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-201001217
Log # TXNB-10063

Ref. # 10 CFR 52

September 16, 2010

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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 4315

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 4315 (CP RAI #145) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI involves accidental releases of radioactive liquid effluents in ground and surface waters.

The Final Safety Analysis Report (FSAR) pages affected by the response are listed in Attachment 2 and provided on the enclosed CD. Distribution addressees will receive the FSAR pages electronically. Should you have any questions regarding this response, 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 September 16, 2010.

Sincerely,

Luminant Generation Company LLC

for

Rafael Flores

Attachments: 1. Response to Request for Additional Information No. 4315 (CP RAI #145)
2. Revised FSAR Pages on the Enclosed CD

D090
NRO

Electronic distribution w/attachments:

Rafael.Flores@luminant.com
mlucas3@luminant.com
jeff.simmons@energyfutureholdings.com
Bill.Moore@luminant.com
Brock.Degeyter@energyfutureholdings.com
rbird1@luminant.com
Allan.Koenig@luminant.com
Timothy.Clouser@luminant.com
Ronald.Carver@luminant.com
David.Volkening@luminant.com
Bruce.Turner@luminant.com
Eric.Evans@luminant.com
Robert.Reible@luminant.com
donald.woodlan@luminant.com
John.Conly@luminant.com
JCaldwell@luminant.com
David.Beshear@txu.com
Ashley.Monts@luminant.com
Fred.Madden@luminant.com
Dennis.Buschbaum@luminant.com
Carolyn.Cosentino@luminant.com
NuBuild Licensing files

Luminant Records Management (.pdf files only)

shinji_kawanago@mnes-us.com
masanori_onozuka@mnes-us.com
ck_paulson@mnes-us.com
joseph_tapia@mnes-us.com
russell_bywater@mnes-us.com
diane_yeager@mnes-us.com
mutsumi_ishida@mnes-us.com
nan_sirirat@mnes-us.com
nicolas_kellenberger@mnes-us.com
rjb@nei.org
kak@nei.org
michael.takacs@nrc.gov
cp34update@certrec.com
michael.johnson@nrc.gov
David.Matthews@nrc.gov
Balwant.Singal@nrc.gov
Hossein.Hamzehee@nrc.gov
Stephen.Monarque@nrc.gov
jeff.ciocco@nrc.gov
michael.willingham@nrc.gov
john.kramer@nrc.gov
Brian.Tindell@nrc.gov
Alicia.Williamson@nrc.gov
Elmo.Collins@nrc.gov
Loren.Plisco@nrc.com
Laura.Goldin@nrc.gov
James.Biggins@nrc.gov
Susan.Vrahoretis@nrc.gov
ComanchePeakCOL.Resource@nrc.gov
sfrantz@morganlewis.com
jrund@morganlewis.com
tmatthews@morganlewis.com
regina.borsh@dom.com
diane.aitken@dom.com

Attachment 1

Response to Request for Additional Information No. 4315 (CP RAI #145)

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.: 4315 (CP RAI #145)

SRP SECTION: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

QUESTIONS for Hydrologic Engineering Branch (RHEB)

DATE OF RAI ISSUE: 2/26/2010

QUESTION NO.: 02.04.13-5

NUREG-0800, Standard Review Plan (SRP), Chapter 2.4.13, 'Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters,' establishes criteria that the NRC staff intends to use to evaluate whether an Applicant meets the NRC's regulations.

By letter dated October 5, 2009, the NRC staff issued RAI ID 3673 (RAI No. 116) Question Number 14273 (02.04.13-1), in which the NRC staff asked "Provide a description of the development of alternate conceptual models of the site and the process used in the selection of the most conservative and plausible pathway taking into consideration changes that will occur to site hydrology as a result of site alterations during construction."

