Luminant

Rafael Flores
Senior Vice President &
Chief Nuclear Officer
rafael.flores@luminant.com

Luminant Power
P O Box 1002
6322 North FM 56
Glen Rose, TX 76043

T 254.897.5590
F 254.897.6652
C 817.559.0403

CP-201300662
Log # TXNB-13016

Ref. # 10 CFR 52

May 13, 2013

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
139 (4309) AND 250 (6342) (SECTIONS 2.4.2 AND 3.3.2)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein supplemental information for the responses to Request for Additional Information (RAI) 139 (4309) and 250 (6342) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental information addresses the design basis flood and design basis hurricane.

Should you have any questions regarding the supplemental information, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me. Addressees on electronic distribution will received an optimized PDF file of the affected FSAR pages, but will not receive the revised calculations or the CVL drawings provided on the CD.

There are no commitments in this letter.

I state under penalty of perjury that the foregoing is true and correct.

Executed on May 13, 2013.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments: 1. Supplemental Response to Request for Additional Information 139 (4309)
2. Supplemental Response to Request for Additional Information 250 (6342)
3. Documents Provided on the Enclosed CD

D090
NRO

cc: Stephen Monarque with attachments

Electronic distribution w/o CD:

Rafael.Flores@luminant.com
jeffry.simmons@luminant.com
Stephanie.Moore@energyfutureholdings.com
Ken.Peters@luminant.com
Robert.Bird@luminant.com
Allan.Koenig@luminant.com
Timothy.Clouser@luminant.com
Eric.Evans@luminant.com
Robert.Reible@luminant.com
donald.woodlan@luminant.com
John.Conly@luminant.com
Janice.Caldwell@luminant.com
David.Beshear@txu.com
Fred.Madden@luminant.com
Debra.Gilliam@luminant.com
Brad.Watson@luminant.com
NuBuild Licensing files
sfrantz@morganlewis.com
jrund@morganlewis.com
tmatthews@morganlewis.com
tomo_imamura@mhi.co.jp
masahiko_morino@mhi.co.jp
kano_saito@mhi.co.jp
shigemitsu_suzuki@mhi.co.jp
yoshiki_ogata@mnes-us.com
Luminant Records Management (.pdf files only)

masanori_onozuka@mnes-us.com
tatsuya_hashimoto@mnes-us.com
joseph_tapia@mnes-us.com
michael_melton@mnes-us.com
michael_tschiltz@mnes-us.com
atsushi_kumaki@mnes-us.com
yukako_hill@mnes-us.com
nicholas_kellenberger@mnes-us.com
ryan_sprengel@mnes-us.com
seiki_yamabe@mnes-us.com
molly_spalding@mnes-us.com
rjb@nei.org
kra@nei.org
michael.takacs@nrc.gov
cp34update@certrec.com
David.Matthews@nrc.gov
Balwant.Singal@nrc.gov
Stephen.Monarque@nrc.gov
jeff.ciocco@nrc.gov
john.kramer@nrc.gov
Rayo.Kumana@nrc.gov
Frank.Akstulewicz@nrc.gov
ComanchePeakCOL.Resource@nrc.gov
Sujata.Goetz@nrc.gov
Art.Howell@nrc.gov
Samuel.Lee@nrc.gov

Attachment 1

Supplemental Response to Request for Additional Information 139 (4309)

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.: 139 (4309)

SRP SECTION: 02.04.02 - Floods

QUESTIONS for Hydrologic Engineering Branch (RHEB)

DATE OF RAI ISSUE: 2/18/2010

QUESTION NO.: 02.04.02-2

NUREG-0800, Standard Review Plan, Section 2.4.2, 'Floods,' establishes criteria that Staff intends to use to evaluate whether an applicant meets the NRC's regulations.

By letter dated October 1, 2009, the NRC staff issued RAI ID 3664 (RAI 102) Question Number 14245 (02.04.02-1), in which the NRC staff asked "In order to determine the safety of structures, systems, and components (SSCs) with respect to floods, Luminant is requested to state explicitly in the COL FSAR the water surface elevation and associated flow rate for the design basis flood (DBF) at the site, and describe all assumptions used in determining the DBF from the flooding scenarios detailed in FSAR Sections 2.4.3 through 2.4.9. Provide a rationale and describe the process used to determine that the stated DBF is bounding conservative, with respect to all permutations of stream, local precipitation, dam failure scenarios, tsunami, surge, seiche, and wind/wave coincidence."

