GE Energy

James C. Kinsey
Project Manager, ESBWR Licensing

PO Box 780 M/C J-70
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057
jim.kinsey@ge.com

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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 81 – DCD Tier 2 Section 14.3 – RAI Numbers 14.3-95, 14.3-96, 14.3-98, 14.3-100 and 14.3-101**

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

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

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Reference:

1. MFN 06-462, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 81 Related to the ESBWR Design Certification Application*, November 14, 2006

Enclosures:

1. MFN 06-520 – Response to Portion of NRC Request for Additional Information Letter No. 81 – DCD Tier 2 Section 14.3 – RAI Numbers 14.3-95, 14.3-96, 14.3-98, 14.3-100 and 14.3-101

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0061-0115

ENCLOSURE 1

MFN 06-520

Partial Response to NRC RAI Letter No. 81 Related to ESBWR Design Certification Application

DCD Tier 2 Section 14.3

RAI Numbers 14.3-95, 14.3-96, 14.3-98, 14.3-100 & 14.3-101

NRC RAI 14.3-95:

Item 1, Table 2.15.1: ASME Section III, Subsections NE and CC are relevant to the inspection and testing of the as-built construction of the containment system. Conformance to a sketch in figure 2.15.1 does not cover any acceptance criterion related to the dimensions and tolerances of the major components of the as-built structure compared to the as designed structure. The inspection of actual configurations of process piping, electrical conduits and containment penetrations should be parts of these inspections. Provide appropriate description of the acceptance criteria for the containment system components.

GE Response:

According to Article CC-3140 of ASME Section III, Division 2, the Construction Specification shall delineate the tolerance requirements for fabrication and construction. The designer shall ensure that the tolerances specified in the Construction Specification are compatible with the design assumptions. Requirements in Article CC-4500 are followed for the Fabrication and Construction of RCCV liners. A guide for dimensional tolerances for liners is provided in Appendix D of ASME Section III, Division 2. Requirements in Article NE-4000 of ASME Section III, Division 1 are followed for the Fabrication and Construction of the steel components, not backed by concrete, of the RCCV.

ASME Section III, Division 1, Non-mandatory Appendix T will be used for piping system and support location tolerances. ASME Section III, NF-4220, NF-5360, and Non-mandatory Appendix K will be used for tolerances for vessel supports and structural welds. Tolerances not provided by relevant industry Codes and Standards will be provided on Design and Construction Drawings and Specifications. The Design and Construction Specifications will be certified by a Registered Professional Engineer, as required by NCA-3360, NCA-3255 and NCA-3555.

All dimensions shown on the Design and Construction Drawings will be inspected for conformance to the tolerances shown on the drawings and referenced documents, such as those described above. Deviations from specified tolerances will be evaluated by the designer in accordance with ASME Section III, NCA-3370, or NCA-3554 for consistency with the Certified Design and Construction Reports.

For DCD Tier 1, a listing of construction related inspections detailed above is not required. Only conformance to DCD Tier 1 Figure 2.15.1-1 is required.

DCD Impact:

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

NRC RAI 14.3-96:

Item 2, Table 2.15.1: Cite ASME code required documents that will be used for inspection and acceptance criteria related to ASME Code Certified stress reports appropriate for this Tier 1 document.

GE Response:

For ASME Section III, Division 2 construction, stress reports will comply with NCA-3350 through NCA-3380 and NCA-3454. For Division 1 construction, they will comply with NCA-3550. All such reports will be certified by a Registered Professional Engineer, as required by NCA-3360, NCA-3255 and NCA-3555 and will be available during plant construction.

Most, if not all, of the as-built stress reports are not within the scope of the engineering for design certification and will be generated during the construction phase. Therefore, most, if not all, of the stress reports are not available to be included in DCD Tier 1 ITAAC. However, a commitment to have the stress reports will be added to DCD Table 2.15.1-1, Item 2.

DCD Impact:

Revisions 3 to DCD Tier 1 Table 2.15.1-1 will reflect the changes noted on the attached markup.

NRC RAI 14.3-98:

Section 2.16.7 Fuel Building: Table 2.16.7-1, no specific ITAAC is specified for maintaining the pool water level and preventing internal flooding of the building from the pool overflow. Provide the ITAAC for the pool internal flooding requirements.

GE Response:

The water level in the spent fuel storage, lower fuel transfer and cask pools is ensured by designing the pools with no connecting pipe below pool normal water level, by locating overflow weirs at pool normal water level and by providing the submerged pipes with anti-siphon provisions. Please see the response to NRC RAI 14.3-67 for specific ITAAC for these design features submitted under MFN 06-382.

