July 20, 1992

Docket Nos. 50-445
and 50-446

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

Dear Mr. Cahill:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON TOPICAL REPORT (TAC NO. M79866)

During the review of the subject report, the NRC staff has determined the need for additional information. Enclosed is a list of questions from the NRC staff and our contractor. The nature of the concerns reflected in the enclosed questions indicate that the submittals received to date are misfocused and require major modification. We recognize that this upgrading may require significant effort; however, the questions are comprehensive and by thoroughly addressing them the outstanding issues can be resolved and the methodology approved. If clarification of the questions is required by your staff, please contact Tom Bergman at (301) 504-1330.

The reporting requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under Public Law 96-511.

Due to the extensive nature of the questions we request that a meeting be held at NRC headquarters to discuss your results prior to submittal of your response to the questions. On the basis of discussions with your staff, this meeting will be scheduled for early November 1992, with a submittal date of no later than November 30, 1992.

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

Enclosure:
Request of Additional Information

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Request for Additional Information
Review of Comanche Peak RETRAN Model Qualification

PART I.

1.0 RETRAN-02 Modeling Methods

Due to limited available plant transient events, TUEC is relying heavily on the demonstration analyses to qualify models used in the base plant model. Because of a lack of a global qualification effort, it becomes more important for TUEC to qualify its CPSES RETRAN plant model on a component-by-component basis.

1. Justify using a two or three-node steam generator (SG) secondary side. Discuss in detail why the separator need not be modeled.

2. Since in FSAR analysis, TUEC made extensive use of the low-low SG water level setpoint, the model to compute the water level must be carefully qualified. Discuss in detail how the mixture level in the SG is computed. Provide details of qualification of the level computation method including benchmark against any data. If data are not available for this purpose from Comanche peak, use data from a similar plant to qualify this portion of the model. Discuss the "appropriate assumptions" necessary to compute the masses corresponding to the SG low-low water level trip setpoint and the initial SG water level.

   Explain further the statement on page 9 of Reference 2 which refers to "inaccuracies associated with the water level indication from a coarse steam generator model..." and justify TUEC assumptions and limitations which result from these inaccuracies.

3. Justify the adequacy of the primary-to-secondary heat transfer with the CPSES SG model.

4. Demonstrate that RETRAN control systems used for simulation of transients accurately perform their intended functions.

5. Discuss and justify the conservatism of the boron and N-16 transport models as used in analyses, including noding, dilution rate, etc.

6. Explain the parameters necessary for the decay heat model.

7. Discuss the rationale and values used to determine the fuel rod gap

thermal conductivity on an event-specific basis.

8. Explain the "simple DNBR calculational model" and its differences from the model presented in the VIPRE topical report.

9. Provide results from qualification analysis of the RETRAN-02 "hot spot" model. If benchmarked to any fuel performance code, provide comparative analysis.

2.0 Comparison with Plant Data

10. For the purpose of checking the reactivity control systems, perform benchmark analysis of reactivity related transient. If CPSES transient is unavailable, use data from a sister plant.

2.1 Full Load Rejection Test

11. Justify not matching the SG secondary side pressure, which, as TUEC noted, became a major cause of differences in the primary and secondary behaviors. Expand the first 20 seconds of Figure 3.1-8 to show the comparison of two sets of data.

2.2 RCS Flow Coastdown Test

No questions.

PART II.

3.0 TUEC Demonstration Analyses - General

12. Justify shortening the rod drop time from 3.33 seconds to 2.67 seconds.

13. Provide a table of initial conditions comparing the RETRAN and FSAR data. Justify using initial conditions which are unmatched to the FSAR analysis conditions.

14. On an event-specific basis, quantify and compare the reactivity coefficients used for demonstration analyses with the current FSAR values and justify the use of different reactivity coefficients from the FSAR values. Similarly, on an event-specific basis, discuss why moderator temperature coefficients (remove the pressure effect from the density) and/or Doppler power (more responsive than to the temperature in some cases) coefficients were not used. Define "minimum" and "maximum" reactivity in terms of least or most negative and least or most positive.

15. Discuss any modeling changes to the qualification model necessary to perform demonstration analyses.

3.1 Excessive Increase in Secondary Steam Flow

16. Explain why the demonstration analysis is predicting a slower cooldown in the vessel average temperature (Fig. 4.2-3) and reaching a higher equilibrium temperature in Cases 1 and 2.

Explain why TUEC included the maximum Doppler reactivity effect for the maximum reactivity cases.

3.2 Turbine Trip

17. Discuss the source(s) of and justify the slower initial RCS pressurization and underprediction of primary-to-secondary heat transfer causing a subsequent convergence to higher RCS temperatures and pressure in all cases analyzed for this transient.

18. TUEC lowered the low-low SG water level setpoint for Case 4. Discuss reliability of RETRAN model to compute low SG water level accurately.

19. Discuss why a delay of scram by 2 seconds did not cause the higher RCS temperature peak to be predicted in the demonstration analyses.

3.3 Loss of Nonemergency AC Power

19. Discuss the source(s) of slower initial pressurization of the primary predicted in the demonstration analysis when compared to the FSAR analysis.

20. Justify using the same conditions and assumptions to maximize RCS pressure and SG pressure.

3.4 Loss of Normal Feedwater Event

20. Discuss the source(s) of delay in reaching the low-low SG water level setpoint.

3.5 Feedwater System Pipe Break Event

21. Expand the discussion (by providing detailed analysis) related to the determination of a different single failure event including the impact of using a different AFW purge volume.

22. Explain, in detail, Figure 4.6-6.

3.6 Partial Loss of Coolant Flow

23. Discuss in depth the cause(s) of the large differences in timing and magnitudes of RCS pressure prediction between the RETRAN and FSAR analyses for this and the complete loss of flow transients.

3.7 Complete Loss of Flow

See Q.23.

3.8 Locked Rotor

See Q.10.

24. Explain the difference in prediction of timing and magnitudes of RCS pressure peaks. Furthermore, discuss the difference in the cooldown portion of the transient prediction between two sets of analyses.

4.0 <u>Licensing Analysis Approach</u>

25. Address the following topics in the tabular form for all Chapter 15 transients:

Table 1. Identify the transients to be re-analyzed for reload. Provide brief description of events, applicable GDC's and core parameters (reactivity feedback, power peaking, power profile) as well as expected consequences and/or comments. In stating core parameters, identify the time of core life and reactivity feedback as least or most negative (or positive). Identify whether parametric runs (such as reactivity insertion rates or at power vs. zero power) are to be part of any of these re-analysis, if so, provide the range.

Table 2. On a transient-by-transient basis, with respect to each analysis objective (e.g., max RCS pressure, max SG secondary side pressure, worst DNB or others such as potential for PZR water solid or long-term core coolability), identify how initial system parameter values are selected. System parameters should include all key primary and secondary parameters as well as availability and modelling of control, reactor protection and safeguards systems. Responses should be qualitative rather than quantitative and designed to provide the reviewers with an understanding of TUEC's approach to selection of conservative input values within allowable margin of uncertainty. In addition, identify which plant and SG nodalizations are used for each analysis and reference where justifications are given.