
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 852-6003 REVISION 3
SRP SECTION: 03.07.02 – Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 10/24/11

QUESTION NO. RAI 03.07.02-126:

With respect to Section 5.3 of MUAP-10001(R3), “Development of the R/B Complex Dynamic FE Model,” the applicant is requested to provide the following information in order for the staff to determine the adequacy of the dynamic model and the results of the SSI analyses of the R/B complex.

(i) Figures 5.3.1-2, -3, -5, -6 seem to indicate that one to three layers of solid elements are used for the basemat. ANSYS recommends the use of at least 4 solid elements for adequate moment capability. Please clarify the modeling of the basemat, and if applicable, provide technical justification for using fewer than 4 elements.

(ii) In Table 5.3.2.1-1, “Concentrated Mass of RV Model,” explain the differences between vertical mass and horizontal mass.

(iii) Explain the large difference in Figure 5.3.3.1.2-3, “R/B Modal Analysis Results – Cumulative Mass in the Vertical Direction (Z),” and discuss how it affects the responses.

(iv) Explain the 33% difference in Figure 5.3.3.2.3-7, “CIS ARS Results – Comparison at Top of Reactor Vessel, X-direction (Uncracked Analyses),” between the detailed and dynamic FE models. Identify the frequency at which it occurs. Provide comparable information for Figures 5.3.3.2.3-11, -12, -14, -16,-17.

(v) Explain the large difference in Figure 5.3.4.1-3, between SASSI and ANSYS Dynamic model analyses.

ANSWER:

Technical Report MUAP-10001, Rev. 3, is superseded by Technical Report MUAP -10006, Rev. 3. The reactor building (R/B), prestressed concrete containment vessel (PCCV), containment internal structure (CIS), east and west power source buildings (PS/Bs), auxiliary building (A/B), and essential service water pipe chase (ESWPC) are now structurally integrated and supported on a combined basemat to form the R/B complex. Technical Report MUAP-10006, Rev. 3,

presents the information relevant to the A/B as well as the other buildings that make up the R/B complex.

The validation of the model no longer uses the methodology or acceptance criteria that were stated in Technical Report MUAP-10001. The methodology and validation of the model is presented in Part 2 of Technical Report MUAP-10006, Rev. 3.

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 Technical/Topical Report

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