

DUKE POWER COMPANY  
OCONEE 3 CYCLE 17  
CORE OPERATING LIMITS REPORT

QA CONDITION 1

REFERENCE OSC-6553

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Date: 9 APR 98

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Date: 09 Apr 1998

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Date: 09 Apr 98

Oconee Nuclear Station  
Unit 3 Cycle 17  
Core Operating Limits Report  
Insertion Sheet for Revision 8

**This revision is not valid until the end of operation for Unit 3 Cycle 16.**

**Remove these Revision 7 pages**

1,2,3,5,13,16,17,32,36

**Insert these Revision 8 pages**

1,2,3,5,13,16,17,32,36

Oconee Nuclear Station  
Unit 3 Cycle 17  
Core Operating Limits Report  
Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
8	March 1998	1,2,3,5,13 16,17,32, 36			38
7	December 1996	1-38	-	-	38

Oconee 3 Cycle 16 Revisions Below					
6	September, 1995	1,2,3,9, 28,29,30, 31	-	-	38
5	June, 1995	1,2,3,7	-	-	38
4	May, 1995	1-33	34-38	-	38

Oconee 3 Cycle 15 Revisions Below					
3	March, 1995	1-3,12,19, 22-25	-	-	33
2	January, 1995	1-3,12,19, 22-25	-	-	33
1		1-3,25,33	-	-	33
0		-	1-33	-	33

## 1.0 ERROR-ADJUSTED CORE OPERATING LIMITS

This Core Operating Limits Report for O3C17 has been prepared in accordance with the requirements of Technical Specification 6.9. The core operating limits within this report have been developed using NRC-approved methodology (References 1, 2, 3, and 4). The RPS protective limits and maximum allowable setpoints are documented in References 6 and 7, and validated in References 5 and 8 for O3C17. Operational limits and requirements are documented in Reference 5. The reactor coolant system design flow used in References 5 and 8 for O3C17 is 107.5 % (of 88,000 gpm per pump). The core operating limits have been developed with a radial local peaking factor ( $F_{\Delta H}^N$ ) of 1.714 and an axial peaking factor ( $F_Z^N$ ) of 1.5.

The error-adjusted core operating limits (i.e., setpoints) have been determined for O3C17, with all necessary uncertainties and margins applied. The calculations that support these setpoints are documented in Reference 5. The following cycle specific error-adjusted setpoints are included in this report:

- 1) RPS protective limits (Figures 1.1 and 2.1), and RPS maximum allowable setpoints (Figures 1.2 and 1.3),
- 2) Steady state operating band,
- 3) BWST, SFP, CBAST, and CFT boron requirements,
- 4) Quadrant power tilt operational setpoints,
- 5) RPS power-imbalance trip setpoints,
- 6) Power-imbalance operational setpoints and,
- 7) Rod index operational alarm and shutdown margin-restricted setpoints.

## 1.1 REFERENCES

- 1) Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004A, November 1992.
- 2) ONS Reload Design Methodology II, DPC-NE-1002A, October 1985.
- 3) ONS Reload Design Methodology, NFS-1001A, April 1984.
- 4) ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003A, July 1989.
- 5) O3C17 Maneuvering Analysis, OSC-6553, Rev. 5, March 1998.
- 6) Variable Low Pressure Safety Limit, OSC-4048, Revision 0, July 1990.
- 7) Power-Imbalance Safety Limits and Tech. Spec. Setpoints Using Error-Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 0, November 1993.
- 8) Oconee 3 Cycle 17 Specific DNB Analysis, OSC-6582, Revision 0, June 1996.

