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

April 1, 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-10091

Subject: MHI's Response to US-APWR DCD RAI No.539-4329 Revision 2

References: 1) "Request for Additional Information No.539-4329 Revision 2, SRP Section: 09.04.02 – Spent Fuel Pool Area Ventilation System, Application Section: DCD 9.4.2 & 9.4.3" dated March 2, 2010.

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.539-4329 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,

Y. Ogata

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

Enclosure:

1. Response to Request for Additional Information No. 539-4329, 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

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Docket No. 52-021
MHI Ref: UAP-HF-10091

Enclosure 1

UAP-HF-10091
Docket Number 52-021

Response to Request for Additional Information
No. 539-4329, Revision 2

April, 2010

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

4/01/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO.539-4329 REVISION 2**
SRP SECTION:	**09.04.02 – SPENT FUEL POOL AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**Tier 2 DCD FSAR Sections 9.4.2 & 9.4.3**
DATE OF RAI ISSUE:	**03/02/2010**

QUESTION NO. : 09.04.02-4

The staff finds the applicant's conglomerate responses of RAI No. 65-844 Revision 0 Question No.09.04.02-1, RAI 9.4.2-5 and RAI No.328-2436 Revision 1 Question 09.04.02-2 as fundamentally acceptable but notes that the applicant stated that there is no impact on the DCD for either response. Staff believes that the DCD should be revised to be consistent with the responses.

Accordingly, the performance of Preoperational Test 14.2.12.1.99 "Auxiliary Building HVAC System Preoperational Test" will not guarantee that the A/B ventilation system will be tested to the area flow rate values reflected in the applicant's responses to these two RAI questions. In particular:

1) Figure 9.4.3-1 has not been revised to reflect that the SFP Pump and HX rooms, as displayed in Figures 1.2-16 and 1.2-24, are not part of the "fuel handling area." These areas are part of the R/B controlled area and are serviced by the A/B HVAC system during normal mode of operation. The R/B controlled area as displayed on this figure should be revised to reflect the existence of the SFP Pump and HX rooms.

2) DCD section 9.4.3 "Auxiliary Building Ventilation System" has not been revised to reflect that ... during normal mode of operation, the total supply airflow from the two 50% A/B HVAC system AHU is 196,000 cfm and the exhaust is 208,000 cfm. Hence, all the radiological controlled areas served by the A/B HVAC system, as identified in Figure 9.4.3-1, are maintained under a constant negative pressure. The fuel handling area is also supplied airflow of 21,800 cfm from the A/B HVAC system AHUs and exhausts airflow of 24,000 cfm from this area.

3) DCD Table 12.2-60 has not been revised to reflect that the supply airflow to each zone is less than the exhaust airflow rates (i.e. Zone V to VI: 1,500 cfm; Radiation Zone IV: 14,000 cfm; and Radiation Zone III : 76,000 cfm.), thus maintaining a negative pressure.
The staff requests that the applicant amend the DCD to reflect the information provided to the staff with the applicant's responses to RAI No. 65-844 Revision 0 Question No.09.04.02-1, RAI 9.4.2-5 and RAI No.328-2436 Revision 1 Question 09.04.02-2.

Reference:

MHI's responses to US-APWR DCD RAI No. 65[-844], October 3, 2008, MHI Ref: UAP-HF-08217, ML082810406

ANSWER:

1) Figure 9.4.3-1 is revised to reflect the existence of the SFP Pump Areas.

2) DCD section 9.4.3.2.1 is revised to consistent with the response to RAI No.328-2436 Revision 1 Question 09.04.02-2.

3) The airflow rate (i.e. Zone V to VI: 1,500 cfm; Radiation Zone IV: 14,000 cfm; and Radiation Zone III : 76,000 cfm.) shown in Table 12.2-60 Sheet 3 of 3 of DCD Tier 2 Revision 2 is the minimum exhaust airflow rate from radiological controlled areas (RCA) that are served by the auxiliary building HVAC system. Thus, as-design exhaust airflow rate from RCA that is served by the auxiliary building HVAC system may be more than the airflow rate shown in Table 12.2-60 Sheet 3 of 3. Meanwhile, the supply airflow to RCA is designed to be less than the exhaust airflow rate and to maintain a slightly negative pressure in the controlled areas with respect to outdoor environment.

