
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	NO. 856-6094 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 03.07.02-176:

In Subsection 3.3.2 of MUAP-11011 (R0), "Coupled Dynamic SSSI Effect," the fifth paragraph (Page 30) states, "The comparison of the 5%-damped ARS calculated using different acceleration time histories shown in Figures 3.3.2-1a through 3.3.2-1d, indicate that differences in the ISRS resulting from the variations of the frequency content of the input acceleration histories, can be more than 30%. This demonstrates that the selected guideline for assessing the significance of the SSSI effects is well within the uncertainty introduced in the seismic design of standard plant due to the variations in the CSDRS-compatible input ground acceleration histories."

The ARS shown in Figures 3.3.2-1a through 3.3.2-1d are for the fixed base condition. The SSI effect is not included. The staff is not able to comprehend the significance and relevance of the information presented in these figures with the SSSI effect. The differences presented in these figures are meaningless because the motions in the x direction and y direction are statistically independent. The applicant is requested to provide more detailed information that shows how it will use the information presented in Figures 3.3.2-1a through 3.3.2-1d to assess the SSSI effect in the design basis of standard plant SSCs. Also, the applicant is requested to provide a sketch that shows the locations in the structure where ARS (presented in Figures 3.3.2-1a through 3.3.2-1d) are generated.

ANSWER:

Technical Report MUAP-11011, Rev. 0 has been superseded and the relevant information on the structure-soil-structure interaction (SSSI) analysis methodology has been incorporated into Technical Report MUAP-10006, Rev. 3.

The reactor building (R/B) complex now consists of the 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) structurally integrated and supported on a common basemat. A SSSI analysis of the influence of the turbine building (T/B) on the R/B complex was performed as described in Subsections 03.3.3 and 03.3.4 of Technical Report MUAP-10006, Rev. 3. The SSSI analysis used finite element (FE) models of both the R/B complex and the T/B. The SSSI analysis produced some instances where the

results were higher than the soil-structure interaction results. As such, the design basis envelope for the US-APWR includes the SSSI results.

It is agreed that the differences in acceleration response spectra in the x direction and y direction have no meaningful basis for structure-soil-structure interaction analysis. Information presented in Figures 3.3.2-1a through 3.3.2-1d is no longer used to assess the SSSI effect in the design basis of standard plant structures, systems, and components, and as such, a sketch of their locations is not relevant and is not provided.

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.