

Mr. C. Lance Terry  
TU Electric  
Group Vice President, Nuclear  
Attn: Regulatory Affairs Department  
P. O. Box 1002  
Glen Rose, TX 76043

March 27, 1998

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 -  
AMENDMENT NOS. 57 AND 43 TO FACILITY OPERATING LICENSE NOS.  
NPF-87 AND NPF-89 (TAC NOS. M99847 AND M99848)

Dear Mr. Terry:

The Commission has issued the enclosed Amendment Nos. 57 and 43 to Facility Operating License Nos. NPF-87 and NPF-89 for the Comanche Peak Steam Electric Station (CPSES), Units 1 and 2. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated October 24, 1997 (TXX-97228).

The amendments revised core safety limit curves and Overtemperature N-16 reactor trip setpoints based on analyses of the core configuration and expected operation for CPSES Unit 1, Cycle 7. The changes apply equally to CPSES Units 1 and 2 licenses since the Technical Specifications are combined.

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,  
ORIGINAL SIGNED BY:  
Timothy J. Polich, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosures: 1. Amendment No. 57 to NPF-87  
2. Amendment No. 43 to NPF-89  
3. Safety Evaluation

cc w/encs: See next page

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Document Name: CP99847.AMD

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

March 27, 1998

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Group Vice President, Nuclear  
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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 cursive script, reading "Timothy J. Polich".

Timothy J. Polich, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosures: 1. Amendment No.57 to NPF-87  
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3. Safety Evaluation

cc w/encls: See next page

Mr. C. Lance Terry  
TU Electric Company

Comanche Peak, Units 1 and 2

cc:

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

TEXAS UTILITIES ELECTRIC COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1  
DOCKET NO. 50-445  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 57  
License No. NPF-87


1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Texas Utilities Electric Company (TU Electric, the licensee) dated October 24, 1997 (TXX-97228), 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. 57, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The licensee 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 to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Timothy J. Polich, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: March 27, 1998



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

TEXAS UTILITIES ELECTRIC COMPANY  
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 2  
DOCKET NO. 50-446  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 43  
License No. NPF-89


1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Texas Utilities Electric Company (TU Electric, the licensee) dated October 24, 1997 (TXX-97228), 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. 43, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. TU 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 to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Timothy J. Polich, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: March 27, 1998

ATTACHMENT TO LICENSE AMENDMENT NOS. 57 AND 43

FACILITY OPERATING LICENSE NOS. NPF-87 AND NPF-89

DOCKET NOS. 50-445 AND 50-446

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE

2-2  
2-9  
2-10  
2-11

INSERT

2-2  
2-9  
2-10  
2-11



## 2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

### 2.1 SAFETY LIMITS

#### REACTOR CORE

2.1.1 The combination of THERMAL POWER, pressurizer pressure, and the highest operating loop coolant temperature ( $T_{avg}$ ) shall not exceed the limits shown in Figure 2.1-1.

APPLICABILITY: MODES 1 and 2.

#### ACTION:

Whenever the point defined by the combination of the highest operating loop average temperature and THERMAL POWER has exceeded the appropriate pressurizer pressure line, be in HOT STANDBY within 1 hour, and comply with the requirements of Specification 6.7.1.

#### REACTOR COOLANT SYSTEM PRESSURE

2.1.2 The Reactor Coolant System pressure shall not exceed 2735 psig.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

#### ACTION:

MODES 1 and 2:

Whenever the Reactor Coolant System pressure has exceeded 2735 psig, be in HOT STANDBY with the Reactor Coolant System pressure within its limit within 1 hour, and comply with the requirements of Specification 6.7.1.

MODES 3, 4 and 5:

Whenever the Reactor Coolant System pressure has exceeded 2735 psig, reduce the Reactor Coolant System pressure to within its limit within 5 minutes, and comply with the requirements of Specification 6.7.1.

