
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

08/01/2013

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

RAI NO.: NO. 1045-7141 REVISION 3
SRP SECTION: 03.08.05 – Foundations
APPLICATION SECTION: 3.8.5
DATE OF RAI ISSUE: 07/08/2013

QUESTION NO. 03.08.05-65:

On April 3, 2013, the applicant submitted a markup of DCD Tier 2 Section 3.8 to provide updated information related to a seismic design change.

In Subsection 3.8.5.5.1, "Overturning Acceptance Criteria," the second paragraph (Page 3.8-104) states, "The calculated minimum factor of safety presented in Table 3.8.5-6 show that the SSE [safe shutdown earthquake] load combination governs over wind and tornado load combinations for evaluating overturning stability. The standard plant SSE overturning stability evaluations are performed using the dynamic FE [finite element] models and the seismic driving forces/moments obtained from the site independent SSI [soil-structure interaction] analyses."

The applicant is requested to provide the following information:

1. Indicate whether the calculated minimum factor of safety presented in Table 3.8.5-6 is in the E-W or N-S direction for the overturning stability because the reactor building (R/B) complex is not a square shape.
 2. Descriptions for the "dynamic FE models" mentioned in the second sentence of the quoted sentences above, and the differences between these dynamic FE models with those presented on Figures 3.8.5-5 through 3.8.5-10.
 3. Does the calculated minimum factor of safety presented in Table 3.8.5-6 consider the three directions of earthquake input simultaneously?
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ANSWER:

1. The minimum factor of safety for overturning stability presented in Table 3.8.5-6 is in the E-W direction.
2. The dynamic FE Model used in overturning stability analysis is comprised of the Model presented on Figures 3.8.5-5 through 3.8.5-10 and the backfill soil on top of the ESWPC. In the current US-APWR design, the ESWPC is attached to the R/B

complex, with the roof of the ESWPC below grade. The backfill soil has been modeled in the SSI analysis. In the overturning analysis, the backfill soil is considered as a part of the R/B structure, since its inertia force and gravity load can be transferred to the R/B complex through the interface between the backfill soil and the ESWPC.

3. The three directions of earthquake input are considered simultaneously when calculating the minimum factor of safety presented in Table 3.8.5-6.

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.

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