April 4, 1995

Mr. C. Lance Terry
Group Vice President, Nuclear
TU Electric
Energy Plaza
1601 Bryan Street, 12th Floor
Dallas, Texas 75201-3411

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 - AMENDMENT NOS. 36 AND 22 TO FACILITY OPERATING LICENSE NOS. NPF-87 AND NPF-89 (TAC NOS. M88952 AND M88953)

Dear Mr. Terry:

The Commission has issued the enclosed Amendment Nos. 36 and 22 to Facility Operating License Nos. NPF-87 and NPF-89 for the Comanche Peak Steam Electric Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated February 14, 1994 (TXX-94008), as supplemented by letters dated May 17, 1994 (TXX-94142), and April 3, 1995 (TXX-95098).

The amendments revise TS 3/4.2.4, "Quadrant Power Tilt Ratio," by replacing the existing TSs and associated Bases concerning the quadrant power tilt ratio with a TS consistent with the improved Standard Technical Specifications (NUREG-1431).

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. 36 to NPF-87
2. Amendment No. 22 to NPF-89
3. Safety Evaluation

cc w/encls: See next page

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Document Name: CP88952.AMD *See previous concurrence

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

April 4, 1995

Mr. C. Lance Terry
Group Vice President, Nuclear
TU Electric
Energy Plaza
1601 Bryan Street, 12th Floor
Dallas, Texas 75201-3411

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Mr. C. Lance Terry
TU Electric Company

Comanche Peak, Units 1 and 2

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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. 36
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 February 14, 1994 (TXX-94008), supplemented by letters dated May 17, 1994 (TXX-94142), and April 3, 1995 (TXX-95098), 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. 36, 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 within 30 days of the date of issuance.

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: April 4, 1995

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. 22
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 February 14, 1994 (TXX-94008), as supplemented by letters dated May 17, 1994 (TXX-94142), and April 3, 1995 (TXX-95098), 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. 22, 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 within 30 days of the date of issuance.

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: April 4, 1995

ATTACHMENT TO LICENSE AMENDMENT NOS. 36 AND 22

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	INSERT
xi	xi
1-5	1-5
3/4 2-10	3/4 2-10
3/4 2-11	3/4 2-11
3/4 3-5	3/4 3-5
B 3/4 2-5	B 3/4 2-5
B 3/4 2-6	B 3/4 2-6
-	B 3/4 2-7
-	B 3/4 2-8
-	B 3/4 2-9
-	B 3/4 2-10
-	B 3/4 2-11

INDEX

BASES

BASES

PRIMARY PLANT VENTILATION SYSTEM

1.24 A PRIMARY PLANT VENTILATION SYSTEM shall be any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment. Such a system is not considered to have any effect on noble gas effluents.

PROCESS CONTROL PROGRAM

1.25 The PROCESS CONTROL PROGRAM (PCP) shall contain the current formulas, sampling, analyses, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Parts 20, 61, and 71, State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

PURGE - PURGING

1.26 PURGE or PURGING shall be any controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

QUADRANT POWER TILT RATIO

1.27 QUADRANT POWER TILT RATIO shall be the ratio of the maximum upper half excore detector calibrated output to the average of the upper half excore detector calibrated outputs, or the ratio of the maximum lower half excore detector calibrated output to the average of the lower half excore detector calibrated outputs, whichever is greater. With one excore detector inoperable and power $\leq$ 75% RTP, the remaining three detectors shall be used for computing the average. With one excore detector inoperable and power above 75% RTP, the movable incore detectors shall be used to determine quadrant power and average power based on the relationship between incore and excore power using the most recent flux maps.

RATED THERMAL POWER

1.28 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 3411 MWt.

REACTOR TRIP SYSTEM RESPONSE TIME

1.29 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until loss of stationary gripper coil voltage.

