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MFN 08-274

Docket No. 52-010

March 24, 2008

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

Subject: **Response to Portion of NRC Request for Additional
Information Letter No. 103 Related to ESBWR Design
Certification Application, RAI Number 6.2-178**

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 July 23, 2007 (Reference 1). The GEH response to RAI Number 6.2-178 is in Enclosure 1.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

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NR0

Reference:

1. MFN-08-040, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 103 Related To ESBWR Design Certification Application*, July 23, 2007.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 103 Related to ESBWR Design Certification Application, Containment Systems, RAI Number 6.2-178

cc: AE Cabbage USNRC (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
DH Hinds GEH/Wilmington (with enclosure)
eDRFSection 0000-0076-5910

Enclosure 1

MFN 08-274

Response to Portion of NRC Request for

Additional Information Letter No. 103

Related to ESBWR Design Certification Application

Containment Systems

RAI Number 6.2-178

NRC RAI 6.2-178

DCD, Revision 3, Tier 2, subsection 6.2.5.4.1, makes these two statements addressing containment structural integrity:

- The pressure capability of the ESBWR containment vessel is such that it will not be exceeded by any design basis or special event.

- The pressure capability of the containment's limiting component is higher than the pressure that results from assuming 100% fuel clad-coolant reaction. There is sufficient margin to the containment pressure capability such that there is no need for an automatic containment overpressure protection system.

These statements are not specific enough for the staff to be able to determine whether the structural integrity of the containment design is acceptable. First, it is unclear as to what is meant by a "special event." Second, the DCD does not provide the actual pressure that results from assuming 100% fuel clad-coolant reaction, and most especially does not indicate whether the assumption of 100% fuel clad-coolant reaction includes hydrogen burning, as required by 10 CFR 50.44(c)(5). It may be that the inerted condition of the containment would preclude burning for many or most accidents, but there may be beyond design-basis accident sequences in which sufficient oxygen is generated by radiolysis of water to support combustion.

Provide in the DCD a description of which "special events" were considered in the analysis. Provide the actual pressure that results from assuming 100% fuel clad-coolant reaction, and whether the assumption of 100% fuel clad-coolant reaction includes hydrogen burning. If no hydrogen burning was assumed for any accident, justify this assumption, with consideration of beyond design-basis accident information from DCD, Tier 2, Chapter 19.

GEH Response

Design basis and special events considered were those described in DCD Tier 2 Chapters 6 and 15.

The estimate of internal pressure that results from assuming 100% fuel clad-coolant reaction is 1.097 MPA (absolute) as described in the response to RAI 19.2-39, Supplement 1 (MFN 06-428, Supplement 2 dated April 13, 2007). As described and justified in the response to RAI 6.2-96, Supplement 1 (MFN 06-428, Supplement 1, dated January 16, 2007), burning of hydrogen was not considered because the containment is inerted.

DCD Impact

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