

**Catawba Unit 1 Cycle 21**  
**Core Operating Limits Report**  
**Revision 0**

**October 2012**

Calculation Number: CNC-1553.05-00-0582

		Date
Prepared By:	<u>Casoy Kle</u>	<u>10/22/12</u>
Checked By:	<u>Sandra L. Abbey</u>	<u>10/23/2012</u>
Checked By:	<u>Nathan S. Hoffman</u> (Sections 1.1, 2.1, and 2.9 – 2.18)	<u>10/22/12</u>
Approved By:	<u>RC Harvey</u>	<u>10/23/2012</u>

**QA Condition 1**

The information presented in this report has been prepared and issued in accordance with Catawba Technical Specification 5.6.5.

## Catawba 1 Cycle 21 Core Operating Limits Report

## INSPECTION OF ENGINEERING INSTRUCTIONS

Inspection Waived By: RC Haney  
(Sponsor)Date: 10/23/2012CATAWBAInspection  
Waived

MCE (Mechanical &amp; Civil)

☒

Inspected By/Date: \_\_\_\_\_

RES (Electrical Only)

☒

Inspected By/Date: \_\_\_\_\_

RES (Reactor)

☒

Inspected By/Date: \_\_\_\_\_

MOD

☒

Inspected By/Date: \_\_\_\_\_

Other ( \_\_\_\_\_ )

☐

Inspected By/Date: \_\_\_\_\_

OCONEEInspection  
Waived

MCE (Mechanical &amp; Civil)

☐

Inspected By/Date: \_\_\_\_\_

RES (Electrical Only)

☐

Inspected By/Date: \_\_\_\_\_

RES (Reactor)

☐

Inspected By/Date: \_\_\_\_\_

MOD

☐

Inspected By/Date: \_\_\_\_\_

Other ( \_\_\_\_\_ )

☐

Inspected By/Date: \_\_\_\_\_

MCGUIREInspection  
Waived

MCE (Mechanical &amp; Civil)

☐

Inspected By/Date: \_\_\_\_\_

RES (Electrical Only)

☐

Inspected By/Date: \_\_\_\_\_

RES (Reactor)

☐

Inspected By/Date: \_\_\_\_\_

MOD

☐

Inspected By/Date: \_\_\_\_\_

Other ( \_\_\_\_\_ )

☐

Inspected By/Date: \_\_\_\_\_

## **Catawba 1 Cycle 21 Core Operating Limits Report**

### **Implementation Instructions for Revision 0**

#### **Revision Description and PIP Tracking**

Revision 0 of the Catawba Unit 1 Cycle 21 COLR contains limits specific to the reload core. There is no PIP associated with this revision.

#### **Implementation Schedule**

Revision 0 may become effective any time during No MODE between Cycles 20 and 21 but must become effective prior to entering MODE 6 which starts Cycle 21. The Catawba Unit 1 Cycle 21 COLR will cease to be effective during No MODE between Cycles 21 and 22.

#### **Data files to be Implemented**

No data files are transmitted as part of this document.

**Catawba 1 Cycle 21 Core Operating Limits Report**

## REVISION LOG

<b><u>Revision</u></b>	<b><u>Effective Date</u></b>	<b><u>Pages Affected</u></b>	<b><u>COLR</u></b>
0	October 2012	1-32, Appendix A*	C1C21 COLR, Rev. 0

\*Appendix A contains power distribution monitoring factors used in Technical Specification Surveillance. Appendix A is included only in the electronic COLR copy sent to the NRC.

## Catawba 1 Cycle 21 Core Operating Limits Report

### 1.0 Core Operating Limits Report

This Core Operating Limits Report (COLR) has been prepared in accordance with the requirements of Technical Specification 5.6.5. The Technical Specifications that reference this report are listed below:

TS Section	Technical Specifications	COLR Parameter	COLR Section	COLR Page
2.1.1	Reactor Core Safety Limits	RCS Temperature and Pressure Safety Limits	2.1	9
3.1.1	Shutdown Margin	SDM	2.2	9
3.1.3	Moderator Temperature Coefficient	MTC	2.3	11
3.1.4	Rod Group Alignment Limits	SDM	2.2	9
3.1.5	Shutdown Bank Insertion Limit	SDM	2.2	9
		Rod Insertion Limits	2.4	11
3.1.6	Control Bank Insertion Limit	SDM	2.2	9
		Rod Insertion Limits	2.5	15
3.1.8	Physics Tests Exceptions	SDM	2.2	9
3.2.1	Heat Flux Hot Channel Factor	$F_Q$	2.6	15
		AFD	2.8	21
		$OT\Delta T$	2.9	24
		Penalty Factors	2.6	19
3.2.2	Nuclear Enthalpy Rise Hot Channel Factor	$F\Delta H$	2.7	20
		Penalty Factors	2.6	19
3.2.3	Axial Flux Difference	AFD	2.8	21
3.3.1	Reactor Trip System Instrumentation	$OT\Delta T$	2.9	24
		$OP\Delta T$	2.9	25
3.3.9	Boron Dilution Mitigation System	Reactor Makeup Water Flow Rate	2.10	26
3.4.1	RCS Pressure, Temperature and Flow limits for DNB	RCS Pressure, Temperature and Flow	2.11	26
3.5.1	Accumulators	Max and Min Boron Conc.	2.12	26
3.5.4	Refueling Water Storage Tank	Max and Min Boron Conc.	2.13	28
3.7.15	Spent Fuel Pool Boron Concentration	Min Boron Concentration	2.14	28
3.9.1	Refueling Operations - Boron Concentration	Min Boron Concentration	2.15	28
5.6.5	Core Operating Limits Report (COLR)	Analytical Methods	1.1	6

The Selected License Commitments that reference this report are listed below:

SLC Section	Selected Licensing Commitment	COLR Parameter	COLR Section	COLR Page
16.7-9	Standby Shutdown System	Standby Makeup Pump Water Supply	2.16	29
16.9-11	Boration Systems – Borated Water Source – Shutdown	Borated Water Volume and Conc. for BAT/RWST	2.17	29
16.9-12	Boration Systems – Borated Water Source – Operating	Borated Water Volume and Conc. for BAT/RWST	2.18	30

## Catawba 1 Cycle 21 Core Operating Limits Report

### 1.1 Analytical Methods

Analytical methods used to determine core operating limits for parameters identified in Technical Specifications and previously reviewed and approved by the NRC, as specified in Technical Specification 5.6.5, are as follows.

1. WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," (W Proprietary).

Revision 0

Report Date: July 1985

**Not Used**

2. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model using the NOTRUMP Code," (W Proprietary).

Revision 0

Report Date: August 1985

3. WCAP-10266-P-A, "THE 1981 VERSION OF WESTINGHOUSE EVALUATION MODEL USING BASH CODE", (W Proprietary).

Revision 2

Report Date: March 1987

**Not Used**

4. WCAP-12945-P-A, Volume 1 and Volumes 2-5, "Code Qualification Document for Best-Estimate Loss of Coolant Analysis," (W Proprietary).

Revision: Volume 1 (Revision 2) and Volumes 2-5 (Revision 1)

Report Date: March 1998

5. BAW-10168P-A, "B&W Loss-of-Coolant Accident Evaluation Model for Recirculating Steam Generator Plants," (B&W Proprietary).

Revision 1

SER Date: January 22, 1991

Revision 2

SER Dates: August 22, 1996 and November 26, 1996.

Revision 3

SER Date: June 15, 1994.

**Not Used**

## Catawba 1 Cycle 21 Core Operating Limits Report

### 1.1 Analytical Methods (continued)

6. DPC-NE-3000-PA, "Thermal-Hydraulic Transient Analysis Methodology," (DPC Proprietary).  
  
Revision 5a  
Report Date: October 2012
7. DPC-NE-3001-PA, "Multidimensional Reactor Transients and Safety Analysis Physics Parameter Methodology," (DPC Proprietary).  
  
Revision 0a  
Report Date: May 2009
8. DPC-NE-3002-A, "UFSAR Chapter 15 System Transient Analysis Methodology".  
  
Revision 4b  
Report Date: September 2010
9. DPC-NE-2004P-A, "Duke Power Company McGuire and Catawba Nuclear Stations Core Thermal-Hydraulic Methodology using VIPRE-01," (DPC Proprietary).  
  
Revision 2a  
Report Date: December 2008
10. DPC-NE-2005P-A, "Thermal Hydraulic Statistical Core Design Methodology," (DPC Proprietary).  
  
Revision 4a  
Report Date: December 2008
11. DPC-NE-2008P-A, "Fuel Mechanical Reload Analysis Methodology Using TACO3," (DPC Proprietary).  
  
Revision 1a  
Report Date: December 2008  
**Not Used**
12. DPC-NE-2009-P-A, "Westinghouse Fuel Transition Report," (DPC Proprietary).  
  
Revision 3a  
Report Date: September 2011
13. DPC-NE-1004A, "Nuclear Design Methodology Using CASMO-3/SIMULATE-3P."  
  
Revision 1a  
Report Date: January 2009  
**Not Used**

## **Catawba 1 Cycle 21 Core Operating Limits Report**

### **1.1 Analytical Methods (continued)**

14. DPC-NF-2010-A, "Duke Power Company McGuire Nuclear Station Catawba Nuclear Station Nuclear Physics Methodology for Reload Design."

Revision 2a

Report Date: December 2009

15. DPC-NE-2011-PA, "Duke Power Company Nuclear Design Methodology for Core Operating Limits of Westinghouse Reactors," (DPC Proprietary).

Revision 1a

Report Date: June 2009

16. DPC-NE-1005-P-A, "Nuclear Design Methodology Using CASMO-4 / SIMULATE-3 MOX", (DPC Proprietary).

Revision 1

Report Date: November 12, 2008

17. BAW-10231P-A, "COPERNIC Fuel Rod Design Computer Code" (Framatome ANP Proprietary)

Revision 1

SER Date: January 14, 2004

**Not Used**



## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.0 Operating Limits

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC approved methodologies specified in Section 1.1.

#### 2.1 Reactor Core Safety Limits (TS 2.1.1)

The Reactor Core Safety Limits are shown in Figure 1.

#### 2.2 Shutdown Margin - SDM (TS 3.1.1, TS 3.1.4, TS 3.1.5, TS 3.1.6, TS 3.1.8)

**2.2.1** For TS 3.1.1, SDM shall be greater than or equal to 1.3%  $\Delta K/K$  in MODE 2 with  $K_{eff} < 1.0$  and in MODES 3 and 4.

**2.2.2** For TS 3.1.1, SDM shall be greater than or equal to 1.0%  $\Delta K/K$  in MODE 5.

**2.2.3** For TS 3.1.4, SDM shall be greater than or equal to 1.3%  $\Delta K/K$  in MODE 1 and MODE 2.

**2.2.4** For TS 3.1.5, SDM shall be greater than or equal to 1.3%  $\Delta K/K$  in MODE 1 and MODE 2 with any control bank not fully inserted.

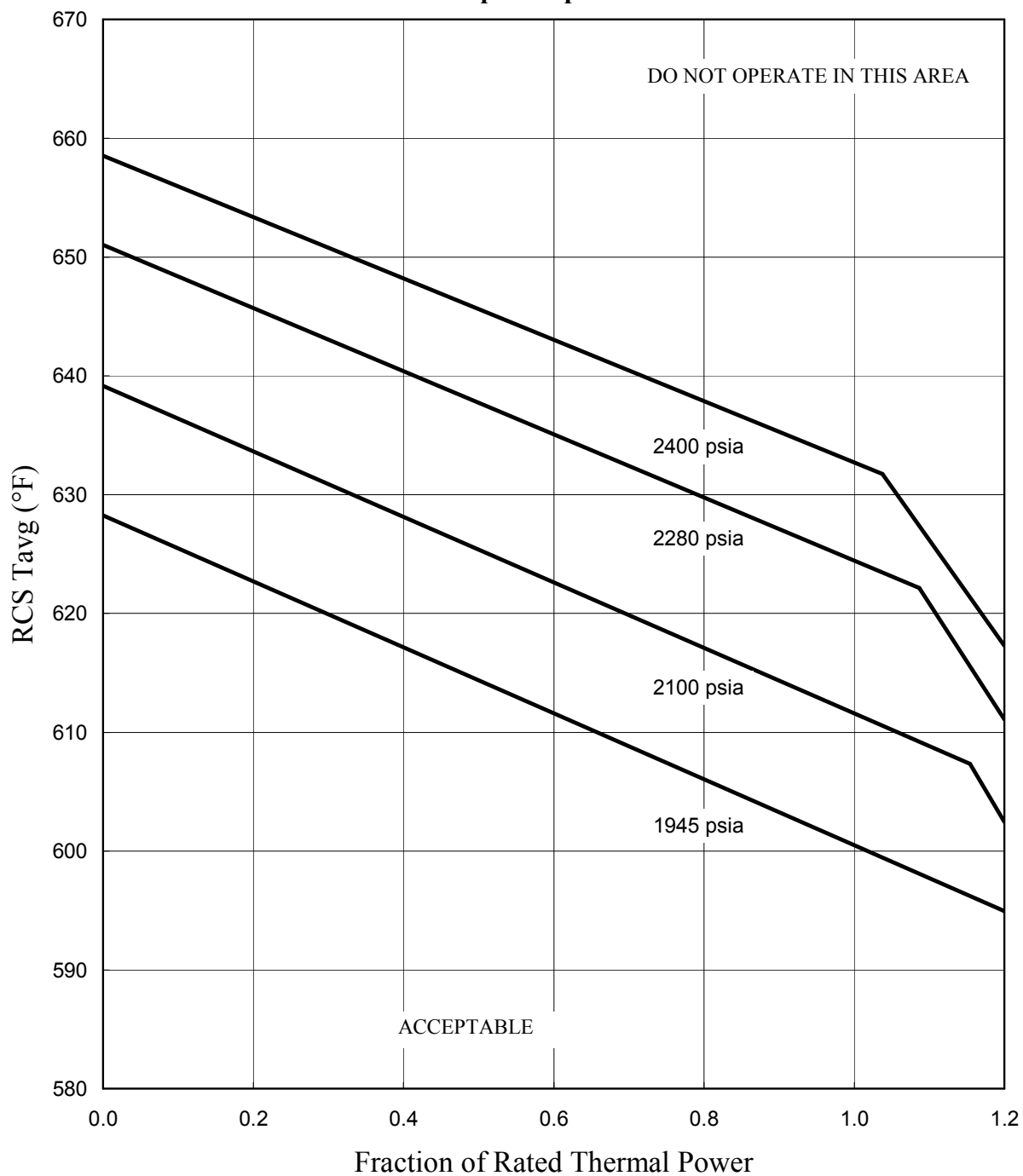
**2.2.5** For TS 3.1.6, SDM shall be greater than or equal to 1.3%  $\Delta K/K$  in MODE 1 and MODE 2 with  $K_{eff} \geq 1.0$ .

**2.2.6** For TS 3.1.8, SDM shall be greater than or equal to 1.3%  $\Delta K/K$  in MODE 2 during PHYSICS TESTS.

## Catawba 1 Cycle 21 Core Operating Limits Report

Figure 1

### Reactor Core Safety Limits Four Loops in Operation



## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.3 Moderator Temperature Coefficient - MTC (TS 3.1.3)

#### 2.3.1 The Moderator Temperature Coefficient (MTC) Limits are:

The MTC shall be less positive than the upper limits shown in Figure 2. The BOC, ARO, HZP MTC shall be less positive than  $0.7\text{E-}04 \Delta\text{K/K/}^{\circ}\text{F}$ .

The EOC, ARO, RTP MTC shall be less negative than the  $-4.3\text{E-}04 \Delta\text{K/K/}^{\circ}\text{F}$  lower MTC limit.

#### 2.3.2 The 300 ppm MTC Surveillance Limit is:

The measured 300 PPM ARO, equilibrium RTP MTC shall be less negative than or equal to  $-3.65\text{E-}04 \Delta\text{K/K/}^{\circ}\text{F}$ .

#### 2.3.3 The 60 PPM MTC Surveillance Limit is:

The 60 PPM ARO, equilibrium RTP MTC shall be less negative than or equal to  $-4.125\text{E-}04 \Delta\text{K/K/}^{\circ}\text{F}$ .

Where:

- BOC = Beginning of Cycle (burnup corresponding to most positive MTC)
- EOC = End of Cycle
- ARO = All Rods Out
- HZP = Hot Zero Thermal Power
- RTP = Rated Thermal Power
- PPM = Parts per million (Boron)

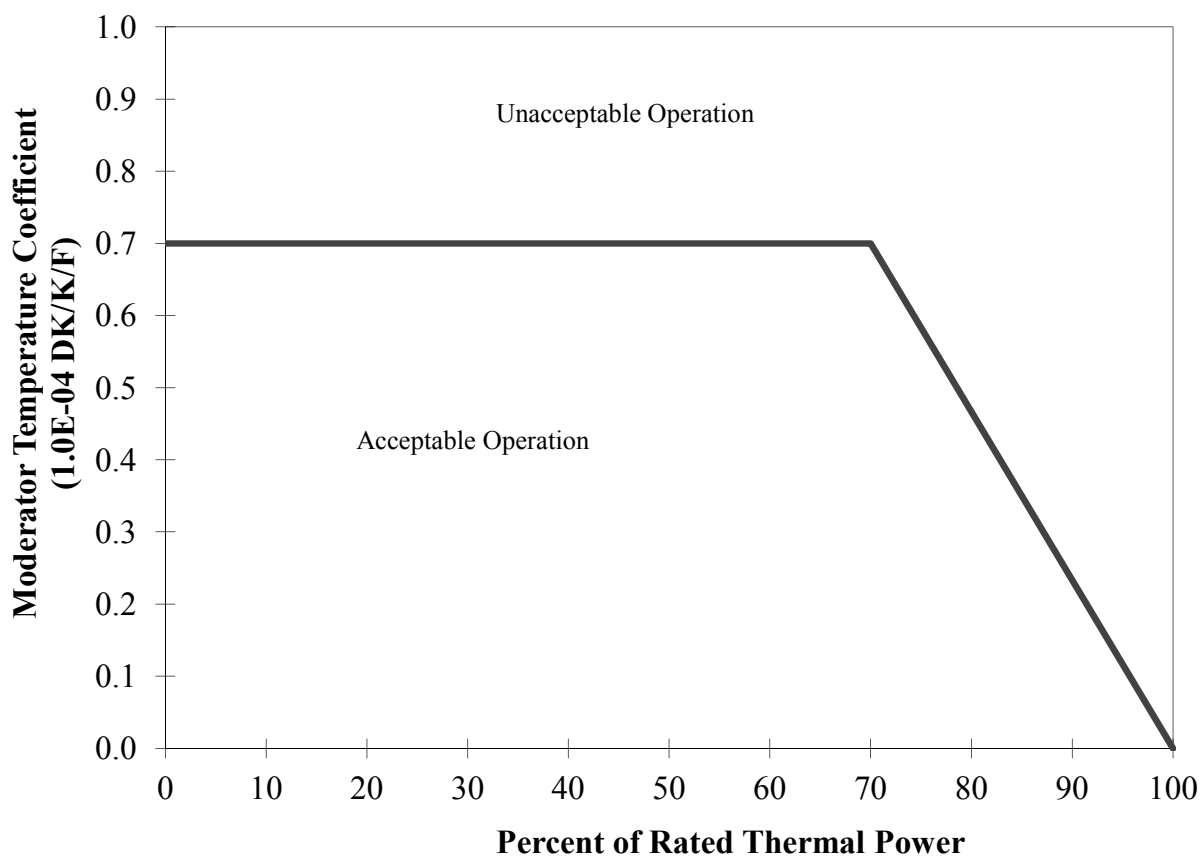
### 2.4 Shutdown Bank Insertion Limit (TS 3.1.5)

#### 2.4.1 Each shutdown bank shall be withdrawn to at least 222 steps. Shutdown banks are withdrawn in sequence and with no overlap.

## Catawba 1 Cycle 21 Core Operating Limits Report

Figure 2

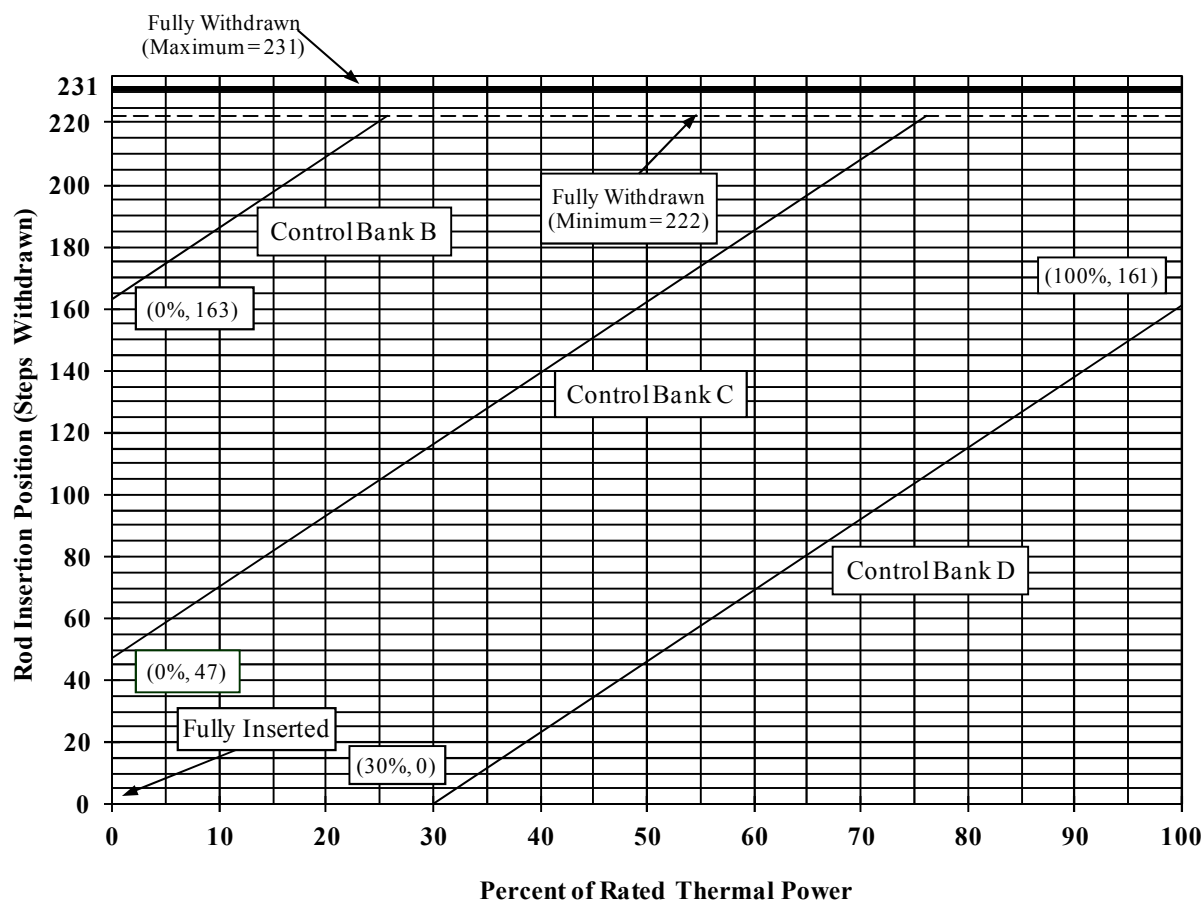
### Moderator Temperature Coefficient Upper Limit Versus Power Level



**NOTE:** Compliance with Technical Specification 3.1.3 may require rod withdrawal limits. Refer to the Unit 1 ROD manual for details.

## Catawba 1 Cycle 21 Core Operating Limits Report

**Figure 3**  
**Control Bank Insertion Limits Versus Percent Rated Thermal Power**



The Rod Insertion Limits (RIL) for Control Bank D (CD), Control Bank C (CC), and Control Bank B (CB) can be calculated by:

$$\text{Bank CD RIL} = 2.3(P) - 69 \quad \{30 \leq P \leq 100\}$$

$$\text{Bank CC RIL} = 2.3(P) + 47 \quad \{0 \leq P \leq 76.1\} \text{ for CC RIL} = 222 \quad \{76.1 < P \leq 100\}$$

$$\text{Bank CB RIL} = 2.3(P) + 163 \quad \{0 \leq P \leq 25.7\} \text{ for CB RIL} = 222 \quad \{25.7 < P \leq 100\}$$

where  $P = \% \text{Rated Thermal Power}$

**NOTES:** Compliance with Technical Specification 3.1.3 may require rod withdrawal limits. Refer to the Unit 1 ROD manual for details.

## Catawba 1 Cycle 21 Core Operating Limits Report

**Table 1**  
**Control Bank Withdrawal Steps and Sequence**

Fully Withdrawn at 222 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
222 Stop	106	0	0
222	116	0 Start	0
222	222 Stop	106	0
222	222	116	0 Start
222	222	222 Stop	106

Fully Withdrawn at 224 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
224 Stop	108	0	0
224	116	0 Start	0
224	224 Stop	108	0
224	224	116	0 Start
224	224	224 Stop	108

Fully Withdrawn at 226 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
226 Stop	110	0	0
226	116	0 Start	0
226	226 Stop	110	0
226	226	116	0 Start
226	226	226 Stop	110

Fully Withdrawn at 228 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
228 Stop	112	0	0
228	116	0 Start	0
228	228 Stop	112	0
228	228	116	0 Start
228	228	228 Stop	112

Fully Withdrawn at 230 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
230 Stop	114	0	0
230	116	0 Start	0
230	230 Stop	114	0
230	230	116	0 Start
230	230	230 Stop	114

Fully Withdrawn at 223 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
223 Stop	107	0	0
223	116	0 Start	0
223	223 Stop	107	0
223	223	116	0 Start
223	223	223 Stop	107

Fully Withdrawn at 225 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
225 Stop	109	0	0
225	116	0 Start	0
225	225 Stop	109	0
225	225	116	0 Start
225	225	225 Stop	109

Fully Withdrawn at 227 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
227 Stop	111	0	0
227	116	0 Start	0
227	227 Stop	111	0
227	227	116	0 Start
227	227	227 Stop	111

Fully Withdrawn at 229 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
229 Stop	113	0	0
229	116	0 Start	0
229	229 Stop	113	0
229	229	116	0 Start
229	229	229 Stop	113

Fully Withdrawn at 231 Steps			
Control Bank A	Control Bank B	Control Bank C	Control Bank D
0 Start	0	0	0
116	0 Start	0	0
231 Stop	115	0	0
231	116	0 Start	0
231	231 Stop	115	0
231	231	116	0 Start
231	231	231 Stop	115

## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.5 Control Bank Insertion Limits (TS 3.1.6)

**2.5.1** Control banks shall be within the insertion, sequence, and overlap limits shown in Figure 3. Specific control bank withdrawal and overlap limits as a function of the fully withdrawn position are shown in Table 1.

### 2.6 Heat Flux Hot Channel Factor - $F_Q(X,Y,Z)$ (TS 3.2.1)

**2.6.1**  $F_Q(X,Y,Z)$  steady-state limits are defined by the following relationships:

$$\begin{aligned} F_Q^{RTP} * K(Z)/P & \quad \text{for } P > 0.5 \\ F_Q^{RTP} * K(Z)/0.5 & \quad \text{for } P \leq 0.5 \end{aligned}$$

where,

$$P = (\text{Thermal Power})/(\text{Rated Power})$$

Note: The measured  $F_Q(X,Y,Z)$  shall be increased by 3% to account for manufacturing tolerances and 5% to account for measurement uncertainty when comparing against the LCO limit. The manufacturing tolerance and measurement uncertainty are implicitly included in the  $F_Q$  surveillance limits as defined for COLR Sections 2.6.5 and 2.6.6.

**2.6.2**  $F_Q^{RTP} = 2.70 \times K(\text{BU})$

**2.6.3**  $K(Z)$  is the normalized  $F_Q(X,Y,Z)$  as a function of core height.  $K(Z)$  for Westinghouse RFA fuel is provided in Figure 4.

**2.6.4**  $K(\text{BU})$  is the normalized  $F_Q(X,Y,Z)$  as a function of burnup.  $F_Q^{RTP}$  with the  $K(\text{BU})$  penalty for Westinghouse RFA fuel is set to 1.0 at all burnups.

The following parameters are required for core monitoring per the Surveillance Requirements of Technical Specification 3.2.1:

**2.6.5**  $[F_Q^L(X,Y,Z)]^{OP} = \frac{F_Q^D(X,Y,Z) * M_Q(X,Y,Z)}{UMT * MT * TILT}$

where:

$[F_Q^L(X,Y,Z)]^{OP}$  = Cycle dependent maximum allowable design peaking factor that ensures  $F_Q(X,Y,Z)$  LOCA limit is not exceeded for operation within the AFD, RIL, and QPTR limits.  
 $F_Q^L(X,Y,Z)^{OP}$  includes allowances for calculational and measurement uncertainties.

### Catawba 1 Cycle 21 Core Operating Limits Report

$F_Q^D(X,Y,Z)$  = Design power distribution for  $F_Q$ .  $F_Q^D(X,Y,Z)$  is provided in Appendix Table A-1 for normal operating conditions and in Appendix Table A-4 for power escalation testing during initial startup operation.

$M_Q(X,Y,Z)$  = Margin remaining in core location X,Y,Z to the LOCA limit in the transient power distribution.  $M_Q(X,Y,Z)$  is provided in Appendix Table A-1 for normal operating conditions and in Appendix Table A-4 for power escalation testing during initial startup operation.

UMT = Total Peak Measurement Uncertainty. (UMT = 1.05)

MT = Engineering Hot Channel Factor. (MT = 1.03).

TILT = Peaking penalty that accounts for allowable quadrant power tilt ratio of 1.02. (TILT = 1.035)

$$2.6.6 \quad [F_Q^L(X,Y,Z)]^{RPS} = \frac{F_Q^D(X,Y,Z) * M_C(X,Y,Z)}{UMT * MT * TILT}$$

where:

$[F_Q^L(X,Y,Z)]^{RPS}$  = Cycle dependent maximum allowable design peaking factor that ensures  $F_Q(X,Y,Z)$  Centerline Fuel Melt (CFM) limit is not exceeded for operation within the AFD, RIL, and QPTR limits.  $[F_Q^L(X,Y,Z)]^{RPS}$  includes allowances for calculational and measurement uncertainties.

$F_Q^D(X,Y,Z)$  = Design power distributions for  $F_Q$ .  $F_Q^D(X,Y,Z)$  is provided in Appendix Table A-1 for normal operating conditions and in Appendix Table A-4 for power escalation testing during initial startup operations.

$M_C(X,Y,Z)$  = Margin remaining to the CFM limit in core location X,Y,Z from the transient power distribution.  $M_C(X,Y,Z)$  is provided in Appendix Table A-2 for normal operating conditions and in Appendix Table A-5 for power escalation testing during initial startup operations.



### Catawba 1 Cycle 21 Core Operating Limits Report

UMT = Total Peak Measurement Uncertainty. (UMT = 1.05)

MT = Engineering Hot Channel Factor. (MT = 1.03).

TILT = Peaking penalty that accounts for allowable quadrant power tilt ratio of 1.02. (TILT = 1.035)

#### 2.6.7 KSLOPE = 0.0725

where:

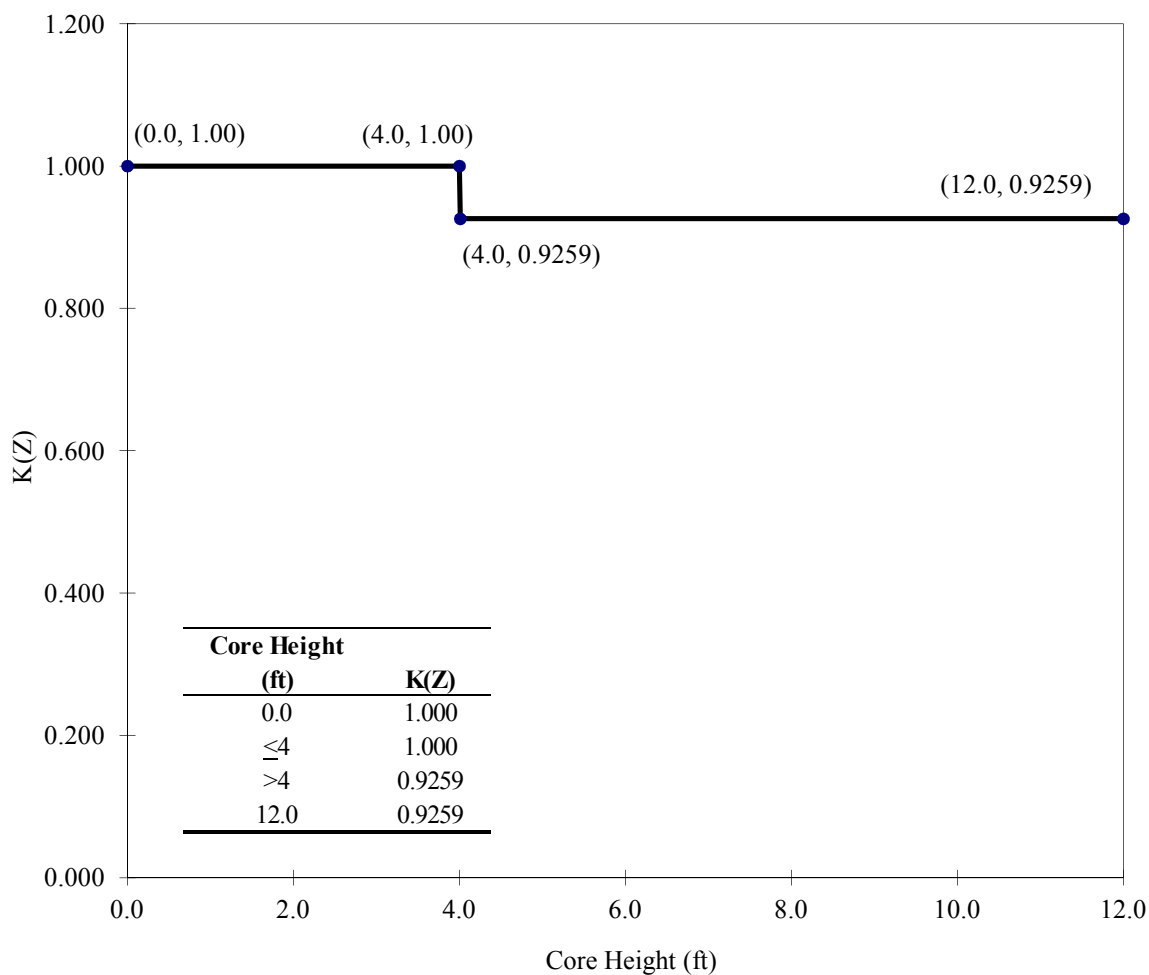
KSLOPE = Adjustment to  $K_1$  value from OTΔT trip setpoint required to compensate for each 1%  $F_Q^M(X,Y,Z)$  exceeds  $F_Q^L(X,Y,Z)^{RPS}$ .

#### 2.6.8 $F_Q(X,Y,Z)$ Penalty Factors for Technical Specification Surveillances 3.2.1.2 and 3.2.1.3 are provided in Table 2.

# Catawba 1 Cycle 21 Core Operating Limits Report

Figure 4

**$K(Z)$ , Normalized  $F_Q(X,Y,Z)$  as a Function of Core Height  
for Westinghouse RFA Fuel**



**Catawba 1 Cycle 21 Core Operating Limits Report****Table 2**

**$F_Q(X,Y,Z)$  and  $F_{\Delta H}(X,Y)$  Penalty Factors  
For Tech Spec Surveillances 3.2.1.2, 3.2.1.3 and 3.2.2.2**

<b>Burnup (EFPD)</b>	<b><math>F_Q(X,Y,Z)</math> Penalty Factor (%)</b>	<b><math>F_{\Delta H}(X,Y)</math> Penalty Factor (%)</b>
4	2.00	2.00
12	2.00	2.00
25	2.00	2.00
50	2.00	2.00
75	2.00	2.00
100	2.00	2.00
125	2.00	2.00
150	2.00	2.00
175	2.00	2.00
200	2.00	2.00
225	2.00	2.00
250	2.00	2.00
275	2.00	2.00
300	2.00	2.00
325	2.00	2.00
350	2.00	2.00
375	2.00	2.00
400	2.00	2.00
425	2.00	2.00
450	2.00	2.00
460	2.00	2.00
475	2.00	2.00
485	2.00	2.00
490	2.00	2.00
500	2.00	2.00
510	2.00	2.00

**Note:** Linear interpolation is adequate for intermediate cycle burnups.  
All cycle burnups outside the range of the table shall use a 2% penalty factor for both  $F_Q(X,Y,Z)$  and  $F_{\Delta H}(X,Y)$  for compliance with the Tech Spec Surveillances 3.2.1.2, 3.2.1.3 and 3.2.2.2.

## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.7 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(X,Y)$ (TS 3.2.2)

$F_{\Delta H}$  steady-state limits referred to in Technical Specification 3.2.2 are defined by the following relationship.

$$2.7.1 \quad [F_{\Delta H}^L(X,Y)]^{LCO} = \text{MARP}(X,Y) * \left[ 1.0 + \frac{1}{\text{RRH}} * (1.0 - P) \right]$$

where:

$[F_{\Delta H}^L(X,Y)]^{LCO}$  is the steady-state, maximum allowed radial peak and includes allowances for calculation/measurement uncertainty.

$\text{MARP}(X,Y) =$  Cycle-specific operating limit Maximum Allowable Radial Peaks.  $\text{MARP}(X,Y)$  radial peaking limits are provided in Table 3.

$$P = \frac{\text{Thermal Power}}{\text{Rated Thermal Power}}$$

$\text{RRH} =$  Thermal Power reduction required to compensate for each 1% measured radial peak,  $F_{\Delta H}^M(X,Y)$ , exceeds the limit.  
( $\text{RRH} = 3.34, 0.0 < P \leq 1.0$ )

The following parameters are required for core monitoring per the surveillance requirements of Technical Specification 3.2.2.

$$2.7.2 \quad [F_{\Delta H}^L(X,Y)]^{SURV} = \frac{F_{\Delta H}^D(X,Y) * M_{\Delta H}(X,Y)}{\text{UMR} * \text{TILT}}$$

where:

$[F_{\Delta H}^L(X,Y)]^{SURV} =$  Cycle dependent maximum allowable design peaking factor that ensures  $F_{\Delta H}(X,Y)$  limit is not exceeded for operation within the AFD, RIL, and QPTR limits.  $F_{\Delta H}^L(X,Y)^{SURV}$  includes allowances for calculational and measurement uncertainty.

$F_{\Delta H}^D(X,Y) =$  Design radial power distribution for  $F_{\Delta H}$ .  $F_{\Delta H}^D(X,Y)$  is provided in Appendix Table A-3 for normal operation and in Appendix Table A-6 for power escalation testing during initial startup operation.

## Catawba 1 Cycle 21 Core Operating Limits Report

$M_{\Delta H}(X,Y)$  = Margin remaining in core location X,Y relative to Operational DNB limits in the transient power distribution.  $M_{\Delta H}(X,Y)$  is provided in Appendix Table A-3 for normal operation and in Appendix Table A-6 for power escalation testing during initial startup operation.

UMR = Uncertainty value for measured radial peaks (UMR = 1.0). UMR is set to 1.0 since a factor of 1.04 is implicitly included in the variable  $M_{\Delta H}(X,Y)$ .

TILT = Peaking penalty that accounts for allowable quadrant power tilt ratio of 1.02. (TILT = 1.035)

### 2.7.3 $RRH = 3.34$

where:

$RRH$  = Thermal Power reduction required to compensate for each 1% measured radial peak,  $F_{\Delta H}^M(X,Y)$  exceeds its limit. ( $0 < P \leq 1.0$ )

### 2.7.4 $TRH = 0.04$

where:

$TRH$  = Reduction in OTΔT  $K_1$  setpoint required to compensate for each 1% measured radial peak,  $F_{\Delta H}^M(X,Y)$  exceeds its limit.

### 2.7.5 $F_{\Delta H}(X,Y)$ Penalty Factors for Technical Specification Surveillance 3.2.2.2 are provided in Table 2.

## 2.8 Axial Flux Difference – AFD (TS 3.2.3)

### 2.8.1 Axial Flux Difference (AFD) Limits are provided in Figure 5.

## Catawba 1 Cycle 21 Core Operating Limits Report

**Table 3**  
**Maximum Allowable Radial Peaks (MARPS)**

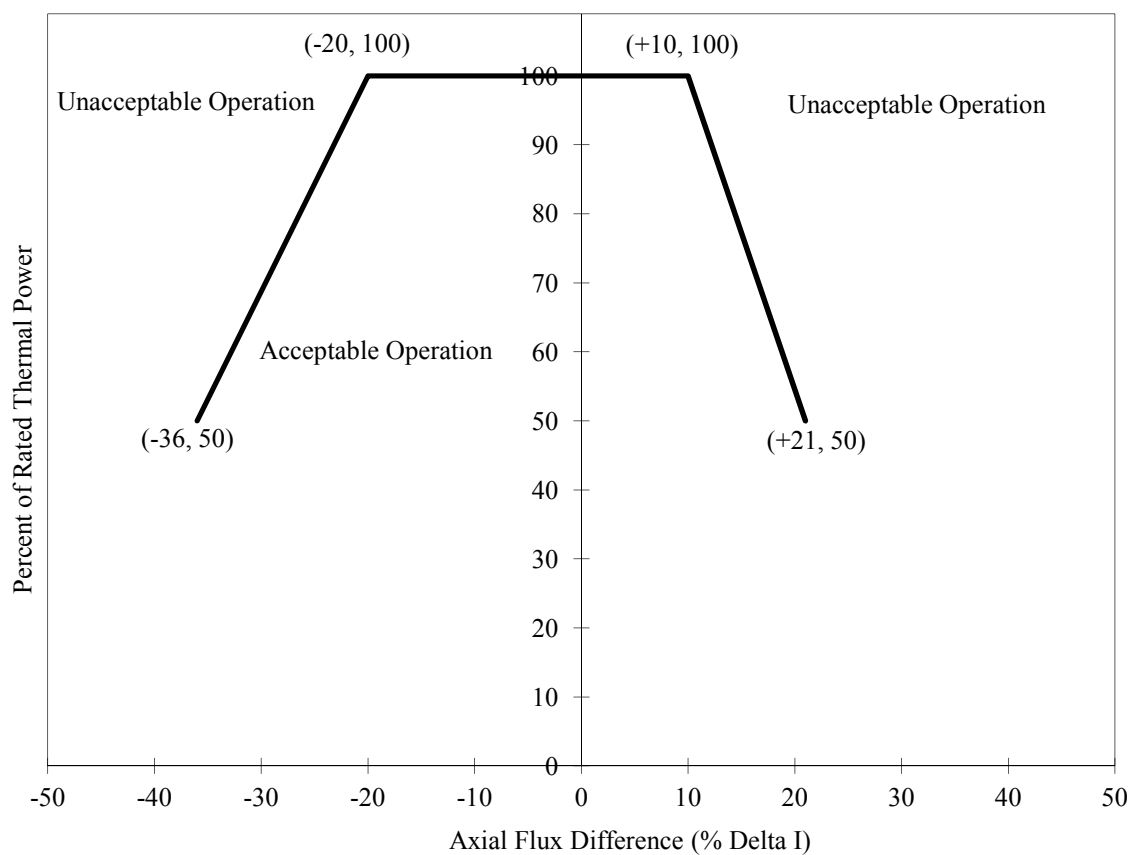
RFA Fuel MARPs  
100% Full Power

Core Height (ft)	Axial Peak												
	1.05	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.1	3.0	3.25
0.12	1.8092	1.8553	1.9489	1.9953	1.9741	2.1073	2.0498	2.0090	1.9333	1.8625	1.7780	1.3151	1.2461
1.20	1.8102	1.8540	1.9401	1.9953	1.9741	2.1073	2.0191	1.9775	1.9009	1.8306	1.7852	1.3007	1.2235
2.40	1.8093	1.8525	1.9312	1.9779	1.9741	2.0735	1.9953	1.9519	1.8760	1.8054	1.7320	1.4633	1.4616
3.60	1.8098	1.8514	1.9204	1.9641	1.9741	2.0495	1.9656	1.9258	1.8524	1.7855	1.6996	1.4675	1.3874
4.80	1.8097	1.8514	1.9058	1.9449	1.9741	2.0059	1.9441	1.9233	1.8538	1.7836	1.6714	1.2987	1.2579
6.00	1.8097	1.8514	1.8921	1.9212	1.9455	1.9336	1.8798	1.8625	1.8024	1.7472	1.6705	1.3293	1.2602
7.20	1.8070	1.8438	1.8716	1.8930	1.8872	1.8723	1.8094	1.7866	1.7332	1.6812	1.5982	1.2871	1.2195
8.40	1.8073	1.8319	1.8452	1.8571	1.8156	1.7950	1.7359	1.7089	1.6544	1.6010	1.5127	1.2182	1.1578
9.60	1.8072	1.8102	1.8093	1.7913	1.7375	1.7182	1.6572	1.6347	1.5808	1.5301	1.4444	1.1431	1.0914
10.80	1.7980	1.7868	1.7611	1.7163	1.6538	1.6315	1.5743	1.5573	1.5088	1.4624	1.3832	1.1009	1.0470
11.40	1.7892	1.7652	1.7250	1.6645	1.6057	1.5826	1.5289	1.5098	1.4637	1.4218	1.3458	1.0670	1.0142

## Catawba 1 Cycle 21 Core Operating Limits Report

Figure 5

### Percent of Rated Thermal Power Versus Percent Axial Flux Difference Limits



**NOTE:** Compliance with Technical Specification 3.2.1 may require more restrictive AFD limits. Refer to the Unit 1 ROD manual for operational AFD limits.

## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.9 Reactor Trip System Instrumentation Setpoints (TS 3.3.1) Table 3.3.1-1

#### 2.9.1 Overtemperature $\Delta T$ Setpoint Parameter Values

<u>Parameter</u>	<u>Nominal Value</u>
Nominal $T_{avg}$ at RTP	$T' \leq 585.1 \text{ } ^\circ\text{F}$
Nominal RCS Operating Pressure	$P' = 2235 \text{ psig}$
Overtemperature $\Delta T$ reactor trip setpoint	$K_1 = 1.1978$
Overtemperature $\Delta T$ reactor trip heatup setpoint penalty coefficient	$K_2 = 0.03340/^\circ\text{F}$
Overtemperature $\Delta T$ reactor trip depressurization setpoint penalty coefficient	$K_3 = 0.001601/\text{psi}$
Time constants utilized in the lead-lag compensator for $\Delta T$	$\tau_1 = 8 \text{ sec.}$ $\tau_2 = 3 \text{ sec.}$
Time constant utilized in the lag compensator for $\Delta T$	$\tau_3 = 0 \text{ sec.}$
Time constants utilized in the lead-lag compensator for $T_{avg}$	$\tau_4 = 22 \text{ sec.}$ $\tau_5 = 4 \text{ sec.}$
Time constant utilized in the measured $T_{avg}$ lag compensator	$\tau_6 = 0 \text{ sec.}$
$f_1(\Delta I)$ "positive" breakpoint	$= 19.0 \text{ } \%\Delta I$
$f_1(\Delta I)$ "negative" breakpoint	$= \text{N/A}^*$
$f_1(\Delta I)$ "positive" slope	$= 1.769 \text{ } \%\Delta T_0 / \%\Delta I$
$f_1(\Delta I)$ "negative" slope	$= \text{N/A}^*$

- \* The  $f_1(\Delta I)$  negative breakpoints and slopes for OT $\Delta T$  are less restrictive than the OP $\Delta T$   $f_2(\Delta I)$  negative breakpoint and slope. Therefore, during a transient which challenges the negative imbalance limits the OP $\Delta T$   $f_2(\Delta I)$  limits will result in a reactor trip before the OT $\Delta T$   $f_1(\Delta I)$  limits are reached. This makes implementation of an OT $\Delta T$   $f_1(\Delta I)$  negative breakpoint and slope unnecessary.



## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.9.2 Overpower $\Delta T$ Setpoint Parameter Values

<u>Parameter</u>	<u>Nominal Value</u>
Nominal $T_{avg}$ at RTP	$T'' \leq 585.1 \text{ } ^\circ\text{F}$
Overpower $\Delta T$ reactor trip setpoint	$K_4 = 1.0864$
Overpower $\Delta T$ reactor trip penalty	$K_5 = 0.02 \text{ } / \text{ } ^\circ\text{F}$ for increasing $T_{avg}$ $K_5 = 0.00 \text{ } / \text{ } ^\circ\text{F}$ for decreasing $T_{avg}$
Overpower $\Delta T$ reactor trip heatup setpoint penalty coefficient (for $T > T''$ )	$K_6 = 0.001179 / ^\circ\text{F}$ for $T > T''$ $K_6 = 0.0 \text{ } / ^\circ\text{F}$ for $T \leq T''$
Time constants utilized in the lead-lag compensator for $\Delta T$	$\tau_1 = 8 \text{ sec.}$ $\tau_2 = 3 \text{ sec.}$
Time constant utilized in the lag compensator for $\Delta T$	$\tau_3 = 0 \text{ sec.}$
Time constant utilized in the measured $T_{avg}$ lag compensator	$\tau_6 = 0 \text{ sec.}$
Time constant utilized in the rate-lag controller for $T_{avg}$	$\tau_7 = 10 \text{ sec.}$
$f_2(\Delta I)$ "positive" breakpoint	$= 35.0 \text{ } \% \Delta I$
$f_2(\Delta I)$ "negative" breakpoint	$= -35.0 \text{ } \% \Delta I$
$f_2(\Delta I)$ "positive" slope	$= 7.0 \text{ } \% \Delta T_0 / \% \Delta I$
$f_2(\Delta I)$ "negative" slope	$= 7.0 \text{ } \% \Delta T_0 / \% \Delta I$

## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.10 Boron Dilution Mitigation System – BDMS (TS 3.3.9)

2.10.1 Reactor Makeup Water Pump combined flow rate limits:

<u>Applicable MODE</u>	<u>Limit</u>
MODE 3	$\leq 110$ gpm
MODE 4 or 5	$\leq 70$ gpm

### 2.11 RCS Pressure, Temperature and Flow DNB Limits (TS 3.4.1)

The RCS pressure, temperature and flow limits for DNB are shown in Table 4.

### 2.12 Accumulators (TS 3.5.1)

2.12.1 Boron concentration limits during MODES 1 and 2, and MODE 3 with RCS pressure >1000 psi:

<u>Parameter</u>	<u>Applicable Burnup</u>	<u>Limit</u>
Accumulator <b>minimum</b> boron concentration.	0 - 200 EFPD	2,500 ppm
Accumulator <b>minimum</b> boron concentration.	200.1 - 250 EFPD	2,400 ppm
Accumulator <b>minimum</b> boron concentration.	250.1 - 300 EFPD	2,341 ppm
Accumulator <b>minimum</b> boron concentration.	300.1 - 350 EFPD	2,273 ppm
Accumulator <b>minimum</b> boron concentration.	350.1 - 400 EFPD	2,206 ppm
Accumulator <b>minimum</b> boron concentration.	400.1 - 450 EFPD	2,139 ppm
Accumulator <b>minimum</b> boron concentration.	450.1 - 500 EFPD	2,073 ppm
Accumulator <b>minimum</b> boron concentration.	500.1 - 510 EFPD	2,007 ppm
Accumulator <b><u>maximum</u></b> boron concentration.	0 - 510 EFPD	3,075 ppm

**Catawba 1 Cycle 21 Core Operating Limits Report****Table 4**

Reactor Coolant System DNB Parameters

PARAMETER	INDICATION	No. Operable CHANNELS	LIMITS
1. Indicated RCS Average Temperature	meter	4	$\leq 587.2$ °F
	meter	3	$\leq 586.9$ °F
	computer	4	$\leq 587.7$ °F
	computer	3	$\leq 587.5$ °F
2. Indicated Pressurizer Pressure	meter	4	$\geq 2219.8$ psig
	meter	3	$\geq 2222.1$ psig
	computer	4	$\geq 2215.8$ psig
	computer	3	$\geq 2217.5$ psig
3. RCS Total Flow Rate			$\geq 388,000$ gpm

**Catawba 1 Cycle 21 Core Operating Limits Report****2.13 Refueling Water Storage Tank - RWST (TS 3.5.4)****2.13.1** Boron concentration limits during MODES 1, 2, 3, and 4:

<u>Parameter</u>	<u>Limit</u>
RWST minimum boron concentration.	2,700 ppm
RWST maximum boron concentration.	3,075 ppm

**2.14 Spent Fuel Pool Boron Concentration (TS 3.7.15)****2.14.1** Minimum boron concentration limit for the spent fuel pool. Applicable when fuel assemblies are stored in the spent fuel pool.

<u>Parameter</u>	<u>Limit</u>
Spent fuel pool minimum boron concentration.	2,700 ppm

**2.15 Refueling Operations - Boron Concentration (TS 3.9.1)****2.15.1** Minimum boron concentration limit for filled portions of the Reactor Coolant System, refueling canal, and refueling cavity for MODE 6 conditions. The minimum boron concentration limit and plant refueling procedures ensure that core  $K_{\text{eff}}$  remains within the MODE 6 reactivity requirement of  $K_{\text{eff}} \leq 0.95$ .

<u>Parameter</u>	<u>Limit</u>
Minimum Boron concentration of the Reactor Coolant System, the refueling canal, and the refueling cavity.	2,700 ppm

## Catawba 1 Cycle 21 Core Operating Limits Report

### 2.16 Standby Shutdown System - (SLC-16.7-9)

**2.16.1** Minimum boron concentration limit for the spent fuel pool required for Standby Makeup Pump Water Supply. Applicable for MODES 1, 2, and 3.

<u>Parameter</u>	<u>Limit</u>
Spent fuel pool minimum boron concentration for TR 16.7-9.3.	2,700 ppm

### 2.17 Boration Systems Borated Water Source – Shutdown (SLC 16.9-11)

**2.17.1** Volume and boron concentrations for the Boric Acid Tank (BAT) and the Refueling Water Storage Tank (RWST) during MODE 4 with any RCS cold leg temperature  $\leq 210^{\circ}\text{F}$ , and MODES 5 and 6.

<u>Parameter</u>	<u>Limit</u>
BAT minimum boron concentration	7,000 ppm
Volume of 7,000 ppm boric acid solution required to maintain SDM at 68°F	2,000 gallons
BAT Minimum Shutdown Volume (Includes the additional volumes listed in SLC 16.9-11)	13,086 gallons (14.9%)

**NOTE: When cycle burnup is  $\geq 471$  EFPD, Figure 6 may be used to determine the required BAT Minimum Level.**

RWST minimum boron concentration	2,700 ppm
Volume of 2,700 ppm boric acid solution required to maintain SDM at 68 °F	7,000 gallons
RWST Minimum Shutdown Volume (Includes the additional volumes listed in SLC 16.9-11)	48,500 gallons (8.7%)

## Catawba 1 Cycle 21 Core Operating Limits Report

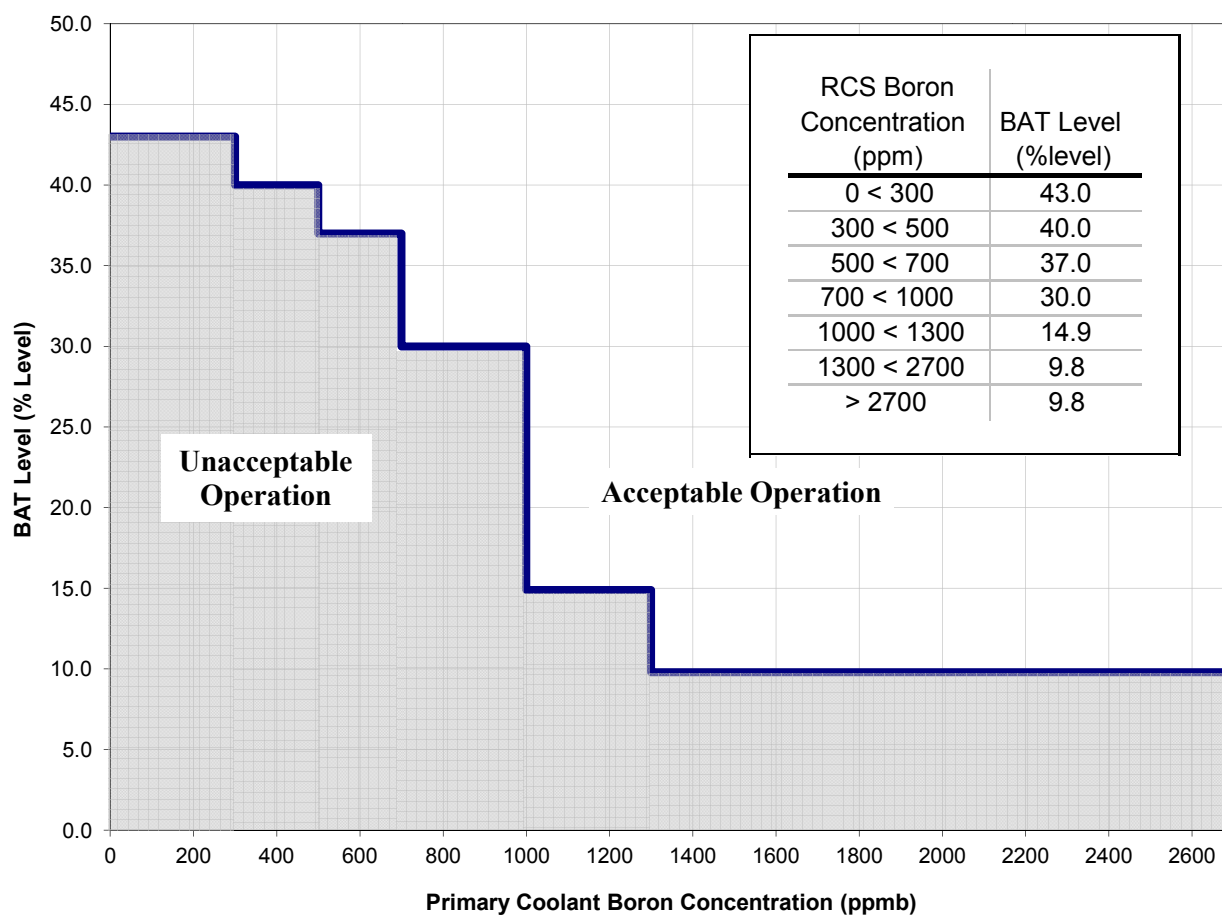
### 2.18 Boration Systems Borated Water Source - Operating (SLC 16.9-12)

**2.18.1** Volume and boron concentrations for the Boric Acid Tank (BAT) and the Refueling Water Storage Tank (RWST) during MODES 1, 2, and 3 and MODE 4 with all RCS cold leg temperatures > 210°F.

<u>Parameter</u>	<u>Limit</u>
BAT minimum boron concentration	7,000 ppm
Volume of 7,000 ppm boric acid solution required to maintain SDM at 210°F	13,500 gallons
BAT Minimum Shutdown Volume (Includes the additional volumes listed in SLC 16.9-12)	25,200 gallons (45.8%)

**NOTE: When cycle burnup is  $\geq 471$  EFPD, Figure 6 may be used to determine the required BAT Minimum Level.**

RWST minimum boron concentration	2,700 ppm
Volume of 2,700 ppm boric acid solution required to maintain SDM at 210 °F	57,107 gallons
RWST Minimum Shutdown Volume (Includes the additional volumes listed in SLC 16.9-12)	98,607 gallons (22.0%)

**Catawba 1 Cycle 21 Core Operating Limits Report****Figure 6****Boric Acid Storage Tank Indicated Level Versus  
Primary Coolant Boron Concentration****(Valid When Cycle Burnup is  $\geq 471$  EFPD)****This figure includes additional volumes listed in SLC 16.9-11 and 16.9-12**

## **Catawba 1 Cycle 21 Core Operating Limits Report**

### **Appendix A**

#### **Power Distribution Monitoring Factors**

Appendix A contains power distribution monitoring factors used in Technical Specification Surveillance. This data was generated in the Catawba 1 Cycle 21 Maneuvering Analysis calculation file, CNC-1553.05-00-0579. Due to the size of the monitoring factor data, Appendix A is controlled electronically within Duke and is not included in the Duke internal copies of the COLR. The Catawba Reactor and Electrical Systems Engineering Section controls this information via computer files and should be contacted if there is a need to access this information.