MHI will revise the DCD Revision 2 Subsection 9.4.3.2.1 and amend the response to RAI No.328-2436 Revision 1 Question 09.04.02-2 Part (3) below

"The **minimum** exhaust airflow from radiological controlled areas (RCA) that are served by the auxiliary building HVAC system is shown in Table 12.2-60 "Parameters and Assumptions for Calculating Airborne Radioactive Concentrations (Reactor Building and Auxiliary Building) (Sheet 3 of 3)" of DCD Tier 2 Revision 1, as follows;

- Radiation Zone V to VI : 1,500 cfm
- Radiation Zone IV : 14,000 cfm
- Radiation Zone III : 76,000 cfm

The **as-design** supply airflow to each zone above is less than the **as-design** exhaust airflow rates, thus maintaining a negative pressure. The airflow rates to each zone are adjusted by the balancing dampers located at each supply and exhaust duct branch throughout the system. The Radiation Zones are shown on figure 12.3-1."

Impact on DCD

Figure 9.4.3-1 will be revised as shown in 4th page.

5th paragraph of DCD Revision 2 Subsection 9.4.3.2.1 will be revised as following;

"During normal plant operation, the two air handling units and two exhaust fans are placed into operation. **The total supply airflow of two air handling units is 196,000 ft^3/min and the total exhaust airflow of two exhaust fans is 208,000 ft^3/min.** Upon energizing the air handling unit, its isolation dampers automatically open. Upon energizing the two exhaust fans, their airflow is continuously and automatically controlled at a predetermined value to maintain a slightly negative pressure in the controlled areas within the A/B, R/B, **including the fuel handling area,** and AC/B to minimize exfiltration from the radiologically controlled areas. **The fuel handling area is supplied airflow of 21,800 ft^3/min from auxiliary building HVAC system air handling units and exhausts an airflow of 24,000 ft^3/min from this area. The airflow to radiological controlled areas is adjusted by the balancing damper located in supply and exhaust duct branch throughout the system.**"

