
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/29/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 810-5874 REVISION 3
SRP SECTION: 03.07.02 – Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 08/22/2011

QUESTION NO. 03.07.02-98:

In Subsection 3.7.2.8 of DCD (R3), “Interaction of Non-Seismic Category I Structures with Seismic Category I Structures”, the sixth paragraph (page 3.7-39) states, “Maximum lateral earth pressure due to the backfill, surcharge due to live load or adjacent basemat bearing pressures, groundwater, and other such static-load effects on below-grade exterior walls are discussed in Section 3.8. The design of below grade exterior walls for US-APWR seismic category I structures takes into account any dynamic increases of these loads due to a seismic event. This is accomplished through the use of conservative maximum static and dynamic lateral pressure distribution profiles developed using analysis methods provided in Section 3.5.3 of ASCE 4-98 (Reference 3.7-9).”

The analysis methods provided in Section 3.5.3 of ASCE 4-98 do not consider the follow two effects on the dynamic lateral earth pressure:

1. The effect of high water table, and
2. The effect of the base rocking motion due to the effect of soil-structure interaction.

The staff reviewed DCD Section 3.8 and could not find any information regarding the two effects listed above. The Applicant is therefore requested to consider the two effects mentioned in the preceding paragraph. Alternatively, the Applicant is requested to provide technical basis and justification for not considering these two effects.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP- HF-11402 (ML11332A148).

Subsection 3.7.2.8 of the Design Control Document (DCD) incorporates the methodology provided in Standard Review Plan (SRP) 3.8.4, Acceptance Criterion II.4.H, to compute lateral earth pressures on the exterior basement walls. The response to RAI 212-1950, Question 3.7.2-13, describes methodology and parameters to determine design static and dynamic lateral earth pressures acting on basement exterior walls of the reactor building

(R/B) complex. The two items in the question are addressed in the current methodology as follows:

1. The effect of high water table is addressed by conservatively assuming that the groundwater level is at the plant grade when calculating dynamic lateral (Wood's) pressure, while the groundwater level is at the bottom of the basemat level when calculating passive pressure. Refer to the response to RAI 212-1950, Question 3.7.2-13, for detailed information.
2. The effect of base rocking motion is addressed by using the envelope of the dynamic plus static pressure and total passive pressure, as described in the response to RAI 212-1950, Question 3.7.2-13. It is also detailed in the response to RAI 657-5135, Question 03.08.05-39, part 3.

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.