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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 2 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 application dated May 18, 1990, as supplemented by letter dated July 9, 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, Unit No. 1. The proposed changes would modify Tables 2.2-1 and 3.3-3 to permit use of an analog panel front-installed meter for calibration of High and Low setpoints for power range neutron flux meters and correct a bias in the steam generator water level Low-Low and High-High setpoints.

EVALUATION

Power Range Neutron Flux Setpoints

Technical Specification (TS) 4.3.1.1 (Note 2 to Table 4.3-1) requires that the power range Nuclear Instrumentation System (NIS) channels be readjusted if the power indicated on the panel front meter differs from the power calculated from the daily power calorimetric by more than 2 percent of rated thermal power (RTP). The statistical setpoint study performed for Comanche Peak assumed that a digital multimeter would be used for readjustment if required by the daily power calorimetric. Calibration with a digital multimeter requires that the NIS drawer be withdrawn and reinserted after the readjustment is completed. Each time the drawer is repositioned, several cables are flexed and/or extended. To reduce the potential for damaging these cables or their terminals, it is desirable to use the panel front power meters in place of a digital multimeter as a calibration device. However, because the uncertainty associated with the panel front meters is greater than the uncertainty associated with the digital multimeter, an additional uncertainty must be considered in the calculations of the power range neutron flux setpoints. The additional uncertainty is treated as a sensor measurement and test equipment uncertainty, and thus acts to increase the total channel statistical combination of all uncertainties associated with a particular channel. For the Power Range Neutron Flux setpoints, adequate allowance exists between the safety analysis limit and the nominal setpoint currently presented in Table 2.2-1 of the Technical Specifications to offset the increase in the channel statistical allowance. Thus, only the "S" term in Table 2.2-1 is affected and the setpoints remain unchanged. The change in the "S" term only affects the determination of channel operability and has no effect on the nominal or

allowable setpoints presented in the table. Because the magnitude of the total channel statistical allowance remains less than the total allowance between the safety analysis limit and the nominal setpoint, the safety analysis assumptions concerning the NIS setpoints are preserved.

Technical Specification (TS) 2.2.1 requires that the Reactor Trip System Instrumentation and Interlock Setpoints be set consistent with the values shown in Table 2.2.1. The sensor error, "S", for item 2) of that table (Power Range, Neutron Flux) has been changed from 0 to 1.25 percent of span to account for the higher uncertainty associated with the analog panel front installed meter. Because the power range neutron flux measurements continue to be made with an acceptable level of accuracy to ensure that operation within the indicated setpoints will assure that the assumptions in the accident analyses are valid, and the change will reduce the potential for damage to sensitive cabling or terminations, this change is acceptable.

Steam Generator Water Level Trip Setpoints

The calculation for the steam generator water level trip setpoints included an uncertainty due to the velocity head created by fluid flowing past the lower narrow range level tap. This tap is located in the annular region of the steam generator downcomer where the fluid velocity is relatively high and perpendicular to the tap. The high fluid velocity and direction act to reduce the pressure at the lower tap, thus increasing the total pressure difference between the lower and upper level taps. The effect of the increased pressure difference is to cause the indicated steam generator water level to be less than the actual level. This difference between the indicated and actual levels only acts in one direction; therefore, the effect of the velocity head is treated as a bias in the setpoint calculation. During a recent review of Comanche Peak specific documents, Westinghouse noted an error in the application, in magnitude and direction, of the velocity head bias used in the Comanche Peak setpoint study.

The nominal value of the steam generator water level Low-Low setpoint is calculated such that the trip signal will be generated when the actual steam generator water level is greater than or equal to the level setpoint assumed in the accident analysis. Because the velocity head effect causes the indicated level to be lower than the actual level, the indicated steam generator water level will be below the steam generator water level Low-Low setpoint at a time when the actual level is above the setpoint. Therefore, the generation of a trip signal on steam generator water level Low-Low, prior to the time that the actual steam generator water level falls below the level setpoint assumed in the accident analysis, can be assured without incorporating the velocity head bias into the calculation of the steam generator water level Low-Low setpoint. Conversely, this effect must be considered in the calculation of the steam generator water level High-High setpoint in order to ensure that a trip signal is generated prior to the time that the actual level is above the level setpoint assumed in the accident analysis.

Westinghouse has informed TU Electric that there was an error in the application, in magnitude and direction, of the velocity head bias used in the Comanche Peak setpoint study. The magnitude of the bias should be 2.6 percent of the steam generator water level narrow range span and is applicable to the High-High level setpoint only. Thus, the velocity head effect of 3.5 percent should be deleted from the Low-Low setpoint and the velocity head effect for the High-High setpoint should be increased from the present value of 2.1 percent to the correct value of 2.6 percent. Although the revised magnitude of the velocity bias is greater than that value allowed for in the calculation of the steam generator water level High-High setpoint, the revised total channel statistical allowance remains less than the total allowance between the nominal setpoint currently in the TSs and the setpoint assumed in the accident analysis. Therefore, the accident analysis remains bounding.

For the steam generator water level Low-Low setpoint in Table 2.2-1 and Table 3.3-3, based on the elimination of the 3.5 percent bias, it is possible to lower the nominal setpoint from its current value of 28 percent of span to 24.5 percent of span. However, 0.5 percent of the possible 3.5 percent bias has been retained as additional margin. Thus, both the Trip Setpoint and the Total Allowance have been reduced by only 3.0 percent of span from 28.0 to 25.0. The Z term in Tables 2.2-1 and 3.3-3, which is the statistical summation of errors assumed in the setpoint analysis, excluding those associated with the sensor and rack drift and the accuracy of their measurement, has been reduced from 25.58 percent to 22.08 percent of span (which is a difference of 3.5 percent, the magnitude of the misapplied velocity head bias). Finally, the channel statistical allowance, which is the statistical summation of all uncertainties associated with a particular channel, has also been reduced by 3.5 percent of span as a result of the elimination of the 3.5 percent bias. The Allowable Value, which is the nominal setpoint minus the lesser of the retained margin or rack uncertainty, now becomes 23.1 percent of span.

For the steam generator water level High-High setpoint in Table 3.3-3, the Z term has been changed from 4.28 percent to 4.78 percent (or .5 percent of span) which reflects the difference between the previously assumed velocity head bias of 2.1 percent and the revised bias of 2.6 percent of span. However, the revised total channel statistical allowance remains less than the total allowance between the nominal setpoint currently in the Comanche Peak, Unit 1 TSs and the setpoint assumed in the accident analysis. Thus, there is no change to the nominal or allowable High-High setpoints presented in Table 3.3-3.

For both steam generator water level setpoints, the total channel statistical allowance remains less than the total allowance between the safety analysis limit and the nominal setpoint, thereby preserving the safety analysis assumptions concerning the steam generator water level setpoints. These changes are, therefore, considered 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 and changes in surveillance requirements. 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). 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.

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