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April 13, 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. 5377 (SECTION 11.5), 5474 (SECTION 11.2), AND 5598 (SECTION 9.4.1)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 5377 (CP RAI #201), 5474 (CP RAI #208) and 5598 (CP RAI #207) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAIs address the evaporation pond effluent radiation monitor and main control room envelope heater sizing calculation.

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 April 13, 2011.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments:
1. Response to Request for Additional Information No. 5377 (CP RAI #201)
2. Response to Request for Additional Information No. 5474 (CP RAI #208)
3. Response to Request for Additional Information No. 5598 (CP RAI #207)

D090
NRO

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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.: 5377 (CP RAI #201)

SRP SECTION: 11.05 - Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 1/26/2011

QUESTION NO.: 11.05-4

The NRC Staff's review of COLA FSAR (Rev. 1), Updated Tracking Report (Rev. 4), and response to RAI 2747, Question 11.02-4 (RAI Letter Number 29) found the applicant did not fully describe information on process and effluent radiation monitor sensitivity for compliance with 10 CFR Part 50, Appendix A, GDC 60 and 64, and SRP Sections 11.2 and 11.5. In the response to RAI 2747, Question 11.02-4 (RAI Letter No. 29), item (3), it states a portion of the [liquid] flow will go through the radiation monitor in the unlikely event that the bypass valve (VLV-531) which is normally locked-closed and tagged is left open or partially open. The in-line process effluent radiation monitor (RE-035) is to initiate pump shutdown, valve closure, and operator actions when the monitor reaches the high setpoint, but can be bypassed along with discharge control valves (RCV-035A/B) to ensure the discharge operation is not interrupted by either failure of control valves and/or radiation monitor.

Section 5.5 of ANSI/ANS-55.6-1993 (R2007), referenced in SRP Section 11.2, states that process and effluent radiation monitors shall have sensitivity sufficient to establish that discharges are within established limits and allow determination of the integrated quantity of radioactivity. Please provide a detailed analysis with the methodology, basis, and assumptions which demonstrates that the RE-035 radiation monitor has adequate sensitivity to meet its design objectives under this operation condition with reduced liquid discharge flow rates. Provide a mark-up of the proposed FSAR changes.

ANSWER:

As discussed in the response to Question 11.02-4, bypass valve VLV-531 is administratively controlled and normally maintained in the locked-closed position. This valve can only be opened with a key controlled by CPNPP Operations and its position status is verified by two technically-qualified members of CPNPP Operations.

Bypass valve VLV-531 is opened only during an outage of radiation monitor RE-035 and/or control valves RCV-035A/B. After maintenance is complete, the radiation monitor and/or control valves are reinstalled and tested as required. Following maintenance, the bypass valve VLV-531 is administratively controlled and maintained in the locked-closed position. The valve position is verified by at least two technically qualified members of the CPNPP Operations staff before discharge can start.

With this verification, there is no anticipated flow path through bypass valve VLV-531. However, the overall radiation monitor sensitivity and the impact on monitoring performance for the conservative assumption that the valve is inadvertently left fully-open are discussed below.

Flow from a waste monitor tank is monitored by radiation monitor RE-035. The continuous flow is stored in the sample chamber of the monitoring skid. There is no impact on monitoring sensitivity from a reduced flow rate because the sample chamber is always filled with liquid. However, there is an impact on monitor responsiveness from a reduced flow rate. When the bypass valve is closed, the monitor takes several seconds to respond. However, the monitor will take a few minutes to respond when the bypass valve is fully-opened. The design objective of RE-035 is to prevent a significant release of radionuclides from the liquid effluent. There is no significant difference between the two cases at normal operation, including anticipated operational occurrences, with respect to the design objective of RE-035.

The average liquid effluent activity from a waste monitor tank is shown below. These average liquid effluent activities can be detected by RE-035 (lower range = 1E-07 μCi/cm^3); therefore, RE-035 has sufficient sensitivity to establish that discharges are within established limits and allow determination of the integrated quantity of radioactivity.

There is no impact on the annual liquid release and the annual dose to the members of the public if the bypass valve is inadvertently left fully-open because RE-035 has sufficient sensitivity and the operator checks the tank water radioactivity concentration and water volume by sampling prior to the liquid effluent release.

