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CP-201100377
Log # TXNB-11015

Ref. # 10 CFR 52

March 18, 2011

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 RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION NO. 4207 (SECTION 12.3-12.4) AND NO. 4208 (SECTION 12.5)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein supplemental responses to Request for Additional Information No. 4207 (CP RAI #133) and No. 4208 (CP RAI #136) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental responses address maintaining the dose to each construction worker at less than 100 mrem per year and reducing unnecessary contributions to the plant source term from components.

Should you have any questions regarding these supplemental responses, 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 March 18, 2011.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments: 1. Supplemental Responses to Request for Additional Information No. 4207 (CP RAI #133)
2. Supplemental Responses to Request for Additional Information No. 4208 (CP RAI #136)

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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.: 4207 (CP RAI #133)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 1/21/2010

QUESTION NO.: 12.03-12.04-9

10 CFR 20.1101, 1301, 1302, NUREG-0800, 'Standard Review Plan,' Section 12.03-12.04

In RAI No. 3318 (RAI # 119), Question 12.03-12.04-8 (13150), the NRC staff asked the Applicant to change the combined license (COL) final safety analysis report (FSAR) to better define the as low as reasonably achievable (ALARA) program for construction workers.

The requirement of 10 CFR 20.1301(a)(1) is "The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year," and 10 CFR 20.1101(b) requires exposure to members of the public be as low as reasonably achievable (ALARA). In response to the NRC staff's RAI, the Applicant noted that they would continually monitor construction worker dose during construction, they would take the actions appropriate to maintain exposure ALARA, and they would ensure protection of construction workers to radiation exposure from radiography sources and radioactive materials. However, since the Radiation Protection milestones described in COL FSAR Table 13.4-201 do not require any Radiation Protection program elements until the receipt of radioactive sources under the COL License, the NRC staff is unable to determine who has responsibility for monitoring and controlling cumulative construction worker dose resulting from activities of diverse licensees.

The Applicant is requested to update and revise COL FSAR Section 12.4 to describe how the Applicant will meet the requirements of § 20.1101, 1301 and 1302 to control, limit and monitor exposure to members of the public involved in the construction of CPNPP, Units 3 and 4.

SUPPLEMENTAL INFORMATION:

As a result of a discussion with the NRC Staff on February 14, 2011, FSAR Subsections 12.2.1.1.10 and 12.4.1.9 have been revised to include a statement that Luminant maintains procedures to control, limit, and monitor cumulative dose for construction workers and security employees such that total exposure for each construction worker and security employee is maintained less than 100 mrem per year in accordance with 10 CFR Part 20.1301.

Luminant's procedures will include precautions to keep construction workers and security personnel clear of areas of potential exposure due to various sources that may be on site. Once elements of the Radiation Protection Program are implemented per FSAR 12.5 and Table 13.4-201, this program and its supporting procedures will be used to control and monitor exposure. Prior to the implementation of the CPNPP Units 3 and 4 Radiation Protection Program, the controls in the Offsite Calculation Manual (ODCM) for CPNPP Units 1 and 2 limit the dose in Unrestricted Areas (which includes the construction sites for Units 3 and 4).

Impact on R-COLA

See attached marked-up FSAR Rev 1 pages 12.2-2 and 12.4-1.

Impact on S-COLA

None.

Impact on DCD

None.

The estimated fission and corrosion product activity in the evaporation pond water are shown in the Table 12.2-201. This estimated source term is initial activity into the evaporation pond, based on the realistic source term of the Waste Monitor Tank and the decontamination factors from NUREG-0017. RCOL2_12.02-2

~~Any additional solid, liquid and gaseous radiation sources that are not identified in Subsection 12.2.1, including radiation sources used for instruments calibration or radiography, will be provided when such site specific information would become available in the procurement phase. These sources will be incorporated in the updated FSAR.~~Additionally, the site maintains contained sources of known isotope and activity containing byproduct, source, or special nuclear materials for use as calibration, check, or radiography sources. Example uses for these types of sources include systems security checks; equipment standardization and calibration; process control; gauging and quality assurance testing; teaching; and nuclear reactor operations. RCOL2_12.02-1

Licensed sources containing byproduct, source, and special nuclear materials that warrant shielding design consideration meet the applicable requirements of 10 CFR Parts 20, 30, 31, 32, 33, 34, 40, 50, and 70. A supplementary warning symbol is used in the presence of large sources of ionizing radiation consistent with the guidance in Regulatory Issue Summary (RIS) 2007-03. Sources maintained on site are shielded to keep personnel exposure ALARA. Sources brought on-site by contractors for activities such as the servicing or calibration of plant instrumentation or the performance of radiography are maintained and used in accordance with the provisions of the licensed utility group or contractor. If these sources must be maintained on site, designated plant personnel approve the storage location and identify appropriate measures for maintaining security and personnel protection. Luminant maintains procedures to control, limit and monitor cumulative dose for construction workers and security employees such that total exposure for each construction worker and security employee is maintained less than 100 mrem per year in accordance with 10 CFR Part 20.1301. RCOL2_12.03-12.04-9
RCOL2_12.02-1
RCOL2_12.03-12.04-9 S01
RCOL2_12.03-12.04-10 S01

