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William J. Cahill, Jr.
Group Vice President

February 14, 1994

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
SUBMITTAL OF LICENSE AMENDMENT REQUEST 94-002
QUADRANT POWER TILT RATIO

Gentlemen:

Pursuant to 10CFR50.90, TU Electric hereby requests an amendment to the CPSES Unit 1 and Unit 2 Operating Licenses (NPF-87 and NPF-89) by incorporating the attached changes into the CPSES Units 1 and 2 Technical Specifications. These changes apply equally to CPSES Units 1 and 2.

The proposed changes revise the CPSES Units 1 and 2 Technical Specifications by replacing the existing specification and associated bases concerning the Quadrant Power Tilt Ratio (QPTR) with a specification and bases consistent with the improved Standard Technical Specifications for Westinghouse Plants (NUREG-1431).

Attachment 2 provides a detailed description of the proposed changes, a safety analysis of the changes, and TU Electric's determination that the proposed changes do not involve a significant hazard consideration. Attachment 3 provides the affected Technical Specification pages (NUREG-1468), marked-up to reflect proposed changes.

TU Electric requests approval of this proposed license amendment by July 31, 1995, with implementation of the Technical Specification change to occur within 30 days of approval.

In accordance with 10CFR50.91(b), TU Electric is providing the State of Texas with a copy of this proposed amendment.

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Should you have any questions, please contact Mr. Bob Dacko at (214) 812-8228.

Sincerely,

William J. Cahill, Jr.
Group Vice President, Nuclear

BSD
Attachments:
1. Affidavit
2. Description and Assessment
3. Affected Technical Specification page (NUREG-1468) as revised by all approved license amendments

Enclosures:
1. NUREG 1431, "Technical Specifications for Westinghouse Plants," September 1992, Pages 3.2-18 through 3.2-20

2. CPSES Technical Specifications TS 3/4.2.2 and TS 3/4.2.3 (NUREG-1468), Pages 3/4.2-4 through 3/4.2-9

c - Mr. L. J. Callan, Region IV
Mr. T. A. Bergman, NRR
Mr. L. A. Yandell, NRR
Resident Inspectors, CPSES (2)

Mr. D. K. Lacker
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Texas Utilities Electric Company	)	Docket Nos. 50-445
	)	50-446
(Comanche Peak Steam Electric	)	License Nos. NPF-87
Station, Units 1 & 2)	)	NPF-89

AFFIDAVIT

William J. Cahill, Jr. being duly sworn, hereby deposes and says that he is Group Vice President, Nuclear for TU Electric, the licensee herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission this License Amendment Request 94-002; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

William J. Cahill, Jr.
Group Vice President, Nuclear

STATE OF TEXAS)
)
COUNTY OF SOMERVELL)

Subscribed and sworn to before me, on this 14th day of February, 1994.

Patricia Wilson
Notary Public

PATRICIA WILSON
MY COMMISSION EXPIRES
March 16, 1997

DESCRIPTION AND ASSESSMENT

I. BACKGROUND

During a return to full power following a relatively short period of operation at reduced power, CPSES has experienced problems meeting the Limiting Condition for Operation (LCO) for Technical Specification 3.2.4. This Technical Specification requires that when above 50% Rated Thermal Power (RTP), the Quadrant Power Tilt Ratio (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 Technical Specification 3.0.4, the power cannot be increased above 50% RTP until the QPTR limit is satisfied. As a result, the plant must be maintained below 50% RTP for several hours until the xenon transient decays.

In order to avoid unnecessary delays in returning the plant to full power operation, it is proposed that the Action Statements presented in the improved Standard Technical Specifications (STS) [1] be incorporated into the CPSES Technical Specifications. These Action Statements are structured such that the requirements of TS 3.0.4 are no longer restrictive. The revised specification permits power ascension above 50% RTP with the QPTR above 1.02, provided that the assumptions of affected safety analyses are confirmed to be satisfied.

II. DESCRIPTION OF THE TECHNICAL SPECIFICATION CHANGE REQUEST

The affected Technical Specification (TS) is 3/4.2.4, "Quadrant Power Tilt Ratio." The changes which are being proposed will replace the existing Technical Specification with the corresponding specification from NUREG-1431, "Standard Technical Specifications for Westinghouse Plants." Only the content (not format) of the Standard Technical Specifications will be incorporated into the CPSES Technical Specifications.

