MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

June 27, 2012

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-12180

Subject: MHI's Response to US-APWR DCD RAI No. 873-6168 Revision 0 (SRP 06.02.05)

Reference: 1) "Request for Additional Information No. 873-6168 Revision 0, SRP Section: 06.02.05 – Combustible Gas Control in Containment, Application Section: 6.2.5," dated November 21, 2011.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") the document entitled "Response to Request for Additional Information No. 873-6168 Revision 0 (SRP 06.02.05)".

Enclosed is the response to 1 RAI question contained within Reference 1.

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
Director - APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

D081
NRO

Enclosure:

1. Response to Request for Additional Information No. 873-6168 Revision 0 (SRP 06.02.05)

CC: J. A. Ciocco
J. Tapia

Contact Information
Joseph Tapia, General Manager of Licensing Department
Mitsubishi Nuclear Energy Systems, Inc.
1001 19th Street North, Suite 710
Arlington, VA 22209
E-mail: joseph_tapia@mnes-us.com
Telephone: (703) 908 – 8055

Enclosure 1

UAP-HF-12180
Docket Number 52-021

Response to Request for Additional Information No. 873-6168
Revision 0 (SRP 06.02.05)

June 2012

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/27/2012

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.: **NO. 873-6168 REVISION 0**

SRP SECTION: **06.02.05 – Combustible Gas Control in Containment**

APPLICATION SECTION: **6.2.5**

DATE OF RAI ISSUE: 11/21/2011

QUESTION NO. : 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-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)" 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.

ANSWER:

In the response to RAI 871-6121 Question 19-560, MHI proposed a design change for the hydrogen igniters to be powered by dedicated batteries having a capacity of at least 24 hours following the onset of an SBO and loss of AAC. This design change will prevent hydrogen accumulation in the RWSP even in the event of a beyond design basis accident.

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical Report

There is no impact on the Technical/Topical Report.