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Supplement 1

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U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555-0001

Subject: **Response to Portion of NRC Request for Additional Information E-mail from S. Williams Related to ESBWR Design Certification Application – Isolation Condenser System, RAI Number 5.4-55 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 E-mail from Shawn Williams. The previous response was submitted via Reference 3 in response to Reference 2. RAI Number 5.4-55 S01 is addressed in Enclosure 1.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

DW
NRO

References:

1. E-Mail from U.S. Nuclear Regulatory Commission (Shawn Williams) to GEH, *Request For Additional Information Related to ESBWR Design Certification Application (RAI 5.4-55 S01)*
2. MFN 06-391, Letter from U.S. Nuclear Regulatory Commission to David Hinds Request for Additional Information Letter No. 77 Related to ESBWR Design Certification Application, October 11, 2006
3. MFN 06-501, Letter from David Hinds to the U.S. Nuclear Regulatory Commission, "Response to Portion of NRC Request for Additional Information Letter No. 72 – Isolation Condenser System – RAI Numbers 5.4-55 and 5.4-56," dated December 11, 2006 (*Note: Original RAI Response letter referenced NRC Letter No. 72 but should have referenced Letter No. 77*)

Enclosure:

1. Response to Portion of NRC Request for Additional Information E-mail Related to ESBWR Design Certification Application, Isolation Condenser System, RAI Number 5.4-55 S01

cc: AE Cabbage USNRC (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
eDRF 0000-0056-4647

Enclosure 1

MFN 06-501, Supplement 1

**Response to Portion of NRC Request for
Additional Information E-Mail
Related to ESBWR Design Certification Application
Isolation Condenser System
RAI Number 5.4-55 S01**

For historical purposes, the original text of RAI 5.4-55 and the GE response is included. The attachments (if any) are not included from the original response to avoid confusion.

NRC RAI 5.4-55

Reviewer: Karwoski K

Question Summary: Discuss inservice inspection for the IC

Full Text: In DCD Tier 2, Revision 1, Section 5.4.6.4, you indicated that routine inservice inspection is required for the IC in accordance with ASME Code Section III and Section XI (requirements for design and accessibility of welds). Please confirm that the entire length of all IC welds and the full length of each IC tube will be inspectible after fabrication. Please provide a specific reference to the ASME Code subsection/paragraph that contains the inspection requirements for the IC tubes. If the inspection scope, inspection frequency, inspection method, tube repair criteria, tube repair methods, and acceptance criteria are not included in those requirements, please provide them. In addition, please discuss the technical basis for these requirements. Please discuss the basis for the corrosion allowance used in determining the required wall thickness (please provide a reference to the actual corrosion data). In addition, please discuss whether this corrosion allowance has ever been exceeded in operating BWRs. If it has, please discuss the circumstances (and what requirements are in place to ensure that these Reviewer Question Summary Full Text -3-circumstances will not occur in the future). Please discuss the scope of the preservice inspection requirements of the IC tubes. If all tubes are not inspected during the preservice inspection, please discuss the basis.

GE Response

Section 5.4.6.4 addresses inspection requirements for materials and fabrication (ASME Code Section III) as well as for Inservice Inspection (ASME Code Section XI). Although there is some ASME Section III Class 1 piping in the ICS, the ICs are Class 2. Requirements for Class 2 inservice inspection (ISI) are addressed in Subsection IWC of ASME Section XI, which is referenced by DCD Section 6.6 covering preservice and inservice inspection of Class 2 systems. The eddy current inspection of IC tubing mentioned in Section 5.4.6.4 refers to the Construction Code, ASME Section III, NC-2550, which addresses examination of the tubing material. Due their size (NPS 2), the IC tubes are exempt from volumetric and surface preservice and inservice examinations by ASME Section XI, IWC-1220 (exempts size NPS 4 and smaller). Note that repair/replacement requirements are also addressed by ASME Section XI, IWA-4000, as referenced in Section 6.6.5. Regarding the corrosion allowance for tubing material, a corrosion allowance of 12 mils (0.3 mm) for 60 years of operation will be included in the materials specification; that allowance is based on GE work performed in the late 1960s and published in proprietary GE reports. Because the isolation condenser provides only an emergency core

cooling function, actual system operation will be less than 1000 hours; therefore the general corrosion rate will probably be negligible. Alloy 600 tubing was used as replacement tubing for early BWR isolation condensers, such as for Millstone 1; the corrosion rate were not monitored, but the material performed satisfactorily without incident due to general corrosion in this application, so the allowance was sufficient in that operating experience. The isolation condensers are subject to leakage (VT-2) examination under ASME Section XI, IWC-2500, Category C-H, and the system is monitored for radiation leakage as described in Section 5.4.6.2.2.

DCD Impact

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

NRC RAI 5.4-55 S01

Received by E-mail from S. Williams

In GE's response to RAI 5.4-55, GE indicated that the Alloy 600 tubing (presumably SB-163 and not SB-167) was used as replacement tubing for several early BWR isolation condenser and that the material performed satisfactorily without incident due to general corrosion in this application. Discuss whether there were any other "incidents" associated with the use of these materials in these applications.

GEH Response

Review of the isolation condenser industry experience did not identify any "incidents" associated with the use of Alloy 600 material in this application.

DCD Impact

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