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CP-200901565
Log # TXNB-09068

Ref. # 10 CFR 52

November 16, 2009

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
RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION
NO. 3316, 3318, 3510, AND 3673

Dear Sir:

Luminant Generation Company LLC (Luminant) herein submits responses to Requests for Additional Information No. 3316, 3318, 3510, and 3673 for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The affected Final Safety Analysis Report pages are included with the responses.

Should you have any questions regarding these responses, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

The commitments made in this letter are specified on page 3.

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

Executed on November 16, 2009.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

- Attachments
1. Response to Request for Additional Information No. 3316 (CP RAI #118)
 2. Response to Request for Additional Information No. 3318 (CP RAI #119)
 3. Response to Request for Additional Information No. 3510 (CP RAI #117)
 4. Response to Request for Additional Information No. 3673 (CP RAI #116)

DO90
HRO

Electronic Distribution w/all Attachments

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Luminant, Records Management –
Portfolio of .pdf files

Regulatory Commitments in this Letter

This communication contains the following new or revised commitments which will be completed or incorporated into the CPNPP licensing basis as noted. The Commitment Number is used by Luminant for internal tracking.

<u>Number</u>	<u>Commitment</u>	<u>Due Date/Event</u>
6731	Once NEI 07-08 is approved by the NRC, FSAR Chapter 12 referenced sections will be revised to reflect the approved version NEI 07-08A and all differences, if any, will be addressed.	June 30, 2010
6741	Once NEI 08-08 is approved by the NRC, FSAR Chapter 12 referenced sections will be revised to reflect the approved version NEI 08-08A and all differences, if any, will be addressed.	June 30, 2010

U. S. Nuclear Regulatory Commission
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Attachment 1

Response to Request for Additional Information No. 3316 (CP RAI #118)

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.: 3316 (CP RAI #118)

SRP SECTION: 12.01 - Assuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.01-1

10 CFR 20.1101 and NEI 07-03

The applicant's FSAR Sections 12.1 and 12.5 includes a commitment to the use of the NEI Template 07-03, Generic FSAR Template Guidance for Radiation Protection Description to describe, at the functional level, elements of the radiation protection program required by 10 CFR 20.1101. The applicant is requested to update the commitment of FSAR Section 12.5 to reference the final version of this template (or otherwise update the FSAR to address any differences from this final template version), consistent with Regulatory Guide 1.206 and Section 12.5 of the Standard Review Plan (NUREG 0800), or justify an alternative. Accordingly, the applicant is also requested to update all internal citations to the final NEI Template 07-03 in applicable FSAR subsections and references.

ANSWER:

FSAR Sections 12.1 and 12.5 Revision 0 reference the use of NEI 07-03, Revision 5. NEI 07-03 has been reviewed by the NRC and Revision 7 of this document was approved by the NRC for use in COL applications. The approved version of the document has been issued as NEI 07-03A, Revision 0. Therefore, COLA FSAR Chapter 12 has been revised to include the approved version NEI 07-03A. These revisions were reflected in FSAR Update Tracking Report Revision 7, submitted via Luminant letter TXNB-09056, dated October 21, 2009.

Impact on R-COLA

None.

Impact on S-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.: 3316 (CP RAI #118)

SRP SECTION: 12.01 - Assuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.01-2

10 CFR 20 and RG 1.206

The applicant's FSAR, Section 12.1, includes a commitment on the use of guidance for ensuring that occupational radiation exposures are as low as is reasonably achievable (ALARA), based on draft NEI Template 07-08 "Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures are as Low as is Reasonably Achievable (ALARA)", which is currently under NRC staff review. This NEI template discusses operational policies and operational considerations to ensure that occupational radiation exposures are ALARA.

Should the NRC staff accept NEI Template 07-08, please revise and update the FSAR to reflect the use of the final version of this template (or otherwise update the FSAR to address any differences for consistency with an approved template). Accordingly, the applicant is requested to also update all internal citations to the final approved NEI Template 07-08 in applicable FSAR subsections and references.

ANSWER:

Revision 0 of COLA FSAR Sections 12.1 and 12.5 reference the use of NEI 07-08, Revision 1. Revision 3 is the latest version of NEI 07-08 and it is currently under NRC review. FSAR Chapter 12 was revised to include NEI 07-08, Revision 3 as reflected in FSAR Update Tracking Report Revision 7, submitted via Luminant letter TXNB-09056, dated October 21, 2009. Once NEI 07-08 is approved by the NRC, FSAR Chapter 12 referenced sections will be revised to reflect the approved version NEI 07-08A and all differences, if any, will be addressed.

Impact on R-COLA

None.

Impact on S-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.: 3316 (CP RAI #118)

SRP SECTION: 12.01 - Assuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.01-3

10 CFR 20.1101

COL Information Item 12.1(3), Operational Radiation Protection Program, references several Regulatory Guides (RGs) which are outdated according to the consolidated guidance of NUREG 1736, and are not mentioned in NEI 07-03 or NEI 07-08. Please revise COL item 12.1(3) so that RGs 8.20 and 8.32 are deleted from the listing of RGs, and that RGs 1.206 and 4.21 are added to the listing of RGs.

The applicant is requested to revise and update the Comanche Peak Nuclear Power Plant FSAR to add references to RG 1.206, RG 4.21 and to delete references to RG 8.20 and 8.32, or describe and justify the alternate approaches used.

ANSWER:

Luminant agrees that NUREG-1736 identifies RGs 8.20 and 8.32 in its "List of Outdated Regulatory Guidance." In addition to RGs 8.20 and 8.32, NUREG-1736 also lists RG 8.26 as outdated regulatory guidance. Therefore, RGs 8.20, 8.32, and 8.26 were deleted from FSAR Subsection 12.1.3 [i.e., COL Information Item 12.1(3)] and from DCD Reference section 12.1.5. These changes were described in FSAR Update Tracking Report Revision 0 submitted to the NRC via Luminant letter TXNB-09005 dated April 2, 2009 (ML092450337).

RG 4.21 is added to DCD Subsection 12.1.3 in Revision 2 as Reference 12.1-27. This reference was added by DCD RAI 91-1496 Revision 1, Question No. 12.03-12.04-2 submitted to the NRC via MHI letter UAP-HF-09003 dated January 9, 2009 (ML090150211).

Luminant believes RG 1.206 is not needed as an addition to the listing of RGs in COL 12.1(3), because the applicable RGs referenced in RG 1.206 C.I.12.1.3 are already included in the listing of RGs for this FSAR section.

Impact on R-COLA

None.

Impact on S-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.: 3316 (CP RAI #118)

SRP SECTION: 12.01 - Assuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.01-4

10 CFR 20.1406

The applicant's FSAR, Sections 12.1 and 12.5 do not include a commitment to the use of Guidance for Life-Cycle Minimization of Contamination, based on draft NEI Template 08-08 "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination", which is currently under NRC staff review. This NEI template discusses operational policies and operational programs to ensure that meet the programmatic requirements of 10 CFR 20.1406 for life cycle minimization of contamination, in part by addressing the applicable regulatory position elements of Regulatory Guide 4.21.

The applicant is requested to revise and update the COL FSAR to describe:

1. The applicant's position with respect to that adoption of NEI template 08-08.
2. If the applicant decides to fully adopt NEI 08-08, then should the staff accept NEI Template 08-08, please update the COL FSAR to reflect the use of the final version of this template,
3. If the applicant decides to adopt portions of NEI 08-08 then the applicant is requested to revise and update the FSAR to address any differences with an approved template, and the alternate applicant methods of ensuring compliance with the intent of the guidance provided in RG 4.21.
4. Update the COL FSAR to include the COL Applicant data items specified within NEI 08-08.

Alternately using acceptable guidance, Luminant may provide a description, and associated justification, of all the operational programs and COL information items necessary to demonstrate how the application meets the requirements of 10 CFR 20.1406.

ANSWER:

FSAR Sections 1.6 and 12.5 were updated to include the use of Guidance for Life-Cycle Minimization of Contamination, based on full adoption of NEI 08-08, Revision 3, currently under NRC review. Once NEI 08-08 is approved by the NRC, FSAR Chapter 12 referenced sections will be revised to reflect the approved version NEI 08-08A and all differences, if any, will be addressed.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 1.6-2, 12.5-2, and 12.5-3.

Impact on S-COLA

None.

Impact on DCD

None.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

CP SUP 1:6(1)

**Table 1.6-201
Material Referenced**

Report Number	Title	FSAR Section Number
52-021, Docket Number.	US-APWR Design Control Document, Rev. 2	All FSAR Chapters
NEI 07-09A	Generic FSAR Template Guidance for Offsite Dose Calculation Manual Program Description, Rev.0	11.5
NEI 07-10A	Generic FSAR Template Guidance for Process Control Program, Rev.0	11.4
NEI 07-08	Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA), Rev. 3	12.1
NEI 07-03A	Generic FSAR Template Guidance for Radiation Protection Program Description, Rev. 0	12.1, 12.5
<u>NEI 08-08</u>	<u>Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination, Rev. 3</u>	<u>12.5</u>
NEI 06-13A	Template for an Industry Training Program Description, Rev. 1	13.2
NEI 06-06	Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites, Rev. 3	13.7
NEI 06-09	Risk-Managed Technical Specifications (RMTS) Guidelines, Rev. 0	16.1, Chapter 19
NEI 04-10	Risk-Informed Method for Control of Surveillance Frequencies, Rev. 1	16.1
NEI 06-14A	Quality Assurance Program Description, Rev. 0	17.5
NEI 07-02A	Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52, Rev. 0	17.6

RCOL2_12.03-1
2.04-1
RCOL2_12.01-4
RCOL2_12.03-1
2.04-7

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR

Add the following information after the paragraph in the discussion on Radwaste Handling in Subsection 12.5.4.2 of NEI 07-03A.

