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CP-201201162
Log # TXNB-12034

Ref. # 10 CFR 52

September 24, 2012

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
SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 6403 (SECTION 14.3.7) AND 6457 (SECTION 14.2)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein supplemental information for the responses to Request for Additional Information (RAI) No. 6403 (CP RAI #254) and 6457 (CP RAI #257) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental information addresses inspections, tests, analyses, and acceptance criteria, and addresses the initial test program.

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

This submittal completes Regulatory Commitment #8359 (ML12174A248, June 21, 2012). The capacity of the new unit heaters added to FSAR Table 9.4-202 has not been determined. These values and any associated impact on FSAR Chapter 8 will be provided by November 27, 2012. This is being tracked as Regulatory Commitment #8394.

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

Executed on September 24, 2012.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments: 1. Supplemental Response to Request for Additional Information No. 6403 (CP RAI #254)
2. Supplemental Response to Request for Additional Information No. 6457 (CP RAI #257)

DO90
NRO

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Attachment 1

Supplemental Response to Request for Additional Information
No. 6403 (CP RAI #254)

SUPPLEMENTAL 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.: 6403 (CP RAI #254)

SRP SECTION: 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria

QUESTIONS for Balance of Plant and Technical Specifications Branch (BPTS)

DATE OF RAI ISSUE: 4/12/2012

QUESTION NO.: 14.03.07-38

Based on the staff's review of Comanche Peak Nuclear Power Plant Units 3 and 4, Revision 2, Part 10 - ITAAC, Appendix A.1, "Ultimate Heat Sink System (UHSS) and Essential Service Water system (ESWS) (Portions Outside the Scope of the Certified Design)," the applicant is requested to address the following items below.

1. Site-specific ITAAC should clearly describe testing of the UHS transfer pumps and associated MOVs from their various safety-related power supplies.

2. Site-specific ITAAC should clearly describe testing of the ESWS/UHS heat tracing.

3. Site-specific ITAAC should clearly describe testing of the ESWS/UHS freeze protection features (which may include operating the UHS fans in reverse speed).

4. Site-specific ITAAC should clearly describe and conclude that the UHS fans are designed to withstand the effects of design basis tornado differential pressure.

5. Site-specific ITAAC (see ITAAC #18) should clearly describe the UHS is capable of performing its safety function without exceeding the maximum temperature limit of the water in the UHS basin.

6. Site-specific ITAAC should clearly describe that the UHS spray nozzles and orifices are adequately designed with consideration for blockage. Note, US-APWR DCD 9.2.1.2.2 states that the ESWS strainer mess is 3 mm to assure that potential clogging of the cooling tower nozzles is avoided.

SUPPLEMENTAL INFORMATION:

Luminant responded to parts 1, 4, 5, and 6 of this question in letter TXNB-12022 (ML12174A248).

1. The following supplements the original response to part 1 to address NRC feedback from a teleconference with the NRC on July 13, 2012:

Table 9.2.5-201 has been added to show the electrical power configuration for the UHS transfer pumps and associated MOVs.

2. FSAR Subsections 9.2.1 and 9.4.5 have been revised to address freeze protection for the ESW piping and UHS transfer piping that pass through the piping rooms that are between the pump house and the essential service water pipe tunnel (ESWPT). These piping rooms are heated by unit heaters in the UHS ESW pump house ventilation system, which prevents freezing of the ESW and UHS piping contained therein. Therefore, heat tracing is not applied for freeze protection.

   Site-specific inspection and testing for UHS ESW pump house ventilation system is already described in COLA Part 10 Table A.2-1 Item #4. This inspection and testing confirms that the ambient temperature in the piping rooms can be maintained above 40°F by the UHS ESW pump house ventilation system so that ESW and UHS transfer piping within each piping room will not freeze.

3. FSAR Subsections 9.2.1 and 9.4.5 have been revised to address ESWS/UHS freeze protection. COLA Part 10 ITAAC Appendix A.1 Figure A.1-1 has also been revised to include a drain valve to drain water in the exposed portion of the ESW return line in the cooling tower. The drain valve is tested in accordance with ITAAC Appendix A.1 Table A.1-1 Item #1.a.

   For freeze protection of the ESW return piping in the cooling tower, the water in the spray header is drained to the basin though the spray nozzles and the water in the vertical piping is drained to the basin through the drain line (please refer to the revised Subsection 9.2.1.3 for more detail).

   Prior to the onset of temperatures which could cause freezing, a plant operator opens the locked-closed manual valve in the ESW pump room on the cooling tower drain line to drain the water in the exposed portion to the basin. After draining, the operator closes and locks the drain valve. The water in the spray header is drained to the basin through the spray nozzles.

   Additionally, operation of the UHS fans in reverse speed for freeze protection is not applied.

Impact on R-COLA

See attached marked-up FSAR Revision 3 pages 3.2-4, 3.2-5, 3D-5, 3D-6, 3D-7, 3D-8, 3D-9, 3D-10, 3D-11, 3D-12, 3D-13, 9.2-5, 9.2-17, 9.2-26, 9.2-39, 9.2-42, 9.2-43, 9.4-3, 9.4-4, 9.4-6, 9.4-12, 9.4-16, 9.4-17, 9.4-21, and COLA Part 10 pages 22, 28, 30, and 31.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

Table 3.2-201 (Sheet 2 of 3)

CP COL 3.2(4)
CP COL 3.2(5)
CP COL 3.2(6)

Classification of Site-Specific Mechanical and Fluid Systems, Components, and Equipment

System and Components	Equipment Class	Location	Quality Group	10 CFR 50 Appendix B (Reference 3.2-8)	Code and Standards[3]	Seismic Category	Notes
2. UHS							
UHS transfer pumps	3	UHSRS	C	YES	3	I	
UHS cooling tower fans	3	UHSRS	C	YES	5	I	
UHS basins	3	UHSRS	C	YES	3	I	
Transfer line piping and valves from UHS transfer pumps to basins	3	UHSRS, ESWPT	C	YES	3	I	
ESW return line piping	3	UHSRS, ESWPT	C	YES	3	I	
Drain line branched from ESW return line from branch point from ESW return line up to and including the following drain valves: UHS-VLV-521A,B,C,D	3	UHSRS	C	YES	3	I	
Drain line branched from ESW return line downstream of and excluding the following drain valves: UHS-VLV-521A,B,C,D	9	UHSRS	NA	NA	5	Non-seismic (NS)	
UHS basin makeup piping and valves	9	UHSRS	NA	NA	5	Non-seismic (NS)	
3. UHS ESW pump house ventilation system							
ESW pump room exhaust fans	3	UHSRS	C	YES	5	I	
UHS transfer pump room exhaust fans	3	UHSRS	C	YES	5	I	

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Table 3.2-201 (Sheet 3 of 3)

CP COL 3.2(4)
CP COL 3.2(5)
CP COL 3.2(6)

