RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/29/2013

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:	**11/15/2010**

QUESTION NO. 03.08.05-41:

In the response to Question 03.08.05-33, MHI states that the value of the coefficient of friction, μ, for concrete-to-concrete friction ranges from 0.6 to 1.4 per ACI 349 Section11.7. The value of μ=0.6 is for concrete placed against hardened concrete not intentionally roughened, while the value of 1.4 is for concrete placed monolithically. MHI further states that the construction sequence of the foundation for US-APWR will allow the use of the value of 0.7 and quotes the publication "State of the Art Report on Finite Element Analysis of Reinforced Concrete: ASCE," as the supporting document. The staff disagrees with this position since US-APWR is stated to be designed in accordance with ACI 349, and not a report of ASCE. MHI also states that at certain sites minor roughening of the fill concrete surface *may* be required. The staff finds that unless the requirement for a "roughened surface" is specified in DCD, a conservative value should be used in the analyses, i.e., μ=0.6. MHI is requested to specify "roughened surface" for the fill concrete to justify use of μ=0.7, or to use μ=0.6 in the analysis.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10351 (ML110040127)

Section 4.4 of Technical Report MUAP-12002, Rev. 1 requires roughening of engineered fill concrete, before placing new foundation concrete, in order to achieve a reliable static coefficient of friction μ = 0.7 at the concrete-to-concrete interface. This requirement is included in the Design Control Document (DCD) Subsection 3.8.5.5.2.

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.