MAP-12-102

CPNPP Units 3 and 4 have a plan to store temporarily radioactive wastes/materials in Interim Radwaste Storage/Staging Building outside the plant structures. Entry into the radiologically controlled areas of this building is allowed only through the issuance of a Radiation Work Permit. Non-radiologically controlled areas allow for general access.

CTS-00463

Add the following information after the third paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The locations and radiological controls of the radiation zones on plant layout drawings are located in DCD Subsection 12.3.1.2. Administrative controls for restricting access to Very High Radiation Areas are incorporated into plant procedures which require approval provided by the Plant Manager's (or designee) approval for each entry. Entry will be controlled through the Radiation Work Permit (RWP) process. Physical Access controls for Very High Radiation Areas is controlled are provided by physical barriers such as lockable the gates or doors which prevent unauthorized access and entry to these areas is allowed only through the issuance of a Radiation Work Permit. It's not necessary to enter these areas periodically. DCD Subsection 12.3.1.2 includes detailed drawings of the very high radiation areas and indicates the physical access controls. Table 12.5-201 summarizes the plant areas with the potential to become very high radiation areas. Radiation monitor locations for each area are indicated in DCD Subsection 12.3.4.

RCOL2_12.0
3-12.04-2

Add the following information after the sixth paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The gates provide access control of the fuel transfer tube inspection (Very High Radiation Area) and the area near the seismic gap below the transfer tube. Access control for these areas is controlled by the gates and entry to these areas is allowed only the issuance of a Radiation Work Permit.

Add the following information at the end of Subsection 12.5.4.8 of NEI 07-03A.

RCOL2_12.0
3-12.04-1

In addition, NEI Template 08-08 Revision 3, "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" is fully adopted. And also, the guidance provided in NEI 08-08 will be used at CPNPP Units 3 and 4 to minimize contamination during construction, operation and decommissioning. This will include the use of photographs and video records during construction to facilitate

RCOL2_12.0
1-4
RCOL2_12.0
3-12.04-7

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR

updating the conceptual site model for groundwater movement and aid in revising the groundwater monitoring plan post-construction. Final layout drawings, photographs, global positioning survey information and video records will be used in assessing the proper location for groundwater monitoring wells, foundations, pipes, conduits and other below grade structures.

RCOL2_12.0
3-12.04-1

RCOL2_12.0
1-4

RCOL2_12.0
3-12.04-7

Replace the first and second paragraph in Subsection 12.5.4.12 of NEI 07-03A with the following.

MAP-12-102

The radiation protection program and procedures are established, implemented, maintained and reviewed consistent with the 10 CFR 20.1101 and the quality assurance program referenced in Chapter 17.

U. S. Nuclear Regulatory Commission
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11/16/2009

Attachment 2

Response to Request for Additional Information No. 3318 (CP RAI #119)

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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-2

NEI 07-03A notes that each COL applicant will demonstrate compliance with 10 CFR 20.1602 by including in their application a description of each Very High Radiation Area (VHRA) and associated additional administrative controls for restricting access to each Very High Radiation Area. In accordance with the provisions of NEI 07-03A Revision 0 Section 12.5.4.4 Access Control, site specific information that the applicant will provide to supplement the template, and which will be reviewed separately by the NRC staff, includes:

- Providing a description of each Very High Radiation Area (VHRA)
- Providing the reasons for accessing each VHRA
- Providing the anticipated frequency of accessing each of the Very High Radiation Areas, including a description of the additional administrative controls to be employed for restricting access to each Very High Radiation Area as required by 10 CFR 20.1602, consistent with the guidance of RG 8.38, 'Control of Access to High and Very High Radiation Areas in Nuclear Power Plants,' Revision 1 (May 2006).
- Provision of drawings that show the location of each Very High Radiation Area in plant layout diagrams in FSAR Section 12.3-4.
- Provision of detailed drawings for each Very High Radiation Area in FSAR Sections 12.3-4 that indicate physical barriers sufficient to thwart undetected entry, or an explanation of how such barriers to the Very High Radiation Areas will be verified in the final design of the facility.

In accordance with the requirements of 10 CFR 20.1602, the guidance of RG 8.38 and the provisions of NEI Template 07-03A Rev. 0, the applicant is requested to revise and update the FSAR to provide the information noted, above, or describe and justify the specific alternate approaches employed.

ANSWER:

COLA FSAR Section 12.5 includes the following supplemental information to Subsection 12.5.4.4 as incorporated by reference from NEI 07-03A regarding Comanche Peak Units 3 and 4 radiation zones:

The locations and radiological controls of the radiation zones on plant layout drawings are located in DCD Subsection 12.3.1.2. Administrative controls for restricting access to Very High Radiation Area are provided by Plant Manager's

(or designee) approval. Access control for Very High Radiation Areas is controlled by the gates and entry to these areas is allowed only through the issuance of a Radiation Work Permit. Subsection 12.3.1.2 includes detailed drawings of the very high radiation areas and indicates the physical access controls. Radiation monitor locations for each area are indicated in DCD Subsection 12.3.4.

DCD Figure 12.3-1 (Sheets 1 through 34) provides the plant layout drawings referenced in the COLA FSAR. These drawings show the radiation zone categories for each plant area under normal and shutdown conditions as well as the associated access control (physical barriers) for the US-APWR.

The radiation zone designator "X" in DCD Figure 12.3-1 corresponds to dose rates in excess of 500 rad/hr at one meter from a radiation source or from any surface the radiation penetrates and therefore indicates the Very High Radiation Areas (VHRAs) for the US-APWR. It's not necessary to enter these areas periodically and the issuance of a specific Radiation Work Permit is not regularly permitted.

To the extent possible, entry into VHRAs is forbidden unless there is a sound operational or safety reason for entering. If entry into a VHRA is required, it would usually occur during periods when expected dose rates are minimized and be governed by a specific Radiation Work Permit. Additionally, applicable ALARA principles, such as remote operations, limiting stay time, using temporary shielding, backwashing filters, and draining tanks, will be employed to achieve dose and dose rate reductions, and ensure station personnel dose is ALARA.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 12.5-2 and 12.5-4.

Impact on S-COLA

None.

Impact on DCD

None.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

Add the following information after the paragraph in the discussion on Radwaste Handling in Subsection 12.5.4.2 of NEI 07-03A.

MAP-12-102

CPNPP Units 3 and 4 have a plan to store temporarily radioactive wastes/materials in Interim Radwaste Storage/Staging Building outside the plant structures. Entry into the radiologically controlled areas of this building is allowed only through the issuance of a Radiation Work Permit. Non-radiologically controlled areas allow for general access.

CTS-00463

Add the following information after the third paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The locations and radiological controls of the radiation zones on plant layout drawings are located in DCD Subsection 12.3.1.2. Administrative controls for restricting access to Very High Radiation Areas are incorporated into plant procedures which require approval provided by the Plant Manager's (or designee) approval for each entry. Entry will be controlled through the Radiation Work Permit (RWP) process. Physical Access controls for Very High Radiation Areas is controlled are provided by physical barriers such as lockable the gates or doors which prevent unauthorized access and entry to these areas is allowed only through the issuance of a Radiation Work Permit. It's not necessary to enter these areas periodically. DCD Subsection 12.3.1.2 includes detailed drawings of the very high radiation areas and indicates the physical access controls. Table 12.5-201 summarizes the plant areas with the potential to become very high radiation areas. Radiation monitor locations for each area are indicated in DCD Subsection 12.3.4.

RCOL2_12.0
3-12.04-2

Add the following information after the sixth paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The gates provide access control of the fuel transfer tube inspection (Very High Radiation Area) and the area near the seismic gap below the transfer tube. Access control for these areas is controlled by the gates and entry to these areas is allowed only the issuance of a Radiation Work Permit.

Add the following information at the end of Subsection 12.5.4.8 of NEI 07-03A.

