
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/22/2013

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

RAI NO.: NO. 909-6315 REVISION 3
SRP SECTION: 03.07.02 - SEISMIC SYSTEM ANALYSIS
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 03/05/2012

QUESTION NO. 03.07.02-193:

In Section 5.1.1 of MUAP-11002(R1), "Dead Loads," the second sentence on top of Page 38 states, "If the weight of the equipment is less than the applicable live load, then the equipment weight shall be neglected in the dead load determination and shall be accounted for by the area live load."

The staff disagrees with the Applicant that the weight of the equipment which is dead load can be replaced by live load. Dead load and live load are two different types of loads and cannot be interchanged. The Applicant is requested to provide the basis for this assumption and justify that the assumption will result in a conservative design.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-12124, dated June 5, 2012 (ML12158A478).

The assumption is conservative for the seismic analysis as shown in Table 1 because the floor area live loads were applied to all portions of the superstructure floors, even those areas of the floors occupied by equipment weighing more than the floor area live load. Floor area live load was applied to areas where live load cannot occur because the space is occupied by equipment. For seismic analysis 25 percent of the floor area live load was considered in the seismic mass, per the DCD, 3.7.2.3.6.1. Table 1 compares the weight of the equipment replaced with floor area live load against 25 percent of the floor area live loads applied to corresponding equipment footprint areas. Table 1 shows that using 25 percent of the floor live load produces a larger total load for both the Turbine Building (T/B) and the Electrical Room. Therefore, the seismic mass used in the seismic analysis is conservative.

Table 1. Comparison of T/B and Electrical Room Loads⁽¹⁾

Floor	Sum of Equipment Weights for Equipment Weighing < Floor Area Live Load ⁽²⁾ (kips)	Sum of 25% of Floor Area Live Loads x Corresponding Equipment Footprint Areas (kips)	Total Floor Dead Load (kips)	Percent Difference [(2)-(1)] / (3)
	(1)	(2)	(3)	
T/B Second	253.5	190.3	16733	-0.38
T/B Third	41.1	170.7	20594	+0.63
T/B Fourth	310.5	300.5	25965	-0.04
T/B Total	605.1	661.5	63292	+0.09
Electrical Room Second	409.0	559.6	4170	+3.61
Notes: ¹⁾ Comparison is only for floors with equipment replaced with floor area live load. ²⁾ The T/B fourth floor loads include 310 kips of dead load for two tool rooms (155 kips each). The Electrical Room second floor loads include 331 kips for electrical room equipment and 78 kips for battery room equipment.				

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/Topical Report.

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