~~WITHHOLD FROM PUBLIC DISCLOSURE UNDER 10 CFR 2.390(d)(1)~~

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CP-201100622
Log # TXNB-11032

Ref. # 10 CFR 52
10 CFR 2.390

May 6, 2011

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
ATTN: David B. Matthews, Director
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 5585
(SECTION 9.4.5)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 5585 (CP RAI #213) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI addresses the essential service water pump house ventilation systems.

Three FSAR figures attached with this response contain Security Related Information and Attachment 2 should be withheld from public disclosure in accordance with 10 CFR 2.390(d)(1). The letter is unclassified upon separation from Attachment 2.

Should you have any questions regarding this response, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

There are no commitments in this letter.

I state under penalty of perjury that the foregoing is true and correct.

Executed on May 6, 2011.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments: 1. Response to Request for Additional Information No. 5585 (CP RAI #213)(Public)
2. Response to Request for Additional Information No. 5585 (CP RAI #213)(SRI)

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NRO

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U. S. Nuclear Regulatory Commission
CP-201100622
TXNB-11032
5/6/2011

Attachment 1

Response to Request for Additional Information No. 5585 (CP RAI #213) (Public Version)

{ Information withheld from public disclosure is designated by single braces. }

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-13

Follow-Up RAI
This is a follow-up request for additional information (RAI) to the applicant's response, dated December 16, 2009, to RAI No. 3232, (RAI Letter Number 123), Question No. 09.04.05-8. The staff has documented the following three outstanding issues for applicant resolution:

(1) From the amended FSAR subsection 9.4.5.2.6 as described in Question No. 09.04.05-8, the last sentence of the third paragraph reads:

"The four UHS ESW pump houses are physically separate and independent structures and are each supplied by independent Class 1E power supplies with Emergency Gas Turbine Generators backup."

The NRC staff interprets this statement to read that all Class 1E equipment contained within one ultimate heat sink (UHS) essential service water (ESW) pump house is powered by the same divisional power supply (i.e. redundant divisional trains A, B, C or D). This statement conflicts with the second bullet of FSAR section 9.4.5.3.6 which reads:

"The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan are separated by a three-hour fire rated barrier. Therefore, each fan powered by different Class 1E power supplies is protected and remains functional in the event of a fire in either room."

The staff requests that the applicant amend FSAR subsections 9.4.5.2.6 and 9.4.5.3.6, and other FSAR subsections as necessary to resolve this discrepancy.

(2) From the amended FSAR subsection 9.4.5.2.6 as described in Question No. 09.04.05-8, the first sentence of the ninth paragraph reads:

"The unit heaters in each pump room maintain minimum room temperatures during normal and emergency plant operations, to prevent freezing of instrument lines, the wet pipe sprinkler system, and the standpipe hose station."

From this statement the staff is led to assume that the unit heaters and the exhaust fans of the ESW pump room and of the transfer pump room, will be powered by non Class 1E power supplies during normal plant operation and then switched over to a Class 1E power supplies during and subsequent to postulated accidents including loss of offsite power. The NRC staff requests additional design information about this transition. The staff also requests that the applicant amend FSAR subsection 9.4.5.2.6 and other FSAR sections as necessary to capture this operating characteristic of the system.

(3) From the amended FSAR subsection 9.4.5.2.6 as described in Question No. 09.04.05-8, the first sentence of the tenth paragraph reads:

"The backdraft dampers are Seismic Category I and do not perform an active safety function."

The NRC staff disagrees with the statement "... do not perform an active safety function". During the summertime, these dampers will have to change position from the normally closed position to the open position for the UHS ESW Pump House Ventilation System to perform its safety function of keeping the pump house room temperatures within design basis limits. The staff requests that the applicant re-evaluate this sentence and amend the FSAR as necessary to provide greater clarity.

ANSWER:

(1, 2) As revised by the response to Question 09.04.05-8 in RAI No. 3232 (CP RAI #123) (ML093520667), the second sentence of the fourth paragraph in FSAR Subsection 9.4.5.2.6 states that the ventilation systems and components associated with the UHS ESW system are classified as safety-related, equipment class 3 and seismic category I. The ventilation systems, consisting of exhaust fans and unit heaters, are safety-related and are supplied with Class 1E power. The following additional information clarifies the Class 1E power supply arrangements in each UHS ESW pump house.

If an ESW pump fails, its related UHS transfer pump may be required to transfer the contents of the UHS basin to another basin. Therefore, the transfer pump and the ESW pump in a single pump house are powered from different Class 1E power supplies. The two power supply trains are in different fire areas separated by a three-hour fire barrier. The UHS transfer pump room and the ESW pump room are also in separate fire areas.

In a UHS ESW pump house, the ESW pump and its supporting ventilation system in the ESW pump room are powered by one Class 1E power train while the UHS transfer pump and its supporting ventilation system in the UHS transfer pump room are powered by a different Class 1E power train as follows:

ESW Pump House	EWS Pump Room Class 1E Power Supply	Transfer Pump Room Class 1E Power Supply
Train A	A Class 1E on-site ac power supply system	D1 Class 1E on-site ac power supply system (for two train system)*
Train B	B Class 1E on-site ac power supply system	D1 Class 1E on-site ac power supply system (for two train system)*
Train C	C Class 1E on-site ac power supply system	A1 Class 1E on-site ac power supply system (for two train system)*
Train D	D Class 1E on-site ac power supply system	A1 Class 1E on-site ac power supply system (for two train system)*

* See DCD Subsection 8.1.3.1 for discussion of the two train system and the D1 and A1 load groups.

FSAR Subsections 9.4.5.2.6 and 9.4.5.3.6 have been revised to clearly state that the ventilation systems in the UHS ESW pump houses are safety-related and have Class 1E power supplies.

(3) See the response to Question 09.04.05-14 below. FSAR Subsection 9.4.5.2.6 has been clarified.

