Luminant

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

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

T 254.897.5590
F 254.897.6652
C 817.559.0403

CP-200901549
Log # TXNB-09061

Ref. # 10 CFR 52

November 5, 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. 2757, 2819, 2836, 2837, AND 3592

Dear Sir:

Luminant Generation Company LLC (Luminant) herein submits responses to Requests for Additional Information No. 2757, 2819, 2836, 2837, and 3592 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 5, 2009.

Sincerely,

Luminant Generation Company LLC

Donald R Woodlan for

Rafael Flores

Attachments
1. Response to Request for Additional Information No. 2757 (CP RAI #67)
2. Response to Request for Additional Information No. 2819 (CP RAI #66)
3. Response to Request for Additional Information No. 2836 (CP RAI #68)
4. Response to Request for Additional Information No. 2837 (CP RAI #69)
5. Response to Request for Additional Information No. 3592 (CP RAI #71)

D090
NRO

Electronic Distribution w/Attachments

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

Luminant Records Management –
Portfolio of .pdf files

masahiko_kaneda@mnes-us.com
masanori_onozuka@mnes-us.com
ck_paulson@mnes-us.com
joseph_tapia@mnes-us.com
russell_bywater@mnes-us.com
diane_yeager@mnes-us.com
kazuya_hayashi@mnes-us.com
mutsumi_ishida@mnes-us.com
nan_sirirat@mnes-us.com
rjb@nei.org
kak@nei.org
michael.takacs@nrc.gov
cp34update@certrec.com
michael.johnson@nrc.gov
David.Matthews@nrc.gov
Balwant.Singal@nrc.gov
Hossein.Hamzehee@nrc.gov
Stephen.Monarque@nrc.gov
jeff.ciocco@nrc.gov
michael.willingham@nrc.gov
john.kramer@nrc.gov
Brian.Tindell@nrc.gov
Elmo.Collins@nrc.gov
Loren.Plisco@nrc.com
Laura.Goldin@nrc.gov
James.Biggins@nrc.gov
Susan.Vrahoretis@nrc.gov
sfrantz@morganlewis.com
tmatthews@morganlewis.com

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.

Number	Commitment	Due Date/Event
6601	Luminant does plan to share resources between the proposed CPNPP Units 3 and 4 and the existing CPNPP Units 1 and 2 at the Comanche Peak site. The plans for resource sharing are not yet matured, but will be provided to the NRC 18 months prior to Unit 3 fuel load. The plan will include sharing of personnel between the units, a description of their duties, and the proportion of their time that they may routinely be assigned between the units.	18 months prior to Unit 3 fuel load
6611	In addition, the training program will be accredited prior to fuel load or within the time frame established by INPO and the operating company senior management using the guidance provided by ACAD 08-001, "The Process for Initial Accreditation of Training in the Nuclear Power Industry."	Prior to fuel load

Attachment 1

Response to Request for Additional Information No. 2757 (CP RAI #67)

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.: 2757 (CP RAI #67)

SRP SECTION: 03.02.02 - System Quality Group Classification

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.02.02-1

NUREG-800, Standard Review Plan (SRP) 3.2.2 identifies that, consistent with SECY-93-087, the NRC staff should review applications using the newest codes and standards that have been endorsed by the NRC and unapproved editions will be reviewed on a case by case basis. FSAR Table 3.2-201 and the notes do not define editions for codes and standards or applicable codes and standards for certain structures, systems, and components (SSCs), such as the ultimate heat sink (UHS) essential service water (ESW) pump house ventilation system. Clarify which editions of codes and standards apply to the SSCs included in Table 3.2-201 and, for SSCs that refer to codes and standards defined in the design bases, identify what commercial codes and standards apply. If this information is to be determined later, advise when this information will be available.

ANSWER:

The following list summarizes the industry codes and standards that will be applied to those SSCs that are identified in FSAR Table 3.2-201. Not all the codes and standards listed are applicable for each SSC, and additional codes and standards may be applied during the detailed design and fabrication of the SSCs. A more definitive list applied to each SSC will be available onsite during the detailed design phase.

Piping, Valves, Pumps and Cooling Towers

American Society of Mechanical Engineers (ASME)

- ASME Boiler and Pressure Vessel Code, Section II, 2001 Edition with 2003 Addendum.
- ASME Boiler and Pressure Vessel Code, Section III, 2001 Edition with 2003 Addendum
- ASME Boiler and Pressure Vessel Code, Section V, 2001 Edition with the 2003 Addendum.
- ASME Boiler and Pressure Vessel Code, Section IX, 2001 Edition with 2003 Addendum.
- ASME Boiler and Pressure Vessel Code, Section XI, 2001 Edition with 2003 Addendum.

- B31.1-2004 Power piping
- B31.3-2006 Process Piping

HVAC and Electrical Controls

American Society of Mechanical Engineers (ASME)

- ASME AG-1 - 2003 "Code on Nuclear Air and Gas Treatment"
- ASME N509 - 2002 "Nuclear Power Plant Air-Cleaning Units and Components"
- ASME N510 - 2007 "Testing of Nuclear Air Treatment Systems"

Air-Conditioning Heating and Refrigeration Institute (AHRI)

- 410 - 2001 "Forced-Circulation Air-Cooling and Air-Heating Coils"
- 430 - 1999 "Central Station Air-Handling Units"
- 440 - 2005 "Performance Rating of Room Fan-coils"
- 450 - 2007 "Water-Cooled Refrigeration Condensers, Remote type"
- 550/590 - 2003 "Water Chilling Packages Using the Vapor Compression Cycle"
- 575 - 1994 "Method of Measuring Machinery Sound within an Equipment Space"
- 850 - 2004 "Standard for Performance Rating of Commercial and Industrial Air Filter Equipment"

Air Movement and Control Association (AMCA)

- 99 – 2003 "Standards Handbook"
- 200 – 1995 "Air Systems"
- 201 – 2002 "Fans and Systems"
- 204 – 2005 "Balance Quality and Vibration Levels for Fans"
- 210 – 2007 "Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating"
- 211 – 2005 "Certified Ratings Program – Product Rating Manual for Fan Air Performance"
- 230 -1999 "Laboratory Methods for Testing Fans for Ratings"
- 300 – 2005 "Reverberant Room Method for Sound Testing of Fans"
- 301 – 1990 "Methods for Calculating for Sound Ratings from Laboratory Test Data"
- 303 – 1979 "Application Sound Power Level Ratings for Fans"
- 801 – 2001 "Industrial Process / Power Generation Fans: Specification Guidelines"
- 802 – 2002 "Industrial Process / Power Generation Fans: Establishing Performance Using Laboratory Models"

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

- 52.1 – 1992 "Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter"
- 52.2 – 2007 "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size"
- 62.1 – 2007 "Ventilation for Acceptable Indoor Air Quality"

IEEE Standards

- 323-1974 "Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations"
- 344-1987 (Reaffirmed 1993), as modified by USNRC Regulatory Guide 1.100, Rev. 2 dated June 1988, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"
- 383-2003 Standard for Type Test of Class 1E Electrical Cables, Field Splices, and Connections of Nuclear Power Generating Stations.
- 384-1992, Standard Criteria for Independence of Class 1E Equipment and Circuits.
- 603-1998 "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations"

National Air Filtration Association (NAFA)

- 2006 "Installation, Operation and Maintenance of Filtration Systems, Second Edition"

National Fire Protection Association (NFPA)

- 90A – 2002 "Standard for the Installation of Air Conditioning and Ventilating Systems"
- 90B – 2009 "Standard for the Installation of Warm Air Heating and Air-Conditioning Systems"

Sheet Metal and Air-conditioning Contractor's National Association (SMACNA)

- 1143 – 1985 "HVAC Air Duct Leakage Test Manual, First Edition; Technical Research Update – 92"
- 1208 – 1990 "HVAC Systems – Duct Design, Third Edition"
- 1299 – 1980 "Rectangular Industrial Duct Construction Standards, First Edition"
- 1481 – 2005 "HVAC Duct Construction Standards, Edition"
- 1520 – 1999 "Round Industrial Duct Construction Standards, Second Edition"
- 1780 – 2002 "HVAC Systems Testing, Adjusting and Balancing, Third Edition"
- 1819 – 2002 "Fire, Smoke and Radiation Damper Installation Guides for HVAC Systems, Fifth Edition"

Underwriters Laboratory (UL)

- 555 – 2006 "Standard for Fire Dampers"
- 555S – 1999 "Standard for Smoke Dampers"
- 586 – 1996 "UL Standard for high-Efficiency Particulate Air Filter Units"
- 900 – 2004 "UL Standard for Safety Air Filter Units"

- 1278 – 2000 "UL Standard for Safety Movable and Wall- or Ceiling-Hung Electric Room Heaters"
- 1996 – 2009 "UL Standard for Safety Electric Duct Heaters"
- 2021 – 1997 "UL Standard for Safety Fixed and Location-Dedicated Electric Room Heaters"

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.: 2757 (CP RAI #67)

SRP SECTION: 03.02.02 - System Quality Group Classification

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.02.02-2

SRP 3.2.2 indicates that the review includes the applicant's presentation on suitable piping and instrumentation diagrams of the system quality group classifications. Site-specific system piping & instrumentation diagrams (P&IDs), such as FSAR Figure 9.2.1-1R for the ESWS, do not appear to show the system quality group classifications or boundaries. Show the quality group classifications and boundaries on these figures or otherwise clarify if the final P&IDs will be available for audit.

ANSWER:

System quality group classifications and boundaries are not shown on the piping and instrumentation diagrams (P&IDs), but equipment classes and boundaries are shown. Systems and components are listed in DCD Table 3.2-2 and FSAR Table 3.2-201. Each component's equipment class and corresponding quality group is described in DCD Section 3.2.2. Therefore, the P&IDs show the information necessary to identify the quality group classifications and boundaries when used in conjunction with DCD Table 3.2-2 and FSAR Table 3.2-201.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

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.: 2757 (CP RAI #67)

SRP SECTION: 03.02.02 - System Quality Group Classification

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.02.02-3

Although the circulating water (CWS) system does not have safety-related functions, the failure of the CWS piping may have adverse consequences on important to safety SSCs due to its location or large size. This system is also important for continued plant operation. Therefore, the CWS is normally constructed to industry quality standards that are intended to minimize the potential for such a failure. SRP 10.4.5 identifies that the CWS is designed to Quality Group D. The circulating water system is not classified in FSAR Table 3.2-201 or DCD Table 3.2-1 and it is not clear what quality standards including codes and standards are applied to the design and construction of this piping. Identify the quality group and appropriate codes and standards that apply to the design and construction of the CWS piping.

ANSWER:

DCD Subsection 3.2.2 has been revised to reflect current US-APWR equipment classifications, defining Equipment Class 1 (EC 1) through EC 10. The CWS and its components are classified as EC 9 and Quality Group N/A.

Failure of the CWS or its components will have no detrimental effect on any safety-related equipment. In addition, none of the CWS components contain radioactive material. Therefore, the CWS is not designed to any quality group standards, but the CWS components meet the intent of the quality group D standards based on the following design features described in DCD Subsection 10.4.5:

- CWS above ground piping is carbon steel and designed and constructed to ASME B31.1 Power Piping Code.
- The underground CWS piping are constructed of pre-stressed concrete.
- CWS pumps and cooling towers are built to applicable industry and manufacturer's standards.

DCD Table 3.2-1 identifies non-safety components required for normal shutdown. The CWS components have been added to the table (attached).

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

"Cooling towers" and "Circulating water pumps" were added to DCD Table 3.2-1, "Non-Safety Components Required for Normal Shutdown," (Sheet 2 of 2)

Attachment

Mitsubishi Heavy Industries, Ltd. letter to the NRC, "Update of Chapter 3 of US-APWR DCD," dated October 28, 2009 (UAP-HF-09491)

MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

October 28, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09491

Subject: **Update of Chapter 3 of US-APWR DCD**

Reference:
1) CP-200801264 Log # TXNB-08024 from M. L. Lucas (Luminant) to U.S. NRC,"COMBINED LICENSE APPLICATION FOR COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4 PROJECT NO. 0754" dated on September 19, 2008
2) Letter MHI Ref: UAP-HF-09490 from Y. Ogata (MHI) to U.S. NRC, "Submittal of US-APWR Design Control Document Revision 2 in Support of Mitsubishi Heavy Industries, Ltd.'s Application for Design Certification of the US-APWR Standard Plant Design" dated on October 27, 2009.
3) NRC Request for Additional Information No. 2757 Revision 0, RAI #67, 9/20/2009, Comanche Peak Units 3 and 4, Luminant Generation Company, LLC. Docket No. 52-034 and 52-035, SRP Section: 03.02.02 - System Quality Group Classification, Application Section: 3.2.2

During the review process of the Combined License Application for Comanche Peak Units 3 and 4 (Reference 1, "R-COLA"), which incorporates by reference the Mitsubishi Heavy Industries, Ltd. (MHI) Design Certification Application for the US-APWR Standard Plant Design (Reference 2, "DCD"), the U.S. Nuclear Regulatory Commission ("NRC") Staff has requested additional information about the CWS (Reference 3).

Based on our response to this RAI, updates of Chapter 3 of our US-APWR Design Control Document are required.

