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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 69 Related to ESBWR Design Certification Application –
Technical Specifications – RAI Numbers 16.2-82, 16.2-83, 16.2-84,
16.2-85, and 16.2-88**

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,

Bathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

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Reference:

1. MFN 06-381, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 69 Related to ESBWR Design Certification Application*, October 11, 2006

Enclosure:

1. MFN 07-023 – Response to Portion of NRC Request for Additional Information Letter No. 69 Related to ESBWR Design Certification Application – Technical Specifications – RAI Numbers 16.2-82, 16.2-83, 16.2-84, 16.2-85, and 16.2-88

cc: AE Cabbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRFs 60-4196, 60-4198

Enclosure 1

MFN 07-023

Response to Portion of NRC Request for

Additional Information Letter No. 69

Related to ESBWR Design Certification Application

Technical Specifications

RAI Numbers 16.2-82, 16.2-83, 16.2-84, 16.2-85, and 16.2-88

NRC RAI 16.2-82

Provide the basis for the proposed Completion Times in DCD Tier 2, Chapter 16, Rev. 1, TS Limiting Conditions for Operation (LCO) 3.8.1 CONDITION B and LCO 3.8.5 CONDITION A.

GE Response

Design Control Document (DCD) Tier 2, Revision 2, Chapter 8, "Electric Power," describes the current ESBWR design for safety-related electrical distribution. The ESBWR design consists of four divisions with two 72-hour batteries per division for a total of eight safety-related batteries. The ESBWR no longer includes 24-hour batteries. The ESBWR design ensures single failure tolerance is maintained when any three of the four divisions of DC and uninterruptible AC electrical power sources are operable and the associated distribution systems are energized. The design described is reflected in Revision 2 of DCD Tier 2, Chapter 16, "Technical Specifications," which requires operability of only three of the four DC and uninterruptible AC electrical divisions.

The revised LCO 3.8.1, "DC Sources – Operating," Condition B, applies when one or both DC sources (i.e., batteries and chargers) in any required division are inoperable and establishes a Completion Time (CT) of 24 hours for restoration of both DC sources to operable status. This 24-hour CT recognizes that there are significant differences between the ESBWR design and the design modeled in the BWR/6 Standard Technical Specifications (STS), NUREG-1434, Revision 3.1, which requires restoration within 2 hours when one or both DC sources in any required division are inoperable. Loss of a required division of DC in the design modeled in the BWR/6 STS could prevent proper operation of an entire associated division of emergency core cooling system pumps and valves when using either onsite or offsite power, could result in the failure of the diesel generator to start and load, and could hamper restoration of offsite power. Conversely, the ESBWR is designed so that a complete loss of any two of the four divisions of electrical distribution will not prevent proper operation of any of the four divisions of emergency core cooling with or without the loss of offsite power because all required safety functions can be actuated by any two divisions. As such, the impact of the inoperability of DC sources in one required division in the ESBWR will not prevent any safety-related function from performing as assumed. The design differences between the ESBWR and the design modeled for the BWR/6 STS support the CT for restoration of inoperable DC sources used in ESBWR LCO 3.8.1.

The revised LCO 3.8.4, "Inverters – Operating," (LCO 3.8.5 in Revision 1) Condition A, applies when one or both inverters in any required division are inoperable and establishes a CT of 24 hours for restoration of both inverters to operable status. This 24-hour CT is consistent with the 24-hour CT used in the BWR/6 STS for when a non-safety-related constant voltage transformer, powered by an offsite or onsite AC source rather than the battery, is used to support the uninterruptible AC buses. The 24-hr CT used for the ESBWR was selected to be consistent with the 24 hour CT in NUREG-1434 for the same Condition.

DCD Impact

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

NRC RAI 16.2-83

Provide the basis for the lack of a CONDITION for an inoperable 72-hour battery in the DCD Tier 2, Chapter 16, Rev. 1, proposed TS 3.8.2.

GE Response

As described in the response to RAI 16.2-82, Design Control Document (DCD) Tier 2, Revision 2, Chapter 8, "Electric Power," describes the current ESBWR design for safety-related electrical distribution. The ESBWR design consists of four divisions with two 72-hour batteries per division for a total of eight safety-related batteries. The ESBWR no longer includes 24-hour batteries. In conjunction with this change, Revision 2 of LCO 3.8.1, DC Sources – Operating, established requirements for safety-related batteries and LCO 3.8.2, "72 hour DC Sources – Operating," Revision 1, was deleted. Therefore, this RAI response is now applicable to revision 2 of ESBWR LCO 3.8.1.

ESBWR LCO 3.8.1 does provide a Condition and Action for an inoperable battery. A DC source is described in the Bases of LCO 3.8.1 as the combination of a battery and the associated normal or standby battery charger. LCO 3.8.1, Condition B, "One or more DC sources inoperable on one required division for reasons other than Condition A," applies when a DC source is inoperable for reasons other than an inoperable battery charger (i.e., Condition A). Therefore, Condition B applies when a battery is inoperable. This presentation of requirements for an inoperable battery is consistent with the presentation in LCO 3.8.4 "DC Sources – Operating," in the BWR/6 Standard Technical Specifications (STS), NUREG-1434, Revision 3.1.

DCD Impact

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

NRC RAI 16.2-84

Provide the basis for the brackets around SRs 3.8.1.2 and 3.8.1.4 and around '≥ rated' in SR 3.8.2.2 in DCD Tier 2, Chapter 16, Rev. 1, TS.