REPORTABLE EVENT

1.30 A REPORTABLE EVENT shall be any of those conditions specified in 10 CFR 50.73.

SHUTDOWN MARGIN

1.31 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all rod cluster assemblies (shutdown and control) are fully inserted except for the single rod cluster assembly of highest reactivity worth which is assumed to be fully withdrawn.

SITE BOUNDARY

1.32 The SITE BOUNDARY shall be that line as shown in Figure 5.1-3.

SLAVE RELAY TEST

1.33 A SLAVE RELAY TEST shall be the energization of each slave relay and verification of OPERABILITY of each relay. The SLAVE RELAY TEST shall include a continuity check, as a minimum, of associated testable actuation devices.

SOURCE CHECK

1.34 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a source of increased radioactivity.

STAGGERED TEST BASIS

1.35 A STAGGERED TEST BASIS shall consist of:

a. A test schedule for n systems, subsystems, trains, or other designated components obtained by dividing the specified test interval into n equal subintervals, and

b. The testing of one system, subsystem, train, or other designated component at the beginning of each subinterval.

THERMAL POWER

1.36 THERMAL POWER shall be the total core heat transfer rate to the reactor coolant.

TRIP ACTUATING DEVICE OPERATIONAL TEST

1.37 A TRIP ACTUATING DEVICE OPERATIONAL TEST shall consist of operating the Trip Actuating Device and verifying OPERABILITY of alarm, interlock and/or trip functions. The TRIP ACTUATING DEVICE OPERATIONAL TEST shall include adjustment, as necessary, of the Trip Actuating Device such that it actuates at the required setpoint within the required accuracy.

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 $F^N_{\Delta H}$ shall be determined to be within its limit by using the movable incore detectors to obtain a power distribution map:

a. Prior to operation above 75% of RATED THERMAL POWER after each fuel loading,

b. At least once per 31 Effective Full Power Days, and

c. The measured $F^N_{\Delta H}$ shall be increased by 4% for measurement uncertainty.

3/4.2.4 QUADRANT POWER TILT RATIO

LIMITING CONDITION FOR OPERATION

3.2.4 The QUADRANT POWER TILT RATIO shall not exceed 1.02.

APPLICABILITY: MODE 1, above 50% of RATED THERMAL POWER*.

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02:

1. a) Within 2 hours, reduce THERMAL POWER by at least 3% from RATED THERMAL POWER for each 1% of QUADRANT POWER TILT RATIO in excess of 1,

   b) At least once per 12 hours, calculate the QUADRANT POWER TILT RATIO and reduce THERMAL POWER by at least 3% from RATED THERMAL POWER for each 1% of QUADRANT POWER TILT RATIO in excess of 1, and

   c) Within 24 hours, and once per 7 days thereafter, confirm that the Heat Flux Hot Channel Factor $F_Q(Z)$, is within its limit by performing Surveillance Requirement 4.2.2.2 and confirm that Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$, is within its limit by performing Surveillance Requirement 4.2.3.2.;

2. Prior to increasing THERMAL POWER above the limit of Action a.1:

   a) Re-evaluate the safety analyses and confirm that the results remain valid for the duration of operation under this condition, and then

   b) Calibrate excore detectors to show zero QPTR;

3. After Action a.2 is completed and within 24 hours of reaching RATED THERMAL POWER, or within 48 hours of increasing THERMAL POWER above the limit of ACTION a.1, confirm that $F_Q(Z)$ is within its limit by performing Surveillance Requirement 4.2.2.2 and that $F^N_{\Delta H}$ is within its limit by performing Surveillance Requirement 4.2.3.2; and

4. If the requirements of a.1, a.2 or a.3 above are not met, reduce THERMAL POWER to ≤ 50% of Rated Thermal Power within the next 4 hours.

---

*See Special Test Exceptions Specification 3.10.2.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE,

b. Calculating the ratio at least once per 12 hours when the alarm is inoperable, and

c. Calculating the ratio at least once per 12 hours when above 75% RATED THERMAL POWER with one Power Range channel inoperable.

