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Ref. # 10 CFR 52

May 16, 2012

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 6316 (SECTION 8.1), 6410 (SECTION 17.4), AND 6447 (SECTION 13.4)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Requests for Additional Information (RAIs) No. 6316 (CP RAI #249), No. 6410 (CP RAI #253), and No. 6447 (CP RAI #255) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAIs address sharing equipment in the switching station, the reliability assurance program, and the non-licensed operator training program, respectively.

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 May 16, 2012.

Sincerely,

Luminant Generation Company LLC

Donald R. Woodlan for

Rafael Flores

Attachments: 1. Response to Request for Additional Information No. 6316 (CP RAI #249)
2. Response to Request for Additional Information No. 6410 (CP RAI #253)
3. Response to Request for Additional Information No. 6447 (CP RAI #255)

D090
NRO

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Attachment 1

Response to Request for Additional Information No. 6316 (CP RAI #249)

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.: 6316 (CP RAI #249)

SRP SECTION: 08.01 - Electric Power - Introduction

QUESTIONS for Instrumentation, Controls and Electrical Engineering 1 (AP1000/EPR Projects) (ICE1)

DATE OF RAI ISSUE: 3/1/2012

QUESTION NO.: 08.1-3

The revised Section 8.1.2.1, "Utility Power Grid Description," FSAR markup of the final safety analysis report (FSAR) discusses Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4's compliance with 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 5. Revised Section 8.1.2.1 states that the switching station equipment shared between Unit 3 and 4 has the capacity and is configured such that sharing will not significantly impair its ability to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit. This section also states that adequate offsite power capacity exists to support both Units 3 and 4 during this scenario.

GDC 5 requires, in part, that structures, systems, and components (SSCs) important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units. During a clarification conference call on September 20, 2011, the NRC Staff and the applicant discussed the issue related to the capacity of offsite power to support the auxiliary loads of one unit connected to the switching station during an accident while providing for an orderly shutdown and cool down of the remaining unit. In a supplementary response to RAI 2576, Question 08.01-2, Open Item 08.01-1, submitted on October 17, 2011, the applicant provided some clarification of the issue discussed during the September 20, 2011 conference call. The staff verified the offsite power capacity by reviewing the study discussed in FSAR Subsection 8.2.2.2. The study addressed a number of contingencies including the simultaneous trip of CPNPP Units 3 and 4. The case studies show that the transmission system remains stable with slight voltage and frequency variation. The response to RAI 2576, Question 08.01-2 addresses the capacity question of the offsite power to support the auxiliary loads of one unit connected to the switching station during an accident while providing for an orderly shutdown and cool down of the remaining unit. However, it does not answer the question about the sharing of SSCs.

The staff requests the following additional information:

(1) Explain how the sharing of switching station equipment will not significantly impair the ability of that equipment to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit, and

(2) Demonstrate that adequate offsite power capacity exists to support both Units 3 and 4 during this scenario.

(3) The FSAR markup provided in the October 17, 2011 response to RAI 2576, Question 08.01-2 only mentions the switching station equipment as the shared equipment, excluding any other shared equipment in the switchyard such as the breakers. Confirm whether the switching station equipment is the only shared equipment among units.

(4) If there is no other equipment shared by Units 3 and 4 under any operating scenario (normal or emergency conditions) reflect this fact in the FSAR markup for clarification.

ANSWER:

(1) The switching station components (including the circuit breakers) for CPNPP Units 3 and 4 are the only shared structures, systems or components that support plant operations (for any operating scenario, either normal or emergency). The switching station equipment is not important to safety and as such GDC 5 does not apply. However, GDC 5 is met to the extent that sharing the switching station equipment will not significantly impair the ability to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit, and that adequate offsite power capacity exists to support both units during this scenario.