Impact on R-COLA

See the attached marked-up FSAR Revision 1 pages 9.4-4, 9.4-5, and 9.4-6.

Impact on S-COLA

This response is considered STD.

Impact on DCD

None.

CP COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.2.5.

9.4.5.2.6 UHS ESW Pump House Ventilation System

Each of the four independent UHS structures consists of a UHS ESW pump house and a water basin with a cooling tower above it. The UHS ESW pump house contains two separate rooms: the ESW pump room and the UHS transfer pump room. Each pump room has an independent ventilation system and each pump room is in a different fire area separated by three-hour fire barriers. RCOL2_09.04.05-13 CTS-01262

The ESW pump room ventilation has an exhaust fan for cooling and two unit heaters for heating. The UHS transfer pump room has an exhaust fan and one unit heater. The ventilation systems are classified as safety-related equipment class 3, seismic Category I and are capable of performing their safety function under all associated design basis accidents coincident with a LOOP.

The UHS ESW pump house ventilation systems are shown in Figure 9.4-201 and the UHS ESW pump house layout arrangement is shown in Figure 1.2-206. The UHS ESW pump house ventilation equipment design data is presented in Table 9.4-202.

The UHS ESW pump houses do not contain quantities of airborne radioactive contamination and are not provided with filtering or radiation monitoring capability. The pump house room ventilation systems exhaust directly to atmosphere.

The ESW pump room ventilation system is powered by the same Class 1E power train that supplies the associated ESW pump in the same room. The UHS transfer pump and UHS transfer pump room ventilation system in the same UHS ESW pump house are supplied by a Class 1E power train different from the one supplying the ESW pump. This is to ensure that the UHS transfer pump is available to transfer UHS basin water to another UHS basin if the ESW pump were to fail. Each Class 1E power train in the UHS ESW pump house is located in a different fire area separated by a three-hour fire barrier.

~~The UHS ESW pump house ventilation system is shown in Figure 9.4-201 and the equipment design data is presented in Table 9.4-202.~~ RCOL2_09.04.05-8

~~There are four separate and independent UHS ESW pump houses and each has its own ventilation system. Each UHS ESW pump house ventilation system has an exhaust fan that provides 100 percent of the ventilation requirements for the associated ESW pump room. The UHS transfer pump room within the UHS ESW pump house has an exhaust fan that provides 100 percent of the ventilation requirements for the UHS transfer pump room. The ESW pump room and the UHS transfer pump room each have separate independent supply and exhaust openings to the outside.~~

The UHS ESW pump house ventilation systems contain no ductwork. In each pump room, a backdraft damper is mounted in the seismic Category I wall RCOL2_09.04.05-3 RCOL2_09.04.05-13

opening and the fan is mounted on the seismic Category I outside wall. A backdraft damper is also installed in each fresh air intake wall opening. The backdraft dampers are safety-related equipment class 3 and seismic Category I. The safety function of the backdraft (gravity) damper is to open in the direction of air flow and close by counterbalance when no air flow is present. RCOL2_09.04.05-13 RCOL2_09.04.05-14

The UHS ESW pump house fresh air intakes are positioned as high as physically possible above ground level to minimize dust entrainment. The height of the UHS ESW pump house is 16 feet above grade and the intake air is not filtered. The electrical and instrument enclosures within the UHS ESW pump house are NEMA type 12 (dust tight and drip tight – for indoor use) and if there are louvered vents on the enclosures they are provided with filters to minimize the intake of dust, dirt, and grit. The UHS ESW pump house is designed to satisfy the requirements in compliance with GDC 17. Also, based on the location of the UHS ESW pump houses' fresh air intakes, there is no source of hazardous contaminant that could enter through the outside air openings. The UHS ESW pump houses do not harbor any potential sources of explosive gas or fuel-vapor mixtures on a continuous basis. RCOL2_09.04.05-9 RCOL2_09.04.05-12

The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan provide 100% of the ventilation required for their associated rooms during normal and emergency plant operations. The ventilation system is thermostatically controlled by area temperature controllers to cycle the exhaust fans off and on to maintain design temperatures during the summer and winter. These exhaust fans, mounted in exterior walls, each have independent gravity type backdraft dampers which discharge to the outdoors. Makeup supply air is drawn into each pump room through wall openings with gravity type backdraft dampers mounted in the walls. In the event of the presence of smoke, the exhaust fans may be actuated to purge the smoke. CTS-01262 RCOL2_09.04.05-8

The unit heaters in each pump room maintain minimum room temperatures, during normal and emergency plant operations, to prevent~~Unit heaters are provided in the UHS transfer pump room and the ESW pump room to maintain a minimum room temperature to prevent the~~ freezing of instrument lines, the wet pipe sprinkler system, and the standpipe hose station. The unit heaters are controlled by locally mounted thermostats. When the temperature drops below the set point, the heating element and fan will be energized. When the temperature rises above the set point, the heating element will de-energize. The ESW pump room and the UHS transfer pump room unit heater elements and fans are designed such that they do not exceed a specified allowable Watt density for the unit heater coils. The fan will continue to run, circulating air through the unit until the fan is de-energized by a time delay relay. RCOL2_09.04.05-7 RCOL2_09.04.05-8 CTS-01262

Temperature sensors are provided in the ESW and UHS transfer pump rooms, which alarm in the main control room to notify operators of either high or low temperature conditions in these areas. These alarms are an indication of a loss of ventilation or a loss of heating. RCOL2_09.04.05-13 CTS-01262 RCOL2_09.04.05-8

The UHS ESW pump houses each contain a wet-pipe sprinkler system, hose station and smoke detection system. These fire protection components are classified as non-safety-related. The wet-pipe sprinkler system and smoke detection system are Seismic Category II. Their failure during a design basis seismic event will not damage any of the safety-related equipment in the areas. The standpipe systems supplying hose stations are Seismic Category II and will remain functional under safe shutdown earthquake loadings for manual fire suppression in areas containing equipment required for safe-shutdown. RCOL2_09.04.05-3