The applicant responded in document CP-200901564-Log No TXNB-09067-(ML093230704) executed on November 13, 2009. The NRC staff has reviewed this response and the revisions included in FSAR Updated Tracking Report No. 4 referenced in the response, and has determined that additional information is needed in order to complete its review.

The NRC staff determined that the applicant has clarified the design basis flood elevations and causal mechanisms for the scenario that the applicant included in the safety analysis. However, the applicant has not explained in its response why this scenario, with its multiple simplifying assumptions, computations, and omission of existing and proposed upstream reservoirs, is bounding conservative with respect to all other scenarios. As an example, the Staff noted that the water elevation below Squaw Creek Dam is computed using an equation for uniform flow at the Brazos-Paluxy confluence, but there is no explanation of why this assumption of uniform flow is bounding and conservative. Other assumptions include the absence of wind setup on reservoirs included in the domino failure scenario, the selection a constant loss rate for infiltration rate in watershed runoff modeling, and dismissal of the possibility of surge and seiche flooding in the analysis. While the likelihood of these factors contributing to a design-basis flood is addressed in other RAIs (and remains unresolved after the NRC staff's review of the RAI responses), the argument for the conservative and bounding nature of the applicant's scenario incorporating all of these assumptions and computations needs to be proffered in FSAR Section 2.4.2.

In order to make its safety determinations, the NRC staff requests the applicant provide a clear description and justification of the conservatism and incorporation of the unaccounted for parameters and factors in the analysis for the determination of design basis flood.

This is supplemental RAI 2.4.2-00-S.

SUPPLEMENTAL INFORMATION (S03):

This supplemental information is provided to address concerns from the NRC public teleconference conducted on December 1, 2011, from the NRC hydrology audit conducted on March 27, 2012, and from the NRC public teleconference conducted on January 8, 2013 (call summary - ML13043A181). This supplemental information also addresses recent site modifications.

The NRC concern is related to calculation packages:

- TXUT-001-FSAR-2.4.2-CALC-036 (CALC-036), Revision 1, (ML11319A339)
- TXUT-001-FSAR-2.4.2-CALC-037 (CALC-037), Revision 1, (ML11319A340).

Luminant proposed site modifications at CPNPP Units 3 and 4 subsequent to the December 2011 NRC call and March 2012 NRC audit. The proposed site modifications resulted in slight changes in drainage areas used in CALC-036, Revision 1, and CALC-037, Revision 1. Luminant has proposed an additional storm water basin (Drainage Pond C) southeast of Unit 3.

The effects of local intense precipitation were re-evaluated to account for site modifications and NRC concerns identified in ML13043A181, which require that the maximum water level associated with a storm producing the Probable Maximum Precipitation (PMP) on the local area to be determined. The revised local site analysis is documented in CALC-036, Revision 3 (attached).

Additionally, the erosion potential due to the effects of the local intense PMP was re-evaluated to account for site modifications and NRC concerns identified in ML13043A181. Erosion potential affecting safety-related structures is determined using conservative estimates in the HEC-RAS model to identify higher than permissible velocities, supercritical velocities, and hydraulic jumps at the site. The analysis identifying erosion potential is documented in CALC-037, Revision 3 (attached).

Three supplemental responses (S00, S01, and S02) were previously submitted to the NRC. The S00 response was superseded by the S01 response. The S02 response supplemented the S01 response. The S03 supersedes the S00 and S02 responses and partially supersedes the S01 response. The S03 supplements the S01 response, but attachments provided with S01 response are superseded by the S03 attachments.

