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February 16, 2004

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

Subject: Oconee Nuclear Site Docket No. 50-269, 50-270, 50-287
Core Operating Limits Report (COLR)

Gentlemen:

Attached, pursuant to Oconee Technical Specifications 5.6.5, is an information copy of a revision to the Core Operating Limits Report for Oconee Unit 1, Cycle 22, Rev. 21, Unit 2, Cycle 20, Rev. 20, Unit 3, Cycle 21, Rev.19.

Very truly yours,

Bruce Hamilton / for
R. A. Jones Site, Vice President
Oconee Nuclear Site

Attachment

A001

NRC Document Control Desk
February 16, 2004
Page 2

xc w/att: Mr. L. A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II

Mr. L. N. Olshan, Project Manager
Office of Nuclear Reactor Regulation

Mr. Mel Shannon
Senior Resident Inspector
Oconee Nuclear Site

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REFERENCE

NUCLEAR GENERAL OFFICE
OCONEE NUCLEAR STATION
EXEMPTION CODE: M-5
OCONEE 1 CYCLE 22
OCONEE 2 CYCLE 20
OCONEE 3 CYCLE 21
CORE OPERATING LIMITS REPORT
(COLR)

Page 1 of 1

Date: 02/06/04

Document Transmittal #: DUK040370006

QA CONDITION ☒ Yes ☐ No

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MANAGER
NUCLEAR ENGINEERING

BY:
J W SIMMONS JWS/AYB EC08H

Duke Power Company

Oconee 1 Cycle 22

Core Operating Limits Report

QA Condition 1

FOR INFORMATION ONLY

REVIEWED AND APPROVED BY CFAM 3.13

Prepared By : J. M. Sanders

Date : 04 Feb 2004

Checked By : G. M. Presnell

Date : 2-4-2004

CDR By : J. L. Abbott

Date : 4 FEB 04

Approved By : R. R. St. Clair

Date : 4 Feb 04

Stephen P. Schultz
for R.R. St. Clair

INSPECTION OF ENGINEERING INSTRUCTIONS

Inspection Waived By: Stephen C. Peltz for R.R. St. Clair
(Sponsor)Date: 04 Feb 04CATAWBAInspection
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Inspected By/Date: _____

RES (Reactor)

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Other (_____)

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MCE (Mechanical & Civil)

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RES (Electrical Only)

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MCE (Mechanical & Civil)

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Oconee 1 Cycle 22
Core Operating Limits Report

Insertion Sheet for Revision 21

This revision is not valid until the end of operation for Oconee 1 Cycle 21.

Remove these revision 20 pages

1 - 4, 6

Insert these revision 21 pages

1 - 4, 6

Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
Oconee 1 Cycle 22 revisions below					
21	Feb 2004	1 - 4, 6	-	-	33
20	Nov 2003	1 - 32	33	-	33
Oconee 1 Cycle 21 revisions below					
19	Aug 2003	1, 2, 3	1a	-	32
18	Apr 2002	1, 2, 4	-	-	32
17	Mar 2002	1-31	32	-	32
Oconee 1 Cycle 20 revisions below					
16	May 2001	1-4	-	-	31
15	Nov 2000	1-31	-	-	31

Oconee 1 Cycle 22

1.0 Error Adjusted Core Operating Limits

The Core Operating Limits Report for O1C22 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 through 11. The RPS protective limits and maximum allowable setpoints are documented in references 12 through 14. These limits are validated for use in O1C22 by references 15 through 17. The O1C22 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, and an EOC (< 100 ppmB) Tavg reduction of up to 10°F provided 4 RCPs are in operation and Tavg does not decrease below 569°F .

The error adjusted core operating limits included in section 1 of the report incorporate all necessary uncertainties and margins required for operation of the O1C22 reload core.