CP COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.3.5

9.4.5.3.6 UHS ESW Pump House Ventilation System

- The ESW pump room ~~exhaust fan~~ventilation system and the UHS transfer pump room ~~exhaust fan~~ventilation system located in each UHS ESW pump house are each powered by ~~the~~a different Class 1E bus~~es~~. RCOL2_09.04.05-13
- The UHS transfer pump and the ESW pump in a single UHS ESW pump house are powered from different Class 1E power supplies and are located in different fire areas separated by three-hour fire barriers. The two Class 1E power supply trains in a UHS ESW pump house are physically separated by a three-hour fire barrier. CTS-01262 CTS-01262
- ~~The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan are separated by a three-hour fire rated barrier. Therefore, each fan powered by different Class 1E power supplies is protected and remains functional in the event of a fire in either room.~~ RCOL2_09.04.05-13
- The safety function of the UHS ESW pump house ventilation system is assured by the physical separation provided by the four separate and independent UHS ESW pump houses. All ventilation system ~~equipment and~~ components are classified as equipment class 3, seismic category I. RCOL2_09.04.05-10
- The ESW pump room ~~exhaust fans~~ventilation system and the UHS transfer pump room ~~exhaust fans~~ventilation system are capable of performing ~~its~~their safety function under all associated design basis accidents coincident with LOOP. RCOL2_09.04.05-13 CTS-01262
- The ESW pump room exhaust fans and UHS transfer pump room exhaust fans are capable of performing required safety functions under all postulated internal flooding events as described in Subsection 3.4.1.3. CTS-01171
- As shown in Table 9.4-203, ~~F~~failure of a single active component in one of the UHS ESW pump house ventilation system ~~exhaust fans~~ does not result in a loss of the system's safety function. DCD_09.04.05-1 RCOL2_09.04.05-13
- The UHS ESW pump house ventilation system components are protected from tornado generated missiles by their location inside a seismic category I structure.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-14

Follow-up RAI
This is a follow-up RAI to the applicant's responses, dated December 16, 2009 and November 13, 2009, to RAIs No. 3232 Question No. 09.04.05-12 (ML093520667) and RAI No. 3532, (RAI Letter Number 83), Question 14.03.07-21 (ML093210468).

The staff notes that the applicant responded to RAI No. 3232, Question No. 09.04.05-12 with the statement:

"The backdraft dampers are Seismic Category I and do not perform an active safety function as indicated in ITAAC Table A.2-2 page 23 (attached). The backdraft dampers are a gravity type and open in the direction of air flow, and close due to the counterbalance when no air flow is present. The backdraft dampers will be procured to withstand the effects of site specific tornado wind and atmospheric differential pressure loading, as the detailed design of the system progresses."

The staff disagrees with the applicant's statement that the dampers do not perform an active safety function. During the summer months these dampers must change state from the normally closed position to the open position whenever the exhaust fans are running. This change of state function, allows the ESW Pump House rooms to remain below the design basis limiting temperature of 120°F in support of running the safety related UHS ESW pumps. Conversely during the winter months, these dampers must fail to the closed position to ensure that the ESW Pump House rooms remain above the design basis lower limiting temperature of 40°F. This change of state function, helps to ensure that the safety related UHS ESW pumps remain operable while in standby during normal plant operations.

Based on this the staff resubmits its original request that the COL applicant: (1) amend FSAR subsection 9.4.5.4.6 to include required factory testing of these dampers to demonstrate the dampers capability of withstanding the effects of tornadic winds and atmospheric differential pressure loading; and (2) amend the ITAAC to include verification of the operational capability of the installed safety related backdraft dampers to open upon flow induced demand and to fully close in the absence of flow.

Accordingly, the applicant may need to redress its response to both RAI No. 3232, Question No. 09.04.05-12 and RAI No. 3532, Question 14.03.07-21, when answering this question.

ANSWER:

FSAR Subsection 9.4.5.3.6 has been revised to identify the backdraft dampers as safety-related components. FSAR Subsection 9.4.5.4.6 has also been revised to include factory testing of the backdraft dampers.

The backdraft dampers are passive components that have the safety function to open in the direction of airflow and close by counterbalance when no air flow is present. A footnote in ITAAC Table A.2-2 states that this is not an active safety function.

Impact on R-COLA

See attached marked-up FSAR Revision 1 pages 9.4-5 and 9.4-7, and COLA Part 10 Revision 1 pages 29 and 30.

Impact on S-COLA

This response is considered standard.

Impact on DCD

None.

opening and the fan is mounted on the seismic Category I outside wall. A backdraft damper is also installed in each fresh air intake wall opening. The backdraft dampers are safety-related equipment class 3 and seismic Category I. The safety function of the backdraft (gravity) damper is to open in the direction of air flow and close by counterbalance when no air flow is present. RCOL2_09.04.05-13 RCOL2_09.04.05-14

The UHS ESW pump house fresh air intakes are positioned as high as physically possible above ground level to minimize dust entrainment. The height of the UHS ESW pump house is 16 feet above grade and the intake air is not filtered. The electrical and instrument enclosures within the UHS ESW pump house are NEMA type 12 (dust tight and drip tight – for indoor use) and if there are louvered vents on the enclosures they are provided with filters to minimize the intake of dust, dirt, and grit. The UHS ESW pump house is designed to satisfy the requirements in compliance with GDC 17. Also, based on the location of the UHS ESW pump houses' fresh air intakes, there is no source of hazardous contaminant that could enter through the outside air openings. The UHS ESW pump houses do not harbor any potential sources of explosive gas or fuel-vapor mixtures on a continuous basis. RCOL2_09.04.05-9 RCOL2_09.04.05-12

