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January 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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 6173
(SECTION 9.2.5)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 6173 (CP RAI #241) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI response addresses the Technical Specification surveillance requirements for the ultimate heat sink water temperature and level.

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 January 24, 2012.

Sincerely,

Luminant Generation Company LLC

Rafael Flores for

Attachment: Response to Request for Additional Information No. 6173 (CP RAI #241)

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.: 6173 (CP RAI #241)

SRP SECTION: 09.02.05 - Ultimate Heat Sink

QUESTIONS for Balance of Plant Branch 1 (SBPA)

DATE OF RAI ISSUE: 11/22/2011

QUESTION NO.: 09.02.05-17

NRC regulations 10 CFR 50.36(c)(2)(ii) states that a technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria ... (C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Luminant plans to use mechanical draft cooling towers (MDCT) at Comanche Peak, Units 3 and 4 for its ultimate heat sink (UHS). Regulatory Position 4 from Regulatory Guide (RG) 1.27 (1976), "Ultimate Heat Sink for Nuclear Power Plants," states, in part, that the technical specifications for the plant should include provisions for actions to be taken in the event that conditions threaten partial loss of the capability of the UHS. Thus, the staff needs assurance that the assumptions used to calculate the UHS cooling capability bound actual conditions.

There are already surveillance requirements in TS 3.7.9 for the UHS cooling tower basin water temperature (SR 3.7.9.2) and level (SR 3.7.9.1). For a MDCT, wet bulb (WB) temperature dictates the cooling tower's heat removal capacity. The higher the ambient WB temperature, the worse the cooling performance of the tower. A higher WB temperature than previously analyzed would threaten the cooling capability of the MDCT UHS. Thus, if RG 1.27 is followed, plants that use MDCTs for their UHS should incorporate an ambient WB temperature surveillance requirement in their TS.

For the Comanche Peak (CP) COL FSAR – Revision 2, the variable "wet bulb" is found in several locations as shown below:

- CP FSAR Section 9.2.5.1, "Design Bases," states that the UHS is designed in accordance with Regulatory Guide 1.27 with inventory sufficient to provide cooling for at least 30 days following an accident, with no makeup water. The performance of the UHS is based upon 30 years of site-specific historical wet bulb temperature conditions.

- CP FSAR 9.2.5.2.3, "System Performance," states that the wet bulb design temperature was selected to be 80°F based on 30 years (1977-2006) of climatological data obtained from National Climatic Data Center /National Oceanic & Atmospheric Administrator for Dallas/ Fort Worth

International Airport Station in accordance with RG 1.27. The worst 30 day period based on the above climatological data was between June 1, 1998 and June 30, 1998, with an average wet bulb temperature of 78.0°F. A 2°F recirculation penalty was added to the maximum average wet bulb temperature was added to the maximum average wet bulb temperature.

The 83° F wet bulb temperature site characteristic value shown in the COLA FSAR Table 2.0-1R corresponds to the 0% exceedance value (two consecutive hourly peak temperatures on July 12, 1995, at 1500 hours and 1600 hours).
The 0% exceedance criterion is an historical limit which excludes peaks of less than two hours. The 83° F wet bulb temperature is used to establish the cooling tower basin water temperature surveillance requirements.

- CP FSAR 9.2.5.2.1, "General Description," states that the cooling towers are designed for the following conditions: water flow of 12,000 gpm, hot (inlet) water temperature of 128° F, cold (outlet) water temperature of 95° F, ambient wet bulb temperature of 80° F, and DBA design heat load of 196.00×10^6 Btu/hr.

- CP FSAR 9.2.5.3, "Safety Evaluation," states that during normal power operation, the UHS basin water temperature is expected to be below 93° F under the worst-case ambient condition (i.e. wet bulb temperature of 83° F based on the 0% annual exceedance value). At the initiation of the LOOP event, each basin contains approximately 3.12 million gallons of water (minimum required is 2.80 million gallons per Technical Specification 3.7.9). The heat load peaks (196 million Btu/hr/train) four hours into the accident and then decreases continuously. The heat load is approximately 81 million Btu/hr/train at 24 hours into the accident. Cooling tower water discharge at 95° F and at a flow rate of 12,000 gpm mixing with the large quantity of basin water increases the basin water temperature (initially below 93° F). The basin water temperature increases until an equilibrium is reached. However, since the cooling tower is designed for 95° F discharge water at a peak heat load of 196 million Btu/hr, the basin water temperature will not exceed 95° F. LOCA peak heat loads are less than the safe shutdown peak heat loads. Thus, the safe shutdown analysis bounds the LOCA case.

