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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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1/11/13

### US-APWR Design Certification

#### Mitsubishi Heavy Industries

Docket No. 52-021

**RAI NO.:** NO. 657-5135 REVISION 2  
**SRP SECTION:** 03.08.05 – Foundations  
**APPLICATION SECTION:** 3.8.5  
**DATE OF RAI ISSUE:** 11/15/10

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#### QUESTION NO. RAI 03.08.05-38:

In its response to Part 5 of Question 03.08.05-28, MHI states that the high water table will not affect the soil spring stiffness for the R/B-PCCV analyses. However, the Applicant does not present any data to substantiate this claim. The staff disagrees with this position because the equations of motion for elastic waves in fluid-saturated porous media are different from those used in the derivation of the soil springs given in ASCE 4-98. MHI is requested to provide numerical data to support their argument that the high water table has no effect on the soil spring constants.

In the response to Part (c), MHI states that Figures 3.8.5-11 and 3.8.5-12 of US-APWR DCD Revision 2 indicate that the dent in the R/B basemat is filled with concrete and becomes part of the structural basemat. However, the staff notices that the description of the basemat presented in the first paragraph of the US-APWR DCD Revision 2 Subsection 3.8.5.1.1 has not been updated. MHI is requested to update this description.

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#### ANSWER:

This answer revises and replaces the previous MHI answer transmitted by letter UAP-HF-10351 in December 2010 (ML103190086).

Soil springs are no longer used in the finite element (FE) analyses. Full continuous FE modeling of the soil-foundation system is used as described in Technical Report MUAP-10006, Rev. 3. The standard design of US-APWR plant considers the water table elevation to be located 1 ft below the nominal plant grade elevation. This is addressed in the FE model by assuming the soil is saturated. Technical Report MUAP-11007, Rev. 2, addresses the effects of groundwater level on the soil-structure interaction (SSI) analysis by comparing results from unsaturated soil profiles with the saturated results in Technical Report MUAP-10006, Rev. 3.

The reactor building (R/B), prestressed concrete containment vessel (PCCV), containment internal structure, east and west power source buildings (PS/Bs), auxiliary building (A/B), and essential service water pipe chase are now structurally integrated and supported on a combined basemat to form the R/B complex. DCD Tier 2, Subsection 3.8.5.1.1 has been revised to incorporate the revised configuration to reflect the removed dent, now filled with reinforced concrete, of the R/B complex on its basemat.

**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.