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

July 31, 1990

Docket No. 50-445

Mr. William J. Cahill, Jr.
Executive Vice President
TU Electric
400 North Olive Street, L.B. 81
Dallas, Texas 75201

Dear Mr. Cahill:

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1 - AMENDMENT NO. 1 TO
FACILITY OPERATING LICENSE NO. NPF-87 (TAC NO. M77000)

The Commission has issued the enclosed Amendment No. 1 to Facility Operating License No. NPF-87 for the Comanche Peak Steam Electric Station, Unit 1. The amendment consists of changes to the Technical Specifications in response to your application dated June 22, 1990, for changes to the Technical Specifications (Appendix A to the operating license).

The amendment changes Technical Specifications 3.2.1, 4.2.1 and 4.2.2 to allow Base Load Operation as an alternative to the normal operating mode in order to maintain the radial peaking factor within the range assumed by the plant's safety analyses. Technical Specification 6.9.1.6 and the Bases to Section 3/4.2.1 have also been revised to reflect the new Base Load mode of operation.

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,

James H. Wilson, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 1 to NPF-87
- 2. Safety Evaluation

cc w/enclosures:
See next page

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July 31, 1990

cc w/enclosures:

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

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

Amendment No. 1
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) acting for itself and as agent for Texas Municipal Power Agency (licensees) dated June 22, 1990, 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.

*The current owners of the Comanche Peak Steam Electric Station are: Texas Utilities Electric Company and Texas Municipal Power Agency. Transfer of ownership from Texas Municipal Power Agency to Texas Utilities Electric Company was previously authorized by Amendment No. 9 to Construction Permit CPPR-126 on August 25, 1988 to take place in 10 installments as set forth in the Agreement attached to the application for Amendment dated March 4, 1988. At the completion thereof, Texas Municipal Power Agency will no longer retain any ownership interest.

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

The Technical Specifications contained in Appendix A, as revised through Amendment No. 1, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

Christopher I. Grimes

Christopher I. Grimes, Director
Project Directorate IV-2
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 31, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 1

FACILITY OPERATING LICENSE NO. NPF-87

DOCKET NO. 50-445

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE PAGES

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3/4 2-2

3/4 2-6
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B3/4 2-2
B3/4 2-4
B3/4 2-5
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INSERT PAGES

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3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AXIAL FLUX DIFFERENCE

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within the following target band (flux difference units) about the target flux difference for Normal Operation and Base Load Operation.[#]

- a. $\pm 5\%$ for core average accumulated burnup of less than or equal to 3000 MWD/MTU; and
- b. $+ 3\%$, -12% for core average accumulated burnup of greater than 3000 MWD/MTU.

For Normal Operation, the indicated AFD may deviate outside the above required target band at greater than or equal to 50% but less than 90% of RATED THERMAL POWER provided the indicated AFD is within the Acceptable Operation Limits of Figure 3.2-1 and the cumulative penalty deviation time does not exceed 1 hour** during the previous 24 hours.

For Normal Operation, the indicated AFD may deviate outside the above required target band at greater than 15% but less than 50% of RATED THERMAL POWER provided the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

For Base Load Operation, the AFD shall remain within the target band defined above.

APPLICABILITY: MODE 1, above 15% of RATED THERMAL POWER.*

ACTION:

- a. For Normal Operation with the indicated AFD outside of the above required target band and with THERMAL POWER greater than or equal to 90% of RATED THERMAL POWER, within 15 minutes either:
 1. Restore the indicated AFD to within the target band limits, or
 2. Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER.
- For Base Load Operation with the indicated AFD outside of the above required target band, within 15 minutes either:

* See Special Test Exceptions Specification 3.10.2.

** Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1 provided the indicated AFD is maintained within the Acceptable Operation Limits of Figure 3.2-1. While in Normal Operation, a total of 16 hours operation may be accumulated with the AFD outside of the above required target band during testing without penalty deviation.

Base Load Operation requires a minimum allowable power level, APLND, of 75% RATED THERMAL POWER to be maintained based on the figures given in the Radial Peaking Factor Limit Report for Base Load Operation per Specification 6.9.1.6.

