
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

05/31/2013

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO. 766-5819 REVISION 3
SRP SECTION: 03.07.02 – Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 06/09/2011

QUESTION NO. RAI 03.07.02-48:

In MUAP-11002 (R0) Section 8.0, "CONCLUSIONS," the first paragraph (page 27) states, "Therefore, it is concluded that the 4 inch space between the TI, and R/B and PS/B is sufficient to prevent contact between the buildings during a SSE." The staff reviewed Subsection 7.1.3, "Evaluation of 4 inch Space," (page 24) and concluded that the applicant's evaluation does not specifically address differential settlement, nor does it consider cracking of the concrete substructure, and is thus incomplete. As a result, the applicant is requested to reevaluate this analysis, including any lateral displacements caused by the differential settlement of the two foundations, and to provide information and/or reanalysis that include the effect of concrete cracking in the calculations of the lateral displacements of two adjacent buildings.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-11393, dated November 16, 2011 (ML11326A130).

The design of the T/B structures was modified as part of the comprehensive Seismic Closure Plan (UAP-HF-13034, 2/15/2013) and is documented in the TeR MUAP-11002 (Rev. 2). According to Subsections 1.1.2 and 1.1.3, of TeR MUAP-11002 (Rev. 2) submitted via UAP-HF-13027, 2/19/2013 (ML13066A705), the gap between the R/B complex structure and the T/B complex structures is [] . []

[] , the maximum tilt of the R/B complex foundation during operational life of the plant is [] . For the T/B complex, the tilt during operational life of the plant is calculated as [] . Based on assuming that the R/B complex and the T/B complex tilt toward each other, at the top of the north wall of the T/B building, the gap closure due to tilt is [] closure of the gap between the structures.

Regarding the effect of concrete cracking, please also refer to the response to RAI 909-6315 Question 03.07.02-188. Per the response, the results of the uncracked SSI results will be added to TeR MUAP-11002 (Rev. 3). According to the results, the maximum displacement of the T/B complex on the north wall immediately adjacent to the R/B complex (node 605) increased from 2.3210 inches for cracked concrete condition to 2.3874 inches for the uncracked condition. []

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The evaluation provided below shows that the gap closure is much less than the gap provided. Therefore, sufficient separation is available to preclude interaction between the R/B complex and the T/B complex.

Notes:

1. Gap closures rounded up to the nearest inch.
2. See discussion above in this response.
3. See TeR MUAP-12002 (Rev. 1) and response to RAI 960-6709 Question 03.07.02-212(c) for the method to combine sliding of the two structures.
4. See discussion above in this response.
5. US-APWR Reactor Building Complex Standard Plant SSI Analysis

Impact on DCD

There is no impact on the DCD.

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 to a Technical/Topical Report.

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