RCOL2_12.0
3-12.04-1

In addition, NEI Template 08-08 Revision 3, "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" is fully adopted. And also, the guidance provided in NEI 08-08 will be used at CPNPP Units 3 and 4 to minimize contamination during construction, operation and decommissioning. This will include the use of photographs and video records during construction to facilitate

RCOL2_12.0
1-4
RCOL2_12.0
3-12.04-7

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR

Table 12.5-201
Summary of Comanche Peak Units 3 and 4
Very High Radiation Areas (VHRAs)

RCOL2_1
2.03-12.04
-2

<u>Plant Area</u>	<u>Description of Area and Methods Employed to Ensure Personnel Safety</u>
<u>Refueling Canal</u>	<u>These areas have the potential to become VRHAs during underwater spent fuel transfer and inspection operations. These areas are submerged during this period and it becomes inaccessible for personnel. Per DCD Subsection 12.3.2.2.4, all spent fuel removal, transfer, and inspection operations are performed under borated water to provide radiation protection and to maintain sub-criticality conditions. Administrative and access controls, such as temporary fences or ropes, are in place to assure that personnel doses are maintained ALARA during fuel handling and inspection operations. With the exception of the spent fuel pit, the dose rates in these areas of the plant are significantly less under all other operating conditions</u>
<u>Refueling Cavity (including Core Internals Laydown Area)</u>	
<u>Cask Pit</u>	
<u>Fuel Inspection Pit</u>	
<u>Spent Fuel Pit</u>	
<u>Fuel Transfer Tube</u>	<u>This area only has the potential to reach Zone X radiation conditions while there is spent fuel passing through the tube. As indicated in Section 12.5 of the COL FSAR, locked gates provide positive access control of the fuel transfer tube. Entry to these areas is allowed only through the issuance of a specific Radiation Work Permit. However, the issuance of a specific Radiation Work Permit for access to these areas is not regularly permitted while spent fuel is passing through the tube.</u>
<u>Reactor Cavity</u>	<u>This area is designed to contain the molten core from the reactor vessel in the event of a severe accident. This area is inaccessible to personnel.</u>
<u>Reactor Vessel</u>	<u>This area is inaccessible to personnel.</u>
<u>Waste Gas Surge Tanks Rooms</u>	<u>As indicated in DCD Figure 12.3-1, these areas are isolated in individual shielded compartments with elevated access by ladder/stairs or completely enclosed shielded compartments with hatch openings or removable concrete block walls. Locked gates positively control entry into these areas, which is allowed only with the issuance of a Specific Radiation Work Permit. However, there is no projected reason for entry into these areas for equipment maintenance, repair or replacement. The issuance of a specific Radiation Work Permit for access to these areas is not regularly permitted. However, if entry is required, the applicable ALARA principles, such as remote operations, limiting stay time, using temporary shielding, backwashing filters, draining tanks, etc., will be employed to reduce doses as much as practical.</u>
<u>Spent Resin Storage Tank Rooms</u>	
<u>Charcoal Beds Rooms (including the passage near the rooms)</u>	
<u>Mixed-Bed Demineralizer Room</u>	
<u>Cation-Bed Demineralizer Room</u>	
<u>A & B Waste Demineralizers Room</u>	
<u>Volume Control Tank Room</u>	

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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-3

10 CFR 20.1501 requires that radiation protection instrumentation be periodically calibrated. NUREG-0800, Standard Review Plan (SRP) Section 12.3-12.4 and RG 1.206 C.III subsection C.I.12.5.2 note that the applicant is to provide the criteria for selection and the method of calibration of portable and laboratory radiation protection instrumentation. NEI 07-03 12.5.4.1 Radiological Surveillance notes that instruments are calibrated prior to initial use and at least annually thereafter. The US-APWR DCD FSAR Tier 2 section 12.3.4 describes Area and Airborne Radioactivity Monitoring Instrumentation and notes that procedures for the calibration of Portable Personnel Monitors and Radiation Survey Instruments are to be provided by the COL applicant. NEI 07-03 and NEI 07-08 do not specify any criteria for the selection or calibration of portable radiation protection instrumentation.

In accordance with the requirements of 10 CFR 20.1501, and the intent of the guidance provided in RG 1.206 and SRP Section 12.3-12.4, the applicant is requested to revise and update the FSAR to describe the methods of selection and calibration of portable radiation protection instrumentation, or describe and justify the specific alternate approaches employed.

ANSWER:

NEI 07-03A Section 12.5.3.2 states:

Radiation monitoring instrumentation and equipment are selected, maintained and used to provide appropriate detection capabilities, ranges, sensitivities, and accuracies required for the types and levels of radiation anticipated at the plant and in the environs during routine operation, major outages, abnormal occurrences, and postulated accident conditions.

As noted in the question, this statement does not specify the criteria for the selection, maintenance, or calibration of portable radiation protection instrumentation.

FSAR Section 12.5 has been revised using relevant information from Subsection 12.5.3.2 of NEI 07-03A to describe that relevant industry standards are the basis for the selection and calibration of portable radiation protection instrumentation.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 12.5-1.

Impact on S-COLA

None.

Impact on DCD

None.

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12.5 OPERATIONAL RADIATION PROTECTION PROGRAM

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

CP COL 12.1(5) Replace the contents in DCD Section 12.5 with the following.

NEI 07-03A, Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 0, is incorporated by reference. Site specific information in radiation protection program will be implemented in accordance with the milestones listed in Table 13.4-201, by utilizing of NEI 07-03A, and NEI 07-08, Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures are as Low as is Reasonably Achievable (ALARA), Revision 3, in combination with existing or modified CPNPP Units 1 and 2 site program information.

MAP-12-102

MAP-12-102

CTS-00879
RCOL2_12.0
5-3

Revise the contents of NEI 07-03A, with the following.

MAP-12-102

Add the following information after the first paragraph in Subsection 12.5.3.2 of NEI 07-03A.

RCOL2_12.0
3-12.04-3

The selection and calibration of this instrumentation and equipment is based on relevant industry standards such as ANSI N42.17A-1989, as it relates to the accuracy and overall performance of portable survey instrumentation, and ANSI N323A-1997, as it relates to the calibration and maintenance of portable radiation survey instruments.

CP COL 12.2(2) Add the following information after the second paragraph in Subsection 12.5.3.3 of NEI 07-03A.
CP COL 12.3(1)
CP COL 12.3(5)

MAP-12-102

In case the National Institute for Occupational Safety and Health/Mine Safety and Health Administration certified equipments are not used, equipments are used to be compliance with 10 CFR 20.1703(b) and 20.1705.

Add the following information prior to the last paragraph in Subsection 12.5.4.1 of NEI 07-03A.

RCOL_12.05
-4

Calibration of portable and non-portable radiation protection equipment is normally performed onsite by station personnel, although, calibration by a qualified vendor is allowed. Calibration is performed using written procedures and radioactive sources traceable to the National Institute of Standards (NIST) or using transfer instruments, such as electrometers, which have been calibrated using NIST traceable sources.

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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-4

10 CFR Part 50, Appendix A, General Design Criteria (GDC) GDC 61 and GDC 63 requires that facilities for waste be designed to ensure adequate safety. Generic Letter 81-38 provides guidance regarding considerations for interim waste storage facilities. 10 CFR 20.1801 requires licensees to secure from unauthorized removal or access, additional materials that are in storage in controlled or unrestricted areas. The US-APWR FSAR Tier 2 Section 12.2.3 COL 12.2(1) notes that the applicant is responsible for identifying any additional sources of radiation that are not identified in FSAR Tier 2 Section 12.2.1. Comanche Peak Nuclear Power Plant (CPNPP) FSAR 12.2.1.1.10 notes that CPNPP, Units 3 and 4 waste will be stored in an Interim Radioactive Waste Storage Facility, to be constructed outside the plant structures. The stated intent of the applicant is to use this COL submittal process as the approval mechanism for the additional storage facility; however, the applicant has not provided any design information consistent with GDC 61 and GDC 63, or the guidance of Generic Letter 81-38 that will allow the NRC staff to determine that the storage facility provided will assure a reasonable assurance of safety.

In accordance with the requirements of 10 CFR 20.1801, GDC 61 and 63, and the intent of the guidance provided in SRP Section 12.3-12.4 and Generic Letter 81-38, the applicant is requested to revise and update the FSAR to describe the design features of the Interim Radioactive Waste Facility, or describe and justify the specific alternate approaches employed.

ANSWER:

FSAR Subsection 11.4.2.3 was revised to describe the design features and design criteria used for the Interim Radioactive Waste Storage Facility as a result of the July 2009 Health Physics Safety Site Visit Information Need item HPSV-09. These changes are reflected in FSAR Update Tracking Report Revision 4 submitted via Luminant letter TXNB-09039 dated September 2, 2009 (ML092520125).

FSAR Subsection 12.2.1.1.10 has been revised to refer to Subsection 11.4.2.3 for the design features of the Interim Radioactive Waste Storage Facility. FSAR Subsections 11.4.2.3 and 12.2.1.1.10 have been revised to add 10 CFR 50, Appendix A, GDC 61 and 63, 10 CFR Part 20.1801, and Generic Letter 81-38 guidance.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 11.4-3 and 12.2-1.

Impact on S-COLA

None.

Impact on DCD

None.

Comanche Peak Nuclear Power Plant, Units 3 & 4
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Specially shielded above grade cell vaults capable of storing a number of containers each are provided in the Remote Handled waste storage bay for very-high activity Class B, C waste. Facility shielding is designed to meet 10CFR 20 and 40 CFR 190 dose levels and minimize total facility construction costs.

HPSV-09

HPSV-09

The facility is designed to have separate control and equipment room ventilation, radiation monitoring, and fire protection systems designed to meet minimum essential requirements, and reduced capital cost.

The facility have remotely operated bridge crane with closed circuit television cameras and crane mounted storage bay lighting sources. Optimal crane designs are used to minimize total facility construction cost.

The radioactive mixed waste storage area is designed and constructed in accordance with permit application for its operation received from the State of Texas Commission on Environmental Quality.

