TXU Electric
Comanche Peak
Steam Electric Station
P.O. Box 1002
Glen Rose, TX 76043
Tel: 254 897 8920
Fax: 254 897 6652
lterry1@txu.com

C. Lance Terry
Senior Vice President & Principal Nuclear Officer

Ref: 10CFR50.90

CPSES-200002173
Log # TXX-00174
File # 00236

August 31, 2000

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION AND SUPPLEMENT TO LICENSE AMENDMENT REQUEST 99-10
ALLOWABLE VALUES FOR LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION

REF: 1) TXU Electric letter TXX-00008, from C. L. Terry to the NRC, dated May 17, 2000

Gentlemen:

Pursuant to 10CFR50.90, TXU Electric submitted, via Reference 1, License Amendment Request (LAR) 99-010 to revise the Allowable Values specified in Technical Specification Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to ensure that the 6.9 kV and 480 V undervoltage relays initiate the necessary actions when required. Subsequently, the NRC Staff provided a Request for Additional Information (RAI). The TXU Electric response to the RAI is included in Attachment 2.

A001

Also, in order to be consistent with revised undervoltage function designation proposed in LAR 99-010, TXU Electric has identified that the designation of the "6.9 kV bus undervoltage" function which is used in Technical Specification Limiting Condition for Operation (LCO) 3.3.5 Actions Condition D should be similarly changed to the "6.9 kV Class 1E bus loss of voltage" function. This supplement provides an additional marked-up Technical Specifications page for completeness that is consistent with the original LAR 99-010 submittal. It does not affect the originally submitted LAR 99-010 description of the proposed changes, the safety analysis of the proposed changes, and TXU Electric's determination that the proposed changes do not involve a significant hazard consideration (see Reference 1, Attachment 2).

The affidavit for this proposed supplement to LAR 99-010 is provided in Attachment 1. Attachment 3 provides the affected Technical Specification page marked-up to reflect the proposed change. Attachment 4 provides the corresponding changes to the affected pages of the Technical Specification Bases for information. Bases changes will be processed per CPSES procedures. Attachment 5 provides the retyped Technical Specification page that incorporates the requested change. Attachment 6 provides the retyped Technical Specification Bases pages that incorporate the requested change.

No change is requested to the proposed amendment review and implementation schedules originally submitted LAR 99-010. Approval of this supplement to LAR 99-010 is not required to support continued safe plant operations.

This communication contains no new licensing basis commitments regarding CPSES Units 1 and 2.

Should you have any questions, please contact Mr. Mike Riggs at (254) 897-5218.

Sincerely,

C. L. Terry

By: Roger D. Walker
Roger D. Walker
Regulatory Affairs Manager

MJR/wp

Attachment:
1. Affidavit
2. TXU Electric Response to Request for Additional Information
3. Markup of Technical Specifications pages
4. Markup of Technical Specifications Bases pages (for information)
5. Retyped Technical Specification Pages
6. Retyped Technical Specification Bases Pages (for information)

c - E. W. Merschoff, Region IV
J. I. Tapia, Region IV
D. H. Jaffe, NRR
Resident Inspectors, CPSES

Mr. Authur C. Tate
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)		
	)		
TXU Electric	)	Docket Nos.	50-445
	)		50-446
(Comanche Peak Steam Electric Station,	)	License Nos.	NPF-87
Units 1 & 2)	)		NPF-89

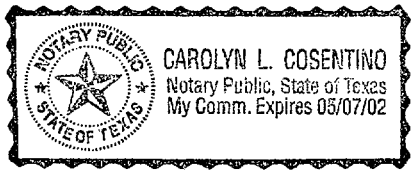
AFFIDAVIT

Roger D. Walker being duly sworn, hereby deposes and says that he is Regulatory Affairs Manager of TXU Electric, the licensee herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission this supplement to License Amendment Request 99-010; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

Roger D. Walker
Regulatory Affairs Manager

STATE OF TEXAS)
)
COUNTY OF Johnson)

Subscribed and sworn to before me, on this 31st day of August, 2000.



Carolyn L Cosentino
Notary Public

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING COMANCHE PEAK PROPOSED TECHNICAL SPECIFICATION CHANGE ALLOWABLE VALUES FOR LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION

Q1. The upper limits of the preferred and alternate offsite bus undervoltage relays are important. If the relays are set too high, unnecessary trips of offsite power and unnecessary diesel generator starts could occur due to normal plant operations such as transients. In addition, if the relays are set too high, offsite power could be tripped following an accident when in fact sufficient voltage is available to support the safety functions. Comanche Peak Technical Specification 3.8.1 requires two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System be operable. Discuss how the proposed TSs to remove the upper limits comply with TS 3.8.1.