Nuclide(1)	Expected Effluent Release (Ci/y)(2)		Effluent Volume (gpd)(3) (B)	Average Effluent Concentration (μCi/cm^3)(4) (C)
	From Waste Monitor Tank (WMT) via Holdup Tank (HT) (A1)	From Waste Monitor Tank (WMT) via Waste Holdup Tank (WHT) (A2)		
Rb-88	0	0.00187	From WMT via HT: 2785 gpd + 900 gpd From WMT via WHT: 2023 gpd	2.3E-07
Ru-106/Rh106	0.0001	0.00243		3.2E-07
Cs-136	0.0003	0.00112		1.8E-07
Cs-137/Ba-137m	0.00003	0.00008		1.4E-08
Ba-140	0.00001	0.00031		4.0E-08
La-140	0.00001	0.00051		6.5E-08
Total	6.8E-03 (Ci/y)		8.02E+09 (cm^3/y)	8.4E-07

Notes
(1) The major gamma-emitter nuclides are selected.
(2) See DCD Table 11.2-10 ("Shim Bleed" and "Misc. Wastes" columns).
These effluent releases are derived from the ANSI/ANS-18.1-1999 (realistic source term) and MHI PWR-GALE code.
"Shim bleed" effluent released from WMT via HT.

"Misc. wastes" effluent released from the WMT via WHT.

(3) See DCD Table 11.2-9 ("Shim Bleed Flow Rate," "Coolant Drain Flow Rate," and "Dirty Drainage Flow Rate" rows.)

(4) Average Effluent concentration is calculated from the equation shown below:

$\mathbf{C}$ = ($\mathbf{A1}$ + $\mathbf{A2}$) x 1E+06 (µCi/Ci) / ($\mathbf{B}$ x 365.25 (day/year) x 3.785412E+03 (cm^3/gal))

Impact on R-COLA

See attached marked-up FSAR Revision 1 pages 11.2-3 and 11.2-4.

Impact on S-COLA

None; this RAI is site-specific.

Impact on DCD

None.

evaporation pond effluents are commingled with various Unit 1 and 2 waste effluent streams. This Unit 1 circulating water flow path then goes to the Unit 1 condenser water box outlet, where it joins the Unit 2 condenser water box outlet flow. The joined flows from the Unit 1 and 3 condenser water boxes are then sent to the SCR via the Unit 1 and 2 discharge tunnel and outfall structure from all four units (see Figure 11.2-201 Sheet 10) for a visual representation of the above described flow path.

The header where the WMS intersects with the CWS is located within the Unit 1 Turbine building. The header contains two flow balancing valves (1CW-247 and 1CW-248) for Units 1 and 2. This arrangement ensures that there is always circulating cooling water flow for Unit 1 and/or Unit 2. The circulating water discharge piping then becomes progressively larger and flows freely (no valves) into the Unit 1 condenser water discharge box. This flow path also ensures there is less back pressure into the treated effluent flow. Based on the fact that the effluent piping flows freely into the box and that there is less back pressure, there is no need for a mixing orifice and backflow preventer, as the large circulating water return flow and length of pipe is sufficient to thoroughly mix the release.

The bypass valve, VLV-531, is located in the same area with the radiation monitor and the discharge control valves (RCV-035A and RCV-035B), which are inside the Auxiliary Building. All normal discharge is required to go through the discharge control valves. To ensure discharge operation is not ~~interrupted~~prevented by the failure of the control valves at any time, a bypass valve is added around the radiation monitor and the discharge control valves. Plant procedures require that an operator verify the tank water radioactivity concentration by sampling and water volume by level indicator prior to a liquid effluent release via the bypass valve. The ODCM and supporting procedures ensure appropriate actions to prevent an unmonitored release. RCOL2_11.02-17 RCOL2_11.02-17

Any leakage from the ~~bypass~~piping and the valves inside the buildings is collected in the floor drain sump, and is forwarded to the waste holdup tank for re-processing. It should be noted that the discharge control valves are downstream of the discharge isolation valve (AOV-522A and AOV-522B). During normal operations, the discharge is anticipated to occur once a week for approximately three hours for treated effluent, and one discharge (approximately an hour at 20 gpm) of detergent waste (filtered personnel showers and hand washes) daily. After each discharge, the line is flushed with demineralized water for decontamination. RCOL2_12.03-12.04-11

