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

MFN 07-246

Docket No. 52-010

May 14, 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. 96 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-113 through 16.2-117**

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

D068

Reference:

1. MFN 07-231, Letter from U.S. Nuclear Regulatory Commission to Robert E. Browns, *Request for Additional Information Letter No. 96 Related to ESBWR Design Certification Application,* April 12, 2007

Enclosure:

1. MFN 07-246 – Response to Portion of NRC Request for Additional Information Letter No. 96 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-113 through 16.2-117

cc:	AE Cubbage	USNRC (with enclosures)
	DH Hinds	GE (with enclosures)
	RE Brown	GE (w/o enclosures)
	eDRFs	0067-2122, 0067-6848, 0067-4530/1, 0067-4172

Enclosure 1

MFN 07-246

Response to Portion of NRC Request for

Additional Information Letter No. 96

Related to ESBWR Design Certification Application

- Technical Specifications -

RAI Numbers 16.2-113 through 16.2-117

NRC RAI 16.2-113

Please revise the DCD to use consistent language for Action D of TS 3.3.6.4 and Function 10 of Table 3.3.6.4-1 "Reactor Building Boundary Isolation Dampers," which are not "containment isolation valves."

GE Response

DCD Chapter 16, Technical Specification (TS) 3.3.6.4, Actions will be revised in Revision 4 to include a new Condition E that is specific to the reactor building boundary isolation dampers. The existing Conditions E through H will be renumbered as Conditions F through I, respectively. Table 3.3.6.4-1 will be revised to reflect the changes in Condition numbering and indicate applicability of Condition E to the Reactor Building Isolation Function. DCD Chapter 16B will also be revised to incorporate discussion of the new Condition E and to be consistent with the renumbering of existing Conditions.

DCD Impact

DCD Chapter 16 and Chapter 16B will be revised in Revision 4 as described above to include the following Condition;

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. As required by Required Action C.1 and referenced in Table 3.3.6.4-1.	E.1	Declare associated reactor building boundary isolation damper(s) inoperable.	Immediately

and supporting Bases;

E.1

If the affected actuation division cannot be verified to be in trip within the specified Completion Time or if isolation actuation capability cannot be restored within the specified Completion Time, plant operations may continue if the associated Reactor Building Boundary Isolation Damper(s) is declared inoperable immediately. Because isolation actuation is required to ensure that the dampers perform their intended function, sufficient remedial measures are provided by declaring the associated damper(s) inoperable.

NRC RAI 16.2-114

TS 3.7.6 "Selected Control Rod Run-In and Selected Rod Insertion Functions" is not in either Section 3.1 or Section 3.3, although it is related to automatic rod motion control and is an I&C system. Please clarify the reason this TS is not included in either of these sections, and if there is none, revise the DCD to fix the inconsistency.

GE Response

The Selected Control Rod Run-In (SCRRI) and Selected Rod Insertion (SRI) Functions are assumed to function during transient events that could result in a decrease in core coolant temperature (i.e., loss of feedwater heating, generator load rejection with turbine bypass, and turbine trip with turbine bypass). Power reduction from the electrical run-in and hydraulic insertion of selected control rods during these events mitigates the decrease in the MCPR during the event.

Decisions to place Specifications in one Section are not governed by any specific guidance and tend to be based on past precedent and similarity with other Specifications in the Section. As such, the LCO 3.7.6, "Selected Control Rod Run-In (SCRRI) and Selected Rod Insertion (SRI) Functions," are analogous to the Main Turbine Bypass System presented in ESBWR Technical Specification 3.7.4, "Main Turbine Bypass System" (and NUREG-1434, Revision 3.1, LCO 3.7.6, "Main Turbine Bypass System"). The Main Turbine Bypass System is assumed to function during transient events to mitigate the MCPR increase in reactor vessel pressure, which affects the MCPR. The turbine bypass valves (TBVs) are controlled by the pressure regulation function of the Steam Bypass and Pressure Control (SB&PC) System. The normally closed TBVs are opened by redundant signals from the SB&PC digital control system.

The operability of the SCRRI and SRI automatic logic functions remain required by the proposed Specification, whether the Specification is placed in Section 3.3 or 3.7. Any degradation in instrumentation function would require evaluation for operability impact on the SCRRI and SRI system function and may result in entering the Actions of Specification 3.7.6. Similarly, the operability requirements for the control rod electrical insertion support system remains required by this Specification whether placed in Section 3.1 or 3.7.

The hydraulic insertion function is adequately addressed in LCO 3.1.3, "Control Rod OPERABILITY." However, since the hydraulic insertion function of LCO 3.1.3 would be considered a support system for the SCRRI and SRI function, Note 2 will be added to the Actions of LCO 3.1.3 to state: "Enter applicable Conditions and Required Actions of LCO 3.7.6, 'Selected Control Rod Run-In (SCRRI) and Selected Rod Insertion (SRI) Functions,' when inoperable control rods result in inoperability of the SRI function." Conforming Bases changes will also be made. This is modeled after Note 3 in Specification 3.6.1.3, "Containment Isolation Valves," to ensure appropriate remedial actions are taken, if necessary, if the SRI function is rendered inoperable by an inoperable control rod(s). Pursuant to LCO 3.0.6, these ACTIONS are not required even when the associated LCO is not met. Therefore, Note 2 is added to LCO 3.1.3 Actions to require the proper actions be taken.

Since the overall system function and basis for operability is analogous to Specification 3.7.4, "Main Turbine Bypass System," the presentation in Section 3.7 is justified.

DCD Impact

DCD Tier 2, Chapter 16, Specification 3.1.3 Actions Note will be revised as shown below, and conforming changes will also be made to Chapter 16B, Bases, in Revision 4 to the ESBWR DCD.