R1. The function of Preferred and Alternate offsite source bus under voltage relays is to isolate the class 1E loads from offsite power source before the 6.9kV bus voltage approaches 75% of 6.6kV. This ensures that the 6.9kV system motors will not be exposed to a voltage of less than 75% of their rating as required by ANSI C50.41-1982. The Technical Specification allowable value for this function is defined as a voltage of $\geq$ 5040 V. Any upper value of allowable voltage for these functions will not be the limiting voltage to ensure the function. Therefore, the upper limits on these allowable values neither meet the criteria of 10CFR50.36 for limiting safety system setting nor meet the criteria for inclusion in the Technical Specification. Therefore, the upper limits are deleted from Technical Specification allowable value for Preferred and Alternate offsite source bus under voltage relays.

CPSES has two qualified offsite sources, per TS 3.8.1, available to feed each Class 1E bus. The availability of these sources is monitored by Preferred and Alternate offsite source under voltage relays, and the degraded condition of offsite power sources is monitored by 6.9 kV Class 1E bus and 480 V Class 1E bus degraded voltage relays. The offsite source under voltage and bus degraded voltage relays ensure the adequacy of offsite power sources. The bus degraded voltage relays ensure that the system loads will not be exposed to a sustained operation at less than 90% of their rated voltage. The Technical Specification allowable value for Class 1E bus degraded function is defined as a voltage of $\geq$ 6024V at 6.9 kV bus and $\geq$ 439V at 480V bus. Any upper value of allowable voltage for degraded bus voltage functions will not be the limiting voltage to ensure the function. Therefore, the upper limits on these allowable values are not required per the Current Technical Specification. Similarly, as described above, the upper allowable limits are being deleted from Preferred and Alternate source under voltage functions. This deletion of upper limit for Preferred and Alternate offsite source under voltage allowable values does not compromise the qualification of the offsite sources, therefore, the proposed TS change meets the requirement of TS 3.8.1.

The requirement to trip the incoming source only after the voltage has decreased below the normal system transients, i.e.: the voltage expected during motor starts, is an important operational requirement for reliability, which may result in unnecessary Diesel Generator start. The CPSES relay setting design complies with this requirement and provides settings to eliminate such nuisance tripping.

Q2. The Improved Standard Technical Specifications (ISTSs) require the allowable values of two time delay relays (both with upper and lower limits) be in the TSs. The first time delay relay is used to prevent unnecessary separation from the offsite power source as a result of motor starting and other transients. The second time delay relay determines how long the plant will operate at the degraded voltage. Explain why the current TSs do not include the requirement for time relays mentioned above in the Table 3.3.5-1.

R2. The actuation of Class 1E bus degraded voltage relays, which monitor the degraded condition of offsite power source, will trip the offsite source breaker after a time delay. A time delay of 8 seconds, to override the motor start and other transients, is used to trip the offsite source if safety injection signal is present. In the absence of the safety injection signal the offsite source is tripped after a time delay of 60 seconds. This time delay, to allow time for offsite voltage to recover, is employed to avoid unnecessary tripping of the offsite source. The CPSES design adequately implements the referenced time delays. The response times for these time delays are addressed in TR 13.3.5, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation Response Times.

Q3. What is the difference between 480 V Class 1E bus low grid under voltage relays and the 480 V Class 1E bus degraded voltage relays. Why the proposed allowable values of these relays are the same.

R3. The 480 V Class 1E bus low grid under voltage relays and the 480 V Class 1E bus degraded voltage relays have the same safety function of protecting loads exposure to sustained voltages of less than 90% of their rating. Therefore, the proposed Technical Specification allowable values of these relays are the same. However, the 480 V Class 1E bus low grid under voltage relays trip set points are adjusted, set higher than the 480 V Class 1E bus degraded voltage relays, to provide early notification of degraded grid. The 480 V Class 1E bus low grid under voltage relays will isolate the Class 1E system from offsite source if the source remained at sustained low voltage for 60 seconds and a Safety Injection Signal is present. This is to ensure that Class 1E buses are isolated from the offsite source which are at the threshold of degraded level and an early action is taken to align the safety related buses to a healthy source. The 480 V Class 1E bus degraded voltage relays employ two time delays as described in Response 2 above.

Q4. Provide set point calculations showing all uncertainties used to establish the proposed allowable values in Table 3.3.5-1. Verify that voltages just above the set points are adequate to allow all equipment to start and operate properly at all voltage levels down to and including the 120 volt levels.

R4. Calculation EE-CA-0008-871 Rev 4, Protective relay settings for safeguard buses over/under voltage relays and associated time delay relays, is available.