Appendix A is included in the COLR copy transmitted to the NRC.



**Appendix A****Power Distribution Monitoring Factors**

<b>Table</b>	<b>Description</b>	<b>Page</b>
TABLE A-1	F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) NORMAL OPERATION .....	2
TABLE A-2	M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION .....	218
TABLE A-3	F-DEL-H & M-DEL-H VALUES NORMAL OPERATION .....	242
TABLE A-4	F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) POWER ESCALATION .....	251
TABLE A-5	M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION .....	299
TABLE A-6	F-DEL-H & M-DEL-H VALUES POWER ESCALATION .....	311

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 2 of 312

TABLE A-1

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5762 *	* .5921 *	* .5926 *	* .5968 *	* .6808 *	* .5837 *	* .5726 *	* .3136 *
	* 2.7779 *	* 3.1667 *	* 3.2917 *	* 3.1651 *	* 2.7507 *	* 3.1893 *	* 3.2183 *	* 5.3694 *
9	* .5921 *	* .6756 *	* .6159 *	* .6831 *	* .5903 *	* .5676 *	* .5716 *	* .3156 *
	* 3.1667 *	* 2.8853 *	* 3.1288 *	* 2.7928 *	* 3.1968 *	* 3.2895 *	* 3.2408 *	* 5.2956 *
10	* .5926 *	* .6158 *	* .5793 *	* .6071 *	* .6512 *	* .5557 *	* .5264 *	* .2928 *
	* 3.2917 *	* 3.1291 *	* 3.3601 *	* 3.1704 *	* 2.9710 *	* 3.4660 *	* 3.5951 *	* 5.7809 *
11	* .5968 *	* .6832 *	* .6072 *	* .6419 *	* .5490 *	* .5711 *	* .4079 *	* .2128 *
	* 3.1651 *	* 2.7924 *	* 3.1699 *	* 3.0456 *	* 3.5363 *	* 3.3373 *	* 4.4135 *	* 8.2754 *
12	* .6808 *	* .5904 *	* .6514 *	* .5491 *	* .4653 *	* .5029 *	* .3269 *	
	* 2.7507 *	* 3.1960 *	* 2.9698 *	* 3.5357 *	* 3.7905 *	* 3.5347 *	* 5.2503 *	
13	* .5837 *	* .5687 *	* .5561 *	* .5713 *	* .5029 *	* .4369 *	* .2444 *	
	* 3.1893 *	* 3.2832 *	* 3.4636 *	* 3.3366 *	* 3.5347 *	* 3.9938 *	* 6.8354 *	
14	* .5726 *	* .5723 *	* .5268 *	* .4080 *	* .3268 *	* .2499 *		
	* 3.2183 *	* 3.2368 *	* 3.5925 *	* 4.4127 *	* 5.2520 *	* 6.6901 *		
15	* .3136 *	* .3158 *	* .2929 *	* .2128 *	* F-SUB-Q			
	* 5.3694 *	* 5.2933 *	* 5.7789 *	* 8.2724 *	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3689 *	* 1.2059 *	* 1.3023 *	* 1.2070 *	* 1.4312 *	* 1.2059 *	* 1.3633 *	* .6613 *
	* 1.3473 *	* 1.5850 *	* 1.5348 *	* 1.5961 *	* 1.3358 *	* 1.5775 *	* 1.3816 *	* 2.6049 *
9	* 1.2059 *	* 1.4138 *	* 1.3430 *	* 1.4150 *	* 1.2761 *	* 1.2681 *	* 1.3639 *	* .6862 *
	* 1.5850 *	* 1.3911 *	* 1.4701 *	* 1.3793 *	* 1.5090 *	* 1.5030 *	* 1.3872 *	* 2.4892 *
10	* 1.3023 *	* 1.3427 *	* 1.2998 *	* 1.3059 *	* 1.3025 *	* 1.2251 *	* 1.2741 *	* .6513 *
	* 1.5348 *	* 1.4704 *	* 1.5279 *	* 1.5090 *	* 1.5186 *	* 1.6008 *	* 1.5175 *	* 2.6571 *
11	* 1.2070 *	* 1.4151 *	* 1.3060 *	* 1.2909 *	* 1.1961 *	* 1.3082 *	* .8778 *	* .4484 *
	* 1.5961 *	* 1.3791 *	* 1.5088 *	* 1.5241 *	* 1.6343 *	* 1.4832 *	* 2.0788 *	* 4.0097 *
12	* 1.4312 *	* 1.2767 *	* 1.3030 *	* 1.1963 *	* 1.0721 *	* 1.2427 *	* .7195 *	
	* 1.3358 *	* 1.5083 *	* 1.5181 *	* 1.6340 *	* 1.7086 *	* 1.4935 *	* 2.4319 *	
13	* 1.2059 *	* 1.2705 *	* 1.2259 *	* 1.3085 *	* 1.2428 *	* 1.0982 *	* .5712 *	
	* 1.5775 *	* 1.5004 *	* 1.5997 *	* 1.4829 *	* 1.4934 *	* 1.6738 *	* 2.9893 *	
14	* 1.3633 *	* 1.3653 *	* 1.2748 *	* .8779 *	* .7194 *	* .5742 *		
	* 1.3816 *	* 1.3857 *	* 1.5166 *	* 2.0786 *	* 2.4326 *	* 2.9761 *		
15	* .6613 *	* .6867 *	* .6514 *	* .4485 *	* F-SUB-Q			
	* 2.6049 *	* 2.4879 *	* 2.6565 *	* 4.0084 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 3 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4242	* 1.3871	* 1.5206	* 1.3703	* 1.4095	* 1.3775	* 1.4568	* .7310 *
	* 1.3938	* 1.4362	* 1.3352	* 1.4455	* 1.3721	* 1.3993	* 1.3127	* 2.3897 *
9	* 1.3871	* 1.5192	* 1.5377	* 1.4577	* 1.4739	* 1.4853	* 1.4220	* .7653 *
	* 1.4362	* 1.3347	* 1.3045	* 1.3654	* 1.3188	* 1.3026	* 1.3482	* 2.2584 *
10	* 1.5206	* 1.5374	* 1.5565	* 1.4936	* 1.4041	* 1.4217	* 1.4220	* .7478 *
	* 1.3352	* 1.3048	* 1.2929	* 1.3404	* 1.4158	* 1.3975	* 1.3768	* 2.3472 *
11	* 1.3703	* 1.4577	* 1.4937	* 1.4199	* 1.3889	* 1.3081	* 1.0050	* .5157 *
	* 1.4455	* 1.3654	* 1.3402	* 1.4263	* 1.4212	* 1.5148	* 1.8404	* 3.5361 *
12	* 1.4095	* 1.4754	* 1.4046	* 1.3892	* 1.3421	* 1.3159	* .8039	* .8039 *
	* 1.3721	* 1.3174	* 1.4147	* 1.4211	* 1.4399	* 1.4638	* 2.2175	* 2.2175 *
13	* 1.3775	* 1.4880	* 1.4227	* 1.3085	* 1.3161	* 1.3360	* .6744	* .6744 *
	* 1.3993	* 1.3002	* 1.3964	* 1.5145	* 1.4636	* 1.4123	* 2.5832	* 2.5832 *
14	* 1.4568	* 1.4235	* 1.4229	* 1.0051	* .8038	* .6861	*	*
	* 1.3127	* 1.3467	* 1.3758	* 1.8403	* 2.2179	* 2.5409	*	*
15	* .7310	* .7659	* .7480	* .5158	* F-SUB-Q			
	* 2.3897	* 2.2571	* 2.3466	* 3.5350	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5347	* 1.4762	* 1.6378	* 1.4562	* 1.5098	* 1.4710	* 1.5829	* .7429 *
	* 1.3268	* 1.3953	* 1.2600	* 1.3794	* 1.2962	* 1.3268	* 1.2238	* 2.3834 *
9	* 1.4762	* 1.6451	* 1.6533	* 1.5789	* 1.5795	* 1.6057	* 1.5468	* .7780 *
	* 1.3953	* 1.2539	* 1.2304	* 1.2814	* 1.2470	* 1.2204	* 1.2569	* 2.2522 *
10	* 1.6378	* 1.6529	* 1.6842	* 1.6033	* 1.5145	* 1.5343	* 1.5566	* .7720 *
	* 1.2600	* 1.2306	* 1.2103	* 1.2670	* 1.3249	* 1.3113	* 1.2736	* 2.3043 *
11	* 1.4562	* 1.5789	* 1.6034	* 1.5384	* 1.4886	* 1.4145	* 1.0496	* .5322 *
	* 1.3794	* 1.2815	* 1.2669	* 1.3365	* 1.3409	* 1.4275	* 1.7904	* 3.4714 *
12	* 1.5098	* 1.5812	* 1.5158	* 1.4888	* 1.4602	* 1.4306	* .8237	* .8237 *
	* 1.2962	* 1.2456	* 1.3238	* 1.3407	* 1.3521	* 1.3754	* 2.2065	* 2.2065 *
13	* 1.4710	* 1.6088	* 1.5354	* 1.4150	* 1.4309	* 1.4934	* .7112	* .7112 *
	* 1.3268	* 1.2181	* 1.3102	* 1.4271	* 1.3752	* 1.2902	* 2.4994	* 2.4994 *
14	* 1.5829	* 1.5487	* 1.5577	* 1.0497	* .8237	* .7253	*	*
	* 1.2238	* 1.2555	* 1.2726	* 1.7902	* 2.2066	* 2.4528	*	*
15	* .7429	* .7786	* .7722	* .5323	* F-SUB-Q			
	* 2.3834	* 2.2508	* 2.3037	* 3.4701	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 4 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5765	* 1.4999	* 1.6720	* 1.4815	* 1.5573	* 1.5011	* 1.6363	* .7509 *
	* 1.3203	* 1.3993	* 1.2543	* 1.3769	* 1.2763	* 1.3202	* 1.2017	* 2.3960 *
9	* 1.4999	* 1.6927	* 1.6916	* 1.6261	* 1.6136	* 1.6439	* 1.6017	* .7894 *
	* 1.3993	* 1.2363	* 1.2201	* 1.2639	* 1.2392	* 1.2084	* 1.2329	* 2.2553 *
10	* 1.6720	* 1.6912	* 1.7239	* 1.6393	* 1.5611	* 1.5739	* 1.6149	* .7854 *
	* 1.2543	* 1.2204	* 1.1995	* 1.2574	* 1.3046	* 1.2966	* 1.2446	* 2.2996 *
11	* 1.4815	* 1.6261	* 1.6395	* 1.5843	* 1.5283	* 1.4610	* 1.0739	* .5365 *
	* 1.3769	* 1.2639	* 1.2573	* 1.3203	* 1.3317	* 1.4066	* 1.7804	* 3.4928 *
12	* 1.5573	* 1.6156	* 1.5625	* 1.5285	* 1.5000	* 1.4845	* .8396 *	
	* 1.2763	* 1.2377	* 1.3034	* 1.3316	* 1.3433	* 1.3531	* 2.2105 *	
13	* 1.5011	* 1.6472	* 1.5752	* 1.4616	* 1.4848	* 1.5662	* .7305 *	
	* 1.3202	* 1.2064	* 1.2954	* 1.4062	* 1.3528	* 1.2561	* 2.4876 *	
14	* 1.6363	* 1.6038	* 1.6161	* 1.0742	* .8397	* .7459 *		
	* 1.2017	* 1.2316	* 1.2436	* 1.7800	* 2.2103	* 2.4384 *		
15	* .7509	* .7899	* .7856	* .5367	* F-SUB-Q			
	* 2.3960	* 2.2540	* 2.2990	* 3.4911	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5878	* 1.5022	* 1.6803	* 1.4873	* 1.5752	* 1.5107	* 1.6582	* .7564 *
	* 1.3354	* 1.4179	* 1.2663	* 1.3951	* 1.2846	* 1.3358	* 1.2066	* 2.4225 *
9	* 1.5022	* 1.7071	* 1.7038	* 1.6422	* 1.6250	* 1.6572	* 1.6251	* .7965 *
	* 1.4179	* 1.2444	* 1.2307	* 1.2718	* 1.2519	* 1.2147	* 1.2368	* 2.2756 *
10	* 1.6803	* 1.7034	* 1.7363	* 1.6516	* 1.5784	* 1.5891	* 1.6404	* .7926 *
	* 1.2663	* 1.2310	* 1.2096	* 1.2679	* 1.3111	* 1.3037	* 1.2441	* 2.3171 *
11	* 1.4873	* 1.6422	* 1.6518	* 1.6004	* 1.5447	* 1.4804	* 1.0882	* .5376 *
	* 1.3951	* 1.2718	* 1.2678	* 1.3212	* 1.3425	* 1.4106	* 1.7802	* 3.5364 *
12	* 1.5752	* 1.6271	* 1.5799	* 1.5450	* 1.5163	* 1.5090	* .8520 *	
	* 1.2846	* 1.2503	* 1.3098	* 1.3423	* 1.3557	* 1.3594	* 2.2222 *	
13	* 1.5107	* 1.6607	* 1.5905	* 1.4811	* 1.5094	* 1.6026	* .7423 *	
	* 1.3358	* 1.2127	* 1.3024	* 1.4101	* 1.3590	* 1.2578	* 2.5098 *	
14	* 1.6582	* 1.6273	* 1.6417	* 1.0886	* .8522 *			
	* 1.2066	* 1.2354	* 1.2431	* 1.7795	* 2.2218	* 2.4596 *		
15	* .7564	* .7971	* .7930	* .5379	* F-SUB-Q			
	* 2.4225	* 2.2742	* 2.3162	* 3.5345	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 5 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6073	* 1.5109	* 1.6966	* 1.4994	* 1.5993	* 1.5258	* 1.6904	* .7551 *
	* 1.3341	* 1.4250	* 1.2668	* 1.4106	* 1.2922	* 1.3503	* 1.2083	* 2.4783 *
9	* 1.5109	* 1.7311	* 1.7239	* 1.6678	* 1.6444	* 1.6835	* 1.6570	* .7938 *
	* 1.4250	* 1.2415	* 1.2378	* 1.2747	* 1.2623	* 1.2195	* 1.2379	* 2.3317 *
10	* 1.6966	* 1.7234	* 1.7578	* 1.6719	* 1.6051	* 1.6120	* 1.6736	* .7911 *
	* 1.2668	* 1.2381	* 1.2154	* 1.2741	* 1.3119	* 1.3070	* 1.2405	* 2.3658 *
11	* 1.4994	* 1.6678	* 1.6721	* 1.6261	* 1.5678	* 1.5086	* 1.0916	* .5341 *
	* 1.4106	* 1.2747	* 1.2740	* 1.3140	* 1.3472	* 1.4014	* 1.7899	* 3.6088 *
12	* 1.5993	* 1.6466	* 1.6067	* 1.5680	* 1.5395	* 1.5399	* .8505 *	
	* 1.2922	* 1.2606	* 1.3106	* 1.3470	* 1.3605	* 1.3571	* 2.2696 *	
13	* 1.5258	* 1.6865	* 1.6134	* 1.5093	* 1.5404	* 1.6439	* .7453 *	
	* 1.3503	* 1.2173	* 1.3057	* 1.4007	* 1.3567	* 1.2499	* 2.5480 *	
14	* 1.6904	* 1.6594	* 1.6750	* 1.0921	* .8507	* .7614	*	
	* 1.2083	* 1.2361	* 1.2394	* 1.7891	* 2.2691	* 2.4964	*	
15	* .7551	* .7944	* .7915	* .5344	* F-SUB-Q			
	* 2.4783	* 2.3302	* 2.3648	* 3.6067	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6130	* 1.5111	* 1.7023	* 1.5030	* 1.6108	* 1.5325	* 1.7073	* .7553 *
	* 1.3531	* 1.4518	* 1.2867	* 1.4380	* 1.3145	* 1.3772	* 1.2252	* 2.5383 *
9	* 1.5111	* 1.7404	* 1.7330	* 1.6793	* 1.6533	* 1.6990	* 1.6742	* .7926 *
	* 1.4518	* 1.2546	* 1.2532	* 1.2908	* 1.2849	* 1.2367	* 1.2533	* 2.3915 *
10	* 1.7023	* 1.7325	* 1.7679	* 1.6816	* 1.6179	* 1.6241	* 1.6920	* .7905 *
	* 1.2867	* 1.2536	* 1.2289	* 1.2883	* 1.3260	* 1.3187	* 1.2507	* 2.4187 *
11	* 1.5030	* 1.6792	* 1.6817	* 1.6376	* 1.5799	* 1.5227	* 1.0946	* .5322 *
	* 1.4380	* 1.2908	* 1.2882	* 1.3294	* 1.3552	* 1.4109	* 1.8165	* 3.6695 *
12	* 1.6108	* 1.6557	* 1.6195	* 1.5802	* 1.5518	* 1.5564	* .8509 *	
	* 1.3145	* 1.2830	* 1.3247	* 1.3550	* 1.3708	* 1.3640	* 2.2977 *	
13	* 1.5325	* 1.7021	* 1.6256	* 1.5236	* 1.5569	* 1.6688	* .7480 *	
	* 1.3772	* 1.2344	* 1.3174	* 1.4102	* 1.3636	* 1.2559	* 2.5853 *	
14	* 1.7073	* 1.6767	* 1.6936	* 1.0952	* .8512	* .7640	*	
	* 1.2252	* 1.2514	* 1.2496	* 1.8155	* 2.2970	* 2.5334	*	
15	* .7553	* .7932	* .7909	* .5325	* F-SUB-Q			
	* 2.5383	* 2.3899	* 2.4175	* 3.6671	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 6 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6227	* 1.5140	* 1.7114	* 1.5091	* 1.6256	* 1.5418	* 1.7278	* .7532 *
	* 1.3867	* 1.4832	* 1.3044	* 1.4686	* 1.3394	* 1.4080	* 1.2446	* 2.6168 *
9	* 1.5140	* 1.7543	* 1.7454	* 1.6949	* 1.6651	* 1.7170	* 1.6946	* .7883 *
	* 1.4832	* 1.2702	* 1.2726	* 1.3081	* 1.3103	* 1.2571	* 1.2713	* 2.4712 *
10	* 1.7114	* 1.7448	* 1.7813	* 1.6941	* 1.6344	* 1.6387	* 1.7133	* .7877 *
	* 1.3044	* 1.2730	* 1.2467	* 1.3070	* 1.3417	* 1.3346	* 1.2633	* 2.4875 *
11	* 1.5091	* 1.6949	* 1.6943	* 1.6532	* 1.5942	* 1.5402	* 1.0952	* .5286 *
	* 1.4686	* 1.3081	* 1.3068	* 1.3416	* 1.3780	* 1.4304	* 1.8514	* 3.7642 *
12	* 1.6256	* 1.6675	* 1.6361	* 1.5945	* 1.5661	* 1.5754	* .8484	* .7532 *
	* 1.3394	* 1.3082	* 1.3403	* 1.3778	* 1.3957	* 1.3812	* 2.3605	* .7883 *
13	* 1.5418	* 1.7202	* 1.6403	* 1.5411	* 1.5760	* 1.6947	* .7481	* .7877 *
	* 1.4080	* 1.2547	* 1.3333	* 1.4297	* 1.3809	* 1.2667	* 2.6456	* 2.4875 *
14	* 1.7278	* 1.6972	* 1.7150	* 1.0958	* .8488	* .7642		
	* 1.2446	* 1.2694	* 1.2621	* 1.8502	* 2.3597	* 2.5921		
15	* .7532	* .7889	* .7882	* .5290	* F-SUB-Q			
	* 2.6168	* 2.4696	* 2.4863	* 3.7617	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5974	* 1.4955	* 1.6937	* 1.4938	* 1.6091	* 1.5291	* 1.7104	* .7563 *
	* 1.4469	* 1.5402	* 1.3547	* 1.5285	* 1.3979	* 1.4666	* 1.2981	* 2.6899 *
9	* 1.4955	* 1.7325	* 1.7300	* 1.6757	* 1.6506	* 1.7067	* 1.6799	* .7955 *
	* 1.5402	* 1.3224	* 1.3217	* 1.3618	* 1.3633	* 1.3048	* 1.3224	* 2.5268 *
10	* 1.6937	* 1.7294	* 1.7658	* 1.6801	* 1.6170	* 1.6270	* 1.6995	* .7940 *
	* 1.3547	* 1.3221	* 1.2941	* 1.3557	* 1.3943	* 1.3817	* 1.3086	* 2.5396 *
11	* 1.4938	* 1.6756	* 1.6803	* 1.6344	* 1.5828	* 1.5241	* 1.1020	* .5299 *
	* 1.5285	* 1.3618	* 1.3555	* 1.3928	* 1.4301	* 1.4782	* 1.8838	* 3.8514 *
12	* 1.6091	* 1.6530	* 1.6188	* 1.5831	* 1.5554	* 1.5619	* .8578	* .7563 *
	* 1.3979	* 1.3611	* 1.3928	* 1.4298	* 1.4530	* 1.4383	* 2.4032	* 2.6899 *
13	* 1.5291	* 1.7099	* 1.6287	* 1.5249	* 1.5625	* 1.6841	* .7542	* .7955 *
	* 1.4666	* 1.3024	* 1.3803	* 1.4773	* 1.4380	* 1.3170	* 2.7097	* 2.5268 *
14	* 1.7104	* 1.6825	* 1.7013	* 1.1027	* .8582	* .7709		
	* 1.2981	* 1.3204	* 1.3073	* 1.8825	* 2.4023	* 2.6531		
15	* .7563	* .7961	* .7945	* .5303	* F-SUB-Q			
	* 2.6899	* 2.5251	* 2.5382	* 3.8486	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 7 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6198	* 1.5062	* 1.7126	* 1.5074	* 1.6346	* 1.5455	* 1.7454	* .7502 *
	* 1.4745	* 1.5824	* 1.3871	* 1.5688	* 1.4275	* 1.5054	* 1.3190	* 2.8100 *
9	* 1.5062	* 1.7599	* 1.7524	* 1.7043	* 1.6720	* 1.7351	* 1.7133	* .7853 *
	* 1.5824	* 1.3471	* 1.3499	* 1.3844	* 1.3946	* 1.3304	* 1.3431	* 2.6512 *
10	* 1.7126	* 1.7518	* 1.7899	* 1.7021	* 1.6462	* 1.6511	* 1.7338	* .7847 *
	* 1.3871	* 1.3504	* 1.3209	* 1.3840	* 1.4147	* 1.4062	* 1.3249	* 2.6561 *
11	* 1.5074	* 1.7043	* 1.7023	* 1.6627	* 1.6059	* 1.5537	* 1.0963	* .5236 *
	* 1.5688	* 1.3844	* 1.3839	* 1.4150	* 1.4496	* 1.4945	* 1.9534	* 4.0166 *
12	* 1.6346	* 1.6749	* 1.6480	* 1.6062	* 1.5784	* 1.5920	* .8466 *	
	* 1.4275	* 1.3922	* 1.4131	* 1.4493	* 1.4713	* 1.4513	* 2.4994 *	
13	* 1.5455	* 1.7385	* 1.6529	* 1.5547	* 1.5926	* 1.7228	* .7490 *	
	* 1.5054	* 1.3277	* 1.4047	* 1.4937	* 1.4509	* 1.3276	* 2.8062 *	
14	* 1.7454	* 1.7161	* 1.7356	* 1.0971	* .8469	* .7649	*	
	* 1.3190	* 1.3410	* 1.3235	* 1.9521	* 2.4985	* 2.7503	*	
15	* .7502	* .7860	* .7852	* .5240	* F-SUB-Q			
	* 2.8100	* 2.6494	* 2.6545	* 4.0136	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6177	* 1.5013	* 1.7117	* 1.5055	* 1.6384	* 1.5464	* 1.7529	* .7488 *
	* 1.5223	* 1.6342	* 1.4343	* 1.6224	* 1.4831	* 1.5668	* 1.3668	* 2.9270 *
9	* 1.5013	* 1.7610	* 1.7546	* 1.7076	* 1.6744	* 1.7429	* 1.7213	* .7835 *
	* 1.6342	* 1.3920	* 1.3979	* 1.4346	* 1.4489	* 1.3781	* 1.3902	* 2.7618 *
10	* 1.7117	* 1.7539	* 1.7926	* 1.7046	* 1.6506	* 1.6559	* 1.7427	* .7829 *
	* 1.4343	* 1.3985	* 1.3700	* 1.4351	* 1.4643	* 1.4547	* 1.3677	* 2.7623 *
11	* 1.5055	* 1.7076	* 1.7048	* 1.6659	* 1.6103	* 1.5593	* 1.0963	* .5215 *
	* 1.6224	* 1.4346	* 1.4350	* 1.4655	* 1.4972	* 1.5442	* 2.0241	* 4.1705 *
12	* 1.6384	* 1.6773	* 1.6525	* 1.6106	* 1.5831	* 1.5989	* .8457 *	
	* 1.4831	* 1.4464	* 1.4627	* 1.4969	* 1.5186	* 1.4915	* 2.5871 *	
13	* 1.5464	* 1.7464	* 1.6577	* 1.5603	* 1.5995	* 1.7357	* .7491 *	
	* 1.5668	* 1.3753	* 1.4532	* 1.5433	* 1.4913	* 1.3614	* 2.8965 *	
14	* 1.7529	* 1.7241	* 1.7447	* 1.0971	* .8461	* .7648	*	
	* 1.3668	* 1.3880	* 1.3663	* 2.0226	* 2.5861	* 2.8395	*	
15	* .7488	* .7842	* .7835	* .5220	* F-SUB-Q			
	* 2.9270	* 2.7599	* 2.7605	* 4.1673	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 8 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5931	* 1.4827	* 1.6939	* 1.4900	* 1.6219	* 1.5333	* 1.7364	* .7494 *
	* 1.5047	* 1.6106	* 1.4112	* 1.5953	* 1.4597	* 1.5447	* 1.3629	* 2.8963 *
9	* 1.4827	* 1.7401	* 1.7392	* 1.6890	* 1.6600	* 1.7324	* 1.7073	* .7867 *
	* 1.6106	* 1.3718	* 1.3733	* 1.4124	* 1.4305	* 1.3710	* 1.3888	* 2.7261 *
10	* 1.6939	* 1.7385	* 1.7770	* 1.6903	* 1.6339	* 1.6441	* 1.7294	* .7861 *
	* 1.4112	* 1.3738	* 1.3460	* 1.4139	* 1.4559	* 1.4502	* 1.3756	* 2.7394 *
11	* 1.4900	* 1.6890	* 1.6905	* 1.6478	* 1.5988	* 1.5438	* 1.0998	* .5208 *
	* 1.5953	* 1.4125	* 1.4138	* 1.4502	* 1.5087	* 1.5509	* 2.0075	* 4.1827 *
12	* 1.6219	* 1.6629	* 1.6358	* 1.5992	* 1.5724	* 1.5858	* .8515 *	
	* 1.4597	* 1.4281	* 1.4542	* 1.5084	* 1.5411	* 1.5229	* 2.5915 *	
13	* 1.5333	* 1.7359	* 1.6460	* 1.5448	* 1.5864	* 1.7255	* .7527 *	
	* 1.5447	* 1.3684	* 1.4486	* 1.5499	* 1.5223	* 1.4074	* 2.9471 *	
14	* 1.7364	* 1.7101	* 1.7314	* 1.1007	* .8520	* .7691	*	
	* 1.3629	* 1.3865	* 1.3741	* 2.0058	* 2.5903	* 2.8871	*	
15	* .7494	* .7874	* .7867	* .5212	* F-SUB-Q			
	* 2.8963	* 2.7241	* 2.7374	* 4.1790	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6092	* 1.4881	* 1.7069	* 1.4985	* 1.6415	* 1.5444	* 1.7660	* .7416 *
	* 1.4537	* 1.5663	* 1.3670	* 1.5489	* 1.4087	* 1.4977	* 1.3087	* 2.8511 *
9	* 1.4881	* 1.7615	* 1.7558	* 1.7120	* 1.6761	* 1.7555	* 1.7356	* .7748 *
	* 1.5663	* 1.3230	* 1.3280	* 1.3605	* 1.3835	* 1.3210	* 1.3339	* 2.6963 *
10	* 1.7069	* 1.7550	* 1.7955	* 1.7068	* 1.6577	* 1.6631	* 1.7587	* .7751 *
	* 1.3670	* 1.3285	* 1.3004	* 1.3668	* 1.4009	* 1.3990	* 1.3199	* 2.7054 *
11	* 1.4985	* 1.7119	* 1.7069	* 1.6705	* 1.6170	* 1.5684	* 1.0913	* .5131 *
	* 1.5489	* 1.3605	* 1.3666	* 1.3961	* 1.4538	* 1.4884	* 1.9726	* 4.1263 *
12	* 1.6415	* 1.6792	* 1.6597	* 1.6173	* 1.5907	* 1.6109	* .8380 *	
	* 1.4087	* 1.3810	* 1.3992	* 1.4535	* 1.4843	* 1.4603	* 2.5628 *	
13	* 1.5444	* 1.7592	* 1.6650	* 1.5694	* 1.6115	* 1.7599	* .7460 *	
	* 1.4977	* 1.3184	* 1.3975	* 1.4874	* 1.4597	* 1.3443	* 2.8934 *	
14	* 1.7660	* 1.7386	* 1.7608	* 1.0923	* .8384	* .7613	*	
	* 1.3087	* 1.3317	* 1.3184	* 1.9708	* 2.5617	* 2.8379	*	
15	* .7416	* .7755	* .7758	* .5136	* F-SUB-Q			
	* 2.8511	* 2.6943	* 2.7033	* 4.1226	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 9 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6080	* 1.4830	* 1.7060	* 1.4962	* 1.6451	* 1.5445	* 1.7755	* .7376 *
	* 1.4073	* 1.5188	* 1.3228	* 1.4980	* 1.3571	* 1.4462	* 1.2570	* 2.7642 *
9	* 1.4830	* 1.7639	* 1.7579	* 1.7163	* 1.6784	* 1.7635	* 1.7453	* .7681 *
	* 1.5188	* 1.2771	* 1.2829	* 1.3117	* 1.3347	* 1.2713	* 1.2813	* 2.6229 *
10	* 1.7060	* 1.7571	* 1.7986	* 1.7091	* 1.6632	* 1.6679	* 1.7693	* .7697 *
	* 1.3228	* 1.2834	* 1.2559	* 1.3199	* 1.3483	* 1.3482	* 1.2673	* 2.6262 *
11	* 1.4962	* 1.7163	* 1.7093	* 1.6748	* 1.6219	* 1.5752	* 1.0873	* .5086 *
	* 1.4980	* 1.3117	* 1.3198	* 1.3455	* 1.4020	* 1.4312	* 1.9075	* 4.0103 *
12	* 1.6451	* 1.6817	* 1.6653	* 1.6223	* 1.5957	* 1.6206	* .8325 *	
	* 1.3571	* 1.3323	* 1.3467	* 1.4017	* 1.4326	* 1.4044	* 2.4828 *	
13	* 1.5445	* 1.7673	* 1.6699	* 1.5763	* 1.6208	* 1.7752	* .7432 *	
	* 1.4462	* 1.2687	* 1.3466	* 1.4302	* 1.4038	* 1.2887	* 2.7947 *	
14	* 1.7755	* 1.7484	* 1.7715	* 1.0883	* .8329	* .7583	*	
	* 1.2570	* 1.2792	* 1.2659	* 1.9057	* 2.4816	* 2.7418	*	
15	* .7376	* .7688	* .7704	* .5090	* F-SUB-Q			
	* 2.7642	* 2.6209	* 2.6241	* 4.0065	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5985	* 1.4733	* 1.6989	* 1.4889	* 1.6411	* 1.5392	* 1.7738	* .7348 *
	* 1.3692	* 1.4788	* 1.2848	* 1.4567	* 1.3162	* 1.4039	* 1.2170	* 2.6856 *
9	* 1.4733	* 1.7579	* 1.7532	* 1.7120	* 1.6739	* 1.7633	* 1.7448	* .7677 *
	* 1.4788	* 1.2399	* 1.2443	* 1.2723	* 1.2947	* 1.2296	* 1.2396	* 2.5400 *
10	* 1.6989	* 1.7524	* 1.7942	* 1.7048	* 1.6600	* 1.6656	* 1.7695	* .7683 *
	* 1.2848	* 1.2449	* 1.2179	* 1.2799	* 1.3068	* 1.3054	* 1.2249	* 2.5455 *
11	* 1.4889	* 1.7120	* 1.7049	* 1.6705	* 1.6196	* 1.5727	* 1.0862	* .5059 *
	* 1.4567	* 1.2723	* 1.2798	* 1.3048	* 1.3567	* 1.3855	* 1.8457	* 3.8991 *
12	* 1.6411	* 1.6772	* 1.6621	* 1.6200	* 1.5936	* 1.6215	* .8318 *	
	* 1.3162	* 1.2923	* 1.3051	* 1.3564	* 1.3857	* 1.3570	* 2.4001 *	
13	* 1.5392	* 1.7672	* 1.6676	* 1.5738	* 1.6217	* 1.7779	* .7426 *	
	* 1.4039	* 1.2271	* 1.3038	* 1.3845	* 1.3565	* 1.2405	* 2.6987 *	
14	* 1.7738	* 1.7479	* 1.7717	* 1.0872	* .8322	* .7575	*	
	* 1.2170	* 1.2375	* 1.2234	* 1.8439	* 2.3990	* 2.6481	*	
15	* .7348	* .7684	* .7690	* .5063	* F-SUB-Q			
	* 2.6856	* 2.5379	* 2.5433	* 3.8954	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 10 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5772	* 1.4572	* 1.6826	* 1.4749	* 1.6258	* 1.5267	* 1.7570	* .7361 *
	* 1.4532	* 1.5671	* 1.3597	* 1.5423	* 1.3932	* 1.4840	* 1.2879	* 2.8122 *
9	* 1.4572	* 1.7381	* 1.7387	* 1.6940	* 1.6599	* 1.7523	* 1.7302	* .7712 *
	* 1.5671	* 1.3149	* 1.3153	* 1.3482	* 1.3689	* 1.2968	* 1.3100	* 2.6522 *
10	* 1.6826	* 1.7379	* 1.7790	* 1.6908	* 1.6431	* 1.6532	* 1.7555	* .7718 *
	* 1.3597	* 1.3159	* 1.2875	* 1.3527	* 1.3839	* 1.3775	* 1.2931	* 2.6570 *
11	* 1.4749	* 1.6940	* 1.6909	* 1.6526	* 1.6072	* 1.5567	* 1.0893	* .5061 *
	* 1.5423	* 1.3482	* 1.3526	* 1.3826	* 1.4306	* 1.4657	* 1.9278	* 4.0849 *
12	* 1.6258	* 1.6632	* 1.6453	* 1.6075	* 1.5816	* 1.6086	* .8373 *	
	* 1.3932	* 1.3663	* 1.3821	* 1.4303	* 1.4600	* 1.4303	* 2.4950 *	
13	* 1.5267	* 1.7561	* 1.6553	* 1.5578	* 1.6088	* 1.7653	* .7453 *	
	* 1.4840	* 1.2941	* 1.3758	* 1.4647	* 1.4302	* 1.3038	* 2.8099 *	
14	* 1.7570	* 1.7333	* 1.7578	* 1.0904	* .8378	* .7609 *		
	* 1.2879	* 1.3078	* 1.2916	* 1.9259	* 2.4937	* 2.7550 *		
15	* .7361	* .7719	* .7725	* .5066	* F-SUB-Q			
	* 2.8122	* 2.6501	* 2.6548	* 4.0809	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5991	* 1.4668	* 1.7001	* 1.4863	* 1.6484	* 1.5401	* 1.7893	* .7275 *
	* 1.3894	* 1.5130	* 1.3081	* 1.4889	* 1.3372	* 1.4324	* 1.2314	* 2.7732 *
9	* 1.4668	* 1.7644	* 1.7594	* 1.7211	* 1.6784	* 1.7774	* 1.7607	* .7579 *
	* 1.5130	* 1.2595	* 1.2639	* 1.2905	* 1.3175	* 1.2445	* 1.2530	* 2.6304 *
10	* 1.7001	* 1.7585	* 1.8010	* 1.7101	* 1.6695	* 1.6739	* 1.7867	* .7600 *
	* 1.3081	* 1.2645	* 1.2367	* 1.3005	* 1.3252	* 1.3236	* 1.2361	* 2.6287 *
11	* 1.4863	* 1.7210	* 1.7103	* 1.6784	* 1.6261	* 1.5830	* 1.0793	* .4981 *
	* 1.4889	* 1.2905	* 1.3003	* 1.3236	* 1.3722	* 1.4006	* 1.8927	* 4.0420 *
12	* 1.6484	* 1.6818	* 1.6717	* 1.6265	* 1.5999	* 1.6363	* .8216 *	
	* 1.3372	* 1.3149	* 1.3235	* 1.3719	* 1.3980	* 1.3623	* 2.4712 *	
13	* 1.5401	* 1.7814	* 1.6760	* 1.5841	* 1.6365	* 1.7985	* .7361 *	
	* 1.4324	* 1.2418	* 1.3219	* 1.3996	* 1.3622	* 1.2400	* 2.7612 *	
14	* 1.7893	* 1.7639	* 1.7890	* 1.0804	* .8221	* .7507 *		
	* 1.2314	* 1.2508	* 1.2346	* 1.8907	* 2.4700	* 2.7102 *		
15	* .7275	* .7586	* .7607	* .4986	* F-SUB-Q			
	* 2.7732	* 2.6283	* 2.6265	* 4.0380	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 11 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5971	* 1.4646	* 1.7015	* 1.4849	* 1.6481	* 1.5400	* 1.7913	* .7241 *
	* 1.3380	* 1.4609	* 1.2605	* 1.4383	* 1.2906	* 1.3824	* 1.1866	* 2.6931 *
9	* 1.4646	* 1.7653	* 1.7620	* 1.7226	* 1.6793	* 1.7817	* 1.7633	* .7544 *
	* 1.4609	* 1.2146	* 1.2172	* 1.2441	* 1.2705	* 1.1973	* 1.2068	* 2.5541 *
10	* 1.7015	* 1.7611	* 1.8037	* 1.7120	* 1.6705	* 1.6762	* 1.7894	* .7566 *
	* 1.2605	* 1.2179	* 1.1911	* 1.2531	* 1.2779	* 1.2746	* 1.1898	* 2.5520 *
11	* 1.4849	* 1.7226	* 1.7122	* 1.6789	* 1.6263	* 1.5831	* 1.0760	* .4951 *
	* 1.4383	* 1.2441	* 1.2530	* 1.2764	* 1.3202	* 1.3497	* 1.8308	* 3.9345 *
12	* 1.6481	* 1.6828	* 1.6727	* 1.6267	* 1.5999	* 1.6353	* .8174 *	
	* 1.2906	* 1.2679	* 1.2762	* 1.3199	* 1.3427	* 1.3093	* 2.3947 *	
13	* 1.5400	* 1.7857	* 1.6783	* 1.5843	* 1.6355	* 1.7986	* .7320 *	
	* 1.3824	* 1.1947	* 1.2730	* 1.3487	* 1.3092	* 1.1905	* 2.6745 *	
14	* 1.7913	* 1.7665	* 1.7917	* 1.0771	* .8178	* .7464 *		
	* 1.1866	* 1.2046	* 1.1884	* 1.8289	* 2.3935	* 2.6254 *		
15	* .7241	* .7552	* .7573	* .4956	* F-SUB-Q			
	* 2.6931	* 2.5521	* 2.5498	* 3.9305	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5643	* 1.4476	* 1.6819	* 1.4671	* 1.6174	* 1.5227	* 1.7541	* .7258 *
	* 1.3232	* 1.4330	* 1.2362	* 1.4121	* 1.2756	* 1.3560	* 1.1749	* 2.6086 *
9	* 1.4476	* 1.7325	* 1.7409	* 1.6907	* 1.6577	* 1.7585	* 1.7288	* .7617 *
	* 1.4330	* 1.2003	* 1.1944	* 1.2293	* 1.2482	* 1.1757	* 1.1931	* 2.4561 *
10	* 1.6819	* 1.7400	* 1.7810	* 1.6916	* 1.6385	* 1.6549	* 1.7542	* .7621 *
	* 1.2362	* 1.1950	* 1.1693	* 1.2295	* 1.2634	* 1.2509	* 1.1759	* 2.4589 *
11	* 1.4671	* 1.6906	* 1.6917	* 1.6466	* 1.6029	* 1.5495	* 1.0784	* .4972 *
	* 1.4121	* 1.2293	* 1.2294	* 1.2620	* 1.2966	* 1.3360	* 1.7710	* 3.8036 *
12	* 1.6174	* 1.6611	* 1.6407	* 1.6033	* 1.5770	* 1.5963	* .8243 *	
	* 1.2756	* 1.2457	* 1.2618	* 1.2963	* 1.3178	* 1.2963	* 2.3009 *	
13	* 1.5227	* 1.7625	* 1.6571	* 1.5507	* 1.5965	* 1.7547	* .7321 *	
	* 1.3560	* 1.1732	* 1.2493	* 1.3350	* 1.2962	* 1.1787	* 2.5887 *	
14	* 1.7541	* 1.7320	* 1.7565	* 1.0795	* .8248	* .7473 *		
	* 1.1749	* 1.1910	* 1.1744	* 1.7692	* 2.2997	* 2.5385 *		
15	* .7258	* .7624	* .7628	* .4977	* F-SUB-Q			
	* 2.6086	* 2.4542	* 2.4569	* 3.7998	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 12 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5704	* 1.4541	* 1.6904	* 1.4725	* 1.6166	* 1.5274	* 1.7558	* .7168 *
	* 1.2845	* 1.3909	* 1.1988	* 1.3721	* 1.2456	* 1.3180	* 1.1442	* 2.5784 *
9	* 1.4541	* 1.7338	* 1.7478	* 1.6928	* 1.6641	* 1.7639	* 1.7279	* .7481 *
	* 1.3909	* 1.1695	* 1.1596	* 1.1970	* 1.2122	* 1.1421	* 1.1634	* 2.4410 *
10	* 1.6904	* 1.7469	* 1.7868	* 1.6993	* 1.6402	* 1.6613	* 1.7508	* .7463 *
	* 1.1988	* 1.1602	* 1.1360	* 1.1930	* 1.2305	* 1.2150	* 1.1479	* 2.4510 *
11	* 1.4725	* 1.6928	* 1.6994	* 1.6484	* 1.6066	* 1.5515	* 1.0612	* .4889 *
	* 1.3721	* 1.1971	* 1.1929	* 1.2290	* 1.2597	* 1.3001	* 1.7548	* 3.7769 *
12	* 1.6166	* 1.6675	* 1.6424	* 1.6070	* 1.5797	* 1.5898	* .8075	* .8075 *
	* 1.2456	* 1.2097	* 1.2289	* 1.2594	* 1.2808	* 1.2687	* 2.2897	* 2.2897 *
13	* 1.5274	* 1.7679	* 1.6634	* 1.5526	* 1.5905	* 1.7396	* .7142	* .7142 *
	* 1.3180	* 1.1396	* 1.2135	* 1.2992	* 1.2681	* 1.1561	* 2.5854	* 2.5854 *
14	* 1.7558	* 1.7311	* 1.7530	* 1.0623	* .8079	* .7281	*	*
	* 1.1442	* 1.1614	* 1.1465	* 1.7531	* 2.2887	* 2.5383	*	*
15	* .7168	* .7489	* .7470	* .4894	* F-SUB-Q			
	* 2.5784	* 2.4390	* 2.4489	* 3.7732	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5322	* 1.4170	* 1.6301	* 1.4338	* 1.5681	* 1.4798	* 1.6907	* .7131 *
	* 1.2478	* 1.3991	* 1.2182	* 1.3814	* 1.2189	* 1.3333	* 1.1643	* 2.5437 *
9	* 1.4170	* 1.6643	* 1.6885	* 1.6268	* 1.6099	* 1.6981	* 1.6616	* .7393 *
	* 1.3991	* 1.1942	* 1.1762	* 1.2206	* 1.2277	* 1.1622	* 1.1854	* 2.4244 *
10	* 1.6301	* 1.6877	* 1.7112	* 1.6466	* 1.5771	* 1.6035	* 1.6735	* .7292 *
	* 1.2182	* 1.1767	* 1.1622	* 1.2059	* 1.2545	* 1.2334	* 1.1765	* 2.4620 *
11	* 1.4338	* 1.6268	* 1.6468	* 1.5835	* 1.5500	* 1.5017	* 1.0344	* .4743 *
	* 1.3814	* 1.2207	* 1.2058	* 1.2539	* 1.2788	* 1.2807	* 1.7655	* 3.8247 *
12	* 1.5681	* 1.6129	* 1.5791	* 1.5504	* 1.5172	* 1.5354	* .7988	* .7988 *
	* 1.2189	* 1.2255	* 1.2530	* 1.2785	* 1.3060	* 1.2858	* 2.2698	* 2.2698 *
13	* 1.4798	* 1.7019	* 1.6055	* 1.5028	* 1.5361	* 1.6396	* .6866	* .6866 *
	* 1.3333	* 1.1597	* 1.2319	* 1.2799	* 1.2852	* 1.2006	* 2.6378	* 2.6378 *
14	* 1.6907	* 1.6646	* 1.6757	* 1.0354	* .7992	* .6993	*	*
	* 1.1643	* 1.1833	* 1.1750	* 1.7639	* 2.2687	* 2.5920	*	*
15	* .7131	* .7400	* .7298	* .4747	* F-SUB-Q			
	* 2.5437	* 2.4224	* 2.4600	* 3.8209	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 13 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5579	* 1.2584	* 1.3881	* 1.2635	* 1.5918	* 1.2830	* 1.5878	* .6506 *
	* 1.2478	* 1.5476	* 1.4089	* 1.5402	* 1.2189	* 1.5139	* 1.2197	* 2.7524 *
9	* 1.2584	* 1.5249	* 1.4629	* 1.5635	* 1.3677	* 1.4599	* 1.5977	* .6787 *
	* 1.5476	* 1.2802	* 1.3358	* 1.2467	* 1.4241	* 1.3304	* 1.2126	* 2.6061 *
10	* 1.3881	* 1.4622	* 1.4096	* 1.4301	* 1.4519	* 1.3720	* 1.4909	* .6486 *
	* 1.4089	* 1.3364	* 1.3892	* 1.3661	* 1.3407	* 1.4192	* 1.3003	* 2.7317 *
11	* 1.2635	* 1.5637	* 1.4303	* 1.4421	* 1.3252	* 1.5171	* .9231	* .4156 *
	* 1.5402	* 1.2466	* 1.3659	* 1.3521	* 1.4723	* 1.2807	* 1.9502	* 4.3126 *
12	* 1.5918	* 1.3689	* 1.4530	* 1.3258	* 1.2476	* 1.4970	* .7395	* .7395 *
	* 1.2189	* 1.4229	* 1.3397	* 1.4717	* 1.5637	* 1.2975	* 2.4182	* .7395 *
13	* 1.2830	* 1.4629	* 1.3737	* 1.5181	* 1.4977	* 1.3562	* .5892	* .5892 *
	* 1.5139	* 1.3276	* 1.4176	* 1.2799	* 1.2968	* 1.4303	* 3.0337	* .5892 *
14	* 1.5878	* 1.6001	* 1.4927	* .9240	* .7400	* .6001	* .6001	* .6001 *
	* 1.2197	* 1.2109	* 1.2988	* 1.9484	* 2.4169	* 2.9809	* 2.9809	* .6001 *
15	* .6506	* .6795	* .6492	* .4160	* F-SUB-Q	* F-SUB-Q	* F-SUB-Q	* F-SUB-Q
	* 2.7524	* 2.6036	* 2.7295	* 4.3085	* M-SUB-Q	* M-SUB-Q	* M-SUB-Q	* M-SUB-Q

AT 100% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6754	* .5772	* .5767	* .5787	* .6840	* .5713	* .6022	* .2956 *
	* 2.8536	* 3.3442	* 3.3539	* 3.3307	* 2.8122	* 3.3684	* 3.1868	* 6.0105 *
9	* .5772	* .6595	* .6054	* .6785	* .5764	* .5859	* .6035	* .3011 *
	* 3.3443	* 2.9289	* 3.1935	* 2.8427	* 3.3426	* 3.2820	* 3.1808	* 5.8310 *
10	* .5767	* .6052	* .5670	* .6012	* .6538	* .5678	* .5544	* .2816 *
	* 3.3539	* 3.1946	* 3.4130	* 3.2113	* 2.9490	* 3.3936	* 3.4656	* 6.2452 *
11	* .5787	* .6787	* .6015	* .6452	* .5514	* .6047	* .4086	* .1884 *
	* 3.3307	* 2.8420	* 3.2101	* 2.9929	* 3.5002	* 3.1838	* 4.3675	* 9.4496 *
12	* .6840	* .5768	* .6543	* .5516	* .5104	* .5678	* .3262	* .3262 *
	* 2.8122	* 3.3402	* 2.9472	* 3.4989	* 3.7809	* 3.3894	* 5.4398	* .3262 *
13	* .5713	* .5870	* .5684	* .6051	* .5681	* .4942	* .2512	* .2512 *
	* 3.3684	* 3.2758	* 3.3900	* 3.1816	* 3.3876	* 3.8919	* 7.0635	* .2512 *
14	* .6022	* .6044	* .5551	* .4090	* .3264	* .2552	* .2552	* .2552 *
	* 3.1868	* 3.1764	* 3.4615	* 4.3640	* 5.4359	* 6.9585	* 6.9585	* .2552 *
15	* .2956	* .3014	* .2819	* .1886	* F-SUB-Q	* F-SUB-Q	* F-SUB-Q	* F-SUB-Q
	* 6.0105	* 5.8260	* 6.2395	* 9.4401	* M-SUB-Q	* M-SUB-Q	* M-SUB-Q	* M-SUB-Q