The sharing of switching station equipment will not significantly impair the ability of that equipment to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit. The following summarizes the FSAR information regarding how the normal and alternate preferred power supply (PPS) circuits and associated protection equipment and controls are redundant to the extent that offsite power can be reliably provided during normal or emergency conditions. If the normal or alternate PPS circuits fail, normal and emergency operation of both units can continue without interruption. Each unit can operate normally with service from only one circuit of the normal or alternate PPS. Both normal and alternate PPS circuits consist of two separate power circuits (one for Unit 3 and one for Unit 4). Each PPS circuit has associated control and protection circuits and associated control and protection equipment. The plant switching station components include two control houses (#1 and #2) located several hundred feet apart. The control and protection equipment and portions of their associated circuits for the two normal PPS power circuits are contained in control house #1. The control and protection equipment and portions of their associated circuits for the two alternate PPS power circuits are contained in control house #2. Each normal and alternate PPS power service and controls can provide adequate offsite power and control capacity to support both units during normal and emergency conditions. The control and protection circuit cables associated with the different control houses are routed in the switching station yard, and are physically separated to avoid a common cause failure of the two control houses and to assure availability of the associated offsite power circuits.

The four transmission line tie lines to the unit switchyards are physically separated and installed on separate sets of transmission towers and do not cross each other. Under normal conditions, any credible failure of one PPS circuit, including catastrophic failure of transmission towers, will not cause the failed circuit or tower to fall into a PPS circuit for the same unit. The normal PPS unit switchyard is located on the southwest side of the turbine building (T/B), and the alternate PPS unit switchyard is located on the southeast side of the T/B. Therefore, to the extent of providing a reliable source of power to the unit switchyards, the normal and alternate PPS circuits are redundant. This is described in FSAR Subsections 8.2.1.2, 8.2.1.2.1.1, 8.2.2.2, Table 8.2-203, and Figures 8.2-202, 8.2-206, 8.2-207, and 8.2-208.

(2) During a clarification call with the NRC on March 29, 2010, the NRC requested that Luminant restate the capacity of offsite power and to confirm that the statement still applies. The capacity is restated in the response to Part (1) above. The previous Luminant statement still applies and is found in Supplemental response #02 to RAI 2576 (CP RAI #9) Question 08.01-02 (ML11291A180). Also, FSAR Revision 2 Subsection 8.1.2.1, second paragraph, was previously revised to reflect the same statement.

(3) FSAR Subsection 8.1.2.1 has been revised to reflect that the switching station equipment shared between Units 3 and 4 includes the circuit breakers.

(4) FSAR Subsection 8.1.2.1 has been revised to reflect that no SSCs that are important to safety are shared between Units 3 and 4 under any operating scenario (normal or emergency).

Impact on R-COLA

See attached marked-up FSAR Revision 2 pages 8.1-1 and 8.1-2.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

8.0 ELECTRIC POWER

8.1 INTRODUCTION

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

8.1.1 General

CP COL 8.2(3) Replace the fourth paragraph in DCD Subsection 8.1.1 with the following.

Figure 8.1-1R is a simplified electrical one line diagram depicting the alternating current (ac) and direct current (dc) onsite and offsite electric power system including the site-specific switchyard.

8.1.2.1 Utility Power Grid Description

CP COL 8.2(1) Replace the paragraph in DCD Subsection 8.1.2.1 with the following.

Oncor Electric Delivery Company LLC (Oncor) is the transmission service provider (TSP) for the Comanche Peak Nuclear Power Plant (CPNPP). Oncor operates the largest distribution and transmission system in Texas, providing power to three million electric delivery points over more than 101,000 miles of distribution and 14,000 miles of transmission lines. Oncor operates in a service area of east, west, and north central Texas and serves cities that include the Dallas-Fort Worth area and surrounding cities. The Oncor grid is connected to fossil-fueled plants, combustion turbine plants and nuclear plants supplying electric energy over a transmission system consisting of various voltages up to 345 kV. Oncor is a member of Electric Reliability Council of Texas (ERCOT). ERCOT is comprised of members engaged in generation, transmission, distribution and marketing of electric energy in the state of Texas. ERCOT is the independent system operator that oversees all generation and transmission functions.

