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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 100 Related to ESBWR Design Certification Application - Preservice and Inservice Inspection and Testing Programs - RAI Number 5.2-64**

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the subject NRC Request for Additional Information (RAI) transmitted via the Reference 1 letter.

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in DCD Revision 5.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

DOT68
NRC

Reference:

1. MFN 07-327, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 100 Related to ESBWR Design Certification Application*, May 30, 2007

Enclosure:

1. MFN 08-366 - Response to Portion of NRC Request for Additional Information Letter No. 100 Related to ESBWR Design Certification Application - Preservice and Inservice Inspection and Testing Programs - RAI Number 5.2-64

cc: AE Cabbage USNRC (with enclosures)
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eDRF 0000-0075-7511R1

Enclosure 1

MFN 08-367

**Response to Portion of NRC Request for
Additional Information Letter No. 100
Related to ESBWR Design Certification Application**

Preservice and Inservice Inspection and Testing Programs

RAI Number 5.2-64

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in DCD Revision 5.

NRC RAI 5.2-64:

DCD, Tier 2, Revision 3, Chapters 5.2.4 and 6.6, states that the COL Holder is responsible for the development of PSI/ISI programs.

Revise the DCD Chapters 5.2.4 and 6.6 to include a COL Applicant Action Item to provide a detailed description of the PSI/ISI programs and augmented inspection programs and to provide milestones for their implementation.

GEH Response:

DCD Tier 2, Subsection 5.2.6 will be revised by modifying the COL Holder Item 5.2-1-H to become COL Applicant Item 5.2-1-A. The revised COL Applicant Item will address the request to include a COL Applicant Item by stating that the COL Applicant is to provide a full description of the preservice inspection (PSI)/inservice inspection (ISI) programs and augmented inspection programs, and to provide milestones for their implementation. Providing a full description of the PSI/ISI programs and augmented inspection programs is consistent with the requirements of Regulatory Guide 1.206. In addition, the existing statement regarding COL Holder responsibility will be deleted to be consistent with the regulatory treatment of other Operational Programs that are addressed as part of the COL application process.

In DCD Tier 2, Subsection 6.6.11, COL Applicant Item 6.6-1-A already contains the COL Applicant Item requested by this RAI. COL Applicant Item 6.6-1-A will be revised to be consistent with the wording of this RAI.

DCD Impact:

DCD Tier 2, Subsection 5.2.4.11, Subsection 5.2.6 (COL Item 5.2-1-A), Section 6.6, and Subsection 6.6.11 (COL Item 6.6-1-A) will be revised as shown in the attached markups.

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5.2.4.9 Preservice Examination

Preservice examinations required by design specification and preservice documentation are in accordance with ASME Section III, NB-5280. Components exempt from preservice examination are described in ASME Section III, NB-5283.

5.2.4.10 Relief Requests

The specific areas where the applicable ASME Code requirements cannot be met are identified after the examinations are performed. Should relief requests be required, they will be developed through the regulatory process and submitted to the NRC for approval in accordance with 10 CFR 50.55a(g)(5). The relief requests include appropriate justifications and proposed alternative inspection methods.

5.2.4.11 COL Information for Preservice and Inservice Inspection and Testing of Reactor Coolant Pressure Boundary

The COL Holder is responsible for the development of the preservice and inservice inspection programs ~~plans~~ that are based on the ASME Code, Section XI, ~~Edition and Addenda approved in 10 CFR 50.55a(b) 12 months before initial fuel load (see Subsection 5.2.6, 5.2-1-H, for COL Information).~~ The requirements are described above in DCD Subsections 5.2.4.1 through 5.2.4.104. ~~The COL Applicant is responsible for providing a full description of the PSI/ISI programs and augmented inspection programs, by supplementing, as necessary, the information in Subsection 5.2.4, and to provide milestones for their implementation (see Subsection 5.2.6, COL Item 5.2-1-A, for COL Information).~~

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10 CFR 50.55a prescribes Section XI Editions and Addenda applicable to inservice inspection programs, subject to limitations and modifications found therein. Additionally, 10 CFR 50.55a provides an allowance to request alternatives to or relief from Code requirements. Section XI requirements can be modified by invoking approved Section XI Code Cases. Approved Code Cases are listed in Regulatory Guide 1.147.

5.2.5 Reactor Coolant Pressure Boundary (RCPB) Leakage Detection

As discussed in SRP 5.2.5, the ~~Reactor Coolant Pressure Boundary (RCPB)~~ leakage detection systems are designed to provide a means of detecting and, to the extent practical, identifying the source of the reactor coolant leakage (see Subsection 5.2.6, 5.2-2-H, for COL information). The system is designed to perform the detection and monitoring function to assure conformance with the requirements of General Design Criteria 2 and 30. The system design considers the following:

- The system is capable of identifying to the extent practical, the source of the reactor coolant leakage;
- The system is capable of separately monitoring and collecting leakage from both identifiable and unidentifiable sources;

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The monitoring instrumentation of the drywell floor drain sump, the air particulate radioactivity, and the drywell air cooler condensate flow rate are equipped with provisions to readily permit testing for operability and calibration during plant operation, thus satisfying RG 1.45, Position C.8.

Limiting conditions for identified and unidentified leakage and for the availability of various types of leakage detection instruments are established in the technical specifications. This satisfies Position C.9 of RG 1.45.