Classification of Site-Specific Mechanical and Fluid Systems, Components, and Equipment

System and Components	Equipment Class	Location	Quality Group	10 CFR 60 Appendix B (Reference 3.2-8)	Code and Standards[3]	Seismic Category	Notes
UHS ESW pump house supply and exhaust backdraft dampers	3	UHSRS	C	YES	5	I	
ESW pump room unit heaters	3	UHSRS	C	YES	5	I	
UHS transfer pump room unit heaters	3	UHSRS	C	YES	5	I	
ESW Piping Room Unit Heaters	3	UHSRS	C	YES	5	I	
UHS Transfer Piping Room Unit Heaters	3	UHSRS	C	YES	5	I	
4. Startup steam generator (SG) blowdown system							
System components, piping and valves	6	turbine building (T/B), auxiliary building (A/B), outdoors	N/A	not applicable (N/A)	6	Note 1	

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Notes:

1. Seismic category meeting RG 1.143 (Reference 3.2-10) is applied.
2. Not used.
3. Identification number for "Code and Standards"
   (1) American Society of Mechanical Engineers (ASME) Code, Section III, Class 1 (Reference 3.2-14)
   (2) ASME Code, Section III, Class 2 (Reference 3.2-14)
   (3) ASME Code, Section III, Class 3 (Reference 3.2-14)
   (4) RG 1.26 (Reference 3.2-13), Table 1, Quality Standards
   (5) Codes and standards as defined in design bases
   (6) Codes and standards, and guidelines provided in RG 1.143 (Reference 3.2-10), for design of SSCs for Radwaste Facility
4. Not used

CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 4 of 12)
Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
30	VRS-MEH-603B	B - UHS Transfer Pump Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
31	VRS-MEH-603C	C - UHS Transfer Pump Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
32	VRS-MEH-603D	D - UHS Transfer Pump Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
33	VRS-MEH-604A	A-ESW Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
34	VRS-MEH-604B	B-ESW Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
35	VRS-MEH-604C	C-ESW Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
36	VRS-MEH-604D	D-ESW Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
37	VRS-MEH-605A	A-UHS Transfer Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
38	VRS-MEH-605B	B-UHS Transfer Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
39	VRS-MEH-605C	C-UHS Transfer Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 5 of 12)
Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location: PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	Purpose: ESF, PAM, Other	Operational Duration	Environmental Conditions: Harsh or Mild	Qualification Process: E=Electrical M=Mechanical	Seismic Category: I, II, Non	Comments
40	VRS-MEH-605D	D-UHS Transfer Piping Room Unit Heater	UHSRS	ESF	1 yr	Mild	M	I	
~~33~~41	VRS-TS-803	A - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~34~~42	VRS-TS-804	A - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~35~~43	VRS-TS-805	A - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~36~~44	VRS-TS-806	A - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~37~~45	VRS-TS-812	A - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~38~~46	VRS-TS-813	A - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 6 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	Purpose ESF, PAM, Other	Operational Duration	Environmental Conditions Harsh or Mild	Qualification Process E=Electrical M=Mechanical	Seismic Category I, II, Non	Comments
~~39~~47	VRS-TS-814	A - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~40~~48	VRS-TS-815	A - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~41~~49	VRS-TS-823	B - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~42~~50	VRS-TS-824	B - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~43~~51	VRS-TS-825	B - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~44~~52	VRS-TS-826	B - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~45~~53	VRS-TS-832	B - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~46~~54	VRS-TS-833	B - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 7 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
~~47~~55	VRS-TS-834	B - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~48~~56	VRS-TS-835	B - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~49~~57	VRS-TS-843	C - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~50~~58	VRS-TS-844	C - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~51~~59	VRS-TS-845	C - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~52~~60	VRS-TS-846	C - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~53~~61	VRS-TS-852	C -UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~54~~62	VRS-TS-853	C - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 8 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
~~55~~63	VRS-TS-854	C - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~56~~64	VRS-TS-855	C - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~57~~65	VRS-TS-863	D - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~58~~66	VRS-TS-864	D - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~59~~67	VRS-TS-865	D - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~60~~68	VRS-TS-866	D - ESW Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~61~~69	VRS-TS-872	D - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~62~~70	VRS-TS-873	D - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 9 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
~~63~~71	VRS-TS-874	D - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~64~~72	VRS-TS-875	D - UHS Transfer Pump Room Temperature	UHSRS	Other	2 wks	Mild	E	I	
~~65~~73	UHS-MPP-001A	A - UHS Transfer Pump	UHSRS	ESF	1 yr	Mild	M	I	
~~66~~74	UHS-MPP-001B	B - UHS Transfer Pump	UHSRS	ESF	1 yr	Mild	M	I	
~~67~~75	UHS-MPP-001C	C - UHS Transfer Pump	UHSRS	ESF	1 yr	Mild	M	I	
~~68~~76	UHS-MPP-001D	D - UHS Transfer Pump	UHSRS	ESF	1 yr	Mild	M	I	
~~69~~77	UHS-MFN-001A	A – UHS Cooling Tower Fan No.1	UHSRS	ESF	1 yr	Mild	M	I	
~~70~~78	UHS-MFN-001B	B – UHS Cooling Tower Fan NO.1	UHSRS	ESF	1 yr	Mild	M	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 10 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
~~71~~79	UHS-MFN-001C	C - UHS Cooling Tower Fan NO.1	UHSRS	ESF	1 yr	Mild	M	I	
~~72~~80	UHS-MFN-001D	D - UHS Cooling Tower Fan No.1	UHSRS	ESF	1 yr	Mild	M	I	
~~73~~81	UHS-MFN-002A	A – UHS Cooling Tower Fan No.2	UHSRS	ESF	1 yr	Mild	M	I	
~~74~~82	UHS-MFN-002B	B – UHS Cooling Tower Fan NO.2	UHSRS	ESF	1 yr	Mild	M	I	
~~75~~83	UHS-MFN-002C	C - UHS Cooling Tower Fan NO.2	UHSRS	ESF	1 yr	Mild	M	I	
~~76~~84	UHS-MFN-002D	D - UHS Cooling Tower Fan No.2	UHSRS	ESF	1 yr	Mild	M	I	
~~77~~85	UHS-MOV-503A	A - UHS Transfer Pump Discharge Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~78~~86	UHS-MOV-503B	B – UHS Transfer Pump Discharge Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~79~~87	UHS-MOV-503C	C – UHS Transfer Pump Discharge Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~80~~88	UHS-MOV-503D	D – UHS Transfer Pump Discharge Valve	UHSRS	ESF	1 yr	Mild	M	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 11 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	Purpose ESF, PAM, Other	Operational Duration	Environmental Conditions Harsh or Mild	Qualification Process E=Electrical M=Mechanical	Seismic Category I, II, Non	Comments
~~81~~89	UHS-MOV-506A	A - UHS Transfer Line Basin Inlet Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~82~~90	UHS-MOV-506B	B - UHS Transfer Line Basin Inlet Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~83~~91	UHS-MOV-506C	C - UHS Transfer Line Basin Inlet Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~84~~92	UHS-MOV-506D	D - UHS Transfer Line Basin Inlet Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~85~~93	EWS-HCV-010	A - UHS Basin Blowdown Control Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~86~~94	EWS-HCV-011	B - UHS Basin Blowdown Control Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~87~~95	EWS-HCV-012	C - UHS Basin Blowdown Control Valve	UHSRS	ESF	1 yr	Mild	M	I	
~~88~~96	EWS-HCV-013	D - UHS Basin Blowdown Control Valve	UHSRS	ESF	1 yr	Mild	M	I	

