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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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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

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**QUESTION NO. 03.08.05-47:**

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 3.8.5.1.1, "Reactor Building Complex," the last two sentences of the first paragraph (page 3.8-95) state, "The central region of the basemat with a diameter of approximately 187 ft supports the PCCV [prestressed concrete containment vessel] and CIS [containment internal structure] with a thickness of approximately 38 ft, 2 in. The peripheral portion, which supports the east PS/B [power source building], west PS/B, ESWPC [essential service water pipe chase] and A/B [auxiliary building] is 13 ft, 4 in."

The staff notices that the thickness of the basemat supporting R/B [reactor building] is not given. The applicant is requested to specify the thickness of the R/B.

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**ANSWER:**

The basemat has a thickness of 13 ft. - 4 in. to support all structures of the reactor building (R/B) complex except for the prestressed concrete containment vessel (PCCV) and the containment internal structure (CIS). Therefore, the thickness of the basemat supporting the R/B is 13 ft. - 4 in.

**Impact on DCD**

Section 3.8.5.1.1 will be revised as shown in Attachment 1 of this RAI.

**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.

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

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

~~portion which supports the R/B is 9 ft, 11 in. thick. The R/B, PCCV, east PS/B, west PS/B, ESWPC, A/B and CIS are built on a common basemat and isolated~~ separated from adjacent AC/B and T/B. The basemat of the R/B complex is essentially a rectangular shaped reinforced concrete mat. The length of the basemat in the north-south direction is 334 ft, 7 in., and in the east-west direction at its greatest point is 413 ft-0 in., as shown in Figure 3J-1. The central region of the basemat with a diameter of approximately 187 ft supports the PCCV and CIS with a thickness of approximately 38 ft, 2 in. The peripheral portion, which supports the R/B, east PS/B, west PS/B, ESWPC and A/B is 13 ft, 4 in.

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The basemat includes hollow portions such as the tendon gallery, tendon gallery access tunnel, and other portions such as in-core chase and CV recirculation sump. Since the vertical tendons are anchored at the roof of the tendon gallery, the upper part of the tendon gallery is important from the structural point of view.

The basemat reinforcement consists of a top horizontal layer of reinforcement, a bottom horizontal layer of reinforcement, and vertical shear reinforcement. The bottom layer of reinforcement is arranged in a rectangular grid. The top layer of reinforcement is arranged in a rectangular grid at the center of the ~~mat~~ PCCV and radiates outward in a polar pattern in order to avoid interference with PCCV reinforcement. The top and bottom reinforcement at the upper portion of the tendon gallery is in a polar pattern.

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Outlines of the R/B, PCCV and ~~containment internal structure~~ CIS including the basemat are provided in Figures 3.8.5-1 through 3.8.5-3.

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#### 3.8.5.1.2 ~~Power Source Buildings~~ Deleted

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~~The east and west PS/Bs are free standing structures, each on an independent reinforced concrete basemat. Each PS/B basemat is a rectangular reinforced concrete mat with a thickness of 119 in. The bottom of basemat is at elevation 36 ft, 3 in.~~

~~The bottom layer of basemat reinforcement is arranged in a rectangular grid. The basemat also consists of a top layer of reinforcement, and vertical shear reinforcement.~~

#### 3.8.5.1.3 Site Specific Structures

Other non-standard seismic category I plant buildings and structures of the US-APWR are designed by the COL Applicant based on site-specific subgrade conditions.

#### 3.8.5.2 Applicable Codes, Standards and Specifications

The following industry codes, standards and specifications are applicable for the design, construction, materials, testing and inspections of the ~~PCCV basemat~~ R/B complex basemat. Pressure retention requirements of the vessel are in accordance with the guidance from SRP 3.8.1. (Reference 3.8-7).

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- Rules for Construction of Nuclear Facility Components, Division 2, Concrete Containments, Section III, American Society of Mechanical Engineers, 2001 Edition through the 2003 Addenda (hereafter referred to as ASME Code). (Reference 3.8-2).