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

1. Restore the indicated AFD to within the target band limits, or
 2. Discontinue Base Load Operation and adjust THERMAL POWER as necessary for Normal Operation.
- b. For Normal Operation with the indicated AFD outside of the above required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours or outside the Acceptable Operation Limits of Figure 3.2-1 and with THERMAL POWER less than 90% but equal to or greater than 50% of RATED THERMAL POWER:
1. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes, and
 2. Reduce the Power Range Neutron Flux - High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.
- c. For Normal Operation with the indicated AFD outside of the above required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours and with THERMAL POWER less than 50% but greater than 15% of RATED THERMAL POWER, the THERMAL POWER shall not be increased equal to or greater than 50% of RATED THERMAL POWER until the indicated AFD is within the above required target band.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AFD shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

- a. Monitoring the indicated AFD for each OPERABLE excor channel:
 - 1) At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
 - 2) At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.
- b. Monitoring and logging the indicated AFD for each OPERABLE excor channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD Monitor Alarm is inoperable. # The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

During Base Load Operation at less than or equal to 90% RATED THERMAL POWER, the AFD Monitor Alarm shall be considered inoperable unless the AFD Monitor Alarm has provisions to immediately alarm above APLND with AFD outside the target band.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

4.2.1.2 The indicated AFD shall be considered outside of its target band when two or more OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the above required target band shall be accumulated on a time basis of:

- a. One minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and
- b. One-half minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

4.2.1.3 The target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days. The provisions of Specification 4.0.4 are not applicable.

4.2.1.4 The target flux difference shall be updated at least once per 31 Effective Full Power Days by either determining the target flux difference pursuant to Specification 4.2.1.3 above or by linear interpolation between the most recently measured value and 0% at the end of the cycle life. The provisions of Specification 4.0.4 are not applicable.

