWR is to The ESBWR design includes require specific access requirements, in accordance with 10 CFR 50.55a(g)(3), to support the preferred UT or optional RT examinations. in the equipment procurement specifications that are in compliance with the ASME Section XI Code. The design of each component and system takes into account the NDE method, UT or RT, that will be . The selection of which NDE method, UT or RT, that will be used to fulfill PSI and ISI examination requirements and will take into full consideration the operational and radiological concerns associated with the method selected to ensure that the performance of the required examination will be practical during commercial operation of the plant. Additionally, the design procedural requirements for the 3D layout of the plant include acceptance criteria regarding access for inspection equipment and personnel. Through these procedural requirements, no deviations in providing the required access are expected.]*~~ However, with respect to for any design activities for components that are not included in the referenced ESBWR certified design, it is the responsibility of the COL Applicant to preserve accessibility to piping systems to enable NDE of ASME Code Class 2 austenitic and DM welds during ISI (COL 6.6-2-A).

Class 2 and Class 3 Piping, Pumps, Valves and Supports

The design and physical arrangement of piping, pumps, valves, and supports provide personnel access to each weld location for performance of volumetric and surface (magnetic particle or liquid penetrant) examinations (Class 2 only), and sufficient access to supports for performance of visual VT-1 and VT-3 examinations in accordance with Subsection IWF. The design of the nuclear power plant structures, systems, and components provides access for the performance of Inservice Testing (IST) and ISI as required by the applicable ASME Code. Working platforms are provided in some areas to facilitate servicing of pumps and valves. Removable thermal insulation is provided on welds and components, which require frequent access for examination or are located in high radiation areas. Welds are located to permit 100% volumetric ultrasonic examination from at least one side, but where component geometry permits, access from both sides is provided.

GEH Response:

GEH accepts the proposed changes to DCD Tier 2, Subsections 5.2.4.2 and 6.6.2.

DCD Impact:

DCD Tier 2, Subsections 5.2.4.2 and 6.6.2 will be revised as noted in the attached markups.

Enclosure 2

MFN 08-366 Supplement 1

**Response to Portion of NRC Request for
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**Inservice Inspection Requirements
for ASME Code Class 1, 2 and 3 Components**

RAI Number 5.2-62 S01

DCD Markup

The description of portions of systems excluded from the RCPB does not address Class 1 components exempt from inservice examinations under ASME Code Section XI rules. The Class 1 components exempt from inservice examinations are described in ASME Code Section XI, IWB-1220, with the limitation of 10 CFR 50.55a(b)(2)(xi) which restricts the use of ASME Section XI to the 1989 Edition. This limitation excludes the use of paragraph IWB-1220(d). If any Class 1 welds are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe, they are still considered to be within the scope of ASME Section XI and are subject to examination requirements.

5.2.4.2 Accessibility

All items within the Class 1 boundary are designed to provide access for the examinations required by ASME Section XI, IWB-2500. Additional considerations for accessibility are defined in IWA-1500 of Section XI. Items such as nozzle-to-vessel welds often may have inherent access restrictions when vessel internals are installed. Therefore, preservice examination shall be performed as necessary to achieve the required examination volume on these items prior to installation of internals, which would interfere with examination. Access is sufficient for the inservice examination of the volume described in Code Case N-613-1.

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Reactor Pressure Vessel Access

Access for examinations of the RPV is incorporated into the design of the vessel, biological shield wall and vessel insulation as follows:

RPV Welds - The shield wall and vessel insulation behind the shield wall are spaced away from the RPV outside surface to provide access for remotely operated ultrasonic examination devices as described in Subsection 5.2.4.3. Access for the insertion of automated devices is provided through removable insulation panels and at shield wall hatches in the upper drywell area. Platforms are attached to the biological shield wall to provide access for installation of remotely operated examination devices.

normal reactor operation by two valves each of which is normally closed or capable of automatic closure.

- Systems, other than radioactive waste management systems, not covered by the above three paragraphs, that contain or may contain radioactive material and whose postulated failure would result in conservatively calculated potential offsite doses (reference RG 1.183), that exceed 0.5 rem (5 mSv) to the whole body or its equivalent to any part of the body.

6.6.2 Accessibility

All items within the Class 2 and 3 boundaries are designed to provide access for the examinations required by IWC-2500 and IWD-2500.

*[The process that is being used by GEH in the certified design of the ESBWR design is to require specific access requirements, in accordance with 10 CFR 50.55a(e)(3), to support the preferred UT or optional RT examinations, in the equipment procurement specifications that are in compliance with the ASME Section XI Code. The design of each component and system takes into account the NDE method, UT or RT, that will be used to fulfill PSI and ISI examination requirements and will take into full consideration the operational and radiological concerns associated with the method selected to ensure that the performance of the required examination will be practical during commercial operation of the plant. Additionally, the design procedural requirements for the 3D layout of the plant include acceptance criteria regarding access for inspection equipment and personnel. Through these procedural requirements, no deviations in providing the required access are expected.]** However, with respect to for any design activities

for components that are not included in the referenced ESBWR certified design, it is the responsibility of the COL Applicant to preserve accessibility to piping systems to enable NDE of ASME Code Class 2 austenitic and DM welds during ISI (COL 6.6-2-A).

Class 2 and Class 3 Piping, Pumps, Valves and Supports

The design and physical arrangement of piping, pumps, valves, and supports provide personnel access to each weld location for performance of volumetric and surface (magnetic particle or liquid penetrant) examinations (Class 2 only), and sufficient access to supports for performance of visual VT-1 and VT-3 examinations in accordance with Subsection IWF. The design of the nuclear power plant structures, systems, and components provides access for the performance of Inservice Testing (IST) and ISI as required by the applicable ASME Code. Working platforms are provided in some areas to facilitate servicing of pumps and valves. Removable thermal insulation is provided on welds and components, which require frequent access for examination or are located in high radiation areas. Welds are located to permit 100% volumetric ultrasonic examination from at least one side, but where component geometry permits, access from both sides is provided.

Restrictions: For piping systems and portions of piping systems subject to volumetric examination, the following piping designs are generally not used:

- Valve to valve;
- Valve to reducer;