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January 9, 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. 6193
(SECTION 2.3)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 6193 (CP RAI #242) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI response addresses the ultimate heat sink design air temperature.

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 9, 2012.

Sincerely,

Luminant Generation Company LLC

RD Grant for
Rafael Flores

Attachment: Response to Request for Additional Information No. 6193 (CP RAI #242)

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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.: 6193 (CP RAI #242)

SRP SECTION: 02.03.01 - Regional Climatology

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 11/23/2011

QUESTION NO.: 02.03.01-14

General Design Criteria 44, "Cooling Water," of Appendix A to 10 CFR Part 50 states a system to transfer heat from SSCs important to safety to an ultimate heat sink (UHS) shall be provided. Section C.III.2.3.1.2, "Regional Meteorological Conditions for Design and Operating Bases," of RG 1.206 states the meteorological data used to evaluate the performance of the UHS should be provided.

The following sentences were added in Revision 2 of FSAR Section 2.3.1.2.10, "Ultimate Heat Sink," in the response to Question 02.03.01-1:

> *The ambient design air temperatures in Table 2.0-1R are considered in the design of the UHS and are derived based on hourly readings of dry bulb temperature and dew point data from Dallas/Fort Worth Airport (DFW) for the 30-year period from 1977- 2006. Wet bulb temperatures are determined from the NOAA/NCDC data using psychrometric conversion algorithms consistent with the ASHRAE Handbook – Fundamentals (2005). The 1-percent exceedance values for dry bulb temperature and non-coincident wet bulb temperature represent the 99th percentile values (minimum and maximum). The 1-day, 5-day and 30-day worst time periods for the 30-year period were selected from these data. The 0-percent exceedance values (maximum and minimum historical limits) were selected by screening the 30-year hourly temperature records with maximum or minimum dry bulb temperature readings for at least two consecutive hours. Mean coincident wet bulb temperatures represent the average wet bulb values associated with the corresponding dry bulb temperatures at the specified exceedance value.*

Please update FSAR Section 2.3.1.2.10 as follows:

a. Clarify which of the ambient design air temperatures in FSAR Table 2.0-1R were considered in the design of the UHS.
b. Explain how the 1% exceedance dry bulb and non-coincident wet bulb temperatures discussed in the paragraph above were used in the design of the UHS.
c. Describe the 1-day and 5-day worst time periods discussed in the paragraph above and explain how they were used in the design of the UHS.

ANSWER:

a. As described in FSAR Subsection 9.2.5, the Ultimate Heat Sink (UHS) is designed in accordance with RG 1.27 (1976). The design for cooling towers and the UHS are based upon an ambient wet bulb temperature of 80°F. As stated in Subsection 9.2.5.2.3, the UHS wet bulb design temperature was selected to be 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 for conservatism, resulting in a UHS design basis wet bulb temperature of 80°F. The UHS design basis wet bulb temperature (80°F) is not presented in FSAR Table 2.0-1R.

b. FSAR Table 2.0-1R includes the 1% exceedance dry bulb and non-coincident wet bulb ambient air temperatures. These temperatures are not used in the design or surveillance requirements for the UHS and are provided in FSAR Table 2.0-1R for other purposes or are provided for information only. The UHS cooling tower basin water temperature surveillance requirement (SR 3.7.9.B.1) was based on the 0% exceedance non-coincident wet bulb temperature (83°F) as given in FSAR Table 2.0-1R, which is the more conservative temperature. The Luminant COLA and the US-APWR DCD use the definition given in the Advanced Light Water Reactor Utility Requirements Document (URD), EPRI TR-016780. As specified in the US-APWR DCD, the 0% exceedance maximum design dry-bulb temperature is defined as the historical limit, excluding peaks of less than two hours, combined with the maximum wet-bulb temperature that exists in that population of dry-bulb temperatures. The wet bulb temperature is used because the performance efficiency of a mechanical draft cooling tower is governed by the wet-bulb temperature of air. Therefore, only non-coincident wet bulb temperatures were used in the UHS design (as discussed in item a. above) or in the surveillance requirements.