The applicant responded in document CP-200901565-Log No TXNB-09068-(ML093230229) executed on November 16, 2009. The NRC staff has reviewed the response, as well as portions of Updated Tracking Report No. 4 referenced in the response, and has determined that additional information is needed in order to complete its review.

Similar to the applicant's response to RAI 3672 (RAI No. 114), this response does not adequately illustrate and discuss construction alterations, and the impact to the groundwater and surface water systems (e.g., groundwater levels and flowpaths). The NRC staff notes that SRP 2.4.13 states that alternative conceptual models should be developed and analyzed based on geologic and hydrologic characteristics of the site.

In order to make its safety determinations based on consideration of conservative parameters and scenarios for the transport of accidentally released radioactive liquid effluents, the NRC staff requests that the applicant provide conceptual models and selections for bounding sets of pathways that produce the most adverse contaminant concentrations to receptors in the analysis. Specifically the vertical migration pathway to the Twin Mountains Formation should be evaluated and calculations conducted to estimate potential concentrations at wells within the Twin Mountains Formation.

This is supplemental RAI 2.4.13-00-S.

ANSWER:

The response to RAI No. 4314 (CP RAI #147) submitted in letter TXNB-10060 on August 26, 2010 revised FSAR Subsections 2.4.12.2.4, 2.4.12.3 and 2.4.13.3 to substantiate the conclusion that the preferential pathway for a postulated release of the source term activity as a result of a tank failure is horizontally to Squaw Creek Reservoir instead of vertically to the Twin Mountain Formation. The response to Question 02.04.13-7 below revises FSAR Subsection 2.4.13.5 to reflect the most plausible pathway.

Impact on R-COLA

See marked-up FSAR Revision 1 pages 2.4-91, 2.4-94, 2.4-95, and 2.4-96 in Attachment 2 of this letter.

Impact on DCD

None.

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.: 4315 (CP RAI #145)

SRP SECTION: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

QUESTIONS for Hydrologic Engineering Branch (RHEB)

DATE OF RAI ISSUE: 2/26/2010

QUESTION NO.: 02.04.13-6

NUREG-0800, Standard Review Plan (SRP), Chapter 2.4.13, 'Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters,' establishes criteria that the NRC staff intends to use to evaluate whether an Applicant meets the NRC's regulations.

By letter dated October 5, 2009, the NRC staff issued RAI ID 3673 (RAI No. 116) Question Number 14274 (02.04.13-2), in which the NRC staff asked "In order to demonstrate compliance with the requirements of providing adequate protection to water users, discuss the potential for preferential flowpaths and vertical migration and provide conservative evaluations and discussion of the potential for flow to offsite wells (displayed on Figure 2.4.-205). Also provide data and discuss the applicability of using the calculations performed as part of the FSAR for Units 1 and 2 as the basis to eliminate conceptual models of vertical groundwater flow through the Glen Rose to offsite wells in the Twin Mountains Formation from Units 3 and 4."

The applicant responded in document CP-200901565-Log No TXNB-09068-(ML093230229) executed on November 16, 2009. The NRC staff has reviewed the applicant's response and has determined that additional information is needed in order to complete its review.

The NRC staff notes that offsite groundwater wells located within the Twin Mountains Formation could be potential receptors of groundwater flowing from the site. The applicant's response to this RAI seeks to eliminate the vertical pathway to the Twin Mountains Formation based on analyses performed as part of the Comanche Peak Nuclear Power Plant, Unit 1 and 2 evaluations and included in the Units 1 and 2 FSAR. However, these calculations showed that flow to wells within the Twin Mountains Formation was possible within approximately 400 years and that the resultant concentration of 137-Cs was above the 10 CFR Part 20 Appendix B Effluent Concentration Limits (ECL), despite the 400 year travel time. In addition, vertical migration calculations conducted for Units 1 and 2 do not appear to incorporate conservative, site specific conditions encountered at Units 3 and 4. Through review of information published by the U.S. Geological Survey (USGS) and the Texas Water Development Board (TWDB), the NRC staff has determined that since the construction of Units 1 and 2, water levels within the Twin Mountains Formation have fallen below the top of the Twin Mountains Formation in the area of the site,

creating a downward gradient and the potential for a downward flow. As a result of these findings, the staff believes that site specific porosity measurements, distances between the bottom of the tanks and Twin Mountains Formation, vertical gradients and tank source terms are different for Units 3 and 4 than for Units 1 and 2.