Primary regulations and NRC/Industry guidance covering the design and operation of interim radioactive waste storage facilities are 10 CFR 20, 10 CFR 20.1801, 10 CFR 50 Appendix A, GDC 61 and 63, 10 CFR 61, 10 CFR 71, 40 CFR 190, 49 CFR 173, NUREG-0800 SRP Appendix 11.4-A, Generic Letter 81-38, Information Notice No. 89-27 and SECY-94-0198.

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3-12.04-4

This interim storage facility is provided with the knowledge that as of July 1, 2008, the low level radioactive waste disposal facility in Barnwell, South Carolina, is no longer accepting Class B and C wastes from sources in states such as Texas that are outside of the Atlantic Compact, and that the disposal facility in Clive, Utah, is still accepting Class A waste from out of state. Class B and C waste constitutes a small fraction of the total low level radioactive waste that will be generated by CPNPP.

CPNPP Units 3 and 4 are scheduled to load fuel and begin commercial operation no earlier than 2016. Therefore, these units will not be generating Class B and C waste prior to that time. Although the interim storage facility is designed to store the Class A, B and C wastes generated by CPNPP Units 1, 2, 3, and 4 for 10 years, the facility could store waste for a proportionally longer period of operation if only Class B and C wastes were to be stored in that facility. It is likely that another disposal facility will be available that will accept Class B and C waste from sources in Texas well before the storage space in the interim storage facility is filled. In particular, in 2004, Waste Control Specialists applied for a license from the Texas Commission on Environmental Quality to develop a disposal facility in Andrews County, Texas, for Class A, B, and C waste. In August 2008 Waste Control Specialists received a draft license from the Texas Commission on Environmental Quality. According to its website, Waste Control Specialists plans on opening the Andrews County site in about December of 2010. Notwithstanding this, if additional storage capacity were eventually to be needed, CPNPP could expand the interim storage facility or construct additional storage facilities in accordance with applicable NRC guidance, such as Regulatory Issue Summary

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12.2 RADIATION SOURCES

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

12.2.1.1.10 Miscellaneous Sources

CP COL 12.2(2) Replace the second and third sentences of the sixth paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional storage space for radwaste inside the plant structures. An additional storage space for radwaste, to be named the Interim Radwaste Storage Building, is planned for the future construction outside the plant structures. The radiation protection program (see Section 12.5) associated with this additional radwaste storage space is in place to ensure compliance with ~~Title 10, Code of Federal Regulations (CFR) Part 20, 10 CFR 50, Appendix A, GDC 61 and 63, 40 CFR 190~~ and to be consistent with the recommendations of RG 8.8 and Generic Letter 81.38. The Interim Radwaste Storage Building design criteria is described in Subsection 11.4.2.3.

CTS-00717

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3-12.04-4
DCD_12.02-
15

CP COL 12.2(2) Replace the second sentence of the seventh paragraph in DCD Subsection 12.2.1.1.10 with the following.

CPNPP Units 3 and 4 have no additional radwaste facilities for dry active waste.

CP COL 12.2(1) Replace the last paragraph in DCD Subsection 12.2.1.1.10 with the following.

The Evaporation Pond is described in FSAR Subsection 11.2.3.4. Access to the radioactive material in the pond will be restricted by use of a fence with locked gate, surrounding the pond area with posting and labeling, such as the appropriate radioactive placards, in accordance with the Operational Radiation Protection Program. The fence will be placed at a distance from the pond, so that the dose rate at the fence is below the maximum dose rate for Zone I (0.25 mrem/hr). Additionally, the evaporation pond is located within the Owner Property Boundary and the area is subject to surveillance by random Security patrols. Potential exposure to airborne activity is discussed in FSAR Subsections 11.2.3.1 and 11.2.3.4.

RCOL2_12.0
2-2

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

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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Docket Nos. 52-034 and 52-035**

RAI NO.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-5

The dose limits to the construction workers are reviewed by the NRC staff against the Regulation 10 CFR 20.1301, which states in (a)(1) "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". CPNPP FSAR Chapter 12.4.1.9.4.1 Direct Radiation and Environmental Report Part 3 - Environmental Report, Section 4.5 'Radiation Exposure to Construction Workers,' notes that the refueling water storage tanks are the principal contained sources that could contribute to direct radiation exposure at the construction site. These sections of the FSAR and ER evaluate the potential radiological dose impacts to construction workers at the CPNPP resulting from the operation of CPNPP, Units 1 and 2. They note that CPNPP Units 1 and 2 have a general area monitoring program that monitors various points inside the protected area. They state that the limiting cumulative dose rate is 0.001 mrem/hr from the protected area fence thermo-luminescent dosimeter (TLD) readings for 2006. However, these sections fail to account for doses from other sources such as: the current Interim Waste Storage for CPNPP, Units 1 and 2, shipment/receipt of CPNPP, Units 1 and 2 outage support equipment and materials, movement of radioactive materials during CPNPP, Units 1 and 2 outages and other radioactive material storage areas of CPNPP, Units 1 and 2. Some of these areas have dose rate limits at the restricted area fence boundary as high as 0.5 mrem/hr. Since some of the construction work is located at the Waste Water Treatment Facility adjacent to CPNPP, Units 1 and 2, dose sources may be located closer to some Construction Workers than the assumed 1000 ft distance to the Independent Spent Fuel Storage Installation Facility, or the protected area fence surrounding CPNPP, Units 1 and 2. Since neither the CPNPP, FSAR Section 12.4 or the CPNPP Environmental Report Chapter 3, Section 4.5 describes the location of the TLDs used to determine the construction worker dose estimates, it is not clear if the reported values are bounding for all of the onsite construction workers.

The applicant is requested to revise and update the CPNPP FSAR Section 12.4 to:

- Describe all of the sources that may be a source of exposure to construction workers.
- Provide a figure that depicts the location of the fence TLDs used to perform the construction worker dose estimates.

Alternately, the applicant may describe and justify the use of different approach.

ANSWER:

Direct sources of radiation exposure and associated doses to construction workers were provided in revised FSAR Subsection 12.4.1.9.2.1 as a result of the July 2009 Health Physics Safety Site Visit Information Needs items HPSV-07 and HPSV-09. These revisions were reflected in FSAR Update Tracking Report Revision 4, submitted via Luminant letter TXNB-09039, dated September 2, 2009. (ML092520125). This revision considers worker exposure doses for the modification to the Waste Water Treatment Facility, and the existing Warehouse C Dry Active Waste and Fixed Contamination Tool area, the planned Outage Laydown Area east of the CPNPP Units 1 and 2 Fuel Building, and the existing Storage Level "D" Zone where Class B and C radioactive waste is stored. Worker exposures will be kept to less than 2 mrem/hr in accordance with the current site Radiation Protection Program, STA 650, "General Health Physics Plan." Additionally, as described in revised FSAR Subsection 12.4.1.9.2.1, these areas are greater than 1000 feet away from each other. As a result, a figure depicting the location of the fence TLDs is unnecessary since the worker exposure doses at 2 mrem/hr are ALARA.

Impact on R-COLA

None.

Impact on S-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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-6

CPNPP COL FSAR section 12.4.1.9 provides a description of the potential sources of exposure to construction workers. The dose limits to the workers are reviewed by the staff against the standards of 10 CFR 20.1301. 10 CFR 20.1301 (a)(1) states "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".

1. The CPNPP COL FSAR subsection 12.4.1.9.4.3 discusses sources of exposure from effluents to site construction workers, but the FSAR does not include potential exposure to liquid effluents from Units 1 & 2 while workers are performing liquid waste effluent discharge piping connections.

The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9.4.3 to describe this potential source of exposure. The revision information should include the potential contribution to construction worker exposure and provide sufficient information to demonstrate that the standards of 10 CFR 20.1301 are met concerning the estimated dose to construction workers due to the liquid waste effluent discharge piping connection between the operating Units, 1 and 2 and proposed Units 3 and 4. Alternately, the applicant could describe and justify the use of different approach.

2. The CPNPP COL FSAR subsection 12.4.1.9 discusses sources of exposure from operating reactors, other than CPNPP, Units 1 and 2, to site construction workers. It notes that construction work from low power testing at less than 5 percent power at CPNPP, Unit 3, is not expected to present a significant source of exposure to the construction workers. However, there is no discussion of the controls or reviews that are required prior to operation of one of the units at a power level greater than 5 percent while construction work is still in progress, nor does it address the condition of operation of CPNPP, Unit 4, while construction work is still in progress.

The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9 to describe the controls and reviews that are required prior to exceeding 5 percent power at either CPNPP, Units 3 or 4, while construction workers are on site. The revision information should include the potential contribution to construction worker exposure from both units, and provide sufficient information to demonstrate that the standards of 10 CFR 20.1301 are met, concerning the

estimated dose to construction workers due to operation of Units 3 and 4. Alternately, the applicant may describe and justify the use of different approach.

3. 10 CFR 20.1101(a) & (b) note that the licensee is have a radiation protection program, sufficient to ensure compliance with 10 CFR Part 20, and to use sound radiation protection principles, to the extent practical, to achieve doses to members of the public that are ALARA. The CPNPP Environmental Report Part 3, Section 4.5 notes that actions to reduce worker exposure could include monitoring and the use of work plans to reduce construction worker exposure.