3/4.2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB-related parameters shall be maintained within the stated limits:

a. Indicated Reactor Coolant System $T_{avg} \leq 592°F$

b. Indicated Pressurizer Pressure ≥ 2219 psig*

c. Indicated Reactor Coolant System (RCS) Flow ≥ 403,400 gpm** for Unit 1
≥ 395,200 gpm** for Unit 2

APPLICABILITY: MODE 1.

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5.1 Each of the above parameters shall be verified to be within its limits at least once per 12 hours.

4.2.5.2 The RCS total flow rate shall be verified to be within its limits at least once per 31 days by plant computer indication or measurement of the RCS elbow tap differential pressure transmitters' output voltage.

4.2.5.3 The RCS loop flow rate indicators shall be subjected to a CHANNEL CALIBRATION at least once per 18 months. The channels shall be normalized based on the RCS flow rate determination of Surveillance Requirement 4.2.5.4.

4.2.5.4 The RCS total flow rate shall be determined by precision heat balance measurement after each fuel loading and prior to operation above 85% of RATED THERMAL POWER. The feedwater pressure and temperature, the main steam pressure, and feedwater flow differential pressure instruments shall be calibrated within 90 days of performing the calorimetric flow measurement.

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*Limit not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% of RATED THERMAL POWER.

**Includes a 1.8% flow measurement uncertainty.

TABLE 3.3-1 (Continued)

TABLE NOTATIONS

[a]Only if the reactor trip breakers happen to be in the closed position and the Control Rod Drive System is capable of rod withdrawal.

[b]Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

[c]Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

[d]Above the P-7 (At Power) Setpoint

[e]The applicable MODES and ACTION statements for these channels noted in Table 3.3-2 are more restrictive and therefore, applicable.

[f]Above the P-8 (3-loop flow permissive) Setpoint.

[g]Above the P-7 and below the P-8 Setpoints.

[h]The boron dilution flux doubling signals may be blocked during reactor startup.*

[i]Above the P-9 (Reactor trip on Turbine trip Interlock) Setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours,

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1, and

c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.1.

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*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint,

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or within the next hour open the reactor trip breakers and suspend all operations involving positive reactivity changes. With no channels OPERABLE complete the above actions within 4 hours.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

When an F_Q measurement is taken, an allowance for both experimental error and manufacturing tolerance must be made. An allowance of 5% is appropriate for a full-core map taken with the Incore Detector Flux Mapping System, and a 3% allowance is appropriate for manufacturing tolerance.

The heat flux hot channel factor $F_Q(Z)$ is measured periodically and increased by a cycle and height dependent power factor appropriate to Constant Axial Offset Control (CAOC) operation, W(Z), to provide assurance that the limit on the heat flux hot channel factor, $F_Q(Z)$, is met. W(Z) accounts for the effects of normal operation transients within the AFD band and was determined from expected power control maneuvers over the range of burnup conditions in the core. The W(Z) function is provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.6.

When $F^N_{\Delta H}$ is measured, an adjustment for measurement uncertainty must be included for a full-core flux map taken with the Incore Detector Flux Mapping System.

$F_Q(Z)$ should be measured with the reactor core at, or near, equilibrium conditions. Therefore, the effects of transient maneuvers, such as power increases, should be permitted to decay to the extent possible while assuring that flux maps are taken in accordance with the specified surveillance schedules.

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR)

BACKGROUND

The QPTR limit ensures that the gross radial power distribution remains consistent with the design values used in the safety analyses. Precise radial power distribution measurements are made during startup testing, after refueling, and periodically during power operation.

The power density at any point in the core must be limited so that the fuel design criteria are maintained. Together, LCO 3/4.2.1, "AXIAL FLUX DIFFERENCE (AFD)," LCO 3/4.2.4, and LCO 3/4.1.3.6, "Control Rod Insertion Limits," provide limits on process variables that characterize and control the three dimensional power distribution of the reactor core. Control of these variables ensures that the core operates within the fuel design criteria and that the power distribution remains within the bounds used in the safety analyses.

