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Ref. # 10 CFR 52

November 11, 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. 2765, 2954, 3074, AND 3558

Dear Sir:

Luminant Generation Company LLC (Luminant) herein submits responses to Requests for Additional Information No. 2765, 2954, 3074, and 3558 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.

Attachment 5 provides the ARCON96 files requested by RAI No. 3558. These files are in their native format as required by the NRC so they do not meet the requirements of "Guidance for Electronic Submissions to the NRC," Revision 5.

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

There are no commitments in this letter.

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

Executed on November 11, 2009.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

D090
NRO

Attachments
1. Response to Request for Additional Information No. 2765 (CP RAI #73)
2. Response to Request for Additional Information No. 2954 (CP RAI #75)
3. Response to Request for Additional Information No. 3074 (CP RAI #74)
4. Response to Request for Additional Information No. 3558 (CP RAI #72)
5. Electronic Attachments (on CD)

cc: Stephen Monarque w/all Attachments (on CD)

Electronic Distribution w/Attachments 1-4

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Attachment 1

Response to Request for Additional Information No. 2765 (CP RAI #73)

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-1

Luminant is requested to provide a response to the following information so the NRC staff can verify, using NUREG-0800 Standard Review Plan (SRP) 3.11, that Luminant fully described the Environmental Qualification Program and its implementation in conformance with the relevant requirements of 10 CFR 50.49; 10 CFR Part 50, Appendix A, General Design Criteria 1, 2, 4, and 23; and 10 CFR Part 50, Appendix B, Quality Assurance Criteria III, XI, and XVII.

Comanche Peak FSAR Section 3.11, "Environmental Qualification of Mechanical and Electrical Equipment," incorporates by reference the provisions in the US-APWR Design Control Document (DCD) for the design process for the environmental qualification of mechanical equipment at Comanche Peak Units 3 and 4. Describe the implementation of the design process specified in the US-APWR DCD. For example, discuss the application of ASME Standard QME-1-2007, "Qualification of Active Mechanical Equipment used in Nuclear Power Plants," specified in MHI Technical Report MUAP-08015, "US-APWR Equipment Environmental Qualification Program," referenced in the US-APWR DCD. Also, discuss the availability of design and procurement specifications for NRC on-site review to demonstrate the implementation of the US-APWR environmental qualification (EQ) process for mechanical equipment to be used at Comanche Peak.

ANSWER:

The implementation of the US-APWR design process for the environmental qualification of mechanical equipment, including the application of ASME Standard QME-1, is described in MUAP-08015 Revision 1, "US-APWR Equipment Qualification Program (EQP)" (MHI letter UAP-HF-09515, dated November 9, 2009).

MUAP-08015 presents an implementation schedule for a licensee's EQP, which is applicable to CPNPP Units 3 and 4. The design and procurement specifications, including the environmental qualification

requirements for mechanical equipment, will be developed and available on-site during the detailed design and procurement stages prior to equipment procurement.

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-2

Comanche Peak FSAR Section 3.11 incorporates by reference the provisions in the US-APWR DCD in describing the operational program for environmental qualification (EQ) of mechanical equipment at Comanche Peak. Through a combination of the US-APWR DCD and Comanche Peak FSAR, fully describe the operational program for EQ of mechanical equipment per the guidance in Commission paper SECY-05-0197 and Regulatory Guide 1.206. For example, the COL applicant is requested to provide or reference the following information, or indicate the status of and schedule for its availability, related to the EQ operational program for mechanical equipment for the Comanche Peak, Units 3 and 4, including

(a) the process to determine the suitability of environmentally sensitive mechanical equipment needed for safety-related functions and to verify that the design of such materials, parts, and equipment is adequate, such as

(i) identifying safety-related mechanical equipment located in harsh environmental areas,

(ii) identifying nonmetallic subcomponents of such equipment,

(iii) identifying environmental conditions and process parameters for which this equipment must be qualified,

(iv) identifying nonmetallic material capabilities, and

(v) evaluating the environmental effects on the nonmetallic components of the equipment; and

(b) documentation for the successful completion of qualification tests and/or analysis, and qualification status for each type of equipment.

The NRC staff will use the requested information to perform its review of the EQ operational program description for mechanical equipment based on the acceptance criteria in SRP Section 3.11.

ANSWER:

Implementation of the equipment qualification program for mechanical and electrical equipment is a license condition as indicated in FSAR Table 13.4-201.

The US-APWR equipment qualification program and its interface with the Operational Equipment Qualification Program (OEQP) is described in MUAP-08015 (R1), "US-APWR Equipment Qualification Program (EQP) (MHI letter UAP-HF-09515, dated November 9, 2009). MUAP-08015 (R1) is an update to original document MUAP-08015 (see the Answer to Question 03.11-1 above).

The environmental parameters to be considered in the design process, such as pressure, temperature, seismic, etc. are identified and specified for the normal, abnormal, and design basis accident conditions in MUAP-08015. The environmentally-qualified mechanical equipment needed for safety and important to safety functions are listed in DCD Table 3D-2 and FSAR Table 3D-201. Operational equipment qualification records addressing safety-related and important to safety equipment including EQ parameters and materials (e.g., non-metallic components) is available for NRC review as shown in the licensee's EQP implementation schedule. MUAP-08015 presents an implementation schedule for a licensee's EQP, which is applicable to CPNPP Units 3 & 4.

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-3

Comanche Peak FSAR Section 3.11 provides plant-specific information in addition to incorporating by reference the US-APWR DCD. Confirm that the provisions in the US-APWR DCD for environmental qualification (EQ) of mechanical equipment will be applied to the plant-specific systems identified in the Comanche Peak FSAR, or describe plant-specific EQ provisions for these systems at Comanche Peak.

ANSWER:

Luminant confirms that the provisions in the US-APWR DCD for environmental qualification of mechanical equipment will be applied to the plant-specific systems identified in the Comanche Peak Units 3 and 4 FSAR. FSAR Subsection 3.11.1.1 has been revised to clarify this.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-2.

Impact on S-COLA

None.

Impact on DCD

None.

3.11.1.1 Equipment Identification

CP COL 3.11(5) Replace the last sentence of the first paragraph in DCD Subsection 3.11.1.1 with the following.

Table 3D-201 identifies CPNPP Units 3 and 4 site-specific electrical and mechanical equipment locations and environmental conditions (both normal and accident) to be addressed in the EQ program. This table lists information on site-specific safety-related or important to safety equipment. The provision in the US-APWR DCD for environmental qualification (EQ) of mechanical equipment will be applied to the plant-specific systems. RCOL2_03.11-3

3.11.1.2 Definition of Environmental Conditions

CP COL 3.11(9) Replace the fourth sentence of the first paragraph in DCD Subsection 3.11.1.2 with the following.

Plant Specific EQ parameters are documented in the corresponding equipment specifications, drawings, procedures, instructions, and qualification packages. ~~Any parameters based on site-specific considerations are identified in the environmental qualification documentation described in Section 3.11.~~ RCOL2_03.11-6

3.11.3 Qualification Test Results

CP COL 3.11(2) Replace the fifth paragraph in DCD Subsection 3.11.3 with the following.

Test results for site-specific electrical and mechanical equipment are maintained with the project records as auditable files. Such records are maintained from the time of initial receipt through the entire period during which the subject equipment remains installed in the plant, is stored for future use, or is held for permit verification. The license holder for CPNPP Units 3 and 4 assumes full responsibility for the EQ program at time of license issuance. The EQ records are maintained for the life of plant to fulfill the records retention requirements delineated in 10 CFR 50.49 (Reference 3.11-2) and in compliance with the QAP described in Chapter 17.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-4

US-APWR DCD Tier 2, Section 3.11 states that the COL Applicant is responsible for assembling and maintaining the EQ document, which summarizes the qualification results for all equipment identified in US-APWR DCD Tier 2, Appendix 3D, "US-APWR Equipment Qualification List - Safety and Important to Safety Electrical and Mechanical Equipment," for the life of the plant. Comanche Peak FSAR Section 3.11 states that CPNPP Units 3 and 4, at time of license issuance, assumes full responsibility for the EQ program, assembles, and maintains the EQ records for the life of the plant to fulfill the records retention requirements delineated in 10 CFR 50.49 and in compliance with the quality assurance program described in Chapter 17. In that 10 CFR 50.49 applies to electrical equipment, discuss the EQ record retention plans for mechanical equipment at Comanche Peak, Units 3 and 4.

ANSWER:

There is no difference in EQ record retention as it pertains to electrical or mechanical SSCs; all records are treated equally. FSAR Section 3.11 has been revised to clarify this.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-1.

Impact on S-COLA

None.

Impact on DCD

None.

3.11 ENVIRONMENTAL QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT

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

CP COL 3.11(3) Replace the last sentence of the fifth paragraph in DCD Section 3.11 with the following.

The CPNPP Units 3 and 4 EQ Program implementation milestones are as follows: | CTS-00606

Activity	Milestone	
Formulate Units 3 and 4 EQ Program	COLA Submittal	CTS-00606
Assist with Reactor Vendor/Architect-Engineer/Constructor EQ Program	Combined License	CTS-00606
Assume EQ Responsibilities for Unit 3	Unit 3 Fuel Load	CTS-00606
Assume EQ Responsibilities for Unit 4	Unit 4 Fuel Load	CTS-00606

CP COL 3.11(1) Replace the first sentence of the sixth paragraph in DCD Section 3.11 with the following.

CPNPP Units 3 and 4, at time of license issuance, assumes full responsibility for the EQ program, assembles, and maintains the electrical and mechanical EQ records for the life of the plant to fulfill the records retention requirements delineated in 10 CFR 50.49 (Reference 3.11-2) and in compliance with the quality assurance program (QAP) described in Chapter 17. | RCOL2_03.11-4

CP COL 3.11(4) Replace the eighth paragraph in DCD Section 3.11 with the following.

This subsection addresses EQ implementation in conjunction with the initial design, procurement, construction, startup and testing up to the point of turnover and initial license issuance. Implementation of the operational EQ program is included in Table 13.4-201. Periodic tests, calibrations, and inspections which verify that the identified equipment remains capable of fulfilling its intended function are described in Reference 3.11-3. The features of the US-APWR Equipment Environmental Qualification Program Technical Report MUAP-08015 (Reference 3.11-3) is included in the CPNPP Units 3 and 4 EQ Program. | RCOL2_03.11-5

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-5

US-APWR DCD Tier 2, Section 3.11 states that the COL Applicant is to describe periodic tests, calibrations, and inspections, to be performed during the life of the plant, which verify the identified equipment remains capable of fulfilling its intended function. The DCD also states that the procedures and results of qualification by tests, analyses, or other methods for the safety-related equipment are documented and maintained as part of the unit's EQ document.

As a replacement for these DCD provisions, Comanche Peak FSAR Section 3.11 states that this subsection addresses EQ implementation in conjunction with the initial design, procurement, construction, startup and testing up to the point of turnover and initial license issuance. The FSAR also states that implementation of the operational EQ program is included in Table 13.4-201. The FSAR specifies that periodic tests, calibrations, and inspections, which verify that the identified equipment remains capable of fulfilling its intended function, are described in a referenced technical report, US-APWR Equipment Environmental Qualification Program, MUAP-08015, by Mitsubishi Heavy Industries (MHI), which was submitted by MHI to NRC for review.

Confirm that the MHI responses to the NRC staff requests for additional information on the US-APWR Equipment Environmental Qualification Program Technical Report, MUAP-08015, and any modifications to the report, will be met as part of the EQ program for Comanche Peak Units 3 and 4.

ANSWER:

Luminant confirms that the MHI responses to the NRC staff requests for additional information on the US-APWR Equipment Environmental Qualification Program Technical Report, MUAP-08015, and any modifications to the report, will be met as part of the EQ program for Comanche Peak Units 3 and 4. FSAR Section 3.11 has been revised to clarify that the features of the latest version of the report will be included.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1, page 3.11-1.