The NRC concerns regarding CALC-036, Revision 1 as captured by Luminant during the December 2011 teleconference are addressed individually as shown below:

NRC Concern #1: CVL- drawings provided have good resolution; however, it is difficult to discern the different layers within the drawings (for instance, existing contours are overlaid making it difficult to discern watershed delineation)

Resolution- CVL-drawings have been revised with high resolution and disaggregated layers to clearly identify pre- and post-construction contours, watershed boundaries, flow paths, etc. The revised versions (Revision I) of drawings CVL-12-11-101.001, CVL-12-11-102.001, CVL-12-11-103.001, CVL-12-11-104.001, and CVL-12-11-105.001, are provided as Attachment D in CALC-036, Revision 3. A figure showing watershed boundaries is provided as an attachment (Attachment E) in CALC-036, Revision 3.

NRC Concern #2: Structures related to the PMP event (culverts, channels, outlets) are not identified and it is necessary to identify where these are located.

Resolution- CVL-drawings have been revised to identify structures related to PMP events. Channels, culverts, and outlets are identified to facilitate review. The revised versions (Revision I) of drawings CVL-12-11-101.001, CVL-12-11-102.001, CVL-12-11-103.001, CVL-12-11-104.001, and CVL-12-11-105.001 are provided as Attachment D in CALC-036, Revision 3. Culverts related to the PMP are identified in Figures 7-91, 7-105, 7-138, and 7-147 of CALC-036, Revision 3.

NRC Concern #3: NRC staff identified 6.25 in. for 5 min intensity (75 in/hr). However, HEC-RAS input for PMP was 6.2 in. for 5 min intensity. Why wasn't the more conservative 6.25 in. for 5 min value used? Clarification of source and design input is needed.

Resolution- The PMP value of 6.2 in. was derived in Calculation TXUT-001-FSAR-2.4.2-CALC-019 (CALC-019), Revision 0 using Hydrometerological Report 51 (HMR-51) and HMR-52. This appears to be a rounding issue and CALC-019 has been revised to utilize the conservatively rounded value of 6.3 inches for 5 min intensity. The revised PMP values are documented in CALC-019, Revision 2. The PMP value of 6.3 in. is used in CALC-036 Revision 3 and CALC-037 Revision 3.

NRC Concern #4: Interpolation- Interpolation between cross sections was not turned on for the HEC-RAS model in all regions. The NRC staff uses interpolation (every 5 ft) as this will affect water surface elevations; why wasn't interpolation used?

Resolution- Interpolation between cross sections was initially used only in certain areas where the HEC-RAS model was unstable. Luminant was not able to locate any guidance indicating 5 ft interpolation. However, CALC-036, Revision 3, includes interpolation at every 5 ft or less between all cross sections, which is a conservative approach.

NRC Concern #5: Manning's Roughness Coefficient- How were the coefficient values selected? The calculation uses 50 percent increase in coefficients, but the values are not tied to specific references other than Chow.

Resolution- Manning's roughness coefficients are selected based on the surface cover identified in the revised site grading and drainage drawings. The initial estimates for roughness coefficient were obtained by reference to Chow. To ensure a bounding conservative approach, the selected roughness coefficients for each surface cover have been increased by a factor of 50 percent for CALC-036, Revision 3 and decreased by 50 percent for CALC-037, Revision 3. A higher roughness coefficient will result in a higher water surface elevation, while a lower roughness coefficient will result in a higher velocity. Therefore, it is conservative to increase the value by 50 percent for CALC-036 and reduce it by 50 percent for CALC-037.

NRC Concern #6: Some cross sections are overlapping (CALC-036, Figure 7.1.4.3); was this intentional?

Resolution- The channel/cross section layouts in the HEC-RAS schematic figures are not representative of the actual configurations, which are based on contours and features, and are not accurately reflected by the Geometry Editor in HEC-RAS. Cross sections have been revised to reflect no overlapping to the extent possible to better represent the site hydraulics. Note that for each channel, CALC-037, Revision 3, correctly shows the cross section location and orientation based on the site drainage and grading plans. The HEC-RAS schematic only provides a graphically limited view of the channel/cross section layout.

NRC Concern #7: Figure 7.1.3-3 (CALC-036) Unit 3 East Channel shows no cross section. NRC staff feels that this is a critical area and a cross section should be added to understand how that upstream boundary condition is conservative because it could produce a higher water surface elevation.

Resolution- CALC-036, Revision 3 includes five cross sections and one weir for the Unit 3 East Channel.

