

GE Energy

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MFN 06-231 Supplement 2

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Subject:Response to Portion of NRC Request for Additional InformationLetter No. 39 - Engineered Safety Features - RAI Number 6.2-85 S01

Enclosure 1 contains GE's response to the subject NRC RAI originally transmitted via the Reference 1 letter and supplemented by an NRC request for clarification.

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

Sincerely,

Bathy Sedney for

James C. Kinsey Project Manager, ESBWR Licensing



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Reference:

1. MFN 06-202, Letter from U.S. Nuclear Regulatory Commission to David Hinds, Request for Additional Information Letter No. 39 Related to ESBWR Design Certification Application, June 22, 2006

Enclosure:

 MFN 06-231 Supplement 2 - Response to Portion of NRC Request for Additional Information Letter No. 39 - Related to ESBWR Design Certification Application -Engineered Safety Features - RAI Number 6.2-85 S01

cc: AE Cubbage USNRC (with enclosures) BE Brown GE/Wilmington (with enclosures) GB Stramback GE/San Jose (with enclosures) eDRF 0000-0067-7598 **Enclosure 1**

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Response to Portion of NRC Request for

Additional Information Letter No. 39

Related to ESBWR Design Certification Application

Engineered Safety Features

RAI Number 6.2-85 S01

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NRC RAI 6.2-85:

DCD Tier 2, Section 6.2.6.1.2, under the heading "Additional Criteria for Integrated Leakage Rate Tests," discusses venting and draining of systems for the test. However, the criteria are not completely consistent with either Option A or Option B of Appendix J, or the associated guidance documents. Specifically:

(a) In the second sub-bullet of the first bullet, the DCD says that portions of closed systems inside containment that penetrate containment and that are not relied upon for containment isolation purposes following a LOCA are kept open or vented to the containment atmosphere during the ILRT. By contrast, Option A, section III.A.1.(d) replaces the highlighted portion above with "rupture as a result of a loss of coolant accident." For Option B, NEI 94-01, Revision 0, is applicable. It states, in section 8.0:

"All Appendix J pathways must be properly drained and vented during the performance of the ILRT, with the following exceptions:

- Pathways in systems which are required for proper conduct of the Type A test or to maintain the plant in a safe shutdown condition during the Type A test;
- Pathways in systems that are normally filled with fluid and operable under post-accident conditions;
- Portions of the pathways outside primary containment that are designed to Seismic Category I and at least Safety Class 2; or,
- For planning and scheduling purpose, or ALARA considerations, pathways which are Type B or C tested within the previous 24 calendar months need not be vented or drained during the Type A test."

The second bullet is applicable.

(b) The third bullet in the DCD states:

"Those portions of fluid systems penetrating containment that are external to the containment and that are not designed to provide a containment isolation barrier are vented to the outside atmosphere, as applicable, to ensure that full post-accident differential pressure is maintained across the containment isolation barrier." [emphasis added]

For Option B, the third bullet of the quotation from NEI 94-01, Revision 0, section 8.0, above, differs from the highlighted phrase from the DCD. For Option A, there is no specifically-applicable guidance.

These differences between the DCD and the requirements are significant. Revise the DCD to provide justifications for these variances from the requirements, or revise the DCD to be consistent with the requirements for both Option A and Option B.

GE Original Response:

Comment in (a) for Options A and B is accepted. DCD Tier 2, Section 6.2.6.1.2 is revised by incorporating the requirement of Appendix J, Option A, section III.A.1.(d) and adding the requirements for Option B as per NEI 94-01 Revision 0, Section 8.0.

Comment (b) is accepted. DCD Tier 2, Section 6.2.6.1.2 under the heading "Additional Criteria for Integrated Leakage Rate Tests" is revised by incorporating Option B requirements.

The DCD changes are shown in Attachment A.

NRC RAI 6.2-76 S01:

Staff's original RAI requested revisions, consistent with Appendix J and associated guidance documents, to the criteria in the DCD governing the venting and draining of systems in preparation for an ILRT. GEs response in MFN 06-231 accepted this request and proposed appropriate DCD revisions. However, two items are questionable:

1. DCD Tier 2, Section 6.2.6.1.2, under the heading "Additional Criteria for Integrated Leakage Rate Tests," in the second sub-bullet of the first bullet, says that portions of closed systems inside containment that penetrate containment and that are not relied upon for containment isolation purposes following a LOCA are kept open or vented to the containment atmosphere during the ILRT. By contrast, Option A, section III.A.1.(d) replaces the underlined portion above with "rupture as a result of a loss of coolant accident."