Impact on S-COLA

None.

Impact on DCD

None.

3.11 ENVIRONMENTAL QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT

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

CP COL 3.11(3) Replace the last sentence of the fifth paragraph in DCD Section 3.11 with the following.

The CPNPP Units 3 and 4 EQ Program implementation milestones are as follows: | CTS-00606

Activity	Milestone	
Formulate Units 3 and 4 EQ Program	COLA Submittal	CTS-00606
Assist with Reactor Vendor/Architect-Engineer/Constructor EQ Program	Combined License	CTS-00606
Assume EQ Responsibilities for Unit 3	Unit 3 Fuel Load	CTS-00606
Assume EQ Responsibilities for Unit 4	Unit 4 Fuel Load	CTS-00606

CP COL 3.11(1) Replace the first sentence of the sixth paragraph in DCD Section 3.11 with the following.

CPNPP Units 3 and 4, at time of license issuance, assumes full responsibility for the EQ program, assembles, and maintains the electrical and mechanical EQ records for the life of the plant to fulfill the records retention requirements delineated in 10 CFR 50.49 (Reference 3.11-2) and in compliance with the quality assurance program (QAP) described in Chapter 17. | RCOL2_03.1 1-4

CP COL 3.11(4) Replace the eighth paragraph in DCD Section 3.11 with the following.

This subsection addresses EQ implementation in conjunction with the initial design, procurement, construction, startup and testing up to the point of turnover and initial license issuance. Implementation of the operational EQ program is included in Table 13.4-201. Periodic tests, calibrations, and inspections which verify that the identified equipment remains capable of fulfilling its intended function are described in Reference 3.11-3. The features of the US-APWR Equipment Environmental Qualification Program Technical Report MUAP-08015 (Reference 3.11-3) is included in the CPNPP Units 3 and 4 EQ Program. | RCOL2_03.1 1-5

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-6

US-APWR DCD Tier 2, Subsection 3.11.1.2, "Definition of Environmental Conditions," states that the COL Applicant may revise the environmental parameters indicated in the DCD based on site-specific considerations. Comanche Peak FSAR Subsection 3.11.1.2 of the same title states that any parameters based on site-specific considerations are identified in the EQ documentation described in Section 3.11. Specify any site-specific environmental parameters to be used for the Comanche Peak EQ program that differ from the US-APWR DCD EQ program description.

ANSWER:

Luminant and MHI will identify site-specific environmental conditions (parameters) for CPNPP Units 3 and 4 during the detailed design for the project (see DCD Figure 3.11-1). Parameters based on site-specific considerations are documented in the corresponding equipment specifications, drawings, procedures, instructions, and qualification packages. FSAR Subsection 3.11.1.2 has been revised to clarify this.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1, page 3.11-2.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment

US-APWR DCD Revision 2 Figure 3.11-1

3.11.1.1 Equipment Identification

CP COL 3.11(5) Replace the last sentence of the first paragraph in DCD Subsection 3.11.1.1 with the following.

Table 3D-201 identifies CPNPP Units 3 and 4 site-specific electrical and mechanical equipment locations and environmental conditions (both normal and accident) to be addressed in the EQ program. This table lists information on site-specific safety-related or important to safety equipment. The provision in the US-APWR DCD for environmental qualification (EQ) of mechanical equipment will be applied to the plant-specific systems. RCOL2_03.11-3

3.11.1.2 Definition of Environmental Conditions

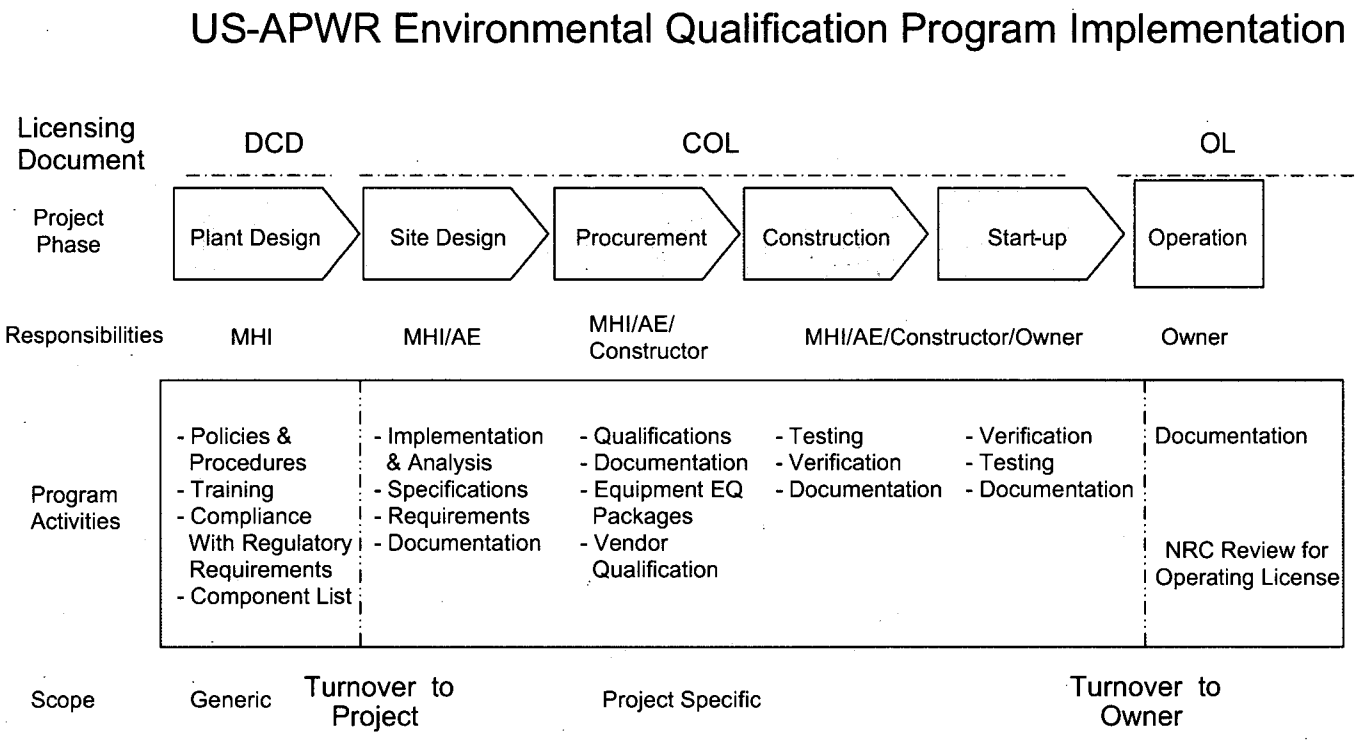
CP COL 3.11(9) Replace the fourth sentence of the first paragraph in DCD Subsection 3.11.1.2 with the following.

Plant Specific EQ parameters are documented in the corresponding equipment specifications, drawings, procedures, instructions, and qualification packages. ~~Any parameters based on site-specific considerations are identified in the environmental qualification documentation described in Section 3.11.~~ RCOL2_03.11-6

3.11.3 Qualification Test Results

CP COL 3.11(2) Replace the fifth paragraph in DCD Subsection 3.11.3 with the following.

Test results for site-specific electrical and mechanical equipment are maintained with the project records as auditable files. Such records are maintained from the time of initial receipt through the entire period during which the subject equipment remains installed in the plant, is stored for future use, or is held for permit verification. The license holder for CPNPP Units 3 and 4 assumes full responsibility for the EQ program at time of license issuance. The EQ records are maintained for the life of plant to fulfill the records retention requirements delineated in 10 CFR 50.49 (Reference 3.11-2) and in compliance with the QAP described in Chapter 17.



DCD – Design Control Document – Generic to all US-APWRS

COL – Combined License – Specific to each plant/site

OL - Operating License– Issued to plant owner/operator

Figure 3.11-1 Project EQ Program Implementation Framework

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-7

US-APWR DCD Tier 2, Section 3.11.3, "Qualification Test Results," specifies that the COL Applicant is to describe how the results of the qualification tests are to be recorded in an auditable file in accordance with requirements of 10 CFR 50.49(j). The DCD also specifies that such a record is maintained for the entire period during which the related equipment remains installed in the plant, stored for future use, or is held for permit verification.

As a replacement for these DCD provisions, Comanche Peak FSAR Section 3.11.3 of the same title states that test results for site-specific electrical and mechanical equipment are maintained with the project records as auditable files. The FSAR states that such records are maintained from the time of initial receipt through the entire period during which the subject equipment remains installed in the plant, is stored for future use, or is held for permit verification. The FSAR indicates that the license holder for CPNPP Units 3 and 4 assumes full responsibility for the EQ program at time of license issuance. Finally, the FSAR specifies that the EQ records are maintained for the life of plant to fulfill the records retention requirements delineated in 10 CFR 50.49 and in compliance with the quality assurance program described in Chapter 17.

In that 10 CFR 50.49 applies to electrical equipment, clarify that the FSAR provisions for EQ record retention applies to all electrical and mechanical equipment within the scope of the EQ program for Comanche Peak, Units 3 and 4, and indicate any differences in record retention for electrical and mechanical equipment.

ANSWER:

MUAP-08015(R1), "US-APWR Equipment Qualification Program (EQP)" (MHI letter UAP-HF-09515, dated November 9, 2009), contains additional information and clarifications on the US-APWR environmental and seismic qualification programs applicable to the construction of CPNPP Units 3 and 4, as well as the Operational Equipment Qualification Program (OEQP). Electrical and mechanical EQ records generated by the project EQP become the basis of the OEQP. Both electrical and

mechanical records of SSCs that are important to safety are retained for the life of the plant. There is no difference in EQ record retention as it pertains to electrical or mechanical SSCs; all records are treated equally.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-1 provided with the response to Question 03.11-4 above.

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-8

US-APWR DCD Tier 2, Section 3.11.4, "Loss of Ventilation," specifies that the COL Applicant is to qualify site-specific electrical and mechanical equipment (including instrumentation and control, certain accident monitoring equipment) using an equivalent qualification process to that delineated for the US-APWR Standard Plant. The DCD states that this includes equipment that is subject to environmental control systems including heat tracing and air conditioning.

As a replacement for these DCD provisions, Comanche Peak FSAR Section 3.11.4 of the same title states that site-specific electrical and mechanical equipment (including instrumentation and control and certain accident monitoring equipment), subject to environmental stress associated with loss of ventilation or other environmental control systems including heat tracing, heating, and air conditioning, is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant.

Describe the "equivalent qualification process" to be used to qualify site-specific electrical and mechanical equipment, subject to environmental stress associated with loss of ventilation or other environmental control systems including heat tracing, heating, and air conditioning, for NRC review in support of the Comanche Peak COL application.

ANSWER:

The phrase "equivalent qualification process" means that the site-specific electrical and mechanical equipment will be qualified following the guidance provided in MUAP-08015(R1), "US-APWR Equipment Qualification Program (EQP)" (MHI letter UAP-HF-09515, dated November 9, 2009)." MUAP-08015 (R1) is an update to original document MUAP-08015 (see the Answer to Question 03.11-1 above).

As noted in the response to US-APWR Design Control Document (DCD) RAI 444-2531, Question 3.11-16 (MHI letter #UAP-HF-09463), the concept of qualification for site-specific equipment has been clarified by rephrasing the first sentence of the second paragraph in DCD Subsection 3.11.4 to state

> The COL Applicant is to qualify site-specific electrical and mechanical equipment (including instrumentation and control, and certain accident monitoring equipment) using a qualification process that is equivalent to that delineated for the US-APWR standard plant, as described in Technical Report MUAP-08015(R1).

