
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 495-3980 REVISION 1
SRP SECTION: 03.07.02 - Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 12/01/09

QUESTION NO. RAI 03.07.02-04:

In the response to RAI 3.7.2-21, the applicant justifies not considering soil layering and the location of the water table in the SSI analysis of the standard plant by referring to the site-specific commitment to confirm the conservatism of the SSI analysis of the standard plant in the COLA. The applicant points out that this commitment is addressed by COL Items 3.7(2), 3.7(20), 3.7(22), and 3.7(25).

In contrast, the response to RAI 3.7.2-25 states that site-specific SSI analysis of the PS/Bs, A/B, and T/B is not required unless dictated by structure-to-structure interaction considerations. If site specific SSI analyses are not performed for all of the seismic category (SC)-I and SC-II structures, how does the applicant intend to satisfy the requirements of COL Items 3.7(20) and 3.7(22), and how will the applicant confirm the conservatism of each of the site-independent SSI analyses?

Also, the table shown in response to RAI 3.7.2-25 indicates in several places that the method of site-specific SSI analysis for some structures will be determined by the COL applicant. Describe the possible methods for site-specific SSI analysis.

Reference: MHI response to RAI212-1950, MHI Ref: UAP-HF-09113, ML090930727, dated 3/30/2009.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10029 (ML100360838).

As described in Technical Report MUAP-10006, Rev. 3, site-independent soil-structure interaction (SSI) and structure-soil-structure interaction (SSSI) analyses are performed for the standard plant turbine building (T/B) and the reactor building (R/B) complex, which now includes the power source buildings (PS/Bs) and the auxiliary building (A/B). Because the A/B and PS/B structures are no longer separate from the R/B complex, they are not subjected to its structure-soil-structure interaction effects. Site-specific analyses are required for the R/B complex, which includes all standard plant seismic category I structures, to address COL Items 3.7(2), 3.7(20), 3.7(22), and 3.7(25) and to confirm the applicability of the standard seismic design for the particular site.

The essential service water pipe tunnel (ESWPT), power source fuel storage vaults (PSFSVs), and ultimate heat sink related structures (UHSRS) are seismically analyzed and designed on a site-specific basis. DCD Subsection 3.7.2.3.1 and Subsection 3.7.2.4.5, and COL Items 3.7(3) and 3.7(26), require the SSI analyses of the ESWPT, PSFSVs, and UHSRS to be performed with SASSI using three-dimensional finite element models of the structure and subgrade. The COL Applicant is also required by COL Item 3.7(10) to address the potential SSSI effect of the R/B complex and T/B on the site-specific seismic category I structures.

The table provided in the response to RAI 212-1950 Question 3.7.2-25 has been updated and now identifies that site specific SASSI analysis is required for all seismic Category I structures (R/B complex, ESWPT, PSFSVs, and UHSRS). The standard seismic design of the seismic category II T/B is based on the same design-basis generic subgrade conditions and the same certified seismic design response spectra as the R/B complex. Therefore, the site-specific applicability of the T/B standard seismic design can be demonstrated based on the premise that the R/B complex site-independent seismic design is successfully validated by the R/B complex site-specific seismic analyses performed per COL Items 3.7(1), 3.7(2), 3.7(5), 3.7(6), 3.7(20), 3.7(22) and 3.7(25).

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 a Technical/Topical Report.

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