



GE Energy

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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 54 Related to ESBWR Design Certification Application –
Radioactive Waste Management/Radiation Protection – RAI
Numbers 11.2-4 through 11.2-8 and 11.4-15**

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

A handwritten number "2068" in the bottom right corner of the page.

Reference:

1. MFN 06-302, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application*, August 23, 2006

Enclosure:

1. MFN 06-311 – Response to Portion of NRC Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application – Radioactive Waste Management/Radiation Protection – RAI Numbers 11.2-4 through 11.2-8 and 11.4-15

cc: AE Cabbage USNRC (with enclosures)
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ENCLOSURE 1

MFN 06-311

**Response to Portion of NRC Request for
Additional Information Letter No. 54
Related to ESBWR Design Certification Application
Radioactive Waste Management/Radiation Protection
RAI Numbers 11.2-4 through 11.2-8 and 11.4-15**

NRC RAI 11.2-4

DCD Tier 2, Table 11.2-1 specifies equipment codes for use in the liquid waste system. It states that the information is from Regulatory Guide (RG) 1.143, Table 1. The row for atmospheric tanks in Table 11.2-1 reflects RG 1.143, Rev. 1, which adds "ASME Code Section III, Class 3" as an acceptable Design and Fabrication code, and "AWWA D-100" as an acceptable Inspection and Testing code. Revision 2 of RG 1.143 specifies API-650 for these codes. (The currently released version of RG 1.143 contains a misprint for the Inspection & Testing code. Both columns should site API-650. A correction is being processed by the NRC.) Please revise this Table 11.2-1 to reflect Revision 2 of the RG 1.143.

GE Response

DCD Tier 2 Chapter 11 Table 11.2-1 will be revised as shown in the attached markup to comply with Regulatory Guide 1.143, Revision 2 Table 1 as it pertains to atmospheric tanks, including API-650 for the Inspection & Testing code.

NRC RAI 11.2-5

DCD Tier 2, Table 11.2-1 specifies equipment codes for use in the liquid waste system. It states that the information is from RG 1.143, Table 1. The row for 0-15 psi tanks in Table 11.2-1 reflects RG 1.143, Rev. 1, which adds "ASME Code Section III, Class 3" as an acceptable Design and Fabrication code & Inspection and Testing code. Revision 2 of RG 1.143 specifies API-620 for these codes. (The currently released version of RG 1.143 contains a misprint for the Inspection & Testing code. Both columns should site API-620. A correction is being processed by the NRC.) Please revise Table 11.2-1 to reflect Revision 2 of RG 1.143.

GE Response

DCD Tier 2 Chapter 11 Table 11.2-1 will be revised as shown in the attached markup to comply with Regulatory Guide 1.143, Revision 2 Table 1 as it pertains to 0-15 psig tanks, including API-620 for the Inspection & Testing code.

NRC RAI 11.2-6

DCD Tier 2, Table 11.2-1 specifies equipment codes for use in the liquid waste system. It states that the information is from RG 1.143, Table 1. The row for pumps in Table 11.2-1 reflects both Rev. 1 & Rev. 2 of RG 1.143. Specifically, in the Design & Construction column and the Materials column, the DCD copies both Rev. 1 & Rev. 2, citations entirely. Rev. 1 & Rev. 2 cite different codes. In the Welding column and the Inspection & Testing column, Revision 1 is cited. Please revise Table 11.2-1 to reflect Revision 2 of RG 1.143.

GE Response

DCD Tier 2 Chapter 11 Table 11.2-1 will be revised as shown in the attached markup to comply with Regulatory Guide 1.143, Revision 2 Table 1 as it pertains to pumps.

NRC RAI 11.2-7

DCD Tier 2, Table 11.2-1 specifies equipment codes for use in the liquid waste system. It states that the information is from RG 1.143, Table 1. The row for piping & valves in the DCD copies citations from both Rev. 1 & Rev. 2 of RG 1.143. Specifically, the DCD Table quotes Rev. 2 for Design & Fabrication and for Inspection & Testing. It quotes Rev. 1 for the Materials & the Welding. Please revise Table 11.2-1 to reflect Revision 2 of RG 1.143.

GE Response

DCD Tier 2 Chapter 11 Table 11.2-1 will be revised as shown in the attached markup to comply with Regulatory Guide 1.143, Revision 2 Table 1 as it pertains to piping and valves.

NRC RAI 11.2-8

DCD Tier 2, Table 11.2-1 specifies equipment codes for use in the liquid waste system. It states that the information is from RG 1.143, Table 1. However, the title block has an asterisk note which states that, per RG 1.143, all materials are ASME Section II. This conflicts with the rows for Piping & Valves (see question 11.2-4 above), Pumps (See 11.2-3 above) and Flexible Hoses. Please explain and justify these apparent conflicts.

GE Response

DCD Tier 2 Chapter 11 Table 11.2-1 will be revised as shown in the attached markup to comply with Regulatory Guide 1.143, Revision 2 Table 1 as it pertains to materials.

NRC RAI 11.4-15

DCD Tier 2, Section 11.4 describes the operation of the wet solid waste handling subsystem and provides a process flow diagram. Include Inspection, Test, Analysis, and Acceptance Criteria (ITAAC) to verify that the plant configuration is consistent with the described operations and process diagram.