The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9 to describe the Construction Worker ALARA program. The revision information should include the implementation milestone dates, and provide sufficient information to demonstrate that the standards of 10 CFR 20.1101(a), (b), 1301 and 1302 are met, concerning maintaining dose to construction workers ALARA. Alternately, the applicant may describe and justify the use of different approach.

ANSWER:

1. The location of the Unit 3 and 4 liquid waste management system (LWMS) connection to Unit 1 and 2 is an open pit near the Unit 1 and 2 waste treatment ponds (northeast corner of Unit 1 and 2 radioactive waste treatment facility). The CPNPP Unit 3 and 4 effluent tap will be made into CPNPP Unit 1 and 2 at the pipe inside the Unit 1 Turbine Building, which is several hundred feet away. Therefore, the estimated dose to construction workers is unknown. However, in accordance with the Radiation Protection Program (see FSAR Subsection 13.4 and Table 13.4-201), the construction worker dose for this connection tie-in will be ALARA and meet the limits established in 10 CFR 20.1301. Pre-staging of the connection, health physics surveys, and other effective techniques will be utilized to ensure that worker doses are ALARA in accordance with an approved Radiation Work Permit. FSAR Subsection 12.4.1.9.4.3 has been revised to describe this information.
2. FSAR Subsection 12.4.1.9 has been revised to reflect that once Unit 3 completes power ascension testing at 5% power and proceeds to commercial operation, the remaining construction worker exposure will be maintained ALARA and below the limits specified in 10 CFR 20.1301. The estimated dose for remaining construction workers from both CPNPP Units 3 and 4 operations will be maintained less than 2 mrem/hr.
3. FSAR Subsection 12.4.1.9 was revised to refer to FSAR Section 13.4 for implementation of the Radiation Protection Program, including milestones, and to state that the standards of 10 CFR 20.1101(a) and (b), 1301, and 1302 will be met as described in FSAR Section 12.5 for the Operational Radiation Protection Program.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 12.4-1, 12.4-5, and 12.4-6.

Impact on S-COLA

None.

Impact on DCD

None.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
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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 conservatism 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. 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.

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3-12.04-6

12.4.1.9.1 Site Layout

The CPNPP Units 3 and 4 power block areas are shown on Figure 1.2-1R. As shown, the additional units would be located northwest of the protected area for the existing units. Construction activity for CPNPP Units 3 and 4 would be outside the protected area for CPNPP Units 1 and 2, but inside the restricted area boundary.

12.4.1.9.2 Radiation Sources

Workers constructing CPNPP Units 3 and 4 could be exposed to direct radiation and to gaseous and liquid radioactive effluents emanating from the routine operation of CPNPP Units 1 and 2 as described in the following paragraphs.

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12.4.1.9.4.1 Direct Radiation

Using the protected area fence cumulative dose rate of 0.001 mrem/hr from Subsection 12.4.1.9.3.1, the annual dose due to direct radiation at the CPNPP Units 1 and 2 protected area fence would be 2.5 mrem based on an exposure of 2500 hr/yr. This is the dose at the CPNPP Units 1 and 2 protected area fence. Doses to the CPNPP Units 3 and 4 construction workers would be reduced due to the distance to the construction area.

12.4.1.9.4.2 Gaseous Effluents

The annual gaseous effluent doses to the maximally exposed member of the public are based on continuous occupancy. Adjusted for an exposure time of 2500 hr/yr, the estimated individual worker doses due to gaseous effluent releases from CPNPP Units 1 and 2 are 4.05E-03 mrem for the total body and 4.20E-03 mrem for the critical organ. Applying a weighting factor of 0.03 to the critical organ dose, as discussed in RG 1.183, page 1.183-9, and adding to the total body dose, a total effective dose equivalent (TEDE) of 4.18E-03 mrem is estimated.

12.4.1.9.4.3 Liquid Effluents

The annual liquid effluent doses to the maximally exposed member of the public are based on continuous occupancy and are adjusted for an exposure time of 2500 hr/yr. Although the liquid effluent dose rates to which the workers would be exposed are not expected to be as high as the dose to the maximally exposed member of the public, the doses calculated for the public are used. The resulting doses are 2.9E-02 mrem for the whole body and 2.9E-02 mrem for the critical organ. Applying a weighting factor of 0.03 to the organ dose and adding to the whole body dose, a TEDE of 3.0E-02 mrem is estimated.

The location for the Units 3 and 4 liquid waste management system (LWMS) connection to the Units 1 and 2 is an open pit near the existing Units 1 and 2 waste treatment ponds (Northeast corner of Units 1 and 2 radioactive waste treatment facility). The CPNPP Units 3 and 4 effluent tap will be made into CPNPP Units 1 and 2 at the pipe inside the Unit 1 Turbine Building. In accordance with the Radiation Protection Program established (see FSAR Subsection 13.4 and Table 13.4-201), the construction worker dose for this connection tie-in will be ALARA and meet the limits established in 10 CFR 20.1301. Pre-staging of the connection, health physics surveys and other effective techniques will be utilized to ensure

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3-12.04-6

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that worker doses are ALARA in accordance with an approved Radiation Work Permit.

RCOL2_12.0
3-12.04-6

12.4.1.9.4.4 Total Doses

The annual doses from all three pathways are compared to the public dose criteria of 10 CFR 20.1301 in Table 12.4-201. Because the calculated doses meet the public dose criteria of 10 CFR 20.1301, the workers would not need to be classified as radiation workers. The maximum annual collective dose to the construction work force of 4300 workers is estimated to be 10.75 person-rem.

The calculated doses are based on available dose rate measurements and calculations. It is possible that these dose rates could increase in the future as site conditions change. The site will be continually monitored during the construction period, and appropriate actions would be taken as necessary to ensure that the construction workers are protected from radiation.

The annual estimated construction worker doses attributable to the operation of CPNPP Units 1 and 2 for the proposed construction areas for CPNPP Units 3 and 4 are below 10 CFR 20 limits. Therefore, in accordance with 10 CFR 20.1301 criteria, monitoring of individual construction workers is not required.

12.4.3 Combined License Information

Replace the content of DCD Subsection 12.4.3 with the following.

CP COL 12.4(1)

12.4(1) *Estimated annual doses to construction workers*

This COL item is addressed in Subsection 12.4.1.9 and Table 12.4-201.

12.4.4 References

Add the following references after the last reference in DCD Subsection 12.4.4.

- 12.4-201 *Comanche Peak Steam Electric Station Units 1 and 2 Radioactive Effluent Release Report, January 1, 2006 - December 31, 2006.*
- 12.4-202 *U.S. Nuclear Regulatory Commission, XOQDOQ Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations, NUREG/CR-2919, September 1982.*

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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-7

10 CFR 20.1406 requires a program for minimizing contamination of the facility and the environment and facilitation of the eventual decontamination of the facility. Regulatory Guide 4.21, 'Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning,' Appendix A-3 "Facilitating Decommissioning" notes that Plans and procedures to facilitate decommissioning should include comprehensive video records of the equipment layout in areas where radiation fields are expected to be high following operations and further notes that construction records should include global positioning system readings that pinpoint all buried component locations, particularly components in the site environs. NEI Template 08-08 "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" endorses the guidance of EPRI report TR-1016099 "Groundwater Protection Guidelines for Nuclear Power Plants – Public Edition". TR-1016099 notes in several locations that photographs taken during the construction phase that show foundations, pipes, conduits and other below grade structures should be used as part of the site conceptual model. Contrary to the guidance provided in the noted documents, COL FSAR Chapter 12 does not describe the intended practices with respect to documentation actual structures located below grade or in high radiation areas of the plant.

The applicant is requested to revise and update the FSAR Chapter 12.3 to describe the methods that will be used to provide as built construction details needed to support the continual maintenance of the Conceptual Site Model for groundwater movement, and the facility decommissioning efforts, or the applicant may describe and justify the use of different approach.

ANSWER:

FSAR Sections 1.6 and 12.5 have been revised to reflect that the guidance provided in NEI 08-08 is used. This includes the use of photographs and video records during construction to facilitate updating the Conceptual Site Model for groundwater movement.

Revisions to FSAR Subsections 2.4.12 and 2.4.13 for the groundwater conceptual site model were made as a result of the July 2009 Hydrology Safety Site Visit Information Needs Items HYDSV-17 through HYDSV-30 and were reflected in FSAR Update Tracking Report Revision 4 submitted via Luminant letter TXNB-09039 dated September 2, 2009 (ML092520125). A groundwater monitoring program will be developed before fuel load that will include radiological sampling based upon post-construction configuration as described in FSAR Subsection 2.4.12.4 (this was identified as Information

Needs item HYDSV-26). Final layout drawings, photographs, global positioning survey information, and video records will be used in assessing the proper location for groundwater monitoring wells, foundations, pipes, conduits, and other below grade structures.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 1.6-2, 12.5-2, and 12.5-3.

Impact on S-COLA

None.

Impact on DCD

None.