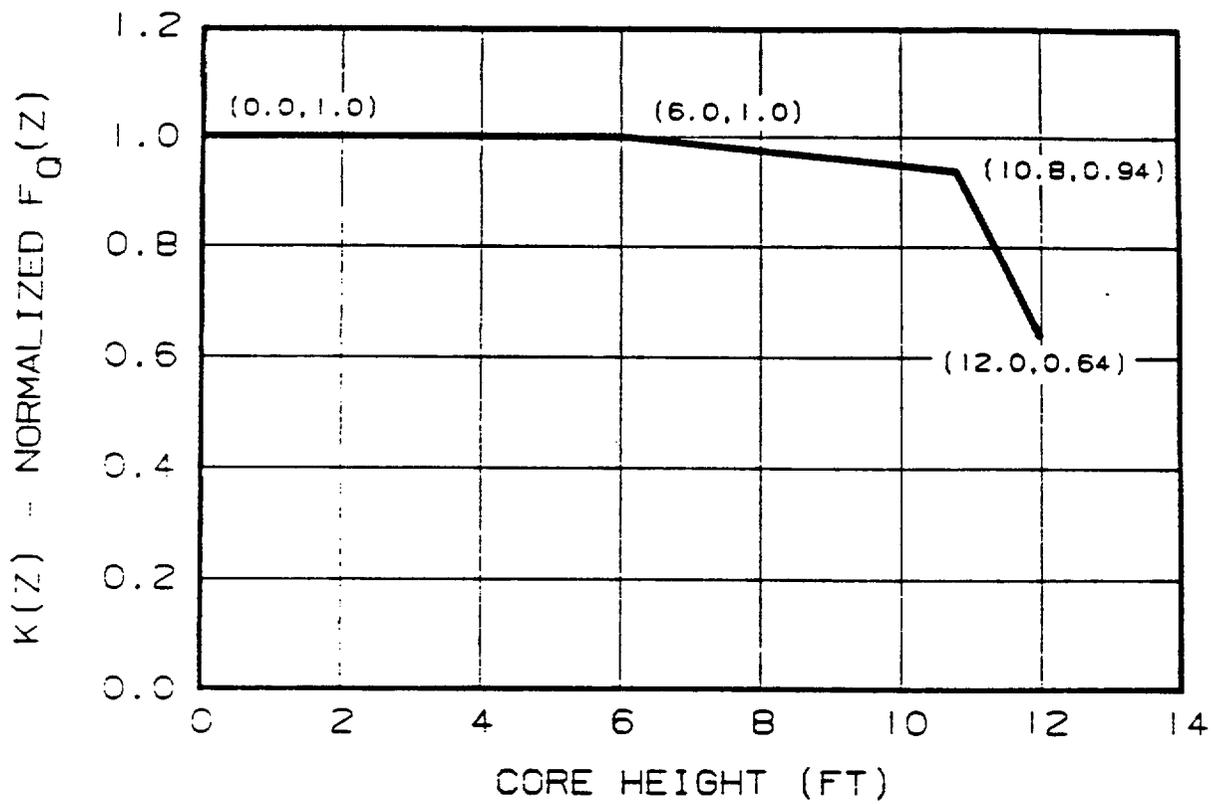


FIGURE 3.2-2

$K(Z) - F_0(Z)$ AS A FUNCTION OF CORE HEIGHT

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

- 4.2.2.1 The provisions of Specification 4.0.4 are not applicable.
- 4.2.2.2. Base Load Operation# is permitted at powers at/or above APL^{ND} if the following conditions are satisfied:
- a. Prior to entering Base Load Operation, maintain THERMAL POWER above APL^{ND} and at or below the maximum allowable power level indicated by the most recent F_{xy} surveillance (and maintain THERMAL POWER within $\pm 5\%$) for at least the previous 24 hours. Maintain the AFD within the target band required for Base Load Operation during this time period. Base Load Operation is then permitted provided that THERMAL POWER is maintained at/or above APL^{ND} and F_{xy} surveillance is maintained pursuant to Specification 4.2.2.3.
 - b. During Base Load Operation, if the THERMAL POWER is decreased below APL^{ND} then the conditions of 4.2.2.2a. shall be satisfied before re-entering Base Load Operation.
- 4.2.2.3 F_{xy} shall be evaluated to determine if $F_Q(Z)$ is within its limit by:
- a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER for Normal Operation or APL^{ND} for Base Load Operation,
 - b. Increasing the measured F_{xy} component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties,
 - c. Comparing the F_{xy} computed (F_{xy}^C) obtained in Specification 4.2.2.3b., above to:
 - 1) The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) for the appropriate measured core planes given in Specification 4.2.2.3e. and f., below, and
 - 2) The relationship:
$$F_{xy}^L = F_{xy}^{RTP} [1+0.2(1-P)],$$
Where F_{xy}^L is the limit for fractional THERMAL POWER operation expressed as a function of F_{xy}^{RTP} and P is the fraction of RATED THERMAL POWER at which F_{xy} was measured.

Base Load Operation requires a minimum allowable power level, APL^{ND} , of 75% RATED THERMAL POWER to be maintained based on the figures given in the Radial Peaking Factor Limit Report for Base Load Operation per Specification 6.9.1.6.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

- d. Remeasuring F_{xy} according to the following schedule:
- 1) When F_{xy}^C is greater than the F_{xy}^{RTP} limit for the appropriate measured core plane but less than the F_{xy}^L relationship, additional power distribution maps shall be taken and F_{xy}^C compared to F_{xy}^{RTP} and F_{xy}^L either:
 - a) Within 24 hours after exceeding by 20% of RATED THERMAL POWER or greater, the THERMAL POWER at which F_{xy}^C was last determined, or
 - b) At least once per 31 Effective Full Power Days (EFPD), whichever occurs first.
 - 2) When the F_{xy}^C is less than or equal to the F_{xy}^{RTP} limit for the appropriate measured core plane, additional power distribution maps shall be taken and F_{xy}^C compared to F_{xy}^{RTP} and F_{xy}^L at least once per 31 EFPD.
- e. The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) shall be provided for all core planes containing Bank "D" control rods and all unrodded core planes in a Radial Peaking Factor Limit Report per Specification 6.9.1.6;
- f. The F_{xy} limits of Specification 4.2.2.3e., above, are not applicable in the following core plane regions as measured in percent of core height from the bottom of the fuel:
- 1) Lower core region from 0 to 15%, inclusive,
 - 2) Upper core region from 85 to 100%, inclusive,
 - 3) Grid plane regions at $17.8 \pm 2\%$, $32.1 \pm 2\%$, $46.4 \pm 2\%$, $60.6 \pm 2\%$, and $74.9 \pm 2\%$, inclusive, and
 - 4) Core plane regions within $\pm 2\%$ of core height [± 2.88 inches] about the bank demand position of the Bank "D" control rods.
- g. With F_{xy}^C exceeding F_{xy}^L , the effects of F_{xy} on $F_Q(Z)$ shall be evaluated to determine if $F_Q(Z)$ is within its limits.
- 4.2.2.4 When $F_Q(Z)$ is measured for other than F_{xy} determinations, an overall measured $F_Q(Z)$ shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

