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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-10278

Subject: MHI's Response to US-APWR DCD RAI No.634-4845 Revision 2

References: 1) "Request for Additional Information No. 634-4845 Revision 2, SRP Section: 09.04.03 – Auxiliary and Radwaste Area Ventilation System Application Section: DCD Sections 9.4.3" dated September 17, 2010.

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.634-4845 Revision 2".

Enclosed are the responses to 3 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. Responses to Request for Additional Information No. 634-4845, Revision 2

CC: J. A. Ciocco
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Enclosure 1

UAP-HF-10278
Docket Number 52-021

Responses to Request for Additional Information
No. 634-4845, Revision 2

October, 2010

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

10/15/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO.634-4845 REVISION 2**
SRP SECTION:	**09.04.03 - AUXILIARY AND RADWASTE AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**DCD Sections 9.4.3**
DATE OF RAI ISSUE:	**09/17/2010**

QUESTION NO. : 09.04.03-11

New Follow-up RAI

The staff submits the following questions based on its review of the applicant's response to RAI 483-3885, Question No. 09.04.03-9.

(1) The staff notes that DCD Tier 2 Figure 9.4.3-1 and Figure 9.4.6-1 displays a system interface between the auxiliary building ventilation system and the containment low volume purge exhaust subsystem. The staff asks what provisions are part of the system design configuration to prevent the back flow of containment purge ventilation air into areas of the fuel handling area, building reactor building, auxiliary building and access building controlled areas. One way this scenario becomes a possibility is when isolation valves VAS-AOD-353-N/-363-N/-373-N/-383-N and -393-N are opened to align the system to the Containment Low Volume Purge Exhaust Filtration Units and the auxiliary building exhaust fan suctions are overpowered by the process of relieving containment pressure at 2 psig during normal power operations.

(2) With respect to occupational radiation protection, the staff notes that SRP Section 12.3-12.4 under specific SRP Acceptance Criteria 3 "Ventilation" reads (in part):

"The ventilation system will be acceptable for radiation protection purposes if the criteria and bases for ventilation rates within the areas covered in SAR Section 12.2.2 will ensure that air will flow from areas of low potential airborne radioactivity to areas of higher airborne radioactivity and then to filters or vents, that the concentrations of radioactive material in areas normally occupied can be maintained in accordance with the requirements 10 CFR 20.1701, and that the dose limits of 10 CFR 20.1201 are met consistent with the requirements of 10 CFR 20.1202, 10 CFR 20.1203, and 10 CFR 20.1204. The system has adequate capability to reduce concentrations of airborne radioactivity to 1.0 derived air concentration (DAC), as specified in Appendix B to 10 CFR Part 20, in areas not normally occupied where maintenance or inservice inspection must be performed."

In addition, specific Acceptance Criteria 4.B reads (in part):

"The airborne radioactivity monitoring system will be acceptable if it is consistent with the guidance on continuous air sampling in Regulatory Guide 8.25 and meets the following criteria:

i. Engineering controls provide the principal protection against the intake of radioactive materials."

The staff also notes that SRP 12.2 SRP Acceptance Criteria reads (in part):

"Shielding and ventilation design fission product source terms will be acceptable if developed using these

bases:
• An offgas rate of 370 MBq/s (100,000 μCi/s) after a 30-minute delay for BWRs.
• *0.25-percent fuel cladding defects for PWRs.*
• Post accident shielding (for vital area access, including work in the area) source terms from NUREG-0737, Item II.B.2, or Regulatory Guide 1.183."

The staff finds the above SRP guidance in conflict with Part 3) of the applicant's response which indicates that the applicant is using ANSI/ANS-18.1 for in plant (not effluent) airborne activity levels and reads (in part):
"The design basis source terms are applied for the purposes of shielding, to establish operating range. For normal operation, which includes anticipated operational occurrences (startup and refueling), the system operation, equipment loading under normal conditions, effluent specifications, and solid waste classifications, are based on the realistic source terms in accordance with ANSI/ANS-18.1."

The staff requests that the applicant redress its response to Question No. 09.04.03-9 to address the Occupational Exposure Control design aspects of the HVAC system or provide additional information that clarifies this apparent inconsistency. Either use the approved guidance or provide a justification that the deviation from the guidance is acceptable.

Reference: MHI's Response to US-APWR DCD RAI No. 483-3885; MHI Ref: UAPHF-10037; dated February 5, 2010; ML100480086.