With this letter, MHI transmits to the NRC Staff the proposed updates to be made to the DCD based on our response to this RAI. These updates will be incorporated into future DCD revisions.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this letter. His contact information is provided below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosure:

1. Update of Chapter 3 of the US-APWR DCD

CC: J. A. Ciocco
C. K. Paulson

Contact Information
C. Keith Paulson, Senior Technical Manager
Mitsubishi Nuclear Energy Systems, Inc.
300 Oxford Drive, Suite 301
Monroeville, PA 15146
E-mail: ck_paulson@mnes-us.com
Telephone: (412) 373-6466

Enclosure 1

UAP-HF-09491
Docket No. 52-021

Update of Chapter 3 of US-APWR DCD

October 2009

Mitsubishi received an NRC Request for Additional Information No. 2757 Revision 0, RAI #67, dated on 9/20/2009.

In response to the above RAI #67, it became necessary to revise Chapter 3 of our US-APWR Design Control Document.

Table 1 shows the change list of Chapter 3 of the DCD, which gives the positions, the contents and the reasons of changing DCD. Mark-up drafts of the DCD are also attached in this document.

Table 1 Change List of Chapter 3 of DCD

Page	Location **(e.g., subsection with paragraph/ sentence/ item, table with row/column, or figure)**	Description of Change
3.2-16	Table 3.2-1 Sheet 2	Add two rows for CWS components "Cooling towers" and "Circulating water pumps" to the table. Reason: The components of the CWS system are required for normal shutdown. The cooling towers and the circulating water pumps were erroneously omitted.

Table 3.2-1 Non-Safety Components Required for Normal Shutdown (Sheet 1 of 2)

Systems	Components
Reactor Coolant System	Reactor Coolant System and oil lift pump
	Pressurizer heater (Control Group)
	Pressurizer spray valve
Chemical and volume control system	Charging pump
	Boric acid transfer pump
	Volume control tank
	Boric acid tank
	Hold up tank
	Regenerative heat exchanger
	Letdown heat exchanger
	Seal water heat exchanger
	Reactor coolant filter
	Seal water injection filter
	Seal water return strainer
	Charging flow control valve
	Seal water injection flow control valve
	Letdown line 1st (2nd) stop valve
	Letdown line inside prestressed concrete containment vessel
	Centrifugal charging pump inlet line volume control tank Side 1st, 2nd isolation valves
	Centrifugal charging pump inlet line boric and tank side isolation valve
	Centrifugal charging pump inlet line refueling water storage auxiliary tank side isolation valves
	Residual heat removal letdown line pressure control valve
	Seal water return line 1st, 2nd isolation valves
Primary Makeup Water System	Primary make-up water pump
	Primary make-up water storage tank
Residual Heat Removal System	CS/residual heat removal cooler outlet flow control valves
	CS/residual heat removal heat exchanger bypass flow control valves
Main Stream and Feedwater System	Main steam relief valves (Normal)
	Turbine bypass valves
	Main feedwater bypass valves
	Steam generator water filling control valves

Table 3.2-1 Non-Safety Components Required for Normal Shutdown (Sheet 2 of 2)

Instrument Air System	Instrument air compressors
Secondary System	Condenser
	Condensate pump
	Deaerator
	Main feedwater pump
	Cooling towers
	Circulating water pumps
Heating, Ventilation, and Air Conditioning	Containment fan cooler unit fan
	Reactor cavity cooling fan
	Control rod drive mechanism cooling fan
	Non-Class 1E electrical room air handling unit fan
	Non-essential chiller units
	Non-essential chilled water pumps

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.: 2757 (CP RAI #67)

SRP SECTION: 03.02.02 - System Quality Group Classification

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR PROJECTS) (EMB2)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.02.02-4

10 CFR Part 52 requires, in part, that, prior to granting a combined license, which references a standard design certification, that information normally contained in certain specifications be available for audit if such information is needed to make the determination that the application is consistent with the certified design. Confirm that design information contained in procurement specifications concerning the quality group classification of all important to safety SSCs and the basis for the classification is available for NRC staff to audit, or establish when such design information will be available. In addition, clarify what design basis classification information, such as design specifications, P&IDs, and Q List, is available for the NRC staff to audit.

ANSWER:

The design information contained in procurement specifications of all important to safety SSCs will be available throughout the procurement and construction phases of the project. The basis for the quality group classification is available in FSAR Table 3.2-201.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment 2

Response to Request for Additional Information No. 2819 (CP RAI #66)

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-1

In order for the NRC staff to verify that the site-specific tornado characteristics for the Comanche Peak Nuclear Power Plant (CPNPP) are enveloped by the maximum design-basis tornado characteristics listed in Table 1 of Regulatory Guide 1.76, 'Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants,' Revision 1 (March 2007) for Region 1, a comparison of the two sets of tornado characteristics is requested to demonstrate compliance with General Design Criterion (GDC)-2 in 10 CFR 50, Appendix A.

The maximum tornado wind speed listed in Table 1 of Regulatory Guide 1.76, Revision 1, for Region 1 was reduced from 360 mph, as specified in the original version of Regulatory Guide 1.76 (Revision 0, 1974), to 230 mph in the current version. This change was based on the enhanced Fujita (EF)-scale approach that was used to replace the Fujita (F)-scale approach to project and update the design-basis tornado characteristic in Regulatory Guide 1.76. However, the following summary describes considerations involved in determining the maximum tornado wind speed.

(1) The EF-Scale was initially based on the need to correlate the actual damage intensity of structures related to tornados, instead of investigating the maximum tornado wind speeds. In addition, members of the Fujita-Scale Forum insisted that the historical tornado database be preserved. These considerations resulted in the 0.6246 correlation factor (or reduction factor) between the F-scale and EF-Scale, where the EF-Scale equals 0.6246 times the F-Scale.

(2) The Bridge Creek tornado that occurred on May 3, 1999 in the Oklahoma City area is a good example of a recent maximum tornado event. During this tornado, researchers from the University of Oklahoma used "Doppler on Wheels" (DOW) to measure a tornado wind speed of 318 mph near Bridge Creek, Oklahoma. The data obtained by the DOW team was subjected to scientific peer review, and results of this review suggest that the maximum speed actually may be less than 318 mph, but still in the 300 mph range.

Because research tools such as DOW are being developed and used to measure tornado wind speed, the 230 mph value used by the COL applicant may not envelope the maximum tornado wind speed that could occur during a severe tornado event at the CPNPP site.

Therefore, the COL applicant is requested to provide an analysis that compares the maximum design-basis tornado characteristics listed in Table 1 of Regulatory Guide 1.76, Revision 1 for Region 1 and the tornado characteristics for the CPNPP site in northern Texas. This information is needed to allow the NRC staff to verify that the site-specific tornado characteristics for the CPNPP are enveloped by the maximum design-basis tornado characteristics listed in Table 1 of the Regulatory Guide 1.76, Revision 1 for Region 1.

ANSWER:

NRC Staff has made available a document titled "Staff's responses to public comments on DG-1143." Draft regulatory guide DG-1143 was published on January 2006 and is the draft regulatory guide that preceded Revision 1 of RG 1.76 which was published in March 2007.

Public general Comment 7 noted the old Fujita (F) scale was being replaced by the Enhanced Fujita (EF) scale. In the NRC Resolution to Comment 7, the revision to RG 1.76 implements the new EF scale. As stated in the resolution, the change from the F scale to the EF scale reduced the 10^{-7} tornado wind speeds in DG-1143 for each of the three regions. The net result of this conversion of measurement scale correctly reflects the reduction of maximum tornado wind speed from 360 mph to 230 mph. Because of this reduction in the wind speeds, the analysis also recalculated the resulting missile speeds presented in DG-1143. The NRC also states in RG 1.76, Rev 1, B. Discussion:

> The NRC staff has determined that the design-basis tornado wind speeds for new reactors should correspond to the exceedance frequency of 10^{-7} per year (calculated as a best estimate), thus using the same exceedance frequency as the original version of this regulatory guide. The results of the analysis indicated that a maximum wind speed of 103 meters per second (m/s) [230 miles per hour (mph)] is appropriate for tornadoes for the central portion of the United States.

In addition, DCD Section 2.0 states the site-specific parameters for the US-APWR bound an estimated 75% to 80% of the United States landmass. FSAR Subsection 2.3.1.2.3 discusses the maximum tornado wind speed near CPNPP in northern Texas, and concludes the expected maximum tornado wind speed and upper limit of the expected tornado wind speed are bounded by the tornado wind speed in Table 1 of RG 1.76, R1 for Region 1 which is considered by the US-APWR standard plant design. The table below, drawn from FSAR Subsection 2.3.1.2.3, shows the comparison of tornado wind speed for CPNPP site and tornado wind speed in Table 1 of RG 1.76 R1 for Region 1. These wind speeds are for exceedance probabilities of 10^{-7} per year. Tornados recorded in the vicinity of CPNPP are significantly less than that recorded during the Bridge Creek tornado that occurred on May 3, 1999. Therefore, Luminant has evaluated meteorological data for site-specific tornado wind speeds and determined the tornado wind speeds are bounded by the key site parameters for the standard US-APWR:

Comparison of Maximum Tornado Wind Speed

Expected maximum tornado wind speed for CPNPP	Upper limit (90 percent) of the expected tornado wind speed for CPNPP	Maximum tornado wind speed in RG 1.76 R1 for Region 1 and in US-APWR DCD Subsection 3.3.2.1
205 mph	212 mph	230 mph

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-2

In order for the NRC staff to verify compliance with requirements in GDC-2 in 10 CFR 50, Appendix A, the COL applicant is requested to provide information on potential tornado-generated missile impact effects that are more severe than those produced by the missiles included in the missile spectrum defined in Table 2 of Regulatory Guide 1.76, Rev. 1.

[I] The design-basis tornado missile spectrum and maximum horizontal speeds that are acceptable to the NRC staff are defined in Table 2 of Regulatory Guide 1.76, Rev. 1. The three types of missiles included in the spectrum are (1) a schedule 40 pipe, (2) an automobile, and (3) a solid steel sphere. According to Section 3.3.2.2.3 of the USAPWR design control document (DCD), which was incorporated by reference into the COL application, the COL applicant states:

> Overall effects of missile impact are designed for flexural, shear, and buckling effects on structural members using the equivalent static load obtained from the evaluation of structural response. The impact is assumed to be plastic, and is determined as outlined in "Impact Effect of Fragments Striking Structural Elements" (Reference 3.3-6)."

Provide a description of the fragment spectrum considered in Reference 3.3-6 of the US-APWR DCD and identify the missiles included in the fragment spectrum, if any, which are capable of producing tornado missile impact effects that are more severe than those produced by the missiles included in the missile spectrum defined in Table 2 of Regulatory Guide 1.76, Rev. 1. Reference 3.3-6 is R.A. Williamson and R R Alvy, 'Impact Effect of Fragments Striking Structural Elements,' Holmes and Narver, Inc. Publishers, November 1973.

[II]. Compliance with GDC 2 requires that nuclear power plant structures systems and components (SSCs) are designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their intended safety functions. The design-basis tornado-generated missile spectrum in Table 2 of Regulatory Guide 1.76, Rev. 1 is generally acceptable to the NRC staff for the design of nuclear power plants. However, other possible types of missiles that could adversely affect SSCs by reducing their capability to perform their intended safety functions should be analyzed by the applicant to ensure compliance with GDC 2 requirements.

Provide information on any potential tornado-generated missiles and fragments identified by the COL applicant that could produce tornado-generated missile impact effects more severe than those produced by the missiles included in the missile spectrum defined in Table 2 of Regulatory Guide 1.76, Rev. 1.

ANSWER:

[I] "Impact Effect of Fragments Striking Structural Elements" (DCD Reference 3.3-6) outlines a method used to obtain an equivalent static load for use in a structural analysis, but it does not specify a tornado-generated missile spectrum. DCD Subsection 3.5.1.4, which is incorporated by reference into the COL application, provides the tornado-generated missile spectrum that is consistent with RG 1.76, Revision 1. Further, FSAR Subsection 3.3.2.3 states that other miscellaneous non-seismic buildings and structures in the plant yard are located and/or anchored such that their failure will not generate missiles not bounded by those discussed in Subsection 3.5.1.4. Therefore, the missile spectrum used in the design of CPNPP Units 3 and 4 is defined in Table 2 of RG 1.76, Revision 1.

[II] As stated in DCD Section 2.3, COL Applicant Item COL 2.3(1) is to verify that the site-specific regional climatology and local meteorology are bounded by the site parameters for the standard US-APWR design, or to demonstrate by some other means that the proposed facility and associated site-specific characteristics are acceptable at the proposed site. FSAR Subsection 2.3.1.2.3 evaluated the site-specific conditions for tornados and concluded the design basis tornado parameters used in the design and operation of CPNPP Units 3 and 4 are based on RG 1.76 Revision 1. Therefore, no potential tornado-generated missiles and fragments are identified that could produce tornado-generated missile impact effects more severe than those produced by the missiles included in the missile spectrum defined in Table 2 of RG 1.76, Revision 1.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-3

In order for the NRC staff to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A, additional information about the response characteristics of the Ultimate Heat Sink Related Structures (UHSRS) to wind effects is requested. Specifically, NRC staff needs additional information to determine whether Method 2 can be used to determine the design wind loads for the UHSRS in accordance with ASCE/SEI 7-05, Section 6.5 requirements.