APPLICABLE SAFETY ANALYSES

This LCO precludes core power distributions that violate the following fuel design criteria:

QUADRANT POWER TILT RATIO (QPTR) (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

a. During a large break loss of coolant accident, the peak cladding temperature must not exceed 2200°F (Ref. 1);

b. During a loss of forced reactor coolant flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 departure from nucleate boiling (DNB) criterion) that the hot fuel rod in the core does not experience a DNB condition;

c. During an ejected rod accident, the fission energy input to the fuel must not exceed 280 cal/gm (Ref. 2); and

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (Ref. 3).

The LCO limits on the AFD, the QPTR, the Heat Flux Hot Channel Factor ($F_Q(Z)$), the Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$), and control bank insertion are established to preclude core power distributions that exceed the safety analyses limits.

The QPTR limits ensure that $F^N_{\Delta H}$ and $F_Q(Z)$ remain below their limiting values by preventing an undetected change in the gross radial power distribution.

In MODE 1, the $F^N_{\Delta H}$ and $F_Q(Z)$ limits must be maintained to preclude core power distributions from exceeding design limits assumed in the safety analyses.

The QPTR satisfies Criterion 2 of the NRC Policy Statement on Technical Specification Improvement for Nuclear Power Reactors (58 FR 39132 of July 22, 1993).

LCO

The QPTR limit of 1.02, at which corrective action is required, provides a margin of protection for both the DNB ratio and linear heat generation rate contributing to excessive power peaks resulting from X-Y plane power tilts. A limiting QPTR of 1.02 can be tolerated before the margin for uncertainty in $F_Q(Z)$ and ($F^N_{\Delta H}$) is possibly challenged.

QUADRANT POWER TILT RATIO (QPTR) (Continued)

APPLICABILITY

The QPTR limit must be maintained in MODE 1 with THERMAL POWER > 50% RTP to prevent core power distributions from exceeding the design limits.

Applicability in MODE 1 ≤ 50% RTP and in other MODES is not required because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the reactor coolant to require the implementation of a QPTR limit on the distribution of core power. The QPTR limit in these conditions is, therefore, not important. Note that the $F^N_{\Delta H}$ and $F_Q(Z)$ LCOs still apply, but allow progressively higher peaking factors at 50% RTP or lower.

ACTIONS

a.1.a) With the QPTR exceeding its limit, a power level reduction of 3% from RTP for each 1% by which the QPTR exceeds 1.00 is a conservative tradeoff of total core power with peak linear power. The completion time of 2 hours allows sufficient time to identify the cause and correct the tilt. Note that the power reduction itself may cause a change in the tilted condition.

a.1.b) After completion of ACTION a.1.a), the QPTR alarm may still be in its alarmed state. As such, any additional changes in the QPTR are detected by requiring a check of the QPTR once per 12 hours thereafter. If the QPTR continues to increase, THERMAL POWER has to be reduced accordingly. A 12 hour completion time is sufficient because any additional change in QPTR would be relatively slow.

a.1.c) The peaking factors $F^N_{\Delta H}$ and $F_Q(Z)$ are of primary importance in ensuring that the power distribution remains consistent with the initial conditions used in the safety analyses. Performing SRs on $F^N_{\Delta H}$ and $F_Q(Z)$ within the completion time of 24 hours ensures that these primary indicators of power distribution are within their respective limits. A completion time of 24 hours takes into consideration the rate at which peaking factors are likely to change, and the time required to stabilize the plant and perform a flux map. If these peaking factors are not within their limits, the required actions of these Surveillances provide an appropriate response for the abnormal condition. If the QPTR remains above its specified limit, the peaking factor surveillances are required each 7 days thereafter to evaluate $F^N_{\Delta H}$ and $F_Q(Z)$ with changes in power distribution. Relatively small changes are expected due to either burnup and xenon redistribution or correction of the cause for exceeding the QPTR limit.