The bypass valve is normally locked-closed and tagged. It requires an administrative approval key to open and the valve position is verified by at least two technically qualified members of the CPNPP Operations staff before discharge can start. Thus, a single operator error does not result in an unmonitored release. In the unlikely event that the valve is inadvertently left open, or partially open, the flow element detects flow and initiates an alarm for operator action. ~~Also, at least a portion of the flow goes through the radiation monitor.~~Also, a portion of the flow continues to flow through the radiation monitor sample RCOL2_11.02-17 RCOL2_11.05-4 chamber. Because the monitor output depends on radionuclide concentration and not flow rate, there is no impact on radiation monitor sensitivity from reduced flow conditions. Prior to opening VLV-531 to establish the alternate flow path, the tanks (ATK-006A and ATK-006B) will be sampled and water volume verified by level indicator to confirm that the contents meet the discharge specifications. Therefore, there is no impact on the annual liquid release and the annual dose to the members of the public if the bypass valve is inadvertently left fully-open. RCOL2_11.05-4 RCOL2_11.02-17

If the monitor reaches the high setpoint, it sends signals to initiate pump shutdown, valve closure and operator actions.

11.2.2.2.2 Tanks

RCOL2_11.02-14

Replace the second paragraph in DCD Subsection 11.2.2.2.2 with the following.

The tanks are equipped with overflows (at least as large as the largest inlet) into the appropriate sumps. The cells/cubicles housing tanks that contain significant quantities of radioactive material are coated with epoxy to a height that is sufficient to hold the tank contents in the event of tank failure. These coating are Service Level II as defined in RG 1.54 Revision 1, and are subject to the limited QA provisions, selection, qualification, application, testing, maintenance and inspection provisions of RG 1.54 and standards reference therein, as applicable to Service Level II coatings. Table 13.4-201 provides the milestone for decontaminable paints (epoxy coating implementation). Post-construction initial inspection is performed by personnel qualified using ASTM D 4537 (Reference 11.2-22) using the inspection plan guidance of ASTM D 5163 (Reference 11.2-23). Level detecting instrumentation measuring the current tank inventories is provided. High- and low-level alarms are provided. These alarms are annunciated in the radwaste control room located in the A/B and also in the MCR.

11.2.3.1 Radioactive Effluent Releases and Dose Calculation in Normal Operation

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CP COL 11.2(2)
CP COL 11.2(4)

Replace the last ~~five~~six paragraphs in DCD Subsection 11.2.3.1 with the following. MAP-11-201

The detailed design information of release point is described in Subsection 11.2.2.

The annual average release of radionuclides is estimated by the PWR-GALE Code (Ref.11.2-13) with the reactor coolant activities that is described in Section 11.1. The version of the code is a proprietary modified version of the NRC RCOL2_11.03-4

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.: 5474 (CP RAI #208)

SRP SECTION: 11.02 - Liquid Waste Management System

QUESTIONS for Balance of Plant Branch 2 (SBPB)

DATE OF RAI ISSUE: 3/10/2011

QUESTION NO.: 11.02-17

In response to RAI 11.2-4, Luminant provided information on the administrative controls regarding the bypass around the discharge radiation monitor in the liquid waste management system. However, the following additional information is needed in the COLA FSAR to confirm compliance with Part 50, Appendix A, General Design Criterion (GDC) 60:

The RAI response states: "Prior to opening VLV-531 to establish the alternate flow path, the tanks (ATK-006A and ATK-006B) will be sampled and the contents confirmed to meet the discharge specifications." This statement should be included in the FSAR to ensure that tank concentrations are less than the effluent concentration limits (ECLs) specified in 10 CFR 20, Appendix B prior to opening the bypass valve, in order to comply with Part 50, Appendix A GDC 60 and 64.