Design wind loads for buildings and other structures, including the Main Wind-Force Resisting Systems (MWFRS) and components, may be determined using one of three procedures defined in ASCE/SEI 7-05, Section 6.1.2. The applicant selected Method 2 – Analytical Procedure described in ASCE/SEI 7-05, Section 6.5 to determine design wind loads for the UHSRS. According to this procedure, Method 2 can only be used to design the MWFRS for buildings that satisfy the two conditions defined in ASCE/SEI 7-05, Section 6.5.1. Condition 2 for Method 2 states that the building does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; and does not have a site location from which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

The COL applicant used Method 2 – Analytical Procedure described in ASCE/SEI 7-05 to transform wind speed into pressure-induced forces applied to the UHSRS in the CPNPP. According to ASCE/SEI 7-05, Section 6.5, Method 2 can be used for the design of MWFRS for the UHSRS provided they satisfy both of the conditions in Section 6.5.1. The COL applicant is requested to provide information on the geometrical shapes of the buildings and the response characteristics of the buildings due to tornado-generated wind to verify that the UHSRS comply with both Condition 1 and 2 for Method 2.

ANSWER:

ASCE/SEI Section 6.5.1 states:

> A building or other structure whose design wind loads are determined in accordance with this section (Section 6.5: Method 2 – Analytical Procedure) shall meet all of the following conditions:

1. The building or other structure is a regular-shaped building or structure as defined in Section 6.2.

2. The building or other structure does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; or does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

ASCE/SEI Section 6.2 defines regularly shaped building or other structure as a building or other structure having no unusual geometrical irregularity in spatial form.

ASCE/SEI 7-05 Commentary, Section C6.5.2, page 284, states:

> The provisions given under Section 6.5.2 apply to the majority of site locations and buildings and structures, but for some locations, these provisions may be inadequate. Examples of site locations and buildings and structures (or portions thereof) that require the use of recognized literature for documentation pertaining to wind effects, or the use of wind tunnel procedure or Section 6.6 include;
>
> 1. Site locations that have channeling effects from up-wind obstructions. Channeling effects can be caused by topographic features (e.g., mountain gorge) or buildings (e.g., a cluster of tall buildings). Wakes can be caused by hills or by buildings or other structures.
>
> 2. Buildings with unusual or irregular geometric shape, including barrel vaults, and other buildings whose shape (in plan or profile) differs significantly from a uniform series of superimposed prisms similar to those indicated in Figs. 6-6 through 6-17. Unusual or irregular geometric shapes include buildings with multiple setbacks, curved facades, irregular plan resulting from significant indentations or projections, openings through the building, or multitower buildings connected by bridges.
>
> 3. Buildings with unusual response characteristics that result in across-wind loading and/or dynamic torsional loads, loads caused by vortex shedding, or loads resulting from instabilities, such as fluttering or galloping. Examples of buildings and structures that may have unusual response characteristics include flexible buildings with natural frequencies normally below 1 Hz, tall slender buildings (building height-to-width ratio exceeds 4), and cylindrical buildings or structures. Note: Vortex shedding occurs when wind blows across a slender prismatic or cylindrical body. Vortices are alternately shed from one side of the body and then the other side, which results in a fluctuation force acting at right angles to the wind direction (across-wind) along the length of the body.
>
> 4. Bridges, cranes, electrical transmission lines, guyed masts, telecommunication towers, and flagpoles.

FSAR Figures 2.5.1-215 and 2.5.5-204 show that the site does possess natural features such as escarpments or hills near the Ultimate Heat Sink-Related Structures (UHSRS) complex that may promote channeling effects or the creation of wakes, but not to the extent that special consideration is warranted. Method 2 of ASCE/SEI 7-05 provides a topographic factor, K_{zt}, in Section 6.5.7 "Topographic Effects," to address this issue when calculating the design wind loading. Also, the other buildings on the site are not of the height, plan dimension, or location relative to the UHSRS such that channeling effects or the creation of wakes or other non-standard wind effects are produced that extend beyond the provisions of the ASCE/SEI 7-05 Method 2 procedure.

FSAR Table 3KK-2 states that the minimum natural frequency of the UHSRS is 7.1 Hz for the east-west direction, which is the lowest fundamental frequency in any orthogonal direction for any of the soil conditions considered. This means that the UHSRS are rigid with respect to wind loading. As shown in FSAR Figures 3.8-206 through 3.8-211, the UHSRS complex is comprised of relatively low-rise, nearly rectangular structures that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Based on the configuration and properties of the UHSRS complex, the complex does not fall within the limitations of Section C6.5.2 of the ASCE/SEI 7-05 Commentary cited above.

Therefore, the UHSRS are not considered to be irregularly shaped and do not have response characteristics that make them subject to unusual wind effects such as across wind loading, vortex shedding, or instability due to galloping or flutter. Thus, conditions 1 and 2 of ASCE/SEI Section 6.5.1 are satisfied for tornado-generated wind loading.

FSAR Subsection 3.3.1.2 has been revised to incorporate this response.

Impact on R-COLA

See attached marked-up of FSAR Draft Revision 1 pages 3.3-1 and 3.3-2.

Impact on S-COLA

None.

Impact on DCD

None.

3.3 WIND AND TORNADO LOADINGS

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

3.3.1.1 Design Wind Velocity and Recurrence Interval

CP COL 3.3(1) Replace the last sentence of the second paragraph in DCD Subsection 3.3.1.1 with the following.

The site-specific basic wind speed of 90 mph corresponds to a 3-second gust at 33 ft. above ground for exposure category C, with the same recurrence interval as described above, and is therefore enveloped by the basic wind speed used for the design of the standard plant. Site-specific structures, systems, and components (SSCs) are designed using the site-specific basic wind speed of 90 mph, or higher.

3.3.1.2 Determination of Applied Forces

CP COL 3.3(4) Replace the last paragraph in DCD Subsection 3.3.1.2 with the following.

Specific descriptions of wind load design method and importance factor for US-APWR site-specific plant structures are as follows:

- The UHSRS (seismic category I) are analyzed using method 2 of American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) 7-05 (Reference 3.3-1) and an importance factor of 1.15. FSAR Figures 2.5.1-215 and 2.5.5-204 show that the site does possess natural features such as escarpments or hills near the Ultimate Heat Sink Related Structures (UHSRS) complex that may promote channeling effects or the creation of wakes, but not to the extent that special consideration is warranted. Method 2 of ASCE/SEI 7-05 provides a topographic factor, Kzt, in Section 6.5.7 “Topographic Effects,” to address this issue when calculating the design wind loading. Also, the other buildings on the site are not of the height, plan dimension, or location relative to the UHSRS such that channeling effects or the creation of wakes or other non-standard wind effects are produced that extend beyond the provisions of the ASCE/SEI 7-05 method 2 procedure. FSAR Table 3KK-2 states that the minimum natural frequency of the UHSRS is 7.1 Hz for the east-west direction, which is the lowest fundamental frequency in any orthogonal direction for any of the soil conditions considered. This means that the UHSRS are rigid with respect to wind RCOL2_03.03.02-3

loading. As shown in FSAR Figures 3.8-206 through 3.8-211, the UHSRS complex is comprised of relatively low-rise, nearly rectangular structures that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Therefore, based on the configuration and properties of the UHSRS complex, method 2 of ASCE/SEI 7-05 is an appropriate method of wind load design. RCOL2_03.03.02-3

- The exposed portions of the ESWPT (seismic category I) and power source fuel storage vaults (PSFSVs) (seismic category I) are analyzed using method 1 of ASCE/SEI 7-05 (Reference 3.3-1) and an importance factor of 1.15.
- Portions of shallow-embedded duct banks or chases, which are exposed at the interface with other structures, are analyzed using the same ASCE/SEI 7-05 (Reference 3.3-1) method as the structure with which they interface, and an importance factor of 1.15. RCOL2_03.03.02-4

CPNPP Units 3 and 4 do not have site-specific seismic category II buildings and structures. CTS-00638

3.3.2.2.2 Tornado Atmospheric Forces

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

Site-specific seismic category I structures include shallow-embedded duct bank/chases, the UHSRS, ESWPT, and the PSFSVs. RCOL2_03.03.02-4

The UHSRS, including the pump houses and transfer pump rooms, are configured with large openings and/or vents. The UHS basins and cooling tower enclosures ~~and~~ are ~~therefore~~ designed as vented with respect to tornado atmospheric differential pressure loading. Venting of the pump houses and transfer pump rooms is anticipated during a tornado event, however, for the purpose of structural design, the external walls, internal walls, and slabs of the pump houses and transfer pumps rooms are conservatively designed as unvented and the full tornado atmospheric differential pressure loading is applied. Since the full pressure differential for the structural elements is considered, a depressurization model is not used for the structural design. ~~Where applicable, interior walls are designed considering tornado differential atmospheric pressure loading.~~ RCOL2_03.03.02-6

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

The tornado atmospheric pressure loading on shallow-embedded duct banks and chases is described as follows. The portions of the duct banks (solid) or chases (hollow) which are wholly embedded are not subjected to atmospheric differential pressure effects. The exposed at ground level portions of chases, which are unvented, are assessed for the full effects of tornado atmospheric differential pressure. RCOL2_03.03.02-4

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-4

Design wind loads for buildings and other structures, including the Main Wind-Force Resisting Systems (MWFRS) and components, may be determined using one of three procedures defined in ASCE/SEI 7-05, Section 6.1.2. In order for the NRC staff to determine whether Method 1, 2, or 3 can be used to determine the design wind loads for the site-specific Seismic Category I yard piping and conduits in accordance with ASCE/SEI 7-05, additional information about the response characteristics of the site-specific Seismic Category I yard piping and conduits to tornado-generated wind effects is requested to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A.

The CPNPP includes site-specific Seismic Category I yard piping and conduits that are routed within reinforced concrete duct banks (solid) or reinforced concrete chases (hollow). The duct banks and chases have shallow embedments and are buried partially or wholly below grade within structurally engineered and compacted backfill that extends down to the top of the limestone at nominal elevation 782 ft. Therefore, the COL applicant is requested to submit the following information for the site-specific Seismic Category I yard piping and conduits.

- The method defined in ASCE/SEI 7-05, Section 6.1.2 that was used to transform wind speed into pressure-induced forces applied to each of these site-specific Seismic Category I structures.
- Design details about each of these site-specific, Seismic Category I structures that can be used to evaluate compliance with the conditions for Method 1, 2 or 3 defined in ASCE/SEI 7-05, Section 6.4.1.1, 6.5.1, or 6.6.2, as applicable.
- A structural assessment of atmospheric pressure change effects, if any, for each of these site-specific Seismic Category I structures due to venting.
- An assessment of tornado missile impact effects, if any, for each of these site-specific Seismic Category I structures.
- A description of the methodology used to determine the maximum tornado wind load effects for each of these site-specific Seismic Category I structures.

ANSWER:

Seismic Category I shallow-embedded duct banks and chases are included in FSAR Chapter 3 in the anticipation that such items will be needed, but the application of these designs will be confirmed as detailed electrical, mechanical, and piping commodities design and yard layout progresses. The portions of the duct banks (solid) or chases (hollow) that are wholly embedded are not subjected to wind loading or atmospheric differential pressure effects. Generally, any portion of a duct bank or chase that is not wholly embedded is only marginally exposed and not to an extent that an analysis of wind loading is required. This includes those portions which are embedded flush with the ground surface. The portions of duct banks and chases exposed at ground level are required to be assessed for tornado missile impact effects. However, only the exposed at ground level portions of chases are required to be assessed for tornado atmospheric differential pressure effects.

If a portion of a duct bank or chase is significantly exposed at or near the interface of another structure, then the wind loading applied to the duct bank or chase is the wind loading calculated for that portion of the interfacing structure. In these cases, the wind loads on the duct bank or chase correspond to the ASCE method 1 or 2 that is used for the interfacing structure. The portions of duct banks and chases significantly exposed at or near the interface of another structure are required to be assessed for tornado missile impact effects. However, only the portions of chases that are exposed at or near the interface of another structure are required to be assessed for tornado atmospheric differential pressure effects. The chases will be enclosed and provide no venting. Therefore, they are to be assessed for the full pressure drop as outlined in Table 1 of RG 1.76, Revision 1.

For site-specific Seismic Category I reinforced concrete duct banks (solid) and chases (hollow), tornado missile impact effects are required to be assessed in the same manner as standard plant Seismic Category I SSCs. The response to DCD RAI No. 218-1907 Question 3.3.2-02 (ML090570305) addresses the tornado missile spectrum used for the standard plant design as well as the methods used to obtain equivalent static loading for use in a structural analysis. The response states that Table 2 of RG 1.76, Revision 1 provides the selected design basis tornado missile spectrum with maximum horizontal speeds and "Impact Effect of Fragments Striking Structural Elements" (DCD Reference 3.3-6) is used to obtain equivalent static loading. Both of these documents are applicable for assessing tornado missile impact effects on site-specific Seismic Category I duct banks and chases.

The methodology used to determine the maximum tornado wind load effects for each of these site-specific Seismic Category I structures is the same as that used for standard plant Seismic Category I SSCs. The response to DCD RAI No. 218-1907 Question 3.3.2-03 outlines the load combinations of the three individual tornado effects (direct wind pressure, atmospheric pressure change, and tornado missiles). These combinations are in accordance with SRP 3.3.2 and are supplemented by the design criteria and procedures provided in the Bechtel Topical Report BC-TOP-3-A, Revision 3, "Tornado and Extreme Wind Design Criteria for Nuclear Power Plants." Section 3.4 of the Topical Report gives the following six load combinations:

$$W_t = W_w \qquad W_t = W_w + 0.5\,W_p$$

$$W_t = W_p \qquad W_t = W_w + W_m$$

$$W_t = W_m \qquad W_t = W_w + 0.5W_p + W_m$$

where

W_t = Total Tornado Load

W_w = Load from Tornado Wind Effect

W_p = Load from Tornado Atmospheric Pressure Change Effect

W_m = Load from Tornado Missile Impact Effect

The maximum value of W_t is used in the design of site specific Seismic Category I reinforced concrete duct banks and chases, where applicable.