POWER DISTRIBUTION LIMITS

3/4.2.3 NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR $F_{\Delta H}^N$

LIMITING CONDITION FOR OPERATION

3.2.3 $F_{\Delta H}^N$ shall be limited by the following relationship:

$$F_{\Delta H}^N \leq 1.55 [1.0 + 0.2 (1.0 - P)]$$

Where:

$$P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

APPLICABILITY: MODE 1.

ACTION:

With $F_{\Delta H}^N$ exceeding its limit:

- a. Within 2 hours either:
 1. Restore $F_{\Delta H}^N$ to within the above limit, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER and reduce the Power Range Neutron Flux - High Trip Setpoint to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.
- b. Within 24 hours of initially being outside the above limit, verify through incore flux mapping that $F_{\Delta H}^N$ has been restored to within the above limit, or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours.
- c. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced THERMAL POWER limit required by ACTION a.2. and/or b., above; subsequent POWER OPERATION may proceed provided that $F_{\Delta H}^N$ is demonstrated, through incore flux mapping, to be within its limit prior to exceeding the following THERMAL POWER levels:
 1. A nominal 50% of RATED THERMAL POWER,
 2. A nominal 75% of RATED THERMAL POWER, and
 3. Within 24 hours of attaining greater than or equal to 95% of RATED THERMAL POWER.

3/4.2 POWER DISTRIBUTION LIMITS

BASES

The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (1) maintaining the minimum DNBR in the core greater than or equal to 1.30 during normal operation and in short-term transients, and (2) limiting the fission gas release, fuel pellet temperature, and cladding mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definitions of certain hot channel and peaking factors as used in these specifications are as follows:

- $F_Q(Z)$ Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods;
- $F_{\Delta H}^N$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to the average rod power; and
- $F_{xy}(Z)$ Radial Peaking Factor, is defined as the ratio of peak power density to average power density in the horizontal plane at core elevation Z .

3/4.2.1 AXIAL FLUX DIFFERENCE

The limits on AXIAL FLUX DIFFERENCE (AFD) assure that the $F_Q(Z)$ upper bound envelope of 2.32 times the normalized axial peaking factor^Q is not exceeded during either normal operation or in the event of xenon redistribution following power changes.

Target flux difference is determined at equilibrium xenon conditions. The rods may be positioned within the core in accordance with their respective insertion limits and should be inserted near their normal position for steady-state operation at high power levels. The value of the target flux difference obtained under these conditions divided by the fraction of RATED THERMAL POWER is the target flux difference at RATED THERMAL POWER for the associated core burnup conditions. Target flux differences for other THERMAL POWER levels are obtained by multiplying the RATED THERMAL POWER value by the appropriate fractional THERMAL POWER level. The periodic updating of the target flux difference value is necessary to reflect core burnup considerations.

POWER DISTRIBUTION LIMITS

BASES

AXIAL FLUX DIFFERENCE (Continued)

The limits on AXIAL FLUX DIFFERENCE (AFD) are given in Specification 3.2.1. Two modes of operation are permissible. One mode is Normal Operation. If the AFD limits result in restrictions in the maximum allowed power level to guarantee operation with $F_0(Z)$ less than its limiting value, another operating mode which does not allow significant changes in power level has been defined. This mode is called Base Load Operation, which restricts power levels to between APL^{ND} and RATED THERMAL POWER, inclusive. Prior to entering Base Load Operation, a 24-hour waiting period at a power level above APL^{ND} (and maintained within $\pm 5\%$) is necessary to allow core xenon stabilization. After the waiting period, Base Load Operation is permitted. During Base Load Operation, AFD must remain within its target band.

