

PMComanchePeakPEm Resource

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Sent: Wednesday, June 09, 2010 8:34 AM
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Cc: ComanchePeakCOL Resource; Ng, Ronnie; Magee, Michael
Subject: Comanche Peak RCOL Chapter 2, Section 2.5.2 - RAI Number 168
Attachments: RAI 4725 (RAI 168).docx

The NRC staff has identified that additional information is needed to continue its review of the combined license application. The NRC staff's request for additional information (RAI) is contained in the attachment. Luminant is requested to inform the NRC staff if a conference call is needed.

The response to this RAI is due within **35** calendar days of June 9, 2010.

Note: If changes are needed to the safety analysis report, the NRC staff requests that the RAI response include the proposed changes.

thanks,

Stephen Monarque
U. S. Nuclear Regulatory Commission
NRO/DNRL/NMIP
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Request for Additional Information (RAI) No. 4725, COLA Revision 1

RAI Number 168

6/9/2010

Comanche Peak Units 3 and 4
Luminant Generation Company, LLC.
Docket No. 52-034 and 52-035
SRP Section: 02.05.02 - Vibratory Ground Motion
Application Section: 2.5.2

QUESTIONS for Geosciences and Geotechnical Engineering Branch 1 (RGS1)

02.05.02-22

In response to RAI 2.5.2-2 (ML092820486), you stated "The list of contributing seismic sources in Tables 2.5.2-202 through 2.5.2-207 were taken from the original EPRI PSHA study, and were confirmed with the updated calculations that used the EPRI (2004) ground motion equations." Your statement suggests that the use of the new ground motion equations did not result in any increase in hazard contributions of those EPRI-SOG seismic sources that originally contributed less than 1% of the total hazard and were not used in the final hazard calculations. As a result, you revised the FSAR text to state this explicitly (ML092820486). However, in your responses to RAI 2.5.2-16 (ML092740182; ML0935611011; ML100550203), you presented additional seismic sources in the updated tables (FSAR Tables 2.5.2-202 through 2.5.2-207) which show new seismic sources that did not exist in the earlier version. In response to RAI 2.5.2-16 you also eliminated the revised text of the FSAR and removed the revisions inserted as part of the response to RAI 2.5.2-2 without providing justification. In accordance with NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion", please:

- a. Clarify these apparent discrepancies between the two RAI responses and provide revised answers to the respective RAIs, as necessary.
- b. Add brief geologic descriptions of these new sources in the appropriate subsections of the FSAR.
- c. Describe why you added the new sources that do not appear to be contributing to the total hazard. Did the original submission not list the original EPRI-SOG sources correctly?

02.05.02-23

In response to RAI 2.5.2-1 (ML093080116), you provided an updated supplementary earthquake catalog which extended the spatial coverage of the initial Comanche Peak Nuclear Power Plant (CPNPP) earthquake catalog to enclose all seismic sources used in the CPNPP hazard study. In your response, you stated that based on the supplementary earthquake catalog there are two seismic sources whose maximum earthquake magnitude (M_{max}) values need to be updated and you did not discuss updates to the probability of activity (P_a) values based on the occurrence of earthquakes. In accordance with NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion", please explain the following:

a. While you stated that the updated earthquake catalog required only updates to two of the Electric Power Research Institute (EPRI) sources M_{max} values, as part of your response to RAI 2.5.2-16 you updated FSAR Table 2.5.2-10 which shows five additional M_{max} updates to the EPRI sources. Please clarify this apparent discrepancy and explain the source of M_{max} updates shown in the RAI 2.5.2-16 response.

b. The supplementary earthquake catalog includes a moderate-sized earthquake that occurred on 08/10/2005 with a magnitude of 5.4 within a few of the seismic sources used for the CPNPP hazard study. Although you evaluated the impacts of this earthquake on M_{max} model parameters and conducted a sensitivity study to assess its impacts as part of your RAI response, your response did not address the issue of P_a values of these sources. The Law Engineering Earth Science Team's (EST's) seismic source zone 26, for which you updated the M_{max} value, has a P_a value of 0.6. Since there is now already a large earthquake in this source, its P_a value requires updating. Similarly, this earthquake also falls within the Bechtel EST's zone 39 with a P_a value of 0.2 and the Woodward Clyde EST's zone 46a with a P_a value of 0.08. Please provide an update to your RAI 2.5.2-1 response considering the impacts of P_a updates.

c. Please also provide an assessment of the impacts of the updated M_{max} and P_a values on the EPRI-Seismicity Owners (SOG) seismic sources that were not used in the original calculations because their initial hazard contributions were less than 1% of the total hazard, such as the Gulf coast sources and the Rondout and Dames & Moore ESTs sources. Do these sources still contribute less than 1% of the total hazard after the necessary M_{max} and P_a updates?

