December 11, 1990

Docket Nos. 50-295
and 50-304

Mr. Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
1400 OPUS Place
Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: REVIEW OF COMMONWEALTH EDISON TOPICAL REPORT NFSR-0069;
REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. 76660 AND 76661)

International Technical Services, Incorporated (ITS) has completed a preliminary review of the code adaptation aspects of the Commonwealth Edison Company (CECo) Topical Report NFSR-0069, entitled "Transient Analysis Envelope for Zion Units 1 and 2," for use with Zion Units 1 and 2. Apparently due to a misconstruance of the guidance provided by RETRAN-02 and VIPRE-01 manuals and their associated SER's dated September 4, 1984, and May 1, 1986, NFSR-0069 lacks an appropriate level of detail to describe and justify the adaptation of the RETRAN and VIPRE models. Consequently, in order for ITS to complete its evaluation of the code adaptation aspects of the CECo Topical Report, certain specific information is required. Enclosed please find a list of questions describing the information required to complete this review. Upon receipt of this request for additional information, please contact Chandu Patel (301) 492-3025, so that a telecon may be arranged to discuss NFSR-0069, the enclosed request, and information requirements to resolve staff concerns.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,
Original Signed By:
Robert M. Pulsifer, Project Manager
Project Directorate III-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
DISTRIBUTION

Docket File	NRC & Local PDRs	PDIII-2 r/f
DCrutchfield, 13A2	BBoger, 14E4	JZwolinski
CMoore	RPulsifer	OGC
EJordan, MNBB 3701	ACRS (10)	WShafer, RIII
A. Thadani, 8E2	C. Patel	R. Jones, 8E23
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PDIII-2:LA/DRP345	PDIII-2:PM/DRP345	PDIII-2:PD/DRP345
CMoore	RPulsifer:ra	RBarrett
12/7/90	12/11/90	12/11/90

DF01
1/1

cc:

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

(Referenced page numbers from NFSR-0069, "Transient Analysis Envelope for Zion Units 1 and 2.")

Part I Model Adaptation

A. Model Verification: In addressing the following items please focus on nodalization (both SG and core) sensitivity, thermal/hydraulic model sensitivity and selection and modeling of control systems, while being detailed and thorough.

1. Provide detailed results from the "comprehensive review of the model," referred to on p. 99, in terms of a check of the model adequacy for transient analysis.

2. Provide the "best-estimate comparison of the model against Zion startup test results," referred to on p. 99, as a "demonstration of Zion Base Model prediction accuracy."

3. Provide results from the "review of each transient performed against expected results as well as previous Westinghouse results," referred to on p. 99.

4. Justify the Zion pressurizer model described in Section A.2.1 of NFSR-0069.

5. Provide a discussion of model changes to the Zion Base Model which were necessary before it was used in the reload analysis.

B. VIPRE-01 Adaptation: In addressing the following items please do not limit consideration to only one set of conditions, rather consider a spectrum of transients to be analyzed.

1. Provide detailed results from the "CECo's own (channel size) sensitivity study," referred to on p. 118, to justify that the base model is conservative.

2. NFSR-0069 states on p. 119 that several axial noding models were used to test the effects of axial noding on the thermal-hydraulic solution in a sensitivity study before selecting a 4" axial node. Provide results, in detail, from such studies, including comparison of DNBR resulted from other node sizes, to justify that the 4" axial node is conservative.

3. Provide justification for the gap conduction model selections of: (i) dynamic gap in the hot assembly; (ii) constant gap conductance in the lumped conducting rods; and (iii) a time dependent constant gap conductance in the locked rotor transient.

4. Explain and justify the axial power shapes on a transient-by-transient basis.

5. Provide and justify the basis for determining the mixing coefficient value of 0.038 with FTM=0.8 for Zion.

6. Justify use of 0.5 for a subchannel loss coefficient in the method used to determine crossflow resistance.

7. Provide a description of and justify the data used for the following:

   a. active fuel length;
   b. the choice of a factor for core flow maldistribution;
   c. grid loss coefficient;
   d. damping factor;
   e. gap/centroid distance;
   f. slip ratio;
   g. turbulent mixing coefficient.

8. Justify, by providing sensitivity study results, that the selection of T/H models/correlations (also see Table 20, p. 130) results in conservative MDNBR prediction. In particular focus on:

   a. Convergence criteria selected;
   b. each of heat transfer correlations (including those for single phase and nucleate boiling regime) except for the CHF correlation;
   c. each of flow correlations.

9. Justify use of the extended W-3 correlation with VIPRE-01. Further provide analysis results used for determination of new DNBR limits of: (i) 1.45 for the low pressure range of 500-1000 psia; (ii) 1.30 between 1000-1500 psia for the steamline break; (iii) 1.42 between 1500-2500 psia with the WRB-1 correlation; and (iv) the safety limit of 1.43.

10. Provide detailed descriptions and justifications of changes made to the officially approved VIPRE-01 code. In addition, qualification and justification is required for addition of Novendstern and Sandberg single phase friction factor and the Bishop-Sandberg-Tong film boiling correlation to VIPRE-01 for use in the Zion analysis. Provide further evidence of proper implementation into the code by demonstrating that they reproduce the original test results.

11. Justify use of a 1/8 core symmetric base model to analyze asymmetric transients including the MSLB transient. Provide detailed discussion of how the MSLB DNBR calculations are performed.

12. Provide and justify that the data used for the following are conservative or provide reference for approval of its use: (i) hot channel factor, (ii) axial power profile and its peaking factor, (iii) radial peaking factor and pin radial-local peak.

13. Explain what is meant by the "single stage analysis methodology," as stated on p. 150.

14. Explain, in detail, the methodology using VIPRE-01 to develop dropped rod limit lines for the dropped rod event analysis.

15. Describe and justify the fuel densification model that will be used by CECo for Zion reload analysis.

Part II Application of Adapted Models to Zion Units 1 and 2 Safety Analysis

Part II of this Request for Additional Information dealing with Application of the adapted Models (reviewed in Part I) will be issued, if necessary, upon completion of the Part I review.