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CP COL 3.11(5)
CP COL 3.11(8)

Table 3D-201 (Sheet 12 of 12)

Site-Specific Environmental Qualification Equipment List

Item Num	Equipment Tag	Description	Location	Purpose	Operational Duration	Environmental Conditions	Qualification Process	Seismic Category	Comments
			PCCV, R/B, A/B, O/B, T/B, UHSRS, ESWPT	ESF, PAM, Other		Harsh or Mild	E=Electrical M=Mechanical	I, II, Non	
~~89~~97	EWS-AOV-576A	ESWP Discharge Strainer Backwash Isolation Valve to ESWS blowdown main header	UHSRS	ESF	1 yr	Mild	M	I	
~~90~~98	EWS-AOV-576B	ESWP Discharge Strainer Backwash Isolation Valve to ESWS blowdown main header	UHSRS	ESF	1 yr	Mild	M	I	
~~91~~99	EWS-AOV-576C	ESWP Discharge Strainer Backwash Isolation Valve to ESWS blowdown main header	UHSRS	ESF	1 yr	Mild	M	I	
~~92~~ 100	EWS-AOV-576D	ESWP Discharge Strainer Backwash Isolation Valve to ESWS blowdown main header	UHSRS	ESF	1 yr	Mild	M	I	
~~93~~ 101	EWS-AOV-577	ESWS Blowdown main Header Isolation Valve to CWS blowdown main header	UHSRS	ESF	1 yr	Mild	M	I	

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Design of the basin provides adequate submergence of the pumps to assure the NPSH for the pumps. The basin is divided into two levels. One is approximately 12 feet lower than the other, and directly above it is installed the ESWP. The ESWP is designed to operate with the lowest expected water level (after 30 days of accident mitigation). The basins have sufficient water inventory to assure adequate cooling and NPSH for 30 days without makeup. This is discussed further in Subsection 9.2.5.2.

Recovery procedures contained in the Operating and Maintenance Procedures (see Subsection 13.5.2.1) are implemented if the UHS approaches low water level.

CP COL 9.2(2) Replace the seventeenth paragraph in DCD Subsection 9.2.1.3 with the following.

Based on the lowest anticipated ambient temperature, the following countermeasures are provided to prevent the ESW from freezing in the basins or piping:

- The basins are located below grade and thus ground temperature prevents water from freezing.
- In the operating trains, water is continuously circulated which helps to prevent freezing. Ultimate heat sink (UHS) transfer pumps can be used to circulate water from the idle basins. Plant procedures are developed to operate the pumps in this mode based on the basin water and ambient temperatures.
- UHS ESW pump house ventilation system maintains pre determined minimum temperature in the pump house areas including the pump rooms and the piping rooms. This is further described in Subsection 9.4. RCOL2_14.0 3.07-38 S01
- Temperature in the reactor building is maintained through ventilation and therefore heat tracing is not required.
- For the ~~E~~exposed safety-related ESW piping in the cooling tower that may be filled with water while the pump is not operating ~~is heat traced. The safety-related heat tracing is activated when the thermostat senses a pre-set low ambient temperature~~, water in the piping is drained to the basin through the drain line by opening the drain valve manually prior to the onset of temperatures that could cause freezing. After draining, the operator closes and locks the drain valve. RCOL2_14.0 3.07-38 S01

For the thermal overpressure protection of the component cooling water heat exchanger ESW side, the valves located at the component cooling water heat exchanger ESW side inlet and outlet lines are administratively locked open valves. These locked open valves assure protection from the thermal overpressurization due to the erroneous valve operation coincident with the heat input from the component cooling water (CCW) side to ESW side. During

Technical Specifications, during maintenance, and for brief periods during cold weather conditions for recirculation. As the header is normally not in service, deterioration due to flow-accelerated corrosion is insignificant. Transfer of water inventory is required assuming one train/basin of ESW/UHS is out of service (e.g., for maintenance), and a second train is lost due to a single failure. When a transfer pump is in operation, fluid velocity in the header is approximately 5.1 ft/sec. Operating conditions are approximately 20 psig and 95° F. Therefore, header failures are not considered credible.

The UHS transfer pump is designed to supply 800 gpm flow at a total dynamic head (TDH) of 40 feet. Transfer pump capacity is more than adequate to replenish the maximum water inventory losses from two operating ESWS trains. Minimum available net positive suction head (NPSHA) is approximately 40 feet. This is based on the lowest expected water level of approximately 12 feet in the UHS ESW intake basin and 95° F water temperature. Transfer pump location and submergence level precludes vortex formation. In addition, the transfer pump and the ESW pump from the same basin typically do not operate simultaneously. Although it is not a normal operating condition, the UHS transfer pump and the ESW pump in the same basin may operate simultaneously. Under these conditions the UHS transfer pump and ESW pumps will be able to perform their safety functions because the basin water inventory is sufficient even at the minimum allowable basin water level for both pumps to operate simultaneously until the UHS transfer pump is stopped by operators. The water inventory of the basin will decrease if the operator does not realize that both the ESW pump and the UHS transfer pump of the same basin are operating. An alarm will be annunciated to the MCR when the basin water level reaches the low water set point and the operator will stop the UHS transfer pump. There is no adverse impact on the safety function in this case because water can be supplied by starting the UHS transfer pump in an idle basin. RCOL2_09.02.05-20

The chemical condition and quality of the ESW is controlled. The UHS transfer system piping is carbon steel with an internal polyethylene lining to reduce corrosion and water does not frequently flow other than periodic operation of the UHS transfer pump. The UHS transfer system is designed such that pipe wall thinning will not occur. After UHS transfer pump testing, the UHS transfer system remains full of chemically treated ESW except for the discharge piping from the basin inlet valve to another basin, which is drained.

