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Subject: Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application, DCD Tier 1, RAI Numbers 14.3-361, 14.3-362, 14.3-363 and 14.3-370

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 December 20, 2007 (Reference 1). RAI Numbers 14.3-361, 14.3-362, 14.3-363 and 14.3-370 are addressed in Enclosure 1.

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in DCD Revision 5.

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

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 07-718, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 126 Related To ESBWR Design Certification Application*, dated December 20, 2007

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application, DCD Tier 1, RAI Numbers 14.3-361, 14.3-362, 14.3-363 and 14.3-370

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	0000-0080-4821	NRC RAI 14.3-361
	0000-0080-4821	NRC RAI 14.3-362
	0000-0080-4821	NRC RAI 14.3-363
	0000-0080-4821	NRC RAI 14.3-370

Enclosure 1

*MFN 08-086, Supplement 24

Response to Portion of NRC Request for

Additional Information Letter No. 126

Related to ESBWR Design Certification Application

DCD Tier 1

RAI Numbers 14.3-361, 14.3-362, 14.3-363 and 14.3-370

***Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in DCD Revision 5.**

NRC RAI 14.3-361

NRC Summary:

New fuel storage rack seismic qualification

NRC Full Text:

For ITAAC Table 2.5.6-1, Item 1, for consistency, the staff requests that the applicant include "analysis" in the ITA, in addition to inspection, and modify the AC to refer to a "report(s) that document(s) inspection results and analysis results that demonstrate..."

GEH Response

GEH agrees with the Staff recommended consistency clarifications to the ITA and AC in ITAAC Table 2.5.6-1, Item 1.

DCD Impact

DCD Tier 1, Table 2.5.6-1, Item 1 will be revised as shown in the attached markups.

Table 2.5.6-1

ITAAC For The Fuel Storage Racks (Spent and New)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. New fuel storage racks are designed to withstand a design bases seismic event.	An inspection and analysis of the new fuel storage racks configuration will be performed to ensure the design conforms to the seismic analyses.	~~Report(s) document that an analysis exists~~ Report(s) document(s) inspection results and analysis results that demonstrate and conclude(s) that the new fuel racks can withstand seismic design basis dynamic loads, and that the as-built configuration conforms to the analyses.
2. Spent fuel storage racks are designed to withstand a design bases seismic event.	An inspection and analysis of the spent fuel storage racks configuration will be performed to ensure the design conforms to the seismic analyses.	~~Report(s) document that an analysis exists~~Report(s) document(s) inspection results and analysis results that demonstrate and conclude(s) that the spent fuel racks can withstand seismic design basis dynamic and that the as-built configuration conforms to the analyses.
3. A full new fuel rack will remain subcritical by at least 5% Δk, i.e. keff $\leq$ 0.95.	Analyses will be performed to determine k_{eff} for fully loaded new fuel pool storage racks.	Analysis records confirm that the maximum calculated $k_{eff} \leq 0.95$.
4. A full spent fuel rack will remain subcritical by at least 5% Δk, i.e. keff $\leq$ 0.95.	Analyses will be performed to determine k_{eff} for fully loaded spent fuel pool storage racks.	Analysis records confirm that the maximum calculated $k_{eff} \leq 0.95$.
5. The maximum spent fuel rack water coolant flow temperature at the rack exit shall be $\leq$ 100°C (212°F).	Analyses will be performed to determine the maximum temperature of the spent fuel racks.	Analysis records confirm that the maximum temperature in the spent fuel racks is < 100°C (212°F) at rack exit under normal operating conditions.

NRC RAI 14.3-362

NRC Summary:

Spent fuel storage rack seismic qualification

NRC Full Text:

For ITAAC Table 2.5.6-1, Item 2, for consistency, the staff requests that the applicant include "analysis" in the ITA, in addition to inspection, and modify the AC to refer to a "report(s) that document(s) inspection results and analysis results that demonstrate..."

GEH Response

GEH agrees with the Staff recommended consistency clarifications to the ITA and AC in ITAAC Table 2.5.6-1, Item 2.

DCD Impact

DCD Tier 1, Table 2.5.6-1, Item 2 will be revised as shown in the attached markups.