FSAR Subsection 3.11.4 has been revised to clarify this. In addition, FSAR Subsections 3.11.5 and 3.11.6 have been revised in the same manner to be consistent with the changes in DCD Subsections 3.11.5 and 3.11.6 addressed in the response to DCD RAI 444-2531, Question 3.11-16.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-3.

Impact on S-COLA

None.

Impact on DCD

None.

3.11.4 Loss of Ventilation

CP COL 3.11(6) Replace the second paragraph in DCD Subsection 3.11.4 with the following.

Site-specific electrical and mechanical equipment (including instrumentation and control and certain accident monitoring equipment), subject to environmental stress associated with loss of ventilation or other environmental control systems including heat tracing, heating, and air conditioning, is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant as described in Technical Report MUAP-08015 (Reference 3.11-3). | RCOL2_03.11-8

3.11.5 Estimated Chemical and Radiation Environment

CP COL 3.11(7) Replace paragraph in DCD, Subsection 3.11.5 with the following.

Chemical and radiation environmental requirements for site-specific electrical and mechanical equipment (including instrumentation and control and certain accident monitoring equipment) are to be included in the Equipment EQ Technical Report (Reference 3.11-3). This equipment is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant as described in Technical Report MUAP-08015 (Reference 3.11-3). | CTS-00639 | RCOL2_03.11-8

3.11.6 Qualification of Mechanical Equipment

CP COL 3.11(8) Replace the second paragraph in DCD, Subsection 3.11.6 with the following.

Site-specific mechanical equipment requirements are to be included in Table 3D-201 by completion of detailed design. This equipment is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant as described in Technical Report MUAP-08015 (Reference 3.11-3). | RCOL2_03.11-8

3.11.7 Combined License Information

CP COL 3.11(1) Replace the content of DCD Subsection 3.11.7 with the following.

3.11(1) *Environmental qualification document assembly and maintenance*

This COL item is addressed in Section 3.11.

CP COL 3.11(2) ***3.11(2)*** *Qualification tests results recorded*

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-9

US-APWR DCD Tier 2, Section 3.11.5, "Estimated Chemical and Radiation Environment," specifies that the COL Applicant is to identify chemical and radiation environmental requirements for site-specific qualification of electrical and mechanical equipment (including instrumentation and control, and certain accident monitoring equipment). The DCD indicates that this equipment is to be qualified using an equivalent qualification process to that delineated for the US-APWR standard plant.

As a replacement for these DCD provisions, Comanche Peak FSAR Section 3.11.5 (as modified in the Updated Tracking Report, Revision 0, dated April 2, 2009) states that chemical and radiation environmental requirements for site-specific electrical and mechanical equipment (including instrumentation and control and certain accident monitoring equipment) are to be included in the Equipment EQ Technical Report (MHI Technical Report "US-APWR Equipment Environmental Qualification Program", MUAP-08015). The FSAR also states that this equipment is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant. Describe the "equivalent qualification process" to be used to qualify the referenced site-specific electrical and mechanical equipment for NRC review in support of the Comanche Peak COL application.

ANSWER:

The phrase "equivalent qualification process" means that the site-specific electrical and mechanical equipment will be qualified following the guidance provided in MUAP-08015(R1), "US-APWR Equipment Qualification Program (EQP)" (MHI letter UAP-HF-09515, dated November 9, 2009), as described in the answer to Question 03.11-8 above. FSAR Subsection 3.11.5 has been revised to clarify that the site-specific qualification process follows the guidance described in Technical Report MUAP-08015.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-3 provided with the response to Question 03.11-8 above.

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-10

US-APWR DCD Tier 2, Section 3.11.6, "Qualification of Mechanical Equipment," specifies that the COL Applicant is to provide the site-specific mechanical equipment requirements, and that this equipment is to be qualified using an equivalent qualification process to that delineated for the US-APWR standard plant.

Comanche Peak FSAR Section 3.11.6 of the same title states that site-specific mechanical equipment requirements are to be included in Table 3D-201 by completion of detailed design. The FSAR also states that this equipment is qualified using an equivalent qualification process to that delineated for the US-APWR standard plant. Describe the "equivalent qualification process" to be used to qualify the mechanical equipment in support for the NRC review of the Comanche Peak COL application.

ANSWER:

The phrase "equivalent qualification process" means that the site-specific electrical and mechanical equipment will be qualified following the guidance provided in MUAP-08015(R1), "US-APWR Equipment Qualification Program (EQP)" (MHI letter UAP-HF-09515, dated November 9, 2009), as described in the answer to Question 03.11-8 above. FSAR Subsection 3.11.6 has been revised to clarify the site-specific qualification process follows the guidance described in Technical Report MUAP-08015.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 3.11-3 provided with the response to Question 03.11-8 above.

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.: 2765 (CP RAI #73)

SRP SECTION: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 03.11-11

Part 10, "Inspections, Tests, Analyses And Acceptance Criteria (ITAAC) And Proposed License Conditions," of the Comanche Peak Units 3 and 4 COL application states that the operational programs (section 2.3) identified in Table 13.4-201, "Operational Programs Required by NRC Regulation and Program Implementation," and their implementation by the milestones indicated in the table is a potential condition to the license. Part 10 of the Comanche Peak COL application does not specify a license condition for implementation of operational programs.

Discuss the plans to develop license conditions for operational program implementation consistent with the guidance in Regulatory Guide 1.206 and Commission paper SECY-05-0197. For example, RG 1.206, Section C.IV.4.3 states that the COL will contain a license condition that requires the licensee to submit to the NRC a schedule, 12 months after issuance of the COL, that supports planning for and conduct of NRC inspections of operational programs. The schedule should be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until either the operational programs in FSAR Table 13.4-201 have been fully implemented or the plant has been placed in commercial service, whichever comes first.

ANSWER:

A proposed license condition to address operational programs, including the Environmental Qualification Program, is provided in Part 10 of the COL application. The appropriate pages from Update Tracking Report, Revision 0 for COLA Part 10 transmitted by TXBN-09053 on October 21, 2009 are attached. The operational environmental qualification program is a subset of the overall environmental qualification program which is fully described in US-APWR DCD Section 3.11 and CPNPP COLA FSAR Section 3.11.

Rather than propose a license condition for the operational program schedule, Luminant commits to submit a schedule to the NRC that supports the planning and conduct of NRC inspections of operational

programs, including the environmental qualification program, no later than 12 months after issuance of the COL or at the start of construction as defined in 10 CFR 50.10a, whichever is later. This is similar to the approach for the ITAAC schedule required in 10 CFR 52.99(a).

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments

Updated Tracking Report, Revision 0 for COLA Part 10, pages 4, 5 and 6.

2.3 Operational Programs

Operational Programs are identified in Table 13.4-201 and their implementation by the milestones indicated in the Table is a potential condition to the license. Some of these programs may be adequately controlled by other methods such as the regulations, the technical specifications or a commitment tracking system and will not need to be addressed in a license condition. A proposed license condition is provided in section 3 below based upon the current information in Chapter 13 of the COLA FSAR. CTS-00841

2.4 Environmental Protection Plan

The Environmental Protection Plan (EPP) and its implementation may also be a potential condition to the license. The EPP has typically been an appendix to the operating license and that precedent may be followed for COLs as well. No plant specific environmental items have been identified which are not adequately controlled by regulations, the appropriate permits, etc. and thus an EPP has not been proposed and is not needed. CTS-00841

2.5 Technical Specifications

Implementation of Technical Specifications prior to fuel load could also constitute a potential condition to the license. The Technical Specifications have typically been an appendix to the operating license and that precedent may be followed for COLs as well.

2.6 Others

The current operating licenses have some typical license conditions in areas such as security, fire protection and others. These current license conditions may or may not apply to COLs.

3. Specific Proposed License Conditions

The ~~only~~ license conditions identified thus far during the COL development and review are ~~is~~: CTS-00841

Proposed License Condition	Source
The plant-specific PTS evaluation of the as-procured reactor vessel material properties will be submitted to the NRC within 12 months following acceptance of the reactor vessel.	Answer to RAI 2353 (CP RAI #8) question 05.03.02-3 as provided in TXNB-09028 dated August 7, 2009. RCOL2_05.03.02-3
The licensee shall implement the programs or portions of programs identified in the table below on or before the associated milestones.	COLA FSAR Table 13.4-201 Items 3, 5, 6, 8, 9, 10, 12, 15, 18, and 19.

Operational Programs to be implemented per License Condition above: CTS-00841

Program Title	Milestone
Environmental Qualification Program	Prior to Initial Fuel Load
Reactor Vessel Material Surveillance Program	Prior to Initial Criticality
Preservice Testing Program	Prior to Initial Fuel Load
Fire Protection Program	Prior to fuel receipt for elements of the Fire Protection Program necessary to support receipt and storage of fuel on-site. Prior to initial fuel load for elements or the Fire Protection Program necessary to support fuel load and plant operation.
Process and Effluent Monitoring and Sampling Program – Radiological Effluent Technical Specifications/Standard Radiological Effluent Controls	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Offsite Dose Calculation Manual	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Radiological Environmental Monitoring Program	Prior to receipt of radioactive material on-site
Process and Effluent Monitoring and Sampling Program – Process Control Program	Prior to receipt of radioactive material on-site
Radiation Protection Program	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

CTS-00841

Program Title	Milestone
	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.
Reactor Operator Training Program	18 months prior to scheduled fuel load.
Security Program – Physical Security Program	Prior to receipt of fuel on site.
Security Program- Safeguards Contingency Program	Prior to receipt of fuel on site.
Security Program – Training and Qualification Program	Prior to receipt of fuel on site.
Motor-Operated Valve Testing	Prior to initial fuel load.
Initial Test Program	Prior to the first construction test for the Construction Test Program. Prior to the first preoperational test for the Preoperational Test Program. Prior to initial fuel loading for the Startup Test Program.
Fitness for Duty Program – Construction Mgt & Oversight personnel	Prior to on site construction of safety or security related SSCs.
Fitness for Duty Program – Construction Workers & first Line Supv.	Prior to on site construction of safety or security related SSCs.
Fitness for Duty Program – Operations Phase Program	Prior to fuel receipt

Attachment 2

Response to Request for Additional Information No. 2954 (CP RAI #75)

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-2

NUREG-0800 Standard Review Plan (SRP) 14.2 Acceptance criterion 3.B.v states in part, "The staff will find that the controls provided for plant modification and repairs, identified as a result of plant testing, are acceptable if the controls ... (3) will ensure a review of any proposed facility modifications by the original design organization or other designated design organizations..."

The NRC staff requests that the applicant revise section 14AA of the Comanche Peak Nuclear Power Plant, Units 3 & 4 COL FSAR to include controls to ensure the review of any proposed facility modifications by the original design organization or other designated design organizations, or justify its exclusion.

ANSWER:

Appendix 14AA was deleted from the FSAR in FSAR Update Tracking Report Revision 4 (TXNB-09039 dated September 2, 2009) (ML092520137) and replaced with a reference to Mitsubishi Heavy Industries, Ltd. Technical Report, "Test Program Description" (MUAP-08009 Revision 0) (ML082900194). Subsequently, Revision 1 to the technical report MUAP-08009 was transmitted to the NRC by MHI letter UAP-HF-09494 dated October 26, 2009. MUAP-08009 Revision 1 is referenced in DCD Revision 2 and is therefore incorporated by reference in the FSAR.