NRC Concern #8: Table 7-8 (CALC-036) shows runoff of 52 cfs and the value does not seem to be accounted for in HEC-RAS.

Resolution- A flow of 52 cfs is the peak flow for Drainage Area 1. The site modifications resulted in minor shifts in drainage boundaries. The peak flow in Drainage Area 1 is now 53 cfs. The revised peak flows for all drainage areas are documented in CALC-036, Revision 3.

Runoff from Drainage Areas 1 through 7 is directed to a culvert in Drainage Area 6 (Center North Channel). Assuming the culvert is non-functional, the combined runoff from these areas would overtop the loop road and split. Some runoff would enter the Unit 4 UHS Channel and the remaining runoff would enter the Unit 3 UHS Channel. As a conservative approach, it is assumed for the Unit 4 UHS Channel analysis that the entire upstream runoff enters the Unit 4 UHS Channel. Similarly, for the Unit 3 UHS analysis, it is assumed that the entire upstream runoff enters the Unit 3 UHS Channel. Therefore, the entire runoff of 53 cfs from Drainage Area 1 is conservatively accounted for three times (Unit 4 UHS, Unit 3 UHS, and Center North Channel) in CALC-036, Revision 3.

NRC Concern #9: In CALC-036, the Southeast Channel culverts should be identified to indicate how the flow is augmented.

Resolution- CALC-036 has been revised to identify the culvert and to describe how the flow is augmented into the Unit 3 Southeast Channel. Runoff from Drainage Areas 29 and 9 account for flow in the Unit 3 Southeast Channel. Runoff from Drainage Area 9 (West Channel) could enter the Unit 3 Southeast Channel through the culvert structure in the West Channel. It is conservative for the Unit 3 Southeast Channel analysis to assume that the total runoff from Drainage Area 9 will flow into the Unit 3 Southeast Channel. The culvert in Southeast Channel is identified in CALC-036, Revision 3, Figure 7-147. The revised analysis is documented in CALC-036, Revision 3.

NRC Concern #10: The 2423 cfs contribution to the East Channel is reduced and it is not apparent why. Clarification is needed.

Resolution- The reduction is the result of a culvert. The culvert has been removed and the water will be impounded in Drainage Pond C. The revised analysis is documented in CALC-036, Revision 3.

NRC Concern #11: Identify the East Channel culvert.

Resolution- The culvert to the East Channel has been removed as a result of site modifications.

NRC Concern #12: The process of transfer of surface boundary conditions between models is not clear. There appears to be a discrepancy with final water elevations. What is the process to transfer boundary conditions and subcritical flow from downstream to upstream? Additionally, the NRC staff has identified a higher downstream water surface elevation for the Center North Channel than provided in CALC-036.

Resolution- Downstream models were run first and the highest resulting water surface elevation at the interface with the upstream channel was used as the downstream boundary condition. Unit 3 UHS Channel Cross Section 12 is used as the downstream boundary condition for the Center North Channel. Based on inspection of the site grading and drainage plan, Unit 4 UHS Channel Cross Section 10 and Unit 4 UHS Branch Channel 107 have the potential to act as a downstream boundary condition. However, Unit 3 UHS Channel Cross Section 12 is validated as the bounding downstream boundary condition because it has the highest water surface elevation of all three options.

NRC Concern #13: HEC-RAS modeling suggests using two cross sections for upstream and downstream inline structures. However, this does not appear to be presented in the model. Why was this not done?

Resolution- CALC-036, Revision 3, includes at least two cross sections upstream and downstream of inline structures within a hydraulic channel.

NRC Concern #14: Figure 2-1 includes a surface water elevation of 822.70 ft. While the exceedance is not adjacent to Unit 3 or 4, the NRC staff needs additional rationale and certainty that there is no threat to safety-related structures. The exceedance can result in pressure gradients and water can be pushed in a direction that is not assumed.

Resolution- There are boundaries that will direct the water away from safety-related structures. The higher water surface elevations in the upstream portions of the Unit 3 Southeast Channel are a function of the channel configuration. The grading and drainage map shows that the ground elevations at the upstream end of the Unit 3 Southeast Channel are relatively high. The higher water surface elevations correspond to the higher ground elevations in this area. The Unit 3 Southeast Channel has steeper slopes and lower ground elevations as it carries flow past safety-related structures to Drainage Pond B northeast of Unit 3. Additional text has been provided in CALC-036, Revision 3, Summary Section 7.14, and FSAR 2.4.2 to affirm that increases above the DCD requirement are not located adjacent to and will not affect safety-related structures, which are located adjacent to the Unit 3 Southeast Channel, East Channel and Off-site Channel.

