REQUEST FOR ADDITIONAL INFORMATION 570-4428 REVISION 0

4/13/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.09.04 - Control Rod Drive Systems
Application Section: 3.9.4

QUESTIONS for Engineering Mechanics Branch 1 (AP1000/EPR Projects) (EMB1)

03.09.04-3

In the DCD, Revision 2, Tier 1, page 2.4-2, fourth paragraph under 'Seismic and ASME Code Classification', it says "CRDM *pressure* housings". Later in Tier 1, in Table 2.4.1-1, page 2.4-4, it says, "CRDM housings". These entries should be consistent. The applicant is requested to correct one of the entries to be the same as the other.

03.09.04-4

Revision 2 of the DCD, in response to RAI 107-1293, question 10, inserted the following at the end of section 3.9.4.4.

Post-Refueling Startup Test

- The stepping and the drop tests are performed as in-service/post-refueling tests. The criteria of this test are applicable to all CRDMs as described in Subsection 14.2.

This test references the Initial Plant Test Program in section 14.2 which would include the following CRDM tests.

14.2.12.2.1.5 Rod Drop Time Measurement Test
14.2.12.2.1.6 CRDM Operational Test

However, Chapter 16, Technical Specifications, contains surveillance requirements with the criteria for the stepping and drop tests as follows.

SR 3.1.4.2
Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.

Frequency: [92 days OR In accordance with the Surveillance Frequency Control Program]

SR 3.1.4.3
Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 3.15 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with:
a. Tavg ≥ 500°F and
b. All reactor coolant pumps operating.

Frequency: Prior to criticality after each removal of the reactor head

As written, the description for the newly inserted test, *"The stepping and the drop tests are performed as in-service/post-refueling tests."* is not clear as to exactly which tests are being performed and what their frequencies are. The applicant is requested to clarify the testing to be performed, their respective frequenciues, and the criteria which apply to the post-refueling startup test.

Reference: MHI's Response to US-APWR DCD RAI No. 107; MHI Ref: UAP-HF-08278; dated December 19, 2008; ML090130257.

03.09.04-5

In the DCD, Revision 2, section 3.9.4.4, the Preoperational Test describes a startup test. The test title is inconsistent with the description. The applicant is requested to clarify by either: 1) changing the title to match the test described or 2) changing the description to match the title.

03.09.04-6

DCD, Revision 2, section 3.9.4.4, lists production tests which are performed on all [CRDM] units before shipment. After the units are installed and prior to fuel loading, CRDM preoperational system testing is performed as required by section 14.2. Section 14.2, includes the following CRDM tests.

14.2.12.1.10 CRDM Motor-Generator Set Preoperational Test
14.2.12.1.11 CRDM Initial Timing Preoperational Test

Each of these tests includes the following prerequisites.

1. Required construction testing is completed.
2. Component testing and instrument calibration is completed.

However, there is no information regarding testing of individual CRDM components to ensure their proper installation prior to system testing. The applicant is requested to describe what testing or checks are performed to ensure the proper installation of the individual CRDM components prior to system testing. Also, the applicant is requested to describe what testing or checks are included in the two prerequisites listed above.