Docket Nos.: 50-269, 50-270, and 50-287

> Mr. H. B. Tucker, Vice President Nuclear Production Department. Duke Power Company 422 South Church Street Charlotte, North Carolina 28242

Dear Mr. Tucker:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION CONCERNING TOPICAL REPORT DPC-NE-2003, "CORE THERMAL-HYDRAULIC METHODOLOGY USING VIPRE-01" (TACS 69377, 69378, AND 69379)

The NRC is reviewing your topical report DPC-NE-2003, "Core Thermal-Hydraulic Methodology Using VIPRE-01" for Oconee Nuclear Station, Units 1, 2, and 3 submitted August 31, 1988. We find that further information, as indicated in the enclosure, is required to complete our review.

Your response to the enclosed questions is requested within 60 days of the date of this letter. If you have any questions regarding this matter, I may be contacted at (301) 492-1442.

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:

MRood

PD11-3

8703270434 870322 PDR ADOCK 05000269

Darl S. Hood, Acting Project Manager Project Directorate II-3 Division of Reactor Projects - I/II Office of Nuclear Reactor Regulation

Enclosure: As stated

cc w/enclosure: See next page

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

March 22, 1989

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Sincerely,

100 ARL

Darl S. Hood, Acting Project Manager Project Directorate II-3 Division of Reactor Projects - I/II Office of Nuclear Reactor Regulation

Enclosure: As stated

cc w/enclosure: See next page Mr. H. B. Tucker Duke Power Company

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Mr. Paul Guill Duke Power Company Post Office Box 33189 422 South Church Street Charlotte, North Carolina 28242

Mr. Alan R. Herdt, Chief Project Branch #3 U.S. Nuclear Regulatory Commission 101 Marietta Street, NW, Suite 2900 Atlanta, Georgia 30323

ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION ON DPC-NE-2003 CORE THERMAL-HYDRAULIC METHODOLOGY USING VIPRE-01

- 1. Section 4.0 of the topical report describes the nodalization sensitivity study performed to demonstrate that the simplified core models to be used for licensing calculations are conservative relative to the more detailed core model. (a) Was the study performed with the same thermal-hydraulic models and/or correlations to be used for licensing calculation? If not, identify those models and correlations which are not the same. (b) Would the use of different correlations and/or models lead to different nodalization sensitivity results? Demonstrate the conservatism of the simplified core model with the final T-H models for licensing application. (c) It is understood that only the BWC correlation will be used for critical heat flux calculation. What do you intend to do if the core conditions are outside the ranges of applicability of the BWC correlation?
- 2. Section 5.5 states that the spacer grid form loss coefficients for the individual subchannels are determined analytically by the vendor from the overall grid form loss coefficient. Provide sufficient detail of the analytical determination of the individual subchannel form loss coefficients. Are these values for single or two phase flow?
- 3. Section 5.8.2 discusses the determination of the value (Proprietary) of the turbulent mixing coefficient to be used for all Oconee Nuclear Station core thermal-hydraulic analyses based on vendor prediction of the mixing test results. Explain the process of vendor prediction of mixing test results and mixing coefficient, and explain how this correlates to the Oconee computation.
- 4. Section 5.8.2 also discusses the selection of the turbulent momentum factor (FTM) from the sensitivity study performed with the FTM of 0.0, 0.8 and 1.0. (a) Justfy the selected value which is not the most conservative value as shown in Table 5-4. (b) Explain how and why only the three values of FTM were selected for the sensitivity study.
- 5. Section 5.10 states that a new routine is added to the VIPRE-01 code to generate axial power shapes with inlet, symmetric, or outlet peaks. Provide sufficient details of this routine.
- 6. In Section 6.6, the inputs for the fuel gap conduction model are selected through a sensitivity study performed by varying three input parameters, i.e., pellet-cladding gap size, gas composition and pellet radial power frofile. Explain how this study enables the selection of conservative values of the eight parameters for input to the conduction model.

7. Section 6.6 also indicates that a sensitivity study shows very little difference in the pump coastdown results with regard to the choice of nucleate boiling correlation. Provide more detail of the sensitivity study performed to select the nucleate boiling correlation.