
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 868-6156 REVISION 3
SRP SECTION: 03.07.02 – Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 11/14/11

QUESTION NO. RAI 03.07.02-178:

This request for additional information (RAI) is necessary for the staff to determine if the application meets the requirements of 10 CFR Part 50, Appendix A, General Design Criteria 2; 10 CFR Part 50 Appendix S; and 10 CFR Part 100; as well as the guidance in NUREG-0800, 'Standard Review Plan for the Review of Safety Analysis for Nuclear Power Plants,' Chapter 3.7.2, "Seismic System Analysis."

In RAI 660-5134, Rev. 2, Question 3.7.2-54, the staff asked the applicant to describe the criteria used for selecting the lower boundaries of the SSI models per the soil profiles shown in Tables 3-3A through 3-3H of MHI's Technical Report, MUAP-10006 (R0). The applicant responded by stating that the placement of the lower boundaries of the SSI models was selected such that the depth was more than twice the base dimension of the structure and thus was consistent with the guidelines of SRP 3.7.2. Per the guidelines of SRP 3.7.2, the selection of the model depth should be verified by parametric studies. In order to safely evaluate the adequacy of the SSI model, the staff requests that the applicant provide a parametric study for the selection of the lower boundaries of the SSI models.

ANSWER:

Tables 3-3A through 3-3H showing subgrade properties used as input for the soil-structure interaction (SSI) analyses are now replaced by Tables 03.3.1-1 through 03.3.1-7, containing similar information, in Part 3 of Technical Report MUAP-10006, Rev. 3. Subgrade properties, and the lower boundaries of the models for the reactor building (R/B) complex that are presented in the tables, have been changed in order to address the revised configuration of the combined foundation, and changes in the methodology for SSI analyses from consideration of a surface mounted foundation to an embedded foundation.

As discussed in Section 03.3.1 of Technical Report MUAP-10006, Rev. 3, the lower boundaries of the SSI models are established at depths below the foundation level that are at least twice the largest base dimension of the reconfigured R/B complex foundation. Per the guidelines of SRP 3.7.2, the selections of the model depths are verified by a parametric study documented in Appendix 3-D of Technical Report MUAP-10006, Rev. 3. The parametric study is performed for the 270-500 soil profile, in which the depth is increased by approximately 36% beyond the

layering depth used in the design-basis SSI analyses. Profile 270-500 is chosen because it is both the softest and deepest soil profile of the six generic profiles, and thus comes closest to representing a deep soil site. The other five generic profiles are either stiffer and/or, as stated in Appendix 3-D of the report, the depth of the base rock is shallow, such that extending the half space further into the rock has an insignificant impact on the results. The results of the parametric study confirm the adequacy of the SSI models' lower boundaries by demonstrating that the layering depths chosen for the SSI models are not a limiting parameter with respect to the SSI response.

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.