In order to make its safety determination based on consideration of conservative parameters and alternate scenarios for the transport of accidentally released radioactive liquid effluents, the NRC staff requests that the applicant perform an analysis to determine the impact of vertical migration of an accidental effluent release from Units 3 and 4 to the nearest offsite groundwater receptor within the Twin Mountains Formation. Conservative estimates or measurements of groundwater levels, hydraulic conductivity, effective porosity, flow directions and other hydraulic parameters for the Twin Mountains Formation should be presented and appropriately incorporated into this vertical transport analysis. The applicant is also requested to confirm that receptor concentrations resulting from this analysis comply with Effluent Concentration Limits.

This is supplemental RAI 2.4.13-01-S.

ANSWER:

The response to Question 02.04.13-5 above describes the basis for eliminating the vertical pathway to the Twin Mountains Formation.

Impact on R-COLA

None.

Impact on DCD

None.

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.: 4315 (CP RAI #145)

SRP SECTION: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

QUESTIONS for Hydrologic Engineering Branch (RHEB)

DATE OF RAI ISSUE: 2/26/2010

QUESTION NO.: 02.04.13-7

NUREG-0800, Standard Review Plan (SRP), Chapter 2.4.13, 'Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters,' establishes criteria that the NRC staff intends to use to evaluate whether an Applicant meets the NRC's regulations.

By letter dated October 5, 2009, the NRC staff issued RAI ID 3673 (RAI No. 116) Question Number 14276 (02.04.13-4), in which the NRC staff asked "Provide a discussion of the assumptions and input parameters, including a table of the assumed undiluted concentration of radionuclides in the tanks at time zero, used with the RATAF code to perform the accidental liquid radioactive effluent release analysis for Comanche peak Nuclear Power Plant, Units 3 and 4 and demonstrate the conservative nature of site-specific parameters in the model input. Please specifically discuss the conservatism of the dilution factor representing the volume of Squaw Creek Reservoir used in the RATAF analysis and the assumed travel time of 365 days."

The applicant responded in document CP-200901565-Log No TXNB-09068-(ML093230229) executed on November 16, 2009. The NRC staff has reviewed the response and has determined that additional information is needed in order to complete its review.

The applicant's response states that this is a DCD related issue and therefore the requested information was not provided to the NRC staff. In a phone call with the US-APWR DCD Applicant on January 20th, 2010, the US-APWR DCD applicant agreed to calculate initial tank concentrations based on 1 percent failed fuel and revise US-APWR DCD Table 11.2-17 to include these concentrations for each tank identified in the table. As such, the COL Applicant is requested to confirm that these revised values were used in the effluent release calculations to calculate concentrations at all receptors identified in the FSAR.

The NRC staff disagrees with the applicant's use of 100 percent instantaneous dilution in the Squaw Creek Reservoir for the horizontal migration scenario since the method does not demonstrate the required level of conservatism. The NRC staff also requests that the applicant present and discuss in the COL application the conservative nature of the value used as the site specific dilution factor.

Using the applicant's parameters and assumptions provided in Table 2.4.12-211 the travel time from the release tank to the Reservoir was estimated by staff to be 189 days for Scenario 2 Pathway 4a. This is more than 10 times faster than the applicant's estimate and much less than the 365 days assumed in the US-APWR DCD generic calculation that the applicant's evaluation references and is dependent upon.

In order to make its safety determination based on consideration of conservative parameters, the NRC staff requests the following information.