NRC Concern #15: There is a discrepancy in surface water elevation for Unit 3 Southeast Channel (listed in one table as 822.7 ft and as 819.77 ft in another). Additionally for those channels where "N/A" was listed for surface water elevation, actual values in the Tables should be provided.

Resolution- CALC-037, Revision 3, Table 2-1 provides elevation values for all channels. FSAR Table 2.4.2-208 has been updated to provide the maximum water surface elevations determined in CALC-037, Revision 3.

Additionally, Luminant has reviewed CPNPP calculations for conformance and the following calculations were revised and the new revisions are listed below:

- TXUT-001-FSAR 2.4.3 -CALC-011 (CALC-011), Revision 4
- TXUT-001-FSAR 2.4.3 -CALC-012 (CALC-012), Revision 5
- TXUT-001-FSAR 2.4.3 -CALC-013 (CALC-013), Revision 4
- TXUT-001-FSAR 2.4.4 -CALC-015 (CALC-015), Revision 3

CALC-011 evaluates the critical storm center for the PMP Analysis and utilizes a HEC-HMS model developed in CALC-012 for the critical PMP determination.

CALC-012 evaluates the Probable Maximum Flood (PMF) for the Squaw Creek Reservoir (SCR) utilizing the PMP estimates from CALC-011 as input and the CALC-015 result as a downstream boundary condition.

CALC-013 is the wind wave analysis for the SCR and utilizes the PMF elevation from CALC-012 for fetch length, wave run-up, and wind setup estimates.

CALC-015 evaluates the peak flow at the confluence of Brazos River and Paluxy River due to the effects of a PMF coincident with assumed hydrologic failure of upstream dams.

The results of this review revealed the following items:

<u>CALC-011, Revision 3</u>

1. Basin Areas – The calculation indicates that basin areas are referenced from a Breach Analysis document. However, the areas listed in the calculation and utilized in the HEC-HMS hydrologic model are different from the areas listed in the Breach Analysis.

2. HMR Charts – The incorrect location was used to estimate some of the tabulated PMP estimates listed in Table 7-2 of the calculation.

3. HMR Basin Area Coordinates – In some cases, the basin area linework used to create the set of coordinates does not match the actual coordinates entered into the HMR 52 coding. Additionally, the natural watershed orientation has been rotated. HMR 52 is dependent on the natural watershed orientation to determine the critical storm.

4. Other HMR 52 Input – An incorrect value for the 5000-sq mi, 12-hr PMP was entered into the HMR coding (13.0 vs. 13.1).

Resolution: CALC-011, Revision 3 has been revised to address Items 1 through 4. CALC-011, Revision 4 addresses items 1 through 4 resulting in a

- PMP of 35.22 in. for overall watershed (Squaw Creek and Paluxy River combined) with two-thirds temporal distribution
- PMP of 43.19 in. for Squaw Creek watershed with two-thirds temporal distribution

CALC-012, Revision 3

5. Basin Areas – This is the same issue as Item 1 identified above for CALC-011. The incorrect basin area also affects the derived unit hydrograph parameters.

6. HEC-RAS Model – The calculation assumes initial flow to be zero. However, the HEC-RAS model includes an initial flow of 100 cfs.

7. For the unsteady state analysis and the sensitivity analysis, time series flow hydrographs from the HEC-HMS model were entered into the unsteady state HEC-RAS model. Although the data was extracted from the HEC-HMS model and inputted into the HEC-RAS models accurately, there is a discrepancy between what is stated in the calculation and what is applied for the HEC-HMS model. According to the calculation text, the two-thirds temporal distribution is used in the HEC-HMS model for the critical storm centers. However, the HEC-HMS model input includes an incorrect center temporal distribution instead of a two-thirds temporal distribution to produce the peak result for Basin 2. The watershed is divided in four sub-watersheds which are identified as Basin 1 through 4. The critical water surface elevation at the site is from SCR, which is located in Basin 1. Basin 2 is located downstream of the site and SCR.