Although it is intended that the plant will be operated with the AFD within the target band required by Specification 3.2.1 about the target flux difference, during rapid plant THERMAL POWER reductions while in Normal Operation, control rod motion will cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation will not affect the xenon redistribution sufficiently to change the envelope of peaking factors which may be reached on a subsequent return to RATED THERMAL POWER (with the AFD within the target band) provided the time duration of the deviation is limited. Accordingly, a 1-hour penalty deviation limit cumulative during the previous 24 hours is provided for operation outside of the target band but within the limits of Figure 3.2-1 while at THERMAL POWER levels between 50% and 90% of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER, deviations of the AFD outside of the target band are less significant. The penalty of 2 hours actual time reflects this reduced significance.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the 1-minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for two or more OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 90% and between 15% and 50% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively.

During Base Load Operation at less than or equal to 90% RATED THERMAL POWER, the AFD Monitor Alarm is considered inoperable unless the AFD Monitor Alarm has provisions to immediately alarm above APL^{ND} with AFD outside the target band.

Figure B 3/4 2-1 shows a typical monthly target band.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor and nuclear enthalpy rise hot channel factor ensure that: (1) the design limits on peak local power density

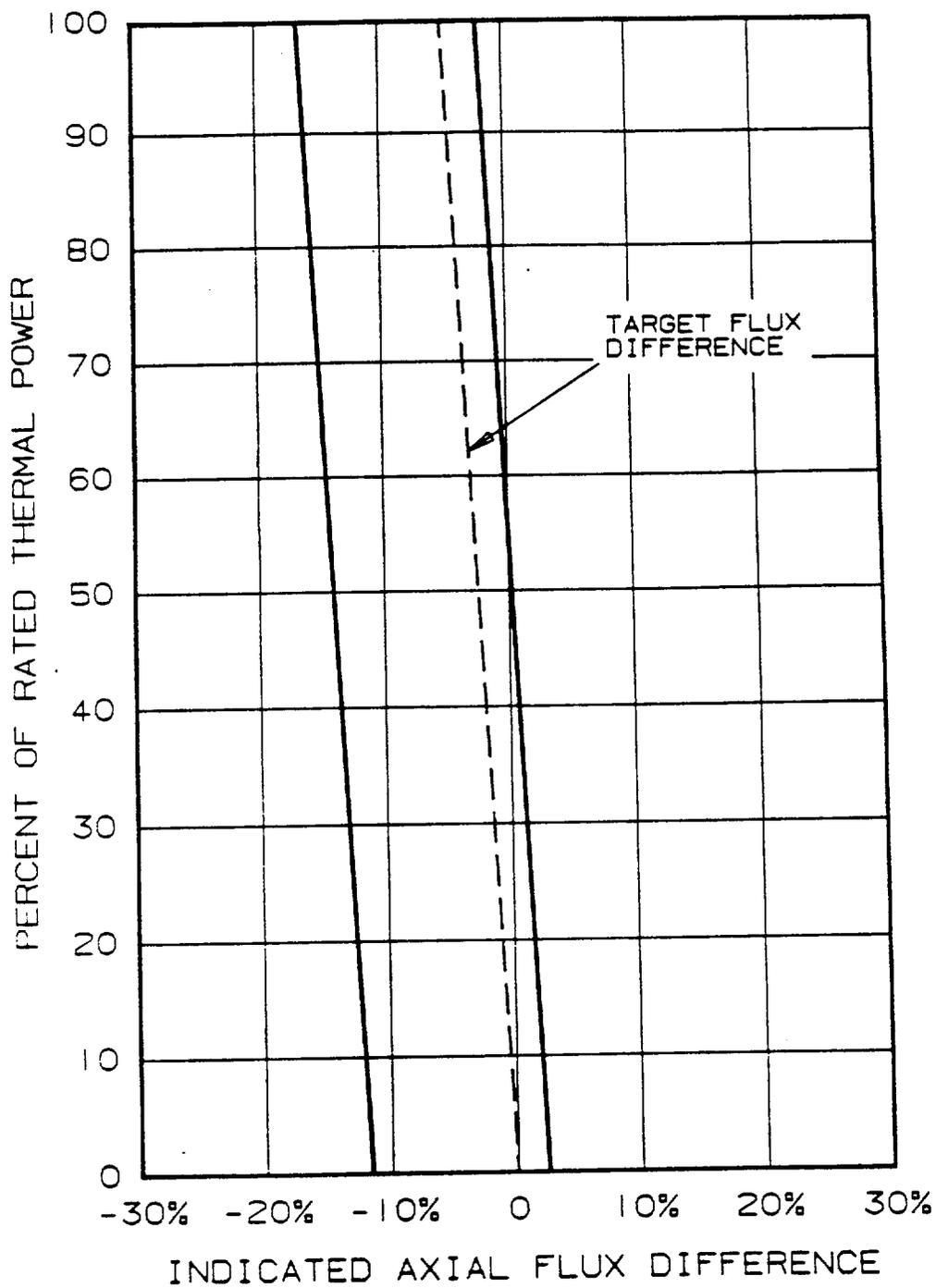


FIGURE B 3/4 2-1
TYPICAL INDICATED AXIAL FLUX DIFFERENCE VERSUS THERMAL POWER

POWER DISTRIBUTION LIMITS

BASES

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

and minimum DNBR are not exceeded and (2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps, indicated, from the group demand position;
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6;
- c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained; and
- d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

$F_{\Delta H}^N$ will be maintained within its limits provided Conditions a. through d. above are maintained. The relaxation of $F_{\Delta H}^N$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits.

Fuel rod bowing reduces the value of DNBR ratio. Credit is available to offset this reduction in the generic margin. The generic margins, totaling 9.1% DNBR completely offset any rod bow penalties. This margin includes the following:

- a. Design limit DNBR of 1.30 vs 1.28,
- b. Grid Spacing (K_g) of 0.046 vs 0.059,
- c. Thermal Diffusion Coefficient of 0.038 vs 0.051,
- d. DNBR Multiplier of 0.86 vs 0.88, and
- e. Pitch reduction.

The applicable values of rod bow penalties are referenced in the FSAR.

POWER DISTRIBUTION LIMITS

BASES

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.

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

The Radial Peaking Factor, $F_{xy}(Z)$, is measured periodically to provide assurance that the Hot Channel Factor, $F_H(Z)$, remains within its limit. The F_{xy} limit for RATED THERMAL POWER (F_{xy}^{RTPQ}) as provided in the Radial Peaking Factor Limit Report per Specification 6.9.1.6 was determined from expected power control maneuvers over the full range of burnup conditions in the core.

