

Duke Power Company

Oconee 1 Cycle 19

Core Operating Limits Report

QA Condition 1

FOR INFORMATION ONLY

Not Reviewed or Approved by CFAM 3.13

Prepared By: T. P. Pehn

Date: 6/29/99

Checked By: Joy D. Howter

Date: 29 JUN 99

Approved By: R. R. St. Clair

Date: 6/29/99

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Core Operating Limits Report

Insertion Sheet for Revision 12

This revision is effective July 1999.
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Remove these revision 11 pages

1, 2, 3, 8, 10, 13, 31

Insert these revision 12 pages

1, 2, 3, 8, 10, 13, 31

Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
<b>Oconee 1 Cycle 19 revisions below</b>					
12	Jul-99	1, 2, 3, 8, 10, 13, 31	-	-	31
11	May-99	1 - 31	-	1-31	31
<b>Oconee 1 Cycle 18 revisions below</b>					
10	Mar-99	1 - 31	-	32-38	31
9	Feb-98	1,2,3,5,13, 16,17,32,36	-	-	38
8	Nov-97	1,2,3,5,10, 32	37	-	38
7	Aug-97	1 - 38	-	-	38
<b>Oconee 1 Cycle 17 revisions below</b>					
6	Nov-95	1-33	34 - 38	-	38

## Oconee 1 Cycle 19

### 1.0 Error Adjusted Core Operating Limits

The Core Operating Limits Report for O1C19 has been prepared in accordance with the requirements of ITS 5.6.5. The core operating limits within this report have been developed using NRC approved methodology identified in references 1, 2, 3, 4, 5, and 6. The RPS protective limits and maximum allowable setpoints are documented in references 7 and 8. These limits are validated for use in O1C19 by references 9, 10, and 11. The O1C19 analyses assume a design flow of 107.5% of 88,000 gpm per RCS pump, radial local peaking ( $F_{\Delta h}$ ) of 1.714, and axial peaking factor ( $F_z$ ) of 1.5.

The error adjusted core operating limits included in section 1 of the report incorporate all necessary uncertainties and margins required for operation of the O1C19 reload core.

### 1.1 References

1. Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004A, Revision 0, SER dated November 23, 1992.
2. Oconee Nuclear Station Reload Design Methodology II, DPC-NE-1002A, Revision 1, SER dated October 1, 1985.
3. Oconee Nuclear Station Reload Design Methodology, NFS-1001A, Revision 4, SER dated July 29, 1981.
4. ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003A, July 1989, SER dated July 19, 1989.
5. Thermal Hydraulic Statistical Core Design Methodology, DPC-NE-2005P-A, Revision 1, SER dated November 7, 1996.
6. Fuel Mechanical Reload Analysis Methodology Using TACO3, DPC-NE-2008P-A, SER dated April 3, 1995.
7. Variable Low Pressure Safety Limit, OSC-4048, Revision 3, July 1998.
8. Power Imbalance Safety Limits and Tech Spec Setpoints Using Error Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 1, November 1998.
9. O1C19 Maneuvering Analysis, OSC-7295, Revision 1, June 1999.
10. O1C19 Specific DNB Analysis, OSC-7302, Revision 1, March 1999.
11. O1C19 Reload Safety Evaluation and 50.59, OSC-7402, Revision 0, May 1999.

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Operational Power Imbalance Setpoints

	%FP	Full Incore	Backup Incore	Out of Core
4 Pumps	0	-31.5	-31.0	-31.5
	80	-31.5	-31.0	-31.5
	90	-29.7	-29.3	-29.7
	100	-19.1	-18.7	-19.1
	102	-17.0	-16.5	-17.0
	102	17.0	17.0	17.0
	100	19.1	18.7	19.1
	90	22.4	21.8	22.4
	80	23.1	22.3	23.1
	0	23.1	22.3	23.1
3 Pumps	0.0	-31.5	-31.0	-31.5
	63.30	-31.5	-	-31.5
	63.77	-	-31.0	-
	77.0	-17.0	-16.5	-17.0
	77.0	17.0	17.0	17.0
	71.99	-	22.3	-
	71.24	23.1	-	23.1
	0.0	23.1	22.3	23.1