FSAR Subsection 3.3.1.2, 3.3.2.2.2 and 3.3.2.2.4 have been revised to incorporate this response.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 3.3-2 and 3.3-3.

Impact on S-COLA

None.

Impact on DCD

None.

loading. As shown in FSAR Figures 3.8-206 through 3.8-211, the UHSRS complex is comprised of relatively low-rise, nearly rectangular structures that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Therefore, based on the configuration and properties of the UHSRS complex, method 2 of ASCE/SEI 7-05 is an appropriate method of wind load design. RCOL2_03.03.02-3

- The exposed portions of the ESWPT (seismic category I) and power source fuel storage vaults (PSFSVs) (seismic category I) are analyzed using method 1 of ASCE/SEI 7-05 (Reference 3.3-1) and an importance factor of 1.15.
- Portions of shallow-embedded duct banks or chases, which are exposed at the interface with other structures, are analyzed using the same ASCE/SEI 7-05 (Reference 3.3-1) method as the structure with which they interface, and an importance factor of 1.15. RCOL2_03.03.02-4

CPNPP Units 3 and 4 do not have site-specific seismic category II buildings and structures. CTS-00638

3.3.2.2.2 Tornado Atmospheric Forces

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

Site-specific seismic category I structures include shallow-embedded duct bank/chases, the UHSRS, ESWPT, and the PSFSVs. RCOL2_03.03.02-4

The UHSRS, including the pump houses and transfer pump rooms, are configured with large openings and/or vents. The UHS basins and cooling tower enclosures ~~and are therefore~~ designed as vented with respect to tornado atmospheric differential pressure loading. Venting of the pump houses and transfer pump rooms is anticipated during a tornado event; however, for the purpose of structural design, the external walls, internal walls, and slabs of the pump houses and transfer pumps rooms are conservatively designed as unvented and the full tornado atmospheric differential pressure loading is applied. Since the full pressure differential for the structural elements is considered, a depressurization model is not used for the structural design. ~~Where applicable, interior walls are designed considering tornado differential atmospheric pressure loading.~~ RCOL2_03.03.02-6

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

The tornado atmospheric pressure loading on shallow-embedded duct banks and chases is described as follows. The portions of the duct banks (solid) or chases (hollow) which are wholly embedded are not subjected to atmospheric differential pressure effects. The exposed at ground level portions of chases, which are unvented, are assessed for the full effects of tornado atmospheric differential pressure. RCOL2_03.03.02-4

3.3.2.2.4 Combined Tornado Effects

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

Site-specific seismic category I structures, i.e., the UHSRS and exposed portions of shallow embedded duct banks/chases, the ESWPT and PSFSVs, are designed for the same tornado loadings and combined tornado effects using the same methods for qualification described for standard plant SSCs. RCOL2_03.03.02-4

3.3.2.3 Effect of Failure of Structures or Components Not Designed for Tornado Loads

CP COL 3.3(3) Replace the last paragraph of DCD Subsection 3.3.2.3 with the following.

Other miscellaneous NS buildings and structures in the plant yard are located and/or anchored such that their failure will neither jeopardize safety-related SSCs nor generate missiles not bounded by those discussed in Subsection 3.5.1.4. Further, any site-specific or field routed safety-related SSCs in the plant yard are evaluated prior to their installation to determine if structural reinforcement and/or missile barriers are required to ensure their function and integrity.

3.3.3 Combined License Information

Replace the content of DCD Subsection 3.3.3 with the following.

CP COL 3.3(1) ***3.3(1)*** *Wind speed requirements*

This COL item is addressed in Subsection 3.3.1.1.

CP COL 3.3(2) ***3.3(2)*** *Tornado loadings and combined tornado effects*

This COL item is addressed in Subsection 3.3.2.2.4.

CP COL 3.3(3) ***3.3(3)*** *Structures not designed for tornado loads*

This COL item is addressed in Subsection 3.3.2.3.

CP COL 3.3(4) ***3.3(4)*** *Wind load design methods and importance factors*

This COL item is addressed in Subsection 3.3.1.2.

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-5

Guidance for determining the combination of tornado-generated wind effects, atmospheric pressure change effects, and missile impact effects that produce the most adverse total tornado effect is provided in NUREG-0800, 'Standard Review Plan,' (SRP) Section 3.3.2. Understanding the procedures used to transform tornado parameters into effective loads on structures is key to verifying that the most adverse combination of total tornado effects are identified and considered. This is necessary to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A

The COL applicant is requested to provide additional information on the procedures used to determine the most adverse combination of total tornado effects on the Essential Service Water Pipe Tunnel (ESWPT) and Power Source Fuel Storage Vaults (PSFSVs) so the NRC staff can verify that the individual loads were combined in a manner that will produce the most adverse total tornado effect on structures.

The requested information should include the approach used for determining the most adverse combination of total tornado effects on the ESWPT and PSFSVs and the analytical techniques used to ensure that the combination of tornado effects for the ESWPT and PSFSVs are established in a conservative manner. In addition, information about the analytical techniques used by the COL applicant is requested to verify that the most adverse combination of tornado wind load effects, atmospheric pressure change effects, and tornado missile impact effects are identified and considered.

ANSWER:

The methodology used to determine the maximum tornado effects for the ESWPT and PSFSV structures is the same used for the standard plant Seismic Category I SSCs. The response to DCD RAI No. 218-1907 Question 3.3.2-03 (ML090570305) outlines the load combinations of the three individual tornado effects (direct wind pressure, atmospheric pressure change, and tornado missiles). These combinations are in accordance with SRP 3.3.2 and are supplemented by the design criteria and procedures provided in the Bechtel Topical Report BC-TOP-3-A, Revision 3, "Tornado and Extreme Wind Design Criteria for Nuclear Power Plants". These load combinations ensure that tornado effects are combined conservatively for the ESWPT and PSFSVs. Section 3.4 of the Topical Report gives the following six load combinations:

$W_t = W_w$ $\qquad$ $W_t = W_w + 0.5\, W_p$

$W_t = W_p$ $\qquad$ $W_t = W_w + W_m$

$W_t = W_m$ $\qquad$ $W_t = W_w + 0.5W_p + W_m$

where

W_t = Total Tornado Load

W_w = Load from Tornado Wind Effect

W_p = Load from Tornado Atmospheric Pressure Change Effect

W_m = Load from Tornado Missile Impact Effect

The maximum value of W_t is the maximum tornado effect calculated for the ESWPT and PSFSV structures, respectively.

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-6

The COL applicant designed the Ultimate Heat Sink Related Structures (UHSRS), which have vents or large openings, as vented structures. For venting to be effective in equalizing the internal and external atmospheric pressures on the UHSRS resulting from passage of a tornado, the vents or openings must permit air movement and allow sufficient air flow through the openings and vents to accommodate depressurization.

In order for the NRC staff to evaluate the effectiveness of the vents and openings in equalizing the internal and external pressures on the UHSRS, the COL applicant is requested to provide additional information on the depressurization model used to analyze air flow patterns and characteristics through the vents and openings in the UHSRS. In addition, the COL applicant is requested to provide additional information about the procedures used to determine the most adverse combination of total tornado effects on the UHSRS so the NRC staff can verify that the individual loads were combined in a manner that will produce the most adverse total tornado effect on structures.

Furthermore, the COL applicant is requested to provide a description of the analytical techniques used to verify that the most adverse combination of tornado wind load effects, atmospheric pressure change effects, and tornado missile impact effects on the UHSRS are identified and considered. This information is needed by the NRC staff to evaluate atmospheric pressure change effects and combined tornado load effects in accordance with guidance provided in SRP Section 3.3.2, Subsection II, Item C and to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A.

ANSWER:

The UHS basins are uncovered and have no ability to maintain pressure differential. Each UHS cooling tower has a large-diameter opening (452 ft^2) at the top and has substantial openings of 252 ft^2 on each side to allow air flow for the cooling process. Since this configuration is open to air flow, a pressure differential cannot occur and a depressurization model was not judged to be necessary.

Venting of the pump houses and transfer pump rooms is anticipated during a tornado event due to the ventilation openings present. For purposes of structural design, the external walls of the pump houses and transfer pump rooms are conservatively designed as unvented and the full tornado atmospheric pressure differential is included in the structural design. The internal walls and slabs of these rooms are also conservatively designed for the full tornado atmospheric pressure differential. Since the full pressure differential for both internal and external structural elements was considered, a depressurization model is not used for the structural design. FSAR Subsection 3.3.2.2.2 has been revised to incorporate this response.

The tornado wind effect W_w, tornado atmospheric pressure change effect W_p, and tornado missile impact effect W_m, were combined in a conservative manner to form the total tornado load W_t using the following load combinations in accordance with DCD Subsection 3.3.2.2.4 and SRP 3.3.2 Acceptance Criterion 3.E:

1) $W_t = W_p$

2) $W_t = W_w + 0.5\ W_p + W_m$

These load combinations are the governing combinations shown in the response to Question 03.03.02-5 above. W_p and W_w were applied as pressures in ANSYS. A different load set was applied for W_p and for each direction of applied wind in each horizontal direction +x, -x, +y, -y. The load directions were combined using ASCE 7-05 Figure 6-9. To these cases, the effect of W_p was added in accordance with load combination 2 above. These cases were then added to the dead, live, earth, and fluid loads in accordance with the load combinations of ACI 349-01 and the maximum and minimum demands were determined at each design location. Tornado missile demands were calculated at critical areas and added to these demands at each design location.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.3-2.

Impact on S-COLA

None.

Impact on DCD

None.

loading. As shown in FSAR Figures 3.8-206 through 3.8-211, the UHSRS complex is comprised of relatively low-rise, nearly rectangular structures that do not include any unusual or irregular geometric shapes and are constructed of reinforced concrete walls, floors, and roofs. Therefore, based on the configuration and properties of the UHSRS complex, method 2 of ASCE/SEI 7-05 is an appropriate method of wind load design. RCOL2_03.03.02-3

- The exposed portions of the ESWPT (seismic category I) and power source fuel storage vaults (PSFSVs) (seismic category I) are analyzed using method 1 of ASCE/SEI 7-05 (Reference 3.3-1) and an importance factor of 1.15.
- Portions of shallow-embedded duct banks or chases, which are exposed at the interface with other structures, are analyzed using the same ASCE/SEI 7-05 (Reference 3.3-1) method as the structure with which they interface, and an importance factor of 1.15. RCOL2_03.03.02-4

CPNPP Units 3 and 4 do not have site-specific seismic category II buildings and structures. CTS-00638

3.3.2.2.2 Tornado Atmospheric Forces

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

Site-specific seismic category I structures include shallow-embedded duct bank/chases, the UHSRS, ESWPT, and the PSFSVs. RCOL2_03.03.02-4

The UHSRS, including the pump houses and transfer pump rooms, are configured with large openings and/or vents. The UHS basins and cooling tower enclosures ~~and~~ are ~~therefore~~ designed as vented with respect to tornado atmospheric differential pressure loading. Venting of the pump houses and transfer pump rooms is anticipated during a tornado event, however, for the purpose of structural design, the external walls, internal walls, and slabs of the pump houses and transfer pumps rooms are conservatively designed as unvented and the full tornado atmospheric differential pressure loading is applied. Since the full pressure differential for the structural elements is considered, a depressurization model is not used for the structural design.~~Where applicable, interior walls are designed considering tornado differential atmospheric pressure loading.~~ RCOL2_03.03.02-6

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

The tornado atmospheric pressure loading on shallow-embedded duct banks and chases is described as follows. The portions of the duct banks (solid) or chases (hollow) which are wholly embedded are not subjected to atmospheric differential pressure effects. The exposed at ground level portions of chases, which are unvented, are assessed for the full effects of tornado atmospheric differential pressure. RCOL2_03.03.02-4

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.: 2819 (CP RAI #66)

SRP Section: SRP SECTION: 03.03.02 - Tornado Loads

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

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 03.03.02-7

Design wind loads for buildings and other structures, including the Main Wind-Force Resisting Systems (MWFRS) and components, may be determined using one of three procedures defined in ASCE/SEI 7-05, Section 6.1.2. In order for the NRC staff to determine whether Method 1, 2, or 3 can be used to determine the design wind loads for the site-specific Seismic Category II structures in accordance with ASCE/SEI 7-05 and to evaluate impacts on the function and integrity of safety-related SSCs, additional information about the response characteristics of the site-specific Seismic Category II structures to tornado-generated wind effects is requested to demonstrate compliance with GDC-2 in 10 CFR 50, Appendix A.

According to the DCD for the US-APWR standard design, the COL applicant is responsible for identifying the wind load design method and importance factor for site-specific Seismic Category I and II buildings and structures. In addition, Seismic Category II structures and components are required to be designed for the same tornado wind loads as Seismic Category I structures, in order to preclude impact on the function and integrity of safety-related SSCs. In order for the NRC staff to evaluate compliance with these requirements, the following information for the site-specific Seismic Category II structures is requested.

- The method defined in ASCE/SEI 7-05, Section 6.1.2 that was used to transform wind speed into wind forces applied to each site-specific Seismic Category II structure.
- The importance factor for each site-specific Seismic Category II structure.
- Design details about each site-specific Seismic Category II structure that can be used to evaluate compliance with the conditions for Method 1, 2 or 3 defined in ASCE/SEI 7-05, Section 6.4.1.1, 6.5.1, or 6.6.2, as applicable.