Resolution: CALC-012, Revision 3 has been revised to address Items 5 through 7. CALC-012, Revision 5 addresses items 5 through 7 resulting in

- PMF water surface elevation is 794.09 ft NAVD 88 with corresponding flow of 342,954 cfs
- Maximum backwater flow on the downstream side of the Squaw Creek dam accounting for dam failure is 212,107 cfs with a water surface elevation of 769.11 ft NAVD 88.

CALC-013, Revision 3

8. Run-up – There is a rounding error in the run-up calculation for the vertical slopes. The equation as shown should yield a precision result of 5.158 m, which is shown as 5.15 m. Traditional rounding should report a result of 5.16 m. This also affects the converted result in English units.

9. Critical Fetch Profile – From the bathymetric figure used to generate the critical fetch profile shown in Figure 7-1 of the calculation, it is apparent that the 700-ft contour is crossed twice over

a particular length, which would create a long, flat portion of the profile. However, the profile shown in the calculation contains a single low point in the corresponding portion of the profile.

Resolution: CALC-013, Revision 3 has been revised to address Items 8 and 9. CALC-013, Revision 4 addresses items 8 and 9 resulting in the maximum water surface elevation of 811.09 ft NAVD 88 due to the PMF coincident with wind wave activity.

CALC-015, Revision 1

10. Hubbard Creek Dam fetch length – By comparison to the CAD file, the fetch length appears to have been rounded incorrectly to 60,017 ft. Standard rounding would yield 60,016 ft. Additionally, Table 7-3 of the calculation also lists the total fetch length as 60,117 ft instead of 60,017 ft.

11. De Cordova Bend Dam overtopping – The equation after Table 7-21, fifth line of the calculated equation, has an error. With reference to Figure 7-51, the (693 ft. + 706.5 ft.)/2 term should be (706.5 ft. + 706.5 ft.)/2.

Resolution: CALC-015, Revision 1 has been revised to address Items 10 and 11. CALC-011, Revision 3 addresses items 10 and 11, resulting in a total breach flow of 8,380,000 cfs from upstream dam failures transposed downstream without any attenuation to the confluence of Brazos River and Paluxy River.

FSAR Subsections 2.4.2, 2.4.3, 2.4.4, 2.4.5, 2.4.7, 2.4.10, and 2.4.14 have been revised to reflect the revisions in CALC-011, CALC-012, CALC-013, CALC-015, CALC-019, CALC-036, and CALC-037. FSAR Table 19.1-205 is currently being revised to reflect revisions to FSAR Sections 2.2, 2.3, and 2.4 and will be submitted in FSAR UTR Rev. 3.

Attachments (on CD)

Calculation TXUT-001-FSAR 2.4.3 -CALC-011, Revision 4

Calculation TXUT-001-FSAR 2.4.3 -CALC-012, Revision 5

Calculation TXUT-001-FSAR 2.4.3 -CALC-013, Revision 4

Calculation TXUT-001-FSAR 2.4.4 -CALC-015, Revision 3

Calculation TXUT-001-FSAR 2.4.2 -CALC-019, Revision 2

Calculation TXUT-001-FSAR 2.4.2 -CALC-036, Revision 3

Calculation TXUT-001-FSAR 2.4.2 -CALC-037, Revision 3

Grading & Drainage Plan 4CS-CP34-20080060, Revision 4 (Includes all CVL drawings referenced in this response)

Impact on R-COLA

See the following marked-up FSAR Revision 3 pages and figures (on CD):

2.0-9	2.4-33	2.4-61	2.4-187	Figure 2.4.3-202
2.4-18	2.4-34	2.4-65	2.4-188	Figure 2.4.3-203
2.4-19	2.4-35	2.4-142	2.4-189	Figure 2.4.3-204
2.4-20	2.4-36	2.4-147	2.4-190	Figure 2.4.3-205
2.4-21	2.4-47	2.4-152	2.4-191	Figure 2.4.3-207
2.4-22	2.4-48	2.4-177	2.4-193	Figure 2.4.3-208

