

REQUEST FOR ADDITIONAL INFORMATION 245-2176 REVISION 1

3/2/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 10.04.01 - Main Condensers

Application Section: 10.4.1

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

10.04.01-1

Request for Additional Information

1. US-APWR RAI 10.4.1-1

Conformance to Item III.2.A of SRP Section 10.4.1, "Main Condensers," the SRP guidance specifies that means should be provided for controlling and correcting cooling water leakage into the condensate. Tier 2 Section 10.4.1.2.1, "System Operation," of the US-APWR design certification document (DCD) describes that the main condenser (MC) interfaces with the tube leak detection system to permit sampling of the condensate in the condenser hot-well. The DCD further states that should circulating water in-leakage occur, these provisions permit determination of which tube bundle has sustained leakage. This is performed by isolating the circulating water system from the affected water box of the MC. However, the DCD does not provide further details on the provisions that permit detection of which tube bundle is affected by the leakage and what follow up actions will be performed. Therefore, the staff requests the applicant to provide additional information in the DCD as related to the provisions to determine which MC tube bundle is affected with the leakage.

2. US-APWR RAI 10.4.1-2

In Tier 2 Section 10.4.3, "Safety Evaluation," the DCD provides its evaluation of the US-APWR MC system. The DCD states that during normal operation and shutdown, the MC contains insignificant quantity of radioactive contaminants. The DCD states that radioactive contaminants may enter through a steam generator tube leak. A discussion of these leaks is included in Tier 2 Chapter 11. The DCD further states that no hydrogen buildup in the MC is anticipated. Also, in Section 10.4.1.2.1 (system operation), the DCD states that air leakage and non-condensable gases contained in the turbine exhaust steam are collected in the condenser and removed by the MC evacuation system.

However, conformance to GDC 60, as stipulated in SRP Section 10.4.1, Section II, "Acceptance Criteria, Item 1, requires that the design of the MC is acceptable if the integrated design of the system meets the requirements of GDC 60 as related to failures in the design of the system which do not result in excessive releases of radioactivity to

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the environment. Also, Item 1.B of SRP Acceptance Criteria states that the requirements of GDC 60 are met if the MC is designed to withstand the effects of any potential explosion and if instrumentation is provided to detect and annunciate the buildup of potentially explosive mixtures and dual instrumentation is provided to detect, annunciate, and effect control measures to prevent the buildup of potentially explosive mixtures. The DCD does not provide adequate details to justify the requirements of GDC 60, as it relates to failure of the MC system and potential explosion due to hydrogen buildup. Therefore, the staff requests Mitsubishi to provide additional information in the DCD, with full justification, to conform to the GDC 60 criteria as described above, or provide a COL information item for the COL applicants to provide adequate details in this regard.

3. US-APWR RAI 10.4.1-3

In Tier 2 Section 10.4.3, "Safety Evaluation," the DCD states that the failure of the MC and any resultant flooding will not preclude operation of any essential system since the water can not reach safety-related equipment located in Category I structures. This statement meets the guidance of Item 3.A in Section 10.4.1. III (SRP Review Procedures), as it relates to flood protection of the safety-related structures, systems, and components. However, the DCD does not provide details of the provisions recommended to keep the flood water from reaching the safety-related equipment. Therefore, the staff requested the applicant to provide additional information in the DCD regarding flooding affects due to failure of the MC and its components.