
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 854-6088 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 03.07.02-154:

Section 3.2 in MUAP 11007 (R0) states that in MUAP-10001(R3), “the profiles are compatible with the strains generated by the input ground motion and are also representative of the effects of geological, geotechnical, and hydrological site parameters for representative nuclear power plant sites.” In fact, the strains computed in MUAP-10001(R3) are not compatible with the CSDRS surface response, but at best can only be considered approximations associated with those profiles. Of more importance, however, it is not clear that the strain-iterated velocities in MUAP-10001 (R3) are in any way related to the eight generic velocity profiles used in MUAP-11007 (R0). The eight generic site profiles described in MUAP-11007(R0) are not obviously consistent with the velocity profiles described in MUAP-10001(R3), Figures 4.2-1 and 5.2-1, where profiles of variable velocity with depth are shown.

Therefore, the applicant is requested to provide the following information:

(a) Clarify the relation between the eight generic shear wave velocity profiles used in MUAP 11007 (R0) and the strain-iterated shear wave velocities in MUAP 10001(R3). Explain whether the profiles described in MUAP-11007(R0) are consistent with the profiles described in MUAP-10001(R3). If they are not consistent, explain the basis for any differences, and how conclusions relevant to the MUAP-10001(R3) profiles are reached using the MUAP-11007(R0) profiles.

(b) Provide complete definitions of the velocity profiles (V_s and V_p as a function of depth) for the eight generic profiles described in MUAP-11007(R0).

ANSWER:

Technical Report MUAP-10001 has been incorporated into Technical Report MUAP-10006, Rev. 3.

(a) Technical Report MUAP-11007, Rev. 2 uses the generic soil profiles developed in Technical Report MUAP-10006, Rev. 3 Section 01.5.2. However, since the harder soil profiles (900-100, 900-200 and 2032-100) are not affected by the presence of ground water, unsaturated soil profiles were only developed for the 270-200, 270-500 and 560-500 soil profiles. The development of the strain compatible soil properties for the saturated profiles in Technical

Report MUAP-10006, Rev. 3 is discussed in Section 03.3.1, and the input soil properties for the 270-200, 270-500 and 560-500 soil profiles are provided in Tables 03.3.1-1 through 03.3.1-3, respectively. The development of the equivalent strain compatible soil properties for the profiles with the unsaturated conditions evaluated in Technical Report MUAP-11007 is discussed in Section 3.1 and Table 3-1 through Table 3-3.

- (b) Complete definition of the three soil profiles used for the ground water study in Technical Report MUAP-11007 are provided in Table 3-1 through Table 3-3. The velocity profiles for the unsaturated strain-iterated profiles used for the water table studies are shown in Technical Report MUAP-11007, Rev. 2. Comparison of the strain compatible shear wave velocities, compression wave velocities, damping and Poisson ratios are provided in Figure 3-2 through Figure 3-5.

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.