GE Response:

This RAI requests Tier 1 or ITAAC changes and/or additions; therefore, it has been reviewed per GE internal Tier 1 content determination guidelines, which are based on draft SRPs 14.3 through 14.3.11 and DG-1145 (as of July 31, 2006). This response is provided consistent with those guidelines. The following includes some of regulatory bases used to develop the GE Tier 1 content determination guidelines.

Draft SRP 14.3, Appendix A, Section IV, first paragraph states, "While the Tier 1 information must address the complete scope of the design to be certified, the amount of design information is proportional to the safety-significance of the structures and systems of the design." Therefore, a graded approach, based on safety functions, is used for determining the amount of detail in the Tier 1 DD and ITAAC.

Draft SRP 14.3, Appendix A, Section IV, Item B.1 states, "The design descriptions (DD) address the most safety-significant aspects of each of the systems of the design, and were derived from the detailed design information contained in Tier 2. The applicant should put the top-level design features and performance characteristics that were the most significant to safety in the Tier 1 design descriptions. The level of detail in Tier 1 governed by a graded approach to the SSCs of the design, based on the safety significance of the functions they perform." (Bold text emphasis is added.) Therefore, not all safety-significant systems are required to be described in Tier 1.

As delineated in 10 CFR 50.69, plants are expected to have "safety-related SSCs that perform low safety significant functions, and thus, those SSCs should not be considered as most safety-significant. However, for the ESBWR, the Tier 1 change determination process conservatively assumes that all safety-related functions qualify as safety-significant. For a passive plant, like the ESBWR, the safety-significant nonsafety-related SSCs are determined by applying the Regulatory Treatment of Nonsafety Systems (RTNSS) criteria. (The safety-significant nonsafety-related SSCs are addressed in Tier 2, Appendix 1D.) Therefore, the "safety-significant aspects" of the ESBWR involve the performance of all safety-related functions and the RTNSS functions of the nonsafety-related equipment. By exclusion, all other SSC functions are not safety-significant, and therefore, are not required to be addressed in Tier 1.

Draft SRP 14.3, Appendix A, Section IV, Item B.2, sixth paragraph states "The level of detail specified in the ITAAC should be commensurate with the safety significance of the functions and bases for that SSC." Therefore, the ITAAC for a system should be based on the safety significant information in the DD.

The Solid Waste Management System (SWMS) is not safety-related nor does it qualify as a RTNSS system, and thus, it is not safety significant. Therefore, per the guidance in draft SRPs 14.3 – 14.3.11 and DG-1145, only the system name, without a DD or ITAAC, is required to be included in Tier 1. However, Tier 1 currently contains some DD information without ITAAC, and therefore, already contains more information than is required. Consequently, no additional information for the SWMS is required to be contained or added in Tier 1.

No DCD change will be made in response to this RAI

**Table 11.2-1
Equipment Codes (from Table 1, RG 1.143)**

Component	Design and Construction	Materials¹	Welding	Inspection and Testing
Pressure Vessels and Tanks (>15 psig)	ASME Code BPVC Div. 1 or Div.2	ASME Code Section II	ASME Code Section IX	ASME Code Section VIII, Div. 1 or Div.2
Atmospheric Tanks	API 650	ASME Code ³ Section II	ASME Code Section IX	API 650
0-15 psig Tanks	API 620	ASME Code ³ Section II	ASME Code Section IX	API 620
Heat Exchangers	TEMA STD, 8th Edition ; ASME Code BPVC Section VIII, Div. 1 or Div. 2	ASTM B359-98 or ASME Code Section II	ASME Code Section IX	ASME Code Section VIII, Div. 1 or Div. 2
Piping and Valves	ANSI/ASME B31.3 ^{5,6}	ASME Code Section II ⁷	ASME Code Section IX	ANSI/ASME B31.3
Pumps	API 610; API 674 ; API 675 ; ASME BPVC Section VIII, Div.1 or Div.2	ASTM A571-84 (1997) or ASME Code Section II	ASME Code Section IX	ASME BPVC Code ² Section III, Class 3
Flexible Hoses and Hose Connections for MRWP ⁴	ANSI/ANS-40.37	ANSI/ANS-40.37	ANSI/ANS-40.37	ANSI/ANS-40.37

Notes:

- (1) Manufacturer's material certificates of compliance with material specifications may be provided in lieu of certified material test reports as discussed in Regulatory Position 1.1.2 of Regulatory Guide 1.143
- (2) ASME Code stamp, material traceability, and the quality assurance criteria of ASME BPVC, Section III, Div.1, Article NCA are not required. Therefore, these components are not classified as ASME Code Section III, Class 3.
- (3) Fiberglass-reinforced plastic tanks may be used in accordance with appropriate articles of Section 10 of the ASME Boiler and Pressure Vessel Code for applications at ambient temperature.
- (4) Flexible Hoses should only be used in conjunction with Mobile Radwaste Processing Systems (MRWP).
- (5) Class RW-IIa and RW-IIb Piping Systems are to be designed as category "M" systems.
- (6) Classes RW-IIa, RW-IIb and RW-IIc are discussed in Regulatory Position 5 of Regulatory Guide 1.143.
- (7) ASME BPVC Section II required for Pressure Retaining Components.