July 6, 1993

Docket No. 50-445
and 50-446

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

Dear Mr. Cahill:

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 - AMENDMENT NOS. 17 AND 3 TO FACILITY OPERATING LICENSE NOS. NPF-87 AND NPF-89 (TAC NOS. M84916 AND M86187)

The Commission has issued the enclosed Amendment Nos. 17 and 3 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 in response to your application dated October 16, 1992. By letter dated March 17, 1993, TU Electric expanded the applicability of the requested change to include Unit 2.

The amendments change the Technical Specifications to allow an increase in the maximum allowable fuel enrichment from 3.5 percent to 4.3 percent enriched fuel.

A copy of our related Safety Evaluation is enclosed. Also enclosed is a copy of the Notice of Issuance which has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Original Signed By

Thomas A. Bergman, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 17 to NPF-87
2. Amendment No. 3 to NPF-89
3. Safety Evaluation
4. Notice

cc w/enclosures:
See next page

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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. 17
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 October 16, 1992, as supplemented by letter dated March 17, 1993, 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.

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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. 17 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance to be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne C. Black

Suzanne C. Black, Director
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 6, 1993

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

TEXAS UTILITIES ELECTRIC COMPANY, ET AL.*

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 2

DOCKET NO. 50-446

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 3
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) acting for itself and as agent for Texas Municipal Power Agency (licensees) dated October 16, 1992, as supplemented by letter dated March 17, 1993, 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. 8 to Construction Permit CPPR-127 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-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. 3, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. TU Electric shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance to be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne C. Black

Suzanne C. Black, Director
Project Directorate IV-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 6, 1993

ATTACHMENT TO LICENSE AMENDMENT NOS. 17 AND 3

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

DOCKET NOS. 50-445 AND 50-446

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

REMOVE	INSERT
5-5	5-5

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 17 AND 3 TO

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

TEXAS UTILITIES ELECTRIC COMPANY, ET AL.

COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By application dated October 16, 1992, as supplemented by letter dated March 17, 1993, Texas Utilities Electric Company (the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License Nos. NPF-87 and NPF-89) for the Comanche Peak Steam Electric Station, Unit Nos. 1 and 2. The proposed changes would increase the maximum Uranium-235 enrichment for reload fuel assemblies to 4.3 weight percent from the current 3.5 weight percent Uranium-235 in Section 5.3.1 of the Comanche Peak Steam Electric Station (CPSES) Technical Specifications. Section 5.3.1 provides a brief description of the fuel, cladding material, active fuel length, and maximum enrichment used in CPSES. The maximum enrichment limit cited in Section 5.3.1 pertains to fuel handling and to fuel storage in the fresh fuel and spent fuel storage racks.

The proposed change revises the CPSES Technical Specification 5.3 Reactor Core, Section 5.3.1 to reflect the new enrichment limit. Specifically, the sentence "Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment not to exceed 3.5 weight percent U-235" is changed to "Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment not to exceed 4.3 weight percent U-235." Consistent with this change in the allowable fuel enrichment, the licensee evaluated the impact of fuel irradiation up to 60,000 megawatt days per metric ton of uranium. The licensee's evaluation of fuel irradiation for new fuel will be performed in conjunction with cycle specific reload analyses.

2.0 DISCUSSION

TU Electric is currently using Westinghouse Electric Corporation built fresh fuel, spent fuel, and in-containment storage racks capable of storing 17 x 17 design fuel qualified at an enrichment limit of 3.5 weight percent U-235. The fresh fuel storage racks at CPSES consist of full-length annealed stainless steel storage cans with an inner dimension of 9.00 inches and a wall thickness of approximately 0.075 inches. The fresh fuel storage racks are designed so

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that there are seven groupings (sections) of two rows each, with a center-to-center spacing between assemblies within a row of 21 inches, and 21 inches between rows within a grouping. The center-to-center distance between nearest rows of assemblies in adjacent groupings is 36 inches. Three of the groupings have ten assemblies per row; the remainder, nine. The fresh fuel storage racks can accommodate 132 fuel assemblies. Fresh fuel storage is normally dry. The fresh fuel storage racks are designed so that it is not possible to insert a fuel assembly in any position within the rack array not intended for fuel. The fresh fuel storage racks are currently licensed at an enrichment limit 3.5 weight percent U-235 and are capable of storing Westinghouse 17 x 17, Standard and Optimized, and Siemens 17 x 17 large and small diameter fuel rod designs.