The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan provide 100% of the ventilation required for their associated rooms during normal and emergency plant operations. The ventilation system is thermostatically controlled by area temperature controllers to cycle the exhaust fans off and on to maintain design temperatures during the summer and winter. These exhaust fans, mounted in exterior walls, each have independent gravity type backdraft dampers which discharge to the outdoors. Makeup supply air is drawn into each pump room through wall openings with gravity type backdraft dampers mounted in the walls. In the event of the presence of smoke, the exhaust fans may be actuated to purge the smoke. CTS-01262 RCOL2_09.04.05-8

The unit heaters in each pump room maintain minimum room temperatures, during normal and emergency plant operations, to prevent ~~Unit heaters are provided in the UHS transfer pump room and the ESW pump room to maintain a minimum room temperature to prevent the~~ freezing of instrument lines, the wet pipe sprinkler system, and the standpipe hose station. The unit heaters are controlled by locally mounted thermostats. When the temperature drops below the set point, the heating element and fan will be energized. When the temperature rises above the set point, the heating element will de-energize. The ESW pump room and the UHS transfer pump room unit heater elements and fans are designed such that they do not exceed a specified allowable Watt density for the unit heater coils. The fan will continue to run, circulating air through the unit until the fan is de-energized by a time delay relay. RCOL2_09.04.05-7 RCOL2_09.04.05-8 CTS-01262

Temperature sensors are provided in the ESW and UHS transfer pump rooms, which alarm in the main control room to notify operators of either high or low temperature conditions in these areas. These alarms are an indication of a loss of ventilation or a loss of heating. RCOL2_09.04.05-13 CTS-01262 RCOL2_09.04.05-8

- Backdraft dampers are capable of withstanding the affects of tornado wind and atmospheric differential pressure loading.
- The UHS ESW pump house air intakes and air outlets are protected from tornado missiles as described in Subsection 3.8.4.1.3.2. | CTS-01262 RCOL2_09.0 4.05-4

~~CP~~STD COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.4.5. | CTS-01140

9.4.5.4.6 UHS ESW Pump House Ventilation System

In addition to the general requirements in Subsection 9.4.5.4, the backdraft dampers are to be factory tested to demonstrate their capability to withstand the tornado wind effects and atmospheric differential pressure loading. | RCOL2_09.0 4.05-14

The general requirements in Subsection 9.4.5.4 apply.

~~CP~~STD COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.5.5. | CTS-01140

9.4.5.5.6 UHS ESW Pump House Ventilation System

The following instrumentation serving the UHS ESW pump houses includes:

- Alarm on low airflow for ESW pump room or UHS transfer pump room.
- Indication of the status of the exhaust fans.
- Alarm on high room temperature in ESW pump room or UHS transfer pump room.
- Alarm on low room temperature in ESW pump room or UHS transfer pump room.
- Temperature switches for control of ESW pump room and UHS transfer pump room exhaust fans and heaters. | RCOL2_09.0 4.05-10

9.4.6.2.4.1 Containment Low Volume Purge System

~~CP~~STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.6.2.4.1 with the following. | CTS-01140

The capacity of cooling and heating coils that are affected by site specific conditions is shown in Table 9.4-201.

Appendix A.2

Table A.2-2 (Sheet 1 of 2)
UHS ESW Pump House Ventilation System Equipment Characteristics

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~ Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
ESW Pump Room Exhaust Fan	VRS-~~O~~MFN-601A,B,C,D	-	Yes	-	Yes/No	High Temperature	Start	-
UHS Transfer Pump Room Exhaust Fan	VRS-~~O~~MFN-602A,B,C,D	-	Yes	-	Yes/No	High Temperature	Start	-
ESW Pump Room Unit Heater	VRS-~~OEQ~~MEH-601A,B,C,D, VRS-~~OEQ~~MEH-602A,B,C,D	-	Yes	-	Yes/No	Low Temperature	Start	-
UHS Transfer Pump Room Unit Heater	VRS-~~OEQ~~MEH-603A,B,C,D	-	Yes	-	Yes/No	Low Temperature	Start	-
ESW Pump Room Temperature switch	VRS-TS-803,804,805,806 VRS-TS-823,824,825,826 VRS-TS-843,844,845,846 VRS-TS-863,864,865,866	=	Yes	=	Yes/No	=	=	=
UHS Transfer Pump Room Temperature switch	VRS-TS-812,813,814,815 VRS-TS-832,833,834,835 VRS-TS-852,853,854,855 VRS-TS-872,873,874,875	=	Yes	=	Yes/No	=	=	=
ESW Pump Room Air Intake Gravity Type Backdraft Damper	VRS-BDD-601 A,B,C,D	=	Yes	=	No/No	=	(1)	=
ESW Pump Room Air Discharge Gravity Type Backdraft Damper	VRS-BDD-602 A,B,C,D	=	Yes	=	No/No	=	(1)	=

RCOL2_14 .03.07-6 CTS-01208

MAP-00-201

RCOL2_14 .03.07-7 RCOL2_09.04.05-14

RCOL2_14 .03.07-21

RCOL2_09.04.05-14

Appendix A.2

Table A.2-2 (Sheet 2 of 2)
UHS ESW Pump House Ventilation System Equipment Characteristics

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~ Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
UHS Transfer Pump Room Air Intake Gravity Type Backdraft Damper	VRS-BDD-603 A,B,C,D	-	Yes	-	No/No	-	(1)	-
UHS Transfer Pump Air Discharge Gravity Type Backdraft Dampers	VRS-BDD-604 A,B,C,D	-	Yes	-	No/No	-	(1)	-

(1) The backdraft dampers are passive components that have the safety functions to open in the direction of airflow and close by counterbalance when no air flow is present.

