ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8807130323 DOC.DATE: 88/07/07 NOTARIZED: NO DOCKET #
FACIL:50-269 Oconee Nuclear Station, Unit 1, Duke Power Co. 05000269
50-270 Oconee Nuclear Station, Unit 2, Duke Power Co. 05000270
50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. 05000287
AUTH.NAME AUTHOR AFFILIATION
TUCKER,H.B. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: "Oconee 2,Cycle 10 Startup Testing Rept."

DISTRIBUTION CODE: IE26D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 15
TITLE: Startup Report/Refueling Report (per Tech Specs)

NOTES:AEOD/Ornstein:1cy. 05000269
AEOD/Ornstein:1cy. 05000270
AEOD/Ornstein:1cy. 05000287

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD2-3 LA	1	0	PD2-3 PD	1	1
	PASTIS,H	2	2			
INTERNAL:	ACRS	5	5	ARM TECH ADV	1	1
	NRR-CHATTERTON	1	1	NUDOCS-ABSTRACT	1	1
	REG FILE 02	1	1	RES/DRPS DEPY	1	1
	RGN2 FILE 01	1	1	RGN2/DRSS/EPRPB	1	1
EXTERNAL:	LPDR	1	1	NRC PDR	1	1
	NSIC	1	1			
NOTES:		1	1			

TOTAL NUMBER OF COPIES REQUIRED: LTTR 20 ENCL 19

R I D S / A D D S

R I D S / A D D S

OCONEE 2 CYCLE 10
Startup Testing Report
Table of Contents

Part I: Zero Power Physics Test

Part II: Power Escalation Test

Enclosures

IE 26
1/1

OCONEE 2 CYCLE 10
STARTUP TESTING REPORT

PART I

ZERO POWER PHYSICS TEST

1.0 Introduction and Summary

The Oconee 2 Cycle 10 Zero Power Physics Test (ZPPT) was conducted from 4/2/88 through 4/7/88 per Station Procedure TT/2/A/0711/10. The purpose of this testing was to verify the nuclear parameters upon which the Oconee 2 Cycle 10 safety analysis and Technical Specifications are based.

Zero Power Physics Testing measurements were made with reactor power controlled between 2.0 x 10(-10) amps and 1.6 x 10(-7) amps on the intermediate range instrumentation; reactivity insertions were maintained $< \pm$ 120 pcm. RCS pressure and temperature were maintained at approximately 2150 psig and 532°F, respectively.

The following nuclear parameters were measured:

(a) All-rods-out boron concentration (See Enclosure 1.0);

(b) Integral rod worth for Control Rod (CR) Groups 5, 6, and 7 (See Enclosure 2.0);

(c) Differential boron worth (See Enclosure 1.0);

(d) Temperature and moderator coefficients of reactivity (See Enclosure 2.0).

The plant computer was used to record RC pressure, RC temperature, intermediate range power levels, and control rod positions. Reactivity was calculated by the plant computer and output to a chart recorder.

On 4/7/88 at 1750, ZPPT was declared complete. All acceptance criteria were met.

2.0 Approach to Criticality

The initial RCS heatup following the refueling outage began on 4/2/88. Hot shutdown was reached on 4/5/88 at approximately 2300. Source range count rates were recorded and 1/M (inverse multiplication) vs RC temperature plots were generated throughout heatup.

Rod withdrawal for the Control Rod Drive Trip Time Test began at 2010 on 4/6/88; 1/M vs. withdrawn rod worth plots were maintained throughout. Criticality was achieved on 4/6/88 at 2358, with rod groups 1-7 at 100% withdrawn (wd) and group 8 at 70% wd. Groups 1-7 were then tripped at 0010 (4/7/88) for the CRD Trip Time Test (per Station Procedure IP/0/A/0301/003W). After repeating the test for a single rod which did not pass on the first execution, the trip time test was declared complete at 0105. With the RCS boron concentration adjusted accordingly, the reactor was taken critical at approximately all-rods-out with group 8 at 35% wd.

