



GE Energy

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MFN 06-071

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Subject: **Response to NRC Request for Additional Information Letter No. 9
Related to ESBWR Design Certification Application – Containment
Systems and Initial Test Program – RAI Numbers 6.2-1 through 6.2-3,
14.2-1, and 14.2-2**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the
Reference 1 letter.

If you have any questions about the information provided here, please let me know.

Sincerely,

A handwritten signature in cursive script that reads "Kathy Sedney for".

David H. Hinds
Manager, ESBWR

Handwritten initials or a signature that appears to be "DOLB8".

Reference:

1. MFN 06-044, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 9 Related to ESBWR Design Certification Application*, January 31, 2006

Enclosure:

1. MFN 06-071 – GE Response to NRC Request for Additional Information Letter No. 9 Related to ESBWR Design Certification Application – Containment Systems and Initial Test Program – RAI Numbers 6.2-1 through 6.2-3, 14.2-1, and 14.2-2

cc: WD Beckner USNRC (w/o enclosures)
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MFN 06-071
Enclosure 1

ENCLOSURE 1

MFN 06-071

GE Response to NRC Request for Additional Information
Letter No. 9 Related to ESBWR Design Certification Application
Containment Systems and Initial Test Program
RAI Numbers 6.2-1 through 6.2-3, 14.2-1, and 14.2-2

NRC RAI 6.2-1

Certain pertinent Regulatory Guides are not addressed or even mentioned in DCD sections 6.2.4 through 6.2.6. Examples: RG 1.141, "Containment Isolation Provisions for Fluid Systems;" RG 1.163, "Performance-Based Containment Leak-Test Program." Although not necessarily required, the staff can reasonably expect discussions of conformance (or non-conformance) with the provisions of these Regulatory Guides to be included in the DCD. Provide these discussions.

GE Response

Reference to Regulatory Guides 1.141 and 1.163 as applicable regulatory guides is already provided in DCD Tables 1.9-21. In response to this RAI, GE has revised sections 6.2.4 and 6.2.6 in Revision 01 of the DCD as given below.

In second paragraph of section 6.2.4, the following sentence has been added:

"Regulatory Guide 1.141 and ANS 56.2 are used as guidance documents for the design of containment isolation provisions for fluid systems."

In the first paragraph of section 6.2.6, revised first sentence and added second sentence as follows:

"This subsection describes the testing program for determining the containment integrated leakage rate (Type A tests), containment penetration leakage rates (Type B tests), and containment isolation valve leakage rates (Type C tests) that complies with 10 CFR 50 Appendix J, Option A or Option B as per Regulatory Guide 1.163, and GDC 52, 53 and 54. The leakage rate testing capability is consistent with the testing requirements of ANS-56.8."

NRC RAI 6.2-2

In accordance with RG 1.70, section 6.2.4 of the DCD should include a table or tables that list all of the containment fluid penetrations and containment isolation valves. There should be 22 items of information for each penetration, such as number and types of valves, line sizes, etc. The ESBWR DCD tables lack approximately 5 of the expected items, per penetration. Provide the missing information.

GE Response

GE has reviewed Section 6.2.4.2 of RG 1.70 and concluded that the information on 5 items which are 6, 7, 8, 11 and 12 was missing in Containment Isolation Valve Information Tables. Information on items 6, 8, 11 and 12 for each penetration has been added in DCD Revision 01, Tables 6.2-16 through 6.2-38. Information on item 7, which

is "Through-line leakage classification (dual containments)" does not apply because the ESBWR does not have a dual containment.

NRC RAI 6.2-3

It appears that DCD section 6.2.6, "Containment Leakage Testing," was written with the intent to conform to the requirements of Option A, "Prescriptive Requirements," of Appendix J to 10 CFR Part 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." No mention is made of Option B, "Performance- Based Requirements," of Appendix J to 10 CFR Part 50. As such, potential COL applicants would be constrained to follow the requirements of Option A. Considering that virtually all current nuclear power plant licensees conform to Option B, at least in part, the staff would like to know if (and when) the applicant is planning to revise DCD section 6.2.6 to incorporate Option B, as this would be a major revision and staff review should wait until the revision is made.

