

January 31, 2007

Mr. David H. Hinds, Manager, ESBWR
General Electric Company
P.O. Box 780, M/C J70
Wilmington, NC 28402-0780

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 92 RELATED TO
ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Hinds:

By letter dated August 24, 2005, General Electric Company (GE) submitted an application for final design approval and standard design certification of the economic simplified boiling water reactor (ESBWR) standard plant design pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed design.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. This RAI concerns Chapter 8, "Electrical Power," of Revision 2 of the ESBWR Design Control Document.

Chapter 8: 8.1-15 through 19; 8.2-12 and 13; and, 8.3-49 through 55.

To support the review schedule, you are requested to respond to this RAI by March 15, 2007.

If you have questions or comments concerning this matter, please contact me at (301) 415-0224 or tak@nrc.gov or you may contact Amy Cubbage at (301) 415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Thomas A. Kevern, Senior Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-0010

Enclosure: As stated

cc: See next page

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ACCESSION NO. ML070290375

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Distribution for DCD RAI Letter No. 92 dated January 31, 2007

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Requests for Additional Information (RAIs)
ESBWR Design Control Document (DCD) Tier 2, Revision 2, Chapter 8

RAI Number	Reviewer	Summary	Full Text
8.1-15	Morris G	Clarify generator breaker location.	Regarding DCD Tier 2, Revision 2, Figure 8.1-1, it is the staff's understanding that the generator breaker will be relocated back to the high voltage side of the generator step-up transformer. Please confirm.
8.1-16	Morris G	Clarify surveillance requirements for diesel generators.	DCD Tier 2, Revision 2, Table 8.1-1, Note 3, states the criteria of Regulatory Guide (RG) 1.6, RG 1.9, IEEE 308, IEEE 387 (and other references in the table) do not apply to the ESBWR because the plant investment protection (PIP) diesel generators (DGs) are not safety-related. Using the guidance in RG 1.9 and IEEE 387, please identify the surveillances that will apply to the PIP DGs.
8.1-17	Roughley W	Define safety systems, non-safety system, and Class 1E.	If not defined elsewhere in the DCD, please define the terms "safety systems," "non-safety system," and "Class 1E" as used in Chapter 8 and identify any differences with respect to the definitions in IEEE 308 and IEEE 603.
8.1-18	Roughley W	Clarify the battery sizing criteria.	<p>The battery sizing criteria appears to be inconsistent as stated in DCD Tier 2, Revision 2, Sections 8.1, 8.2, and 8.3. Confirm that the battery will be sized to envelop a worse case load profile that includes a loss of preferred power coincident with a design bases accident or abnormal event for 72 hours, and also is sufficient to support a 72-hour station blackout (SBO).</p> <p>Examples of different statements regarding battery sizing criteria are the following:</p> <ol style="list-style-type: none"> (1) Section 8.1.3.1 provides criteria stating that the batteries are sized to supply emergency power to the safety related systems for 72 hours in the event of loss of all AC power sources. (2) Section 8.2.2 states that for GDC 17 the DC power sources are provided to support passive cooling and containment safety-related functions without mention of the time. (3) Section 8.3.2.1.1 states that each battery supplies power to selected safety related loads for at least 72 hours following a licensing basis event without load shedding. The fourth paragraph states the batteries are each rated for 72-hour SBO conditions.

RAI Number	Reviewer	Summary	Full Text
8.1-19	Raughley W	Clarify whether the DC/AC inverters are part of the DC system.	DCD Tier 2, Revision 2, Section 8.1.3 excludes the DC/AC inverters from the DC system. However, in note 7 of DCD Tier 2, Revision 2, Table 8.1-1 the 1E UPS is included in the DC onsite applicability column.
8.2-12	Morris G	Clarify application of GDC-18.	DCD Tier 2, Revision 2, Section 8.2.2, Analysis, states that GDC-18 does not apply to ESBWR. GDC-18, Inspection and Testing of Electric Power Systems, applies to all electric power systems <u>important to safety</u> , not just safety-related systems. Therefore, GDC-18 is applicable to any part of the ESBWR electric system required to maintain the plant in a safe condition, even if not required until after 72 hours. Please discuss.
8.2-13	Morris G	Clarify degraded voltage protection.	Please clarify the description of degraded voltage protection. DCD Tier 2, Revision 2, Section 8.2.4.12 states that degraded voltage protection is described in Section 8.3.4.4; however, Section 8.3.1.1.2 describes degraded voltage protection on the Isolation Power Centers and also refers to Section 8.3.4.4. However, Section 8.3.4.4 only addresses protection of Class 1E motors that do not exist in the ESBWR design. It appears that Section 8.3.1.1.2 describes degraded voltage protection.
8.3-49	McConnell M	Address the capability of the proposed 72-hour battery and discuss the industry standards that will be applied	Provide additional details on design of the proposed 72-hour safety-related batteries including the expected service life. The battery standards in DCD Tier 2, Table 8.3-6 should agree with the battery design. Justify the use of any standards that have not been endorsed by the NRC.
8.3-50	Morris G	Address 480 volt supplies for battery chargers.	DCD Tier 2, Revision 2, Section 8.3.1.1.6, Bus Protection, should address the 480 volt input supplies for the division battery chargers and bypass transformers for the 120 V Class 1E buses.
8.3-51	Morris G	Clarify application of GDC-18.	DCD Tier 2, Revision 2, Section 8.3.1.1.8, Analysis, states that GDC-18 does not apply to ESBWR. GDC-18, Inspection and Testing of Electric Power Systems, applies to all electric power systems <u>important to safety</u> , not just safety-related systems. Therefore, GDC-18 is applicable to any part of the ESBWR electric system required to maintain the plant in a safe condition, even if not required until after 72 hours. Please discuss.
8.3-52	Morris G	Address battery load profile.	DCD Tier 2, Table 8.3-6 should identify an ESBWR common design load profile rather than defer the information as a COL item.

RAI Number	Reviewer	Summary	Full Text
8.3-53	Raughley W	Identify electrical equipment not previously used at nuclear plants.	Please identify any electrical equipment associated with the ESBWR design that was not previously used at US nuclear plants. The staff needs to know whether the ESBWR detailed design considers the use of electrical equipment for which regulatory documents do not currently exist.
8.3-54	Raughley W	Clarify the fast bus transfer.	Clarify the fast bus transfer from the reserve auxiliary transformer (RAT) to the unit auxiliary transformer (UAT). DCD Tier 2, Revision 2, Section 8.3.1.1 indicates that if the UAT is available, a manually selected fast bus transfer may be performed from the RAT to the UAT. The staff understands that normal practice is to accomplish this transfer by momentarily paralleling the transformers.
8.3-55	Raughley W	Clarify the unavailability of non-safety equipment credited in the analyses.	<p>Clarify the unavailability of non-safety equipment credited in the analyses for the following:</p> <p>A. Section DCD Tier 2, Revision 2, 8.3.1.1.2 states that a transportable AC generator is capable of supplying Class1E loads while recharging the Class 1E batteries. What is the outcome if the transportable AC generator is unavailable.</p> <p>B. Section DCD Tier 2, Revision 2, 8.3.1.1.7 takes credit for the non-safety DGs in the loss-of-coolant accident (LOCA) and loss of preferred power (LOPP) scenarios. What is the outcome if DGs are unavailable.</p>

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