02.05.02-24

In response to RAI 2.5.2-4 (ML092820486), you stated that "1) the EPRI-SOG model does not adequately describe the Alpine earthquake and 2) it is not legitimate technical interpretation of the earthquake to account for its occurrence by updating the M_{max} values of the contributing EPRI-SOG source zones that contain the earthquake." You stated that you reached this conclusion by using your expert judgment and based on input you received from Dr. Diane Doser, and subsequently you created a new seismic source model to incorporate the potential contributions of such similar future earthquakes in your hazard estimations. You have not conducted a Senior Seismic

Hazard Analysis Committee (SSHAC) study for the development of your new seismic source. The staff examined the e-mail correspondence between you and Dr. Doser at the site audit conducted on April 7-8, 2010, and found that even though she believes this earthquake is a result of the tectonic forces related to the Rio Grande Rift system, she clearly indicated that the scientific work on this earthquake is quite limited and uncertainties exist. Given the uncertainty surrounding the tectonic causes of this earthquake, the staff is concerned that your model does not adequately represent the potential hazard at the site. Because this event is within the area of the several EPRI-SOG source models that host the CPNPP site and all of these sources have Mmax values lower than the observed earthquake, and based on the criteria in NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion", please update these models, similar to what you did in many of the other EPRI sources you used in your hazard calculations (FSAR Table 2.5.2-210). The updated analysis should incorporate the impacts of the Mmax updates to the EPRI-SOG sources based on the occurrence of this magnitude 5.8 earthquake. Also, please evaluate if any of the unused seismic sources should now be used because their seismic source model parameters need to be updated due to the occurrence of this earthquake (i.e., will this update bring the unused seismic sources' hazard contributions above the 1% threshold?)

02.05.02-25

In your response to RAI 2.5.2-14, you stated that your hazard calculations used the Bellefonte FSAR's New Madrid Seismic Zone (NMSZ) source model. The Bellefonte FSAR uses both time-independent and time-dependent models for the NMSZ. In the time-dependent model, the Bellefonte model uses an exposure time of 50 years and it does not consider the possibility of any construction delays and/or possible 20-year license renewal period beyond the initially planned 40-year licensing period. The staff is concerned that combined impacts of these issues may not be negligible considering that the NMSZ is one of the main hazard contributor at the CPNPP site. In accordance with the guidance in NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion", please provide an updated analysis that incorporates the potential impacts of these issues.

02.05.02-26

As part of the site audit conducted on April 7-8, 2010, the staff inspected Calculation Report, TXUT-1908-01, which discusses issues, related to induced seismicity within the site region. In accordance with the guidance in NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion".

Section 2.5.1.2.5.10.2.3 of the FSAR documents that of the ~130 earthquakes identified within Texas in the past 150 years, 22 appear to be associated with oil and gas production (approximately 17% of the total). This estimate does not include the recent swarm of earthquakes that has occurred near the Dallas-Fort Worth airport (DFW).

These events are located within the Fort Worth Basin and appear to be located at depths consistent with ongoing oil and gas stimulation activities (pers. comm., Prof. Brian Stump, SMU). The Comanche Peak NPP is also located within the Fort Worth Basin and is underlain by the same major geologic units (Ellenburger Limestone and Barnett Shale) as the DFW region. Figure 2.5.1-228 shows that there are a large number of active gas production wells within 10 miles of the Comanche Peak NPP site.

Section 2.5.1.2.5.10.3 contains a qualitative discussion of the bases for concluding that seismic hazards associated with induced seismicity do not need to be considered in the site-specific PSHA for the Comanche Peak site. In particular the last paragraph of this section concludes that it is unlikely that any earthquake induced by gas production or fluid injection in the Fort Worth Basin would exceed mb 5.0

The staff requests the applicant submit calculations and quantitative evaluations that support the applicant's conclusion regarding the maximum earthquake size associated with gas production or fluid injection in the Fort Worth Basin.

02.05.02-27

In response to RAI 2.5.2-5 (ML092820486), you presented the logic tree used to describe the Meers fault's Mmax parameters and the recurrence intervals. In your response, you also indicated that you did not include this logic tree in the FSAR. Since the logic tree is a critical part of the Meers fault model and in accordance with the guidance in NUREG-0800, Standard Review Plan, Chapter 2.5.2, "Vibratory Ground Motion," and Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion", please incorporate this figure into the FSAR.