ANSWER:

Part 1)
The containment low volume purge system is not aligned to exhaust from the containment and the auxiliary building HVAC system simultaneously. When exhaust from the auxiliary building HVAC system is filtered by the containment low volume purge exhaust filtration unit, the containment low volume purge system containment isolation valve is manually closed and the containment low volume purge supply fan is manually stopped.

DCD Section 9.4.6.2.4.1 will be revised to clarify the containment low volume purge system operation when the exhaust is aligned from the auxiliary building HVAC system.

Part 2)
In the response to RAI 483-3885, Question No. 09.04.03-9, Part 3, MHI discussed two source terms consistent with the guidance in RG 1.206 Subsection C.I.11.1: a design basis source term and a realistic source term. As described in DCD Subsection 11.1, the design basis source term, which for the US-APWR is based on 1% failed fuel, provides a basis for the radwaste system design, effluent monitoring design, and shielding requirements. DCD Table 12.2-60 provides the assumptions and parameters used for calculating the airborne source term in various plant locations. Sheets 1, 2, and 3 of DCD Table 12.2-60 indicate that a fuel defect of 1% is assumed for calculation of the airborne radioactivity concentrations in the containment, fuel handling area, and reactor and auxiliary buildings, respectively. Thus the design basis source term, including the 1% failed fuel assumption, is used as the basis for determining the in plant airborne radioactive concentrations. Therefore, the MHI design meets the SRP 12.2 Acceptance Criteria identified in the RAI by the reviewer.

Alternatively, DCD Subsection 11.1 states that the realistic source term, which for the US-APWR based on ANSI/ANS-18.1, provides the basis for calculating the annual release of radioactive materials through the liquid and gaseous effluents for demonstrating compliance with applicable concentration and public dose limits. The use of the realistic source term for this application is appropriate since the US-APWR contains design controls to prevent continual operation with a fuel defect level of up to 1%. Therefore, the

actual expected fuel defect level and associated source term under anticipated normal operating conditions is much smaller than the design-basis source term.

In conclusion, the response to RAI 483-3885, Question No. 09.04.03-9, Part 3, incorrectly implied that the ANSI/ANS-18.1 source term was utilized for in plant airborne activity levels. As described above, DCD Subsection 11.1 and several places in DCD Chapter 12 correctly indicate the actual usage of the design basis and realistic source terms. Therefore, there is no need to modify the DCD as a result of this response.

Impact on DCD

DCD Revision 2 Subsection 9.4.6.2.4.1 will be revised to clarify the containment low volume purge system operation when the exhaust is aligned to the auxiliary building HVAC system.
Add the following sentence to the end of the 8th paragraph in Section 9.4.6.2.4.1:
"When exhaust from the auxiliary building HVAC system is filtered by the containment low volume purge exhaust filtration unit, the containment low volume purge system containment isolation valve is manually closed and the containment low volume purge supply fan is manually stopped."

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

10/15/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO.634-4845 REVISION 2**
SRP SECTION:	**09.04.03 - AUXILIARY AND RADWASTE AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**DCD Sections 9.4.3**
DATE OF RAI ISSUE:	**09/17/2010**

QUESTION NO. : 09.04.03-12

New Follow-up RAI
The following are follow-up questions to RAI No. 483-3885, Question No. 09.04.03-10:

1) The fourth paragraph of the applicant's "ANSWER" reads:
"As indicated in the design bases in Subsection 9.4.3.1.2.1, the system provides sufficient supply and exhaust air flow to keep the dose levels from airborne radioactivity below 10CFR20 limits. A minimum air flow value of 2,500 cubic feet per minute is required to avoid settling out of airborne particulates and lowers the dose levels."

The staff notes that the reference appears to be in error. Subsection 9.4.3.1.2.1 does not list a volumetric flow rate. The related passage in Subsection 9.4.3.2.1 refers to a minimum duct velocity of 2,500 feet per minute (fpm) and not a volumetric flow rate of cubic feet per minute. The staff notes that 2,500 fpm may be of sufficient velocity to keep the internals of ducts from becoming traps for radioactive contaminants. However, this subsection does not discuss how velocity flow rates from lower contamination to higher contamination areas will be established to ensure adequate sweep rates. As a point of reference for this question, the staff acknowledges the existence of the applicant's "Answer" to Chapter 12.02, RAI 427-2909, Q 12.02-19. Please address this apparent error.

