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TOKYO, JAPAN

September 18, 2009

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-09456

Subject: MHI's Response to US-APWR DCD RAI No.442-3378 Revision 1

References: 1) "Request for Additional Information No.442-3378 Revision 1, SRP Section: 09.04.01 – Control Room Area Ventilation System, Application Section: DCD sections 6.4 and 9.4.1 through 9.4.6" dated August 25, 2009.

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.442-3378 Revision 1".

Enclosed is the response 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,

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

Enclosure:

1. Response to Request for Additional Information No. 442-3378, Revision 1

CC: J. A. Ciocco
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Docket No. 52-021
MHI Ref: UAP-HF-09456

Enclosure 1

UAP-HF-09456
Docket Number 52-021

Response to Request for Additional Information No. 442-3378,
Revision 1

September, 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/18/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**442-3378 REVISION 1**
SRP SECTION:	**09.04.01 – CONTROL ROOM AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**Tier 2 DCD SPCV Sections 6.4 AND 9.4.1 THROUGH 9.4.6**
DATE OF RAI ISSUE:	**08/25/2009**

QUESTION NO. : 09.04.01-10

DCD Section 6.4 Habitability Systems (subsection 6.4.5, Table 6.4-1, Table 6.4-2)
As a part of satisfying "SRP Acceptance Criteria" #4 for the "Emergency Standby Atmosphere Filtration System, SRP 6.4 indicates that iodine removal for this system should be in accordance with the guidelines of Regulatory Guide 1.52, Revision 3. DCD Reference 6.4-2 lists revision 3 of RG 1.52 which is consistent with the SRP guidance.
Regulatory Position C.3 of RG 1.52 invokes the use of ASME AG-1-1997 and RG 1.52 cites this ASME AG-1 version as its basis in Reference #9. Therefore, ASME AG-1-1997 is the most recent version of ASME AG-1 endorsed by the NRC staff.
In contrast, DCD section 6.4.8 "References" cites ASME AG-1-2003 as part of its licensing bases in Reference 6.4-5. Provide justification for use of the newer code rather than the NRC endorsed version of the code.

DCD Section 9.4.1 Main Control Room HVAC System (subsections 9.4.1.1.1 and 9.4.1.4)

As a part of satisfying the provisions of GDC 60, SRP 9.4.1 indicates that the regulatory position C.3 of RG 1.52, revision 3 should be used regarding the suitable control of the release of gaseous radioactive effluents to the environment. DCD Reference 9.4.8-3 lists revision 3 of RG 1.52 which is consistent with the SRP guidance. Regulatory Position C.3 of RG 1.52 invokes the use of ASME AG-1-1997 and RG 1.52 cites this ASME AG-1 version as its basis in Reference #9. Therefore, ASME AG-1-1997 is the most recent version of ASME AG-1 endorsed by the NRC staff.
In contrast, DCD section 9.4.8 "References" cites ASME AG-1-2003 as part of its licensing bases in Reference 9.4.8-2. Provide justification for use of the newer code rather than the NRC endorsed version of the code.

DCD subsection 9.4.3.4.4 Technical Support Center (TSC) HVAC System

As a part of satisfying the provisions of GDC 60, SRP 9.4.3 indicates that regulatory positions C.2 and C.3 of RG 1.140, revision 2 should be used in the 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. DCD Reference 9.4.8-15 lists revision 2 of RG 1.140 which is consistent with the SRP guidance. Regulatory Position C.3 "System Design Criteria" of RG 1.140 invokes the use of ASME AG-1-

1997 and RG 1.140 revision 2 cites this ASME AG-1 version as its basis in Reference #3. Therefore, ASME AG-1-1997 is the most recent version of ASME AG-1 endorsed by the NRC staff.
In contrast, DCD section 9.4.8 "References" cites ASME AG-1-2003 as part of its licensing bases in Reference 9.4.8-2. Provide justification for use of the newer code rather than the NRC endorsed version of the code.