QUADRANT POWER TILT RATIO (QPTR) (Continued)

a.2.a) Although $F^N_{\Delta H}$ and $F_Q(Z)$ are of primary importance as initial conditions in the safety analyses, other changes in the power distribution may occur as the QPTR limit is exceeded and may have an impact on the validity of the safety analysis. A change in the power distribution can affect such reactor parameters as bank worths and peaking factors for rod malfunction accidents. When the QPTR exceeds its limit, it does not necessarily mean a safety concern exists. It does mean that there is an indication of a change in the gross radial power distribution that requires an investigation and evaluation that is accomplished by examining the incore power distribution. Specifically, the core peaking factors and the quadrant tilt must be evaluated because they are the factors that best characterize the core power distribution. This re-evaluation is required to ensure that, before increasing THERMAL POWER to above the limit of ACTION a.1, the reactor core conditions are consistent with the assumptions in the safety analyses.

a.2.b) If the QPTR has exceeded the 1.02 limit and a re-evaluation of the safety analysis is completed and shows that safety requirements are met, the excore detectors are recalibrated to show a zero QPTR (normalized to 1.00), prior to increasing THERMAL POWER to above the limit of ACTION a.1. This is done to detect any subsequent significant changes in QPTR.

ACTION a.2.b) states that the QPTR is zeroed out after the re-evaluation of the safety analysis has determined that core conditions at RTP are within the safety analysis assumptions (i.e., ACTION a.2.a)).

a.3 Once the flux tilt is zeroed out (i.e., ACTION a.2.b) is performed), it is acceptable to return to full power operation. However, as an added check that the core power distribution at RTP is consistent with the safety analysis assumptions, ACTION a.3 requires verification that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their specified limits within 24 hours of reaching RTP. As an added precaution, if the core power does not reach RTP within 24 hours, but is increased slowly, then the peaking factor surveillances must be performed within 48 hours of the time when the ascent to power was begun. These completion times are intended to allow adequate time to increase THERMAL POWER to above the limit of ACTION a.1, while not permitting the core to remain with unconfirmed power distributions for extended periods of time.

QUADRANT POWER TILT RATIO (QPTR) (Continued)

a.3 (Continued)

ACTION a.3 states that the peaking factor surveillances may only be done after the excore detectors have been calibrated to show zero tilt (i.e., ACTION a.2.b)). The intent is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are calibrated to show zero tilt and the core returned to power.

a.4 If ACTIONS a.1 through a.3 are not completed within their associated completion times, the unit must be brought to a MODE or condition in which the requirements do not apply. To achieve this status, THERMAL POWER must be reduced to < 50% RTP within 4 hours. The allowed completion time of 4 hours is reasonable, based on operating experience regarding the amount of time required to reach the reduced power level without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 4.2.4.1 SR 4.2.4.1 allows QPTR to be calculated with three power range channels if THERMAL POWER is < 75% RTP and one power range channel is inoperable.

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. The frequency of 7 days when the QPTR alarm is OPERABLE is acceptable because of the low probability that this alarm can remain inoperable without detection.

When the QPTR alarm is inoperable, the frequency is increased to 12 hours. This frequency is adequate to detect any relatively slow changes in QPTR, because for those causes of QPT that occur quickly (e.g., a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt.

Surveillance 4.2.4.1c) is required only when one power range channel is inoperable and the THERMAL POWER is ≥ 75% RTP.

With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are

QUADRANT POWER TILT RATIO (QPTR) (Continued)

SR 4.2.4.1 (Continued)

likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. Performing SR 4.2.4.1c) at a frequency of 12 hours provides an accurate alternative means for ensuring that any tilt remains within its limits.

For purposes of monitoring the QPTR when one power range channel is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. The incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8.