$F_{xy}(Z)$ 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

The QUADRANT POWER TILT RATIO limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during STARTUP testing and periodically during power operation.

The limit of 1.02, at which corrective action is required, provides DNB and linear heat generation rate protection with x-y plane power tilts. A limit of 1.02 was selected to provide an allowance for the uncertainty associated with the indicated power tilt.

The 2-hour time allowance for operation with a tilt condition greater than 1.02 is provided to allow identification and correction of a dropped or misaligned control rod. In the event such action does not correct the tilt, the margin for uncertainty on F_Q is reinstated by reducing the maximum allowed power by 3% for each percent of tilt in excess of 1.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of four symmetric thimbles.

POWER DISTRIBUTION LIMITS

BASES

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 of 1.30 throughout each analyzed transient. The indicated T_{avg} value of 592.7°F (conservatively rounded to 592°F) and the indicated pressurizer pressure value of 2207 psig correspond to analytical limits of 594.7°F and 2193 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.

ADMINISTRATIVE CONTROLS

ANNUAL REPORTS (Continued)

- b. The results of specific activity analyses in which the primary coolant exceeded the limits of Specification 3.4.7. The following information shall be included: (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded (in graphic and tabular format); (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; (3) Clean-up flow history starting 48 hours prior to the first sample in which the limit was exceeded; (4) Graph of the I-131 concentration ($\mu\text{Ci/gm}$) and one other radioiodine isotope concentration ($\mu\text{Ci/gm}$) as a function of time for the duration of the specific activity above the steady-state level; and (5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.3 The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR 50.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**

6.9.1.4 The Semiannual Radioactive Effluent Release Report covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and PCP and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR 50.

MONTHLY OPERATING REPORTS

6.9.1.5 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the PORVs or safety valves, shall be submitted on a monthly basis to the Director, Office of Resource

*A single submittal may be made for a multiple unit station.

**A single submittal may be made for a multi-unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

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MONTHLY OPERATING REPORTS (Continued)

Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Regional Administrator of the Regional Office of the NRC, no later than the 15th of each month following the calendar month covered by the report.

RADIAL PEAKING FACTOR LIMIT REPORT

6.9.1.6 The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) shall be established for at least each reload core for Normal Operation and Base Load Operation and shall be maintained available in the Control Room. The limits shall be established and implemented on a time scale consistent with normal procedural changes.

