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March 4, 2013

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555  
ATTN: David B. Matthews, Director  
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4  
DOCKET NUMBERS 52-034 AND 52-035  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 272 (6997)  
(SECTION 6.2.2)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) 272 (6997) for the Combined License (COL) Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI addresses some inconsistent language for COL Information Item descriptions and describes the containment cleanliness program.

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

There are no commitments in this letter.

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

Executed on March 4, 2013.

Sincerely,

Luminant Generation Company LLC

*Donald R. Woodlan for*

Rafael Flores

Attachment: Response to Request for Additional Information 272 (6997)

*DO90  
MRO*

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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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**Comanche Peak, Units 3 and 4**

**Luminant Generation Company LLC**

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

**RAI 272 (6997)**

**SRP SECTION: 06.02.02 Containment Heat Removal Systems**

**DATE OF RAI ISSUE: 1/29/2013**

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### QUESTION NO.: 06.02.02-6

The NRC staff found inconsistent descriptions for three COL items, 6.2(5), 6.2(6), 6.2(8), between Chapter 1, Table 1.8-201 and Chapter 6.2, Subsection 6.2.8, "Combined License Information." Request applicant to address inconsistent language for STD COL item descriptions (to include FSAR location listed in Table 1.8-201).

Also the staff found an inconsistent FSAR Subsection reference: Table 6.2.2-R for STD COL 6.2(5) indicates that containment cleanliness is addressed in US-APWR Design Subsection 6.2.2.3 whereas CPNPP Section 6.2 indicates that STD COL item 6.2(5) is addressed in Subsection 6.2.2.3.2.

Note: It appears that these inconsistencies were introduced in an effort to incorporate future (interim) changes to USAPWRE DCD Revision 3, related to STD COL Item 6.2(5), that the DC applicant has already communicated to the NRC staff in DCD docketed correspondence, such as tracking reports or in DCD RAI responses. On this basis, the staff requests the COL applicant to clearly identify what additional docketed DCD correspondence (in addition to USAPWR DCD Revision 3) is being used to support the COL application regarding Section 6.2, "Containment Systems."

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### ANSWER:

The "inconsistent language" between Table 1.8-201 and RCOLA Subsection 6.2.8 is standard practice for COL Item descriptions in the RCOLA. The standard practice is to include the full text of the COL Item in Table 1.8-201 and to summarize the COL Item descriptions within each chapter. As such, no changes to the Comanche Peak COLA are required for these COL item descriptions.

Table 1.8-201 and Table 6.2.2-2R have been revised to list the more specific FSAR location (6.2.2.3.2) where COL Item 6.2(5) is addressed.

Interim changes between DCD revisions are tracked by docketing DCD Tracking Reports. Comanche Peak COLA Rev. 3 is based on all docketed DCD correspondence up to and including MHI Report MUAP-11021, "US-APWR DCD Revision 3 Tracking Report", Revision 2 submitted on April 6, 2012 (ML12103A264). Page 6-1 of MUAP-11021 lists docketed DCD correspondence for Section 6.2 in addition to that listed in DCD Rev. 3.

A summary of the interim changes since DCD Revision 3 that impact FSAR Subsection 6.2.2.3.2 is given below:

<u>RAI</u>	<u>Question</u>	<u>MHI Letter</u>	<u>MHI Letter Date</u>
RAI 354-2585	Q 06.02.02-44	UAP-HF-09382	7/17/09
RAI 466-3715	Q 06.02.02-55	UAP-HF-09534	11/24/09
RAI 736	Q 06.02.02-63	UAP-HF-11185	6/21/11
RAI 736	Q 06.02.02-63	UAP-HF-11215	7/13/11
DCD R3 TR R1		UAP-HF-11287	8/31/11

The DCD reference in FSAR Subsection 6.2.2.3.2 is scheduled to be confirmed subsequent to the issuance of DCD Revision 4 (Summer 2013) and FSAR Revision 4 (Fall 2013).