1) Provide revised initial concentrations in the tank used in the accidental effluent release analysis and confirm that the tank has highest concentration and volume as required.

2) Explain the conservative nature of the value used as the site specific dilution factor and use conservative site specific estimates of travel times to potential receptors as well as conservative methods to apply the estimates of dilution, where applicable, in the calculation of contaminant concentrations at receptor locations. Sound justifications for the assumptions used in the evaluations should be provided.

3) Provide estimates of contaminant flux into the reservoir from lateral groundwater discharge. This flux information should be used in conjunction with surface water evaluations to determine the concentration and potential exposure through surface water at offsite locations downstream of the Squaw Creek Reservoir Dam.

This is supplemental RAI 2.4.13-03-S.

ANSWER:

1) The initial concentrations in the Waste Tank, Waste Holdup Tank and the Boric Acid Tank (BAT) have been revised using the guidance of NUREG-0133 and the RATAF code, both of which are identified in SRP Section 11.2. The initial concentrations were developed assuming a 1 percent fuel defect and then scaling down using 0.12 percent fuel defect, as allowed by Branch Technical Position (BTP) 11-6, and applying the appropriate tank factors. DCD Table 11.2-17 has been revised to reflect these values by MHI letter UAP-HF-10244 dated September 8, 2010.

   The BAT remains the tank with the highest concentration of radionuclides and the largest volume; therefore, the discussion in FSAR Subsection 2.4.13.1 remains valid.

2) The tank failure analysis as previously described in DCD Subsection 11.2.3.2 has been revised and site-specific information related to the analysis has been deleted. COL Information Item 11.2(3) has been revised in the DCD to require COL applicants to assess the effect of a liquid-containing tank failure based upon their site-specific hydrogeological conditions using the revised source term provided in DCD Table 11.2-17. The site-specific analysis performed for Comanche Peak Units 3 and 4 has been revised as follows:

   - Post-construction drawings have been revised to show there is engineered fill surrounding the Auxiliary Building (A/B) that houses the BAT. This engineered fill is assumed to be fully saturated due to rain infiltration and will carry the source term from either Unit 3 or 4 to the existing fill (a result of Unit 1 and 2 construction) north of Unit 4 or east of Unit 3. No credit is taken for any retardation, dilution or retention of the engineered fill. The response to RAI No. 4314 (CP RAI #147) submitted in letter TXNB-10060 included FSAR Figures 2.4.12-212 and 2.4.12-213. Figure 2.4.12-212 has been further revised to eliminate the previous tank failure analysis cross-section locations. Figure 2.4.12-213, which is the Unit 3 Pathway 1 cross section, now shows the stormwater retention pond east of Unit 3. The stormwater retention pond has no affect on the source term transport reaching SCR. A discussion

regarding the stormwater retention pond is provided in Subsection 2.4.13.5.1.

- Once the source term reaches the existing fill, it will slowly move through existing fill with the groundwater, but only 25 percent of the total 9.98E06 gallons of available groundwater (Subsection 2.4.13.5.3) is conservatively credited for dilution purposes.
- The infiltration rate into Squaw Creek Reservoir (SCR) is very slow and based upon the groundwater flow through the existing fill. The infiltration rate is determined by assuming the source term activity enters SCR as a slug or a half-elliptical cone. For the case of a slug, the 6.12 gpm infiltration rate (Subsection 2.4.13.5.3) was determined based upon the circular area of the BAT. The half-elliptical cone infiltration rate is 149.7 gpm (Subsection 2.4.13.5.3). For the tank failure analysis, the higher half-elliptical cone infiltration rate is conservatively used even though the source term activity is assumed to enter SCR as a slug form. This infiltration rate is much greater than what is realistically expected due to the hydrostatic pressure differential between SCR and the existing fill groundwater. Infiltration would realistically take place when SCR elevation changes occur that reduce the SCR hydrostatic pressure.
- Once the source term activity has infiltrated into SCR, the activity will be adequately mixed with either 2.0 million gpm if both CPNPP Unit 1 and 2 circulating water (CW) pumps are running at maximum capacity or 1 million gpm if only one unit is operating.
- Once the source term activity combines with the CW pump flow and exits the south side of the Unit 1 and 2 peninsula, it will mix with approximately 3.7E09 gallons (Subsection 2.4.13.5.6) of water, although no credit is taken for this dilution in order to meet the Effluent Concentration Limits (ECLs). This volume does not include water at depths of 66 feet or greater since it cannot be shown that adequate mixing occurs at these depths.
- Due to the driving force of the CW pumps operating at full capacity, the source term activity could potentially reach the Roto-cone gravity drain device, which is considered the release point to an unrestricted body of potable water, i.e., Squaw Creek and subsequently to the Brazos River.

