



GE Energy

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MFN 06-123

Docket No. 52-010

May 8, 2006

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

**Subject: Response to NRC Request for Additional Information Letter No. 15  
Related to ESBWR Design Certification Application – RWCU/SDC  
System – RAI Numbers 5.4-8 through 5.4-10**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter. This completes GE's response to RAI Letter Number 15.

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

Sincerely,

David H. Hinds  
Manager, ESBWR

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Enclosure:

1. MFN 06-123 - Response to NRC Request for Additional Information Letter No. 15 Related to ESBWR Design Certification Application – RWCU/SDC System – RAI Numbers 5.4-8 through 5.4-10

Reference:

1. MFN 06-102, Letter from U. S. Nuclear Regulatory Commission to Mr. David H. Hinds, *Request for Additional Information Letter No. 15 Related to ESBWR Design Certification Application*, March 30, 2006

cc: WD Beckner USNRC (w/o enclosures)  
AE Cabbage USNRC (with enclosures)  
LA Dudes USNRC (w/o enclosures)  
GB Stramback GE/San Jose (with enclosures)  
eDRF 0000-0053-5860

MFN 06-123  
Enclosure 1

**ENCLOSURE 1**

**MFN 06-123**

**Response to NRC Request for Additional Information Letter  
No. 15 Related to ESBWR Design Certification Application  
RWCU/SDC System – RAI Numbers 5.4-8 through 5.4-10**

NRC RAI 5.4-8

*Describe how the effects of high and moderate energy piping failures outside the primary containment were evaluated in the RWCU/SDC design to ensure that the other safety-related systems and equipment will not be made inoperable.*

GE Response

The evaluation of RWCU/SDC system high and moderate energy piping failures outside the primary containment is documented in the following DCD Sections:

DCD Section 3.6 provides description of protection against dynamic effects associated with postulated rupture of piping outside containment for moderate and high energy piping.

DCD Section 3.6.1.2 refers to Tables 3.6.4 which identifies the high-energy piping located outside the containment includes RWCU/SDC System piping.

In DCD Section 3.6.2.1, under the heading "Postulated Pipe Breaks and Cracks" second paragraph provides the description of the piping beyond the second containment isolation valve subjected to reactor pressure during plant operation that are analyzed for potential damage resulting from dynamic effects. RWCU/SDC system piping outside the containment beyond the second isolation valve subjected to reactor pressure are included in the analysis.

DCD Section 6.2.3.2 describes the RWCU/SDC system compartments outside the containment and the model used for analyzing the design basis RWCU/SDC compartment break.

DCD Section 6.2.3.3 provides the RWCU/SDC system compartment pressurization analysis due to high energy line break and results.

DCD Section 3H.3.2, Table 3H-9 in Appendix 3H provides the equipment qualification design environmental conditions in the reactor building for accident conditions. These design condition(s) consider breaks in the RWCU/SDC system outside the containment as is stated in Section 3H.3.2.

Since there is no safety-related equipment in the RWCU/SDC system compartments, there is no jet impingement due to system pipe failures on safety-related equipment. The safety-related equipment is environmentally qualified for the accident conditions in the reactor building.

NRC RAI 5.4-9

*Demonstrate the capability of safety-related systems to withstand the effects of internally-generated missiles resulting from RWCU/SDC system, both inside and outside the primary containment*

GE Response

DCD Section 3.5 includes the evaluation of safety-related systems to withstand the effects of internally-generated missiles both inside and outside the containment. In particular Section 3.5.1.1.1 includes consideration of missiles from rotating equipment such as RWCU/SDC pumps and Section 3.5.1.1.2.2.6 describes design of blowout panels such as RWCU/SDC system compartment blowout panels. As per evaluation in the above Sections of the DCD, there is no concern about internally-generated missiles resulting from RWCU/SDC system effecting the safety-related equipment

NRC RAI 5.4-10

*Demonstrate the capability of structures housing the RWCU/SDC including safety-related components and instrument inside these structures to withstand external and internal flood conditions.*

GE Response

The RWCU/SDC system components are housed in the containment and the reactor building. The internal and external flooding evaluation is described in Section 3.4 and its subsections. The following changes will be made in Revision 2 of the DCD to emphasize the effect on safety-related equipment:

Section 3.4.1.3, last paragraph will be revised to read as follows:

“All safety-related equipment within the Containment that must operate during or after a design basis accident is qualified for LOCA environmental conditions. Flooding associated with the postulated failure of any moderate energy pipe is within the bounds of the LOCA qualification. Consequently, no detailed evaluation of this less severe event is required to verify the effect on safety-related equipment or safe plant shutdown capability as a result of moderate energy piping failures in the Containment.”

Section 3.4.1.4, last paragraph will be revised to read as follows:

“Safety-Related equipment and ~~Equipment~~ equipment necessary for safe shutdown is located above the maximum flood height or is qualified for flood conditions. Accordingly, flooding due to moderate energy pipe failure or fire fighting or other flooding sources does not affect any safety-related equipment and the ability to safely shut down the plant.”

Section 3.4.1.4.2, sixth paragraph will be revised to read as follows:

“This results in a flood level of 20 cm (8 in) in the RB lower elevation. This maximum flood level is lower than the CRD Hydraulic Control Unit (HCU) room elevation. Other safety-related components in the lower elevation are located above the maximum flood level. Therefore, no flood in this RB elevation could affect the safety-related equipment or plant's safe shutdown capacity.”