RCOL2_14 .03.07-6 CTS-01208
RCOL2_09.04.05-14

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-15

Follow-up RAI
This is a follow-up RAI to the applicant's responses, dated December 16, 2009 and November 13, 2009, to RAIs No. 3232 Question No. 09.04.05-12 and RAI No. 3366 (RAI Letter Number 82) Question 14.03.07-15.

The staff concluded that upon review of the ITAAC Table A.2-1 Item 4 that the statement in the Acceptance Criteria (AC) lacked precise definition when compared to the statement contained in FSAR subsection 9.4.5.1.1.6.

The AC reads "*The as-built UHS ESW pump house ventilation system is capable of maintaining area design temperature limits within the respective room.*" The staff concludes that this sentence will not require the COL applicant to satisfy the more restrictive requirements of the safety related design basis of subsection 9.4.5.1.1.6 which reads:

"The UHS ESW pump house ventilation system provides and maintains the proper environmental conditions within the required temperature range (40 °F – 120 °F) to support the operation of the instrumentation and control equipment and components in the individual UHS ESW pump houses during a design basis accident and LOOP with outside ambient design temperature condition of 0% temperature exceedance values."

The staff requests that the applicant amend the AC of ITAAC Table A.2-1 Item 4 to read similar to: "*The as-built UHS ESW pump house ventilation system is capable of maintaining area design temperature within the limits of 40 °F – 120 °F within the respective rooms during a design basis accident and LOOP with outside ambient design temperature conditions of 0% temperature exceedance values (i.e. -5 °F - 115 °F).*"

Accordingly, the applicant may need to redress its response to both RAI No. 3232 Question No. 09.04.05-12 and RAI No. 3366 Question 14.03.07-15.

ANSWER:

COLA Part 10 Table A.2-1 has been revised with the proposed wording from the NRC staff with the following minor changes. The design limits of 40°F and 120°F for the UHS ESW pump house are identified in FSAR Subsection 9.4.5.1.1.6. Therefore, a reference to design limits has been substituted for these values. The reference to 0% exceedance values has been removed because -5°F and 115°F are the extreme values based on the 100-year return value and not on 0% exceedance values. Reference to normal operation has also been added.

Impact on R-COLA

See attached marked-up COLA Part 10 Revision 1 page 27.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

Appendix A.2

Table A.2-1 (Sheet 2 of 3)
UHS ESW Pump House Ventilation System
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria	
3.a ~~The~~ Class 1E ~~components~~equipment~~,~~ identified in Table A.2-2~~,~~ ~~are~~is powered from ~~their~~its respective Class 1E division.	3.a A test will be performed on each division of the as-built Class 1E equipment identified in Table A.2-2~~UHS ESW pump house ventilation system~~ by providing a simulated test signal only in ~~each~~the Class 1E division under test.	3.a The simulated test signal exists ~~only~~ at the as-built Class 1E equipment identified in Table A.2 -2 under test ~~in the as-built UHS ESW pump house ventilation system~~.	RCOL2_14 .03.07-22 CTS-01174
3.b. Separation is provided between redundant divisions of UHS ESW pump house ventilation system Class 1E ~~divisions~~cables, and between Class 1E ~~divisions~~cables and non-Class 1E cable.	3.b Inspections of the as-built Class 1E divisional cables ~~and raceways~~ will be performed.	3.b ~~The as-built Class 1E electrical cables with only one division are routed in raceways assigned to the same division. There are no other safety division electrical cables in a raceway assigned to a different division.~~Physical separation or electrical isolation is provided in accordance with RG 1.75 between the redundant divisions of the as-built UHS ESW pump house ventilation system Class 1E cables and between Class 1E cables and non-Class 1E cables.	RCOL2_14 .03.07-4 CTS-01174
4. The UHS ESW pump house ventilation system provides ventilation air to maintain area temperature within design limits~~provides and maintains the proper environmental conditions within~~ the ~~respective room~~UHS ESW pump houses during normal operations, abnormal and accident conditions of the plant.	4. Tests and analyses of the as-built UHS ESW pump house ventilation system will be performed for all four divisions.	4. ~~The~~A report exists and concludes that the as-built UHS ESW pump house ventilation system ~~provides and maintains the proper environmental conditions~~is capable of ~~within~~providing ventilation air to maintain area temperature within design limits in the ~~respective room by the exhaust fan and/or unit heater operation~~UHS ESW pump houses during normal operations, abnormal and accident conditions of the plant with outside ambient design temperature condition (i.e. -5°F - 115 °F).	RCOL2_14 .03.07-1 CTS-01174 RCOL2_14 .03.07-15 CTS-01174 RCOL2_09 .04.05-15
5.a. Controls ~~exist~~are provided in the MCR to start and stop the UHS ESW pump house ventilation system exhaust fans and unit heaters identified in Table A.2-3.	5.a. Tests will be performed on the as-built exhaust fans and unit heaters identified in Table A.2-3 using controls in the as-built MCR.	5.a Controls exist in the as-built MCR ~~operate~~ to start and stop the as-built UHS ESW pump house ventilation system exhaust fan and unit heaters identified in Table A.2-3.	RCOL2_14 .03.07-16

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-16

Follow-up RAI
This is a follow-up RAI to the applicant's response, dated December 16, 2009, to RAI No. 3232, (RAI Letter Number 123), Question No. 09.04.05-3-4.