3.0 Pre-Physics Measurements

After establishing steady conditions with the reactor critical, NI overlap was verified and recorded, and the point of adding sensible heat was determined. From the sensible heat determination, the upper testing limit on the intermediate range NIs (as indicated on the Control Room Chart) was established for ZPPT.

An on-line OAC reactimeter checkout* was then performed by making reactivity insertions of about ± 50 and ± 120 pcm, and measuring the associated doubling times. These doubling times were input to an off-line reactivity calculation and the results were then compared to the on-line reactivity values.

*NOTE: An off-line OAC reactimeter checkout was performed during RCS heatup. This checkout verified correct calculational and chart recorder response to three test cases in which simulated power ramps were input via floppy discs.

4.0 Physics Testing

A. All Rods Out Boron Concentration Measurement

The RCS equilibrium boron concentration was measured with Groups 1-6 at 100% wd, Group 7 at 96% wd, and CR Group 8 at 35% wd. The control rods were moved to their all-rods-out position (Groups 1-7 at 100% wd, Gp. 8 at 35% wd) and the associated reactivity change was converted to ppmB. All Rod Out Boron concentration was then calculated and verified to be within 50 ppmB of its predicted value.

B. Reactivity Coefficient Measurements

The temperature coefficient measurement was made while maintaining equilibrium boron concentration in the RCS, with CR Group 7 withdrawn to 96% wd and with CR Group 8 at 35% wd. This measurement was made by varying RCS temperature by about 10°F and observing the associated reactivity change. The change in reactivity was divided by the change in RCS temperature to calculate the temperature coefficient. The measured temperature coefficient was corrected for the difference in RCS average test temperature and reference temperature (532°F). The moderator temperature coefficient was calculated by subtracting the calculated isothermal Doppler coefficient from the measured temperature coefficient.

C. Control Rod Group Integral Worths and Differential Boron Worth Measurement

The worths of Groups 5, 6, and 7 were measured by steadily deborating the RCS and compensating for the resulting positive reactivity ramp by inserting (in discrete steps of ~100 pcm) the control rods from 100% wd on Group 7 to 42% wd on Group 4 (with no rod overlap). The reactivity changes resulting from the discrete control rod insertions were summed for each group to obtain the group integral worth.

The differential boron worth was calculated by dividing the total rod worth inserted during the rod worth measurements by the corresponding change in RCS boron concentration. The initial value for the boron concentration was recorded at critical equilibrium conditions. The final values of boron concentration and reactivity were recorded as they approached steady-state at a rate of less than 8 pcm/minute.

PART II

POWER ESCALATION TEST

1.0 Introduction and Summary

The Oconee 2 Cycle 10 Power Escalation Test was performed between 4/7/88 and 5/2/88 per Station Procedure TT/2/A/0811/10. Testing was performed at 15% Full Power (FP), 40% FP, and 93% FP (100% FP for Core Power Distribution test) to verify nuclear parameters upon which the Oconee 2 Cycle 10 safety analysis and Technical Specifications are based. The following tests and verifications were performed:

(A) Initial Core Symmetry Check @ 15% FP

(B) NSS Heat Balance (including RCS flow measurement at 100% FP) @ 15% FP, 40% FP, and 93% FP (See Enclosure 4.0)

(C) Incore Detector Checkout @ 15% FP, 40% FP and 93% FP

(D) Power Imbalance Detector Correlation Slope Measurement @ 40% FP

(E) Core Power Distribution @ 40% FP and 93% and 100% FP (See Enclosures 5.0-5.3 and 6.0)

(F) All Rods Out Critical Boron Concentration @ 100% FP (See Enclosure 1.0)

The unit reached 15% FP at midnight on 4/8/88. All low power testing was completed that day. Because of maintenance required in the Reactor Building, the unit went to hot shutdown at approximately 1100 on 4/8/88.