1.1 References

1. Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004P-A, 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 5, SER dated December 8, 2000.
4. ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003P-A, Revision 1, SER dated June 23, 2000.
5. Thermal Hydraulic Statistical Core Design Methodology, DPC-NE-2005P-A, Revision 2, SER dated June 8, 1999.
6. Fuel Mechanical Reload Analysis Methodology Using TACO3, DPC-NE-2008P-A, Revision 0, SER dated April 3, 1995.
7. UFSAR Chapter 15 Transient Analysis Methodology, DPC-NE-3005-PA, Revision 2, SER dated September 24, 2003.
8. DPC-NE-3000P-A, Thermal Hydraulic Transient Analysis Methodology, Rev. 3, SER dated September 24, 2003.
9. BAW-10192-PA, BWNT LOCA - BWNT Loss of Coolant Accident Evaluation Model for Once-Through Steam Generator Plants, SER dated February 18, 1997.
10. BAW-10164P-A, Rev. 4, "RELAP5/MOD2-B&W - An Advanced Computer Program for Light Water Reactor LOCA and Non-LOCA Transient Analysis", SER dated April 9, 2002.
11. BAW-10227-PA, Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel, SER dated February 4, 2000.
12. RPS RCS Pressure & Temperature Trip Function Uncertainty Analyses and Variable Low Pressure Safety Limit, OSC-4048, Revision 4, January 2001.
13. Power Imbalance Safety Limits and Tech Spec Setpoints Using Error Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 2, October 2001.
14. ΔT_c and EOC Reduced Tavg Operation, OSC-7265, Rev. 1, Duke Power Co., June 2002.
15. O1C22 Maneuvering Analysis, OSC-8413, Revision 3, February 2004.
16. O1C22 Specific DNB Analysis, OSC-8460, Revision 1, September 2003.
17. O1C22 Reload Safety Evaluation, OSC-8471, Revision 0, November 2003.

Oconee 1 Cycle 22

Steady State Operating Band

EFPD	Rod Index		APSR %WD	
	Min	Max	Min	Max
0 to 433	292 ± 5	300	30	40
433 to EOC	292 ± 5	300	100	100

Quadrant Power Tilt Setpoints

Core Power Level, %FP	Steady State		Transient		Maximum
	30 - 100	0 - 30	30 - 100	0 - 30	
Full Incore	3.50	7.60	7.10	9.39	16.54
Out of Core	2.36	6.09	5.63	7.72	14.22
Backup Incore	2.26	3.87	3.63	4.81	10.07

Referred to by ITS 3.2.3.

Correlation Slope (CS)

1.15

Referred to by ITS 3.3.1 (SR 3.3.1.3).

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Oconee 2 Cycle 20

Core Operating Limits Report

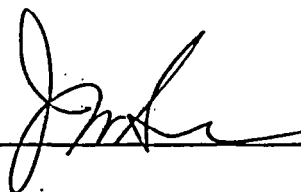
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QA Condition 1

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Prepared By : J. M. Sanders



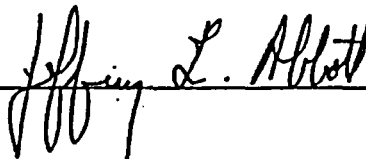
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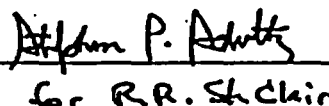
Date : 2-4-2004

CDR By : J. L. Abbott



Date : 4 FEB 04

Approved By : R. R. St. Clair


for R. R. St. Clair

Date : 04 Feb 04

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Inspection Waived By:

Stephen P. Schultz for R.R. St. Clair
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Oconee 2 Cycle 20
Core Operating Limits Report

Insertion Sheet for Revision 20

This revision is not valid until the end of operation for Oconee 2 Cycle 19.

Remove these revision 19 pages

1 - 3, 5

Insert these revision 20 pages

1 - 3, 5

Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
Oconee 2 Cycle 20 revisions below					
20	Feb 2004	1 - 3, 5	-	-	33
19	Nov 2003	1-4,8-10,12-13,29	-	-	33
18	Oct 2002	1-3,14,16,24,30	-	-	32
17	Oct 2002	1 - 31	32	-	32
Oconee 2 Cycle 19 revisions below					
16	May 2001	1 - 31	-	-	31
Oconee 2 Cycle 18 revisions below					
15	Apr 2001	1-4	-	-	31
14	Feb 2000	1-4	-	-	31
13	Nov 1999	1-31	-	-	31
12	Sep 1999	1-31	-	-	31
11	Apr 1999	1-4, 6	-	-	31
10	Mar 1999	1-31	-	-	31

Oconee 2 Cycle 20

1.0 Error Adjusted Core Operating Limits

The Core Operating Limits Report for O2C20 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 through 10. The RPS protective limits and maximum allowable setpoints are documented in references 11 through 13. These limits are validated for use in O2C20 by references 14 through 16. The O2C20 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, and an EOC (< 100 ppmB) Tav_g reduction of up to 10 °F provided 4 RCPs are in operation and Tav_g does not decrease below 569 °F.

