



Log # TXX-90240
File # 916
Ref. # 10CFR50.90
10CFR50.92

William J. Cahill, Jr.
Executive Vice President

July 9, 1990

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) UNIT 1
DOCKET NO. 50-445
SUPPLEMENTARY INFORMATION CONCERNING LICENSE AMENDMENT
REQUEST (LAR) 90-001

REF: TU Electric Letter TXX-90176 from William J. Cahill, Jr. to
the NRC dated May 18, 1990.

Gentlemen:

In response to oral requests for additional information TU Electric is
supplementing the application of May 18, 1990, for a License Amendment with
the attached information.

The attached information does not invalidate or change the significant hazards
consideration evaluation in our previous submittal. The attached information
is presented to clarify and augment our previous submittal and is intended to
facilitate processing by the NRC staff.

Sincerely,

A handwritten signature in black ink, appearing to read 'William J. Cahill, Jr.', written over a horizontal line.

William J. Cahill, Jr.

JDR/grp
Enclosures

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)
Mr. J. H. Wilson, NRR

9007160179 900709
PDR ADOCK 05000445
P FDC

2029
111

SUPPLEMENTAL INFORMATION
PROPOSED CPSES UNIT 1 TECHNICAL SPECIFICATION CHANGE
STEAM GENERATOR WATER LEVEL SETPOINTS
and
POWER RANGE NEUTRON FLUX SETPOINTS

LAR 90-001

I. DESCRIPTION OF TECHNICAL SPECIFICATION CHANGE REQUEST

This request proposes to revise Comanche Peak Steam Electric Station (CPSES) Unit 1 Technical Specification Tables 2.2-1, "Reactor Trip System Instrumentation Setpoints" and 3.3-3, "Engineered Safety Features Actuation System Instrumentation Trip Setpoints" to:

A. Power Range Neutron Flux Setpoints

Revise the power range neutron flux sensor error for High and Low setpoints to account for higher uncertainty associated with the use of an analog panel front installed meter. This change will reduce the potential for damaging several cables and/or terminals by using, as a calibration device, the panel front power meters in place of a digital multimeter which requires repositioning of the drawer during calibration.

B. Steam Generator Water Level Trip Setpoints

Revise the Steam Generator Water Level Low-Low and High-High setpoints to reflect the correction of an error in the magnitude and direction of a velocity head bias used in the calculation of these setpoints. This change will (a) ensure that the High-High trip signal is generated at the proper actual water level by correcting the maximum statistical summation of errors (excluding errors in the rack and sensor), and (b) extend the acceptable steam generator water level envelope, reducing unnecessary trips and safety system challenges.

II. BACKGROUND

A. Power Range Neutron Flux Setpoints

The power range Nuclear Instrumentation System (NIS) channels are required by CPSES-1 Technical Specification 3/4.3.1 (Note 2 to Table 4.3-1) to 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% of rated thermal power (RTP). The statistical setpoint study for CPSES-1 assumed that a digital multimeter would be used for readjustment if required by the daily power calorimetric. Calibration with a digital multimeter requires the NIS drawer to be withdrawn and reinserted after the readjustment is completed.

B. Steam Generator Water Level Trip Setpoints

The calculation for the steam generator water level trip setpoints included an allowance for an uncertainty due to the velocity head created by fluid flowing past the lower narrow range level tap. For CPSES-1, this tap is 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 would be to cause the indicated Steam Generator water level to be less than the actual level. During the preparation of plant specific documents requested by TU Electric, Westinghouse recently noted an error in the application, in magnitude and direction, of the velocity head bias used in the CPSES-1 setpoint study.

III. JUSTIFICATION

A. Power Range Neutron Flux Setpoints

The proposed change to the power range neutron flux setpoints in Table 2.2-1 would allow the use of the power meters on the front of the Nuclear Instrumentation System (NIS) panel when adjusting the NIS indicated power to match the power calculated via the daily power calorimetric. Use of the front panel meter would not require the NIS drawer to be withdrawn and the cables would not be disturbed.

B. Steam Generator Water Level Trip Setpoints

The changes to the Steam Generator Water Level setpoints reflect the correction of an error in the magnitude and direction of a bias used in the calculation of these setpoints.

The velocity of the fluid at the lower instrument tap causes an increase in differential pressure which is registered by the instrument as an indicated level which is lower than actual steam generator level. The high-high level setpoint calculation must take into account this added inherent error.

The proposed change to the steam generator water level low-low trip setpoints will remove a misapplied velocity head bias and thus increase the available operating margin by lowering the setpoints.

IV. SAFETY EVALUATION

The proposed changes to the Technical Specifications do not affect any of the setpoints used in the accident analyses. The proposed changes involve the instrument and process uncertainties that are applied to the safety analysis limit to establish the nominal setpoints presented in the Technical Specifications.