The Limiting Condition for Operation (LCO) and Applicability is the same for each of the two specifications. Although revised slightly, when considered in conjunction with the proposed BASES, the Surveillance Requirements (SRs) of each of the two specifications are also the same.

The essential changes to the existing CPSES Technical Specifications are described below:

a) DEFINITION 1.27 QUADRANT POWER TILT RATIO is revised to include the use of movable incore detectors when above 75% power with one power range channel inoperable.

b) If the LCO 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% RTP.

This requirement is not included in the proposed Technical Specification.

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

The proposed specification 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 specification requires that the LCO be satisfied within 24 hours of exceeding the limit or that the reactor power be reduced to less than 50% of Rated Thermal Power 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% of Rated Thermal Power within the next 4 hours.

The proposed specification 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 specification.

If the $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances reveal these parameters to be within their limits, the proposed specification would then allow operation at Rated Thermal Power 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% RTP, the current specification 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% RTP.

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

f) Furthermore, the proposed specification 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% 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 STS, modified to reflect the CPSES format.

The Special Test Exception for Physics Testing is unaffected by the proposed changes.

In summary, the QPTR Action Statements in the proposed specification reflect the fact that actual problems with the core power distributions can be handled through the required $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances and Action Statements. Any indication problems associated with the QPTR, but which do not result in $F_Q(Z)$ or $F^N_{\Delta H}$ concerns, can be addressed at or near Rated Thermal Power. Further, operation with an indicated QPTR which exceeds the QPTR LCO can continue indefinitely provided that the QPTR Action Statements are satisfied.

III. ANALYSIS

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% 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% RTP, if the QPTR limit is exceeded, the Action Statements limit the power to less than 100% RTP in order to ensure that the margins of the accident analyses are preserved.

Current Action Statement a.1

The Action Statement a.1 in the current Technical Specification requires that the QPTR be calculated at least once per hour until power is reduced to less than 50% RTP or the calculated QPTR satisfies the LCO. In the case of an occurrence which resulted in a rapid QPTR change, such as a dropped RCCA, actions performed in accordance with other documents (e.g., Abnormal Operating Procedures or the Action Statements for another LCO) would be invoked. However, because the QPTR is used to detect relatively slow, gross changes in the core power distribution, the hourly QPTR calculation does not provide any additional useful information and may be deleted without consequence.

Current Action Statement a.2

The Action Statement a.2 in the current Technical Specification requires the core power be reduced by at least 3% RTP for each 1% of indicated QPTR in excess of 1. This requirement, based on a conservative trade-off between total core power and peak linear power, is preserved in the proposed Technical Specification in proposed action a.1.

The current Action Statement also requires that the Power Range Neutron Flux - High Reactor Trip Setpoint be reduced by at least 3% RTP for each 1% of indicated QPTR in excess of 1. This action is deleted from the proposed Technical Specification. The time required to reset these trip setpoints is approximately 12 hours. The proposed Action Statement a.1.c) (see below) requires that more precise measurements of the core power distribution ($F_Q(Z)$ and $F^N_{\Delta H}$) be performed within 24 hours. If the core power distribution was actually outside the assumptions of the accident analyses, the appropriate Action Statements would be taken as described in the following paragraphs. The expected frequency of events which would require adjustment of the Power Range Neutron Flux - High reactor trip function is reduced by relying on more precise measurements to determine the need and by limiting the time operations can continue above 50% RTP before these measurements are taken. Further, because the Protection Cabinets must be entered in order to reset the reactor trip setpoints, the potential for an inadvertent reactor trip is reduced by the proposed changes.

The improved STS BASES indicates that 24 hours is sufficient to stabilize power and perform the required surveillances. At CPSES, experience has shown that for larger power increases, 24 hours are typically required to establish the equilibrium conditions required by the $F_Q(Z)$ surveillance. In certain instances, to meet the 24 hour requirement contained in the proposed Action Statements a.1.c) and a.3, measurements of $F_Q(Z)$ may have to be taken with non-equilibrium conditions. However, in these instances the values of $F_Q(Z)$ are expected to be conservative, (i.e., peaking factor values are higher) and therefore acceptable for confirming that $F_Q(Z)$ is within its accident analysis limit.