Table 2.5.6-1

ITAAC For The Fuel Storage Racks (Spent and New)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. New fuel storage racks are designed to withstand a design bases seismic event.	An inspection and analysis of the new fuel storage racks configuration will be performed to ensure the design conforms to the seismic analyses.	~~Report(s) document that an analysis exists~~ Report(s) document(s) inspection results and analysis results that demonstrate and conclude(s) that the new fuel racks can withstand seismic design basis dynamic loads, and that the as-built configuration conforms to the analyses.
2. Spent fuel storage racks are designed to withstand a design bases seismic event.	An inspection and analysis of the spent fuel storage racks configuration will be performed to ensure the design conforms to the seismic analyses.	~~Report(s) document that an analysis exists~~Report(s) document(s) inspection results and analysis results that demonstrate and conclude(s) that the spent fuel racks can withstand seismic design basis dynamic and that the as-built configuration conforms to the analyses.
3. A full new fuel rack will remain subcritical by at least 5% Δk, i.e. keff $\leq$ 0.95.	Analyses will be performed to determine k_{eff} for fully loaded new fuel pool storage racks.	Analysis records confirm that the maximum calculated $k_{eff} \leq 0.95$.
4. A full spent fuel rack will remain subcritical by at least 5% Δk, i.e. keff $\leq$ 0.95.	Analyses will be performed to determine k_{eff} for fully loaded spent fuel pool storage racks.	Analysis records confirm that the maximum calculated $k_{eff} \leq 0.95$.
5. The maximum spent fuel rack water coolant flow temperature at the rack exit shall be $\leq$ 100°C (212°F).	Analyses will be performed to determine the maximum temperature of the spent fuel racks.	Analysis records confirm that the maximum temperature in the spent fuel racks is < 100°C (212°F) at rack exit under normal operating conditions.

NRC RAI 14.3-363

NRC Summary:

Spent fuel storage rack qualification

NRC Full Text:

For ITAAC Table 2.5.6-1, Item 6, the ITA refers to "allowable stress under maximum rack temperature" whereas the DC and AC refer to "design allowable under accident conditions". The staff requests that the applicant ensure consistency between the ITA, DC, and AC (i.e., it is not apparent from the ITAAC that maximum rack temperature equates to the temperature during accident conditions).

GEH Response

GEH will ensure consistency in ITAAC Table 2.5.6-1, Item 6 by clarifying the ITA to state that maximum stresses do not exceed ASME Code, Section III, design allowables during accident conditions.

DCD Impact

DCD Tier 1, Table 2.5.6-1, Item 6 will be revised as shown in the attached markups.

Table 2.5.6-1

ITAAC For The Fuel Storage Racks (Spent and New)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. The maximum stresses in the spent fuel racks do not exceed ASME Code, Section III, design allowable during accident conditions.	Analyses will be performed to ~~determine allowable stress under maximum rack temperature.~~confirm that maximum stresses do not exceed ASME Code, Section III, design allowables during accident conditions.	Report(s) document that analysis records confirm that the maximum stresses in the racks will not exceed ASME Code, Section III, design allowable during accident conditions.

NRC RAI 14.3-370

NRC Summary:

FAPCS external connections

NRC Full Text:

For ITAAC Table 2.6.2-2, Item 7c), the ITA specifies the performance of a test for both the flow path and capacity while the AC only refers to flow path. The staff requests that the applicant modify the AC to include the flow rate criteria for acceptance.

GEH Response

GEH agrees and will revise the AC in Table 2.6.2-2, Item 7c to include the flow rate criteria for acceptance.

DCD Impact

DCD Tier 1, Table 2.6.2-2, Item 7c will be revised as shown in the attached markups.

Table 2.6.2-2

ITAAC For The Fuel and Auxiliary Pools Cooling Cleanup System

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
a. Suppression pool cooling mode	pools.	by operation of the function. The flow rate is ≥ 545.1 m^3/hr.
b. Low-pressure coolant injection mode.	Perform a test to confirm the flow path from the FAPCS to the RWCU/SDC system.	Test report(s) document that the injection flow path is demonstrated and confirmed by operation of the function. The flowrate is ≥340 m^3/hr (1500 gpm) at a differential pressure of 1.03 MPa (150 psi).
c. External connection for emergency water to IC/PCC pool and Spent Fuel Pool from the Fire Protection System and offsite water supplies	Perform a test to confirm flow path and flow capacity from the Fire Protection System and offsite water sources to the pools.	Test report(s) document that the makeup water flow path and flow capacity (see ITAAC Table 2.16.3-2, Item 7) are ~~is~~ demonstrated and confirmed by operation of the function.
8. FAPCS minimum inventory of alarms, displays, and status indications in the main control room (MCR) are addressed in Section 3.3.	See Tier 1 Section 3.3.	See Tier 1 Section 3.3.
9. Level instruments with adequate operating ranges are provided for the Spent Fuel Pool and IC/PCC pools.	Inspections of the FAPCS will be conducted to verify that level instruments with adequate operating ranges are provided for the Spent Fuel Pool and IC/PCC pools.	Inspection report(s) document that the as-built FAPCS provides Spent Fuel Pool and IC/PCC pool level instrumentation with adequate operating ranges.
10. Equipment qualification for the FAPCS is addressed in Tier 1 Section 3.8.	See Tier 1 Section 3.8.	See Tier 1 Section 3.8.