Provide additional information in the FSAR to confirm that an unmonitored release will not occur during the scenario where the unmonitored discharge bypass is being used for an offsite discharge and the monitor tank sample is not indicative of the actual radionuclide concentration of the tanks (for example due to human error, or analysis equipment error). Provide additional details in the FSAR to ensure that this unmonitored discharge effluent will be less than the effluent concentration limits specified in 10 CFR 20, Appendix B.

NUREG-0800, Standard Review Plan (SRP) Section 11.2, "Review Procedures," 3.F specifies that NRC guidance includes industry standards including ANS 55.6. ANS 55.6 Section 5.5 "Process and Effluent Radiation Monitoring" states: "The process and effluent radiation monitoring devices shall be designed to provide continuous monitoring and recording of information about radioactive liquids being released to the environment from the [Liquid Radwaste Processing Systems] (LRWPS). Effluent radiation monitors in the system shall automatically terminate the release of radioactive waste upon determination of high radiation (above a predetermined set point) in the discharge... All pathways of liquid radioactive releases to the environment shall be monitored." The current design has a bypass around the radiation monitor, therefore creating a pathway of liquid radioactive release to the environment that is not monitored. In addition, the design has isolation provisions for the radiation monitor as well, so it cannot be relied upon for monitoring in bypass discharge configurations. Table 1.9 -212, "Comanche Peak Nuclear Power Plant Units 3 & 4 Conformance with Standard Review Plan Chapter 11 Radioactive Waste Management," does not show this exception from SRP 11.2 guidance. Provide additional details in the FSAR either addressing how the design ensures the pathway of liquid radioactive release to the environment will always be monitored or specifically justify the exception from SRP 11.2 and ANS 55.6 in FSAR Section 11.2 and Table 1.9.-212.

ANSWER:

As discussed in the response to RAI No. 5377 (CP RAI #201) Question 11.05-4 above, VLV-531, the bypass valve around radiation monitor RE-035, is administratively controlled and normally maintained in the locked-closed position. This valve can only be opened with a key controlled by CPNPP Operations and its position status is verified by two technically-qualified members of CPNPP Operations.

Procedure compliance requires the operator to verify the tank water radioactivity concentration by sampling and verify water volume by level indicator prior to releasing effluent. Therefore, unmonitored effluent will not be discharged to the environment. The liquid effluent can be monitored even if RE-035 is inoperable and the bypass line is being used. The FSAR has been revised to include the procedural requirement to sample concentration and verify tank water volume before release. This is compliant with SRP 11.5 Acceptance Criteria regarding the monitoring of batch releases. As such, the CPNPP FSAR does not need to identify an exception to SRP 11.2 or ANS 55.6.

Impact on R-COLA

See attached marked-up FSAR pages 11.2-3 and 11.2-4.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

evaporation pond effluents are commingled with various Unit 1 and 2 waste effluent streams. This Unit 1 circulating water flow path then goes to the Unit 1 condenser water box outlet, where it joins the Unit 2 condenser water box outlet flow. The joined flows from the Unit 1 and 3 condenser water boxes are then sent to the SCR via the Unit 1 and 2 discharge tunnel and outfall structure from all four units (see Figure 11.2-201 Sheet 10) for a visual representation of the above described flow path.

The header where the WMS intersects with the CWS is located within the Unit 1 Turbine building. The header contains two flow balancing valves (1CW-247 and 1CW-248) for Units 1 and 2. This arrangement ensures that there is always circulating cooling water flow for Unit 1 and/or Unit 2. The circulating water discharge piping then becomes progressively larger and flows freely (no valves) into the Unit 1 condenser water discharge box. This flow path also ensures there is less back pressure into the treated effluent flow. Based on the fact that the effluent piping flows freely into the box and that there is less back pressure, there is no need for a mixing orifice and backflow preventer, as the large circulating water return flow and length of pipe is sufficient to thoroughly mix the release.