A complete description of the tank failure analysis, including sound justification for all assumptions used in the analysis, is provided in the attached Subsection 2.4.13.5 FSAR revision where it is shown that the ECLs are met.

3) Lateral groundwater discharge is from the existing fill to SCR as depicted on FSAR Figure 2.4.12-212. The effect of the existing fill groundwater dilution (25 percent of total available groundwater) and resulting source term activity concentration is provided in FSAR Table 2.4.13-205. The Roto-cone device on the southern end of SCR is considered the release point to an unrestricted potable water supply. Therefore, it is unnecessary to evaluate the contaminant flux downstream in the Brazos River since no credit is being taken for dilution downstream of the SCR Roto-cone device. The concentration that exists at the Roto-cone is what would be considered the downstream concentration in the Brazos River. Luminant has an existing Term Permit with the Texas Commission on Environmental Quality that requires a minimum of 1.5 cfs be maintained at the Highway 144 crossing over Squaw Creek southeast of SCR. This results in a constant flow from the Roto-cone into the SCR spillway.

Impact on R-COLA

See marked-up FSAR Revision 1 pages 2.4-89, 2.4-90, 2.4-91, 2.4-92, 2.4-96, 2.4-97, 2.4-98, 2.4-99, 2.4-100, 2.4-101, 2.4-102, 2.4-103, 2.4-104, 2.4-105, 2.4-106, 2.4-107, 2.4-108, 2.4-109, 2.4-110, 2.4-111, 2.4-112, 2.4-113, 2.4-123; new pages 2.4-223, 2.4-224, 2.4-225, 2.4-226, 2.4-227, 2.4-228, 2.4-229, 2.4-230, 2.4-231, 2.4-232, 2.4-233, 2.4-234, 2.4-235, 2.4-236, and 2.4-237; Figures 2.4.12-212

and 2.4.12-213; and new Figures 2.4.13-201, 2.4.13-202, 2.4.13-203, 2.4.13-204, 2.4.13-205, 2.4.13-206, and 2.4.13-207 in Attachment 2 of this letter.

Impact on DCD

None.

Attachment 2

Revised FSAR Pages on the Enclosed CD

2.4-89	2.4-100	2.4-110	2.4-228	Figure 2.4.12-212
2.4-90	2.4-101	2.4-111	2.4-229	Figure 2.4.12-213
2.4-91	2.4-102	2.4-112	2.4-230	Figure 2.4.13-201
2.4-92	2.4-103	2.4-113	2.4-231	Figure 2.4.13-202
2.4-94	2.4-104	2.4-123	2.4-232	Figure 2.4.13-203
2.4-95	2.4-105	2.4-223	2.4-233	Figure 2.4.13-204
2.4-96	2.4-106	2.4-224	2.4-234	Figure 2.4.13-205
2.4-97	2.4-107	2.4-225	2.4-235	Figure 2.4.13-206
2.4-98	2.4-108	2.4-226	2.4-236	Figure 2.4.13-207
2.4-99	2.4-109	2.4-227	2.4-237	