The changes requested by the NRC staff have been provided in Section 9.1 of MHI technical report MUAP-08009 Rev.1 which contains the following:

> All proposed plant modifications and repairs identified as a result of testing are reviewed by the original design organization, [Plant Engineering], [Testing], the [Joint Test Group] and the [Test Review Group]. Impacts to test methods and/or test acceptance criteria, requirements for additional testing or repeat of completed testing, and impacts on test sequences and tests which rely upon the satisfactory completion of completed testing, are identified and incorporated into the affected test procedures.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-3

SRP 14.2 acceptance criterion 3.C.iv states, "The sequential schedule for individual startup tests should establish that test requirements will be completed in accordance with plant technical specification requirements for SSC operability before changing plant modes."

The NRC staff requests that the applicant either revise Section 14.2.11 or 14AA to include a statement that the schedule for individual startup tests will establish that test requirements will be completed in accordance with plant technical specification requirements for structure, system, and component (SSC) operability before changing plant modes or justify the exclusion of this control.

ANSWER:

Luminant will comply fully with all Technical Specification requirements during startup testing, including required conditions for plant operating mode changes.

A paragraph has been added to the end of DCD Subsection 14.2.11 stating that the schedule for individual startup tests establishes that test requirements are completed in accordance with plant Technical Specification requirements for SSC operability before changing plant modes. Luminant has incorporated DCD Section 14.2 by reference with no departures.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

Attachment

US-APWR DCD Rev. 2 page 14.2-23

are included for each activity in the schedule. Activities include the preparation of procedures, testing, and the evaluation of the test results

At least nine months are scheduled for the preoperational testing. A detailed description of initial fuel loading and initial criticality is contained in Subsections 14.2.10.1 and 14.2.10.2. At least three months are scheduled for startup and power ascension testing. A detailed description of low power and power ascension testing is contained in Subsection 14.2.10.3. Test procedure preparation is scheduled to provide test specifications and approved test procedures to the NRC at least 60 days before their intended use and 60 days before the fuel load for power ascension test procedures. Timely notification is made to the NRC of any test procedure changes prior to performance.

The ITP schedule assures that the test requirements are met for those plant SSCs credited to prevent, limit, or mitigate the consequences of postulated accidents prior to the beginning of the initial fuel load. Tests or portions of tests required to be completed prior to the fuel load which are designed to satisfy the requirements for completing the ITAAC are identified and cross-referenced to the ITAAC requirements. The test schedule is established so that a system required to support another system test is tested prior to its need to assure that plant safety does not rely on untested systems, components, or features. This is a prime factor in the determination of the required sequence of testing.

As construction is completed on systems, the systems are turned over to the startup organization for preoperational testing. Most process systems rely on common support systems, such as electrical power systems, cooling water systems, and compressed gas systems for operation. The common support systems are tested prior to the process systems they support as much as possible.

Sequencing of testing during the startup phase depends primarily on specified power conditions and intersystem prerequisites. To the extent practicable, the schedule establishes that, prior to exceeding 25% power, the test requirements are met for those plant SSCs that are relied on to prevent, limit, or mitigate the consequences of postulated accidents.

The schedule for individual startup tests establishes that test requirements are completed in accordance with plant technical specification requirements for system, structure and component (SSC) operability before changing plant modes.

The COL applicant provides an event-based schedule, relative to fuel loading, for conducting each major phase of the test program. For multiunit sites, the COL applicant discusses the effects of overlapping initial test program schedules on organizations and personnel participating in each ITP. The COL applicant identifies and cross-references each test or portion of a test required to be completed prior to fuel load which satisfies ITAAC requirements.

14.2.11.1 Major Phases of the Test Program

The major phases of the ITP are the preoperational testing, initial fuel loading, initial criticality, low power testing, and power ascension testing.

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-4

SRP Section 14.2 Acceptance Criterion 3.D.i states, "The applicant should describe the education, training, and experience requirements established for each management and operating staff member—including the NSSS vendor, architect-engineer, and other major contractors, subcontractors, and vendors, as appropriate—who will conduct the preoperational and startup tests and will develop testing, operating, and emergency procedures."

The applicant's COL application, in Section 14AA.11, "Certification and Qualification of Test Personnel," includes the certification and qualification of the test engineers, the training of the test engineers, supervisors and managers, and the qualification of supervisors. Section 14AA.11 references Ch 17, "Quality Assurance and Reliability Assurance," of the applicant's COL FSAR and Regulatory Guide 1.8, revision 3 (May 2000). Regulatory Guide 1.8, revision 3 (May 2000) endorses ANSI/ANS-3.1-1993, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," with certain clarifications, additions, and exceptions.

Table 13.1-201 in Section 13.1 of the applicant's COL FSAR lists the projected staffing levels for the startup organization, which include the startup manager, preoperational test engineer, and startup engineer. Table 13.1-201 also references ANSI/ANS-3.1-1993 for the general description, needed education, minimum experience required, and special requirements for the preoperational test engineer and the startup engineer. No specific education and experience requirements are established for the startup manager.

Furthermore, Table 13.0-201 does not include the construction installation test manager, the preoperational and acceptance test manager, and the test program manager and the needed education, minimum experience required, and special requirements for those positions.

In addition, the COL application does not establish education and experience requirements for the architect-engineer personnel, other contract/vendor staff, and the site startup organization.

Lastly, Section 14.AA.3.2 and 14AA.11 list the responsibilities, certification and qualification requirements of test engineers. Table 13.1-201 in Chapter 13 identifies the specific positions identified in ANSI/ANS-3.1-1993, the corresponding plant specific title, and the corresponding titles from the

plant-specific organization. Table 13.1-201 lists the startup organization as consisting of the startup manager, preoperational engineers and startup engineers. Please specify the corresponding qualification and training requirements in ANSI-3.1-1993 that will be established for the test engineers, and revise Sections 14.AA.3.2 and 14AA.11 accordingly.

Please revise Section 14.2.2 and 14AA.11 to describe the education, training, qualification, and experience requirements for organizations responsible for conducting preoperational and startup tests, and for organizations that will develop testing, operating, and emergency procedures, or justify an alternative.

ANSWER:

Appendix 14AA was deleted from the FSAR in FSAR Update Tracking Report Revision 4 (TXNB-09039 dated September 2, 2009) (ML092520137) and replaced with a reference to Mitsubishi Heavy Industries, Ltd Technical Report, "Test Program Description" (MUAP-08009 Revision 0) (ML082900194). Subsequently, Revision 1 to the technical report MUAP-08009 was transmitted to the NRC by MHI Letter UAP-HF-09494 dated October 26, 2009. MUAP-08009 Revision 1 is referenced in DCD Revision 2 and is therefore incorporated by reference in the FSAR.

A comparison of staff positions identified in MUAP 08009 vs. corresponding positions identified in FSAR Table 13.1-201, Appendix 14AA and ANSI/ANS-3.1-1993 associated with the preoperational and startup testing nuclear function is summarized in the following table. The education, training, qualification, and experience requirements for these positions have been incorporated into the FSAR.

MUAP 08009 rev. 0 (titles in [ ])	**FSAR Chapter 14 Appendix 14AA (deleted)**	**Function Position (ANSI/ANS-3.1-1993 section)**	**FSAR Ch 13 Table 13.1-201 CPNPP Units 3 and 4 Positions**
Test Manager	Test Manager	Startup Testing Engineer (4.4.12)	Startup Manager
Installation Test Manager	Construction Installation Test Manager	Preoperational Testing Engineer (4.4.11)	Not specified.
Preoperational and Acceptance Test Manager	Preoperational and Acceptance Test Manager	Preoperational Testing Engineer (4.4.11)	Not specified.
Operations Startup Manager	Not applicable.	Senior Operator (4.4.2)	Not specified.
Startup Test Manager	Startup Manager	Startup Testing Engineer (4.4.12)	Not specified.
Test Program Manager	Test Program Manager	Startup Testing Engineer (4.4.12)	Not specified.
Test Engineer	Test Engineer	Preop Test Engineer (4.4.11)	Preoperational Test Engineer
Test Engineer	Test Engineer	Startup Test Engineer (4.4.12)	Startup Test Engineer

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 14.2-2 and 14.2-18.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

group. The primary function of the test review group is the review and approval of initial startup program test procedures, procedure revisions, and test results. DCD_14.02-8

Replace the fourth bullet of the third paragraph in Section 3.5 of MUAP-08009 with the following.

- MHI and/or MNES

Replace the first sentence in Section 8.2 of MUAP-08009 with the following.

Test procedures are, at a minimum, reviewed by MHI or MNES engineering, Testing, Operations, Quality Assurance, Maintenance, and Licensing.

~~Appendix 14AA provides a description of the organizations responsible for all phases of the ITP, and a description of the administrative controls that assure that experienced and qualified supervisory personnel and other principal participants are responsible for managing, developing, and conducting the ITP.~~ CTS-00635

CTS-00635

Test personnel comply with the education, training, qualification, and experience requirements contained in ANSI/ANS-3.1 as endorsed and amended by RG 1.8 as they relate to the duties described in ANSI/ANS-3.1 and FSAR Table 14.2-203. RCOL2_14.02-4

In addition, individuals who:

- develop or review testing, operating, and emergency procedures,
- evaluate test deficiencies, propose or review the resolution to test deficiencies, or
- evaluate test results for acceptability

are qualified in accordance with ANSI/ANS-3.1 as endorsed and amended by RG 1.8. This includes architect-engineer personnel, other contract/vendor staff, and the site organization supporting preoperational and startup testing. Qualification requirements for architect-engineering personnel are consistent with engineering support positions defined in ANSI/ANS-3.1 (i.e., Section 4.4.10 for supervision and Section 4.6.1 for system engineers).

14.2.3 Test Procedures

RCOL2_14.02-4

Table 14.2-203

Comparison with the Qualification Requirements of the Staffing in ANS-3.1

Table 13.1-201, CPNPP Units 3 and 4 Position	Position Title in MUAP-08009	Function Position (ANSI/ANS-3.1-1993 section)
Startup Manager	Test Manager	Startup Test Engineer (4.4.12)
(Not specified.)	Installation Test Manager	Preoperational Test Engineer (4.4.11)
(Not specified.)	Preoperational and Acceptance Test Manager	Preoperational Test Engineer (4.4.11)
(Not specified.)	Operations Startup Manager	Senior Operator (4.4.2)
(Not specified.)	Startup Test Manager	Startup Test Engineer (4.4.12)
(Not specified.)	Test Program Manager	Startup Test Engineer (4.4.12)
Preoperational Test Engineer	Test Engineer	Preoperational Test Engineer (4.4.11)
Startup Test Engineer	Test Engineer	Startup Test Engineer (4.4.12)

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-5

Standard Review Plan ((SRP) NUREG-0800) Section 14.2, paragraph II.3.D.ii regarding COL applicants, "Staff Responsibilities, Authorities, and Qualifications," states that "the applicant should develop a training program for each functional group of employees in the organization relative to the schedule for preoperational testing and initial startup testing to ensure that the necessary plant staff are ready to begin the test program."

Section 14AA.11.2, "Training," states that "test engineers, supervisors and managers are indoctrinated in the use of applicable administrative procedures, test procedures and familiarized with applicable quality assurance requirements," and that "test engineers, supervisors, and managers complete systems training to provide familiarization with system and component operations unique to the design of pressurized-water reactor (PWR) nuclear power plants."

The NRC staff requests that the applicant revise Section 14AA.11.2 to include when the training will occur relative to the schedule for preoperational testing and initial startup testing.

ANSWER:

Appendix 14AA was deleted from the FSAR in FSAR Update Tracking Report Revision 4 (TXNB-09039 dated September 2, 2009) (ML092520137) and replaced with a reference to Mitsubishi Heavy Industries, Ltd Technical Report, "Test Program Description" (MUAP-08009 Revision 0) (ML082900194). Subsequently, Revision 1 to the technical report MUAP-08009 was transmitted to the NRC by MHI Letter UAP-HF-09494 dated October 26, 2009. MUAP-08009 Revision 1 is referenced in DCD Revision 2 and is therefore incorporated by reference in the FSAR.

