

REQUEST FOR ADDITIONAL INFORMATION 583-4554 REVISION 2

5/10/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 09.04.05 - Engineered Safety Feature Ventilation System
Application Section: DCD Tier 2 Section 9.4.5

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

09.04.05-11

This a follow-up RAI to RAI No. 64-735, Question No. 09.04.05-01 RAI 9.4.5-10 and is a result of the staff's review of Revision 2 of the DCD.

Annulus Emergency Exhaust System -- Safety Function -- VRS-OTD-004-S adverse effects associated with the tornado depressurization of the air exhaust line are prevented by the specially designed tornado damper in the exhaust line. The staff requests additional information about the special design of these tornado dampers and a justification for not including these dampers in FMEA Table 9.4.5-2.

Class 1E Electrical Room HVAC System -- The staff requests additional information and corrections to the DCD where applicable for the following issues:

- a) **DCD subsection 9.4.5.2.2 reads "*an outside air intake and exhaust outlets with a tornado missile protection grid and a tornado depressurization protection damper. All components are qualified as equipment class 3, seismic category I.*" Figure 9.4.5-2 displays twelve tornado depressurization protection dampers (i.e. VRS-OTD-207A thru -207D; VRS-OTD-207A thru -207D; and VRS-OTD-206A thru -206D). The staff requests additional information about these dampers and a justification for not including these dampers in FMEA Table 9.4.5-2.**
- b) **Items 2.5 and 2.6 of Table 9.4.5-2 are duplicates of each other. The staff requests that the applicant remove one of these line items from the Table.**
- c) **For line item 2.10 the "Component," it appears that the description is in error. Does the description need to be changed to read "Class 1E battery room exhaust fan outlet damper VRS-EHD-252A (-252B, -252C, and -252D analogous)"?**
- d) **Table 9.4.5-2 does not address two failure modes of concern. (1) What design features will prevent the failure of a essential chilled water cooling coil leak inside the Class 1E Electrical Room HVAC System AHUs from adversely impacting the safety related components contained in the Class 1E electrical rooms? (2) DCD subsection 9.2.7.2.1.1 reads "*The valve failure position at the loss of a control signal and electrical power is 'as is'.*" for the "Chilled Water Control**

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Valves”. What is the implication of this mode of failure with respect to the ventilation system?

Safeguard Component Area HVAC System – Table 9.4.5-2 does not address two failure modes of concern. (1) What design features will prevent the failure of a essential chilled water cooling coil leak inside the Safeguard Component Area HVAC System AHUs from adversely impacting the safety related components contained in the A, B, C & D safeguard component areas of Figure 9.4.5-3? (2) DCD subsection 9.2.7.2.1.1 reads “*The valve failure position at the loss of a control signal and electrical power is ‘as is’.*” for the “Chilled Water Control Valves”. What is the implication of this mode of failure with respect to the ventilation system? The staff requests additional information and a justification for not including these modes of failure in Table 9.4.5-2.

Emergency Feedwater Pump Area HVAC System -- The staff requests additional information and corrections to the DCD where applicable for the following issues:

- a) **Table 9.4.5-2 does not address two failure modes of concern. What design features will prevent the failure of a essential chilled water cooling coil leak inside the Emergency Feedwater Pump Area HVAC System AHUs from adversely impacting the safety related components contained in the A, B, C & D EFW Pump areas of Figure 9.4.5-4? (2) DCD subsection 9.2.7.2.1.1 reads “*The valve failure position at the loss of a control signal and electrical power is ‘as is’.*” for the “Chilled Water Control Valves”. What is the implication of this mode of failure with respect to the ventilation system? The staff requests additional information and a justification for not including these modes of failure in Table 9.4.5-2.**
- b) **The staff notes that the A & D EFW Pump areas displayed on Figure 9.4.5-4, both contain dampers (i.e. VRS-OTD-403A & D and VRS-OTD-404 A & D) that appear to be tornado depressurization dampers. The staff could find no discussion of these dampers in DCD subsections 9.4.5.1.1.4, 9.4.5.2.4 and 9.4.5.3.4. The staff requests additional information about these dampers and that a discussion of these dampers be added to the DCD subsections as well as a justification for not including these dampers in FMEA Table 9.4.5-2.**
- c) **Table 3.2-2 of the DCD (page 48 of 57) contains two line items for dampers for the Emergency Feedwater Pump Area HVAC system. The first line item does not include VRS-OTD-403D, & -404D. While the second line item lists an Equipment Class 5, Seismic Category II. The first line item lists an Equipment Class 3, Seismic Category I for dampers in the same physical line depicted in the Figure. The staff requests additional information about these apparent inconsistencies.**

Safety Related Component Area HVAC System – Table 9.4.5-2 does not address two failure modes of concern. (1) What design features will prevent the failure of a essential chilled water cooling coil leak inside the Safety Related Component Area HVAC System AHUs from adversely impacting the safety related components contained in the fourteen safety related

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areas served as depicted in sheets 1, 2 and 3 of Figure 9.4.5-5? (2) DCD subsection 9.2.7.2.1.1 reads “*The valve failure position at the loss of a control signal and electrical power is ‘as is’.*” for the “Chilled Water Control Valves”. What is the implication of this mode of failure with respect to the ventilation system? The staff requests additional information and a justification for not including these modes of failure in Table 9.4.5-2.

Reference: MHI's Responses to US-APWR DCD RAI No. 64(-735); MHI Ref: UAP-HF-08216; dated October 6, 2008; ML082830021.

09.04.05-12

With the issuance of Revision 2 to the DCD, the applicant added two air handling units (VRS-MAH-561A-S and VRS-MAH-561B-S) to the scope of included equipment contained in the safety related component area HVAC system. The applicant amended the DCD to reflect this equipment addition and designated the equipment names as “A – Spent Fuel Pit Pump Area Air Handling Unit” and “B – Spent Fuel Pit Pump Area Air Handling Unit” respectively. These AHUs are displayed in Table 9.4.5-1, Table 9.4.5-2 and Figure 9.4.5-5 sheet 3 of 3. These AHUs are also listed in Table 9.2.7.2 “Essential Chilled Water Heat Load and Flow Rate”. However, the staff did find that the applicant failed to amend DCD subsection 9.4.5.2.5 and Table 9.4-1 to reflect this scope addition to the safety related component area HVAC system. The staff requests that the applicant update DCD subsection 9.4.5.2.5 and Table 9.4-1 to reflect this scope addition

The staff requests additional information about the impact of this scope addition on Table 9A-1 “US-APWR Fire Areas and Fire Zones” and on Table 9A-2 “Fire Hazard Analysis Summary”. In particular, has the applicant updated DCD Revision 2 Table 9A-2 to include the scope addition?

The staff notes that Figure 9.4.5-5 neither displays isolation valves in the supply and exhaust lines of the auxiliary building ventilation system nor radiation monitors in the A (&B) – Spent Fuel Pit Pump Areas. The staff could not find specific information about anticipated radiation dose rates for the Spent Fuel Pit Pump Areas in Chapter 12 of the DCD. The staff requests additional information as to the applicant’s reasons for not including either detection or isolation in the design of the US-APWR.

The staff also requests that the applicant amend its response to RAI No. 356-2549, Question No. 09.04.05-9 to include the relevant technical information for the two (A & B) Spent Fuel Pit Pump Area Air Handling Units.

Reference: MHI's Responses to US-APWR DCD RAI No. 356-2549; MHI Ref: UAP-HF-09386; dated July 17, 2009; ML092030375.