The UHS transfer pumps and the ESWPs located in each basin are powered by the different Class 1E buses, e.g., for basin A, the ESWP is powered from bus A, and the UHS transfer pump is powered from bus C or D, depending on manual breaker alignment. The power operated valve at each transfer pump discharge and instrumentation associated with each individual transfer pump are powered from the same buses as the transfer pump. The power operated valves at the transfer lines discharging into the UHS basins are powered from different buses than the transfer pumps in their respective basins. Electrical power division of the UHS transfer pumps and associated motor-operated valves is described in Table 9.2.5-201. RCOL2_14.03.07-38 S01

CP COL 9.2(11) ***9.2(11)*** *Source of potable water to the site, the necessary required treatment and the system operation*

This COL item is addressed in Subsections 9.2.4.1, 9.2.4.2, 9.2.4.2.1, 9.2.4.2.2.4, 9.2.4.2.3, 9.2.4.4, 9.2.4.5, Figure 9.4-201 and Figure 9.2.4-1R.

CP COL 9.2(12) ***9.2(12)*** *Sanitary waste treatment*

This COL item is addressed in Subsections 9.2.4.1 and 9.2.4.2.1.

9.2(13) *Deleted*

CP COL 9.2(14) ***9.2(14)*** *Potable and sanitary water system components data*

This action is addressed in Subsections 9.2.4.2.1 and Table 9.2.4-1R.

CP COL 9.2(15)
STD COL 9.2(15) ***9.2(15)*** *Total number of people at the site, the usage capacity and sizing of the potable water tank and associated pumps.*

This COL item is addressed in Subsections 9.2.4.1, 9.2.4.2.2.1, 9.2.4.2.2.2 and 9.2.4.2.2.3.

9.2(16)*Deleted*

CP COL 9.2(17) ***9.2(17)****Sanitary lift stations and the sizing the appropriate interfaces*

This COL item is addressed in Subsections 9.2.4.1 and 9.2.4.2.3.

CP COL 9.2(18)
STD COL 9.2(18) ***9.2(18)*** *The type of the UHS based on specific site conditions and meteorological data*

This COL item is addressed in Subsections 9.2.5.1 and 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3.

CP COL 9.2(19) ***9.2(19)*** *The design of the electrical power supply to the UHS*

This COL item is addressed in Subsection 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3 and Table 9.2.5-201. RCOL2_14.0 3.07-38 S01

CP COL 9.2(20) ***9.2(20)*** *The description and the P&ID of the UHS*

This COL item is addressed in Subsections 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3, Table 9.2.5-3R and Figure 9.2.5-1R.

CP COL 9.2(21) ***9.2(21)*** *The source of makeup water to the UHS and the blowdown discharge location*

This COL item is addressed in Subsections 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3.

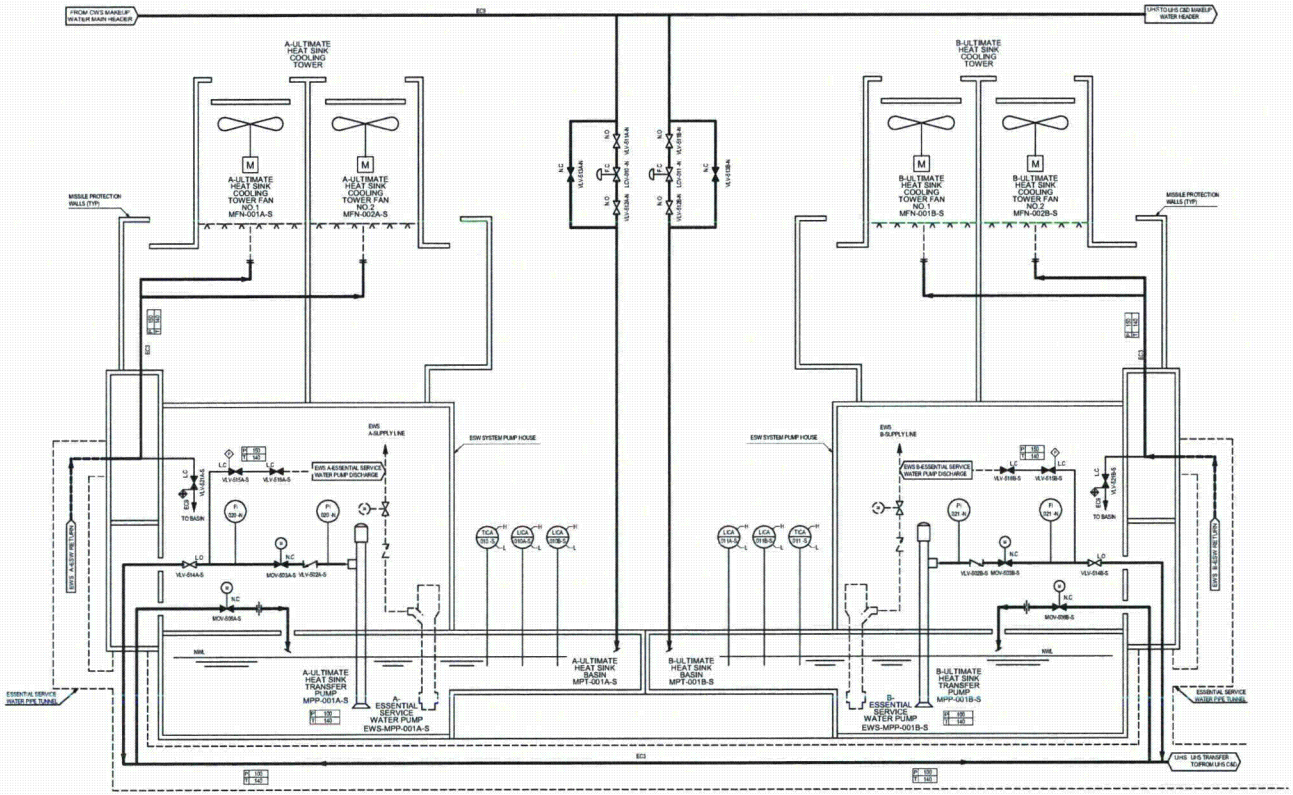
RCOL2_14.0
3.07-38 S01

Table 9.2.5-201

Electrical Power Division of UHS Transfer Pumps and Associated Motor-operated Valves

Equipment Tag	Component	Electrical Power Division
UHS-MPP-001A	A - UHS Transfer Pump	D1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MPP-001B	B - UHS Transfer Pump	D1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MPP-001C	C - UHS Transfer Pump	A1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MPP-001D	D - UHS Transfer Pump	A1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MOV-503A	A - UHS Transfer Pump Discharge Valve	D1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MOV-503B	B - UHS Transfer Pump Discharge Valve	D1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MOV-503C	C - UHS Transfer Pump Discharge Valve	A1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MOV-503D	D - UHS Transfer Pump Discharge Valve	A1 (Class 1E 480V ac power source system (for 2 trains))
UHS-MOV-506A	A - UHS Transfer Line Basin Inlet Valve	A (Class 1E 480V ac power source system)
UHS-MOV-506B	B - UHS Transfer Line Basin Inlet Valve	B (Class 1E 480V ac power source system)
UHS-MOV-506C	C - UHS Transfer Line Basin Inlet Valve	C (Class 1E 480V ac power source system)
UHS-MOV-506D	D - UHS Transfer Line Basin Inlet Valve	D (Class 1E 480V ac power source system)