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CP SUP 1.6(1)

**Table 1.6-201
Material Referenced**

Report Number	Title	FSAR Section Number
52-021, Docket Number	US-APWR Design Control Document, Rev. 2	All FSAR Chapters
NEI 07-09A	Generic FSAR Template Guidance for Offsite Dose Calculation Manual Program Description, Rev.0	11.5
NEI 07-10A	Generic FSAR Template Guidance for Process Control Program, Rev.0	11.4
NEI 07-08	Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA), Rev. 3	12.1
NEI 07-03A	Generic FSAR Template Guidance for Radiation Protection Program Description, Rev. 0	12.1, 12.5
<u>NEI 08-08</u>	<u>Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination, Rev. 3</u>	<u>12.5</u>
NEI 06-13A	Template for an Industry Training Program Description, Rev. 1	13.2
NEI 06-06	Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites, Rev. 3	13.7
NEI 06-09	Risk-Managed Technical Specifications (RMTS) Guidelines, Rev. 0	16.1, Chapter 19
NEI 04-10	Risk-Informed Method for Control of Surveillance Frequencies, Rev. 1	16.1
NEI 06-14A	Quality Assurance Program Description, Rev. 0	17.5
NEI 07-02A	Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52, Rev. 0	17.6

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2.04-1
RCOL2_12.01-4
RCOL2_12.03-1
2.04-7

Comanche Peak Nuclear Power Plant, Units 3 & 4
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Add the following information after the paragraph in the discussion on Radwaste Handling in Subsection 12.5.4.2 of NEI 07-03A.

MAP-12-102

CPNPP Units 3 and 4 have a plan to store temporarily radioactive wastes/materials in Interim Radwaste Storage/Staging Building outside the plant structures. Entry into the radiologically controlled areas of this building is allowed only through the issuance of a Radiation Work Permit. Non-radiologically controlled areas allow for general access.

CTS-00463

Add the following information after the third paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The locations and radiological controls of the radiation zones on plant layout drawings are located in DCD Subsection 12.3.1.2. Administrative controls for restricting access to Very High Radiation Areas are incorporated into plant procedures which require approval provided by the Plant Manager's (or designee) approval for each entry. Entry will be controlled through the Radiation Work Permit (RWP) process. Physical Access controls for Very High Radiation Areas is controlled are provided by physical barriers such as lockable the gates or doors which prevent unauthorized access and entry to these areas is allowed only through the issuance of a Radiation Work Permit. It's not necessary to enter these areas periodically. DCD Subsection 12.3.1.2 includes detailed drawings of the very high radiation areas and indicates the physical access controls. Table 12.5-201 summarizes the plant areas with the potential to become very high radiation areas. Radiation monitor locations for each area are indicated in DCD Subsection 12.3.4.

RCOL2_12.0
3-12.04-2

Add the following information after the sixth paragraph in Subsection 12.5.4.4 of NEI 07-03A.

MAP-12-102

The gates provide access control of the fuel transfer tube inspection (Very High Radiation Area) and the area near the seismic gap below the transfer tube. Access control for these areas is controlled by the gates and entry to these areas is allowed only the issuance of a Radiation Work Permit.

Add the following information at the end of Subsection 12.5.4.8 of NEI 07-03A.

RCOL2_12.0
3-12.04-1

In addition, NEI Template 08-08 Revision 3, "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" is fully adopted. And also, the guidance provided in NEI 08-08 will be used at CPNPP Units 3 and 4 to minimize contamination during construction, operation and decommissioning. This will include the use of photographs and video records during construction to facilitate

RCOL2_12.0
1-4
RCOL2_12.0
3-12.04-7

Comanche Peak Nuclear Power Plant, Units 3 & 4
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updating the conceptual site model for groundwater movement and aid in revising the groundwater monitoring plan post-construction. Final layout drawings, photographs, global positioning survey information and video records will be used in assessing the proper location for groundwater monitoring wells, foundations, pipes, conduits and other below grade structures.

RCOL2_12.0
3-12.04-1
RCOL2_12.0
1-4
RCOL2_12.0
3-12.04-7
MAP-12-102

Replace the first and second paragraph in Subsection 12.5.4.12 of NEI 07-03A with the following.

The radiation protection program and procedures are established, implemented, maintained and reviewed consistent with the 10 CFR 20.1101 and the quality assurance program referenced in Chapter 17.

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.: 3318 (CP RAI #119)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.03-12.04-8

10 CFR 20.1001(b) states in part: (b) It is the purpose of the regulations in this part to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in the regulations in this part. . . ."

For the purposes of the NRC staff's review of radiation protection program elements for an applicant for a combined license (COL), a large percentage of the many anticipated construction workers are considered to be members of the public for the purposes of exposure control, estimates of dose, training, and dosimetry. Public dose is as defined in 10 CFR 20.1003, which notes that it includes the dose received by a member of the public from exposure to ". . . any other source of radiation under the control of a licensee, . . ." exclusive of occupational, background, or medical administrations.

NUREG-1736 provides further guidance, noting the limits for public dose from licensed activities, including dose from transient activities (i.e., dose in any one hour) and cumulative activities over a year, and further notes that this regulation is applicable to all NRC licensees whose activities may result in exposure to members of the public.

In addressing the requirements of 10 CFR 20.1101, NUREG-1736 also notes that the licensee must have a written radiation protection program to reduce exposure, including to members of the public, with such review to be performed at least annually.

Based on the foregoing, the applicant is requested to revise and update FSAR Chapter 12.4 to further describe information regarding the origin and justification for exposure resulting from licensee related activities, such as construction related radiography and other uses of radioactive materials, and the radiation program elements associated with maintaining Construction Worker doses ALARA consistent with NUREG-1736, or describe the specific alternate approaches and the associated justification.

ANSWER:

The CPNPP site will be continually monitored during the construction period and appropriate actions will be taken to ensure that the construction workers are protected from radiation exposure. Use of

radioactive materials and sources during construction, such as sources used in radiography, will be controlled and monitored to maintain construction worker doses as Low as is Reasonably Achievable (ALARA). FSAR Subsection 12.4.1.9.2.1 has been revised to include this information.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 12.4-3.

Impact on S-COLA

None.

Impact on DCD

**Comanche Peak Nuclear Power Plant, Units 3 & 4
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The CPNPP site will be continually monitored during the construction period and appropriate actions will be taken as necessary to ensure that the construction workers are protected from radiation exposure. Use of radioactive materials and sources during construction, such as sources used in radiography, will be controlled and monitored to maintain construction worker doses ALARA.

RCOL2_12.0
3-12.04-8

12.4.1.9.2.2 Gaseous Effluents

Some radioactive gaseous effluents are released on a batch basis from CPNPP Units 1 and 2 to the environment. Release pathways in this category include intentional discharges from the containment purge exhaust and the waste gas decay tanks via the plant vent stacks. Radioactive gaseous effluents are released continuously from CPNPP Units 1 and 2 to the environment from the fuel buildings, safeguards buildings, and auxiliary building (A/B) ventilation exhaust systems, and the condenser off-gas system via the plant vent stacks.

The CPNPP Units 1 and 2 annual releases for 2006 have been reported as 148 Ci of fission and activation gases, 4.23E-04 Ci of iodines, 0.00 Ci of particulates with half-lives greater than eight days, and 47 Ci of tritium (Reference 12.4-201). The annual releases for 2006 are higher than normal for the existing units (Reference 12.4-201).

12.4.1.9.2.3 Liquid Effluents

Effluents from the liquid waste disposal system introduce small amounts of radioactivity into Squaw Creek Reservoir and the low volume waste pond. The annual liquid radioactivity releases for 2006 have been reported as 5.9E-03 Ci of fission and activation products, 1522 Ci of tritium, and 0.54 Ci of dissolved and entrained gases (Reference 12.4-201). The annual releases for 2006 are typical for the existing units; however, the tritium production is dependent on fuel type, power production, and core power history.

12.4.1.9.3 Measured and Calculated Dose Rates

12.4.1.9.3.1 Direct Radiation

CPNPP Units 1 and 2 have a general area monitoring program that monitors various points inside the protected area. The limiting cumulative dose rate is 0.001 mrem/hr from the protected area fence thermoluminescent dosimeter readings for 2006. This dose rate bounds the CPNPP Units 3 and 4 construction worker direct radiation dose rate from CPNPP Units 1 and 2 because this location is closer to CPNPP Units 1 and 2 than to the CPNPP Units 3 and 4 construction area.

12.4.1.9.3.2 Gaseous Effluents

The Annual Radioactive Effluent Release Report for 2006 (Reference 12.4-201) provides continuous and batch mode releases for CPNPP Units 1 and 2. The total

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Attachment 3

Response to Request for Additional Information No. 3510 (CP RAI #117)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3510 (CP RAI #117)

SRP SECTION: 12.05 - Operational Radiation Protection Program

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.05-3

10 CFR 20.1101 requires each licensee to have a Radiation Protection Program. Guidance for the content of this program is provided in Regulatory Guides 8.8, 'Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as Low as is Reasonably Achievable, Revision 3 (June 1978) and 8.10, 'Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as is Reasonably Achievable,' Revision 1-R (September 1975). NUREG-0800, Standard Review Plan (SRP) Section 12.5 provides guidance regarding the content of the radiation protection program. Comanche Peak Nuclear Power Plant (CPNPP) FSAR Sections 12.1 and 12.5 note that they address the required Radiation Protection Program elements with information provided in NEI templates NEI 07-03A "Generic FSAR Template Guidance for Radiation Protection Program Description" and 07-08, "Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)", in combination with existing or modified CPNPP Units 1 and 2 site program information. However, the applicant does not provide any additional information regarding the pre-existing radiation program at CPNPP Units 1 and 2, and in particular, how those programs may have elements or features that deviate from the guidance provided in NEI Templates 07-03A and 07-08.

