



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

April 20, 2001

Mr. C. Lance Terry  
Senior Vice President  
& Principal Nuclear Officer  
TXU Electric  
Attn: Regulatory Affairs Department  
P. O. Box 1002  
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES), UNITS 1 AND 2  
- ISSUANCE OF AMENDMENTS RE: CHANGES TO ALLOWABLE VALUES  
FOR LOSS OF POWER DIESEL GENERATOR START  
INSTRUMENTATION (TAC NOS. MA9030 AND MA9031)

Dear Mr. Terry:

The Commission has issued the enclosed Amendment No. 85 to Facility Operating License No. NPF-87 and Amendment No. 85 to Facility Operating License No. NPF-89 for CPSES, Units 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated May 17, 2000, as supplemented by letters dated August 31, 2000, and January 31, 2001.

The amendments revise the Allowable Values specified in TS Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to ensure that the 6.9 kiloVolt and 480 Volt undervoltage relays initiate the necessary actions when required. In addition, a change is made to Condition D of TS 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to eliminate the term "undervoltage." This change is consistent with a change to TS Table 3.3.5-1.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "David H. Jaffe", written over a circular stamp or seal.

David H. Jaffe, Senior Project Manager, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosures: 1. Amendment No. 85 to NPF-87  
2. Amendment No. 85 to NPF-89  
3. Safety Evaluation

cc w/encs: See next page

Comanche Peak Steam Electric Station

cc:

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Honorable Dale McPherson  
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**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

TXU ELECTRIC

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT NO. 1

DOCKET NO. 50-445

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 85  
License No. NPF-87

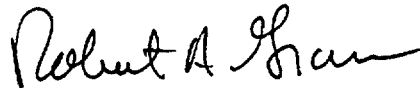
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by TXU Electric dated May 17, 2000, as supplemented by letters dated August 31, 2000, and January 31, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-87 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 85 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. TXU Electric shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Robert A. Gramm".

Robert A. Gramm, Chief, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: April 20, 2001



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

TXU ELECTRIC

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT NO. 2

DOCKET NO. 50-446

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 85  
License No. NPF-89

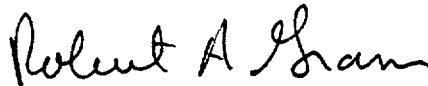
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by TXU Electric dated May 17, 2000, as supplemented by letters dated August 31, 2000, and January 31, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-89 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 85 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. TXU Electric shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Gramm, Chief, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: April 20, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 85  
TO FACILITY OPERATING LICENSE NO. NPF-87  
AND AMENDMENT NO. 85  
FACILITY OPERATING LICENSE NO. NPF-89  
DOCKET NOS. 50-445 AND 50-446

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
3.3-45	3.3-45
3.3-47	3.3-47

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
	<u>OR</u> 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
	<u>OR</u> E.2.1 Declare both offsite power source buses inoperable.	1 hour
	<u>AND</u> 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



Table 3.3.5-1 (page 1 of 1)  
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
1. Automatic Actuation Logic and Actuation Relays	2 trains	3.3.5.1	NA	
2. Preferred offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	$\leq 5580 \text{ V}$ and $\geq 5040 \text{ V}$	
3. Alternate offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	$\leq 5580 \text{ V}$ and $\geq 5040 \text{ V}$	
4. 6.9 kv Class 1E bus loss of voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	$\leq 2115 \text{ V}$	
5. 6.9 kv Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	$\geq 6024 \text{ V}$	
6. 480 V Class 1E bus low grid undervoltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	$\geq 439 \text{ V}$	
7. 480 V Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	$\geq 439 \text{ V}$	