Impact on R-COLA

See attached marked-up FSAR Revision 3 pages 1.8-37 and 6.2-4.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

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

CP COL 1.8(2)

**Table 1.8-201 (Sheet 26 of 72)**

**Resolution of Combined License Items for Chapters 1 - 19**

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 6.1(5)	Deleted from the DCD.			
COL 6.1(6)	Deleted from the DCD.			
COL 6.1(7)	The COL Applicant is responsible for identifying the implementation milestones for the coatings program.	6.1.2	2	
COL 6.2(1)	Deleted from the DCD.			
COL 6.2(2)	Deleted from the DCD.			
COL 6.2(3)	Deleted from the DCD.			
COL 6.2(4)	Deleted from the DCD.			
COL 6.2(5)	Preparation of a cleanliness, housekeeping and foreign materials exclusion program is the responsibility of the COL applicant. This program will be established to limit 200lbs of latent debris, and to limit the allocated 200ft <sup>2</sup> of miscellaneous debris per sump.	6.2.2.3.2 Table 6.2.2-2R	2	RCOL2_0 6.02.02-6
COL 6.2(6)	Preparation of administrative procedures is the responsibility of the COL Applicant. The procedures will ensure that RMI and fiber insulation debris within ZOIs will be consistent with the design basis debris specified in the Table 6.2.2-4, and will ensure that the aluminum in containment exposed to water in containment in post-LOCA condition (i.e., spray and blowdown water) is limited to equal or less than 810 ft <sup>2</sup> .	<u>6.2.2.3.2</u>	<u>2</u>	RCOL2_ 06.02.02-5
COL 6.2(7)	Deleted from the DCD.			
COL 6.2(8)	The COL applicant is responsible for identifying the implementation milestone for the containment leakage rate testing program described under 10CFR50, Appendix J.	6.2.6.1	1b	

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

**Table 6.2.2-2R (Sheet 7 of 22)**

**Comparison of RWSP Recirculation Intake Debris Strainer Design to RG 1.82 Requirements**

No.	Regulatory Position	US-APWR Design
1.1.1.14	All drains from the upper regions of the containment building, as well as floor drains, should terminate in such a manner that direct streams of water, which may contain entrained debris, will not discharge downstream of the sump screen, thereby, bypassing the sump screen.	The US-APWR design of engineered safety features (ESF) structures, systems, or components (SSCs) does not include a containment spray system (CSS) or safety injection system (SIS) suction flow path that bypasses the RWSP suction strainers.
1.1.1.15	Advanced strainer designs (e.g., stacked disc strainers) have demonstrated capabilities that are not provided by simple flat plate or cone-shaped strainers or screens. For example, these capabilities include built-in debris traps where debris can collect on surfaces while keeping a portion of the screen relatively free of debris. The convoluted structure of such strainer designs increases the total screen area, and these structures tend to prevent the condition sometimes referred to as the TBE. It may be desirable to include these capabilities in any new sump strainer/screen designs. The performance characteristics and effectiveness of such designs should be supported by the appropriate test data for any particular intended application.	An advanced strainer design is planned for the US-APWR. Thin Bed Effects (TBE) are addressed in the US-APWR Sump Strainer Performance document (Ref. 6.2-34).
1.1.2	<p><b>Minimizing Debris</b></p> <p>The debris (see Regulatory Position 1.3.2) that could accumulate on the sump screen should be minimized.</p>	<p><b>Design Features and Capabilities</b></p> <p>The design features and capabilities employed to minimize debris are presented below.</p>
STD COL 6.2(5)	<p>1.1.2.1 Cleanliness programs should be established to clean the containment on a regular basis, and plant procedures should be established for the control and removal of foreign materials from the containment.</p>	<p>Cleanliness programs are addressed in Subsection 6.2.2.3.2.</p>

RCOL2\_06.0  
2.02-6



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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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**Comanche Peak, Units 3 and 4**

**Luminant Generation Company LLC**

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

**RAI 272 (6997)**

**SRP SECTION: 06.02.02 Containment Heat Removal Systems**

**DATE OF RAI ISSUE: 1/29/2013**

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### **QUESTION NO.: 06.02.02-7**

This is a follow-up question to RAI Letter Number 271-6965 Question 06.02.02-4.