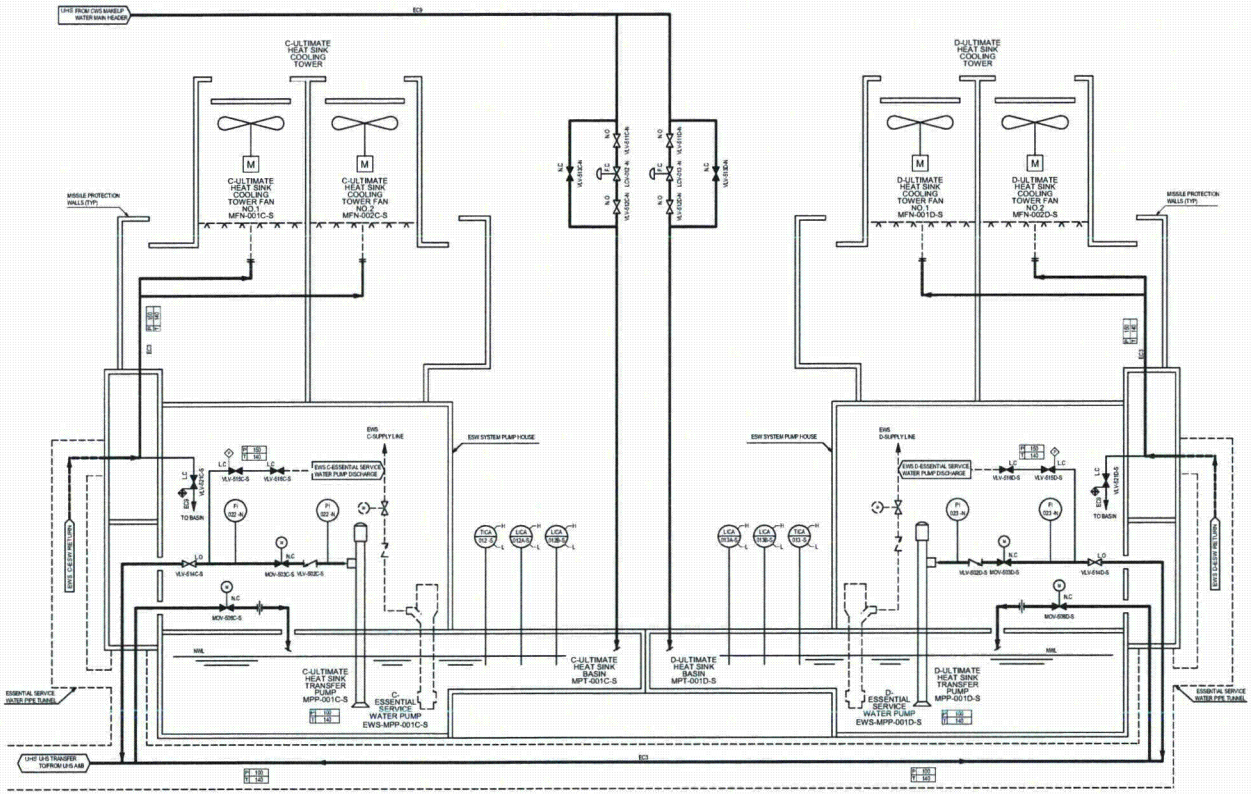
RCOL2_14.0
3.07-38 S01



CP COL 9.2(20)

Figure 9.2.5-1R Ultimate Heat Sink System Piping and Instrumentation Diagram (Sheet 1 of 2)

RCOL2_14.0
3.07-38 S01



CP COL 9.2(20)

Figure 9.2.5-1R Ultimate Heat Sink System Piping and Instrumentation Diagram (Sheet 2 of 2)

9.4.5 Engineered Safety Feature Ventilation System

CP COL 9.4(6) Delete the last paragraph and insert the following text to the end of the list of ESF ventilation systems in first paragraph of DCD Subsection 9.4.5.

- UHS ESW Pump House Ventilation System

CP COL 9.4(6) Add the following new subsection after DCD Subsection 9.4.5.1.1.5.

9.4.5.1.1.6 UHS ESW Pump House Ventilation System

The UHS ESW pump house ventilation system provides and maintains the proper environmental conditions within the required temperature range of 40°F – 120°F to support the operation of the instrumentation and control equipment and components in the individual UHS ESW pump houses including the pump rooms and the piping rooms during normal operations, a design basis accident and LOOP. The ventilation system is designed based on the outside ambient design temperature conditions (-5°F – 115°F) using 100-year return period temperature values. RCOL2_14.0 3.07-38 S01

The ESWP is installed at a location in the pump house where cooling air is adequately being circulated for cooling the ESWP motor.

9.4.5.2.2 Class 1E Electrical Room HVAC System

STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.5.2.2 with the following.

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

9.4.5.2.3 Safeguard Component Area HVAC System

CP COL 9.4(4) Replace the third sentence of the second paragraph in DCD Subsection 9.4.5.2.3 with the following.

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

9.4.5.2.4 Emergency Feedwater Pump Area HVAC System

STD COL 9.4(4) Replace the fourth sentence of the second paragraph in DCD Subsection 9.4.5.2.4 with the following.

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

9.4.5.2.5 Safety Related Component Area HVAC System

CP COL 9.4(4) Replace the third sentence of the second paragraph in DCD Subsection 9.4.5.2.5 with the following.

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

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.

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. In addition, the ESW and UHS transfer piping rooms each have 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. RCOL2_14.0 3.07-38 S01

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

The unit heaters in each pump room and piping 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. 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 and piping 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_14.0 3.07-38 S01 RCOL2_14.0 3.07-38 S01

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.

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.

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 ventilation system and the UHS transfer pump room ventilation system located in each UHS ESW pump house are each powered by a different Class 1E bus.
- 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.
- 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 components are classified as equipment class 3, seismic category I.
- The ESW pump room ventilation system and the UHS transfer pump room ventilation system are capable of performing their safety function under all associated design basis accidents coincident with LOOP.