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

**SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

**RELATED TO AMENDMENT NO. 85 TO**

**FACILITY OPERATING LICENSE NO. NPF-87**

**AND AMENDMENT NO. 85 TO**

**FACILITY OPERATING LICENSE NO. NPF-89**

**TXU ELECTRIC**

**COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2**

**DOCKET NOS. 50-445 AND 50-446**

**1.0 INTRODUCTION**

By application dated May 17, 2000, as supplemented by letters dated August 31, 2000, and January 31, 2001, TXU Electric (the licensee) requested changes to the Technical Specifications (TSs) for the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2. The proposed changes would revise the Allowable Values specified in TS Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to ensure that the 6.9 kiloVolt (kV) and 480 Volt (V) undervoltage relays initiate the necessary actions when required. In addition, a change would be made to Condition D of TS 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to eliminate the term "undervoltage." This change is consistent with a proposed change to TS Table 3.3.5-1. The supplements dated August 31, 2000, and January 31, 2001, were referenced in the U.S. Nuclear Regulatory Commission (NRC) staff's proposed no significant hazard consideration determination related to the May 17, 2000, application, published in the *Federal Register* on March 21, 2001 (66 FR 15930).

**2.0 BACKGROUND**

The emergency diesel generators (EDGs) provide a source of emergency power when offsite power is either unavailable or degraded. Undervoltage protection will generate a LOP EDG start signal if a loss of voltage or degraded voltage condition occurs in the 6.9 kV Class 1E bus. Each CPSES unit has a designated preferred offsite power source and a designated alternate offsite power source. The preferred offsite power source normally energize the 6.9 kV Class 1E buses. If the preferred offsite power source is lost, the 6.9 kV 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 EDGs are started to energize the 6.9 kV Class 1E buses. Undervoltage and degraded voltage protection on the 480 V Class 1E buses supplement the protection provided on the 6.9 kV buses.

The undervoltage protection system, leading to the start of the EDGs on LOP, consists of the following groups:

- preferred offsite source undervoltage
- alternate offsite source undervoltage
- 6.9 kV Class 1E bus loss of voltage
- 480V Class 1E bus low grid undervoltage
- 6.9 kV Class 1E degraded voltage
- 480V Class 1E bus degraded voltage

TS 3.3.5 provides the operability requirements for the LOP EDG start instrumentation. The nominal relay settings are listed in the Bases, Table B 3.3.5-1; the allowable values are listed in TS Table 3.3.5-1.

The licensee indicated that, as part of a recent review of the TS Bases, it evaluated the accumulated error for the undervoltage, degraded voltage, loss of voltage, and low grid undervoltage relay channels, accounting for potential transformer accuracy, temperature, and direct current input voltage impact on relay accuracy, relay repeatability, and calibration errors. From this review, it concluded that the margin between the TS allowable value and the nominal trip setting was not sufficient to allow for the expected relay drift and repeatability. Furthermore, the licensee determined that the TS allowable values included inadequate uncertainty allowances.

The licensee proposes to revise TS Table 3.3.5-1 allowable values as follows:

- 1) Preferred and alternate source bus undervoltage trip function. Revise the allowable value for preferred and alternate source bus undervoltage range from " $\geq 4900$  V and  $\leq 5900$  V" to " $\geq 5040$  V and  $\leq 5580$  V".
- 2) 6.9 kV Class 1E bus loss of voltage trip function. Delete the lower limit allowable value of " $\geq 1935$  V" and decrease the upper limit value from " $\leq 3450$  V" to " $\leq 2115$  V." Also, the designation of this relay is changed from "6.9 kV Class 1E bus undervoltage loss of voltage" to "6.9 kV Class 1E bus loss of voltage" to better clarify the relay function.
- 3) 6.9 kV Class 1E bus degraded voltage trip function. Revise the 6.9 kV Class 1E bus degraded voltage allowable value from " $\geq 5933$  V" to " $\geq 6024$  V."
- 4) 480 V Class 1E bus low grid undervoltage and 480 V Class 1E bus degraded voltage trip functions. Revise the Class 1E bus low grid undervoltage and degraded voltage allowable values from " $\geq 443$  V" and " $\geq 435$  V," respectively, to " $\geq 439$  V."