Adherence to the guidance provided in NEI Templates 07-03A and 07-08 provides the basis for the staff finding for a radiation protection program that meets the requirements of 10 CFR 20.1101. Please revise and update the CP FSAR Chapter 12, to describe those program elements that deviate from the information provided in the NEI Templates.

ANSWER:

As described in the responses to RAI No. 3316 (CP RAI #118), Questions 12.01-1 and 12.01-02 in Attachment 1 to this letter, FSAR Sections 12.1 and 12.5 have been revised to reflect the approved version of NEI 07-03 (NEI 07-03A) and the latest revision of NEI 07-08.

Regarding the phrase in FSAR Sections 12.1 and 12.5 referring to "in combination with existing or modified CPNPP Units 1 and 2 site program information", it was Luminant's intent to consider the use

and incorporation of relevant "good practices and processes" (information) from the existing Units 1 and 2 Radiation Protection Program during development of the program for Units 3 and 4. However, it is also Luminant's intent to adhere to the guidance of the approved template NEI 07-03A, Revision 0 and the latest version of NEI 07-08. Luminant may still consider the use or incorporation of Units 1 and 2 site program information in the future, but only after ensuring consistency with the provisions of the generic NEI guidance documents referenced above.

In order to remove any confusion in the current FSAR description and Luminant's intent, FSAR Sections 12.1 and 12.5 have been revised to remove the phrase "in combination with existing or modified CPNPP Units 1 and 2 site program information."

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 12.1-1, 12.1-2, and 12.5-1.

Impact on S-COLA

None.

Impact on DCD

None.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

12.0 RADIATION PROTECTION

12.1 ENSURING THAT OCCUPATIONAL RADIATION EXPOSURES ARE AS LOW AS REASONABLY ACHIEVABLE

This section of the referenced Design Control Document (DCD) is incorporated by reference with the following departures and/or supplements.

12.1.1.3.1 Compliance with Regulatory Guide 1.8

CP COL 12.1(1) Replace the paragraph in DCD Subsection 12.1.1.3.1 with the following.

The administrative programs and procedures demonstrate compliance with Regulatory Guide (RG) 1.8, including the operation policies activities conducted by management personnel who have plant operational responsibility for radiation protection, by utilizing NEI 07-08 (Reference 12.1-2), ~~in combination with existing or modified Comanche Peak Nuclear Power Plant (CPNPP) Units 1 and 2 site program information.~~ These are addressed in the operational radiation protection program, described in Section 12.5.

RCOL2_12.0
5-3

12.1.1.3.2 Compliance with Regulatory Guide 8.8

CP COL 12.1(1) Replace the second paragraph in DCD Subsection 12.1.1.3.2 with the following.

The administrative programs and procedures demonstrate compliance with RG 8.8, including the operation policies activities conducted by management personnel who have plant operational responsibility for radiation protection, by utilizing of NEI 07-08 (Reference 12.1-2), ~~in combination with existing or modified CPNPP Units 1 and 2 site program information.~~ These are addressed in the operational radiation protection program, described in Section 12.5.

RCOL2_12.0
5-3

12.1.1.3.3 Compliance with Regulatory Guide 8.10

CP COL 12.1(1) Replace the paragraph in DCD Subsection 12.1.1.3.3 with the following.

The administrative programs and procedures demonstrate compliance with RG 8.10, including the operation policies activities conducted by management personnel who have plant operational responsibility for radiation protection, by utilizing of NEI 07-08 (Reference 12.1-2), ~~in combination with existing or modified CPNPP Units 1 and 2 site program information.~~ These are addressed in the operational radiation protection program, described in Section 12.5.

RCOL2_12.0
5-3

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR

12.1.3 Operational Considerations

CP COL 12.1(3) Replace the first and second paragraphs in DCD Subsection 12.1.3 with the following.

DCD_12.03-12.04-2

The operational radiation protection program for ensuring that operational radiation exposures are as low as reasonably achievable (ALARA) is discussed in Section 12.5, by utilizing of NEI 07-03A (Reference 12.1-25) ~~in combination with existing or modified CPNPP Units 1 and 2 site program information.~~ The program follows the guidance of RG 8.2, 8.4, 8.6, 8.7, 8.9, 8.13, 8.15, 8.25, 8.27, 8.28, 8.29, 8.34, 8.35, 8.36, and 8.38.

MAP-12-102
RCOL2_12.05-3
DCD_12.01-2

CP COL 12.1(6) Replace the last sentence of third paragraph in DCD Subsection 12.1.3 with the following.
CP COL 12.1(7)

DCD_12.03-12.04-2

To achieve this objective, two kinds of operational procedures are developed. First operational procedures are developed to perform periodic review of operational practices to ensure that operating procedures are revised to reflect the installation of new or modified equipment, personnel qualification and training are kept current, and facility personnel are following the operating procedures. The other operational procedures are developed to track implementation of requirements for record retention according to 10 CFR 50.75(g) and 10 CFR 70.25(g) as applicable. This record, containing facility design and construction, facility design changes, site conditions before and after construction, onsite waste disposal and contamination, and results of radiological surveys, is used to facilitate decommissioning. These procedures are addressed in the Plant Radiation Protection Procedures, described in 13.5.2.2.

12.1.4 Combined License Information

Replace the content of DCD Subsection 12.1.4 with the following.

CP COL 12.1(1) **12.1(1)** *Policy considerations regarding plant operations*

This Combined License (COL) item is addressed in Subsections 12.1.1.3.1, 12.1.1.3.2 and 12.1.1.3.3.

12.1(2) *Deleted from the DCD.*

CP COL 12.1(3) **12.1(3)** *Following the guidance regarding radiation protection*

This COL item is addressed in Subsection 12.1.3.

12.1(4) *Deleted from the DCD.*

CP COL 12.1(5) **12.1(5)** *Radiation protection program*

This COL item is addressed in Section 12.5.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

12.5 OPERATIONAL RADIATION PROTECTION PROGRAM

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

CP COL 12.1(5) Replace the contents in DCD Section 12.5 with the following.

NEI 07-03A, Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 0, is incorporated by reference. Site specific information in radiation protection program will be implemented in accordance with the milestones listed in Table 13.4-201, by utilizing of NEI 07-03A, and NEI 07-08, Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures are as Low as is Reasonably Achievable (ALARA), Revision 3, in combination with existing or modified CPNPP Units 1 and 2 site program information.

MAP-12-102

MAP-12-102

CTS-00879
RCOL2_12.0
5-3

Revise the contents of NEI 07-03A, with the following.

MAP-12-102

Add the following information after the first paragraph in Subsection 12.5.3.2 of NEI 07-03A.

RCOL2_12.0
3-12.04-3

The selection and calibration of this instrumentation and equipment is based on relevant industry standards such as ANSI N42.17A-1989, as it relates to the accuracy and overall performance of portable survey instrumentation, and ANSI N323A-1997, as it relates to the calibration and maintenance of portable radiation survey instruments.

CP COL 12.2(2) Add the following information after the second paragraph in Subsection 12.5.3.3
CP COL 12.3(1) of NEI 07-03A.
CP COL 12.3(5)

MAP-12-102

In case the National Institute for Occupational Safety and Health/Mine Safety and Health Administration certified equipments are not used, equipments are used to be compliance with 10 CFR 20.1703(b) and 20.1705.

Add the following information prior to the last paragraph in Subsection 12.5.4.1 of NEI 07-03A.

RCOL_12.05
-4

Calibration of portable and non-portable radiation protection equipment is normally performed onsite by station personnel, although, calibration by a qualified vendor is allowed. Calibration is performed using written procedures and radioactive sources traceable to the National Institute of Standards (NIST) or using transfer instruments, such as electrometers, which have been calibrated using NIST traceable sources.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3510 (CP RAI #117)

SRP SECTION: 12.05 - Operational Radiation Protection Program

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 10/5/2009

QUESTION NO.: 12.05-4

10 CFR 20.1501(b) requires that instruments used for radiation measurements be periodically calibrated. NUREG-1736 "Consolidated Guidance: 10 CFR Part 20 – Standards for Protection Against Radiation" notes that this is normally done by adjusting an instrument response to reflect the value from a known standard. The applicant is relying on NEI 07-03 to describe the radiation protection program elements described in SRP Section 12.5. While NEI 07-03A discusses instrument calibration, neither NEI 07-03A or the CPNPP FSAR specifically address the process to be used to ensure that calibration of portable and laboratory instruments is performed using known standards (i.e. traceability to the National Institute of Standards and Technology (NIST) or equivalent international standards).

Since NEI 07-03 does not specifically address methods for establishing reference values for calibration standards, the applicant is requested to revise and update the COL FSAR 12.5 to describe those program elements related to establishing traceability of portable and laboratory radiation protection instruments to recognized national or international standards. Alternately, the applicant may describe the use of a different approach.

ANSWER:

FSAR Section 12.5 has been revised to describe the traceability of calibration sources for portable and laboratory radiation protection instruments.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 12.5-1.

Impact on S-COLA

None.

Impact on DCD

None.

**Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application
Part 2, FSAR**

12.5 OPERATIONAL RADIATION PROTECTION PROGRAM

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

CP COL 12.1(5) Replace the contents in DCD Section 12.5 with the following.