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 14 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5093 *	* .5208 *	* .5231 *	* .5282 *	* .6025 *	* .5147 *	* .5133 *	* .2836 *
	* 3.1288 *	* 3.5737 *	* 3.7050 *	* 3.5492 *	* 3.0833 *	* 3.5835 *	* 3.5542 *	* 5.8689 *
9	* .5208 *	* .5957 *	* .5434 *	* .6052 *	* .5212 *	* .5067 *	* .5123 *	* .2839 *
	* 3.5737 *	* 3.2493 *	* 3.5375 *	* 3.1322 *	* 3.5903 *	* 3.6503 *	* 3.5811 *	* 5.8072 *
10	* .5231 *	* .5432 *	* .5131 *	* .5370 *	* .5842 *	* .4984 *	* .4750 *	* .2645 *
	* 3.7050 *	* 3.5379 *	* 3.7685 *	* 3.5652 *	* 3.2866 *	* 3.8336 *	* 3.9529 *	* 6.3315 *
11	* .5282 *	* .6053 *	* .5371 *	* .5752 *	* .4900 *	* .5159 *	* .3663 *	* .1944 *
	* 3.5492 *	* 3.1318 *	* 3.5646 *	* 3.3758 *	* 3.9346 *	* 3.6695 *	* 4.8621 *	* 8.9722 *
12	* .6025 *	* .5214 *	* .5844 *	* .4901 *	* .4199 *	* .4564 *	* .2969 *	
	* 3.0833 *	* 3.5889 *	* 3.2854 *	* 3.9339 *	* 4.1531 *	* 3.8706 *	* 5.7327 *	
13	* .5147 *	* .5076 *	* .4987 *	* .5160 *	* .4564 *	* .4003 *	* .2238 *	
	* 3.5835 *	* 3.6437 *	* 3.8310 *	* 3.6688 *	* 3.8706 *	* 4.3404 *	* 7.4189 *	
14	* .5133 *	* .5129 *	* .4753 *	* .3663 *	* .2969 *	* .2287 *		
	* 3.5542 *	* 3.5772 *	* 3.9502 *	* 4.8613 *	* 5.7346 *	* 7.2616 *		
15	* .2836 *	* .2841 *	* .2646 *	* .1944 *	F-SUB-Q			
	* 5.8689 *	* 5.8056 *	* 6.3296 *	* 8.9691 *	M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2332 *	* 1.0838 *	* 1.1696 *	* 1.0914 *	* 1.2888 *	* 1.0812 *	* 1.2373 *	* .6121 *
	* 1.4940 *	* 1.7635 *	* 1.7000 *	* 1.7541 *	* 1.4733 *	* 1.7446 *	* 1.5089 *	* 2.7837 *
9	* 1.0838 *	* 1.2782 *	* 1.2092 *	* 1.2831 *	* 1.1585 *	* 1.1502 *	* 1.2376 *	* .6311 *
	* 1.7635 *	* 1.5331 *	* 1.6266 *	* 1.5126 *	* 1.6503 *	* 1.6395 *	* 1.5154 *	* 2.6731 *
10	* 1.1696 *	* 1.2089 *	* 1.1709 *	* 1.1831 *	* 1.1979 *	* 1.1180 *	* 1.1621 *	* .5989 *
	* 1.7000 *	* 1.6269 *	* 1.6861 *	* 1.6579 *	* 1.6475 *	* 1.7419 *	* 1.6501 *	* 2.8597 *
11	* 1.0914 *	* 1.2832 *	* 1.1832 *	* 1.1878 *	* 1.0987 *	* 1.1966 *	* .8010 *	* .4173 *
	* 1.7541 *	* 1.5125 *	* 1.6578 *	* 1.6478 *	* 1.7699 *	* 1.6131 *	* 2.2564 *	* 4.2698 *
12	* 1.2888 *	* 1.1590 *	* 1.1983 *	* 1.0989 *	* .9882 *	* 1.1436 *	* .6663 *	
	* 1.4733 *	* 1.6496 *	* 1.6470 *	* 1.7696 *	* 1.8475 *	* 1.6174 *	* 2.6082 *	
13	* 1.0812 *	* 1.1523 *	* 1.1186 *	* 1.1969 *	* 1.1437 *	* 1.0177 *	* .5305 *	
	* 1.7446 *	* 1.6368 *	* 1.7407 *	* 1.6128 *	* 1.6173 *	* 1.8006 *	* 3.2031 *	
14	* 1.2373 *	* 1.2388 *	* 1.1627 *	* .8011 *	* .6662 *	* .5334 *		
	* 1.5089 *	* 1.5139 *	* 1.6492 *	* 2.2563 *	* 2.6090 *	* 3.1866 *		
15	* .6121 *	* .6315 *	* .5990 *	* .4174 *	F-SUB-Q			
	* 2.7837 *	* 2.6718 *	* 2.8592 *	* 4.2686 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 15 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3629	* 1.2848	* 1.3953	* 1.2702	* 1.3724	* 1.2858	* 1.3841	* .7043
	* 1.4427	* 1.5457	* 1.4511	* 1.5321	* 1.4010	* 1.4884	* 1.3701	* 2.4566
9	* 1.2848	* 1.4157	* 1.4206	* 1.3687	* 1.3789	* 1.3818	* 1.3571	* .7346
	* 1.5457	* 1.4097	* 1.4068	* 1.4312	* 1.4007	* 1.3904	* 1.4074	* 2.3302
10	* 1.3953	* 1.4203	* 1.4291	* 1.3923	* 1.3395	* 1.3326	* 1.3512	* .7121
	* 1.4511	* 1.4070	* 1.4020	* 1.4322	* 1.4792	* 1.4820	* 1.4386	* 2.4425
11	* 1.2702	* 1.3687	* 1.3924	* 1.3376	* 1.3153	* 1.2743	* .9502	* .4931
	* 1.5321	* 1.4309	* 1.4320	* 1.5079	* 1.5006	* 1.5418	* 1.9308	* 3.6683
12	* 1.3724	* 1.3802	* 1.3400	* 1.3155	* 1.2653	* 1.2723	* .7756	*
	* 1.4010	* 1.3993	* 1.4786	* 1.5005	* 1.5231	* 1.5099	* 2.2852	*
13	* 1.2858	* 1.3842	* 1.3335	* 1.2747	* 1.2724	* 1.2715	* .6434	*
	* 1.4884	* 1.3879	* 1.4809	* 1.5414	* 1.5097	* 1.4809	* 2.6974	*
14	* 1.3841	* 1.3587	* 1.3520	* .9502	* .7755	* .6544	*	*
	* 1.3701	* 1.4058	* 1.4377	* 1.9308	* 2.2856	* 2.6523	*	*
15	* .7043	* .7351	* .7123	* .4932	* F-SUB-Q			
	* 2.4566	* 2.3290	* 2.4419	* 3.6672	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5113	* 1.3918	* 1.5277	* 1.3758	* 1.5248	* 1.4071	* 1.5494	* .7416
	* 1.3368	* 1.4625	* 1.3489	* 1.4372	* 1.2784	* 1.3804	* 1.2419	* 2.3684
9	* 1.3918	* 1.5659	* 1.5547	* 1.5180	* 1.5139	* 1.5254	* 1.5208	* .7724
	* 1.4625	* 1.3099	* 1.3046	* 1.3168	* 1.2947	* 1.2729	* 1.2739	* 2.2501
10	* 1.5277	* 1.5544	* 1.5709	* 1.5219	* 1.4756	* 1.4693	* 1.5198	* .7566
	* 1.3489	* 1.3049	* 1.2940	* 1.3299	* 1.3589	* 1.3635	* 1.2967	* 2.3333
11	* 1.3758	* 1.5180	* 1.5221	* 1.4824	* 1.4408	* 1.4204	* 1.0200	* .5222
	* 1.4372	* 1.3165	* 1.3297	* 1.3835	* 1.3869	* 1.4091	* 1.8299	* 3.5137
12	* 1.5248	* 1.5155	* 1.4761	* 1.4411	* 1.4060	* 1.4272	* .8202	*
	* 1.2784	* 1.2933	* 1.3577	* 1.3867	* 1.4020	* 1.3762	* 2.2057	*
13	* 1.4071	* 1.5282	* 1.4704	* 1.4209	* 1.4275	* 1.4564	* .6947	*
	* 1.3804	* 1.2710	* 1.3625	* 1.4087	* 1.3760	* 1.3215	* 2.5519	*
14	* 1.5494	* 1.5226	* 1.5208	* 1.0201	* .8202	* .7085	*	*
	* 1.2419	* 1.2723	* 1.2958	* 1.8297	* 2.2058	* 2.5031	*	*
15	* .7416	* .7729	* .7567	* .5223	* F-SUB-Q			
	* 2.3684	* 2.2488	* 2.3328	* 3.5124	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 16 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5846	* 1.4383	* 1.5805	* 1.4253	* 1.6066	* 1.4633	* 1.6349	* .7673 *
	* 1.3045	* 1.4474	* 1.3274	* 1.4109	* 1.2345	* 1.3507	* 1.1969	* 2.3300 *
9	* 1.4383	* 1.6352	* 1.6141	* 1.5890	* 1.5759	* 1.5956	* 1.6075	* .8020 *
	* 1.4474	* 1.2828	* 1.2772	* 1.2777	* 1.2652	* 1.2354	* 1.2251	* 2.2059 *
10	* 1.5805	* 1.6137	* 1.6283	* 1.5810	* 1.5479	* 1.5336	* 1.6079	* .7864 *
	* 1.3274	* 1.2775	* 1.2679	* 1.3013	* 1.3154	* 1.3269	* 1.2449	* 2.2830 *
11	* 1.4253	* 1.5890	* 1.5812	* 1.5523	* 1.5034	* 1.5026	* 1.0653	* .5377 *
	* 1.4109	* 1.2774	* 1.3011	* 1.3461	* 1.3555	* 1.3596	* 1.7853	* 3.4667 *
12	* 1.6066	* 1.5777	* 1.5486	* 1.5038	* 1.4706	* 1.5128	* .8555 *	
	* 1.2345	* 1.2637	* 1.3142	* 1.3553	* 1.3701	* 1.3270	* 2.1623 *	
13	* 1.4633	* 1.5981	* 1.5348	* 1.5031	* 1.5131	* 1.5562	* .7274 *	
	* 1.3507	* 1.2334	* 1.3258	* 1.3591	* 1.3267	* 1.2646	* 2.4946 *	
14	* 1.6349	* 1.6095	* 1.6091	* 1.0655	* .8556	* .7428	*	
	* 1.1969	* 1.2236	* 1.2440	* 1.7849	* 2.1622	* 2.4440	*	
15	* .7673	* .8025	* .7866	* .5379	* F-SUB-Q			
	* 2.3300	* 2.2047	* 2.2824	* 3.4652	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6191	* 1.4600	* 1.6045	* 1.4523	* 1.6502	* 1.4939	* 1.6828	* .7866 *
	* 1.3033	* 1.4529	* 1.3298	* 1.4125	* 1.2262	* 1.3500	* 1.1861	* 2.3202 *
9	* 1.4600	* 1.6676	* 1.6442	* 1.6245	* 1.6088	* 1.6373	* 1.6566	* .8234 *
	* 1.4529	* 1.2770	* 1.2765	* 1.2721	* 1.2638	* 1.2272	* 1.2116	* 2.1925 *
10	* 1.6045	* 1.6438	* 1.6566	* 1.6124	* 1.5871	* 1.5699	* 1.6581	* .8069 *
	* 1.3298	* 1.2768	* 1.2674	* 1.2988	* 1.3057	* 1.3189	* 1.2284	* 2.2675 *
11	* 1.4523	* 1.6245	* 1.6125	* 1.5884	* 1.5400	* 1.5502	* 1.0965	* .5477 *
	* 1.4125	* 1.2717	* 1.2987	* 1.3330	* 1.3492	* 1.3417	* 1.7602	* 3.4602 *
12	* 1.6502	* 1.6108	* 1.5877	* 1.5404	* 1.5078	* 1.5630	* .8827 *	
	* 1.2262	* 1.2622	* 1.3045	* 1.3490	* 1.3653	* 1.3135	* 2.1413 *	
13	* 1.4939	* 1.6399	* 1.5712	* 1.5509	* 1.5634	* 1.6160	* .7509 *	
	* 1.3500	* 1.2252	* 1.3177	* 1.3412	* 1.3132	* 1.2497	* 2.4802 *	
14	* 1.6828	* 1.6587	* 1.6594	* 1.0969	* .8829	* .7666	*	
	* 1.1861	* 1.2100	* 1.2274	* 1.7596	* 2.1410	* 2.4303	*	
15	* .7866	* .8240	* .8072	* .5480	* F-SUB-Q			
	* 2.3202	* 2.1912	* 2.2668	* 3.4585	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 17 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6550	* 1.4795	* 1.6316	* 1.4796	* 1.6964	* 1.5243	* 1.7359	* .7960
	* 1.2961	* 1.4577	* 1.3238	* 1.4183	* 1.2212	* 1.3548	* 1.1769	* 2.3480
9	* 1.4795	* 1.7048	* 1.6769	* 1.6647	* 1.6442	* 1.6814	* 1.7094	* .8317
	* 1.4577	* 1.2666	* 1.2766	* 1.2678	* 1.2650	* 1.2223	* 1.2005	* 2.2222
10	* 1.6316	* 1.6764	* 1.6891	* 1.6464	* 1.6296	* 1.6087	* 1.7118	* .8154
	* 1.3238	* 1.2769	* 1.2666	* 1.2970	* 1.2958	* 1.3124	* 1.2134	* 2.2926
11	* 1.4796	* 1.6647	* 1.6466	* 1.6291	* 1.5797	* 1.6002	* 1.1132	* .5510
	* 1.4183	* 1.2674	* 1.2968	* 1.3172	* 1.3413	* 1.3205	* 1.7545	* 3.4988
12	* 1.6964	* 1.6463	* 1.6304	* 1.5800	* 1.5471	* 1.6152	* .8928	*
	* 1.2212	* 1.2633	* 1.2946	* 1.3411	* 1.3597	* 1.2987	* 2.1621	*
13	* 1.5243	* 1.6842	* 1.6100	* 1.6009	* 1.6156	* 1.6770	* .7629	*
	* 1.3548	* 1.2203	* 1.3113	* 1.3199	* 1.2984	* 1.2302	* 2.4958	*
14	* 1.7359	* 1.7117	* 1.7132	* 1.1137	* .8930	* .7790	*	*
	* 1.1769	* 1.1989	* 1.2124	* 1.7537	* 2.1617	* 2.4450	*	*
15	* .7960	* .8323	* .8158	* .5513	* F-SUB-Q			
	* 2.3480	* 2.2210	* 2.2917	* 3.4969	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6722	* 1.4879	* 1.6451	* 1.4950	* 1.7241	* 1.5429	* 1.7695	* .8045
	* 1.3087	* 1.4787	* 1.3418	* 1.4405	* 1.2345	* 1.3754	* 1.1863	* 2.3872
9	* 1.4879	* 1.7237	* 1.6952	* 1.6871	* 1.6656	* 1.7109	* 1.7432	* .8391
	* 1.4787	* 1.2758	* 1.2887	* 1.2821	* 1.2817	* 1.2326	* 1.2079	* 2.2627
10	* 1.6451	* 1.6947	* 1.7084	* 1.6664	* 1.6549	* 1.6333	* 1.7465	* .8228
	* 1.3418	* 1.2890	* 1.2776	* 1.3072	* 1.3035	* 1.3181	* 1.2160	* 2.3279
11	* 1.4950	* 1.6871	* 1.6666	* 1.6521	* 1.6048	* 1.6317	* 1.1269	* .5543
	* 1.4405	* 1.2817	* 1.3071	* 1.3255	* 1.3426	* 1.3194	* 1.7695	* 3.5342
12	* 1.7241	* 1.6678	* 1.6564	* 1.6051	* 1.5721	* 1.6487	* .9025	*
	* 1.2345	* 1.2799	* 1.3023	* 1.3423	* 1.3619	* 1.2955	* 2.1743	*
13	* 1.5429	* 1.7137	* 1.6347	* 1.6324	* 1.6492	* 1.7179	* .7729	*
	* 1.3754	* 1.2306	* 1.3169	* 1.3188	* 1.2951	* 1.2271	* 2.5133	*
14	* 1.7695	* 1.7457	* 1.7480	* 1.1275	* .9027	* .7891	*	*
	* 1.1863	* 1.2062	* 1.2150	* 1.7686	* 2.1738	* 2.4626	*	*
15	* .8045	* .8396	* .8232	* .5546	* F-SUB-Q			
	* 2.3872	* 2.2614	* 2.3269	* 3.5321	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 18 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6893	* 1.4954	* 1.6588	* 1.5092	* 1.7520	* 1.5604	* 1.8029	* .8086 *
	* 1.3409	* 1.5184	* 1.3583	* 1.4700	* 1.2532	* 1.4033	* 1.2011	* 2.4498 *
9	* 1.4954	* 1.7439	* 1.7133	* 1.7102	* 1.6862	* 1.7396	* 1.7766	* .8408 *
	* 1.5184	* 1.2889	* 1.3069	* 1.3016	* 1.3044	* 1.2493	* 1.2210	* 2.3284 *
10	* 1.6588	* 1.7128	* 1.7276	* 1.6858	* 1.6815	* 1.6571	* 1.7807	* .8260 *
	* 1.3583	* 1.3073	* 1.2947	* 1.3241	* 1.3153	* 1.3308	* 1.2239	* 2.3845 *
11	* 1.5092	* 1.7102	* 1.6860	* 1.6759	* 1.6288	* 1.6626	* 1.1355	* .5545 *
	* 1.4700	* 1.3012	* 1.3239	* 1.3343	* 1.3605	* 1.3319	* 1.7931	* 3.6116 *
12	* 1.7520	* 1.6885	* 1.6831	* 1.6291	* 1.5960	* 1.6811	* .9062 *	
	* 1.2532	* 1.3026	* 1.3141	* 1.3600	* 1.3832	* 1.3075	* 2.2259 *	
13	* 1.5604	* 1.7426	* 1.6586	* 1.6634	* 1.6817	* 1.7569	* .7785 *	
	* 1.4033	* 1.2471	* 1.3296	* 1.3312	* 1.3071	* 1.2335	* 2.5630 *	
14	* 1.8029	* 1.7791	* 1.7823	* 1.1362	* .9064	* .7950	*	
	* 1.2011	* 1.2192	* 1.2228	* 1.7921	* 2.2253	* 2.5107	*	
15	* .8086	* .8413	* .8264	* .5549	* F-SUB-Q			
	* 2.4498	* 2.3271	* 2.3834	* 3.6094	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6689	* 1.4849	* 1.6446	* 1.4999	* 1.7405	* 1.5552	* 1.7936	* .8166 *
	* 1.3998	* 1.5747	* 1.4101	* 1.5305	* 1.3071	* 1.4593	* 1.2511	* 2.5123 *
9	* 1.4849	* 1.7261	* 1.7023	* 1.6958	* 1.6785	* 1.7372	* 1.7701	* .8541 *
	* 1.5747	* 1.3411	* 1.3570	* 1.3576	* 1.3562	* 1.2949	* 1.2681	* 2.3729 *
10	* 1.6446	* 1.7018	* 1.7169	* 1.6767	* 1.6712	* 1.6524	* 1.7751	* .8377 *
	* 1.4101	* 1.3574	* 1.3434	* 1.3728	* 1.3643	* 1.3761	* 1.2659	* 2.4278 *
11	* 1.4999	* 1.6958	* 1.6769	* 1.6628	* 1.6243	* 1.6563	* 1.1488	* .5590 *
	* 1.5305	* 1.3572	* 1.3726	* 1.3837	* 1.4072	* 1.3718	* 1.8208	* 3.6864 *
12	* 1.7405	* 1.6808	* 1.6729	* 1.6246	* 1.5926	* 1.6765	* .9220 *	
	* 1.3071	* 1.3543	* 1.3629	* 1.4068	* 1.4351	* 1.3575	* 2.2556 *	
13	* 1.5552	* 1.7402	* 1.6539	* 1.6571	* 1.6771	* 1.7555	* .7894 *	
	* 1.4593	* 1.2926	* 1.3748	* 1.3711	* 1.3570	* 1.2795	* 2.6178 *	
14	* 1.7936	* 1.7726	* 1.7768	* 1.1495	* .9223	* .8066	*	
	* 1.2511	* 1.2663	* 1.2648	* 1.8197	* 2.2548	* 2.5628	*	
15	* .8166	* .8547	* .8382	* .5594	* F-SUB-Q			
	* 2.5123	* 2.3715	* 2.4266	* 3.6840	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 19 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6928	* 1.4900	* 1.6621	* 1.5160	* 1.7752	* 1.5737	* 1.8364	* .8136 *
	* 1.4279	* 1.6216	* 1.4465	* 1.5740	* 1.3337	* 1.5012	* 1.2715	* 2.6217 *
9	* 1.4900	* 1.7541	* 1.7246	* 1.7265	* 1.7027	* 1.7705	* 1.8115	* .8461 *
	* 1.6216	* 1.3681	* 1.3885	* 1.3841	* 1.3900	* 1.3210	* 1.2878	* 2.4894 *
10	* 1.6621	* 1.7240	* 1.7407	* 1.6998	* 1.7049	* 1.6800	* 1.8175	* .8306 *
	* 1.4465	* 1.3889	* 1.3735	* 1.4036	* 1.3855	* 1.4018	* 1.2814	* 2.5390 *
11	* 1.5160	* 1.7265	* 1.7001	* 1.6936	* 1.6518	* 1.6937	* 1.1470	* .5544 *
	* 1.5740	* 1.3841	* 1.4035	* 1.4072	* 1.4258	* 1.3863	* 1.8873	* 3.8406 *
12	* 1.7752	* 1.7052	* 1.7067	* 1.6521	* 1.6198	* 1.7156	* .9142 *	
	* 1.3337	* 1.3880	* 1.3841	* 1.4254	* 1.4543	* 1.3667	* 2.3432 *	
13	* 1.5737	* 1.7736	* 1.6816	* 1.6946	* 1.7162	* 1.8026	* .7868 *	
	* 1.5012	* 1.3187	* 1.4004	* 1.3856	* 1.3662	* 1.2871	* 2.7065 *	
14	* 1.8364	* 1.8142	* 1.8193	* 1.1478	* .9145	* .8032	*	
	* 1.2715	* 1.2860	* 1.2802	* 1.8861	* 2.3425	* 2.6518	*	
15	* .8136	* .8468	* .8312	* .5548	* F-SUB-Q			
	* 2.6217	* 2.4879	* 2.5377	* 3.8379	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6899	* 1.4834	* 1.6592	* 1.5154	* 1.7820	* 1.5761	* 1.8481	* .8143 *
	* 1.4660	* 1.6669	* 1.4856	* 1.6167	* 1.3748	* 1.5531	* 1.3189	* 2.7311 *
9	* 1.4834	* 1.7539	* 1.7253	* 1.7296	* 1.7062	* 1.7811	* 1.8237	* .8466 *
	* 1.6669	* 1.4039	* 1.4271	* 1.4222	* 1.4378	* 1.3701	* 1.3343	* 2.5935 *
10	* 1.6592	* 1.7247	* 1.7422	* 1.7019	* 1.7115	* 1.6865	* 1.8307	* .8308 *
	* 1.4856	* 1.4276	* 1.4149	* 1.4479	* 1.4362	* 1.4527	* 1.3241	* 2.6416 *
11	* 1.5154	* 1.7296	* 1.7021	* 1.6974	* 1.6585	* 1.7041	* 1.1497	* .5534 *
	* 1.6167	* 1.4217	* 1.4477	* 1.4530	* 1.4735	* 1.4321	* 1.9565	* 3.9902 *
12	* 1.7820	* 1.7087	* 1.7133	* 1.6588	* 1.6269	* 1.7277	* .9159 *	
	* 1.3748	* 1.4357	* 1.4348	* 1.4730	* 1.5032	* 1.4085	* 2.4257 *	
13	* 1.5761	* 1.7843	* 1.6882	* 1.7051	* 1.7283	* 1.8204	* .7889 *	
	* 1.5531	* 1.3677	* 1.4513	* 1.4314	* 1.4080	* 1.3211	* 2.7951 *	
14	* 1.8481	* 1.8265	* 1.8325	* 1.1505	* .9162	* .8052	*	
	* 1.3189	* 1.3323	* 1.3228	* 1.9552	* 2.4249	* 2.7394	*	
15	* .8143	* .8473	* .8314	* .5538	* F-SUB-Q			
	* 2.7311	* 2.5918	* 2.6400	* 3.9873	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 20 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6626	* 1.4666	* 1.6385	* 1.4993	* 1.7630	* 1.5635	* 1.8319	* .8162 *
	* 1.4548	* 1.6438	* 1.4659	* 1.5910	* 1.3529	* 1.5245	* 1.3009	* 2.6764 *
9	* 1.4666	* 1.7298	* 1.7072	* 1.7086	* 1.6910	* 1.7711	* 1.8100	* .8519 *
	* 1.6438	* 1.3872	* 1.4054	* 1.4022	* 1.4127	* 1.3500	* 1.3196	* 2.5328 *
10	* 1.6385	* 1.7065	* 1.7244	* 1.6854	* 1.6945	* 1.6745	* 1.8179	* .8357 *
	* 1.4659	* 1.4059	* 1.3933	* 1.4251	* 1.4137	* 1.4334	* 1.3185	* 2.5929 *
11	* 1.4993	* 1.7085	* 1.6856	* 1.6778	* 1.6476	* 1.6904	* 1.1547	* .5533 *
	* 1.5910	* 1.4017	* 1.4249	* 1.4332	* 1.4752	* 1.4303	* 1.9211	* 3.9665 *
12	* 1.7630	* 1.6936	* 1.6963	* 1.6482	* 1.6165	* 1.7158	* .9233 *	
	* 1.3529	* 1.4106	* 1.4122	* 1.4745	* 1.5108	* 1.4208	* 2.4068 *	
13	* 1.5635	* 1.7744	* 1.6762	* 1.6914	* 1.7165	* 1.8118	* .7939 *	
	* 1.5245	* 1.3476	* 1.4320	* 1.4295	* 1.4203	* 1.3529	* 2.8177 *	
14	* 1.8318	* 1.8128	* 1.8199	* 1.1556	* .9237	* .8108	*	
	* 1.3009	* 1.3176	* 1.3171	* 1.9196	* 2.4058	* 2.7600	*	
15	* .8162	* .8525	* .8364	* .5537	* F-SUB-Q			
	* 2.6764	* 2.5311	* 2.5912	* 3.9633	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6732	* 1.4603	* 1.6438	* 1.5041	* 1.7836	* 1.5702	* 1.8615	* .8079 *
	* 1.4113	* 1.6106	* 1.4271	* 1.5481	* 1.3064	* 1.4827	* 1.2507	* 2.6321 *
9	* 1.4603	* 1.7448	* 1.7170	* 1.7264	* 1.7027	* 1.7922	* 1.8388	* .8384 *
	* 1.6106	* 1.3429	* 1.3651	* 1.3545	* 1.3706	* 1.3037	* 1.2692	* 2.5048 *
10	* 1.6438	* 1.7163	* 1.7357	* 1.6962	* 1.7156	* 1.6900	* 1.8478	* .8235 *
	* 1.4271	* 1.3656	* 1.3522	* 1.3832	* 1.3638	* 1.3871	* 1.2668	* 2.5609 *
11	* 1.5041	* 1.7263	* 1.6964	* 1.6960	* 1.6650	* 1.7150	* 1.1452	* .5448 *
	* 1.5481	* 1.3540	* 1.3831	* 1.3847	* 1.4248	* 1.3751	* 1.8887	* 3.9117 *
12	* 1.7836	* 1.7054	* 1.7175	* 1.6656	* 1.6323	* 1.7425	* .9090 *	
	* 1.3064	* 1.3685	* 1.3623	* 1.4243	* 1.4589	* 1.3634	* 2.3807 *	
13	* 1.5702	* 1.7956	* 1.6918	* 1.7160	* 1.7432	* 1.8473	* .7863 *	
	* 1.4827	* 1.3014	* 1.3857	* 1.3742	* 1.3629	* 1.2932	* 2.7692 *	
14	* 1.8615	* 1.8417	* 1.8498	* 1.1462	* .9094	* .8023	*	
	* 1.2507	* 1.2673	* 1.2654	* 1.8871	* 2.3797	* 2.7150	*	
15	* .8079	* .8391	* .8241	* .5452	* F-SUB-Q			
	* 2.6321	* 2.5032	* 2.5591	* 3.9084	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 21 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6640	* 1.4470	* 1.6340	* 1.4965	* 1.7826	* 1.5645	* 1.8669	* .8023
	* 1.3676	* 1.5630	* 1.3804	* 1.4957	* 1.2567	* 1.4307	* 1.1992	* 2.5474
9	* 1.4470	* 1.7387	* 1.7106	* 1.7232	* 1.6986	* 1.7953	* 1.8447	* .8297
	* 1.5630	* 1.2958	* 1.3177	* 1.3044	* 1.3213	* 1.2526	* 1.2168	* 2.4327
10	* 1.6340	* 1.7099	* 1.7304	* 1.6909	* 1.7157	* 1.6891	* 1.8548	* .8161
	* 1.3804	* 1.3182	* 1.3049	* 1.3347	* 1.3113	* 1.3353	* 1.2140	* 2.4826
11	* 1.4965	* 1.7232	* 1.6911	* 1.6934	* 1.6660	* 1.7185	* 1.1386	* .5387
	* 1.4957	* 1.3040	* 1.3345	* 1.3334	* 1.3727	* 1.3207	* 1.8242	* 3.7993
12	* 1.7826	* 1.7014	* 1.7177	* 1.6667	* 1.6324	* 1.7480	* .9008	*
	* 1.2567	* 1.3192	* 1.3099	* 1.3721	* 1.4085	* 1.3103	* 2.3051	*
13	* 1.5645	* 1.7987	* 1.6909	* 1.7196	* 1.7488	* 1.8596	* .7817	*
	* 1.4307	* 1.2503	* 1.3339	* 1.3199	* 1.3098	* 1.2398	* 2.6722	*
14	* 1.8669	* 1.8477	* 1.8569	* 1.1396	* .9012	* .7975	*	*
	* 1.1992	* 1.2149	* 1.2128	* 1.8226	* 2.3041	* 2.6204	*	*
15	* .8023	* .8304	* .8168	* .5391	* F-SUB-Q			
	* 2.5474	* 2.4311	* 2.4809	* 3.7960	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6441	* 1.4278	* 1.6165	* 1.4810	* 1.7691	* 1.5513	* 1.8567	* .7961
	* 1.3331	* 1.5261	* 1.3449	* 1.4572	* 1.2206	* 1.3910	* 1.1622	* 2.4760
9	* 1.4278	* 1.7216	* 1.6953	* 1.7086	* 1.6849	* 1.7867	* 1.8359	* .8260
	* 1.5261	* 1.2616	* 1.2817	* 1.2690	* 1.2841	* 1.2129	* 1.1781	* 2.3566
10	* 1.6165	* 1.6945	* 1.7154	* 1.6765	* 1.7038	* 1.6783	* 1.8469	* .8113
	* 1.3449	* 1.2822	* 1.2688	* 1.2975	* 1.2728	* 1.2949	* 1.1742	* 2.4079
11	* 1.4810	* 1.7086	* 1.6767	* 1.6795	* 1.6560	* 1.7089	* 1.1327	* .5336
	* 1.4572	* 1.2685	* 1.2974	* 1.2959	* 1.3291	* 1.2784	* 1.7662	* 3.6968
12	* 1.7691	* 1.6877	* 1.7058	* 1.6567	* 1.6224	* 1.7398	* .8972	*
	* 1.2206	* 1.2820	* 1.2714	* 1.3285	* 1.3640	* 1.2664	* 2.2272	*
13	* 1.5513	* 1.7901	* 1.6801	* 1.7100	* 1.7405	* 1.8551	* .7779	*
	* 1.3909	* 1.2106	* 1.2936	* 1.2776	* 1.2659	* 1.1938	* 2.5816	*
14	* 1.8567	* 1.8389	* 1.8491	* 1.1337	* .8976	* .7935	*	*
	* 1.1622	* 1.1762	* 1.1730	* 1.7646	* 2.2262	* 2.5320	*	*
15	* .7961	* .8267	* .8120	* .5341	* F-SUB-Q			
	* 2.4760	* 2.3550	* 2.4060	* 3.6935	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 22 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6095	* 1.4059	* 1.5877	* 1.4563	* 1.7382	* 1.5287	* 1.8266	* .7923
	* 1.4192	* 1.6178	* 1.4296	* 1.5482	* 1.2972	* 1.4743	* 1.2335	* 2.5998
9	* 1.4059	* 1.6881	* 1.6675	* 1.6773	* 1.6586	* 1.7633	* 1.8080	* .8250
	* 1.6178	* 1.3438	* 1.3607	* 1.3508	* 1.3624	* 1.2829	* 1.2487	* 2.4657
10	* 1.5877	* 1.6667	* 1.6874	* 1.6496	* 1.6746	* 1.6540	* 1.8198	* .8099
	* 1.4296	* 1.3613	* 1.3471	* 1.3770	* 1.3522	* 1.3714	* 1.2434	* 2.5193
11	* 1.4563	* 1.6772	* 1.6498	* 1.6490	* 1.6324	* 1.6815	* 1.1285	* .5304
	* 1.5482	* 1.3503	* 1.3768	* 1.3782	* 1.4047	* 1.3542	* 1.8496	* 3.8844
12	* 1.7382	* 1.6614	* 1.6766	* 1.6331	* 1.5993	* 1.7133	* .8970	*
	* 1.2972	* 1.3601	* 1.3507	* 1.4041	* 1.4410	* 1.3388	* 2.3217	*
13	* 1.5287	* 1.7667	* 1.6558	* 1.6826	* 1.7141	* 1.8302	* .7760	*
	* 1.4743	* 1.2806	* 1.3699	* 1.3534	* 1.3382	* 1.2577	* 2.6941	*
14	* 1.8266	* 1.8110	* 1.8219	* 1.1295	* .8975	* .7921	*	*
	* 1.2335	* 1.2468	* 1.2420	* 1.8479	* 2.3206	* 2.6407	*	*
15	* .7923	* .8257	* .8106	* .5308	* F-SUB-Q			
	* 2.5998	* 2.4640	* 2.5175	* 3.8809	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6125	* 1.3923	* 1.5852	* 1.4513	* 1.7462	* 1.5237	* 1.8417	* .7759
	* 1.3613	* 1.5735	* 1.3838	* 1.5037	* 1.2496	* 1.4325	* 1.1844	* 2.5737
9	* 1.3923	* 1.6945	* 1.6678	* 1.6852	* 1.6583	* 1.7701	* 1.8219	* .8026
	* 1.5735	* 1.2941	* 1.3154	* 1.3014	* 1.3189	* 1.2370	* 1.1989	* 2.4572
10	* 1.5852	* 1.6669	* 1.6884	* 1.6496	* 1.6833	* 1.6564	* 1.8345	* .7896
	* 1.3838	* 1.3160	* 1.3014	* 1.3308	* 1.3008	* 1.3236	* 1.1920	* 2.5038
11	* 1.4513	* 1.6851	* 1.6498	* 1.6562	* 1.6350	* 1.6910	* 1.1075	* .5168
	* 1.5037	* 1.3008	* 1.3307	* 1.3255	* 1.3492	* 1.2974	* 1.8197	* 3.8630
12	* 1.7462	* 1.6612	* 1.6854	* 1.6356	* 1.6007	* 1.7240	* .8719	*
	* 1.2496	* 1.3167	* 1.2993	* 1.3486	* 1.3822	* 1.2784	* 2.3016	*
13	* 1.5237	* 1.7736	* 1.6583	* 1.6922	* 1.7247	* 1.8472	* .7591	*
	* 1.4325	* 1.2346	* 1.3222	* 1.2965	* 1.2779	* 1.1952	* 2.6488	*
14	* 1.8417	* 1.8250	* 1.8367	* 1.1085	* .8724	* .7741	*	*
	* 1.1844	* 1.1970	* 1.1906	* 1.8180	* 2.3006	* 2.5986	*	*
15	* .7759	* .8032	* .7903	* .5173	* F-SUB-Q			
	* 2.5737	* 2.4555	* 2.5018	* 3.8594	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 23 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5875	* 1.3700	* 1.5642	* 1.4289	* 1.7218	* 1.5020	* 1.8186	* .7619 *
	* 1.3249	* 1.5360	* 1.3492	* 1.4704	* 1.2196	* 1.3987	* 1.1541	* 2.5253 *
9	* 1.3700	* 1.6720	* 1.6468	* 1.6634	* 1.6358	* 1.7500	* 1.7998	* .7882 *
	* 1.5360	* 1.2623	* 1.2818	* 1.2691	* 1.2867	* 1.2036	* 1.1674	* 2.4106 *
10	* 1.5642	* 1.6460	* 1.6671	* 1.6282	* 1.6611	* 1.6357	* 1.8127	* .7755 *
	* 1.3492	* 1.2824	* 1.2683	* 1.2975	* 1.2686	* 1.2889	* 1.1598	* 2.4552 *
11	* 1.4289	* 1.6634	* 1.6285	* 1.6340	* 1.6127	* 1.6674	* 1.0894	* .5068 *
	* 1.4704	* 1.2691	* 1.2973	* 1.2929	* 1.3128	* 1.2640	* 1.7793	* 3.7951 *
12	* 1.7218	* 1.6387	* 1.6632	* 1.6133	* 1.5791	* 1.7003	* .8560 *	
	* 1.2196	* 1.2845	* 1.2671	* 1.3123	* 1.3424	* 1.2431	* 2.2532 *	
13	* 1.5020	* 1.7535	* 1.6376	* 1.6686	* 1.7011	* 1.8239	* .7452 *	
	* 1.3987	* 1.2013	* 1.2874	* 1.2632	* 1.2426	* 1.1595	* 2.5908 *	
14	* 1.8186	* 1.8029	* 1.8149	* 1.0904	* .8564	* .7598	*	
	* 1.1541	* 1.1655	* 1.1585	* 1.7776	* 2.2522	* 2.5419	*	
15	* .7619	* .7888	* .7762	* .5072	* F-SUB-Q			
	* 2.5253	* 2.4089	* 2.4533	* 3.7915	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5275	* 1.3352	* 1.5204	* 1.3853	* 1.6563	* 1.4594	* 1.7476	* .7490 *
	* 1.3301	* 1.5221	* 1.3428	* 1.4681	* 1.2266	* 1.3930	* 1.1618	* 2.4885 *
9	* 1.3352	* 1.6131	* 1.5990	* 1.6045	* 1.5862	* 1.6960	* 1.7320	* .7816 *
	* 1.5221	* 1.2663	* 1.2773	* 1.2732	* 1.2841	* 1.2010	* 1.1733	* 2.3548 *
10	* 1.5204	* 1.5983	* 1.6186	* 1.5808	* 1.6005	* 1.5866	* 1.7447	* .7673 *
	* 1.3428	* 1.2779	* 1.2640	* 1.2929	* 1.2740	* 1.2847	* 1.1649	* 2.4034 *
11	* 1.3853	* 1.6045	* 1.5810	* 1.5751	* 1.5601	* 1.6024	* 1.0720	* .4997 *
	* 1.4681	* 1.2732	* 1.2928	* 1.2978	* 1.3105	* 1.2708	* 1.7492	* 3.7291 *
12	* 1.6563	* 1.5890	* 1.6025	* 1.5607	* 1.5293	* 1.6338	* .8474 *	
	* 1.2266	* 1.2818	* 1.2725	* 1.3100	* 1.3382	* 1.2489	* 2.2008 *	
13	* 1.4594	* 1.6994	* 1.5885	* 1.6035	* 1.6345	* 1.7489	* .7326 *	
	* 1.3930	* 1.1987	* 1.2832	* 1.2700	* 1.2484	* 1.1657	* 2.5460 *	
14	* 1.7476	* 1.7350	* 1.7468	* 1.0730	* .8478	* .7478	*	
	* 1.1618	* 1.1713	* 1.1636	* 1.7476	* 2.1998	* 2.4954	*	
15	* .7490	* .7822	* .7680	* .5001	* F-SUB-Q			
	* 2.4885	* 2.3532	* 2.4016	* 3.7257	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 24 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4930	* 1.3049	* 1.4952	* 1.3553	* 1.6130	* 1.4256	* 1.7050	* .7198
	* 1.3236	* 1.5169	* 1.3287	* 1.4608	* 1.2257	* 1.3878	* 1.1586	* 2.5231
9	* 1.3049	* 1.5798	* 1.5696	* 1.5707	* 1.5533	* 1.6591	* 1.6881	* .7464
	* 1.5169	* 1.2586	* 1.2662	* 1.2658	* 1.2759	* 1.1940	* 1.1709	* 2.4028
10	* 1.4952	* 1.5688	* 1.5895	* 1.5519	* 1.5637	* 1.5550	* 1.6997	* .7322
	* 1.3287	* 1.2668	* 1.2524	* 1.2815	* 1.2689	* 1.2759	* 1.1629	* 2.4542
11	* 1.3553	* 1.5707	* 1.5521	* 1.5412	* 1.5247	* 1.5597	* 1.0290	* .4793
	* 1.4608	* 1.2659	* 1.2813	* 1.2908	* 1.3034	* 1.2694	* 1.7736	* 3.7893
12	* 1.6130	* 1.5561	* 1.5656	* 1.5253	* 1.4950	* 1.5887	* .8091	*
	* 1.2257	* 1.2737	* 1.2674	* 1.3028	* 1.3304	* 1.2480	* 2.2431	*
13	* 1.4256	* 1.6625	* 1.5567	* 1.5608	* 1.5894	* 1.6942	* .6981	*
	* 1.3878	* 1.1917	* 1.2745	* 1.2686	* 1.2475	* 1.1682	* 2.5992	*
14	* 1.7050	* 1.6910	* 1.7017	* 1.0299	* .8095	* .7117	*	*
	* 1.1586	* 1.1690	* 1.1615	* 1.7720	* 2.2421	* 2.5507	*	*
15	* .7198	* .7471	* .7328	* .4797	* F-SUB-Q			
	* 2.5231	* 2.4010	* 2.4522	* 3.7859	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4072	* 1.2443	* 1.4073	* 1.2869	* 1.5021	* 1.3397	* 1.5822	* .6869
	* 1.3742	* 1.5571	* 1.3817	* 1.5059	* 1.2877	* 1.4457	* 1.2217	* 2.5914
9	* 1.2443	* 1.4749	* 1.4783	* 1.4651	* 1.4578	* 1.5498	* 1.5655	* .7085
	* 1.5571	* 1.3196	* 1.3156	* 1.3281	* 1.3304	* 1.2504	* 1.2355	* 2.4809
10	* 1.4073	* 1.4776	* 1.4882	* 1.4647	* 1.4557	* 1.4586	* 1.5705	* .6904
	* 1.3817	* 1.3162	* 1.3089	* 1.3285	* 1.3340	* 1.3308	* 1.2313	* 2.5513
11	* 1.2869	* 1.4651	* 1.4649	* 1.4381	* 1.4295	* 1.4567	* .9690	* .4506
	* 1.5059	* 1.3281	* 1.3283	* 1.3537	* 1.3593	* 1.3294	* 1.8445	* 3.9547
12	* 1.5021	* 1.4603	* 1.4574	* 1.4301	* 1.3945	* 1.4778	* .7693	*
	* 1.2877	* 1.3282	* 1.3325	* 1.3587	* 1.3948	* 1.3121	* 2.3103	*
13	* 1.3397	* 1.5529	* 1.4602	* 1.4577	* 1.4784	* 1.5477	* .6508	*
	* 1.4457	* 1.2480	* 1.3294	* 1.3286	* 1.3115	* 1.2502	* 2.7310	*
14	* 1.5822	* 1.5681	* 1.5723	* .9698	* .7697	* .6630	*	*
	* 1.2217	* 1.2335	* 1.2299	* 1.8430	* 2.3093	* 2.6817	*	*
15	* .6869	* .7092	* .6909	* .4509	* F-SUB-Q			
	* 2.5914	* 2.4789	* 2.5494	* 3.9512	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 25 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 50 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3281	* 1.0670	* 1.1695	* 1.0987	* 1.3962	* 1.1170	* 1.4190	* .5971
	* 1.4331	* 1.7875	* 1.6363	* 1.7356	* 1.3629	* 1.7062	* 1.3402	* 2.9401
9	* 1.0670	* 1.3104	* 1.2425	* 1.3655	* 1.1961	* 1.2848	* 1.4272	* .6178
	* 1.7875	* 1.4582	* 1.5396	* 1.3981	* 1.5961	* 1.4832	* 1.3330	* 2.8055
10	* 1.1695	* 1.2420	* 1.1980	* 1.2410	* 1.3029	* 1.2103	* 1.3340	* .5887
	* 1.6363	* 1.5403	* 1.5996	* 1.5412	* 1.4653	* 1.5781	* 1.4270	* 2.9505
11	* 1.0987	* 1.3659	* 1.2414	* 1.2901	* 1.1795	* 1.3687	* .8284	* .3822
	* 1.7356	* 1.3977	* 1.5406	* 1.4818	* 1.6219	* 1.3932	* 2.1253	* 4.6029
12	* 1.3962	* 1.1971	* 1.3038	* 1.1800	* 1.1193	* 1.3630	* .6776	*
	* 1.3629	* 1.5949	* 1.4643	* 1.6212	* 1.7073	* 1.3990	* 2.5849	*
13	* 1.1170	* 1.2873	* 1.2116	* 1.3695	* 1.3636	* 1.2371	* .5404	*
	* 1.7062	* 1.4804	* 1.5765	* 1.3924	* 1.3984	* 1.5395	* 3.2434	*
14	* 1.4190	* 1.4291	* 1.3354	* .8290	* .6780	* .5505	*	*
	* 1.3402	* 1.3312	* 1.4255	* 2.1235	* 2.5836	* 3.1851	*	*
15	* .5971	* .6184	* .5892	* .3825	* F-SUB-Q			
	* 2.9401	* 2.8031	* 2.9484	* 4.5990	* M-SUB-Q			

AT 100% POWER, 50 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5639	* .4806	* .4794	* .4922	* .5865	* .4902	* .5287	* .2639
	* 3.3456	* 3.9307	* 3.9476	* 3.8364	* 3.2152	* 3.8487	* 3.5623	* 6.5991
9	* .4806	* .5529	* .5069	* .5795	* .4932	* .5075	* .5298	* .2672
	* 3.9307	* 3.4215	* 3.7327	* 3.2611	* 3.8313	* 3.7162	* 3.5558	* 6.4373
10	* .4794	* .5068	* .4768	* .5148	* .5688	* .4926	* .4889	* .2500
	* 3.9476	* 3.7338	* 3.9734	* 3.6742	* 3.3222	* 3.8349	* 3.8567	* 6.8948
11	* .4922	* .5797	* .5150	* .5599	* .4799	* .5349	* .3595	* .1696
	* 3.8364	* 3.2601	* 3.6729	* 3.3795	* 3.9408	* 3.5296	* 4.8541	* 10.2965
12	* .5865	* .4936	* .5692	* .4801	* .4488	* .5072	* .2916	*
	* 3.2152	* 3.8288	* 3.3202	* 3.9393	* 4.2158	* 3.7230	* 5.9584	*
13	* .4902	* .5084	* .4931	* .5353	* .5074	* .4442	* .2262	*
	* 3.8487	* 3.7098	* 3.8313	* 3.5275	* 3.7212	* 4.2495	* 7.6897	*
14	* .5287	* .5305	* .4894	* .3598	* .2918	* .2298	*	*
	* 3.5623	* 3.5512	* 3.8527	* 4.8508	* 5.9546	* 7.5720	*	*
15	* .2639	* .2674	* .2502	* .1698	* F-SUB-Q			
	* 6.5991	* 6.4325	* 6.8893	* 10.2873	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 26 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4660 *	* .4726 *	* .4764 *	* .4811 *	* .5480 *	* .4684 *	* .4744 *	* .2634 *
	* 3.3841 *	* 3.8812 *	* 4.0294 *	* 3.8534 *	* 3.3517 *	* 3.8877 *	* 3.7998 *	* 6.1960 *
9	* .4726 *	* .5415 *	* .4948 *	* .5516 *	* .4769 *	* .4664 *	* .4738 *	* .2636 *
	* 3.8812 *	* 3.5208 *	* 3.8461 *	* 3.3973 *	* 3.8822 *	* 3.9184 *	* 3.8266 *	* 6.1536 *
10	* .4764 *	* .4947 *	* .4685 *	* .4936 *	* .5406 *	* .4615 *	* .4442 *	* .2467 *
	* 4.0294 *	* 3.8468 *	* 4.0742 *	* 3.8423 *	* 3.5142 *	* 4.0939 *	* 4.1790 *	* 6.6854 *
11	* .4811 *	* .5517 *	* .4937 *	* .5336 *	* .4512 *	* .4828 *	* .3393 *	* .1846 *
	* 3.8534 *	* 3.3967 *	* 3.8415 *	* 3.5958 *	* 4.1761 *	* 3.8745 *	* 5.1514 *	* 9.3136 *
12	* .5480 *	* .4770 *	* .5408 *	* .4513 *	* .3918 *	* .4299 *	* .2796 *	
	* 3.3517 *	* 3.8807 *	* 3.5130 *	* 4.1755 *	* 4.3553 *	* 4.0595 *	* 5.9973 *	
13	* .4684 *	* .4672 *	* .4617 *	* .4828 *	* .4299 *	* .3812 *	* .2133 *	
	* 3.8877 *	* 3.9118 *	* 4.0915 *	* 3.8740 *	* 4.0596 *	* 4.5095 *	* 7.6702 *	
14	* .4744 *	* .4744 *	* .4445 *	* .3394 *	* .2795 *	* .2178 *		
	* 3.7998 *	* 3.8224 *	* 4.1766 *	* 5.1510 *	* 5.9995 *	* 7.5281 *		
15	* .2634 *	* .2637 *	* .2467 *	* .1846 *	F-SUB-Q			
	* 6.1960 *	* 6.1523 *	* 6.6841 *	* 9.3114 *	M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1186 *	* .9890 *	* 1.0654 *	* 1.0007 *	* 1.1703 *	* .9884 *	* 1.1341 *	* .5735 *
	* 1.6315 *	* 1.9115 *	* 1.8454 *	* 1.8952 *	* 1.6084 *	* 1.8858 *	* 1.6281 *	* 2.9164 *
9	* .9890 *	* 1.1689 *	* 1.1034 *	* 1.1762 *	* 1.0648 *	* 1.0580 *	* 1.1347 *	* .5902 *
	* 1.9115 *	* 1.6591 *	* 1.7673 *	* 1.6323 *	* 1.7770 *	* 1.7621 *	* 1.6349 *	* 2.8141 *
10	* 1.0654 *	* 1.1031 *	* 1.0685 *	* 1.0932 *	* 1.1195 *	* 1.0383 *	* 1.0754 *	* .5611 *
	* 1.8454 *	* 1.7677 *	* 1.8264 *	* 1.7774 *	* 1.7484 *	* 1.8575 *	* 1.7639 *	* 3.0091 *
11	* 1.0007 *	* 1.1763 *	* 1.0934 *	* 1.1124 *	* 1.0291 *	* 1.1115 *	* .7439 *	* .3978 *
	* 1.8952 *	* 1.6322 *	* 1.7771 *	* 1.7393 *	* 1.8691 *	* 1.7176 *	* 2.3873 *	* 4.4182 *
12	* 1.1703 *	* 1.0652 *	* 1.1198 *	* 1.0293 *	* .9292 *	* 1.0705 *	* .6312 *	
	* 1.6084 *	* 1.7763 *	* 1.7479 *	* 1.8689 *	* 1.9461 *	* 1.7115 *	* 2.7151 *	
13	* .9884 *	* 1.0598 *	* 1.0389 *	* 1.1117 *	* 1.0705 *	* .9624 *	* .5053 *	
	* 1.8858 *	* 1.7597 *	* 1.8564 *	* 1.7174 *	* 1.7115 *	* 1.8878 *	* 3.3167 *	
14	* 1.1341 *	* 1.1358 *	* 1.0759 *	* .7439 *	* .6310 *	* .5083 *		
	* 1.6281 *	* 1.6334 *	* 1.7631 *	* 2.3872 *	* 2.7160 *	* 3.3043 *		
15	* .5735 *	* .5905 *	* .5612 *	* .3979 *	F-SUB-Q			
	* 2.9164 *	* 2.8129 *	* 3.0088 *	* 4.4174 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 27 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3237	* 1.2009	* 1.2884	* 1.1987	* 1.3396	* 1.2028	* 1.3188	* .6819
	* 1.4695	* 1.6335	* 1.5530	* 1.6080	* 1.4247	* 1.5748	* 1.4230	* 2.4918
9	* 1.2009	* 1.3393	* 1.3233	* 1.3070	* 1.3036	* 1.2899	* 1.2976	* .7111
	* 1.6335	* 1.4681	* 1.4980	* 1.4757	* 1.4747	* 1.4664	* 1.4530	* 2.3719
10	* 1.2884	* 1.3230	* 1.3213	* 1.3090	* 1.2907	* 1.2599	* 1.2893	* .6858
	* 1.5530	* 1.4982	* 1.5003	* 1.5095	* 1.5207	* 1.5521	* 1.4925	* 2.5009
11	* 1.1987	* 1.3073	* 1.3091	* 1.2744	* 1.2632	* 1.2652	* .9076	* .4786
	* 1.6080	* 1.4754	* 1.5094	* 1.5648	* 1.5522	* 1.5367	* 1.9874	* 3.7295
12	* 1.3396	* 1.3041	* 1.2911	* 1.2634	* 1.2075	* 1.2415	* .7612	*
	* 1.4247	* 1.4741	* 1.5202	* 1.5520	* 1.5820	* 1.5326	* 2.2972	*
13	* 1.2028	* 1.2917	* 1.2607	* 1.2655	* 1.2416	* 1.2221	* .6244	*
	* 1.5748	* 1.4643	* 1.5511	* 1.5364	* 1.5324	* 1.5286	* 2.7426	*
14	* 1.3188	* 1.2990	* 1.2900	* .9076	* .7611	* .6349	*	*
	* 1.4230	* 1.4515	* 1.4916	* 1.9875	* 2.2977	* 2.7027	*	*
15	* .6819	* .7115	* .6859	* .4787	* F-SUB-Q			
	* 2.4918	* 2.3708	* 2.5006	* 3.7287	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5037	* 1.3244	* 1.4252	* 1.3237	* 1.5231	* 1.3357	* 1.5043	* .7353
	* 1.3271	* 1.5181	* 1.4308	* 1.4791	* 1.2685	* 1.4399	* 1.2657	* 2.3462
9	* 1.3244	* 1.5114	* 1.4665	* 1.4756	* 1.4495	* 1.4493	* 1.4853	* .7660
	* 1.5181	* 1.3318	* 1.3725	* 1.3274	* 1.3458	* 1.3243	* 1.2862	* 2.2360
10	* 1.4252	* 1.4663	* 1.4682	* 1.4526	* 1.4544	* 1.4076	* 1.4747	* .7426
	* 1.4308	* 1.3728	* 1.3708	* 1.3811	* 1.3707	* 1.4098	* 1.3231	* 2.3445
11	* 1.3237	* 1.4759	* 1.4527	* 1.4372	* 1.4101	* 1.4478	* .9928	* .5152
	* 1.4791	* 1.3271	* 1.3810	* 1.4120	* 1.4134	* 1.3690	* 1.8492	* 3.5147
12	* 1.5231	* 1.4502	* 1.4549	* 1.4104	* 1.3608	* 1.4257	* .8238	*
	* 1.2685	* 1.3444	* 1.3702	* 1.4132	* 1.4367	* 1.3571	* 2.1672	*
13	* 1.3357	* 1.4512	* 1.4085	* 1.4482	* 1.4259	* 1.4183	* .6837	*
	* 1.4399	* 1.3226	* 1.4089	* 1.3687	* 1.3569	* 1.3466	* 2.5595	*
14	* 1.5043	* 1.4869	* 1.4755	* .9928	* .8237	* .6975	*	*
	* 1.2657	* 1.2849	* 1.3224	* 1.8492	* 2.1675	* 2.5144	*	*
15	* .7353	* .7665	* .7427	* .5153	* F-SUB-Q			
	* 2.3462	* 2.2349	* 2.3443	* 3.5138	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 28 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5954	* 1.3827	* 1.4858	* 1.3883	* 1.6254	* 1.4011	* 1.6039	* .7721 *
	* 1.2787	* 1.4877	* 1.4000	* 1.4356	* 1.2096	* 1.3973	* 1.2074	* 2.2749 *
9	* 1.3827	* 1.5985	* 1.5355	* 1.5669	* 1.5241	* 1.5322	* 1.5915	* .8059 *
	* 1.4877	* 1.2883	* 1.3333	* 1.2722	* 1.3034	* 1.2738	* 1.2202	* 2.1638 *
10	* 1.4858	* 1.5352	* 1.5360	* 1.5244	* 1.5458	* 1.4829	* 1.5742	* .7808 *
	* 1.4000	* 1.3335	* 1.3324	* 1.3383	* 1.3118	* 1.3603	* 1.2592	* 2.2679 *
11	* 1.3883	* 1.5672	* 1.5245	* 1.5224	* 1.4895	* 1.5532	* 1.0492	* .5369 *
	* 1.4356	* 1.2719	* 1.3382	* 1.3583	* 1.3642	* 1.3031	* 1.7842	* 3.4271 *
12	* 1.6254	* 1.5248	* 1.5464	* 1.4898	* 1.4378	* 1.5366	* .8719 *	
	* 1.2096	* 1.3022	* 1.3113	* 1.3640	* 1.3906	* 1.2875	* 2.0944 *	
13	* 1.4011	* 1.5342	* 1.4839	* 1.5536	* 1.5369	* 1.5279	* .7234 *	
	* 1.3973	* 1.2722	* 1.3593	* 1.3027	* 1.2872	* 1.2786	* 2.4770 *	
14	* 1.6039	* 1.5932	* 1.5751	* 1.0494	* .8719	* .7384	*	
	* 1.2074	* 1.2189	* 1.2584	* 1.7840	* 2.0944	* 2.4319	*	
15	* .7721	* .8063	* .7810	* .5371	* F-SUB-Q			
	* 2.2749	* 2.1629	* 2.2676	* 3.4260	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6440	* 1.4130	* 1.5170	* 1.4251	* 1.6837	* 1.4384	* 1.6619	* .7978 *
	* 1.2680	* 1.4872	* 1.3958	* 1.4261	* 1.1919	* 1.3895	* 1.1889	* 2.2480 *
9	* 1.4130	* 1.6427	* 1.5734	* 1.6192	* 1.5669	* 1.5815	* 1.6547	* .8344 *
	* 1.4872	* 1.2805	* 1.3254	* 1.2566	* 1.2936	* 1.2585	* 1.1966	* 2.1333 *
10	* 1.5170	* 1.5730	* 1.5731	* 1.5662	* 1.5985	* 1.5276	* 1.6327	* .8078 *
	* 1.3958	* 1.3257	* 1.3247	* 1.3262	* 1.2923	* 1.3443	* 1.2358	* 2.2351 *
11	* 1.4251	* 1.6195	* 1.5665	* 1.5703	* 1.5378	* 1.6168	* 1.0886	* .5514 *
	* 1.4261	* 1.2563	* 1.3258	* 1.3354	* 1.3481	* 1.2760	* 1.7470	* 3.3950 *
12	* 1.6837	* 1.5676	* 1.5991	* 1.5381	* 1.4840	* 1.6045	* .9069 *	
	* 1.1919	* 1.2929	* 1.2918	* 1.3479	* 1.3764	* 1.2628	* 2.0594 *	
13	* 1.4384	* 1.5836	* 1.5286	* 1.6173	* 1.6049	* 1.5948	* .7516 *	
	* 1.3895	* 1.2568	* 1.3433	* 1.2756	* 1.2625	* 1.2576	* 2.4482 *	
14	* 1.6619	* 1.6565	* 1.6337	* 1.0888	* .9070	* .7671	*	
	* 1.1889	* 1.1953	* 1.2350	* 1.7466	* 2.0592	* 2.4038	*	
15	* .7978	* .8348	* .8080	* .5515	* F-SUB-Q			
	* 2.2480	* 2.1324	* 2.2347	* 3.3938	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 29 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6914	* 1.4389	* 1.5478	* 1.4584	* 1.7412	* 1.4720	* 1.7210	* .8121 *
	* 1.2567	* 1.4868	* 1.3860	* 1.4270	* 1.1810	* 1.3913	* 1.1759	* 2.2634 *
9	* 1.4389	* 1.6862	* 1.6103	* 1.6727	* 1.6074	* 1.6294	* 1.7185	* .8476 *
	* 1.4868	* 1.2699	* 1.3216	* 1.2474	* 1.2906	* 1.2501	* 1.1790	* 2.1516 *
10	* 1.5478	* 1.6099	* 1.6103	* 1.6085	* 1.6502	* 1.5709	* 1.6919	* .8202 *
	* 1.3860	* 1.3219	* 1.3203	* 1.3172	* 1.2778	* 1.3333	* 1.2170	* 2.2509 *
11	* 1.4584	* 1.6730	* 1.6089	* 1.6191	* 1.5837	* 1.6806	* 1.1108	* .5575 *
	* 1.4270	* 1.2471	* 1.3169	* 1.3104	* 1.3339	* 1.2483	* 1.7348	* 3.4197 *
12	* 1.7412	* 1.6082	* 1.6508	* 1.5841	* 1.5282	* 1.6720	* .9234 *	
	* 1.1810	* 1.2899	* 1.2773	* 1.3336	* 1.3650	* 1.2397	* 2.0670 *	
13	* 1.4720	* 1.6316	* 1.5719	* 1.6811	* 1.6724	* 1.6605	* .7668 *	
	* 1.3913	* 1.2484	* 1.3323	* 1.2479	* 1.2394	* 1.2355	* 2.4569 *	
14	* 1.7210	* 1.7204	* 1.6930	* 1.1111	* .9235	* .7830	*	
	* 1.1759	* 1.1777	* 1.2162	* 1.7343	* 2.0668	* 2.4112	*	
15	* .8121	* .8480	* .8204	* .5577	* F-SUB-Q			
	* 2.2634	* 2.1507	* 2.2504	* 3.4184	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7168	* 1.4522	* 1.5640	* 1.4785	* 1.7761	* 1.4929	* 1.7589	* .8240 *
	* 1.2644	* 1.5046	* 1.4032	* 1.4461	* 1.1910	* 1.4112	* 1.1818	* 2.2946 *
9	* 1.4522	* 1.7091	* 1.6320	* 1.7053	* 1.6323	* 1.6610	* 1.7598	* .8587 *
	* 1.5046	* 1.2793	* 1.3313	* 1.2580	* 1.3054	* 1.2599	* 1.1828	* 2.1840 *
10	* 1.5640	* 1.6315	* 1.6323	* 1.6351	* 1.6822	* 1.5984	* 1.7306	* .8308 *
	* 1.4032	* 1.3317	* 1.3297	* 1.3222	* 1.2822	* 1.3382	* 1.2179	* 2.2796 *
11	* 1.4785	* 1.7055	* 1.6355	* 1.6522	* 1.6134	* 1.7224	* 1.1285	* .5630 *
	* 1.4461	* 1.2577	* 1.3219	* 1.3125	* 1.3336	* 1.2431	* 1.7461	* 3.4468 *
12	* 1.7761	* 1.6332	* 1.6828	* 1.6139	* 1.5570	* 1.7172	* .9378 *	
	* 1.1910	* 1.3047	* 1.2817	* 1.3333	* 1.3643	* 1.2316	* 2.0733 *	
13	* 1.4930	* 1.6633	* 1.5996	* 1.7231	* 1.7177	* 1.7049	* .7793 *	
	* 1.4112	* 1.2582	* 1.3373	* 1.2427	* 1.2313	* 1.2305	* 2.4684 *	
14	* 1.7589	* 1.7618	* 1.7317	* 1.1289	* .9379	* .7957	*	
	* 1.1818	* 1.1815	* 1.2170	* 1.7456	* 2.0730	* 2.4226	*	
15	* .8240	* .8591	* .8311	* .5632	* F-SUB-Q			
	* 2.2946	* 2.1830	* 2.2790	* 3.4454	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 30 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7409	* 1.4631	* 1.5792	* 1.4957	* 1.8094	* 1.5114	* 1.7962	* .8309 *
	* 1.2930	* 1.5438	* 1.4216	* 1.4752	* 1.2080	* 1.4406	* 1.1944	* 2.3511 *
9	* 1.4631	* 1.7307	* 1.6521	* 1.7364	* 1.6547	* 1.6902	* 1.7990	* .8631 *
	* 1.5438	* 1.3052	* 1.3496	* 1.2757	* 1.3283	* 1.2778	* 1.1942	* 2.2439 *
10	* 1.5792	* 1.6516	* 1.6529	* 1.6590	* 1.7121	* 1.6238	* 1.7677	* .8364 *
	* 1.4216	* 1.3501	* 1.3474	* 1.3370	* 1.2935	* 1.3517	* 1.2255	* 2.3321 *
11	* 1.4957	* 1.7367	* 1.6594	* 1.6831	* 1.6402	* 1.7623	* 1.1401	* .5646 *
	* 1.4752	* 1.2754	* 1.3367	* 1.3220	* 1.3510	* 1.2522	* 1.7661	* 3.5203 *
12	* 1.8094	* 1.6556	* 1.7127	* 1.6407	* 1.5833	* 1.7599	* .9448 *	
	* 1.2080	* 1.3276	* 1.2930	* 1.3507	* 1.3840	* 1.2393	* 2.1197 *	
13	* 1.5114	* 1.6925	* 1.6250	* 1.7629	* 1.7604	* 1.7463	* .7869 *	
	* 1.4406	* 1.2760	* 1.3507	* 1.2517	* 1.2389	* 1.2376	* 2.5165 *	
14	* 1.7962	* 1.8010	* 1.7689	* 1.1405	* .9449	* .8037	*	
	* 1.1944	* 1.1928	* 1.2246	* 1.7654	* 2.1194	* 2.4691	*	
15	* .8309	* .8637	* .8367	* .5648	* F-SUB-Q			
	* 2.3511	* 2.2426	* 2.3315	* 3.5188	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7251	* 1.4535	* 1.5684	* 1.4921	* 1.8019	* 1.5088	* 1.7930	* .8407 *
	* 1.3499	* 1.6019	* 1.4749	* 1.5332	* 1.2594	* 1.4985	* 1.2421	* 2.4116 *
9	* 1.4535	* 1.7133	* 1.6445	* 1.7278	* 1.6496	* 1.6901	* 1.7965	* .8803 *
	* 1.6019	* 1.3584	* 1.4010	* 1.3264	* 1.3812	* 1.3253	* 1.2402	* 2.2826 *
10	* 1.5684	* 1.6439	* 1.6460	* 1.6552	* 1.7056	* 1.6221	* 1.7651	* .8513 *
	* 1.4749	* 1.4014	* 1.3977	* 1.3844	* 1.3415	* 1.3975	* 1.2680	* 2.3711 *
11	* 1.4921	* 1.7281	* 1.6557	* 1.6782	* 1.6392	* 1.7601	* 1.1569	* .5709 *
	* 1.5332	* 1.3262	* 1.3841	* 1.3639	* 1.3910	* 1.2879	* 1.7922	* 3.5900 *
12	* 1.8019	* 1.6505	* 1.7063	* 1.6396	* 1.5839	* 1.7606	* .9635 *	
	* 1.2594	* 1.3804	* 1.3410	* 1.3905	* 1.4348	* 1.2856	* 2.1445 *	
13	* 1.5088	* 1.6924	* 1.6233	* 1.7608	* 1.7611	* 1.7480	* .8003 *	
	* 1.4985	* 1.3234	* 1.3965	* 1.2874	* 1.2852	* 1.2844	* 2.5683 *	
14	* 1.7930	* 1.7986	* 1.7663	* 1.1573	* .9637	* .8179	*	
	* 1.2421	* 1.2388	* 1.2672	* 1.7915	* 2.1441	* 2.5181	*	
15	* .8407	* .8808	* .8516	* .5711	* F-SUB-Q			
	* 2.4116	* 2.2814	* 2.3704	* 3.5884	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 31 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7549	* 1.4640	* 1.5858	* 1.5085	* 1.8415	* 1.5269	* 1.8394	* .8401 *
	* 1.3752	* 1.6486	* 1.5148	* 1.5804	* 1.2860	* 1.5450	* 1.2628	* 2.5155 *
9	* 1.4640	* 1.7409	* 1.6667	* 1.7647	* 1.6738	* 1.7225	* 1.8433	* .8731 *
	* 1.6486	* 1.3854	* 1.4354	* 1.3491	* 1.4180	* 1.3552	* 1.2597	* 2.3978 *
10	* 1.5858	* 1.6661	* 1.6686	* 1.6807	* 1.7404	* 1.6494	* 1.8094	* .8450 *
	* 1.5148	* 1.4359	* 1.4318	* 1.4161	* 1.3652	* 1.4267	* 1.2852	* 2.4836 *
11	* 1.5085	* 1.7650	* 1.6811	* 1.7137	* 1.6675	* 1.8064	* 1.1568	* .5672 *
	* 1.5804	* 1.3489	* 1.4157	* 1.3857	* 1.4157	* 1.3006	* 1.8598	* 3.7406 *
12	* 1.8415	* 1.6747	* 1.7411	* 1.6679	* 1.6139	* 1.8098	* .9590 *	
	* 1.2860	* 1.4172	* 1.3647	* 1.4153	* 1.4549	* 1.2913	* 2.2266 *	
13	* 1.5269	* 1.7249	* 1.6506	* 1.8071	* 1.8103	* 1.7963	* .7987 *	
	* 1.5450	* 1.3534	* 1.4257	* 1.3001	* 1.2908	* 1.2924	* 2.6547 *	
14	* 1.8394	* 1.8455	* 1.8107	* 1.1573	* .9592	* .8155	*	
	* 1.2628	* 1.2583	* 1.2843	* 1.8590	* 2.2262	* 2.6052	*	
15	* .8401	* .8736	* .8453	* .5674	* F-SUB-Q			
	* 2.5155	* 2.3968	* 2.4828	* 3.7388	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7564	* 1.4602	* 1.5843	* 1.5107	* 1.8517	* 1.5304	* 1.8555	* .8429 *
	* 1.4121	* 1.6968	* 1.5565	* 1.6243	* 1.3259	* 1.6012	* 1.3102	* 2.6215 *
9	* 1.4602	* 1.7406	* 1.6690	* 1.7728	* 1.6784	* 1.7337	* 1.8600	* .8758 *
	* 1.6968	* 1.4227	* 1.4761	* 1.3901	* 1.4641	* 1.4085	* 1.3060	* 2.4988 *
10	* 1.5843	* 1.6684	* 1.6713	* 1.6861	* 1.7490	* 1.6572	* 1.8249	* .8470 *
	* 1.5565	* 1.4766	* 1.4755	* 1.4633	* 1.4088	* 1.4814	* 1.3299	* 2.5856 *
11	* 1.5107	* 1.7731	* 1.6866	* 1.7233	* 1.6758	* 1.8227	* 1.1622	* .5674 *
	* 1.6243	* 1.3898	* 1.4629	* 1.4369	* 1.4660	* 1.3441	* 1.9285	* 3.8892 *
12	* 1.8517	* 1.6794	* 1.7497	* 1.6763	* 1.6249	* 1.8294	* .9636 *	
	* 1.3259	* 1.4632	* 1.4083	* 1.4656	* 1.5044	* 1.3297	* 2.3061 *	
13	* 1.5304	* 1.7361	* 1.6584	* 1.8234	* 1.8300	* 1.8161	* .8026 *	
	* 1.6012	* 1.4065	* 1.4804	* 1.3435	* 1.3293	* 1.3296	* 2.7448 *	
14	* 1.8555	* 1.8622	* 1.8263	* 1.1628	* .9638	* .8193	*	
	* 1.3102	* 1.3045	* 1.3290	* 1.9275	* 2.3057	* 2.6943	*	
15	* .8429	* .8763	* .8474	* .5677	* F-SUB-Q			
	* 2.6215	* 2.4977	* 2.5847	* 3.8873	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 32 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7323	* 1.4433	* 1.5663	* 1.4992	* 1.8360	* 1.5204	* 1.8449	* .8467 *
	* 1.4014	* 1.6730	* 1.5344	* 1.5937	* 1.3021	* 1.5697	* 1.2954	* 2.5681 *
9	* 1.4433	* 1.7153	* 1.6537	* 1.7555	* 1.6653	* 1.7261	* 1.8501	* .8847 *
	* 1.6730	* 1.4071	* 1.4518	* 1.3683	* 1.4372	* 1.3869	* 1.2934	* 2.4353 *
10	* 1.5663	* 1.6531	* 1.6567	* 1.6738	* 1.7342	* 1.6478	* 1.8153	* .8552 *
	* 1.5344	* 1.4523	* 1.4510	* 1.4370	* 1.3849	* 1.4590	* 1.3233	* 2.5323 *
11	* 1.4992	* 1.7559	* 1.6743	* 1.7101	* 1.6677	* 1.8121	* 1.1705	* .5688 *
	* 1.5937	* 1.3680	* 1.4366	* 1.4127	* 1.4541	* 1.3396	* 1.8893	* 3.8584 *
12	* 1.8360	* 1.6663	* 1.7350	* 1.6683	* 1.6193	* 1.8223	* .9731	*
	* 1.3021	* 1.4364	* 1.3843	* 1.4537	* 1.5151	* 1.3451	* 2.2821	*
13	* 1.5204	* 1.7286	* 1.6490	* 1.8129	* 1.8229	* 1.8108	* .8100	*
	* 1.5697	* 1.3850	* 1.4579	* 1.3390	* 1.3447	* 1.3571	* 2.7556	*
14	* 1.8449	* 1.8523	* 1.8166	* 1.1711	* .9734	* .8273	*	*
	* 1.2954	* 1.2919	* 1.3223	* 1.8883	* 2.2816	* 2.7038	*	*
15	* .8467	* .8853	* .8555	* .5691	* F-SUB-Q			
	* 2.5681	* 2.4340	* 2.5313	* 3.8563	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7481	* 1.4428	* 1.5719	* 1.5046	* 1.8613	* 1.5276	* 1.8786	* .8406 *
	* 1.3560	* 1.6344	* 1.4933	* 1.5509	* 1.2554	* 1.5264	* 1.2434	* 2.5207 *
9	* 1.4428	* 1.7289	* 1.6637	* 1.7780	* 1.6771	* 1.7471	* 1.8844	* .8721 *
	* 1.6344	* 1.3635	* 1.4099	* 1.3201	* 1.3946	* 1.3393	* 1.2409	* 2.4078 *
10	* 1.5719	* 1.6630	* 1.6672	* 1.6865	* 1.7557	* 1.6634	* 1.8478	* .8436 *
	* 1.4933	* 1.4105	* 1.4090	* 1.3934	* 1.3367	* 1.4120	* 1.2698	* 2.5008 *
11	* 1.5046	* 1.7783	* 1.6870	* 1.7323	* 1.6853	* 1.8448	* 1.1627	* .5611 *
	* 1.5509	* 1.3199	* 1.3930	* 1.3618	* 1.4052	* 1.2838	* 1.8562	* 3.8024 *
12	* 1.8613	* 1.6782	* 1.7565	* 1.6859	* 1.6381	* 1.8593	* .9619	*
	* 1.2554	* 1.3938	* 1.3361	* 1.4047	* 1.4601	* 1.2850	* 2.2506	*
13	* 1.5276	* 1.7496	* 1.6647	* 1.8456	* 1.8600	* 1.8481	* .8032	*
	* 1.5264	* 1.3375	* 1.4109	* 1.2833	* 1.2845	* 1.2960	* 2.7053	*
14	* 1.8786	* 1.8867	* 1.8492	* 1.1634	* .9621	* .8197	*	*
	* 1.2434	* 1.2395	* 1.2689	* 1.8551	* 2.2501	* 2.6565	*	*
15	* .8406	* .8726	* .8441	* .5614	* F-SUB-Q			
	* 2.5207	* 2.4066	* 2.4997	* 3.8003	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 33 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7424	* 1.4317	* 1.5630	* 1.4988	* 1.8636	* 1.5233	* 1.8883	* .8369 *
	* 1.3126	* 1.5849	* 1.4442	* 1.4971	* 1.2059	* 1.4722	* 1.1904	* 2.4336 *
9	* 1.4317	* 1.7215	* 1.6582	* 1.7782	* 1.6739	* 1.7512	* 1.8947	* .8651 *
	* 1.5849	* 1.3167	* 1.3606	* 1.2699	* 1.3440	* 1.2863	* 1.1879	* 2.3328 *
10	* 1.5630	* 1.6576	* 1.6623	* 1.6836	* 1.7566	* 1.6634	* 1.8574	* .8380 *
	* 1.4442	* 1.3611	* 1.3593	* 1.3433	* 1.2852	* 1.3592	* 1.2163	* 2.4191 *
11	* 1.4988	* 1.7785	* 1.6841	* 1.7342	* 1.6882	* 1.8533	* 1.1583	* .5557 *
	* 1.4971	* 1.2697	* 1.3430	* 1.3098	* 1.3534	* 1.2323	* 1.7904	* 3.6877 *
12	* 1.8636	* 1.6750	* 1.7574	* 1.6887	* 1.6419	* 1.8719	* .9553 *	
	* 1.2059	* 1.3432	* 1.2847	* 1.3529	* 1.4091	* 1.2336	* 2.1772 *	
13	* 1.5233	* 1.7538	* 1.6647	* 1.8541	* 1.8725	* 1.8626	* .8000 *	
	* 1.4722	* 1.2846	* 1.3582	* 1.2318	* 1.2332	* 1.2429	* 2.6105 *	
14	* 1.8883	* 1.8970	* 1.8588	* 1.1589	* .9556	* .8164	*	
	* 1.1904	* 1.1866	* 1.2154	* 1.7893	* 2.1767	* 2.5637	*	
15	* .8369	* .8658	* .8384	* .5560	* F-SUB-Q			
	* 2.4336	* 2.3314	* 2.4181	* 3.6855	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7231	* 1.4138	* 1.5463	* 1.4851	* 1.8518	* 1.5114	* 1.8816	* .8316 *
	* 1.2784	* 1.5465	* 1.4075	* 1.4570	* 1.1697	* 1.4306	* 1.1512	* 2.3622 *
9	* 1.4138	* 1.7013	* 1.6435	* 1.7645	* 1.6604	* 1.7438	* 1.8886	* .8627 *
	* 1.5465	* 1.2818	* 1.3237	* 1.2338	* 1.3066	* 1.2452	* 1.1483	* 2.2562 *
10	* 1.5463	* 1.6428	* 1.6480	* 1.6705	* 1.7444	* 1.6535	* 1.8515	* .8341 *
	* 1.4075	* 1.3243	* 1.3222	* 1.3053	* 1.2478	* 1.3178	* 1.1753	* 2.3434 *
11	* 1.4851	* 1.7648	* 1.6710	* 1.7230	* 1.6798	* 1.8457	* 1.1540	* .5513 *
	* 1.4570	* 1.2336	* 1.3049	* 1.2705	* 1.3108	* 1.1910	* 1.7309	* 3.5829 *
12	* 1.8518	* 1.6615	* 1.7452	* 1.6803	* 1.6344	* 1.8674	* .9534 *	
	* 1.1697	* 1.3057	* 1.2472	* 1.3103	* 1.3619	* 1.1890	* 2.0996 *	
13	* 1.5114	* 1.7464	* 1.6548	* 1.8466	* 1.8681	* 1.8601	* .7973 *	
	* 1.4306	* 1.2434	* 1.3168	* 1.1905	* 1.1886	* 1.1957	* 2.5186 *	
14	* 1.8816	* 1.8910	* 1.8529	* 1.1547	* .9537	* .8134	*	
	* 1.1512	* 1.1470	* 1.1745	* 1.7298	* 2.0990	* 2.4740	*	
15	* .8316	* .8633	* .8346	* .5517	* F-SUB-Q			
	* 2.3622	* 2.2550	* 2.3422	* 3.5807	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 34 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6859	* 1.3891	* 1.5179	* 1.4620	* 1.8196	* 1.4898	* 1.8533	* .8281 *
	* 1.3617	* 1.6437	* 1.4976	* 1.5465	* 1.2430	* 1.5164	* 1.2203	* 2.4790 *
9	* 1.3891	* 1.6642	* 1.6159	* 1.7314	* 1.6338	* 1.7213	* 1.8606	* .8632 *
	* 1.6437	* 1.3660	* 1.4065	* 1.3133	* 1.3872	* 1.3173	* 1.2168	* 2.3565 *
10	* 1.5179	* 1.6152	* 1.6206	* 1.6438	* 1.7140	* 1.6297	* 1.8248	* .8340 *
	* 1.4976	* 1.4071	* 1.4047	* 1.3853	* 1.3264	* 1.3959	* 1.2444	* 2.4482 *
11	* 1.4620	* 1.7318	* 1.6443	* 1.6935	* 1.6568	* 1.8163	* 1.1509	* .5484 *
	* 1.5465	* 1.3130	* 1.3850	* 1.3492	* 1.3867	* 1.2616	* 1.8109	* 3.7626 *
12	* 1.8196	* 1.6349	* 1.7149	* 1.6574	* 1.6131	* 1.8401	* .9531	*
	* 1.2430	* 1.3863	* 1.3258	* 1.3862	* 1.4365	* 1.2556	* 2.1890	*
13	* 1.4898	* 1.7238	* 1.6310	* 1.8171	* 1.8408	* 1.8363	* .7964	*
	* 1.5164	* 1.3154	* 1.3948	* 1.2610	* 1.2552	* 1.2592	* 2.6251	*
14	* 1.8533	* 1.8630	* 1.8263	* 1.1516	* .9534	* .8126	*	*
	* 1.2203	* 1.2153	* 1.2434	* 1.8097	* 2.1883	* 2.5785	*	*
15	* .8281	* .8638	* .8345	* .5487	* F-SUB-Q			
	* 2.4790	* 2.3551	* 2.4472	* 3.7602	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6869	* 1.3751	* 1.5107	* 1.4520	* 1.8256	* 1.4814	* 1.8658	* .8106 *
	* 1.3050	* 1.5964	* 1.4526	* 1.5058	* 1.1978	* 1.4758	* 1.1720	* 2.4528 *
9	* 1.3751	* 1.6653	* 1.6110	* 1.7353	* 1.6288	* 1.7237	* 1.8737	* .8381 *
	* 1.5964	* 1.3179	* 1.3625	* 1.2650	* 1.3454	* 1.2722	* 1.1679	* 2.3502 *
10	* 1.5107	* 1.6103	* 1.6155	* 1.6388	* 1.7169	* 1.6275	* 1.8371	* .8116 *
	* 1.4526	* 1.3632	* 1.3608	* 1.3415	* 1.2787	* 1.3499	* 1.1935	* 2.4349 *
11	* 1.4520	* 1.7357	* 1.6393	* 1.6965	* 1.6556	* 1.8262	* 1.1278	* .5335 *
	* 1.5058	* 1.2648	* 1.3411	* 1.2982	* 1.3368	* 1.2073	* 1.7822	* 3.7441 *
12	* 1.8256	* 1.6299	* 1.7178	* 1.6561	* 1.6135	* 1.8528	* .9269	*
	* 1.1978	* 1.3445	* 1.2781	* 1.3363	* 1.3773	* 1.1958	* 2.1656	*
13	* 1.4814	* 1.7264	* 1.6288	* 1.8271	* 1.8536	* 1.8514	* .7778	*
	* 1.4758	* 1.2703	* 1.3488	* 1.2068	* 1.1954	* 1.1966	* 2.5823	*
14	* 1.8658	* 1.8761	* 1.8386	* 1.1285	* .9272	* .7934	*	*
	* 1.1720	* 1.1665	* 1.1925	* 1.7810	* 2.1650	* 2.5369	*	*
15	* .8106	* .8386	* .8121	* .5338	* F-SUB-Q			
	* 2.4528	* 2.3492	* 2.4337	* 3.7417	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 35 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6532	* 1.3470	* 1.4834	* 1.4236	* 1.7933	* 1.4546	* 1.8360	* .7933 *
	* 1.2751	* 1.5650	* 1.4235	* 1.4787	* 1.1734	* 1.4467	* 1.1456	* 2.4143 *
9	* 1.3470	* 1.6354	* 1.5831	* 1.7031	* 1.5990	* 1.6977	* 1.8443	* .8204 *
	* 1.5650	* 1.2917	* 1.3345	* 1.2405	* 1.3192	* 1.2427	* 1.1412	* 2.3129 *
10	* 1.4834	* 1.5823	* 1.5874	* 1.6093	* 1.6857	* 1.6004	* 1.8094	* .7946 *
	* 1.4235	* 1.3351	* 1.3331	* 1.3147	* 1.2535	* 1.3205	* 1.1651	* 2.3955 *
11	* 1.4236	* 1.7035	* 1.6097	* 1.6652	* 1.6268	* 1.7941	* 1.1057	* .5212 *
	* 1.4787	* 1.2402	* 1.3143	* 1.2720	* 1.3054	* 1.1802	* 1.7480	* 3.6917 *
12	* 1.7933	* 1.6001	* 1.6865	* 1.6273	* 1.5860	* 1.8212	* .9070 *	
	* 1.1734	* 1.3183	* 1.2529	* 1.3050	* 1.3406	* 1.1659	* 2.1263 *	
13	* 1.4546	* 1.7004	* 1.6017	* 1.7950	* 1.8219	* 1.8236	* .7614 *	
	* 1.4467	* 1.2409	* 1.3195	* 1.1796	* 1.1654	* 1.1636	* 2.5324 *	
14	* 1.8360	* 1.8467	* 1.8109	* 1.1065	* .9073	* .7766 *		
	* 1.1456	* 1.1397	* 1.1642	* 1.7468	* 2.1258	* 2.4882 *		
15	* .7933	* .8209	* .7950	* .5215	* F-SUB-Q			
	* 2.4143	* 2.3118	* 2.3943	* 3.6893	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5763	* 1.3012	* 1.4312	* 1.3713	* 1.7108	* 1.4041	* 1.7519	* .7740 *
	* 1.2916	* 1.5648	* 1.4278	* 1.4859	* 1.1895	* 1.4506	* 1.1612	* 2.3970 *
9	* 1.3012	* 1.5665	* 1.5261	* 1.6255	* 1.5381	* 1.6353	* 1.7605	* .8070 *
	* 1.5648	* 1.3053	* 1.3397	* 1.2577	* 1.3272	* 1.2480	* 1.1561	* 2.2777 *
10	* 1.4312	* 1.5254	* 1.5306	* 1.5488	* 1.6112	* 1.5423	* 1.7306	* .7815 *
	* 1.4278	* 1.3403	* 1.3380	* 1.3216	* 1.2691	* 1.3254	* 1.1777	* 2.3588 *
11	* 1.3713	* 1.6259	* 1.5492	* 1.5908	* 1.5637	* 1.7088	* 1.0811	* .5103 *
	* 1.4859	* 1.2574	* 1.3213	* 1.2878	* 1.3115	* 1.1968	* 1.7294	* 3.6529 *
12	* 1.7108	* 1.5393	* 1.6120	* 1.5642	* 1.5234	* 1.7335	* .8904	*
	* 1.1895	* 1.3263	* 1.2685	* 1.3111	* 1.3462	* 1.1816	* 2.0938	*
13	* 1.4041	* 1.6378	* 1.5435	* 1.7097	* 1.7342	* 1.7402	* .7446	*
	* 1.4506	* 1.2461	* 1.3243	* 1.1962	* 1.1811	* 1.1754	* 2.5016	*
14	* 1.7519	* 1.7628	* 1.7321	* 1.0818	* .8907	* .7600	*	
	* 1.1612	* 1.1546	* 1.1768	* 1.7282	* 2.0932	* 2.4563	*	
15	* .7740	* .8076	* .7819	* .5106	* F-SUB-Q			
	* 2.3970	* 2.2762	* 2.3578	* 3.6506	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 36 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5184	* 1.2551	* 1.3901	* 1.3200	* 1.6430	* 1.3538	* 1.6831	* .7329 *
	* 1.3037	* 1.5798	* 1.4309	* 1.5029	* 1.2057	* 1.4645	* 1.1759	* 2.4670 *
9	* 1.2551	* 1.5147	* 1.4792	* 1.5644	* 1.4848	* 1.5802	* 1.6911	* .7598 *
	* 1.5798	* 1.3142	* 1.3452	* 1.2717	* 1.3382	* 1.2564	* 1.1707	* 2.3575 *
10	* 1.3901	* 1.4785	* 1.4844	* 1.4976	* 1.5506	* 1.4919	* 1.6666	* .7350 *
	* 1.4309	* 1.3459	* 1.3428	* 1.3299	* 1.2833	* 1.3330	* 1.1895	* 2.4439 *
11	* 1.3200	* 1.5648	* 1.4980	* 1.5300	* 1.5074	* 1.6400	* 1.0235	* .4830 *
	* 1.5029	* 1.2715	* 1.3295	* 1.3026	* 1.3224	* 1.2122	* 1.7778	* 3.7620 *
12	* 1.6430	* 1.4858	* 1.5514	* 1.5079	* 1.4662	* 1.6598	* .8384 *	
	* 1.2057	* 1.3373	* 1.2827	* 1.3220	* 1.3594	* 1.1987	* 2.1636 *	
13	* 1.3538	* 1.5827	* 1.4932	* 1.6408	* 1.6604	* 1.6685	* .7010 *	
	* 1.4645	* 1.2545	* 1.3319	* 1.2116	* 1.1982	* 1.1902	* 2.5849 *	
14	* 1.6831	* 1.6934	* 1.6680	* 1.0242	* .8386	* .7148 *		
	* 1.1759	* 1.1692	* 1.1885	* 1.7766	* 2.1631	* 2.5404 *		
15	* .7329	* .7603	* .7354	* .4833	* F-SUB-Q			
	* 2.4670	* 2.3562	* 2.4426	* 3.7596	* M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3872	* 1.1694	* 1.2885	* 1.2214	* 1.4881	* 1.2470	* 1.5209	* .6791 *
	* 1.3964	* 1.6598	* 1.5111	* 1.5906	* 1.3029	* 1.5567	* 1.2735	* 2.6097 *
9	* 1.1694	* 1.3870	* 1.3697	* 1.4303	* 1.3691	* 1.4486	* 1.5277	* .7010 *
	* 1.6598	* 1.4051	* 1.4219	* 1.3612	* 1.4203	* 1.3410	* 1.2682	* 2.5048 *
10	* 1.2885	* 1.3691	* 1.3684	* 1.3880	* 1.4179	* 1.3739	* 1.5084	* .6764 *
	* 1.5111	* 1.4226	* 1.4258	* 1.4040	* 1.3734	* 1.4163	* 1.2859	* 2.6035 *
11	* 1.2214	* 1.4306	* 1.3884	* 1.3985	* 1.3834	* 1.4851	* .9406	* .4448 *
	* 1.5906	* 1.3609	* 1.4036	* 1.3943	* 1.4088	* 1.3092	* 1.8946	* 4.0079 *
12	* 1.4881	* 1.3700	* 1.4186	* 1.3840	* 1.3416	* 1.4970	* .7737 *	
	* 1.3029	* 1.4193	* 1.3728	* 1.4083	* 1.4528	* 1.2993	* 2.2959 *	
13	* 1.2470	* 1.4509	* 1.3751	* 1.4858	* 1.4976	* 1.4970	* .6409 *	
	* 1.5567	* 1.3389	* 1.4152	* 1.3086	* 1.2988	* 1.2970	* 2.7695 *	
14	* 1.5209	* 1.5298	* 1.5097	* .9412	* .7739	* .6532 *		
	* 1.2735	* 1.2666	* 1.2849	* 1.8934	* 2.2953	* 2.7231 *		
15	* .6791	* .7015	* .6767	* .4451	* F-SUB-Q			
	* 2.6097	* 2.5032	* 2.6023	* 4.0054	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 37 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 125 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2074 *	* .9727 *	* 1.0545 *	* 1.0088 *	* 1.2736 *	* 1.0142 *	* 1.3064 *	* .5674 *
	* 1.5800 *	* 1.9640 *	* 1.8172 *	* 1.8947 *	* 1.4995 *	* 1.8835 *	* 1.4597 *	* 3.0805 *
9	* .9727 *	* 1.2087 *	* 1.1260 *	* 1.2709 *	* 1.1013 *	* 1.1708 *	* 1.3142 *	* .5854 *
	* 1.9640 *	* 1.5836 *	* 1.7021 *	* 1.5059 *	* 1.7394 *	* 1.6322 *	* 1.4516 *	* 2.9574 *
10	* 1.0545 *	* 1.1255 *	* 1.0863 *	* 1.1510 *	* 1.2358 *	* 1.1191 *	* 1.2358 *	* .5576 *
	* 1.8172 *	* 1.7028 *	* 1.7670 *	* 1.6657 *	* 1.5494 *	* 1.7112 *	* 1.5449 *	* 3.1146 *
11	* 1.0088 *	* 1.2711 *	* 1.1514 *	* 1.2257 *	* 1.1100 *	* 1.2853 *	* .7766 *	* .3690 *
	* 1.8947 *	* 1.5056 *	* 1.6653 *	* 1.5639 *	* 1.7283 *	* 1.4883 *	* 2.2604 *	* 4.7696 *
12	* 1.2736 *	* 1.1020 *	* 1.2364 *	* 1.1103 *	* 1.0540 *	* 1.2921 *	* .6520 *	
	* 1.4995 *	* 1.7383 *	* 1.5487 *	* 1.7278 *	* 1.8188 *	* 1.4809 *	* 2.6847 *	
13	* 1.0142 *	* 1.1727 *	* 1.1199 *	* 1.2858 *	* 1.2925 *	* 1.1707 *	* .5200 *	
	* 1.8835 *	* 1.6297 *	* 1.7100 *	* 1.4877 *	* 1.4804 *	* 1.6328 *	* 3.3653 *	
14	* 1.3064 *	* 1.3156 *	* 1.2367 *	* .7770 *	* .6522 *	* .5296 *		
	* 1.4597 *	* 1.4500 *	* 1.5437 *	* 2.2591 *	* 2.6839 *	* 3.3110 *		
15	* .5674 *	* .5858 *	* .5578 *	* .3692 *	F-SUB-Q			
	* 3.0805 *	* 2.9555 *	* 3.1133 *	* 4.7668 *	M-SUB-Q			