The bypass valve, VLV-531, is located in the same area with the radiation monitor and the discharge control valves (RCV-035A and RCV-035B), which are inside the Auxiliary Building. All normal discharge is required to go through the discharge control valves. To ensure discharge operation is not ~~interrupted~~prevented by the failure of the control valves at any time, a bypass valve is added around the radiation monitor and the discharge control valves. Plant procedures require that an operator verify the tank water radioactivity concentration by sampling and water volume by level indicator prior to a liquid effluent release via the bypass valve. The ODCM and supporting procedures ensure appropriate actions to prevent an unmonitored release. RCOL2_11.02-17 RCOL2_11.02-17

Any leakage from the ~~bypass~~piping and the valves inside the buildings is collected in the floor drain sump, and is forwarded to the waste holdup tank for re-processing. It should be noted that the discharge control valves are downstream of the discharge isolation valve (AOV-522A and AOV-522B). During normal operations, the discharge is anticipated to occur once a week for approximately three hours for treated effluent, and one discharge (approximately an hour at 20 gpm) of detergent waste (filtered personnel showers and hand washes) daily. After each discharge, the line is flushed with demineralized water for decontamination. RCOL2_12.03-12.04-11

The bypass valve is normally locked-closed and tagged. It requires an administrative approval key to open and the valve position is verified by at least two technically qualified members of the CPNPP Operations staff before discharge can start. Thus, a single operator error does not result in an unmonitored release. In the unlikely event that the valve is inadvertently left open, or partially open, the flow element detects flow and initiates an alarm for operator action. ~~Also, at least a portion of the flow goes through the radiation monitor.~~Also, a portion of the flow continues to flow through the radiation monitor sample RCOL2_11.02-17 RCOL2_11.05-4 chamber. Because the monitor output depends on radionuclide concentration and not flow rate, there is no impact on radiation monitor sensitivity from reduced flow conditions. Prior to opening VLV-531 to establish the alternate flow path, the tanks (ATK-006A and ATK-006B) will be sampled and water volume verified by level indicator to confirm that the contents meet the discharge specifications. Therefore, there is no impact on the annual liquid release and the annual dose to the members of the public if the bypass valve is inadvertently left fully-open. RCOL2_11.05-4 RCOL2_11.02-17

If the monitor reaches the high setpoint, it sends signals to initiate pump shutdown, valve closure and operator actions.

11.2.2.2.2 Tanks

RCOL2_11.02-14

Replace the second paragraph in DCD Subsection 11.2.2.2.2 with the following.

The tanks are equipped with overflows (at least as large as the largest inlet) into the appropriate sumps. The cells/cubicles housing tanks that contain significant quantities of radioactive material are coated with epoxy to a height that is sufficient to hold the tank contents in the event of tank failure. These coating are Service Level II as defined in RG 1.54 Revision 1, and are subject to the limited QA provisions, selection, qualification, application, testing, maintenance and inspection provisions of RG 1.54 and standards reference therein, as applicable to Service Level II coatings. Table 13.4-201 provides the milestone for decontaminable paints (epoxy coating implementation). Post-construction initial inspection is performed by personnel qualified using ASTM D 4537 (Reference 11.2-22) using the inspection plan guidance of ASTM D 5163 (Reference 11.2-23). Level detecting instrumentation measuring the current tank inventories is provided. High- and low-level alarms are provided. These alarms are annunciated in the radwaste control room located in the A/B and also in the MCR.

11.2.3.1 Radioactive Effluent Releases and Dose Calculation in Normal Operation

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CP COL 11.2(2) CP COL 11.2(4)

Replace the last ~~five~~six paragraphs in DCD Subsection 11.2.3.1 with the following. MAP-11-201

The detailed design information of release point is described in Subsection 11.2.2.

The annual average release of radionuclides is estimated by the PWR-GALE Code (Ref.11.2-13) with the reactor coolant activities that is described in Section 11.1. The version of the code is a proprietary modified version of the NRC RCOL2_11.03-4

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.: 5598 (CP RAI #207)

SRP SECTION: 09.04.01 - Control Room Area Ventilation System

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

DATE OF RAI ISSUE: 3/10/2011

QUESTION NO.: 09.04.01-3

This is follow-up question to RAI No. 3219 (RAI Letter No 63), Question No. 09.04.01-1. The applicant provided its responses to RAI No 3219 on October 30, 2009 and October 29, 2010. (ADAMS Accession Numbers ML093090163 and ML103060043).