A new 345 kV switching station for CPNPP Units 3 and 4 (plant switching station) is constructed prior to fuel loading. The plant switching station is a part of the ERCOT grid and has four outgoing transmission circuits to remote substations as described in Section 8.2. In addition, the plant switching station has four independent overhead transmission tie lines, two for CPNPP Unit 3 and the other two for CPNPP Unit 4. The plant switching station has two main buses configured in a breaker and a half scheme. The switching station equipment shared between Units 3 and 4, including the circuit breakers, has the capacity and is configured such that sharing will not significantly impair the ability to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit and that adequate offsite power capacity exists to support both

RCOL2_08.0 1-2 S01
RCOL2_08.0 1-3
RCOL2_08.0 1-2 S02

units during this scenario. No important to safety SSCs are shared between Units 3 and 4 under any operating scenario (normal or emergency). RCOL2_08.01-3

~~8.1.5.3.5 Institute of Electrical and Electronics Engineers Standards~~ CTS-01367

~~CP-COL 8.2(3) Add the following bulleted text after the thirty-sixth bulleted text in DCD Subsection 8.1.5.3.5.~~

- ~~IEEE Std 605-1998, IEEE Guide for Design of Substation Rigid-Bus Structures~~

Attachment 2

Response to Request for Additional Information No. 6410 (CP RAI #253)

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.: 6410 (CP RAI #253)

SRP SECTION: 17.04 - Reliability Assurance Program (RAP)

QUESTIONS for PRA and Severe Accidents Branch (SPRA)

DATE OF RAI ISSUE: 4/12/2012

QUESTION NO.: 17.04-9

In its response to RAI 5312, question 17.04-7, dated February 18, 2011, the applicant referred to its response to question 17.04-6 and stated that MHI revised the US-APWR DCD to include the essential service water (ESW) pump room exhaust fans (based on the assumption that the ESW pump motors are air-cooled) in DCD Table 17.4-1 ("Risk-Significant SSCs") and to clarify that the design of the ultimate heat sink (UHS) and associated HVAC systems are not within the scope of the US-APWR standard design (i.e., the design of these SSCs are site-specific). The staff confirmed these changes in Revision 3 of the US-APWR DCD. From Section 9.4 of the COL FSAR, the site-specific design of the ESW pump house ventilation system includes the ESW pump room exhaust fans and other key components such as ESW pump room heaters, room temperature controllers/switches for control of the ESW pump room exhaust fans and heaters, and room air intake and discharge back draft dampers. Since the ESW pump room exhaust fans are considered by engineering judgment to be risk-significant in DCD Table 17.4-1, Revision 3, it would suggest that the other key components of the ESW pump house ventilation system may also be risk-significant.

The staff requests that the applicant provide the basis for not considering risk-significant in COL FSAR Table 17.4-201 the other key components of the ESW pump house ventilation system. Consideration of common cause failures and defense-in-depth should also be addressed in this discussion.

ANSWER:

The standard US-APWR and the R-COLA design are based on air-cooled ESW pump motors. Cooling of the ESW pump motors is necessary for the operability of the pumps and common cause failure of the ESW pump room exhaust fans is considered to be risk significant. Therefore, the system for cooling the ESW pump motors is addressed in DCD Revision 3 Table 17.4-1 with specific mention of the ESW pump room exhaust fans as risk significant SSCs. COL Item 9.2(6) as identified in DCD Revision 3, specifies that the COL Applicant is to provide design details, including cooling of the ESW pump motors.

It is not appropriate to address design details of the ESW pump house ventilation system in the DCD because the design of the system is site-specific. Therefore, the DCD is being revised by MHI Letter UAP-HF-12117 to address ESW pump room cooling at the "system level" by identifying the system as a

risk-significant SSC in lieu of addressing specifically the ESW pump room exhaust fans. COL FSAR Chapter 17 Section 4 incorporates by reference the risk-significant SSCs in the DCD. Thus, the FSAR does not need to be revised based on the revisions to the DCD identified in MHI letter UAP-HF-12117.

The final plant design D-RAP list is maintained by procedural controls, will be based on the site-specific design, and will be implemented in the site-specific D-RAP as part of the Phase II and III D-RAP processes in accordance with FSAR Subsection 17.4.3.

Impact on R-COLA

None.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

Attachment

MHI Letter UAP-HF-12117

MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

May 9, 2012

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

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-12117

Subject: **Update of Chapters 17 and 19 of US-APWR DCD**

References: 1) Letter MHI Ref: UAP-HF-09521 from Y. Ogata (MHI) to U.S. NRC, "Update of Chapter 9 of US-APWR DCD", dated November 17, 2009.

