



GE Energy

James C. Kinsey
Project Manager, ESBWR Licensing

PO Box 780 M/C J-70
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057
jim.kinsey@ge.com

MFN 06-523
Supplement 2

Docket No. 52-010

June 1, 2007

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

Subject: Supplemental Response to Portion of NRC Request for Additional Information Letter No. 43 Related to ESBWR Design Certification Application - Supplement 2 –ESBWR Containment Fragility- RAI Number 19.2-56S01.

Enclosure 1 contains GE's response to the subject NRC RAI transmitted via the Reference 1 questions and from the NRC Seismic Fragility Audit of February 5, 2007.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

James C. Kinsey
Project Manager, ESBWR Licensing

Reference:

1. MFN 06-237, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 43 Related to ESBWR Design Certification Application*, July 18, 2006.
2. MFN 06-523, Response to Portion of NRC Request for Additional Information Letter No. 43 Related to ESBWR Design Certification Application –ESBWR Containment Fragility- RAI Numbers 19.2-56, 19.2-63, and 19.2-65. December 15, 2006.

Enclosures:

1. MFN 06-523 Supplement 2, Partial Response to RAI Letter No. 43 Related to ESBWR Design Certification Application (Previously Submitted¹ Under MFN 06-428 and Supplement 1 and Supplement 2 Containment Fragility- RAI Number 19.2-563S01.

cc: AE Cabbage USNRC (with enclosures)
George Stramback GE/San Jose (with enclosures)
RE Brown GE/Wilmington (with enclosures)
EDRF Section 0000-0068-9788

ENCLOSURE 1

MFN 06-523 Supplement 2

**Partial Response to RAI Letter No. 43
Related to ESBWR Design Certification Application (Previously
Submitted¹ Under MFN 06-523**

ESBWR Containment Fragility- RAI Number 19.2-56S01

¹ **Original Response previously submitted under MFN 06-523
The original responses are included to provide historical continuity during review.**

NRC RAI 19.2-56

In PRA, Section 21.3, GE described that the DCH events to induce damage of the containment are physically unreasonable, based on: a) the initiating events for DCH is 2.8×10^{-9} per year, b) the DCH generated superheated gases (>1000 oK) failing the inlets to SRV, DPV, and IC lines, leading to natural depressurization of the RPV, and c) vent clearing from UDW into a huge heat sink of the WW in less than 1 second. Provide the following information:

a) Provide a discussion of a scenario that, given the locations of the inlets to SRV, DPV, and IC lines in UDW, it is reasonable to assume that the containment liner is also exposed to a 1000oK temperature during the same time frame, which is required to fail the inlets to SRV, DPV, and IC lines, and if so, the liner integrity could be breached, especially near penetrations.

b) Although GE stated that vent clearing was modeled with a high degree of fidelity, there is still a possibility, albeit small, that the vent may be cleared beyond the time frame required to redirect the superheated gases from UDW to WW suppression pool. What is the impact of the vent clearing failure or delay on the containment integrity?

GE Original Response:

NEDO-33201 Rev 1 Section 21 evaluated the DCH threat independently of (a) the low frequency of the high-pressure scenario, and (b) of “natural” depressurization due to steam line failure prior to melt ejection. (a) The RPV and all lines are thermally insulated, so high temperatures in all these components could have no impact on the containment liner temperature or integrity. Moreover, the distances and heat transfer pathways in this geometry are such that even in the absence of insulation there could be no ill effects on the containment liner.

(b) Vent clearing is a straightforward phenomenon, which has been characterized in great detail as it pertains to design basis accidents. As we show in NEDO-33201 Rev 1 Section 21.3, even with a simple, but fundamental, accounting of key physics we are able to do as well or even better than analysis tools used for design basis LOCA event evaluations. Vent clearing is a passive event, there is absolutely no way that it can “fail”, and there is absolutely no basis to arbitrarily delay the vent clearing time as suggested by this question. Vent clearing is probably the best known of all events analyzed in NEDO-33201 Rev 1 Section 21. As shown by the results, in Regime III, the vent clearing process is not the controlling factor for the magnitude of the peak pressures reached.

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

NRC RAI 19.2-56, Supplement 1

NRC Assessment Following the February 5, 2007 Audit

Staff Assessment:

a) Acceptable. NRC RAI 19.2-56, Supplement 1

NRC Assessment Following the February 5, 2007 Audit

Staff Assessment:

- a) Acceptable.
- b) Acceptable.

Audit Interest

None. NRC RAI 19.2-56, Supplement 1

NRC Assessment Following the February 5, 2007 Audit

Staff Assessment:

- a) Acceptable.
- b) Acceptable.

Audit Interest

None.

Status Update/Resolution of RAI

- a) GE will delete the following sentence “Moreover, the distances and heat transfer pathways in this geometry are such that even in the absence of insulation there could be no ill effects on the containment liner.” to remove ambiguity.
- b) See 19.2-51.

Status Update/Resolution of RAI

- a) GE will delete the following sentence “Moreover, the distances and heat transfer pathways in this geometry are such that even in the absence of insulation there could be no ill effects on the containment liner.” to remove ambiguity.

- b) See 19.2-51.
- b) Acceptable.

Audit Interest

None.

Status Update/Resolution of RAI

- a) GE will delete the following sentence “Moreover, the distances and heat transfer pathways in this geometry are such that even in the absence of insulation there could be no ill effects on the containment liner.” to remove ambiguity.
- b) See 19.2-51.

GE Response

The sentence in question appeared in the RAI response, but does not appear in NEDO-33201. The intent of the supplemental question has been met and the GE believes that the question should be considered resolved.

DCD Impact

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

No changes to NEDO-33201 are required in response to this RAI.