

REQUEST FOR ADDITIONAL INFORMATION 873-6168 REVISION 0

11/21/2011

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)

06.02.05-46

RAI 06.02.05-46

Clarify how the US-APWR Containment Atmosphere Mixing and Combustible Gas Control Systems comply with 10 CFR 50.44(c)(1); and (c)(2).

In RAI Number 803-5891 Question 06.02.05-44, the staff requested you clarify if the US-APWR Hydrogen igniters are needed for compliance with 10 CFR 50.44(c)(1). The staff also requested that you clarify how accident sequences were selected to demonstrate compliance with 10 CFR 50.44.

In your response to this RAI and also in the response to RAI Number 751-5709, Question 06.02.05-43 you stated that the US-APWR complies with the above regulations by following the guidance of RG 1.7.

The staff has reviewed Regulatory Guide 1.7 and its references, and the above regulations and the RAI responses and the proposed DCD changes and the staff does not agree that compliance with the several design criteria for Combustible Gas Control Systems specified by RG 1.7 alone would be an acceptable basis for conclusion that a Combustible Gas Control System meets the regulation. 10 CFR 50.44(c)(1) requires all containments to have the capability for ensuring a mixed atmosphere during significant beyond design-basis accidents. Therefore the staff must review the performance of design features of a given atmospheric mixing and combustible gas control system in the significant beyond design- basis accident scenarios in which they are expected to perform.

In previous RAI responses it was identified that, for the US-APWR design, there exist significant design basis accidents which consist of the loss of AC power to the Containment Atmosphere Mixing and hydrogen control systems. In these scenarios, it was also identified that hydrogen has the potential to accumulate in the RWSP to detonable levels.

RG 1.7 Section C.1 states the following:

“Structures, systems, and components (SSCs) installed to mitigate the hazard from the generation of combustible gas in containment should be designed to provide reasonable assurance that they will operate in the severe accident environment for which they are intended and over the time span for which they are needed.”

“...The required system performance criteria will be based on the results of design-specific reviews that include probabilistic risk assessment as required by 10 CFR 52.47(a)”

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The staff interprets that “operation” in the above statement means effective operation; operation a level that ensures that atmosphere mixing and hydrogen control requirements of the regulation are met.

RAI 19-522 has been issued requesting clarification on how this beyond design-basis accident scenario was modeled in the PRA, and how the underlying containment performance goals are met.

The staff requests, in conjunction with your response to that question, that you clarify how the structures, systems, and components installed to mitigate the hazard from the generation of combustible gas in containment are designed to provide reasonable assurance that they will operate in the beyond design basis accident scenarios for which they are intended and over the time span for which they are needed.