2.4-23	2.4-49	2.4-178	2.4-194	Figure 2.4.3-209
2.4-24	2.4-50	2.4-179	2.4-195	Figure 2.4.3-211
2.4-25	2.4-51	2.4-180	2.4-196	Figure 2.4.3-212
2.4-27	2.4-52	2.4-181	Figure 2.4.2-202	Figure 2.4.3-213
2.4-28	2.4-53	2.4-182	Figure 2.4.2-203	Figure 2.4.3-214
2.4-29	2.4-54	2.4-183	Figure 2.4.2-204	Figure 2.4.3-215
2.4-30	2.4-55	2.4-184	Figure 2.4.2-205	Figure 2.4.3-216
2.4-31	2.4-56	2.4-185	Figure 2.4.2-206	Figure 2.4.3-217
2.4-32	2.4-57	2.4-186	Figure 2.4.2-207	Figure 2.4.4-203

See the following new tables added to the FSAR (on CD):

2.4.3-211	2.4.3-212	2.4.3-213	2.4.3-214	2.4.3-215

See the following new figures added to the FSAR (on CD):

2.4.3-219	2.4.3-220	2.4.3-221	2.4.3-222	2.4.3-223

Impact on DCD

None.

Attachment 2

Supplemental Response to Request for Additional Information 250 (6342)

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.: 250 (6342)

SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 3/13/2012

QUESTION NO.: 03.03.02-9

The NRC issued Regulatory Guide 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants" (October 2011), and the staff issued an RAI (US-APWR DCD RAI 3.3.2.-06) requesting MHI to provide information that addresses design-basis hurricane and hurricane missiles for US-APWR DC in consideration of the guidance provided in RG 1.221. The staff requests the COL applicant to provide information that addresses the design-basis hurricane and hurricane missiles for the Comanche Peak Nuclear Power Plant, Units 3 and 4 site and their impact on the safety of the site-specific Category I SSCs.

SUPPLEMENTAL INFORMATION (S01):

This supplements the previous response to address comments received from the NRC staff.

A) The NRC requested an error in the reference to the SRP in FSAR Subsection 3.3.2.2.1 to be updated:

> Add the following after the third paragraph in DCD Subsection 3.3.2.2.1.Hurricane velocity pressures for site-specific seismic category I structures are determined by converting hurricane wind speeds into effective velocity pressures in accordance with procedures accepted by SRP 3.3.2 (Reference 3.3-5). Design hurricane loads for seismic category I structures are determined for enclosed and partially enclosed buildings using the analytical procedure method 1 or method 2 provided in Subsection 3.3.1.2, where:
>
> *V* is the maximum hurricane windspeed = 145 mph
>
> For the design basis hurricane, wind pressure varies with respect to height; therefore, adjustment for wind speed variation with respect to height applies.

The phrase "SRP 3.3.2 (Reference 3.3-5)" has been corrected to read "SRP 3.3.1 (DCD Reference 3.3-2)".

B) The NRC requested a clarification be made in FSAR Subsection 3.3.2.2.4:

> Site-specific seismic category I structures, i.e., the UHSRS and exposed portions of the ESWPT and PSFSVs, are designed for the same tornado or hurricane loadings and combined tornado or hurricane effects using the same methods for qualification described for standard plant SSCs.

The phrase "designed for the same tornado or hurricane loadings" has been revised to "designed for the same tornado loadings but reduced hurricane loadings (parameters used for establishing qualifications are specified in Table 2.0-1)."

Impact on R-COLA

See attached marked-up FSAR Revision 3 pages 3.3-2 and 3.3-3.

Impact on DCD

Luminant has been informed that MHI is making a similar correction regarding the SRP reference in the Tier 2 DCD.

that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Therefore, based on the configuration and properties of the UHSRS complex, method 2 of ASCE/SEI 7-05 is an appropriate method of wind load design.

- The exposed portions of the ESWPT (seismic category I) and power source fuel storage vaults (PSFSVs) (seismic category I) are analyzed using method 1 of ASCE/SEI 7-05 (Reference 3.3-1) and an importance factor of 1.15.