In addition, the licensee proposed a change to Condition D of TS 3.3.5 to eliminate the term "undervoltage." This change is consistent with a proposed change to the 6.9 kV Class 1E bus loss of voltage instrumentation function.

The licensee included changes to TS Bases to implement the proposed changes to the TS to include the revised trip setpoints in TS Table B 3.3.5-1 associated with the revised allowable values in the proposed TS above. The licensee also included the changes to the CPSES FSAR to include the effects of the analyses performed by the licensee in support of this proposed amendment request.

### 3.0 EVALUATION

The NRC staff has evaluated the proposed revised allowable values submitted by the licensee as follows:

- 1) Preferred and alternate source bus undervoltage trip function. Revise the allowable value for preferred and alternate source bus undervoltage range from " $\geq 4900$  V and  $\leq 5900$  V" to " $\geq 5040$  V and  $\leq 5580$  V."

The lower voltage limits on the preferred and alternate offsite source bus undervoltage trip function is provided to assure that the 6.9 kV system motors will not be exposed to a sustained voltage of less than 75% of their rating. The safety function of these undervoltage relays is to isolate the Class 1E loads from the offsite power source before the 6.9 kV motor voltage approaches 75% of 6.6 kV. The voltage is sensed on the low voltage side of the startup transformer and the licensee defines this design safety limit as a bus voltage of  $\geq 4980$  V. The licensee defined the TS allowable value as a voltage of  $\geq 5040$  V. The proposed revision on the lower limit of  $\geq 5040$  V for preferred and alternate source bus undervoltage is to ensure that 6.9 kV motors will not be exposed to a sustained voltage of less than 75% of their rating. Based on the above discussion, the NRC staff finds the proposed revision to the TS to be acceptable.

The licensee proposed to change upper limit, allowable value, of the preferred and alternate offsite source bus voltage from  $\leq 5900$  V to  $\leq 5580$  V. The purpose of the upper voltage limit on these undervoltage relays is to prevent unnecessary trips of offsite power and unnecessary EDG starts due to normal plant operation such as motor start transients. If these 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. Decreasing the preferred and alternate offsite source bus voltage from  $\leq 5900$  V to  $\leq 5580$  V decreases the likelihood of unnecessary trips of offsite power and unnecessary EDG starts due to normal plant operation such as motor start transients. The licensee, in the January 31, 2001, supplemental letter, evaluated the minimum voltage at 6.9 kV buses, during motor start as  $> 5767$  V; therefore, the corresponding TS value of  $\leq 5580$  V is acceptable.

- 2) 6.9 kV Class 1E bus loss of voltage trip function. Delete the lower limit allowable value of " $\geq 1935$  V" and decrease the upper limit allowable value from " $\leq 3450$  V" to " $\leq 2115$  V." Also, the designation of this relay is changed from "6.9 kV Class 1E bus

undervoltage loss of voltage" to "6.9 kV Class 1E bus loss of voltage" to better clarify the relay function.

The 6.9 kV Class 1E bus loss of voltage function verifies the dead bus status. This function assures that the bus voltage has dropped low enough to be energized from another source and not result in Class 1E equipment damage. A residual voltage of 31.5% assures that a motor connected to the bus is not exposed to more than 1.33 V per hertz on bus re-energization. The licensee defines the safety limit as a voltage of  $\leq 2174$  V and TS allowable value as a voltage of  $\leq 2115$  V. The current lower limit of  $\geq 1935$  V does not provide a setpoint that ensures that automatic protective action will correct an abnormal situation before a safety limit is exceeded. Any voltage below the proposed limit will also meet the safety requirement of the functions; therefore, the lower limit does not need to be in the TS. Based on the above discussion, the NRC staff finds the proposed revisions to 6.9 kV Class 1E bus loss of voltage allowable values acceptable.

The deletion of the term "undervoltage" from the description of this relay, and in Condition D of TS 3.3.5, does not change any safety function of the instrumentation, better defines the relay function, and is acceptable.

