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TO: MR B C RUSCHE

FROM: DUKE POWER COMPANY
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DESCRIPTION
LTR FURNISHING INFO TO CLARIFY CERTAIN ASPECTS OF THE CALCULATIONAL PROCEDURE THAT WERE USED TO ESTABLISH THE FLUX/FLOW TRIP SETPOINTS.....

ENCLOSURE

ACKNOWLEDGED
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PLANT NAME: OCONEE 1-2

FOR ACTION/INFORMATION ENVIRO 6-1-76 RB

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

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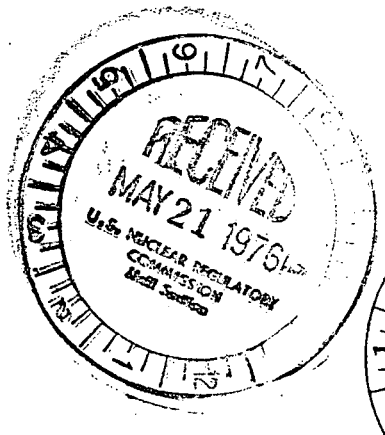

May 17, 1976

Mr. Benard C. Rusche, Director
Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. R. A. Purple, Chief
Operating Reactors Branch No. 1

Re: Oconee Units 1 and 2
Docket Nos. 50-269 and -270

Dear Sir:

The following information is submitted to clarify certain aspects of the calculational procedure previously utilized to establish the flux/flow trip setpoints for Oconee 1 (Cycle 3) and Oconee 2 (Cycle 2) and now revised to include an additional allowance for the accuracy of the reactor protection system flow instrumentation string.

The flux/flow trip setpoints for Oconee 1 and Oconee 2 were determined utilizing a calculational procedure which consisted of various conservative assumptions and allowances including (1) a steady-state power level of 108% (indicated power level of 102% plus 6% uncertainty in power level measurement), (2) design power peaking factors and hot channel factors, (3) a conservative value for the trip delay time, (4) maximum effect of fuel densification on DNBR, (5) an allowance for errors in the coolant inlet temperature and system pressure, (6) a 5% reduction in hot assembly flow to account for flow maldistribution, (7) a reactor coolant system flow rate of 107.6 percent of the original design flow rate (as compared to the measured flow values of 108.6% for Oconee 1 and 111.5% for Oconee 2), (8) a conservative allowance for core bypass flow through control rod and instrument guide tube, core shroud, etc., (9) the effective core flow further reduced by 4.6% for an assumed stuck open vent valve, and (10) the flow measurement errors associated with the RPS flow instrument string assumed to be calibrated out of the system. The flux/flow ratio resulting from this calculation was further reduced by 1.5% for flow signal noise to yield a flux/flow trip setpoint of 1.055 for Oconee 1 and 1.07 for Oconee 2. The flux/flow trip setpoint analysis, however, did not explicitly include an allowance for possible errors in the RPS flow instrument string, as has been previously indicated in discussions with the staff.

Detailed analysis of the precision and reliability of the various components of the RPS flow instrument string - ΔP transmitter, summer amplifier, function generator, and bistable comparator - indicates that the errors in the RPS flow instrument string could amount to a 1.2% reduction in the flux/flow ratio. However, the 4.6% additional core flow available from the consideration that the vent valves remain closed more than adequately compensates for this reduction.

A re-analysis of the Oconee 1 flux/flow ratio without including the effect of an assumed stuck open vent valve yielded a flux/flow trip setpoint of 1.08 after including an allowance of 1.2% for errors in the RPS flow instrument string and 1.5% for noise in the flow signal. Thus, the existing 1.055 flux/flow trip setpoint is conservative compared to that which could be allowed and still provides a flow margin in excess of 3%.

In the case of Oconee 2 also the proposed flux/flow trip setpoint of 1.07 for Cycle 2 continues to be conservative, and the fact that the measured flow is 111.5 percent of the original design is indicative of the considerable flow margin that exists in the flux/flow trip setpoint.

Very truly yours,

William O. Parker, Jr.

PMA:mmb