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TOKYO, JAPAN

September 29, 2010

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-10260

Subject: MHI's Response to US-APWR DCD RAI No.615-4816 Revision 2

References: 1) "Request for Additional Information No. 615-4816 Revision 2, SRP Section: 06.05.01 – ESF Atmosphere Cleanup Systems Application Section: DCD Sections 9.4.6" dated August 13, 2010.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Responses to Request for Additional Information No.615-4816 Revision 2".

Enclosed are the responses to 2 RAIs contained within Reference 1.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

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

Enclosure:

1. Responses to Request for Additional Information No. 615-4816, Revision 2

CC: J. A. Ciocco C. K. Paulson

Contact Information

C. Keith Paulson, Senior Technical Manager Mitsubishi Nuclear Energy Systems, Inc. 300 Oxford Drive, Suite 301 Monroeville, PA 15146 E-mail: ck_paulson@mnes-us.com Telephone: (412) 373-6466



Docket No. 52-021 MHI Ref: UAP-HF-10260

Enclosure 1

UAP-HF-10260 Docket Number 52-021

Responses to Request for Additional Information No. 615-4816, Revision 2

September, 2010

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/29/2010

US-APWR Design Certification Mitsubishi Heavy Industries Docket No. 52-021

RAI NO.:NO.615-4816 REVISION 2SRP SECTION:06.05.01 - ESF ATMOSPHERE CLEANUP SYSTEMSAPPLICATION SECTION:DCD Sections 9.4.6DATE OF RAI ISSUE:08/13/2010

QUESTION NO. : 06.05.01-19

This is a follow-up question to RAI 558-4227, Revision 2 Question No. 06.05.01-9 (MHI Ref: UAP-HF-10150)

The staff notes that the applicant did not adequately address the staff's closing inquiry of Question No. 06.05.01-9 ... "the staff asks on what basis is the containment purge isolation function associated with radiation monitors RMS-RE-40 and 41 not safety related."

The applicant responded that:

"The non-safety containment radiation monitors are used to detect leakage into the containment atmosphere from the reactor coolant pressure boundary (RCPB). The monitor has a range capable of detecting less than 0.5 gpm leakage within one hour of response time. The containment isolation valves are closed to reduce the radioactive material leakage from RCPB to the environment through the containment purge system when RMS-RE-40 or 41 detects the leakage."

Based on this response, it appears the monitors are used to actuate a safety system (containment isolation system) and the monitors are credited with terminating a design basis event (*conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events and natural phenomena for which the plant must be designed to ensure function*). As a result, the monitors appear meet the definition of safety-related (10 CFR 50.49). The staff again requests the applicant to explain why the monitors are not designated as safety-related. Specifically, describe if the monitors are credited to terminate an RCS leakage event. Additionally, explain how the applicable regulatory criteria (including dose criteria) are met for all design basis events if RMS-RE-40 and 41 fail to initiate the system response described in the RAI response.

The staff requests that the applicant amend the DCD, as the applicant's response to the above question warrants.

The staff also notes that the applicant's response to Question No. 06.05.01-9 explained the use of optical isolation of the non-safety related RMS-RE-40 and RMS-RE-41 electrical inputs to the safety related ESFAS. Since this response was central to the staff's questioning of Question No. 06.05.01-9, the staff requests that the applicant amend the DCD to include this information. This will allow the staff to use this information in its final Safety Evaluation Report (SER).

Reference: MHI's 2nd Response to US-APWR DCD RAI No. 558-4227; MHI

06.05.01-1

Ref: UAP-HF-10150; dated May 27, 2010; ML101530606.

ANSWER:

The radiation monitors RMS-RE-40 and 41 are part of the process and effluent radiological monitoring and sampling system. This system is discussed in DCD Section 11.5.2.1 and these two monitors are specifically described in Section 11.5.2.2 and are categorized as non-safety related. These monitors provide a signal for the actuation of a system used to reduce gaseous effluent release with the RCS leakage into the containment. These monitors are required for plant operation and do not perform a safety function. As stated in DCD subsection 5.2.5.4, these monitors show a background level that is indicative of the normal level of unidentified leakage inside the containment. Variations in airborne radioactivity above the normal level signify an increase in unidentified leakage rates and signal plant operators to take corrective action. Therefore, the monitors are not credited with mitigating the consequences of design basis events by closing the containment isolation valves of the containment purge system.

