

---

---

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

---

---

1/31/2013

### US-APWR Design Certification

### Mitsubishi Heavy Industries

Docket No. 52-021

**RAI NO.:** NO. 852-6003 REVISION 3  
**SRP SECTION:** 03.07.02 – Seismic System Analysis  
**APPLICATION SECTION:** 3.7.2  
**DATE OF RAI ISSUE:** 10/24/11

---

#### QUESTION NO. RAI 03.07.02-127:

In Section 5.3 of MUAP-10001 (R3), "Development of the R/B Complex Dynamic FE Model," the 6th paragraph (Page 5-81) states: "The thickness of the PCCV is also simplified for ease of modeling. Only the large equipment hatch is modeled and the elements modeling the buttresses on the East and West sides of the structure are not offset with respect to adjacent elements. Also, the personnel airlocks as well as the Main Steam and Feed Water penetrations are not modeled in the Dynamic FE Model. Figure 5.3.1-4 shows the Dynamic PCCV Model."

The applicant did not discuss how the polar building crane is modeled in the PCCV Dynamic Model (shown on Figure 5.3.1-4) including the effects of the mass of the crane (with its maximum load lift) on the PCCV model. The applicant is requested to provide the details of the de-coupling criteria (including the actual mass ratios and frequency ratios) and justification for dynamic de-coupling of the polar crane's seismic response from the building response.

---

#### ANSWER:

Technical Report MUAP-10001, Rev. 3 has been replaced by Technical Report MUAP-10006, Rev. 3. Section 5.3 in MUAP-10001, Rev. 3 is Section 02.5.1 in MUAP-10006, Rev. 3. A paragraph is included in Section 02.5.1.1 to discuss how the polar crane is modeled. This paragraph states:

The PCCV polar crane (crane self-weight supported by the polar crane girder) is modeled into the PCCV directly and attached to the crane rail girder supported by the corbels located at the 0° and 180° azimuths. This is a generic crane design intended solely to be used for seismic analyses.

Section 02.4.1.1.4 of MUAP-10006, Rev 3, discusses the masses used in the polar crane model. This paragraph states:

The PCCV Polar Crane and the Fuel Handling cranes are modeled in their respective parked locations with trolley masses and lifted load masses (Spent fuel cask, RV Head, etc.) included.

Detailed modeling and analysis of the polar crane will be performed on a site specific basis. COL Item 3.7(11) was previously reinstated into DCD Tier 2, Subsections 3.7.2.3.4 and 3.7.5 and

Table 1.8-2. COL Item 3.7(11) requires the COL Applicant to confirm the masses and frequencies of the PCCV polar crane to determine if coupled site-specific analyses are required.

**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 the Technical/Topical Report.

---

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