2) The fourth paragraph of the applicant's "Answer" reads "*As indicated in the design bases in Subsection 9.4.3.1.2.1, the system provides sufficient supply and exhaust air flow to keep the dose levels from airborne radioactivity below 10CFR20 limits.*" The staff notes that the applicant's answer does not appear to be not consistent with the data provided in Table 12.2-61, sheet 4 of 6 as identified in RAI 532-4019, Question 12.02-26. Question 12.02-26 which notes that some areas of the A/B are listed as having airborne activity levels greater than 1 DAC (e.g. I-131, Xe-133, I-133, Kr-88). The staff requests that the applicant clarify its response to Question No.: 09.04.03-10 based on this information.

3) The staff notes that the applicant failed to provide a response to the staff's question: What is the limiting design basis AOO for the US-APWR (for example a small RCS leak in effected equipment areas)? The applicant also failed to provide the expected most limiting case airborne activities and dose consequences in the Reactor Building and Auxiliary Building during this design basis event. The staff resubmits these requests for additional information and needs this information to make its regulatory

finding.

References:
1. MHI's Response to US-APWR DCD RAI No. 483-3885; MHI Ref: UAP-HF-10037; dated February 5, 2010; ML100480086.
2. MHI's Responses to US-APWR DCD RAI No. 427-2909, 428-2910, and 429-3178; MHI Ref: UAP-HF-09473; dated November 25, 2009; ML093340084.
3. MHI's Response to US-APWR DCD RAI No. 532-4019; MHI Ref: UAP-HF-10099; dated April 9, 2010; ML101050111.

ANSWER:

Part 1)
The reference to DCD Section 9.4.3.1.2.1 in the fourth paragraph of the response to RAI No. 483-3885, Question No. 09.04.03-10 [MHI Ref: UAP-HF-10037; dated February 5, 2010; ML100480086], is applicable to the first sentence. As a clarification, the reference is to the second bullet of the first paragraph in DCD Section 9.4.3.1.2.1.

The second sentence in the fourth paragraph of the response to RAI No. 483-3885, Question No. 09.04.03-10 refers to duct flow velocity and should not have been included in the response.

As further identified in DCD Section 9.4.3.1.2.1, in the third and fourth bullets of the first paragraph, the power generation design basis of the auxiliary building HVAC system includes the requirement to maintain a slightly negative pressure in the controlled areas of the A/B to minimize exfiltration from the radiologically controlled areas during normal plant operation and to maintain air flow from areas of low radioactivity to areas of potentially higher radioactivity. These design requirements are met by controlling exhaust flowrate higher than supply flowrate by approximately 10% and exhausting from areas of potentially higher radioactivity. The slightly negative pressure ensures ventilation flow from low radioactivity, adjacent buildings and outside areas to potentially higher radioactivity areas to keep dose levels due to the airborne radioactivity below the allowable values set by 10 CFR 20.

Part 2)
Appendix B of 10 CFR 20 provides dose limits for specific radionuclides in terms of annual limits on intake (ALIs) and derived air concentrations (DACs). The DAC values in Appendix B of 10 CFR 20 are derived from the ALIs based on assumptions of breathing rates and exposure duration. 1 DAC provides the air concentration necessary to give 1 ALI of dose for 2000 hours of work. SRP Section 12.3-12.4 Acceptance Criteria 3 states that ventilation systems should have the capability to reduce concentrations of airborne radioactivity to 1.0 DAC, as specified in Appendix B to 10 CFR Part 20, in areas not normally occupied where maintenance or in service inspection must be performed.

DCD Tier 2 Revision 2 Table 12.2-61 (Sheet 4 of 6) provides the airborne radioactivity concentrations in those portions of the Reactor Building and Auxiliary Building designated a Radiation Zone V and higher. Per DCD Table 12.3-2, areas in the reactor and auxiliary buildings designated Radiation Zone V and higher are areas of expected high radiation and/or contamination. As such, these areas are normally inaccessible with locked doors and positive access controls such that entry and exit of the areas are under the supervision of the plant health physics staff. This ensures that occupancy in these areas is significantly less than the 2000 work-hours associated with the 1 DAC limit for areas not normally occupied. Maintenance or in service inspection activities performed in these zones requires both routine and job-specific monitoring by health physics personnel prior to work permit authorization as part of the plant Radiological Protection Program. If these pre-job surveillances indicate sufficiently high levels of airborne radioactivity, the Radiological Protection Program requires the use of some means of reducing the personnel internal dose, such as the use of stay time limitations, respiratory protection equipment, or portable filtration systems that can reduce the airborne radioactivity to an acceptable level. For these areas, which are not normally occupied, the HVAC system alone is not relied upon for keeping doses

within the 10 CFR 20 limits. Instead, provisions in the Radiological Protection Program are relied upon for ensuring worker doses are ALARA and well within any regulatory limits.