ANSWER:

There are no site-specific Seismic Category II buildings or structures at CPNPP Units 3 and 4. Refer to CPNPP FSAR Update Tracking Report Revision 0 (ML091120319) Section 3.3.1.2, Page 3.3-1 (attached).

Non-safety related structures at the CPNPP site are located such that their collapse or displacement due to tornado-generated wind effects will not have any interaction with or effect on adjacent Seismic Category I structures.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment

FSAR Update Tracking Report Revision 0 page 3.3-1.

3.3 WIND AND TORNADO LOADINGS

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

3.3.1.1 Design Wind Velocity and Recurrence Interval

CP COL 3.3(1) Replace the last sentence of the second paragraph in DCD Subsection 3.3.1.1 with the following.

The site-specific basic wind speed of 90 mph corresponds to a 3-second gust at 33 ft. above ground for exposure category C, with the same recurrence interval as described above, and is therefore enveloped by the basic wind speed used for the design of the standard plant. Site-specific structures, systems, and components (SSCs) are designed using the site-specific basic wind speed of 90 mph, or higher.

3.3.1.2 Determination of Applied Forces

CP COL 3.3(4) Replace the last paragraph in DCD Subsection 3.3.1.2 with the following.

Specific descriptions of wind load design method and importance factor for US-APWR site-specific plant structures are as follows:

- The UHSRS (seismic category I) are analyzed using method 2 of American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) 7-05 (Reference 3.3-1) and an importance factor of 1.15.
- The exposed portions of the ESWPT (seismic category I) and power source fuel storage vaults (PSFSVs) (seismic category I) are analyzed using method 1 of ASCE/SEI 7-05 (Reference 3.3-1) and an importance factor of 1.15.

CPNPP Units 3 and 4 do not have site-specific seismic category II buildings and structures. CTS-00638

3.3.2.2.2 Tornado Atmospheric Forces

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

Attachment 3

Response to Request for Additional Information No. 2836 (CP RAI #68)

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.: 2836 (CP RAI #68)

SRP SECTION: 13.01.01 - Management and Technical Support Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.01-1

NUREG-0800, Standard Review Plan (SRP), Section 13.1.1, "Management and Technical Support Organization," section I.1.A.vii states that the following aspects of the implementation or delegation of design and construction responsibilities for procurement of materials and equipment should be described. FSAR section 13.1 does not appear to include a description of the plan to describe the procurement of materials and equipment.

Please identify the location of this information in the Comanche Peak Combined License application (COLA), or justify its exclusion

---

ANSWER:

The CPNPP Units 3 and 4 Support Organization, shown in FSAR Figure 13.1-204, is responsible for implementation of procurement activities. As described in FSAR Subsection 13.1.1.2.2, the Director, NuBuild Project, is responsible for establishing and managing procurement activities, with Quality Assurance (QA) oversight provided by the Manager, NuBuild Quality Assurance.

The CPNPP Units 3 and 4 staffing plan in FSAR Table 13.1-201 includes the estimated number of full time equivalent personnel from the design review phase through the operational phase of the project. The staffing plan includes personnel responsible for procurement activities, such as the manager and supervisors of contracts and procurement, and QA personnel.

Delegation of responsibility for procurement activities during the design and construction phases of the project, to Mitsubishi Nuclear Energy Systems, Inc. (MNES), is described in FSAR Appendix 13AA. Review and approval of safety-related material and component specifications of systems, structures and components (SSCs) designed by MNES are in accordance with the MNES QA program and FSAR Chapter 17. The MNES QA Manual ensures that MNES either reviews vendor designs, or ensures that the vendor performs design reviews in accordance with a QA program accepted by MNES.

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.: 2836 (CP RAI #68)

SRP SECTION: 13.01.01 - Management and Technical Support Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.01-2

NUREG-0800, SRP Section 13.1.1, "Management and Technical Support Organization," section I.1.B.i refers to Appendix 14B. The FSAR does not appear to include an Appendix 14B.

Please identify the location of this information in the Comanche Peak COLA.

ANSWER:

The reference in FSAR Appendix 13AA, Subsection 13AA.2 to Appendix 14B is incorrect. It should have referred to FSAR Chapter 14, Appendix 14AA. FSAR Appendix 14AA was removed by COLA FSAR Update Tracking Report Revision 4 (ML092520137) and replaced with a reference to Technical Report "US-APWR Test Program Description" (MUAP-08009 Revision 0) (ML082900194), which is also referenced in the DCD.

FSAR Subsection 13AA.2 has been revised to delete the reference to Appendix 14B.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 13AA-3.

Impact on S-COLA

None.

Impact on DCD

None.

construction, and in developing the Security Plan. The Physical Security Plan is designed with provisions that meet the applicable NRC regulations.

Development of Safety Analysis Reports - Information regarding the development of the FSAR is found in Section 1.1.

Review and Approval of Material and Component Specifications - Safety-related material and component specifications of SSCs designed by MNES are reviewed and approved in accordance with the MNES quality assurance program and Chapter 17. The MNES QA Manual ensures that MNES either reviews vendor designs, or ensures that the vendor performs design reviews in accordance with a QA program accepted by MNES.

Management and Review of Construction Activities - Overall management and responsibility for construction activities are assigned to the Director, NuBuild Project. The project manager of the EPC contractor is accountable to the Director, NuBuild Project for construction activities. Monitoring and review of construction activities by Luminant personnel is a continuous process at the CPNPP Units 3 and 4 site. Contractor performance is monitored to provide objective data to utility management in order to identify problems early and develop solutions. Monitoring of construction activities verifies that contractors are in compliance with contractual obligations for quality, schedule, and cost. Monitoring and review of construction activities is divided functionally across the various disciplines of the utility construction staff, and schedule progress and performance is tracked by system and major plant components/areas. After each system is turned over to plant staff, the construction organization relinquishes responsibility for that system. At that time they will be responsible for completion of construction activities as directed by plant staff and available to provide support for preoperational and start-up testing as necessary.

13AA.2 Pre-Operational Activities

Pre-operational activities are those activities required to transition the unit from the construction phase to the operational phase. These activities include turnover of systems from construction, preoperational testing, schedule management, procedure development for tests, fuel load, integrated startup testing, and turnover of systems to plant staff. Preoperational and startup testing are conducted by the Pre-operational and Startup Test organization, which, under the Startup Test Manager, reports directly to the Plant Manager. The functions and responsibilities of this organization, and the content of the pre-operational test program, are addressed and described in Section 14.2~~ and Appendix 14B~~. RCOL2_13.01.01-2 Sufficient numbers of personnel are assigned to perform preoperational and startup testing safely and efficiently. Plant-specific training provides instruction on the administrative controls of the test program, and CPNPP Units 3 and 4 operations and technical staff are engaged to support the test program and review test results.

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.: 2836 (CP RAI #68)

SRP SECTION: 13.01.01 - Management and Technical Support Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.01-3

Standard Review Plan Section 13.1.1, "Management and Technical Support Organization," section I.1.B.ii states that the applicant should provide a description of the plan for the development and implementation of the applicant's staff recruiting and training programs. FSAR section 13.1 does not appear to include a description of the plan to develop the staff recruiting and training programs.

Please identify the location of this information in the Comanche Peak COL application, or justify its exclusion

---

ANSWER:

CPNPP has partnered with local community leadership, educators, colleges, and other utilities in the development of a regional-based education alliance. Specifically, CPNPP is currently working with Texas A & M University, the University of North Texas, Hill College, and Texas State Technical Institute to provide the educational background needed for a successful career in the nuclear energy industry. All of the course work required for an Associate or Bachelors degree in a technical field is offered on the CPNPP site by the University of North Texas and Hill College.

In addition, CPNPP currently has a thriving Industrial Technology Program that selects promising students from local high schools and colleges and provides those candidates hands-on nuclear experience while they are concurrently enrolled in college level curriculum leading to an Associate or Bachelors degree in a Technical Field. Upon graduation selected candidates are offered employment at CPNPP.

The long-term vision is to develop a workforce pipeline that would support attrition challenges and operational expansion strategies.

The plant staff training program is provided in Section 13.2. These plans will be substantially accomplished before preoperational testing begins as shown in new FSAR Figure 13.1-205, "CPNPP Units 3 and 4 Plant Staff Hiring and Training Schedule." Reactor operator (RO) and senior reactor operator (SRO) candidates will be recruited that meet the requirements of ACAD 09-001 section 6, "Reactor Operator and Senior Reactor Operator Candidate Education, Experience, and Training Requirements for Initial Startup and Operation of New Construction Plants (Cold Licensing)".

The guidelines in ACAD 09-001 that describe major subject areas and topics to define the RO and SRO training and qualification programs will be used to develop the training programs. Plant-specific content of each program and the associated subject areas and topics will be determined in the design phase of the training program.

The training program will be accredited prior to fuel load or within the time frame established by INPO and the operating company senior management using the guidance provided by ACAD 08-001, "The Process for Initial Accreditation of Training in the Nuclear Power Industry".

FSAR Figure 13.1-205 is based on information of NEI 06-13A, "Template for an Industry Training Program Description." This template has been developed by the New Plant Training Task Force, which is the subject of an on-going discussion under the operator readiness task force meetings. Figure 13.1-205 shows the relative positions of hiring and training milestones (i.e., first license class, etc.) for the various types of personnel (i.e., licensed operators, non-licensed operators, technical and support personnel). The staffing plan for CPNPP Units 3 and 4 nuclear personnel, based on ANSI/ANS3.1-1993 functional positions, is provided in FSAR Table 13.1-201.

FSAR Section 13.2 incorporates by reference NEI 06-13A, "Template for an Industry Training Program Description" Revision 1, to provide a complete generic training program description. Although Table 13.4–201, item 19, Initial Test Program, provides the schedule milestones for the ITP as it relates to the construction test program, preoperational test program and startup test program, it does not provide the management staff recruiting and training program during the ITP. FSAR Section 14.2 references MUAP-08009, (previously Appendix 14AA) which provides a description of the organization responsible for all phases of the initial test program, and a description of the administrative controls that ensure that experienced and qualified supervisory personnel and other principal participants are responsible for managing, developing and conducting the initial test program. See response to Question 13.01.01-4 below for additional information on MUAP-08009.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 13.1-12, 13.2-1, 13.2-2, and new Figure 13.1-205.

Impact on S-COLA

None.

Impact on DCD

None.

accommodate unexpected absences of on-duty crew members, provided immediate action is taken to restore the crew composition within the minimum shown in the table. This exception does not permit any crew composition to be unmanned upon shift turnover due to an oncoming crewmember being late or absent.

Plant administrative procedures implement the required shift staffing. These procedures establish staffing of the operational shifts with sufficient qualified plant personnel who are readily available in the event of an abnormal or emergency situation. The objective is to operate the plant with the required staff and develop work schedules that minimize overtime for plant staff members who perform safety-related functions. Work hour limitations and shift staffing requirements defined by TMI Action Plan I.A.1.3 are defined in station procedures. When overtime is necessary, the provisions in the technical specifications and the plant administrative procedures apply. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work.

13.1.2.6 Supervisory Succession

The Plant Manager is responsible for the operation of CPNPP Units 3 and 4. If the Plant Manager is absent, becomes incapacitated, or in the event of any other unexpected circumstance of a temporary nature, the line of succession of authority and responsibility for overall operations is:

1. Director of Operations
2. Director of Maintenance

As described in Subsection 13.1.2.1, the Director of Operations is the Plant Manager's direct representative for the conduct of operations. The succession of authority includes the authority to issue standing or special orders as required. During back shift and weekend periods when the station staff is not on site, the Shift Manager is responsible for all activities at CPNPP Units 3 and 4.

13.1.3 Qualifications of Nuclear Plant Personnel

CP COL 13.1(5)
CP COL 13.1(7)

Replace the content of DCD Subsection 13.1.3 with the following.

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the requirements for education and experience described in ANSI/ANS-3.1 (Reference 13.1-201), as endorsed and amended by RG 1.8. For Operators and SROs, these requirements are modified in Section 13.2.

RO and SRO candidates meet the requirements of ACAD 09-001 Section 6, "Reactor Operator and Senior Reactor Operator Candidate Education, Experience, and Training Requirements for Initial Startup and Operation of New Construction Plants (Cold Licensing)." RCOL2_13.01-3

13.2 TRAINING

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

STD COL 13.2(1) STD COL 13.2(2) STD COL 13.2(3) STD COL 13.2(4) STD COL 13.2(5) Add the following text to the end of DCD Section 13.2.

NEI 06-13A, "Template for an Industry Training Program Description" Revision 2 which includes Appendix A – Cold License Training Plan (Reference 13.2-201), including all subsections, is incorporated by reference. NEI 06-13A provides a complete generic program description for use with COL applications. The document reflects guidance provided by the NRC and by Industry-NRC discussions on training-related issues. A main objective of this program is to assist in expediting NRC review and issuance of the combined license. Chapter 1 of NEI 06-13A states "The results of reviews of operating experience are incorporated into training and retraining programs in accordance with the provisions of TMI Action Item I.C.5, Appendix 1A." CTS-00898 CTS-00898 CTS-00898

CPNPP has partnered with local community leadership, educators, colleges, and other utilities in the development of a regional-based education alliance. Specifically, CPNPP is currently working with Texas A & M University, the University of North Texas, Hill College, and Texas State Technical Institute to provide the educational background needed for a successful career in the nuclear energy industry. All of the course work required for an Associate or Bachelors degree in a technical field is offered on the CPNPP site by the University of North Texas and Hill College. RCOL2_13.01-3

In addition, CPNPP currently has a thriving Industrial Technology Program that selects promising students from local high schools and colleges and provides those candidates hands-on nuclear experience while they are concurrently enrolled in college level curriculum leading to an Associate or Bachelors degree in a Technical Field. Upon graduation selected candidates are offered employment at CPNPP.

