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MFN 06-473 Supplement 1

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**Subject: Response to Portion of NRC Request for Additional
Information Letter No. 79 Related to ESBWR Design
Certification Application - Containment Systems -
RAI Number 6.2-127 S01**

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the subject NRC RAI originally transmitted via the Reference 1 letter and supplemented by an NRC request for clarification in Reference 2.

If you have any questions or require additional information, please contact me.

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

*Doc 8
NRC*

References:

1. MFN 06-393, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 79 Related to ESBWR Design Certification Application*, October 11, 2006
2. E-Mail from Shawn Williams, U.S. Nuclear Regulatory Commission, to George Wadkins, GE Hitachi Nuclear Energy, dated May 30, 2007 (ADAMS Accession Number ML071500023)

Enclosure:

1. MFN 06-473 Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 79 - Related to ESBWR Design Certification Application - Containment Systems - RAI Number 6.2-127 S01

cc: AE Cabbage USNRC (with enclosures)
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GB Stramback GEH/San Jose (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
eDRF 0000-0074-1858

Enclosure 1

MFN 06-473 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 79

Related to ESBWR Design Certification Application

Containment Systems

RAI Number 6.2-127 S01

NRC RAI 6.2-127:

DCD Tier 2, Revision 1, Section 6.2.4.3.2.2, "Effluent Lines from Containment," under the heading "Process Radiation Monitoring System," states that all of the CIVs are located outside containment "for easy access" and that the "piping to these valves is considered an extension of the containment boundary." These design statements are deficient, as discussed in RAIs 6.2-123 and 6.2-126. Provide in the DCD a detailed description of the Process Radiation Monitoring System's conformance with the guidelines discussed in RAIs 6.2-123 and 6.2-126.

GEH Response:

The Drywell Fission Monitoring Radiation Monitoring Subsystem of the Process Radiation Monitoring takes a continuous air sample from the containment drywell, analyzes it, and routes it back to the containment via isolation valves that are located outside the containment. These sample lines are designed in accordance with Regulatory Guide 1.11. The line sizes are approximately 25 mm (1 inch) in diameter (similar to instrument lines) and meet the Quality Group B requirements as identified in DCD Table 3.2-1. There are dual solenoid valves on these lines, two on both inlet and outlet, and they perform the containment isolation function. Due to the small diameter of these lines, GE considers these lines to be acceptable as they are in accordance with Regulatory Guide 1.11.

DCD Impact:

DCD Subsection 6.2.4.3.2.2 will be revised in the next update as noted on the attached markup.

NRC RAI 6.2-127 S01:

RAI 6.2-127 questioned the design of the Process Radiation Monitoring System, in that all of the containment isolation valves (CIVs) are outside of containment. The applicant responded that the lines, 1 in (25 mm) in diameter, should be treated as instrument lines and that the design was acceptable because it was in accordance with RG 1.11, "Instrument Lines Penetrating Primary Reactor Containment."

Supplemental Request:

The staff accepts the classification of these lines as instrument lines. However, there is not enough information to conclude that they comply with RG 1.11.

RG 1.11, section C.2, states that the lines should have one CIV inside and one outside containment (which they do not), or else conform to sections 1.b. through 1.e. The staff needs more information to determine if the lines satisfy each of these provisions, but notes, for example, that 1.c. states, in part, that the CIVs should fail as-is, whereas DCD, Tier 2, Revision 3, Table 6.2-42 states that they fail closed. Provide in the DCD a

discussion showing that these lines conform to RG 1.11, or, if not, the requirements for non-instrument lines.

GEH Response:

The ESBWR design has been changed to include Containment Isolation Valves on the Drywell Fission Product Radiation Monitoring System (subsystem of the Process Radiation Monitoring System) incoming line, and also on the return to drywell line to comply with Regulatory Guide 1.11. These containment isolation valves will remain open all the time and shall be designed to fail in "As-is" condition. Instrument lines are discussed in DCD Tier 2, Subsection 6.2.4.2.2.

A new DCD Tier 2, Figure 6.2-30, will be added to show these isolation valves. DCD Tier 2, Tables 3.9-8 and 6.2-42, will also be revised to include both inboard and outboard containment isolation valves.

DCD Impact:

DCD Tier 2, Tables 3.9-8 and 6.2-42 will be revised, and a new DCD Tier 2, Figure 6.2-30 will be added, as shown in the attached markup.

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Design Control Document/Tier 2

Table 3.9-8
In-Service Testing

No.	Qty	Description (a)	Valve Type (i)	Act (b)	Code Class (a)	Code Cat. (c)	Valve Func. (d)	Norm Pos	Safety Pos.	Fail Safe Pos	C I V	Test Para (e)	Test Freq. (f)
D11 Process Radiation Monitoring System Valves													
F001	1	Drywell Fission Product Monitoring Line Inboard isolation Valve	GB	SO	2	A	A	O	C	As-Is	Y	SC FC P L	3 mo 3 mo 2 yrs App J
F002	1	Drywell Fission Product Monitoring Line Outboard isolation Valve	GB	SO	2	A	A	O	C	As-Is	Y	SC FC P L	3 mo 3 mo 2 yrs App J
F003	1	Drywell Fission Product Monitoring Line Inboard/Outboard isolation Valve	GB	SO	2	A	A	O	C	As-Is	Y	SC FC P L	3 mo 3 mo 2 yrs App J
F004	1	Drywell Fission Product Monitoring Line Outboard/Inboard isolation Valve	GB	SO	2	A	A	O	C	As-Is	Y	SC FC P L	3 mo 3 mo 2 yrs App J

