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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 90 Related to ESBWR Design Certification Application – Safety Analyses – RAI Number 15.4-15**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated January 29, 2007. GEH's response to RAI Number 15.4-15 is addressed in Enclosure 1.

If you have any questions or require additional information, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 07-084, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, GEH, *Request For Additional Information Letter No. 90 Related To ESBWR Design Certification Application*, dated January 29, 2007.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 90 Related to ESBWR Design Certification Application ESBWR – Safety Analyses – RAI Number 15.4-15

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF	0000-0075-5972

Enclosure 1

MFN 07-588

Response to Portion of NRC Request for Additional Information Letter No. 90 Related to ESBWR Design Certification Application

Safety Analyses

RAI Number 15.4-15

NRC RAI 15.4-15:

Question Summary: Provide paint specification for paint to be used in the containment surfaces.

Section 4.1.2.1, "Hydrochloric Acid ,"(HCl) in the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) discusses the production and formation of HCl.

The formation of organic iodides in the containment following a loss of-coolant accident could result from processes initiated at the surfaces of containment paint. Therefore, please provide paint specification for paint to be used in the containment surfaces.

GEH Response:

As stated in section 4.1.2.1 of NEDE-33279, the production of HCL is from the radiolysis of chloride bearing cable insulation during accidents. The bulk of these types of cables are from the Fine Motion Control Rod Drives (FMCRDs).

DCD Tier 2, Subsection 6.1.2 Organic Materials, states that the coating systems applied inside the containment meet the regulatory positions of Regulatory Guide (RG) 1.54 and the Standards of ASTM D5144, as applicable. Section C.1(2) of RG 1.54 Revision 1, states that standard ASTM D 5144-00, Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants, addresses by reference the preparation of test specimens, radiation tolerance testing, decontaminability of coatings, physical properties, chemical resistance tests, and other testing. ASTM D 5144-00 as a top-level ASTM standard references other important standards including ASTM D 3912-95 (2001), Chemical Resistance of Coating Used in Light-Water Nuclear Power Plants, which is referenced in Section 4 of RG 1.54 Revision 1 in evaluating the chemical resistance of coatings. The specific chemicals to be used are selected to characterize the anticipated exposure. Test Method D 3912 establishes procedures for the evaluation of the chemical resistance of coatings used in light-water nuclear power plants. Once the paint coatings are screened, they are tested using Design Base Accident conditions in accordance with ASTM D 3911-03, Standard Test Method for Evaluating Coatings Used in Light-Water Nuclear Power Plants at Simulated Design Basis Accident Conditions, using ESBWR specific containment pressure and temperature data. The coating chosen based upon RG 1.54 and ASTM D 5144-00 will minimize the radiological production of hydrochloric acid.

Additionally, the paint used in containment surfaces will be specified in the ESBWR Purchase Specification for ASME Section III Containment Liner Components. The paint specifications will comply with Figure 1, ASTM Standards Relevant to NPP Class I, II, and III Protective Coatings of RG 1.54 Revision 1. The paint selected will minimize the production of hydrochloric acid in the containment.

The expected painting and coating criteria are listed below:

1. Structural Steel – Epoxy Primer (S) or (F), (QA)

2. Liner Plate – Epoxy Primer (S) or (F), (QA) and Epoxy Topcoat (F); (QA)
3. Support Steel – Epoxy Painted (S) or (F), (QA) Finish Coat not required,

Where:

(S) – Shop Painted, (F) – Field Painted, and (QA) QA Documentation Required.

Some miscellaneous steel items inside the containment such as grating will not be painted. Instead, they will be hot dipped with galvanized steel.

Potential vendors for protective coating systems, which include epoxy primers, are qualified in accordance with the US NRC Regulatory Guide 1.54 and accepted ASTM standards.

DCD Impact:

Table 1.9-22 Industrial Codes and Standards Applicable to ESBWR, will be revised as noted on the attached markup in DCD Tier 2 Revision 5, to include ASTM D 3912-95 (2001).

Table 1.9-22

Industrial Codes and Standards[2] Applicable to ESBWR

Code or Standard Number	Year	Title
A709/A709M-05	2005	Standard Specification for Carbon and High-Strength Low-Alloy Structural Steel Shapes, Plates, and Bars and Quenched-and-Tempered Alloy Structural Steel Plates for Bridges
A887-89	1989 (R 2004)	Standard Specification for Borated Stainless Steel Plate, Sheet, and Strip for Nuclear Application
A992/A992M-06a	2006	Standard Specification for Structural Steel Shapes
B8-04	2004	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
B61-02	2002	Standard Specification for Steam or Valve Bronze Castings
B62-02	2002	Standard Specification for Composition Bronze or Ounce Metal Castings
B359-98	1998	Standard Specification for Copper and Copper-Alloy Seamless Condenser and Heat Exchanger Tubes With Integral Fins
C33	2003	Standard Specification for Concrete Aggregates
C150-05	2005	Standard Specification for Portland Cement
C260-01	2001	Standard Specification for Air-Entraining Admixtures for Concrete
C494/C494M-05	2005	Standard Specification for Chemical Admixtures for Concrete
C618-05	2005	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
C776-83	1983	Standard Specification for Sintered Uranium Dioxide Pellets
C934-85	1985 (R 1990)	Guide for Design and Quality Assurance Practices for Nuclear Fuel Rods, Edition 1
D512-04	2004	Standard Test Methods for Chloride Ion In Water
D635-03	2003	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
D975Rev C-04	2004	Standard Specification for Diesel Fuel Oils
D1411-04	2004	Standard Test Methods for Water-Soluble Chlorides Present as Admixtures in Graded Aggregate Road Mixes
D3350	2004	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
D3803	1989 (R 1995)	Standard Test Methods for Nuclear-Grade Activated Carbon
D3843-00	2000	Standard Practice for Quality Assurance for Protective Coatings Applied to Nuclear Facilities
D3912	1995 (R 2001)	Standard Test Method for Chemical Resistance of Coatings Used in Light-water Nuclear Power Plants
D5144-00	2000	Standard Guide for Use of Protective Coating Standards in Nuclear Power Plants
E84-04	2004	Standard Test Method for Surface Burning Characteristics of Building Materials