NEI 07-03A, Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 0, is incorporated by reference. Site specific information in radiation protection program will be implemented in accordance with the milestones listed in Table 13.4-201, by utilizing of NEI 07-03A, and NEI 07-08, Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures are as Low as is Reasonably Achievable (ALARA), Revision 3, in combination with existing or modified CPNPP Units 1 and 2 site program information.

MAP-12-102

MAP-12-102

CTS-00879
RCOL2_12.0
5-3

Revise the contents of NEI 07-03A, with the following.

MAP-12-102

Add the following information after the first paragraph in Subsection 12.5.3.2 of NEI 07-03A.

RCOL2_12.0
3-12.04-3

The selection and calibration of this instrumentation and equipment is based on relevant industry standards such as ANSI N42.17A-1989, as it relates to the accuracy and overall performance of portable survey instrumentation, and ANSI N323A-1997, as it relates to the calibration and maintenance of portable radiation survey instruments.

CP COL 12.2(2) Add the following information after the second paragraph in Subsection 12.5.3.3
CP COL 12.3(1) of NEI 07-03A.
CP COL 12.3(5)

MAP-12-102

In case the National Institute for Occupational Safety and Health/Mine Safety and Health Administration certified equipments are not used, equipments are used to be compliance with 10 CFR 20.1703(b) and 20.1705.

Add the following information prior to the last paragraph in Subsection 12.5.4.1 of NEI 07-03A.

RCOL2_12.05
-4

Calibration of portable and non-portable radiation protection equipment is normally performed onsite by station personnel, although, calibration by a qualified vendor is allowed. Calibration is performed using written procedures and radioactive sources traceable to the National Institute of Standards (NIST) or using transfer instruments, such as electrometers, which have been calibrated using NIST traceable sources.

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CP-200901565
TXNB-09068
11/16/2009

Attachment 4

Response to Request for Additional Information No. 3673 (CP RAI #116)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3673 (CP RAI #116)

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: 10/5/2009

QUESTION NO.: 02.04.13-1

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.

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.

ANSWER:

The NRC expressed an interest in a description of the alternate conceptual models with consideration of site alterations during construction during the Hydrology Safety Site Visit in July 2009 at CPNPP. This was identified as Information Needs HYDSV-23 and HYDSV-30. In response to HYDSV-23 and HYDSV-30, the subsections and figure changes cited below were reflected in FSAR Update Tracking Report Revision 4 submitted via Luminant letter TXNB-09039 dated September 2, 2009 (ML092520125).

FSAR Subsections 2.4.12.1.1 and 2.4.13.2 through 2.4.13.5 were revised to clarify how alternate conceptual models were chosen, the criteria for selecting the alternative pathways, how the horizontal release pathways were chosen and why they are considerably conservative, and how the vertical pathway was eliminated.

FSAR Subsections 2.4.12.1.1 and 2.4.13.2 through 2.4.13.5, and Figures 2.4.12-212 through 2.4.12-214 were clarified to show the impacts of construction-related alterations to the site for the plausible pathways identified. These changes also resolved ER RAI HYD-04 (2.3.1-4) which was submitted via Luminant letter TXNB-09025 dated July 13, 2009 (ML092450439).

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3673 (CP RAI #116)

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: 10/5/2009

QUESTION NO.: 02.04.13-2

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.

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.

ANSWER:

During the Hydrology Safety Site Visit in July 2009 at CPNPP, the NRC expressed an interest in Luminant demonstrating compliance in protecting water users; in the potential for preferential flow paths and vertical migration as well as flow to offsite wells; and in the applicability of using the CPNPP Units 1 and 2 vertical pathway elimination analysis for CPNPP Units 3 and 4. These were identified as Information Needs HYDSV-17, HYDSV-29, and HYDSV-31.

In response to HYDSV-17, HYDSV-29 and HYDSV-31, the following revisions were provided in FSAR Update Tracking Report Revision 4 submitted via Luminant letter TXNB-09039 dated September 2, 2009 (ML092520125).

New post-construction cross-section Figures 2.4.12-212 through 2.4.12-214 identified the plausible horizontal pathways. FSAR Subsections 2.4.12.1.1, 2.4.13.4 and 2.4.13.5 were revised to clarify the conservativeness of the groundwater horizontal release pathways chosen.

FSAR Subsection 2.4.13.4 was revised to clarify how the vertical pathway was eliminated and to describe the applicability of using the CPNPP Units 1 and 2 vertical pathway elimination analysis due to the following:

- Discrete engineering layers in the Glen Rose formation can be traced in the subsurface throughout the site and correlated approximately 2000 feet away in the CPNPP Units 1 and 2 borings and historical excavation photographs.
- Known post-construction excavation limits can be correlated with the stratigraphy exposed in the Glen Rose formation photographs.

A complete discussion of the core borings stratigraphy and CPNPP Units 1 and 2 historical excavation photographs as compared to CPNPP Units 3 and 4 borings is provided in FSAR Subsection 2.5.4.3.1. These changes also resolve ER RAI HYD-22 (7.2-1) that was submitted via Luminant letter TXNB-09025 dated July 20, 2009 (ML092090653).

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3673 (CP RAI #116)

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: 10/5/2009

QUESTION NO.: 02.04.13-3

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.

In its letter dated December 18, 2008, Luminant provided a response to the NRC staff's request for additional information. In its response to Question 2.4.13-03, Luminant stated that chelating agents will not affect potential contaminant transport due to the small quantity and limited use planned for the proposed plants.

To further satisfy the requirements of 10 CFR 100.20(c)(3), Luminant is requested to provide an expanded discussion and relevant data concerning prior or potential future use of chemicals that have the potential to alter transport characteristics of liquid radioactive effluents at or near the site.

ANSWER:

The NRC expressed an interest in the future use of chemicals that could potentially alter the transport characteristics of liquid radioactive effluents during the Hydrology Safety Site Visit in July 2009 at CPNPP. This was identified as Information Need HYDSV-28. In response to HYDSV-28, FSAR Subsection 2.4.13.1 was changed (as shown below) in FSAR Update Tracking Report Revision 4, submitted via Luminant letter TXNB-09039 dated September 2, 2009 (ML092520125).

There are small amounts of analytical chelating agents that are expected to be used onsite for laboratory analyses such as TPTZ (2,4,6 - tris (2 - pyridyl) -1,3,5 - triazine), ZINCON (1 - (2-Hydroxycarbonyl-phenyl) - 5 - (2 - Hydroxy - 5 - sulfophenyl) -3 - phenylformazan, sodium salt), EDTA (ethylene-diamine-tetra acetic acid). Other chemicals such as sulfuric acid (H₂SO₄), hydrogen peroxide (H₂O₂), sodium chloride (NaCl), nitric acid (HNO₃), sodium carbonate (Na₂CO₃), acetic acid (CH₃COOH), sodium hydroxide (NaOH), and hydrochloric acid (HCl) are also used in the performance of laboratory chemical analyses. Annual amounts of chelating agents used for chemical analyses are

expected to be smaller than 0.1 gram for TPTZ and ZINCON, and 3 grams for EDTA based on operating laboratory experience.

Sample analyses with the applicable chemical agents are performed in very low concentrations. After analysis, samples are directly discarded to a dedicated chemical drain tank and not back to the tank from which it was taken.

FSAR Subsection 2.4.13.1 was revised to state:

Chemical agents used in laboratory analysis are also sent to the chemical drain tank for treatment. Therefore, neither the chelating agents nor the chemical agents used in the sampling analysis will have any effect on the transport characteristics of the source term liquid effluent release analysis.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**Comanche Peak Units 3 and 4
Luminant Generation Company LLC
Docket No. 52-034 and 52-035**

RAI NO.: 3673 (CP RAI #116)

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: 10/5/2009

QUESTION NO.: 02.04.13-4

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.

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 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.

ANSWER:

Assumptions included in the DCD tank failure analysis are:

- isotopic concentrations less than 1.0E-3 were excluded
- 80 percent of the contents of each tank considered was released
- released tank volume is diluted by the equivalent volume of Squaw Creek Reservoir (4.4E10 gallons)
- 0.12 percent fuel defect
- removal effects by demineralizer or other treatment equipment were credited

In addition, the following conservatisms are included in the DCD tank failure analysis:

- a travel time of 365 days
- no retardation or retention by the subsurface strata
- no dilution of the liquid radioactive waste by groundwater

These assumptions and conservatisms were provided in the response to RAI No. 2332 (CP RAI #1) Question 02.04.13-07, submitted via Luminant letter TXNB-08031, dated December 18, 2008 (ML083590297).

Hydrological velocity and travel times for CPNPP Units 3 and 4 were calculated based on site-specific data. It was determined that it would take 1916 days or approximately 5.25 years for groundwater to reach Squaw Creek Reservoir. The velocity and travel times were reflected in FSAR Subsections 2.4.13.1, 2.4.13.5, and 2.4.13.7, and in Table 2.4.12-211 in Update Tracking Report, Revision 4, submitted via Luminant letter TXNB-09039, dated September 2, 2009 (ML092520125). Therefore, no additional run of the RATAF analysis was performed for CPNPP Units 3 and 4.

The 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, was provided in response to Question 11.02-06, Item 2 in DCD RAI 164-1925 (ML090570441).

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.