Oconee 3 Cycle 17

ERROR ADJUSTED POWER-IMBALANCE OPERATIONAL SETPOINTS

0 EFPD to EOC

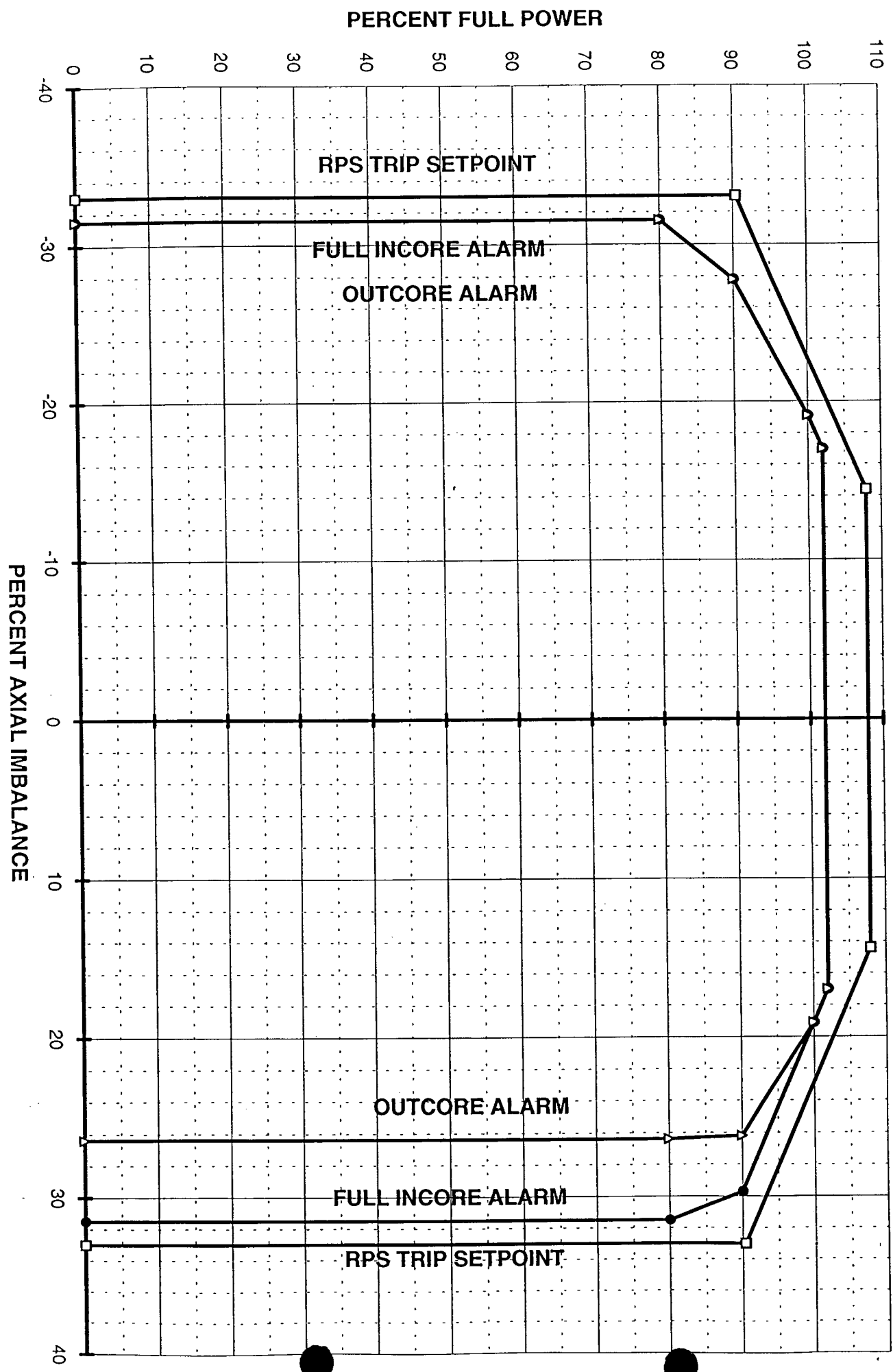
	POWER % OF 2568 MW	P-I OPERATIONAL LIMIT	FULL INCORE ALARM SETPOINT	BACKUP INCORE SETPOINT	OUTCORE ALARM SETPOINT
4 PUMP	0	-43.8	-31.5	-31.2	-31.5
	80	-43.8	-31.5	-31.2	-31.5
	90	-40.0	-27.8	-27.6	-27.8
	100	-30.0	-19.1	-18.9	-19.1
	102	-	-17.0	-17.0	-17.0
	102	-	+17.0	+17.0	+17.0
	100	+30.0	+19.1	+18.9	+19.1
	90	+38.0	+29.7	+25.9	+26.2
	80	+37.5	+31.5	+25.9	+26.4
	0	+37.5	+31.5	+25.9	+26.4
3 PUMP	0.0	-43.8	-31.5	-31.2	-31.5
	63.3	-	-31.5	-	-31.5
	63.6	-	-	-31.2	-
	77.0	-43.8	-17.0	-17.0	-17.0
	77.0	+37.5	+17.0	+17.0	+17.0
	68.6	-	-	+25.9	-
	68.1	-	-	-	+26.4
	63.3	-	+31.5	-	-
	0.0	+37.5	+31.5	+25.9	+26.4