The unit was restarted and reached 40% FP on 4/10/88. Testing at this power level was completed on 4/11/88. Following a Stator Coolant runback on 4/15/88, the unit reached 93% FP on 4/16/88 at 1310. While the unit was held at 93% FP for the acquisition of I&E flow data, the portions of full-power testing not requiring xenon equilibrium were performed. After proceeding to 100% FP, the unit experienced another Stator Coolant runback on 4/18/88. After the unit was returned to 100% FP on 4/19/88, the remainder of full-power testing was completed. Power Escalation Testing was declared complete on 5/2/88.

2.0 NSS Heat Balance/RC Flow Verification

Off-line secondary and primary heat balances were performed at 15% FP (primary only), 40% FP, and 93% and 100% FP. These tests verified the accuracy of CTPA, the on-line plant computer program which performs primary and secondary heat balances. The plant computer was used to average heat balance data (flows, temperatures, pressures, etc.) for 15 minutes. This data was input into the off-line heat balance programs, the results were compared to CTPA averages for the same period, and agreement within 2% FP was verified.

An off-line program was used to calculate RC flow based on a primary heat balance for LPT, a secondary heat balance for IMPT and FPT, and measured primary loop enthalpy changes. This demonstrated that the RC flow rate was above that assumed in the core design (106.5% design flow) and, for FPT, below that which could cause core lift at 415°F (115% design flow).

After establishing the primary flow rate at full power, the plant computer flow constants (used to calculate flow from the primary Delta-P instrumentation) were normalized. Slope and reference flow constants for the Delta-T power indication were then normalized, based on secondary heat balance. CTPA primary and secondary, and Delta-T power indications were compared and verified to agree within 2% FP.

3.0 Core Power Distribution

Core Power Distribution tests were conducted at 40% FP and at 93% and 100% FP. These tests verified that reactor power imbalance, quadrant power tilt, minimum DNBR, maximum linear heat rate (LHR) and radial/total power peaks did not exceed their respective specified limits. An initial Core Symmetry Check was performed at 15% FP.

Specific checks were made as follows:

- Incore imbalance was compared to the error adjusted imbalance LOCA limit curve and was verified to be within specified limits (based on Tech. Spec. 3.5.2.6).

  The maximum positive quadrant power tilt was verified to be less than the error adjusted LOCA limit (based on Tech. Spec. 3.5.2.4).

  The LHR was verified to be within the LOCA limit at each core level (per Reload Report DPC-RD-2010).

  The worst case minimum DNBR and maximum LHR, when extrapolated to the overpower trip, were verified to be within the clad failure and fuel melt limits, respectively (per Technical Specification 2.1 and Reload Report).

  Prior to performing the radial and total peaking factor comparisons, PT/0/A/0302/06 (Review and Control of Incore Neutron Detector Signals) was performed to identify erroneous SPND signals. This test was performed at 15% FP as part of Core Symmetry Verification, and at 40% FP and 93% FP as directed in the Incore Detector Checkout.

  The radial and total peaking factors were measured and compared to the predicted values at 40% and 100% FP. The following acceptance criteria were applied:

  (a) $$\% \text{ Deviation} = \frac{(\text{Predicted} - \text{Measured})}{\text{Measured}} \times 100$$

  $$\leq \begin{cases} \pm 15\% \text{ for radial peaking factors} \\ \pm 20\% \text{ for total peaking factors (recommended maximum deviation - not an acceptance criterion)} \end{cases}$$

(b) Largest Peak % deviation = $\frac{LMP-LPP}{LMP} \times 100$

$$\leq \begin{cases} + 5.0\% \text{ for radial peaking factors} \\ + 7.5\% \text{ for total peaking factors} \end{cases}$$

Where: LMP is the largest measured peaking factor
LPP is the largest predicted peaking factor

(c) The full core root mean square radial peaking factor deviation (RMS) for all core locations with operable incore detector strings was limited as follows:

$$\% \text{ RMS deviation} = \left[\sum_{i=1}^{n} \frac{(PP_i - MP_i)^2}{n-1} \right]^{\frac{1}{2}} \times 100 \leq 7.5\%$$

Where: PP = Predicted radial peaking factor
MP = Measured radial peaking factor
n = Total number of operable incore detector strings (Strings 28 & 48 were inoperable for both 40% and 100% FP.)