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

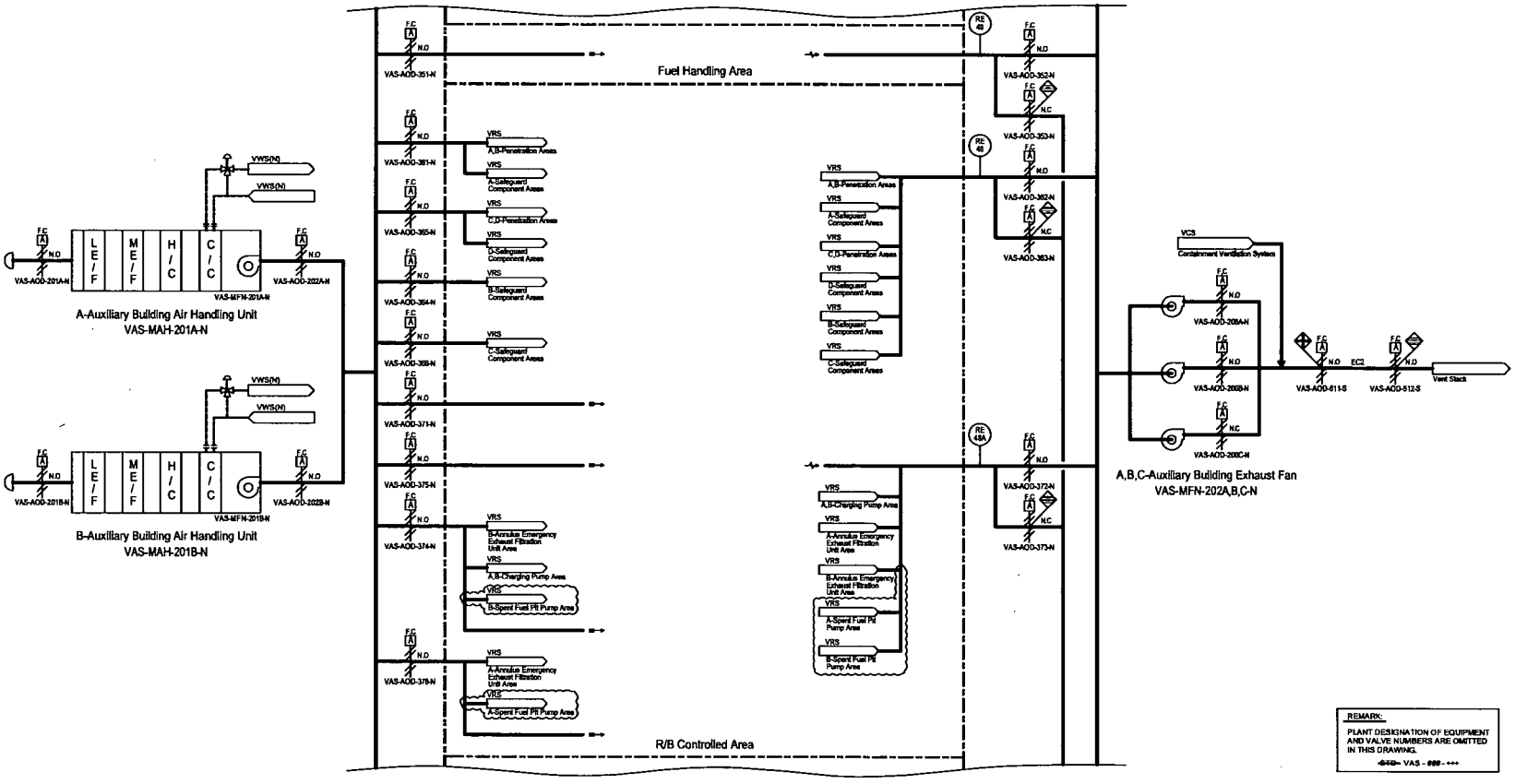

Figure 9.4.3-1 Auxiliary Building HVAC System Flow Diagram (Markup)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

4/01/2010

US-APWR Design Certification

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RAI NO.:	**NO.539-4329 REVISION 2**
SRP SECTION:	**09.04.02 – SPENT FUEL POOL AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**Tier 2 DCD FSAR Sections 9.4.2 & 9.4.3**
DATE OF RAI ISSUE:	**03/02/2010**

QUESTION NO. : 09.04.02-5

In RAI No. 65-844, Revision 0 Question No. 09.04.02-1, RAI 9.4.2-2 (ML082810406) the applicant's "Answer" concluded with the words:

"Although by virtue of monitoring airborne radiation in the exhaust duct, and providing an alarm to alert on high radiation, this function enables the system to comply with GDC 60 requirements, this system does not incorporate the clean up system that complies with RG 1.52 or RG 1.140. Therefore, MHI concluded the A/B HVAC system is not required to meet the GDC 60."

While the staff finds the overall direction of the applicant's response as acceptable, the staff does not agree with the concluding sentence above. It has negative connotations when taken out of context. The staff notes that the applicant correctly concludes in the sentence before that the system (i.e. A/B HVAC system) does comply with GDC 60 by its interface to the to the RG 1.140 cleanup system of the low volume purge system.

The staff requests that the applicant amend its response to Question No. 09.04.02-1, RAI 9.4.2-2 to remove the concluding divergent statement.

The staff also notes that DCD Revision 2 Tier 2 Table 1.9.2-9 for SRP Section 9.4.2 "Status" reads "Criterion 3 is N/A. (Not air .cleanup system)" and for SRP Section 9.4.3 reads "Criterion 3: Air clean up function is provided for TSC HVAC system only". As documented in the applicant's response to Question No. 09.04.02-1, RAI 9.4.2-2, this status is not accurate. The staff requests that the applicant amend Table 1.9.2-9 to reflect the conclusion of the applicant's response to Question No. 09.04.02-1, RAI 9.4.2-2.

The staff notes a similar finding with respect to the first full sentence of page 9.4-15 of Revision 2 of the DCD underlined in the following excerpt:

"The auxiliary building HVAC system and containment low volume purge system arrangement for the fuel handling area meets the GDC 60 requirements for normal plant operation based on compliance with RG 1.140. However, based on the fuel handling accident analysis (Section 15.7.4) no credit is given for any filtration of released radionuclide's and the calculated offsite dose is well within the guideline dose limit values of 10 CFR 50.34. Therefore, compliance with GDC 60 and 61 is not required for the postulated fuel handling accident condition."

The staff requests that the wording of this last sentence be revised (or removed) such that it will not produce incorrect connotations when taken out of context.

ANSWER:

1) MHI will amend the last sentence of the response to RAI No. 65-844, Revision 0 Question No. 09.04.02-1, RAI 9.4.2-2 to remove below:

"Although by virtue of monitoring airborne radiation in the exhaust duct, and providing an alarm to alert on high radiation, this function enables the system to comply with GDC 60 requirements, this system does not incorporate the clean up system that complies with RG 1.52 or RG 1.140. ~~Therefore, MHI concluded the A/B HVAC system is not required to meet the GDC 60.~~"

2) MHI will revise Table 1.9.2-9 for SRP Section 9.4.2 "Status" and SRP Section 9.4.3 "Status" to reflect the conclusion of RAI responses..

3) 10th paragraph of Subsection 9.4.3.2.1 is revised to remove the last sentence.

Impact on DCD

10th paragraph of Subsection 9.4.3.2.1 is revised as follows:

"The auxiliary building HVAC system and containment low volume purge system arrangement for the fuel handling area meets the GDC 60 requirements for normal plant operation based on compliance with RG 1.140. However, based on the fuel handling accident analysis (Section 15.7.4) no credit is given for any filtration of released radionuclide's and the calculated offsite dose is well within the guideline dose limit values of 10 CFR 50.34. ~~Therefore, compliance with GDC 60 and 61 is not required for the postulated fuel handling accident condition.~~"

Table 1.9.2-9 for SRP Section 9.4.2 "Status" and SRP Section 9.4.3 "Status" will be revised as follows:.

