HITACHI

GE Hitachi Nuclear Energy

Richard E. Kingston
Vice President, ESBWR Licensing

P.O. Box 780 M/C A-65
Wilmington, NC 28402-0780
USA

T 910.675.6192
F 910.362.6192
rick.kingston@ge.com

MFN 09-287 Docket No. 52-010

April 30, 2009

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Revised Response to Portion of NRC Request for Additional Information Letter No. 275 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Number 9.1-107**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) revised response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC Letter 275 dated December 11, 2008, Reference 1. The original response was transmitted via Reference 2 as part of the responses to RAIs 9.1-96 through 9.1-115 in response to Reference 1. GEH's revised response to RAI Number 9.1-107 is addressed in Enclosure 1.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

References:

1. MFN 08-967, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 275 Related to ESBWR Design Certification Application,* December 11, 2008**.**

2. MFN 09-163, Response to Portion of NRC Request for Additional Information Letter No. 275 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Numbers 9.1-96 through 9.1-115.

Enclosure:

1. Revised Response to Portion of NRC Request for Additional Information Letter No. 275 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Number 9.1-107

cc:	AE Cubbage	USNRC (with enclosure)
	JG Head	GEH/Wilmington (with enclosure)
	DH Hinds	GEH/Wilmington (with enclosure)
	eDRF	0000-0100-9613

Enclosure 1

MFN 09-287

Revised Response to Portion of NRC Request for

Additional Information Letter No. 275

Related to ESBWR Design Certification Application

Auxiliary Systems

RAI Number 9.1-107

NRC RAI 9.1-107

In Section 9.1.4, "Light Load Handling System (Related to Refueling)," NUREG-0800, "Standard Review Plan," (SRP), acceptance criteria for meeting the relevant requirements of GDC 61 and GDC 62 are based on meeting the guidelines of ANSI/ANS 57.1-1992. Table 1, "Required Interlock Protection," in ANSI/ANS-57.1-1992 provides interlock protection guidelines for each component of a fuel handling system. The application describes the interlocks associated with the refueling machine and fuel handling machine, which are not complete with respect to Table 1 listed above. Additionally, Table 1 lists interlock guidelines for equipment such as the fuel building crane, reactor building crane, fuel prep machine, control component change mechanism, inclined fuel transfer system, and the upenders, which are not described in the application. Please describe in the DCD how each required interlock specified in Table 1 of ANSI/ANS 57.1-1992 is applied for each of the components listed in Table 1 and provide a markup in the DCD Tier 2 showing the above requested information or show how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with NRC regulations.

GEH Revised Response

Per a follow-up telephone call between GEH and the NRC on March 23, 2009, the NRC stated the revision made to DCD Tier 2 Subsection 9.1.4.1 previously submitted in MFN-09-163 would need to be refined in order to be acceptable to the NRC. The NRC wanted it clearly stated that all the interlocks from Table 1 of ANSI/ANS 57.1 are applicable to the fuel handling system except those interlocks associated with equipment that is not applicable to the ESBWR fuel handling system design. DCD Tier 2 Subsection 9.1.4.1 is being revised to clearly state the interlocks listed in Table 1 of ANSI/ANS 57.1 are applicable to the ESBWR fuel handling system except for the interlocks associated with the New Fuel Elevator, which is not a part of the ESBWR fuel handling system design.

DCD Impact

DCD Tier 2, Subsection 9.1.4.1 is being revised in Revision 6 as noted in the attached markup.

Subsection 9.1.4.2. Relevant interlocks for the fuel handling system discussed in Subsection 9.1.4 are a partial list of the interlocks listed in Table 1 of ANSI/ANS 57.1. The interlocks listed in this table are applicable to the ESBWR design except for interlocks associated with the New Fuel Elevator, which is not a part of the ESBWR design.

Fuel transfer from the point of receipt up to inspection, storage, and placement in the reactor core is accomplished with fuel grapples. A general purpose fuel grapple is used when fuel movement is performed by the fuel building crane on the fuel building floor prior to placement in the fuel preparation machine and transfer to the Spent Fuel Pool or buffer pool. During refueling operations, however, fuel movement is performed in the fuel building by the fuel handling machine and in the Reactor Building by the refueling machine telescoping grapples.

The refueling machine and the fuel handling machine are classified as nonsafety-related Seismic Category I, and are constructed in accordance with the quality assurance requirements of 10 CFR 50, Appendix B to ensure compliance with applicable design, construction and test requirements.

Working loads of the refueling machine and fuel handling machine structures are in accordance with the American Institute of Steel and Construction (AISC) Manual of Steel Construction. All parts of the hoist systems are designed to have a safety factor of at least 10, based on the ultimate strength of the material. A redundant load path is incorporated in the fuel grapples.

Both the refueling machine and the fuel handling machine have telescoping masts with integral grapples mounted from a trolley structure. They are also equipped with auxiliary hoists and jib cranes to which other grapples are attached when required. Both have redundant safety features and indicators that ensure positive engagement with fuel bundles. The fuel masts have interlocks that provide the necessary position control boundaries during deployment and limit travel during transfer of irradiated fuel. These safety provisions prevent physical damage to the mast. A safe water shielding depth of at least 2591 mm (8.5 ft.) is always maintained over the active fuel during transit.

The spent fuel cask pit is intentionally located outside the areas normally confined to fuel movement. The cask and other heavy loads are not permitted to encroach within any part of any spent fuel, spent fuel storage pool, or safety-related structure.

Inadvertent cask movement by the main crane over the fuel storage pools is prevented by travel limit controls. See Subsection 9.1.5.

9.1.4.2 System Description

Table 9.1-6 is a listing of typical tools and servicing equipment. The following paragraphs describe the use of some of the major tools and equipment and address safety aspects of the design where applicable for light loads.

Subsection 9.1.4 provides the data that verifies the ESBWR Standard Plant light load handling systems and satisfies the guidelines of NUREG-0612.

9.1.4.3 Spent Fuel Cask

Not in ESBWR Standard Plant Scope.