
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

08/01/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 1044-7140 REVISION 3
SRP SECTION: 03.08.04 – Other Seismic Category I Structures
APPLICATION SECTION: 3.8.4
DATE OF RAI ISSUE: 07/08/2013

QUESTION NO. 03.08.04-53:

On April 3, 2013, the applicant submitted a markup of DCD Tier 2 Section 3.8 to provide updated information related to a seismic design change.

In Subsection 3.8.4.1, "Description of Structures," the first paragraph (Page 3.8-61) states, "The R/B [reactor building] complex superstructure is separated from the T/B [turbine building] by approximately 16 in. at the closest interface point. The R/B complex basemat, discussed in Subsection 3.8.5 (page 3.8-94) , is horizontally separated from the T/B basemat by approximately 20 ft. 6 in."

In MUAP-11002, Revision 2, "Turbine Building Model Properties, SSI Analyses, and Structural Integrity Evaluation," Figure 1.1.1-1 shows a gap of 13'-2" between the T/B and R/B complex. The applicant is requested to address these apparent discrepancies.

ANSWER:

MHI response to RAI 03.08.05-42 states that, "All standard plant seismic category 1 structures are on a common basemat. The turbine building (T/B) is located approximately 20 ft. away from the safety related reactor building (R/B) and power source buildings (PS/Bs). The access building (AC/B) and tank house are located adjacent to the auxiliary building (A/B) (placed on the R/B complex common basemat) with 16 in. gaps in between. These gaps are verified by adding the closure due to static loads to the seismic induced gap closure (wall bending, sliding)."

The 16 in. value is no longer correct and should be consistent with those provided in Technical Report MUAP-11002, Rev. 2 or the updated calculations for the R/B Complex and R/B Basemat. The Design Control Document (DCD) markup for Revision 3 was based on the response provided in RAI 03.08.05-42.

Based on Technical Report MUAP-11002 and the updated calculations, the gap above grade between the T/B and R/B Complex is approximately 13 ft.-2 in. as shown in the figure below.



Impact on DCD

Section 3.8.4.1 of the DCD will be revised to reflect a value of 13 ft.-2 in. between the T/B and R/B Complex above grade. See Attachment 1 for the DCD markup.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical Report

There is no impact on the Technical/Topical Report

This completes MHI's response to the NRC's question.

3. DESIGN OF STRUCTURES, SYSTEMS, COMPONENTS, AND EQUIPMENT US-APWR Design Control Document

US-APWR standard plant seismic category I structures and subsystems are designed for a SSE which is equivalent to the CSDRS defined in Subsection 3.7.1.1. Major US-APWR standard plant seismic category I structures with seismic designs based on the CSDRS are identified as:

- R/B
• East and west PS/Bs
• ESWPC

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Discussion of design methodology, applicable loads, load combinations and acceptance criteria within this subsection is applicable for the R/B structures, and the east and west PS/Bs, and the ESWPC, which are part of the US-APWR standard plant.

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The COL Applicant is responsible for the seismic design of those seismic category I and seismic category II SSCs not seismically designed as part of the US-APWR standard plant, including the following seismic category I structures:

- ESWPT
• UHSRS
• PSFSVs

Note that the system descriptions of PSFSVs and ESWPT are within the scope of the US-APWR standard plant design.

Non-standard seismic category I SSCs are site-specific, and are designed for the site specific or more conservative SSE based on the ground motion response spectra, the site specific foundation input response spectra, and the minimum response spectrum as described in Subsection 3.7.1.1.

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3.8.4.1 Description of the Structures

Seismic category I buildings, except the R/B, PCCV, and containment internal structure, are free standing on separate concrete basemats and are primarily reinforced concrete structures. The R/B, PCCV, and containment internal structure share a common basemat; however, they are otherwise independent of each other. Adjoining building basemats are structurally separated by a 4 in. gap at and below the grade. This requirement does not apply to engineered mat fill concrete that is designed to be part of the basemat subgrade for the interface between the R/B, and east and west PS/Bs. To be consistent with seismic modeling requirements of Section 3.7, no 4 in. gap is permitted in the fill concrete between these buildings. The US-APWR R/B complex consists of the R/B, PCCV, CIS, A/B, east PS/B, west PS/B, and ESWPC supported on a common reinforced concrete basemat. The R/B, east PS/B, west PS/B, and A/B are combined structures that share structural shear walls. The PCCV and CIS are independent structures that share the common basemat with the other structures. The ESWPC located at the south side of the R/B complex shares, as a common wall, a portion of the southern wall of the R/B, east PS/B and west PS/B below grade. The R/B complex superstructure is separated from the T/B by approximately 4613 ft.- 2 in. at the closest interface point. The R/B complex

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