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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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1/31/2013

### US-APWR Design Certification

### Mitsubishi Heavy Industries

Docket No. 52-021

**RAI NO.:** NO. 659-5133 REVISION 2  
**SRP SECTION:** 03.07.01 – Seismic Design Parameters  
**APPLICATION SECTION:** 3.7.1  
**DATE OF RAI ISSUE:** 11/15/10

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#### QUESTION NO. RAI 03.07.01-12 (03.07.01-18):

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 3.7.1, "Seismic Design Parameters." RG 1.61 provides acceptable damping values for computing in-structure response spectra (ISRS).

However, Table 3-7 in MHI's Topical Report, MUAP-10006 (RO), indicates that SSE damping values are used in the ISRS computation. In order to ensure that the seismic responses of plant-specific systems or subsystems are not under-predicted, the applicant should either add a COL Action Item that states that this issue must be satisfactorily addressed for the seismic analysis of plant-specific structures, or else provide a technical justification for not including this as a COL Action Item.

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#### ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10353 (ML110040136)

The effects of concrete stiffness on the in-structure response spectra (ISRS) are addressed by enveloping the results obtained from site-independent soil-structure interaction analyses of structural models with: (1) full stiffness and OBE damping corresponding to lower stress levels and uncracked concrete properties and (2) reduced stiffness and SSE damping corresponding to higher stress levels and cracked concrete properties. Section 02.4.2 of Technical Report MUAP-10006, Rev. 3, describes the approach used to address the effect of concrete cracking in the standard design. Technical Report MUAP-10006, Rev. 3, Table 02.4.1.1.3-2 refers to Technical Report MUAP-11018, Rev. 1 that contains a discussion of the SC module test data and stress analyses that establishes the bases for the stiffness and damping values used in the seismic analysis.

DCD Section 3.7.1.2 and COL Action Item 3.7(4) require each applicant to review the resulting level of seismic response and determine appropriate damping values for the site-specific calculations of ISRS that serve as input for the seismic analysis of seismic category I and seismic category II subsystems.

**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.

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