The analytical methods used to generate the F_{xy} limits shall be reviewed and approved by the NRC for CPSES specific use. If changes to these methods are deemed necessary they will be evaluated in accordance with 10 CFR 50.59 and submitted to the NRC for review and approval prior to their use if the change is determined to involve an unreviewed safety question or if such a change would require amendment of previously submitted documentation.

A report containing the F_{xy} limits for all core planes containing Bank "D" control rods and all unrodded core planes along with the plot of predicted $F_q^T \cdot P_{REL}$ axial core height (with the limit envelope for comparison) shall be provided to the NRC Document Control desk with copies to the Regional Administrator and the Resident Inspector within 30 days of their implementation.

The report shall also establish the minimum allowable power level, APL^{ND} , for Base Load Operation for at least each reload core and shall be maintained in the Control Room.

SPECIAL REPORTS

6.9.2 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, special reports shall be submitted to the Regional Administrator of the Regional Office of the NRC within the time period specified for each report.

6.10 RECORD RETENTION

6.10.1 In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

6.10.2 The following records shall be retained for at least 5 years:

- a. Records and logs of unit operation covering time interval at each power level;
- b. Records and logs of principal maintenance activities, inspections, repair, and replacement of principal items of equipment related to nuclear safety;

ADMINISTRATIVE CONTROLS

RECORD RETENTION (Continued)

- c. ALL REPORTABLE EVENTS;
- d. Records of surveillance activities, inspections, and calibrations required by the Technical Specifications, Technical Requirements Manual, and Fire Protection Report, except as explicitly covered in Specification 6.10.3;
- e. Records of changes made to the procedures required by Specification 6.8.1;
- f. Records of radioactive shipments;
- g. Records of sealed source and fission detector leak tests and results; and
- h. Records of annual physical inventory of all sealed source material of record.

6.10.3 The following records shall be retained for the duration of the unit Operating License:

- a. Records and drawing changes reflecting unit design modifications made to systems and equipment described in the Final Safety Analysis Report;
- b. Records of new and irradiated fuel inventory, fuel transfers, and assembly burnup histories;
- c. Records of radiation exposure for all individuals entering radiation control areas;
- d. Records of gaseous and liquid radioactive material released to the environs;
- e. Records of transient or operational cycles for those unit components identified in Table 5.7-1;
- f. Records of reactor tests and experiments;
- g. Records of training and qualification for current members of the unit staff;
- h. Records of inservice inspections performed pursuant to these Technical Specifications;
- i. Records of quality assurance activities required by the Quality Assurance Manual;
- j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59;
- k. Records of meetings of the SORC and the ORC;
- l. Records of the service lives of all hydraulic and mechanical snubbers required by the Technical Requirements Manual including the date at

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RECORD RETENTION (Continued)

- which the service life commences and associated installation and maintenance records;
- m. Records of secondary water sampling and water quality; and
 - n. Records of analyses required by the Radiological Environmental Monitoring Program that would permit evaluation of the accuracy of the analysis at a later date. This should include procedures effective at specified times and QA records showing that these procedures were followed.
 - o. Records of reviews performed for changes made to the OFFSITE DOSE CALCULATION MANUAL and the PROCESS CONTROL PROGRAM.

6.11 RADIATION PROTECTION PROGRAM

6.11.1 Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

6.12 HIGH RADIATION AREA

6.12.1 Pursuant to paragraph 10 CFR 20.203(c)(5), in lieu of the "control device" or "alarm signal" required by paragraph 10 CFR 20.203(c), each high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is equal to or less than 1000 mR/h at 45 cm (18 in.) from the radiation source or from any surface which the radiation penetrates shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g., Radiation Protection Technician) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates equal to or less than 1000 mR/h, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

- a. A radiation monitoring device which continuously indicates the radiation dose rate in the area; or
- b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them; or
- c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the RWP.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 1 TO FACILITY OPERATING LICENSE NO. NPF-87
TEXAS UTILITIES ELECTRIC COMPANY, ET AL.
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1
DOCKET NO. 50-445