Specific details regarding the isotope, quantity, form and use of these sources are maintained onsite following their procurement. The following minimum information is maintained: RCOL2_12.02-1

- Isotopic concentration
- Location on site
- Source strength, form, and geometry (as applicable)
- Description of the use

Written procedures based upon the Radiation Protection Program govern the procurement, receipt, inventory, labeling, leak testing, surveillance, control, transfer, disposal, storage, issuance, and use of these sources. Additionally, these

12.4 DOSE ASSESSMENT

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

12.4.1.9 Dose to Construction Workers

CP COL 12.4(1) Replace the paragraph in DCD Subsection 12.4.1.9 with the following.

RG 1.206 requires that an annual dose to construction workers be estimated in a new unit construction area for multi-unit plants. This subsection evaluates the potential radiological dose impacts to construction workers at the CPNPP Units 3 and 4 resulting from the operation of CPNPP Units 1 and 2. Because the CPNPP Units 3 and 4 construction period occurs while CPNPP Units 1 and 2 are operating, construction workers at CPNPP Units 3 and 4 would be exposed to direct radiation and gaseous radioactive effluents from CPNPP Units 1 and 2. Doses to CPNPP Unit 4 construction workers from operation of CPNPP Unit 3 are not evaluated because the CPNPP Unit 4 construction will be substantially complete and many of the construction workers gone before CPNPP Unit 3 begins commercial operation. Gaseous effluent releases from CPNPP Unit 3 during fuel loading and low power testing, less than 5 percent power, are not expected to be significant, and are bounded by the conservatisms in the following dose estimate. During CPNPP Unit 3 testing, the overall work force, as well as outdoor construction activities on CPNPP Unit 4, would be reduced.

Additionally, the site maintains contained sources of known isotope and activity containing byproduct, source, or special nuclear materials for use in equipment standardization and calibration, security checks, process control, gauging, quality assurance, teaching, or radiography sources. Luminant maintains procedures to control, limit and monitor cumulative dose for construction workers and security employees such that total exposure for each construction worker and security employee is maintained less than 100 mrem in a year in accordance with 10 CFR Part 20.1301 and the Radiation Protection Program. Once CPNPP Unit 3 completes 5% power ascension testing and proceeds to commercial operation, the remaining construction workers doses will be maintained ALARA in accordance with 10 CFR 20.1301 as described in Section 12.5, Operational Radiation Protection Program. Subsection 13.4 provides an implementation milestones for the Operational Radiation Protection Program that meets the regulations provided in 10 CFR Parts 20.1101 (a) and (b), 1301 and 1302. Once CPNPP Units 3 and 4 become operational, the estimated dose for remaining construction workers will be maintained ALARA at less than 2 mrem/hr.

RCOL2_12.03-12.04-9 S01
RCOL2_12.03-12.04-10 S01
RCOL2_12.03-12.04-6

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.: 4207 (CP RAI #133)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 1/21/2010

QUESTION NO.: 12.03-12.04-10

10 CFR 20.1101, 1301, 1302, NUREG-0800, SRP Section 12.03-12.04

In RAI No. 3318 (RAI# 119), Question 12.03-12.04-5 (13147), the NRC staff asked the Applicant to change the combined license (COL) final safety analysis report (FSAR) to better define the sources of radiation exposure to the construction workers, and to clarify the placement of area monitoring dosimetry used to monitor construction worker exposure.

In response to the NRC staff's RAI, the Applicant noted that they would keep construction worker exposures less than 2 mrem/hr in accordance with the current Radiation Protection Program, STA 650 "General Health Physics Plan" and that monitoring construction worker exposure is unnecessary because limiting construction worker exposure to 2 mrem/hr is as low as reasonably achievable (ALARA). However, controlling construction worker to exposure to dose rates less than 2 mrem/hr does not address § 20.1301(a)(1), which limits doses to members of the public to 100 mrem (1 milli Sv) in a year, nor does it address the requirements of § 20.1101(b), which requires exposure to members of the public be ALARA. The Applicant further noted that construction worker dose will be maintained ALARA in accordance with the Radiation Protection Milestones noted in COL FSAR Table 13.4-201. However, prior to fuel receipt, Table 13.4-201 only requires those Radiation Protection program elements necessary to support COL Licensee receipt of sources. Since the location of the exposure monitoring TLDs are not adequately described in the COL FSAR, the NRC staff is unable to determine that the Applicant is meeting the requirements of § 20.1302(a) to perform surveys sufficient to demonstrate that exposure to members of the public meet the public dose limits of §20.1301(a)(1). Additionally, based on the available information, the NRC staff is unable to determine that the provisions of STA 650 adequately address the requirements of § 20.1101(b) to maintain construction worker radiation exposure ALARA, and § 20.1301(a)(1), which limits doses to members of the public to 100 mrem.