The expected probability of an overpower event occurring during the time period when the condition of the core power distribution is being confirmed is very small. Hence, there is no real necessity nor an increase in plant safety to be gained by resetting the Power Range Neutron Flux - High reactor trip setpoint within 2 hours while the cause of the excessive QPTR is under investigation. In fact, under the current Action Statement, plant safety may actually be reduced because there is an increased probability of a unit trip while resetting the trip setpoint.

Current Action Statement a.3

The proposed revision to current Action Statement a.3 (Action Statement a.1.c) in the proposed specification) is based on the recognition that the QPTR is used to detect gross changes in the radial power distributions; thus, if the QPTR LCO is not satisfied, a precise assessment of the core power distribution ($F_Q(Z)$ and $F^N_{\Delta H}$) is performed in order to determine if the core power distribution is truly outside of the assumptions of the accident analyses. Until the core power distribution has been measured, the core power is limited by Action Statements a.1.a) and a.1.b) in order to compensate for the potentially adverse distribution. If, as a result of the performance of the required power distribution measurement, it is determined that $F_Q(Z)$ or $F^N_{\Delta H}$ do not satisfy their respective LCOs, the Action Statements of those LCOs are applied. Note that if the core power distribution is truly adverse, the applicable action statements are similar to the Action Statement a.2 in the current QPTR Technical Specification.

In summary, the proposed Action Statement would require essentially the same actions as the current Action Statement if the actual core power distribution, as determined through measurements of $F_Q(Z)$ and $F^N_{\Delta H}$, exceeded the assumptions of the accident analyses. However, if the actual core power distribution is found to be within the assumptions of the accident analyses, a further power reduction is not required.

Current Action Statement a.4

Action Statement a.4 of the current Technical Specification requires that the cause of the LCO violation be identified and corrected.

Subsequent operation above 50% RTP is allowed if the LCO is satisfied and is verified to be within its limit once per hour for 12 hours or until the QPTR is verified to be acceptable at or above 95% RTP.

The Action Statement a.2 of the proposed Technical Specification is based on the presumed cause of the excessive QPTR:

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

2. 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.

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

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

If, through the more precise measurements of the core power distribution in accordance with the $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances, it is determined that the assumptions of the accident analyses are satisfied, the proposed Action Statement would require the re-normalization of the excore detectors. Power ascension to 100% RTP would then be allowed. The $F_Q(Z)$ and $F^N_{\Delta H}$ surveillances are required to be repeated (per proposed Action Statement a.3) within 24 hours of reaching Rated Thermal Power 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.

Proposed Action Statement a.4

This action statement is contained in the improved Standard Technical Specifications, but is not in the current CPSES Technical Specifications. The proposed Action Statement a.4 requires that the reactor power be reduced to less than 50% RTP within 4 hours if any of the proposed Action Statements are not met within the required completion time. This requirement places the plant in a condition outside of the APPLICABILITY of the specification.

Surveillance Requirement 4.2.4.1 and 4.2.4.2

There are no significant differences between the current surveillance requirements (SRs) and the proposed SR. Changes are only of a clarifying or editorial nature. The proposed change incorporates SR 4.2.4.2 into SR 4.2.4.1. In conjuction with the revised definition of QPTR, the proposed SR 4.2.4.1 contains the same requirements contained

in current surveillances SR 4.2.4.1 and SR 4.2.4.2. This change removes an existing inconsistency between current SR 4.2.4.2 and the current definition of QPTR. Currently, QPTR is defined only for the excore detectors. However, the current SR 4.2.4.2 requires calculating QPTR using movable incore detectors.

Also, the current SR 4.2.4.2 specifies that the movable incore detectors are to be used to verify that the QPTR is within its limits by using the four pairs of symmetric thimble locations or the Movable Incore Detection System. The four pairs of symmetric thimble locations are a subset of the Movable Incore Detection System. In the proposed SR, only the movable incore detectors are specified as the alternate means of monitoring the QPTR. However, the BASES for the proposed SR provide guidance concerning the use of the four pairs of symmetric thimble locations. Thus, when the SR and associated BASES are considered together, the proposed SR is essentially the same as the current SRs.

