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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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02/27/2013

### US-APWR Design Certification

### Mitsubishi Heavy Industries

Docket No. 52-021

**RAI NO.:** NO. 853-6029 REVISION 3  
**SRP SECTION:** 03.07.02 – Seismic System Analysis  
**APPLICATION SECTION:** 3.7.2  
**DATE OF RAI ISSUE:** 10/24/2011

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#### QUESTION NO. 03.07.02-147:

The staff has reviewed the verification results for the PCCV, R/B and FHA, and the CIS that are reported in Section 5.2 of MUAP-11006 (R0). The staff has noted several inconsistencies shown below. The applicant is requested to describe the effects each of these inconsistencies have on the validation results of the LMSMs of the PCCV, R/BFHA, and CIS.

1. The third sentence of third paragraph of Subsection 5.2.1.1 of MUAP-11006 (R0) states that the total mass of the dynamic FE model of the PCCV is 2,447 kip-s<sup>2</sup>/ft and that the difference between the mass of the dynamic FE model and the LMSM is less than 0.2%. In contrast, Table 5.1.1-1 of MUAP-11006 (R0) shows the mass of the LMSM of the PCCV to be 2.311 kip-s<sup>2</sup>/ft. However the sum of the masses shown in Table 5.1.1-1 is 2.439 kip-s<sup>2</sup>/ft, which is different than both of the values above.
2. In Section 5.2.2.1 of MUAP-11006 (R0), it is stated that the total weight of the LMSM of the R/B and FHA is 372,000 kips, which is based on the weight of the FE model given in that Subsection. 372,000 kips appears to represent the weight of the model without the basemat. In contrast, Table 5.1.1-3 of MUAP-11006 (R0) shows the total weight of the LMSM of the R/B and basemat to be 766,760 kips. The applicant is requested to explain the interpretation of the two different weights.
3. The sum of the masses in Table 5.1.1-3 is 340.24 x 103 kip-s<sup>2</sup>/ft, not the value of 2,882 kips shown in the table.
4. The weight of 766,760 kips shown in Table 5.1.1-3 is inconsistent with either the mass of 2882 kips shown in the table, or the mass of 340.24 x 103 kips<sup>2</sup>/ft arrived at by summing the values in the table. The applicant is requested explain this inconsistency.
5. In Subsection 5.2.3.1 of MUAP-11006 (R0), it is stated that the total mass of the CIS from the dynamic FE model is 3,120 kip-s<sup>2</sup>/ft or 100,383 kips and that the difference between the mass of the LMSM and the dynamic FE model is 5.3%. However the mass of the CIS from the LMSM is shown as 2,882 kip-s<sup>2</sup>/ft in Table 5.1.1-2 with a difference of more than 5.3%. The applicant is requested to provide the acceptance criteria, explain this inconsistency, and to provide the proper masses and interpretation for the values shown in the report and supporting tables identified above.

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**ANSWER:**

A lumped mass stick model of the seismic category I structures is no longer used for the associated studies (Structure-Soil-Structure Interaction (SSSI) in Technical Report MUAP-11011 and embedment and water table in Technical Report MUAP-11007). Technical Report MUAP-11006 is withdrawn.

**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.