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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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05/31/2013

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

**RAI NO.:** NO. 985-6948 REVISION 3

**SRP SECTION:** 03.08.03 – Concrete and Steel Internal Structures of Steel or Concrete Containments

**APPLICATION SECTION:** 3.8.3

**DATE OF RAI ISSUE:** 01/08/2013

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**QUESTION NO. 03.08.03-103:**

The staff reviewed the applicant's response to RAI 905-6311, Question 03.08.03-68 regarding design of the shear studs connecting faceplates and concrete of steel-concrete (SC) walls. The staff understands that a specific attachment load design methodology is being developed and will be submitted for NRC review upon completion. However, the staff requests that the applicant explain, in the design of the SC wall shear studs, whether tensile loads other than those from attachments need to be considered (e.g., the tensile loads due to steel faceplate buckling, thermal loads, and horizontal wet concrete load on faceplates resulting in tension loads in the studs in the section below the concrete pour). If not considered, explain why not. If considered, explain how these tensile loads acting on the studs are considered.

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**ANSWER:**

The design approach for attachment loads is discussed in Section 2.10 of Technical Report MUAP-11019, Rev. 1. This approach engages the full SC cross section via the tie bars, rather than applying tension to the studs and imparting flexure into the SC faceplate between the studs. As a result, the studs on the steel-concrete (SC) wall faceplate do not need to be designed for the combination of interfacial shear and applied tension, and the SC faceplates are not required to be designed for localized flexure between the studs.

Tensile loads are not considered in the design of SC wall shear studs because they are not caused by a specific load combination for design.

[

] The section tie bars  
provide significant integrity to the SC wall cross-section, as discussed in Section 2.7 of  
Technical Report MUAP-11019, Rev. 1.

As discussed in Section 2.2 of Technical Report MUAP-11019, Rev. 1, the steel faceplates are designed to be non-slender, i.e., yielding occurs before local buckling. The full axial compressive strength of the SC wall section is reached when the steel faceplates yield in compression as discussed in response to RAI 03.08.03-102. Therefore, the tensile loads due to steel faceplate buckling will not occur before the SC wall section strength (failure) has been reached.

**Impact on DCD**

There is no impact on the DCD.

**Impact on R-COLA**

There is no impact on the R-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.

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