4.0 Power Imbalance Detector Correlation

The Power Imbalance Detector Correlation Test was performed at 40% FP. The purpose of this test was to measure the outcore to full incore power imbalance correlation slopes for NI Channels 5, 6, 7, and 8; and to verify these slopes to be equal to or greater than 0.95.

The incore/outcore imbalance correlation slope for each NI Channel (5-8) was determined by a least squares fit of outcore to incore imbalance indications. A total of 30 incore imbalance points which ranged between -7.89% and +3.75% were used. All the slopes were verified to be greater than 0.95.

The correlation slopes for NI Channels 5,7,and 8 were calculated to be 1.12; the slope for NI Channel 6 was 1.11. The differential amp gain settings for NI Channels 5-8 were 4.08, 4.23, 4.01, and 3.95 respectively.

5.0 Reactivity Measurement at Power

Per the Oconee Generic Startup Physics Test Program (May 1986 reissue), testing for measurement of reactivity coefficients at power is no longer required. The All Rods Out Critical Boron at Power measurement was made at 100% FP, and the boron anomaly between measured and predicted concentration was verified to be less than 50 ppmB.

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 1.0

ALL-RODS-OUT (ARO) AND DIFFERENTIAL BORON WORTH RESULTS

	Zero Power ARO Critical Boron Concentration	At-Power ARO Critical Boron concentration	Differential Boron Worth
CONDITIONS	Gp 7 @ 100% wd Gp 8 @ 35% wd (Initial critical equilibrium: Gp 7 @ 96% wd Gp 8 @ 35% wd 1568 ppmB)	100% FP 6.3 EFPD Gp 7 @ 95% wd Gp 8 @ 30% wd actual concentration 1072 ppmB	Initial: Gp 7 @ 94% wd Gp 8 @ 35% wd 1569 ppmb Final: Gp 4 @ 42% wd Gp 5 @ 0% wd Gp 8 @ 35% wd 1216 ppmB 1393 ppmB Average During Measurement
MEASURED VALUE	1569 ppmB	1073 ppmB	- 1.0052% δk/k per 100 ppmB
PREDICTED VALUE	1596 ppmB	1080 ppmB	- 0.8657% δk/k per 100 ppmB
DEVIATION	- 27 ppmB	- 7 ppmB	- 13.88% (% Dev = $\frac{\text{Pred - Meas}}{\text{Meas}}$ X 100)
ACCEPTANCE CRITERIA	Predicted ± 50 ppmB	Predicted ± 50 ppmB	Measured more positive than - 1.33% δk/k and ± 15% deviation from predicted

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 2.0

INTEGRAL GROUP ROD WORTH MEASUREMENTS

PARAMETER	MEASURED VALUE (% δk/k)	PREDICTED VALUE (% δk/k)	DEVIATION* (%)	ACCEPTANCE CRITERION
Gp 7 Integral Worth	- 0.915	- 0.817	- 10.7	± 15% Deviation
Gp 6 Integral Worth	- 0.909	- 0.910	- 0.2	± 15% Deviation
Gp 5 Integral Worth	- 1.352	- 1.236	- 8.5	± 15% Deviation
Gp 5-7 Integral Worth	- 3.176	- 2.963	- 6.7	± 10% Deviation

* $\%\ \text{Deviation} = \frac{\text{predicted-measured}}{\text{measured}} \times 100$