NUREG-0800, Standard Review Plan (SRP) 6.2.2, 'Containment Heat Removal Systems,' and Regulatory Guide 1.82, 'Water Sources for Long-term Recirculation Cooling Following a Loss-of-Coolant Accident,' Revision 3, establish an acceptable approach with criteria that the NRC staff will use to evaluate whether an applicant meets applicable NRC's regulations.

Regulatory Guide 1.82, Revision 3, as modified and supplemented for pressurized water reactors by the Nuclear Energy Institute (NEI) Guidance Report (NEI 04-07 GR) and the associated NRC safety evaluation (SE) provide guidance for cleanliness programs and debris evaluations.

The Comanche Peak Nuclear Power Plant (CPNPP) COL Application Part 2, FSAR Revision 3, Sub-section 6.2.2.3.2, describes STD COL item 6.2(5) - containment cleanliness program. The COL application states that the program [containment cleanliness] includes the following:

- Guidance documents used to develop the cleanliness program survey/sampling methods including NEI 04-07 (Ref. 6.2-24) and associated NRC safety evaluation dated December 6, 2004.
- Inspection Frequency
- Evaluation Frequency

The staff seeks more specificity in these areas related to the containment cleanliness program. The staff requests that the applicant clearly state in the FSAR if the cleanliness program (to include the survey/sampling aspects) is to be implemented consistent with NEI 04-07 and the associated NRC safety evaluation. Areas of non-conformance with the guidance need to be identified and justified.

The staff requests that the applicant clearly state the inspection frequency for Latent debris, for example, inspections (to include survey/sampling) are conducted before initial startup and after refueling or maintenance outages, to provide reasonable assurance that the plant Latent debris design bases are met during plant operation.

The staff requests that the applicant clearly state when the sampling results will be evaluated (in relation to startup) and provide justification for the selected approach.

The FSAR documentation for Vogtle Electric Generating Plant, Units 3 & 4 related to containment cleanliness, and the staff's associated safety evaluation, provide a useful example of how to address the staff's information needs associated with a cleanliness program.."

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**ANSWER:**

With the exception of sampling frequency and sampling locations that may result in personnel safety risks if sampled, the Comanche Peak 3 and 4 containment cleanliness program will be implemented in accordance with NEI 04-07 and the accompanying NRC SER. Sampling locations deemed to be a high risk to plant personnel will be visually observed and a conservative estimate of latent debris will be used in lieu of sampling. An example of a high-risk sampling area is one where a fall hazard exists that would require scaffolding and fall protection in order to obtain samples or locations that may result in high personnel doses.

Regarding sampling frequency, Luminant will conduct sampling prior to initial plant start-up following the conclusion of construction and pre-operational testing in containment per NEI 04-07 and its corresponding SER. Results of the initial containment sampling will be evaluated prior to initial start-up to ensure that the latent debris in containment is within design basis limits.

Following plant start-up, visual observation and containment closeout walk downs in accordance with NEI 02-01 will be performed at the end of each refueling outage prior to implementation of Mode 1-4 containment access controls. Based on Luminant's operating experience with the housekeeping procedures developed for Comanche Peak Unit 1 and Unit 2, subsequent sampling will only be conducted if visual observation indicates abnormal build-up of latent debris. Subsequent sampling will also be conducted following any invasive or extended maintenance activities such as steam generator replacement.

Sampling conducted by operating plants in response to NRC GL 2004-02 has indicated latent debris amounts are well within the US-APWR design basis of 200 lbs (15% fiber, 85% particulate) or have indicated a trend of increasing cleanliness, as shown in Table 1 below. Table 1 includes a partial list of results at operating plants identified from an initial review of publicly available responses in ADAMS and is not intended to be a complete list of results. These results were measured after many years in service prior to increased industry awareness of the potential impacts of latent debris and implementation of more rigorous containment cleanliness programs.