The Applicant is requested to update and revise COL FSAR Section 12.4 to describe how the Applicant will meet the requirements of § 20.1101, 1301 and 1302 to control, limit and monitor exposure to members of the public involved in the construction of CPNPP Units 3 and 4.

SUPPLEMENTAL INFORMATION:

As a result of a discussion with the NRC Staff on February 14, 2011, FSAR Subsections 12.2.1.1.10 and 12.4.1.9 have been revised to include a statement that Luminant maintains procedures to control, limit and monitor cumulative dose for construction workers and security employees such that the total exposure for each construction worker and security employee is maintained less than 100 mrem per year in accordance with 10 CFR Part 20.1301.

Impact on R-COLA

See marked-up FSAR Rev 1 pages 12.2-2 and 12.4-1 attached above.

Impact on S-COLA

None.

Impact on DCD

None.

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.: 4208 (CP RAI #136)

SRP SECTION: 12.05 - Operational Radiation Protection Program

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 2/2/2010

QUESTION NO.: 12.05-6

In its response, dated November 11, 2009, to the NRC staff's RAI 3319 (RAI 100), Question 12.05-2, the applicant referenced the Design Certification (DC) applicant response to US-APWR Tier 2 DCD RAI 147-1850, dated February 6, 2009, and RAI 428-2910, Question 12.03-12.04-3, dated September 30, 2009. The DC applicant revised section 12.3 to include some design specifications for selection of materials employed for the purpose of implementing the as low as reasonably achievable (ALARA) concept during construction. However, the DC applicant's response did not describe the program elements, that when implemented, will provide an on going understanding of the plant source term, including knowledge of input mechanisms and the process to reduce unnecessary contributions to the plant source term from components.

Since the on going effort to reduce the radiation source term in the plant is an essential element of meeting the requirements of 10 CFR 20.1101(b), the COL applicant is requested to revise and update the combined license (COL) application final safety analysis report (CPNPP FSAR) section 12.5 to describe those program elements related to establishing an understanding of input mechanisms to the plant source term and the program elements that will be used to reduce unnecessary contributions to the plant source term from components. Alternately, the applicant may describe the use of a different approach.

SUPPLEMENTAL INFORMATION:

As a result of a discussion with the NRC Staff on February 14, 2011, FSAR Section 12.5 has been revised to include a commitment to identify sources of cobalt and other activated materials prior to initial plant startup and utilize latest industry practice guidelines similar to those in Electric Power Research Institute (EPRI) report TR-103296 in establishing a source reduction program for maintenance, plant modifications and procurement of replacement components once CPNPP Unit 3 becomes operational.

Impact on R-COLA

See attached marked-up FSAR Revision 2 page 12.5-3.

Impact on S-COLA

None.

Impact on DCD

None.

In order to ensure that the B.A. evaporator room does not become a VHRA during the end of cycle, routine surveillance for the B.A. evaporator room during the end of cycle is stipulated in the Radiation Protection Program. In the event that the routine surveillance shows an increase in dose level, an appropriate strategy to sufficiently reduce the dose rate below the criteria for a VHRA is to be provided. DCD_12.02-29 DCD_12.02-30

Add the following information after the last paragraph in the discussion on Calibration in Subsection 12.5.4.2 of NEI 07-03A. RCOL2_12.05-6

Source Term Reduction Strategy

The plant source term is described by the level of radiation, or radioactive material, given off or contained in plant systems, structures, or components that results in occupational radiation exposure from routine operation of the plant, including anticipated operational occurrences. The source term includes, but is not limited to, activated components in the primary coolant, corrosion and wear products activated in the reactor and distributed in plant systems, or sealed sources maintained to support plant operations. The reduction and control of the plant radiation source term is an essential element of meeting the requirements of 10 CFR 20.1101(b). RCOL2_12.05-6

FSAR Subsection 12.1.1.3.2 commits the administrative programs and procedures to comply with RG 8.8, which provides several strategies for reducing personnel exposure, including some options that would limit the overall source term, such as crud control and equipment isolation and decontamination. Additionally, the following DCD Subsections, which describe design considerations for the reduction of the overall source term, are already incorporated into the FSAR by reference:

- Subsection 12.1.2.1
- Subsection 12.1.2.2.3
- Subsection 12.3.1.1.1.1 Item (E)
- Table 12.3-7

Luminant will identify cobalt and other activated material sources during the detailed design phase of the project. During plant operation, Luminant will utilize industry practice guidance similar to EPRI report TR-103296 to ensure that procurement of components or piping, conducting maintenance, or modifications considers the identified sources of cobalt and other activated materials. RCOL2_12.05-6 S01