The applicant, in its response dated October 23, 2009 (ML093090163) provided information on the basic equation used and the parameters used to derive the kilowatt sizing of each air handling unit (AHU) heater. The applicant based this calculation on an outside air temperature of -0.5°F, based on the historical limit excluding 2 hour peaks from COLA FSAR Table 2.0-1R. The applicant amended this response on October 29, 2010 (ML103060043) with a recalculated heater size based on outside air temperature of -5°F based on the more conservative 0% exceedance minimum value. This revision of FSAR Table 2.0-1R data was driven by the applicant's response to RAI No. 4606 (RAI Letter No 155), Question No. 02.03.01-6, dated September 29, 2010 (ML102780284).

The staff evaluated the information presented in the RAI responses and concluded that the methodology used to derive the kilowatt sizing of each AHU heater was reasonable. However it was not obvious or verifiable from the data presented in the RAI responses, that the resultant temperature from mixing the two air streams of 18,000 cfm returning from the control room with 1800 cfm of fresh outside air was accurate. Furthermore, the calculations, inputs (e.g. MCR heat loads) and assumptions used to determine the 75.1°F return temperature of the air (i.e. 18,000 cfm) from the MCR were not part of the applicant's response. The derivation of this parameter is a key in determining the integrity of the heater sizing calculations. Therefore, the NRC staff requests that the applicant make available to the staff, the calculations, assumptions and input parameters used in the derivation of the MCR air handling unit heaters. As an option, Luminant may place these calculations and supporting information in the Luminant's Comanche Peak electronic reading room. Alternatively, the staff can perform a formal audit of the applicant's engineering support calculations at the applicant's business site.

The staff also notes that the applicant, in its response to Question No. 09.04.01-1, did not amend FSAR section 9.4.1.2 to reflect the design basis of the heaters (i.e. change of outside air temperature from -0.5°F to -5.0°F). The staff requests that the applicant correct this FSAR deficiency as part of its response.

ANSWER:

As described in DCD Subsection 9.4.1.2.1, the Main Control Room (MCR) HVAC system provides 20,000 cfm of supply airflow to the MCR (and the other rooms in the MCR complex hereafter just referred to as the MCR) and the MCR Toilet/Kitchen Exhaust Fan transfers 1,800 cfm to the outside during normal operation mode. Therefore, the return airflow rate from the MCR is 18,200 cfm. The supply air temperature to the MCR (78°F) is determined to maintain the maximum MCR temperature as described in DCD Table 9.4-1. Return air temperature from the MCR is derived from heat loss from the MCR, supply airflow to the MCR, and supply air temperature. The heat loss from the MCR (62,000 BTU/h) is through the concrete walls at -5°F outside air temperature and is a design value. The return air temperature is calculated by the following equation and is determined by the following design condition.

$$tr = ts - q / (\rho \times Cp \times Q \times 60)$$
$$= 78 - 62{,}000 / (0.075 \times 0.24 \times 20{,}000 \times 60)$$
$$= 75.13^{\circ}F \text{ (use } 75.1^{\circ}F \text{ for conservatism)}$$

where,

tr:	Return air temperature (°F)
ts:	Supply air temperature (78.0°F)
q:	Heat loss from MCR (62,000 BTU/h)
ρ:	Density (0.075 lb/ft^3)
Cp:	Specific heat (0.24 BTU/lb-F)
Q:	Supply airflow rate across the heating coils (20,000 CFM with two AHU operating)

Entering air temperature of heating coil mixed with 1,800 cfm of outside air (makeup air) at -5°F and 18,200 cfm of return air from the MCR at 75.1°F is:

$$67.8^{\circ}F = ((- 5 \times 1800 + 75.1 \times 18200) / 20000)$$

The full calculation package (4CS-CP34-20110004) has been placed in the electronic reading room for staff review.

Luminant revised the FSAR to use the 100-year return period minimum dry bulb temperatures for site calculations in a supplemental response to RAI No. 4606 (CP RAI #155) (ML102780284). In that submittal, Luminant committed to determine if there were other changes resulting from the use of the extreme temperatures. Those additional changes to both RAI responses and FSAR pages were submitted (ML103060043), including a revision to FSAR Table 9.4-201, which provided the design impact of using an outside air temperature of -5.0°F instead of -0.5°F.

Impact on R-COLA

None.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.