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September 16, 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
SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 5116 (SECTION 8.2)

Dear Sir:

As a result of a feedback from the NRC, Luminant Generation Company LLC (Luminant) submits herein supplemental information for the response to Request for Additional Information (RAI) No. 5116 (CP RAI #182) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental information addresses anti-motoring protective relaying for the main generator.

Should you have any questions regarding this supplemental information, 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 September 16, 2011.

Sincerely,

Luminant Generation Company LLC

Rafael Flores for

Attachment: Supplemental Response to Request for Additional Information No. 5116 (CP RAI #182)

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NRO

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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.: 5116 (CP RAI #182)

SRP SECTION: 08.02 - Offsite Power System

QUESTIONS for Electrical Engineering Branch (EEB)

DATE OF RAI ISSUE: 10/19/2010

QUESTION NO.: 08.02-30

The regulatory basis for this question is discussed in NUREG-0800, Standard Review Plan (SRP), Section 8.2.

FSAR Subsection 8.2.2.2 states that:
"The Comanche Peak generation remains stable for reasonably expected contingencies. These study cases include loss of the most heavily loaded transmission circuit connected to the plant switching station, loss of the largest capacity transmission circuit connected to the plant switching station and removal of the largest load from the system. In addition, in case of loss of the largest supply, i.e. CPNPP Units 3 and 4, the transmission system remains stable with slight voltage and frequency variation. The voltage low point is about 0.976 per unit and frequency deviation from 60 Hz is only 0.24 Hz at the lowest point. In addition, the maximum frequency decay rate does not exceed 5 Hz/second that is assumed in the reactor coolant system flow analysis in Chapter 15." (emphasis added)

It is not clear from the applicant's statement that the stability of the grid will be studied to confirm that after a turbine trip, adequate power to the RCPs is maintained for at least three seconds as required in the transient and accident analysis in Chapter 15. Confirm that anti-motoring protective relaying for the main generator will open the generator output breaker after a time delay of at least 15 seconds, during which time the rotating generator will provide voltage support to the grid, and provide an ITAAC to verify the 15 seconds time delay associated with anti-motoring protective relaying to trip generator output breaker. Also, confirm that the analyses in Chapter 15 do not assume (credit) operation of the RCPs following the turbine trip if the initiating event is an electrical system failure.

SUPPLEMENTAL INFORMATION:

In a supplemental response to DCD RAI 687-5394 Question No.15.0.0-24 (MHI Letter UAP-HF-11049), MHI revised COL Item 8.2(11) to require applicants to address the stability and reliability study of the offsite power system to confirm that after a turbine trip, adequate power to the reactor coolant pumps (RCPs) is maintained for at least three seconds as required in the transient and accident analysis in Chapter 15.

The accident analyses in Chapter 15 consider a loss of offsite power (LOOP) for all events that lead to a turbine generator trip. In these events, the analyses assume that a LOOP occurs a minimum of three seconds after the turbine generator trip. The power supply to RCPs is assumed to be maintained for at least three seconds under the various unit trip conditions.

When a reactor/turbine trip occurs, the turbine trip signal is actuated to trip the main generator and open the generator load break switch (GLBS). Prior to the GLBS opening, the generator will motor at a synchronous speed governed by the grid frequency. Since the generator remains connected to the unit auxiliary transformers (UATs), the RCPs are powered by the generator. Therefore, power to the RCPs will be maintained as long as the generator is motoring on the offsite power grid. The time delay between the reactor/turbine trip and the main generator trip/GLBS opening is set at 15 seconds. The reverse power relay is provided to protect the generator from motoring. It trips the generator and opens the GLBS after a 30-second delay from its actuation. The time delay is set within the permissible time for anti-motoring protection, a maximum of about one minute. The 30-second anti-motoring protection time delay serves as a backup to the 15-second reactor/turbine trip time delay in opening the GLBS. However, neither of these time delays are credited in the Chapter 15 analyses. After the generator trips and the GLBS opens, the RCPs will be powered directly by offsite power through the UATs. As a result of this design, the RCPs will be continuously powered following a reactor/turbine trip for as long as offsite power is maintained. Since the stability of the offsite power is expected to be maintained for at least three seconds, this ensures the power supply to the RCPs assumed in the Chapter 15 analyses, regardless of the time delay between the reactor/turbine trip and the main generator trip/GLBS opening or the time delay for the reverse power relay.