Reference 1 described updates to Chapter 9 of the US-APWR Design Control Document ("DCD") to state that the Essential Service Water Pump ("ESWP") motor cooling method shall be determined by the Combined License ("COL") Applicant and that the air-cooling method is Standard Plant Design Information.

MHI has determined that an update to the US-APWR DCD Revision 3 Chapter 17 D-RAP list is required to reflect this ESWP motor cooling information. A similar change is required for Chapter 19.

With this letter, MHI transmits the enclosed DCD markup to the NRC Staff. This markup will be incorporated into a future DCD revision.

Please contact Mr. Joseph Tapia, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning this letter.

Sincerely,

Y. Ogata

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

Enclosure:

1. Update of US-APWR DCD Chapter 17 Table 17.4-1 and Subsection 19.1.4.1.2

CC: J. A. Ciocco
J. Tapia

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Docekt No.52-021
MHI Ref: UAP-HF-12117

Enclosure 1

UAP-HF-12117
Docket Number 52-021

Update of US-APWR DCD Chapter 17 Table 17.4-1
and Subsection 19.1.4.1.2

May 2012

MHI has determined that an update of Chapters 17 and 19 of the MHI US-APWR DCD is required to reflect the information regarding the ESWP motor cooling described in MHI letter UAP-HF-09521 from Y. Ogata (MHI) to U.S. NRC, "Update of Chapter 9 of US-APWR DCD", dated November 17, 2009.

Table 1 shows the change list for Chapters 17 and 19 of the DCD with the page and the location of the changes to the DCD. The actual DCD markups are attached.

Table 1 Change List for Chapters 17 and 19 of the DCD

Page	Location	Description of Change
17.4-37 (DCD Rev. 3)	Table 17.4-1 Sheet 31 of 51	Revised description to refer to system for cooling ESW pump motors.
19.1-38 (DCD Rev. 3)	Subsection 19.1.4.1.2 Results of importance analysis	Revised description to refer to system for cooling ESW pump motors.

Table 17.4-1 Risk-significant SSCs (Sheet 31 of 54)

#	Systems, Structures and Components (SSCs)	Rationale[1]	Failure Mode[2]	Insights and Assumptions
3	~~ESW pump room exhaust fans~~System for cooling ESW pump motors	EJ	LR	~~Based on the assumption that the ESW pump motors are air-cooled, the ESW pump room ventilation system is included in this table. The ESW pump room ventilation system provides convection air cooling to ESW pump motors in the ESW room.~~The ESW pump motors are air-cooled in the standard design. Therefore, the PRA identified the ESW pump room ventilation system as risk-significant. Details of ESW pump motor cooling are site-specific.

MIC-03-17-0 0002

(12)ATWS: The reactor trip function fails to actuate because of the rod injection failure, which results in the initiating event. One EFW train is unavailable due to a random failure or testing and maintenance, and cooling from the secondary side is insufficient. RCS pressure cannot be reduced down to allowable pressures. Immediately, the core damage occurs. The frequency of this sequence is 1.2E-08/RY and accounts for 1.2% of the total CDF.

(13)LOOP with reactor trip: The emergency power supply system functions successfully. Recovery of the CCWS prevents a RCP seal LOCA. However, the RCS cannot be depressurized, since the cooling from the primary side (FAB: manually open the SDVs and start the SI pumps) and from the secondary side (the removal of decay heat via the SGs) is unavailable. Eventually, the core is damaged. The frequency of this sequence is 1.1E-08/RY and accounts for 1.1% of the total CDF.

The top 20 cutsets for these sequences are shown in Table 19.1-27, Table 19.1-28, Table 19.1-29 and Table 19.1-131 through Table 19.1-139. Each of the other event sequences represents less than 1% of the total CDF. Cutsets for the reactor vessel rupture event are not listed here because the initiating event is assumed to directly lead to core damage.

Importance analyses have been performed to determine the following:

- Basic event importance
- CCF importance
- Human error importance
- Component importance

The results of importance are organized by a Fussell Vesely (FV) importance and risk achievement worth (RAW). Risk significant basic events which have FV importance equal or greater than 0.005 and RAW equal or greater than 2.0 are listed in Table 19.1-30 and Table 19.1-31, respectively.

