Duke Power Company

Oconee 2 Cycle 18

Core Operating Limits Report

QA Condition 1

NOT REVIEWED OR APPROVED BY CFAM 3.13

Prepared By : Joy D. Forster Date : 15JUN1999

Checked By : G. Michael Presnell Date : 6/15/99

CDR By : J. J. Abbott Date : 6/15/99

Approved By : R. R. St. Clair Date : 6/15/99

Oconee 2 Cycle 18

Core Operating Limits Report

Insertion Sheet for Revision 12

This revision is not valid until the end of operation for Oconee 2 Cycle 17.

Remove these revision 11 pages	Insert these revision 12 pages
1-4	1-4

Revision Log

Revision	Effective Date	Pages Revised	Pages Added	Pages Deleted	Total Effective Pages
Oconee 2 Cycle 18 revisions below					
12	Jun-99	1-4	-	-	31
11	Apr-99	1-4, 6	-	-	31
10	Mar-99	1 - 31	-	-	31
Oconee 2 Cycle 17 revisions below					
9	Feb-99	1 - 31	-	32 - 38	31
8	May-98	1-3,5,11,32,35		-	38
7	Mar-98	1 - 38	-	-	38
Oconee 2 Cycle 16 revisions below					
6	Oct-96	1-3, 18	-	-	38
5	Mar-96	1 - 34	35 - 38	-	38

Oconee 2 Cycle 18

1.0 Error Adjusted Core Operating Limits

The Core Operating Limits Report for O2C18 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, 6, and 7. The RPS protective limits and maximum allowable setpoints are documented in references 8 and 9. These limits are validated for use in O2C18 by references 10, 11, and 12. The O2C18 analyses assume a design flow of 107.5% of 88,000 gpm per RCS pump, radial local peaking (FDh) of 1.714, and axial peaking factor (Fz) 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 O2C18 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-2003P-A, (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. UFSAR Chapter 15 Transient Analysis Methodology, DPC-NE-3005-PA, Revision 1, (SER dated May 25, 1999)

8. Variable Low Pressure Safety Limit, OSC-4048, Revision 3, July 1998.

9. Power Imbalance Safety Limits and Tech Spec Setpoints Using Error Adjusted Flux-Flow Ratio of 1.094, OSC-5604, Revision 1, November 1998.

10. O2C18 Maneuvering Analysis, OSC-7273, Revision 2, June 1999.

11. O2C18 Specific DNB Analysis, OSC-7333, Revision 0, January 1999.

12. O2C18 Reload Safety Evaluation , OSC-7361, Revision 0, (Pending).

Oconee 2 Cycle 18

Miscellaneous Setpoints

BWST boron concentration shall be greater than 2220 ppm and less than 3000 ppm.
Referred to by ITS 3.5.4.

Spent fuel pool boron concentration shall be greater than 2220 ppm and less than 3000 ppm.
Referred to by ITS 3.7.12.

The equivalent of at least 1100 cubic feet of 11,000 ppm boron shall be maintained in the CBAST.
Referred to by ITS SLC 16.5.13.

CFT boron concentration shall be greater than 1835 ppm. The average boron concentration in the CFT's shall be less than 4000 ppm. Referred to by ITS 3.5.1.

RCS and Refueling canal boron concentration shall be greater than 2220 ppm.
Referred to by ITS 3.9.1.

Shutdown Margin (SDM) shall be greater than 1% $\Delta k/k$.
Referred to by ITS 3.1.1.

Moderator Temperature Coefficient (MTC) shall be less than :
Linear interpolation is valid within table provided.
Referred to by ITS 3.1.3.

MTC x 10-4 $\Delta\rho$ / °F	% FP
0.700	0
0.030	15
-0.281	95
-0.300	100
-0.375	120

Departure from Nucleate Boiling (DNB) parameter for RCS loop pressure shall be
Referred to by ITS 3.4.1.

4 RCP: measured hot leg pressure $\geq$ 2125 psig
3 RCP: measured hot leg pressure $\geq$ 2125 psig

DNB parameter for RCS loop average temperature shall be:
Referred to by ITS 3.4.1.

Max Loop Tavg Incl 2°F unc	ΔTc, °F
581.00	0

The measured Tavg must be less than the temperature specified by an amount equal to the uncertainty corresponding to the instrument from which it is read.
ΔTc is the setpoint value selected by the operators.

DNB parameter for RCS loop total flow shall be:
Referred to by ITS 3.4.1.

4 RCP: Measured $\geq$ 107.5 %df
3 RCP: Measured $\geq$ 74.7 % of 4 RCP min flow

Regulating rod groups shall be withdrawn in sequence starting with group 5, group 6, and finally group 7.
Referred to by ITS 3.2.1.

Regulating rod group overlap shall be 25% ± 5% between two sequential groups.
Referred to by ITS 3.2.1.

Attachment 4

Markup of Attachment VIII

of the April 5, 1999,

License Amendment Request

Table 8-2 Core Operating Limits Report Changes

Specification	Description of Change
ITS 3.1.3	Revised the Moderator Temperature Coefficient (MTC) limits to reflect assumptions in the new UFSAR Chapter 15 methodology
ITS 3.4.1	Revised the Departure from Nucleate Boiling (DNB) parameter for RCS loop pressure to reflect assumptions in the new UFSAR Chapter 15 methodology.
ITS 3.4.1	Revised Tave vs ΔTc requirements to reflect assumptions in the new UFSAR Chapter 15 methodology
ITS 3.4.1	Revised DNB parameter for RCS loop total flow to reflect assumptions in the new UFSAR Chapter 15 methodology.