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TOKYO, JAPAN

July 10, 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-12195

Subject: **MHI's Revised Response to US-APWR DCD RAI No. 533-4261 Revision 2 (SRP 11.03)**

References: 1) "Request for Additional Information No. 533-4261 Revision 2, SRP Section 11.03 –Gaseous Waste Management System: 11.3", dated March 2, 2010 (ML100621120).
2) "MHI Response to US-APWR DCD RAI No. 533-4261 Revision 2, MHI letter UAP-HF-10109, dated April 20, 2010 (ML101130288).

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Revised Response to Request for Additional Information No. 533-4261 Revision 2 (SRP 11.03)."

Enclosed is the revised response to the question contained within Reference 1. The enclosed response supersedes the response transmitted by Reference 2 in its entirety.

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.

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NRO

Enclosure:

1. Revised Response to Request for Additional Information No. 533-4261 Revision 2 (SRP 11.03)

CC: J. A. Ciocco
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Enclosure 1

UAP-HF-12195
Docket No. 52-021

Revised Response to Request for Additional Information
No. 533-4261 Revision 2 (SRP 11.03)

July 2012

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

7/10/2012

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 533-4261 REVISION 2**
SRP SECTION:	**11.03 – Gaseous Waste Management System**
APPLICATION SECTION:	**11.3**
DATE OF RAI ISSUE:	**03/02/2010**

QUESTION NO. : 11.03-15

Staff review of DCD Tier 1, Revision 2, Section 2.7.4.2 and Table 2.7.4.2-1 found that information on ITAAC for the GWMS to demonstrate compliance with 10 CFR 52.47(b)(1) and to provide reasonable assurance that a plant that incorporates the US-APWR design certification and operates in accordance with the design certification will meet the provisions of the Atomic Energy Act and NRC regulations was not fully described. Without confirming the initial introduction of the proper types and amounts of charcoal media and desiccants, and delay time, the GWMS would fail to meet the design criteria in the DCD Tier 2, Revision 2, Section 11.3.1.2. As a result, gaseous releases could exceed 10 CFR 20, Appendix B, Table 1, effluent concentration and dose limits, and 10 CFR 50, Appendix I dose objectives. The staff requests the applicant to address the following:

1. Describe in DCD Tier 1, Section 2.7.4.2.1, how the GWMS is designed to process gaseous waste prior to release and insure compliance with 10 CFR 20, Appendix B, Table 1 effluent concentration and dose limits, and 10 CFR 50, Appendix I dose objectives for gaseous effluents when the plant is operational.

2. Describe in DCD Tier 1, Section 2.7.4.2.1, the process design of the GWMS subsystems and how the initial loading of the subsystem demineralizers and vessels includes the proper types and amounts of charcoal media and desiccant, and delay time that will meet or exceed the system design descriptions and parameters listed in DCD Tier 2, Revision 2, Tables 11.3-1 and 11.3-2. Provide in DCD Tier 1, Table 2.7.4.2-1, the assigned ITAAC to confirm the charcoal quantity.

3. Provide in DCD Tier 1, Table 2.7.4.2-1, the assigned ITAAC to confirm the radiation monitor at the discharge side of the adsorbers which sends a signal to close the GWMS discharge valves upon detection of radiation levels above the set point monitor, source test of the radiation monitor, alarms, indications, and automatic initiation functions as described in DCD Tier 1, Revision 2, Section 2.7.4.2.1 and DCD Tier 2, Revision 2, Sections 11.3.2.1.6 and 11.5.2.4.1.

Please revise the DCD to include this information and provide a markup.

ANSWER:

The GWMS is designed to use gas surge tanks to provide temporary storage of radioactive gases. It also includes four charcoal beds for the decay of radioactive gases before the gases are released into the environment. The four charcoal beds provide adequate delay and decay time of radioactive gases before it is routed to the discharge structure. The primary source of radioactive gases come from the vents from the holdup tanks and the volume control tank and contains moisture that is harmful to the charcoal medium. The gases are demoisturized in the waste gas dryer before it reaches the charcoal beds. This dry gas is then processed through the charcoal beds for decay of radioactive gases before release of the gases to the environment.

The use of the gas surge tanks and charcoal media and GWMS design is common in the nuclear industry and their performances on removal of radioactive gases are also commercially proven. The charcoal beds have sufficient amount of charcoal material to insure the gaseous release meets the limits of 10 CFR Part 20, Appendix B and 10 CFR Part 50, Appendix I. DCD Section 11.3 provides the analyses demonstrating that regulatory release limits will be met by the specified design, including the size of the charcoal bed. Radiation monitors are provided to monitor the release to insure these limits are not exceeded. The discharge valve remains open when the radiation setpoint is not exceeded, otherwise, the radiation monitors will an initiate alarms in the MCR for operator actions to close the discharge valves and recycle the gases for more treatment.

1. As part of the Tier 1 improvement effort, DCD Revision 3 incorporated many changes to Tier 1, including Section 2.7.4.2. These changes were made to improve the inspectability of the ITAAC, to align the Tier 1 information with Tier 2 information, and to ensure that Tier 1 was consistent with NRC SRP guidance and NRC RIS 2008-05 R1. The DCD Revision 3, Tier 1, Section 2.7.4.2 shown in Attachment 1 addresses the key design features of the GWMS..

