## PMComanchePeakPEm Resource

**From:** Monarque, Stephen
**Sent:** Wednesday, October 20, 2010 1:56 PM
**To:** Woodlan, Don; Conly, John
**Cc:** Kallan, Paul; ComanchePeakCOL Resource
**Subject:** Comanche peak COL Chapter 3 - Section 3.7 topics of discussion for Thursday's call
**Attachments:** FSAR Appendices 3LL-3NN Questions and Comments 10_19_10 1534PDT.docx

Don,

I have attached the topics and questions we wanted to discuss during Thursday's call. Question 3.7.2-16 will not be discussed.

First, I provided additional information on question 3.7.2-11. There are 6 questions on your response to 3.7.2-11.

Second, the staff provided information on CPNPP, COLA, part 2 Chapter 3, Appendices 3KK through 3NN. There are 15 questions on these appendices. Because we were late in providing this information, we could table this topic for the next call. I will leave that decision up to Luminant.

Thanks,

Stephen Monarque
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**Comanche Peak FSAR, Revision 1**
**Notes and Comments on Appendices 3KK through 3NN**
**and Associated RAI 3.7.2-11.**

1. In the second paragraph of Section 3KK.1, the applicant states that response spectra analyses are performed in ANSYS to obtain seismic design demands. Which spectra are used for this analysis and how are they generated? Do the spectra include SSI effects? If so, how?
2. According to the text in the appendices and in the response to RAI 3.7.2-11, the UHSRS was analyzed via response spectrum analysis in ANSYS and the loads were *verified* with SASSI. In the case of the ESWPT, the SASSI results were used as *input* to the ANSYS models of the structures. Moreover, segments 1 and 3 were analyzed in ANSYS using statically equivalent accelerations, but response spectra analysis was performed in ANSYS on segment 2. In the case of the PSFSVs, an SSI analysis was performed in SASSI and used to *confirm* ANSYS input demands. The SSI evaluation in ANSYS was performed using equivalent static loads. The SSI evaluation of the R/B-PCCV-CIS used SASSI exclusively. What is the logic behind the different analytical approaches to SSI modeling for the UHSRS, ESWPT, PSFSVs, and the R/B-PCCV-CIS that are reported in Appendices 3KK through 3NN?
3. Clarify the backfill and subgrade combinations in each of the analyses documented in Appendices 3KK through 3NN. A table or tables would be helpful.
4. On p. 3KK-2, it is stated that the use of OBE damping is consistent with the low seismicity of the site. On p. 3KK-3, it is stated that all roof slabs and elevated slabs are considered cracked with an out-of-plane bending stiffness of 50% of the gross section stiffness. Is this assumption consistent with the low seismicity of the site and has this assumption been confirmed to be consistent with the final combined stresses in the members?
5. Same question as above for Section 3MM.2.
6. On p. 3KK-5, it is stated that the response spectrum analysis was modeled by considering the flexible base slab, which was modeled using a soil-springs approach calculated using ASCE 4 methodology. How were the flexible slab and soil springs modeled in the response spectrum analysis?
7. How were the forces and moments mentioned in the second paragraph on p 3LL-3 developed and extracted for each of the ESWPT segments and how were these force and moments imported or used in the ANSYS models for each of the three segments?
8. How is the UHSRS embedment simulated in the response spectrum analysis?
9. Where are the comparisons between the ANSYS modal results and the SASSI fixed base results per the first paragraph of Section 3MM.1?
10. How are SASSI soil pressures used as input to the ANSYS models as is stated in the second paragraph of Section 3MM.1?
11. How were the acceleration described in footnote 2 to Table 3MM-5 developed and applied? Were they applied in ANSYS as equivalent forces? Also, the

values in the footnote do not appear to be consistent with the values in the table – why?

12. Note that references to Appendix 3H that appear in Appendix 3NN should be updated to refer to the coupled model.
13. The analyses of the UHSRS, ESWPT, and PSFSVs documented in Appendices 3KK, 3LL, and 3MM simulate soil separation from the embedment, but the analysis of the R/B-PCCV-CIS does not according to Section 3NN.4. Why not?
14. The analyses of the UHSRS, ESWPT, and PSFSVs documented in Appendices 3KK, 3LL, and 3MM provide ISRS at several damping values, but in Section 3NN.5, ISRS are only provided at 5% spectral damping. Why the difference?
15. As a general comment, note that in Appendix 3LL, SASSI is alternately referred to as a frequency domain program (p. 3LL-1) and time history analysis program (top of p. 3LL-3). This is confusing especially because on p. 3LL-3, the applicant refers to the "time history" analysis indirectly, but they evidently are talking about the SASSI analysis. This inconsistent terminology appears in Appendices 3MM and 3NN also. It is suggested that a consistent terminology be used and that the programs ANSYS and SASSI always be referred to by name instead of referring to frequency domain analysis or time domain analysis.

**Questions on Response to RAI 3.7.2-11**:

1. The last sentence on the second page of the response states that "the SASSI analyses results were used to produce the final response spectra and provide confirmation of the design spectra and seismic soil pressures used in ANSYS." What is meant by "the final spectra"? What is meant by the "design spectra"? What is done with the seismic soil pressures and how were they obtained?
2. The next paragraph states that "ANSYS analyses were used to calculate the structural demands of the UHSRS to seismic soil pressure and seismic motion including hydrodynamic effects. The response spectra and soil pressure cases discussed below were analyzed for two boundary conditions: (1) fixed base and (2) on soil springs." Does this mean that SSI effects are not modeled directly in the response spectrum analysis? How are soil springs incorporated into the response spectrum analysis? The approach described implies that the application of the wall pressures is for checking the wall design, but that it is decoupled from any SSI effects. Is this correct? Is there any soil modeled in the ANSYS evaluation?
3. Repeat of comment 1 above for description of ESWPT analysis on p. 3 of the response.
4. Why was response spectrum analysis performed for segment 2 of the ESWPT, but equivalent static analysis was used for segments 1 and 3?
5. How were the "accelerations" applied in the static analysis of segments 1 and 3 of the ESWPT? Was a single bounding acceleration applied to everything via the "acel" command, or were localized equivalent forces applied to different parts of the structure? If it is the former, what acceleration was chosen? If it is the latter, provide the details describing how this was done.

6. Is the application of seismic wall pressures decoupled from the SSI evaluation in for the ESWPT?