CP COL 9.4(6)

Table 9.4-202

UHS ESW Pump House Ventilation System Equipment Design Data

ESW Pump Room Exhaust Fan		
Number of Fans	4	
Equipment Class	3	
Seismic Category	I	
Airflow Capacity	~~57,000~~56,000 cfm	RCOL2_09.04.05-23 S01
Fan Type	Propeller	
UHS Transfer Pump Room Exhaust Fan		
Number of Fans	4	
Equipment Class	3	
Seismic Category	I	
Airflow Capacity	~~4,000~~5,000 cfm	RCOL2_09.04.05-23 S01
Fan Type	Propeller	
ESW Pump Room Unit Heater		
Number of Units	8 (2 per pump room)	
Equipment Class	3	
Seismic Category	I	
Capacity	~~24~~21 kW	RCOL2_09.04.05-23 S01
UHS Transfer Pump Room Unit Heater		
Number of Units	4	
Equipment Class	3	
Seismic Category	I	
Capacity	~~3.5~~10 kW	RCOL2_09.04.05-23 S01
ESW Piping Room Unit Heater		RCOL2_14.03.07-38 S01
Number of Units	4	
Equipment Class	3	
Seismic Category	I	
UHS Transfer Piping Room Unit Heater		
Number of Units	4	
Equipment Class	3	
Seismic Category	I	

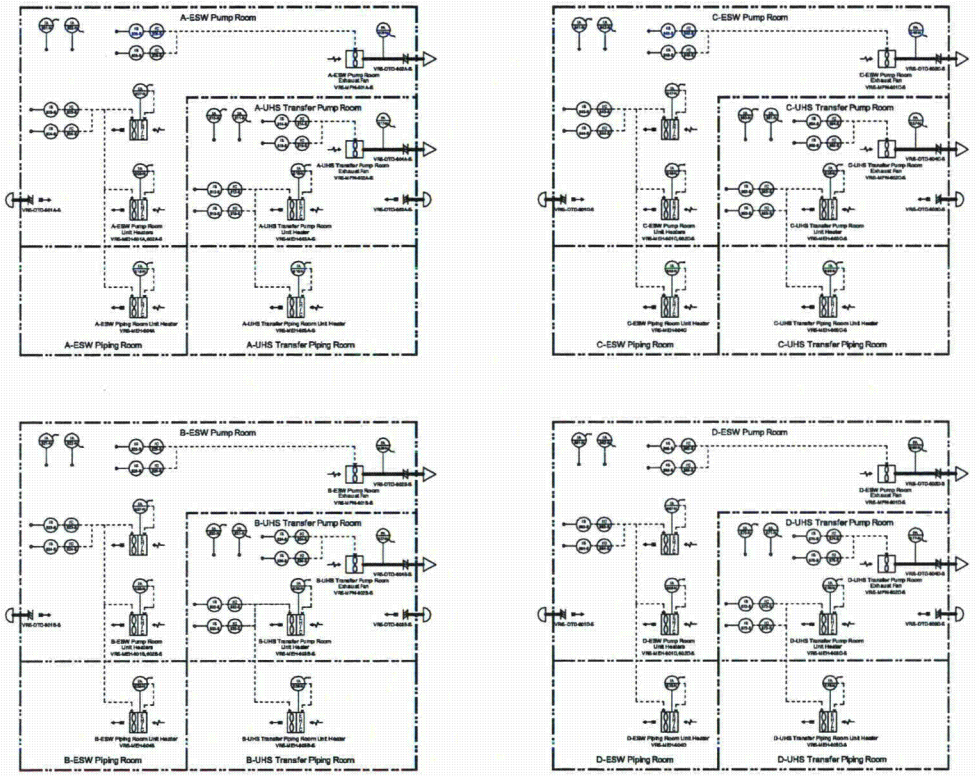
Table 9.4-203 (Sheet 4 of 8)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

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 Piping Room Unit Heaters (VRS-MEH-604A,B,C,D)	Provides heating to ESW piping room	All	Fails to energize on t'sat command	Status indication in MCR	None. Remaining three ESW system are available	RCOL2_14.03.07-38 S01
			Fails to deenergize on t'sat command	Status indication in MCR	None. Remaining three ESW system are available	
			Trips for any reason	Status indication in MCR	None. Remaining three ESW system are available	
			Unit heater fan fails	High heating element temperature alarm in MCR	None. Remaining three ESW system are available	

Table 9.4-203 (Sheet 5 of 8)
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
UHS Transfer Piping Room Unit Heaters (VRS-MEH-605A,B,C,D)	Provides heating to UHS transfer piping room	All	Fails to energize on t'sat command	Status indication in MCR	None. Remaining three UHS transfer system are available	RCOL2_14.03.07-38 S01
			Fails to deenergize on t'sat command	Status indication in MCR	None. Remaining three UHS transfer system are available	
			Trips for any reason	Status indication in MCR	None. Remaining three UHS transfer system are available	
			Unit heater fan fails	High heating element temperature alarm in MCR	None. Remaining three UHS transfer system are available	

RCOL2_14.0
3.07-38 S01



NOTE
1. ALL SAFETY-RELATED FANS, DAMPERS, HEATERS AND INSTRUMENTATION IN THIS SHEET ARE DESIGNATED IN ACCORDANCE WITH SEISMIC CATEGORY I.
2. BACKDRAFT DAMPERS ARE MOUNTED IN THE WALL OPENING.
3. THERE IS NO DUCTWORK IN THE VENTILATION SYSTEMS.
4. EXHAUST FANS ARE WALL-MOUNTED.
5. THE NON-SAFETY RELATED INSTRUMENTATION IS SEISMIC CATEGORY II.

REMARK:
PLANT DESIGNATION OF EQUIPMENT AND VALVE NUMBERS ARE OMITTED IN THIS DRAWING.
- VRS - ### -

STD COL 9.4(6)

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

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 10 - ITAAC and Proposed License Conditions

Appendix A.1

Figure A.1-1 Ultimate Heat Sink System and Essential Service Water System (Portions Outside the Scope of the Certified Design)