Furthermore, operating experience from Comanche Peak Units 1 and 2 has indicated that the containment cleanliness and housekeeping programs implemented in response to GL 2004-02, although not completely eliminating latent debris, have significantly reduced latent debris. This trend is due to continual improvement of rigorous housekeeping procedures during refueling outages and maintenance activities. The representative latent debris amounts at operating plants from Table 1 are decreasing following implementation of improved cleanliness and housekeeping implemented in response to GL 2004-02.

As a result of Luminant's operating experience with Comanche Peak Units 1 and 2, industry results from containment sampling at other operating plants, and margin in the US-APWR latent debris design basis, Luminant considers additional sampling to be a source of unnecessary cost and personnel radiation dose



with no significant added benefit to nuclear safety. Therefore, Luminant considers additional sampling following initial plant start-up to be unnecessary.

**Table 1. Latent Debris Sampling at Selected Operating US Plants**

Plant	Type	Latent Debris (lbs)			ADAMS Accession Number
		Particulate	Fiber	Total	
North Anna 2	<u>W</u> 3-Loop	85% (96.05)	15% (16.95)	113	ML072740400
Millstone 2*	CE	85% (110.5 / 65.45)	15% (19.5 / 11.55)	130 / 77	ML072290550
Millstone 3**	<u>W</u> 4-Loop	85% (481.95 / 292.4)	15% (85.05 / 51.6)	567 / 344	ML080650561
Diablo Canyon (1/2)	<u>W</u> 4-Loop	85% (51)	15% (9)	60	ML081980104
Arkansas Nuclear One	B&W L-Loop	85% (85)	15% (15)	100	ML082700499
Beaver Valley 1	<u>W</u> 3-Loop	85% (134.81)	15% (23.79)	158.6	ML091830390
Beaver Valley 2	<u>W</u> 3-Loop	85% (156.4)	15% (27.6)	184	ML091830390
US-APWR***	PWR 4-Loop	85% (170)	15% (30)	200	ML12254A101

\*The masses given in each field are two sets of sampling results taken during refueling outages 2R16 and 2R17 respectively.

\*\*The masses given in each field are two sets of sampling results taken during refueling outages 3R10 and 3R11 respectively.

\*\*\*US-APWR maximum design basis latent debris loading is given for comparison purposes.

#### Impact on R-COLA

See attached marked-up FSAR Revision 3 page 6.2-1

#### Impact on S-COLA

None; this response is site-specific.

#### Impact on DCD

None.

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

**6.2 CONTAINMENT SYSTEMS**

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

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**6.2.2.3.2 Debris Source Term**

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STD COL 6.2(5) Replace the last sentence of the first bullet of seventh paragraph in **DCD Subsection 6.2.2.3.2** with the following.

Administrative procedures in **Subsection 13.5.1** implement the containment cleanliness program.

The program includes the following:

- Organizational responsibilities for implementing the program
- Controls and limits on type and quantity of materials for all modes of operation (not limited to outages)
- ~~Guidance documents used to develop the cleanliness program survey/sampling methods including NEI 04-07 (Ref. 6.2-24) and associated NRC safety evaluation dated December 6, 2004.~~ With the exception of sampling locations and sampling frequency, a containment sampling program is developed to be consistent with the guidance in NEI 04-07 (Ref. 6.2-24) and the associated NRC safety evaluation dated December 6, 2004.
- ~~Inspection frequency~~ Sampling locations deemed to be a high risk to plant personnel will be visually observed and a conservative estimate of latent debris will be used rather than direct sampling. An example of a high risk sampling location is one where a fall hazard or high radiation exists.
- ~~Evaluation frequency~~ Sampling of latent debris is conducted prior to initial plant start-up following the conclusion of construction and pre-operational testing. Results of initial containment sampling are evaluated prior to initial plant start-up.
- Inspections performed following refueling outages and prior to implementation of Mode 1 - Mode 4 containment access controls consist of containment exit cleanliness inspections and walk downs per the guidance in NEI 02-01. Subsequent sampling is not conducted unless visual observation indicates abnormal build-up or if extensive maintenance activities have been performed such as steam generator replacement.

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