The spent fuel storage racks provide a center-to-center distance between fuel assemblies of 16 inches. The racks employ full length annealed stainless steel cans with an inner dimension of 9.00 inches and a wall thickness of approximately 0.075 inches. These racks do not contain any additional poison material and rely on the water gap to maintain sub-criticality. Comanche Peak has two spent fuel storage pools designed to contain spent fuel storage racks (including the damaged fuel containers) that have a total capacity of 1116 fuel assemblies. Pool number 1 is designed to contain twelve 6 x 5 rack modules, seven 5 x 5 rack modules, and one modified 5 x 5 rack module which can store 19 fuel assemblies and two damaged fuel containers. Pool number 2 is designed to contain twelve 6 x 5 rack modules and eight 5 x 5 rack modules. In both spent fuel storage pools, the space between storage positions is blocked to prevent insertion of fuel. The spent fuel pools are currently partially racked with a total of 553 storage cell locations. The spent fuel storage racks are currently designed to store Westinghouse 17 x 17, Standard and Optimized, and Siemens 17 x 17 large and small diameter fuel rod designs with an enrichment limit of 3.5 weight percent U-235.

The containment refueling cavity of each unit has additional interim storage space consisting of one 5 x 5 rack module. The in-containment storage racks are identical in design to the spent fuel storage racks.

3.0 EVALUATION

Although the licensee requested a technical specification change for the maximum fuel enrichment to be increased from 3.5 percent to 4.3 percent (which is expected to bound the requirements for future 18 month cycles), criticality safety analyses were performed to verify the acceptability of an enrichment limit of 5.0 weight percent U-235 for the fresh fuel, spent fuel, and in-containment storage racks. The criticality analyses were performed with the KENO-5a three dimensional Monte-Carlo computer code, and the CASMO-3 two dimensional multigroup transport theory assembly code.

The use of KENO-5a and CASMO-3 for fuel storage criticality analyses has been validated by comparison to fuel storage critical experiments. Additionally, intercomparison calculations between the two analytical methods were conducted. This comparison indicated that (1) fuel enrichment does not have a significant effect over the range of 2.5 percent to 5.0 percent weight percent, and (2) mean delta k difference lies within the 95 percent confidence

limit. Additionally, a special routine was developed to interpolate the hydrogen scattering matrix for temperatures between 20 and 277 degrees centigrade. This special routine corrects a deficiency noted in NRC Information Notice 91-66.

Results of the benchmark calculations indicate that the temperature obtained by both codes is comparable over the range investigated. These benchmarks indicate that the analytical methods adequately reproduce the experimental values. The staff finds these methods and models to be acceptable.

The design basis for preventing criticality outside the reactor is that, including uncertainties, there is a 95 percent probability at a 95 percent confidence level (95/95 probability/confidence) that the effective multiplication factor (k-eff) of the fuel assembly array will be no greater that 0.95 when fully moderated by unborated water and no greater than 0.98 when moderated by reduced density hydrogenous material such as foam or mist (optimum moderation). The licensee performed calculations for the four fuel assembly designs for which the storage facilities could be used; Westinghouse standard and optimized designs, and Siemens large and small fuel rod designs. The Westinghouse optimized design exhibited the highest reactivity, and was used for all calculations.

