
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/22/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 909-6315 REVISION 3
SRP SECTION: 03.07.02 - SEISMIC SYSTEM ANALYSIS
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 03/05/2012

QUESTION NO. 03.07.02-191:

In Section 4.3.1 of MUAP-11002(R1), "Approaches for Developing Maximum Relative Displacement," the first sentence in the first paragraph (Page 34) states, "The relative displacements of select TI nodes with respect to the ground surface motion in the free field were calculated using the ACS SASSI RELDISP module."

In Section 4.2.1 of MUAP-11002(R1), "Subsurface Profile/Properties," (Page 32), the Applicant indicates that the cut-off frequency used for SSI analysis is 50 Hz. The data shown in Figures 3-10, 3-11, and 3-12 indicate that up to 50 Hz there is only 70% of the mass participation in the x direction and y direction, and only 40% of the mass participation in the z direction. The Applicant is requested to include the missing mass effect in the evaluation; otherwise, the Applicant needs to provide data to show that ignoring the effect of missing mass is conservative in the evaluation of the relative displacement.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-12124, dated June 5, 2012 (ML12158A478).

Per Subsection 3.1.3 of Technical Report MUAP-11002 Rev. 2, the ANSYS analysis has been revised to include at least 90 percent of the dynamic mass in all directions. The missing mass issue does not apply to the SSI analysis performed in the frequency domain that the seismic responses of structures are obtained through transfer functions, not through the modal superposition.

Impact on DCD

There is no current 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 a Technical/Topical Report.

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