

# REQUEST FOR ADDITIONAL INFORMATION 654-4640 REVISION 0

11/1/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 04.05.01 - Control Rod Drive Structural Materials

Application Section: 4.5.1

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)  
(CIB1)

04.05.01-11

In RAI 04.05.01-10(3), the staff requested that the applicant discuss its use of furnace sensitized austenitic stainless steel. The staff noted that DCD Subsection 4.5.1.2 states that furnace sensitized material is allowed. In the applicant's response to the above RAI, it stated that MHI does not use sensitized material for the CRDM housing. Although the staff finds the applicant's response acceptable, the staff requests that the applicant modify DCD Subsection 4.5.1.2, in order to provide clarity, to state that furnace sensitized material is not allowed.

04.05.01-12

DCD Table 1.9.1-1 does not identify Subsection 4.5.1 in the line item for RG 1.31. In addition, DCD Subsection 4.5.1.2 does not reference RG 1.31. In order to provide clarity, the staff requests that the applicant modify DCD Section 4.5.1.2 to reference the use of RG 1.31 for the fabrication of pressure boundary and non-pressure boundary CRDM components. In addition, the staff requests that the applicant list Subsection 4.5.1 in the line item for RG 1.31 in Table 1.9.1-1 to make it clear that the applicant follows the guidance provided in RG 1.31, without exception, for all welded austenitic stainless steel CRDM components.

04.05.01-13

DCD Subsection 4.5.1.1 states "The tempering temperature of martensitic stainless steels and the aging temperature of precipitation-hardened stainless steels are specified for assurance that these materials will not deteriorate from stress corrosion cracking in service. Acceptable heat treatment temperatures include aging at 1050°F for Type 410 stainless steel." The staff is unable to identify any precipitation hardened stainless steels in Table 4.5-1. The staff requests that the applicant identify any precipitation hardened austenitic steels used in CRDMs, and modify Table 4.5-1 accordingly, or delete the reference to precipitation hardened stainless steels if none are used. In addition, the staff believes that the applicant's reference to aging Type 410 stainless steel is incorrect and should be modified to state that Type 410 stainless steel is tempered at 1050°F.

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### 04.05.01-14

In RAI 04.05.01-10, the staff requested that the applicant verify, and state in the DCD, that a stagnant primary coolant environment will not exist in any portion of the CRDM. The applicant responded and stated that the dissolved oxygen level of primary coolant is controlled to less than 0.1%. The applicant also stated that low dissolved oxygen water flows into the CRDM housing by thermal siphoning flow and as a result the environmental condition of the inside surface near the portion of the CRDM housing weld is low dissolved oxygen. In order to provide clarity, the staff requests that the applicant modify the DCD to state that a stagnant primary coolant environment does not exist in any portion of the CRDM that could result in a dissolved oxygen content greater than 0.10 ppm.

### 04.05.01-15

In response to RAI 04.05.01-8 (1) the applicant stated that it would modify DCD Section 4.5.1.2 to state "Austenitic stainless steel base materials for CRDM applications are the solution heat that is treated to prevent sensitization and stress corrosion cracking (SCC)." In order to provide clarity, the staff suggests that the applicant modify the above statement to state "Austenitic stainless steel base materials for CRDM applications are used in the solution annealed condition and are not heated above 800F after solution annealing, other than locally by welding operations, in accordance with the recommendations listed in RG 1.44."