The safety-related monitors (RMS-RE-91A & B, 92A & B, 93A & B, and 94A & B) are credited with mitigating the consequences of a LOCA and abnormal high radiation inside the containment by closure of the containment isolation valves as stated in DCD subsection 12.3.4.1.1.

Regarding the use of optical isolation of the non-safety related radiation monitors electrical inputs to the safety related engineered safety features actuation system (ESFAS), the explanation for optical isolation is discussed in DCD Section 7.9.1.1.2 and in US-APWR Technical Report, MUAP-07004, Appendix B.5.6. DCD Table 7.3-1 and Figure 7.3-2 also indicate that electrical independence between signals of the non-safety radiation monitors and the ESFAS is achieved. Therefore, no amendment of DCD is needed.

Impact on DCD

The following will be added in DCD Subsection 9.4.6.2.4.1 and 9.4.6.2.4.2 per revision of response to RAI 558-4227, Revision 2 Question No. 06.05.01-9.

"The containment radiation monitors **RMS-RE-040 and-041** described in Subsection 11.5.2.2.1 provide <u>a means for</u> detection of <u>unidentified</u> leakage into the containment atmosphere from the rector coolant pressure boundary (RCPB). Following detection of <u>When the unidentified</u> leakage <u>rates</u> <u>increases</u>, alarms are initiated in the MCR and a containment purge isolation signal is generated. Upon receipt of the isolation signal, the containment high volume purge system containment isolation valves are automatically closed. <u>The radiation monitors are required in normal operation as</u> <u>described in DCD Subsection 5.2.5.4.</u>"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/29/2010

US-APWR Design Certification Mitsubishi Heavy Industries Docket No. 52-021

RAI NO.:	NO.615-4816 REVISION 2
SRP SECTION:	06.05.01 - ESF ATMOSPHERE CLEANUP SYSTEMS
APPLICATION SECTION:	DCD Sections 9.4.6
DATE OF RAI ISSUE:	08/13/2010

QUESTION NO. : 06.05.01-20

The staff has reviewed the applicant's response to RAI No. 558-4277 Revision 2, Question 06.05.01-18. (MHI Ref: UAP-HF-10115).

The applicant committed to amend DCD subsection 14.2.12.4.11 D.1 "Ventilation Capability Test" as follows:

"Temperature conditions are maintained in the containment and ESF areas in accordance with Subsections 9.4.5, 9.4.6, and Table 9.4-1. It has been demonstrated through testing and analyses that the temperatures for these areas are being maintained within the design temperatures based on recorded environmental conditions."

The staff is concerned that the term 'based on recorded environmental conditions' lacks a precise meaning and could be misinterpreted. The staff requests that the applicant clarify the statement. The following would be one of many acceptable approaches.

"Temperature conditions are maintained in the containment and ESF areas in accordance with Subsections 9.4.5, 9.4.6, and Table 9.4-1. It has been demonstrated through testing and analyses that the temperatures for these areas are being maintained within the design temperatures based on the design basis environmental conditions and design basis heat loads."

Reference: MHI's 1st Response to US-APWR DCD RAI No. 558-4227; MHI Ref: UAP-HF-10115; dated April 22, 2010; ML101170172.

ANSWER:

DCD subsection 14.2.12.4.11 D.1 "Ventilation Capability Test" will be revised to be clarified.

Impact on DCD

DCD Subsection 14.2.12.4.11 D.1 will be revised as follow. "Temperature conditions are maintained in the containment and ESF areas in accordance with Subsections 9.4.5, 9.4.6, and Table 9.4-1. It has been demonstrated through testing and analyses that the temperatures for these areas are being maintained within the design temperatures based on <u>the</u> <u>design basis</u> recorded environmental conditions <u>and design basis heat loads.</u>"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.