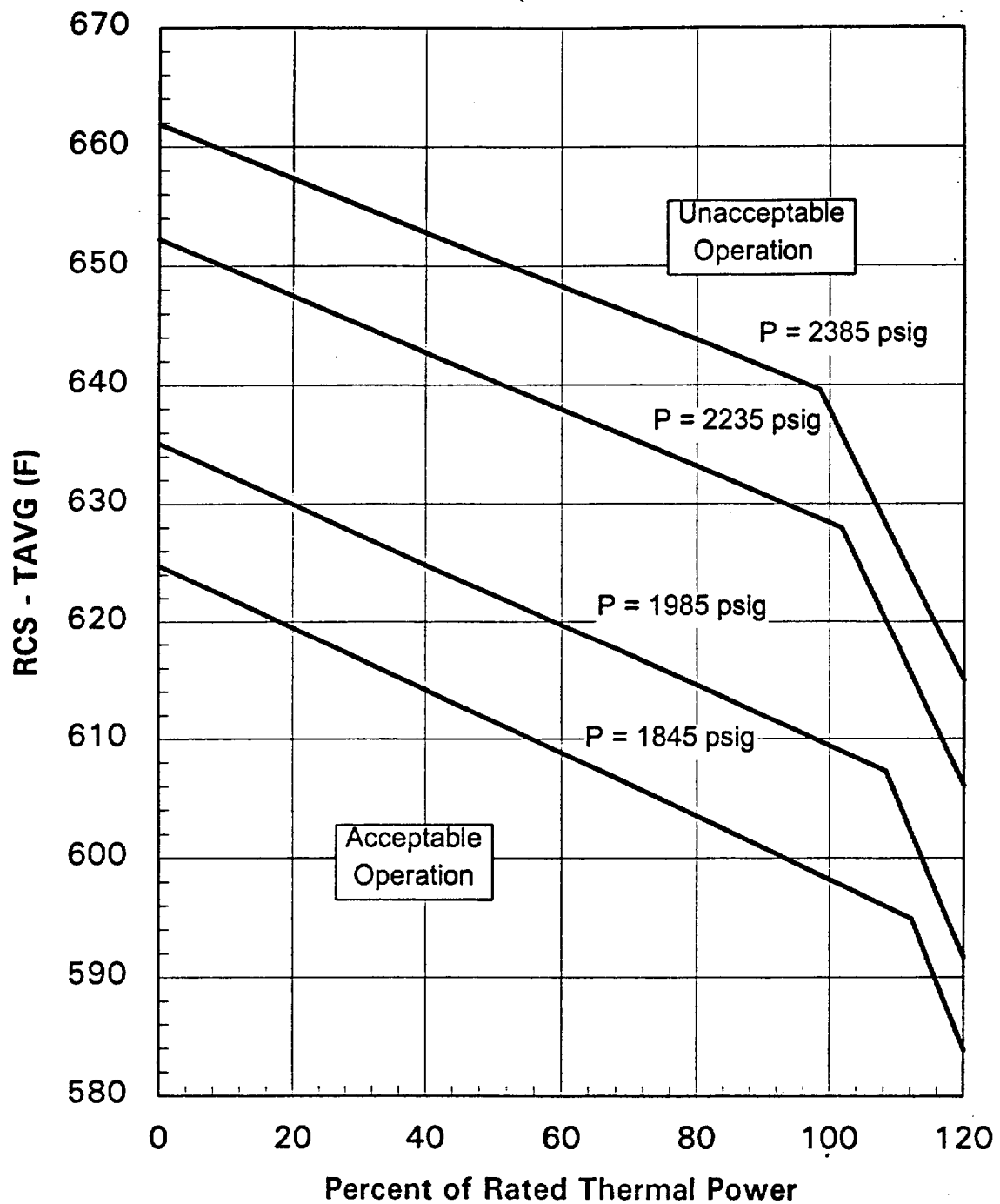


FIGURE 2.1-1a

UNIT 1 REACTOR CORE SAFETY LIMITS

TABLE 2.2-1 (Continued)

TABLE NOTATIONS

NOTE 1: Overtemperature N-16

$$N = K_1 - K_2 \frac{[1 + T_1 S]}{1 + T_2 S} T_c - T_c^\circ + K_3 (P - P^1) - f_1 (\Delta q)$$