In December, 2009 the applicant's responded to Question No. 09.04.05-3-4 with the statement:

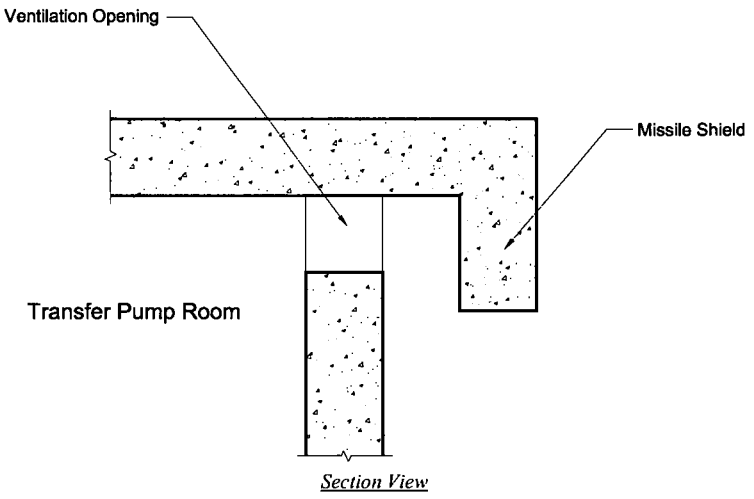
"The locations of the missile shields for the UHS ESW pump house are shown in the plan view of the UHSRS in FSAR Figure 3.8-206 at the northwest and southeast corners of each UHS ESW pump house. The missile shields for the transfer pump room air intake and exhaust openings are not shown in FSAR Figure 3.8-206. The locations of the ESW and transfer pump room ventilation opening missile shields are subject to change as detailed ventilation design and equipment layout progresses. FSAR Figure 3.8-206 and related Chapter 3 figures will be revised in a future FSAR Update Tracking Report as the detailed ventilation design and equipment layout progresses."

The staff cannot complete its review and close out this Open Item without bringing closure to this issue. Please state how missile protection will be provided for the ESW and transfer pump room ventilation openings.

ANSWER:

Figure 3.8-206 has been revised to add a note clarifying that missile shields on the ventilation openings for the ESW pump room and UHS transfer pump room are provided. The location of the air supply intake and exhaust openings for the transfer pump room has been identified but the drawing has not been revised as of this time. The openings will be placed on the walls of the transfer pump room and missile shielding is provided for each opening by the reinforced concrete walls and roof slabs, which are thick enough to withstand missile impact loads and to prevent perforation and the potential generation of secondary missiles by spalling or scabbing effects. A typical drawing of the missile shield is shown below. The reinforced concrete walls and roof slabs surround all the ventilation openings and are

arranged to provide protection so there is no straight pathway for incoming missiles to enter through the ventilation opening.



Typical Missile Shield Drawing for Ventilation Openings

Impact on R-COLA

See attached marked-up FSAR Revision 1 Figure 3.8-206.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

RCOL2_09.0 4.05-16

(SRI)

CP COL 3.8(19)

Figure 3.8-206 General Arrangement of UHS Basin

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-17

Follow-up RAI
This is a follow-up RAI to the applicant's response, dated December 16, 2009, to RAI No. 3232, (RAI Letter Number 123), Question No. 09.04.05-5.

In their December, 2009 response to Question No. 09.04.05-5, the applicant indicated that that the detailed evaluation of the flooding event and the detailed design of the floor drains and door sill was not complete. The flooding event evaluation will be described in a new FSAR Subsection 3.4.1.5.3 and the details of the floor drain and sill design will be shown in FSAR Figure 3.8-209 or related FSAR Section 3.8 figures in a future FSAR Update Tracking Report. FSAR Subsection 9.4.5.3.6 will also be revised to reflect the new flooding-related FSAR information.

A search of the Comanche Peak Tracking Reports through Revision 4, does not list this pending final design change. The staff cannot complete its review without addressing this topic. Please provide the staff with the requested information.

ANSWER:

CPNPP Units 3 and 4 have been evaluated for internal flood protection for site-specific structures. The evaluation concluded that

> Postulated internal flooding due to events including MELB and fire suppression activities cannot adversely affect safe plant operations or the ability of the plant to achieve and maintain a safe shutdown condition, if necessary, in accordance with the single failure criterion.

Floor drains are provided in the ESW pump rooms and UHS transfer pump rooms to allow internal flood waters to drain to the basin below.

FSAR Subsection 9.4.5.3.6 was revised (by CTS-01171) in Update Tracking Report Revision 5 (letter TXNB-11027 dated April 25, 2011) to reflect the flood study and additional revisions have been made to the FSAR in the attached pages.

Impact on R-COLA

See attached FSAR Revision 1 page 3.4-2, Figure 3.8-208, Figure 3.8-209, and page 9.4-6.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

~~CP~~STD COL 3.4(3) Replace the last sentence in the ninth paragraph in DCD Subsection 3.4.1.2 with the following. CTS-01140

Site-specific potential sources of external flooding such as the cooling tower, service water piping, or circulating water piping are not located near structures containing safety-related SSCs, with the exception of piping entering plant structures. The CWS enters only within the T/B, and any postulated pipe break is prevented from back-flowing into the safety-related R/B by watertight separation. Postulated pipe breaks near structures are prevented from entering the structures by adequate sloped site grading and drainage.

3.4.1.3 Flood Protection from Internal Sources

RCOL2_09.04.05-17

STD COL 3.4(7) Replace the last sentence in the last paragraph of DCD Subsection 3.4.1.3 with the following.

Three site-specific safety-related structures have been evaluated for internal flooding concerns: the UHSRS, the ESWPT, and the PSFSV. Other site-specific buildings and structures in the plant yard are designated as non safety-related. By definition, their postulated failure due to internal flooding or other postulated events do not adversely affect safety-related SSCs or required safety functions.

Each of these three structures is configured with independent compartments, divisionally separated. Internal flooding of any one compartment and corresponding division will not prevent the system from performing required safety-related functions. Postulated flooding events such as those caused by moderate energy line break (MELB) or fire suppression system activation within one division will affect that respective division only. Flooding affecting one compartment will not affect adjacent areas.

