
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

08/13/2013

**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. 03.08.05-61:

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 3.8.5.4.4, "Analyses of Settlement," the fifth paragraph (Page 3.8-101) states, "The loads considered in the settlement analyses are as follows: ...Live Loads(L), assumed to act with 25% of their maximum intensity considered for structural design (i.e., long term values), during the operational life of the plant."

The staff believes that the maximum live load reduction allowed in ANSI/ASCE 7-05 is 40%.

Therefore, the applicant is requested to provide the code basis for considering only 25% of live loads in the settlement calculation.

ANSWER:

The difference between the use of 25% of the Live Load (0.25L) and 40% of the Live Load (0.40L) represents approximately 3% of the total load producing settlements. The Live Load here does not include the fixed equipment loads. These loads are considered to act 100% of the time as is the dead load.

No guidance has been found in Codes for the use of Live Loads in the determination of long term settlement. The guidance in ASCE 7 is for the design of structural members and not for the calculation of settlements. The Commentary of ASCE 7 provides tables of the statistics used to develop the reductions. The area considered is 200 square feet for the structures considered except for schools where the area is 1000 square feet. These are areas associated with members supporting floors.

The calculation of settlement uses guidance from the Standard Review Plan Section 3.7.2, Paragraph II.3.D. The SRP recommends considering 25% of the Live Load (and 75% for roof loads) in seismic analyses. Thus, given that a seismic event can occur at any time during the life of the facility, the average value of Live Load expected during the life of the facility is 25%.

Thus, 25% was considered to be a reasonable upper bound to the live load to consider for the calculation of settlement over the life of the facility.

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.