ACTIONS

- NOTES -

1. Separate Condition entry is allowed for each control rod.

2. Enter applicable Conditions and Required Actions of LCO 3.7.6, "Selected Control Rod Run-In (SCRRI) and Selected Rod Insertion (SRI) Functions," when inoperable control rods result in inoperability of the SRI function.

NRC RAI 16.2-115

Note 1 to ACTIONS of TS 3.3.3.2, "Remote Shutdown System," and the same note in Required Actions A.1 and B.1 of TS 3.3.2.1, "Control Rod Block Instrumentation," states:

"LCO 3.0.4.c is applicable."

This is unclear. Please rephrase the note (global comment).

GE Response

DCD Chapter 16, Specification 3.3.2.1, "Control Rod Block Instrumentation," Actions A.1 and B.1 and the associated Bases will be revised to delete the Notes stating that "LCO 3.0.4.c is applicable."

DCD Chapter 16, Specification 3.3.3.2, "Remote Shutdown System," Actions Note 1 and the associated Bases will be revised to delete the Note stating that "LCO 3.0.4.c is applicable."

There is one other occurrence of the LCO 3.0.4.c applicability Note in DCD, Revision 3, Chapter 16. Specification 3.4.3, "RCS Specific Activity," Required Action A.1 also contains a Note stating that "LCO 3.0.4.c is applicable;" however, the application of this Note is consistent with NUREG-1434, Revision 3.1, TS 3.4.8, "RCS Specific Activity," and is retained.

DCD Impact

DCD Chapter 16 and Chapter 16B will be revised in Revision 4 as described above and as shown below.

Specification 3.3.2.1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Automated Thermal Limit Monitor (ATLM) channel inoperable.	~~- NOTE -~~ ~~LCO 3.0.4.c is applicable.~~ A.1 Restore the inoperable ATLM channel to OPERABLE status.	7 days
B. One Rod Worth Minimizer (RWM) channel inoperable.	~~- NOTE -~~ ~~LCO 3.0.4.c is applicable.~~ B.1 Restore the inoperable RWM channel to OPERABLE status.	7 days

Specification 3.3.3.2

ACTIONS

- NOTES -

1. ~~LCO 3.0.4.c is applicable.~~

~~2.~~ Separate Condition entry is allowed for each Function.

Bases 3.3.2.1, page B 3.3.2.1-5

ACTIONS (continued)

~~A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE while relying on the ACTIONS. This allowance is acceptable since the probability of an event is low during the short 7 day Completion Time, has been shown to be acceptable by Reference 4, and the ability exists to restore ATLM to OPERABLE status while the plant remains at, or proceeds to power operation.~~

B.1

With one RWM channel inoperable, the remaining OPERABLE channel is adequate to perform the control rod block function; however, overall reliability is reduced because a single failure in the remaining OPERABLE channel can result in no control rod block capability for the RWM. For this reason, Required Action B.1 requires restoration of the inoperable channel to OPERABLE status. The 7 day Completion Time for restoring RWM to OPERABLE status is based on the low probability of an event occurring coincident with a failure in the remaining OPERABLE channel.

~~A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE while relying on the ACTIONS. This allowance is acceptable since the probability of an event is low during the short 7 day Completion Time, has been shown to be acceptable by Reference 4, and the ability exists to restore RWM to OPERABLE status while the plant remains at, or proceeds to power operation.~~

Bases 3.3.3.2, page B 3.3.3.2-4

ACTIONS

~~The ACTIONS are modified by two Notes. Note 1 has been provided to permit the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(S) while relying on the ACTIONS. This allowance is acceptable since the Remote Shutdown System does not directly impact the operation of the plant and due to the low probability of utilizing the Remote Shutdown System.~~

A ~~second~~ Note ~~(Note 2)~~ has been provided to modify the ACTIONS related to Remote Shutdown System Functions. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable Remote Shutdown System Functions provide appropriate compensatory measures for separate Functions. As such, a Note has been provided that allows separate Condition entry for each inoperable Remote Shutdown System Function.

NRC RAI 16.2-116

For clarity, please revise the first sentence of the 5th paragraph of the Applicable Safety Analyses discussion in the Bases for TS 3.5.2 to state: The analysis described in Reference 4 indicates that 2 of the 8 injection branch lines (i.e., 1 GDCS injection train) and 1 of the 4 GDCS equalizing trains are capable of providing the minimum required short-term and long-term core cooling, respectively, following a LOCA.

GE Response

The Applicable Safety Analyses discussion in the Bases for TS 3.5.2, "Gravity-Driven Cooling System (GDCS) - Operating," will be revised consistent with the recommendation in this RAI.

DCD Impact

The Applicable Safety Analyses section of DCD Chapter 16B, TS 3.5.2, "Gravity-Driven Cooling System (GDCS) - Operating," will be changed in Revision 4 as follows:

> The analysis described in Reference 4 indicates that ~~only~~ 2 of the 8 injection branch lines (i.e., 1 GDCS injection train) and ~~only~~ 1 of the 4 GDCS equalizing trains are capable providing the minimum required short-term and long-term core cooling following a LOCA.

NRC RAI 16.2-117

Please revise TS 3.8.1, Required Action A.3, to state: "Restore required battery chargers to operable status."

GE Response

DCD Chapter 16, TS 3.8.1, "DC Sources - Operating," Required Action A.3 will be revised as recommended. The revised Required Action A.3 will state: "Restore required battery chargers to OPERABLE status." No changes to the associated Bases are required to support this change.

DCD Impact

DCD Chapter 16, TS 3.8.1, "DC Sources - Operating," Required Action A.3, will be revised in Revision 4 as shown below:

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
	A.3	Restore required battery chargers to OPERABLE status.	72 hours