Table 1.9.2-9 US-APWR Conformance with Standard Review Plan Chapter 9 Auxiliary Systems (sheet 19 of 30)

SRP Section and Title	SRP Excerpt Indicating Acceptance Criteria for DCD	Status	Appears in DCD Chapter/Section
9.4.1 Control Room Area Ventilation System (continued)	5. Control of Releases of Radioactive Material to the Environment. Information that addresses the requirements of GDC 60 regarding the suitable control of the release of gaseous radioactive effluents to the environment will be considered acceptable if the guidance of RGs 1.52 and 1.140 as related to design, inspection, testing, and maintenance criteria for post-accident and normal atmosphere cleanup systems, ventilation exhaust systems, air filtration, and adsorption units of light-water-cooled nuclear power plants are appropriately addressed. For RG 1.52 rev 2, the applicable regulatory position is C.2. For RG 1.52 rev 3, the applicable regulatory position is C.3. For RG 1.140 rev 1, the applicable regulatory positions are C.1 and C.2. For RG 1.140 rev 2, the applicable regulatory positions are C.2 and C.3. 6. Loss of All Alternating Current Power. Information that addresses the requirements of 10CFR50.63 regarding the necessary support systems providing sufficient capacity and capability for coping with a station blackout event will be considered acceptable if the guidance of RG1.155, including position C.3.2.4 is applied appropriately.		
9.4.2 Spent Fuel Pool Area Ventilation System	1. For GDC 2, acceptance is based on the guidance of RG 1.29, Position C.1 for safety-related portions and Position C.2 for nonsafety-related portions. 2. For GDC 5, acceptance is based on the determination that the use of the SFPAVS in multiple-unit plants during an accident in one unit does not significantly affect the capability to conduct a safe and orderly shutdown and cool-down in the remaining unit(s).	Conformance with exceptions. Criterion 2 is N/A.(Not multiple unit plants) Criterion 3 ~~is N/A. (Not air .cleanup system)~~**: Fuel handling area is served by auxiliary building HVAC system. Auxiliary building HVAC system interfaces to the air cleanup system of containment low volume purge system.** Criterion 4 is N/A.(satisfy the limit offsite dose consequences from fuel handling area without ESF ventilation (filtration) system.)	9.4.2

Table 1.9.2-9 US-APWR Conformance with Standard Review Plan Chapter 9 Auxiliary Systems (sheet 20 of 30)

SRP Section and Title	SRP Excerpt Indicating Acceptance Criteria for DCD	Status	Appears in DCD Chapter/Section
9.4.2 Spent Fuel Pool Area Ventilation System (continued)	3. For GDC 60, acceptance is based on the guidance of RGs 1.52 and 1.140 as related to design, inspection, testing, and maintenance criteria for post-accident and normal atmosphere cleanup systems, ventilation exhaust systems, air filtration, and adsorption units of light-water-cooled nuclear power plants. For RG 1.52 rev 2, the applicable regulatory position is C.2. For RG 1.52 rev 3, the applicable regulatory position is C.3. For RG 1.140 rev 1, the applicable regulatory positions are C.1 and C.2. For RG 1.140 rev 2, the applicable regulatory positions are C.2 and C.3. 4. For GDC 61, acceptance is based on the guidance of RG 1.13 as to the design of the ventilation system for the spent fuel storage facility, Position C.4.		
9.4.3 Auxiliary and Radwaste Area Ventilation System	1. For GDC 2, acceptance is based on the guidance of RG 1.29, Position C.1 for safety-related portions, and Position C.2 for nonsafety-related portions. 2. For GDC 5, acceptance is based on the determination that the use of the ARAVS in multiple-unit plants during an accident in one unit does not significantly affect the capability to conduct a safe and orderly shutdown and cool-down in the remaining unit(s). 3. For GDC 60, acceptance is based on the guidance of RGs 1.52 and 1.140 as related to design, inspection, testing, and maintenance criteria for post-accident and normal atmosphere cleanup systems, ventilation exhaust systems, air filtration, and adsorption units of light-water-cooled nuclear power plants. For RG 1.52 rev 2, the applicable regulatory position is C.2. For RG 1.52 rev 3, the applicable regulatory position is C.3. For RG 1.140 rev 1, the applicable regulatory positions are C.1 and C.2. For RG 1.140 rev 2, the applicable regulatory positions are C.2 and C.3.	Conformance with exceptions. Criterion 2:Not multiple unit plants Criterion 3: Air clean up function is provided for TSC HVAC system ~~only~~ **and Auxiliary building HVAC system**. **Auxiliary building HVAC system interfaces to the air cleanup system of containment low volume purge system.**	9.4.3

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.