The symmetric thimble flux map can be used to generate symmetric thimble "tilt." This can be compared to a reference symmetric thimble tilt, from the most recent full core flux map, to generate an incore QPTR. Therefore, QPTR can be used to confirm that QPTR is within limits.

With one NIS channel inoperable, the indicated tilt may be changed from the value indicated with all four channels OPERABLE. To confirm that no change in tilt has actually occurred, which might cause the QPTR limit to be exceeded, the incore result may be compared against previous flux maps either using the symmetric thimbles as described above or a complete flux map. Nominally, quadrant tilt from the Surveillance should be within 2% of the tilt shown by the most recent flux map data.

REFERENCES

1. 10 CFR 50.46.

2. Regulatory Guide 1.77, Rev [0], May 1974.

3. 10 CFR 50, Appendix A, GDC 26.

3/4.2.5 DNB PARAMETERS

The limits on the DNB-related parameters assure that each of the parameters are maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR at or above the safety analysis limit value throughout each analyzed transient. The Unit 1 indicated T_{avg} value of 592.7°F (conservatively rounded to 592°F) and the Unit 1 indicated pressurizer pressure value of 2219 psig correspond to analytical limits of 594.7°F and 2205 psig respectively, with allowance for measurement uncertainty. The Unit 2 indicated T_{avg} value of 592.8°F (conservatively rounded to 592°F) and the Unit 2 indicated pressurizer pressure value of 2219 psig correspond to analytical limits of 595.16°F and 2205 psig respectively, with allowance for measurement uncertainty. The indicated uncertainties assume that the reading from four channels will be averaged before comparing with the required limit.

The 12-hour periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation, and to detect any significant flow degradation of the Reactor Coolant System (RCS).

The additional surveillance requirements associated with the RCS total flow rate are sufficient to ensure that the measurement uncertainties are limited to 1.8% as assumed in the Improved Thermal Design Procedure Report for CPSES.

Performance of a precision secondary calorimetric is required to precisely determine the RCS temperature. The transit time flow meter, which uses the N-16 system signals, is then used to accurately measure the RCS flow. Subsequently, the RCS flow detectors (elbow tap differential pressure detectors) are normalized to this flow determination and used throughout the cycle.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 36 AND 22 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 February 14, 1994 (TXX-94008), as supplemented by letters dated May 17, 1994 (TXX-94142), and April 3, 1995 (TXX-95098), Texas Utilities Electric Company (TU Electric/the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Facility Operating License Nos. NPF-87 and NPF-89) for the Comanche Peak Steam Electric Station, Units 1 and 2. The April 3, 1995, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination. The proposed changes would revise the TSs by replacing the existing TS and associated Bases concerning the quadrant power tilt ratio (QPTR) with a TS consistent with the improved Standard Technical Specifications (NUREG-1431).

The essential changes to the existing CPSES TSs are described below:

a) DEFINITION 1.27, QPTR is revised to include the use of movable incore detectors when above 75 percent power with one power range channel inoperable.

b) If the limiting condition for operation (LCO) for TS 3/4.2.4, "Quadrant Power Tilt Ratio," is not satisfied, the current TS Action Statement a.1. requires that the QPTR be calculated at least once per hour until either the LCO is satisfied or until the reactor power is reduced to less than 50 percent rated thermal power (RTP).

   This requirement is not included in the proposed TS.

c) If the LCO is not satisfied within 2 hours, the current TS requires that the reactor power be reduced by at least 3 percent from the RTP for each 1 percent that the indicated QPTR exceeds 1.00. The current TS also requires that the Power Range Neutron Flux - High reactor trip setpoint be reduced by a similar amount.

   The proposed TS requires the same reactor power reduction based on QPTR in excess of 1.00, but does not require that the Power Range Neutron Flux - High reactor trip setpoint be reduced.

d) The current TS requires that the LCO be satisfied within 24 hours of exceeding the limit or that the reactor power be reduced to less than 50 percent of RTP within the next 2 hours. In addition, the Power Range Neutron Flux - High reactor trip setpoint is required to be reduced to less than or equal to 55 percent of RTP within the next 4 hours.