AT 100% POWER, 125 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5126 *	* .4357 *	* .4335 *	* .4484 *	* .5347 *	* .4450 *	* .4882 *	* .2472 *
	* 3.6870 *	* 4.3416 *	* 4.3720 *	* 4.2199 *	* 3.5353 *	* 4.2497 *	* 3.8674 *	* 7.0124 *
9	* .4357 *	* .5042 *	* .4596 *	* .5344 *	* .4536 *	* .4632 *	* .4896 *	* .2500 *
	* 4.3416 *	* 3.7557 *	* 4.1242 *	* 3.5445 *	* 4.1753 *	* 4.0812 *	* 3.8576 *	* 6.8691 *
10	* .4335 *	* .4594 *	* .4345 *	* .4744 *	* .5311 *	* .4553 *	* .4560 *	* .2348 *
	* 4.3720 *	* 4.1254 *	* 4.3668 *	* 3.9954 *	* 3.5670 *	* 4.1589 *	* 4.1454 *	* 7.3375 *
11	* .4484 *	* .5345 *	* .4745 *	* .5252 *	* .4487 *	* .5038 *	* .3352 *	* .1625 *
	* 4.2199 *	* 3.5435 *	* 3.9944 *	* 3.6106 *	* 4.2264 *	* 3.7583 *	* 5.1887 *	* 10.7473 *
12	* .5347 *	* .4539 *	* .5313 *	* .4488 *	* .4217 *	* .4812 *	* .2772 *	
	* 3.5353 *	* 4.1730 *	* 3.5655 *	* 4.2252 *	* 4.4990 *	* 3.9358 *	* 6.2603 *	
13	* .4450 *	* .4639 *	* .4557 *	* .5040 *	* .4814 *	* .4237 *	* .2166 *	
	* 4.2497 *	* 4.0752 *	* 4.1560 *	* 3.7567 *	* 3.9342 *	* 4.4693 *	* 8.0123 *	
14	* .4882 *	* .4901 *	* .4563 *	* .3354 *	* .2773 *	* .2200 *		
	* 3.8674 *	* 3.8535 *	* 4.1422 *	* 5.1863 *	* 6.2574 *	* 7.9046 *		
15	* .2472 *	* .2501 *	* .2349 *	* .1626 *	F-SUB-Q			
	* 7.0124 *	* 6.8652 *	* 7.3336 *	* 10.7404 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 38 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4676 *	* .4728 *	* .4771 *	* .4810 *	* .5463 *	* .4686 *	* .4779 *	* .2676 *
	* 3.3685 *	* 3.8375 *	* 3.9680 *	* 3.8093 *	* 3.3660 *	* 3.8420 *	* 3.7791 *	* 6.0489 *
9	* .4728 *	* .5392 *	* .4957 *	* .5507 *	* .4793 *	* .4689 *	* .4776 *	* .2678 *
	* 3.8375 *	* 3.5330 *	* 3.7876 *	* 3.4055 *	* 3.8185 *	* 3.8553 *	* 3.8011 *	* 6.0367 *
10	* .4771 *	* .4956 *	* .4703 *	* .4972 *	* .5434 *	* .4665 *	* .4521 *	* .2518 *
	* 3.9680 *	* 3.7881 *	* 4.0159 *	* 3.7601 *	* 3.4995 *	* 4.0033 *	* 4.1097 *	* 6.5326 *
11	* .4810 *	* .5507 *	* .4973 *	* .5378 *	* .4584 *	* .4909 *	* .3440 *	* .1919 *
	* 3.8093 *	* 3.4051 *	* 3.7596 *	* 3.5671 *	* 4.0572 *	* 3.8204 *	* 5.0642 *	* 8.9107 *
12	* .5463 *	* .4795 *	* .5435 *	* .4585 *	* .3975 *	* .4399 *	* .2871 *	
	* 3.3660 *	* 3.8173 *	* 3.4985 *	* 4.0567 *	* 4.2053 *	* 3.9735 *	* 5.8364 *	
13	* .4686 *	* .4697 *	* .4668 *	* .4910 *	* .4398 *	* .3926 *	* .2213 *	
	* 3.8420 *	* 3.8491 *	* 4.0011 *	* 3.8200 *	* 3.9736 *	* 4.3873 *	* 7.3818 *	
14	* .4779 *	* .4781 *	* .4523 *	* .3440 *	* .2870 *	* .2257 *		
	* 3.7791 *	* 3.7974 *	* 4.1077 *	* 5.0641 *	* 5.8385 *	* 7.2683 *		
15	* .2676 *	* .2679 *	* .2519 *	* .1919 *	F-SUB-Q			
	* 6.0489 *	* 6.0358 *	* 6.5321 *	* 8.9095 *	M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0935 *	* .9737 *	* 1.0459 *	* .9857 *	* 1.1442 *	* .9698 *	* 1.1158 *	* .5748 *
	* 1.6701 *	* 1.9249 *	* 1.8536 *	* 1.9030 *	* 1.6482 *	* 1.9024 *	* 1.6581 *	* 2.8882 *
9	* .9737 *	* 1.1508 *	* 1.0846 *	* 1.1595 *	* 1.0503 *	* 1.0429 *	* 1.1168 *	* .5914 *
	* 1.9249 *	* 1.6874 *	* 1.7724 *	* 1.6567 *	* 1.7790 *	* 1.7689 *	* 1.6643 *	* 2.8017 *
10	* 1.0459 *	* 1.0844 *	* 1.0511 *	* 1.0844 *	* 1.1179 *	* 1.0323 *	* 1.0668 *	* .5634 *
	* 1.8536 *	* 1.7726 *	* 1.8397 *	* 1.7653 *	* 1.7529 *	* 1.8508 *	* 1.7829 *	* 2.9914 *
11	* .9857 *	* 1.1595 *	* 1.0845 *	* 1.1134 *	* 1.0303 *	* 1.1068 *	* .7410 *	* .4069 *
	* 1.9030 *	* 1.6564 *	* 1.7651 *	* 1.7400 *	* 1.8443 *	* 1.7288 *	* 2.3874 *	* 4.3009 *
12	* 1.1442 *	* 1.0506 *	* 1.1182 *	* 1.0304 *	* .9320 *	* 1.0692 *	* .6385 *	
	* 1.6482 *	* 1.7783 *	* 1.7526 *	* 1.8441 *	* 1.9226 *	* 1.7181 *	* 2.6816 *	
13	* .9698 *	* 1.0443 *	* 1.0328 *	* 1.1069 *	* 1.0692 *	* .9690 *	* .5140 *	
	* 1.9024 *	* 1.7666 *	* 1.8498 *	* 1.7287 *	* 1.7181 *	* 1.8818 *	* 3.2550 *	
14	* 1.1158 *	* 1.1177 *	* 1.0672 *	* .7409 *	* .6383 *	* .5171 *		
	* 1.6581 *	* 1.6629 *	* 1.7822 *	* 2.3876 *	* 2.6825 *	* 3.2490 *		
15	* .5748 *	* .5917 *	* .5634 *	* .4069 *	F-SUB-Q			
	* 2.8882 *	* 2.8007 *	* 2.9915 *	* 4.3005 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 39 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3396	* 1.1875	* 1.2626	* 1.1875	* 1.3573	* 1.1811	* 1.3180	* .6901
	* 1.4490	* 1.6341	* 1.5617	* 1.6047	* 1.4071	* 1.5871	* 1.4246	* 2.4432
9	* 1.1875	* 1.3509	* 1.3024	* 1.3301	* 1.2916	* 1.2724	* 1.3179	* .7204
	* 1.6341	* 1.4530	* 1.5000	* 1.4671	* 1.4681	* 1.4720	* 1.4313	* 2.3339
10	* 1.2626	* 1.3022	* 1.2976	* 1.3030	* 1.3019	* 1.2522	* 1.2863	* .6933
	* 1.5617	* 1.5002	* 1.5141	* 1.4927	* 1.5090	* 1.5463	* 1.4977	* 2.4684
11	* 1.1875	* 1.3302	* 1.3032	* 1.2761	* 1.2729	* 1.3083	* .9102	* .4894
	* 1.6047	* 1.4668	* 1.4925	* 1.5504	* 1.5209	* 1.4888	* 1.9721	* 3.6300
12	* 1.3573	* 1.2920	* 1.3022	* 1.2730	* 1.2091	* 1.2786	* .7791	*
	* 1.4071	* 1.4676	* 1.5086	* 1.5208	* 1.5662	* 1.4830	* 2.2405	*
13	* 1.1811	* 1.2739	* 1.2527	* 1.3085	* 1.2787	* 1.2292	* .6351	*
	* 1.5871	* 1.4702	* 1.5454	* 1.4886	* 1.4829	* 1.5246	* 2.6898	*
14	* 1.3180	* 1.3191	* 1.2869	* .9101	* .7789	* .6462	*	*
	* 1.4246	* 1.4300	* 1.4970	* 1.9722	* 2.2410	* 2.6547	*	*
15	* .6901	* .7207	* .6934	* .4894	* F-SUB-Q			
	* 2.4432	* 2.3332	* 2.4683	* 3.6296	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5281	* 1.3113	* 1.3947	* 1.3133	* 1.5485	* 1.3064	* 1.5094	* .7467
	* 1.3013	* 1.5150	* 1.4390	* 1.4728	* 1.2526	* 1.4557	* 1.2604	* 2.2902
9	* 1.3113	* 1.5305	* 1.4427	* 1.5110	* 1.4368	* 1.4243	* 1.5099	* .7777
	* 1.5150	* 1.3123	* 1.3740	* 1.3112	* 1.3391	* 1.3330	* 1.2658	* 2.1929
10	* 1.3947	* 1.4424	* 1.4385	* 1.4485	* 1.4779	* 1.3952	* 1.4682	* .7506
	* 1.4390	* 1.3742	* 1.3856	* 1.3625	* 1.3490	* 1.4066	* 1.3290	* 2.3120
11	* 1.3133	* 1.5112	* 1.4487	* 1.4503	* 1.4232	* 1.5037	* .9967	* .5267
	* 1.4728	* 1.3108	* 1.3622	* 1.3863	* 1.3848	* 1.3182	* 1.8306	* 3.4191
12	* 1.5485	* 1.4373	* 1.4782	* 1.4234	* 1.3590	* 1.4808	* .8467	*
	* 1.2526	* 1.3386	* 1.3486	* 1.3846	* 1.4248	* 1.3080	* 2.1022	*
13	* 1.3064	* 1.4259	* 1.3959	* 1.5040	* 1.4810	* 1.4205	* .6940	*
	* 1.4557	* 1.3314	* 1.4058	* 1.3180	* 1.3078	* 1.3474	* 2.5125	*
14	* 1.5094	* 1.5112	* 1.4689	* .9966	* .8466	* .7081	*	*
	* 1.2604	* 1.2647	* 1.3283	* 1.8307	* 2.1025	* 2.4730	*	*
15	* .7467	* .7781	* .7506	* .5267	* F-SUB-Q			
	* 2.2902	* 2.1920	* 2.3121	* 3.4186	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 40 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6200	* 1.3684	* 1.4510	* 1.3736	* 1.6436	* 1.3638	* 1.6062	* .7813
	* 1.2549	* 1.4836	* 1.4108	* 1.4313	* 1.1996	* 1.4178	* 1.2029	* 2.2252
9	* 1.3684	* 1.6169	* 1.5070	* 1.6078	* 1.5057	* 1.4964	* 1.6077	* .8152
	* 1.4836	* 1.2690	* 1.3368	* 1.2509	* 1.2990	* 1.2887	* 1.2063	* 2.1268
10	* 1.4510	* 1.5067	* 1.5010	* 1.5216	* 1.5702	* 1.4637	* 1.5594	* .7861
	* 1.4108	* 1.3370	* 1.3490	* 1.3175	* 1.2900	* 1.3619	* 1.2704	* 2.2427
11	* 1.3736	* 1.6080	* 1.5219	* 1.5445	* 1.5004	* 1.6068	* 1.0493	* .5472
	* 1.4313	* 1.2508	* 1.3172	* 1.3270	* 1.3395	* 1.2575	* 1.7711	* 3.3405
12	* 1.6436	* 1.5063	* 1.5706	* 1.5006	* 1.4301	* 1.5902	* .8931	*
	* 1.1996	* 1.2984	* 1.2896	* 1.3392	* 1.3805	* 1.2433	* 2.0353	*
13	* 1.3638	* 1.4981	* 1.4644	* 1.6072	* 1.5904	* 1.5194	* .7307	*
	* 1.4178	* 1.2872	* 1.3611	* 1.2573	* 1.2431	* 1.2866	* 2.4401	*
14	* 1.6062	* 1.6092	* 1.5601	* 1.0493	* .8931	* .7460	*	*
	* 1.2029	* 1.2053	* 1.2699	* 1.7711	* 2.0354	* 2.4001	*	*
15	* .7813	* .8155	* .7861	* .5472	* F-SUB-Q			
	* 2.2252	* 2.1262	* 2.2427	* 3.3399	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6647	* 1.3955	* 1.4767	* 1.4043	* 1.6922	* 1.3917	* 1.6573	* .8029
	* 1.2460	* 1.4839	* 1.4087	* 1.4261	* 1.1877	* 1.4164	* 1.1864	* 2.2076
9	* 1.3955	* 1.6587	* 1.5390	* 1.6604	* 1.5414	* 1.5336	* 1.6601	* .8404
	* 1.4839	* 1.2619	* 1.3312	* 1.2330	* 1.2934	* 1.2804	* 1.1889	* 2.1027
10	* 1.4767	* 1.5386	* 1.5325	* 1.5612	* 1.6201	* 1.5000	* 1.6076	* .8093
	* 1.4087	* 1.3314	* 1.3441	* 1.3055	* 1.2721	* 1.3516	* 1.2537	* 2.2176
11	* 1.4043	* 1.6606	* 1.5615	* 1.5968	* 1.5435	* 1.6636	* 1.0827	* .5591
	* 1.4261	* 1.2328	* 1.3052	* 1.3042	* 1.3254	* 1.2366	* 1.7416	* 3.3214
12	* 1.6922	* 1.5419	* 1.6206	* 1.5437	* 1.4682	* 1.6506	* .9234	*
	* 1.1877	* 1.2929	* 1.2717	* 1.3251	* 1.3723	* 1.2250	* 2.0106	*
13	* 1.3917	* 1.5353	* 1.5007	* 1.6639	* 1.6509	* 1.5731	* .7552	*
	* 1.4164	* 1.2789	* 1.3508	* 1.2364	* 1.2248	* 1.2738	* 2.4208	*
14	* 1.6573	* 1.6615	* 1.6083	* 1.0827	* .9234	* .7706	*	*
	* 1.1864	* 1.1880	* 1.2532	* 1.7414	* 2.0105	* 2.3826	*	*
15	* .8029	* .8408	* .8094	* .5591	* F-SUB-Q			
	* 2.2076	* 2.1019	* 2.2176	* 3.3207	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 41 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7067	* 1.4172	* 1.5009	* 1.4302	* 1.7387	* 1.4147	* 1.7086	* .8122 *
	* 1.2384	* 1.4865	* 1.4017	* 1.4323	* 1.1829	* 1.4257	* 1.1765	* 2.2326 *
9	* 1.4172	* 1.6983	* 1.5688	* 1.7111	* 1.5751	* 1.5683	* 1.7123	* .8474 *
	* 1.4865	* 1.2536	* 1.3312	* 1.2212	* 1.2955	* 1.2794	* 1.1777	* 2.1330 *
10	* 1.5009	* 1.5684	* 1.5623	* 1.5971	* 1.6669	* 1.5332	* 1.6557	* .8162 *
	* 1.4017	* 1.3315	* 1.3436	* 1.3003	* 1.2605	* 1.3471	* 1.2401	* 2.2452 *
11	* 1.4302	* 1.7113	* 1.5974	* 1.6491	* 1.5824	* 1.7190	* 1.0979	* .5622 *
	* 1.4323	* 1.2211	* 1.3001	* 1.2791	* 1.3115	* 1.2150	* 1.7370	* 3.3595 *
12	* 1.7387	* 1.5757	* 1.6673	* 1.5827	* 1.5029	* 1.7093	* .9356 *	
	* 1.1829	* 1.2950	* 1.2601	* 1.3112	* 1.3681	* 1.2084	* 2.0248 *	
13	* 1.4147	* 1.5700	* 1.5340	* 1.7194	* 1.7097	* 1.6247	* .7646 *	
	* 1.4257	* 1.2779	* 1.3463	* 1.2147	* 1.2082	* 1.2600	* 2.4443 *	
14	* 1.7086	* 1.7136	* 1.6564	* 1.0981	* .9356	* .7811	*	
	* 1.1765	* 1.1767	* 1.2395	* 1.7368	* 2.0247	* 2.4030	*	
15	* .8122	* .8478	* .8162	* .5623	* F-SUB-Q			
	* 2.2326	* 2.1323	* 2.2451	* 3.3587	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7282	* 1.4272	* 1.5119	* 1.4437	* 1.7646	* 1.4262	* 1.7384	* .8197 *
	* 1.2468	* 1.5051	* 1.4215	* 1.4558	* 1.1968	* 1.4525	* 1.1868	* 2.2718 *
9	* 1.4271	* 1.7183	* 1.5843	* 1.7395	* 1.5937	* 1.5881	* 1.7427	* .8538 *
	* 1.5051	* 1.2632	* 1.3440	* 1.2297	* 1.3147	* 1.2959	* 1.1867	* 2.1733 *
10	* 1.5119	* 1.5839	* 1.5779	* 1.6177	* 1.6941	* 1.5519	* 1.6834	* .8222 *
	* 1.4215	* 1.3443	* 1.3562	* 1.3087	* 1.2671	* 1.3574	* 1.2459	* 2.2826 *
11	* 1.4437	* 1.7397	* 1.6180	* 1.6807	* 1.6054	* 1.7522	* 1.1095	* .5649 *
	* 1.4558	* 1.2295	* 1.3085	* 1.2801	* 1.3181	* 1.2147	* 1.7547	* 3.3987 *
12	* 1.7646	* 1.5943	* 1.6945	* 1.6058	* 1.5229	* 1.7453	* .9452 *	
	* 1.1968	* 1.3141	* 1.2668	* 1.3178	* 1.3731	* 1.2053	* 2.0383 *	
13	* 1.4262	* 1.5898	* 1.5527	* 1.7526	* 1.7457	* 1.6560	* .7724 *	
	* 1.4525	* 1.2944	* 1.3567	* 1.2144	* 1.2051	* 1.2617	* 2.4662 *	
14	* 1.7384	* 1.7441	* 1.6842	* 1.1097	* .9452	* .7891	*	
	* 1.1868	* 1.1858	* 1.2453	* 1.7544	* 2.0381	* 2.4244	*	
15	* .8197	* .8541	* .8223	* .5650	* F-SUB-Q			
	* 2.2718	* 2.1726	* 2.2824	* 3.3980	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 42 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7494	* 1.4353	* 1.5225	* 1.4552	* 1.7900	* 1.4362	* 1.7675	* .8227 *
	* 1.2755	* 1.5449	* 1.4455	* 1.4888	* 1.2166	* 1.4881	* 1.2037	* 2.3347 *
9	* 1.4353	* 1.7375	* 1.5989	* 1.7669	* 1.6102	* 1.6067	* 1.7723	* .8546 *
	* 1.5449	* 1.2890	* 1.3651	* 1.2438	* 1.3415	* 1.3197	* 1.2023	* 2.2388 *
10	* 1.5225	* 1.5985	* 1.5927	* 1.6361	* 1.7187	* 1.5691	* 1.7105	* .8241 *
	* 1.4455	* 1.3654	* 1.3765	* 1.3264	* 1.2811	* 1.3755	* 1.2577	* 2.3422 *
11	* 1.4552	* 1.7672	* 1.6364	* 1.7106	* 1.6259	* 1.7837	* 1.1156	* .5638 *
	* 1.4888	* 1.2436	* 1.3262	* 1.2929	* 1.3398	* 1.2279	* 1.7819	* 3.4834 *
12	* 1.7900	* 1.6108	* 1.7191	* 1.6262	* 1.5409	* 1.7791	* .9482 *	
	* 1.2166	* 1.3409	* 1.2808	* 1.3395	* 1.3982	* 1.2172	* 2.0898	*
13	* 1.4362	* 1.6085	* 1.5698	* 1.7841	* 1.7795	* 1.6857	* .7758 *	
	* 1.4881	* 1.3182	* 1.3748	* 1.2277	* 1.2170	* 1.2749	* 2.5238 *	
14	* 1.7675	* 1.7738	* 1.7113	* 1.1158	* .9482	* .7928 *		
	* 1.2037	* 1.2013	* 1.2571	* 1.7815	* 2.0897	* 2.4802 *		
15	* .8227	* .8550	* .8242	* .5639	* F-SUB-Q			
	* 2.3347	* 2.2378	* 2.3420	* 3.4825	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7347	* 1.4261	* 1.5109	* 1.4488	* 1.7771	* 1.4292	* 1.7577	* .8295 *
	* 1.3324	* 1.6051	* 1.4994	* 1.5483	* 1.2701	* 1.5508	* 1.2544	* 2.3999 *
9	* 1.4261	* 1.7211	* 1.5896	* 1.7565	* 1.6027	* 1.6001	* 1.7631	* .8668 *
	* 1.6051	* 1.3426	* 1.4175	* 1.2934	* 1.3933	* 1.3719	* 1.2515	* 2.2867 *
10	* 1.5109	* 1.5891	* 1.5842	* 1.6298	* 1.7106	* 1.5627	* 1.7009	* .8371 *
	* 1.4994	* 1.4179	* 1.4277	* 1.3745	* 1.3274	* 1.4250	* 1.3048	* 2.3829 *
11	* 1.4488	* 1.7567	* 1.6301	* 1.7038	* 1.6212	* 1.7761	* 1.1287	* .5685 *
	* 1.5483	* 1.2932	* 1.3743	* 1.3337	* 1.3794	* 1.2666	* 1.8116	* 3.5584 *
12	* 1.7771	* 1.6034	* 1.7111	* 1.6216	* 1.5362	* 1.7735	* .9631 *	
	* 1.2701	* 1.3927	* 1.3270	* 1.3791	* 1.4534	* 1.2659	* 2.1209 *	
13	* 1.4292	* 1.6018	* 1.5634	* 1.7765	* 1.7739	* 1.6798	* .7868 *	
	* 1.5508	* 1.3704	* 1.4242	* 1.2663	* 1.2657	* 1.3272	* 2.5800 *	
14	* 1.7577	* 1.7645	* 1.7017	* 1.1290	* .9631	* .8030 *		
	* 1.2544	* 1.2505	* 1.3042	* 1.8112	* 2.1207	* 2.5384 *		
15	* .8295	* .8672	* .8372	* .5687	* F-SUB-Q			
	* 2.3999	* 2.2859	* 2.3827	* 3.5574	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 43 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7644	* 1.4361	* 1.5257	* 1.4614	* 1.8121	* 1.4411	* 1.7978	* .8269 *
	* 1.3571	* 1.6515	* 1.5412	* 1.5982	* 1.2979	* 1.6027	* 1.2774	* 2.5064 *
9	* 1.4361	* 1.7489	* 1.6086	* 1.7930	* 1.6233	* 1.6245	* 1.8038	* .8591 *
	* 1.6515	* 1.3689	* 1.4540	* 1.3159	* 1.4296	* 1.4069	* 1.2732	* 2.4015 *
10	* 1.5257	* 1.6081	* 1.6037	* 1.6521	* 1.7433	* 1.5841	* 1.7384	* .8275 *
	* 1.5412	* 1.4544	* 1.4644	* 1.4075	* 1.3485	* 1.4577	* 1.3244	* 2.5038 *
11	* 1.4614	* 1.7933	* 1.6524	* 1.7412	* 1.6456	* 1.8175	* 1.1255	* .5634 *
	* 1.5982	* 1.3157	* 1.4073	* 1.3529	* 1.4085	* 1.2823	* 1.8841	* 3.7137 *
12	* 1.8121	* 1.6240	* 1.7439	* 1.6459	* 1.5585	* 1.8176	* .9568 *	
	* 1.2979	* 1.4290	* 1.3480	* 1.4083	* 1.4786	* 1.2754	* 2.2055 *	
13	* 1.4411	* 1.6263	* 1.5848	* 1.8179	* 1.8180	* 1.7195	* .7821 *	
	* 1.6027	* 1.4053	* 1.4570	* 1.2820	* 1.2752	* 1.3399	* 2.6749 *	
14	* 1.7978	* 1.8053	* 1.7392	* 1.1257	* .9568	* .7990	*	
	* 1.2774	* 1.2722	* 1.3238	* 1.8835	* 2.2053	* 2.6293	*	
15	* .8269	* .8594	* .8277	* .5635	* F-SUB-Q			
	* 2.5064	* 2.4010	* 2.5035	* 3.7127	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7692	* 1.4347	* 1.5252	* 1.4632	* 1.8211	* 1.4422	* 1.8108	* .8291 *
	* 1.4034	* 1.7031	* 1.5869	* 1.6493	* 1.3434	* 1.6708	* 1.3263	* 2.6125 *
9	* 1.4347	* 1.7522	* 1.6113	* 1.8029	* 1.6277	* 1.6318	* 1.8173	* .8610 *
	* 1.7031	* 1.4083	* 1.4991	* 1.3610	* 1.4837	* 1.4639	* 1.3209	* 2.5034 *
10	* 1.5252	* 1.6108	* 1.6068	* 1.6576	* 1.7546	* 1.5895	* 1.7502	* .8287 *
	* 1.5869	* 1.4996	* 1.5147	* 1.4595	* 1.3962	* 1.5146	* 1.3717	* 2.6078 *
11	* 1.4632	* 1.8032	* 1.6579	* 1.7523	* 1.6530	* 1.8319	* 1.1297	* .5632 *
	* 1.6493	* 1.3608	* 1.4593	* 1.4018	* 1.4623	* 1.3266	* 1.9543	* 3.8631 *
12	* 1.8211	* 1.6284	* 1.7552	* 1.6533	* 1.5663	* 1.8342	* .9604 *	
	* 1.3434	* 1.4831	* 1.3958	* 1.4620	* 1.5319	* 1.3158	* 2.2865 *	
13	* 1.4422	* 1.6335	* 1.5902	* 1.8323	* 1.8347	* 1.7344	* .7848 *	
	* 1.6708	* 1.4623	* 1.5138	* 1.3263	* 1.3155	* 1.3815	* 2.7699 *	
14	* 1.8108	* 1.8188	* 1.7510	* 1.1301	* .9605	* .8016	*	
	* 1.3263	* 1.3198	* 1.3711	* 1.9537	* 2.2863	* 2.7231	*	
15	* .8291	* .8613	* .8289	* .5634	* F-SUB-Q			
	* 2.6125	* 2.5026	* 2.6074	* 3.8620	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 44 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7526	* 1.4230	* 1.5117	* 1.4549	* 1.8068	* 1.4336	* 1.8009	* .8331 *
	* 1.3807	* 1.6730	* 1.5599	* 1.6145	* 1.3182	* 1.6356	* 1.3202	* 2.5716 *
9	* 1.4230	* 1.7334	* 1.6003	* 1.7890	* 1.6179	* 1.6241	* 1.8077	* .8688 *
	* 1.6730	* 1.3873	* 1.4701	* 1.3362	* 1.4539	* 1.4480	* 1.3168	* 2.4548 *
10	* 1.5117	* 1.5997	* 1.5960	* 1.6484	* 1.7444	* 1.5812	* 1.7402	* .8384 *
	* 1.5599	* 1.4705	* 1.4861	* 1.4298	* 1.3735	* 1.4958	* 1.3725	* 2.5600 *
11	* 1.4549	* 1.7893	* 1.6487	* 1.7420	* 1.6457	* 1.8227	* 1.1386	* .5651 *
	* 1.6145	* 1.3361	* 1.4296	* 1.3829	* 1.4447	* 1.3257	* 1.9200	* 3.8409 *
12	* 1.8068	* 1.6185	* 1.7450	* 1.6460	* 1.5610	* 1.8274	* .9699	* .9699 *
	* 1.3182	* 1.4533	* 1.3731	* 1.4444	* 1.5444	* 1.3344	* 2.2678	* 2.2678 *
13	* 1.4336	* 1.6259	* 1.5819	* 1.8232	* 1.8278	* 1.7284	* .7928	* .7928 *
	* 1.6356	* 1.4465	* 1.4950	* 1.3254	* 1.3341	* 1.4130	* 2.7817	* 2.7817 *
14	* 1.8009	* 1.8092	* 1.7410	* 1.1389	* .9700	* .8088		
	* 1.3202	* 1.3158	* 1.3719	* 1.9194	* 2.2675	* 2.7383		
15	* .8331	* .8693	* .8385	* .5652	* F-SUB-Q			
	* 2.5716	* 2.4539	* 2.5597	* 3.8397	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7753	* 1.4275	* 1.5206	* 1.4628	* 1.8351	* 1.4408	* 1.8361	* .8286 *
	* 1.3308	* 1.6286	* 1.5150	* 1.5694	* 1.2683	* 1.5905	* 1.2652	* 2.5229 *
9	* 1.4275	* 1.7536	* 1.6132	* 1.8191	* 1.6328	* 1.6441	* 1.8437	* .8593 *
	* 1.6286	* 1.3391	* 1.4249	* 1.2839	* 1.4076	* 1.3979	* 1.2614	* 2.4220 *
10	* 1.5206	* 1.6126	* 1.6096	* 1.6646	* 1.7746	* 1.5974	* 1.7736	* .8272 *
	* 1.5150	* 1.4254	* 1.4395	* 1.3833	* 1.3204	* 1.4460	* 1.3149	* 2.5310 *
11	* 1.4628	* 1.8194	* 1.6649	* 1.7719	* 1.6642	* 1.8581	* 1.1324	* .5581 *
	* 1.5694	* 1.2837	* 1.3831	* 1.3272	* 1.3941	* 1.2684	* 1.8837	* 3.7863 *
12	* 1.8351	* 1.6335	* 1.7752	* 1.6645	* 1.5797	* 1.8662	* .9610	* .9610 *
	* 1.2683	* 1.4070	* 1.3199	* 1.3939	* 1.4882	* 1.2735	* 2.2305	* 2.2305 *
13	* 1.4408	* 1.6459	* 1.5981	* 1.8585	* 1.8667	* 1.7644	* .7862	* .7862 *
	* 1.5905	* 1.3965	* 1.4453	* 1.2681	* 1.2732	* 1.3490	* 2.7301	* 2.7301 *
14	* 1.8361	* 1.8453	* 1.7744	* 1.1328	* .9610	* .8029		
	* 1.2652	* 1.2604	* 1.3143	* 1.8830	* 2.2302	* 2.6848		
15	* .8286	* .8596	* .8274	* .5583	* F-SUB-Q			
	* 2.5229	* 2.4213	* 2.5305	* 3.7851	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 45 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7795	* 1.4237	* 1.5183	* 1.4627	* 1.8439	* 1.4403	* 1.8510	* .8278 *
	* 1.2863	* 1.5774	* 1.4641	* 1.5140	* 1.2189	* 1.5348	* 1.2123	* 2.4335 *
9	* 1.4237	* 1.7558	* 1.6144	* 1.8285	* 1.6358	* 1.6514	* 1.8591	* .8557 *
	* 1.5774	* 1.2921	* 1.3743	* 1.2341	* 1.3568	* 1.3438	* 1.2086	* 2.3436 *
10	* 1.5183	* 1.6138	* 1.6110	* 1.6683	* 1.7848	* 1.6015	* 1.7874	* .8244 *
	* 1.4641	* 1.3748	* 1.3888	* 1.3337	* 1.2692	* 1.3932	* 1.2603	* 2.4461 *
11	* 1.4627	* 1.8288	* 1.6686	* 1.7818	* 1.6701	* 1.8728	* 1.1315	* .5544 *
	* 1.5140	* 1.2339	* 1.3335	* 1.2767	* 1.3436	* 1.2178	* 1.8179	* 3.6686 *
12	* 1.8439	* 1.6365	* 1.7855	* 1.6704	* 1.5869	* 1.8840	* .9578 *	
	* 1.2189	* 1.3562	* 1.2687	* 1.3434	* 1.4366	* 1.2228	* 2.1578 *	
13	* 1.4403	* 1.6531	* 1.6023	* 1.8733	* 1.8845	* 1.7818	* .7851 *	
	* 1.5348	* 1.3424	* 1.3925	* 1.2175	* 1.2225	* 1.2943	* 2.6355 *	
14	* 1.8510	* 1.8607	* 1.7883	* 1.1319	* .9579	* .8018	*	
	* 1.2123	* 1.2076	* 1.2597	* 1.8172	* 2.1575	* 2.5918	*	
15	* .8278	* .8562	* .8246	* .5546	* F-SUB-Q			
	* 2.4335	* 2.3424	* 2.4457	* 3.6674	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7730	* 1.4149	* 1.5103	* 1.4571	* 1.8409	* 1.4353	* 1.8528	* .8263 *
	* 1.2467	* 1.5335	* 1.4227	* 1.4692	* 1.1798	* 1.4887	* 1.1699	* 2.3565 *
9	* 1.4149	* 1.7467	* 1.6090	* 1.8250	* 1.6308	* 1.6513	* 1.8614	* .8568 *
	* 1.5335	* 1.2549	* 1.3329	* 1.1947	* 1.3154	* 1.2985	* 1.1659	* 2.2623 *
10	* 1.5103	* 1.6083	* 1.6054	* 1.6639	* 1.7829	* 1.5985	* 1.7889	* .8241 *
	* 1.4227	* 1.3334	* 1.3470	* 1.2923	* 1.2271	* 1.3484	* 1.2159	* 2.3645 *
11	* 1.4571	* 1.8253	* 1.6642	* 1.7798	* 1.6671	* 1.8743	* 1.1326	* .5527 *
	* 1.4692	* 1.1945	* 1.2921	* 1.2344	* 1.2997	* 1.1740	* 1.7533	* 3.5547 *
12	* 1.8409	* 1.6316	* 1.7836	* 1.6675	* 1.5862	* 1.8881	* .9601 *	
	* 1.1798	* 1.3148	* 1.2266	* 1.2994	* 1.3862	* 1.1761	* 2.0763 *	
13	* 1.4353	* 1.6530	* 1.5993	* 1.8748	* 1.8885	* 1.7863	* .7859 *	
	* 1.4887	* 1.2971	* 1.3478	* 1.1737	* 1.1758	* 1.2435	* 2.5375 *	
14	* 1.8528	* 1.8630	* 1.7897	* 1.1330	* .9602	* .8024	*	
	* 1.1699	* 1.1650	* 1.2153	* 1.7526	* 2.0760	* 2.4962	*	
15	* .8263	* .8572	* .8243	* .5529	* F-SUB-Q			
	* 2.3565	* 2.2615	* 2.3640	* 3.5535	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 46 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7500	* 1.3991	* 1.4926	* 1.4444	* 1.8206	* 1.4235	* 1.8360	* .8276 *
	* 1.3198	* 1.6222	* 1.5077	* 1.5529	* 1.2493	* 1.5727	* 1.2358	* 2.4651 *
9	* 1.3991	* 1.7219	* 1.5932	* 1.8027	* 1.6151	* 1.6402	* 1.8448	* .8613 *
	* 1.6222	* 1.3316	* 1.4101	* 1.2665	* 1.3912	* 1.3688	* 1.2313	* 2.3577 *
10	* 1.4926	* 1.5925	* 1.5889	* 1.6481	* 1.7621	* 1.5847	* 1.7722	* .8302 *
	* 1.5077	* 1.4107	* 1.4256	* 1.3656	* 1.2993	* 1.4239	* 1.2840	* 2.4579 *
11	* 1.4444	* 1.8030	* 1.6485	* 1.7587	* 1.6524	* 1.8567	* 1.1367	* .5532 *
	* 1.5529	* 1.2663	* 1.3653	* 1.3069	* 1.3716	* 1.2385	* 1.8274	* 3.7183 *
12	* 1.8206	* 1.6159	* 1.7628	* 1.6528	* 1.5748	* 1.8723	* .9653 *	
	* 1.2493	* 1.3905	* 1.2988	* 1.3713	* 1.4576	* 1.2374	* 2.1580	*
13	* 1.4235	* 1.6418	* 1.5855	* 1.8572	* 1.8728	* 1.7732	* .7905 *	
	* 1.5727	* 1.3674	* 1.4232	* 1.2382	* 1.2371	* 1.3061	* 2.6335 *	
14	* 1.8360	* 1.8463	* 1.7731	* 1.1372	* .9654	* .8059 *		
	* 1.2358	* 1.2303	* 1.2834	* 1.8267	* 2.1578	* 2.5943 *		
15	* .8276	* .8617	* .8304	* .5534	* F-SUB-Q			
	* 2.4651	* 2.3568	* 2.4576	* 3.7170	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7633	* 1.3957	* 1.4941	* 1.4435	* 1.8392	* 1.4234	* 1.8613	* .8163 *
	* 1.2599	* 1.5696	* 1.4582	* 1.5069	* 1.1990	* 1.5265	* 1.1824	* 2.4273 *
9	* 1.3957	* 1.7330	* 1.5972	* 1.8209	* 1.6199	* 1.6513	* 1.8706	* .8436 *
	* 1.5696	* 1.2771	* 1.3625	* 1.2141	* 1.3442	* 1.3188	* 1.1775	* 2.3380 *
10	* 1.4941	* 1.5965	* 1.5928	* 1.6533	* 1.7781	* 1.5913	* 1.7960	* .8126 *
	* 1.4582	* 1.3630	* 1.3771	* 1.3188	* 1.2455	* 1.3735	* 1.2273	* 2.4380 *
11	* 1.4435	* 1.8212	* 1.6536	* 1.7738	* 1.6588	* 1.8798	* 1.1212	* .5415 *
	* 1.5069	* 1.2139	* 1.3186	* 1.2518	* 1.3203	* 1.1813	* 1.7928	* 3.6887 *
12	* 1.8392	* 1.6207	* 1.7788	* 1.6592	* 1.5829	* 1.8985	* .9465 *	
	* 1.1990	* 1.3436	* 1.2450	* 1.3200	* 1.3952	* 1.1750	* 2.1251 *	
13	* 1.4234	* 1.6530	* 1.5920	* 1.8803	* 1.8990	* 1.7986	* .7766 *	
	* 1.5265	* 1.3174	* 1.3728	* 1.1810	* 1.1748	* 1.2391	* 2.5858 *	
14	* 1.8613	* 1.8722	* 1.7969	* 1.1216	* .9466 *	* .7927 *		
	* 1.1824	* 1.1765	* 1.2268	* 1.7920	* 2.1248	* 2.5440 *		
15	* .8163	* .8438	* .8128	* .5417	* F-SUB-Q			
	* 2.4273	* 2.3374	* 2.4375	* 3.6873	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 47 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7422	* 1.3767	* 1.4765	* 1.4257	* 1.8205	* 1.4078	* 1.8464	* .8053
	* 1.2226	* 1.5304	* 1.4224	* 1.4715	* 1.1675	* 1.4886	* 1.1485	* 2.3743
9	* 1.3767	* 1.7105	* 1.5797	* 1.7998	* 1.6012	* 1.6383	* 1.8560	* .8323
	* 1.5304	* 1.2447	* 1.3283	* 1.1840	* 1.3113	* 1.2812	* 1.1434	* 2.2862
10	* 1.4765	* 1.5790	* 1.5746	* 1.6345	* 1.7555	* 1.5752	* 1.7817	* .8017
	* 1.4224	* 1.3288	* 1.3433	* 1.2859	* 1.2153	* 1.3371	* 1.1917	* 2.3837
11	* 1.4257	* 1.8001	* 1.6348	* 1.7505	* 1.6397	* 1.8622	* 1.1078	* .5330
	* 1.4715	* 1.1838	* 1.2857	* 1.2213	* 1.2861	* 1.1470	* 1.7478	* 3.6156
12	* 1.8205	* 1.6020	* 1.7562	* 1.6401	* 1.5673	* 1.8823	* .9338	*
	* 1.1675	* 1.3106	* 1.2148	* 1.2858	* 1.3515	* 1.1376	* 2.0728	*
13	* 1.4078	* 1.6400	* 1.5760	* 1.8627	* 1.8827	* 1.7854	* .7663	*
	* 1.4886	* 1.2799	* 1.3365	* 1.1467	* 1.1373	* 1.1979	* 2.5198	*
14	* 1.8464	* 1.8577	* 1.7825	* 1.1082	* .9339	* .7822	*	*
	* 1.1485	* 1.1425	* 1.1912	* 1.7470	* 2.0726	* 2.4792	*	*
15	* .8053	* .8326	* .8019	* .5332	* F-SUB-Q			
	* 2.3743	* 2.2858	* 2.3832	* 3.6143	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6746	* 1.3360	* 1.4339	* 1.3843	* 1.7515	* 1.3704	* 1.7771	* .7911
	* 1.2297	* 1.5267	* 1.4197	* 1.4694	* 1.1749	* 1.4827	* 1.1558	* 2.3444
9	* 1.3360	* 1.6433	* 1.5334	* 1.7259	* 1.5505	* 1.5916	* 1.7867	* .8241
	* 1.5267	* 1.2543	* 1.3263	* 1.1961	* 1.3124	* 1.2778	* 1.1503	* 2.2399
10	* 1.4339	* 1.5327	* 1.5271	* 1.5836	* 1.6819	* 1.5286	* 1.7157	* .7955
	* 1.4197	* 1.3268	* 1.3426	* 1.2856	* 1.2285	* 1.3349	* 1.1982	* 2.3298
11	* 1.3843	* 1.7262	* 1.5839	* 1.6765	* 1.5862	* 1.7900	* 1.0923	* .5260
	* 1.4694	* 1.1959	* 1.2853	* 1.2344	* 1.2871	* 1.1541	* 1.7170	* 3.5549
12	* 1.7515	* 1.5513	* 1.6825	* 1.5866	* 1.5194	* 1.8087	* .9237	*
	* 1.1749	* 1.3118	* 1.2280	* 1.2868	* 1.3474	* 1.1434	* 2.0283	*
13	* 1.3704	* 1.5933	* 1.5293	* 1.7905	* 1.8092	* 1.7192	* .7566	*
	* 1.4827	* 1.2764	* 1.3342	* 1.1538	* 1.1431	* 1.2010	* 2.4690	*
14	* 1.7771	* 1.7883	* 1.7166	* 1.0927	* .9238	* .7713	*	*
	* 1.1558	* 1.1493	* 1.1976	* 1.7164	* 2.0280	* 2.4327	*	*
15	* .7911	* .8245	* .7959	* .5261	* F-SUB-Q			
	* 2.3444	* 2.2390	* 2.3291	* 3.5537	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 48 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6189	* 1.2941	* 1.3971	* 1.3378	* 1.6928	* 1.3282	* 1.7186	* .7532 *
	* 1.2381	* 1.5353	* 1.4201	* 1.4821	* 1.1847	* 1.4912	* 1.1638	* 2.4019 *
9	* 1.2941	* 1.5892	* 1.4905	* 1.6641	* 1.5017	* 1.5450	* 1.7284	* .7808 *
	* 1.5353	* 1.2635	* 1.3303	* 1.2084	* 1.3204	* 1.2823	* 1.1579	* 2.3060 *
10	* 1.3971	* 1.4898	* 1.4845	* 1.5348	* 1.6172	* 1.4843	* 1.6607	* .7514 *
	* 1.4201	* 1.3308	* 1.3459	* 1.2926	* 1.2446	* 1.3391	* 1.2053	* 2.4062 *
11	* 1.3378	* 1.6644	* 1.5351	* 1.6085	* 1.5343	* 1.7279	* 1.0394	* .5000 *
	* 1.4821	* 1.2082	* 1.2924	* 1.2528	* 1.2957	* 1.1632	* 1.7580	* 3.6488 *
12	* 1.6928	* 1.5025	* 1.6178	* 1.5346	* 1.4706	* 1.7437	* .8745 *	
	* 1.1847	* 1.3197	* 1.2442	* 1.2954	* 1.3543	* 1.1530	* 2.0867 *	
13	* 1.3282	* 1.5467	* 1.4851	* 1.7284	* 1.7442	* 1.6604	* .7162 *	
	* 1.4912	* 1.2808	* 1.3384	* 1.1629	* 1.1527	* 1.2086	* 2.5399 *	
14	* 1.7186	* 1.7299	* 1.6616	* 1.0398	* .8746	* .7307	*	
	* 1.1638	* 1.1569	* 1.2047	* 1.7573	* 2.0864	* 2.5002	*	
15	* .7532	* .7812	* .7516	* .5002	* F-SUB-Q			
	* 2.4019	* 2.3051	* 2.4056	* 3.6475	* M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4716	* 1.2008	* 1.2968	* 1.2344	* 1.5324	* 1.2254	* 1.5529	* .6952 *
	* 1.3336	* 1.6208	* 1.4990	* 1.5740	* 1.2812	* 1.5837	* 1.2611	* 2.5526 *
9	* 1.2008	* 1.4496	* 1.3797	* 1.5104	* 1.3848	* 1.4209	* 1.5625	* .7182 *
	* 1.6208	* 1.3569	* 1.4077	* 1.3036	* 1.4022	* 1.3668	* 1.2540	* 2.4591 *
10	* 1.2968	* 1.3791	* 1.3710	* 1.4190	* 1.4686	* 1.3707	* 1.5031	* .6909 *
	* 1.4990	* 1.4082	* 1.4276	* 1.3690	* 1.3423	* 1.4199	* 1.3044	* 2.5669 *
11	* 1.2344	* 1.5107	* 1.4192	* 1.4575	* 1.4121	* 1.5613	* .9539	* .4608 *
	* 1.5740	* 1.3034	* 1.3687	* 1.3540	* 1.3782	* 1.2596	* 1.8774	* 3.8871 *
12	* 1.5324	* 1.3855	* 1.4691	* 1.4124	* 1.3475	* 1.5698	* .8040 *	
	* 1.2812	* 1.4015	* 1.3419	* 1.3779	* 1.4465	* 1.2527	* 2.2239 *	
13	* 1.2254	* 1.4226	* 1.3713	* 1.5618	* 1.5703	* 1.4960	* .6557 *	
	* 1.5837	* 1.3651	* 1.4192	* 1.2593	* 1.2523	* 1.3121	* 2.7187 *	
14	* 1.5529	* 1.5640	* 1.5038	* .9542	* .8041	* .6688	*	
	* 1.2611	* 1.2529	* 1.3038	* 1.8767	* 2.2236	* 2.6768	*	
15	* .6952	* .7187	* .6911	* .4609	* F-SUB-Q			
	* 2.5526	* 2.4578	* 2.5663	* 3.8857	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 49 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 200 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2243 *	* .9929 *	* 1.0634 *	* 1.0130 *	* 1.2635 *	* .9982 *	* 1.2832 *	* .5741 *
	* 1.5795 *	* 1.9293 *	* 1.7991 *	* 1.8882 *	* 1.5307 *	* 1.9136 *	* 1.5030 *	* 3.0487 *
9	* .9929 *	* 1.2410 *	* 1.1328 *	* 1.2923 *	* 1.1108 *	* 1.1497 *	* 1.2917 *	* .5915 *
	* 1.9293 *	* 1.5618 *	* 1.6875 *	* 1.4998 *	* 1.7202 *	* 1.6621 *	* 1.4937 *	* 2.9443 *
10	* 1.0634 *	* 1.1324 *	* 1.0921 *	* 1.1672 *	* 1.2677 *	* 1.1184 *	* 1.2233 *	* .5647 *
	* 1.7991 *	* 1.6882 *	* 1.7635 *	* 1.6376 *	* 1.5291 *	* 1.7127 *	* 1.5779 *	* 3.0971 *
11	* 1.0130 *	* 1.2925 *	* 1.1674 *	* 1.2640 *	* 1.1300 *	* 1.2902 *	* .7804 *	* .3815 *
	* 1.8882 *	* 1.4995 *	* 1.6373 *	* 1.5354 *	* 1.6943 *	* 1.5001 *	* 2.2608 *	* 4.6342 *
12	* 1.2635 *	* 1.1113 *	* 1.2681 *	* 1.1302 *	* 1.0589 *	* 1.2961 *	* .6666 *	
	* 1.5307 *	* 1.7194 *	* 1.5286 *	* 1.6939 *	* 1.8108 *	* 1.4932 *	* 2.6430 *	
13	* .9982 *	* 1.1512 *	* 1.1190 *	* 1.2905 *	* 1.2964 *	* 1.1714 *	* .5314 *	
	* 1.9136 *	* 1.6600 *	* 1.7118 *	* 1.4998 *	* 1.4928 *	* 1.6497 *	* 3.3074 *	
14	* 1.2832 *	* 1.2927 *	* 1.2238 *	* .7806 *	* .6667 *	* .5414 *		
	* 1.5030 *	* 1.4925 *	* 1.5772 *	* 2.2601 *	* 2.6424 *	* 3.2601 *		
15	* .5741 *	* .5918 *	* .5649 *	* .3816 *	F-SUB-Q			
	* 3.0487 *	* 2.9429 *	* 3.0966 *	* 4.6327 *	M-SUB-Q			

