

---

---

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

---

---

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

---

**QUESTION NO. 03.07.02-139:**

In Section 1.0 MUAP-11006 (R0), the applicant states that the lumped mass stick models (LMSM) will be used in studies of base reactions, effects of embedment, and structure-soil-structure interaction (SSSI) studies. The applicant is requested to provide justification for how validating the models in the fixed-base condition using ANSYS provides sufficient evidence that the LMSM models will provide responses comparable to those that a properly benchmarked and validated detailed SASSI model would predict.

In particular, the validation process does not benchmark the SSI capabilities of either model. For example, the capability of the LMSM model for performing embedment, seismic stability, and SSSI studies is not addressed in the validation process. Results of each of these studies depends on having proper seismically induced lateral wall pressures, but the validation process for the lumped mass models does not benchmark this feature.

The applicant's justification for the use of the SASSI and LMSM should also include a description of the damping implemented in both ANSYS and SASSI. If the damping formulations are different in the two computer codes, the applicant is requested to provide justification for how benchmarking in a fixed-base condition with a different damping formulation in ANSYS provides validation for a SASSI SSI model.

---

**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 Technical Report MUAP-11006 is withdrawn.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.

---

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