Where:

N = Measured N-16 Power by ion chambers,

$T_c$  = Cold leg temperature, °F,

$T_c^\circ$  = 560.5°F for Unit 1, 560.8°F for Unit 2 - Reference  $T_c$  at RATED THERMAL POWER,

$K_1$  = 1.150,

$K_2$  = 0.0148/°F for Unit 1  
0.0138/°F for Unit 2

$\frac{1 + T_1 S}{1 + T_2 S}$  = The function generated by the lead-lag controller for  $T_c$  dynamic compensation,

$T_1, T_2$  = Time constants utilized in the lead-lag controller for  $T_c$ ,  $T_1 \geq 10$  s, and  $T_2 \leq 3$  s,

$K_3$  = 0.00080/psig for Unit 1  
0.000720/psig for Unit 2

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

- P = Pressurizer pressure, psig,  
P<sup>1</sup> ≥ 2235 psig (Nominal RCS operating pressure),  
S = Laplace transform operator, s<sup>-1</sup>,

and  $f_1(\Delta q)$  is a function of the indicated difference between top and bottom halves of detectors of the power-range neutron ion chambers; with gains to be selected based on measured instrument response during plant STARTUP tests such that:

For Unit 1

- (i) for  $q_t - q_b$  between -65% and +5.0%,  $f_1(\Delta q) = 0$ , where  $q_t$  and  $q_b$  are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and  $q_t + q_b$  is total THERMAL POWER in percent of RATED THERMAL POWER,
  - (ii) for each percent that the magnitude of  $q_t - q_b$  exceeds -65%, the N-16 Trip Setpoint shall be automatically reduced by 0.0%\* of its value at RATED THERMAL POWER, and
  - (iii) for each percent that the magnitude of  $q_t - q_b$  exceeds +5.0%, the N-16 Trip Setpoint shall be automatically reduced by 2.15% of its value at RATED THERMAL POWER.
- \* No setpoint reduction is required for the span of the  $\Delta I$  indication.

TABLE 2.2-1 (Continued)  
TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

For Unit 2

- (i) for  $q_t - q_b$  between -65% and +7.5%,  $f_1(\Delta q) = 0$ , where  $q_t$  and  $q_b$  are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and  $q_t + q_b$  is total THERMAL POWER in percent of RATED THERMAL POWER,
- (ii) for each percent that the magnitude of  $q_t - q_b$  exceeds -65%, the N-16 Trip Setpoint shall be automatically reduced by 0.0%\* of its value at RATED THERMAL POWER, and
- (iii) for each percent that the magnitude of  $q_t - q_b$  exceeds +7.5%, the N-16 Trip Setpoint shall be automatically reduced by 2.00% of its value at RATED THERMAL POWER.

\* No setpoint reduction is required for the span of the  $\Delta I$  indication.

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 1.72% of span for Unit 1 or 1.66% of span for Unit 2.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 57 AND 43 TO

FACILITY OPERATING LICENSE NOS. NPF-87 AND NPF-89

TEXAS UTILITIES ELECTRIC COMPANY

COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By application dated October 24, 1997 (TXX-97228), Texas Utilities Electric Company (TU Electric/the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License Nos. NPF-87 and NPF-89) for the Comanche Peak Steam Electric Station, Units 1 and 2. The proposed changes would revise core safety limit curves and Overtemperature N-16 reactor trip setpoints based on analyses of the core configuration for CPSES Unit 1, Cycle 7. The specific changes are to TS Figure 2.1-1a, Unit 1 Reactor Core Safety Limits and TS Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," Units 1 and 2. These changes are required due to the change in core configuration for CPSES Unit 1, Cycle 7 refueling.

2.0 BACKGROUND

The core safety limits are the set of points of Thermal Power, Reactor Coolant System (RCS) pressure, and average temperature below which (1) the calculated Departure from Nucleate Boiling Ratio (DNBR) is no less than the safety analysis limit value, or (2) the average enthalpy at the vessel exit is less than the enthalpy of saturated liquid. The significant parameters used to determine these lines include the RCS flow rate, the design nuclear enthalpy rise hot channel factor ( $F_{\Delta H}$ ), the cycle-specific reference axial power shape, and the cycle-specific core configuration.