The changes requested by the NRC staff have been provided in Section 11.2 of Technical Report MUAP-08009 Rev.1, which contains the following:

> Personnel involved in preoperational testing or startup testing are required to complete necessary training prior to the preparation or review of preoperational or startup test procedures and prior to conducting or participating in the performance of preoperational or startup tests.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-6

SRP 14.2 Acceptance criterion II.3.C.iii states, "Overlapping test program schedules (for multiunit sites) should not result in significant divisions of responsibilities or dilutions of the staff implementing the test program."

Section 14.2.11 of the applicant's COL FSAR states, "Schedule preparation will include an assessment of overlapping test program schedules between CPNPP Units 3 and 4 and provide assurance that CPNPP Unit 3 will be given priority during the period when testing and plant staff personnel will be working on both units."

This statement does not meet the intent of the SRP. The NRC staff requests that the applicant revise Section 14.2.11 of the COL FSAR to include administrative controls to ensure that overlapping test program schedules (for multiunit sites) will not result in significant divisions of responsibilities or dilutions of the staff implementing the test program.

ANSWER:

FSAR Subsection 14.2.11 has been revised to add the recommended administrative controls.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 14.2-5.

Impact on S-COLA

None.

Impact on DCD

None.

14.2.11 Test Program Schedule

CP COL 14.2(~~8~~7) Replace the first and second sentences of the last paragraph in DCD Subsection 14.2.11 with the following. | DCD_14.02-8

An event-based schedule for conducting each major phase of the test program for the Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4, relative to the start of fuel loading, will be provided to the NRC six months prior to the start of preoperational testing. The schedule will be periodically updated to reflect actual progress. Schedule preparation will include an assessment of overlapping test program schedules between CPNPP Units 3 and 4 and provide assurance that CPNPP Unit 3 will be given priority during the period when testing and plant staff personnel will be working on both units. Periodic reviews of the schedules for CPNPP Units 3 and 4 will ensure that overlapping test program schedules do not result in significant divisions of responsibilities or dilutions of the staff implementing the test program. | RCOL2_14.02-6

CP COL 14.2(~~9~~7) Replace the third sentence of the last paragraph in DCD Subsection 14.2.11 with the following. | DCD_14.02-8

Preoperational tests which satisfy inspections, tests analyses, and acceptance criteria (ITAAC) test requirements, and ITAAC test requirements which can be incorporated into preoperational tests, are correlated in Table 14.2-202. This correlation is used to assure that ITAAC test requirements are included in the development of preoperational testing procedures.

14.2.12 Individual Test Descriptions

CP COL 14.2(10) Replace the first sentence of the last paragraph ~~and bullet~~ in DCD Subsection 14.2.12 with the following. | DCD_14.02-90

Testing outside the scope of the certified design is addressed in Subsections 14.2.12.1.112, 14.2.12.1.113, and 14.2.12.1.114. Additional testing for the Fire Protection System Preoperational Test is identified in Subsection 14.2.12.1.90. Table 14.2-201 shows the comprehensive list for the new added subsections. | RCOL2_14.03-1

14.2.12.1 Preoperational Tests

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-7

Standard Review Plan (NUREG-0800) Section 14.2.II.3.i, paragraph F concerning combined license (COL) and operating license applicants, "Review, Evaluation, and Approval of Test Results," states that "specific procedures should be implemented to ensure notification of responsible organizations, such as design organizations, when test acceptance criteria are not met and specific controls have been established to resolve such problems."

In addition, Standard Review Plan (NUREG-0800) Section 14.2.II.3, paragraph F.iv concerning combined license (COL) and operating license applicants, "Review, Evaluation, and Approval of Test Results," states that the COL applicant "should include provisions to allow design organizations to participate in the resolution of design-related problems that result in, or contribute to, a failure to meet test acceptance criteria."

Consistent with SRP Section 14.2, please revise Section 14AA of the FSAR to include specific procedures to ensure notification of responsible organizations, such as design organizations, when test acceptance criteria are not met, specific controls to resolve such problems, and provisions to allow design organizations to participate in the resolution of design-related problems that result in, or contribute to, a failure to meet test acceptance criteria.

ANSWER:

Appendix 14AA was deleted from the FSAR in FSAR Update Tracking Report Revision 4 (TXNB-09039 dated September 2, 2009) (ML092520137) and replaced with a reference to Mitsubishi Heavy Industries, Ltd Technical Report, "Test Program Description" (MUAP-08009 Revision 0) (ML082900194). Subsequently, Revision 1 to the technical report MUAP-08009 was transmitted to the NRC by MHI Letter UAP-HF-09494 dated October 26, 2009. MUAP-08009 Revision 1 is referenced in DCD Revision 2 and is therefore incorporated by reference in the FSAR.

The changes requested by the NRC staff have been provided in Section 9.6 of MHI technical report MUAP-08009 Rev.1 which contains the following:

Test deficiencies documenting the failure to meet test acceptance criteria are evaluated by the responsible engineering design organization for resolution of design-related problems. The resolution of failed acceptance criteria is reviewed by the [Joint Test Group] for preoperational tests and the [Test Review Group] for startup tests.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

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.: 2954 (CP RAI #75)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE of RAI issue: 9/23/2009

QUESTION NO.: 14.02-8

Standard Review Plan (NUREG-0800) Section 14.2.II.3, paragraph F.ii concerning combined license (COL) and operating license applicants, "Review, Evaluation, and Approval of Test Results," states that "before proceeding with testing, the applicant should provide controls relating to... (2) the methods used for initial review of individual parts of multiple tests (e.g., hot functional testing).

Section 14AA.9.2 of the applicant's FSAR states that "the test administrative manual includes controls relating to the methods used for initial review of individual parts of multiple tests (e.g., hot functional testing) in order to assure coordination of plant conditions related to these tests."

The NRC staff requests that the applicant revise Section 14AA.9.2 or 14AA.10 to describe the actual administrative controls (relating to the methods used for initial review of individual parts of multiple tests) that will be implemented at CPNPP consistent with the organization currently described in Section 14AA of the CPNPP FSAR.

ANSWER:

Appendix 14AA was deleted from the FSAR in FSAR Update Tracking Report Revision 4 (TXNB-09039 dated September 2, 2009) (ML092520137) and replaced with a reference to Mitsubishi Heavy Industries, Ltd Technical Report, "Test Program Description" (MUAP-08009 Revision 0) (ML082900194). Subsequently, Revision 1 to the technical report MUAP-08009 was transmitted to the NRC by MHI Letter UAP-HF-09494 dated October 26, 2009. MUAP-08009 Revision 1 is referenced in DCD Revision 2 and is therefore incorporated by reference in the FSAR.

The changes requested by the NRC staff have been provided in Section 9.2 of Technical Report MUAP-08009 Rev.1 which contains the following:

> The test administrative manual includes controls relating to the methods used for initial review of individual parts of multiple tests (e.g., hot functional testing) in order to assure coordination of plant conditions related to these tests.

Test procedures which are required to be performed in parallel, sequentially, or are considered individual parts of multiple tests as specified or identified in the Chapter 14 test abstracts:

- are sent to the reviewing organizations at the same time,
- receive a detailed review to verify coordination of plant conditions with related tests,
- identify all interface requirements, restrictions, prerequisites and post-requisites with related test procedures, and
- include additional reviews for impacts to related procedures when revised or amended by a Test Change Request.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD have been provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

Attachment 3

Response to Request for Additional Information No. 3074 (CP RAI #74)

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.: 3074 (CP RAI #74)

SRP SECTION: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 14.02-1

NUREG-0800, Standard Review Plan (SRP) 14.2.II.5.A.v states, "The applicant should provide abstracts of planned tests to demonstrate and verify the performance capabilities of SSCs and design features that serve the following functions: ...assumed to function, or for which credit is taken, in the accident analysis for the facility, as described in the DCD or Safety Analysis Report (as applicable)."

The applicant incorporates by reference Section 14.2.1 of the USAPWR DCD, which states, "...assumed to function or which are credited in the accident analysis of the USAPWR DCD."

Given that some structures, systems, and components and design features that are assumed to function, or for which credit is taken, in the accident analysis for the facility are site specific, please revise Section 14.2.1 to state,"...assumed to function or which are credited in the accident analysis of the USAPWR DCD or Comanche Peak Nuclear Power Plant FSAR," or justify an alternative.

ANSWER:

The design certification applicant, Mitsubishi Heavy Industries, Ltd, has revised the description to state, "...assumed to function or which are credited in the accident analysis of the US-APWR DCD or applicable FSAR."

This change to the DCD has been incorporated into Revision 2 of the DCD, which was submitted on October 27, 2009.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

Changes to the DCD were provided in Mitsubishi Heavy Industries, Ltd. US-APWR DCD Revision 2 (MHI Letter UAP-HF-09490 dated October 27, 2009).

Attachments

US-APWR DCD Revision 2 pages 14.2-1 and 14.2-2

14.2 Initial Plant Test Program

14.2.1 Summary of Test Program and Objectives

The initial test program (ITP) of the US–APWR plant is described in this chapter. Activities associated with the ITP occur as a part of the initial plant startup.

The ITP conforms to the relevant requirements of the regulations listed below.

- Title 10, Code of Federal Regulations (CFR) Part 30.53 (Reference 14.2-1) as it relates to testing radiation detection equipment and monitoring instruments.
- 10 CFR 50.34(b)(6)(iii) (Reference 14.2-2) as it relates to providing information associated with preoperational testing and initial operations.
- Section XI of Appendix B of 10 CFR 50 (Reference 14.2-3) as it relates test programs to demonstrate that systems, structures, and components (SSCs) will perform satisfactorily.
- Option B of Appendix J of 10 CFR 50 (Reference 14.2-4) as it relates to preoperational leakage rate testing of the containment.
- 10 CFR 52.79 (Reference 14.2-5) as it relates to preoperational testing and initial operations.
- Subpart A, Subpart B, and Subpart C, of 10 CFR 52 (Reference 14.2-6) as they relate to the inspections, tests, analyses, and acceptance criteria (ITAAC).

The objectives of the ITP include a demonstration that the plant construction is in compliance with the plant design; that the plant systems perform in accordance with that design; and that the initial fuel load, initial criticality, low power testing, and power ascension testing are performed in an approved predetermined methodology.

Preoperational and startup testing is performed on SSCs that are:

- Required for safe reactor shutdown and cooldown under normal plant conditions and for maintaining the reactor in a safe condition for an extended shutdown period
- Required for safe reactor shutdown and cooldown under transient (infrequent or moderate frequent events) conditions and postulated accident conditions and for maintaining the reactor in a safe condition for an extended shutdown period following such conditions
- Required for establishing conformance with safety limits (SLs) or limiting conditions for operation (LCOs) included in Chapter 16, "Technical Specifications"
- Classified as engineered safety features (ESF) or classified as required to support or ensure the operation of engineered safety features within design limits

- Assumed to function or which are credited in the accident analysis of the US-APWR DCD or applicable Final Safety Analysis Report (FSAR)
- Required to process, store, control, and/or limit the release of radioactive materials
- Used in the special low-power testing program to be conducted at power levels no greater than five percent for the purposes of providing meaningful technical information beyond that obtained in the normal startup test program as required for resolution of Three Mile Island (TMI) action plan item I.G.1 (Reference 14.2-7)
- Identified as risk-significant as discussed and identified in Subsection 17.4.7 and Table 17.4-1

The ITAAC required by 10CFR 52.47(b)(1) (Reference 14.2-8) for the US-APWR design are found in the Tier 1 document. The criteria for ITAAC selection are contained in Section 14.3, inspections, tests, analyses, and acceptance criteria.

The ITP consists of construction, preoperational, and startup tests.

Following the plant construction, testing is accomplished to demonstrate the proper performance of SSCs and design features.