2. Based on the process design, technical specifications will be prepared to specify the size and design of gas surge tanks, charcoal adsorbers, waste gas compressors and waste coolers and dryers. The technical specifications will specify the type, size, and quantities of initial supply of charcoal and drying media, and the provision of the corresponding performance data, and/or test reports, as appropriate, by the corresponding equipment vendors. The design of the equipment, performance data of the media, test reports are required to be submitted by the equipment manufacturers during bid evaluation processes. In addition, engineering review of the vendor design is also conducted during equipment fabrication phase to insure it meets the design parameters specified. During equipment delivery, inspection of the types, the quality, and the volume of dessicant and charcoal media will be conducted for acceptance. Procedures for loading the media will be prepared to insure that the media loading meets the design and the corresponding vendor specifications for the molecular sieve tanks and charcoal adsorbers capabilities. Refer to item 1 above for a discussion regarding the changes to the ITAAC in Table 2.7.4.2-1.

3. Gaseous radwaste discharge monitor RMS-RE-072 is identified in DCD Tier 1 Table 2.7.6.6-1 of Process Effluent Radiation Monitoring and Sampling System (PERMS) equipment, and is subject to the functional arrangement ITAAC Item 1 of Table 2.7.6.6-2. Table 2.7.4.2-1 ITAAC Item 2 requires the GWMS discharge valves to close in response to a GWMS effluent discharge isolation signal.

Impact on DCD

There is no impact on DCD Revision 3.

1) As part of the DCD Tier 1 improvement effort, DCD Revision 3 incorporated many changes to Tier 1 Section 2.7.4.2.1 Design Description, and Table 2.7.4.2-1, Gaseous Waste Management System Inspections, Tests, Analyses, and Acceptance Criteria, as shown in Attachment 1. These changes adequately address the issues identified above.

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 Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

This completes MHI's response to the NRC's question.

2.7.4.2 Gaseous Waste Management System (GWMS)

2.7.4.2.1 Design Description

The GWMS is a non safety-related system. The GWMS monitors, controls, collects, processes, handles, stores, and disposes of gaseous radioactive waste generated as the result of normal operation, including anticipated operational occurrences (AOOs). The GWMS processes potentially radioactive gases using charcoal beds to remove iodine and create sufficient delay time to allow decay of short half-life radioactive isotopes prior to release. The GWMS ensures that gaseous waste releases comply with 10 CFR Part 20, Appendix B, concentration and dose limits, and 10 CFR Part 50, Appendix I dose objectives for gaseous effluents. The GWMS is located in the auxiliary building (A/B).

The GWMS includes the following components:

- Waste gas surge tanks
- Charcoal beds
- Waste gas compressors
- Waste gas dryer

1. The functional arrangement of the GWMS is as described in the Design Description of Subsection 2.7.4.2.1 and in Table 2.7.4.2-2.
2. Upon receipt of a high radiation signal above the pre-determined setpoint, the GWMS discharge valves close automatically.
3. Deleted.
4. Deleted.
5. GWMS charcoal bed columns each contain the volume needed to allow decay of short half-life isotopes to keep releases within regulatory limits.
6. An alarm from the gaseous radwaste discharge radiation monitor is provided in the MCR.

2.7.4.2.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.4.2-1 describes the ITAAC for the GWMS.

Table 2.7.4.2-1 Gaseous Waste Management System Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the GWMS is as described in the Design Description of Subsection 2.7.4.2.1 and in Table 2.7.4.2-2.	1. Inspection of the as-built GWMS will be performed.	1. The as-built GWMS conforms to the functional arrangement as described in the Design Description of Subsection 2.7.4.2.1 and in Table 2.7.4.2-2.
2. Upon receipt of a high radiation signal above the pre-determined setpoint, the GWMS discharge valves close automatically.	2. Tests of the as-built GWMS discharge valves will be performed using a simulated test signal.	2. Upon receipt of a simulated GWMS high radiation test signal, the as-built GWMS discharge valves close automatically.
3. Deleted.	3. Deleted.	3. Deleted.
4. Deleted.	4.a Deleted.	4.a Deleted.
	4.b Deleted.	4.b Deleted.
5. GWMS charcoal bed columns each contain the volume needed to allow decay of short half-life isotopes to keep releases within regulatory limits.	5. Inspections will be performed to verify the contained volume of each of the charcoal beds.	5. The contained volume in each of the charcoal beds is equal to or greater than 70 ft^3/column.
6. An alarm from the gaseous radwaste discharge radiation monitor is provided in the MCR.	6. Inspection will be performed for the retrievability of the alarm from the gaseous radwaste discharge monitor in the as-built MCR.	6. An alarm from gaseous radwaste discharge radiation monitor can be retrieved in the as-built MCR.

Table 2.7.4.2-2 Gaseous Waste Management System Major Component

Component Name	Quantity	Component Location
Waste gas surge tanks	4	Auxiliary Building
Charcoal beds	4	Auxiliary Building
Waste gas compressors	2	Auxiliary Building
Waste gas dryer	1	Auxiliary Building