The statement in DCD Revision 2 Subsection 9.4.3.1.2.1 should be clarified that the A/B HVAC system is designed to keep dose levels due to the airborne radioactivity in normally occupied areas below the allowable values set by 10 CFR 20 by supplying and exhausting sufficient airflow. This clarification is supported by the airborne radioactivity concentration data already provided in DCD Revision 2 Table 12.2-61 Sheets 5 and 6.

Part 3)
The US-APWR design includes a gaseous waste management system (GWMS) to monitor, control, collect, handle, store, and dispose of gaseous radioactive wastes generated as the result of normal plant operations and anticipated operational occurrences (AOOs). Since the expected gaseous releases are collected and treated, the HVAC systems operating during normal and AOO conditions do not contain additional filtering components for the removal of gaseous radioactivity. The Auxiliary Building (A/B) HVAC system vents radiologically controlled areas within both the reactor and auxiliary building to the environment via the vent stack. This ventilation is designed to prevent the build-up of radioactivity and maintain certain environmental conditions within the reactor building (R/B) and A/B areas of the plant. However, with the exception of the isolation dampers, the A/B HVAC system does not serve any safety function, and it therefore designated as a non-safety system. Under normal operating conditions, the ventilation provided by the A/B HVAC maintains the occupational doses in normally occupied areas of the R/B and A/B (radiological zones III) within 10 CFR 20 limits, as demonstrated by the data provided in DCD Tables 12.2.61 Sheet 6.
DCD Section 12.2 identifies the possible sources of radiation, including airborne radioactivity in the R/B and A/B. Equipment failures, including AOOs potentially involving airborne releases, can result in high levels of airborne radioactivity in Radiation Zones V and higher where this equipment is located. Per DCD Table 12.3-2, areas in the R/B and A/B designated Radiation Zone V and higher are areas of expected high radiation and/or contamination. As such, these areas are normally inaccessible with locked doors and positive access controls such that entry and exit of the areas are under the supervision of the plant health physics staff. The A/B HVAC system is designed to maintain airflow from the normally occupied areas to areas designated Radiation Zone V and higher. As a result, air from Radiation Zones V and higher will not escape from these locked areas. This prevents airborne activity from spreading throughout the normally occupied areas, even during an AOO. Therefore, there is no need to consider or identify a limiting AOO in normally occupied areas. In this case, the normal operating conditions apply and the doses are well below the 10 CFR 20 limits as indicated in DCD Tables 12.2.61 Sheet 6 as described previously. Within the locked areas (Radiation Zones V and higher), there are no personnel assumed present at the time of the AOO and the GWMS will mitigate the results of the AOO.
MHI has not designed and therefore does not credit the A/B HVAC system as an atmospheric clean-up system. As such, the A/B HVAC system is designed to meet the requirements of GDC 60 with respect to monitoring and alarming elevated levels of airborne radiation, but it does not incorporate any clean up components to comply with RG 1.52 or RG 1.140 requirements. MHI concludes that this design is adequate for meeting the relevant regulatory requirements with respect to occupational dose limits in normally occupied areas for normal operating conditions and AOOs.

Impact on DCD

Revise the 2nd bullet of DCD Subsection 9.4.3.1.2.1 as indicated below:

- Keep dose levels due to the airborne radioactivity **in normally occupied areas** below the allowable values set by 10 CFR 20 by supplying and exhausting sufficient airflow

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

10/15/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO.634-4845 REVISION 2**
SRP SECTION:	**09.04.03 - AUXILIARY AND RADWASTE AREA VENTILATION SYSTEM**
APPLICATION SECTION:	**DCD Sections 9.4.3**
DATE OF RAI ISSUE:	**09/17/2010**

QUESTION NO. : 09.04.03-13

New Follow-up RAI

The staff submits the following questions based on its review of the applicant's response to RAI No. 483-3885, Question No. 09.04.03-08. The staff notes the following issues in the DCD. These issues create the potential for unmonitored radioactive releases from the areas served by the auxiliary building HVAC system (ABVS).