The error adjusted core operating limits included in section 1 of the report incorporate all necessary uncertainties and margins required for operation of the O2C20 reload core.

1.1 References

1. Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004P-A, 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 5, SER dated December 8, 2000.
4. ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003P-A, Revision 1, SER dated June 23, 2000.
5. Thermal Hydraulic Statistical Core Design Methodology, DPC-NE-2005P-A, Revision 2, SER dated June 8, 1999.
6. Fuel Mechanical Reload Analysis Methodology Using TACO3, DPC-NE-2008P-A, SER dated April 3, 1995.
7. UFSAR Chapter 15 Transient Analysis Methodology, DPC-NE-3005-PA, Revision 1, SER dated May 25, 1999.
8. DPC-NE-3000P-A, Thermal Hydraulic Transient Analysis Methodology, Rev. 2, SER dated October 14, 1998.
9. BAW-10192-PA, BWNT LOCA - BWNT Loss of Coolant Accident Evaluation Model for Once-Through Steam Generator Plants, SER dated February 18, 1997.
10. BAW-10227-PA, Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel, SER dated February 4, 2000.
11. Variable Low Pressure Safety Limit, OSC-4048, Revision 4, January 2001.
12. Power Imbalance Safety Limits and Tech Spec Setpoints Using Error Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 2, October 2001.
13. ΔT_c and EOC Reduced Tav_g Operation, OSC-7265, Rev. 1, Duke Power Co., June 2002.
14. O2C20 Maneuvering Analysis, OSC-8082, Revision 5, February 2004.
15. O2C20 Specific DNB Analysis, OSC-8103, Revision 0, June 2002.
16. O2C20 Reload Safety Evaluation, OSC-8182, Revision 1, November 2002.

Oconee 2 Cycle 20

Steady State Operating Band

EFPD	Rod Index		APSR %WD	
	Min	Max	Min	Max
0 to 430	292 ± 5	300	30	40
430 to EOC	292 ± 5	300	100	100

Quadrant Power Tilt Setpoints

Core Power Level, %FP	Steady State		Transient		Maximum
	30 - 100	0 - 30	30 - 100	0 - 30	
Full Incore	3.50	7.66	7.16	9.45	16.60
Out of Core	2.31	6.09	5.63	7.72	14.22
Backup Incore	2.24	3.87	3.63	4.81	10.07

Referred to by ITS 3.2.3.

Correlation Slope (CS)

1.15

Referred to by ITS 3.3.1 (SR 3.3.1.3).

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Oconee 3 Cycle 21

Core Operating Limits Report

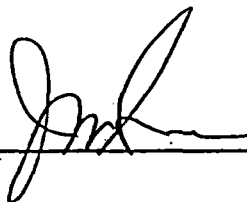
QA Condition 1

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Prepared By : J. M. Sanders



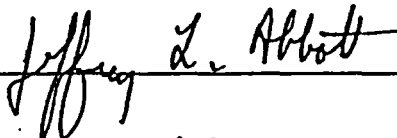
Date : 03 Feb 2004

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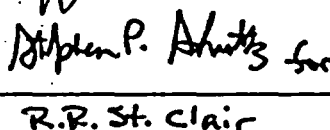
Date : 2-4-2004

CDR By : J. L. Abbott



Date : 4 FEB 04

Approved By : R. R. St. Clair


R.R. St. Clair

Date : 4 Feb 04

INSPECTION OF ENGINEERING INSTRUCTIONS

Inspection Waived By:

Stephen P. Schultz for R.R. St. Clair
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Date:

02/04/04CATAWBAInspection
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MCE (Mechanical & Civil)

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RES (Reactor)

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Oconee 3 Cycle 21
Core Operating Limits Report

Insertion Sheet for Revision 19

This revision is not valid until the end of operation for Oconee 3 Cycle 20.