AT 100% POWER, 200 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5290 *	* .4507 *	* .4459 *	* .4564 *	* .5396 *	* .4466 *	* .4914 *	* .2523 *
	* 3.6173 *	* 4.2064 *	* 4.2408 *	* 4.1453 *	* 3.5457 *	* 4.2325 *	* 3.8841 *	* 6.8748 *
9	* .4507 *	* .5213 *	* .4708 *	* .5486 *	* .4639 *	* .4648 *	* .4933 *	* .2553 *
	* 4.2064 *	* 3.6768 *	* 4.0133 *	* 3.4940 *	* 4.0707 *	* 4.0644 *	* 3.8703 *	* 6.7630 *
10	* .4459 *	* .4706 *	* .4467 *	* .4880 *	* .5472 *	* .4637 *	* .4641 *	* .2408 *
	* 4.2408 *	* 4.0143 *	* 4.2597 *	* 3.8692 *	* 3.5031 *	* 4.0826 *	* 4.1165 *	* 7.2008 *
11	* .4564 *	* .5487 *	* .4881 *	* .5441 *	* .4629 *	* .5168 *	* .3419 *	* .1700 *
	* 4.1453 *	* 3.4934 *	* 3.8687 *	* 3.5266 *	* 4.0856 *	* 3.7050 *	* 5.1092 *	* 10.3139 *
12	* .5396 *	* .4641 *	* .5474 *	* .4630 *	* .4336 *	* .4941 *	* .2864 *	
	* 3.5457 *	* 4.0689 *	* 3.5021 *	* 4.0848 *	* 4.3743 *	* 3.8746 *	* 6.0949 *	
13	* .4466 *	* .4654 *	* .4639 *	* .5170 *	* .4943 *	* .4361 *	* .2248 *	
	* 4.2325 *	* 4.0591 *	* 4.0804 *	* 3.7040 *	* 3.8735 *	* 4.3874 *	* 7.7495 *	
14	* .4914 *	* .4937 *	* .4643 *	* .3420 *	* .2865 *	* .2283 *		
	* 3.8841 *	* 3.8671 *	* 4.1145 *	* 5.1080 *	* 6.0926 *	* 7.6632 *		
15	* .2523 *	* .2554 *	* .2409 *	* .1701 *	F-SUB-Q			
	* 6.8748 *	* 6.7604 *	* 7.1988 *	* 10.3099 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 50 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5382 *	* .5442 *	* .5509 *	* .5526 *	* .6266 *	* .5399 *	* .5576 *	* .3205 *
	* 2.9496 *	* 3.2760 *	* 3.3917 *	* 3.2806 *	* 3.0149 *	* 3.3110 *	* 3.3309 *	* 5.0029 *
9	* .5442 *	* .6172 *	* .5705 *	* .6329 *	* .5546 *	* .5436 *	* .5576 *	* .3209 *
	* 3.2760 *	* 3.1433 *	* 3.2419 *	* 3.0381 *	* 3.2706 *	* 3.2937 *	* 3.3465 *	* 5.0531 *
10	* .5509 *	* .5704 *	* .5446 *	* .5765 *	* .6294 *	* .5458 *	* .5354 *	* .3043 *
	* 3.3917 *	* 3.2424 *	* 3.4120 *	* 3.1936 *	* 3.0928 *	* 3.3816 *	* 3.5630 *	* 5.5143 *
11	* .5526 *	* .6330 *	* .5766 *	* .6250 *	* .5381 *	* .5784 *	* .4070 *	* .2412 *
	* 3.2806 *	* 3.0378 *	* 3.1933 *	* 3.1420 *	* 3.4084 *	* 3.3282 *	* 4.3446 *	* 7.1860 *
12	* .6266 *	* .5547 *	* .6295 *	* .5381 *	* .4632 *	* .5217 *	* .3471 *	
	* 3.0149 *	* 3.2697 *	* 3.0922 *	* 3.4081 *	* 3.4727 *	* 3.4163 *	* 4.8410 *	
13	* .5399 *	* .5443 *	* .5459 *	* .5785 *	* .5217 *	* .4705 *	* .2731 *	
	* 3.3110 *	* 3.2894 *	* 3.3803 *	* 3.3281 *	* 3.4165 *	* 3.7382 *	* 6.0205 *	
14	* .5576 *	* .5581 *	* .5355 *	* .4069 *	* .3469 *	* .2779 *		
	* 3.3309 *	* 3.3439 *	* 3.5620 *	* 4.3452 *	* 4.8428 *	* 6.0023 *		
15	* .3205 *	* .3210 *	* .3043 *	* .2412 *	* F-SUB-Q			
	* 5.0029 *	* 5.0553 *	* 5.5150 *	* 7.1863 *	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1610 *	* 1.0457 *	* 1.1176 *	* 1.0568 *	* 1.2137 *	* 1.0349 *	* 1.1975 *	* .6426 *
	* 1.5998 *	* 1.7683 *	* 1.7087 *	* 1.7575 *	* 1.5943 *	* 1.7720 *	* 1.5907 *	* 2.5614 *
9	* 1.0457 *	* 1.2355 *	* 1.1577 *	* 1.2480 *	* 1.1337 *	* 1.1206 *	* 1.1994 *	* .6608 *
	* 1.7683 *	* 1.6070 *	* 1.6373 *	* 1.5771 *	* 1.6396 *	* 1.6341 *	* 1.5952 *	* 2.5184 *
10	* 1.1176 *	* 1.1575 *	* 1.1263 *	* 1.1732 *	* 1.2230 *	* 1.1213 *	* 1.1577 *	* .6327 *
	* 1.7087 *	* 1.6376 *	* 1.6908 *	* 1.6084 *	* 1.6319 *	* 1.6883 *	* 1.6872 *	* 2.7198 *
11	* 1.0568 *	* 1.2481 *	* 1.1733 *	* 1.2217 *	* 1.1305 *	* 1.2039 *	* .8140 *	* .4758 *
	* 1.7575 *	* 1.5770 *	* 1.6083 *	* 1.6233 *	* 1.6578 *	* 1.6306 *	* 2.2023 *	* 3.7332 *
12	* 1.2137 *	* 1.1340 *	* 1.2232 *	* 1.1306 *	* 1.0227 *	* 1.1712 *	* .7189 *	
	* 1.5943 *	* 1.6392 *	* 1.6316 *	* 1.6577 *	* 1.7275 *	* 1.6080 *	* 2.3865 *	
13	* 1.0349 *	* 1.1217 *	* 1.1216 *	* 1.2040 *	* 1.1712 *	* 1.0723 *	* .5867 *	
	* 1.7720 *	* 1.6324 *	* 1.6876 *	* 1.6306 *	* 1.6080 *	* 1.7451 *	* 2.8681 *	
14	* 1.1975 *	* 1.2001 *	* 1.1580 *	* .8139 *	* .7186 *	* .5909 *		
	* 1.5907 *	* 1.5943 *	* 1.6868 *	* 2.2027 *	* 2.3872 *	* 2.8902 *		
15	* .6426 *	* .6610 *	* .6326 *	* .4758 *	* F-SUB-Q			
	* 2.5614 *	* 2.5190 *	* 2.7204 *	* 3.7335 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 51 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4317	* 1.2435	* 1.3092	* 1.2403	* 1.4443	* 1.2189	* 1.4216	* .7585
	* 1.3836	* 1.5373	* 1.4804	* 1.5192	* 1.3589	* 1.5270	* 1.3575	* 2.2008
9	* 1.2435	* 1.4423	* 1.3536	* 1.4560	* 1.3586	* 1.3239	* 1.4244	* .7898
	* 1.5373	* 1.3856	* 1.4209	* 1.3692	* 1.3886	* 1.4021	* 1.3607	* 2.1323
10	* 1.3092	* 1.3533	* 1.3460	* 1.3809	* 1.4273	* 1.3227	* 1.3794	* .7647
	* 1.4804	* 1.4211	* 1.4362	* 1.3864	* 1.4226	* 1.4509	* 1.4356	* 2.2823
11	* 1.2403	* 1.4561	* 1.3811	* 1.4284	* 1.3654	* 1.4389	* .9829	* .5570
	* 1.5192	* 1.3692	* 1.3863	* 1.4103	* 1.3966	* 1.3872	* 1.8468	* 3.2347
12	* 1.4443	* 1.3588	* 1.4275	* 1.3655	* 1.2846	* 1.4202	* .8667	*
	* 1.3589	* 1.3883	* 1.4224	* 1.3965	* 1.4578	* 1.3693	* 2.0156	*
13	* 1.2189	* 1.3251	* 1.3231	* 1.4389	* 1.4203	* 1.3173	* .7064	*
	* 1.5270	* 1.4009	* 1.4503	* 1.3871	* 1.3693	* 1.4605	* 2.4305	*
14	* 1.4216	* 1.4253	* 1.3797	* .9827	* .8665	* .7179	*	*
	* 1.3575	* 1.3599	* 1.4353	* 1.8471	* 2.0161	* 2.4272	*	*
15	* .7585	* .7900	* .7646	* .5569	* F-SUB-Q			
	* 2.2008	* 2.1330	* 2.2828	* 3.2349	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5907	* 1.3449	* 1.4110	* 1.3394	* 1.5981	* 1.3099	* 1.5814	* .8051
	* 1.2734	* 1.4519	* 1.3939	* 1.4241	* 1.2420	* 1.4371	* 1.2332	* 2.0970
9	* 1.3449	* 1.5978	* 1.4645	* 1.6227	* 1.4755	* 1.4393	* 1.5853	* .8379
	* 1.4519	* 1.2768	* 1.3295	* 1.2438	* 1.2955	* 1.3034	* 1.2353	* 2.0329
10	* 1.4110	* 1.4642	* 1.4568	* 1.5014	* 1.5973	* 1.4356	* 1.5341	* .8086
	* 1.3939	* 1.3297	* 1.3444	* 1.2895	* 1.2883	* 1.3524	* 1.3037	* 2.1828
11	* 1.3394	* 1.6228	* 1.5015	* 1.6007	* 1.4933	* 1.6093	* 1.0509	* .5865
	* 1.4241	* 1.2437	* 1.2894	* 1.2768	* 1.2968	* 1.2590	* 1.7507	* 3.1064
12	* 1.5981	* 1.4758	* 1.5976	* 1.4934	* 1.4056	* 1.5975	* .9231	*
	* 1.2420	* 1.2952	* 1.2881	* 1.2967	* 1.3596	* 1.2414	* 1.9251	*
13	* 1.3099	* 1.4404	* 1.4360	* 1.6094	* 1.5977	* 1.4772	* .7521	*
	* 1.4371	* 1.3024	* 1.3519	* 1.2589	* 1.2414	* 1.3283	* 2.3258	*
14	* 1.5814	* 1.5862	* 1.5344	* 1.0507	* .9229	* .7675	*	*
	* 1.2332	* 1.2346	* 1.3035	* 1.7510	* 1.9254	* 2.3132	*	*
15	* .8051	* .8381	* .8084	* .5864	* F-SUB-Q			
	* 2.0970	* 2.0336	* 2.1834	* 3.1066	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 52 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6438	* 1.3753	* 1.4381	* 1.3680	* 1.6477	* 1.3331	* 1.6358	* .8238 *
	* 1.2553	* 1.4457	* 1.3896	* 1.4127	* 1.2197	* 1.4300	* 1.2059	* 2.0752 *
9	* 1.3753	* 1.6522	* 1.4968	* 1.6843	* 1.5129	* 1.4729	* 1.6401	* .8569 *
	* 1.4457	* 1.2571	* 1.3156	* 1.2127	* 1.2800	* 1.2885	* 1.2074	* 2.0125 *
10	* 1.4381	* 1.4965	* 1.4893	* 1.5416	* 1.6681	* 1.4701	* 1.5866	* .8271 *
	* 1.3896	* 1.3158	* 1.3328	* 1.2702	* 1.2503	* 1.3367	* 1.2743	* 2.1594 *
11	* 1.3680	* 1.6844	* 1.5417	* 1.6732	* 1.5379	* 1.6710	* 1.0802	* .5960 *
	* 1.4128	* 1.2126	* 1.2701	* 1.2401	* 1.2792	* 1.2315	* 1.7293	* 3.0918 *
12	* 1.6477	* 1.5132	* 1.6683	* 1.5381	* 1.4431	* 1.6632	* .9491 *	
	* 1.2197	* 1.2797	* 1.2501	* 1.2791	* 1.3478	* 1.2136	* 1.9055 *	
13	* 1.3331	* 1.4739	* 1.4705	* 1.6711	* 1.6633	* 1.5353	* .7722 *	
	* 1.4300	* 1.2875	* 1.3362	* 1.2314	* 1.2135	* 1.3016	* 2.3089 *	
14	* 1.6358	* 1.6409	* 1.5868	* 1.0800	* .9489	* .7884	*	
	* 1.2059	* 1.2068	* 1.2740	* 1.7295	* 1.9056	* 2.2950	*	
15	* .8238	* .8572	* .8269	* .5960	* F-SUB-Q			
	* 2.0752	* 2.0130	* 2.1600	* 3.0919	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6550	* 1.3783	* 1.4377	* 1.3697	* 1.6559	* 1.3307	* 1.6464	* .8285 *
	* 1.2650	* 1.4634	* 1.4056	* 1.4310	* 1.2308	* 1.4531	* 1.2139	* 2.0927 *
9	* 1.3783	* 1.6658	* 1.4994	* 1.6999	* 1.5174	* 1.4751	* 1.6512	* .8617 *
	* 1.4634	* 1.2659	* 1.3294	* 1.2173	* 1.2929	* 1.3029	* 1.2146	* 2.0293 *
10	* 1.4377	* 1.4990	* 1.4922	* 1.5487	* 1.6893	* 1.4743	* 1.5966	* .8352 *
	* 1.4056	* 1.3296	* 1.3480	* 1.2795	* 1.2445	* 1.3493	* 1.2809	* 2.1664 *
11	* 1.3697	* 1.7000	* 1.5489	* 1.6958	* 1.5475	* 1.6866	* 1.0906	* .5966 *
	* 1.4310	* 1.2172	* 1.2794	* 1.2388	* 1.2876	* 1.2365	* 1.7303	* 3.1238 *
12	* 1.6559	* 1.5177	* 1.6895	* 1.5477	* 1.4483	* 1.6806	* .9583 *	
	* 1.2308	* 1.2926	* 1.2444	* 1.2874	* 1.3656	* 1.2231	* 1.9192 *	
13	* 1.3307	* 1.4761	* 1.4746	* 1.6867	* 1.6807	* 1.5497	* .7814 *	
	* 1.4531	* 1.3020	* 1.3489	* 1.2364	* 1.2230	* 1.3162	* 2.3302 *	
14	* 1.6464	* 1.6520	* 1.5968	* 1.0904	* .9581	* .7964	*	
	* 1.2139	* 1.2141	* 1.2806	* 1.7304	* 1.9193	* 2.3201	*	
15	* .8285	* .8620	* .8350	* .5966	* F-SUB-Q			
	* 2.0927	* 2.0299	* 2.1669	* 3.1239	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 53 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6682	* 1.3785	* 1.4385	* 1.3696	* 1.6664	* 1.3264	* 1.6607	* .8223
	* 1.2709	* 1.4805	* 1.4126	* 1.4559	* 1.2437	* 1.4830	* 1.2231	* 2.1445
9	* 1.3785	* 1.6841	* 1.5027	* 1.7191	* 1.5210	* 1.4780	* 1.6661	* .8542
	* 1.4805	* 1.2649	* 1.3453	* 1.2220	* 1.3094	* 1.3212	* 1.2228	* 2.0815
10	* 1.4385	* 1.5023	* 1.4957	* 1.5549	* 1.7102	* 1.4770	* 1.6101	* .8247
	* 1.4126	* 1.3456	* 1.3597	* 1.2923	* 1.2381	* 1.3632	* 1.2869	* 2.2274
11	* 1.3696	* 1.7192	* 1.5550	* 1.7175	* 1.5554	* 1.7039	* 1.0843	* .5890
	* 1.4559	* 1.2220	* 1.2922	* 1.2338	* 1.2926	* 1.2359	* 1.7497	* 3.2011
12	* 1.6664	* 1.5213	* 1.7104	* 1.5556	* 1.4523	* 1.6995	* .9513	*
	* 1.2437	* 1.3091	* 1.2379	* 1.2925	* 1.3833	* 1.2283	* 1.9614	*
13	* 1.3264	* 1.4790	* 1.4773	* 1.7040	* 1.6997	* 1.5655	* .7744	*
	* 1.4830	* 1.3203	* 1.3628	* 1.2359	* 1.2282	* 1.3237	* 2.3899	*
14	* 1.6607	* 1.6669	* 1.6104	* 1.0842	* .9512	* .7898	*	*
	* 1.2231	* 1.2222	* 1.2867	* 1.7498	* 1.9614	* 2.3779	*	*
15	* .8223	* .8545	* .8246	* .5890	* F-SUB-Q			
	* 2.1445	* 2.0820	* 2.2279	* 3.2011	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6690	* 1.3728	* 1.4320	* 1.3634	* 1.6644	* 1.3167	* 1.6608	* .8173
	* 1.2869	* 1.5065	* 1.4412	* 1.4913	* 1.2703	* 1.5248	* 1.2472	* 2.2016
9	* 1.3728	* 1.6874	* 1.4980	* 1.7230	* 1.5161	* 1.4726	* 1.6666	* .8478
	* 1.5065	* 1.2805	* 1.3670	* 1.2408	* 1.3367	* 1.3514	* 1.2456	* 2.1395
10	* 1.4320	* 1.4976	* 1.4907	* 1.5519	* 1.7151	* 1.4718	* 1.6100	* .8183
	* 1.4412	* 1.3673	* 1.3815	* 1.3118	* 1.2532	* 1.3833	* 1.3069	* 2.2851
11	* 1.3634	* 1.7231	* 1.5520	* 1.7231	* 1.5532	* 1.7062	* 1.0786	* .5832
	* 1.4913	* 1.2408	* 1.3117	* 1.2467	* 1.3119	* 1.2498	* 1.7842	* 3.2660
12	* 1.6644	* 1.5164	* 1.7153	* 1.5534	* 1.4478	* 1.7029	* .9456	*
	* 1.2703	* 1.3364	* 1.2531	* 1.3117	* 1.4026	* 1.2405	* 1.9940	*
13	* 1.3167	* 1.4735	* 1.4721	* 1.7062	* 1.7031	* 1.5671	* .7694	*
	* 1.5248	* 1.3505	* 1.3829	* 1.2497	* 1.2403	* 1.3409	* 2.4351	*
14	* 1.6608	* 1.6674	* 1.6102	* 1.0786	* .9454	* .7847	*	*
	* 1.2472	* 1.2451	* 1.3068	* 1.7843	* 1.9940	* 2.4231	*	*
15	* .8173	* .8481	* .8181	* .5832	* F-SUB-Q			
	* 2.2016	* 2.1401	* 2.2856	* 3.2661	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 54 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6743	* 1.3693	* 1.4291	* 1.3590	* 1.6669	* 1.3096	* 1.6651	* .8103
	* 1.3189	* 1.5499	* 1.4729	* 1.5316	* 1.2996	* 1.5714	* 1.2741	* 2.2754
9	* 1.3693	* 1.6949	* 1.4962	* 1.7309	* 1.5135	* 1.4705	* 1.6715	* .8391
	* 1.5499	* 1.3056	* 1.3949	* 1.2614	* 1.3679	* 1.3853	* 1.2711	* 2.2142
10	* 1.4291	* 1.4958	* 1.4887	* 1.5513	* 1.7232	* 1.4688	* 1.6142	* .8100
	* 1.4729	* 1.3953	* 1.4084	* 1.3373	* 1.2669	* 1.4103	* 1.3289	* 2.3589
11	* 1.3590	* 1.7310	* 1.5514	* 1.7316	* 1.5530	* 1.7123	* 1.0709	* .5752
	* 1.5316	* 1.2614	* 1.3372	* 1.2687	* 1.3425	* 1.2735	* 1.8257	* 3.3658
12	* 1.6669	* 1.5138	* 1.7234	* 1.5531	* 1.4456	* 1.7101	* .9371	*
	* 1.2996	* 1.3676	* 1.2668	* 1.3424	* 1.4389	* 1.2633	* 2.0561	*
13	* 1.3096	* 1.4713	* 1.4691	* 1.7124	* 1.7103	* 1.5718	* .7615	*
	* 1.5714	* 1.3844	* 1.4100	* 1.2734	* 1.2631	* 1.3658	* 2.5125	*
14	* 1.6651	* 1.6723	* 1.6144	* 1.0709	* .9370	* .7779	*	*
	* 1.2741	* 1.2705	* 1.3287	* 1.8257	* 2.0561	* 2.4960	*	*
15	* .8103	* .8392	* .8099	* .5752	* F-SUB-Q			
	* 2.2754	* 2.2154	* 2.3594	* 3.3658	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6530	* 1.3595	* 1.4117	* 1.3446	* 1.6431	* 1.2931	* 1.6408	* .8106
	* 1.3758	* 1.6052	* 1.5268	* 1.5932	* 1.3579	* 1.6396	* 1.3310	* 2.3420
9	* 1.3595	* 1.6751	* 1.4804	* 1.7076	* 1.4956	* 1.4529	* 1.6477	* .8418
	* 1.6052	* 1.3506	* 1.4476	* 1.3135	* 1.4219	* 1.4426	* 1.3265	* 2.2719
10	* 1.4117	* 1.4800	* 1.4707	* 1.5353	* 1.7034	* 1.4522	* 1.5905	* .8172
	* 1.5268	* 1.4480	* 1.4626	* 1.3869	* 1.3129	* 1.4634	* 1.3822	* 2.4013
11	* 1.3446	* 1.7076	* 1.5354	* 1.7123	* 1.5358	* 1.6891	* 1.0750	* .5755
	* 1.5932	* 1.3135	* 1.3869	* 1.3107	* 1.3866	* 1.3187	* 1.8591	* 3.4444
12	* 1.6431	* 1.4959	* 1.7036	* 1.5359	* 1.4277	* 1.6873	* .9438	*
	* 1.3579	* 1.4216	* 1.3128	* 1.3865	* 1.4991	* 1.3192	* 2.0921	*
13	* 1.2931	* 1.4537	* 1.4524	* 1.6892	* 1.6875	* 1.5503	* .7674	*
	* 1.6396	* 1.4417	* 1.4631	* 1.3187	* 1.3190	* 1.4274	* 2.5689	*
14	* 1.6408	* 1.6484	* 1.5907	* 1.0750	* .9437	* .7817	*	*
	* 1.3310	* 1.3259	* 1.3820	* 1.8591	* 2.0921	* 2.5591	*	*
15	* .8106	* .8421	* .8171	* .5755	* F-SUB-Q			
	* 2.3420	* 2.2725	* 2.4016	* 3.4444	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 55 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6750	* 1.3606	* 1.4192	* 1.3483	* 1.6620	* 1.2941	* 1.6628	* .8026 *
	* 1.4000	* 1.6532	* 1.5684	* 1.6448	* 1.3907	* 1.6972	* 1.3593	* 2.4475 *
9	* 1.3606	* 1.6994	* 1.4891	* 1.7334	* 1.5045	* 1.4621	* 1.6703	* .8309 *
	* 1.6532	* 1.3740	* 1.4884	* 1.3373	* 1.4610	* 1.4831	* 1.3535	* 2.3809 *
10	* 1.4192	* 1.4886	* 1.4798	* 1.5451	* 1.7279	* 1.4595	* 1.6120	* .8016 *
	* 1.5684	* 1.4888	* 1.5023	* 1.4247	* 1.3366	* 1.5026	* 1.4065	* 2.5275 *
11	* 1.3483	* 1.7335	* 1.5452	* 1.7371	* 1.5470	* 1.7123	* 1.0639	* .5665 *
	* 1.6448	* 1.3373	* 1.4246	* 1.3327	* 1.4191	* 1.3400	* 1.9367	* 3.6017 *
12	* 1.6620	* 1.5048	* 1.7281	* 1.5472	* 1.4362	* 1.7120	* .9299 *	
	* 1.3907	* 1.4606	* 1.3365	* 1.4190	* 1.5319	* 1.3346	* 2.1813 *	
13	* 1.2941	* 1.4629	* 1.4597	* 1.7123	* 1.7121	* 1.5714	* .7550 *	
	* 1.6972	* 1.4822	* 1.5023	* 1.3400	* 1.3345	* 1.4464	* 2.6750 *	
14	* 1.6628	* 1.6710	* 1.6122	* 1.0638	* .9298	* .7709	*	
	* 1.3593	* 1.3529	* 1.4064	* 1.9366	* 2.1813	* 2.6588	*	
15	* .8026	* .8312	* .8016	* .5665	* F-SUB-Q			
	* 2.4475	* 2.3815	* 2.5280	* 3.6017	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6798	* 1.3599	* 1.4179	* 1.3464	* 1.6638	* 1.2898	* 1.6654	* .8016 *
	* 1.4445	* 1.6996	* 1.6092	* 1.6906	* 1.4346	* 1.7618	* 1.4114	* 2.5476 *
9	* 1.3599	* 1.7044	* 1.4891	* 1.7385	* 1.5036	* 1.4615	* 1.6735	* .8292 *
	* 1.6996	* 1.4139	* 1.5281	* 1.3800	* 1.5108	* 1.5427	* 1.4043	* 2.4797 *
10	* 1.4179	* 1.4886	* 1.4787	* 1.5458	* 1.7333	* 1.4583	* 1.6146	* .8000 *
	* 1.6092	* 1.5285	* 1.5488	* 1.4717	* 1.3839	* 1.5604	* 1.4567	* 2.6284 *
11	* 1.3464	* 1.7386	* 1.5458	* 1.7429	* 1.5476	* 1.7162	* 1.0633	* .5645 *
	* 1.6906	* 1.3799	* 1.4717	* 1.3796	* 1.4730	* 1.3873	* 2.0091	* 3.7412 *
12	* 1.6638	* 1.5039	* 1.7335	* 1.5477	* 1.4350	* 1.7166	* .9289 *	
	* 1.4346	* 1.5105	* 1.3838	* 1.4728	* 1.5889	* 1.3787	* 2.2617 *	
13	* 1.2898	* 1.4622	* 1.4585	* 1.7162	* 1.7167	* 1.5746	* .7547 *	
	* 1.7618	* 1.5418	* 1.5601	* 1.3873	* 1.3786	* 1.4934	* 2.7673 *	
14	* 1.6654	* 1.6741	* 1.6147	* 1.0633	* .9287	* .7695	*	
	* 1.4114	* 1.4037	* 1.4566	* 2.0090	* 2.2617	* 2.7540	*	
15	* .8016	* .8295	* .7999	* .5645	* F-SUB-Q			
	* 2.5476	* 2.4804	* 2.6289	* 3.7411	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 56 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6694	* 1.3610	* 1.4093	* 1.3396	* 1.6509	* 1.2814	* 1.6525	* .8047 *
	* 1.4176	* 1.6571	* 1.5787	* 1.6549	* 1.4079	* 1.7260	* 1.4026	* 2.4984 *
9	* 1.3610	* 1.6951	* 1.4817	* 1.7265	* 1.4945	* 1.4527	* 1.6612	* .8340 *
	* 1.6571	* 1.3869	* 1.4968	* 1.3546	* 1.4811	* 1.5222	* 1.3971	* 2.4277 *
10	* 1.4093	* 1.4812	* 1.4693	* 1.5387	* 1.7240	* 1.4499	* 1.6020	* .8097 *
	* 1.5787	* 1.4972	* 1.5196	* 1.4412	* 1.3619	* 1.5354	* 1.4538	* 2.5646 *
11	* 1.3396	* 1.7265	* 1.5388	* 1.7339	* 1.5393	* 1.7043	* 1.0705	* .5660 *
	* 1.6549	* 1.3545	* 1.4411	* 1.3598	* 1.4528	* 1.3840	* 1.9663	* 3.6945 *
12	* 1.6509	* 1.4948	* 1.7242	* 1.5394	* 1.4257	* 1.7052	* .9372 *	
	* 1.4079	* 1.4808	* 1.3618	* 1.4527	* 1.5890	* 1.3946	* 2.2327 *	
13	* 1.2814	* 1.4534	* 1.4501	* 1.7043	* 1.7054	* 1.5637	* .7617 *	
	* 1.7260	* 1.5213	* 1.5351	* 1.3840	* 1.3944	* 1.5215	* 2.7596 *	
14	* 1.6525	* 1.6619	* 1.6021	* 1.0705	* .9371	* .7756	*	
	* 1.4026	* 1.3966	* 1.4537	* 1.9663	* 2.2327	* 2.7504	*	
15	* .8047	* .8343	* .8096	* .5660	* F-SUB-Q			
	* 2.4984	* 2.4284	* 2.5648	* 3.6945	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6973	* 1.3637	* 1.4212	* 1.3483	* 1.6756	* 1.2865	* 1.6809	* .8000 *
	* 1.3640	* 1.6166	* 1.5316	* 1.6094	* 1.3577	* 1.6826	* 1.3493	* 2.4597 *
9	* 1.3637	* 1.7251	* 1.4957	* 1.7581	* 1.5090	* 1.4675	* 1.6903	* .8268 *
	* 1.6166	* 1.3333	* 1.4512	* 1.3015	* 1.4352	* 1.4746	* 1.3434	* 2.3971 *
10	* 1.4212	* 1.4951	* 1.4835	* 1.5540	* 1.7547	* 1.4628	* 1.6297	* .7974 *
	* 1.5316	* 1.4517	* 1.4724	* 1.3960	* 1.3084	* 1.4883	* 1.3974	* 2.5474 *
11	* 1.3483	* 1.7581	* 1.5540	* 1.7647	* 1.5563	* 1.7335	* 1.0637	* .5591 *
	* 1.6094	* 1.3015	* 1.3960	* 1.3059	* 1.4042	* 1.3289	* 1.9336	* 3.6554 *
12	* 1.6756	* 1.5093	* 1.7548	* 1.5564	* 1.4394	* 1.7361	* .9272 *	
	* 1.3577	* 1.4350	* 1.3083	* 1.4041	* 1.5368	* 1.3376	* 2.2022 *	
13	* 1.2865	* 1.4682	* 1.4630	* 1.7335	* 1.7363	* 1.5912	* .7529 *	
	* 1.6826	* 1.4738	* 1.4881	* 1.3289	* 1.3375	* 1.4598	* 2.7224 *	
14	* 1.6809	* 1.6909	* 1.6298	* 1.0638	* .9271	* .7680	*	
	* 1.3493	* 1.3429	* 1.3973	* 1.9335	* 2.2022	* 2.7088	*	
15	* .8000	* .8271	* .7974	* .5591	* F-SUB-Q			
	* 2.4597	* 2.3978	* 2.5478	* 3.6554	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 57 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7140	* 1.3706	* 1.4282	* 1.3546	* 1.6896	* 1.2897	* 1.6970	* .8016 *
	* 1.3184	* 1.5659	* 1.4812	* 1.5562	* 1.3092	* 1.6288	* 1.2993	* 2.3763 *
9	* 1.3706	* 1.7426	* 1.5048	* 1.7764	* 1.5182	* 1.4768	* 1.7070	* .8261 *
	* 1.5659	* 1.2857	* 1.4024	* 1.2543	* 1.3874	* 1.4238	* 1.2934	* 2.3225 *
10	* 1.4282	* 1.5042	* 1.4918	* 1.5644	* 1.7732	* 1.4709	* 1.6452	* .7975 *
	* 1.4812	* 1.4029	* 1.4238	* 1.3496	* 1.2614	* 1.4392	* 1.3455	* 2.4649 *
11	* 1.3546	* 1.7764	* 1.5644	* 1.7834	* 1.5674	* 1.7506	* 1.0658	* .5571 *
	* 1.5562	* 1.2543	* 1.3496	* 1.2597	* 1.3579	* 1.2820	* 1.8726	* 3.5422 *
12	* 1.6896	* 1.5185	* 1.7733	* 1.5675	* 1.4476	* 1.7544	* .9271	* 2.1366 *
	* 1.3092	* 1.3871	* 1.2613	* 1.3578	* 1.4898	* 1.2910	* 1.2910	* 2.1366 *
13	* 1.2897	* 1.4774	* 1.4710	* 1.7505	* 1.7545	* 1.6075	* .7528	* 2.6394 *
	* 1.6288	* 1.4231	* 1.4390	* 1.2820	* 1.2909	* 1.4078	* 2.6394	* 2.6394 *
14	* 1.6970	* 1.7077	* 1.6453	* 1.0659	* .9270	* .7685		
	* 1.2993	* 1.2930	* 1.3455	* 1.8725	* 2.1367	* 2.6242		
15	* .8016	* .8263	* .7974	* .5571	* F-SUB-Q			
	* 2.3763	* 2.3235	* 2.4653	* 3.5422	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7259	* 1.3770	* 1.4343	* 1.3603	* 1.6996	* 1.2936	* 1.7078	* .8056 *
	* 1.2708	* 1.5132	* 1.4323	* 1.5050	* 1.2635	* 1.5770	* 1.2527	* 2.2954 *
9	* 1.3770	* 1.7556	* 1.5130	* 1.7889	* 1.5253	* 1.4845	* 1.7185	* .8320 *
	* 1.5132	* 1.2388	* 1.3546	* 1.2090	* 1.3406	* 1.3746	* 1.2464	* 2.2385 *
10	* 1.4343	* 1.5123	* 1.4986	* 1.5732	* 1.7868	* 1.4778	* 1.6557	* .8025 *
	* 1.4323	* 1.3551	* 1.3761	* 1.3026	* 1.2143	* 1.3899	* 1.2966	* 2.3768 *
11	* 1.3603	* 1.7889	* 1.5733	* 1.7973	* 1.5757	* 1.7625	* 1.0739	* .5596 *
	* 1.5050	* 1.2090	* 1.3026	* 1.2123	* 1.3099	* 1.2339	* 1.8021	* 3.4208 *
12	* 1.6996	* 1.5256	* 1.7869	* 1.5758	* 1.4542	* 1.7672	* .9346	* 2.0531 *
	* 1.2635	* 1.3403	* 1.2142	* 1.3099	* 1.4376	* 1.2408	* 2.0531	* 2.0531 *
13	* 1.2936	* 1.4851	* 1.4779	* 1.7625	* 1.7673	* 1.6185	* .7593	* 2.5326 *
	* 1.5770	* 1.3739	* 1.3897	* 1.2339	* 1.2407	* 1.3528	* 2.5326	* 2.5326 *
14	* 1.7078	* 1.7191	* 1.6557	* 1.0739	* .9345	* .7735		
	* 1.2527	* 1.2460	* 1.2966	* 1.8020	* 2.0531	* 2.5232		
15	* .8056	* .8323	* .8024	* .5595	* F-SUB-Q			
	* 2.2954	* 2.2391	* 2.3772	* 3.4208	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 58 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7292	* 1.3931	* 1.4378	* 1.3651	* 1.7018	* 1.2997	* 1.7093	* .8157 *
	* 1.3340	* 1.5757	* 1.5057	* 1.5806	* 1.3295	* 1.6544	* 1.3177	* 2.3880 *
9	* 1.3931	* 1.7579	* 1.5179	* 1.7909	* 1.5290	* 1.4889	* 1.7205	* .8438 *
	* 1.5757	* 1.3024	* 1.4227	* 1.2719	* 1.4089	* 1.4433	* 1.3104	* 2.3248 *
10	* 1.4378	* 1.5173	* 1.5013	* 1.5790	* 1.7905	* 1.4819	* 1.6569	* .8191 *
	* 1.5057	* 1.4232	* 1.4470	* 1.3669	* 1.2753	* 1.4592	* 1.3632	* 2.4517 *
11	* 1.3651	* 1.7910	* 1.5790	* 1.8010	* 1.5800	* 1.7653	* 1.0898	* .5665 *
	* 1.5806	* 1.2719	* 1.3669	* 1.2727	* 1.3742	* 1.2949	* 1.8681	* 3.5561 *
12	* 1.7018	* 1.5293	* 1.7906	* 1.5801	* 1.4573	* 1.7703	* .9504 *	
	* 1.3295	* 1.4086	* 1.2753	* 1.3741	* 1.5071	* 1.2998	* 2.1213 *	
13	* 1.2997	* 1.4895	* 1.4820	* 1.7653	* 1.7704	* 1.6209	* .7724 *	
	* 1.6544	* 1.4426	* 1.4590	* 1.2949	* 1.2997	* 1.4165	* 2.6132 *	
14	* 1.7093	* 1.7211	* 1.6569	* 1.0898	* .9503	* .7860	*	
	* 1.3177	* 1.3100	* 1.3632	* 1.8680	* 2.1213	* 2.6063	*	
15	* .8157	* .8440	* .8191	* .5665	* F-SUB-Q			
	* 2.3880	* 2.3255	* 2.4519	* 3.5561	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7707	* 1.4007	* 1.4597	* 1.3837	* 1.7417	* 1.3128	* 1.7534	* .8154 *
	* 1.2651	* 1.5236	* 1.4462	* 1.5226	* 1.2685	* 1.6010	* 1.2568	* 2.3394 *
9	* 1.4007	* 1.8006	* 1.5432	* 1.8375	* 1.5553	* 1.5161	* 1.7653	* .8404 *
	* 1.5236	* 1.2392	* 1.3654	* 1.2096	* 1.3522	* 1.3862	* 1.2493	* 2.2857 *
10	* 1.4597	* 1.5425	* 1.5264	* 1.6058	* 1.8350	* 1.5064	* 1.6994	* .8107 *
	* 1.4462	* 1.3659	* 1.3888	* 1.3116	* 1.2143	* 1.4022	* 1.2998	* 2.4246 *
11	* 1.3837	* 1.8375	* 1.6058	* 1.8453	* 1.6087	* 1.8101	* 1.0889	* .5619 *
	* 1.5226	* 1.2096	* 1.3116	* 1.2114	* 1.3166	* 1.2325	* 1.8276	* 3.5073 *
12	* 1.7417	* 1.5556	* 1.8351	* 1.6088	* 1.4821	* 1.8170	* .9449 *	
	* 1.2685	* 1.3519	* 1.2143	* 1.3165	* 1.4428	* 1.2344	* 2.0836 *	
13	* 1.3128	* 1.5167	* 1.5065	* 1.8100	* 1.8171	* 1.6629	* .7665 *	
	* 1.6010	* 1.3856	* 1.4020	* 1.2326	* 1.2344	* 1.3454	* 2.5688 *	
14	* 1.7534	* 1.7659	* 1.6994	* 1.0890	* .9447	* .7821	*	
	* 1.2568	* 1.2489	* 1.2998	* 1.8274	* 2.0837	* 2.5548	*	
15	* .8154	* .8405	* .8107	* .5619	* F-SUB-Q			
	* 2.3394	* 2.2867	* 2.4250	* 3.5072	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 59 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7875	* 1.4104	* 1.4708	* 1.3936	* 1.7590	* 1.3222	* 1.7722	* .8200 *
	* 1.2054	* 1.4594	* 1.3882	* 1.4636	* 1.2156	* 1.5393	* 1.2032	* 2.2544 *
9	* 1.4104	* 1.8167	* 1.5564	* 1.8558	* 1.5681	* 1.5307	* 1.7849	* .8452 *
	* 1.4594	* 1.1867	* 1.3101	* 1.1585	* 1.2979	* 1.3288	* 1.1954	* 2.2023 *
10	* 1.4708	* 1.5557	* 1.5380	* 1.6195	* 1.8526	* 1.5191	* 1.7175	* .8153 *
	* 1.3882	* 1.3106	* 1.3337	* 1.2581	* 1.1626	* 1.3449	* 1.2437	* 2.3368 *
11	* 1.3936	* 1.8558	* 1.6195	* 1.8625	* 1.6219	* 1.8293	* 1.0967	* .5638 *
	* 1.4636	* 1.1585	* 1.2581	* 1.1594	* 1.2616	* 1.1773	* 1.7542	* 3.3925 *
12	* 1.7590	* 1.5684	* 1.8527	* 1.6220	* 1.4940	* 1.8373	* .9509 *	
	* 1.2156	* 1.2977	* 1.1626	* 1.2615	* 1.3779	* 1.1761	* 2.0006 *	
13	* 1.3222	* 1.5313	* 1.5192	* 1.8292	* 1.8375	* 1.6810	* .7710 *	
	* 1.5393	* 1.3282	* 1.3448	* 1.1773	* 1.1760	* 1.2832	* 2.4692 *	
14	* 1.7722	* 1.7855	* 1.7175	* 1.0968	* .9507	* .7867	*	
	* 1.2032	* 1.1950	* 1.2437	* 1.7541	* 2.0006	* 2.4560	*	
15	* .8200	* .8454	* .8152	* .5638	* F-SUB-Q			
	* 2.2544	* 2.2032	* 2.3372	* 3.3925	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7663	* 1.4166	* 1.4636	* 1.3873	* 1.7403	* 1.3231	* 1.7519	* .8259 *
	* 1.1831	* 1.4113	* 1.3566	* 1.4308	* 1.1951	* 1.4971	* 1.1835	* 2.1786 *
9	* 1.4166	* 1.7923	* 1.5489	* 1.8302	* 1.5585	* 1.5237	* 1.7653	* .8555 *
	* 1.4113	* 1.1683	* 1.2804	* 1.1420	* 1.2703	* 1.2983	* 1.1750	* 2.1179 *
10	* 1.4636	* 1.5483	* 1.5280	* 1.6107	* 1.8281	* 1.5120	* 1.6975	* .8300 *
	* 1.3566	* 1.2809	* 1.3058	* 1.2301	* 1.1447	* 1.3137	* 1.2229	* 2.2335 *
11	* 1.3873	* 1.8303	* 1.6108	* 1.8374	* 1.6101	* 1.8085	* 1.1094	* .5701 *
	* 1.4308	* 1.1420	* 1.2301	* 1.1413	* 1.2343	* 1.1556	* 1.6853	* 3.2643 *
12	* 1.7403	* 1.5588	* 1.8282	* 1.6102	* 1.4841	* 1.8162	* .9659 *	
	* 1.1951	* 1.2701	* 1.1446	* 1.2342	* 1.3456	* 1.1527	* 1.9119 *	
13	* 1.3231	* 1.5244	* 1.5122	* 1.8085	* 1.8163	* 1.6616	* .7828 *	
	* 1.4971	* 1.2977	* 1.3135	* 1.1556	* 1.1526	* 1.2573	* 2.3591 *	
14	* 1.7519	* 1.7659	* 1.6975	* 1.1094	* .9658	* .7966	*	
	* 1.1835	* 1.1746	* 1.2229	* 1.6853	* 1.9119	* 2.3528	*	
15	* .8259	* .8556	* .8300	* .5701	* F-SUB-Q			
	* 2.1786	* 2.1188	* 2.2337	* 3.2644	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 60 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7564	* 1.3925	* 1.4589	* 1.3753	* 1.7322	* 1.3111	* 1.7445	* .8068 *
	* 1.1610	* 1.4015	* 1.3301	* 1.4112	* 1.1734	* 1.4776	* 1.1608	* 2.1810 *
9	* 1.3925	* 1.7761	* 1.5418	* 1.8184	* 1.5501	* 1.5187	* 1.7585	* .8338 *
	* 1.4015	* 1.1512	* 1.2573	* 1.1229	* 1.2483	* 1.2728	* 1.1519	* 2.1249 *
10	* 1.4589	* 1.5411	* 1.5217	* 1.6003	* 1.8096	* 1.5047	* 1.6912	* .8041 *
	* 1.3301	* 1.2578	* 1.2815	* 1.2100	* 1.1291	* 1.2898	* 1.1986	* 2.2543 *
11	* 1.3753	* 1.8184	* 1.6003	* 1.8179	* 1.5989	* 1.7990	* 1.0836	* .5555 *
	* 1.4112	* 1.1228	* 1.2100	* 1.1261	* 1.2136	* 1.1334	* 1.6853	* 3.2761 *
12	* 1.7322	* 1.5504	* 1.8097	* 1.5990	* 1.4747	* 1.8060	* .9391 *	
	* 1.1734	* 1.2481	* 1.1290	* 1.2135	* 1.3212	* 1.1297	* 1.9193 *	
13	* 1.3111	* 1.5194	* 1.5049	* 1.7990	* 1.8062	* 1.6522	* .7601 *	
	* 1.4776	* 1.2722	* 1.2896	* 1.1334	* 1.1296	* 1.2320	* 2.3701 *	
14	* 1.7445	* 1.7592	* 1.6913	* 1.0836	* .9390	* .7748	*	
	* 1.1608	* 1.1515	* 1.1985	* 1.6852	* 1.9194	* 2.3599	*	
15	* .8068	* .8341	* .8040	* .5555	* F-SUB-Q			
	* 2.1810	* 2.1254	* 2.2547	* 3.2761	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6431	* 1.3210	* 1.3897	* 1.3017	* 1.6208	* 1.2457	* 1.6277	* .7613 *
	* 1.2170	* 1.4496	* 1.3707	* 1.4638	* 1.2309	* 1.5271	* 1.2202	* 2.2699 *
9	* 1.3210	* 1.6560	* 1.4647	* 1.6959	* 1.4658	* 1.4389	* 1.6416	* .7861 *
	* 1.4496	* 1.2108	* 1.2991	* 1.1810	* 1.2957	* 1.3185	* 1.2102	* 2.2132 *
10	* 1.3897	* 1.4640	* 1.4437	* 1.5165	* 1.6807	* 1.4283	* 1.5801	* .7582 *
	* 1.3707	* 1.2996	* 1.3258	* 1.2532	* 1.1920	* 1.3331	* 1.2579	* 2.3476 *
11	* 1.3017	* 1.6960	* 1.5165	* 1.6876	* 1.5089	* 1.6781	* 1.0211	* .5247 *
	* 1.4638	* 1.1809	* 1.2531	* 1.1892	* 1.2611	* 1.1911	* 1.7546	* 3.4077 *
12	* 1.6208	* 1.4661	* 1.6808	* 1.5090	* 1.3922	* 1.6797	* .8851 *	
	* 1.2309	* 1.2954	* 1.1919	* 1.2610	* 1.3724	* 1.1897	* 1.9974 *	
13	* 1.2457	* 1.4397	* 1.4284	* 1.6780	* 1.6799	* 1.5379	* .7150 *	
	* 1.5271	* 1.3177	* 1.3329	* 1.1911	* 1.1895	* 1.2959	* 2.4711 *	
14	* 1.6277	* 1.6423	* 1.5802	* 1.0210	* .8850	* .7296	*	
	* 1.2202	* 1.2097	* 1.2578	* 1.7546	* 1.9974	* 2.4577	*	
15	* .7613	* .7864	* .7581	* .5247	* F-SUB-Q			
	* 2.2699	* 2.2137	* 2.3480	* 3.4076	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 61 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 350 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3592	* 1.1188	* 1.1783	* 1.0995	* 1.3365	* 1.0536	* 1.3445	* .6392
	* 1.4477	* 1.6848	* 1.5920	* 1.7070	* 1.4690	* 1.7781	* 1.4535	* 2.6648
9	* 1.1188	* 1.4106	* 1.2389	* 1.4203	* 1.2090	* 1.2071	* 1.3541	* .6569
	* 1.6848	* 1.3976	* 1.5124	* 1.3871	* 1.5463	* 1.5477	* 1.4438	* 2.6099
10	* 1.1783	* 1.2384	* 1.1944	* 1.2782	* 1.4077	* 1.2036	* 1.3012	* .6317
	* 1.5920	* 1.5129	* 1.5777	* 1.4628	* 1.3992	* 1.5569	* 1.5029	* 2.7771
11	* 1.0995	* 1.4203	* 1.2783	* 1.4141	* 1.2412	* 1.3814	* .8506	* .4459
	* 1.7070	* 1.3871	* 1.4627	* 1.3952	* 1.5084	* 1.4225	* 2.0747	* 3.9563
12	* 1.3365	* 1.2092	* 1.4078	* 1.2413	* 1.1407	* 1.3795	* .7426	*
	* 1.4690	* 1.5460	* 1.3991	* 1.5083	* 1.6485	* 1.4244	* 2.3439	*
13	* 1.0536	* 1.2079	* 1.2037	* 1.3814	* 1.3797	* 1.2535	* .5961	*
	* 1.7781	* 1.5465	* 1.5566	* 1.4226	* 1.4242	* 1.5632	* 2.9195	*
14	* 1.3445	* 1.3547	* 1.3013	* .8506	* .7426	* .6078	*	*
	* 1.4535	* 1.4432	* 1.5028	* 2.0746	* 2.3438	* 2.9055	*	*
15	* .6392	* .6571	* .6316	* .4459	* F-SUB-Q			
	* 2.6648	* 2.6107	* 2.7777	* 3.9563	* M-SUB-Q			