REACTIVITY COEFFICIENTS

PARAMETER	CONDITIONS	MEASURED VALUE	PREDICTED VALUE	ACCEPTANCE CRITERIA
Hot Zero Power Temperature Coefficient (ARO)	T_{av} = 537°F Gp 7 @ 96% wd Gp 8 @ 35% wd 1569 ppmB	+ 4.28 x 10(-6) δk/k/°F	- 7.18 x 10(-6) δk/k/°F	Predicted ± 0.3 x 10(-4) δk/k/°F
Hot Zero Power Moderator Temperature Coefficient (ARO)		+ 2.03 x 10(-5) δk/k/°F	+ 0.91 x 10(-5) δk/k/°F	Predicted ± 0.3 x 10(-4) δk/k/°F and Measured $\leq$ + 0.5 x 10(-4) δk/k/°F

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 3.0

NSS HEAT BALANCE/RC FLOW VERIFICATION

Test Plateau	Plant Computer On-Line Primary Power Level (% FP)	Plant Computer On-Line Secondary Power Level	Plant Computer "Delta Temp" Power Level	Off-Line* Calculated Primary Power Level	Off Line* Calculated Secondary Power Level	RCS Flow (% Design Flow)
LPT	9.2	N/A	9.6	9.3	N/A	116.2
IMPT	39.6	40.4	39.5	39.7	40.5	117.7 *
93% FPT	93.0	92.9	92.2	93.0	93.0	114.7 *
100% FPT	99.7	99.4	98.7	99.8	99.4	114.3 *
FPT (adjusted constants)	100.1	100.2	99.7	N/A	N/A	114.3 *

*Calculated by the off-line secondary heat balance program (POWER)

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 4.0

RADIAL PEAKING FACTORS AT 40% FP

	8	9	10	11	12	13	14	15
H	1.00 1.01 +0.8%	1.18 1.24 +5.3%	1.31 1.32 +0.8%	1.02 1.00 -1.9%	0.99 0.97 -1.9%	1.36 1.31 -3.7%	0.85 0.84 -0.8%	0.46 0.48 +4.3%
K		1.09 1.13 +4.0%	1.32 1.40 +6.1%	1.08 1.09 +1.0%	1.31 1.32 +0.4%	1.27 1.25 -1.8%	1.21 1.18 -2.3%	0.48 0.49 +1.9%
L			1.05 1.09 +4.2%	1.32 1.30 -1.7%	1.00 1.00 -0.7%	1.31 1.30 -1.1%	0.92 0.90 -1.5%	0.33 0.32 -3.9%
M				1.08 1.05 -2.6%	1.34 1.30 -2.8%	1.04 1.07 +2.7%	0.62 0.61 -1.3%	
N					1.17 1.15 -2.0%	0.00 1.06 0.0%	0.38 0.37 -2.1%	
O						0.51 0.53 +4.5%		

Meas
Pred
% Dev

$$\% \text{ Dev.} = \frac{\text{Predicted - Measured}}{\text{Measured}} * 100$$

Core Conditions

	Predicted		Measured	
Power	40.0	%FP	41.0	%FP
Group 5	100	%wd	100	%wd
Group 6	100	%wd	100	%wd
Group 7	92	%wd	92.6	%wd
Group 8	35	%wd	35.0	%wd
Imbalance	- 0.44	%FP	+ 0.60	%FP
Burnup	2	EFPD	0.65	EFPD
RCS Boron	1258	ppmB	1265	ppmB
Incore tilt				
			WX: -1.39	XY: +0.36
			YZ: +1.13	ZW: -0.11

The highest % Deviation is 6.1% at location K-10.
The highest measured radial peak is 1.36 at location H-13.
The largest peak % Deviation is -3.0%.
The full core RMS % Deviation is 3.31% with 50 operable detectors.