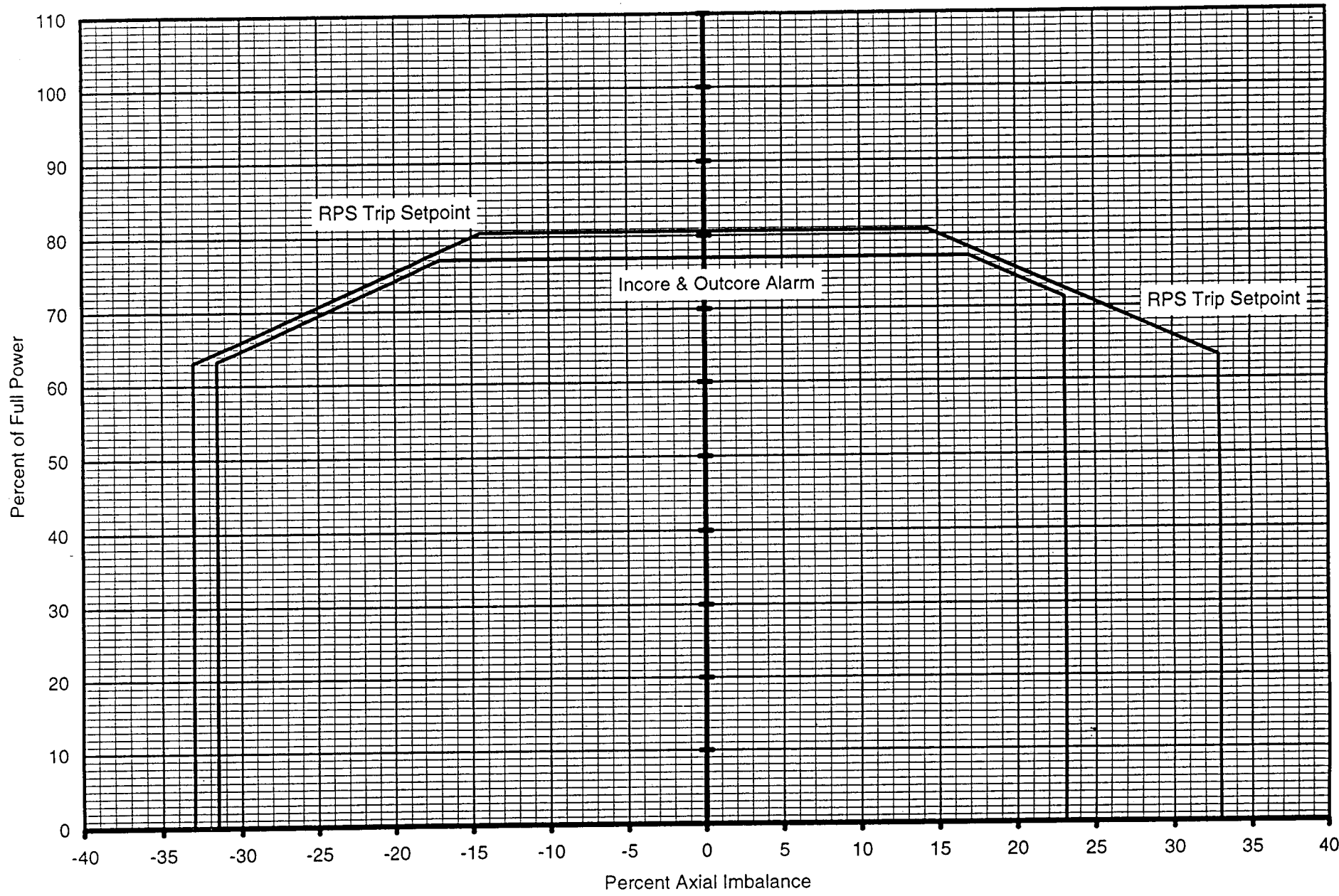
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Operational Power Imbalance Setpoints

Operation with 3 RCS Pumps, BOC to EOC

% FP	RPS Trip		Full Incore Alarm		Out of Core Alarm	
80.6	-14.40	14.40				
80	-15.04	15.04				
79	-16.10	16.10				
78	-17.16	17.16				
77.0	-18.23	18.23	-17.00	17.00	-17.00	17.00
76	-19.29	19.29	-18.06	18.06	-18.06	18.06
75	-20.35	20.35	-19.12	19.12	-19.12	19.12
74	-21.41	21.41	-20.18	20.18	-20.18	20.18
73	-22.48	22.48	-21.23	21.23	-21.23	21.23
72	-23.54	23.54	-22.29	22.29	-22.29	22.29
71.2	-24.35	24.35	-23.10	23.10	-23.10	23.10
71	-24.60	24.60	-23.35	23.10	-23.35	23.10
70	-25.67	25.67	-24.41	23.10	-24.41	23.10
69	-26.73	26.73	-25.47	23.10	-25.47	23.10
68	-27.79	27.79	-26.53	23.10	-26.53	23.10
67	-28.85	28.85	-27.58	23.10	-27.58	23.10
66	-29.92	29.92	-28.64	23.10	-28.64	23.10
65	-30.98	30.98	-29.70	23.10	-29.70	23.10
64	-32.04	32.04	-30.76	23.10	-30.76	23.10
63.3	-32.79	32.79	-31.50	23.10	-31.50	23.10
63.1	-33.00	33.00	-31.50	23.10	-31.50	23.10
63	-33.00	33.00	-31.50	23.10	-31.50	23.10
62	-33.00	33.00	-31.50	23.10	-31.50	23.10
61	-33.00	33.00	-31.50	23.10	-31.50	23.10
60	-33.00	33.00	-31.50	23.10	-31.50	23.10
0	-33.00	33.00	-31.50	23.10	-31.50	23.10
% FP	RPS Trip		Full Incore Alarm		Out of Core Alarm	

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Imbalance Setpoints for 3 Pump Operation, BOC to EOC



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LOCA Limits

Not for Plant Use

Core Elevation Feet	LOCA LHR kw/ft Limit Versus Burnup		
	28 GWd/mtU	45 GWd/mtU	62 GWd/mtU
<b>Mk-B10 Fuel</b>			
0.000	15.8	15.8	13.0
2.506	16.6	16.6	13.0
4.264	17.0	17.0	13.0
6.021	17.0	17.0	13.0
7.779	17.0	17.0	13.0
9.536	16.6	16.6	13.0
12.00	15.8	15.8	13.0
<b>Mk-B10L Fuel</b>			
	0 GWd/mtU	30 GWd/mtU	62 GWd/mtU
0.000	16.2	16.2	11.6
2.506	17.0	17.0	11.6
4.264	17.3	17.3	11.6
6.021	17.3	17.3	11.6
7.779	17.3	17.3	11.6
9.536	17.0	17.0	11.6
12.00	16.2	16.2	11.6