DCD subsections 6.5.1.5, 6.5.1.5.1, Table 6.5-2, Table 6.5-3, subsections 9.4.5.1.1.1 and 9.4.5.4.1 Annulus Emergency Exhaust System

As a part of satisfying the provisions of GDC 60, SRP 9.4.5 indicates that the regulatory position C.3 of RG 1.52, revision 3 should be used in the 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. The staff notes that SRP 6.5.1 also supports this direction. DCD Reference 9.4.8-3 lists revision 3 of RG 1.52 which is consistent with the SRP guidance.
Regulatory Position C.3 of RG 1.52 invokes the use of ASME AG-1-1997 and RG 1.52 cites this ASME AG-1 version as its basis in Reference #9. Therefore, ASME AG-1-1997 is the most recent version of ASME AG-1 endorsed by the NRC staff.
In contrast, DCD section 9.4.8 "References" cites ASME AG-1-2003 as part of its licensing bases in Reference 9.4.8-2. Provide justification for use of the newer code rather than the NRC endorsed version of the code.

DCD Section 9.4.6 Containment Ventilation System (subsections 9.4.6.4.4.1 and 9.4.6.4.4.2)

For the Containment Low Volume Purge System and the Containment High Volume Purge System, the staff used the review guidance of SRP 6.5.1 since there is no SRP that is dedicated exclusively to the review of containment ventilation systems. As a part of satisfying the provisions of GDC 60 and GDC 61, SRP 6.5.1 indicates that the regulatory guidance of RG 1.140 is applicable in the review of these non-ESF atmospheric cleanup systems. DCD Reference 9.4.8-15 lists revision 2 of RG 1.140 which is consistent with the SRP guidance. Regulatory Position C.3 "System Design Criteria" of RG 1.140 invokes the use of ASME AG-1-1997 and RG 1.140 revision 2 cites this ASME AG-1 version as its basis in Reference #3. Therefore, ASME AG-1-1997 is the most recent version of ASME AG-1 endorsed by the NRC staff.
In contrast, DCD section 9.4.8 "References" cites ASME AG-1-2003 as part of its licensing bases in Reference 9.4.8-2. Provide justification for use of the newer code rather than the NRC endorsed version of the code.

ANSWER:

The differences between the ASME Code AG-1-1997 edition referenced in the cited NRC guidance and the ASME Code AG-1-2003 referenced in the US-APWR DCD have been reviewed in order to justify the use of the later Code edition for ventilation system design and testing for the US-APWR. The review was based on the Summary of Changes provided in the AG-1-2003 Code since the 1997 edition. The results of the review are provided in the table below. The changes to the Code were determined to be corrections and clarifications that do not affect the technical or administrative requirements of the Code. Therefore, the use of the 2003 edition of the Code, rather than the 1997 edition referenced in the NRC guidance documents, is justified.

ASME Code AG-1-2003 Summary of Changes Comparison to ASME Code AG-1-1997

Page	Location	Change	Comments
v	Foreword	Revised	Editorial update
235	Article RA-2000	Revised in its entirety	Editorial – reference document revisions updated
242	RA-5100	Revised	Editorial correction
265	Article RA-I-1000	(1) First paragraph revised (2) Footnote 1 deleted	Editorial correction
269	Article RA-MI-1000	(1) First paragraph revised (2) Footnote 1 deleted	Editorial correction
282	Article CA-2000	Revised in its entirety	Editorial – reference document revisions updated
285	Table CA-3230	Revised	Added ASTM A90 and A653 standards for zinc coated materials
286	Table CA-3310	Revised	Added ASTM A90 and A653 standards for zinc coated materials
287	Table CA-3410	Revised	Added ASTM A90 and A653 standards for zinc coated materials
289	CA-4126	Revised in its entirety	Editorial clarification to add material requirement for casings and tube supports
292	CA-4227	Revised in its entirety	Editorial clarification to add material requirement for casings and tube supports
293, 294	CA-4323 CA-4325 CA4327	Subparagraph (c) revised Subparagraphs (b) and (e) revised Subparagraph (b) revised	Replaced reference to ASTM A525 with ASTM A653 (ASTM A653 supersedes A525)

ASME Code AG-1-2003 Summary of Changes Comparison to ASME Code AG-1-1997

Page	Location	Change	Comments
303	Article CA-7000	Revised in its entirety	Editorial change to replace reference to ASME NQA-2 with ASME NQA-1 (ASME NQA-1 incorporated NQA-2 in 1994)
338-350	Section FB	Added	Errata to the 2003 edition re-instated the 1997 edition version of this section

(In addition to these changes, ASME AG-1a-2000 addenda added Section HA 'Housings'. ASME AG-1a-2000 is invoked by Regulatory Guide 1.140, Revision 2.)