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Design Control Document/Tier 2

Table 6.2-42

Containment Isolation Valve Information for the Process Radiation Monitoring System

Penetration Identification	D11-MPEN-0001 ⁴¹		D11-MPEN-0002 ⁴²	
	Valve No.	F001	F002	F003
Applicable Basis	GDC 56	GDC 56	GDC 56	GDC 56
Tier 2 Figure	6.2-30N/A	6.2-30N/A	6.2-30N/A	6.2-30N/A
ESF	No	No	No	No
Fluid	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂
Line Size	25 mm	25 mm	25 mm	25 mm
Type C Leakage Test	Yes	Yes	Yes	Yes
Pipe Length from Cont. to Inboard/Outboard Isolation Valve	See Sub-section 6.2.4.2	See Sub-section 6.2.4.2	See Sub-section 6.2.4.2	See Sub-section 6.2.4.2
Leakage Through Packing ^(a)	(a ₁)	(a ₁)	(a ₁)	(a ₁)
Leakage Past Seat ^(b)	(b ₂)	(b ₂)	(b ₂)	(b ₂)
Location	Out Inboard	Outboard	Out Inboard	Outboard
Valve Type	GB, QT	GB, QT	GB, QT	GB, QT
Operator ^(c)	SO	SO	SO	SO
Normal Position	Open	Open	Open	Open
Shutdown Position	Closed Open	Closed Open	Closed Open	Closed Open
Post-Acc Position	Closed Open	Closed Open	Closed Open	Closed Open
Power Fail Position	Closed As-is	Closed As-is	Closed As-is	Closed As-is
Cont. Iso. Signal ^(d)	C,H,T	C,H,T	C,H,T	C,H,T
Primary Actuation	Automatic	Automatic	Automatic	Automatic
Secondary Actuation	Remote manual	Remote manual	Remote manual	Remote manual

⁴¹ Valve F001 in series with F002.

⁴² Valve F003 in series with F004.

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Design Control Document/Tier 2

Table 6.2-42

Containment Isolation Valve Information for the Process Radiation Monitoring System

Penetration Identification	D11-MPEN-0001 ⁴¹		D11-MPEN-0002 ⁴²	
	F001	F002	F003	F004
Valve No.	F001	F002	F003	F004
Closure Time (sec.)	< 5	< 5	< 5	< 5
Power Source	Div. 2, 4	Div. 1, 3	Div. 2, 4	Div. 1, 3

Note: For explanation of codes, see legend on Table 6.2-15.

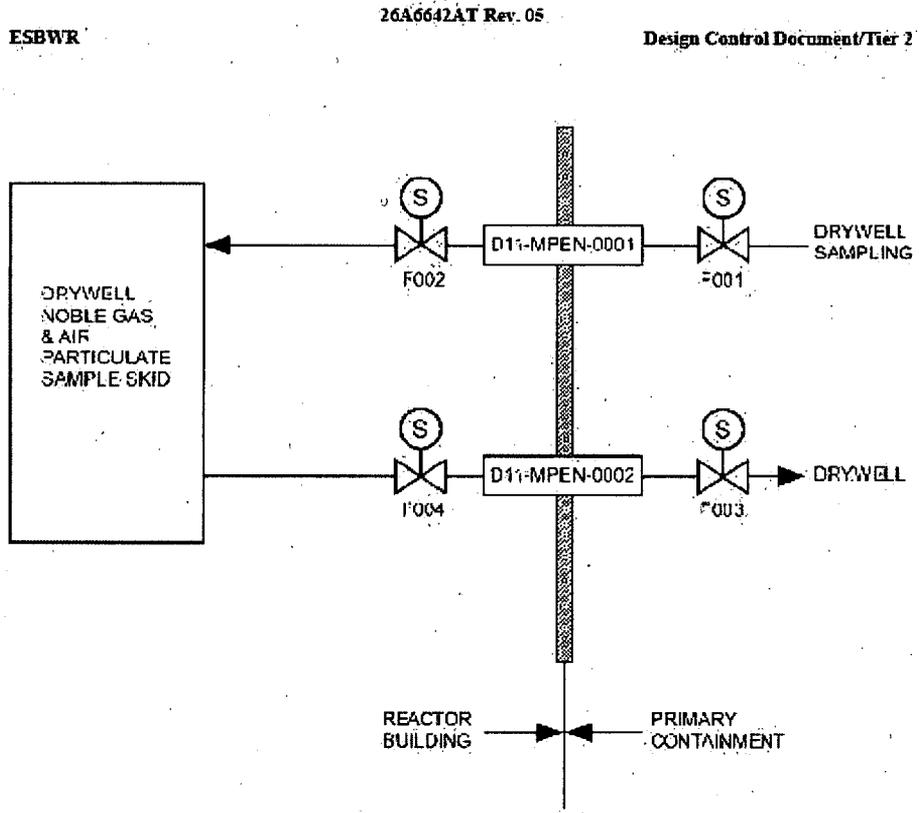


Figure 6.2-30. Drywell Fission Product Radiation Monitoring Subsystem