5.2.5.9 COL Information for Leak Detection Monitoring (COL 5.2-2-H)

The COL Hholder is responsible for the development of a procedure to convert different parameter indications for identified and unidentified leakage (examples: sump pump run time, sump level, condensate transfer rate, process chemistry/radioactivity) into common leak rate equivalents (volumetric or mass flow) and leak rate rate-of-change values. The monitored leakage equivalents provides information used by the plant operators to manage the leakage and establish whether the leakage rates are within the allowable Technical Specifications and determine the trend.

The COL holder is responsible for the development of with procedures for monitoring, recording, trending, determining the source(s) of leakage, and evaluating potential corrective action plans.

5.2.6 COL Information

5.2-1-AH Preservice and Inservice Inspection Program Plan Description

The COL holder Applicant is responsible for providing a full description the development of the preservice and inservice inspection programs plans and augmented inspection programs, by supplementing, as necessary, the information in Subsection 5.2.4, and to provide milestones for their implementation. The program requirements are described in Subsections 5.2.4.1 through 5.2.4.10 and that are based on the ASME Code, Section XI (DCD Subsection 5.2.4.1211).

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5.2-2-H Leak Detection Monitoring

The COL Hholder is responsible for the development of a procedure to convert different parameter indications for identified and unidentified leakage into common leak rate equivalents and leak rate rate-of-change values.

The COL Hholder is responsible for the development of procedures for monitoring, recording, trending, determining the source(s) of leakage, and evaluating potential corrective action plans. (DCD Subsection 5.2.5.9)

5.2-3-A Preservice and Inservice Inspection NDE Accessibility Plan Description

The COL Applicant is responsible for developing a plan and providing a full description of it's use during construction, preservice inspection, inservice inspection, and during design activities for components that are not included in the referenced certified design, to preserve accessibility

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6.6 PRESERVICE AND INSERVICE INSPECTION AND TESTING OF CLASS 2 AND 3 COMPONENTS AND PIPING

The ESBWR meets requirements for periodic inspection and testing of Class 2 and 3 systems in GDC 36, 37, 39, 40, 42, 43, 45 and 46, as specified in part in 10 CFR Section 50.55a, and as detailed in Section XI of the ASME Code. Compliance with the preservice and inservice examinations of 10 CFR 50.55a, as detailed in Section XI of the Code, satisfies in part the requirements of GDC 36, 37, 39, 40, 42, 43, 45 and 46. ESBWR meets SRP 6.6, Revision 1 acceptance criteria by meeting the ISI requirements of these GDC and 10 CFR 50.55a for the areas of review described in Subsection I of the SRP.

This subsection describes the preservice and inservice inspection and system pressure test programs for Quality Groups B and C, that is, ASME Code Class 2 and 3 items, respectively, as defined in Table 3.2-3. This section describes those programs implementing the requirements of ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, Subsections IWC and IWD.A preservice and inservice inspection program for Class 2 and 3 components and piping is based on the ASME code, Section XI, Edition and Addenda specified in accordance with 10 CFR 50.55a subject to limitations and modifications found therein. Additionally, 10 CFR 50.55a provides an allowance to request alternatives to or relief from ASME Section XI Code requirements. The development of preservice and inservice inspection programs is the responsibility of the COL Holder, and shall be based on the ASME Code, Section XI, Edition and addenda approved in 10 CFR 50.55a(b) 12 months before initial fuel load. The COL Applicant is responsible for providing a full description of the PSI/ISI programs and augmented inspection programs for Class 2 and 3 components and piping by supplementing, as necessary, the information in Section 6.6. The COL Applicant will also provide milestones for their implementation (see Subsection 6.6.11, COL Item 6.6-1-A for COL information). The COL Applicant will provide a description of this program and its implementation. (See Subsection 6.6.11.)

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6.6.1 Class 2 and 3 System Boundaries

The Class 2 and 3 system boundaries for both preservice and inservice inspection programs and the system pressure test program item boundaries include all or part of the following:

- Nuclear Boiler System (NBS)
- Isolation Condenser System (ICS)
- Control Rod Drive (CRD) system
- Standby Liquid Control (SLC) system
- Gravity Driven Cooling System (GDCCS)
- Fuel and Auxiliary Pools Cooling System (FAPCS)
- Reactor Water Cleanup/Shutdown Cooling (RWCU/SDC) system
- Chilled Water System (CWS)
- Passive Containment Cooling System (PCCS)

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applicable, the provisions of the Code Cases listed in Table 5.2-1 may be used for preservice and inservice inspections, pressure tests, evaluations, and repair and replacement activities.

6.6.10 Plant Specific PSI/ISI Program Information

6.6.10.1 Relief Requests

The specific areas where the applicable ASME Code requirements cannot be met are identified after the examinations are performed. Should relief requests be required, they will be developed through the regulatory process and submitted to the NRC for approval in accordance with 10 CFR 50.55a(g)(5). The relief requests include appropriate justifications and proposed alternative inspection methods.

6.6.10.2 Code Edition

The ASME Section XI edition and addenda for this program description are as specified in Table 1.9-22. The COL Holder will define the applicable addition and addenda of the ASME Code in the plant specific ISI program (COL 6.6-2-H).

6.6.11 COL Information

6.6-1-A PSI/ISI Program Description

The COL Applicant will be responsible for providing a full description of the PSI/ISI programs and augmented inspection programs for Class 2 and 3 components and piping by supplementing, as necessary, the information in Section 6.6. The COL Applicant will also provide milestones for full program implementation (DCD Section 6.6).

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6.6-2-H ASME Code Description

The COL Holder will define the applicable addition and addenda of the ASME Code in the plant specific ISI program (Subsection 6.6.10.2).

6.6.12 References

None.