Preoperational tests do not begin until construction and designated construction tests of the system are essentially completed. Preoperational tests are performed in cold conditions and at elevated temperatures produced by reactor coolant pump and pressurizer heater operation.

The initial fuel loading marks the beginning of startup testing. Startup tests as defined by Subsection 14.2.1.2.3 are performed to demonstrate that plant systems meet the performance requirements and that the plant can operate in an integrated fashion.

The preparation and performance of preoperational and startup tests are the responsibility of the COL licensee.

The ITP described in this chapter only addresses those systems and components within the US-APWR. A description of the program for the testing of other components and systems that are site-specific is discussed in US-APWR Test Program Description Technical Report, MUAP-08009 (Reference 14.2-29). Testing of these items demonstrates that they meet requirements as defined in the Final Safety Analysis Report (FSAR).

14.2.1.1 Test Program for Nuclear and Balance of Plant Systems

Preoperational and startup testing is conducted in accordance with an approved manual containing ITP administrative controls. The manual is prepared by the startup organization. Final approval of the manual is by the designated plant management. The preparation and approval of the manual is completed prior to the preparation of the first test procedure. This manual contains the administrative procedures and requirements

Attachment 4

Response to Request for Additional Information No. 3558 (CP RAI #72)

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-1

NUREG-0800, Standard Review Plan (SRP), Chapter 2.3.4, 'Short Term Atmospheric Dispersion Estimates for Accident Releases,' establishes criteria that the NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

The Comanche Peak Nuclear Power Plant (CPNPP) combined license application (COLA), FSAR Section 2.3.4.2 states that a building cross-sectional area of 2500 square-meters and a building height of 69.9 meters are conservative assumptions for building wake calculations. Provide, in the COLA, FSAR, a reference to the US-APWR DCD justifying that these are conservative assumptions.

ANSWER:

The PAVAN short-term atmospheric dispersion computer code implements the guidance of Regulatory Guide 1.145 which states that the area used for building wake effects "is the smallest vertical-plane cross-sectional area of the reactor building." Based on Figure 2.2-13 and Table 2.2-2 of the Tier 1 material of the US-APWR DCD, the reactor building height is 69.9 meters and the reactor building area is calculated to be 3092 m^2. Since χ/Q values increase as reactor building cross sectional area decreases per equation 1.3.1(1) of Regulatory Guide 1.145, a conservatively low cross sectional area of 2500 m^2 was used to determine building wake effects.

FSAR Subsection 2.3.4.2 was revised to provide updated text, including a reference to the US-APWR DCD parameters justifying the conservative assumptions.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 2.3-43.

Impact on S-COLA

None.

Impact on DCD

None.

The stability classes were based on the classification system given in Table 1 of U.S. Nuclear Regulatory Commission Regulatory Guide 1.23, as follows:

Classification of Atmospheric Stability
(Reference, Regulatory Guide 1.23, Table 1)

Stability Classification	Pasquill Stability Category	Ambient Temperature change with height (°C/100m)
Extremely unstable	A	$\Delta T < -1.9$
Moderately unstable	B	$-1.9 < \Delta T \leq -1.7$
Slightly unstable	C	$-1.7 < \Delta T \leq -1.5$
Neutral	D	$-1.5 < \Delta T \leq -0.5$
Slightly stable	E	$-0.5 < \Delta T \leq 1.5$
Moderately stable	F	$1.5 < \Delta T \leq 4.0$
Extremely stable	G	$\Delta T > 4.0$

Joint frequency distribution tables were developed from the meteorological data with the assumption that if datum required as input to the PAVAN program (i.e., lower level wind direction, lower level wind speed, and temperature differential) was missing from the hourly data record, all data for that hour were discarded. Also, the data in the joint frequency distribution tables were rounded for input into the PAVAN code.

Building area is defined as the smallest vertical-plane cross-sectional area of the reactor building, in sq meters. Building height is the height above plant grade of the containment structure used in the building-wake term for the annual-average calculations. For conservatism, the containment area is used in the determination of building-wake effects. A conservative building cross-sectional area of 2500 m^2 and a building height of 69.9 meters were used for building wake calculations based on parameters from Figure 2.2-13 and Table 2.2-2 of the US-APWR DCD Tier 1 material. RCOL2_02.0 3.04-1

The tower height is the height at which the wind speed was measured. Based on the lower measurement location, the tower height used was 10 meters.

A ground release includes all release points that are effectively lower than two and one-half times the height of adjacent solid structures (Regulatory Guide 1.145). Therefore, as stated above, a ground-release was assumed.

The cumulative frequency of χ/Q at the EAB can be found in Table 2.3-337. Table 2.3-337 also presents the cumulative frequency at the LPZ. A summary of results is provided below. Median (50 percent) values, provided in Table 2.3-337, may be

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak Units 3 and 4

Luminant Generation Company LLC

Docket No. 52-034 and 52-035

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SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-2

NUREG-0800, Standard Review Plan (SRP), Chapter 2.3.4, 'Short Term Atmospheric Dispersion Estimates for Accident Releases,' establishes criteria that the NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

This question is in regards to FSAR Table 2.3-337, "Relative Concentration at Comanche Peak Nuclear Power Plant." The first two Summaries on this table provide the results for the PAVAN computer code used to determine the exclusion area boundary (EAB) and low population zone (LPZ) χ/Q values. The third section of this table provides the Comanche Peak Maximum Accident χ/Q values, which are used as the site characteristics provided in FSAR Table 2.0-1R.

When comparing the values listed in the third section of COLA, Table 2.3-337 with the PAVAN output file and the first two sections of the table, it appears that the χ/Q values have been increased by a factor of 8 – 10 percent. Please provide a clarification on why the original χ/Q values were not used for comparison with the US-APWR design certification document (DCD) Site Parameters and update the COLA, FSAR as needed.

ANSWER:

The development of the site for the proposed CPNPP Units 3 and 4 was preliminary when the calculations were performed. Therefore, to account for any future changes to the proposed site and any changes in future meteorological data, a 10% margin was added to the maximum accident and a 50% margin to the χ/Q values. The χ/Q values from the PAVAN output file were arbitrarily increased by 10% to provide margin. The resulting values are provided in FSAR Table 2.3-337. FSAR Subsection 2.3.4.2 has been revised to indicate the χ/Q values include a 10% margin.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 page 2.3-44.

Impact on S-COLA

None.

Impact on DCD

None.

used in making realistic estimates of the environmental effects of potential radiological accidents; conservative estimates are based on calculated 5 percent values. A comparison of the site specific χ/Q values with the DCD χ/Q values is provided in Table 2.3-337. The site-specific χ/Q values were arbitrarily increased by 10% to provide margin. RCOL2_02.0 3.04-2

2.3.4.3 Relative Concentration Estimates at the Control Room Emergency Intake

The atmospheric dispersion estimates for the CPNPP control room were calculated based on the guidance provided in Regulatory Guide 1.194. The main control room and Technical Support Center (TSC) χ/Qs were calculated for all probable release points to the control room air intakes using the ARCON96 computer code (NUREG/CR-6331) based on the hourly meteorological data collected for the years 2001 through 2004 and 2006. The locations of the assumed release points and location of the main control room and TSC intakes are shown on Figure 2.3-382. In all cases, the intervening structures between the release point and the main control room and TSC intake were ignored for calculational simplicity, thereby underestimating the true distance to the main control room and TSC intakes. Atmospheric stability was determined by the vertical temperature difference (ΔT) measured over the difference in measurement height and the stability classes given in Regulatory Guide 1.23. All releases were assumed to be point ground-level releases, except the containment shell, which is assumed to be a diffuse area source. For each of the source-to-receptor combinations (Table 2.3-338), the χ/Q value that is not exceeded more than 5.0 percent of the total hours in the meteorological data set (e.g., 95-percentile χ/Q) was determined. The χ/Q values for source-receptor pairs are shown in Table 2.3-339.

2.3.4.4 Hazardous Material Releases

Hazardous material releases and control room habitability are discussed in Section 6.4. The methodology used to calculate concentrations of hazardous materials (e.g., flammable or toxic clouds) outside building structures resulting from the on-site and/or off-site airborne releases of such materials is also presented in this subsection. Conformance with the requirements of Regulatory Guide 1.78 is also given in this subsection.

2.3.4.5 Representativeness and Topographic Effects

As discussed in above, the on-site data are considered to be conservatively representative of meteorological conditions at the site. Topographic effects at the site were discussed in Subsection 2.3.2.2.3. The results were indicative of a flat terrain, with no appreciable effects on short-term diffusion estimates.

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-3

NUREG-0800, Standard Review Plan (SRP), Chapter 2.3.4, 'Short Term Atmospheric Dispersion Estimates for Accident Releases,' establishes criteria that the NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

The PAVAN input files provided to the staff appear to be based on a joint frequency distribution of only one year (less than 8760 meteorological entries make up the joint frequency distribution).

Please submit the PAVAN input files containing data from 2001 – 2006. Also make any necessary changes to the FSAR and subsequent site characteristics that may result from updated PAVAN runs.

ANSWER:

The methodology used to generate the PAVAN joint frequency distribution tables was based on obtaining averages for six years of meteorological data (2001-2006) to present the data on a representative year basis. The joint frequency tables therefore represent not a single year but the composite of six years of data. Because the joint frequency tables were generated as integer hours for the representative year, rounding of the average values results in less than 8760 hours in the distribution. Artificially manipulating the data to achieve exactly 8760 hours in the joint frequency distribution is neither necessary nor valid. The composite joint frequency distribution is contained in the PAVAN input and output files sent to the NRC on July 13, 2009 (ML092520139).

Regulatory Guide 1.23 recommends that a data recovery goal of 90% be achieved for each year of meteorological data. The data recoveries for each year used in the short-term atmospheric dispersion calculation are 92.0%, 96.2%, 98.5%, 97.1%, 88.5%, and 99.8%, for 2001 – 2006, respectively. Typically, only five years of data are required, but because the data recovery for 2005 was below 90%, a sixth year of data was included. The data recovery for the six-year composite data set was 95.4%.

Because the data recovery for 2005 was below the 90% guidance in Regulatory Guide 1.23, a sensitivity study was performed excluding the 2005 data. As before, the methodology used to generate the PAVAN joint frequency distribution averaged five years of meteorological data (2001-2004 & 2006)

to present the data on a representative year basis. The resulting change in the EAB χ /Q was insignificant (from 3.36E-04 s/m^3 to 3.37E-04 s/m^3).

Because the maximum accident X/Q values provided in Table 2.3-337 (Sheet 1 of 2) were increased by a 10% margin, no changes to the maximum accident χ /Qs are necessary. FSAR Subsection 2.3.4.1 and ER Subsection 2.7.3.1 have been revised to clarify the years of data used in the accident χ /Q evaluations.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 2.3-40.

See attached markup-up ER Draft Revision 1 Page 2.7-28.

Impact on S-COLA

None.

Impact on DCD

None.

2.3.4 Short-Term Atmospheric Dispersion Estimates for Accident Releases

2.3.4.1 Objective

CP COL 2.3(2) Add the following after the first paragraph in DCD Subsection 2.3.4.1.

The on-site meteorological data record at CPNPP site for the period 2001 through ~~2004 and~~ 2006 has been used to calculate dilution factors which can be anticipated in the event of an accidental release of radionuclides into the atmosphere. The two-hour dilution factors are calculated at the exclusion area boundary (EAB); for longer time periods the factors are calculated at the outer boundary of the low population zone (LPZ). RCOL2_02.03.04-3

The consequence of a design basis accident in terms of personnel exposure is a function of the atmospheric dispersion conditions at the site of the potential release. Atmospheric dispersion consists of two components: 1) atmospheric transport due to organized or mean airflow within the atmosphere and 2) atmospheric diffusion due to disorganized or random air motions. Atmospheric diffusion conditions are represented by atmospheric dispersion factor (χ/Q) values. This subsection describes the development of the short-term diffusion estimates for the site boundary and the control room. A description of the atmospheric dispersion modeling used in evaluating potential the consequences of hazardous material releases is given in Subsection 2.3.4.5.