The grid reliability and stability analysis performed for CPNPP Units 3 and 4 confirms that the grid maintains stability to ensure the power to the RCPs is maintained for at least three seconds so an ITAAC is not required to verify this time delay. FSAR Subsection 8.2.2.2 states that "in case of loss of the largest supply, i.e. CPNPP Units 3 and 4, the transmission system remains stable with slight voltage and frequency variation." The FSAR has been revised to clarify that the three-second Chapter 15 assumption is enveloped.

Impact on R-COLA

See attached marked-up FSAR Revision 2 pages 1.8-41 and 8.2-12

Impact on S-COLA

None, this response is site-specific.

Impact on DCD

None.

CP COL 1.8(2)

Table 1.8-201 (Sheet 30 of 69)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 8.2(7)	The COL applicant is to address protective relaying for each circuit such as lines and buses.	8.2.1.2.1.1 8.2.1.2.1.2 Figure 8.2-203 Figure 8.2-204 Figure 8.2-209 Figure 8.2-210	3a
COL 8.2(8)	The COL applicant is to address switchyard dc power as part of switchyard design description.	8.2.1.2.1.1 8.2.1.2.1.2	3a
COL 8.2(9)	The COL applicant is to address switchyard ac power as part of switchyard design description.	8.2.1.2.1.1 8.2.1.2.1.2	3a
COL 8.2(10)	The COL applicant is to address transformer protection corresponded to site-specific scheme.	8.2.1.2	3a
COL 8.2(11)	The COL applicant is to address the stability and reliability study of the offsite power system. The stability study is to be conducted in accordance with BTP 8-3 (Reference 8.2-17). The study should address the loss of the unit, loss of the largest unit, loss of the largest load, or loss of the most critical transmission line including the operating range, for maintaining transient stability. A failure modes and effects analysis (FMEA) is to be provided. <u>The grid stability study shows in part that, with no external electrical system failures, the grid will remain stable and the transmission system voltage and frequency will remain within the interface requirements (±10% for voltage and ±5% for frequency) to maintain the RCP flow assumed in the Chapter 15 analysis for a minimum of 3 seconds following reactor/turbine generator trip.</u>	8.2.1.2.1.1 8.2.2.2 8.2.3 Table 8.2-203	3a

RCOL2_08
.02-30 S01

- Loss of the largest load in the grid.

The addition of the proposed CPNPP Units 3 and 4 at the Comanche Peak facility does not adversely impact the stability of the existing units and the new units in the area. The Comanche Peak generation remains stable for reasonably expected contingencies. These study cases include loss of the most heavily loaded transmission circuit connected to the plant switching station, loss of the largest capacity transmission circuit connected to the plant switching station and removal of the largest load from the system. In addition, in case of loss of the largest supply, i.e. CPNPP Units 3 and 4, the transmission system remains stable with slight voltage and frequency variation. The voltage low point is about 0.976 pu and frequency deviation from 60 Hz is only 0.24 Hz at the lowest point. In addition, the maximum frequency decay rate does not exceed 5 Hz/second that is assumed in the reactor coolant system flow analysis in Chapter 15. The grid stability analysis justifies the assumption used in Chapter 15 to power RCPs through the UATs for at least three seconds after a turbine generator trip. RCOL2_08.0 2-30 S01

Grid stability is evaluated on an ongoing basis based on load growth, addition of new transmission lines, addition of new generation capacities and for planned system changes.

The plant switching station and associated outgoing transmission lines and tie lines are newly constructed in CPNPP site and the transmission lines are connected to the four independent and separate local switching station. The transmission system reliability is evaluated in a similar manner as the CPNPP Units 1 and 2. CPNPP Units 1 and 2 have not experienced any LOOP event caused by both the transmission system accepting the unit's output and the transmission system providing the preferred power for the unit's loads, from 1986 to 2007. According to this experience data, the transmission system is expected to be highly reliable.

8.2.3 Design Bases Requirements

CP COL 8.2(11) Replace the first sentence of the second paragraph in DCD Subsection 8.2.3 with the following.

A failure modes and effects analysis is provided in Subsection 8.2.1.2.1.1 and the offsite power system conforms to the following requirements.

STD COL 8.2(11) Replace the last sentence of the third paragraph in DCD Subsection 8.2.3 with the following.

A grid stability analysis is provided in Subsection 8.2.2.2 and the grid stability conforms to this requirement.