

Enclosure 1

MFN 15-053, Supplement 2

GEH Response and Supplemental Response #1 and #2 to

RAI 19-9

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(Please note that below is GEH's original response to RAI 19-9 transmitted in MFN 15-053, Revision 1 and supplemental response #1 transmitted by MFN 15-053 Supplement 1 for convenience)

NRC Request for Additional Information 19-9

In Section 19G.4.2, "Site Arrangement and Plant Structure Design," of the GEH ABWR DCD Tier 2, revision 5, the applicant describes in Items (6) and (7) that the key design features that protect the east and west walls of the Control Buildings by the location and design of the Service Building and Control Building Annex structures from the impact of a large commercial aircraft were described in Section 3H.6, "Summary of the Key Structural Design Features" and figures 1.2-20 through 1.2-22. However, the applicant did not provide any discussions of the design features in Section 3H.6 that the east and west walls of the Control Buildings are protected from the impact of a large commercial aircraft.

Therefore, the applicant is requested to provide the design features in Section 3H.6 that protect the east and west walls of the Control Buildings from the impact of a large commercial aircraft.

GEH Response:

The following key design information will be added to Section 3H.6: (8) The Control Building Annex exterior walls running in the North-South direction are made of reinforced concrete and are at least 600mm thick. (9) The Service Building exterior walls running in the North-South direction are made of reinforced concrete and are at least 600mm thick. Together they will protect the East and West walls of the Control Building from a strike of a large commercial aircraft.

Impact on DCD:

The DCD Tier 2 Section 3H.6 is being revised to address this RAI. The ABWR DCD Rev 5 marked up pages are provided in Enclosure 2 (of MFN 15-053, Revision 1).

NRC Request for Supplemental Additional Information on 19-9:

In ABWR DCD R5 markups for Section 3H.6, Item 4, GEH is changing interior walls to interior partition walls. What is the reason for the change from exterior walls to interior partition walls?

GEH Supplemental Response #1:

An internal engineering review of the ABWR design to address 10CFR50.150 was performed during preparation of ABWR DCD Rev 5 for Certification Renewal. GEH determined that the Aircraft Impact rule acceptance criteria of 10CFR50.150 could not be met for some of the postulated aircraft strike locations and the ABWR design had to incorporate enhanced design features to meet the rule acceptance criteria. Following the guidance outlined in NEI 07-13 "Methodology for Performing Aircraft Impact Assessments for New Plant Designs", engineering settled on two potential enhancements to meet acceptance criteria for the reactor building:

1. Strengthen external structures to prevent damage or provide screening to prevent impact.
2. Relocate equipment outside of the damage footprints to assure fuel cooling can be achieved and maintained or strengthen internal walls.

When ABWR DCD Revision 5 was submitted for Certification Renewal, it was written assuming the first enhancement option would be used by a future COL applicant to address 10CFR50.150 acceptance criteria. Since strengthening the reactor building exterior walls impacts the ABWR Soil Structure Interaction Analysis (SSI), the COL applicant would have to perform a site specific SSI to confirm that the design enhancements were acceptable and did not invalidate the conclusions of ABWR DCD Revision 5, Chapter 3, Appendix 3A - Seismic Soil Structure Interaction Analysis.

As GEH developed the responses for RAI 19-6 thru 19-9, engineering reevaluated its approach to addressing 10 CFR 50.150 acceptance criteria and selected enhancement option 2 from NEI 07-13 as a more optimum solution since it did not impact the ABWR SSI analysis described in ABWR DCD Chapter 3, Appendix 3A and required no further actions by the COL Applicant. In implementing NEI 07-13 enhancement option 2, GEH elected to strengthen internal walls since relocation of equipment outside of the damage footprint was unnecessary to ensure fuel cooling. For this reason exterior walls were replaced with interior partition walls in Section 3H.6, Item 4.

Impact on DCD:

No changes were made to the DCD as a result of this response to the NRC's supplemental information request. (See MFN 15-053, Rev 1, Enclosure 2 for Section 3H.6 markups).

NRC Request for Supplemental Information #2:

In a public teleconference held between GEH and the NRC on October 15, 2015, the NRC requested:

- (1) *That a clerical change be made on Item (3) in Section 3H.6 the word "impact" should be changed to "impacts".*

and

- (2) *That GEH provide supplemental information to explain the reasoning behind the changes to Item (4) of Section 3H.6.*

GEH Response to Request for Supplemental Information #2:

- (1) GEH agrees to revise Section 3H.6 to incorporate the clerical change requested by the NRC.
- (2) NEI 07-13, Revision 8, Section 3.3 outlines an iterative approach to determine damage footprints as a result of an Aircraft Impact. Per this iterative approach, it is assumed the exterior walls are strong enough to stop perforation by the impact of an aircraft. If the aircraft perforates any exterior wall, the options available to counter this are: 1) thicken the exterior wall, or 2) evaluate the ability of the first interior wall to stop debris and secondary missiles caused by the impact. If the combination of the exterior wall and first interior wall is perforated, then the next interior wall's ability to stop debris and secondary missiles must be evaluated.

As previously mentioned in GEH Supplemental Response #1, the exterior wall dimension in ABWR DCD Revision 5 was thickened in order to make it strong enough to stop the plane. After internal review it was determined the exterior wall thickening would impact the Reactor Building Soil Structure Interaction (SSI) analysis. To eliminate the impact on the SSI analysis, GEH decided to maintain the exterior wall thickness at DCD Revision 4 values, and accept the exterior wall being perforated.

GEH has completed the evaluation of the Reactor Building for aircraft impact following NEI 07-13, Revision 8 criteria and determined the minimum thickness for partition walls. These SGI reports are available for NRC review. GEH is committing to locally thicken and strengthen the interior partition walls to stop debris and secondary missiles, applying the SGI report results in detailed design.

Impact on DCD:

The DCD Tier 2 Section 3H.6 is revised as shown. The ABWR DCD Revision 5 marked up page is provided in Enclosure 2.