REQUEST FOR ADDITIONAL INFORMATION 751-5709 REVISION 0

5/2/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 06.02.05 - Combustible Gas Control in Containment
Application Section: 6.2.5

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

06.02.05-43

Question No.: 6.2.5-43
Clarify how the US-APWR RWSP design complies with 10 CFR 50.44(c)(1) and (c)(2).
In RAI Number 696-5433 Question Number 6.2.5-41, the staff requested that you clarify how the US-APWR containment complies with 10 CFR 50.44(c)(2) in light of a recognized indication of greater than 10% by volume concentration in the RWSP under certain accident sequences.
In your response, you have proposed a manual operator action to fill the RWSP with firewater in these scenarios, in order to eliminate the potential for a hydrogen combustion that may pose a challenge to containment integrity.
Your justification for this mitigation strategy is based on the low frequency of the accident sequences and the time required to reach conditions that result in conditions beyond the 10 CFR 50.44 limits specified for a mixed containment atmosphere.
The deterministic requirements of 10 CFR 50.44(c)(2) should be met without consideration for the period of time required for hydrogen to concentrate to levels that exceed the regulation, and without consideration of the analyzed frequency of scenarios that result in conditions that exceed the requirements of the rule.
In addition, the staff believes that it is a less optimal solution to propose operator actions to ensure that the containment is in a configuration that ensures that it conforms to 10 CFR 50.44(c)(1) and (c)(2)requirements. Manual operator actions to fill the tank would cause an increased operator burden. Such actions would necessitate additional instrumentation that would need to be designed to survive a severe accident in order to verify that operator actions to completely fill the RWSP were successful. RAI 5593 question 6.2.5-42 requests additional details on the instrumentation and controls required to support this operator action.
Regulatory Guide 1.7 regulatory position 3 states that atmospheric mixing systems may be active or passive. As it relates to the RWSP compartment, the staff considers that the proposed mixing system for the US-APWR is an active system. The regulatory guide provides design requirements for active systems.

Therefore, in accordance with RG 1.7, please provide a discussion on how the structures, systems and components used to fill the RWSP act to be reliable, redundant, single-failure proof, able to be tested and inspected, and remain operable with a loss of onsite or offsite power. Revise section 6.2.5 of the DCD as necessary to record these design commitments for these components.
In regard to the Hydrogen monitor, since it is established that there is potential to have hydrogen concentration in the RWSP that is different from the rest of containment,

please provide additional details of the US-APWR hydrogen monitoring system that allows monitoring of this compartment. In accordance with 50.44(c)(4)ii. Please also discuss compliance with Regulatory Guide 1.97, regulatory position 5. Revise section 6.2.5 of the DCD as necessary to record these design commitments for these components.