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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 228 - Related to ESBWR Design Certification Application – Design of Structures, Components, Equipment, and Systems - RAI Numbers 3.11-29 , 3.11-32 and 3.11-34**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to a portion of the U.S. Nuclear Regulatory Commission Request for Additional Information (RAI) sent by NRC Letter 228 (Reference 1). The GEH response to RAI Numbers 3.11-29, 3.11-32 and 3.11-34 are addressed in Enclosure 1.

If you have any questions about the information provided here, please contact me.

Sincerely,

Richard E. Kingston  
Vice President, ESBWR Licensing

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HRO



**Enclosure 1**

**MFN 08-732**

**Response to Portion of NRC Request for**

**Additional Information Letter No. 228**

**Related to ESBWR Design Certification Application**

**Design of Structures, Components, Equipment, and Systems**

**RAI Numbers 3.11-29 3.11-32 and 3.11-34**

### **NRC RAI 3.11-29**

#### **NRC Summary:**

*Ensure that all digital instrumentation and control (I&C) components are qualified.*

#### **NRC Full Text:**

*In second paragraph on Page 3.11-1, GEH states that computer based I&C equipment is a subset of digital I&C components. Describe the process that ensures that none of the digital I&C components will be eliminated from the qualification process based on this definition.*

### **GEH Response**

The following ensures that no digital I&C components are eliminated from the qualification process based on the definition of computer based I&C equipment as a subset of digital I&C components.

DCD Tier 2 Revision 5 Section 3.11.1 states: "The equipment qualification program includes safety-related electrical and mechanical equipment located in harsh and mild environments. Safety-related electrical equipment consists of all safety-related electrical power and instrumentation and control (I&C) equipment, which includes all safety-related analog (non-digital) and digital I&C components."

As noted in Section 3.11.2, "The equipment qualification program generates and maintains a list of EQ equipment located in harsh and mild environments." The current list is Table 3.11-1 Electrical and Mechanical Equipment for Environmental Qualification.

The reason that computer based I&C components are identified as a subset of digital I&C components is because RG 1.209 adds regulatory considerations to computer based I&C systems. They are identified as a separate group in order to document the awareness that this group has additional regulatory guidance.

GEH uses a safety-related classification process, as described in DCD Tier 2, Subsection 3.2.3, which determines safety-related functions and impacts by nonsafety-related equipment on performance of safety-related functions. In order to be removed from the EQ program a classification would be performed and concluded that the equipment has no safety-related function and its performance or failure would not affect a safety-related function.

As detail design progresses, the list of EQ equipment located in harsh and mild environments is updated by EQ; and the records identify equipment added or removed, and the basis for the change.

### **DCD Impact**

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

**NRC RAI 3.11-32**

**NRC Summary:**

*Add a sentence to clarify EMI/RFI and surge testing guidance.*

**NRC Full Text:**

*On Page 3.11-11, after the sentence, ""EQ equipment is qualified using the qualification methods of IEEE 323-1974,"" add the following: New electrical and electronic equipment and previously qualified electrical and electronic equipment are tested to supplemental EMI/RFI and surge testing, if applicable."*

**GEH Response**

DCD Tier 2 Revision, 5 Subsection 3.11.3.1 discusses all of the environments including that electromagnetic interference (EMI), radio frequency interference (RFI) and voltage surges that are applicable to all EQ electrical equipment in harsh and mild environments, performed by test, and is consistent with RG 1.180.

Since Subsection 3.11.3.1 already applies to all EQ electrical equipment and even nonsafety-related electrical equipment, it is not necessary to add the statement just for IEEE 323-1974 harsh qualified equipment.

**DCD Impact**

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

**NRC RAI 3.11-34**

NRC Summary:

*Include EMI/RFI and voltage surge testing in computer-based I&C systems type testing.*

NRC Full Text:

*Computer-based I&C systems type testing on Page 3.11-13, did not include EMI/RFI and voltage surge testing. EQ safety-related computer based I&C systems comply with RG 1.209. Include EMI/RFI and voltage surge testing in computer-based I&C systems type testing."*

**GEH Response**

DCD Tier 2 Revision 5 Subsection 3.11.3.1 discusses all of the environments including that electromagnetic interference (EMI)/radio frequency interference (RFI) and voltage surges are applicable to all EQ electrical equipment in harsh and mild environments, performed by test, and is consistent with RG 1.180.

Since Subsection 3.11.3.1 already applies to all EQ electrical equipment and even nonsafety-related electrical equipment, it is not necessary to add the statement just for Computer-based I&C systems equipment.

**DCD Impact**

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