To avoid exceeding the core safety limits during operation, the Overtemperature N-16 reactor trip initiates a reactor trip before the limits are exceeded, providing DNB protection from events that impact power, pressure, temperature, or axial power shape. The setpoint for the N-16 trip is continuously calculated for each loop by analog circuitry by solving the setpoint equation that includes the trip reset function term,  $f(\Delta I)$ .

The actual core power is measured on each loop with an N-16 power meter and used as a comparison to the calculated trip setpoint. Should an axial power distribution occur during operation that is more severe than the reference axial power shape, the trip reset function term of the setpoint equation, reduces the trip setpoint to account for the resultant effects. The range over which the Overtemperature N-16 trip setpoint is calculated is bounded by the pressurizer pressure low, the pressurizer pressure high and the overpower reactor trip setpoints. The power/temperature range that the Overtemperature N-16 trip must provide DNB protection is further limited by the operation of the Main Steam Safety Valves.

### 3.0 EVALUATION

The Unit 1, Cycle 7 core configuration consists of 192 fuel assemblies manufactured by Siemens Power Company and 1 fuel assembly manufactured by Westinghouse Electric Company. The mixed-core penalty for Cycle 7 is the same as Cycle 6. The licensee also calculated the Unit 1, Cycle 7 axial power distributions to be more skewed toward the top half of the core than those calculated for Unit 1, Cycle 6. Therefore, it was necessary for the licensee to change the  $f(\Delta I)$  trip function of the Overtemperature N-16 trip setpoint to reflect the Unit 1, Cycle 7 core configuration.

The licensee indicated that they used NRC-approved methodologies as stated in TS 6.9.1.6.b Items 9, 10, 11, 12, 13, and 14 to determine the new reactor core safety limit curves for Unit 1, TS figure 2.1-1a. The resultant core safety limit curves were evaluated by NRC-approved analytical methods to determine the appropriate values of  $K_1$ ,  $K_2$ , and  $K_3$ , coefficients of the overtemperature setpoint and the  $f(\Delta I)$  trip reset function as noted below:

In TS Table 2.2-1, Note 1 for the Overtemperature N-16 Trip Setpoint, the following terms have been changed for Unit 1:

- $K_2$  revised from 0.0173 to 0.0148/°F
- $K_3$  revised from 0.000890 to 0.00080/psig
- $q_t-q_b$  range from -65% and +4.6% to -65% and +5.0%
- Automatic Overtemperature N-16 setpoint reduction for each percent that the magnitude of  $q_t-q_b$  exceeds +5.0% (current value +4.6%) is decreased from 3.04% to 2.15%.

In TS Table 2.2-1, Note 2 for the Overtemperature N-16 Allowable Value, the maximum amount by which the Trip Setpoint is allowed to exceed the computed Trip Setpoint, is decreased from 3.64% to 1.72%.

The licensee determined that the CPSES Final Safety Analysis Report (FSAR) Chapter 15 event most affected by the change in the Overtemperature N-16 trip setpoint is Section 15.4.2, "Rod Withdrawal at Power." The licensee reanalyzed the event using NRC-approved methodologies listed in TS 6.9.1.6.b Items 9, 10, 11, 12, 13, and 14 and determined that all relevant acceptance criteria were satisfied.

The licensee has requested to change TS Figure 2.1-1a, Unit 1 Reactor Core Safety Limits and TS Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," Units 1 and 2 to accommodate changes due to the designed core configuration for Unit 1, Cycle 7. The staff has reviewed the changes to verify that all safety criteria have been satisfied. The proposed revisions to the safety limit curves and the trip setpoints, and the use of NRC-approved methodologies will provide assurance of DNB margin. Therefore, the staff finds the licensee's requested changes 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 (62 FR 61847). 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: M. Gamberoni

Date: March 27, 1998