RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 212-1950 REVISION 1**
SRP SECTION:	**03.07.02 – Seismic System Analysis**
APPLICATION SECTION:	**3.7.2**
DATE OF RAI ISSUE:	**02/25/09**

QUESTION NO. RAI 03.07.02-01 (03.07.02-09):

Section 3.7.2.5 of the DCD indicate that the ISRS for the Seismic Category 1 structures and design spectra for the RCL system are required to be developed from a coupled model of the RCL-R/B-PCCV-CIS. However, it appears that the spectra that form the basis for the standard plant design are from Appendix 3I of the DCD, which is based on an uncoupled model rather than from the results of the coupled model that are documented in the technical report MAUP-08005, April 2008 (Ref. 3.7-18). Describe the role of the two models and how the results (forces, displacements, accelerations, ISRS) from each of the models were used in the US-APWR standard plant design. Clarify whether the coupled or uncoupled model is the basis for the seismic analysis and design of the standard plant.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-09113 (ML090930727).

The seismic design basis modeling and analyses for the reactor building (R/B) complex are performed using ANSYS and SASSI finite element (FE) models. The reactor coolant loop (including reactor vessel, steam generators, pressurizer, reactor coolant pumps, and major piping) is modeled as a lumped mass stick model and is coupled with the structural FE analysis models to determine the overall dynamic response of the R/B complex, as described in Technical Report MUAP-10006, Rev. 3. Technical Report MUAP-10006, Rev. 3, Sections 02.3.1, 02.4.1 and 02.5.1 provide descriptions of the detailed and dynamic FE models.

The forces, displacements, accelerations, and in-structure response spectra (ISRS) obtained from the seismic analyses of the R/B complex model are used as the basis for the standard plant design. Development of ISRS is described in Section 03.3.6 of Technical Report MUAP-10006, Rev. 3. Results of the seismic analyses of the R/B complex are presented in Section 03.4.0 of Technical Report MUAP-10006, Rev. 3. DCD Section 3.7.2.5 identifies that ISRS for any damping value or location in the R/B complex can be developed using the methodology described in 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 a Technical/Topical Report.

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