GE Response

General Electric (GE) has revised Design Control Document (DCD) Tier 2, Chapter 16, LCO 3.8.1, "DC Sources - Operating," in revision 2 to eliminate the brackets around Surveillance Requirement (SR) 3.8.1.2, the requirement for periodic verification of battery charger capacity.

GE has revised DCD Tier 2, Chapter 16, LCO 3.8.1, in revision 2 to delete SR 3.8.1.4, a requirement for periodic Channel Calibration or System Functional Test of the battery chargers. This bracketed SR was tentatively included in LCO 3.8.1 while GE evaluated any special requirements that would apply if a battery charger is used to support safety-related loads when the battery is disconnected (i.e., operation of the battery charger in battery eliminator mode as described in DCD 8.3.2.1.1, Class 1E Station Batteries and Battery Chargers). SR 3.8.1.4 was deleted because all safety-related loads are supplied through the safety-related inverters, which are subject to SRs for periodic verification of the voltage and frequency supplied to safety-related loads. These SRs, in conjunction with SRs for periodic verification of battery charger voltage and capacity, provide assurance that the battery chargers could function in battery eliminator mode, if required.

GE revised DCD Tier 2, Chapter 16, in revision 2 to combine LCO 3.8.2 into LCO 3.8.1, which eliminated SR 3.8.2.2. This change is a result of design changes and Technical Specification changes described in the response to RAI 16.2-82. This change eliminates the incorrect placement of brackets around '≥ rated' in SR 3.8.2.2.

DCD Impact

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

NRC RAI 16.2-85

DCD Tier 2, Chapter 16, Rev. 1, TS 3.8 states a 7-day allowed outage time (AOT) for Required Action A.3 of LCO 3.8.1 and LCO 3.8.2. Describe the 'alternate means' statement in the Bases section that is being credited for this AOT.

GE Response

As noted in the response to RAI 16.2-60 (General Electric Letter MFN 06-431, dated November 13, 2006), the NRC letter to the Technical Specification Task Force, dated April 11, 2006, "Request for Public Meeting to Discuss Enclosed Document Electrical Engineering Branch Concerns with Technical Specification Task Force (TSTF)-360, Revision 1 DC Electrical Rewrite," (ML061020636 and ML061100185) identifies the same issue as this RAI in "Staff Concern 1." TSTF-360 has already been incorporated into the BWR/6 Standard Technical Specifications (STS), NUREG-1434, Revision 3.1, and industry efforts to resolve this issue are ongoing.

The ESBWR Design Control Document (DCD) Chapter 16 Technical Specifications are based on revision 3.1 of the BWR/6 Standard Technical Specifications, NUREG-1434. It is GE's intent to maintain consistency with the latest approved Standard Technical Specifications to the extent practicable and applicable to the ESBWR design. Upon final resolution of the Staff Concerns with TSTF-360, GE will address any agreed to changes to NUREG-1434.

DCD Impact

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

NRC RAI 16.2-88

Section 8.3.1.4.1 of the DCD Tier 2, Rev. 1, under the heading "Electric penetration assembly," states that "redundant overcurrent interrupting devices are provided for all electrical circuits going through containment penetrations, if the maximum available fault current (including failure of upstream devices) is greater than the continuous rating of the penetration. This avoids penetration damage in the event of failure of any single over current device to clear a fault within the penetration or beyond it." Provide justification why these devices were not included in the TS in accordance with Criterion 3 of 10 CFR 50.36(c)(2)(ii).

GE Response

ESBWR Technical Specifications (TSs) do not include explicit requirements governing the operability of primary containment penetration overcurrent interrupting devices (penetration overcurrent protection) because these components do not satisfy the criteria in 10 CFR 50.36(c)(2)(ii) for inclusion in the TSs. This conclusion is consistent with a risk assessment documented in NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," which provided justification for relocating requirements for penetration overcurrent protection from the TSs to a licensee controlled program for currently licensed plants. NRC concurrence with the results of this assessment is documented in "NRC Staff Review of Nuclear Supply Systems Vendor Owners Groups Application of the Commissions Interim Policy Statement Criteria to Standard Technical Specifications," which was released in a letter from T.E. Murley (NRC) to R.F. Janecek (BWR Owners Group), dated May 9, 1988. The conclusions from these assessments are applicable to the ESBWR, as explained below.

Penetration overcurrent protection requirements do not meet 10 CFR 50.36(c)(2)(ii), Criterion 3, for inclusion in TSs because Criterion 3 applies to structures, systems, or components (SSCs) that are part of the primary success path and which function or actuate to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. As described in Design Control Document (DCD) Tier 2, Revision 2, 8.3.1.4 and 8.3.4.7, circuits feeding loads within the containment have redundant overcurrent protective devices in series to address the potential that the maximum available fault current (including failure of upstream devices) could be greater than the continuous rating of the penetration. These devices would be required to function only if an unanticipated fault occurred in a device inside containment. Therefore, penetration overcurrent protection devices are not part of the primary success path and do not function or actuate to mitigate a DBA.

The devices used for penetration overcurrent protection are relatively simple and highly reliable devices that are addressed by plant configuration management programs, scheduled preventative maintenance programs, and corrective action programs. The design requirement for redundant overcurrent protection devices and the programs that ensure the devices are properly installed and maintained provide a very high degree of assurance that these devices will function properly if required even if not subject to explicit TS requirements for operability.

DCD Impact

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