
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 660-5134 REVISION 2
SRP SECTION: 03.07.02 - Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 11/15/10

QUESTION NO. RAI 03.07.02-31 (03.07.02-58):

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."

It is stated in Section 3.2 of MHI's Topical Report, MUAP-10006 (R0), that eight generic soil profiles were selected for SSI analysis. In contrast, the first sentence of Section 5.2.2 of MUAP-10001, (R1) refers to the nine combinations of soil profile categories and depths to hard or soft rock material. A comparison of the eight soil profiles listed in Section 3.5 of MUAP-10006 (R0) with the nine soil profiles listed in Table 5.2-2 of MUAP-10001 (R1) showed that the profile "270-100" in Table 5.2-2 is not included in the SSI evaluations presented in MUAP-10006 (R0). It is not clear to the staff why this soil profile was not used in the evaluations presented in MHI's Topical Report, MUAP-10006 (R0).

The staff requests that the applicant provide an explanation and justification for why the Vs30=270 m/sec, and depth to rock=100 feet (i.e. the "270-100") soil profile was not included in the SSI evaluations. The question is posed to determine if the soil profiles used in the SSI analysis are consistent with the profiles developed for the analysis, and thus determine if the description and implementation of the Supporting Media for Seismic Category I Structures is acceptable per the guidelines of SRP 3.7.1.11.3.

RAI related to Question 3.7.2-50

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10355 (ML110040071).

The 270-100 profile was removed because it was deemed not to be representative of conditions at candidate sites within the Central and Eastern United States. This is due to the rather unusual condition of soft soil present for only a very shallow depth over a very stiff rock. At sites where such conditions might occur, it is anticipated that the soft soil would be removed or improved as stated in Section 01.4.2 of Technical Report MUAP-10006, Rev. 3. This eliminates the potential for a shallow-depth impedance mismatch created by these conditions.

The US-APWR seismic response analyses currently use six generic subgrade conditions, developed to cover the range of site conditions from soft soil to hard rock that may exist across the Central and Eastern United States. These six soil profiles provide sufficient diversity to allow the development of a standardized design that can be constructed at a wide range of candidate plant sites with limited site-specific changes. The development and implementation of the soil profiles as described in Technical Report MUAP-10006, Rev. 3, Sections 01.3.2, 01.4.2, and 01.5.2 meet the guidelines of SRP 3.7.1.II.3 by providing a detailed description of the supporting media used for evaluating the design of seismic category I structures. This information is summarized in DCD Section 3.7.1.3.

Variations in actual site conditions, such as depth or other site-specific attributes are addressed by US-APWR DCD COL Item 3.7(25), which requires a site-specific SSI evaluation to confirm that site-specific effects are enveloped by the standard design. If the site-specific conditions result in responses not enveloped by the standard design, COL Applicants can undertake remediation measures of the site soil conditions and/or address the site conditions as a Departure.

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.