



GE Energy

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Supplement 2

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**Subject: Response to Portion of NRC Request for Additional Information  
Letter No. 63 Related to ESBWR Design Certification Application -  
Technical Specifications - RAI Number 16.2-30 S01**

Enclosure 1 contains the subject supplemental RAI response resulting from a March 27, 2007 e-mail from the NRC. GE's original response was provided in the Reference 1 letter.

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

References:

1. MFN 07-022, Letter from Jim Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 63 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-23, 16.2-30, 16.2-45, 16.2-50, 16.2-54, 16.2-73, 16.2-74, 16.2-76, and 16.2-77*, January 19, 2007

Enclosures:

1. MFN 07-022, Supplement 2 - Response to Portion of NRC Request for Additional Information Letter No. 63 Related to ESBWR Design Certification Application - Technical Specifications - RAI Number 16.2-30 S01

cc: AE Cabbage USNRC (with enclosures)  
DH Hinds GE (with enclosures)  
RE Brown GE (w/o enclosures)  
eDRF 0000-0060-4199/2

**Enclosure 1**

**MFN 07-022, Supplement 2**

**Response to Portion of NRC Request for**

**Additional Information Letter No. 63**

**Related to ESBWR Design Certification Application**

**- Technical Specifications -**

**RAI Number 16.2-30 S01**

**NRC RAI 16.2-30:**

*The staff proposes the following additions the ESBWR TS Section 3.7.1, Emergency Breathing Air System (EBAS):*

- a. Add an "Action Item" as follows: ACTION CONDITION: Control room temperature not within limit REQUIRED ACTION: Restore control room air temperature to within limit COMPLETION TIME: "XX" hours (Applicant should provide completion time)*
- b. Provide a new SURVEILLANCE REQUIREMENTS (SR) 3.7.1.X1 for air quality of the air storage tanks to meet the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 and associated "FREQUENCY" of "7 days."*
- c. Restate SR 3.7.1.4 to state "Verify that each EBAS train maintains the control room boundary at a positive pressure of 31 Pascals (0.125 inches of W.G.) relative to the adjacent areas at the required air addition flow rate of 9.5 liter/second (100 scfm) ± tolerance limit (i.e 0.5 liter/second ( 5 scfm) using the safety related EBAS air storage tanks." Also, provide SR FREQUENCY as "24 months."*
- d. Provide a new SR 3.7.1.X2 for EBAS pressure relief isolation valves to state "Verify that each EBAS pressure relief isolation valve within the control room boundary is OPERABLE." Also, provide SR FREQUENCY as "In accordance with the Inservice Testing Program."*
- e. Provide a new SR 3.7.1.X3 for EBAS pressure relief dampers to state "Verify that each EBAS pressure relief damper is OPERABLE." Also, provide SR FREQUENCY as "24 months."*
- f. Provide a new SR 3.7.1.X4 for EBAS pressure regulating valves to state "Verify that pressure regulating valve in each EBAS train is OPERABLE." Also, provide "SR FREQUENCY" as "In accordance with the Inservice Testing Program."*
- g. Provide the associated BASES information in details for the above LCO Action Items and SRs in DCD Tier 2 Section B.3.7.1, "Emergency Breathing Air System (EBAS)."*
- h. In DCD Tier 2 Chapter 16, Technical Specifications 3.7.1, "Emergency Breathing Air System," the applicant did not provide a list of Codes and Standards used in Technical Specifications 3.7.1. The Technical Specifications Bases typically reference ASTM Standards, ASHRAE Standards, Regulatory Guides, the Code of Federal Regulations, and others. Therefore, the applicant should provide (as references) a list of Codes and Standards used in the Bases of Technical Specifications 3.7.1. The NRC staff expects a commitment to the latest revisions of the applicable Codes and Standards included in the DCD.*

**GE Response:**

GE is currently evaluating the Control Room Habitability Area Heating and Ventilation System (CRHAHVS) and Emergency Breathing Air System (EBAS) functional requirements and design as a result of continuing development of the control room habitability dose analyses. Because of these ongoing activities, it is anticipated that the CRHAHVS and EBAS design requirements may change in the near future affecting the response to each of the specific issues contained in

this RAI. It is the intent of GE to address each of the requested changes in this RAI in Revision 3 of DCD Chapter 16 and Chapter 16B, and to provide a supplemental response to this RAI at that time.