1) DCD subsection 9.4.3.2.1 indicates that the ABVS contains automatic controls to maintain all areas served by the ABVS at a slightly negative predetermined value:
i. There are no such automatic controls displayed on Figure 9.4.3-1.
ii. What design pressure of the turbine building (T/B) is required to keep the T/B at a high enough pressure to prevent an unmonitored release from occurring from an area served by the ABVS?
iii. What is the predetermined minimum value (or range of values) for the areas served by the ABVS?
1. What is the basis for selection?
2. Please explain why this value is not specified in ITAAC Table 2.7.5.4-3 line item 10. The use of the terminology "slightly negative" pressure is very ambiguous and subject to various interpretations.

2) Prevention of flow from controlled areas of A/B to T/B or other adjacent clean areas/building is not adequately addressed in the RAI response. The clean areas in adjacent buildings must be maintained at a higher pressure than the areas served by the ABVS to prevent an unmonitored release. The staff requests that 14.2.12.1.99 "Auxiliary Building HVAC System Pre-operational Test" be amended to include this requirement as part of the test method and acceptance criteria. More specifically, verify that an unmonitored release will not occur under credible worst-case ventilation balance conditions for adjacent building HVAC systems.

3) The applicant's response indicates that the Penetrations and Safe Guards areas will have differential pressure (dP) indicators. However,
I. there is no mention of monitoring differential pressures between other adjacent areas (e.g. A/B or T/B) and the areas served by the ABVS;
II. there is no mention of alarms or controls associated with these missing dP units;
III. there is no mention of limits on the dP between T/B negative pressure and A/B negative pressure.

4) There is no mention in DCD subsection 9.4.3.4 "Inspection and Testing Requirements" of a plant

program that will ensure that the optimum flow balance conditions established in 14.2.12.1.99 "Auxiliary Building HVAC System Pre-operational Test" as amended in 2) above will be maintained throughout the plant life cycle. Please explain how the flow will remain balanced through the life of the plant.

5) In addition, the staff notes that issue presented in "b." of Part II of RAI 483-3885, Question No. 09.04.04-8 was not adequately resolved in the applicant's response. *The response indicates that a release "... will be minimal" and "... should not have significant impact." This does not provide the staff with reasonable assurance that unmonitored releases will not take place during the life-cycle of the US-APWR plant through this connection path.* The staff again requests that the applicant provide an engineering solution (e.g. installation of drain traps with sufficient height differences to prevent air flow) that addresses the issue. Please include a means for demonstrating the effectiveness of the solution.

6) Part II of the applicant's response revises Tier 1 Table 2.7.5.4-3 by adding line item 9. The staff finds that both the Design Commitment and the Acceptance Criteria lack precise definition. The staff requests that the "Acceptance Criteria" of line item 9 be revised to read similar to:
"The as-built ABVS is capable of providing conditioned air to the areas served by the auxiliary building ventilation system in accordance with subsection 9.4.3 and Table 9.4-1. It has been demonstrated through testing and analyses that the temperatures for these areas are being maintained within the design temperatures based on the design basis environmental conditions and design basis heat loads."

The "Design Commitment" should be revised similarly.

Reference: MHI's Response to US-APWR DCD RAI No. 483-3885; MHI Ref: UAPHF-10037; dated February 5, 2010; ML100480086.

ANSWER:

Part 1)
The auxiliary building exhaust fans are rated for approximately 10% higher airflow rate than the supply fans as indicated in DCD Table 9.4.3-1. The exhaust fan airflow is continuously controlled at the rated airflow rate by a flow control damper provided downstream of exhaust fans. The flow control damper modulates based upon the flow signal from the flow controller that is provided downstream of the exhaust fans. This maintains the design exhaust airflow rate from the areas served by auxiliary building HVAC system. Consequently, all areas served by auxiliary building HVAC system is maintained at a slightly negative pressure. The airflow rate differential maintains a slightly negative pressure in the areas served by the auxiliary building HVAC system with respect to the outside environment and adjacent buildings to prevent the uncontrolled leakage of potentially contaminanted air to the surrounding environment.

i. DCD Figure 9.4.3-1 will be revised to add the exhaust flow controller and flow control damper.

