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

July 9, 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-12182

Subject: MHI's Response to US-APWR DCD RAI No. 915-6344 Revision 0 (SRP 09.02.01)

Reference: 1) "Request for Additional Information No. 915-6344 Revision 0, SRP Section 09.02.01 - Station Service Water System: 9.2.1, dated March 29, 2012.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 915-6344 Revision 0."

Enclosed is the response to a 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 this submittal. His contact information is provided below.

Sincerely,

Y. Ogata

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

Enclosure:

1. Response to Request for Additional Information No. 915-6344 Revision 0

D081
NRO

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-12182
Docket No. 52-021

Response to Request for Additional Information No. 915-6344
Revision 0

July 2012

REQUEST FOR ADDITIONAL INFORMATION

7/9/2012

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.: **NO. 915-6344 REVISION 0**

SRP SECTION: **09.02.01 – Station Service Water Systems**

APPLICATION SECTION: 9.2.1

DATE OF RAI ISSUE: 3/29/2012

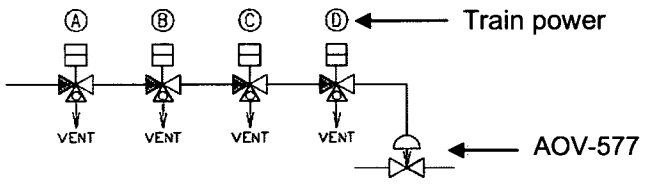
QUESTION NO.: 09.02.01-60

New RAI 9.2.1 to support open item in SER 9.2.1.
Related to COL Item 9.2(7), Comanche Peak, the COL applicant indicated in a January, 23, 2012, call with the NRC that ESWS safety-related to nonsafety-related boundary valve, AOV-577 (shown on Figure 9.2.1-1, Sheet 1) has four different power supplies.
The following should be addressed by the DCD applicant.

1. The four different power supplies are not specifically described in the DCD, including Tier 1. The COL applicant stated that this item should be resolved in the DCD and not under COL Item 9.2(7).
2. AOV-577 logic states that this valve closes on ESWS pump stop. AOV 577 logic to close should be clarified and the DCD Failure Modes and Affects Analysis (FMEA) revised, DCD Table 9.2.1-2.
3. DCD FMEA should evaluate boundary valve AOV 577 not going full open. The DCD applicant should determine if there a safety feature for this valve to remain open. For example, if the valve fails closed during power operations, the UHS basin chemistry may not be able to be maintained.
4. DCD FMEA should evaluate VLV-544A/B/C/D (blowdown bypass) being open with single failure of AOV 577 not fully closing (which might occur if there were a bent valve stem).
5. Not all boundary valves are listed in the DCD FMEA when compared to the Comanche Peak COL FMEA.

ANSWER:

1. AOV-577 has 4 pilot valves that are supplied electric power from different trains, as shown below. A, B, C and D Class 1E DC-buses power AOV-577, and when power is lost to any of the buses, AOV-577 closes.



(AOV : Fail–Closed)

2. AOV-577 is a fail-closed valve, and closes automatically on a low basin water level signal, ECCS actuation signal, UV signal or ESW pump stop signal. Closure isolates non-safety-related portions to maintain the required UHS basin inventory for a minimum of 30 days without makeup water. Valve closure also precludes system inventory drain down which may lead to water hammer at pump restart. The valve position is indicated in the MCR. As indicated in the response to Item 5, the valve is not included in the DCD failure mode and effects analysis (FMEA) because it is not part of the standard design.

3. The safety function of AOV-577 is to isolate the UHS blowdown line to ensure that the UHS basin inventory required for cooling the unit for a minimum of 30 days without makeup water is maintained. Either AOV-577 and HCV-010,011,012,013-S or AOV-576 A/B/C/D-S can perform the safety function to isolate the UHS blowdown line. Conversely, opening AOV-577 is not a safety function. If AOV-577 fails closed, the UHS basin water chemistry wouldn't be controlled; however, controlling basin water chemistry is not required during an accident and AOV-577 is designed to close during an accident, as stated in the response to Item 2. The function of AOV-577 for water hammer prevention is also not a safety function because it is not related to accident mitigation. As indicated in the response to Item 5, the valve is not included in the DCD failure mode and effects analysis (FMEA) because it is not part of the standard design.

4. The postulated failure resulting in a blowdown bypass could be terminated by operator action. The effect of uncontrolled blowdown for 30 minutes on basin inventory is insignificant. For example, Comanche Peak Nuclear Power Plant, Units 3&4 COLA Rev. 3, Part 3, Table 3.3-1 describes that the maximum blowdown flow rate is 515 gpm per unit. Blowdown water volume for 30 minutes is 15,450 gallons, which is less than 1% of the total required basin water volume of approximately 8.40 million gallons per unit. When EWS-HCV-010, 011, 012, 013-S or VLV-544A/B/C/D (blowdown bypass valve) is open with a single failure of AOV-577 not fully closing, an operator has sufficient time to close the appropriate valve(s) to terminate an uncontrolled blowdown.

5. In general, components within the scope of the standard design are described in the DCD and those within the scope of the site-specific design are described in the COLA. For example, AOV-577 was not described in DCD Revision 3 as it is within the scope of site-specific design. However, it will be included in the next revision of the DCD in Figure 9.2.1-1 as conceptual design information (Reference UAP-HF-11235, dated July 27, 2011). As stated above, AOV-577 is not included in the DCD because it is conceptual design information.

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 Topical / Technical Report

There is no impact on topical and technical reports.