c. The worst 1-day and 5-day time periods are periods with the highest average temperatures for these durations over the 30-year data record. RG 1.27 states that the meteorological conditions considered in the design of the UHS should be selected with respect to the controlling parameters and critical time periods unique to the specific design of the sink. Because the critical time period for the mechanical draft cooling towers is 30 days, the 1-day and 5-day worst time periods were not used in the design of the UHS. Per RG 1.27,

> The meteorological conditions resulting in maximum evaporation and drift losses should be the worst 30-day average combination of controlling parameters (e.g., dewpoint, depression, windspeed, solar radiation). The meteorological conditions resulting in minimum water cooling should be the worst combination of controlling parameters, including diurnal variations where appropriate, for the critical time period(s) unique to the specific design of the sink.

The controlling parameter for a mechanical draft cooling tower is the wet-bulb temperature of air. The 1-day and 5-day time periods are not critical time periods for the CPNPP Units 3 and 4 UHS. Therefore, the worst 30-day average wet-bulb temperature was the controlling parameter used in the design of the UHS.

FSAR Subsection 2.3.1.2.10 has been revised to clarify the wet bulb temperatures used in the UHS design and surveillance requirements.

Impact on R-COLA

See attached marked-up FSAR Revision 2 page 2.3-23.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

safety-related systems and components would not be jeopardized. US-APWR seismic category I building roofs are designed as a drainage system capable of handling the PMWP. The US-APWR DCD also states that seismic category I structures have sloped roofs designed to preclude roof ponding. This is accomplished by channeling rainfall expeditiously off the roof.

2.3.1.2.9 Dust Storms

Blowing dust or sand may occur occasionally in West Texas where strong winds are more frequent and vegetation is sparse. While blowing dust or sand may reduce visibility to less than five mi over an area of thousands of sq mi, dust storms that reduce visibility to one mi or less are quite localized and depend on soil type, soil condition, and vegetation in the immediate area. The NCDC Storm Event database did not report any dust storms in Somervell County between January 1, 1950 and August 31, 2007.

2.3.1.2.10 Ultimate Heat Sink

The performance of the ultimate heat sink is discussed in Subsection 9.2.5. The ambient design air temperatures ~~in Table 2.0-1R~~ are considered in the design of the UHS ~~and~~ are ~~derived~~ based on hourly readings of dry bulb temperature and dew point data from Dallas/Fort Worth Airport (DFW) for the 30-year period from 1977- 2006. Wet bulb temperatures are determined from the NOAA/NCDC data using psychrometric conversion algorithms consistent with the ASHRAE Handbook – Fundamentals (2005). ~~The 1 percent exceedance values for dry bulb temperature and non-coincident wet bulb temperature represent the 99th percentile values (minimum and maximum).~~ The ~~1-day, 5-day and~~ worst 30-day ~~worst~~ time period~~s~~ for the 30-year period ~~were~~was selected ~~from these data~~. ~~The 0-percent exceedance values (maximum and minimum historical limits) were selected by screening the 30-year hourly temperature records with maximum or minimum dry bulb temperature readings for at least two consecutive hours. Mean coincident wet bulb temperatures represent the average wet bulb values associated with the corresponding dry bulb temperatures at the specified exceedance value. The wet bulb design temperature for the ultimate heat sink was selected to be 80°F in accordance with RG 1.27. The worst 30 day period was selected~~ from the above climatological data between June 1, 1998 and June 30, 1998, with an average wet bulb temperature of 78.0°F. A 2°F margin was added to the maximum average wet bulb temperature for conservatism. Consequently, the design basis non-coincident wet bulb temperature for the ultimate heat sink was specified as 80°F in accordance with RG 1.27. The 0% exceedance non-coincident wet bulb temperature was determined by screening the 30-year hourly temperature records and selecting the maximum wet bulb temperature that existed for at least two consecutive hours. The 0% exceedance non-coincident wet bulb temperature is 83°F which is used for determining the basin water temperature surveillance requirement. The potential for freezing of the ultimate heat sink is remote due to the infrequent occurrence of low temperatures and the short duration of low temperatures.

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