New Fuel Vault

The calculational model used for these analyses was an infinite array of 2 x 10 storage boxes. The model describes the concrete reflector in one direction, but uses reflecting boundary conditions over the length of the vault. This effectively creates an infinite array in this direction, which is conservative since four of the rows have only 9 cells rather than the 10 described in the model. The licensee supplied a figure which shows the variation of the k(eff) of the new fuel storage vault with water density. The maximum k(eff) occurs at 5.3 percent of normal water density. The calculated k(eff) and uncertainties for both the optimum moderation (5.3 percent water density) and the fully flooded conditions were presented. The maximum calculated values of k(eff) for the new fuel storage vault are 0.972 at the optimum low-density moderating condition and 0.929 for the fully flooded condition.

These calculations were performed for 5.0 percent enriched fuel. Discussions with the licensee verified that the calculations were performed for the highest reactivity fuel type (Westinghouse optimized fuel), since Table 2 of their submittal did not reference fuel type. The maximum k(eff) values for the fuel enrichment requested by the licensee (4.3 percent), would be slightly lower than these limiting calculational values. These values are within the staff guidelines stated in Standard Review Plan Section 9.1.1 of 0.98 and 0.95, respectively. In addition, the reactivity effects of mechanical uncertainties (e.g., center-to center spacing) have been incorporated at a 95/95 probability/confidence level. This meets the staff's acceptance criteria and is acceptable.

Fuel Handling Design Basis Accident

In its evaluation for Comanche Peak, issued in July 1981, the staff conservatively estimated offsite doses due to radionuclides released to the atmosphere from a fuel handling accident. The staff concluded that the plant mitigative features would reduce the doses for this DBA to below the doses specified in NUREG-0800.

Since the licensee intends to utilize higher enrichment fuel the staff reanalyzed the fuel handling DBA for this case. According to NUREG/CR-5009 (February 1989) increasing fuel enrichment to 5.0 weight percent U-235 with a maximum burnup of 60,000 MWD/T increases the doses for a fuel handling accident by a factor of 1.2. The licensee proposes to limit enrichment to 4.3 weight percent U-235. Therefore, the 1.2 factor increase in dose displayed in Table 1 below, bounds the dose consequences of the licensee's proposal. In Table 1, the new and old DBA doses are presented and compared to the guideline doses in NUREG-0800 (established based on 10 CFR Part 100).

Table 1
Radiological Consequence of Fuel
Handling Design Basis Accident (rem)

	Exclusion Area Thyroid	Low Population Zone Thyroid
Staff Evaluation July 1981	2.1	1
Bounding Estimates for Higher Enrichment Fuel Burnup*	2.5	1.2
Regulatory Requirement (NUREG-0800 Chapter 15.7.4)	75	75

* Factor of 1.2 greater than original estimate for iodine.

The staff concludes that the only potential increased doses resulting from the fuel handling accidents with increased enrichment is the thyroid doses; these doses remain well within the dose limits set forth in NUREG-0800 and are, therefore, acceptable.

Evaluation Summary

The licensee has proposed a change to Section 5.3.1 of the Technical Specifications. The analyses submitted by the licensee were conservative in that they were performed for a 5.0 percent fuel enrichment. The analyses' results were within staff limits for maximum k(eff) for the various scenarios;

therefore, no burnup or fuel assembly checkerboarding restrictions were submitted. The technical specification change simply changes the maximum weight percent limit for fuel storage, from 3.5 percent to 4.3 percent. The proposed change is consistent with the results of the criticality analyses provided, and is, therefore, acceptable.

Based on the above review and evaluation, the staff concludes that fuel assemblies having initial enrichments up to 4.3 percent U-235 may be safely stored in the fresh and spent fuel racks. This conclusion is based on the following:

(1) Analyses were performed with well established methods that were properly verified.

(2) Conservative input assumptions were used.

(3) The analysis results meet the NRC criteria for acceptance with respect to k(eff); and the consequences of limiting accidents are acceptable.

(4) The proposed TS is consistent with the analyses provided.

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

Pursuant to to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact was published in the Federal Register on June 23, 1993 (58 FR 34065).

Accordingly, based upon the environmental assessment, the Commission has determined that issuance of these amendments will not have a significant effect on the quality of the human environment.

6.0 CONCLUSION

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

Principal Contributor: B. Holian, NRR

Date: July 6, 1993