RCOL2_14.0 3.07-38 S01

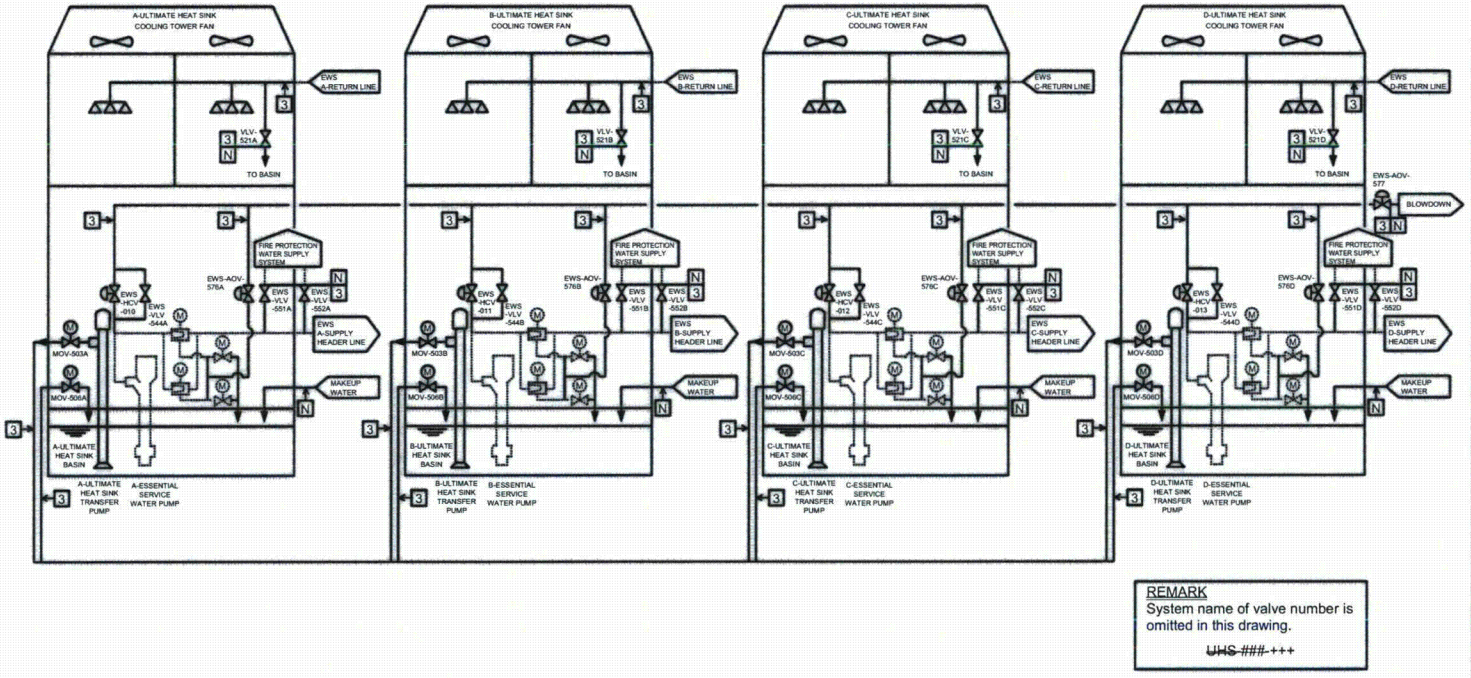


Table A.2-2 (Sheet 1 of 2)
UHS ESW Pump House Ventilation System Equipment Characteristics

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
ESW Pump Room Exhaust Fan	VRS-MFN-601A,B,C,D	-	Yes	-	Yes/No	High Temperature	Start	-
UHS Transfer Pump Room Exhaust Fan	VRS-MFN-602A,B,C,D	-	Yes	-	Yes/No	High Temperature	Start	-
ESW Pump Room Unit Heater	VRS-MEH-601A,B,C,D, VRS-MEH-602A,B,C,D	-	Yes	-	Yes/No	Low Temperature	Start	-
UHS Transfer Pump Room Unit Heater	VRS-MEH-603A,B,C,D	-	Yes	-	Yes/No	Low Temperature	Start	-
ESW Piping Room Unit Heater	VRS-MEH-604A,B,C,D	-	Yes	-	Yes/No	Low Temperature	Start	-
UHS Transfer Piping Room Unit Heater	VRS-MEH-605A,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-OTD-601 A,B,C,D	-	Yes	-	No/No	-	(1)	-

RCOL2_14.0 3.07-38 S01

Appendix A.2

Table A.2-3
UHS ESW Pump House Ventilation System Equipment Alarms, Displays, and Control Functions

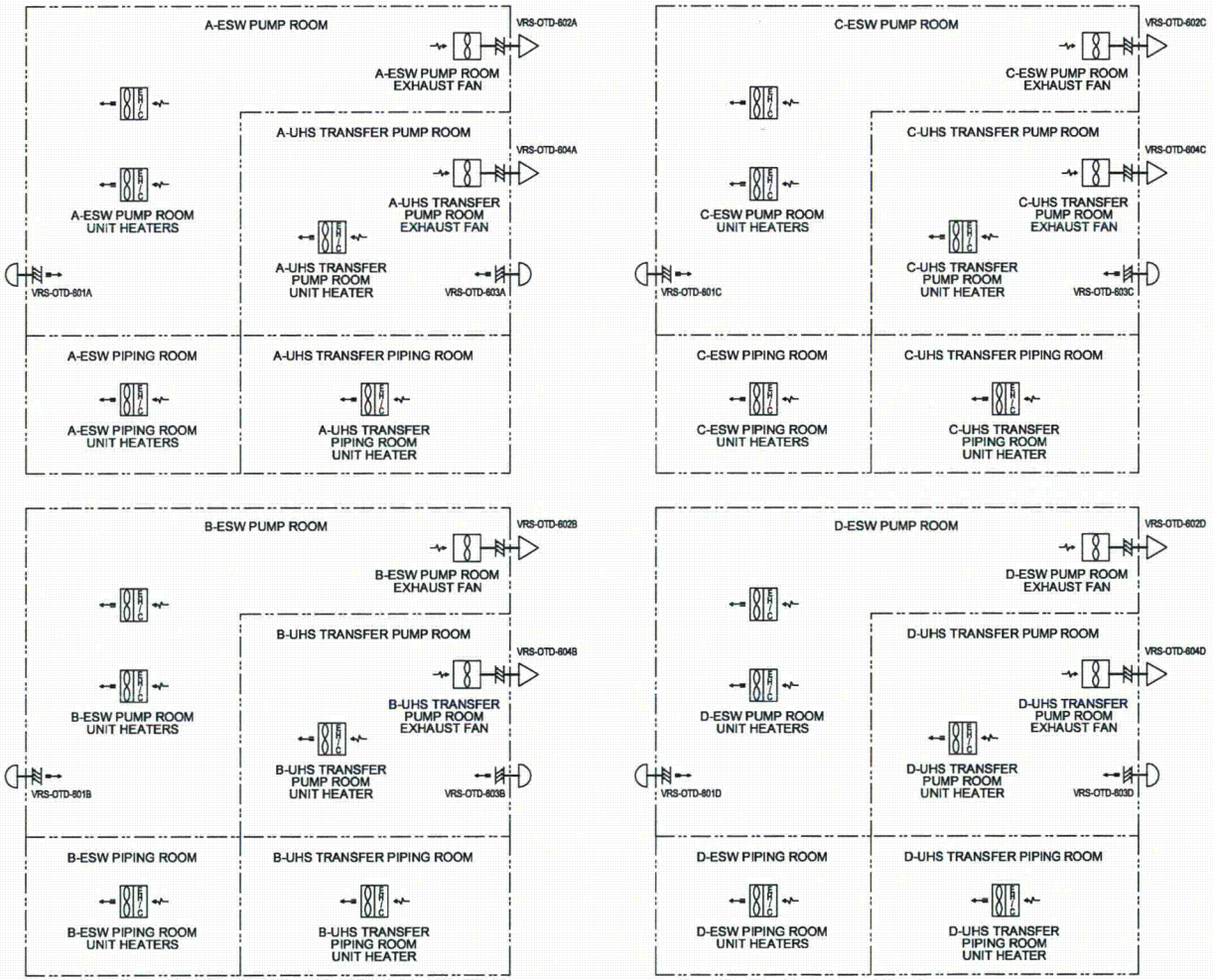
Equipment/Instrument Name	MCR/RSC Alarm	MCR/RSC Display	MCR/RSC Control Function
ESW Pump Room Exhaust Fan (VRS-MFN-601A,B,C,D)	No	Yes	Yes
UHS Transfer Pump Room Exhaust Fan (VRS-MFN-602A,B,C,D)	No	Yes	Yes
ESW Pump Room Unit Heater (VRS-MEH-601A,B,C,D, VRS-MEH-602A,B,C,D)	No	Yes	Yes
UHS Transfer Pump Room Unit Heater (VRS-MEH-603A,B,C,D)	No	Yes	Yes
ESW Piping Room Unit Heater (VRS-MEH-604A,B,C,D)	No	Yes	Yes
UHS Transfer Piping Room Unit Heater (VRS-MEH-605A,B,C,D)	No	Yes	Yes