Internal flooding in the Fuel Building is prevented by Fuel Pools and Fuel and Auxiliary Pools Cooling System (FAPCS) design (see DCD Tier 2 Subsection 9.1.3 for the FAPCS detailed description). The FAPCS pumps cool and clean water to the fuel pool from the skimmer surge tanks while the fuel pool's overflow returns water to the skimmer by way of the pool weirs. To prevent skimmer overflow in abnormal conditions, the skimmer surge tanks are provided with an overflow line to the Liquid Waste Management System.

DCD Impact:

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

NRC RAI 14.3-100:

In Item 2, "Design Commitment", of Table 2.15.1-1, "ITAAC for Containment System", provide the specific sections of ASME Code, Section III, that contain the design requirements for the primary containment pressure boundary.

GE Response:

The reinforced concrete containment vessel (RCCV) and its liners are designed to meet the requirements in Article CC-3000 of ASME Code, Section III, Division 2. The steel components of the RCCV, not backed by concrete, are designed to meet the requirements in Article NE-3000 of ASME Code, Section III, Division 1.

These design criteria will be added to DCD Tier 1 Table 2.15.1-1, Item 2.

DCD Impact:

Revision 3 to DCD Tier 1 Table 2.15.1-1 will reflect the changes noted on the attached markup.

NRC RAI 14.3-101:

In Item 5, "Inspections, Tests, Analysis," of Table 2.15.1-1, provide the specific section which contain the requirements and criteria for conducting a containment Structural Integrity Test.

GE Response:

The requirements and criteria for conducting the containment Structural Integrity Test are given in ASME Section III, Division 2, Article CC-6000, *Structural Integrity Test of Concrete Containments*. This requirement will be added to DCD Tier 1 Table 2.15.1-1, Item 5.

DCD Impact:

Revision 3 to DCD Tier 1 Table 2.15.1-1 will reflect the changes noted in the attached markup.

Table 2.15.1-1

ITAAC For The Containment System

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the Containment System (CS) is as shown on Figure 2.15.1-1.	1. Inspections of the as-built system will be conducted.	1. The as-built Containment System conforms to Figure 2.15.1-1.
2. The primary containment pressure boundary defined in Subsection 2.15.1 is designed to meet ASME Code, Section III requirements. The reinforced concrete containment vessel (RCCV) and its liners are designed to meet the requirements in Article CC-3000 of ASME Code, Section III, Div. 2. The steel components of the RCCV are designed to meet the requirements in Article NE-3000 of ASME Code, Section III, Div. 1.	2. Inspections of ASME Code required documents will be conducted.	2. An ASME Code Certified Stress Report exists for the pressure boundary components. For ASME Section III, Division 2 construction, stress reports demonstrate compliance to NCA-3350 through NCA-3380, and NCA-3454. For ASME Section III, Division 1 construction, stress reports demonstrate compliance to NCA-3550.
3. Maximum calculated drywell and wetwell pressures and temperatures for the design basis accidents are less than their design values.	3. Analyses will be performed using the as-designed CS data.	3. The maximum calculated pressures and temperatures are less than design conditions.

Table 2.15.1-1

ITAAC For The Containment System

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4. The containment provides a barrier against the release of fission products.	4. A containment integrated leak rate test will be conducted as per 10 CFR 50 Appendix J.	4. The containment air leakage rate demonstrated by the integrated leak rate test at the peak containment pressure developed during the bounding case of DBA is less than or equal to 0.5% per day by weight of air in containment free volume determined at the containment design pressure 310 kPa gauge (45 psig) and standard temperature of 20°C (68°F).
5. The pressure boundary of the CS retain their integrity under the design pressure of 310 kPa gauge (45 psig).	5. A containment Structural Integrity Test (SIT) will be conducted per ASME requirements at a test pressure of 1.15 times the design pressure. The first prototype containment structure will be instrumented to measure strains per ASME Code Section III, Div. 2, CC-6370.	5. Test results demonstrate compliance to ASME Code Section III, Div. 2, CC-6000, Structural Integrity Test of Concrete Containments.
6. The design differential pressure of the diaphragm floor between the drywell and the wetwell is 241 kPa(d) [35 psid] with higher pressure value on the drywell side.	6. Part of the SIT will test the diaphragm floor and vent wall structure with a test pressure equal to 1.15 times the design differential pressure conducted with the drywell pressure greater than wetwell pressure.	6. The results of SIT meet ASME Code requirements for the applied test pressure.