

## PMComanchePeakPEm Resource

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**From:** Monarque, Stephen  
**Sent:** Sunday, November 22, 2009 6:11 PM  
**To:** ComanchePeakCOL Resource  
**Subject:** FW: 2009-10-14 Discussion on GSV-01 & 02 for tomorrow  
**Attachments:** 2009-10-13 Sensitivity Analysis Proposal R1.pdf

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**From:** Donald.Woodlan@luminant.com [mailto:Donald.Woodlan@luminant.com]  
**Sent:** Thursday, November 19, 2009 9:46 PM  
**To:** Ward, William  
**Cc:** Monarque, Stephen  
**Subject:** FW: 2009-10-14 Discussion on GSV-01 & 02 for tomorrow

Steve's email said I should forward his email to you.

### Donald R. Woodlan

Manager, Nuclear Regulatory Affairs  
**Luminant Power**  
254-897-6887, cell 214-542-7761

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**From:** Woodlan, Don  
**Sent:** Thursday, November 19, 2009 6:50 PM  
**To:** Monarque, Stephen  
**Cc:** Joe Tapia (joseph\_tapia@mnes-us.com); Conly, John (John.Conly@luminant.com)  
**Subject:** FW: 2009-10-14 Discussion on GSV-01 & 02 for tomorrow

Steve,

Here is the information that you asked for regarding the conference call we desire.

### Donald R. Woodlan

Manager, Nuclear Regulatory Affairs  
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**From:** Woodlan, Don  
**Sent:** Tuesday, October 13, 2009 4:44 PM  
**To:** Monarque, Stephen  
**Cc:** Conly, John; joseph\_tapia@mnes-us.com; nicholas\_kellenberger@mnes-us.com  
**Subject:** 2009-10-14 Discussion on GSV-01 & 02 for tomorrow

Steve,

If possible we would like to discuss our strategy to address two items from the GEO site visit (GSV-1 and GSV-2).

GSV-1: Site Response - randomization profiles need more discussion

GSV-2: Perform sensitivity study to evaluate the inter-bedded layers (Possible input to FSAR depending on results)

It is important that we agree on an acceptable strategy because the resources to respond are extensive and we want to do it in an acceptable manner, the first time. Attached is a memo summarizing our proposed strategy. I believe the reviewer most interested in these topics was Carl Costantino from ISL.

Please let me know what dates and times work for you.

*D. R. Woodlan*

Donald R. Woodlan

**Luminant**

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**Email Number:** 734

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**Subject:** FW: 2009-10-14 Discussion on GSV-01 & 02 for tomorrow  
**Sent Date:** 11/22/2009 6:11:01 PM  
**Received Date:** 11/22/2009 6:11:04 PM  
**From:** Monarque, Stephen

**Created By:** Stephen.Monarque@nrc.gov

**Recipients:**  
"ComanchePeakCOL Resource" <ComanchePeakCOL.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

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|---|-------------|------------------------|
| MESSAGE   | 2547        | 11/22/2009 6:11:04 PM  |
| 2009-10-13 Sensitivity Analysis Proposal R1.pdf |             | 1032897                |

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October 12, 2009

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## **Introduction**

On July 28, 2009, a meeting between Luminant and the NRC was held at the Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4 site to review and discuss COLA information presented in Chapter 2.5 of the Final Safety Analysis Report (FSAR). In addition to reviewing specific Request for Information (RAI) questions submitted prior to the meeting, additional discussions were held peripheral to specific RAI content. In particular, discussions respective to the site response approach presented in Chapter 2.5 of the FSAR and more recently issued regulatory guidance such as Regulatory Guide, RG 1.208, A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion, March 2007 and Interim Staff Guidance 017 (Draft) identified several topics for further consideration. As a proactive measure, Luminant requested the technical support staff to develop a systematic approach to evaluate and gauge these topics.

## **Background**

The initial site investigation and analysis for the CPNPP Units 3 and 4 was started in mid 2006 in accordance with existing regulatory guidance and standard of practice. Following developments in the approach to site response analysis and soil-structure interaction through the Nuclear Energy Institute (NEI) and NRC, the approach implemented for the CPNPP Units 3 and 4 anticipated many of these requirements. For instance, development of the Ground Motion Response Spectra (GMRS) and defining input motions for specific foundation depths later referred to as Foundation Input Response Spectra (FIRS). Concurrent with the completion and submittal of these supporting analyses presented in Chapter 2.5 of the FSAR, the NRC and industry, through NEI, have continued to develop new guidance as the approach to site response evolves with the issuance of RG 1.208 in March 2007 and more recently the issuance of ISG-017 which provides specific procedures for developing site response to ensure consistent input for SSI.

## **Proposed Evaluation**

The following outline presents an approach to develop a series of sensitivity studies respective to the site response presented in Chapter 2.5 of the CPNPP FSAR. The site-specific input parameters developed for the CPNPP are provided in Project Report TXUT-001-PR-007, Dynamic Profile. This report presents the data and methodology for developing the profile from the ground surface to seismic basement (depth at which a shear wave velocity of 9200 feet/sec and greater is defined). The profile developed for the CPNPP consists of a shallow profile (ground surface to about 550 feet depth) and a deep profile (550 feet to seismic basement). The shallow profile and dynamic properties were developed from site-specific measurements while the deep profile was developed from regional data. The site GMRS was defined as the top of the in-situ competent layer which is termed Layer C within the shallow profile and is a limestone unit roughly 60 feet thick. Because all Category 1 structures will be founded directly on Layer C or a leveling fill concrete, the top of Layer C was also defined as the Foundation Input Response Spectra depth (FIRS1) hence, GMRS/FIRS1. The following sensitivity analyses are proposed for the site-specific profile GMRS/FIRS1 to first test the relationship assigned between the layers defining the shallow and deep profile. Next, the computational procedure will be tested by following guidance within ISG-017 and assuming non-linearity of the shallow profile. Last, an alternative model for Layer C will be evaluated by including shale interbedding.



### Sensitivity Run 1

The initial sensitivity analysis will use full correlation between all layers. The current calculations use partial correlation for the shallow profile layers and full correlation for the deep profile layers.

### Sensitivity Run 2

The second sensitivity analysis will utilize Non-linear degradation curves developed in TXUT-001-PR-007 and will also consider full correlation between layers. The following procedures will be applied following ISG 017 guidance:

1. first run will iterate on soil properties to top of layer A equivalent to Geologic Outcrop
2. truncate column to top of Layer C and re-run using strain dependent Vs and D profiles from Run 1. above

### Sensitivity Run 3

The third sensitivity analysis will repeat the Sensitivity Run 2 however the foundation bearing Layer C will be modeled as interbedded. Shale layers will be added with appropriate degradation properties.

### **Comparative Basis**

For each of the sensitivity runs above, both strain profiles and amplification factors for the GMRS/FIRS1 will be compared to the existing site response results. Results will be provided in supporting calculations for information only, and will not be formally documented in accordance with existing QA requirements. No revision to the FSAR is anticipated.

It is recommended that this approach be provided to the NRC audit team for comment prior to commencing these analyses.

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