RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 495-3980 REVISION 1**
SRP SECTION:	**03.07.02 - Seismic System Analysis**
APPLICATION SECTION:	**3.7.2**
DATE OF RAI ISSUE:	**12/01/09**

QUESTION NO. RAI 03.07.02-02:

This Request for Additional Information (RAI) was prepared based on Revision 1 of the DCD prior to the submission of Revision 2.

In the response to RAIs 3.7.2-9 and 3.7.2-10, the applicant has stated that coupled RCL-R/B-PCCV-CIS model provides a better representation than the uncoupled model of this structure and that the coupled model forms the basis for design. The applicant also states in the response to RAI 3.7.2-9 that the ISRS presented in Appendix 3I of Revision 1 of the DCD that are obtained from the coupled model will be replaced with the ISRS from the coupled model. Are the ISRS from the uncoupled model going to be presented in Revision 2 of the DCD or does the applicant propose a straightforward replacement with the ISRS from the coupled model? If the applicant proposes a straight replacement, then RAI 3.7.2-10 becomes obsolete. If not, and if the applicant would like to draw conclusions based on comparisons between the ISRS from the coupled and uncoupled models, the applicant should provide frequency-by-frequency plots of the ratios of the coupled and uncoupled spectral curves so that the differences in each of the curves can be readily quantified and evaluated.

Reference: MHI response to RAI 212-1950, MHI Ref: UAP-HF-09113, ML090930727, dated 3/30/2009.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10029 (ML100360838).

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. Development of in-structure response spectra (ISRS) is described in Section 03.3.6. Results of the seismic analyses of the R/B complex are presented in Section 03.4.0 of Technical Report MUAP-10006, Rev. 3. ISRS at key locations are presented in Appendix 3-B. 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. Since all the ISRS provided in earlier versions of the DCD have been replaced, RAI 03.07.02-01 (03.07.02-10) is obsolete. Further, because an uncoupled model is not utilized, frequency-by-frequency plots of the ratios of the coupled and uncoupled spectral curves are no longer applicable and are not provided.

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.