- CP FSAR Table 9.2.5-3R, "Ultimate Heat Sink Design Data," states that the design wet bulb temperature is 80° F.

Since the ambient WB temperature greatly influences the heat removal capacity and efficiency of the MDCT and may simultaneously affects all four trains of the UHS, which is used to protect fission product barriers:

a. Describe in the COLA FSAR the condition of the UHS that would exist if the ambient WB temperature exceeds the UHS design basis 80° F and 0% exceedance (historic maximum 2-hour) 83° F WB temperatures.

b. Describe in the CP TS bases the UHS WB temperature margins.

c. Create a Comanche Peak (CP) TS surveillance (and associated TS Bases) for ambient WB temperature as it relates to cooling tower performance. Also, describe in the CP TS how ambient WB is to be measured and on what frequency.

Or, provide justification for why the TS surveillance requirements for UHS water temperature and level alone provide assurance, in accordance with RG 1.27, that if the ambient WB is exceeded, the UHS is still able to perform its intended heat removal function.

ANSWER:

The wet bulb temperature of 80°F and the 0% exceedance wet bulb temperature of 83°F are appropriately calculated in accordance with RG 1.27 and the Advanced Light Water Utility Requirements Document (URD) EPRI TR-016780. These are the meteorological parameters used to confirm that the UHS system as designed is capable of performing its required function. Using these parameters, the UHS has design margin to accommodate postulated future changes in local meteorology.

As described in FSAR Subsection 9.2.5, the UHS is designed in accordance with RG 1.27. The design for the MDCT and the UHS is confirmed using an ambient wet bulb temperature of 80°F. As stated in Subsection 9.2.5.2.3, the UHS wet bulb temperature used to confirm the design was 80°F based on 30 years (1977-2006) of climatological data obtained from the National Climatic Data Center/National Oceanic & Atmospheric Administration for the Dallas/Fort Worth International Airport Station. From this data, the worst 30-day period relative to wet bulb temperature occurred between June 1, 1998 and June 30, 1998, with an average wet bulb temperature of 78.0°F. A recirculation penalty of 2°F was added as margin to give an 80°F UHS design basis wet bulb temperature.

The UHS cooling tower basin water temperature surveillance requirement (SR 3.7.9.2) that the UHS water temperature is ≤ 93°F provides margin for the plant operating staff to monitor and verify the UHS temperature is ≤ 95°F averaged over the previous 24-hour period. This operability limit for the UHS was confirmed by analyses using the 0% exceedance non-coincident wet bulb temperature (83°F) as given in FSAR Table 2.0-1R, which is the more conservative temperature and provides additional margin. The operator needs only to check the UHS basin temperature to assure UHS heat removal performance. The UHS heat removal capacity depends on the UHS basin temperature and directly affects the CCW heat exchanger, which dominates the plant cooling performance. The period of functionality is based upon the volume of water available, which is verified by basin water level. As such, UHS basin temperature and water level alone provide assurance, in accordance with RG 1.27, that the UHS is capable of performing its intended heat removal functions. In accordance with the regulatory guide, an appropriate worst case combination of controlling meteorological parameters were used to confirm the adequacy of the design and neither the design or the Technical Specifications need to address the potential or consequences of exceeding those worst case meteorological parameters. Thus, the impact of exceeding the worst case wet bulb temperature has not been calculated (and the RG does not require that it be calculated) although it is known that increasing wet bulb temperature will decrease the performance of the system. RG 1.27 was confirmed to be implemented in this manner in the Standard Technical Specifications and in the technical specifications for numerous operating plants.

In summary, while 78°F wet bulb temperature would satisfy the regulatory guide, Luminant added margin and used 80°F for the 30-day safety analysis of the system and used 83°F (the 0% exceedance non-coincident wet bulb value) to confirm performance of the system. The conservatism used by Luminant shows that the UHS design has sufficient margin to accommodate postulated future changes in local meteorology.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.