

# REQUEST FOR ADDITIONAL INFORMATION NO. 176-1987 REVISION 1

2/3/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 15.00.03 - Design Basis Accidents Radiological Consequence Analyses for Advanced  
Light Water Reactors  
Application Section: 15.0.3

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

15.00.03-27

In order to verify compliance with the guidelines of SRP 15.0.3 Acceptance Criterion 1 [based on 10 CFR Part 50, Section 50.34(a)(1)], as it relates to evaluation and analysis of fission product releases, the pH of the containment sump water must be raised above 7.0 after a LOCA to prevent revolatilization of iodine. The staff requests additional information in order to complete its confirmatory calculation of the sump pH.

DCD Section 15.6.5.5.1.1 provides specific assumptions about contents of water that are released from the primary system into the containment during a DBA. However, the staff requests additional information related to the following two topics:

- a) What are total elemental amounts for fission products released from fuel and into containment water? This information is especially important for volatile elements which may affect the pH like I and Cs (including Br and Rb), and should include stable isotopes such as I-127, I-129, Cs-133, Cs-135, and Br-81.
- b) What is the total estimated volume of water in the RCS that empties into containment during accidents? Additionally, what values of the chemical parameters listed in DCD Table 5.2.3-2 were assumed in the applicant's calculation, if different from those listed in the DCD? The specific concentrations assumed for boric acid and LiOH are required since Table 5.2.3-2 provides a range for these two parameters.

15.00.03-28

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The calculation of pH requires knowledge of all possible constituents in the water, consistent with the guidelines in Section 3.1.2 above. It is possible that acids produced by radiolysis in containment may lower the pH over time, and these should be considered for completeness.

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The staff, therefore, requests the following information:

- a) What is the dose rate to primary system water from all sources during the course of the accident?
- b) Provide estimates for the amount (mass) of electrical cable jacketing exposed to radiation in containment, the dose rate of that radiation, and the approximate temperature in containment during accidents.