In response, GE proposed to leave the second sub-bullet unchanged and add a third subbullet which contained the requested criterion. The staff's intention was for the second subbullet to be deleted and replaced by what is now the third sub-bullet. As proposed by GE, the second sub-bullet is unnecessary and could be deleted, leaving the third sub-bullet in its place; however, the staff has no objection to it remaining, as it is an additional, conservative requirement.

2. The proposed third sub-bullet states:

- portions of closed systems inside containment that penetrate containment and rupture as a result of LOCA. However ESBWR does not have any system that penetrates the containment and ruptures as a result of LOCA. The latter sentence is problematic. RAI 6.2-129 asked if there are any closed systems inside containment whose lines penetrate the containment, but the response did not answer that question (see RAI 6.2-111 and RAI 6.2-129 supplements below). The intent of the Appendix J requirement is that closed systems inside containment that penetrate containment, and do not rupture as a result of LOCA, do not need to be vented or drained during an ILRT because they are not expected to be containment atmosphere leakage pathways during a LOCA. In order to assume that a closed system inside containment which are to be credited as containment isolation barriers, as contained in SRP 6.2.4, Rev. 2, RG 1.141, and national standard ANS-56.2/ANSI N271-1976:

- *A.* The system does not communicate with either the reactor coolant system or the containment atmosphere.
- B. The system is protected against missiles, pipe whip, and jet force.
- C. The system is designated seismic Category I.
- D. The system is classified Safety Class 2.

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- *E.* The system is designed to withstand temperatures at least equal to the containment design temperature.
- *F.* The system is designed to withstand the external pressure from the containment structure acceptance test.
- G. The system is designed to withstand the LOCA transient and environment.
- *H.* The system is protected against overpressure from thermal expansion when isolated, if required.

Thus, GE should first determine if there are any closed systems inside containment whose lines penetrate the containment, and then if these closed systems meet the guidelines for closed systems inside containment which are to be credited as containment isolation barriers, as contained in SRP 6.2.4, Rev. 2, RG 1.141, and national standard ANS-56.2/ANSI N271-1976. If such systems meet the referenced guidelines, then the subject sentence in the third sub-bullet may remain. Otherwise, revise the DCD in conformance with this discussion (such as by deleting the subject sentence) or else provide additional justification for retaining the subject sentence.

GE Response:

- 1. GE will revise DCD Tier 2, Section 6.2.6.1.2, paragraph 5, in DCD Tier 2, Revision 4, to accept the NRC comment that the second sub-bullet should have been deleted in response to RAI 6.2-85 (MFN 06-231).
- 2. There are no closed systems inside containment credited as containment isolation barriers. Therefore, no systems inside containment are required to meet SRP 6.2.4 Revision 2, RG 1.141, and ANS-56.2/ANSI N271-1976 guidelines. GE will revise DCD Tier 2, Section 6.2.6.1.2, paragraph 5, in DCD Tier 2, Revision 4, to delete the second sentence in the current third sub-bullet.

DCD Impact:

DCD Tier 2, Section 6.2.6.1.2, paragraph 5, will be revised in DCD Tier 2, Revision 4, as shown in the attached markup.

[DCD Tier 2, Section 6.2.6.1.2, 5th Paragraph]

The following additional Criteria will be met for Integrated Leakage Rate Tests if 10 CFR 50 Appendix J Option A is implemented:

- The following portions of systems are kept open or vented to the containment atmosphere during the ILRT:
 - Portions of fluid systems that are part of the reactor coolant pressure boundary that are open directly to the reactor containment atmosphere under post-accident conditions and that become an extension of the boundary of the reactor containment; and
 - Portions of closed systems inside containment that penetrate containment and that are not relied upon for containment isolation purposes following a LOCA; and
 - Portions of closed systems inside containment that penetrate containment and rupture as a result of LOCA. However ESBWR does not have any system that penetrates the containment and ruptures as a result of LOCA.