

  
**MITSUBISHI HEAVY INDUSTRIES, LTD.**  
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TOKYO, JAPAN

December 25, 2008

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-08304

**Subject: MHI's Responses to US-APWR DCD RAI No.109-1637 Revision 1**

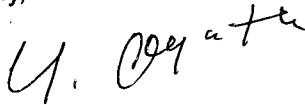
**Reference:** 1) "REQUEST FOR ADDITIONAL INFORMATION NO. 109-1637 REVISION 1, SRP Section: 09.03.01 - Compressed Air System Application Section: Section 9.3.1, QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)" dated December 1, 2008.

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.109-1637 Revision 1."

Enclosed is the responses to Questions 09.03.01-1 through 09.03.01-5 that are 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,



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

Enclosure:

1. Responses to Request for Additional Information No.109 Revision 1

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

DO81  
NRO

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Docket No. 52-021  
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Enclosure 1

UAP-HF-08304  
Docket No. 52-021

Responses to Request for Additional Information No.109-1637  
Revision 1

December 2008

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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12/25/2008

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

**RAI NO.:** NO. 109-1637 REVISION 1  
**SRP SECTION:** 09.03.01 – Compressed Air System  
**APPLICATION SECTION:** 9.3.1  
**DATE OF RAI ISSUE:** 12/1/2008

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**QUESTION NO.:** 09.03.01-1

**RAI 9.3.1-1**

Resolution of Generic Issue 43, "Reliability of Air Systems," ensures the reliability of safety-related equipment actuated or controlled by compressed air. An air system designed to air quality requirements of ANSI/ISA S7.3-R1981, "Quality Standard for Instrument Air," helps ensure that the compressed air system (CAS) and connected components will perform their safety-function. Tier 2 DCD Section 9.3.1.3, "Safety Evaluation," states that the instrument air system (IAS) meets the air quality standards specified in ANSI/ISA S7.3-R1981 and that periodic checks are made to ensure instrument air quality. However, no information concerning the air quality of the station service air system (SSAS) is provided. Additionally, the CAS has the capability to cross connect the instrument air and service air portions of the system, to supply safety related components when required. Regulatory Guide (RG) 1.68.3, "Preoperational Testing of Instrument and Control Air Systems," Position C.9, stresses the importance of all system components meeting the same air quality requirements.

The staff requests the applicant to clarify what air quality standards apply to the station service air system and how the SSAS air quality will be verified. Include this information in the DCD, identify which revision it will appear in, and provide a markup in your response.

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**ANSWER:**

When instrument air is provided from the station service air system (SSAS) using the cross connection, air from SSAS passes through the filter system and dryer system of IAS. By passing through these systems, the air from SSAS can meet the air quality requirements of ANSI/ISA S7.3-R1981. Therefore, there is no need to require the air quality of SSAS.

**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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12/25/2008

**US-APWR Design Certification  
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**QUESTION NO.:** 09.03.01-2

RAI 9.3.1-2

DCD Tier 2, Table 6.2.4-3 (Sheet 6 of 8), part of the information provided for Penetration P245 indicates that the manual globe valve CAS-VLV-004 is normally open and is required to be open during shutdown. However, Figure 6.2.4-1 (Sheet 35 of 50) indicates that CAS-VLV-004 is locked closed. The staff requests the applicant to provide a revised indication of the valve position in the table or a revised figure that correctly identifies the normal position of CAS-VLV-004. Include this information in the DCD, identify which revision it will appear in, and provide a markup in your response.

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**ANSWER:**

Since CAS-VLV-004 is installed for isolation valve leak test, it is normally closed and closed during shutdown and post-accident. Therefore, the information of Table 6.2.4-3 is incorrect. Table 6.2.4-3 (Sheet 6 of 8) will be revised.

**Impact on DCD**

Table 6.2.4-3 will be revised as follows:

Valve Number	Valve Position		
	Normal	Shutdown	Post-accident
CAS-VLV-004	Θ <u>C</u>	Θ <u>C</u>	C

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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12/25/2008

**US-APWR Design Certification**

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**Docket No. 52-021**

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**APPLICATION SECTION:** 9.3.1  
**DATE OF RAI ISSUE:** 12/1/2008

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**QUESTION NO.: 09.03.01-3**

RAI 9.3.1-3

DCD Tier 1, Section 2.7.2.1, under the sub-heading of “Alarms, Displays, and Controls,” reference is made to Table 2.7.2-1 as the list identifying the alarms, displays and controls related to the Compressed Air and Gas (CAGS) that are located in the main control room. However, inspection of Table 2.7.2-1 revealed that no such list is included. The staff requests the applicant to include in the DCD a revised statement that correctly identifies the location of the list of alarms, displays, and controls related to the CAGS located in the MCR.

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**ANSWER:**

DCD Tier 1, Section 2.7.2.1, under the sub-heading of “Alarms, Displays, and Controls,” reference to Table 2.7.2-1 is incorrect. Table 2.7.2-2 is the correct reference of this part. Table 2.7.2-2 shows “Compressed Air and Gas System Equipment Alarms, Displays and Control Functions”. Therefore DCD Tier 1, Section 2.7.2.1 will be revised.

**Impact on DCD**

DCD Tier 1, Section 2.7.2.1, under the sub-heading of “Alarms, Displays, and Controls” will be revised as follows:

**Alarms, Displays, and Controls**

Table 2.7.2-1~~2~~ identifies alarms, displays, and controls related to the CAGS that are located in the main control room (MCR).