A. Power Range Neutron Flux Setpoints

As stated earlier, readjustment of the power range channel as required by CPSES-1 Technical Specification 3/4.3.1 (Note 2 to Table 4.3-1), if the power indicated on the panel front meter differs from the power calculated from the daily power calorimetric by more than 2% of rated thermal power (RTP), currently requires the NIS drawer to be withdrawn and reinserted after readjustment. 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 the 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, this 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 (SMTE) uncertainty, and thus acts to increase the total channel statistical allowance for the NIS power range trip setpoints. The channel statistical allowance represents the 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 absorb the increase in the channel statistical allowance. Thus, only the "S" term in Table 2.2-1 is affected, and the values of 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 Table 2.2-1. 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.

B. Steam Generator Water Level Trip Setpoints

As a consequence of the increased pressure difference caused by the velocity head resulting from the fluid flowing past the lower narrow range level tap, the indicated level narrow range level is lower 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. 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 trip 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.

During the preparation of plant specific documents requested by TU Electric, Westinghouse recently noted an error in the application of the velocity head bias used in the CPSES-1 setpoint study. Westinghouse has informed TU Electric that the magnitude of the bias should be 2.6% of the steam generator water level narrow range span and, as discussed above, is only required for the calculation of the steam generator water level - high-high setpoint. The calculations supporting the setpoints presently contained in the CPSES-1 Technical Specifications include biases for the velocity head effect of 3.5% for the low-low level trip setpoint and 2.1% for the high-high level trip setpoint. Thus, the 3.5% bias may be removed from the low-low level trip setpoint; however, an additional bias of 0.5% must be factored into the high-high level setpoint calculation.

As stated above, 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. However, for this setpoint, the revised total channel statistical allowance remains less than the total allowance between the nominal setpoint currently in the CPSES-1 Technical Specifications and the setpoint assumed in the accident analysis. Thus, the only revision to Table 3.3-3 required as a result of the inclusion of the revised velocity head bias is the modification of the "Z" term. The modified "Z" term only affects the determination of channel operability and has no effect on the nominal or allowable setpoints presented in this table. 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. Finally, by extending the acceptable steam generator water level operating envelope, the number of unnecessary reactor trips and the ensuing challenges to the plant safety systems may be reduced.

V. DETAILED DISCUSSION OF PROPOSED TECHNICAL SPECIFICATION CHANGES (REFERENCE NUREG-1399)

- A. In table 2.2-1 page 2.4 for the Power Range Neutron Flux High setpoint and Low setpoint, the sensor error has been changed from 0 to 1.25 to account for the higher uncertainty associated with the analog panel front installed meter.
- B. In table 2.2-1 page 2-5 and in table 3.3-3 page 3 / 4 3-28 for the Steam Generator Water Level - Low-Low the Total Allowance (IA) column has been changed from 28.0 to 25.0, the Z term column has been changed from 25.58 to 22.08, the Trip setpoint column has been changed from 28.0 to 25.0, and the Allowable Value column has been changed from 26.4 % to 23.1 % to account for the removal of the uncertainty associated with the misapplication of the velocity head at the lower tap.
- C. In table 3.3-3 page 3 / 4 3-27 the Z value for the Steam Generator Water Level High-High has been changed from 4.28 to 4.78 to account for the velocity head bias.

VI. NO SIGNIFICANT HAZARDS EVALUATION PER 10 CFR 50.92

TU Electric has evaluated the no significant hazards considerations involved with the proposed changes by focusing on the three standards set forth in 10CFR50.92(c) as discussed below:

Does the proposed change:

- A. Involve a significant increase in the probability or consequences of any accident previously evaluated?

The proposed changes only affect the nominal setpoint or the terms used to evaluate the operability of a channel as provided in the CPSES-1 Technical Specifications. Through the use of nominal setpoints which include adequate instrument uncertainties, the accident analysis assumptions are preserved; therefore, there is no effect on the consequences of any accident previously evaluated. In addition, because the steam generator water level operating band is extended to its current analytical limit, the probability of an unnecessary plant transient is decreased.

- B. Create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed changes do not degrade nor negate any of the reactor protection system safety functions. No change is made to the plant which could create a new or different kind of accident.

- C. Involve a significant reduction in the margin of safety, as defined by the Bases of the Technical Specifications?

Through the use of nominal setpoints, controlled through the plant Technical Specifications, which include adequate instrument uncertainties, the accident analysis assumptions are preserved; therefore, there is no significant effect on any margin of safety as defined by the bases of the Technical Specifications.

VII. NO SIGNIFICANT HAZARDS DETERMINATION

Based on the above evaluations, TU Electric concludes that the activities associated with the above described changes satisfy the no significant hazards consideration standards of 10CFR50.92(c) and, accordingly, a no significant hazards consideration finding is justified.

VIII. 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 amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), an environmental assessment of the proposed changes is not required.

IX. REFERENCES

1. NUREG-1399, "Technical Specifications, CPSES Unit 1", April 1990
2. "Steam Generator Level and NIS Channel Setpoint Revisions", Reactor Engineering Calculation No. RXE-TA-CP1/1-029, Revision 0, March, 1990.