INTRODUCTION

By License Amendment Request 90-002, dated June 22, 1990, Texas Utilities Electric Company (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-87) for the Comanche Peak Steam Electric Station (CPSES), Unit 1. The proposed changes modify Technical Specification (TS) 3.2.1 and Surveillance Requirements 4.2.1 and 4.2.2 to allow Base Load Operation as an alternative to the normal operating mode. In addition, the Bases to Section 3/4.2.1 are revised to describe the purpose and concept of Base Load Operation and TS 6.9.1 has been modified to require that limits for radial peaking factor and minimum power level for Base Load Operation be established and reported in the Radial Peaking Factor Limit Report for at least each reload core. The request was initiated when predictions during power ascension testing at the 50 percent power plateau indicated that the radial peaking factor, F_{xy} , could exceed the Technical Specification limit at 100 percent rated thermal power (RTP) at beginning of core life. The predictions were based on fuel vendor (Westinghouse) and licensee Cycle 1 analytical core models designed to anticipate the measured F_{xy} value at higher power levels.

EVALUATION

Evaluation of F_{xy} is performed to determine that the heat flux hot channel factor, F_Q , is within its Technical Specification limit. This evaluation assumes the most limiting axial power distributions expected to result from maneuvering control banks B, C, and D and the associated variation of xenon and power distributions. Although the measured F_{xy} was within its Technical Specification

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limit during CPSES Unit 1 Cycle 1 power ascension testing at 50 percent rated thermal power (RTP), both Westinghouse and licensee calculations indicated that F_{xy} could possibly exceed its limit at 100 percent RTP.

In order to obtain additional F_{xy} limit margin, the effects of cycle exposure on F_{xy} limits were accounted for. Because F_{xy} is anticipated to approach the limit only during beginning-of-life, additional margin is available once burnup exceeds 3000 MWD/MTU. In addition, an alternative operating mode, Base Load Operation, has been defined which restricts the minimum power level, APL^{ND} , to greater than 75 percent RTP. By restricting power maneuvering during Base Load Operation, the results of load follow cases at power levels less than 75 percent RTP can be eliminated from the analyses in which the F_{xy} limits are derived. Since these load follow cases involve reactor power maneuvers which produce significant xenon distribution changes in the core, the F_{xy} limits for Base Load Operation differ from those in normal operation. Although the analysis performed by Westinghouse and the licensee assumed a lower limit of 70 percent, the value of APL^{ND} specified for Cycle 1 is 75 percent RTP. This is conservative with respect to the minimum value used to derive the F_{xy} figures presented in the revised Radial Peaking Factor Limit Report for Base Load Operation and is, therefore, acceptable.

The changes to the Technical Specifications consist of revisions to allow Base Load Operation as an alternative to the normal operating mode. A definition of Base Load Operation which establishes a minimum acceptable power level for Base Load Operation is included in TS 3.2.1 and 4.2.1, along with additional changes in these sections, as well as to TS 4.2.2, to clarify which requirements apply to the two operating modes and to make the revised specifications internally consistent. The Bases to Section 3/4.2.1 are revised to describe the purpose and concept of Base Load Operation and TS 6.9.1 has been modified to require that limits for radial peaking factor and minimum power level for Base Load Operation be established and reported in the Radial Peaking Factor Limit Report for at least each reload core.

The revised Technical Specifications contain requirements to discontinue Base Load Operation and to observe normal operation F_{xy} limits if the power level falls below APL^{ND} or within 15 minutes after the indicated axial flux difference (AFD) is outside of its required target band. In addition, prior to entering or returning to Base Load Operation, a 24-hour waiting period at a power level above APL^{ND} (and maintained within ± 5 percent) must be observed to allow core xenon stabilization.

The proposed changes maintain the current AFD bands of Technical Specification 3/4.2.1 and, therefore, the input assumptions in the CPSES Unit 1 safety analyses remain valid. The Base Load mode of operation uses the same approved analytical methods to generate the F_{xy} limits as does the normal mode of operation, as specified in the Administrative Controls Technical Specification 6.9.1.6, and has been approved for other Westinghouse reactors. Therefore, the staff finds the proposed changes acceptable.

ENVIRONMENTAL CONSIDERATION

The amendment involves a change in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or a change to a surveillance requirement. The staff has determined that the amendment involves 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 exposures. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). The amendment also involves changes in recordkeeping, reporting or administrative procedures or requirements. Accordingly, with respect to these items, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR §51.22(c)(10). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

CONCLUSION

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: July 31, 1990

Principal Contributor: L. Kopp