GE Response

Refer to response to RAI # 6.2-1 for a change already incorporated in Revision 01 of DCD section 6.2.6 in response to this RAI. In addition, changes given below will be made in section 6.2.6.1.2 in DCD Revision 02.

(a) In section 6.2.6.1.2, first two paragraphs will be revised to read as follows:

Following the initial preoperational tests, ILRTs (Type A tests) are conducted periodically according to 10 CFR 50 Appendix J to ensure that the containment integrity is maintained and to determine if the leakage rate has increased since the previous ILRT. The tests are performed at intervals as described below, after major repairs, and upon indication of excessive leakage. The periodic ILRTs follow the same method as the initial ILRT, and the same test prerequisites and acceptance criteria also apply to the periodic ILRTs. Verification tests are also performed after each ILRT.

After the initial ILRT, periodic ILRTs will be performed at intervals depending on whether Option A or Option B of 10 CFR 50 Appendix J is selected by the COL Holder. In case Option A is selected, the ILRTs will be performed approximately at equal intervals during each 10-year service period. In case Option B is selected, the test intervals will be as per Regulatory Guide 1.163. In addition, any major modification or replacement of components of the reactor containment performed after the initial ILRT are followed by either a Type A or a Type B test of the area affected by the modification, with the affected area meeting the applicable acceptance criteria. This frequency of testing is established on the basis of 10 CFR 50 Appendix J.

(b) In section 6.2.6.2, the fourth paragraph will be revised to read as follows:

In accordance with 10 CFR 50 Appendix J, Type B tests are performed at intervals depending on whether Option A or Option B of 10 CFR 50 Appendix J is selected by the COL Holder. In case Option A is selected, Type B tests (except for air locks) will be performed during each reactor shutdown for major fuel reloading, or other convenient intervals, but in no case at intervals greater than two years. Under this option the air-locks opened when containment integrity is required are tested in manual mode within 3 days of being opened. If the air-lock is to be opened more frequently than once every 3 days, the air-lock is tested at least once every 3 days during the period of frequent openings. Air-locks are tested at initial fuel loading, and at least once every 6 months thereafter. In case Option B is selected, the test interval will be as per Regulatory Guide 1.163. Air-locks that are allowed to be opened during full power may be tested at full power so as to avoid shutting down. These air-locks contain no inflatable seals.

(c) In Section 6.2.6.3, the first paragraph will be revised to read as follows:

Type C tests are performed on all containment isolation valves required to be tested per 10 CFR 50 Appendix J Option A or Option B. Containment isolation valves subject to Type C tests are listed within Tables 6.2-16 through 6.2-42

(d) In Section 6.2.6.4, the first paragraph which reads as below will be deleted:

“The periodic leakage rate test schedule requirements for Types A, B, and C tests are specified in the plant-specific Technical Specifications.”

(e) In Section 6.2.6.4, the second paragraph will be revised to read as follows:

Type B and C tests will be conducted at any time during normal plant operations or during shutdown periods, with test intervals as per Option A or Option B of 10 CFR 50 Appendix J. Each time a Type B or C test is completed, the overall total leakage rate for all required Type B and C tests is updated to reflect the most recent test results. In addition to the periodic tests, any major modification or replacement of a component that is part of the primary reactor containment boundary performed after the preoperational leakage rate test will be followed by either a Type A, B, or C test (as applicable) for the area affected by the modification. Type A, B, and C test results are submitted to the NRC in the summary report approximately three months after each test.

NRC RAI 14.2-1

In section 14.2.8.1.28, "Containment Penetration Leakage Rate Tests," there is an erroneous reference to Table 6.2-13. The correct reference appears to be 6.2-47. Clarify this discrepancy.

GE Response

The correct reference is "Table 6.2-47" instead of "Table 6.2-13". Section 14.2.8.1.28 has been modified by making this correction in Revision 01 of the DCD.

NRC RAI 14.2-2

In section 14.2.8.1.33, "Containment Isolation Valve Functional and Closure Timing Tests," there is a reference to Table 6.2-50, but no such Table exists in the DCD. Clarify this discrepancy.

GE Response

The correct reference is "Tables 6.2-16 to 6.2-42" instead of "Table 6.2-50". Section 14.2.8.1.33 has been modified by making this correction in Revision 01 of the DCD.