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.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/18/2009

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

RAI NO.:	**442- 3378 REVISION 1**
SRP SECTION:	**09.04.01 – CONTROL ROOM AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**Tier 2 DCD SPCV Sections 6.4 AND 9.4.1 THROUGH 9.4.6**
DATE OF RAI ISSUE:	**08/25/2009**

QUESTION NO. : 09.04.01-11

The applicant's response to Question 09.04.01-9 (RAI No. 327-2401, Revision 1; MHI Ref. # UAP-HF-09323, dated June 19, 2009) eliminated COL 9.4(1) in Revision 1 of the DCD due to the fact that it duplicated COL 6.4(1). However, the wording of COL 6.4(1) does not resolve the staff's original concern about the need for the design of the ESF atmospheric cleanup system to consider the effects on the system due to the environment in which the nuclear plant is sited. The staff in RAI Question 09.04.01-32 (RAI No. 63, MHI Ref. UAP-HF-08215, dated October 3, 2008) that preceded Question 09.04.01-9 also raised this issue.

In particular, the staff notes that Revision 3 of NUREG-0800 SRP 9.4.1 Section II, "SRP Acceptance Criteria " #5 indicates that regulatory position C.3 of Regulatory Guide 1.52, Revision 3 applies. C.3 of RG 1.52 reads that:

> *"...If the atmosphere surrounding the plant could contain significant environmental contaminants, such as dusts and residues from smoke cleanup systems from adjacent coal-burning power plants or industry, or is a salty environment near an ocean, the design of the system should consider these contaminants and prevent them from affecting the operation of any ESF atmosphere cleanup system."*

The environment in which a nuclear plant is sited, can affect the short term daily operations of an ESF atmosphere cleanup system as well as the long term integrity and operability of the system.

The staff finds that COL 6.4(1) does not capture the need for the COL applicant to consider these or similar issues in the design of the ESF atmosphere cleanup system.

The staff requests that the DCD applicant amend COL 6.4(1) or create a separate COL item to capture the expectations of SRP 9.4.1 Section II, "SRP Acceptance Criteria " #5 and regulatory position C.3 of Regulatory Guide 1.52.

ANSWER:

As indicated in the response to RAI 327-2401 Question No. 09.04.01-9, Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of

Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants", recommends that the air intakes for all ESF atmosphere cleanup systems be designed such as to prevent adverse effects from any environmental contaminants.

There are only two ESF atmospheric cleanup systems. The Annulus Emergency Exhaust System and the Main Control Room HVAC System. The Annulus Emergency Exhaust System is not operating during normal plant operation and does not take suction directly from outside. It takes suction from interior compartments, which would be isolated from any outside air source during a Design Base Accident, when it is operating. Therefore, environmental contamination is not an issue and has no application on the Annulus Emergency Exhaust System. However, the Main Control Room HVAC System's, Emergency Filtration System does take suction from outside and is subject to environmental contaminants. Therefore, only the Main Control Room HVAC System has to be addressed.

As stated in Section 9.4.1, the Main Control Room HVAC System is compliant with Regulatory Guide 1.52. A full compliance matrix of US-APWR design features which meet RG 1.52 is presented in Section 6.4, Table 6.4-2 "Main Control Room Emergency Filtration System." Included in the safety design bases for the MCR HVAC system is the capacity to withstand the effects of adverse environmental conditions except for the toxic gases. COL Item 6.4(1) requires the COL Applicant only to provide details of specific toxic chemicals of mobile and stationary sources within the requirements of RG 1.78 (Ref 6.4-4) and evaluate the control room habitability based on the recommendation of RG 1.78 (Ref 6.4-4).

Therefore, the effects of adverse environmental conditions except for the toxic gases do not need to be described as COL Item.

Item No.3.11 of Table 6.4-2 will be revised to clarify the design feature to withstand the effect of adverse environmental conditions because it is insufficient to comply with RG.1.52.

Impact on DCD

Revise DCD Section 6.4, Table 6.4-2 No.3.11 as follows:

No.	Regulatory Position	US-APWR Design
3.11	Outdoor air intakes protected to minimize the effects of onsite, offsite, and environmental contaminates	Outside air intakes include tornado-generated missile protection grid and a tornado depressurization protection dampers. **In addition, outside air is filtered and monitored in order to ensure that potential environmental contaminants do not adversely affect the operation of the MCR HVAC system.**

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.