RCOL2_14.0 3.07-38 S01

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 10 - ITAAC and Proposed License Conditions

Appendix A.2

Figure A.2-1 UHS ESW Pump House Ventilation System



CTS-01504
RCOL2_14.0
3.07-38 S01

Attachment 2

Supplemental Response to Request for Additional Information
No. 6457 (CP RAI #257)

SUPPLEMENTAL 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.: 6457 (CP RAI #257)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE OF RAI ISSUE: 5/3/2012

QUESTION NO.: 14.02-21

During the review of COL FSAR Section 14.2.12.1.113, "Ultimate Heat Sink (UHS) System Preoperational Test," the NRC staff determined there is incomplete or missing information. Specifically, the applicant is requested to address the following in the FSAR:

1. Testing for water hammer (or lack of a water hammer event) during system pump starts and stops.
2. Testing to ensure the ESWS/UHS void detection system works as designed.
3. UHS transfer pumps operate with various power supplies since pumps and associated motor operated valves get powered from more than one safety bus.
4. Testing of the freeze protection design features associated with the ESWS/UHS.
5. Testing of the UHS transfer pumps for adequate net positive suction head at the lower water level requirements and testing for lack of UHS transfer pump vortexing.
6. Testing of the UHS fans (speed and direction) – missing from acceptance criteria.

SUPPLEMENTAL INFORMATION:

Luminant responded to parts 1, 2, 3, 5, and 6 of this question in letter TXNB-12022 (ML12174A248).

4. The freeze protection design features of the ESWS/UHS have been described in the response to RAI 254-6403 S01 Question 14.03.07-38.

   FSAR Subsection 14.2.12.1.113 has been revised to include testing the ESWS return line drain valves. The ESW piping and UHS transfer piping between the pump house and the essential service water pipe tunnel are heated by unit heaters in the UHS ESW pump house ventilation system. Testing UHS ESW pump house ventilation system is already included in FSAR Subsection 14.2.12.1.114. That is, as indicated in response to RAI No. 3232 (CP RAI #123), Question 09.04.05-12 (ML093520667 Attachment 1 pages 48-53), the unit heaters that maintain proper environmental conditions during cold season are tested in accordance with DCD Subsection 14.2.12.2.4.11. Additionally, verification of the

heater fan flow rates to maintain the proper environmental conditions is conducted as required by FSAR Subsection 14.2.12.1.114, Items B-1 and B-2.

Impact on R-COLA

See attached marked-up FSAR Revision 3 pages 14.2-6 and 14.2-7

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

2. Component testing and instrument calibration is completed.
3. Test instrumentation is available and calibrated.
4. Required support systems are available.
5. Required system flushing/cleaning is completed.
6. Required electrical power supplies and control circuits are energized and operational.
7. Makeup water to the UHS basins is available.
8. CS/RHRS, CCWS, and ESWS are available during hot functional testing. RCOL2_14.0 2-20

C. Test Method

1. System component control and interlock circuits and alarms are verified, including cooling tower fan logic, basin water level sensors, temperature sensors, makeup water control, basin process chemical sensors, ~~spray header level switches,~~ blowdown control valves and ESW return line drain valves. RCOL2_14.0 2-16 S01, RCOL2_09.0 2.01-9 S01, RCOL2_14.0 2-21
2. The performance of each ESW pump and UHS transfer pump are monitored as basin water level is decreased to the minimum water level (end of the 30 day emergency period). RCOL2_14.0 2-21 S01
3. Basin water level and chemistry controls are monitored during continuous operations in the water level and chemistry control mode using the ESWS blowdown feature.
4. The capability of the ESWS to provide water to the FSS is demonstrated by opening the isolation valves and obtaining a total flow of at least 150 gpm to the hose stations located in the R/B and ESWS pump house while maintaining required ESWS flows and pressures.
5. UHS performance data is monitored during RCS cooldown in conjuction with hot functional testing. RCOL2_14.0 2-20

D. Acceptance Criteria

1. With the basin at minimum level (end of the 30 day emergency period), each ESW pump and UHS transfer pump has adequate NPSH and maintain design flow rates without vortex formation. RCOL2_14.0 2-21
2. The UHS fans operate as discussed in Subsection 9.2.5, including speed and direction.

3. ~~UHS transfer pumps operate as discussed in Subsection 9.2.5.~~ESW pumps, UHS transfer pumps, associated manual valves and motor-operated valves operate from their associated Class 1E buses as discussed in Subsections 9.2.1 and 9.2.5. RCOL2_09.02.05-21 RCOL2_14.02-21 S01

4. ~~UHS basin water level sensors and basin water level controls, and water chemistry monitors, controls, interlocks and associated blowdown equipment operate as discussed in Subsection 9.2.5.~~The UHS basin water level and temperature sensors, logic, and associated control functions; water chemistry monitors, logic, and associated control functions; ESW pump start logic, interlocks, and associated control functions; ESW pump discharge strainer isolation and backwash valves and valve logic; associated makeup and blowdown equipment; ~~and spray header level switches and logic;~~ and electric heat tracing operate as discussed in Subsections 9.2.1 and 9.2.5. RCOL2_14.02-16 S01 RCOL2_14.02-16 S01 RCOL2_14.02-21 RCOL2_09.02.01-9 S01 RCOL2_14.02-21 S01

5. ESWS maintains required flows and pressures while water is provided to the FSS as described in Subsection 9.2.1.3.

6. Significant water hammer does not occur during ESW pump and UHS transfer pump starts and stops. RCOL2_14.02-21

7. The UHS is capable of cooling down the RCS as discussed in Subsections 9.2.1 and 9.2.5. RCOL2_14.02-20

STD COL 14.2(10)

14.2.12.1.114 UHS ESW Pump House Ventilation System Preoperational Test

A. Objectives

1. To demonstrate operation of the UHS ESW pump house ventilation system.

B. Prerequisites

1. Required construction testing is completed.

2. Component testing and instrument calibration are completed.

3. Test instrumentation is available and calibrated.

4. Required support systems are available.

C. Test Method

1. Simulate interlock signals for each exhaust fan and unit heater and verify operation and annunciation.