2.3.4.2 Calculations

CP COL 2.3(2) Add the following after the last sentence in DCD Subsection 2.3.4.2.

The efficiency of diffusion is primarily dependent on winds (speed and direction) and atmospheric stability characteristics. Dispersion is rapid within Stability Classes A through D and much slower for Classes E through G. That is, atmospheric dispersion capabilities decrease with progression from Class A to Class G, with an abrupt reduction from Class D to Class E (Regulatory Guide 1.145 and NUREG/CR-2858).

Relative concentrations of released gases, χ/Q values, as a function of direction for various time periods at the exclusion area boundary (EAB) and the outer boundary of the low population (LPZ), were determined by the use of the computer code PAVAN (NUREG/CR-2858). This code implements the guidance provided in Regulatory Guide 1.145. The χ/Q calculations are based on the theory that material released to the atmosphere will be normally distributed (Gaussian) about the plume centerline. A straight-line trajectory is assumed between the point

2.7.3 SHORT-TERM ATMOSPHERIC DISPERSION ESTIMATES FOR ACCIDENT RELEASES

2.7.3.1 Objective

The on-site meteorological data record at CPNPP site for the period 2001~~-2004 and~~ through 2006, has been used to calculate dilution factors that can be anticipated in the event of an accidental release of radionuclides into the atmosphere. The 2-hr dilution factors are calculated at the exclusion area boundary (EAB); for longer time periods the factors are calculated at the outer boundary of the low population zone (LPZ). RCOL2_02.0 3.04-3 MET-13

The consequence of a design basis accident in terms of personnel exposure is a function of the atmospheric dispersion conditions at the site of the potential release. Atmospheric dispersion consists of two components: 1) atmospheric transport due to organized or mean airflow within the atmosphere and 2) atmospheric diffusion due to disorganized or random air motions. Atmospheric diffusion conditions are represented by relative air concentration (χ/Q) values. This section describes the development of the short-term diffusion estimates for the site boundary and the low population zone. MET-12

2.7.3.2 Calculations

The efficiency of diffusion is primarily dependent on winds (speed and direction) and atmospheric stability characteristics. As stated in Regulatory Guide 1.145 and NUREG/CR-2858, dispersion is rapid within stability classes A – D and much slower for classes E – G. That is, atmospheric dispersion capabilities decrease with progression from class A to class G, with an abrupt reduction from class D to class E.

As indicated in NUREG/CR 2858, relative concentrations of released gases, χ/Q values, as a function of direction for various time periods at the exclusion area boundary (EAB) and the outer boundary of the low population (LPZ), were determined by the use of the computer code PAVAN. This code implements the guidance provided in Regulatory Guide 1.145. The χ/Q calculations are based on the theory that material released to the atmosphere would be normally distributed (Gaussian) about the plume centerline. As stated in NUREG/CR 2858 and Regulatory Guide 1.145, a straight-line trajectory is assumed between the point of release and all distances for which χ/Q values are calculated.

Using joint frequency distributions of wind direction and wind speed by atmospheric stability, PAVAN provides the χ/Q values as functions of direction for various time periods at the exclusion area boundary (EAB) and the low population zone (LPZ). The meteorological data needed for this calculation included wind speed, wind direction, and atmospheric stability. The meteorological data used for this analysis was collected from the on-site monitoring equipment from 2001 to 2006. Data recovery for 2005 was below 90 percent. Consequently this year of data was not used. The five years of data (2001 - 2004 and 2006) were averaged and the joint frequency distributions are reported in Table 2.7-105. Other plant specific data included tower height at which wind speed was measured (10.0 m) and distances to the EAB (0.5 mi) and LPZ (2 mi). The distances to the EAB, LPZ, and from the release boundary to the EAB are given in Table 2.7-119.

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-4

Please provide an electronic copy of the ARCON96 input and output files used in FSAR Section 2.3.4, along with justification for any assumptions that were made in generating the input files.

ANSWER:

The ARCON96 input and output files were sent to the NRC in response to ER RAI GEN-10 via Luminant letter TXNB-09041 dated September 8, 2009. Since the submittal of these ARCON96 files, the source-to-receptor distances and directions, and the source and receptor heights, have changed slightly. As a function of a more complete design, Mitsubishi provided more precise locations for the main control room receptors, which had been conservatively estimated earlier. The χ /Q calculations were revised using the more precise receptor locations. Associated revisions to FSAR Tables 2.0-1R, 2.3-338 and 2.3-339 are attached reflecting these changes. Table 2.3-338 now presents the bounding cases for all accidents and associated receptor distances. As result, the specific distances to receptors for the specific analyzed accidents have been deleted. The attached ARCON96 input and output files reflect the updated source and receptor heights along with source to receptor distances and directions.

The assumptions and the rationale for those assumptions are included in two related calculations: TXUT-001-2.3-FSAR-CALC-024 R1, "CPNPP Control Room Accident χ /Q Calculation," and TXUT-001-13.3-FSAR-CALC-026 R1, "CPNPP Technical Support Center Accident χ /Q Calculation." Both calculations are attached.

Impact on R-COLA

See attached marked-up FSAR Draft Revision 1 pages 2.0-4 through 2.0-7 and 2.3-242 through 2.3-246.

Impact on S-COLA

None.

Impact on DCD

None.

Attachments (see Attachment 5 to this letter)

TXUT-001-2.3-FSAR-CALC-024 R1, "CPNPP Control Room Accident χ /Q Calculation"

TXUT-001-13.3-FSAR-CALC-026 R1, "CPNPP Technical Support Center Accident χ /Q Calculation"

ARCON96 input and output files

Table 2.0-1R (Sheet 3 of 12)
Key Site Parameters

	Food production area annual average		5.0×10^{-6} s/m^3	Not calculated as a single value. Annual average χ/Q values provided as a function of distance and direction out to a 50-mile distance. CTS-00636
CP COL 2.1(1)	*Deposition factor (D/Q value) for on-site and off-site locations:*			
CP COL 2.2(1) CP COL 2.3(1)	EAB annual average		4.0×10^{-8} 1/m^2	5.5×10^{-8} 1/m^2
CP COL 2.3(2) CP COL 2.3(3)	*Atmospheric dispersion factors (χ/Q values) for main control room (MCR) heating, ventilation, and air conditioning (HVAC) intake for specified release points*[b]*:*			
CP COL 2.4(1) CP COL 2.5(1)	Plant vent [c] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	1.1×10^{-3} s/m^3 6.6×10^{-4} s/m^3 4.2×10^{-4} s/m^3 1.9×10^{-4} s/m^3	East HVAC Intake 0 – 2 hours: ~~6.9E-04~~6.3E-04 2 – 8 hours: ~~4.4E-04~~4.1E-04 8 – 24 hours: ~~1.8E-04~~1.7E-04 1 – 4 days: ~~1.2E-04~~1.1E-04 4 – 30 days: ~~9.8E-05~~9.0E-04	West HVAC Intake 0 – 2 hours: ~~1.0E-03~~9.4E-04 2 – 8 hours: ~~7.6E-04~~7.3E-04 8 – 24 hours: ~~3.2E-04~~3.1E-04 1 – 4 days: ~~2.0E-04~~1.9E-04 4 – 30 days: ~~1.7E-04~~1.6E-04

RCOL2_02.03.04-4

Table 2.0-1R (Sheet 4 of 12)
Key Site Parameters

CP COL 2.1(1)
CP COL 2.2(1)
CP COL 2.3(1)
CP COL 2.3(2)
CP COL 2.3(3)
CP COL 2.4(1)
CP COL 2.5(1)

Ground-level containment releases[c]		East HVAC Intake Containment Shell		West HVAC Intake Containment Shell	
0-8 hrs	2.2×10^{-3} s/m^3	0 – 2 hours	~~8.0E-04~~7.5E-04	0 – 2 hours	~~9.1E-04~~8.7E-04
8-24 hrs	1.3×10^{-3} s/m^3	2 – 8 hours	~~5.2E-04~~5.1E-04	2 – 8 hours	~~6.4E-04~~6.1E-04
1-4 days	8.3×10^{-4} s/m^3	8 – 24 hours	~~2.3E-04~~2.2E-04	8 – 24 hours	~~2.9E-04~~2.7E-04
4-30 days	3.6×10^{-4} s/m^3	1 – 4 days	1.4E-04	1 – 4 days	~~1.8E-04~~1.7E-04
		4 – 30 days	~~1.2E-05~~1.2E-04	4 – 30 days	1.4E-04

RCOL2_02.03.04-4

Table 2.0-1R (Sheet 5 of 12)
Key Site Parameters

CP COL 2.1(1)
CP COL 2.2(1)
CP COL 2.3(1)
CP COL 2.3(2)
CP COL 2.3(3)
CP COL 2.4(1)
CP COL 2.5(1)

Main steam relief valve and safety valve releases[(d)]		East HVAC Intake Main Steam Relief Valves	West HVAC Intake Main Steam Relief Valves
0-8 hrs	5.3×10^{-3} s/m^3	0 – 2 hours: ~~3.1~~2.9E-03	0 – 2 hours: ~~3.7~~3.4E-03
8-24 hrs	3.1×10^{-3} s/m^3	2 – 8 hours: ~~1.8~~1.7E-03	2 – 8 hours: ~~2.7~~2.4E-03
1-4 days	2.0×10^{-3} s/m^3	8 – 24 hours: ~~7.3~~6.9E-04	8 – 24 hours: ~~1.1E-03~~9.9E-04
4-30 days	8.7×10^{-4} s/m^3	1 – 4 days: ~~5.3~~4.9E-04	1 – 4 days: ~~7.2~~6.6E-04
		4 – 30 days: ~~4.2~~3.9E-04	4 – 30 days: ~~4.9~~4.5E-04
		East HVAC Intake Main Steam Safety Valves	West HVAC Intake Main Steam Safety Valves
		0 – 2 hours: ~~3.6~~3.3E-03	0 – 2 hours: ~~4.6~~4.1E-03
		2 – 8 hours: ~~2.0~~1.9E-03	2 – 8 hours: ~~3.0~~2.7E-03
		8 – 24 hours: ~~8.3~~7.6E-04	8 – 24 hours: ~~1.2~~1.1E-03
		1 – 4 days: ~~6.1~~5.4E-04	1 – 4 days: ~~8.9~~8.1E-04
		4 – 30 days: ~~4.2E-05~~3.8E-04	~~5.6~~5.1E-04

RCOL2_02.03.04-4

Table 2.0-1R (Sheet 6 of 12)
Key Site Parameters

CP COL 2.1(1)
CP COL 2.2(1)
CP COL 2.3(1)
CP COL 2.3(2)
CP COL 2.3(3)
CP COL 2.4(1)
CP COL 2.5(1)