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 4.1

TOTAL PEAKING FACTORS AT 40% FP

	8	9	10	11	12	13	14	15
H	1.14 1.13 -1.2%	1.43 1.40 -2.2%	1.51 1.49 -1.1%	1.16 1.13 -2.8%	1.19 1.11 -6.8%	1.61 1.53 -5.1%	0.97 0.99 +1.8%	0.52 0.56 +8.5%
K		1.26 1.27 +1.0%	1.54 1.59 +3.8%	1.23 1.22 -0.8%	1.52 1.50 -1.6%	1.49 1.45 -2.6%	1.43 1.39 -2.4%	0.56 0.57 +2.7%
L			1.18 1.24 +5.1%	1.50 1.48 -1.3%	1.11 1.16 +4.7%	1.52 1.51 -1.2%	1.07 1.05 -1.3%	0.37 0.37 -0.8%
M				1.22 1.21 -1.1%	1.54 1.51 -1.9%	1.28 1.25 -2.7%	0.71 0.72 +0.8%	
N					1.40 1.35 -3.6%	0.00 1.27 0.0%	0.44 0.44 -0.5%	
O						0.59 0.63 +7.6%		

Meas
Pred
% Dev

$$\% \text{ Dev.} = \frac{\text{Predicted - Measured}}{\text{Measured}} * 100$$

Core Conditions

	Predicted		Measured	
Power	40.0	%FP	41.0	%FP
Group 5	100	%wd	100	%wd
Group 6	100	%wd	100	%wd
Group 7	92	%wd	92.6	%wd
Group 8	35	%wd	35.0	%wd
Imbalance	- 0.44	%FP	+ 0.60	%FP
Burnup	2	EFPD	0.65	EFPD
RCS Boron	1258	ppmB	1265	ppmB
Incore tilt				
			WX: -1.39	XY: +0.36
			YZ: +1.13	ZW: -0.11

The highest % Deviation is 8.5% at location H-15.
The highest measured radial peak is 1.61 at location H-13.
The largest peak % Deviation is 1.1%.
The full core RMS % Deviation is 3.97% with 50 operable detectors.

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 4.2

RADIAL PEAKING FACTORS AT 100% FP

	8	9	10	11	12	13	14	15
H	1.02 1.01 -1.0%	1.20 1.23 +2.5%	1.33 1.30 -2.2%	1.03 1.00 -2.5%	0.99 0.98 -1.4%	1.35 1.30 -4.0%	0.86 0.86 -0.6%	0.47 0.50 +6.4%
K		1.17 1.13 -3.7%	1.32 1.38 +4.3%	1.08 1.08 +0.6%	1.30 1.30 -0.3%	1.28 1.24 -3.4%	1.19 1.18 -1.2%	0.49 0.51 +3.5%
L			1.05 1.09 +3.8%	1.30 1.28 -1.3%	1.00 1.00 -0.1%	1.28 1.29 +0.4%	0.91 0.91 +0.2%	0.34 0.33 -2.6%
M				1.08 1.05 -2.5%	1.30 1.29 -1.1%	1.07 1.07 +0.1%	0.62 0.63 +1.5%	
N					1.17 1.15 -2.1%	0.00 1.07 0.0%	0.39 0.39 -1.0%	
O						0.51 0.55 +7.3%		

Meas
Pred
% Dev

$$\% \text{ Dev.} = \frac{\text{Predicted - Measured}}{\text{Measured}} * 100$$

Core Conditions

	Predicted		Measured	
Power	100.0	%FP	99.6	%FP
Group 5	100	%wd	100	%wd
Group 6	100	%wd	100	%wd
Group 7	92	%wd	94.3	%wd
Group 8	35	%wd	30.4	%wd
Imbalance	- 7.91	%FP	- 2.61	%FP
Burnup	4	EFPD	6.34	EFPD
RCS Boron	1079	ppmB	1072	ppmB
Incore tilt				
			WX: -0.16	XY: -0.16
			YZ: +0.24	ZW: +0.09

The highest % Deviation is 7.3% at location O-13.
The highest measured radial peak is 1.35 at location H-13.
The largest peak % Deviation is -2.0%.
The full core RMS % Deviation is 2.66% with 50 operable detectors.