3.4.1.4 Evaluation of External Flooding

~~CP~~STD COL 3.4(2) Replace the last sentence in the last paragraph of DCD Subsection 3.4.1.4 with the following. CTS-01140

As discussed in ~~Chapter 2~~Section 2.4, the site-specific DBFL does not exceed the maximum flood level for the standard plant design. Therefore, there are no static and/or dynamic flooding forces beyond those considered in the standard plant design. CTS-01089

RCOL2_09.0
4.05-17

(SRI)

CP COL 3.8(19)

Figure 3.8-208 Typical Section of UHS Looking North at Pump House, UHS Basin and Cooling Tower Fans

RCOL2_09.0
4.05-17

(SRI)

CP COL 3.8(19)

Figure 3.8-209 Typical Section Looking West at UHS Basin and Pump House Interface with ESWPT

The UHS ESW pump houses each contain a wet-pipe sprinkler system, hose station and smoke detection system. These fire protection components are classified as non-safety-related. The wet-pipe sprinkler system and smoke detection system are Seismic Category II. Their failure during a design basis seismic event will not damage any of the safety-related equipment in the areas. The standpipe systems supplying hose stations are Seismic Category II and will remain functional under safe shutdown earthquake loadings for manual fire suppression in areas containing equipment required for safe-shutdown. RCOL2_09.04.05-3

CP COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.3.5

9.4.5.3.6 UHS ESW Pump House Ventilation System

- The ESW pump room ~~exhaust fan~~ventilation system and the UHS transfer pump room ~~exhaust fan~~ventilation system located in each UHS ESW pump house are each powered by ~~the~~a different Class 1E bus~~es~~. RCOL2_09.04.05-13
- The UHS transfer pump and the ESW pump in a single UHS ESW pump house are powered from different Class 1E power supplies and are located in different fire areas separated by three-hour fire barriers. The two Class 1E power supply trains in a UHS ESW pump house are physically separated by a three-hour fire barrier. CTS-01262 CTS-01262
- ~~The ESW pump room exhaust fan and the UHS transfer pump room exhaust fan are separated by a three-hour fire rated barrier. Therefore, each fan powered by different Class 1E power supplies is protected and remains functional in the event of a fire in either room.~~ RCOL2_09.04.05-13
- The safety function of the UHS ESW pump house ventilation system is assured by the physical separation provided by the four separate and independent UHS ESW pump houses. All ventilation system ~~equipment and~~ components are classified as equipment class 3, seismic category I. RCOL2_09.04.05-10
- The ESW pump room ~~exhaust fans~~ventilation system and the UHS transfer pump room ~~exhaust fans~~ventilation system are capable of performing ~~its~~their safety function under all associated design basis accidents coincident with LOOP. RCOL2_09.04.05-13 CTS-01262
- The ESW pump room exhaust fans and UHS transfer pump room exhaust fans are capable of performing required safety functions under all postulated internal flooding events as described in Subsection 3.4.1.3. CTS-01171
- As shown in Table 9.4-203, ~~F~~failure of a single active component in one of the UHS ESW pump house ventilation system ~~exhaust fans~~ does not result in a loss of the system's safety function. DCD_09.04.05-1 RCOL2_09.04.05-13
- The UHS ESW pump house ventilation system components are protected from tornado generated missiles by their location inside a seismic category I structure.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5585 (CP RAI #213)

SRP SECTION: 09.04.05 - Engineered Safety Feature Ventilation System

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

DATE OF RAI ISSUE: 3/24/2011

QUESTION NO.: 09.04.05-18

Follow-up RAI
This is a follow-up RAI to the applicant's response, dated December 16, 2009, to RAI No. 3232, (RAI Letter Number 123), Question No. 09.04.05-10.

(1) The staff disagrees with the statement contained in 2b of the applicant's response "... do not perform an active safety function". During the summer months these dampers must change state from the normally closed position to the open position whenever the exhaust fans are running. This change of state function, allows the ESW Pump House rooms to remain below the design basis limiting temperature of 120°F in support of running the safety related UHS ESW pumps. Conversely during the winter months, these dampers must fail to the closed position to ensure that the ESW Pump House rooms remain above the design basis lower limiting temperature of 40°F. This change of state function, helps to ensure that the safety related UHS ESW pumps remain operable while in standby during normal plant operations. The staff requests that the applicant re-evaluate this sentence and amend the FSAR as necessary and in particular ITAAC Table A.2-2 and FSAR 9.4.5.2.6, with greater clarity.

(2) The staff notes that Part 10 ITAAC Table A.2-2 lists the safety related temperature switches (e.g. VRS-TS-2610C,D,E,F) for the "ESW Pump Room Temperature" and "UHS ESW pump Room Temperature " but not their in series Temperature Controllers (e.g. VRS-TC-2610C,D,E,F). The staff requests additional information about the this series safety related/non-safety arrangement and the Class 1E and non Class 1E control circuits.

(3) The staff notes that the safety related temperature switches (e.g. VRS-TS-2610C,D,E,F) do not appear in FMEA Table 9.4-203. The staff requests that these safety related components be added to the Table 9.4-203.

ANSWER:

(1) See the response to Question 09.04.05-14 above.

(2) The temperature switches (TSs) VRS-TS-803-S, 804-S, 805-S, 806-S (i.e., VRS-TS-2610C, D, E and F in COLA Rev. 1) and the associated temperature controllers (TCs) in question, VRS-TC-803-S, 804-S, 805-S, 806-S (VRS-TC-2610C, D, E and F in COLA Rev. 1) (for ESW Pump Room A) are safety-related. Temperature controllers located in series with their respective TSs, as shown in FSAR Figure 9.4-201, are part of a plant control system that starts/stops the associated heaters or exhaust fans. The plant control system used with safety-related components is the Protection and Safety Monitoring System (PSMS), which is a basic software program described in DCD Chapter 7 and incorporated by reference into the R-COLA. The signals from the TSs are transmitted to the PSMS, which provides the start or stop signal to the associated heaters and exhaust fans. This is the same design for all ESW pump rooms and UHS transfer pump rooms.

