
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

08/01/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 1044-7140 REVISION 3
SRP SECTION: 03.08.04 – Other Seismic Category I Structures
APPLICATION SECTION: 3.8.4
DATE OF RAI ISSUE: 07/08/2013

QUESTION NO. 03.08.04-54:

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 3.8.4.3.4.6, "Construction Loads," the first paragraph (page 3.8-70) states, "In the load combination for the construction case, the live load is defined as the additional construction loads produced by cranes, trucks, or any type of vehicle with its pick-up load, as required by construction. ASCE 37-02 (Reference 3.8-36) provides additional guidance. For steel beams supporting concrete floors, the weight of the concrete plus 100 lb/ft² uniform load or 5,000 pounds concentrated load, distributed near points of maximum shear and moment, are applied. A one third increase in allowable stress is permitted in this case."

The staff was not able to locate the provision in ASCE 37-02, "Design Loads on Structures during Construction," that allows a one third increase in allowable stress. Therefore, the applicant is requested to provide the referenced section of the ASCE standard that allows the one third increase in allowable stress.

ANSWER:

There is no provision in American Society of Civil Engineers (ASCE) 37-02, "Design Loads on Structures during Construction," that allows for a one third increase in allowable stress. A one third increase in allowable stress was not used in the analysis/design calculations for construction load in the updated calculations.

Impact on DCD

Subsection 3.8.4.3.4.6 of the Design Control Document (DCD) will be revised to remove the one third increase in allowable stress discussion from the DCD. See Attachment 1 for the DCD markup.

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.

3. DESIGN OF STRUCTURES, SYSTEMS, COMPONENTS, AND EQUIPMENT US-APWR Design Control Document

3.8.4.3.4.4 Concentrated Loads for the Design of Local Members

Concentrated load on beams and girders (in load combinations that do not include seismic load)	5,000 lbs to be applied as to maximize moment or shear. This load is not carried to columns. It is not applied in office or access control areas ⁽¹⁾
Concentrated load on slabs (to be considered with dead load only)	5,000 lbs to be so applied as to maximize moment or shear. This load is not cumulative and is not carried to columns. It is not applied in office or access control areas ⁽¹⁾

⁽¹⁾ Area where no heavy equipment is located or transported.

In the design reconciliation analysis, if actual loads are established to be lower than the above loads, the actual loads may be used for reconciliation.

3.8.4.3.4.5 Temporary Exterior Wall Surcharge

~~When applicable, the most critical of either a minimum subsurface wall surcharge of 250 lb/ft² (wheel load converted to equivalent uniform vertical load) or a railroad surcharge is applied. The most critical of either a minimum surcharge of 450 psf (attributed to wheel loading converted to equivalent uniform load) or a railroad surcharge is applied. The surcharge is applied at plant grade adjacent to below-grade walls when such loading may be present.~~

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3.8.4.3.4.6 Construction Loads

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DCD_03.08.04-54

Metal decking and precast concrete panels used as formwork for concrete floors are designed for the wet weight of the concrete plus a construction live load of 20 lb/ft² uniform or 150 pound concentrated. The deflection for these items used as a form is limited to the lesser of 0.75 in. or the span length (in inches) divided by 180. For relatively high construction loads, temporary supports may be used to prop floor beams without increasing their size.

3.8.4.3.4.7 Crane Loads

Crane and equipment supplier's information are used to determine wheel loads, equipment loads, weights of moving parts, and reactions of clamps (if any). Construction loads are considered where applicable.