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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 391 Related to Design Control Document (DCD) Revision 6 - RAI Number 8.3-67**

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) 8.3-67 (Reference 1).

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

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

Reference:

1. MFN 09-725, Letter from the U.S. Nuclear Regulatory Commission to Jerald G. Head, Request for Additional Information Letter No. 391, Related To Design Control Document Revision 6, dated November 9, 2009

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 391 Related to Design Control Document (DCD) Revision 6 - RAI Number 8.3-67

cc:	AE Cubbage	USNRC (with enclosures)
	J G Head	GEH/Wilmington (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	LF Dougherty	GEH/Wilmington (with enclosures)
	eDRF Section	0000-0110-0572

Enclosure 1

MFN 09-743

Response to Portion of NRC Request for

Additional Information Letter No. 391

Related to Design Control Document (DCD) Revision 6

RAI Number 8.3-67

NRC RAI 8.3-67

DCD Section 8.3.3.2 does not address the use of underground cables or cables in a wetted environment. Operating experience has shown that cross-linked polyethylene (XLPE) or high-molecular-weight polyethylene insulation materials are most susceptible to water tree formation. Cable failures have a variety of causes: manufacturing defects, damaged caused by shipping and installation and exposure to electrical transients or abnormal environmental conditions during operation. Electrical cables in nuclear power plants are usually located in dry environments, but some cables are exposed to moisture from condensation and wetting in inaccessible locations such as buried conduits, cable trenches, cable troughs, above ground and underground duct banks, underground vaults, and direct buried installations. Since underground cables are susceptible to moisture, identify the cables that are inaccessible or routed underground that support equipment and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule). Indicate whether there are any plans to implement a program for inaccessible or underground power, control, and instrumentation cables for testing and inspection in accordance with Generic Letter 2007-01; and indicate the frequency for such testing and inspection or provide justification for not developing such program.

GEH Response

GEH has reviewed and discussed the GL referenced reports with nuclear cable vendors and found that GL 2007-01 is based on failures that were found in “some” medium voltage circuits in operating plants. Low-voltage cables were not found to be susceptible to this failure mode. These circuit failures included booted terminations and cable damage during shipping and handling as main causal factors. Another causal factor was that the failures occurred in a wetted or flooded environment. XLPE cable insulation that was used during the 1960’s, 70’s and 80’s for medium voltage cables may have been subject to water tree formation. The failures appeared to be random. ESBWR has no safety-related medium voltage cables within the design. Cables being manufactured now for medium voltage usage in nuclear power plants are of EPR insulation material that has a tree retardant additive added.

Maintenance Rule and Generic Letter 2007-01 are both addressed to holders of operating licenses for nuclear power plants, while new plants are covered in the COL activities during the formation of their Maintenance Rule applicability matrix for components and systems determined to be within the Rule.

DCD Section 8.3.3.2 Cables and Raceways; states in the second paragraph, “Cables are specified to continue to operate at 100% humidity with a service life expectancy of 60 years.” Monitoring and testing of nonsafety-related medium voltage cables in a wetted environment are covered by the site specific COL Applicant per the Maintenance Rule. The systems and components that are within the scope of the Maintenance Rule are COL Applicant responsibilities as stated in DCD Subsection 8.1.5.2.4 for RG 1.160;

"Maintenance Rule is addressed in Table 1.9-21 and Subsection 13.5.2 for Operating and Maintenance Procedures." Therefore the issues discussed in GL 2007-01 are not applicable to the ESBWR design or COL Applicant.

DCD Impact

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