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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**QUESTION NO.: 09.03.01-4**

**RAI 9.3.1-4**

As part of the "Safety Evaluation" discussion provided in Section 9.3.1 of Revision 1 to the DCD Tier 2, the DC Applicant states, "the safety-related portions of the IAS, SSAS and compressed gas system, are designed to remain functional during and following a safe shutdown earthquake." The DC Applicant later states that the CAGS does not perform any safety-related function other than containment isolation. In both statements, the Compressed Gas System (CGS) is identified as having a safety-related role. 10 CFR 52.47(b)(1) requires a DC applicant to provide proposed ITAAC necessary to ensure that a plant incorporating the certified design is built and will operate in accordance with the DC, the Atomic Energy Act and NRC regulations. In Revision 1 to DCD Tier 2 Section 9.3.6, the DC Applicant has specified a COL information item regarding a COL applicant's responsibility to provide a CGS, consisting of a highpressure nitrogen gas system, a low-pressure nitrogen gas system, the hydrogen gas system, carbon dioxide system, and oxygen supply system. However, there is no requirement for the COL applicant to propose suitable ITAAC to demonstrate that the CGS design meets the acceptance criteria that are necessary and sufficient to ensure that systems have been constructed and operate in conformance with the COL, the Atomic Energy Act, and NRC regulations. This omission is important since the compressed gas system is expected to perform a safety function as indicated above.

The staff requests the applicant to include in the DCD a COL information item that states that a COL applicant is responsible for providing the tests and inspection requirements for the CGS.

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**ANSWER:**

Compressed gases are supplied to various systems. The only safety-related function for compressed gases is containment isolation function. But, containment isolation portions of gas supply lines are assigned to other systems (e.g., Containment isolation portion of N2 supply line to Accumulators belongs to Safety Injection System.). ITAAC for these portions are described in Tier 1, Subsection 2.11.2 as Containment Isolation System. Therefore, there is no need to include the requirement to propose suitable ITAAC for CGS in COL information.

**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**



There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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**QUESTION NO.: 09.03.01-5**

**RAI 9.3.1-5**

During the review of the application, the staff identified several apparent editorial errors. These are identified below.

**RAI 9.3.1-5.a**

DCD Tier 2, Table 1.9.2-9, in the discussion of SRP Section 9.3.1, "Compressed Air System," the discussion of the "Status" states conformance with "Criterion 3, the instrument air system of the US-APWR is not shared." GDC 3 is related to Fire Protection and is not directly concerned with the sharing of systems. GDC 5 is related to whether shared SSCs important to safety are capable of performing their required safety functions. The staff requests the applicant to include in the DCD a revised statement that correctly identifies the criterion related to the sharing of compressed air systems.

**RAI 9.3.1-5.b**

DCD Tier 2 Section 9.3.1.2.1.1, the last sentence in the fourth paragraph states, in part, "...header pressure is monitored and a low pressure alarm indicates a possible instrument air instrument air line rupture." The staff requests the applicant to include in the DCD a revised statement of the possible line rupture that will initiate the low pressure alarm.

**RAI 9.3.1-5.c**

DCD Tier 2 Section 9.3.1.2.1.1, the last paragraph refers to the "instrument air compressor unit" (singular) and to "instrument airA dryers" being located in the T/B. The staff requests the applicant to include in the DCD a revised description of the IAS components located in the T/B.

**RAI 9.3.1-5.d**

DCD Tier 2 Section 9.3.1.2.1.2, the third paragraph refers to the "service air compressor unit" (singular) being located in the T/B. The staff requests the applicant to include in the DCD a revised description of the number of SSAS compressors located in the T/B.

**RAI 9.3.1-5.e**

DCD Tier 2 Section 9.3.1.2.2.2, the paragraph under sub-heading "Air Receivers" refers to "compressed service ari." The staff requests the applicant to include in the DCD a revised description of the compressed service working fluid.

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**ANSWER:**

These are typographical errors. These errors will be revised.

## **Impact on DCD**

### **RAI 9.3.1-5.a**

DCD Tier 2, Table 1.9.2-9, in the discussion of SRP Section 9.3.1, "Compressed Air System", the discussion of the "Status" column will be revised as follows:

Criterion 35, the instrument air system of the US-APWR is not shared.

### **RAI 9.3.1-5.b**

DCD Tier 2 Section 9.3.1.2.1.1, the last sentence in the fourth paragraph will be revised as follows:

Instrument air header pressure is monitored and a low pressure alarm indicates a possible instrument air ~~instrument-air~~ line rupture.

### **RAI 9.3.1-5.c**

DCD Tier 2 Section 9.3.1.2.1.1, the last paragraph will be revised as follows:

The instrument air compressor units, instrument air receivers, instrument airA dryers, and accessories are all located in the T/B.

### **RAI 9.3.1-5.d**

DCD Tier 2 Section 9.3.1.2.1.2, the third paragraph will be revised as follows:

The service air compressor units, receivers and dryers are all located in the T/B.

### **RAI 9.3.1-5.e**

DCD Tier 2 Section 9.3.1.2.2.2, the paragraph under sub-heading "Air Receivers" will be revised as follows:

The two service air receivers function as storage device for compressed service ~~air~~air.

## **Impact on COLA**

There is no impact on the COLA.

## **Impact on PRA**

There is no impact on the PRA.