The long-term vision is to develop a workforce pipeline that would support attrition challenges and operational expansion strategies

---

13.2.1.1 Program Description

Replace the content of DCD Subsection 13.2.1.1 with the following.

The content of this subsection is discussed above. In addition, the training program will be accredited prior to fuel load or within the time frame established by INPO and the operating company senior management using the guidance RCOL2_13.01-3 provided by ACAD 08-001, "The Process for Initial Accrediation of Training in the Nuclear Power Industry." FSAR Figure 13.1-205 depicts anticipated milestone dates to support initial fuel load. RCOL2_13.01.01-3

13.2.1.1.1 Licensed Plant Staff Training Program

Replace the content of DCD Subsection 13.2.1.1.1 with the following.

The content of this subsection is discussed above.

13.2.1.1.2 Non-Licensed Plant Staff Training Program (to be verified during construction)

Replace the content of DCD Subsection 13.2.1.1.2 with the following.

The content of this subsection is discussed above.

Add the following Subsection after DCD Subsection 13.2.1.1.2. HPSV-09

13.2.1.1.3 Hazards Awareness Training

Workers and operators will receive initial and annual refresher training for protection from chemical hazards and confined space entry in accordance with 29 CFR 1910.

13.2.1.2 Coordination with Preoperational Tests and Fuel Loading

Replace the content of DCD Subsection 13.2.1.2 with the following.

The content of this subsection is discussed above.

13.2.2 Applicable Nuclear Regulatory Commission Documents

Replace the content of DCD Subsection 13.2.2 with the following.

The content of this subsection is discussed above.

13.2.3 Combined License Information

Replace the content of DCD Subsection 13.2.3 with the following.

STD COL 13.2(1) ***13.2(1)*** *Training program*
This COL item is addressed in Section 13.2.

STD COL 13.2(2) ***13.2(2)*** *Training programs for reactor operators.*
This COL item is addressed in Section 13.2.

STD COL 13.2(3) ***13.2(3)*** *Training programs for non-licensed plant staff*
This COL item is addressed in Section 13.2.

RCOL2_13
.01.01-3

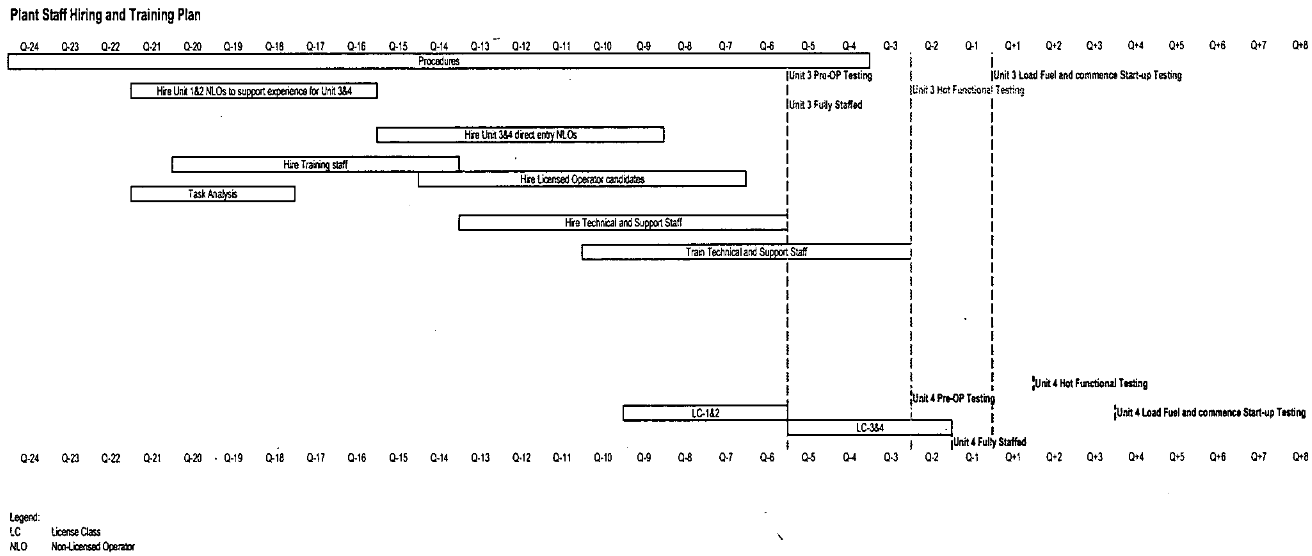

Figure 13.1-205 CPNPP Units 3 and 4 Plant Staff Hiring and Training Plan

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.: 2836 (CP RAI #68)

SRP SECTION: 13.01.01 - Management and Technical Support Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.01-4

Standard Review Plan Section 13.1.1, "Management and Technical Support Organization," section I.1.B.iii states that the applicant should provide a plan for the development of the plant maintenance programs. FSAR section 13.1 does not appear to include a description of the plan to develop the plant maintenance programs.

Please identify the location of this information in the Comanche Peak COL application, or justify its exclusion.

ANSWER:

SRP Section 13.1.1, section I.1.B.iii addresses preoperational management responsibilities and proposed plans for the development of plant maintenance programs. As stated in Subsection 13.1.2.2, the Director, Maintenance, is responsible for developing, maintaining, and implementing maintenance procedures and instructions described in Subsection 13.5.2.2. Preparation of plant procedures is performed in approximately the same time frame as preparation of preoperational and initial startup test procedures. Subsection 13.5.1.2 provides additional details regarding procedure preparation, including review and approval of quality-related procedures prior to use.

COL Item 14.2(2), as modified in MUAP-09003(R1),"US-APWR DCD Tracking Report" Revision 1 dated April 20, 2009 (ML091270581), requires the COL applicant to reconcile the site-specific organizational responsibilities to be consistent with the US-APWR test program description. MUAP-08009 Revision 1, "US-APWR Test Program Description," submitted to the NRC by MHI letter UAP-HF-09494 dated October 26, 2009, includes the following provisions pertaining to maintenance program development for the ITP:

1. The Director, Maintenance and the maintenance department are responsible for performing preventive and corrective maintenance on mechanical and electric equipment, instrumentation and controls following turnover from the construction organization. Therefore, the Director,

Maintenance assumes responsibility for the maintenance program prior to the preoperational test phase of the project.

2. Jurisdictional controls are established for turnover of plant equipment, subsystems, systems or areas from the construction organization to the plant operating organization. This process includes provisions for transferring control back to the construction organization for rework or modifications.

3. Upon completion of construction work, impacts of work performed on completed testing, or additional post-modification testing are identified and tracked to completion under administrative control.

4. Plant administrative procedures establish controls for the issuance of work permits, tracking of work permits to completion and maintaining plant status control during all phases of the ITP.

5. The test organization will review, authorize field performance, and review the results of all field work on SSCs turned over from the construction organization to ensure impacts on testing and plant conditions are carefully monitored and controlled and the as-tested status of SSCs is maintained.

6. Configuration control of SSCs turned over from the construction organization is established and maintained following turnover during all phases of testing and maintenance.

7. Additional maintenance activities, including Installation Testing support, such as field walkdowns and establishing system cleanliness.

In summary, the US-APWR Test Program Description is addressed by CPNPP Units 3 and 4 COL Item 14.2(2) and includes responsibilities and program elements pertaining to maintenance for the initial test program, thereby addressing SRP Section 13.1.1, section I.1.B.iii.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment 4

Response to Request for Additional Information No. 2837 (CP RAI #69)

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.: 2837 (CP RAI #69)

SRP SECTION: 13.01.02-13.01.03 - Operating Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.02-13.01.03-1

NUREG-0800, Standard Review Plan (SRP), Section.13.1.2 – 13.1.3, "Operating Organization," section I.1.G states that the organizational information provided by the applicant should include a schedule, relative to fuel loading for each unit, for filling all positions. FSAR section 13.1 does not appear to include a schedule, relative to fuel loading for each unit, for filling all positions.

Please identify the location of this information in the Comanche Peak application, or justify its exclusion.

ANSWER:

FSAR Section 13.1.3 explicitly states: "All positions will be filled prior to fuel loading for each unit." This is consistent with RG 1.206, Section 13.1.2(7). Table 13.4-201, Items 11 and 12 commit that the non-licensed plant staff and reactor operator training programs will be implemented 18 months prior to scheduled fuel load. This implies that all recruiting and hiring (filling of jobs) will be accomplished prior to that date.

More specifically, Table 13.1-201 presents a detailed staffing plan for CPNPP Units 3 and 4. This table includes the entire complement of individuals that will be required to operate and support the new units, subdivided into the major functions of executive management, nuclear support, quality assurance, safety, training, plant management, operations, offsite engineering, onsite engineering, system engineering, chemistry, radiation protection, maintenance, nuclear fuels services, fire protection, emergency preparedness, security, and preoperational and startup testing. While precise hire dates cannot be predicted for all these positions, the staffing plan shows the committed availability of the staff positions in terms of full time equivalents (FTEs) for the four major project phases: Design Review, Construction, Preoperational, and Operational. Resources specified in the Design Review Phase are currently committed to the CPNPP Units 3 and 4 Project. The increment of additional FTEs specified in the Construction Phase will be available no later than the start of construction, expected to commence soon after the Combined License is issued. The increment of additional resources specified in the Preoperational Phase will be available no later than 18 months prior to fuel load. The full-time complement of operating resources indicated in the Operational Phase will be available after all preoperational testing and initial loading of fuel is complete and the units are ready for full power operation.

See the response to RAI No. 2836 (CP RAI #68) Question 13.01.01-3 for additional information.

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.: 2837 (CP RAI #69)

SRP SECTION: 13.01.02-13.01.03 - Operating Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.02-13.01.03-2

Standard Review Plan Section 13.1.2 – 13.1.3, "Operating Organization," section I.2.C requests the applicant provide the functions, responsibilities, and authorities of the following plant positions or their equivalents:

vii. technical supervisors
viii. radiation protection supervisors
ix. instrumentation and controls maintenance supervisors
x. equipment maintenance supervisors

FSAR section 13.1 does not appear to include the functions, responsibilities, and authorities for those positions.

Please identify the location of this information in the Comanche Peak application, or justify its exclusion.

ANSWER:

Chapter 13 has been revised to add descriptions of the functions, responsibilities, and authorities of the identified plant positions.

The staffing plan in Table 13.1-201 lists CPNPP 3 and 4 positions including radiation protection supervisors, instrumentation and controls maintenance supervisors, mechanical and electrical maintenance supervisors with cross-reference to ANSI/ANS-3.1-1993 nuclear functional positions. The position of technical supervisors is added to Table 13.1-201 as System Engineering Supervisors within the System Engineering nuclear function category.

<u>Impact on R-COLA</u>

See attached marked-up FSAR Draft Revision 1, page 13.1-2, 5, 10, 11 and 18.

Impact on S-COLA

None.

Impact on DCD

None.

- The CPNPP Units 3 and 4 Site organization, under the Site Vice President.
- The Oversight and Regulatory Affairs organization, under the Director, Oversight and Regulatory Affairs.
- The Fuel Management organization, under the President, STARS FUELCO.

The major design and operational support responsibilities are design and construction activities, pre-operational activities, and technical support for operation. Design, construction and pre-operational activities are addressed in Appendix 13AA.

13.1.1.1.1 Technical Support for Operations

Technical services and backup support for nuclear operations are furnished by the Nuclear Engineering and Support organization, including personnel who are competent in technical matters related to plant safety and other engineering and scientific support areas. In the event that nuclear operations require assistance with specific problems, the services of qualified individuals, including outside contractual assistance, are engaged as appropriate. The special capabilities that are available include nuclear, mechanical, structural, electrical, thermal-hydraulic, materials and instrumentation and control (I&C) engineering, as well as plant chemistry, health physics, operations support, maintenance support, quality assurance (QA), training, safety review, fire protection, metallurgy, fueling and refueling support, and emergency coordination support. Technical services and backup support for the operating organization will be available before the preoperational test and startup program begins and continue throughout the life of the plant. Technical supervisors are responsible for management of the technical support group functions performed by the System Engineering group. RCOL_13.01.02-13.01.03-2

13.1.1.2 Organizational Arrangement

CP COL 13.1(1) Replace the content of DCD Subsection 13.1.1.2 with the following.

CP COL 13.1(3) Responsible positions in the Nuclear Generation organization are described below. Certain executive and management positions may have deputies assigned. Deputies may act with the full authority of the position to which they are assigned. The CPNPP Units 3 and 4 Nuclear Generation Organization is shown in Figure 13.1-202.

- Executive Vice President and Chief Nuclear Officer - The Executive Vice President and Chief Nuclear Officer, reports directly to the Chief Operating Officer, Luminant Power, and is responsible for directing the reliable operation and maintenance of CPNPP; providing the QA Program and associated evaluation services applicable to nuclear activities, providing engineering services, technical and administrative services, nuclear fuel services, and licensing services. The Executive Vice President and Chief the design control program, assuring that design outputs are consistent with the design basis of the plant, and providing engineering specialists.