ii. There is no design pressure limit established for the T/B. Unmonitored releases from radiologically controlled areas to the T/B are prevented by the negative pressure in the controlled areas relative to the T/B. The negative pressure is maintained by greater exhaust ventilation flowrate than supply ventilation flowrate as described above. Ventilation for the general area of the T/B is provided by roof exhausters and wall louvers open to the outside (once-through cooling) as described in DCD Section 9.4.4.2.1. The T/B roof exhaust fans produce minimal static pressure such that a lower pressure in the T/B would not be created by operation of the T/B exhaust even with the supply louvers closed. Therefore, it is inherent in the design of the auxiliary building HVAC system and the turbine building ventilation system that air flow will be from the T/B into the adjacent areas served by the auxiliary building HVAC system due to the pressure differential. The design will be confirmed in the auxiliary building HVAC system pre-operational test as described in 2) below.

iii. As described in i. above, the differential between the auxiliary building HVAC system exhaust flowrate and supply flowrate is approximately 10%, which provides a negative pressure within the areas served by the auxiliary building HVAC system relative to the outside environment and adjacent buildings to ensure that air flow is into the controlled areas.

Part 2)
The design of the auxiliary building HVAC system maintains a negative pressure in the controlled areas relative to the outside environment and adjacent buildings as described in 1) above. In addition, backdraft dampers installed at penetrations between controlled and clean areas prevent ventilation backflow from potentially contaminated areas.
Ventilation flow balancing of the auxiliary building HVAC system is performed such that an unmonitored release will not occur under credible worst-case ventilation balance conditions. The acceptance criterion of "Auxiliary Building HVAC System Preoperational Test" will be revised to add the criterion stated above.

Part 3)
As discussed in 1) above, it is inherent in the design of the exhaust systems for the auxiliary building HVAC system and turbine building ventilation system that air flow will be from the T/B into the adjacent controlled areas. The adequacy of the design is confirmed through ITAAC (Tier 1 DCD Table 2.7.5.4-3, line item 10) and pre-operational testing (DCD Section 14.2.12.1.99). Therefore, no differential pressure monitoring instrumentation, alarms, or controls are necessary.

Part 4)
Routine ventilation system flow balance testing will need to be performed during the operational phase to ensure that design air flow rates are maintained within the auxiliary building HVAC system. DCD Section 9.4.3.4 will be revised to clarify that confirmation of ventilation flow balancing is performed such that an unmonitored release will not occur under credible worst-case ventilation balance conditions.

Part 5)
As discussed in 1) above, it is inherent in the design of the exhaust systems for the auxiliary building HVAC system and turbine building ventilation system that air flow will be from the T/B into the adjacent controlled areas. The adequacy of the design is confirmed through ITAAC (Tier 1 DCD Table 2.7.5.4-3, line item 10) and pre-operational testing (DCD Section 14.2.12.1.99). Therefore, there would not be air flow from the A/B to the T/B through the interconnection via the non-radiological sump drain system.
In addition, as indicated on DCD Figure 9.3.3-1 (Sheet 2 of 2), a normally closed valve in the sump pump discharge line isolates the T/B sump from the A/B sump, preventing air flow to the T/B. As described in DCD Section 9.3.3.1.2, the non-radioactive floor and equipment drains in the non-radioactive drain sump collected by the T/B drain system is sent to the waste water system. In the unlikely event that the T/B sump contents become radioactive, the operator can open the valve to pump the contents to the A/B sump. The valve would only be opened during pumping, at which time pump discharge pressure would prevent air flow from the A/B to the T/B.

Part 6)
As described in DCD RAI No. 184-1912 Question No. 14.03.07-26 (ML091040177), the specific values of the acceptable environmental parameters are considered to be below the level of detail for Tier 1. Therefore, DCD Tier 1 Table 2.7.5.4-3, line item 9 does not require to be revised.

Impact on DCD

DCD Figure 9.4.3-1 will be revised to add the exhaust flow controller. See attached revised figure.