The case where the ESW pump motors are air-cooled has small impact on the PRA results because the HVAC system for the ESW pump room has high reliability due to its backup action. ~~The CCF of ESW pump room exhaust fans to run~~The system for cooling ESW pump motors is identified to be risk-significant for RAW based on importance analysis, the results of which are used as input to the reliability assurance program (RAP) in Section 17.4. ~~The exhaust fans are~~The system is listed as a risk-significant SSC~~s~~ instead of components on the ESW pump motor water-cooling line. MIC-03-19-00006 MIC-03-19-00006

The risk significant basic events with FV importance value with 0.02 or higher are as follows:

OPS----PRBF (Failure of offsite power recovery within one hour) – This basic event applies only to a condition where total loss of ac power occurs after LOOP. If offsite power does not recover within one hour, RCP seal LOCA is assumed to occur. The plant CDF is decreased by a factor of 34% if the probability of this failure is set to 0.0.

Attachment 3

Response to Request for Additional Information No. 6447 (CP RAI #255)

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.: 6447 (CP RAI #255)

SRP SECTION: 13.04 - Operational Programs

QUESTIONS for USAPWR Projects Branch (NMIP)

DATE OF RAI ISSUE: 5/3/2012

QUESTION NO.: 13.04-6

During a review of the Comanche Peak COLA, Revision 2, Part 2, FSAR, Table 13.4-201, the NRC staff observed that Luminant had listed 10 CFR 52.78 as a Program Source for Item 11, Program Title 'Non licensed Plant Staff Training Program.' The staff believes that this citation is an error. Luminant is requested to correct this error.

ANSWER:

10 CFR 52.78 has been deleted as a Program Source for Item 11, Program Title, "Non licensed Plant Staff Training Program" in FSAR Table 13.4-201.

10 CFR 52.78 was deleted from Part 52 in the 2007 rulemaking (72 FR 49385, August 28, 2007). Luminant notes that RG 1.206 Sample FSAR Table 13.4-1 in section C.I.13 includes 10 CFR 52.79(a)(33) as a Program Source in Item 11, whereas the same table in section C.III still has 10 CFR 52.78 as a Program Source in Item 11. 10 CFR 52.79(a)(33) merely states that the COL application should provide a description of the training program required by 10 CFR 50.120 of this chapter and its implementation. As the FSAR already lists 10 CFR 50.120 as a program source, adding 10 CFR 52.79(a)(3) to the table as an additional source would add no value and thus it was not added. 10 CFR 50.120 and FSAR Section 13.2.2 are the appropriate listings for this item in the FSAR table.

Impact on R-COLA

See attached marked-up FSAR Revision 3 page 13.4-7.

Impact on S-COLA

None, this response is site specific.

Impact on DCD

None.

CP COL 13.4(1)

Table 13.4-201 (Sheet 6 of 11)

Operational Programs Required by NRC Regulation and Program Implementation

Item	Program Title	Program Source (Required By)	FSAR (SRP) Section	Implementation	
				Milestone	Requirement
10.	Radiation Protection Program • Radioactive Source Control (assignment of RP Supervisor) • Assignment of RP Supervisor • Assignment of Nuclear RP Manager	10 CFR 20.1101 10 CFR 20.1801 10 CFR 20.1802 10 CFR 20.1906	12.5	Prior to initial receipt of by-product, source, or special nuclear materials (excluding Exempt Quantities as described in 10 CFR 30.18) for those elements of the Radiation Protection (RP) Program necessary to support such receipt Prior to fuel receipt for those elements of the RP Program necessary to support receipt and storage of fuel on-site Prior to fuel load for those elements of the RP Program necessary to support fuel load and plant operation Prior to first shipment of radioactive waste for those elements of the RP Program necessary to support shipment of radioactive waste	License Condition
	• Ground Water Monitoring Program	10 CFR 20.1406	12.5	Prior to fuel load	License Condition
11.	Non licensed Plant Staff Training Program	10 CFR 50.120 ~~10 CFR 52.78~~	13.2.2	18 months prior to scheduled fuel load	10 CFR 50.120(b)

RCOL2_198_2 S01

RCOL2_13.04-6