The proposed TS requires that appropriate surveillances on the Heat Flux Hot Channel Factor, $F_Q(Z)$, and the Nuclear Enthalpy Rise Hot Channel Factor, $F^N_{\Delta H}$, be performed within 24 hours to ensure that the core power distribution is within the bounds used in the accident analyses. If not, the action statements relevant to the particular surveillance are invoked. For example, if the $F^N_{\Delta H}$ limit is exceeded, the action statement calls for a reduction in both reactor power and the Power Range Neutron Flux - High reactor trip setpoint to the same limits as required by the current QPTR TS.

If the $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances reveal these parameters to be within their limits, the proposed TS would then allow operation at RTP provided that the safety analyses have been evaluated and the excore detectors calibrated such that any additional QPTR variance would be evident. Periodic surveillances on $F_Q(Z)$ and $F^N_{\Delta H}$ would provide assurance that these parameters remained within the values assumed in the safety analyses.

e) After the reactor power has been reduced to less than or equal to 50 percent RTP, the current TS allows the reactor power to be increased after the cause of the quadrant power tilt has been identified and corrected. Hourly QPTR calculations are required for 12 hours or until the reactor power is increased to 95 percent RTP.

In accordance with the proposed TS, additional $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances would be required within 24 hours of reaching RTP or within 48 hours of exceeding the reduced power required in Item c) above.

f) Furthermore, the proposed TS requires that if any of the previous action statements were not met, the reactor power is to be reduced to less than or equal to 50 percent of RTP within the next 4 hours.

g) The Bases for TS 3/4.2.4 has been replaced with the Bases for TS 3.2.4 from the improved Standard Technical Specifications (STS), modified to reflect the CPSES format.

h) The reference for Action 2.c in TS Table 3.3-1 is changed from Surveillance Requirement 4.2.4.2 to 4.2.4.1.

2.0 BACKGROUND

The QPTR is the ratio of the current from one channel of the top (or bottom) excore neutron detectors to the average current from all four channels (top or bottom). The QPTR limit ensures that the gross radial power distribution remains consistent with the design values used in the safety analyses. Precise radial power distribution measurements, using incore flux maps, are made during

startup testing, after refueling, and periodically during power operation in accordance with TS 3.2.2, "Heat Flux Hot Channel Factor - $F_Q(Z)$," and TS 3.2.3, "Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$."

Process variables, which are more easily monitored during normal operation, are used to detect any relatively slow, gross changes in the power distribution which may occur between the periodic measurements of the $F_Q(Z)$ and $F^N_{\Delta H}$. These relatively slow changes may be a result of a radial xenon oscillation or excessive instrument drift. Rapid changes, such as a dropped rod cluster control assembly (RCCA), are detected by alternate methods.

The power density at any point in the core must be limited so that the fuel design criteria are maintained. Together with TS 3.2.1, "Axial Flux Difference," and TS 3.1.3.6, "Control Rod Insertion Limits," the QPTR LCO provides limits on process variables that characterize and control the three dimensional power distribution of the reactor core. Control of these variables ensures that the core operates within the fuel design criteria and that the power distribution remains within the bounds used in the safety analyses.

The QPTR limit is not applicable at power levels of less than 50 percent RTP, because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the reactor coolant to require implementation of a QPTR limit on the core power distribution. However, above 50 percent RTP, if the QPTR limit is exceeded, the action statements limit the power to less than 100 percent RTP in order to ensure that the margins of the accident analyses are preserved.

During a return to full power following a relatively short period of operation at reduced power, CPSES has experienced problems meeting the LCO for TS 3/4.2.4. This TS requires that when above 50 percent RTP, the QPTR must not exceed a value of 1.02.

