



GE Energy

David H. Hinds
Manager, ESBWR

PO Box 780 M/C L60
Wilmington, NC 28402-0780
USA

T 910 675 6363
F 910 362 6363
david.hinds@ge.com

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Subject: **Response to Portion of NRC Request for Additional Information
Letter No. 68 – Electric Power – RAI Numbers 8.5-1 through 8.5-5**

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

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Reference:

1. MFN 06-379, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 68 Related to ESBWR Design Certification Application*, October 10, 2006

Enclosure:

1. MFN 06-427 – Response to Portion of NRC Request for Additional Information Letter No. 68 – Related to ESBWR Design Certification Application –Electric Power – RAI Numbers 8.5-1 through 8.5-5

cc: AE Cabbage USNRC (with enclosures)
GB Stramback/GE/San Jose (with enclosures)
eDRF 0000-0060-2016

ENCLOSURE 1

MFN 06-427

**Response to Portion of NRC Request for
Additional Information Letter No. 68
Related to ESBWR Design Certification Application
Electric Power
RAIs 8.5-1 and 8.5-5**

NRC RAI 8.5-1

DCD Tier 2 Section 9.4.1.1 states: "The Control Room Habitability Area (CRHA) is isolated during Station Blackout (SBO) conditions and the safety-related EBAS provides pressurization and breathing quality air." It is further stated in the above section that "The Main Control Room (MCR) temperature rise is limited by the CRHA envelope design to 8.3° C for 72-hours in an emergency mode of operation with a SBO event by passive cooling features." However the specific detail regarding what type of passive cooling features are employed to sustain the CRHA envelope design to a temperature rise of 8.3° C in 72-hours was not provided. Please, provide specific detail as to what type of passive cooling features are employed to sustain the CRHA envelope design to a temperature rise of 8.3° C in 72-hours. Also describe the use of any portable cooling devices such as portable fans, cooling coils, etc., powered from a portable generator needed during this 72-hour period.

GE Response

The Control Room heat is dissipated by conduction through the walls, floor and ceiling. No portable cooling devices are used in the Control Room and no portable generator is used to provide power to the Control Room during a SBO or an emergency mode of operation.

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

NRC RAI 8.5-2

DCD Tier 2 Section 8.1.5.2.4 Regulatory Requirements states: "The ESBWR does not require AC power to achieve safe shutdown. Thus, ESBWR meets the intent of Regulatory Guide 1.155. The Station Blackout evaluation is provided in Section 15.5." The performance evaluation for SBO based on TRACG to the requirements of 10 CFR 50.63 is presented in DCD Section 15.5.5, Station Blackout. However, it was not address how the ESBWR design conforms with Section 7.2.4, "Effects of Loss of Ventilation", of NUMARC-8700, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors" for 8-hours coping duration. Please provide coping assessment for 8-hour SBO duration concerning the loss of ventilation effects in accordance with Section 7.2.4 of NUMARC-8700.

GE Response

The ESBWR is designed to cope for 72 hours without AC power. NUMARC-8700, Section 7.2.4 is configured to determine the average steady state temperature in dominant areas containing the active equipment necessary to maintain safe shutdown during station blackout for existing non-passive BWR designs. The NUMARC-8700 is written around the assumption that the subject nuclear power plant has safety-related diesel-generators and active heat generating components. The passive components that perform the safety functions for the ESBWR design are all located within the containment and are designed to perform in the environment of their location. The procedure outlined by this section is not well suited to the ESBWR design, as the design does not include any active dominant components required for safe shutdown in the Reactor or Control Buildings.

The heat generating equipment required, for safe shutdown, are the 1E-DCIS, static inverters, 120 VAC distribution panels and batteries. The Reactor Building and Control Building will passively dissipate the small amount of heat generated by the 1E-DCIS components through conduction, for the duration of a SBO. An alternate computer thermal modeling method of calculating the room heat up temperature of the above listed passive components in the rooms/areas and Main Control Room will be employed for a 72-hour coping period.

Revision 3 to the DCD will provide the results of a heat up analysis for the control and reactor buildings as part of Appendix 3H.

NRC RAI 8.5-3

Identify/list all the air-operated valves (necessary for decay heat removal) that are required to be cycled to cope with an SBO event of 8-hour duration.

GE Response

No air-operated valves necessary for decay heat removal are required to be cycled to cope with a SBO for the designated 8-hour duration or for 72 hours. With a LOPP the valves will fail-safe or may be actuated through a DC source of power to the fail-safe position.

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

NRC RAI 8.5-4

Provide additional information to demonstrate that air operated valves required to cope with an SBO event have sufficient compressed air or can be manually operated under SBO conditions for the specified duration of 8 hours.

GE Response

Per response to RAI 8.5-3, no air-operated valve is required to be operated to cope with a SBO event during the specified duration of 8-hours.

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

NRC RAI 8.5-5

For air-operated valves that rely on manual operation as backup to the compressed air to cope with an SBO event, provide the following:

- *accessibility to the valves in an SBO event; and*
- *identification of the valves to be used in an SBO event.*

GE Response

No air-operated valves rely on manual operation to cope with a SBO event

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