BASES

The BASES provides amplifying information and has no impact on this analysis.

IV. SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TU Electric has evaluated the significant hazards consideration involved with the proposed change by focusing on the three standards set forth in 10 CFR 50.92(c) as discussed below:

Does the proposed change:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed changes affect the Action Statements which are to be taken when it is discovered that the Quadrant Power Tilt Ratio (QPTR) is greater than the value specified in the Limiting Condition for Operation. The frequency for determining QPTR has been reduced. The requirements to reduce power to below 50% RTP and to reduce the power range flux trip setpoints based on QPTR have been replaced by similar requirements based on $F_Q(Z)$ and $F^N_{\Delta H}$. The requirement to correct the cause prior to increasing power and verifying QPTR hourly is replaced with specific requirements to verify that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their limits, the safety analyses remain valid, and the excore detectors are re-normalized to indicate zero quadrant power tilt. If the proposed actions are not met, a requirement to reduce power to $\leq$ 50% RTP within 4 hours was added.

The only item above that could affect the probability of an accident is the removal of the requirement to reduce the power range neutron flux setpoints. However, because the Protection Cabinets must be entered to make these adjustments, eliminating the requirement to adjust these setpoints actually slightly reduces the probability of an inadvertent plant trip. Thus, the changes do not increase the probability of an accident previously evaluated and may reduce the probability of a plant trip.

The proposed Action Statements, require that accident analyses be re-evaluated to confirm that the results remain valid within 24 hours. Prior to the completion of this confirmation, the plant is not permitted to operate at a power level higher than is permitted under the current specification. If the re-evaluation of accident analyses cannot confirm that the plant is within the accident analyses results, the required actions are similar to the requirements of the current specification. Although higher initial power levels generally increase accident consequences, once the accident analyses results are confirmed to be valid, the consequences of any accident will be within analyzed acceptable limits. Thus, the higher plant power levels permitted by the proposed changes do not significantly increase the consequences of any accidents previously evaluated.

The proposed specification does not require a reduction in Power Range Neutron Flux - High reactor trip setpoints during the time the appropriate peaking factor surveillances are being performed. The interval during which the proposed specification permits operation without reduced setpoints (and unverified peaking factors) is longer than is permitted under the current specification. However, the consequences of any accident which could occur during this interval are the same as for the conditions prior to resetting the trip setpoints in the current specification. Therefore the change does not increase the consequences of any accident which could occur during this interval. The impact of the extended interval is addressed in response to question 3) below.

Based on the discussions above, the proposed changes do not involve an increase in the probability or consequences of an accident previously evaluated.

2) Create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed changes do not involve any hardware changes. System operation has not been changed to create any new system configurations which were not previously allowed. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) Involve a significant reduction in a margin of safety?

The limits for the parameters of concern (QPTR, $F_Q(Z)$ and $F^N_{\Delta H}$) remain unchanged. The acceptance criteria for analyzed events also remain the same. The margin of safety established by the LCOs remains unchanged.

The only impact of the proposed changes is an increase in the allowed duration of operation above 50% RTP without a reduction in the Power Range Neutron Flux - High trip setpoint. This could potentially affect a margin of safety by allowing operation at conditions which are potentially outside the assumptions of the accident analyses for an interval longer than is permitted under the current specification. The impact on safety margin is not considered to be significant, however, because: the allowed interval is still small (24 hours versus the current 6 hours); the likelihood of an accident during the interval is small; and, it is considered unlikely that the peaking factors would be outside their limits without other indications.

Thus, it is concluded that the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above evaluations, TU Electric concludes that the activities associated with the proposed changes satisfy the no significant hazards consideration standards of 10CFR50.92(c) and, accordingly, a no significant hazards consideration finding is justified. In addition, all the proposed changes are consistent with NUREG-1431 and, as such, have already been generically assessed by the NRC.

V. ENVIRONMENTAL EVALUATION

TU Electric has evaluated the proposed changes and has determined that the changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amount of any effluents that may be released off-site, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

VI. REFERENCES

1. NUREG 1431, "Standard Technical Specifications for Westinghouse Plants," September 1992