- Director, NuBuild Project – The Director, NuBuild Project, reports directly to the Vice President, Nuclear Engineering and Support, and is responsible for establishing and managing the NSSS and A/E contracts, and also for the new nuclear plant licensing, engineering, procurement, construction, operational development, and QAPD implementation activities.
- Manager, NuBuild Quality Assurance – The Manager, NuBuild Quality Assurance, reports directly to the Vice President, Nuclear Engineering and Support, and is responsible for developing and maintaining the NuBuild QA Program, evaluating compliance with the QA program, and managing the QA organization resources responsible for independently planning and performing activities to verify effective implementation of the QA Program, including but not limited to new nuclear plant activities in engineering, licensing, document control, corrective action program, and procurement. The Manager NuBuild Quality Assurance is responsible for NuBuild QA activities until QA responsibilities are transitioned to the operating organization under the direction of the Director, Oversight and Regulatory Affairs. This transition will occur after receipt of the COL and prior to 30 days before initial fuel load.
- Systems Engineering Supervisors - The Systems Engineering Supervisors report directly to the Director, Site Engineering. The Systems Engineering Supervisors provide oversight to the systems engineers, including providing technical direction to the operating organization and operating support organizations, maintain training and qualification requirements of system engineers, providing technical support for plant surveillance testing and maintaining design configuration control of plant SSCs. RCOL_13.01.02-13.01.03-2

13.1.1.2.3 Oversight and Regulatory Affairs Organization

- Director, Oversight and Regulatory Affairs - The Director, Oversight and Regulatory Affairs, reports directly to the Executive Vice President and Chief Nuclear Officer and is responsible for providing assistance, as required, (including technical interface between Nuclear Generation departments) to assure consistency and compliance with CPNPP licensing commitments, providing liaison with government regulatory agencies, controlling correspondence with regulatory agencies, providing for employee interviews and resolution of concerns through the SAFETEAM process, obtaining, controlling, amending, and renewing licenses and licensing documents needed to safely operate and maintain CPNPP, and implementing the appropriate portions of Nuclear Policy Statements. The Director, Oversight and Regulatory Affairs is also responsible for the definition, direction, maintenance, and measurement of the effectiveness of the QA Program for Nuclear Generation and assures that QA Program requirements are met by conducting evaluations that measure compliance to established requirements, the results of which are reported to the responsible organization and to higher Luminant Power management. The Director, Oversight and Regulatory Affairs is also responsible for the independent licensed operators. Fire brigade members for a shift are designated in accordance with established procedures at the beginning of the shift.

13.1.2.2 Maintenance Department

- Director, Maintenance - The Director, Maintenance, reports directly to the Plant Manager and is responsible for maintenance activities associated with mechanical and electrical equipment, instrumentation, and controls, and for implementing the preventive maintenance program. The Director, Maintenance, ensures that maintenance personnel are trained and qualified and that maintenance activities during routine operation and refueling outages, and maintenance activities associated with the power ascension test program, are conducted in accordance with approved procedures and instructions, regulatory requirements, and applicable policies and directives. The Director, Maintenance, is responsible for developing and maintaining procedures and instructions as described in Subsection 13.5.

- Scheduled Maintenance and Repair Teams - The Scheduled Maintenance and Repair Teams report directly to the Director, Maintenance. These teams are part of a multi-discipline, system-oriented management program established to provide ownership and accountability within the maintenance organization. The Maintenance Team Managers are responsible for the maintenance of electrical and mechanical plant systems and their instrumentation and control systems. They ensure that the electricians, mechanics, and I&C technicians are trained and that safety-related activities are conducted in accordance with applicable procedures, instructions, policies, and regulations. They are responsible for managing their respective areas/systems through the Maintenance Team Supervisors who direct the day-to-day activities of their personnel.
- Maintenance Plant Support Manager - The Maintenance Plant Support Manager reports directly to the Director, Maintenance, and is responsible for providing technical, administrative, and field support for the Maintenance Department.
- PROMPT Team - The PROMPT Team reports directly to the Maintenance Plant Support Manager. Specific duties and responsibilities include, but are not limited to, ensuring PROMPT Team activities are performed in accordance with the applicable site procedures. The PROMPT Team is also responsible for providing immediate response to plant emergent maintenance items.
- Maintenance Team Supervisors - The Maintenance Team Supervisors report directly to the Maintenance Team Managers, and are responsible for directing the day-to-day activities of the electricians, mechanics and I&C technicians for the maintenance of electrical and mechanical plant systems and their instrumentation and control systems. RCOL_13.01.02-13.01.03-2

13.1.2.3 Radiation Protection and Safety Services

- Manager, Radiation and Industrial Safety - The Manager, Radiation and Industrial Safety reports directly to the Plant Manager and is responsible for the supervision of the Radiation Protection Manager and Supervisors, for the transportation of radioactive material, for the CPNPP Units 3 and 4 Radiation Protection program (see Subsection 12.5) and for implementation of the station policy of maintaining operational radiation exposures as low as reasonably achievable (ALARA). The Manager, Radiation and Industrial Safety ensures that personnel are trained and that radiation protection activities are conducted in accordance with applicable procedures, instructions, policies, and regulations. The Manager, Radiation and Industrial Safety is also responsible for industrial safety and environmental services.

- Radiation Protection Supervisors - The Radiation Protection Supervisors report to the Manager, Radiation and Industrial Safety and are responsible for the Radiation Protection support programs, including Dosimetry, ALARA, Rad Waste, Respiratory Protection, fixed and portable radiological instrumentation, and supervision of radiation protection and monitoring and control activities. RCOL_13.01.02-13.01.03-2

13.1.2.4 Plant Support

- Manager, Plant Support Nuclear - The Manager, Plant Support Nuclear, reports directly to the Site Vice President and is responsible for station security and emergency planning. The Manager, Plant Support Nuclear is also responsible for maintaining the CPNPP Units 3 and 4 work control program, scheduling on-line work and tests, and administering the risk assessment process.

- Manager, Work Control/Outages - The Manager, Work Control/Outages reports directly to the Plant Manager and is responsible for outage management, preparation and execution of planned outages, scheduling outage activities, ensuring the implementation of the risk assessment process on outage activities, and incorporation of outage lessons learned.

- Security Manager - The Security Manager reports directly to the Manager, Plant Support Nuclear, and is responsible for the overall development and implementation of the security program at CPNPP Units 3 and 4 as outlined in the Security Plan.

- Emergency Planning Manager - The Emergency Planning Manager reports directly to the Manager, Plant Support Nuclear, and is responsible for the development of the Emergency Plan and procedures, maintenance of emergency response facilities and equipment, and training of the emergency response organization. The Emergency Planning Manager is also responsible for interfacing with local, state, and federal officials to ensure integrated onsite and off-site plans.

Table 13.1-201 (Sheet 4 of 7)

Staffing Plan for CPNPP Units 3 and 4 [1]

			Estimated Numbers of Full Time Equivalents			
Nuclear Function	**Function Position (ANS-3.1-1993 section)**	**CPNPP Units 3 and 4 Position**	**Design Review Phase**	**Construction Phase**	**Preoperational Phase**	**Operational Phase**
Operations	Manager (4.2.2)	Director, Operations		1	1	1
	Functional Manager (4.3.8)	Shift Operations Manager			1	2
	Functional Manager (4.4.1)	Shift Manager [2]			10	10
	Supervisor (4.4.2)	Unit Supervisor [2]			10	10
	Supervisor (4.6.2)	Shift Technical Advisor [2]			5	5
	Licensed Operator (4.5.1)	Senior Reactor Operator [2]			10	10
		Reactor Operator [2]			20	20
	Non-Licensed Operator (4.5.2)	Nuclear Equipment Operator [2]			60	40
Offsite Engineering	Manager (4.2.4)	Director, Engineering Support	0.5	1	1	1
	Manager (4.2.4)	Technical Manager	1	3	3	3
Onsite Engineering	Manager (4.2.4)	Director, Site Engineering	1	1	1	1
	Manager (4.2.4)	Technical Manager	2	3	3	3
System Engineering	Functional Mgr. (4.3.9)	Director, System Engineering	0.5	1	1	1
	Engineering Support (4.4.10)	System Engineering Supervisor	1	1	4	4
	System Engineer (4.6.1)	System Engineer	1	4	24	24
Chemistry		Chemistry Manager		1	1	1
	Supervisor (4.4.6)	Chemistry Supervisor		1	5	5
	Technician (4.5.3.1)	Chemistry Technician [2]		2	10	10

RCOL_13.01.02-3
RCOL_13.01.03-2

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.: 2837 (CP RAI #69)

SRP SECTION: 13.01.02-13.01.03 - Operating Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.02-13.01.03-3

Standard Review Plan Section 13.1.2 – 13.1.3, "Operating Organization," section I.2.E states that applicant provide the extent and nature of the participation of the plant operating and technical staff in the initial test program. FSAR section 13.1 does not appear to include the extent and nature of the participation of the plant operating and technical staff in the initial test program.

Please identify the location of this information in the Comanche Peak application, or justify its exclusion.

ANSWER:

During the preoperational and startup testing phases, functional managers in charge of preoperational and startup testing are assisted by station operating and technical organizations including Plant Operations, Plant Maintenance, and Engineering. These assisting organizations provide support in developing test procedures, conducting the test program, and reviewing test results. These relationships and functions are pointed out and described in Chapters 13 and 14 as detailed below. The purpose of implementing early involvement by station operating and technical organization staff is to ensure that they participate substantially in the initial test program to accumulate valuable operating experience, such that they are well prepared to assume their permanent duties when the units are operational.

Reference to the technical services and backup support functions to the preoperational phase are contained in Subsection 13.1.1.1.1. Staffing of all nuclear functions for the Preoperational Phase of the project, including specific resources for the operating and technical staff, are provided in Table 13.1-201. Availability of implemented operational programs, including those that are required to support the preoperational test program, is specified in Table 13.4-201. Reference to preparation of plant procedures by the plant operating and technical staff during the preoperational phase, is provided in Subsection 13.5.1.2. Reference to the incremental turnover of plant systems to the plant operations staff after the systems have been completely constructed and preoperationally tested, is provided in Section 13AA.1. Reference to the role of operations and technical staff in supporting the preoperational test program and reviewing test results is provided in Section 13AA.2. These references provided in

Chapter 13 indicate ongoing involvement of the plant operating and technical organizations over the entire duration of the initial test program.

Additionally, a number of references regarding operating and technical staff support are made in FSAR Chapter 14 and related Technical Report MUAP-08009, Revision 0, "Test Program Description," starting with general statements in FSAR Section 14.2 and continuing with more specific descriptions in MUAP-08009, that underscore the involvement of the plant operating and technical staff in the initial test program. Appendix 14AA was removed from the FSAR by Update Tracking Report Revision 4 (ML092520137) and replaced with a reference to MUAP-08009. MUAP-08009 Section 3.3 makes a commitment of plant staff to provide operator support during the initial test program and Section 3.4 describes the Joint Test Group that is responsible for reviewing and overseeing all preoperational test activities, of which Operations is a key member. Similarly, MUAP-08009 Section 3.5 describes the Test Review Group, a subcommittee of the Station Operations Review Committee, which is established during the preoperational phase and is charged with review and approval of initial test procedures, procedure revisions, and test results. MUAP-08009 Section 5.2 describes the process of turnover of plant features from the preoperational test group to the plant operations group, a process that takes place over the course of the initial testing period as systems become available for operation and structures become available for occupation. MUAP-08009 Section 8.2 describes the review and approval of initial test procedures, naming Operations, Maintenance, and other plant organizations as key to that review and approval process.

Reference

Technical Report MUAP-08009, Revision 0, "Test Program Description," MHI Ref: UAP-HF-09199, September 30, 2008 (ML082900187)

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.: 2837 (CP RAI #69)

SRP SECTION: 13.01.02-13.01.03 - Operating Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.02-13.01.03-4

Standard Review Plan Section 13.1.2 - 13.13, "Operating Organization," section I.2.F asks the applicant that if the station contains, or there are plans that it contain, power generating facilities other than those specified in the application, including nonnuclear units, interfaces with the organizations operating the other facilities and to describe any proposed sharing of personnel between the units, a description of their duties, and the proportion of their time that they routinely be assigned to nonnuclear units. FSAR section 13.1 does not appear to include these plans.

Please identify the location of this information in the Comanche Peak application, or justify its exclusion.

ANSWER:

There are no non-nuclear units existing or planned for the Comanche Peak site. Luminant does plan to share resources between the proposed CPNPP Units 3 and 4 and the existing CPNPP Units 1 and 2 at the Comanche Peak site. The plans for resource sharing are not yet matured, but will be provided to the NRC 18 months prior to Unit 3 fuel load. The plan will include sharing of personnel between the units, a description of their duties, and the proportion of their time that they may routinely be assigned between the units.

<u>Impact on R-COLA</u>

None.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

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.: 2837 (CP RAI #69)

SRP SECTION: 13.01.02-13.01.03 - Operating Organization

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.01.02-13.01.03-5

FSAR Section 13.1.2.1, "Operations Department" states that the Shift Operations Manager is the position designated to meet ANSI N18.1-1971 qualification requirements for Operations Manager. FSAR Section 13.1.2, "Operating Organization" states that the CPNPP operating organization will meet the guidelines of Regulatory Guide (RG) 1.8, "Qualification and Training of Personnel for Nuclear Power Plants" for its operating organization. The current revision of RG 1.8 endorses ANSI / ANS 3.1-1993.

