
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 03.07.02-169:

In Subsection 3.1 of MUAP-11011 (R0), "SSSI Analyses Methodology," the third paragraph (Page 5) states, in part, that "reduced (cracked concrete) structural stiffness properties will be used for the SSSI analyses for the softer generic site profiles, and full (uncracked concrete) stiffness properties will be used for the harder generic rock profiles."

The applicant is requested to provide technical rationale for using cracked concrete structural stiffness for the softer generic site profiles and using uncracked concrete stiffness for harder generic rock profiles. There are eight soil profiles considered in the US-APWR DCD. The applicant is also requested to identify each of the eight soil profiles as to whether it is either the softer generic site profile or the harder generic rock profile, and to provide a rationale for this categorization.

ANSWER:

Technical Report MUAP-11011, Rev. 0 has been superseded and the relevant information on the structure-soil-structure interaction analysis methodology has been incorporated into Technical Report MUAP-10006, Rev. 3.

The seismic design basis for the US-APWR has been updated to perform soil-structure interaction (SSI) analyses using dynamic finite element (FE) models of the reactor building (R/B) complex, which 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) supported on a combined basemat. As stated in Subsections 02.1.0, 02.3.3, 02.4.1.1.3, and 02.4.2 of Technical Report MUAP-10006, Rev. 3, two different levels of stiffness and damping properties corresponding to cracked and uncracked concrete are assigned to the dynamic FE model of the R/B complex. As stated in Section 03.1.0 of Technical Report MUAP-10006, Rev. 3, the structure-soil-structure interaction analysis is performed for four (270-200, 560-500, 900-100, 900-200) of the six generic profiles used in the SSI analyses, for both the cracked and uncracked conditions. The soil profile 270-500 and the rock profile 2032-100 were not evaluated as explained in Section 03.3.5 of Technical Report MUAP-10006, Rev. 3.

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 the Technical/Topical Report.

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