
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO. 223-1996 REVISION 0
SRP SECTION: 03.08.01 – Concrete Containment
APPLICATION SECTION: 3.8.1
DATE OF RAI ISSUE: 02/26/09

QUESTION NO. RAI 03.08.01-01 (03.08.01-08):

In DCD Subsection 3.8.1.4.2.1, the first paragraph (Page 3.8-11) states “The analysis used to calculate the dynamic response of the PCCV resulting from dynamic loads such as earthquake and hydrodynamic loads considers the potential effects of concrete cracking where significant.”

The applicant is requested to describe how the effects of concrete cracking were considered in the dynamic analysis for the PCCV, and provide the technical basis for that consideration.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-09161 (ML091060749).

The phrase “where significant” has been removed from DCD Subsection 3.8.1.4.2.1. The US-APWR reactor building complex seismic response considers the prestressed concrete containment vessel stiffness reduction due to concrete cracking. Technical Report MUAP-10006, Rev. 3, describes the dynamic finite element (FE) analysis modeling approach. Two sets of models are run to develop response spectra, one set using full stiffness and operating-basis earthquake damping (for uncracked concrete) and the second set using reduced stiffness and safe-shutdown earthquake (SSE) damping (for cracked concrete). Technical Report MUAP-10006, Rev. 3, Sections 02.1.0, 02.3.3, 02.4.1.1.3, 02.4.2, 02.4.2.3, and Appendix 2-A provide further details and technical basis of this approach.

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 Report.

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