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March 18, 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 RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION NO. 4294 (SECTION 3.7) AND NO. 4542 (SECTION 3.8)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein supplemental responses to Request for Additional Information No. 4294 (CP RAI #146) and No. 4542 (CP RAI #167) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental responses address free-field seismic instrumentation.

Should you have any questions regarding these supplemental responses, 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 March 18, 2011.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachment: Supplemental Response to Request for Additional Information No. 4294 (CP RAI #146) and No.4542 (CP RAI #167)

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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.: 4294 (CP RAI #146)

SRP SECTION: 03.07.04 – Seismic Instrumentation

QUESTIONS for Geosciences and Geotechnical Engineering Branch 1 (RGS1)

DATE OF RAI ISSUE: 2/26/2010

QUESTION NO.: 03.07.04-2

Paragraph IV(a)4 of Appendix S of 10 CFR 50 requires that, "Suitable instrumentation must be provided so that the seismic response of nuclear power plant features important to safety can be evaluated promptly after an earthquake." Regulatory Guide (RG) 1.166 provides the guidance regarding the instrumentation and procedures to make the required evaluation.

In FSAR subsection 3.7.4.1, "Comparison with Regulatory Guide 1.12" you proposed to use foundation-level instrumentation for operating basis earthquake (OBE) determinations. The FSAR states that "it is acceptable to perform a CAV check of seismic responses measured at the R/B and PS/B foundation locations". RG 1.166 explicitly states that "The evaluation to determine whether the OBE was exceeded should be performed using data obtained from the three components of the free-field ground motion (i.e., two horizontal and one vertical)". Also, Appendix A to RG 1.166, which provides interim OBE exceedance guidelines in the case that the installed seismic instrumentation or data processing equipment is inoperable, states that "For plants at which instrumentally determined data are available only from an instrument installed on a foundation, the cumulative absolute velocity (CAV) check (see Regulatory Position 4.2 of this guide) is not applicable." Considering that the CAV value of 0.16g-sec was defined using free-field instruments, the staff is not clear based on the justification provided in the FSAR and is concerned that the plant may not be shutdown in all instances when RG 1.166 anticipated a shutdown would be performed. Please provide further clarification why foundation instrument records are appropriate for CAV checks for CPNPP's OBE determinations.

SUPPLEMENTAL INFORMATION:

In the previous response to this RAI (ML100950107), Luminant provided clarification that foundation instrument records are appropriate for CAV checks for OBE determinations. In response to a teleconference on January 27, 2011, Luminant has decided to provide free-field instrumentation at grade in the plant yard in addition to the in-plant seismic instrumentation. The FSAR has been revised accordingly.

Impact on R-COLA

See attached marked-up FSAR Revision 1 pages 3.7-12, 3.7-13, and 3.7-14.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

The seismic category I fuel oil storage tanks are metal tanks which are enclosed by tornado missile protecting concrete vaults (that is, the seismic category I PSFSVs). Since the PSFSVs are below-grade structures, the fuel oil storage tanks are not above-ground tanks. However, the tanks and their mountings are seismically analyzed consistent with the discussion of hydrodynamic loads for above-ground tanks given further below. The tanks' seismic analysis is based on the ISRS which are derived from site-specific SSI analysis of the PSFSVs as documented in Appendix 3MM, using the corresponding site-specific FIRS. Flexibility of the tank shell and tank shell damping effects are considered in estimating the fundamental frequency and spectral accelerations of the tank including its impulsive fluid weight.

3.7.4.1 Comparison with Regulatory Guide 1.12

CP COL 3.7(16) Replace the second paragraph in DCD Subsection 3.7.4.1 with the following. RCOL2_03.07.04-2 S01

The criteria that define the vibratory motion that requires the shutdown of the plant are based on the site-specific OBE. The 5% damping FIRS associated with the site-specific OBE are enveloped by 1/3 of the 5% damping CSDRS. OBE motion is measured at plant grade with seismic instrumentation located in the free field. Spectra scaled from the 5% damping site-specific SSE response spectra are used directly for OBE exceedance checks. An OBE exceedance check is performed in accordance with Section 4 of RG 1.166 (Reference 3.7-41) using both a response spectrum check and a cumulative absolute velocity (CAV) check. The comparison evaluation is to be performed within 4 hours of the earthquake using data obtained from the three components of the earthquake motion as defined by the three orthogonal axes of the standard plant (two horizontal and one vertical) on the uncorrected earthquake records. The evaluation is also to include a check on the operability of the seismic instrumentation as mandated by Section 4.3 of RG 1.166 (Reference 3.7-41).

CP COL 3.7(16) Replace the third paragraph, except the first sentence, in DCD Subsection 3.7.4.1 with the following.

For the free-field instrumentation located in the plant yard, the OBE acceleration and velocity spectra for 5% critical damping are scaled directly from the corresponding SSE spectra. Using site-specific values of OBE input motion, acceleration and velocity spectra for 5% critical damping are also developed for the seismic instrumentation located at the two foundation basemat locations in the R/B and east PS/B. Following the guidance of RG 1.12 and RG 1.166, the basemat instrumentation locations are used for shutdown consideration only in the event that the free-field instrumentation is inoperable. The other three RCOL2_03.07.04-2 S01

instrument locations in the plant superstructure described in Section 3.7.4.2 serve as data sources for long-term evaluation for start-up and as back-up data sources in the unlikely event that both the free-field and the foundation instruments are inoperable during an earthquake, as these instrument locations are not required by RG 1.12 to be used for shutdown determination. RCOL2_03.07.04-2 S01