DCD Revision 2, Section 9.4.3.4.1, will be revised to add the following after the last paragraph to clarify that confirmation of ventilation flow balancing is performed such that an unmonitored release will not occur under credible worst-case ventilation balance conditions.
"In addition to the general requirements in Subsection 9.4.3.4, the auxiliary building HVAC system safety-related isolation dampers are inspected periodically and the damper seats are replaced as required and

tested in accordance with technical specification surveillance requirement for the annulus emergency exhaust system. **The auxiliary building HVAC system ventilation flow balancing also is inspected periodically such that an unmonitored release will not occur under credible worst-case ventilation balance conditions.**"

DCD Revision 2, Section 14.2.12.1.99, Acceptance Criterion of "Auxiliary Building HVAC System Preoperational Test" will be revised to add the following.
"D. Acceptance ~~Criterion~~**Criteria**
1. The auxiliary building HVAC system operates as described in Subsection 9.4.3.
2. Ventilation flow balancing of the auxiliary building HVAC system is performed as described in Subsection 9.4.3."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

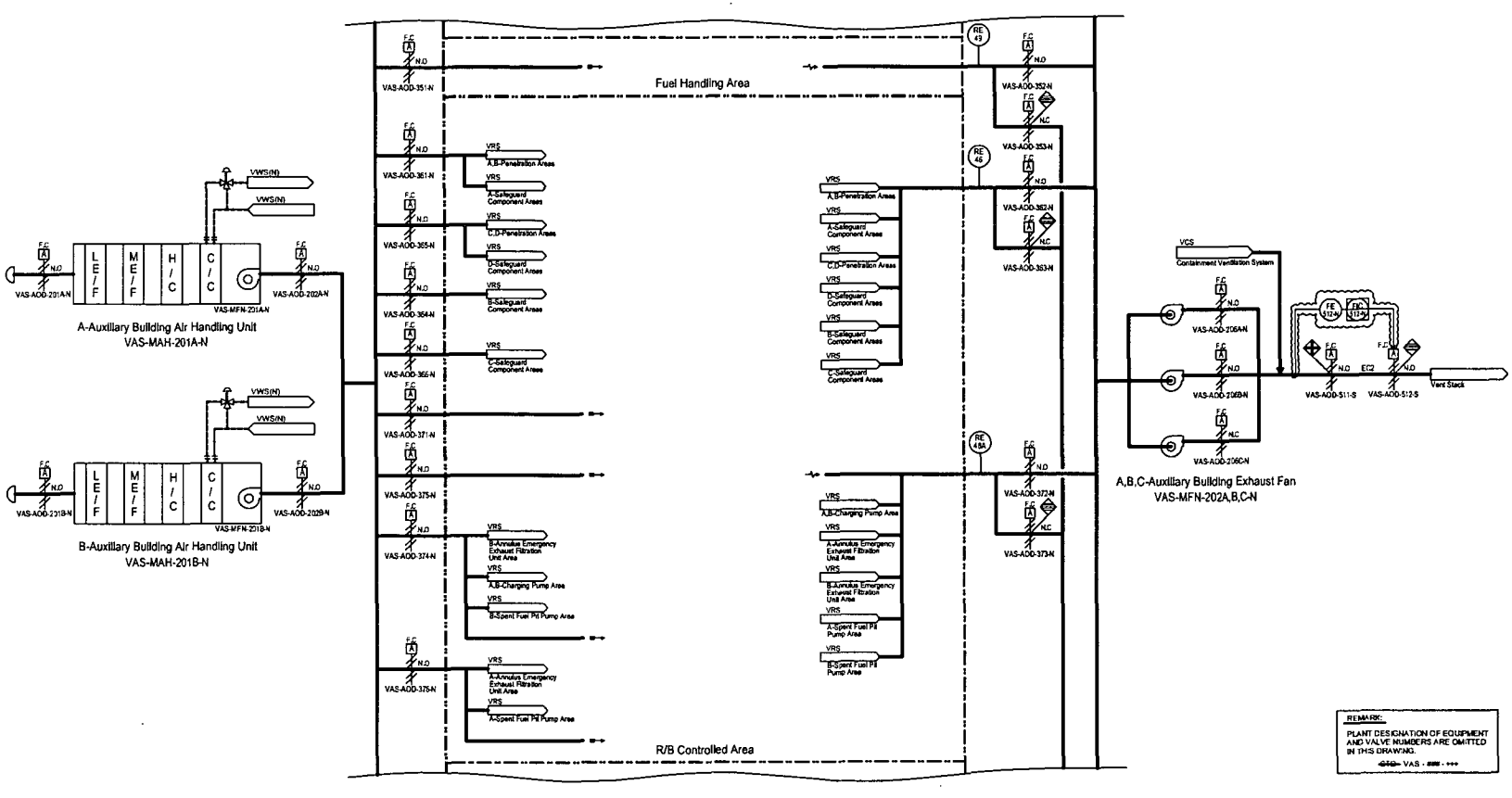

Figure 9.4.3-1 Auxiliary Building HVAC System Flow Diagram