AT 100% POWER, 350 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6282	* .5395	* .5294	* .5279	* .6150	* .5059	* .5577	* .2970
	* 3.0911	* 3.4494	* 3.4947	* 3.5086	* 3.1522	* 3.6568	* 3.4587	* 5.6717
9	* .5395	* .6215	* .5517	* .6368	* .5378	* .5274	* .5605	* .3006
	* 3.4494	* 3.1279	* 3.3482	* 3.0514	* 3.4266	* 3.4940	* 3.4422	* 5.6399
10	* .5294	* .5516	* .5244	* .5689	* .6386	* .5346	* .5362	* .2862
	* 3.4947	* 3.3492	* 3.5435	* 3.2392	* 3.0436	* 3.4562	* 3.6006	* 6.0641
11	* .5279	* .6368	* .5689	* .6380	* .5411	* .5966	* .3973	* .2101
	* 3.5086	* 3.0512	* 3.2391	* 3.0490	* 3.4099	* 3.2502	* 4.3868	* 8.3151
12	* .6150	* .5380	* .6387	* .5412	* .5042	* .5693	* .3387	*
	* 3.1522	* 3.4258	* 3.0435	* 3.4096	* 3.6763	* 3.4042	* 5.0788	*
13	* .5059	* .5278	* .5347	* .5966	* .5694	* .5066	* .2689	*
	* 3.6568	* 3.4907	* 3.4554	* 3.2502	* 3.4036	* 3.8186	* 6.4016	*
14	* .5577	* .5608	* .5363	* .3973	* .3388	* .2730	*	*
	* 3.4587	* 3.4405	* 3.6002	* 4.3868	* 5.0775	* 6.3993	*	*
15	* .2970	* .3007	* .2862	* .2101	* F-SUB-Q			
	* 5.6717	* 5.6421	* 6.0646	* 8.3145	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 62 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6161 *	* .6260 *	* .6344 *	* .6353 *	* .7190 *	* .6238 *	* .6495 *	* .3847 *
	* 2.5579 *	* 2.8051 *	* 2.8966 *	* 2.8129 *	* 2.6606 *	* 2.8361 *	* 2.9019 *	* 4.0393 *
9	* .6260 *	* .7075 *	* .6555 *	* .7266 *	* .6394 *	* .6295 *	* .6496 *	* .3853 *
	* 2.8051 *	* 2.7720 *	* 2.7752 *	* 2.6776 *	* 2.7974 *	* 2.8086 *	* 2.9147 *	* 4.0861 *
10	* .6344 *	* .6554 *	* .6284 *	* .6633 *	* .7249 *	* .6338 *	* .6289 *	* .3677 *
	* 2.8966 *	* 2.7756 *	* 2.9075 *	* 2.7283 *	* 2.7164 *	* 2.8674 *	* 3.0737 *	* 4.4876 *
11	* .6353 *	* .7266 *	* .6633 *	* .7204 *	* .6239 *	* .6743 *	* .4800 *	* .3007 *
	* 2.8129 *	* 2.6774 *	* 2.7281 *	* 2.7663 *	* 2.8991 *	* 2.9011 *	* 3.6215 *	* 5.7708 *
12	* .7190 *	* .6396 *	* .7250 *	* .6240 *	* .5323 *	* .6106 *	* .4156 *	
	* 2.6606 *	* 2.7968 *	* 2.7160 *	* 2.8990 *	* 2.9089 *	* 2.9459 *	* 3.9336 *	
13	* .6238 *	* .6301 *	* .6340 *	* .6743 *	* .6106 *	* .5580 *	* .3327 *	
	* 2.8361 *	* 2.8056 *	* 2.8665 *	* 2.9012 *	* 2.9462 *	* 3.2032 *	* 4.8284 *	
14	* .6495 *	* .6500 *	* .6290 *	* .4799 *	* .4153 *	* .3383 *		
	* 2.9019 *	* 2.9129 *	* 3.0732 *	* 3.6197 *	* 3.9352 *	* 4.8817 *		
15	* .3847 *	* .3853 *	* .3676 *	* .3006 *	F-SUB-Q			
	* 4.0393 *	* 4.0882 *	* 4.4874 *	* 5.7712 *	M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2284 *	* 1.1157 *	* 1.1912 *	* 1.1254 *	* 1.2848 *	* 1.1051 *	* 1.2837 *	* .7146 *
	* 1.5242 *	* 1.6352 *	* 1.5833 *	* 1.6333 *	* 1.5290 *	* 1.6459 *	* 1.5093 *	* 2.2370 *
9	* 1.1157 *	* 1.3230 *	* 1.2305 *	* 1.3317 *	* 1.2102 *	* 1.2000 *	* 1.2858 *	* .7337 *
	* 1.6352 *	* 1.5109 *	* 1.5191 *	* 1.4994 *	* 1.5204 *	* 1.5106 *	* 1.5132 *	* 2.2067 *
10	* 1.1912 *	* 1.2303 *	* 1.2001 *	* 1.2533 *	* 1.3249 *	* 1.2043 *	* 1.2498 *	* .7057 *
	* 1.5833 *	* 1.5193 *	* 1.5657 *	* 1.4834 *	* 1.5280 *	* 1.5523 *	* 1.5876 *	* 2.4034 *
11	* 1.1254 *	* 1.3318 *	* 1.2534 *	* 1.3166 *	* 1.2154 *	* 1.2923 *	* .8872 *	* .5482 *
	* 1.6333 *	* 1.4993 *	* 1.4833 *	* 1.5313 *	* 1.5218 *	* 1.5439 *	* 1.9849 *	* 3.2525 *
12	* 1.2848 *	* 1.2104 *	* 1.3250 *	* 1.2155 *	* 1.1005 *	* 1.2622 *	* .7958 *	
	* 1.5290 *	* 1.5201 *	* 1.5278 *	* 1.5217 *	* 1.5796 *	* 1.5127 *	* 2.0975 *	
13	* 1.1051 *	* 1.2009 *	* 1.2046 *	* 1.2923 *	* 1.2622 *	* 1.1663 *	* .6586 *	
	* 1.6459 *	* 1.5094 *	* 1.5519 *	* 1.5439 *	* 1.5128 *	* 1.6280 *	* 2.4972 *	
14	* 1.2837 *	* 1.2865 *	* 1.2499 *	* .8869 *	* .7954 *	* .6633 *		
	* 1.5093 *	* 1.5125 *	* 1.5874 *	* 1.9840 *	* 2.0982 *	* 2.5499 *		
15	* .7146 *	* .7339 *	* .7055 *	* .5481 *	F-SUB-Q			
	* 2.2370 *	* 2.2076 *	* 2.4036 *	* 3.2528 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 63 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4766	* 1.2827	* 1.3453	* 1.2754	* 1.4840	* 1.2515	* 1.4866	* .8203
	* 1.3584	* 1.4724	* 1.4212	* 1.4623	* 1.3418	* 1.4742	* 1.3201	* 1.9758
9	* 1.2827	* 1.5020	* 1.3902	* 1.5217	* 1.3986	* 1.3664	* 1.4882	* .8531
	* 1.4724	* 1.3537	* 1.3643	* 1.3297	* 1.3345	* 1.3442	* 1.3239	* 1.9202
10	* 1.3453	* 1.3900	* 1.3817	* 1.4244	* 1.5120	* 1.3700	* 1.4468	* .8295
	* 1.4212	* 1.3645	* 1.3818	* 1.3235	* 1.3638	* 1.3843	* 1.3896	* 2.0733
11	* 1.2754	* 1.5218	* 1.4245	* 1.5143	* 1.4176	* 1.5080	* 1.0426	* .6218
	* 1.4623	* 1.3296	* 1.3234	* 1.3489	* 1.3270	* 1.3440	* 1.7078	* 2.9093
12	* 1.4840	* 1.3988	* 1.5122	* 1.4176	* 1.3316	* 1.4947	* .9363	*
	* 1.3418	* 1.3343	* 1.3637	* 1.3269	* 1.3899	* 1.3213	* 1.8147	*
13	* 1.2515	* 1.3672	* 1.3703	* 1.5081	* 1.4947	* 1.3819	* .7692	*
	* 1.4742	* 1.3433	* 1.3839	* 1.3440	* 1.3213	* 1.4146	* 2.1818	*
14	* 1.4866	* 1.4888	* 1.4470	* 1.0423	* .9360	* .7816	*	*
	* 1.3201	* 1.3233	* 1.3894	* 1.7071	* 1.8151	* 2.2084	*	*
15	* .8203	* .8534	* .8293	* .6217	* F-SUB-Q			
	* 1.9758	* 1.9208	* 2.0734	* 2.9096	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5967	* 1.3548	* 1.4158	* 1.3423	* 1.5941	* 1.3124	* 1.6080	* .8524
	* 1.2838	* 1.4213	* 1.3682	* 1.4043	* 1.2614	* 1.4198	* 1.2313	* 1.9204
9	* 1.3548	* 1.6271	* 1.4657	* 1.6483	* 1.4800	* 1.4471	* 1.6103	* .8834
	* 1.4213	* 1.2754	* 1.3081	* 1.2407	* 1.2738	* 1.2806	* 1.2344	* 1.8728
10	* 1.4158	* 1.4654	* 1.4584	* 1.5088	* 1.6424	* 1.4490	* 1.5656	* .8563
	* 1.3682	* 1.3082	* 1.3247	* 1.2621	* 1.2657	* 1.3224	* 1.2959	* 2.0284
11	* 1.3423	* 1.6483	* 1.5089	* 1.6469	* 1.5107	* 1.6368	* 1.0881	* .6400
	* 1.4043	* 1.2406	* 1.2621	* 1.2564	* 1.2625	* 1.2551	* 1.6560	* 2.8556
12	* 1.5941	* 1.4801	* 1.6425	* 1.5108	* 1.4209	* 1.6332	* .9723	*
	* 1.2614	* 1.2736	* 1.2656	* 1.2624	* 1.3279	* 1.2324	* 1.7754	*
13	* 1.3124	* 1.4478	* 1.4492	* 1.6368	* 1.6333	* 1.5075	* .7980	*
	* 1.4198	* 1.2799	* 1.3221	* 1.2551	* 1.2324	* 1.3219	* 2.1411	*
14	* 1.6080	* 1.6109	* 1.5657	* 1.0878	* .9720	* .8137	*	*
	* 1.2313	* 1.2340	* 1.2958	* 1.6552	* 1.7756	* 2.1593	*	*
15	* .8524	* .8835	* .8561	* .6399	* F-SUB-Q			
	* 1.9204	* 1.8736	* 2.0285	* 2.8557	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 64 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6187	* 1.3620	* 1.4182	* 1.3474	* 1.6099	* 1.3123	* 1.6294	* .8571 *
	* 1.2876	* 1.4371	* 1.3847	* 1.4145	* 1.2622	* 1.4348	* 1.2264	* 1.9298 *
9	* 1.3620	* 1.6559	* 1.4707	* 1.6760	* 1.4866	* 1.4550	* 1.6330	* .8894 *
	* 1.4371	* 1.2705	* 1.3164	* 1.2341	* 1.2813	* 1.2856	* 1.2285	* 1.8792 *
10	* 1.4182	* 1.4704	* 1.4640	* 1.5194	* 1.6758	* 1.4557	* 1.5866	* .8617 *
	* 1.3847	* 1.3166	* 1.3347	* 1.2658	* 1.2544	* 1.3297	* 1.2903	* 2.0359 *
11	* 1.3474	* 1.6761	* 1.5194	* 1.6800	* 1.5248	* 1.6626	* 1.0987	* .6398 *
	* 1.4145	* 1.2341	* 1.2657	* 1.2480	* 1.2682	* 1.2527	* 1.6616	* 2.8849 *
12	* 1.6099	* 1.4868	* 1.6759	* 1.5249	* 1.4308	* 1.6633	* .9804 *	
	* 1.2622	* 1.2811	* 1.2543	* 1.2681	* 1.3394	* 1.2294	* 1.7886 *	
13	* 1.3123	* 1.4555	* 1.4559	* 1.6626	* 1.6634	* 1.5342	* .8064 *	
	* 1.4348	* 1.2850	* 1.3294	* 1.2527	* 1.2294	* 1.3206	* 2.1558 *	
14	* 1.6294	* 1.6335	* 1.5867	* 1.0984	* .9801	* .8220	*	
	* 1.2264	* 1.2281	* 1.2902	* 1.6608	* 1.7887	* 2.1747	*	
15	* .8571	* .8897	* .8615	* .6397	* F-SUB-Q			
	* 1.9298	* 1.8798	* 2.0361	* 2.8851	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6080	* 1.3497	* 1.4002	* 1.3324	* 1.5950	* 1.2939	* 1.6173	* .8516 *
	* 1.3102	* 1.4655	* 1.4130	* 1.4474	* 1.2890	* 1.4725	* 1.2488	* 1.9648 *
9	* 1.3497	* 1.6493	* 1.4542	* 1.6666	* 1.4702	* 1.4397	* 1.6215	* .8838 *
	* 1.4655	* 1.2875	* 1.3450	* 1.2544	* 1.3098	* 1.3133	* 1.2500	* 1.9128 *
10	* 1.4002	* 1.4539	* 1.4470	* 1.5044	* 1.6697	* 1.4402	* 1.5749	* .8614 *
	* 1.4130	* 1.3452	* 1.3639	* 1.2909	* 1.2698	* 1.3578	* 1.3120	* 2.0585 *
11	* 1.3324	* 1.6666	* 1.5044	* 1.6745	* 1.5106	* 1.6523	* 1.0953	* .6327 *
	* 1.4474	* 1.2544	* 1.2909	* 1.2636	* 1.2923	* 1.2735	* 1.6786	* 2.9445 *
12	* 1.5950	* 1.4704	* 1.6698	* 1.5107	* 1.4153	* 1.6550	* .9780 *	
	* 1.2890	* 1.3096	* 1.2697	* 1.2922	* 1.3738	* 1.2551	* 1.8179 *	
13	* 1.2939	* 1.4402	* 1.4403	* 1.6523	* 1.6551	* 1.5261	* .8052 *	
	* 1.4725	* 1.3127	* 1.3576	* 1.2735	* 1.2550	* 1.3520	* 2.1997 *	
14	* 1.6173	* 1.6221	* 1.5750	* 1.0952	* .9778	* .8198	*	
	* 1.2488	* 1.2497	* 1.3119	* 1.6776	* 1.8180	* 2.2214	*	
15	* .8516	* .8841	* .8612	* .6326	* F-SUB-Q			
	* 1.9648	* 1.9136	* 2.0586	* 2.9446	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 65 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6052	* 1.3368	* 1.3887	* 1.3193	* 1.5887	* 1.2784	* 1.6152	* .8383
	* 1.3247	* 1.4924	* 1.4278	* 1.4821	* 1.3124	* 1.5120	* 1.2673	* 2.0244
9	* 1.3368	* 1.6507	* 1.4432	* 1.6655	* 1.4591	* 1.4294	* 1.6202	* .8685
	* 1.4924	* 1.2926	* 1.3688	* 1.2704	* 1.3363	* 1.3405	* 1.2674	* 1.9739
10	* 1.3887	* 1.4428	* 1.4355	* 1.4942	* 1.6717	* 1.4288	* 1.5731	* .8419
	* 1.4278	* 1.3691	* 1.3821	* 1.3137	* 1.2724	* 1.3797	* 1.3276	* 2.1327
11	* 1.3193	* 1.6656	* 1.4942	* 1.6751	* 1.5011	* 1.6502	* 1.0794	* .6194
	* 1.4821	* 1.2704	* 1.3137	* 1.2700	* 1.3080	* 1.2835	* 1.7063	* 3.0342
12	* 1.5887	* 1.4592	* 1.6717	* 1.5012	* 1.4047	* 1.6551	* .9600	*
	* 1.3124	* 1.3361	* 1.2724	* 1.3079	* 1.4008	* 1.2700	* 1.8728	*
13	* 1.2784	* 1.4299	* 1.4289	* 1.6501	* 1.6552	* 1.5258	* .7899	*
	* 1.5120	* 1.3399	* 1.3795	* 1.2835	* 1.2699	* 1.3687	* 2.2704	*
14	* 1.6152	* 1.6207	* 1.5731	* 1.0793	* .9598	* .8052	*	*
	* 1.2673	* 1.2670	* 1.3275	* 1.7053	* 1.8728	* 2.2902	*	*
15	* .8383	* .8688	* .8417	* .6193	* F-SUB-Q			
	* 2.0244	* 1.9746	* 2.1328	* 3.0343	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5966	* 1.3246	* 1.3752	* 1.3055	* 1.5768	* 1.2626	* 1.6059	* .8293
	* 1.3438	* 1.5205	* 1.4589	* 1.5223	* 1.3449	* 1.5578	* 1.2961	* 2.0821
9	* 1.3246	* 1.6440	* 1.4303	* 1.6568	* 1.4452	* 1.4169	* 1.6113	* .8578
	* 1.5205	* 1.3115	* 1.3937	* 1.2927	* 1.3675	* 1.3743	* 1.2949	* 2.0327
10	* 1.3752	* 1.4299	* 1.4215	* 1.4810	* 1.6645	* 1.4151	* 1.5639	* .8312
	* 1.4589	* 1.3940	* 1.4107	* 1.3374	* 1.2923	* 1.4036	* 1.3515	* 2.1925
11	* 1.3055	* 1.6568	* 1.4810	* 1.6669	* 1.4882	* 1.6404	* 1.0681	* .6103
	* 1.5223	* 1.2927	* 1.3374	* 1.2889	* 1.3322	* 1.3025	* 1.7429	* 3.1009
12	* 1.5768	* 1.4453	* 1.6645	* 1.4882	* 1.3910	* 1.6466	* .9485	*
	* 1.3449	* 1.3673	* 1.2923	* 1.3321	* 1.4247	* 1.2872	* 1.9079	*
13	* 1.2626	* 1.4174	* 1.4152	* 1.6403	* 1.6467	* 1.5176	* .7803	*
	* 1.5578	* 1.3738	* 1.4034	* 1.3025	* 1.2872	* 1.3904	* 2.3183	*
14	* 1.6059	* 1.6118	* 1.5639	* 1.0680	* .9484	* .7955	*	*
	* 1.2961	* 1.2946	* 1.3515	* 1.7418	* 1.9079	* 2.3383	*	*
15	* .8293	* .8580	* .8310	* .6102	* F-SUB-Q			
	* 2.0821	* 2.0334	* 2.1926	* 3.1010	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 66 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5956	* 1.3171	* 1.3680	* 1.2961	* 1.5726	* 1.2519	* 1.6042	* .8200 *
	* 1.3768	* 1.5634	* 1.4931	* 1.5643	* 1.3770	* 1.6052	* 1.3247	* 2.1508 *
9	* 1.3171	* 1.6449	* 1.4232	* 1.6558	* 1.4369	* 1.4101	* 1.6100	* .8459 *
	* 1.5634	* 1.3379	* 1.4225	* 1.3152	* 1.3991	* 1.4092	* 1.3222	* 2.1048 *
10	* 1.3680	* 1.4228	* 1.4135	* 1.4735	* 1.6645	* 1.4069	* 1.5623	* .8198 *
	* 1.4931	* 1.4229	* 1.4393	* 1.3646	* 1.3129	* 1.4314	* 1.3739	* 2.2647 *
11	* 1.2961	* 1.6559	* 1.4736	* 1.6656	* 1.4806	* 1.6380	* 1.0570	* .6002 *
	* 1.5643	* 1.3152	* 1.3646	* 1.3151	* 1.3653	* 1.3291	* 1.7859	* 3.1944 *
12	* 1.5726	* 1.4370	* 1.6645	* 1.4806	* 1.3828	* 1.6455	* .9371	* 1.3770 *
	* 1.3770	* 1.3989	* 1.3130	* 1.3652	* 1.4618	* 1.3123	* 1.9663	* 1.2519 *
13	* 1.2519	* 1.4105	* 1.4070	* 1.6380	* 1.6456	* 1.5159	* .7698	* 1.6052 *
	* 1.6052	* 1.4087	* 1.4313	* 1.3292	* 1.3122	* 1.4167	* 2.3905	* 1.4314 *
14	* 1.6042	* 1.6105	* 1.5623	* 1.0569	* .9369	* .7840		
	* 1.3247	* 1.3218	* 1.3739	* 1.7848	* 1.9663	* 2.4135		
15	* .8200	* .8459	* .8196	* .6001	* F-SUB-Q			
	* 2.1508	* 2.1062	* 2.2648	* 3.1945	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5743	* 1.3150	* 1.3507	* 1.2810	* 1.5480	* 1.2354	* 1.5794	* .8203 *
	* 1.4339	* 1.6061	* 1.5436	* 1.6233	* 1.4358	* 1.6703	* 1.3806	* 2.2067 *
9	* 1.3150	* 1.6250	* 1.4063	* 1.6312	* 1.4172	* 1.3923	* 1.5855	* .8499 *
	* 1.6061	* 1.3820	* 1.4732	* 1.3670	* 1.4528	* 1.4637	* 1.3766	* 2.1496 *
10	* 1.3507	* 1.4059	* 1.3939	* 1.4556	* 1.6398	* 1.3888	* 1.5378	* .8280 *
	* 1.5436	* 1.4736	* 1.4920	* 1.4132	* 1.3591	* 1.4826	* 1.4269	* 2.2954 *
11	* 1.2810	* 1.6313	* 1.4556	* 1.6440	* 1.4611	* 1.6131	* 1.0607	* .6004 *
	* 1.6233	* 1.3670	* 1.4132	* 1.3580	* 1.4102	* 1.3759	* 1.8130	* 3.2593 *
12	* 1.5480	* 1.4173	* 1.6398	* 1.4612	* 1.3631	* 1.6204	* .9457	
	* 1.4358	* 1.4526	* 1.3591	* 1.4101	* 1.5237	* 1.3692	* 1.9926	
13	* 1.2354	* 1.3927	* 1.3889	* 1.6130	* 1.6205	* 1.4927	* .7756	
	* 1.6703	* 1.4631	* 1.4825	* 1.3760	* 1.3691	* 1.4777	* 2.4359	
14	* 1.5794	* 1.5860	* 1.5378	* 1.0606	* .9455	* .7893		
	* 1.3806	* 1.3762	* 1.4270	* 1.8118	* 1.9926	* 2.4614		
15	* .8203	* .8501	* .8279	* .6003	* F-SUB-Q			
	* 2.2067	* 2.1504	* 2.2953	* 3.2594	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 67 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5923	* 1.3068	* 1.3560	* 1.2823	* 1.5626	* 1.2349	* 1.5984	* .8120 *
	* 1.4571	* 1.6598	* 1.5826	* 1.6728	* 1.4682	* 1.7249	* 1.4072	* 2.2994 *
9	* 1.3068	* 1.6453	* 1.4124	* 1.6510	* 1.4232	* 1.3991	* 1.6050	* .8381 *
	* 1.6598	* 1.4042	* 1.5123	* 1.3926	* 1.4917	* 1.5018	* 1.4020	* 2.2476 *
10	* 1.3560	* 1.4120	* 1.3997	* 1.4613	* 1.6606	* 1.3935	* 1.5562	* .8113 *
	* 1.5826	* 1.5127	* 1.5308	* 1.4504	* 1.3811	* 1.5209	* 1.4500	* 2.4110 *
11	* 1.2823	* 1.6510	* 1.4613	* 1.6613	* 1.4681	* 1.6309	* 1.0484	* .5908 *
	* 1.6728	* 1.3926	* 1.4504	* 1.3815	* 1.4422	* 1.3972	* 1.8848	* 3.4037 *
12	* 1.5626	* 1.4233	* 1.6606	* 1.4681	* 1.3683	* 1.6400	* .9277 *	
	* 1.4682	* 1.4915	* 1.3811	* 1.4421	* 1.5539	* 1.3847	* 2.0797 *	
13	* 1.2349	* 1.3995	* 1.3936	* 1.6308	* 1.6401	* 1.5101	* .7623 *	
	* 1.7249	* 1.5013	* 1.5208	* 1.3972	* 1.3846	* 1.4968	* 2.5339 *	
14	* 1.5984	* 1.6054	* 1.5562	* 1.0484	* .9275	* .7766 *		
	* 1.4072	* 1.4016	* 1.4501	* 1.8836	* 2.0797	* 2.5575 *		
15	* .8120	* .8384	* .8111	* .5907	* F-SUB-Q			
	* 2.2994	* 2.2484	* 2.4111	* 3.4037	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5962	* 1.3083	* 1.3551	* 1.2800	* 1.5631	* 1.2309	* 1.6005	* .8113 *
	* 1.5072	* 1.7209	* 1.6429	* 1.7382	* 1.5231	* 1.7953	* 1.4567	* 2.3847 *
9	* 1.3083	* 1.6502	* 1.4117	* 1.6539	* 1.4212	* 1.3983	* 1.6073	* .8368 *
	* 1.7209	* 1.4514	* 1.5695	* 1.4415	* 1.5480	* 1.5573	* 1.4504	* 2.3322 *
10	* 1.3551	* 1.4113	* 1.3976	* 1.4601	* 1.6640	* 1.3915	* 1.5580	* .8103 *
	* 1.6429	* 1.5700	* 1.5894	* 1.5052	* 1.4279	* 1.5771	* 1.4977	* 2.4975 *
11	* 1.2800	* 1.6539	* 1.4600	* 1.6639	* 1.4667	* 1.6325	* 1.0480	* .5890 *
	* 1.7382	* 1.4415	* 1.5052	* 1.4284	* 1.4944	* 1.4440	* 1.9509	* 3.5225 *
12	* 1.5631	* 1.4213	* 1.6639	* 1.4668	* 1.3658	* 1.6423	* .9263 *	
	* 1.5231	* 1.5478	* 1.4279	* 1.4943	* 1.6077	* 1.4279	* 2.1508 *	
13	* 1.2309	* 1.3986	* 1.3915	* 1.6324	* 1.6424	* 1.5118	* .7611 *	
	* 1.7953	* 1.5568	* 1.5770	* 1.4441	* 1.4278	* 1.5421	* 2.6165 *	
14	* 1.6005	* 1.6077	* 1.5580	* 1.0479	* .9262	* .7757 *		
	* 1.4567	* 1.4501	* 1.4978	* 1.9496	* 2.1508	* 2.6400 *		
15	* .8113	* .8371	* .8101	* .5889	* F-SUB-Q			
	* 2.3847	* 2.3330	* 2.4976	* 3.5225	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 68 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5877	* 1.3165	* 1.3481	* 1.2741	* 1.5511	* 1.2251	* 1.5887	* .8153
	* 1.5052	* 1.6836	* 1.6147	* 1.7015	* 1.5044	* 1.7664	* 1.4648	* 2.3520
9	* 1.3165	* 1.6434	* 1.4050	* 1.6426	* 1.4122	* 1.3907	* 1.5959	* .8432
	* 1.6836	* 1.4422	* 1.5431	* 1.4324	* 1.5318	* 1.5539	* 1.4608	* 2.2950
10	* 1.3481	* 1.4045	* 1.3885	* 1.4532	* 1.6526	* 1.3836	* 1.5463	* .8215
	* 1.6147	* 1.5436	* 1.5717	* 1.4912	* 1.4337	* 1.5738	* 1.5132	* 2.4491
11	* 1.2741	* 1.6426	* 1.4532	* 1.6552	* 1.4579	* 1.6206	* 1.0561	* .5913
	* 1.7015	* 1.4324	* 1.4912	* 1.4361	* 1.5015	* 1.4661	* 1.9315	* 3.4893
12	* 1.5511	* 1.4123	* 1.6525	* 1.4580	* 1.3564	* 1.6305	* .9378	*
	* 1.5044	* 1.5317	* 1.4337	* 1.5015	* 1.6397	* 1.4718	* 2.1429	*
13	* 1.2251	* 1.3910	* 1.3836	* 1.6205	* 1.6305	* 1.5009	* .7692	*
	* 1.7664	* 1.5534	* 1.5737	* 1.4662	* 1.4717	* 1.5990	* 2.6356	*
14	* 1.5887	* 1.5963	* 1.5462	* 1.0560	* .9376	* .7826	*	*
	* 1.4648	* 1.4605	* 1.5133	* 1.9303	* 2.1429	* 2.6641	*	*
15	* .8153	* .8435	* .8214	* .5912	* F-SUB-Q			
	* 2.3520	* 2.2959	* 2.4489	* 3.4894	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6126	* 1.3145	* 1.3593	* 1.2813	* 1.5722	* 1.2283	* 1.6147	* .8108
	* 1.4251	* 1.6210	* 1.5402	* 1.6274	* 1.4274	* 1.6936	* 1.3862	* 2.2756
9	* 1.3145	* 1.6713	* 1.4175	* 1.6695	* 1.4245	* 1.4038	* 1.6224	* .8355
	* 1.6210	* 1.3638	* 1.4714	* 1.3551	* 1.4604	* 1.4806	* 1.3819	* 2.2287
10	* 1.3593	* 1.4170	* 1.4004	* 1.4650	* 1.6805	* 1.3943	* 1.5717	* .8086
	* 1.5402	* 1.4718	* 1.4986	* 1.4223	* 1.3550	* 1.5012	* 1.4309	* 2.3930
11	* 1.2813	* 1.6695	* 1.4650	* 1.6799	* 1.4718	* 1.6454	* 1.0487	* .5844
	* 1.6274	* 1.3552	* 1.4223	* 1.3603	* 1.4295	* 1.3875	* 1.8682	* 3.3927
12	* 1.5722	* 1.4246	* 1.6805	* 1.4718	* 1.3678	* 1.6573	* .9248	*
	* 1.4274	* 1.4603	* 1.3551	* 1.4294	* 1.5630	* 1.3915	* 2.0861	*
13	* 1.2283	* 1.4041	* 1.3943	* 1.6452	* 1.6574	* 1.5255	* .7599	*
	* 1.6936	* 1.4803	* 1.5011	* 1.3876	* 1.3915	* 1.5118	* 2.5612	*
14	* 1.6147	* 1.6228	* 1.5716	* 1.0487	* .9247	* .7736	*	*
	* 1.3862	* 1.3816	* 1.4310	* 1.8670	* 2.0861	* 2.5871	*	*
15	* .8108	* .8357	* .8084	* .5843	* F-SUB-Q			
	* 2.2756	* 2.2295	* 2.3931	* 3.3927	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 69 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6291	* 1.3211	* 1.3673	* 1.2875	* 1.5850	* 1.2319	* 1.6303	* .8133 *
	* 1.3669	* 1.5610	* 1.4835	* 1.5690	* 1.3713	* 1.6353	* 1.3294	* 2.1970 *
9	* 1.3211	* 1.6896	* 1.4265	* 1.6860	* 1.4328	* 1.4129	* 1.6384	* .8348 *
	* 1.5610	* 1.3069	* 1.4163	* 1.2995	* 1.4061	* 1.4244	* 1.3248	* 2.1599 *
10	* 1.3673	* 1.4260	* 1.4082	* 1.4742	* 1.6977	* 1.4019	* 1.5868	* .8090 *
	* 1.4835	* 1.4167	* 1.4433	* 1.3687	* 1.2982	* 1.4451	* 1.3715	* 2.3151 *
11	* 1.2875	* 1.6860	* 1.4742	* 1.6958	* 1.4813	* 1.6604	* 1.0513	* .5831 *
	* 1.5690	* 1.2995	* 1.3687	* 1.3041	* 1.3744	* 1.3297	* 1.8027	* 3.2885 *
12	* 1.5850	* 1.4329	* 1.6976	* 1.4813	* 1.3751	* 1.6734	* .9254 *	
	* 1.3713	* 1.4060	* 1.2983	* 1.3744	* 1.5038	* 1.3315	* 2.0147 *	
13	* 1.2319	* 1.4131	* 1.4018	* 1.6602	* 1.6735	* 1.5403	* .7599 *	
	* 1.6353	* 1.4241	* 1.4450	* 1.3298	* 1.3315	* 1.4458	* 2.4728 *	
14	* 1.6303	* 1.6387	* 1.5866	* 1.0512	* .9252	* .7734	*	
	* 1.3294	* 1.3246	* 1.3717	* 1.8015	* 2.0148	* 2.4984	*	
15	* .8133	* .8348	* .8088	* .5830	* F-SUB-Q			
	* 2.1970	* 2.1614	* 2.3151	* 3.2885	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6426	* 1.3344	* 1.3757	* 1.2944	* 1.5952	* 1.2370	* 1.6419	* .8188 *
	* 1.3202	* 1.5070	* 1.4365	* 1.5205	* 1.3270	* 1.5864	* 1.2847	* 2.1248 *
9	* 1.3344	* 1.7058	* 1.4358	* 1.6990	* 1.4405	* 1.4214	* 1.6504	* .8432 *
	* 1.5070	* 1.2605	* 1.3709	* 1.2556	* 1.3620	* 1.3783	* 1.2798	* 2.0819 *
10	* 1.3757	* 1.4353	* 1.4156	* 1.4835	* 1.7110	* 1.4094	* 1.5979	* .8163 *
	* 1.4365	* 1.3713	* 1.3983	* 1.3243	* 1.2533	* 1.3990	* 1.3247	* 2.2330 *
11	* 1.2944	* 1.6990	* 1.4835	* 1.7100	* 1.4898	* 1.6719	* 1.0608	* .5868 *
	* 1.5205	* 1.2556	* 1.3243	* 1.2581	* 1.3293	* 1.2835	* 1.7374	* 3.1787 *
12	* 1.5952	* 1.4407	* 1.7109	* 1.4898	* 1.3818	* 1.6857	* .9336 *	
	* 1.3270	* 1.3619	* 1.2534	* 1.3293	* 1.4548	* 1.2835	* 1.9401 *	
13	* 1.2370	* 1.4216	* 1.4094	* 1.6718	* 1.6857	* 1.5513	* .7670 *	
	* 1.5864	* 1.3780	* 1.3990	* 1.2836	* 1.2835	* 1.3930	* 2.3777 *	
14	* 1.6419	* 1.6507	* 1.5978	* 1.0608	* .9335	* .7811	*	
	* 1.2847	* 1.2796	* 1.3249	* 1.7362	* 1.9401	* 2.4011	*	
15	* .8188	* .8434	* .8160	* .5867	* F-SUB-Q			
	* 2.1248	* 2.0827	* 2.2331	* 3.1788	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 70 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6514	* 1.3569	* 1.3835	* 1.3029	* 1.6010	* 1.2481	* 1.6472	* .8317 *
	* 1.3875	* 1.5669	* 1.5117	* 1.5994	* 1.3994	* 1.6663	* 1.3538	* 2.2125 *
9	* 1.3569	* 1.7156	* 1.4447	* 1.7059	* 1.4477	* 1.4293	* 1.6561	* .8586 *
	* 1.5669	* 1.3254	* 1.4422	* 1.3230	* 1.4341	* 1.4496	* 1.3482	* 2.1623 *
10	* 1.3835	* 1.4441	* 1.4221	* 1.4931	* 1.7180	* 1.4173	* 1.6028	* .8367 *
	* 1.5117	* 1.4427	* 1.4729	* 1.3920	* 1.3192	* 1.4710	* 1.3953	* 2.3029 *
11	* 1.3029	* 1.7059	* 1.4930	* 1.7191	* 1.4974	* 1.6782	* 1.0802	* .5963 *
	* 1.5994	* 1.3230	* 1.3920	* 1.3221	* 1.3972	* 1.3497	* 1.8022	* 3.3052 *
12	* 1.6010	* 1.4478	* 1.7179	* 1.4974	* 1.3880	* 1.6918	* .9548 *	
	* 1.3994	* 1.4340	* 1.3193	* 1.3972	* 1.5279	* 1.3477	* 2.0012 *	
13	* 1.2481	* 1.4295	* 1.4172	* 1.6780	* 1.6918	* 1.5565	* .7834 *	
	* 1.6663	* 1.4494	* 1.4710	* 1.3499	* 1.3477	* 1.4617	* 2.4526 *	
14	* 1.6472	* 1.6563	* 1.6027	* 1.0802	* .9546	* .7966	*	
	* 1.3538	* 1.3480	* 1.3955	* 1.8010	* 2.0013	* 2.4805	*	
15	* .8317	* .8588	* .8365	* .5962	* F-SUB-Q			
	* 2.2125	* 2.1632	* 2.3027	* 3.3053	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6965	* 1.3673	* 1.4108	* 1.3251	* 1.6430	* 1.2632	* 1.6946	* .8350 *
	* 1.3217	* 1.5242	* 1.4572	* 1.5480	* 1.3426	* 1.6199	* 1.2950	* 2.1688 *
9	* 1.3673	* 1.7644	* 1.4743	* 1.7552	* 1.4775	* 1.4597	* 1.7040	* .8576 *
	* 1.5242	* 1.2657	* 1.3900	* 1.2649	* 1.3831	* 1.3970	* 1.2891	* 2.1303 *
10	* 1.4108	* 1.4737	* 1.4510	* 1.5232	* 1.7686	* 1.4452	* 1.6491	* .8304 *
	* 1.4572	* 1.3905	* 1.4199	* 1.3423	* 1.2602	* 1.4191	* 1.3333	* 2.2824 *
11	* 1.3251	* 1.7551	* 1.5231	* 1.7658	* 1.5296	* 1.7252	* 1.0830	* .5944 *
	* 1.5480	* 1.2649	* 1.3423	* 1.2652	* 1.3442	* 1.2893	* 1.7666	* 3.2591 *
12	* 1.6430	* 1.4776	* 1.7685	* 1.5296	* 1.4163	* 1.7410	* .9508 *	
	* 1.3426	* 1.3829	* 1.2603	* 1.3442	* 1.4658	* 1.2829	* 1.9718 *	
13	* 1.2632	* 1.4599	* 1.4451	* 1.7250	* 1.7410	* 1.6014	* .7805 *	
	* 1.6199	* 1.3968	* 1.4191	* 1.2895	* 1.2828	* 1.3909	* 2.4125 *	
14	* 1.6946	* 1.7043	* 1.6489	* 1.0830	* .9506	* .7936	*	
	* 1.2950	* 1.2889	* 1.3335	* 1.7654	* 1.9718	* 2.4401	*	
15	* .8350	* .8574	* .8302	* .5943	* F-SUB-Q			
	* 2.1688	* 2.1322	* 2.2825	* 3.2591	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 71 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7261	* 1.3887	* 1.4327	* 1.3448	* 1.6709	* 1.2813	* 1.7247	* .8464 *
	* 1.2534	* 1.4517	* 1.3922	* 1.4817	* 1.2820	* 1.5527	* 1.2383	* 2.0867 *
9	* 1.3887	* 1.7965	* 1.4982	* 1.7868	* 1.5010	* 1.4838	* 1.7347	* .8697 *
	* 1.4517	* 1.2048	* 1.3280	* 1.2060	* 1.3218	* 1.3370	* 1.2323	* 2.0487 *
10	* 1.4327	* 1.4976	* 1.4733	* 1.5482	* 1.8008	* 1.4685	* 1.6784	* .8418 *
	* 1.3922	* 1.3285	* 1.3575	* 1.2817	* 1.2000	* 1.3566	* 1.2746	* 2.1957 *
11	* 1.3448	* 1.7867	* 1.5481	* 1.7979	* 1.5542	* 1.7560	* 1.0992	* .6014 *
	* 1.4817	* 1.2060	* 1.2818	* 1.2043	* 1.2826	* 1.2291	* 1.6925	* 3.1452 *
12	* 1.6709	* 1.5011	* 1.8006	* 1.5542	* 1.4382	* 1.7727	* .9646 *	
	* 1.2820	* 1.3216	* 1.2001	* 1.2826	* 1.3968	* 1.2214	* 1.8894 *	
13	* 1.2813	* 1.4840	* 1.4684	* 1.7558	* 1.7727	* 1.6300	* .7913 *	
	* 1.5527	* 1.3368	* 1.3566	* 1.2292	* 1.2214	* 1.3259	* 2.3149 *	
14	* 1.7247	* 1.7349	* 1.6782	* 1.0992	* .9644	* .8045		
	* 1.2383	* 1.2321	* 1.2748	* 1.6914	* 1.8895	* 2.3415		
15	* .8464	* .8694	* .8416	* .6014	* F-SUB-Q			
	* 2.0867	* 2.0506	* 2.1958	* 3.1452	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7300	* 1.4176	* 1.4439	* 1.3568	* 1.6750	* 1.3009	* 1.7268	* .8635 *
	* 1.2167	* 1.3850	* 1.3476	* 1.4337	* 1.2480	* 1.4946	* 1.2062	* 1.9966 *
9	* 1.4176	* 1.8003	* 1.5104	* 1.7891	* 1.5117	* 1.4952	* 1.7373	* .8928 *
	* 1.3850	* 1.1714	* 1.2854	* 1.1747	* 1.2806	* 1.2946	* 1.1997	* 1.9479 *
10	* 1.4439	* 1.5097	* 1.4830	* 1.5622	* 1.8021	* 1.4812	* 1.6802	* .8696 *
	* 1.3476	* 1.2859	* 1.3158	* 1.2390	* 1.1684	* 1.3115	* 1.2410	* 2.0740 *
11	* 1.3568	* 1.7891	* 1.5621	* 1.8044	* 1.5644	* 1.7600	* 1.1264	* .6164 *
	* 1.4337	* 1.1747	* 1.2391	* 1.1688	* 1.2413	* 1.1936	* 1.6097	* 2.9937 *
12	* 1.6750	* 1.5119	* 1.8020	* 1.5644	* 1.4474	* 1.7754	* .9959 *	
	* 1.2480	* 1.2804	* 1.1685	* 1.2413	* 1.3496	* 1.1851	* 1.7813	
13	* 1.3009	* 1.4954	* 1.4812	* 1.7598	* 1.7754	* 1.6316	* .8143 *	
	* 1.4946	* 1.2943	* 1.3115	* 1.1937	* 1.1851	* 1.2863	* 2.1876 *	
14	* 1.7268	* 1.7376	* 1.6800	* 1.1263	* .9957	* .8278		
	* 1.2062	* 1.1995	* 1.2411	* 1.6087	* 1.7814	* 2.2131		
15	* .8635	* .8930	* .8694	* .6163	* F-SUB-Q			
	* 1.9966	* 1.9487	* 2.0738	* 2.9938	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 72 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7507	* 1.4118	* 1.4615	* 1.3679	* 1.6972	* 1.3065	* 1.7508	* .8577 *
	* 1.1764	* 1.3616	* 1.3045	* 1.3942	* 1.2071	* 1.4577	* 1.1650	* 1.9701 *
9	* 1.4118	* 1.8192	* 1.5286	* 1.8121	* 1.5301	* 1.5138	* 1.7621	* .8844 *
	* 1.3616	* 1.1349	* 1.2448	* 1.1361	* 1.2398	* 1.2526	* 1.1582	* 1.9273 *
10	* 1.4615	* 1.5279	* 1.5020	* 1.5802	* 1.8233	* 1.4993	* 1.7040	* .8561 *
	* 1.3045	* 1.2452	* 1.2730	* 1.2000	* 1.1304	* 1.2690	* 1.1978	* 2.0641 *
11	* 1.3679	* 1.8121	* 1.5802	* 1.8237	* 1.5827	* 1.7840	* 1.1181	* .6107 *
	* 1.3942	* 1.1361	* 1.2000	* 1.1317	* 1.2009	* 1.1516	* 1.5875	* 2.9605 *
12	* 1.6972	* 1.5302	* 1.8232	* 1.5827	* 1.4634	* 1.7991	* .9829 *	
	* 1.2071	* 1.2396	* 1.1305	* 1.2009	* 1.3049	* 1.1425	* 1.7656 *	
13	* 1.3065	* 1.5140	* 1.4993	* 1.7838	* 1.7991	* 1.6516	* .8041 *	
	* 1.4577	* 1.2524	* 1.2690	* 1.1518	* 1.1425	* 1.2409	* 2.1658 *	
14	* 1.7508	* 1.7624	* 1.7038	* 1.1180	* .9827	* .8178	*	
	* 1.1650	* 1.1580	* 1.1979	* 1.5865	* 1.7657	* 2.1899	*	
15	* .8577	* .8846	* .8559	* .6106	* F-SUB-Q			
	* 1.9701	* 1.9280	* 2.0642	* 2.9606	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6802	* 1.3628	* 1.4237	* 1.3255	* 1.6320	* 1.2708	* 1.6782	* .8261 *
	* 1.2044	* 1.3865	* 1.3169	* 1.4154	* 1.2344	* 1.4742	* 1.1941	* 2.0113 *
9	* 1.3628	* 1.7409	* 1.4870	* 1.7350	* 1.4841	* 1.4688	* 1.6899	* .8506 *
	* 1.3865	* 1.1651	* 1.2584	* 1.1661	* 1.2569	* 1.2690	* 1.1862	* 1.9705 *
10	* 1.4237	* 1.4864	* 1.4590	* 1.5328	* 1.7398	* 1.4574	* 1.6347	* .8251 *
	* 1.3169	* 1.2589	* 1.2887	* 1.2164	* 1.1637	* 1.2830	* 1.2263	* 2.1057 *
11	* 1.3255	* 1.7349	* 1.5328	* 1.7427	* 1.5311	* 1.7106	* 1.0778	* .5895 *
	* 1.4154	* 1.1661	* 1.2164	* 1.1631	* 1.2195	* 1.1791	* 1.6181	* 3.0161 *
12	* 1.6320	* 1.4842	* 1.7398	* 1.5311	* 1.4164	* 1.7209	* .9486 *	
	* 1.2344	* 1.2567	* 1.1637	* 1.2194	* 1.3242	* 1.1716	* 1.7968 *	
13	* 1.2708	* 1.4692	* 1.4574	* 1.7104	* 1.7210	* 1.5780	* .7727 *	
	* 1.4742	* 1.2686	* 1.2830	* 1.1792	* 1.1715	* 1.2734	* 2.2126 *	
14	* 1.6782	* 1.6902	* 1.6345	* 1.0777	* .9484	* .7881	*	
	* 1.1941	* 1.1860	* 1.2265	* 1.6171	* 1.7968	* 2.2309	*	
15	* .8261	* .8507	* .8249	* .5895	* F-SUB-Q			
	* 2.0113	* 1.9714	* 2.1057	* 3.0162	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 73 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 100% POWER, 460 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4298	* 1.1914	* 1.2509	* 1.1571	* 1.3894	* 1.1145	* 1.4248	* .7120 *
	* 1.3934	* 1.5620	* 1.4766	* 1.5975	* 1.4280	* 1.6565	* 1.3840	* 2.2996 *
9	* 1.1914	* 1.5029	* 1.3032	* 1.4872	* 1.2685	* 1.2784	* 1.4339	* .7312 *
	* 1.5620	* 1.3275	* 1.4144	* 1.3394	* 1.4484	* 1.4361	* 1.3758	* 2.2578 *
10	* 1.2509	* 1.3027	* 1.2531	* 1.3384	* 1.4938	* 1.2743	* 1.3893	* .7061 *
	* 1.4766	* 1.4149	* 1.4779	* 1.3715	* 1.3340	* 1.4444	* 1.4199	* 2.4244 *
11	* 1.1571	* 1.4872	* 1.3383	* 1.4907	* 1.3055	* 1.4487	* .9228	* .5158 *
	* 1.5975	* 1.3394	* 1.3715	* 1.3380	* 1.4076	* 1.3699	* 1.8614	* 3.4000 *
12	* 1.3894	* 1.2687	* 1.4937	* 1.3055	* 1.2054	* 1.4546	* .8158	* .7120 *
	* 1.4280	* 1.4482	* 1.3340	* 1.4076	* 1.5333	* 1.3630	* 2.0567	* 2.2996 *
13	* 1.1145	* 1.2790	* 1.2743	* 1.4485	* 1.4547	* 1.3382	* .6646	* .7312 *
	* 1.6565	* 1.4353	* 1.4444	* 1.3700	* 1.3629	* 1.4761	* 2.5330	* 2.2578 *
14	* 1.4248	* 1.4343	* 1.3892	* .9227	* .8157	* .6776		
	* 1.3840	* 1.3754	* 1.4200	* 1.8602	* 2.0566	* 2.5546		
15	* .7120	* .7314	* .7059	* .5157	* F-SUB-Q			
	* 2.2996	* 2.2587	* 2.4245	* 3.4000	* M-SUB-Q			