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 4.3

TOTAL PEAKING FACTORS AT 100% FP

	8	9	10	11	12	13	14	15
H	1.15 1.14 -1.0%	1.46 1.40 -4.3%	1.53 1.50 -2.3%	1.13 1.13 -0.1%	1.14 1.13 -1.1%	1.58 1.55 -2.0%	0.98 1.01 +3.4%	0.53 0.59 +10.8%
K		1.32 1.27 -3.7%	1.52 1.60 +5.4%	1.21 1.24 +2.0%	1.49 1.55 +3.8%	1.47 1.47 +0.3%	1.40 1.43 +1.9%	0.56 0.60 +6.6%
L			1.17 1.26 +8.1%	1.49 1.52 +2.3%	1.10 1.21 +10.8%	1.48 1.56 +5.3%	1.04 1.09 +4.5%	0.38 0.38 +1.1%
M				1.22 1.25 +2.0%	1.50 1.56 +3.8%	1.22 1.28 +5.3%	0.72 0.74 +2.9%	
N					1.34 1.39 +3.7%	0.00 1.30 0.0%	0.45 0.46 +1.3%	
O						0.59 0.66 +11.7%		

Meas
Pred
% Dev

$$\% \text{ Dev.} = \frac{\text{Predicted - Measured}}{\text{Measured}} * 100$$

Core Conditions

	Predicted		Measured	
Power	100.0	%FP	99.6	%FP
Group 5	100	%wd	100	%wd
Group 6	100	%wd	100	%wd
Group 7	92	%wd	94.3	%wd
Group 8	35	%wd	30.4	%wd
Imbalance	- 7.91	%FP	- 2.61	%FP
Burnup	4	EFPD	6.34	EFPD
RCS Boron	1079	ppmB	1072	ppmB
Incore tilt				
			WX: -0.16	XY: -0.16
			YZ: +0.24	ZW: +0.09

The highest % Deviation is 11.7% at location O-13.
The highest measured radial peak is 1.58 at location H-13.
The largest peak % Deviation is -1.4%.
The full core RMS % Deviation is 5.85% with 50 operable detectors.

OCONEE 2 CYCLE 10

STARTUP REPORT

ENCLOSURE 5.0

CORE POWER DISTRIBUTION DATA SUMMARY AT

LPT, IMPT AND FPT PLATEAUS

	LPT	IMPT	FPT
Power Level (% FP)	15.0	41.0	92.8
Burnup (EFPD)	0.03	0.65	2.35
Group 6/7/8 Positions (% wd)	81/7/34	100/93/35	100/90/35
RCS Boron Concentration (ppmB)	1382	1265	1192
Incore Imbalance (% FP)	+ 0.17	+ 0.60	- 4.52
Incore Tilt WX/XY YZ/ZW	-2.32/+0.91 +1.44/-0.02	-1.39/+0.36 +1.13/-0.11	-1.26/+0.64 +1.02/-0.39
Minimum DNBR	15.66	8.46	3.74
Extrapolated* Worst Case Minimum DNBR	1.83	3.74	2.79
Maximum Linear Heat Rate (kW/ft)	2.27	5.72	11.16
Extrapolated* Worst Case Linear Heat Rate (kW/ft)	12.97	14.70	12.34

* Extrapolated to 85% FP for LPT, 105.5% FP for IMPT, FPT

DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

July 7, 1988

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
Unit 2 Cycle 10 Startup Testing Report

Gentlemen:

Pursuant to Oconee Nuclear Station Technical Specification 6.6.1.1 please find attached the Startup Test Report for Oconee Unit 2, Cycle 10. Part I of the report contains Zero Power Physics Test information. Part II contains Power Escalation Test results.

Very truly yours,

Hal B. Tucker

PJN/80/sbn

Attachment

xc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Ms. Helen Pastis
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. P. H. Skinner
NRC Resident Inspector
Oconee Nuclear Station

IE26
1/1