Steam line break releases 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.9×10^{-2} s/m^3 1.1×10^{-2} s/m^3 7.1×10^{-3} s/m^3 3.1×10^{-3} s/m^3	East HVAC Intake Main Steam Line 0 – 2 hours: ~~1.5~~1.6E-02 2 – 8 hours: ~~7.7~~8.3E-03 8 – 24 hours: ~~3.2~~3.5E-03 1 – 4 days: ~~2.4~~2.5E-03 4 – 30 days: ~~1.6~~1.7E-03	West HVAC Intake Main Steam Line 0 – 2 hours: ~~7.2~~6.6E-03 2 – 8 hours: ~~4.5~~4.3E-03 8 – 24 hours: ~~1.9~~1.8E-03 1 – 4 days: ~~1.4~~1.3E-03 4 – 30 days: ~~9.4~~8.9E-04
Fuel handling area releases (e) 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 9.9×10^{-4} s/m^3 5.9×10^{-4} s/m^3 3.7×10^{-4} s/m^3 1.6×10^{-4} s/m^3	East HVAC Intake 0 – 2 hours: 9.6E-04 2 – 8 hours: 7.5E-04 8 – 24 hours: 3.1E-04 1 – 4 days: 2.0E-04 4 – 30 days: 1.7E-04	West HVAC Intake 0 – 2 hours: ~~5.7~~5.4E-04 2 – 8 hours: ~~4.3~~4.1E-04 8 – 24 hours: ~~1.8~~1.7E-04 1 – 4 days: 1.1E-04 4 – 30 days: ~~8.0~~7.8E-05

RCOL2_02.03.04-4

CP COL 2.3(2)

Table 2.3-338 (Sheet 3 of 7)
Main Control Room and TSC HVAC Intake Distances and Directions

DCD_15.00.03-25

RCOL2_02.03.04-4

Release Heights

Release Point	Elevation Above Grade (m)
Plant Vent	69.9
Main Steam Line (East)	12.8
Main Steam Line (West)	26.3
Fuel Handling Area	5.9
Main Steam Valve (East)	40.7
Main Steam Valve (West)	40.7
Main Steam Safety Valve (East)	38.8
Main Steam Safety Valve (West)	38.8
Containment Shell	49.5

Note:

The sampling system line, air lock and equipment hatch release locations (sources) listed in the DCD (Figure 15A-1) are not considered above because they are interior to the Auxiliary Building. Likewise, the Reactor Building Door is not evaluated because it is an interior door. The Auxiliary Building intake location is not specifically evaluated because this pathway is bounded by the main control room HVAC pathway.

CP COL 2.3(2)

Table 2.3-338 (Sheet 4 of 7)
Main Control Room and TSC HVAC Intake Distances and Directions

DCD_15.00.03-25

~~Table 1 MCR Habitability Analysis Data for MSLB Analysis~~

RCOL2_02.03.04-4

~~Accidents~~	~~MSLB~~			
~~Sources~~	~~Steam Line Break Releases~~		~~PORV and Safety Valve Release~~	
~~Receptors~~	~~Intake~~	~~Inleak~~	~~Intake~~	~~Inleak~~
	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~17~~	~~17~~	~~24~~	~~24~~
~~Vertical Distance (m)~~	~~0~~	~~0~~	~~22~~	~~22~~

~~Table 2 MCR Habitability Analysis Data for Locked Rotor Accident Analysis~~

~~Accidents~~	~~Locked Rotor Accident~~	
~~Sources~~	~~PORV and Safety Valve Release~~	
~~Receptors~~	~~Intake~~	~~Inleak~~
	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~24~~	~~24~~
~~Vertical Distance (m)~~	~~22~~	~~22~~

CP COL 2.3(2)

Table 2.3-338 (Sheet 5 of 7)
Main Control Room and TSC HVAC Intake Distances and Directions

DCD_15.00.03-25

RCOL2_02.03.04-4

~~Table 3 MCR Habitability Analysis Data for RCCA Ejection Accident Analysis~~

~~Accidents~~	~~RCCA Ejection Accident~~			
~~Sources~~	~~Plant Vent~~		~~Ground Level Containment Release Point~~	
~~Receptors~~	~~Intake~~	~~Inleak~~	~~Intake~~	~~Inleak~~
	~~Control Room HVAC Intake~~	~~Auxiliary Intake~~	~~Control Room HVAC Intake~~	~~Auxiliary Intake~~
~~Horizontal Distance (m)~~	~~56~~	~~41~~	~~32~~	~~30~~
~~Vertical Distance (m)~~	~~52~~	~~46~~	~~32~~	~~26~~

~~Accidents~~	~~RCCA Ejection Accident~~	
~~Sources~~	~~PORV and Safety Valve Release~~	
~~Receptors~~	~~Intake~~	~~Inleak~~
	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~24~~	~~24~~
~~Vertical Distance (m)~~	~~22~~	~~22~~

CP COL 2.3(2)

Table 2.3-338 (Sheet 6 of 7)
Main Control Room and TSC HVAC Intake Distances and Directions

DCD_15.00.03-25

~~Table 4 MCR Habitability Analysis Data for Small Line Break and SGTR Analyses~~

RCOL2_02.03.04-4

~~Accidents~~	~~Small Line Break~~		~~SGTR~~	
~~Sources~~	~~Plant Vent~~		~~PORV and Safety Valve Release~~	
~~Receptors~~	~~Intake~~	~~Inleak~~	~~Intake~~	~~Inleak~~
	~~Control Room HVAC Intake~~	~~Auxiliary Building HVAC Intake~~	~~Switchgear Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~56~~	~~41~~	~~24~~	~~24~~
~~Vertical Distance (m)~~	~~52~~	~~46~~	~~22~~	~~22~~

~~Table 5 MCR Habitability Analysis Data for LOCA Analysis~~

~~Accidents~~	~~LOCA~~			
~~Sources~~	~~Plant Vent~~		~~Ground Level Containment Release Point~~	
~~Receptors~~	~~Intake~~	~~Inleak~~	~~Intake~~	~~Inleak~~
	~~Control Room HVAC Intake~~	~~Reactor Building Door~~	~~Control Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~56~~	~~37~~	~~32~~	~~27~~
~~Vertical Distance (m)~~	~~52~~	~~60~~	~~32~~	~~33~~

CP COL 2.3(2)

Table 2.3-338 (Sheet 7 of 7)
Main Control Room and TSC HVAC Intake Distances and Directions

DCD_15.00.03-25

RCOL2_02.03.04-4

~~Table 6 MCR Habitability Analysis Data for Fuel Handling Accident Analysis~~

~~Accidents~~	~~FHA in the Containment~~		~~FHA in the Fuel Handling Building~~	
~~Sources~~	~~Plant Vent~~		~~Fuel Handling Area~~	
~~Receptors~~	~~Intake~~	~~Inleak~~	~~Intake~~	~~Inleak~~
	~~Control Room HVAC Intake~~	~~Auxiliary Building HVAC Intake~~	~~Control Room HVAC Intake~~	~~Switchgear Room HVAC Intake~~
~~Horizontal Distance (m)~~	~~56~~	~~41~~	~~82~~	~~76~~
~~Vertical Distance (m)~~	~~52~~	~~46~~	~~8.5~~	~~10~~

~~Note:~~

~~The sampling system line, air lock and equipment hatch release locations (sources) listed in the DCD (Figure 15A-1) are not considered above because they are interior to the Auxiliary Building. Likewise, the Reactor Building Door is not evaluated because it is an interior door. The Auxiliary Building intake location is not specifically evaluated because this pathway is bounded by the main control room HVAC pathway.~~

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-5

NUREG-0800, Standard Review Plan (SRP), Chapter 2.3.4, 'Short Term Atmospheric Dispersion Estimates for Accident Releases,' establishes criteria that the NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

At the bottom of COLA, FSAR Table 2.3-338 (Sheet 1 of 5), the lower elevation of the Control Room HVAC Intake and Class 1E Electric Room HVAC Intake is given as 14.3 meters (m) above grade. The upper elevation for these intakes is 17.1 m and 16.2 m above grade, respectively. In this same COLA, FSAR table, Sheet 4 of 5 and Sheet 5 of 5, the vertical distance between the Ground Level Containment Release Point and the Intakes is given as 32 m. Please provide clarification on the calculation of this 32 meter vertical distance.

ANSWER:

The value of the intake height is used in ARCON96 for calculating the slant range for ground level releases and the off-centerline correction factors for stack release models. The containment shell is treated as a ground level release, so the Control Room intake height is used to calculate the slant range. The average release height of the containment shell is 49.4 meters while the upper HVAC intake is 17.1 meters. The difference in these heights is approximately 32 meters. Since the submittal of Revision 0 of the FSAR, the source and receptor heights have been updated. The FSAR markups provided in the response to Question 02.03.04-4 above reflect these updated source and receptor heights.

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-6

NUREG-0800, Standard Review Plan (SRP), Chapter 2.3.4, 'Short Term Atmospheric Dispersion Estimates for Accident Releases,' establishes criteria that the NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

The COLA FSAR Table 2.3-338 presents data on the Control Room HVAC Distances and Directions. The receptor distances and heights should be consistent with the US-APWR DCD FSAR Chapter 15, Tables 15A-18 through 15A-23. The NRC staff has found numerous discrepancies between COLA FSAR Table 2.3-338 and the US-APWR DCD tables.

Please explain the discrepancies in the height and distance from the sources to the receptors and make any necessary changes to the FSAR

ANSWER:

The apparent discrepancies between FSAR Tables 2.3-338, Sheets 2 through 5 in Revision 0 and the information contained in the DCD Tables 15A-18 through 15A-23 are explained by the clarifying note provided on FSAR Table 2.3-338, Sheet 5 of 5. This note is replicated below:

> The sampling system line, air lock and equipment hatch release locations (sources) listed in the DCD (Figure 15A-1) are not considered above because they are interior to the Auxiliary Building. Likewise, the Reactor Building Door is not evaluated because it is an interior door. The Auxiliary Building intake location is not specifically evaluated because this pathway is bounded by the main control room HVAC pathway.

The differences found by the staff are due to the DCD inclusion of distances between sources interior to the plant and receptor locations. In performing the CPNPP analyses, these sources were not considered release points to the environment, nor were atmospheric dispersion values calculated for these interior points.

Since the submittal of Revision 0 of the FSAR, the source to receptor vertical and horizontal distances has been updated. See the attached markup to FSAR Table 2.3-338 provided in the response to Question 02.03.04-4 above.

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.: 3558 (CP RAI #72)

SRP SECTION: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

DATE OF RAI ISSUE: 9/23/2009

QUESTION NO.: 02.03.04-7

The Comanche Peak Nuclear Power Plant combined license application (COLA), FSAR Table 2.3-339 and FSAR Table 2.0-1R (sheet 3 of 12) display the site characteristic control room atmospheric dispersion factors (χ/Q) for accident dose analysis for the time intervals of 0-2 hours, 2-8 hours, 8-24 hours, 1-4 days, and 4-30 days. However, COLA FSAR Table 2.0-1R displays the US-APWR, Rev. 1 χ/Q values for the time intervals of 0-8 hours, 8-24 hours, 1-4 days, and 4-30 days.

Provide a discussion in COLA, FSAR Section 2.3.4 explaining the discrepancy between the FSAR time intervals and the US-APWR DCD time intervals. Identify any assumptions that are included and explain why they are reasonable and conservative.

ANSWER:

Per Section 2 of Regulatory Guide 1.194, "control room χ/Q values are generally determined for each of the following averaging periods: 0-8 hours (or 0-2 hours and 2-8 hours), 8-24 hours, 24-96 hours, 96-720 hours." Normally, using a 0-2 hour averaging period χ/Q produces a more conservative χ/Q value than a 0-8 hour averaging period. For the FSAR, the 0-2 averaging period demonstrates that the DCD χ/Q values for the 0-8 hour averaging period are bounding for any time period 0-8 hours post-accident.

See the markup of FSAR Table 2.0-1R provided in the response to Question 02.03.04-4 above for confirmation that the 0-8 hour χ/Q values from the US-APWR DCD bound all 0-2 hour χ/Q values in the CPNPP Units 3 and 4 FSAR.

Impact on R-COLA

None.

Impact on S-COLA

None.

Impact on DCD

None.

Attachment 5

Electronic Attachments (on CD)

TXUT-001-2.3-FSAR-CALC-024 R1

TXUT-001-13.3-FSAR-CACL-026 R1

ARCON96 Input/Output Files