AT 100% POWER, 460 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .7049	* .6102	* .5985	* .5913	* .6847	* .5712	* .6347	* .3505 *
	* 2.7836	* 3.0048	* 3.0397	* 3.0808	* 2.8553	* 3.1854	* 3.0592	* 4.6105 *
9	* .6102	* .6993	* .6185	* .7080	* .6023	* .5978	* .6377	* .3549 *
	* 3.0048	* 2.8078	* 2.9340	* 2.7687	* 3.0021	* 3.0235	* 3.0453	* 4.5924 *
10	* .5985	* .6184	* .5883	* .6350	* .7127	* .6036	* .6144	* .3399 *
	* 3.0397	* 2.9347	* 3.0999	* 2.8449	* 2.7499	* 3.0018	* 3.1619	* 4.9729 *
11	* .5913	* .7080	* .6350	* .7117	* .6075	* .6722	* .4581	* .2567 *
	* 3.0808	* 2.7687	* 2.8450	* 2.7564	* 2.9766	* 2.9052	* 3.6957	* 6.7522 *
12	* .6847	* .6024	* .7127	* .6075	* .5702	* .6454	* .3960	
	* 2.8553	* 3.0016	* 2.7499	* 2.9766	* 3.1895	* 3.0228	* 4.1796	
13	* .5712	* .5982	* .6036	* .6722	* .6454	* .5825	* .3189	
	* 3.1854	* 3.0214	* 3.0015	* 2.9053	* 3.0224	* 3.3407	* 5.2113	
14	* .6347	* .6380	* .6144	* .4581	* .3960	* .3237		
	* 3.0592	* 3.0443	* 3.1619	* 3.6935	* 4.1786	* 5.2794		
15	* .3505	* .3549	* .3398	* .2567	* F-SUB-Q			
	* 4.6105	* 4.5947	* 4.9725	* 6.7518	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 74 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4664 *	* .5347 *	* .5697 *	* .5882 *	* .6805 *	* .5837 *	* .5814 *	* .3106 *
	* 3.2270 *	* 3.7036 *	* 3.5741 *	* 3.4263 *	* 2.9545 *	* 3.4560 *	* 3.5105 *	* 6.0305 *
9	* .5347 *	* .6319 *	* .5989 *	* .6697 *	* .5823 *	* .5690 *	* .5773 *	* .3108 *
	* 3.7036 *	* 3.2645 *	* 3.4198 *	* 3.0252 *	* 3.4608 *	* 3.5479 *	* 3.5375 *	* 5.9524 *
10	* .5697 *	* .5988 *	* .5599 *	* .5886 *	* .6248 *	* .5351 *	* .5162 *	* .2835 *
	* 3.5741 *	* 3.4205 *	* 3.7046 *	* 3.4781 *	* 3.2242 *	* 3.7459 *	* 3.8762 *	* 6.4279 *
11	* .5882 *	* .6698 *	* .5887 *	* .5966 *	* .4993 *	* .5080 *	* .3724 *	* .1957 *
	* 3.4263 *	* 3.0246 *	* 3.4774 *	* 3.4356 *	* 4.0564 *	* 3.8736 *	* 4.9574 *	* 9.2929 *
12	* .6805 *	* .5825 *	* .6251 *	* .4994 *	* .3705 *	* .3927 *	* .2659 *	
	* 2.9545 *	* 3.4598 *	* 3.2225 *	* 4.0553 *	* 4.4129 *	* 4.0998 *	* 6.2530 *	
13	* .5837 *	* .5703 *	* .5356 *	* .5083 *	* .3927 *	* .3199 *	* .1839 *	
	* 3.4560 *	* 3.5403 *	* 3.7427 *	* 3.8725 *	* 4.0995 *	* 4.6332 *	* 8.1568 *	
14	* .5814 *	* .5781 *	* .5167 *	* .3726 *	* .2659 *	* .1881 *		
	* 3.5105 *	* 3.5324 *	* 3.8727 *	* 4.9553 *	* 6.2547 *	* 7.9825 *		
15	* .3106 *	* .3110 *	* .2837 *	* .1958 *	F-SUB-Q			
	* 6.0305 *	* 5.9492 *	* 6.4248 *	* 9.2882 *	M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9745 *	* 1.1160 *	* 1.2926 *	* 1.2283 *	* 1.4735 *	* 1.2440 *	* 1.4265 *	* .6718 *
	* 1.5288 *	* 1.8091 *	* 1.6239 *	* 1.6918 *	* 1.4064 *	* 1.6688 *	* 1.4748 *	* 2.8763 *
9	* 1.1160 *	* 1.3479 *	* 1.3526 *	* 1.4288 *	* 1.3069 *	* 1.3180 *	* 1.4201 *	* .6941 *
	* 1.8091 *	* 1.5730 *	* 1.5528 *	* 1.4622 *	* 1.5908 *	* 1.5794 *	* 1.4675 *	* 2.7263 *
10	* 1.2926 *	* 1.3523 *	* 1.3048 *	* 1.3130 *	* 1.2914 *	* 1.2266 *	* 1.2886 *	* .6473 *
	* 1.6239 *	* 1.5532 *	* 1.6336 *	* 1.6027 *	* 1.6142 *	* 1.6869 *	* 1.5987 *	* 2.8947 *
11	* 1.2283 *	* 1.4290 *	* 1.3131 *	* 1.2290 *	* 1.1013 *	* 1.1925 *	* .8255 *	* .4227 *
	* 1.6918 *	* 1.4620 *	* 1.6025 *	* 1.7167 *	* 1.8519 *	* 1.6811 *	* 2.3093 *	* 4.4410 *
12	* 1.4735 *	* 1.3076 *	* 1.2919 *	* 1.1016 *	* .8109 *	* .9620 *	* .5978 *	
	* 1.4064 *	* 1.5900 *	* 1.6136 *	* 1.8515 *	* 1.9354 *	* 1.6914 *	* 2.8392 *	
13	* 1.2440 *	* 1.3207 *	* 1.2277 *	* 1.1930 *	* .9622 *	* .8255 *	* .4389 *	
	* 1.6688 *	* 1.5763 *	* 1.6855 *	* 1.6806 *	* 1.6913 *	* 1.8919 *	* 3.4963 *	
14	* 1.4265 *	* 1.4220 *	* 1.2897 *	* .8257 *	* .5977 *	* .4413 *		
	* 1.4748 *	* 1.4657 *	* 1.5974 *	* 2.3085 *	* 2.8398 *	* 3.4803 *		
15	* .6718 *	* .6946 *	* .6475 *	* .4229 *	F-SUB-Q			
	* 2.8763 *	* 2.7245 *	* 2.8936 *	* 4.4390 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 75 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0692	* 1.2997	* 1.5198	* 1.3914	* 1.4599	* 1.4348	* 1.5259	* .7460 *
	* 1.5868	* 1.6396	* 1.4124	* 1.5355	* 1.4506	* 1.4763	* 1.3865	* 2.6034 *
9	* 1.2997	* 1.5096	* 1.5598	* 1.4770	* 1.5287	* 1.5518	* 1.4873	* .7795 *
	* 1.6396	* 1.4283	* 1.3760	* 1.4503	* 1.3888	* 1.3668	* 1.4220	* 2.4592 *
10	* 1.5198	* 1.5595	* 1.5783	* 1.5132	* 1.4115	* 1.4362	* 1.4494	* .7475 *
	* 1.4124	* 1.3762	* 1.3650	* 1.4170	* 1.5032	* 1.4746	* 1.4526	* 2.5571 *
11	* 1.3914	* 1.4771	* 1.5134	* 1.3967	* 1.2668	* 1.2173	* .9526	* .4901 *
	* 1.5355	* 1.4503	* 1.4168	* 1.5360	* 1.6073	* 1.7215	* 2.0537	* 3.9257 *
12	* 1.4599	* 1.5306	* 1.4128	* 1.2672	* .9548	* 1.0037	* .6702	* .6702 *
	* 1.4506	* 1.3871	* 1.5018	* 1.6071	* 1.6283	* 1.6644	* 2.5913	* .6702 *
13	* 1.4348	* 1.5551	* 1.4375	* 1.2180	* 1.0040	* 1.0055	* .5214	* .5214 *
	* 1.4763	* 1.3639	* 1.4731	* 1.7210	* 1.6641	* 1.5965	* 3.0194	* 3.0194 *
14	* 1.5259	* 1.4893	* 1.4507	* .9529	* .6702	* .5305	* .5305	* .5305 *
	* 1.3865	* 1.4201	* 1.4513	* 2.0531	* 2.5915	* 2.9699	* 2.9699	* 2.9699 *
15	* .7460	* .7801	* .7479	* .4903	* F-SUB-Q			
	* 2.6034	* 2.4577	* 2.5561	* 3.9238	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1648	* 1.3937	* 1.6401	* 1.4845	* 1.5706	* 1.5368	* 1.6603	* .7596 *
	* 1.5224	* 1.5962	* 1.3460	* 1.4803	* 1.3834	* 1.4127	* 1.3024	* 2.6034 *
9	* 1.3937	* 1.6448	* 1.6843	* 1.6071	* 1.6426	* 1.6814	* 1.6185	* .7941 *
	* 1.5962	* 1.3477	* 1.3102	* 1.3726	* 1.3268	* 1.2928	* 1.3366	* 2.4592 *
10	* 1.6401	* 1.6839	* 1.7169	* 1.6307	* 1.5350	* 1.5563	* 1.5916	* .7744 *
	* 1.3460	* 1.3105	* 1.2878	* 1.3515	* 1.4219	* 1.3988	* 1.3583	* 2.5332 *
11	* 1.4845	* 1.6072	* 1.6309	* 1.5215	* 1.3593	* 1.3233	* 1.0013	* .5091 *
	* 1.4803	* 1.3725	* 1.3514	* 1.4516	* 1.5269	* 1.6349	* 2.0186	* 3.8951 *
12	* 1.5706	* 1.6448	* 1.5365	* 1.3597	* 1.0264	* 1.0937	* .6932	* .6932 *
	* 1.3834	* 1.3250	* 1.4204	* 1.5267	* 1.5400	* 1.5763	* 2.5913	* 2.5913 *
13	* 1.5368	* 1.6852	* 1.5579	* 1.3240	* 1.0941	* 1.1378	* .5579	* .5579 *
	* 1.4127	* 1.2899	* 1.3974	* 1.6344	* 1.5760	* 1.4698	* 2.9410	* 2.9410 *
14	* 1.6603	* 1.6206	* 1.5931	* 1.0017	* .6933	* .5691	* .5691	* .5691 *
	* 1.3024	* 1.3349	* 1.3570	* 2.0178	* 2.5915	* 2.8858	* 2.8858	* 2.8858 *
15	* .7596	* .7947	* .7747	* .5094	* F-SUB-Q			
	* 2.6034	* 2.4577	* 2.5322	* 3.8931	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 76 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2228	* 1.4348	* 1.6817	* 1.5171	* 1.6232	* 1.5705	* 1.7182	* .7695 *
	* 1.5320	* 1.6204	* 1.3607	* 1.4983	* 1.3802	* 1.4256	* 1.2984	* 2.6599 *
9	* 1.4348	* 1.7055	* 1.7330	* 1.6641	* 1.6819	* 1.7242	* 1.6769	* .8076 *
	* 1.6204	* 1.3510	* 1.3202	* 1.3751	* 1.3362	* 1.2976	* 1.3315	* 2.5050 *
10	* 1.6817	* 1.7326	* 1.7675	* 1.6764	* 1.5900	* 1.6045	* 1.6580	* .7913 *
	* 1.3607	* 1.3206	* 1.2980	* 1.3639	* 1.4185	* 1.4019	* 1.3464	* 2.5626 *
11	* 1.5171	* 1.6642	* 1.6765	* 1.5792	* 1.4127	* 1.3841	* 1.0353	* .5179 *
	* 1.4983	* 1.3750	* 1.3638	* 1.4550	* 1.5338	* 1.6294	* 2.0240	* 3.9578 *
12	* 1.6232	* 1.6843	* 1.5917	* 1.4132	* 1.0790	* 1.1674	* .7230 *	
	* 1.3802	* 1.3343	* 1.4169	* 1.5336	* 1.5476	* 1.5682	* 2.6286 *	
13	* 1.5705	* 1.7282	* 1.6061	* 1.3849	* 1.1678	* 1.2361	* .5919 *	
	* 1.4256	* 1.2951	* 1.4004	* 1.6288	* 1.5678	* 1.4477	* 2.9567 *	
14	* 1.7182	* 1.6792	* 1.6597	* 1.0357	* .7232	* .6046 *		
	* 1.2984	* 1.3298	* 1.3451	* 2.0230	* 2.6283	* 2.8976 *		
15	* .7695	* .8082	* .7917	* .5182	* F-SUB-Q			
	* 2.6599	* 2.5033	* 2.5615	* 3.9555	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3209	* 1.4699	* 1.7036	* 1.5335	* 1.6468	* 1.5841	* 1.7449	* .7776 *
	* 1.5707	* 1.6668	* 1.3961	* 1.5377	* 1.4050	* 1.4575	* 1.3162	* 2.7109 *
9	* 1.4699	* 1.7396	* 1.7603	* 1.6937	* 1.6999	* 1.7485	* 1.7050	* .8179 *
	* 1.6668	* 1.3786	* 1.3495	* 1.4008	* 1.3666	* 1.3174	* 1.3486	* 2.5477 *
10	* 1.7036	* 1.7599	* 1.7954	* 1.7028	* 1.6198	* 1.6330	* 1.6950	* .8035 *
	* 1.3961	* 1.3499	* 1.3262	* 1.3934	* 1.4464	* 1.4310	* 1.3644	* 2.6065 *
11	* 1.5335	* 1.6937	* 1.7030	* 1.6150	* 1.4668	* 1.4338	* 1.0661	* .5255 *
	* 1.5377	* 1.4008	* 1.3932	* 1.4833	* 1.5676	* 1.6561	* 2.0630	* 4.0688 *
12	* 1.6468	* 1.7024	* 1.6216	* 1.4673	* 1.1737	* 1.2670	* .7625 *	
	* 1.4050	* 1.3646	* 1.4448	* 1.5674	* 1.5838	* 1.5973	* 2.6766 *	
13	* 1.5841	* 1.7520	* 1.6347	* 1.4347	* 1.2675	* 1.3510	* .6338 *	
	* 1.4575	* 1.3148	* 1.4293	* 1.6554	* 1.5968	* 1.4705	* 3.0228 *	
14	* 1.7449	* 1.7077	* 1.6967	* 1.0666	* .7627	* .6475 *		
	* 1.3162	* 1.3467	* 1.3630	* 2.0618	* 2.6759	* 2.9616 *		
15	* .7776	* .8185	* .8040	* .5258	* F-SUB-Q			
	* 2.7109	* 2.5459	* 2.6051	* 4.0660	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 77 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5046	* 1.5190	* 1.7473	* 1.5573	* 1.6773	* 1.6045	* 1.7826	* .7787 *
	* 1.5924	* 1.6944	* 1.4401	* 1.5884	* 1.4403	* 1.5007	* 1.3404	* 2.8132 *
9	* 1.5190	* 1.7869	* 1.7980	* 1.7351	* 1.7270	* 1.7816	* 1.7443	* .8178 *
	* 1.6944	* 1.4141	* 1.3885	* 1.4353	* 1.4057	* 1.3472	* 1.3740	* 2.6493 *
10	* 1.7473	* 1.7975	* 1.8351	* 1.7398	* 1.6615	* 1.6719	* 1.7418	* .8071 *
	* 1.4401	* 1.3889	* 1.3633	* 1.4330	* 1.4807	* 1.4688	* 1.3909	* 2.7110 *
11	* 1.5573	* 1.7351	* 1.7400	* 1.6646	* 1.5406	* 1.5010	* 1.0893	* .5289 *
	* 1.5884	* 1.4353	* 1.4328	* 1.5199	* 1.5987	* 1.6696	* 2.1426	* 4.2593 *
12	* 1.6773	* 1.7296	* 1.6634	* 1.5412	* 1.3861	* 1.4199	* .7965 *	
	* 1.4403	* 1.4035	* 1.4790	* 1.5984	* 1.6147	* 1.6196	* 2.7737 *	
13	* 1.6045	* 1.7852	* 1.6737	* 1.5019	* 1.4205	* 1.5030	* .6758 *	
	* 1.5007	* 1.3445	* 1.4670	* 1.6687	* 1.6191	* 1.4846	* 3.1136 *	
14	* 1.7826	* 1.7472	* 1.7437	* 1.0899	* .7968	* .6905	*	
	* 1.3404	* 1.3720	* 1.3894	* 2.1412	* 2.7729	* 3.0498	*	
15	* .7787	* .8185	* .8076	* .5293	* F-SUB-Q			
	* 2.8132	* 2.6474	* 2.7094	* 4.2561	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6266	* 1.5547	* 1.7779	* 1.5721	* 1.6947	* 1.6160	* 1.8045	* .7813 *
	* 1.6435	* 1.7571	* 1.5099	* 1.6666	* 1.5032	* 1.5699	* 1.3925	* 2.9455 *
9	* 1.5547	* 1.8177	* 1.8235	* 1.7614	* 1.7430	* 1.8027	* 1.7683	* .8195 *
	* 1.7571	* 1.4783	* 1.4527	* 1.4987	* 1.4697	* 1.4018	* 1.4275	* 2.7789 *
10	* 1.7779	* 1.8229	* 1.8622	* 1.7654	* 1.6884	* 1.6993	* 1.7733	* .8116 *
	* 1.5099	* 1.4532	* 1.4255	* 1.4986	* 1.5439	* 1.5313	* 1.4448	* 2.8441 *
11	* 1.5721	* 1.7614	* 1.7656	* 1.6988	* 1.5974	* 1.5515	* 1.1111	* .5339 *
	* 1.6666	* 1.4987	* 1.4984	* 1.5869	* 1.6361	* 1.7104	* 2.2298	* 4.4832 *
12	* 1.6947	* 1.7459	* 1.6904	* 1.5980	* 1.5369	* 1.5334	* .8289 *	
	* 1.5032	* 1.4673	* 1.5420	* 1.6358	* 1.6560	* 1.6569	* 2.8553 *	
13	* 1.6160	* 1.8065	* 1.7012	* 1.5525	* 1.5340	* 1.6249	* .7140 *	
	* 1.5699	* 1.3989	* 1.5294	* 1.7094	* 1.6563	* 1.5198	* 3.2148 *	
14	* 1.8045	* 1.7713	* 1.7752	* 1.1119	* .8292	* .7295	*	
	* 1.3925	* 1.4254	* 1.4432	* 2.2283	* 2.8543	* 3.1496	*	
15	* .7813	* .8202	* .8121	* .5343	* F-SUB-Q			
	* 2.9455	* 2.7769	* 2.8423	* 4.4796	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 78 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6777	* 1.5797	* 1.8036	* 1.5863	* 1.7142	* 1.6284	* 1.8285	* .7809
	* 1.7172	* 1.8320	* 1.5941	* 1.7610	* 1.5792	* 1.6542	* 1.4567	* 3.1205
9	* 1.5797	* 1.8471	* 1.8476	* 1.7884	* 1.7604	* 1.8247	* 1.7936	* .8171
	* 1.8320	* 1.5550	* 1.5306	* 1.5747	* 1.5470	* 1.4695	* 1.4936	* 2.9520
10	* 1.8036	* 1.8469	* 1.8880	* 1.7899	* 1.7159	* 1.7255	* 1.8045	* .8126
	* 1.5941	* 1.5311	* 1.5010	* 1.5781	* 1.6195	* 1.6071	* 1.5112	* 3.0166
11	* 1.5863	* 1.7884	* 1.7901	* 1.7315	* 1.6425	* 1.5944	* 1.1257	* .5356
	* 1.7610	* 1.5747	* 1.5779	* 1.6518	* 1.6962	* 1.7678	* 2.3194	* 4.7698
12	* 1.7142	* 1.7634	* 1.7180	* 1.6428	* 1.6030	* 1.6031	* .8488	*
	* 1.5792	* 1.5442	* 1.6175	* 1.6959	* 1.7192	* 1.7093	* 2.9868	*
13	* 1.6284	* 1.8286	* 1.7275	* 1.5954	* 1.6037	* 1.7123	* .7395	*
	* 1.6542	* 1.4664	* 1.6051	* 1.7667	* 1.7090	* 1.5630	* 3.3495	*
14	* 1.8285	* 1.7967	* 1.8066	* 1.1265	* .8492	* .7555	*	*
	* 1.4567	* 1.4914	* 1.5094	* 2.3178	* 2.9856	* 3.2810	*	*
15	* .7809	* .8178	* .8132	* .5361	* F-SUB-Q			
	* 3.1205	* 2.9498	* 3.0146	* 4.7657	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6682	* 1.5702	* 1.7922	* 1.5736	* 1.6971	* 1.6147	* 1.8092	* .7847
	* 1.8322	* 1.9432	* 1.6966	* 1.9029	* 1.7058	* 1.7831	* 1.5710	* 3.3094
9	* 1.5702	* 1.8312	* 1.8361	* 1.7731	* 1.7462	* 1.8133	* 1.7783	* .8253
	* 1.9432	* 1.6590	* 1.6521	* 1.7027	* 1.6678	* 1.5794	* 1.6090	* 3.1151
10	* 1.7922	* 1.8354	* 1.8768	* 1.7804	* 1.7024	* 1.7181	* 1.7936	* .8212
	* 1.6966	* 1.6527	* 1.6144	* 1.6957	* 1.7481	* 1.7276	* 1.6264	* 3.1871
11	* 1.5736	* 1.7731	* 1.7806	* 1.7205	* 1.6513	* 1.5910	* 1.1409	* .5404
	* 1.9029	* 1.7027	* 1.6955	* 1.7515	* 1.8030	* 1.8691	* 2.4095	* 5.0237
12	* 1.6971	* 1.7493	* 1.7045	* 1.6516	* 1.6168	* 1.6148	* .8716	*
	* 1.7058	* 1.6648	* 1.7458	* 1.8026	* 1.8290	* 1.8190	* 3.1117	*
13	* 1.6147	* 1.8171	* 1.7201	* 1.5920	* 1.6155	* 1.7347	* .7609	*
	* 1.7831	* 1.5760	* 1.7254	* 1.8679	* 1.8185	* 1.6614	* 3.5012	*
14	* 1.8092	* 1.7814	* 1.7957	* 1.1418	* .8720	* .7779	*	*
	* 1.5710	* 1.6064	* 1.6245	* 2.4076	* 3.1103	* 3.4273	*	*
15	* .7847	* .8260	* .8219	* .5408	* F-SUB-Q			
	* 3.3094	* 3.1128	* 3.1848	* 5.0196	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 79 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6964	* 1.5835	* 1.8128	* 1.5871	* 1.7216	* 1.6292	* 1.8425	* .7776 *
	* 1.9097	* 2.0428	* 1.7782	* 2.0269	* 1.8043	* 1.8953	* 1.6523	* 3.5714 *
9	* 1.5835	* 1.8610	* 1.8591	* 1.8035	* 1.7666	* 1.8397	* 1.8108	* .8141 *
	* 2.0428	* 1.7296	* 1.7298	* 1.7783	* 1.7685	* 1.6684	* 1.6929	* 3.3770 *
10	* 1.8128	* 1.8584	* 1.9021	* 1.8039	* 1.7334	* 1.7435	* 1.8291	* .8117 *
	* 1.7782	* 1.7305	* 1.6882	* 1.7732	* 1.8272	* 1.8098	* 1.7084	* 3.4498 *
11	* 1.5871	* 1.8035	* 1.8041	* 1.7527	* 1.6837	* 1.6272	* 1.1381	* .5354 *
	* 2.0269	* 1.7783	* 1.7730	* 1.8204	* 1.8691	* 1.9329	* 2.5553	* 5.3605 *
12	* 1.7216	* 1.7699	* 1.7355	* 1.6841	* 1.6511	* 1.6575	* .8667	* .8667 *
	* 1.8043	* 1.7652	* 1.8249	* 1.8688	* 1.8993	* 1.8827	* 3.3067	* 3.3067 *
13	* 1.6292	* 1.8437	* 1.7456	* 1.6283	* 1.6582	* 1.7911	* .7637	* .7637 *
	* 1.8953	* 1.6647	* 1.8077	* 1.9317	* 1.8820	* 1.7196	* 3.7191	* 3.7191 *
14	* 1.8425	* 1.8139	* 1.8313	* 1.1390	* .8671	* .7800		
	* 1.6523	* 1.6899	* 1.7064	* 2.5533	* 3.3054	* 3.6443		
15	* .7776	* .8148	* .8124	* .5359	* F-SUB-Q			
	* 3.5714	* 3.3745	* 3.4472	* 5.3560	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6919	* 1.5752	* 1.8071	* 1.5808	* 1.7198	* 1.6242	* 1.8435	* .7741 *
	* 1.9682	* 2.1061	* 1.8352	* 2.0902	* 1.9139	* 2.0273	* 1.7711	* 3.8408 *
9	* 1.5752	* 1.8578	* 1.8559	* 1.8023	* 1.7631	* 1.8407	* 1.8128	* .8102 *
	* 2.1061	* 1.7841	* 1.7852	* 1.8376	* 1.8722	* 1.7891	* 1.8130	* 3.6322 *
10	* 1.8071	* 1.8551	* 1.8994	* 1.8018	* 1.7338	* 1.7440	* 1.8332	* .8084 *
	* 1.8352	* 1.7859	* 1.7461	* 1.8402	* 1.9079	* 1.8991	* 1.8046	* 3.7057 *
11	* 1.5808	* 1.8023	* 1.8020	* 1.7531	* 1.6886	* 1.6319	* 1.1374	* .5332 *
	* 2.0902	* 1.8377	* 1.8400	* 1.8930	* 1.9786	* 2.0382	* 2.7073	* 5.7019 *
12	* 1.7198	* 1.7665	* 1.7360	* 1.6890	* 1.6573	* 1.6670	* .8679	* .8679 *
	* 1.9139	* 1.8687	* 1.9054	* 1.9782	* 2.0091	* 1.9831	* 3.5031	* 3.5031 *
13	* 1.6242	* 1.8447	* 1.7461	* 1.6331	* 1.6677	* 1.8088	* .7668	* .7668 *
	* 2.0273	* 1.7851	* 1.8968	* 2.0368	* 1.9829	* 1.8074	* 3.9287	* 3.9287 *
14	* 1.8435	* 1.8160	* 1.8354	* 1.1384	* .8683	* .7830		
	* 1.7711	* 1.8098	* 1.8023	* 2.7048	* 3.5016	* 3.8506		
15	* .7741	* .8109	* .8092	* .5337	* F-SUB-Q			
	* 3.8408	* 3.6294	* 3.7028	* 5.6968	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 80 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6596	* 1.5491	* 1.7798	* 1.5572	* 1.6939	* 1.6019	* 1.8164	* .7716 *
	* 1.9704	* 2.1025	* 1.8294	* 2.0819	* 1.9052	* 2.0140	* 1.7758	* 3.8315 *
9	* 1.5491	* 1.8274	* 1.8304	* 1.7745	* 1.7390	* 1.8194	* 1.7885	* .8102 *
	* 2.1025	* 1.7811	* 1.7771	* 1.8330	* 1.8625	* 1.7792	* 1.8098	* 3.6131 *
10	* 1.7798	* 1.8296	* 1.8736	* 1.7783	* 1.7087	* 1.7234	* 1.8103	* .8088 *
	* 1.8294	* 1.7779	* 1.7387	* 1.8317	* 1.9014	* 1.8881	* 1.7949	* 3.6604 *
11	* 1.5572	* 1.7745	* 1.7785	* 1.7271	* 1.6713	* 1.6102	* 1.1374	* .5311 *
	* 2.0819	* 1.8331	* 1.8315	* 1.8888	* 1.9723	* 2.0331	* 2.6618	* 5.6514 *
12	* 1.6939	* 1.7423	* 1.7109	* 1.6717	* 1.6416	* 1.6495	* .8727	* .7716 *
	* 1.9052	* 1.8590	* 1.8990	* 1.9718	* 2.0183	* 2.0046	* 3.4774	* 3.8315 *
13	* 1.6019	* 1.8234	* 1.7256	* 1.6113	* 1.6502	* 1.7947	* .7702	* .7702 *
	* 2.0140	* 1.7753	* 1.8857	* 2.0316	* 2.0037	* 1.8521	* 3.9648	* 3.9648 *
14	* 1.8164	* 1.7917	* 1.8126	* 1.1384	* .8732	* .7870		
	* 1.7758	* 1.8066	* 1.7926	* 2.6593	* 3.4756	* 3.8833		
15	* .7716	* .8109	* .8095	* .5316	* F-SUB-Q			
	* 3.8315	* 3.6102	* 3.6572	* 5.6458	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6667	* 1.5452	* 1.7819	* 1.5562	* 1.7034	* 1.6029	* 1.8352	* .7592 *
	* 1.9180	* 2.0545	* 1.7815	* 2.0238	* 1.8312	* 1.9431	* 1.6946	* 3.7397 *
9	* 1.5452	* 1.8386	* 1.8357	* 1.7875	* 1.7444	* 1.8311	* 1.8063	* .7935 *
	* 2.0545	* 1.7251	* 1.7266	* 1.7726	* 1.8028	* 1.7119	* 1.7350	* 3.5419 *
10	* 1.7819	* 1.8349	* 1.8807	* 1.7842	* 1.7231	* 1.7323	* 1.8293	* .7933 *
	* 1.7815	* 1.7274	* 1.6894	* 1.7804	* 1.8347	* 1.8303	* 1.7290	* 3.5905 *
11	* 1.5562	* 1.7875	* 1.7844	* 1.7407	* 1.6813	* 1.6270	* 1.1228	* .5209 *
	* 2.0238	* 1.7727	* 1.7802	* 1.8288	* 1.9199	* 1.9672	* 2.6164	* 5.5165 *
12	* 1.7034	* 1.7478	* 1.7253	* 1.6817	* 1.6521	* 1.6676	* .8555	* .8555 *
	* 1.8312	* 1.7993	* 1.8323	* 1.9195	* 1.9660	* 1.9322	* 3.4066	* 3.4066 *
13	* 1.6029	* 1.8352	* 1.7345	* 1.6282	* 1.6683	* 1.8220	* .7607	* .7607 *
	* 1.9431	* 1.7082	* 1.8280	* 1.9658	* 1.9314	* 1.7805	* 3.8472	* 3.8472 *
14	* 1.8352	* 1.8096	* 1.8316	* 1.1239	* .8560	* .7764		
	* 1.6946	* 1.7319	* 1.7268	* 2.6139	* 3.4051	* 3.7732		
15	* .7592	* .7943	* .7941	* .5214	* F-SUB-Q			
	* 3.7397	* 3.5390	* 3.5875	* 5.5111	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 81 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6535	* 1.5287	* 1.7673	* 1.5425	* 1.6943	* 1.5907	* 1.8308	* .7502 *
	* 1.7771	* 1.9124	* 1.6603	* 1.8852	* 1.7020	* 1.8123	* 1.5733	* 3.4833 *
9	* 1.5287	* 1.8276	* 1.8237	* 1.7788	* 1.7333	* 1.8247	* 1.8024	* .7815 *
	* 1.9124	* 1.6024	* 1.6086	* 1.6454	* 1.6763	* 1.5917	* 1.6079	* 3.3082 *
10	* 1.7673	* 1.8229	* 1.8694	* 1.7732	* 1.7163	* 1.7241	* 1.8262	* .7827 *
	* 1.6603	* 1.6093	* 1.5731	* 1.6550	* 1.6964	* 1.6953	* 1.5961	* 3.3400 *
11	* 1.5425	* 1.7788	* 1.7734	* 1.7327	* 1.6747	* 1.6227	* 1.1114	* .5133 *
	* 1.8852	* 1.6454	* 1.6549	* 1.6901	* 1.7661	* 1.8047	* 2.4184	* 5.1311 *
12	* 1.6943	* 1.7369	* 1.7186	* 1.6751	* 1.6460	* 1.6656	* .8451 *	
	* 1.7020	* 1.6731	* 1.6943	* 1.7658	* 1.8078	* 1.7728	* 3.1616 *	
13	* 1.5907	* 1.8289	* 1.7263	* 1.6239	* 1.6658	* 1.8254	* .7537 *	
	* 1.8123	* 1.5883	* 1.6933	* 1.8035	* 1.7721	* 1.6260	* 3.5573 *	
14	* 1.8308	* 1.8057	* 1.8287	* 1.1125	* .8456	* .7691	*	
	* 1.5733	* 1.6051	* 1.5942	* 2.4160	* 3.1600	* 3.4896	*	
15	* .7502	* .7823	* .7835	* .5138	* F-SUB-Q			
	* 3.4833	* 3.3056	* 3.3372	* 5.1260	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6309	* 1.5066	* 1.7456	* 1.5227	* 1.6766	* 1.5724	* 1.8138	* .7420 *
	* 1.6600	* 1.7898	* 1.5511	* 1.7592	* 1.5835	* 1.6887	* 1.4634	* 3.2505 *
9	* 1.5066	* 1.8067	* 1.8037	* 1.7600	* 1.7144	* 1.8088	* 1.7867	* .7755 *
	* 1.7898	* 1.4966	* 1.5013	* 1.5357	* 1.5590	* 1.4780	* 1.4929	* 3.0763 *
10	* 1.7456	* 1.8028	* 1.8492	* 1.7541	* 1.6992	* 1.7075	* 1.8111	* .7757 *
	* 1.5511	* 1.5020	* 1.4681	* 1.5445	* 1.5826	* 1.5801	* 1.4856	* 3.1023 *
11	* 1.5227	* 1.7599	* 1.7543	* 1.7147	* 1.6592	* 1.6076	* 1.1021	* .5072 *
	* 1.7592	* 1.5357	* 1.5443	* 1.5767	* 1.6427	* 1.6798	* 2.2501	* 4.7988 *
12	* 1.6766	* 1.7179	* 1.7015	* 1.6596	* 1.6310	* 1.6538	* .8388 *	
	* 1.5835	* 1.5559	* 1.5806	* 1.6424	* 1.6817	* 1.6478	* 2.9398 *	
13	* 1.5724	* 1.8130	* 1.7097	* 1.6088	* 1.6540	* 1.8138	* .7481 *	
	* 1.6887	* 1.4749	* 1.5782	* 1.6786	* 1.6471	* 1.5060	* 3.3051 *	
14	* 1.8138	* 1.7901	* 1.8136	* 1.1033	* .8392	* .7632	*	
	* 1.4634	* 1.4902	* 1.4838	* 2.2478	* 2.9384	* 3.2429	*	
15	* .7420	* .7762	* .7765	* .5077	* F-SUB-Q			
	* 3.2505	* 3.0738	* 3.0994	* 4.7939	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 82 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5957	* 1.4775	* 1.7136	* 1.4954	* 1.6464	* 1.5459	* 1.7806	* .7375 *
	* 1.6982	* 1.8273	* 1.5795	* 1.7904	* 1.6154	* 1.7210	* 1.4940	* 3.2835 *
9	* 1.4775	* 1.7709	* 1.7727	* 1.7263	* 1.6849	* 1.7808	* 1.7557	* .7730 *
	* 1.8273	* 1.5275	* 1.5253	* 1.5652	* 1.5878	* 1.5031	* 1.5210	* 3.0979 *
10	* 1.7136	* 1.7718	* 1.8170	* 1.7243	* 1.6675	* 1.6797	* 1.7805	* .7731 *
	* 1.5795	* 1.5260	* 1.4934	* 1.5719	* 1.6122	* 1.6052	* 1.5086	* 3.1166 *
11	* 1.4954	* 1.7263	* 1.7245	* 1.6818	* 1.6324	* 1.5777	* 1.0963	* .5038 *
	* 1.7904	* 1.5653	* 1.5717	* 1.6130	* 1.6738	* 1.7178	* 2.2705	* 4.8406 *
12	* 1.6464	* 1.6884	* 1.6698	* 1.6328	* 1.6049	* 1.6266	* .8380 *	
	* 1.6154	* 1.5847	* 1.6101	* 1.6734	* 1.7113	* 1.6795	* 2.9519 *	
13	* 1.5459	* 1.7850	* 1.6819	* 1.5790	* 1.6268	* 1.7850	* .7452 *	
	* 1.7210	* 1.4999	* 1.6031	* 1.7166	* 1.6787	* 1.5300	* 3.3260 *	
14	* 1.7806	* 1.7590	* 1.7829	* 1.0975	* .8385	* .7609	*	
	* 1.4940	* 1.5183	* 1.5066	* 2.2681	* 2.9503	* 3.2608	*	
15	* .7375	* .7737	* .7739	* .5043	* F-SUB-Q			
	* 3.2835	* 3.0954	* 3.1138	* 4.8355	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6034	* 1.4738	* 1.7152	* 1.4933	* 1.6541	* 1.5450	* 1.7963	* .7228 *
	* 1.5679	* 1.7042	* 1.4702	* 1.6746	* 1.5039	* 1.6110	* 1.3854	* 3.1391 *
9	* 1.4738	* 1.7814	* 1.7769	* 1.7378	* 1.6879	* 1.7890	* 1.7699	* .7533 *
	* 1.7042	* 1.4163	* 1.4196	* 1.4513	* 1.4815	* 1.3987	* 1.4105	* 2.9783 *
10	* 1.7152	* 1.7760	* 1.8221	* 1.7276	* 1.6789	* 1.6846	* 1.7949	* .7550 *
	* 1.4702	* 1.4203	* 1.3891	* 1.4631	* 1.4946	* 1.4928	* 1.3957	* 2.9849 *
11	* 1.4933	* 1.7378	* 1.7278	* 1.6927	* 1.6366	* 1.5900	* 1.0769	* .4919 *
	* 1.6746	* 1.4513	* 1.4629	* 1.4933	* 1.5590	* 1.5895	* 2.1527	* 4.6241 *
12	* 1.6541	* 1.6914	* 1.6812	* 1.6370	* 1.6087	* 1.6397	* .8157 *	
	* 1.5039	* 1.4786	* 1.4926	* 1.5586	* 1.5903	* 1.5531	* 2.8364 *	
13	* 1.5450	* 1.7932	* 1.6869	* 1.5912	* 1.6398	* 1.8015	* .7300 *	
	* 1.6110	* 1.3957	* 1.4908	* 1.5883	* 1.5531	* 1.4139	* 3.1755 *	
14	* 1.7963	* 1.7733	* 1.7974	* 1.0781	* .8162	* .7445	*	
	* 1.3854	* 1.4079	* 1.3939	* 2.1504	* 2.8349	* 3.1166	*	
15	* .7228	* .7540	* .7557	* .4924	* F-SUB-Q			
	* 3.1391	* 2.9758	* 2.9822	* 4.6192	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 83 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5871	* 1.4583	* 1.7003	* 1.4783	* 1.6385	* 1.5303	* 1.7812	* .7134 *
	* 1.4863	* 1.6212	* 1.3967	* 1.5957	* 1.4330	* 1.5351	* 1.3186	* 3.0073 *
9	* 1.4583	* 1.7658	* 1.7626	* 1.7232	* 1.6728	* 1.7757	* 1.7554	* .7435 *
	* 1.6212	* 1.3465	* 1.3485	* 1.3796	* 1.4103	* 1.3291	* 1.3414	* 2.8525 *
10	* 1.7003	* 1.7616	* 1.8073	* 1.7132	* 1.6643	* 1.6708	* 1.7802	* .7452 *
	* 1.3967	* 1.3492	* 1.3194	* 1.3900	* 1.4212	* 1.4176	* 1.3253	* 2.8551 *
11	* 1.4783	* 1.7231	* 1.7134	* 1.6778	* 1.6216	* 1.5755	* 1.0642	* .4850 *
	* 1.5957	* 1.3797	* 1.3899	* 1.4187	* 1.4752	* 1.5070	* 2.0493	* 4.4217 *
12	* 1.6385	* 1.6764	* 1.6667	* 1.6220	* 1.5938	* 1.6234	* .8048 *	
	* 1.4330	* 1.4074	* 1.4193	* 1.4749	* 1.5024	* 1.4736	* 2.6986 *	
13	* 1.5303	* 1.7799	* 1.6731	* 1.5768	* 1.6235	* 1.7844	* .7198 *	
	* 1.5351	* 1.3262	* 1.4157	* 1.5059	* 1.4734	* 1.3412	* 3.0273 *	
14	* 1.7812	* 1.7588	* 1.7827	* 1.0654	* .8052	* .7341	*	
	* 1.3186	* 1.3390	* 1.3236	* 2.0471	* 2.6972	* 2.9715	*	
15	* .7134	* .7443	* .7460	* .4855	* F-SUB-Q			
	* 3.0073	* 2.8501	* 2.8526	* 4.4170	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5405	* 1.4283	* 1.6649	* 1.4473	* 1.5931	* 1.4989	* 1.7275	* .7090 *
	* 1.4548	* 1.5746	* 1.3569	* 1.5521	* 1.4037	* 1.4927	* 1.2946	* 2.8867 *
9	* 1.4283	* 1.7170	* 1.7250	* 1.6755	* 1.6357	* 1.7355	* 1.7046	* .7444 *
	* 1.5746	* 1.3180	* 1.3111	* 1.3504	* 1.3731	* 1.2941	* 1.3148	* 2.7180 *
10	* 1.6649	* 1.7241	* 1.7674	* 1.6767	* 1.6173	* 1.6339	* 1.7283	* .7444 *
	* 1.3569	* 1.3117	* 1.2834	* 1.3510	* 1.3918	* 1.3783	* 1.2978	* 2.7246 *
11	* 1.4473	* 1.6754	* 1.6769	* 1.6303	* 1.5833	* 1.5279	* 1.0573	* .4832 *
	* 1.5521	* 1.3505	* 1.3509	* 1.3888	* 1.4324	* 1.4758	* 1.9612	* 4.2287 *
12	* 1.5931	* 1.6392	* 1.6195	* 1.5837	* 1.5562	* 1.5697	* .8049 *	
	* 1.4037	* 1.3703	* 1.3900	* 1.4321	* 1.4573	* 1.4403	* 2.5602 *	
13	* 1.4989	* 1.7396	* 1.6361	* 1.5291	* 1.5699	* 1.7238	* .7139 *	
	* 1.4927	* 1.2913	* 1.3765	* 1.4747	* 1.4401	* 1.3110	* 2.8900 *	
14	* 1.7275	* 1.7079	* 1.7307	* 1.0584	* .8054	* .7288	*	
	* 1.2946	* 1.3124	* 1.2961	* 1.9592	* 2.5588	* 2.8338	*	
15	* .7090	* .7451	* .7451	* .4837	* F-SUB-Q			
	* 2.8867	* 2.7159	* 2.7223	* 4.2244	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 84 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5324	* 1.4214	* 1.6573	* 1.4391	* 1.5777	* 1.4892	* 1.7127	* .6943
	* 1.4037	* 1.5194	* 1.3086	* 1.4995	* 1.3634	* 1.4431	* 1.2541	* 2.8369
9	* 1.4214	* 1.7022	* 1.7151	* 1.6617	* 1.6263	* 1.7236	* 1.6873	* .7249
	* 1.5194	* 1.2769	* 1.2658	* 1.3076	* 1.3263	* 1.2508	* 1.2753	* 2.6858
10	* 1.6573	* 1.7142	* 1.7559	* 1.6681	* 1.6039	* 1.6244	* 1.7083	* .7227
	* 1.3086	* 1.2665	* 1.2400	* 1.3034	* 1.3477	* 1.3311	* 1.2599	* 2.6995
11	* 1.4391	* 1.6617	* 1.6682	* 1.6168	* 1.5718	* 1.5155	* 1.0312	* .4713
	* 1.4995	* 1.3076	* 1.3033	* 1.3444	* 1.3824	* 1.4270	* 1.9307	* 4.1711
12	* 1.5777	* 1.6297	* 1.6061	* 1.5722	* 1.5441	* 1.5512	* .7819	*
	* 1.3634	* 1.3236	* 1.3460	* 1.3820	* 1.4067	* 1.3958	* 2.5284	*
13	* 1.4892	* 1.7276	* 1.6266	* 1.5167	* 1.5519	* 1.6927	* .6905	*
	* 1.4431	* 1.2480	* 1.3294	* 1.4259	* 1.3952	* 1.2762	* 2.8629	*
14	* 1.7127	* 1.6905	* 1.7106	* 1.0323	* .7823	* .7041	*	*
	* 1.2541	* 1.2730	* 1.2583	* 1.9287	* 2.5272	* 2.8105	*	*
15	* .6943	* .7256	* .7235	* .4718	* F-SUB-Q			
	* 2.8369	* 2.6835	* 2.6971	* 4.1669	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4811	* 1.3721	* 1.5825	* 1.3879	* 1.5153	* 1.4288	* 1.6332	* .6849
	* 1.3594	* 1.5241	* 1.3263	* 1.5057	* 1.3304	* 1.4562	* 1.2732	* 2.7907
9	* 1.3721	* 1.6182	* 1.6405	* 1.5812	* 1.5577	* 1.6427	* 1.6067	* .7103
	* 1.5241	* 1.3004	* 1.2807	* 1.3299	* 1.3399	* 1.2699	* 1.2963	* 2.6597
10	* 1.5825	* 1.6397	* 1.6648	* 1.6001	* 1.5274	* 1.5526	* 1.6170	* .7003
	* 1.3263	* 1.2813	* 1.2655	* 1.3142	* 1.3703	* 1.3478	* 1.2881	* 2.7035
11	* 1.3879	* 1.5812	* 1.6004	* 1.5381	* 1.5019	* 1.4528	* .9964	* .4536
	* 1.5057	* 1.3299	* 1.3140	* 1.3677	* 1.3988	* 1.4022	* 1.9363	* 4.2093
12	* 1.5153	* 1.5607	* 1.5293	* 1.5022	* 1.4686	* 1.4836	* .7670	*
	* 1.3304	* 1.3374	* 1.3686	* 1.3984	* 1.4299	* 1.4100	* 2.4967	*
13	* 1.4288	* 1.6465	* 1.5546	* 1.4539	* 1.4843	* 1.5802	* .6585	*
	* 1.4562	* 1.2671	* 1.3461	* 1.4013	* 1.4093	* 1.3207	* 2.9087	*
14	* 1.6332	* 1.6097	* 1.6192	* .9973	* .7674	* .6707	*	*
	* 1.2732	* 1.2940	* 1.2865	* 1.9345	* 2.4954	* 2.8582	*	*
15	* .6849	* .7110	* .7010	* .4541	* F-SUB-Q			
	* 2.7907	* 2.6576	* 2.7012	* 4.2051	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 85 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4896	* 1.2044	* 1.3333	* 1.2086	* 1.5214	* 1.2264	* 1.5182	* .6195
	* 1.3594	* 1.6855	* 1.5340	* 1.6798	* 1.3304	* 1.6529	* 1.3342	* 3.0176
9	* 1.2044	* 1.4656	* 1.4054	* 1.5011	* 1.3101	* 1.3971	* 1.5282	* .6464
	* 1.6855	* 1.3940	* 1.4548	* 1.3589	* 1.5533	* 1.4542	* 1.3266	* 2.8581
10	* 1.3333	* 1.4048	* 1.3562	* 1.3743	* 1.3921	* 1.3143	* 1.4255	* .6176
	* 1.5340	* 1.4555	* 1.5128	* 1.4889	* 1.4645	* 1.5511	* 1.4239	* 2.9979
11	* 1.2086	* 1.5013	* 1.3745	* 1.3841	* 1.2710	* 1.4509	* .8808	* .3944
	* 1.6798	* 1.3587	* 1.4887	* 1.4767	* 1.6088	* 1.4022	* 2.1380	* 4.7416
12	* 1.5214	* 1.3112	* 1.3932	* 1.2715	* 1.1948	* 1.4308	* .7039	*
	* 1.3304	* 1.5520	* 1.4634	* 1.6081	* 1.7117	* 1.4232	* 2.6574	*
13	* 1.2264	* 1.4001	* 1.3159	* 1.4519	* 1.4315	* 1.2945	* .5603	*
	* 1.6529	* 1.4512	* 1.5492	* 1.4013	* 1.4225	* 1.5722	* 3.3413	*
14	* 1.5182	* 1.5305	* 1.4273	* .8817	* .7043	* .5707	*	*
	* 1.3342	* 1.3246	* 1.4222	* 2.1359	* 2.6559	* 3.2832	*	*
15	* .6195	* .6471	* .6182	* .3948	* F-SUB-Q			
	* 3.0176	* 2.8553	* 2.9954	* 4.7370	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6369	* .5450	* .5455	* .5460	* .6446	* .5385	* .5672	* .2780
	* 3.1140	* 3.6490	* 3.6596	* 3.6391	* 3.0747	* 3.6848	* 3.4930	* 6.5974
9	* .5450	* .6236	* .5728	* .6411	* .5439	* .5524	* .5685	* .2831
	* 3.6490	* 3.1957	* 3.4855	* 3.1051	* 3.6538	* 3.5950	* 3.4870	* 6.4018
10	* .5455	* .5726	* .5369	* .5685	* .6176	* .5358	* .5221	* .2648
	* 3.6596	* 3.4867	* 3.7260	* 3.5093	* 3.2255	* 3.7163	* 3.8024	* 6.8606
11	* .5460	* .6413	* .5688	* .6100	* .5213	* .5698	* .3847	* .1767
	* 3.6391	* 3.1044	* 3.5079	* 3.2731	* 3.8297	* 3.4923	* 4.7948	* 10.3958
12	* .6446	* .5443	* .6180	* .5215	* .4815	* .5346	* .3066	*
	* 3.0747	* 3.6511	* 3.2234	* 3.8283	* 4.1471	* 3.7247	* 5.9835	*
13	* .5385	* .5535	* .5364	* .5702	* .5349	* .4648	* .2359	*
	* 3.6848	* 3.5881	* 3.7122	* 3.4899	* 3.7228	* 4.2840	* 7.7847	*
14	* .5672	* .5693	* .5228	* .3850	* .3068	* .2397	*	*
	* 3.4930	* 3.4820	* 3.7979	* 4.7908	* 5.9792	* 7.6690	*	*
15	* .2780	* .2834	* .2650	* .1769	* F-SUB-Q			
	* 6.5974	* 6.3963	* 6.8542	* 10.3851	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 86 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4048 *	* .4615 *	* .4967 *	* .5168 *	* .5997 *	* .5125 *	* .5209 *	* .2809 *
	* 3.6518 *	* 4.2005 *	* 4.0373 *	* 3.8405 *	* 3.3012 *	* 3.8729 *	* 3.8615 *	* 6.5596 *
9	* .4615 *	* .5514 *	* .5218 *	* .5893 *	* .5126 *	* .5054 *	* .5168 *	* .2804 *
	* 4.2005 *	* 3.6932 *	* 3.8582 *	* 3.3837 *	* 3.8676 *	* 3.9309 *	* 3.8933 *	* 6.4912 *
10	* .4967 *	* .5217 *	* .4896 *	* .5158 *	* .5583 *	* .4778 *	* .4647 *	* .2560 *
	* 4.0373 *	* 3.8589 *	* 4.1756 *	* 3.8837 *	* 3.5564 *	* 4.1333 *	* 4.2401 *	* 6.9955 *
11	* .5168 *	* .5894 *	* .5159 *	* .5323 *	* .4437 *	* .4586 *	* .3342 *	* .1787 *
	* 3.8405 *	* 3.3829 *	* 3.8826 *	* 3.7953 *	* 4.5045 *	* 4.2402 *	* 5.4313 *	* 10.0179 *
12	* .5997 *	* .5128 *	* .5586 *	* .4438 *	* .3333 *	* .3569 *	* .2421 *	
	* 3.3012 *	* 3.8656 *	* 3.5546 *	* 4.5033 *	* 4.8236 *	* 4.4611 *	* 6.7877 *	
13	* .5125 *	* .5064 *	* .4782 *	* .4588 *	* .3569 *	* .2942 *	* .1692 *	
	* 3.8729 *	* 3.9229 *	* 4.1300 *	* 4.2390 *	* 4.4608 *	* 5.0066 *	* 8.7983 *	
14	* .5209 *	* .5176 *	* .4652 *	* .3343 *	* .2421 *	* .1729 *		
	* 3.8615 *	* 3.8884 *	* 4.2367 *	* 5.4293 *	* 6.7895 *	* 8.6109 *		
15	* .2809 *	* .2806 *	* .2562 *	* .1788 *	F-SUB-Q			
	* 6.5596 *	* 6.4891 *	* 6.9925 *	* 10.0132 *	M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .8670 *	* .9828 *	* 1.1460 *	* 1.1031 *	* 1.3230 *	* 1.1130 *	* 1.2955 *	* .6225 *
	* 1.7030 *	* 2.0225 *	* 1.8077 *	* 1.8581 *	* 1.5448 *	* 1.8386 *	* 1.5991 *	* 3.0533 *
9	* .9828 *	* 1.1994 *	* 1.2020 *	* 1.2880 *	* 1.1801 *	* 1.1933 *	* 1.2896 *	* .6399 *
	* 2.0225 *	* 1.7458 *	* 1.7251 *	* 1.6002 *	* 1.7377 *	* 1.7186 *	* 1.5924 *	* 2.9098 *
10	* 1.1460 *	* 1.2018 *	* 1.1607 *	* 1.1776 *	* 1.1772 *	* 1.1143 *	* 1.1748 *	* .5956 *
	* 1.8077 *	* 1.7255 *	* 1.8091 *	* 1.7601 *	* 1.7480 *	* 1.8324 *	* 1.7298 *	* 3.0956 *
11	* 1.1031 *	* 1.2882 *	* 1.1777 *	* 1.1140 *	* 1.0022 *	* 1.0921 *	* .7532 *	* .3935 *
	* 1.8581 *	* 1.5999 *	* 1.7596 *	* 1.8692 *	* 2.0036 *	* 1.8186 *	* 2.4904 *	* 4.7025 *
12	* 1.3230 *	* 1.1808 *	* 1.1776 *	* 1.0025 *	* .7459 *	* .8909 *	* .5556 *	
	* 1.5448 *	* 1.7368 *	* 1.7473 *	* 2.0032 *	* 2.0883 *	* 1.8185 *	* 3.0260 *	
13	* 1.1130 *	* 1.1956 *	* 1.1153 *	* 1.0925 *	* .8911 *	* .7692 *	* .4101 *	
	* 1.8386 *	* 1.7154 *	* 1.8308 *	* 1.8181 *	* 1.8183 *	* 2.0234 *	* 3.7231 *	
14	* 1.2955 *	* 1.2911 *	* 1.1757 *	* .7534 *	* .5556 *	* .4124 *		
	* 1.5991 *	* 1.5906 *	* 1.7285 *	* 2.4896 *	* 3.0267 *	* 3.7033 *		
15	* .6225 *	* .6404 *	* .5958 *	* .3936 *	F-SUB-Q			
	* 3.0533 *	* 2.9080 *	* 3.0947 *	* 4.7006 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 87 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9859	* 1.1712	* 1.3766	* 1.2934	* 1.4201	* 1.3352	* 1.4509	* .7206 *
	* 1.6479	* 1.7712	* 1.5427	* 1.6260	* 1.4738	* 1.5671	* 1.4397	* 2.6545 *
9	* 1.1712	* 1.3878	* 1.4253	* 1.3880	* 1.4246	* 1.4387	* 1.4152	* .7500 *
	* 1.7712	* 1.5377	* 1.4898	* 1.5165	* 1.4727	* 1.4531	* 1.4748	* 2.5173 *
10	* 1.3766	* 1.4251	* 1.4322	* 1.3981	* 1.3418	* 1.3419	* 1.3781	* .7131 *
	* 1.5427	* 1.4901	* 1.4861	* 1.5170	* 1.5717	* 1.5609	* 1.5098	* 2.6428 *
11	* 1.2934	* 1.3883	* 1.3983	* 1.3071	* 1.1993	* 1.1736	* .9016	* .4693 *
	* 1.6260	* 1.5161	* 1.5168	* 1.6247	* 1.6939	* 1.7438	* 2.1390	* 4.0483 *
12	* 1.4201	* 1.4263	* 1.3424	* 1.1996	* .9054	* .9831	* .6504	* .6504 *
	* 1.4738	* 1.4710	* 1.5710	* 1.6937	* 1.7180	* 1.7051	* 2.6520	* 2.6520 *
13	* 1.3352	* 1.4413	* 1.3431	* 1.1742	* .9834	* .9664	* .5016	* .5016 *
	* 1.5671	* 1.4506	* 1.5596	* 1.7433	* 1.7048	* 1.6632	* 3.1320	* 3.1320 *
14	* 1.4509	* 1.4172	* 1.3792	* .9018	* .6504	* .5103	* .5103	* .5103 *
	* 1.4397	* 1.4728	* 1.5085	* 2.1385	* 2.6523	* 3.0795	* 3.0795	* 3.0795 *
15	* .7206	* .7505	* .7135	* .4695	* F-SUB-Q			
	* 2.6545	* 2.5158	* 2.6419	* 4.0466	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1019	* 1.2807	* 1.5124	* 1.4061	* 1.5862	* 1.4660	* 1.6282	* .7611 *
	* 1.5380	* 1.6875	* 1.4479	* 1.5410	* 1.3570	* 1.4658	* 1.3141	* 2.5727 *
9	* 1.2807	* 1.5458	* 1.5684	* 1.5383	* 1.5701	* 1.6000	* 1.5906	* .7912 *
	* 1.6875	* 1.4233	* 1.3949	* 1.4098	* 1.3748	* 1.3407	* 1.3463	* 2.4448 *
10	* 1.5124	* 1.5681	* 1.5842	* 1.5367	* 1.4890	* 1.4873	* 1.5569	* .7613 *
	* 1.4479	* 1.3952	* 1.3827	* 1.4217	* 1.4534	* 1.4515	* 1.3750	* 2.5463 *
11	* 1.4061	* 1.5388	* 1.5369	* 1.4582	* 1.3218	* 1.3171	* .9754	* .5009 *
	* 1.5410	* 1.4093	* 1.4215	* 1.5031	* 1.5756	* 1.6056	* 2.0467	* 3.9177 *
12	* 1.5862	* 1.5721	* 1.4905	* 1.3222	* .9985	* 1.1083	* .6960	* .6960 *
	* 1.3570	* 1.3730	* 1.4520	* 1.5754	* 1.5921	* 1.5655	* 2.5769	* 2.5769 *
13	* 1.4660	* 1.6029	* 1.4887	* 1.3178	* 1.1087	* 1.1241	* .5510	* .5510 *
	* 1.4658	* 1.3383	* 1.4501	* 1.6050	* 1.5652	* 1.4948	* 2.9813	* 2.9813 *
14	* 1.6282	* 1.5928	* 1.5583	* .9757	* .6961	* .5621	* .5621	* .5621 *
	* 1.3141	* 1.3444	* 1.3738	* 2.0460	* 2.5769	* 2.9238	* 2.9238	* 2.9238 *
15	* .7611	* .7918	* .7616	* .5011	* F-SUB-Q			
	* 2.5727	* 2.4432	* 2.5455	* 3.9158	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 88 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1789	* 1.3393	* 1.5739	* 1.4640	* 1.6760	* 1.5284	* 1.7214	* .7899
	* 1.5173	* 1.6882	* 1.4465	* 1.5316	* 1.3272	* 1.4540	* 1.2854	* 2.5645
9	* 1.3393	* 1.6288	* 1.6393	* 1.6203	* 1.6397	* 1.6800	* 1.6856	* .8242
	* 1.6882	* 1.4087	* 1.3872	* 1.3852	* 1.3607	* 1.3211	* 1.3151	* 2.4290
10	* 1.5739	* 1.6390	* 1.6542	* 1.6068	* 1.5732	* 1.5619	* 1.6554	* .7954
	* 1.4465	* 1.3875	* 1.3779	* 1.4136	* 1.4248	* 1.4307	* 1.3384	* 2.5240
11	* 1.4640	* 1.6208	* 1.6071	* 1.5409	* 1.4010	* 1.4085	* 1.0305	* .5209
	* 1.5316	* 1.3848	* 1.4134	* 1.4831	* 1.5568	* 1.5662	* 2.0134	* 3.9030
12	* 1.6760	* 1.6419	* 1.5748	* 1.4015	* 1.0712	* 1.2110	* .7440	*
	* 1.3272	* 1.3589	* 1.4234	* 1.5566	* 1.5731	* 1.5262	* 2.5510	*
13	* 1.5284	* 1.6831	* 1.5635	* 1.4093	* 1.2115	* 1.2463	* .5969	*
	* 1.4540	* 1.3187	* 1.4292	* 1.5656	* 1.5258	* 1.4464	* 2.9426	*
14	* 1.7214	* 1.6881	* 1.6570	* 1.0309	* .7441	* .6097	*	*
	* 1.2854	* 1.3132	* 1.3372	* 2.0125	* 2.5508	* 2.8823	*	*
15	* .7899	* .8248	* .7958	* .5212	* F-SUB-Q			
	* 2.5645	* 2.4275	* 2.5230	* 3.9009	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2962	* 1.3902	* 1.6142	* 1.5002	* 1.7279	* 1.5656	* 1.7762	* .8127
	* 1.5365	* 1.7195	* 1.4723	* 1.5539	* 1.3349	* 1.4700	* 1.2866	* 2.5752
9	* 1.3902	* 1.6827	* 1.6856	* 1.6691	* 1.6813	* 1.7293	* 1.7434	* .8496
	* 1.7195	* 1.4258	* 1.4063	* 1.3978	* 1.3771	* 1.3266	* 1.3142	* 2.4349
10	* 1.6142	* 1.6852	* 1.6998	* 1.6537	* 1.6273	* 1.6132	* 1.7191	* .8217
	* 1.4723	* 1.4067	* 1.3962	* 1.4312	* 1.4364	* 1.4449	* 1.3400	* 2.5331
11	* 1.5002	* 1.6697	* 1.6540	* 1.5980	* 1.4763	* 1.4835	* 1.0788	* .5376
	* 1.5539	* 1.3973	* 1.4310	* 1.4973	* 1.5712	* 1.5666	* 2.0257	* 3.9586
12	* 1.7279	* 1.6837	* 1.6290	* 1.4769	* 1.1823	* 1.3342	* .7981	*
	* 1.3349	* 1.3752	* 1.4349	* 1.5709	* 1.5894	* 1.5316	* 2.5586	*
13	* 1.5656	* 1.7325	* 1.6148	* 1.4844	* 1.3347	* 1.3821	* .6493	*
	* 1.4700	* 1.3241	* 1.4433	* 1.5658	* 1.5312	* 1.4495	* 2.9642	*
14	* 1.7762	* 1.7460	* 1.7207	* 1.0793	* .7983	* .6631	*	*
	* 1.2866	* 1.3122	* 1.3387	* 2.0247	* 2.5581	* 2.9039	*	*
15	* .8127	* .8503	* .8221	* .5379	* F-SUB-Q			
	* 2.5752	* 2.4333	* 2.5319	* 3.9561	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 89 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5062	* 1.4513	* 1.6622	* 1.5372	* 1.7826	* 1.6022	* 1.8364	* .8250 *
	* 1.5509	* 1.7481	* 1.5118	* 1.5936	* 1.3563	* 1.5039	* 1.2992	* 2.6462 *
9	* 1.4513	* 1.7451	* 1.7365	* 1.7239	* 1.7258	* 1.7813	* 1.8054	* .8612 *
	* 1.7481	* 1.4555	* 1.4401	* 1.4228	* 1.4072	* 1.3468	* 1.3274	* 2.5071 *
10	* 1.6622	* 1.7360	* 1.7514	* 1.7054	* 1.6877	* 1.6692	* 1.7879	* .8357 *
	* 1.5118	* 1.4404	* 1.4287	* 1.4639	* 1.4598	* 1.4703	* 1.3544	* 2.6109 *
11	* 1.5372	* 1.7240	* 1.7056	* 1.6637	* 1.5666	* 1.5826	* 1.1158	* .5481 *
	* 1.5936	* 1.4223	* 1.4637	* 1.5250	* 1.5871	* 1.5657	* 2.0855	* 4.1050 *
12	* 1.7826	* 1.7283	* 1.6895	* 1.5671	* 1.4035	* 1.5068	* .8441 *	
	* 1.3563	* 1.4052	* 1.4582	* 1.5868	* 1.6079	* 1.5383	* 2.6233 *	
13	* 1.6022	* 1.7847	* 1.6709	* 1.5835	* 1.5074	* 1.5523	* .6996 *	
	* 1.5039	* 1.3444	* 1.4687	* 1.5649	* 1.5378	* 1.4501	* 3.0264 *	
14	* 1.8364	* 1.8082	* 1.7897	* 1.1165	* .8444	* .7146	*	
	* 1.2992	* 1.3253	* 1.3530	* 2.0842	* 2.6227	* 2.9642	*	
15	* .8250	* .8619	* .8362	* .5484	* F-SUB-Q			
	* 2.6462	* 2.5055	* 2.6096	* 4.1022	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6698	* 1.4979	* 1.7020	* 1.5616	* 1.8177	* 1.6266	* 1.8757	* .8363 *
	* 1.5935	* 1.8043	* 1.5815	* 1.6644	* 1.4081	* 1.5669	* 1.3424	* 2.7525 *
9	* 1.4979	* 1.7875	* 1.7718	* 1.7623	* 1.7553	* 1.8178	* 1.8470	* .8718 *
	* 1.8043	* 1.5178	* 1.5030	* 1.4796	* 1.4655	* 1.3946	* 1.3712	* 2.6127 *
10	* 1.7020	* 1.7713	* 1.7875	* 1.7418	* 1.7292	* 1.7099	* 1.8367	* .8485 *
	* 1.5815	* 1.5034	* 1.4903	* 1.5263	* 1.5152	* 1.5253	* 1.3992	* 2.7223 *
11	* 1.5616	* 1.7623	* 1.7421	* 1.7105	* 1.6361	* 1.6594	* 1.1488	* .5584 *
	* 1.6644	* 1.4791	* 1.5260	* 1.5864	* 1.6161	* 1.5920	* 2.1602	* 4.2945 *
12	* 1.8177	* 1.7579	* 1.7311	* 1.6367	* 1.5649	* 1.6385	* .8863 *	
	* 1.4081	* 1.4632	* 1.5134	* 1.6157	* 1.6393	* 1.5619	* 2.6808 *	
13	* 1.6266	* 1.8212	* 1.7117	* 1.6604	* 1.6391	* 1.6893	* .7447 *	
	* 1.5669	* 1.3919	* 1.5235	* 1.5912	* 1.5614	* 1.4737	* 3.1014 *	
14	* 1.8757	* 1.8499	* 1.8385	* 1.1495	* .8866	* .7605	*	
	* 1.3424	* 1.3690	* 1.3977	* 2.1589	* 2.6800	* 3.0381	*	
15	* .8363	* .8724	* .8490	* .5588	* F-SUB-Q			
	* 2.7525	* 2.6110	* 2.7207	* 4.2913	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 90 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7346	* 1.5371	* 1.7336	* 1.5822	* 1.8507	* 1.6478	* 1.9128	* .8421 *
	* 1.6654	* 1.8893	* 1.6692	* 1.7551	* 1.4753	* 1.6488	* 1.4004	* 2.9049 *
9	* 1.5371	* 1.8247	* 1.8023	* 1.7977	* 1.7817	* 1.8510	* 1.8857	* .8754 *
	* 1.8893	* 1.5891	* 1.5828	* 1.5522	* 1.5404	* 1.4585	* 1.4303	* 2.7657 *
10	* 1.7336	* 1.8017	* 1.8193	* 1.7737	* 1.7673	* 1.7457	* 1.8812	* .8555 *
	* 1.6692	* 1.5833	* 1.5685	* 1.6059	* 1.5861	* 1.5978	* 1.4593	* 2.8774 *
11	* 1.5822	* 1.7977	* 1.7740	* 1.7519	* 1.6884	* 1.7213	* 1.1716	* .5640 *
	* 1.7551	* 1.5516	* 1.6056	* 1.6430	* 1.6699	* 1.6390	* 2.2335	* 4.5542 *
12	* 1.8507	* 1.7844	* 1.7693	* 1.6890	* 1.6392	* 1.7224	* .9127	* .9127 *
	* 1.4753	* 1.5380	* 1.5843	* 1.6693	* 1.6979	* 1.6075	* 2.7954	* .9127 *
13	* 1.6478	* 1.8545	* 1.7475	* 1.7223	* 1.7230	* 1.7888	* .7753	* .7753 *
	* 1.6488	* 1.4557	* 1.5959	* 1.6381	* 1.6070	* 1.5111	* 3.2210	* .7753 *
14	* 1.9128	* 1.8887	* 1.8832	* 1.1724	* .9130	* .7919		
	* 1.4004	* 1.4280	* 1.4577	* 2.2320	* 2.7944	* 3.1546		
15	* .8421	* .8761	* .8561	* .5644	* F-SUB-Q			
	* 2.9049	* 2.7640	* 2.8756	* 4.5507	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7337	* 1.5398	* 1.7272	* 1.5747	* 1.8386	* 1.6419	* 1.9013	* .8507 *
	* 1.7774	* 2.0039	* 1.7761	* 1.8941	* 1.5942	* 1.7756	* 1.5091	* 3.0761 *
9	* 1.5398	* 1.8138	* 1.7957	* 1.7877	* 1.7743	* 1.8475	* 1.8782	* .8897 *
	* 2.0039	* 1.6894	* 1.7038	* 1.6791	* 1.6605	* 1.5663	* 1.5390	* 2.9114 *
10	* 1.7272	* 1.7952	* 1.8136	* 1.7695	* 1.7610	* 1.7453	* 1.8782	* .8695 *
	* 1.7761	* 1.7043	* 1.6833	* 1.7215	* 1.7110	* 1.7162	* 1.5694	* 3.0339 *
11	* 1.5747	* 1.7877	* 1.7698	* 1.7470	* 1.6976	* 1.7303	* 1.1933	* .5719 *
	* 1.8941	* 1.6785	* 1.7213	* 1.7405	* 1.7690	* 1.7276	* 2.3161	* 4.7816 *
12	* 1.8386	* 1.7771	* 1.7630	* 1.6979	* 1.6594	* 1.7428	* .9420	* .9420 *
	* 1.5942	* 1.6579	* 1.7090	* 1.7684	* 1.8036	* 1.7077	* 2.8992	* .9420 *
13	* 1.6419	* 1.8510	* 1.7472	* 1.7313	* 1.7434	* 1.8192	* .8012	* .8012 *
	* 1.7756	* 1.5633	* 1.7142	* 1.7266	* 1.7070	* 1.6033	* 3.3591	* .8012 *
14	* 1.9013	* 1.8812	* 1.8803	* 1.1941	* .9424	* .8188		
	* 1.5091	* 1.5365	* 1.5676	* 2.3145	* 2.8981	* 3.2879		
15	* .8507	* .8904	* .8701	* .5723	* F-SUB-Q			
	* 3.0761	* 2.9095	* 3.0319	* 4.7780	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 91 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7644	* 1.5515	* 1.7468	* 1.5899	* 1.8717	* 1.6580	* 1.9417	* .8462 *
	* 1.8553	* 2.1097	* 1.8655	* 2.0224	* 1.6868	* 1.8932	* 1.5886	* 3.3191 *
9	* 1.5515	* 1.8444	* 1.8187	* 1.8200	* 1.7969	* 1.8785	* 1.9181	* .8801 *
	* 2.1097	* 1.7638	* 1.7871	* 1.7766	* 1.7654	* 1.6569	* 1.6202	* 3.1586 *
10	* 1.7468	* 1.8181	* 1.8385	* 1.7939	* 1.7960	* 1.7738	* 1.9213	* .8619 *
	* 1.8655	* 1.7877	* 1.7635	* 1.8035	* 1.7847	* 1.8006	* 1.6449	* 3.2865 *
11	* 1.5899	* 1.8200	* 1.7942	* 1.7814	* 1.7337	* 1.7751	* 1.1939	* .5683 *
	* 2.0224	* 1.7759	* 1.8032	* 1.8114	* 1.8340	* 1.7868	* 2.4563	* 5.1008 *
12	* 1.8717	* 1.7998	* 1.7981	* 1.7340	* 1.6970	* 1.7939	* .9402 *	
	* 1.6868	* 1.7625	* 1.7827	* 1.8334	* 1.8712	* 1.7614	* 3.0783 *	
13	* 1.6580	* 1.8822	* 1.7758	* 1.7762	* 1.7947	* 1.8830	* .8060 *	
	* 1.8932	* 1.6536	* 1.7987	* 1.7857	* 1.7607	* 1.6559	* 3.5621 *	
14	* 1.9417	* 1.9213	* 1.9234	* 1.1948	* .9406	* .8229	*	
	* 1.5886	* 1.6176	* 1.6431	* 2.4545	* 3.0772	* 3.4895	*	
15	* .8462	* .8808	* .8625	* .5688	* F-SUB-Q			
	* 3.3191	* 3.1565	* 3.2842	* 5.0969	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7591	* 1.5426	* 1.7395	* 1.5843	* 1.8715	* 1.6539	* 1.9456	* .8442 *
	* 1.9086	* 2.1692	* 1.9161	* 2.0907	* 1.7672	* 1.9989	* 1.6991	* 3.5735 *
9	* 1.5426	* 1.8400	* 1.8142	* 1.8184	* 1.7939	* 1.8815	* 1.9230	* .8779 *
	* 2.1692	* 1.8106	* 1.8346	* 1.8305	* 1.8474	* 1.7614	* 1.7232	* 3.4011 *
10	* 1.7395	* 1.8135	* 1.8350	* 1.7912	* 1.7980	* 1.7754	* 1.9285	* .8600 *
	* 1.9161	* 1.8352	* 1.8157	* 1.8596	* 1.8495	* 1.8749	* 1.7244	* 3.5185 *
11	* 1.5843	* 1.8184	* 1.7915	* 1.7820	* 1.7399	* 1.7844	* 1.1953	* .5670 *
	* 2.0907	* 1.8305	* 1.8593	* 1.8720	* 1.9328	* 1.8771	* 2.5815	* 5.4173 *
12	* 1.8715	* 1.7968	* 1.8001	* 1.7402	* 1.7047	* 1.8074	* .9434 *	
	* 1.7672	* 1.8444	* 1.8474	* 1.9320	* 1.9799	* 1.8613	* 3.2638 *	
13	* 1.6539	* 1.8852	* 1.7774	* 1.7855	* 1.8081	* 1.9043	* .8106 *	
	* 1.9989	* 1.7580	* 1.8728	* 1.8759	* 1.8606	* 1.7432	* 3.7672 *	
14	* 1.9456	* 1.9262	* 1.9307	* 1.1962	* .9438	* .8274	*	
	* 1.6991	* 1.7203	* 1.7225	* 2.5793	* 3.2626	* 3.6915	*	
15	* .8442	* .8786	* .8607	* .5674	* F-SUB-Q			
	* 3.5735	* 3.3987	* 3.5157	* 5.4124	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 92 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7236	* 1.5177	* 1.7096	* 1.5596	* 1.8412	* 1.6316	* 1.9172	* .8423 *
	* 1.9143	* 2.1685	* 1.9149	* 2.0841	* 1.7607	* 1.9845	* 1.6875	* 3.5168 *
9	* 1.5177	* 1.8065	* 1.7861	* 1.7877	* 1.7683	* 1.8598	* 1.8975	* .8793 *
	* 2.1685	* 1.8120	* 1.8302	* 1.8293	* 1.8386	* 1.7473	* 1.7126	* 3.3343 *
10	* 1.7096	* 1.7854	* 1.8073	* 1.7653	* 1.7714	* 1.7538	* 1.9047	* .8615 *
	* 1.9149	* 1.8309	* 1.8113	* 1.8542	* 1.8444	* 1.8652	* 1.7155	* 3.4443 *
11	* 1.5596	* 1.7877	* 1.7655	* 1.7539	* 1.7214	* 1.7631	* 1.1960	* .5651 *
	* 2.0841	* 1.8293	* 1.8539	* 1.8704	* 1.9257	* 1.8712	* 2.5375	* 5.3373 *
12	* 1.8412	* 1.7712	* 1.7735	* 1.7218	* 1.6882	* 1.7894	* .9490	* .8423 *
	* 1.7607	* 1.8357	* 1.8422	* 1.9247	* 1.9741	* 1.8600	* 3.2109	* .8423 *
13	* 1.6316	* 1.8635	* 1.7558	* 1.7643	* 1.7902	* 1.8901	* .8147	* .8423 *
	* 1.9845	* 1.7439	* 1.8631	* 1.8700	* 1.8592	* 1.7714	* 3.7693	* .8423 *
14	* 1.9172	* 1.9007	* 1.9069	* 1.1970	* .9495	* .8322		
	* 1.6875	* 1.7097	* 1.7135	* 2.5352	* 3.2093	* 3.6915		
15	* .8423	* .8800	* .8622	* .5656	* F-SUB-Q			
	* 3.5168	* 3.3320	* 3.4417	* 5.3324	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7242	* 1.5035	* 1.7042	* 1.5544	* 1.8498	* 1.6271	* 1.9343	* .8285 *
	* 1.8681	* 2.1230	* 1.8650	* 2.0214	* 1.6934	* 1.9190	* 1.6107	* 3.4289 *
9	* 1.5035	* 1.8108	* 1.7845	* 1.7948	* 1.7682	* 1.8682	* 1.9139	* .8601 *
	* 2.1230	* 1.7532	* 1.7774	* 1.7658	* 1.7807	* 1.6828	* 1.6425	* 3.2678 *
10	* 1.7042	* 1.7838	* 1.8073	* 1.7650	* 1.7819	* 1.7582	* 1.9227	* .8439 *
	* 1.8650	* 1.7781	* 1.7594	* 1.8013	* 1.7779	* 1.8071	* 1.6495	* 3.3655 *
11	* 1.5544	* 1.7948	* 1.7652	* 1.7621	* 1.7292	* 1.7782	* 1.1794	* .5536 *
	* 2.0214	* 1.7651	* 1.8010	* 1.8067	* 1.8691	* 1.8057	* 2.4810	* 5.1792 *
12	* 1.8498	* 1.7712	* 1.7841	* 1.7299	* 1.6949	* 1.8073	* .9301	* .8423 *
	* 1.6934	* 1.7778	* 1.7758	* 1.8681	* 1.9220	* 1.7940	* 3.1514	* .8423 *
13	* 1.6271	* 1.8720	* 1.7602	* 1.7794	* 1.8081	* 1.9168	* .8036	* .8423 *
	* 1.9190	* 1.6795	* 1.8051	* 1.8046	* 1.7933	* 1.7041	* 3.6708	* .8423 *
14	* 1.9343	* 1.9172	* 1.9249	* 1.1805	* .9306	* .8200		
	* 1.6107	* 1.6397	* 1.6476	* 2.4789	* 3.1500	* 3.5987		
15	* .8285	* .8608	* .8446	* .5541	* F-SUB-Q			
	* 3.4289	* 3.2654	* 3.3630	* 5.1746	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 93 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7021	* 1.4790	* 1.6810	* 1.5348	* 1.8340	* 1.6083	* 1.9240	* .8169 *
	* 1.7198	* 1.9628	* 1.7246	* 1.8717	* 1.5669	* 1.7826	* 1.4896	* 3.1831 *
9	* 1.4790	* 1.7910	* 1.7639	* 1.7779	* 1.7498	* 1.8556	* 1.9042	* .8451 *
	* 1.9628	* 1.6173	* 1.6437	* 1.6298	* 1.6493	* 1.5580	* 1.5157	* 3.0421 *
10	* 1.6810	* 1.7632	* 1.7876	* 1.7458	* 1.7684	* 1.7432	* 1.9141	* .8305 *
	* 1.7246	* 1.6444	* 1.6257	* 1.6635	* 1.6365	* 1.6657	* 1.5155	* 3.1277 *
11	* 1.5348	* 1.7778	* 1.7460	* 1.7464	* 1.7175	* 1.7685	* 1.1643	* .5440 *
	* 1.8717	* 1.6291	* 1.6633	* 1.6631	* 1.7149	* 1.6520	* 2.2909	* 4.8152 *
12	* 1.8340	* 1.7529	* 1.7705	* 1.7183	* 1.6827	* 1.7999	* .9160	* .9160 *
	* 1.5669	* 1.6466	* 1.6346	* 1.7140	* 1.7643	* 1.6410	* 2.9096	* 2.9096 *
13	* 1.6083	* 1.8594	* 1.7453	* 1.7698	* 1.8007	* 1.9153	* .7941	* .7941 *
	* 1.7826	* 1.5550	* 1.6639	* 1.6509	* 1.6404	* 1.5552	* 3.3813	* 3.3813 *
14	* 1.9240	* 1.9075	* 1.9165	* 1.1654	* .9164	* .8102		
	* 1.4896	* 1.5133	* 1.5138	* 2.2888	* 2.9083	* 3.3155		
15	* .8169	* .8458	* .8312	* .5445	* F-SUB-Q			
	* 3.1831	* 3.0401	* 3.1254	* 4.8108	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6681	* 1.4478	* 1.6491	* 1.5065	* 1.8043	* 1.5809	* 1.8966	* .8043 *
	* 1.6095	* 1.8408	* 1.6166	* 1.7496	* 1.4603	* 1.6638	* 1.3876	* 2.9731 *
9	* 1.4478	* 1.7588	* 1.7333	* 1.7480	* 1.7207	* 1.8301	* 1.8782	* .8348 *
	* 1.8408	* 1.5153	* 1.5389	* 1.5223	* 1.5374	* 1.4487	* 1.4090	* 2.8312 *
10	* 1.6491	* 1.7325	* 1.7571	* 1.7163	* 1.7413	* 1.7170	* 1.8891	* .8192 *
	* 1.6166	* 1.5395	* 1.5219	* 1.5570	* 1.5298	* 1.5559	* 1.4124	* 2.9098 *
11	* 1.5065	* 1.7480	* 1.7165	* 1.7180	* 1.6931	* 1.7440	* 1.1492	* .5350 *
	* 1.7496	* 1.5217	* 1.5568	* 1.5556	* 1.5975	* 1.5378	* 2.1339	* 4.5099 *
12	* 1.8043	* 1.7237	* 1.7435	* 1.6939	* 1.6587	* 1.7767	* .9057	* .9057 *
	* 1.4603	* 1.5349	* 1.5281	* 1.5971	* 1.6414	* 1.5237	* 2.7005	* 2.7005 *
13	* 1.5809	* 1.8339	* 1.7190	* 1.7453	* 1.7775	* 1.8944	* .7846	* .7846 *
	* 1.6638	* 1.4460	* 1.5542	* 1.5368	* 1.5230	* 1.4376	* 3.1350	* 3.1350 *
14	* 1.8966	* 1.8815	* 1.8914	* 1.1503	* .9062	* .8004		
	* 1.3876	* 1.4067	* 1.4108	* 2.1319	* 2.6993	* 3.0746		
15	* .8043	* .8356	* .8200	* .5356	* F-SUB-Q			
	* 2.9731	* 2.8291	* 2.9074	* 4.5057	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 94 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6188	* 1.4126	* 1.6054	* 1.4683	* 1.7565	* 1.5436	* 1.8482	* .7938 *
	* 1.6539	* 1.8848	* 1.6579	* 1.7897	* 1.4967	* 1.7012	* 1.4220	* 3.0141 *
9	* 1.4126	* 1.7094	* 1.6894	* 1.7008	* 1.6783	* 1.7887	* 1.8320	* .8269 *
	* 1.8848	* 1.5576	* 1.5740	* 1.5607	* 1.5723	* 1.4788	* 1.4409	* 2.8593 *
10	* 1.6054	* 1.6886	* 1.7127	* 1.6734	* 1.6961	* 1.6765	* 1.8434	* .8111 *
	* 1.6579	* 1.5746	* 1.5584	* 1.5940	* 1.5661	* 1.5886	* 1.4405	* 2.9328 *
11	* 1.4683	* 1.7008	* 1.6737	* 1.6719	* 1.6539	* 1.7006	* 1.1351	* .5277 *
	* 1.7897	* 1.5601	* 1.5938	* 1.5995	* 1.6327	* 1.5763	* 2.1610	* 4.5663 *
12	* 1.7565	* 1.6813	* 1.6983	* 1.6546	* 1.6205	* 1.7340	* .8983	*
	* 1.4967	* 1.5697	* 1.5642	* 1.6321	* 1.6766	* 1.5576	* 2.7221	*
13	* 1.5436	* 1.7923	* 1.6785	* 1.7018	* 1.7348	* 1.8514	* .7764	*
	* 1.7012	* 1.4760	* 1.5867	* 1.5752	* 1.5569	* 1.4645	* 3.1624	*
14	* 1.8482	* 1.8352	* 1.8457	* 1.1362	* .8988	* .7925	*	
	* 1.4220	* 1.4385	* 1.4388	* 2.1589	* 2.7208	* 3.0995	*	
15	* .7938	* .8276	* .8119	* .5282	* F-SUB-Q			
	* 3.0141	* 2.8572	* 2.9305	* 4.5620	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6070	* 1.3870	* 1.5877	* 1.4495	* 1.7475	* 1.5236	* 1.8450	* .7705 *
	* 1.5376	* 1.7764	* 1.5562	* 1.6889	* 1.4017	* 1.6067	* 1.3281	* 2.9001 *
9	* 1.3870	* 1.7000	* 1.6735	* 1.6927	* 1.6617	* 1.7774	* 1.8278	* .7972 *
	* 1.7764	* 1.4553	* 1.4772	* 1.4613	* 1.4796	* 1.3864	* 1.3453	* 2.7694 *
10	* 1.5877	* 1.6726	* 1.6972	* 1.6574	* 1.6887	* 1.6624	* 1.8398	* .7837 *
	* 1.5562	* 1.4779	* 1.4619	* 1.4960	* 1.4632	* 1.4891	* 1.3416	* 2.8298 *
11	* 1.4495	* 1.6927	* 1.6576	* 1.6636	* 1.6406	* 1.6939	* 1.1038	* .5099 *
	* 1.6889	* 1.4607	* 1.4958	* 1.4934	* 1.5311	* 1.4710	* 2.0629	* 4.3948 *
12	* 1.7475	* 1.6647	* 1.6909	* 1.6413	* 1.6063	* 1.7282	* .8656	*
	* 1.4017	* 1.4770	* 1.4615	* 1.5305	* 1.5690	* 1.4537	* 2.6322	*
13	* 1.5236	* 1.7812	* 1.6644	* 1.6952	* 1.7290	* 1.8503	* .7529	*
	* 1.6067	* 1.3837	* 1.4873	* 1.4700	* 1.4531	* 1.3627	* 3.0402	*
14	* 1.8450	* 1.8310	* 1.8422	* 1.1049	* .8661	* .7678	*	
	* 1.3281	* 1.3431	* 1.3400	* 2.0608	* 2.6310	* 2.9824	*	
15	* .7705	* .7979	* .7845	* .5104	* F-SUB-Q			
	* 2.9001	* 2.7674	* 2.8275	* 4.3905	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 95 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5674	* 1.3522	* 1.5517	* 1.4138	* 1.7062	* 1.4873	* 1.8037	* .7498 *
	* 1.4713	* 1.7053	* 1.4946	* 1.6291	* 1.3504	* 1.5489	* 1.2783	* 2.8095 *
9	* 1.3522	* 1.6616	* 1.6364	* 1.6548	* 1.6232	* 1.7393	* 1.7874	* .7759 *
	* 1.7053	* 1.3986	* 1.4191	* 1.4057	* 1.4247	* 1.3322	* 1.2936	* 2.6822 *
10	* 1.5517	* 1.6356	* 1.6596	* 1.6201	* 1.6504	* 1.6254	* 1.7997	* .7630 *
	* 1.4946	* 1.4198	* 1.4043	* 1.4375	* 1.4071	* 1.4300	* 1.2878	* 2.7370 *
11	* 1.4138	* 1.6549	* 1.6203	* 1.6258	* 1.6025	* 1.6541	* 1.0757	* .4958 *
	* 1.6291	* 1.4057	* 1.4373	* 1.4347	* 1.4644	* 1.4092	* 1.9853	* 4.2505 *
12	* 1.7062	* 1.6262	* 1.6526	* 1.6032	* 1.5692	* 1.6880	* .8424 *	
	* 1.3504	* 1.4222	* 1.4054	* 1.4638	* 1.4980	* 1.3897	* 2.5299 *	
13	* 1.4873	* 1.7430	* 1.6274	* 1.6553	* 1.6887	* 1.8085	* .7325 *	
	* 1.5489	* 1.3296	* 1.4282	* 1.4083	* 1.3891	* 1.3015	* 2.9215 *	
14	* 1.8037	* 1.7906	* 1.8019	* 1.0768	* .8428	* .7470	*	
	* 1.2783	* 1.2914	* 1.2863	* 1.9833	* 2.5287	* 2.8662	*	
15	* .7498	* .7766	* .7637	* .4963	* F-SUB-Q			
	* 2.8095	* 2.6802	* 2.7348	* 4.2463	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4942	* 1.3055	* 1.4941	* 1.3578	* 1.6254	* 1.4312	* 1.7162	* .7305 *
	* 1.4610	* 1.6719	* 1.4726	* 1.6113	* 1.3460	* 1.5289	* 1.2759	* 2.7439 *
9	* 1.3055	* 1.5880	* 1.5737	* 1.5810	* 1.5586	* 1.6686	* 1.7029	* .7627 *
	* 1.6719	* 1.3890	* 1.4003	* 1.3965	* 1.4089	* 1.3179	* 1.2888	* 2.5966 *
10	* 1.4941	* 1.5729	* 1.5957	* 1.5577	* 1.5748	* 1.5611	* 1.7146	* .7483 *
	* 1.4726	* 1.4009	* 1.3858	* 1.4184	* 1.3996	* 1.4121	* 1.2817	* 2.6538 *
11	* 1.3578	* 1.5810	* 1.5579	* 1.5523	* 1.5351	* 1.5742	* 1.0489	* .4848 *
	* 1.6113	* 1.3965	* 1.4182	* 1.4254	* 1.4451	* 1.4014	* 1.9310	* 4.1321 *
12	* 1.6254	* 1.5615	* 1.5769	* 1.5358	* 1.5050	* 1.6062	* .8266 *	
	* 1.3460	* 1.4064	* 1.3979	* 1.4445	* 1.4758	* 1.3796	* 2.4404 *	
13	* 1.4312	* 1.6721	* 1.5630	* 1.5753	* 1.6069	* 1.7166	* .7139 *	
	* 1.5289	* 1.3154	* 1.4104	* 1.4005	* 1.3789	* 1.2920	* 2.8322 *	
14	* 1.7162	* 1.7060	* 1.7168	* 1.0499	* .8270	* .7287	*	
	* 1.2759	* 1.2866	* 1.2802	* 1.9291	* 2.4393	* 2.7758	*	
15	* .7305	* .7633	* .7489	* .4853	* F-SUB-Q			
	* 2.7439	* 2.5948	* 2.6518	* 4.1282	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 96 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4470	* 1.2646	* 1.4553	* 1.3158	* 1.5676	* 1.3845	* 1.6580	* .6958
	* 1.4443	* 1.6552	* 1.4483	* 1.5938	* 1.3376	* 1.5149	* 1.2657	* 2.7663
9	* 1.2646	* 1.5405	* 1.5297	* 1.5328	* 1.5114	* 1.6159	* 1.6433	* .7218
	* 1.6552	* 1.3720	* 1.3799	* 1.3800	* 1.3921	* 1.3035	* 1.2794	* 2.6345
10	* 1.4553	* 1.5290	* 1.5516	* 1.5143	* 1.5238	* 1.5149	* 1.6538	* .7077
	* 1.4483	* 1.3805	* 1.3649	* 1.3974	* 1.3859	* 1.3938	* 1.2723	* 2.6938
11	* 1.3158	* 1.5328	* 1.5145	* 1.5044	* 1.4856	* 1.5174	* .9976	* .4611
	* 1.5938	* 1.3800	* 1.3972	* 1.4088	* 1.4275	* 1.3906	* 1.9452	* 4.1710
12	* 1.5676	* 1.5141	* 1.5258	* 1.4862	* 1.4569	* 1.5468	* .7823	*
	* 1.3376	* 1.3897	* 1.3842	* 1.4268	* 1.4571	* 1.3688	* 2.4686	*
13	* 1.3845	* 1.6192	* 1.5167	* 1.5185	* 1.5475	* 1.6463	* .6742	*
	* 1.5149	* 1.3009	* 1.3923	* 1.3896	* 1.3682	* 1.2852	* 2.8682	*
14	* 1.6580	* 1.6462	* 1.6559	* .9985	* .7826	* .6874	*	*
	* 1.2657	* 1.2773	* 1.2708	* 1.9434	* 2.4675	* 2.8146	*	*
15	* .6958	* .7225	* .7083	* .4616	* F-SUB-Q			
	* 2.7663	* 2.6324	* 2.6916	* 4.1671	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3511	* 1.1947	* 1.3565	* 1.2375	* 1.4452	* 1.2884	* 1.5235	* .6582
	* 1.4947	* 1.6936	* 1.5017	* 1.6383	* 1.4015	* 1.5741	* 1.3315	* 2.8332
9	* 1.1947	* 1.4245	* 1.4267	* 1.4159	* 1.4044	* 1.4942	* 1.5089	* .6793
	* 1.6936	* 1.4344	* 1.4298	* 1.4439	* 1.4479	* 1.3619	* 1.3467	* 2.7123
10	* 1.3565	* 1.4261	* 1.4383	* 1.4152	* 1.4048	* 1.4070	* 1.5130	* .6616
	* 1.5017	* 1.4304	* 1.4226	* 1.4446	* 1.4529	* 1.4500	* 1.3438	* 2.7921
11	* 1.2375	* 1.4159	* 1.4154	* 1.3902	* 1.3790	* 1.4034	* .9310	* .4300
	* 1.6383	* 1.4439	* 1.4444	* 1.4732	* 1.4840	* 1.4518	* 2.0165	* 4.3380
12	* 1.4452	* 1.4069	* 1.4065	* 1.3796	* 1.3455	* 1.4248	* .7374	*
	* 1.4015	* 1.4454	* 1.4513	* 1.4834	* 1.5227	* 1.4343	* 2.5329	*
13	* 1.2884	* 1.4972	* 1.4087	* 1.4044	* 1.4254	* 1.4894	* .6233	*
	* 1.5741	* 1.3592	* 1.4484	* 1.4509	* 1.4336	* 1.3706	* 3.0012	*
14	* 1.5235	* 1.5115	* 1.5149	* .9318	* .7377	* .6350	*	*
	* 1.3315	* 1.3445	* 1.3423	* 2.0148	* 2.5317	* 2.9471	*	*
15	* .6582	* .6799	* .6621	* .4304	* F-SUB-Q			
	* 2.8332	* 2.7101	* 2.7899	* 4.3340	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 97 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 50 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2621	* 1.0144	* 1.1158	* 1.0459	* 1.3293	* 1.0633	* 1.3530	* .5672
	* 1.5582	* 1.9434	* 1.7781	* 1.8878	* 1.4832	* 1.8575	* 1.4610	* 3.2124
9	* 1.0144	* 1.2513	* 1.1865	* 1.3042	* 1.1406	* 1.2254	* 1.3613	* .5869
	* 1.9434	* 1.5848	* 1.6732	* 1.5204	* 1.7361	* 1.6159	* 1.4534	* 3.0663
10	* 1.1158	* 1.1860	* 1.1455	* 1.1860	* 1.2450	* 1.1554	* 1.2720	* .5592
	* 1.7781	* 1.6739	* 1.7386	* 1.6765	* 1.5958	* 1.7194	* 1.5575	* 3.2269
11	* 1.0459	* 1.3046	* 1.1865	* 1.2336	* 1.1271	* 1.3056	* .7885	* .3618
	* 1.8878	* 1.5200	* 1.6758	* 1.6138	* 1.7671	* 1.5205	* 2.3223	* 5.0437
12	* 1.3293	* 1.1415	* 1.2458	* 1.1276	* 1.0678	* 1.3001	* .6437	*
	* 1.4832	* 1.7347	* 1.5947	* 1.7664	* 1.8652	* 1.5296	* 2.8310	*
13	* 1.0633	* 1.2278	* 1.1566	* 1.3064	* 1.3007	* 1.1787	* .5131	*
	* 1.8575	* 1.6129	* 1.7175	* 1.5196	* 1.5289	* 1.6866	* 3.5599	*
14	* 1.3530	* 1.3633	* 1.2735	* .7891	* .6441	* .5227	*	*
	* 1.4610	* 1.4514	* 1.5558	* 2.3203	* 2.8296	* 3.4960	*	*
15	* .5672	* .5875	* .5597	* .3622	* F-SUB-Q			
	* 3.2124	* 3.0636	* 3.2246	* 5.0392	* M-SUB-Q			