Please explain the reason for this disparity.

ANSWER:

As stated in Subsection 13.1.2, general education and experience requirements for the identified positions or classes of positions are in accordance with ANSI/ANS 3.1-1993, as endorsed and amended by RG 1.8.

Table 13.1-201 identifies the Shift Operations Manager position as corresponding to the function position "Functional Manager" identified in ANSI / ANS 3.1-1993 Section 4.3.8. The reference to ANSI N18.1-1971 contained in Subsection 13.1.2.1 has been changed accordingly to ANSI/ANS 3.1-1993.

<u>Impact on R-COLA</u>

See attached marked-up FSAR Draft Revision 1 page 13.1-8.

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

- Director, Operations - The Director, Operations reports directly to the Plant Manager and is responsible for operations of CPNPP Units 3 and 4; management and training of Operations Department personnel; coordinating the generation of power and changes in operating modes; and participating in power ascension test program and refueling efforts. The Director, Operations provides technical assistance for the development and maintenance of Operations Department procedures to ensure CPNPP Units 3 and 4 are operated as prescribed. The Director, Operations is also responsible for the operation of the radioactive waste handling systems and for the processing and packaging of radioactive waste. Reporting directly to the Director, Operations, are the Shift Operations Manager, the Operations Support Manager, and the Chemistry Manager.

- Shift Operations Manager - The Shift Operations Manager reports directly to the Director, Operations, and is responsible for post-trip reviews, for refueling support, and for reactor operator training support. The Shift Operations Manager directs the Shift Managers and is responsible for ensuring that shift operations personnel are trained and qualified (see Section 13.2). The Shift Operations Manager is the position designated to meet ~~ANSI N18.1-1971 (Reference 13.1-202) qualification requirements for "Operations Manager"~~ANSI/ANS 3.1-1993 (Reference Table 13.1-201) qualification requirements for "Operations" in section 4.3, Middle Manager Level, and is required to maintain a senior reactor operator (SRO) License. RCOL_13.01.02-13.01.03-5

- Shift Managers - The Shift Managers report directly to the Shift Operations Manager, and are members of management responsible for the operation of the CPNPP Units 3 and 4. The Shift Managers are responsible for supervising the evolutions conducted during their shift and ensuring that they are conducted in accordance with the operating license, station procedures, and applicable directives and policies. The Shift Managers are responsible for supervising shift operations personnel and for conducting on-shift training. During periods when senior management personnel are not on site, the Shift Manager assumes responsibility for all station activities. Each Shift Manager is required to maintain a SRO License.

- Unit Supervisors - The Unit Supervisors report directly to the Shift Managers, and are members of management who assist the Shift Managers in discharging their responsibilities for supervision of the CPNPP Units 3 and 4. The Unit Supervisors may assume the duties of the Shift Managers in their absence. Each Unit Supervisor is required to maintain a SRO License.

- Reactor Operators - The Reactor Operators report directly to the Shift Manager or Unit Supervisor, and are responsible for routine evolutions on their assigned unit and for monitoring the status of that unit. Each Reactor Operator is required to maintain a reactor operator (RO) License.

- Nuclear Equipment Operators - Nuclear Equipment Operators work under the direction of a Shift Manager, Unit Supervisor, or Radwaste Supervisor. The Nuclear Equipment Operator responsibilities include operating

Attachment 5

Response to Request for Additional Information No. 3592 (CP RAI #71)

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.: 3592 (CP RAI #71)

SRP SECTION: 13.04 - Operational Programs

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.04-1

10 CFR 20.1406 requires licensees to minimize contamination of the facility and the environment. Regulatory Guide 4.21, Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning," (June 2008) notes that a conceptual site model and ground water monitoring programs are part of a leakage detection and minimization program. NEI Template 08-08 (Draft) "Generic FSAR Template Guidance for Life Cycle Minimization of Contamination", a proposed acceptable method of demonstrating compliance with 10 CFR 20.1406, notes that applicants should develop the appropriate site procedures and implement these procedures and programs consistent with applicant's FSAR section 13.4 (prior to initial fuel load as referenced in Radiation Protection Milestone 3). However, COL FSAR Section 13.4 does not contain any milestones for the development of a ground water monitoring program.

Please revise and update COL FSAR Section 13.4 to describe the ground water monitoring implementation milestone, or provide an alternate approach and the associated justification.

ANSWER:

Table 13.4-201 Item 9, has been revised to include a ground water monitoring program implementation milestone of "prior to fuel load."

<u>Impact on R-COLA</u>

See attached mark-up FSAR Draft Revision 1, page 13.4-5

<u>Impact on S-COLA</u>

None.

<u>Impact on DCD</u>

None.

Table 13.4-201 (Sheet 4 of 7)

Operational Programs Required by NRC Regulation and Program Implementation

Item	Program Title	Program Source (Required By)	FSAR (SRP) Section	Implementation	
				Milestone	Requirement
	• Ground Water Monitoring Program	10 CFR 20.1406	11.5	Prior to fuel load	License Condition
10.	Radiation Protection Program	10 CFR 20.1101	12.5	Prior to initial receipt of by-product, source, or special nuclear materials (excluding Exempt Qualities as described in 10 CFR 30.18) for those elements of the Radiation Protection (RP) Program necessary to support such receipt Prior to fuel receipt for those elements of the RP Program necessary to support receipt and storage of fuel on-site Prior to fuel load for those elements of the RP Program necessary to support fuel load and plant operation Prior to first shipment of radioactive waste for those elements of the RP Program necessary to support shipment of radioactive waste	License Condition
11.	Non licensed Plant Staff Training Program	10 CFR 50.120 10 CFR 52.78	13.2.1	18 months prior to scheduled fuel load	10 CFR 50.120(b)

RCOL_13.04-1

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.: 3592 (CP RAI #71)

SRP SECTION: 13.04 - Operational Programs

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.04-2

DCD FSAR Tier 2 Section 5.4.2.2 notes the requirement for a Primary-to-Secondary Leakage program in accordance with the criterion of NEI 97-06 "Steam Generator Program Guidelines". COL FSAR Section 13.4, Table 13.4-201 "Operational Programs Required by NRC and Program Implementation", Items 1 "Inservice Inspection Program", and 2 "Inservice Testing Program" do not reference this section of the FSAR, nor do they reference 10CFR 50.55a.b(2)(iii) "Steam Generator Tubing". The implementation milestones listed for these two items do not appear to be consistent with the monitoring criteria noted in Technical Specifications 3.4.13.2.

Please revise and update COL FSAR Section 13.4 Table 13.4-201 to reflect the FSAR and 10 CFR 55a sections that drives the Primary-to-Secondary Leakage monitoring program requirements, or provide an alternate approach and the associated justification.

ANSWER:

Table 13.4-201, Items 1 and 2, have been revised to reference the FSAR and 10 CFR 55a subsections that drive the Primary-to-Secondary Leakage monitoring program requirements. In addition, implementation milestones are provided consistent with the monitoring criteria in SR 3.4.13.2 of the Technical Specifications.

Impact on R-COLA

See attached mark-up FSAR Draft Revision 1 page 13.4-2.

Impact on S-COLA

None.

Impact on DCD

None.

STD COL 13.4 (1)

Table 13.4-201 (Sheet 1 of 7)

Operational Programs Required by NRC Regulation and Program Implementation

Item	Program Title	Program Source (Required By)	FSAR (SRP) Section	Implementation		
				Milestone	Requirement	
1.	Inservice Inspection Program	10 CFR 50.55a(g)	5.2.4 6.1 6.6	Prior to Commercial service	10 CFR 50.55a(g) ASME Section XI IWA 2430(b)	
	• Primary-to-Secondary Leakage Monitoring Program	10 CFR 50.55a(b)(2)(iii)	5.4.2.2	After steam generator on-line on nuclear heat	License Condition	RCOL_13.04-2
	• Highly Radioactive Fluid Systems Outside Containment Monitoring Program	10 CFR 50.34.f(2)(xxvi)	Part 4 Technical Specification Subsection 5.5.2	After generator on-line on nuclear heat	License Condition	RCOL_13.04-3
2.	Inservice Testing Program	10 CFR 50.55a(f) 10 CFR 50, Appendix A	3.9.6 5.2.4	After generator on-line on nuclear heat	10 CFR 50.55a(f) ASME OM Code	
	• Primary-to-Secondary Leakage Monitoring Program	10 CFR 50.55a(b)(2)(iii)	5.4.2.2	After steam generator on-line nuclear heat	License Condition	RCOL_13.04-2
	• Highly Radioactive Fluid Systems Outside Containment Monitoring Program	10 CFR 50.34.f(2)(xxvi)	Part 4 Technical Specification Subsection 5.5.2	After generator on-line on nuclear heat	License Condition	RCOL_13.04-3

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.: 3592 (CP RAI #71)

SRP SECTION: 13.04 - Operational Programs

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 9/20/2009

QUESTION NO.: 13.04-3

10 CFR 50.34.f(2)(xxvi) [NUREG- 0737 III.D.1.1] requires leakage control and detection for systems outside containment that might contain highly radioactive fluids, and requires applicants to submit a leakage control program, including an initial test program and a schedule for retesting systems. DCD FSAR Tier 2 Chapter 16 (Technical Specifications), subsection 5.5.2, notes the requirement for a leakage minimization program for systems outside containment that might contain highly radioactive fluids.

1. COL FSAR Section 13.4, Table 13.4-201 "Operational Programs Required by NRC and Program Implementation", Items 1 "Inservice Inspection Program", and 2 "Inservice Testing Program" do not reference this section of the FSAR, nor do they reference 10 CFR 50.34.f(2)(xxvi).
2. Table 13.4-201 also includes Item 6, "Preservice Testing Program", which does not appear to list either the FSAR section or the "Program Source", consistent with the initial test requirements stated in 10 CFR 50.34.f(2)(xxvi) and NUREG- 0737 III.D.1.1.

Please revise and update COL FSAR Section 13.4 Table 13.4-201 to reference 10 CFR 50.34.f(2)(xxvi) and the FSAR sections that describe the Highly Radioactive Fluid Systems Outside Containment monitoring program requirements, or provide an alternate approach and the associated justification.

ANSWER:

Table 13.4-201, Items 1, 2 and 6 have been revised to reference 10 CFR 50.34.f(2)(xxvi) and the FSAR subsections that describe the Highly Radioactive Fluid Systems Outside Containment monitoring program requirements.

Impact on R-COLA

See attached mark-up FSAR Draft Revision 1 pages 13.4-2 and 13.4-3.

Impact on S-COLA

None.

Impact on DCD

None.

STD COL 13.4 (1)

Table 13.4-201 (Sheet 1 of 7)

Operational Programs Required by NRC Regulation and Program Implementation

Item	Program Title	Program Source (Required By)	FSAR (SRP) Section	Implementation Milestone	Implementation Requirement	
1.	Inservice Inspection Program	10 CFR 50.55a(g)	5.2.4 6.1 6.6	Prior to Commercial service	10 CFR 50.55a(g) ASME Section XI IWA 2430(b)	
	• Primary-to-Secondary Leakage Monitoring Program	10 CFR 50.55a(b)(2)(iii)	5.4.2.2	After steam generator on-line on nuclear heat	License Condition	RCOL_13.04-2
	• Highly Radioactive Fluid Systems Outside Containment Monitoring Program	10 CFR 50.34.f(2)(xxvi)	Part 4 Technical Specification Subsection 5.5.2	After generator on-line on nuclear heat	License Condition	RCOL_13.04-3
2.	Inservice Testing Program	10 CFR 50.55a(f) 10 CFR 50, Appendix A	3.9.6 5.2.4	After generator on-line on nuclear heat	10 CFR 50.55a(f) ASME OM Code	
	• Primary-to-Secondary Leakage Monitoring Program	10 CFR 50.55a(b)(2)(iii)	5.4.2.2	After steam generator on-line nuclear heat	License Condition	RCOL_13.04-2
	• Highly Radioactive Fluid Systems Outside Containment Monitoring Program	10 CFR 50.34.f(2)(xxvi)	Part 4 Technical Specification Subsection 5.5.2	After generator on-line on nuclear heat	License Condition	RCOL_13.04-3

Table 13.4-201 (Sheet 2 of 7)

Operational Programs Required by NRC Regulation and Program Implementation

Item	Program Title	Program Source (Required By)	FSAR (SRP) Section	Implementation	
				Milestone	Requirement
3.	Environmental Qualification Program	10 CFR 50.49(a)	3.11	Prior to Initial fuel load	License Condition
4.	Preservice Inspection Program	10 CFR 50.55a(g)	5.2.4 6.6	Completion prior to initial plant start-up	10 CFR 50.55a(g) ASME Code Section XI IWB-2200(a)
5.	Reactor Vessel Material Surveillance Program	10 CFR 50.60 10 CFR 50, Appendix H	5.3.1	Prior to initial criticality	License Condition
6.	Preservice Testing Program	10 CFR 50.55a(f) 10 CFR 50.34.f(2)(xxvi)	3.9.6 5.2.4 Part 4 Technical Specification Subsection 5.5.2	Prior to initial fuel load After generator on-line on nuclear heat	License Condition License Condition
7.	Containment Leakage Rate Testing Program	10 CFR 50.54(o) 10 CFR 50, Appendix A (GDC 32) 10 CFR 50, Appendix J 10 CFR 52.47(a)(1)	6.2.6	Prior to Initial fuel load	10 CFR 50, Appendix J Option A-Section III Option B-Section III.A

RCOL_13.04-3