Remove these revision 18 pages

1 - 4, 6

Insert these revision 19 pages

1 - 4, 6

Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
Oconee 3 Cycle 21 revisions below					
19	Feb 2004	1 - 4, 6	-	-	33
18	Nov. 2003	1 - 3, 5	-	-	33
17	Apr. 2003	1 - 31	32 - 33	-	33
Oconee 3 Cycle 20 revisions below					
16	Oct. 2002	1 - 3, 5	-	-	31
15	Nov. 2001	1 - 3	-	-	31
14	Nov. 2001	1 - 31	-	-	31
Oconee 3 Cycle 19 revisions below					
13	Apr. 2000	1 - 31	-	-	31

Oconee 3 Cycle 21

1.0 Error Adjusted Core Operating Limits

The Core Operating Limits Report for O3C21 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 through 10. The RPS protective limits and maximum allowable setpoints are documented in references 11 through 13. These limits are validated for use in O3C21 by references 14 through 16. The O3C21 analyses assume a design flow of 107.5% of 88,000 gpm per RCS pump, radial local peaking (FAh) of 1.714, and axial peaking factor (Fz) of 1.5, and an EOC (≤ 100 ppmB) Tav_g reduction of up to 10 °F provided 4 RCPs are in operation and Tav_g does not decrease below 569 °F.

The error adjusted core operating limits included in section 1 of the report incorporate all necessary uncertainties and margins required for operation of the O3C21 reload core.

1.1 References

1. Nuclear Design Methodology Using CASMO-3 / SIMULATE-3P, DPC-NE-1004P-A, 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 5, SER dated December 8, 2000.
4. ONS Core Thermal Hydraulic Methodology Using VIPRE-01, DPC-NE-2003P-A, Revision 1, SER dated June 23, 2000.
5. Thermal Hydraulic Statistical Core Design Methodology, DPC-NE-2005P-A, Revision 2, SER dated June 8, 1999.
6. Fuel Mechanical Reload Analysis Methodology Using TACO3, DPC-NE-2008P-A, SER dated April 3, 1995.
7. UFSAR Chapter 15 Transient Analysis Methodology, DPC-NE-3005-PA, Revision 1, SER dated May 25, 1999.
8. DPC-NE-3000P-A, Thermal Hydraulic Transient Analysis Methodology, Rev. 2, SER dated October 14, 1998.
9. BAW-10192-PA, BWNT LOCA - BWNT Loss of Coolant Accident Evaluation Model for Once-Through Steam Generator Plants, SER dated February 18, 1997.
10. BAW-10227-PA, Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel, SER dated February 4, 2000.
11. Variable Low Pressure Safety Limit, OSC-4048, Revision 4, January 2001.
12. Power Imbalance Safety Limits and Tech Spec Setpoints Using Error Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 2, October 2001.
13. ΔT_c and EOC Reduced Tav_g Operation, OSC-7265, Rev. 1, Duke Power Co., June 2002.
14. O3C21 Maneuvering Analysis, OSC-8178, Revision 4, February 2004.
15. O3C21 Specific DNB Analysis, OSC-8220, Revision 0, October 2002.
16. O3C21 Reload Safety Evaluation, OSC-8400, Revision 1, November 2003.

Oconee 3 Cycle 21

Steady State Operating Band

EFPD	Rod Index		APSR %WD	
	Min	Max	Min	Max
0 to 445	292 \pm 5	300	30	40
445 to EOC	292 \pm 5	300	100	100

Quadrant Power Tilt Setpoints

Core Power Level, %FP	Steady State		Transient		Maximum
	30 - 100	0 - 30	30 - 100	0 - 30	
Full Incore	3.50	7.57	7.07	9.36	16.51
Out of Core	2.39	6.09	5.63	7.72	14.22
Backup Incore	2.26	3.87	3.63	4.81	10.07

Referred to by ITS 3.2.3.

Correlation Slope (CS)

1.15

Referred to by ITS 3.3.1 (SR 3.3.1.3).