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MFN 06-311, Supplement 1

Docket No. 52-010

August 31, 2007

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

Subject: **Response to Portion of NRC Request for Additional Information
Letter No. 54 Related to ESBWR Design Certification Application –
Radioactive Waste Management Systems – RAI Numbers 11.2-5S01
and 11.4-15S01**

Enclosure 1 contains GE-Hitachi Nuclear Energy Americas (GEH) response to the subject NRC RAIs transmitted via Reference 1. Enclosure 2 contains the DCD Markups associated with this response.

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

Sincerely,



James C. Kinsey
Project Manager, ESBWR Licensing



NRO

Reference:

1. MFN 06-302 – Letter from US Nuclear Regulatory Commission (NRC) to David H. Hinds, *Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application*, dated August 23, 2006

Enclosures:

1. Response to NRC Request for Additional Information Letter No. 54 Related to ESBWR Design Certification Application – Radioactive Waste Management Systems, RAI Numbers 11.2-5S01 and 11.4-15S01
2. DCD Markups

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GEH /San Jose (with enclosures)
RE Brown GEH /Wilmington (with enclosures)
eDRF 0070-2471 for RAI 11.2-5S01
 0073-6504 for RAI 11.4-15S01

Enclosure 1

MFN 06-311, Supplement 1

**Response to Portion of NRC Request for
Additional Information Letter No. 54
Related to ESBWR Design Certification Application**

Radioactive Waste Management Systems

RAIs 11.2-5S01 and 11.4-15S01

NRC RAI 11.2-5 S01:

In RAI 11.2-5, the staff requested that the applicant revise Table 11.2-1 to reflect the guidance of RG1.143, Revision 2 for tanks rated in the 0-15 PSI range. In its response, the applicant agreed to revise the table to comply with the RG. The staff reviewed the revised table attached to the applicant's response letter, and Revision 3 of the DCD Tier 2. The staff found that the applicant retained a footnote that adds the use of fiberglass reinforced tanks which are constructed in accordance with the requirements of ASME BPVC Section X. Based on the same reasons discussed in the above evaluation for the RAI 11.2-4 response, the staff finds RAI 11.2-5 response not acceptable.

GEH Response:

Note 3 on table 11.2-1 will be deleted. GEH has chosen to eliminate the use of fiberglass-reinforced tanks in the design of the ESBWR liquid radioactive waste tanks.

DCD Impact:

DCD Tier 2, Table 11.2-1 will be revised as noted on the attached markup, and will be provided in DCD Tier 2, Revision 4.

NRC RAI 11.4-15 S01:

The staff reviewed the applicant's response to RAI 11.4-15, and finds the response not acceptable. The safety significance of the SWMS is at the same level as the liquid waste management system and gaseous waste management system. The level of detail for the SWMS in ITAAC should be similar to the liquid waste management system and gaseous waste management system, which include an ITAAC table to describe "design commitment, inspection, tests, and analyses, and acceptance criteria, and a process diagram.

GEH Response:

The Inspections, Tests, Analyses and Acceptance Criteria (ITAACs) that are provided for the liquid and gaseous waste management systems (LWMS or GWMS) include requirements for proper operation of radiation monitor alarms and a requirement to ensure that the discharge valves close upon high radiation monitor signals, thus, precluding inadvertent discharges to the environment. GEH disagrees that the SWMS safety significance is the same level of safety significance as the LWMS and GWMS since both LWMS and GWMS have automatic shutoff features to preclude discharges to the environment. The Solid Waste Radioactive Management System (SWMS) is based primarily on the collection, handling, processing and packaging of waste that does not have similar components that close valves based upon a high radiation signal. The Process Control Program is developed in accordance with 10CFR Part 61, and is the primary program that ensures that waste is minimized, and spills and leaks are precluded. Collection of waste through the use of 55 gallon drums, High Integrity Containers (HICs), casks and other collection devices is performed in accordance with the PCP program. Concurrently, the Radiation Protection Program ensures that doses to waste collection workers are as low as reasonably achievable (ALARA). As stated in DCD Tier 2, Revisions 3, Subsection 11.4.1, the SWMS is located in the radwaste building and consists of the following four subsystems:

- Wet solid waste collection subsystem;
- Mobile wet solid waste processing subsystem;
- Dry solid waste accumulation and conditioning subsystem, and
- Container storage subsystem.

The SWMS Process Diagram depicting all four subsystems is provided in Figure 11.4-1. The radwaste building general arrangement drawing are provided in Figures 1.2-21 through 1.2-25. The SWMS component capacities are provided in Table 11.4-1. The estimated annual shipped waste volumes generated from the SWMS subsystems are provided in Table 11.4-2. The SWMS has the capability to process wastes at rates higher than shown in Table 11.4-2. The SWMS Spent Resin Sludge Transfer System is shown on Figure 11.4-2. The SWMS Solid Radwaste Dewatering System is shown on Figure 11.4-3. Process and effluent radiological monitoring systems are described in

Section 11.5. Therefore, the process diagrams for the SWMS are adequately described in the DCD Tier 2.

DCD Tier 2 COL applicant item 11.4.6.3 requires the license applicant to have a Process Control Program. The template PCP program will have an associated milestone date for plant specific implementation of the applicant's PCP program that is specified in the COL application. Further, DCD Tier 2, Revision 3, Subsection 14.2.8.1.62 currently requires that the SWMS receive a preoperational test that includes proper operation of equipment and controls, protective features, alarms, instrumentation, proper operations for packaging and concentrating waste, proper operation of filters and demineralizers, drains, and sumps to name a few. Therefore, with a COL applicant item to establish a PCP in accordance with 10CFR20, Appendix G, 40CFR Part 190, 10CFR61.55 and 10CFR61.56, and the requisite preoperational test, the SWMS is adequately tested and operated in accordance with applicable regulations, program and procedures.

DCD Impact:

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

Enclosure 2

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DCD Markups

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

Component	Design and Construction	Materials ¹	Welding	Inspection and Testing
Pressure Vessels and Tanks (>15 psig)	ASME Code BPVC Section VIII Div.1 or Div.2	ASME Code Section II	ASME Code Section IX	ASME Code Section VIII, Div.1 or Div.2
Atmospheric Tanks ⁷	API 650	ASME Code ³ Section II	ASME Code Section IX	API 650
0-15 psig Tanks ⁷	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 _{64, 5}	ASME Code Section II ⁷ II ⁶	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 MRWP ³	ANSI/ANS-40.37	ANSI/ANS-40.37	ANSI/ANS-40.37	ANSI/ANS-40.37

Notes for Table 11.2-1:

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.~~
43. Flexible Hoses should only be used in conjunction with Mobile Radwaste Processing Systems (MRWP).
54. Class RW-IIa and RW-IIb Piping Systems are to be designed as category "M" systems.
65. Classes RW-IIa, RW-IIb and RW-IIc are discussed in Regulatory Position 5 of Regulatory Guide 1.143.
76. ASME BPVC Section II required for Pressure Retaining Components.
7. Per Regulatory Guide 1.143, tank design and fabrication are in accordance with ASME Section III, Class 3; API 620; API 650 or American Water Works Association (AWWA) D-100, depending on design requirements.