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MFN 08-557

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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Number 9.1-50 S01**

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 201 dated May 28, 2008, Reference 1. The original response to the RAI was transmitted via Reference 2 in response to Reference 3. GEH response to RAI Number 9.1-50 S01 is addressed in Enclosure 1.

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

Sincerely,

Richard E. Kingston

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Vice President, ESBWR Licensing

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NRO

References:

1. MFN 08-499, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application,* May 28, 2008.
2. MFN 08-439, Response to Portion of NRC Request for Additional Information Letter No. 158 Related to ESBWR Design Certification Application – Auxiliary Systems – RAI Number 9.1-50, May 1, 2008.
3. MFN 08-209, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 158 Related to ESBWR Design Certification Application,* February 29, 2008.

Enclosures:

1. Response to Portion of NRC Request for Additional Information Letter No. 201 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Number 9.1-50 S01

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	DH Hinds	GEH/Wilmington (with enclosure)
	eDRF	0000-0086-9764

Enclosure 1

MFN 08-557

Response to Portion of NRC Request for

Additional Information Letter No. 201

Related to ESBWR Design Certification Application

Auxiliary Systems

RAI Numbers 9.1-50 S01

For historical purposes, the original text of RAI 9.1-50 and the GEH response is included, except for any attachments or DCD mark-ups.

NRC RAI 9.1-50

DCD Tier 2, Rev. 4, Section 9.1.4.5 states that there are interlocks in the refueling machine to ensure that the grapple, in its retracted position, provides sufficient water shielding over the active fuel during transit. Please revise DCD Tier 2 to include the actual height of water above the top of active fuel that will be provided by the interlocks to ensure adequate shielding.

GEH Response

DCD Tier 2, Subsections 9.1.4.1 and 9.1.4.5 will be revised in Revision 5 to include the actual height of water 2591 mm (8.5 ft.) above the top of active fuel that is provided by the interlocks to ensure adequate shielding.

DCD Impact

DCD Tier 2, Subsections 9.1.4.1 and 9.1.4.5 will be revised in Revision 5 as noted in the attached markup.

NRC RAI 9.1-50 S01

The response to this RAI cites an irradiated fuel safe shielding level of 2591 mm (8.5 feet). Justify the discrepancy with SRP 9.1.2 and RG 1.13 level of 3 meters (10 feet).

GEH Response

SRP 9.1.2 and RG 1.13 both state that the minimum pool depth for shielding should be 3 meters (10 feet) above the top of the stored fuel assemblies. The Fuel Building spent fuel storage racks are used for storing both new and spent fuel assemblies. The Reactor Building spent fuel racks in the deep pit in the buffer pool are used for temporary storage of spent fuel assemblies. In the Fuel Building, the distance from the normal water level to the top of the spent fuel storage rack is at least 10 meters (32.8 feet). In the Reactor Building, the distance from the normal water level to the top of the spent fuel racks in the deep pit in the buffer pool is at least 12 meters (39 feet). The storage of fuel assemblies in the Fuel Building spent fuel storage racks and the Reactor Building spent fuel racks in the deep pit in the buffer pool comply with the guidance of SRP 9.1.2 and RG 1.13.

As stated in the response to RAI 9.1-50, 2591 mm (8.5 ft.) is the actual height of water above the top of active fuel that is provided with the normal full up interlock installed on either the refueling and/or fuel handling machine to ensure acceptable shielding over the active fuel region of a single fuel assembly during its transit from/to the reactor vessel and/or the spent fuel storage racks. This interlock height installed on GEH refueling and fuel handling machines has been successfully used in commercial nuclear power plant operations since the 1970s. A shielding calculation has been performed for the GE14 fuel bundle referenced in ESBWR design and fuel handling accident calculations using this interlock height to verify 2591 mm (8.5 ft.) of water above the top of active fuel of a single fuel assembly provides adequate shielding during the transit of a single fuel assembly from/to the reactor vessel and/or the spent fuel storage racks.

DCD Impact

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