- 3) 6.9 kV Class 1E bus degraded voltage trip function. Revise the 6.9 kV Class 1E bus degraded voltage allowable value from " $\geq 5933$  V" to " $\geq 6024$  V."

The 6.9 kV Class 1E bus degraded voltage function is provided to protect 6.9 kV system motors from sustained operation at less than 90% of motor rated voltage. The licensee defines this safety limit as a bus voltage of  $\geq 5965$  V and the TS allowable value as a voltage of  $\geq 6024$  V. The 6.9 kV Class 1E bus degraded voltage relays, via time delays, will trip the 6.9 kV bus source breaker after approximately 60 seconds. In the event of a safety injection (SI) signal, source breakers are tripped after approximately 8 seconds. The NRC staff requested that the licensee confirm that voltages just above the set point are adequate to allow all equipment to start and operate at all voltage levels down to and including the 120 V level. In response to the NRC staff's request, the licensee stated, in the August 31, 2000, supplemental letter, that adequate voltage at safety related loads has been evaluated for degraded voltage safety limits of 5965 V at 6.9 kV switchgear buses. The bus degraded voltage has a TS allowable value of 6024 V and a trip set point of 6192 V at the 6.9 kV bus. These values are higher than the safety limit values evaluated by the licensee. The licensee also confirmed that the voltages at these allowable and trip set point values would allow all equipment to start and operate properly at all voltage levels down to and including the 120 V level. Based on the above discussion, the NRC staff finds that the proposed changes to the 6.9 kV Class 1E bus degraded voltage allowable value to be acceptable.

- 4) 480 V Class 1E bus low grid undervoltage and 480 V Class 1E bus degraded voltage trip functions. Revise the Class 1E bus low grid undervoltage and degraded voltage allowable values from " $\geq 443$  V" and " $\geq 435$  V," respectively, to " $\geq 439$  V".

The 480 V Class 1E bus low grid undervoltage and the 480 V Class 1E bus degraded voltage trip functions protect 480 V system motors from sustained

operation at less than 90% of motor rated voltages. The licensee defines this limit as a bus voltage of  $\geq 435$  V and the TS allowable value as a voltage of  $\geq 439$  V. The 480 V Class 1E bus degraded voltage relays, via time delays, will trip the 6.9 kV bus source breaker after approximately 60 seconds. In the event of an SI signal, source breakers are tripped after approximately 8 seconds. Although the allowable values for both of these functions are at the same value, the licensee indicated that trip set points for 480 V Class 1E bus low grid undervoltage are set by the calibration procedures to actuate before the 480 V Class 1E bus degraded voltage function to provide an early notification of low grid conditions. The 480 V Class 1E bus low grid voltage trip function actuates an alarm if the condition persists for approximately 60 seconds and will trip the 6.9 kV safety related source breaker if a SI signal is present. The 480 V Class 1E bus low grid undervoltage and the 480 V Class 1E bus degraded voltage trip functions supplement the protection of the 6.9 kV Class 1E bus degraded voltage. The current TS allowable value of the 480 V Class 1E bus low grid undervoltage instrumentation,  $\geq 443$  V, is too conservative and could result in unnecessary EDG starts. The proposed revised allowable value of  $\geq 439$  V prevents unnecessary EDG starts and protects the 480 V system motors from sustained operation at less than 90% of motor rated voltages. The current TS allowable value of 480 V Class 1E bus degraded voltage instrumentation,  $\geq 435$  V, was not sufficient to protect the 480 V system motor from operation at less than 90% of motor rated voltages. The proposed revised allowable value of  $\geq 439$  V is more conservative and protects the 480 V system motors from degraded voltage conditions.

Based on the discussion above, the NRC staff finds the proposed revisions to the allowable values, for 480 V Class 1E bus low grid undervoltage and 480 V Class 1E bus degraded voltage, acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Texas State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (66 FR15930, published March 21, 2001). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: D. Nguyen  
D. Jaffe

Date: April 20, 2001