COLA Part 10 ITAAC Table A.2-2 is correct. Figure 9.4-201 has been revised to indicate that TCs are part of the plant control system.

(3) FSAR Table 9.4-203 has been revised to include safety-related TSs for all of the UHS ESW pump house ventilation systems.

Impact on R-COLA

See the attached marked-up FSAR Revision 1 page 9.4-17 and FSAR Figure 9.4-201.

Impact on S-COLA

This response is considered STD.

Impact on DCD

None.

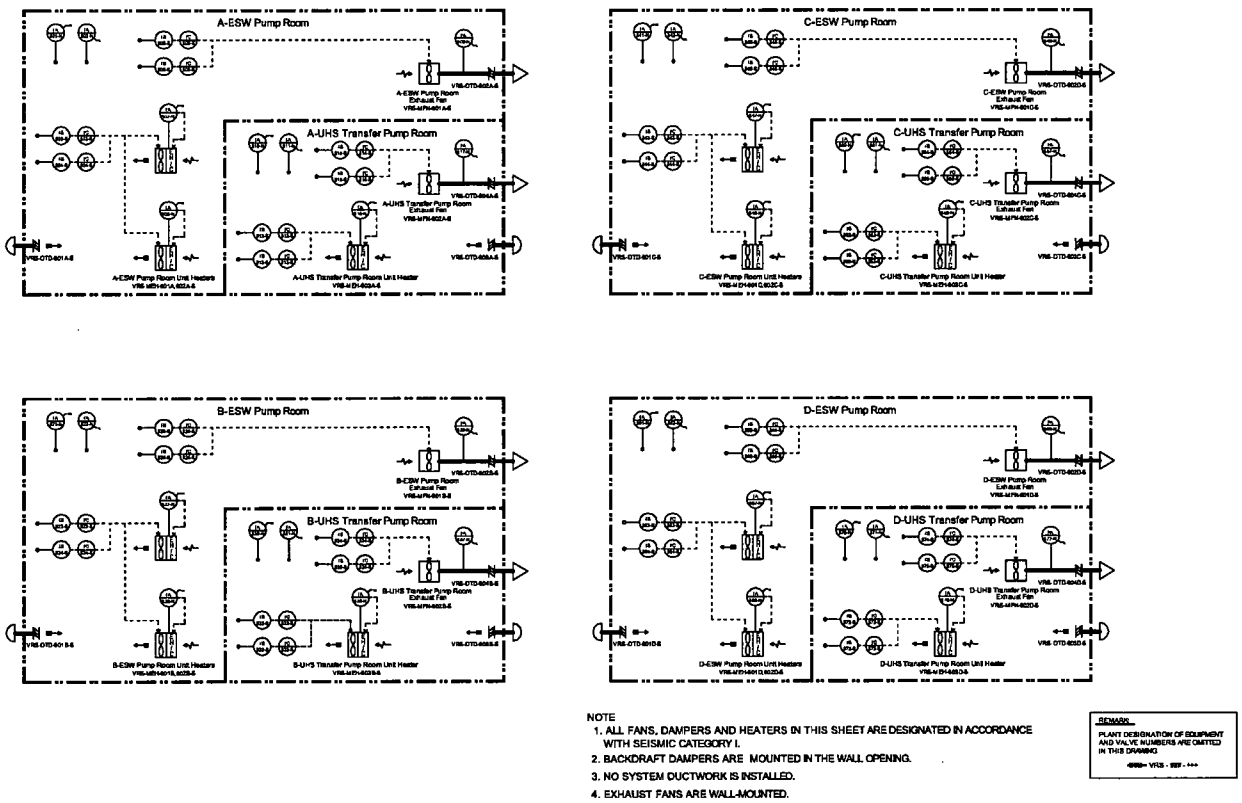
RCOL2_09 .04.05-10

Table 9.4-203 (Sheet 6 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks
ESW Pump Room Temperature Switch VRS-TS-803,804,805,806 VRS-TS-823,824,825,826 VRS-TS-843,844,845,846 VRS-TS-863,864,865,866	Provides input signal to temperature controller for the starting and stopping of the unit heaters and exhaust fan	All	Fails to send input signal to temperature controller for the unit heaters and exhaust fan	Room low temperature alarm in MCR Room high temperature alarm in MCR Low airflow alarm in MCR	None. Remaining three ESW pump houses are available	
UHS Transfer Pump Room Temperature Switch VRS-TS-812,813,814,815 VRS-TS-832,833,834,835 VRS-TS-852,853,854,855 VRS-TS-872,873,874,875	Provides input signal to temperature controller for the starting and stopping of the unit heaters and exhaust fan	All	Fails to send input signal to temperature controller for the unit heaters and exhaust fan	Room low temperature alarm in MCR Room high temperature alarm in MCR Low airflow alarm in MCR	None. Remaining three ESW pump houses are available	

RCOL2_09 .04.05-18

MAP-00-201



NOTE
1. ALL FANS, DAMPERS AND HEATERS IN THIS SHEET ARE DESIGNATED IN ACCORDANCE WITH SEISMIC CATEGORY I.
2. BACKDRAFT DAMPERS ARE MOUNTED IN THE WALL OPENING.
3. NO SYSTEM DUCTWORK IS INSTALLED.
4. EXHAUST FANS ARE WALL-MOUNTED.

REMARK
PLANT DESIGNATION OF EQUIPMENT AND VALVE NUMBERS ARE OMITTED IN THIS DRAWING

RCOL2_09.0 4.05-18

RCOL2_09.0 4.05-3
CTS-01140

~~GPSTD~~ COL 9.2(6)

Figure 9.4-201 UHS ESW Pump House Ventilation System Flow Diagram