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TOKYO, JAPAN

July 19, 2013

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-13194

**Subject: MHI's Supplemental Response to US-APWR DCD RAI No.883-6063
Revision 3 (SRP 09.04.01) Question 09.04.01-32**

- References:**
- 1) "Request for Additional Information No. 883-6063 Revision 3, SRP Section: 09.04.01 – Control Room Area Ventilation System Application Section: Section 9.4.1" dated January 3, 2012 (ML120040395).
 - 2) Letter MHI Ref: UAP-HF-12260 from Y. Ogata to U.S. NRC, "MHI's Second Response to US-APWR DCD RAI No. 883-6063 Revision 3 (SRP 09.04.01)", dated September 19, 2012 (ML12268A027).
 - 3) Letter MHI Ref: UAP-HF-13004 from Y. Ogata to U.S. NRC, "MHI's Amended Response to US-APWR DCD RAI No. 883-6063 Revision 3 (SRP 09.04.01) Question 09.04.01-32", dated January 11, 2013 (ML13014A635).

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Supplemental Response to Request for Additional Information No. 883-6063 Revision 3 (SRP 09.04.01) Question 09.04.01-32."

Enclosed is the supplemental response to 1 RAI question (Questions 09.04.01-32) contained within Reference 1. The response to Question 09.04.01-32 of Reference 1 was originally submitted by MHI in Reference 2 and then amended in Reference 3. The response to this RAI question is being supplemented to clarify the alarm description and corresponding DCD markup.

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

Sincerely,



Yoshiki Ogata,
Executive Vice President
Mitsubishi Nuclear Energy Systems, Inc.
On behalf of Mitsubishi Heavy Industries, LTD.

D081
NRC

Enclosure:

1. Supplemental Response to Request for Additional Information No. 883-6063 Revision 3
(SRP 09.04.01) Question 09.04.01-32

CC: J. A. Ciocco
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Docket No. 52-021
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Enclosure 1

UAP-HF-13194
Docket No.52-021

Supplemental Response to Request for Additional Information No.
883-6063 Revision 3 (SRP 09.04.01) Question 09.04.01-32

July 2013

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

07/19/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: 883-6063 REVISION 3
SRP SECTION: 09.04.01 - Control Room Area Ventilation System
APPLICATION SECTION: DCD SECTION 9.4.1
DATE OF RAI ISSUE: 1/3/2012

Question No. : 09.04.01-32

This is a follow-up RAI to RAI No. 689-4976, Question No. 09.04.01-25. The bases for this follow-up RAI is the review guidance of NUREG-0800 SRP 3.4.1. The staff found that the applicant's response to Question No. 09.04.01-25 provided a lot of useful information as to why a leak from an individual cooling coil tube is unlikely to affect the Main Control Room (MCR). However, the applicant failed to provide sufficient information about the design of the AHU cooling coils and equipment drainage system for the staff to conclude that such a leak, should it occur, will not present a coincidental common mode failure to the instrumentation and controls of the Main Control Room via the common HVAC duct lines (i.e. supply and return).

The staff disagrees with the conclusions of the following passages contained in the applicant's response: "*Therefore, the equipment and floor drain system is not required to be designed for the failure of the main control room air handling unit cooling coils.*" The staff believe the leakage from a cooling coil should not result in unacceptable consequences.

The staff notes that the applicant assumes maximum leakage rates based on an individual tube leak occurring in one of the many cooling coil tubes that make up an AHU heat exchanger. What is it about the design of the AHU cooling coil heat exchanger that prevents a more significant leak (up to 45 gpm per DCD Table 9.2.7-2) from occurring in the piping or on the header that feeds these many cooling coil tubes? In particular, what prevents this larger leakage from reaching the MCR other than the non-safety related equipment drain system? In Question 09.04.01-25, the staff requested that the applicant (1) explain the potential failure of a cooling coil will be directed to the drain system, (2) explain how the bypass of the drain system is precluded and (3) explain how the drain system will be sized, tested and maintained to ensure that it can accommodate the full flow from a cooling coil throughout the life of the plant.

The staff suggests the following as a path to closure of this Open Item. To parts (1) and (2) of the question, the "*robust design of the cooling coils*" should include design provisions to prevent any leakage from carrying over beyond the AHU and into the common (i.e. non-divisional) HVAC supply ductwork to the MCR. For examples, downward air flow across the coils and change of direction of air flows to remove from the airstream any entrained leakage from coil leaks could be part of the robust design. For the part (3) the staff acknowledges that the equipment drain system is not a safety related system but the function of the AHUs is safety related. Therefore, an AHU cooling coil catch basin with a safety related level MCR alarm to annunciate that drain capacity is being exceeded by the flow rate from the coil leak. The alarm if properly designed would give the

plant operators time to respond and isolate essential chilled water flow from the coil. Collectively, these staff suggestions provide one (of potentially many) possible remedies.

The staff requests that the applicant amend DCD section 9.4.1 with the relevant design information that would allow this Open Item to be closed.

ANSWER:

This is a supplemental response to this RAI. MHI previously provided an amended response to this RAI by MHI letter UAP-HF-13004 dated January 11, 2013 to address NRC feedback from the conference call on October 17, 2012. That amended response included a design change to add water level instruments and alarms to the MCR air handling units.

MHI is providing this supplemental response to clarify the classification and display of the alarm. The following paragraph is taken from the previous response, with the supplemental information shown by bold underlined text.

In order to provide additional assurance that water collected within the MCR HVAC AHU, from condensation or in the event of cooling coil leakage, will not result in water intrusion into the MCR through the ventilation supply ductwork, the design of the AHU will include a safety-related level monitoring instrument with an **non safety** alarm in the MCR. **In addition to the non safety alarm on the alarm VDU and the audible alarm, the alarm is also indicated on the safety-related safety VDU as the abnormal indication to ensure high reliability.** The MCR alarm would actuate in the event of a water level above the equipment drain connection in the AHU indicating that the equipment drain capacity is exceeded. The alarm would alert the operator to the excessive water level condition, and action to investigate and resolve the abnormal condition would be initiated.

Impact on DCD

DCD changes were provided as an attachment to the previous response (UAP-HF-13004). In addition to those changes, a supplemental change will be made to DCD Revision 3 Tier 1 Table 2.7.5.1-2 to indicate that the AHU water level alarm is displayed in the MCR and RSC.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

Table 2.7.5.1-2 Main Control Room HVAC System Equipment Alarms, Displays and Control Functions (Sheet 2 of 2)

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Main Control Room Air Handling Unit Outlet Dampers (VRS-EHD-106 A, B, C, D)	No	Yes	No	Yes
Main Control Room Emergency Filtration Unit Fan Outlet Dampers (VRS-MOD-113 A, B)	No	Yes	No	Yes
Main Control Room Temperature (VRS-TCA-146, 156, 166, 176)	Yes	No	No	No
<u>Main Control Room Air Handling Unit Water Level</u> (VRS-LA-147, 157, 167, 177)	<u>Yes</u>	No <u>Yes</u>	<u>No</u>	No <u>Yes</u>
<u>Main Control Room Outside Air Intake Smoke Detectors</u> (VRS-XCA-101, 121)	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>

DCD_09.04.
01-32 S01

DCD_09.04.
01-32 S02

DCD_14.03.
07-76 S01