



GE Energy

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MFN 06-322

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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional Information
Letter No. 50 Related to ESBWR Design Certification Application –
Initial Test Program – RAI Numbers 14.2-13 and 14.2-14**

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 "David H. Hinds for".

David H. Hinds
Manager, ESBWR

D068

Reference:

1. MFN 06-300, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 50 Related to ESBWR Design Certification Application*, August 16, 2006

Enclosure:

1. MFN 06-322 – Response to Portion of NRC Request for Additional Information Letter No. 50 Related to ESBWR Design Certification Application – Initial Test Program – RAI Numbers 14.2-13 and 14.2-14

cc: AE Cabbage USNRC (with enclosures)
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ENCLOSURE 1

MFN 06-322

**Response to Portion of NRC Request for
Additional Information Letter No. 50
Related to ESBWR Design Certification Application
Initial Test Program
RAI Numbers 14.2-13 and 14.2-14**

NRC RAI 14.2-13

Section 1.n.(11) of RG 1.68 states that the initial test program should include the test of the compressed gas systems used to support the normal operation of the facility or are essential for the operation of standby safety equipment or engineered safety features in its pre-operational phase. The test program should include verification of redundancy and electrical independence of the compressed gas system. RG 1.68.3, "Preoperational Testing of Instrument and Control Air Systems," provides guidance for conducting pre-operational testing of the instrument and control air systems. Regulatory position 9 of RG 1.68.3 calls for tests to demonstrate that air supplies such as the service air (SA) supply is not inadvertently tied into the instrument air (IA) system.

Consistent with the above RG:

- (a) Specify whether the redundancy and electrical independence of the IA and SA Systems will be verified as part of the system pre-operational test; and*
- (b) Specify whether a demonstration that the IA system and the SA system cannot be inadvertently interconnected will be conducted as part of the Instrument Air and Service Air Systems preoperational test.*

If these tests will be performed, provide the appropriate test descriptions in the DCD Tier 2, Section 14.2.8.1.19. Otherwise, provide adequate justification for not performing the tests.

GE Response:

- (a) In ESBWR, the IA and SA systems are nonsafety-related and are not required to function during any design basis event to ensure proper functioning of safety-related equipment. For additional information, see the response to RAI 3.2-46, which was provided in GE letter MFN 06-308, dated September 8, 2006. Thus, as nonsafety-related systems, these systems are not required to have redundancy and electrical independence to support the safety design basis of the plant. However, from the standpoint of plant investment protection, these systems are designed with redundant compressors that automatically start if low air supply pressure is detected. The redundant compressors in each system are powered from separate plant investment protection (PIP) buses, thus providing electrical independence as well. Preoperational tests will be performed to ensure that the backup compressors in each system will start as expected from their assigned power buses.
- (b) The SA system provides backup air to the IA system in ESBWR. The standby air compressor will automatically start when a low pressure switch at the instrument air receiver indicates low air supply pressure. Should the pressure in the IA system receiver continue to decrease to the low-low pressure set point, the pressure switch located downstream of the air receiver will automatically open the SA system backup supply line isolation valve to allow compressed air backup from the SA system. The ability of this logic to prevent inadvertent interconnection between the IA and SA systems will be verified during preoperational testing.

DCD Tier 2 Subsection 14.2.8.1.19 already discusses the testing mentioned above under the specific tasks mentioned below.

Redundancy and electrical independence are demonstrated as part of the tasks to verify "Proper operation of instrumentation and equipment in all combinations of logic and instrument channel trip", "Proper operation of compressors and motors in all design operating modes" and "Ability of compressor(s) to maintain receiver at specified pressure(s) and to recharge within specified time under design loading conditions."

Prevention of inadvertent interconnection between the IA and SA systems is demonstrated by a combination of the tasks to verify "Proper operation of instrumentation and equipment in all combinations of logic and instrument channel trip" and "Ability of the SAS to act as backup to the IAS."

No changes will be made to the DCD for this RAI.

NRC RAI 14.2-14

Identify changes to DCD section 14.2 resulting from recent change to AC distribution system.

GE Response:

GE has neither proposed nor made changes to the wording of our AC or DC system testing. The above referenced change was not to the ESBWR AC distribution system. The actual change deleted 480 VAC loads from the four divisions of DC supplied safety-related loads to increase the ampere hour duration of the division batteries. With the load deletion the inverters could be made 250VDC/208-120VAC instead of stepping up to 480VAC. This allowed eight safety-related 480VAC motor control centers to be deleted and four 480VAC/120VAC transformers, that were required to step down to 120VAC for safety-related instrument loads, to also be deleted. As stated above, deletion of un-needed transformers, motor control centers and changing inverter sizes does not change the AC electrical distribution, only the detail design of a specific system. Therefore, all current testing is still applicable to the ESBWR design in that there are no new design components that will cause an increase to the required scope of electrical system testing.

No DCD Tier 2 change will be made in response to this RAI.