Adequacy of voltage at safety related loads has been evaluated for bus degraded voltage safety limits of 5965 V at 6.9 kV switchgear and 435 V at 480 V switchgear buses. The 480 V switchgear bus voltage of 435 V is also utilized to ensure the adequacy of voltage for MCC and 120 V panel Class 1E loads. The bus degraded voltage function has Technical Specification allowable values of 6024 V at 6.9 kV bus and 439 at 480 V bus, and Technical Requirement Manual trip set point voltages of 6192 V at 6.9 kV bus and 442.4 at 480 V bus. These values are higher than the evaluated values. Therefore, the voltages at these allowable and trip set point values allow all equipment to start and operate properly at all voltage levels down to and including the 120-volt levels.

Q5. The proposed allowable value for 6.9 kV Class 1E loss of voltage is $\leq$ 2115V. Technically, the relays could be set to 0V and still comply with the proposed TSs. Provide a technical discussion to address why the proposed allowable value for the first level of under voltage protection does not include the lower limit.

R5. The 6.9 kV Class 1E bus under voltage relay verify the dead bus status. This function ensures that the bus voltage has dropped low enough to be energized from another source and not result in Class 1E equipment damage. Residual voltage of $\leq$ 31.5 % ensures that a motor connected to the bus is not exposed to more than 1.33 V/Hz on bus reenergization. Technical Specification allowable value for this function is defined as a voltage of $\leq$ 2115 V. Any bus residual voltage of less than this value, even 0 V, results in less than 1.33 V/Hz on bus reenergization and is not damaging to motor loads. Therefore, any bus residual voltage less than 2115 V is acceptable and it ensures the performance of the relays safety function. Any lower limit on the allowable value is not a limiting value, as such it neither meets the criteria of 10CFR50.36 for limiting safety system setting and nor meets the criteria for inclusion in the Technical Specification. Therefore the lower limit is deleted from the 6.9 kV Class 1E bus under voltage function.

ATTACHMENT 3 to TXX-00174

MARKUP OF TECHNICAL SPECIFICATIONS PAGE

Page 3.3-45

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two channels per bus for the 6.9 kV bus loss of voltage ~~undervoltage~~ function inoperable.	D.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	D.2	Declare the affected A.C. emergency buses inoperable.	1 hour
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	E.2.1	Declare both offsite power source buses inoperable.	1 hour
	AND		
	E.2.2	Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1	Restore train(s) to OPERABLE status.	1 hour
G. Required Action and associated Completion Time not met.	G.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

ATTACHMENT 4 to TXX-00174

MARKUP OF TECHNICAL SPECIFICATION BASES PAGES
(For Information Only)

Pages B 3.3-149
B 3.3-151

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of power, consists of the following functional groups:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9kV Class 1E buses loss of ~~under~~ voltage,
- 480V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480V Class 1E buses degraded voltage.

Each of the above groups consists of two sensing relays per bus that provide input to two-out-of two logic. The LOP start actuation logic is described in FSAR, Section 8.3 (Ref. 1). In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals as described in the FSAR.

(continued)

BASES

APLICABLE SAFETY ANALYSES (continued)

Accident analyses credit the loading of the DG based on the loss of offsite power with or without a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non-mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay. The LOP DG start instrumentation channels satisfy Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

The LCO for LOP DG start instrumentation requires that two channels per bus of ~~both~~ the loss of voltage, undervoltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. Two trains of Automatic Actuation Logic and Actuation Relays shall also be OPERABLE in MODES 1, 2, 3 and 4. In MODES 5 and 6, there is sufficient time available such that a manual start of the DGs is acceptable. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

(continued)

ATTACHMENT 5 to TXX-00174

RETYPED TECHNICAL SPECIFICATIONS PAGE

Page 3.3-45

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	D.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	D.2	Declare the affected A.C. emergency buses inoperable.	1 hour
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	E.2.1	Declare both offsite power source buses inoperable.	1 hour
	AND		
	E.2.2	Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1	Restore train(s) to OPERABLE status.	1 hour
G. Required Action and associated Completion Time not met.	G.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

ATTACHMENT 6 to TXX-00174

RETYPED TECHNICAL SPECIFICATIONS BASES PAGES
(For Information Only)

Pages B 3.3-149
B 3.3-151

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kv bus. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of power, consists of the following functional groups:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9kV Class 1E buses loss of voltage,
- 480V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480V Class 1E buses degraded voltage.

Each of the above groups consists of two sensing relays per bus that provide input to two-out-of two logic. The LOP start actuation logic is described in FSAR, Section 8.3 (Ref. 1). In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals as described in the FSAR.

(continued)

BASES

APLICABLE SAFETY ANALYSES (continued)

Accident analyses credit the loading of the DG based on the loss of offsite power with or without a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non-mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay. The LOP DG start instrumentation channels satisfy Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

The LCO for LOP DG start instrumentation requires that two channels per bus of the loss of voltage, undervoltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. Two trains of Automatic Actuation Logic and Actuation Relays shall also be OPERABLE in MODES 1, 2, 3 and 4. In MODES 5 and 6, there is sufficient time available such that a manual start of the DGs is acceptable. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

(continued)