
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/29/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 960-6709 REVISION 0
SRP SECTION: 03.07.02 - Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 09/24/2012

QUESTION NO. 03.07.02-214:

The acceptance criteria in SRP Section 3.8.4 II.4, states that cracking of concrete needs to be considered in the design and analysis of structures. The staff notes that Section 2.0 of MHI TR MUAP-12002 (R0), "Sliding Evaluation and Results," indicates that both cracked and uncracked concrete properties are considered for the Reactor Building (R/B) Complex, while only cracked concrete properties are considered for the Turbine Building (T/B) structures. The staff requests the applicant to provide the technical basis and justification for not considering uncracked concrete properties for the T/B structures.

ANSWER:

Both cracked and uncracked concrete properties are considered in the nonlinear sliding analysis and the results are enveloped. To reduce the number of analyses performed with the finite element (FE) model, sensitivity studies were performed for both the reactor building (R/B) complex and the turbine building (T/B) to investigate if either the cracked section properties or the uncracked section properties govern sliding. The results of the sensitivity study performed for the R/B complex are presented in Section 5.2.2.5 of Technical Report MUAP-12002, Rev. 1. Based on these results, a definitive conclusion could not be made if either cracked concrete properties or uncracked concrete properties govern sliding of the R/B complex. Therefore the sliding analyses for the R/B complex were performed for both cases. The results of the sensitivity study performed for the T/B are presented in Section 5.3.2.3 of Technical Report MUAP-12002, Rev. 1. Based on this study, the T/B FE model with uncracked concrete section resulted in maximum sliding on average 80-percent higher than the maximum sliding calculated with the T/B FE model with cracked concrete section. As the T/B model with uncracked concrete section consistently yielded larger sliding, therefore providing more conservative results, the sliding analyses for the T/B were conducted considering the uncracked concrete section only.

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-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.