~~Using these site-specific values of OBE ground input motion, in structure-acceleration and velocity response spectra are developed for the two Unit 3 seismic instrumentation foundation basemat locations in the R/B and east PS/B for 5 percent critical damping. The other three instrument locations described in Subsection 3.7.4.2 serve as back-up data sources in the unlikely event that the foundation instruments are inoperable during an earthquake, and the upper-level instrument locations are also not required by RG 1.12 (Reference 3.7-40) to be used for shutdown determination.~~

~~For CPNPP Units 3 and 4, it is considered acceptable to utilize the foundation-level seismic instrumentation to perform the cumulative absolute velocity (CAV) exceedance check for the following reasons:~~

- ~~The minimum required site-specific ground motion input response spectra (which are the CSDRS anchored at 0.1 g) are greater than the calculated site-specific free-field ground motion, and are also greater than the nominal site-specific ground motion input response spectra calculated for the R/B and PS/B foundations. This is shown in Figure 3.7-201, where FIRS3 represents the free-field ground motion, and FIRS1 represents the nominal site-specific ground motion input spectra for the R/B and PS/B foundations. In this case, it is acceptable to perform a CAV check of seismic responses measured at the R/B and PS/B foundation locations.~~
- ~~Structure-to-structure interactions, which could potentially influence the measured seismic response levels, will not occur because the R/B and PS/B are both founded on the same very stiff limestone layer and are separated by expansion joints which prevent seismic interaction.~~

CP COL 3.7(16) Replace the sixth paragraph in DCD Subsection 3.7.4.1 with the following.

In the event that the free-field instrumentation is inoperable, or both the free-field and the foundation-level instrumentation are inoperable, then the guidance of RG 1.166 Appendix A is applicable.

3.7.4.2 Location and Description of Instrumentation

CP COL 3.7(16) Replace the sixth bullet of the bulleted list in the second paragraph of DCD Subsection 3.7.4.2 with the following.

- In the vicinity of the power block area at surface grade, on top of backfill material, and sufficiently far away from structures in order to appropriately measure free-field ground motion. RCOL2_03.07.04-2 S01

3.7.4.3 Control Room Operator Notification

CP COL 3.7(14) Replace the third sentence of the paragraph in DCD Subsection 3.7.4.3 with the following.

For CPNPP Units 3 and 4, the anticipated seismic response is essentially the same since both units are founded at the same elevation and on the same subgrade with the same stratigraphies, and have the same backfill conditions (including fill concrete) as previously described in Subsection 3.7.1.3 and ~~Chapter 2~~Subsection 2.5.4. Only Unit 3 will be equipped with seismic monitoring instrumentation; however, the main control room (MCR) for both units will be provided with annunciation upon triggering of the instrumentation. CTS-00922

3.7.4.4 Comparison with Regulatory Guide 1.166 RCOL2_03.07.04-2 S01

CP COL 3.7(16) Replace the second sentence of the first paragraph in DCD Subsection 3.7.4.4 with the following.

As previously discussed in Subsection 3.7.4.1, the seismic instrumentation and OBE exceedance checks meet the requirements of RG 1.166 (Reference 3.7-41). The OBE exceedance checks can be performed using only uncorrected earthquake data for the three orthogonal plant directions (two horizontal and one vertical) obtained from seismic instrumentation installed in the free fields as described in Subsection 3.7.4.2.

3.7.4.6 Program Implementation

CP COL 3.7(19) Replace the paragraph in DCD Subsection 3.7.4.6 with the following.

The seismic instrumentation program for CPNPP Units 3 and 4 will be established at least 12 months prior to first fuel load.

3.7.5 Combined License Information

Replace the content of DCD Subsection 3.7.5 with the following.

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.: 4542 (CP RAI #167)

SRP SECTION: 03.08.04 - Other Seismic Category I Structures

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

DATE OF RAI ISSUE: 5/21/2010

QUESTION NO.: 03.08.04-64

This Request for Additional Information (RAI) is necessary for the staff to determine if the application meets the requirements of 10 CFR 50.55a, and General Design Criteria (GDC) 1, 2, 4, and 5.

In its response to RAI 2994 (#108), Question 03.08.04-6, Luminant provides answers in the same format as the question. In Part (a) of the response, the Applicant indicates that the Safe Shutdown Earthquake (SSE) is described in the Final Safety Analysis Report (FSAR), Subsection 3.7.1.1. The staff reviewed FSAR Subsection 3.7.1.1 and was unable to find this description of the SSE. The staff, however, did find the SSE response spectra in Figure 3.7.202 of FSAR which is the minimum Certified Seismic Design Response Spectra (CSDRS) anchored at 0.1g. Please clarify whether the SSE is defined at elevation 782 feet, which is the same elevation where the Ground Motion Response Spectra (GMRS) is defined, and describe the manner in which the required seismic monitoring instrumentation will be installed at elevation 782 feet, which elevation is 40 feet below the ground surface.

For Part (b) the Applicant provides the values for the wind speed, the snow load and roof load used in the design. However, for the SSE, the Applicant, again, refers to FSAR Subsection 3.7.1.1, the subsection where the staff was unable to find the description for the SSE. Address this inconsistency and provide a description of the type and location of the seismic monitoring instrumentation that needs to be installed at elevation 782 feet.

Reference: Luminant's response to request for additional information no. 2994; Log # TXNB-09078; dated December 10, 2009; ML093480149.

SUPPLEMENTAL INFORMATION:

The response to Part (b) of the question (ML102240246) stated that the foundation-level in-plant instrumentation used to measure earthquake motion is considered to be measuring free-field motion as explained in a previous response to RAI 146 (ML100950107). Luminant has decided to install free-field instrumentation in the plant yard at grade in addition to the in-plant seismic instrumentation. The FSAR has been revised accordingly.

Impact on R-COLA

See marked-up FSAR Revision 1 pages 3.7-12, 3.7-13, and 3.7-14 attached above.

Impact on DCD

None.