**NRC RAI 16.2-30 S01:**

*Comment on response to RAI 16.2-30 from MFN 07-022 (ADAMS accession number ML070320106):*

*The response to RAI 16.2-30 says that GE will submit a supplemental response to this RAI when Revision 3 to the DCD is submitted. We have not received this supplement and it was not listed in GE's letter on supplemental RAI responses schedules (MFN 07-143, ADAMS accession number ML070730652). When will we receive this supplement?*

**GE Response:**

The Emergency Breathing Air System (EBAS) has been deleted from the design of the Control Room Habitability Area (CRHA) Heating, Ventilation, and Air Conditioning (HVAC) Subsystem (CRHAVS). Instead of providing pressurized air from the EBAS to the CRHA, a new subsystem has been proposed consisting of two independent and redundant high efficiency air filtration subsystems, or Emergency Filtration Units (EFUs), for treatment of outside supply air. This design utilizing emergency supply air filtration for pressurization of the CRHA during radiological emergencies is similar to other existing commercial nuclear power plant control room habitability designs with some important improvements, primarily to minimize unfiltered air leakage during the emergency filtration mode of operation of the CRHAVS and to provide means to prevent the main control room temperature from exceeding the initial temperature by more than 8.3°C (15°F) in the first 72 hours following a loss of normal CRHA cooling event.

As a result of this design change, DCD Tier 2, Revision 3, Sections 6.4 and 9.4.1 were revised to reflect the new design of the CRHAVS, and appropriate changes were made in the DCD Tier 2, Revision 3, Chapter 16 and 16B Technical Specifications and Bases. The specific Chapter 16 and 16B changes made addressed the original RAI 16.2-30 questions where still applicable to the new design, with the changes made as consistent as possible to the equivalent Standard Technical Specifications in NUREG-1434, Revision 3.1, including the recently approved Technical Specification Task Force (TSTF) Traveler 448, Revision 3. In addition, specific Chapter 16 and 16B changes were made based on the revised CRHA radiological dose analyses assumptions required as a result of the new design of the CRHAVS.

The Technical Specifications and Bases revised in Chapter 16 and 16B in Revision 3 include Technical Specification 3.3.7.1 and Bases, "Control Room Habitability Area (CRHA) Heating, Ventilation, and Air Conditioning (HVAC) Subsystem (CRHAVS) Instrumentation," Technical Specification 3.3.7.2 and Bases, "Control Room Habitability Area (CRHA) Heating, Ventilation, and Air Conditioning (HVAC) Subsystem (CRHAVS) Actuation," and Technical Specification 3.7.2 and Bases, "Control Room Habitability Area (CRHA) Heating, Ventilation, and Air Conditioning (HVAC) Subsystem (CRHAVS)". In addition, a new Technical Specification 5.5.12, "Control Room Habitability Area (CRHA) Boundary Program," was added consistent with TSTF-448, Revision 3, to the extent applicable to the new design of the

CRHAVS, and a new Technical Specification 5.5.13, "Ventilation Filter Testing Program (VFTP)," was added consistent with NUREG-1434, Revision 3.1, Technical Specification 5.5.8, and TSTF-448, Revision 3, to the extent applicable to the new design of the CRHAVS. The specific details of these changes were provided in the change lists provided with DCD Tier 2, Revision 3, Chapter 16 and 16B.

In regards to the original NRC questions:

- a. A new ACTION A was added to Technical Specification 3.7.2 in DCD Tier 2, Revision 3, including CONDITION A stating "CRHA air temperature not within limit," REQUIRED ACTION A.1 stating "Restore CRHA air temperature to within limit," and a COMPLETION TIME of "72 hours." In addition, a new SURVEILLANCE REQUIREMENT (SR) 3.7.2.1 was added, stating "Verify average CRHA air temperature is  $\leq 25.6^{\circ}\text{C}$  ( $78.0^{\circ}\text{F}$ )" with a FREQUENCY of "24 hours." Also, to address the design features necessary to ensure the main control room air temperatures are controlled following initiation of the CRHAVS emergency filtration mode of operation, a new SR 3.7.2.5 was added, stating "Verify de-energization of the main control room Nonsafety-Related Distributed Control and Instrumentation System (N-DCIS) electrical loads on an actual or simulated initiation signal" with a FREQUENCY of "24 months." Appropriate Bases changes were made consistent with these new requirements.
- b. A new SR for air quality of the air storage tanks is no longer necessary since the EBAS has been deleted from the design. Instead, the SRs associated with the replacement EFUs and other CRHAVS components have been proposed consistent with the ESBWR design, NUREG-1434, Revision 3.1, and TSTF-448, Revision 3. Appropriate Bases changes were made consistent with these new requirements.
- c. A new SR for verifying that each EBAS train maintains the control room boundary at a positive pressure is no longer necessary since the EBAS has been deleted from the design. Instead, the SRs associated with the replacement EFUs and other CRHAVS components have been proposed consistent with the ESBWR design, NUREG-1434, Revision 3.1, and TSTF-448, Revision 3. Specifically, new SR 3.7.2.3 requires performance of CRHAVS filter testing in accordance with the newly proposed Ventilation Filter Testing Program (VFTP) required by new Technical Specification 5.5.13, and new SR 3.7.2.6 requires performance of CRHA unfiltered air leakage testing in accordance with the newly proposed CRHA Boundary Program required by new Technical Specification 5.5.12. Appropriate Bases changes were made consistent with these new requirements.
- d. A new SR for verifying OPERABILITY of the EBAS pressure relief isolation valves is no longer necessary since the EBAS has been deleted from the design. Instead, the SRs associated with the replacement EFUs and other CRHAVS components have been proposed consistent with the ESBWR design, NUREG-1434, Revision 3.1, and TSTF-448, Revision 3. Specifically, new SR 3.7.2.2 requires operation of each CRHAVS train every 31 days, and new SR 3.7.2.4 requires verifying that the CRHA isolation dampers and each CRHAVS train actuate on an actual or simulated initiation signal every 24 months. Appropriate Bases changes were made consistent with these new requirements.

- e. A new SR for verifying OPERABILITY of the EBAS pressure relief dampers is no longer necessary since the EBAS has been deleted from the design. Instead, the SRs associated with the replacement EFUs and other CRHAVS components have been proposed consistent with the ESBWR design, NUREG-1434, Revision 3.1, and TSTF-448, Revision 3. Specifically, new SR 3.7.2.2 requires operation of each CRHAVS train every 31 days, and new SR 3.7.2.4 requires verifying that the CRHA isolation dampers and each CRHAVS train actuate on an actual or simulated initiation signal every 24 months. Appropriate Bases changes were made consistent with these new requirements.
- f. A new SR for verifying OPERABILITY of the EBAS pressure regulating valves is no longer necessary since the EBAS has been deleted from the design. Instead, the SRs associated with the replacement EFUs and other CRHAVS components have been proposed consistent with the ESBWR design, NUREG-1434, Revision 3.1, and TSTF-448, Revision 3. Specifically, new SR 3.7.2.2 requires operation of each CRHAVS train every 31 days, and new SR 3.7.2.4 requires verifying that the CRHA isolation dampers and each CRHAVS train actuate on an actual or simulated initiation signal every 24 months. Appropriate Bases changes were made consistent with these new requirements.
- g. Appropriate Bases changes were made consistent with all requirements in the revised Technical Specification 3.7.2, and consistent as possible to the equivalent Standard Technical Specifications in NUREG-1434, Revision 3.1, and TSTF 448, Revision 3.
- h. Appropriate references to Codes and Standards were made in the Technical Specification 3.7.2 Bases consistent with all requirements in the revised Technical Specification 3.7.2, and consistent as possible to the equivalent Standard Technical Specifications Bases in NUREG-1434, Revision 3.1, and TSTF 448, Revision 3. In addition, the appropriate Codes and Standards related to the newly proposed VFTP required by new Technical Specification 5.5.13, and the newly proposed CRHA Boundary Program required by new Technical Specification 5.5.12, were referenced consistent with Standard Technical Specifications in NUREG-1434, Revision 3.1, and TSTF 448, Revision 3. The referenced Codes and Standards reflect the latest revisions approved by the NRC for these newly proposed requirements.

Based on the above discussions, no changes are required to DCD Tier 2, Revision 3, Chapters 16 and 16B, to address the original NRC questions.

**DCD Impact:**

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