CPNPP Units 3 and 4 do not have site-specific seismic category II buildings and structures. FSAR Figures 2.5.1-215 and 2.5.5-204 show that the site location does not have features promoting channeling effects or buffeting in the wake of upwind obstructions that warrant special design consideration. Therefore the wind design methods used for standard plant buildings are valid for the site.

3.3.2.1 Applicable Design Parameter

RCOL2_03.03.02-9

CP COL 3.3(2)
CP COL 3.3(6)

Add the following after the last paragraph in DCD Subsection 3.3.2.1.

The design-basis hurricane wind speed for site-specific seismic category I structures is 145 mph, which corresponds to a 3-second gust at 33 ft. above ground for exposure category C, with the same recurrence interval as described above, and is therefore enveloped by the basic wind speed used for the design of the standard plant. Site-specific SSCs are designed using the site-specific design basis wind speed of 145 mph, or higher.

3.3.2.2.1 Tornado and Hurricane Velocity Forces

CP COL 3.3(2)

Add the following after the third paragraph in DCD Subsection 3.3.2.2.1.

Hurricane velocity pressures for site-specific seismic category I structures are determined by converting hurricane wind speeds into effective velocity pressures in accordance with procedures accepted by SRP 3.3.~~2~~1 (DCD Reference 3.3-~~5~~2). Design hurricane loads for seismic category I structures are determined for enclosed and partially enclosed buildings using the analytical procedure method 1 or method 2 provided in Subsection 3.3.1.2, where: RCOL2_03.03.02-9 S01

V is the maximum hurricane windspeed = 145 mph

For the design basis hurricane, wind pressure varies with respect to height; therefore, adjustment for wind speed variation with respect to height applies. RCOL2_03.03.02-9

3.3.2.2.2 Tornado Atmospheric Forces

CP COL 3.3(5) Replace the last paragraph in DCD Subsection 3.3.2.2.2 with the following.

Site-specific seismic category I structures are the UHSRS, ESWPT, and the PSFSVs.

The UHSRS, including the pump houses and transfer pump rooms, are configured with large openings and/or vents. The UHS basins and cooling tower enclosures are designed as vented with respect to tornado atmospheric differential pressure loading. Venting of the pump houses and transfer pump rooms is anticipated during a tornado event, however, for the purpose of structural design, the external walls, internal walls, and slabs of the pump houses and transfer pumps rooms are conservatively designed as unvented and the full tornado atmospheric differential pressure loading is applied. Since the full pressure differential for the structural elements is considered, a depressurization model is not used for the structural design.

The ESWPT and PSFSV structures are designed as unvented because they do not have openings that permit depressurization during a tornado.

3.3.2.2.4 Combined Tornado or Hurricane Effects

RCOL2_03.03.02-9

CP COL 3.3(2) Replace the first and second sentences of the last paragraph in DCD Subsection 3.3.2.2.4 with the following.

Site-specific seismic category I structures, i.e., the UHSRS and exposed portions of the ESWPT and PSFSVs, are designed for the same tornado ~~or hurricane~~ loadings but reduced hurricane loadings (parameters for establishing qualifications specified in Table 2.0-1R) and combined tornado or hurricane effects using the same methods for qualification described for standard plant SSCs. RCOL2_03.03.02-9 RCOL2_03.03.02-9 S01

Attachment 3

Documents Provided on the Enclosed CD

The enclosed CD contains the following documents

Grading & Drainage Plan 4CS-CP34-20080060, Revision 4
(with all CVL drawings referenced in the supplemental response to RAI 139)

FSAR Ch 2 RAI 139 S03 Figures

FSAR Ch 2 RAI 139 S03 Text and Tables

Calculation TXUT-001-FSAR 2.4.2 -CALC-019, Revision 2

Calculation TXUT-001-FSAR 2.4.2 -CALC-036, Revision 3

Calculation TXUT-001-FSAR 2.4.2 -CALC-037, Revision 3

Calculation TXUT-001-FSAR 2.4.3 -CALC-011, Revision 4

Calculation TXUT-001-FSAR 2.4.3 -CALC-012, Revision 5

Calculation TXUT-001-FSAR 2.4.3 -CALC-013, Revision 4

Calculation TXUT-001-FSAR 2.4.4 -CALC-015, Revision 3