# OCONEE 3 CYCLE 17 IMBALANCE SETPOINTS

## 4 PUMP OPERATION BOC TO EOC

PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	
107.9	-14.40	14.40				
107	-15.36	15.36				
106	-16.42	16.42				
105	-17.48	17.48				
104	-18.55	18.55				
103	-19.61	19.61				
102	-20.67	20.67	-17.00	17.00	-17.00	17.00
101	-21.73	21.73	-18.05	18.05	-18.05	18.05
100	-22.80	22.80	-19.10	19.10	-19.10	19.10
99	-23.86	23.86	-19.97	20.16	-19.97	19.81
98	-24.92	24.92	-20.84	21.22	-20.84	20.52
97	-25.99	25.99	-21.71	22.28	-21.71	21.23
96	-27.05	27.05	-22.58	23.34	-22.58	21.94
95	-28.11	28.11	-23.45	24.40	-23.45	22.65
94	-29.17	29.17	-24.32	25.46	-24.32	23.36
93	-30.24	30.24	-25.19	26.52	-25.19	24.07
92	-31.30	31.30	-26.06	27.58	-26.06	24.78
91	-32.36	32.36	-26.93	28.64	-26.93	25.49
90.4	-33.00	33.00	-27.45	29.28	-27.45	25.92
90	-33.00	33.00	-27.80	29.70	-27.80	26.20
89	-33.00	33.00	-28.17	29.88	-28.17	26.22
88	-33.00	33.00	-28.54	30.06	-28.54	26.24
87	-33.00	33.00	-28.91	30.24	-28.91	26.26
86	-33.00	33.00	-29.28	30.42	-29.28	26.28
85	-33.00	33.00	-29.65	30.60	-29.65	26.30
84	-33.00	33.00	-30.02	30.78	-30.02	26.32
83	-33.00	33.00	-30.39	30.96	-30.39	26.34
82	-33.00	33.00	-30.76	31.14	-30.76	26.36
81	-33.00	33.00	-31.13	31.32	-31.13	26.38
80	-33.00	33.00	-31.50	31.50	-31.50	26.40
0	-33.00	33.00	-31.50	31.50	-31.50	26.40
PERCENT OF FULL POWER	R P S	TRIP	FULL INCORE ALARM		OUTCORE ALARM	

# OCCONEE 3 CYCLE 17 -- BALANCE SETPOINTS 4 PUMP OPERATION -- BOC TO EOC



## 2.0 'CORE' OPERATING LIMITS (NOT ERROR-ADJUSTED)

The following cycle-specific core operating limits are included in this report. All computations performed in setting these limits used the approved SIMULATE methodology.

- 1) RPS protective limits (Figure 2.1 and table),
- 2) Quadrant power tilt operational limits,
- 3) Power-imbalance operational limits and,
- 4) Rod index operational alarm and shutdown margin-restricted limits.

## 2.1 REFERENCES

- 1) Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004A, November 1992.
- 2) ONS Reload Design Methodology II, DPC-NE-1002A, October 1985.
- 3) ONS Reload Design Methodology, NFS-1001A, April 1984.
- 4) ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003A, July 1989.
- 5) O3C17 Maneuvering Analysis, OSC-6553, Revision 5, March 1998.
- 6) Variable Low Pressure Safety Limit, OSC-4048, Revision 0, July 1990.
- 7) Power-Imbalance Safety Limits and Tech. Spec. Setpoints Using Error-Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 0, November 1993.
- 8) Oconee 3 Cycle 17 Specific DNB Analysis, OSC-6582, Revision 0, June 1996.



Oconee 3 Cycle 17

POWER-IMBALANCE OPERATIONAL LIMITS\*

**\*NOT FOR PLANT USE -- SEE PAGE 13**

	POWER % OF 2568 MW	IMBALANCE LIMITS
4 PUMP	0.0	-43.8
	80.0	-43.8
	90.0	-40.0
	100.0	-30.0
	100.0	+30.0
	90.0	+38.0
	80.0	+37.5
	0.0	+37.5
3 PUMP	0.0	-43.8
	77.0	-43.8
	77.0	+37.5
	0.0	+37.5

\* -- These limits have not been error-adjusted and are not for plant use. Refer to Section 1 of this Report for the error-adjusted setpoints.

Referred to by Tech. Spec. 3.5.2.6