For this specific scenario, a xenon redistribution is typically the reason for exceeding the LCO. The QPTR can usually be returned to within its limits by increasing power to expedite the dampening of the xenon effects. However, in accordance with TS 3.0.4, the power cannot be increased above 50 percent RTP until the QPTR limit is satisfied. As a result, the plant must be maintained below 50 percent RTP for several hours until the xenon transient decays.

The licensee proposed that the action statements presented in the improved STS be incorporated into the CPSES TS. These action statements are structured such that the requirements of TS 3.0.4 are no longer restrictive. The revised TS permits power ascension above 50 percent RTP with the QPTR above 1.02, provided that the assumptions of affected safety analyses are confirmed to be satisfied. This change will also avoid unnecessary delays in returning the plant to full power operation.

The changes which are being proposed will replace the existing CPSES TS with the corresponding improved STS from NUREG-1431, "Standard Technical Specifications for Westinghouse Plants." Only the content (not format) of the STS will be incorporated into the CPSES TS.

3.0 EVALUATION

The proposed TS is based on the presumed cause of the excessive QPTR being:

a. High QPTR values due to physical changes in the plant (e.g., dropped rods) would be handled in accordance with other guidance.

b. Real power distributions outside the assumptions of the accident analyses would be handled in accordance with the $F_Q(Z)$ and/or $F^N_{\Delta H}$ LCOs and action statements.

c. Small radial xenon oscillations and actual core tilts would be confirmed to be bounded by the assumptions of the accident analyses.

d. Excessive instrument drift would be corrected through re-normalization of the excore detectors to the incore detectors.

The more precise measurements of the core power distribution in accordance with the $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances can be used to determine if the assumptions of the accident analyses are satisfied. In that case the proposed action statement would require the re-normalization of the excore detectors and power ascension to 100 percent RTP would then be allowed. The $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances are required to be repeated within 24 hours of reaching RTP or within 48 hours of increasing power above the "reduced" power required by previous action statements. This procedure is sufficient to allow power operation to continue while ensuring that actual core power distributions which are outside the assumptions of the accident analyses are detected and corrected.

The proposed QPTR LCO precludes core power distributions that violate the following fuel design criteria:

a. During a large break loss of coolant accident, the peak cladding temperature must not exceed 2200°F (10 CFR 50.46);

b. During a loss of forced reactor coolant flow accident, there must be at least 95 percent probability at the 95 percent confidence level (the 95/95 departure from nucleate boiling (DNB) criterion) that the hot fuel rod in the core does not experience a DNB condition;

c. During an ejected rod accident, the energy deposition to the fuel must not exceed 280 cal/gm (Regulatory Guide 1.77, Revision 0, May 1974); and

d. The control rods must be capable of shutting down the reactor with a minimum required shutdown margin (SDM) with the highest worth control rod stuck fully withdrawn (10 CFR Part 50, Appendix A, GDC 26).

Thus the LCO limits on the axial flux difference (AFD), the QPTR, the Heat Flux Hot Channel Factor ($F_Q(Z)$), the Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$), and control bank insertion are established to preclude core power distributions that exceed the safety analyses limits.

The QPTR limits ensure that $F^N_{\Delta H}$ and $F_Q(Z)$ remain below their limiting values by preventing an undetected change in the gross radial power distribution.

In MODE 1, the $F^N_{\Delta H}$ and $F_Q(Z)$ limits must be maintained to preclude core power distributions from exceeding design limits assumed in the safety analyses.

The QPTR satisfies Criterion 2 of the NRC Policy Statement on Technical Specification Improvements for Nuclear Power Reactors (58 FR 39132) dated July 22, 1993.

In summary, the proposed TS changes will provide a reasonably short period of time to correct the core power distribution within the QPTR limits or reduce total core power. These actions will ensure that the fuel design limits criteria will be satisfied or the plant will be shutdown. The period of vulnerability while the gross power distribution may be outside the limits is comparable to the time required for a controlled plant shutdown. Therefore, the proposed change is 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 and changes surveillance requirements. 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 (59 FR 37087). 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.

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