AT 75% POWER, 50 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5287	* .4510	* .4507	* .4623	* .5507	* .4605	* .4965	* .2476
	* 3.6427	* 4.2793	* 4.2975	* 4.1792	* 3.5039	* 4.1970	* 3.8908	* 7.2178
9	* .4510	* .5201	* .4770	* .5452	* .4639	* .4770	* .4976	* .2506
	* 4.2793	* 3.7246	* 4.0638	* 3.5528	* 4.1750	* 4.0567	* 3.8844	* 7.0425
10	* .4507	* .4769	* .4490	* .4847	* .5352	* .4634	* .4591	* .2345
	* 4.2975	* 4.0650	* 4.3271	* 4.0036	* 3.6227	* 4.1857	* 4.2169	* 7.5476
11	* .4623	* .5454	* .4849	* .5272	* .4518	* .5028	* .3377	* .1587
	* 4.1792	* 3.5516	* 4.0021	* 3.6852	* 4.3012	* 3.8587	* 5.3109	* 11.2880
12	* .5507	* .4643	* .5356	* .4519	* .4222	* .4765	* .2735	*
	* 3.5039	* 4.1722	* 3.6206	* 4.2994	* 4.6089	* 4.0772	* 6.5312	*
13	* .4605	* .4779	* .4639	* .5031	* .4767	* .4171	* .2121	*
	* 4.1970	* 4.0496	* 4.1816	* 3.8564	* 4.0753	* 4.6613	* 8.4448	*
14	* .4965	* .4983	* .4596	* .3379	* .2737	* .2155	*	*
	* 3.8908	* 3.8793	* 4.2124	* 5.3071	* 6.5270	* 8.3156	*	*
15	* .2476	* .2508	* .2347	* .1589	* F-SUB-Q			
	* 7.2178	* 7.0371	* 7.5414	* 11.2776	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 98 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .3668 *	* .4131 *	* .4485 *	* .4694 *	* .5455 *	* .4664 *	* .4820 *	* .2615 *
	* 3.9768 *	* 4.5987 *	* 4.4171 *	* 4.1825 *	* 3.5928 *	* 4.2140 *	* 4.1330 *	* 6.9259 *
9	* .4131 *	* .4986 *	* .4720 *	* .5370 *	* .4678 *	* .4639 *	* .4785 *	* .2610 *
	* 4.5987 *	* 4.0391 *	* 4.2167 *	* 3.6656 *	* 4.1929 *	* 4.2347 *	* 4.1647 *	* 6.8796 *
10	* .4485 *	* .4720 *	* .4452 *	* .4727 *	* .5169 *	* .4418 *	* .4341 *	* .2392 *
	* 4.4171 *	* 4.2175 *	* 4.5437 *	* 4.1918 *	* 3.8007 *	* 4.4216 *	* 4.4869 *	* 7.3836 *
11	* .4694 *	* .5371 *	* .4728 *	* .4937 *	* .4079 *	* .4300 *	* .3098 *	* .1698 *
	* 4.1825 *	* 3.6648 *	* 4.1908 *	* 4.0467 *	* 4.8460 *	* 4.4773 *	* 5.7560 *	* 10.3962 *
12	* .5455 *	* .4680 *	* .5172 *	* .4080 *	* .3114 *	* .3376 *	* .2288 *	
	* 3.5928 *	* 4.1910 *	* 3.7991 *	* 4.8449 *	* 5.0697 *	* 4.6741 *	* 7.1002 *	
13	* .4664 *	* .4648 *	* .4421 *	* .4302 *	* .3377 *	* .2823 *	* .1620 *	
	* 4.2140 *	* 4.2267 *	* 4.4185 *	* 4.4763 *	* 4.6740 *	* 5.2038 *	* 9.0988 *	
14	* .4820 *	* .4791 *	* .4345 *	* .3099 *	* .2287 *	* .1654 *		
	* 4.1330 *	* 4.1599 *	* 4.4838 *	* 5.7544 *	* 7.1023 *	* 8.9292 *		
15	* .2615 *	* .2611 *	* .2393 *	* .1698 *	F-SUB-Q			
	* 6.9259 *	* 6.8778 *	* 7.3814 *	* 10.3927 *	M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .7875 *	* .8832 *	* 1.0349 *	* 1.0087 *	* 1.2003 *	* 1.0162 *	* 1.1899 *	* .5851 *
	* 1.8690 *	* 2.2077 *	* 1.9799 *	* 2.0127 *	* 1.6868 *	* 1.9930 *	* 1.7235 *	* 3.1909 *
9	* .8832 *	* 1.0869 *	* 1.0889 *	* 1.1822 *	* 1.0829 *	* 1.0968 *	* 1.1847 *	* .6005 *
	* 2.2077 *	* 1.9058 *	* 1.8845 *	* 1.7247 *	* 1.8748 *	* 1.8508 *	* 1.7160 *	* 3.0581 *
10	* 1.0349 *	* 1.0887 *	* 1.0539 *	* 1.0830 *	* 1.0936 *	* 1.0324 *	* 1.0874 *	* .5591 *
	* 1.9799 *	* 1.8849 *	* 1.9703 *	* 1.8863 *	* 1.8584 *	* 1.9574 *	* 1.8494 *	* 3.2532 *
11	* 1.0087 *	* 1.1824 *	* 1.0833 *	* 1.0337 *	* .9389 *	* 1.0176 *	* .7003 *	* .3754 *
	* 2.0127 *	* 1.7244 *	* 1.8859 *	* 1.9725 *	* 2.1178 *	* 1.9327 *	* 2.6329 *	* 4.8614 *
12	* 1.2003 *	* 1.0834 *	* 1.0940 *	* .9392 *	* .7027 *	* .8395 *	* .5286 *	
	* 1.6868 *	* 1.8739 *	* 1.8576 *	* 2.1174 *	* 2.2026 *	* 1.9184 *	* 3.1443 *	
13	* 1.0162 *	* 1.0986 *	* 1.0332 *	* 1.0179 *	* .8397 *	* .7315 *	* .3924 *	
	* 1.9930 *	* 1.8479 *	* 1.9560 *	* 1.9323 *	* 1.9183 *	* 2.1206 *	* 3.8515 *	
14	* 1.1899 *	* 1.1860 *	* 1.0881 *	* .7005 *	* .5286 *	* .3948 *		
	* 1.7235 *	* 1.7142 *	* 1.8482 *	* 2.6324 *	* 3.1451 *	* 3.8366 *		
15	* .5851 *	* .6009 *	* .5592 *	* .3755 *	F-SUB-Q			
	* 3.1909 *	* 3.0565 *	* 3.2526 *	* 4.8599 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 99 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9257 *	* 1.0700 *	* 1.2600 *	* 1.2192 *	* 1.3861 *	* 1.2474 *	* 1.3853 *	* .7007 *
	* 1.6840 *	* 1.8826 *	* 1.6680 *	* 1.7079 *	* 1.4957 *	* 1.6612 *	* 1.4937 *	* 2.6842 *
9	* 1.0700 *	* 1.2917 *	* 1.3179 *	* 1.3346 *	* 1.3375 *	* 1.3493 *	* 1.3596 *	* .7291 *
	* 1.8826 *	* 1.6346 *	* 1.5943 *	* 1.5625 *	* 1.5565 *	* 1.5343 *	* 1.5192 *	* 2.5540 *
10	* 1.2600 *	* 1.3177 *	* 1.3174 *	* 1.3089 *	* 1.2941 *	* 1.2663 *	* 1.3163 *	* .6888 *
	* 1.6680 *	* 1.5946 *	* 1.5986 *	* 1.6035 *	* 1.6134 *	* 1.6370 *	* 1.5649 *	* 2.6998 *
11	* 1.2192 *	* 1.3349 *	* 1.3090 *	* 1.2425 *	* 1.1547 *	* 1.1615 *	* .8621 *	* .4559 *
	* 1.7079 *	* 1.5622 *	* 1.6033 *	* 1.6906 *	* 1.7533 *	* 1.7317 *	* 2.1977 *	* 4.1087 *
12	* 1.3861 *	* 1.3382 *	* 1.2946 *	* 1.1550 *	* .8721 *	* .9788 *	* .6413 *	
	* 1.4957 *	* 1.5551 *	* 1.6128 *	* 1.7531 *	* 1.7851 *	* 1.7205 *	* 2.6570 *	
13	* 1.2474 *	* 1.3515 *	* 1.2673 *	* 1.1619 *	* .9790 *	* .9324 *	* .4888 *	
	* 1.6612 *	* 1.5320 *	* 1.6357 *	* 1.7312 *	* 1.7202 *	* 1.7145 *	* 3.1782 *	
14	* 1.3853 *	* 1.3612 *	* 1.3172 *	* .8622 *	* .6412 *	* .4971 *		
	* 1.4937 *	* 1.5174 *	* 1.5638 *	* 2.1974 *	* 2.6574 *	* 3.1316 *		
15	* .7007 *	* .7296 *	* .6890 *	* .4561 *	* F-SUB-Q			
	* 2.6842 *	* 2.5527 *	* 2.6991 *	* 4.1074 *	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0530 *	* 1.1818 *	* 1.3996 *	* 1.3522 *	* 1.5860 *	* 1.3903 *	* 1.5847 *	* .7584 *
	* 1.5299 *	* 1.7598 *	* 1.5478 *	* 1.5865 *	* 1.3443 *	* 1.5314 *	* 1.3370 *	* 2.5382 *
9	* 1.1818 *	* 1.4591 *	* 1.4683 *	* 1.5137 *	* 1.4941 *	* 1.5214 *	* 1.5626 *	* .7885 *
	* 1.7598 *	* 1.4913 *	* 1.4741 *	* 1.4190 *	* 1.4308 *	* 1.3958 *	* 1.3545 *	* 2.4195 *
10	* 1.3996 *	* 1.4680 *	* 1.4722 *	* 1.4602 *	* 1.4660 *	* 1.4217 *	* 1.5125 *	* .7496 *
	* 1.5478 *	* 1.4743 *	* 1.4721 *	* 1.4800 *	* 1.4686 *	* 1.5020 *	* 1.4005 *	* 2.5504 *
11	* 1.3522 *	* 1.5141 *	* 1.4604 *	* 1.4097 *	* 1.2962 *	* 1.3383 *	* .9495 *	* .4945 *
	* 1.5865 *	* 1.4186 *	* 1.4798 *	* 1.5369 *	* 1.6028 *	* 1.5510 *	* 2.0620 *	* 3.9091 *
12	* 1.5860 *	* 1.4958 *	* 1.4666 *	* 1.2966 *	* .9759 *	* 1.1305 *	* .7010 *	
	* 1.3443 *	* 1.4291 *	* 1.4680 *	* 1.6025 *	* 1.6308 *	* 1.5331 *	* 2.5206 *	
13	* 1.3903 *	* 1.5237 *	* 1.4228 *	* 1.3389 *	* 1.1309 *	* 1.0952 *	* .5428 *	
	* 1.5314 *	* 1.3937 *	* 1.5008 *	* 1.5506 *	* 1.5328 *	* 1.5200 *	* 2.9816 *	
14	* 1.5847 *	* 1.5645 *	* 1.5136 *	* .9497 *	* .7010 *	* .5539 *		
	* 1.3370 *	* 1.3529 *	* 1.3995 *	* 2.0615 *	* 2.5208 *	* 2.9285 *		
15	* .7584 *	* .7890 *	* .7498 *	* .4947 *	* F-SUB-Q			
	* 2.5382 *	* 2.4182 *	* 2.5499 *	* 3.9077 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 100 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1325	* 1.2439	* 1.4680	* 1.4244	* 1.6969	* 1.4620	* 1.6928	* .7987 *
	* 1.4893	* 1.7418	* 1.5334	* 1.5574	* 1.2981	* 1.5050	* 1.2936	* 2.4921 *
9	* 1.2439	* 1.5505	* 1.5467	* 1.6140	* 1.5766	* 1.6122	* 1.6782	* .8322 *
	* 1.7418	* 1.4627	* 1.4538	* 1.3766	* 1.4029	* 1.3624	* 1.3041	* 2.3714 *
10	* 1.4680	* 1.5464	* 1.5496	* 1.5417	* 1.5674	* 1.5061	* 1.6220	* .7922 *
	* 1.5334	* 1.4541	* 1.4541	* 1.4552	* 1.4239	* 1.4675	* 1.3508	* 2.4980 *
11	* 1.4244	* 1.6144	* 1.5419	* 1.5053	* 1.3863	* 1.4514	* 1.0136	* .5201 *
	* 1.5574	* 1.3763	* 1.4548	* 1.4983	* 1.5630	* 1.4916	* 2.0041	* 3.8479 *
12	* 1.6969	* 1.5775	* 1.5681	* 1.3867	* 1.0518	* 1.2423	* .7571 *	
	* 1.2981	* 1.4013	* 1.4233	* 1.5626	* 1.5929	* 1.4697	* 2.4582 *	
13	* 1.4620	* 1.6146	* 1.5073	* 1.4520	* 1.2427	* 1.2136	* .5906 *	
	* 1.5050	* 1.3604	* 1.4663	* 1.4911	* 1.4694	* 1.4584	* 2.9116 *	
14	* 1.6928	* 1.6803	* 1.6232	* 1.0139	* .7571	* .6031	*	
	* 1.2936	* 1.3025	* 1.3498	* 2.0035	* 2.4582	* 2.8580	*	
15	* .7987	* .8326	* .7925	* .5203	* F-SUB-Q			
	* 2.4921	* 2.3704	* 2.4974	* 3.8463	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2192	* 1.2965	* 1.5135	* 1.4713	* 1.7633	* 1.5058	* 1.7581	* .8282 *
	* 1.4961	* 1.7633	* 1.5539	* 1.5688	* 1.2965	* 1.5145	* 1.2873	* 2.4851 *
9	* 1.2965	* 1.6117	* 1.5992	* 1.6760	* 1.6287	* 1.6693	* 1.7499	* .8649 *
	* 1.7633	* 1.4726	* 1.4671	* 1.3791	* 1.4125	* 1.3611	* 1.2930	* 2.3595 *
10	* 1.5135	* 1.5988	* 1.6014	* 1.5971	* 1.6344	* 1.5644	* 1.6933	* .8247 *
	* 1.5539	* 1.4674	* 1.4665	* 1.4630	* 1.4251	* 1.4746	* 1.3454	* 2.4888 *
11	* 1.4713	* 1.6765	* 1.5975	* 1.5720	* 1.4654	* 1.5447	* 1.0679	* .5407 *
	* 1.5688	* 1.3787	* 1.4626	* 1.5026	* 1.5651	* 1.4799	* 2.0021	* 3.8747 *
12	* 1.7633	* 1.6296	* 1.6351	* 1.4659	* 1.1401	* 1.3547	* .8145 *	
	* 1.2965	* 1.4108	* 1.4245	* 1.5647	* 1.5974	* 1.4612	* 2.4468 *	
13	* 1.5058	* 1.6719	* 1.5657	* 1.5453	* 1.3552	* 1.3364	* .6425 *	
	* 1.5145	* 1.3590	* 1.4734	* 1.4793	* 1.4608	* 1.4540	* 2.9137 *	
14	* 1.7581	* 1.7521	* 1.6946	* 1.0682	* .8147	* .6559 *		
	* 1.2873	* 1.2914	* 1.3443	* 2.0013	* 2.4465	* 2.8603 *		
15	* .8282	* .8654	* .8250	* .5409	* F-SUB-Q			
	* 2.4851	* 2.3583	* 2.4881	* 3.8730	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 101 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3999	* 1.3604	* 1.5625	* 1.5140	* 1.8299	* 1.5459	* 1.8257	* .8454 *
	* 1.5048	* 1.7884	* 1.5928	* 1.6037	* 1.3115	* 1.5465	* 1.2933	* 2.5418 *
9	* 1.3604	* 1.6797	* 1.6540	* 1.7379	* 1.6796	* 1.7254	* 1.8227	* .8815 *
	* 1.7884	* 1.4994	* 1.4989	* 1.3989	* 1.4400	* 1.3787	* 1.2984	* 2.4186 *
10	* 1.5625	* 1.6536	* 1.6561	* 1.6576	* 1.7035	* 1.6246	* 1.7676	* .8427 *
	* 1.5928	* 1.4993	* 1.4977	* 1.4900	* 1.4438	* 1.4997	* 1.3555	* 2.5561 *
11	* 1.5140	* 1.7384	* 1.6581	* 1.6445	* 1.5588	* 1.6534	* 1.1099	* .5540 *
	* 1.6037	* 1.3985	* 1.4895	* 1.5251	* 1.5738	* 1.4699	* 2.0530	* 4.0020 *
12	* 1.8299	* 1.6806	* 1.7043	* 1.5593	* 1.2819	* 1.5196	* .8656 *	
	* 1.3115	* 1.4382	* 1.4432	* 1.5733	* 1.6088	* 1.4571	* 2.4928 *	
13	* 1.5459	* 1.7280	* 1.6259	* 1.6541	* 1.5201	* 1.5007	* .6937 *	
	* 1.5465	* 1.3765	* 1.4984	* 1.4693	* 1.4567	* 1.4513	* 2.9662 *	
14	* 1.8257	* 1.8250	* 1.7690	* 1.1103	* .8658	* .7085	*	
	* 1.2933	* 1.2968	* 1.3544	* 2.0521	* 2.4925	* 2.9105	*	
15	* .8454	* .8820	* .8430	* .5542	* F-SUB-Q			
	* 2.5418	* 2.4174	* 2.5552	* 4.0000	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6609	* 1.4205	* 1.5984	* 1.5436	* 1.8733	* 1.5728	* 1.8722	* .8603 *
	* 1.5404	* 1.8408	* 1.6651	* 1.6718	* 1.3590	* 1.6103	* 1.3322	* 2.6369 *
9	* 1.4205	* 1.7296	* 1.6939	* 1.7801	* 1.7144	* 1.7642	* 1.8717	* .8959 *
	* 1.8408	* 1.5612	* 1.5627	* 1.4515	* 1.4982	* 1.4268	* 1.3371	* 2.5134 *
10	* 1.5984	* 1.6934	* 1.6961	* 1.7025	* 1.7530	* 1.6692	* 1.8210	* .8588 *
	* 1.6651	* 1.5631	* 1.5609	* 1.5490	* 1.4964	* 1.5569	* 1.3981	* 2.6587 *
11	* 1.5436	* 1.7805	* 1.7030	* 1.6990	* 1.6379	* 1.7474	* 1.1482	* .5669 *
	* 1.6718	* 1.4511	* 1.5485	* 1.5809	* 1.5999	* 1.4896	* 2.1240	* 4.1773 *
12	* 1.8733	* 1.7154	* 1.7538	* 1.6384	* 1.5192	* 1.6781	* .9157 *	
	* 1.3590	* 1.4963	* 1.4957	* 1.5995	* 1.6367	* 1.4735	* 2.5408 *	
13	* 1.5728	* 1.7670	* 1.6706	* 1.7481	* 1.6786	* 1.6521	* .7436 *	
	* 1.6103	* 1.4246	* 1.5556	* 1.4890	* 1.4730	* 1.4722	* 3.0316 *	
14	* 1.8722	* 1.8740	* 1.8224	* 1.1486	* .9159	* .7594	*	
	* 1.3322	* 1.3354	* 1.3970	* 2.1231	* 2.5404	* 2.9748	*	
15	* .8603	* .8964	* .8592	* .5671	* F-SUB-Q			
	* 2.6369	* 2.5122	* 2.6577	* 4.1751	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 102 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7663	* 1.4861	* 1.6361	* 1.5680	* 1.9131	* 1.5955	* 1.9150	* .8691 *
	* 1.6066	* 1.9253	* 1.7580	* 1.7627	* 1.4228	* 1.6955	* 1.3877	* 2.7791 *
9	* 1.4861	* 1.7736	* 1.7286	* 1.8249	* 1.7444	* 1.7987	* 1.9164	* .9025 *
	* 1.9253	* 1.6235	* 1.6460	* 1.5217	* 1.5755	* 1.4931	* 1.3926	* 2.6572 *
10	* 1.6361	* 1.7280	* 1.7312	* 1.7413	* 1.7972	* 1.7082	* 1.8697	* .8687 *
	* 1.7580	* 1.6465	* 1.6433	* 1.6279	* 1.5673	* 1.6337	* 1.4577	* 2.8073 *
11	* 1.5680	* 1.8253	* 1.7418	* 1.7492	* 1.7002	* 1.8264	* 1.1760	* .5745 *
	* 1.7627	* 1.5211	* 1.6274	* 1.6252	* 1.6528	* 1.5304	* 2.1919	* 4.4280 *
12	* 1.9131	* 1.7454	* 1.7980	* 1.7008	* 1.6156	* 1.7941	* .9502 *	
	* 1.4228	* 1.5734	* 1.5666	* 1.6523	* 1.6931	* 1.5119	* 2.6463 *	
13	* 1.5955	* 1.8015	* 1.7096	* 1.8272	* 1.7947	* 1.7676	* .7802 *	
	* 1.6955	* 1.4908	* 1.6322	* 1.5298	* 1.5114	* 1.5104	* 3.1479 *	
14	* 1.9150	* 1.9188	* 1.8712	* 1.1765	* .9504	* .7969	*	
	* 1.3877	* 1.3908	* 1.4565	* 2.1909	* 2.6458	* 3.0881	*	
15	* .8691	* .9031	* .8691	* .5748	* F-SUB-Q			
	* 2.7791	* 2.6556	* 2.8062	* 4.4255	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7833	* 1.5000	* 1.6374	* 1.5673	* 1.9060	* 1.5932	* 1.9099	* .8795 *
	* 1.7156	* 2.0422	* 1.8665	* 1.9006	* 1.5384	* 1.8266	* 1.4935	* 2.9445 *
9	* 1.5000	* 1.7713	* 1.7282	* 1.8223	* 1.7417	* 1.7984	* 1.9131	* .9208 *
	* 2.0422	* 1.7236	* 1.7646	* 1.6444	* 1.6992	* 1.6046	* 1.4982	* 2.7929 *
10	* 1.6374	* 1.7277	* 1.7318	* 1.7450	* 1.7974	* 1.7129	* 1.8712	* .8863 *
	* 1.8665	* 1.7652	* 1.7570	* 1.7366	* 1.6854	* 1.7506	* 1.5682	* 2.9564 *
11	* 1.5673	* 1.8227	* 1.7455	* 1.7599	* 1.7180	* 1.8452	* 1.2033	* .5849 *
	* 1.9006	* 1.6439	* 1.7361	* 1.7126	* 1.7427	* 1.6114	* 2.2718	* 4.6445 *
12	* 1.9060	* 1.7427	* 1.7982	* 1.7185	* 1.6474	* 1.8315	* .9860 *	
	* 1.5384	* 1.6969	* 1.6846	* 1.7420	* 1.7968	* 1.6050	* 2.7402 *	
13	* 1.5932	* 1.8012	* 1.7143	* 1.8460	* 1.8322	* 1.8096	* .8120 *	
	* 1.8266	* 1.6022	* 1.7492	* 1.6107	* 1.6045	* 1.6034	* 3.2807 *	
14	* 1.9099	* 1.9155	* 1.8727	* 1.2039	* .9863	* .8299	*	
	* 1.4935	* 1.4963	* 1.5668	* 2.2707	* 2.7396	* 3.2161	*	
15	* .8795	* .9214	* .8868	* .5852	* F-SUB-Q			
	* 2.9445	* 2.7914	* 2.9552	* 4.6421	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 103 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8258	* 1.5196	* 1.6596	* 1.5836	* 1.9447	* 1.6094	* 1.9541	* .8774 *
	* 1.7887	* 2.1503	* 1.9622	* 2.0332	* 1.6288	* 1.9524	* 1.5733	* 3.1766 *
9	* 1.5196	* 1.8095	* 1.7531	* 1.8622	* 1.7656	* 1.8291	* 1.9586	* .9120 *
	* 2.1503	* 1.8012	* 1.8532	* 1.7357	* 1.8104	* 1.7016	* 1.5776	* 3.0352 *
10	* 1.6596	* 1.7525	* 1.7575	* 1.7734	* 1.8354	* 1.7424	* 1.9173	* .8797 *
	* 1.9622	* 1.8538	* 1.8441	* 1.8203	* 1.7572	* 1.8319	* 1.6461	* 3.2087 *
11	* 1.5836	* 1.8626	* 1.7739	* 1.8032	* 1.7550	* 1.9024	* 1.2071	* .5827 *
	* 2.0332	* 1.7353	* 1.8198	* 1.7805	* 1.8155	* 1.6661	* 2.4127	* 4.9565 *
12	* 1.9447	* 1.7668	* 1.8362	* 1.7556	* 1.6907	* 1.8998	* .9897 *	
	* 1.6288	* 1.8079	* 1.7564	* 1.8149	* 1.8666	* 1.6526	* 2.9091	* .8198 *
13	* 1.6094	* 1.8319	* 1.7439	* 1.9033	* 1.9005	* 1.8792	* .8198 *	
	* 1.9524	* 1.6989	* 1.8304	* 1.6653	* 1.6520	* 1.6565	* 3.4781	* .8371 *
14	* 1.9541	* 1.9611	* 1.9189	* 1.2077	* .9900	* .8371		
	* 1.5733	* 1.5756	* 1.6448	* 2.4115	* 2.9085	* 3.4128		
15	* .8774	* .9125	* .8801	* .5831	* F-SUB-Q			
	* 3.1766	* 3.0338	* 3.2073	* 4.9538	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8275	* 1.5159	* 1.6558	* 1.5812	* 1.9482	* 1.6071	* 1.9623	* .8774 *
	* 1.8422	* 2.2118	* 2.0148	* 2.0972	* 1.7006	* 2.0593	* 1.6878	* 3.4229 *
9	* 1.5159	* 1.8095	* 1.7517	* 1.8664	* 1.7649	* 1.8334	* 1.9678	* .9119 *
	* 2.2118	* 1.8478	* 1.9016	* 1.7845	* 1.8808	* 1.8092	* 1.6854	* 3.2706 *
10	* 1.6558	* 1.7511	* 1.7569	* 1.7754	* 1.8404	* 1.7463	* 1.9277	* .8798 *
	* 2.0148	* 1.9023	* 1.8975	* 1.8776	* 1.8101	* 1.9081	* 1.7276	* 3.4338 *
11	* 1.5812	* 1.8668	* 1.7760	* 1.8121	* 1.7631	* 1.9187	* 1.2120	* .5829 *
	* 2.0972	* 1.7842	* 1.8771	* 1.8463	* 1.9012	* 1.7480	* 2.5339	* 5.2645 *
12	* 1.9482	* 1.7660	* 1.8412	* 1.7636	* 1.7052	* 1.9236	* .9968 *	
	* 1.7006	* 1.8796	* 1.8092	* 1.9006	* 1.9772	* 1.7462	* 3.0877	* .8274 *
13	* 1.6071	* 1.8363	* 1.7478	* 1.9196	* 1.9242	* 1.9050	* .8274 *	
	* 2.0593	* 1.8064	* 1.9065	* 1.7472	* 1.7456	* 1.7486	* 3.6842	* .8447 *
14	* 1.9623	* 1.9703	* 1.9292	* 1.2127	* .9971	* .8447		
	* 1.6878	* 1.6833	* 1.7262	* 2.5324	* 3.0870	* 3.6160		
15	* .8774	* .9124	* .8802	* .5832	* F-SUB-Q			
	* 3.4229	* 3.2690	* 3.4321	* 5.2612	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 104 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7964	* 1.4934	* 1.6305	* 1.5616	* 1.9207	* 1.5878	* 1.9390	* .8771 *
	* 1.8460	* 2.2104	* 2.0134	* 2.0859	* 1.6925	* 2.0430	* 1.6739	* 3.3624 *
9	* 1.4934	* 1.7774	* 1.7278	* 1.8396	* 1.7421	* 1.8146	* 1.9454	* .9167 *
	* 2.2104	* 1.8480	* 1.8965	* 1.7815	* 1.8725	* 1.7937	* 1.6725	* 3.1950 *
10	* 1.6305	* 1.7271	* 1.7339	* 1.7543	* 1.8165	* 1.7279	* 1.9072	* .8844 *
	* 2.0134	* 1.8972	* 1.8922	* 1.8702	* 1.8045	* 1.8976	* 1.7180	* 3.3523 *
11	* 1.5616	* 1.8400	* 1.7549	* 1.7914	* 1.7478	* 1.9004	* 1.2162	* .5826 *
	* 2.0859	* 1.7812	* 1.8696	* 1.8408	* 1.8925	* 1.7415	* 2.4874	* 5.1797 *
12	* 1.9207	* 1.7433	* 1.8174	* 1.7485	* 1.6949	* 1.9108	* 1.0050	* .8523 *
	* 1.6925	* 1.8713	* 1.8036	* 1.8919	* 1.9742	* 1.7491	* 3.0275	* .8344 *
13	* 1.5878	* 1.8175	* 1.7294	* 1.9013	* 1.9115	* 1.8954	* .8344	* 3.6676 *
	* 2.0430	* 1.7910	* 1.8960	* 1.7406	* 1.7484	* 1.7698	* 3.6676	* .8523 *
14	* 1.9390	* 1.9479	* 1.9087	* 1.2169	* 1.0053	* .8523		
	* 1.6739	* 1.6704	* 1.7165	* 2.4858	* 3.0267	* 3.5980		
15	* .8771	* .9173	* .8849	* .5829	* F-SUB-Q			
	* 3.3624	* 3.1931	* 3.3507	* 5.1764	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8020	* 1.4845	* 1.6262	* 1.5568	* 1.9333	* 1.5840	* 1.9595	* .8650 *
	* 1.8016	* 2.1614	* 1.9579	* 2.0259	* 1.6293	* 1.9779	* 1.5987	* 3.2761 *
9	* 1.4845	* 1.7819	* 1.7270	* 1.8511	* 1.7425	* 1.8231	* 1.9667	* .8977 *
	* 2.1614	* 1.7864	* 1.8415	* 1.7200	* 1.8146	* 1.7298	* 1.6016	* 3.1342 *
10	* 1.6262	* 1.7263	* 1.7337	* 1.7563	* 1.8274	* 1.7326	* 1.9275	* .8671 *
	* 1.9579	* 1.8422	* 1.8385	* 1.8166	* 1.7425	* 1.8401	* 1.6521	* 3.2891 *
11	* 1.5568	* 1.8515	* 1.7569	* 1.8040	* 1.7557	* 1.9227	* 1.2012	* .5718 *
	* 2.0259	* 1.7196	* 1.8160	* 1.7820	* 1.8432	* 1.6866	* 2.4411	* 5.0436 *
12	* 1.9333	* 1.7437	* 1.8282	* 1.7564	* 1.7050	* 1.9386	* .9887	* .9887 *
	* 1.6293	* 1.8134	* 1.7416	* 1.8426	* 1.9286	* 1.6921	* 2.9803	* .8241 *
13	* 1.5840	* 1.8260	* 1.7340	* 1.9236	* 1.9393	* 1.9241	* .8241	* 3.5899 *
	* 1.9779	* 1.7272	* 1.8386	* 1.6859	* 1.6916	* 1.7099	* 3.5899	
14	* 1.9595	* 1.9693	* 1.9291	* 1.2019	* .9890	* .8411		
	* 1.5987	* 1.5996	* 1.6507	* 2.4395	* 2.9796	* 3.5249		
15	* .8650	* .8983	* .8676	* .5721	* F-SUB-Q			
	* 3.2761	* 3.1326	* 3.2875	* 5.0405	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 105 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7824	* 1.4622	* 1.6048	* 1.5387	* 1.9197	* 1.5665	* 1.9524	* .8547 *
	* 1.6647	* 2.0078	* 1.8203	* 1.8761	* 1.5047	* 1.8347	* 1.4769	* 3.0360 *
9	* 1.4622	* 1.7637	* 1.7079	* 1.8366	* 1.7251	* 1.8116	* 1.9602	* .8838 *
	* 2.0078	* 1.6570	* 1.7095	* 1.5918	* 1.6804	* 1.5997	* 1.4770	* 2.9128 *
10	* 1.6048	* 1.7072	* 1.7152	* 1.7395	* 1.8139	* 1.7185	* 1.9211	* .8550 *
	* 1.8203	* 1.7102	* 1.7069	* 1.6861	* 1.6120	* 1.7056	* 1.5233	* 3.0463 *
11	* 1.5387	* 1.8370	* 1.7400	* 1.7923	* 1.7451	* 1.9164	* 1.1877	* .5626 *
	* 1.8761	* 1.5911	* 1.6856	* 1.6451	* 1.7009	* 1.5492	* 2.2638	* 4.7033 *
12	* 1.9197	* 1.7263	* 1.8148	* 1.7457	* 1.6962	* 1.9368	* .9755 *	
	* 1.5047	* 1.6793	* 1.6113	* 1.7003	* 1.7783	* 1.5537	* 2.7666 *	
13	* 1.5665	* 1.8144	* 1.7200	* 1.9173	* 1.9375	* 1.9245	* .8156 *	
	* 1.8347	* 1.5974	* 1.7042	* 1.5485	* 1.5532	* 1.5691	* 3.3273 *	
14	* 1.9524	* 1.9628	* 1.9227	* 1.1885	* .9758	* .8324	*	
	* 1.4769	* 1.4752	* 1.5221	* 2.2624	* 2.7659	* 3.2673	*	
15	* .8547	* .8845	* .8555	* .5629	* F-SUB-Q			
	* 3.0360	* 2.9109	* 3.0448	* 4.7003	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7481	* 1.4324	* 1.5744	* 1.5116	* 1.8900	* 1.5406	* 1.9272	* .8422 *
	* 1.5561	* 1.8783	* 1.6970	* 1.7477	* 1.3988	* 1.7100	* 1.3719	* 2.8302 *
9	* 1.4324	* 1.7324	* 1.6782	* 1.8066	* 1.6961	* 1.7871	* 1.9355	* .8741 *
	* 1.8783	* 1.5432	* 1.5908	* 1.4808	* 1.5647	* 1.4857	* 1.3703	* 2.7046 *
10	* 1.5744	* 1.6775	* 1.6860	* 1.7109	* 1.7859	* 1.6930	* 1.8973	* .8442 *
	* 1.6970	* 1.5915	* 1.5883	* 1.5676	* 1.4983	* 1.5832	* 1.4113	* 2.8254 *
11	* 1.5116	* 1.8070	* 1.7114	* 1.7656	* 1.7214	* 1.8917	* 1.1736	* .5540 *
	* 1.7477	* 1.4807	* 1.5671	* 1.5313	* 1.5842	* 1.4401	* 2.0964	* 4.3681 *
12	* 1.8900	* 1.6973	* 1.7868	* 1.7220	* 1.6741	* 1.9152	* .9660 *	
	* 1.3988	* 1.5636	* 1.4975	* 1.5836	* 1.6601	* 1.4468	* 2.5696 *	
13	* 1.5406	* 1.7899	* 1.6944	* 1.8926	* 1.9159	* 1.9050	* .8068 *	
	* 1.7100	* 1.4836	* 1.5820	* 1.4394	* 1.4462	* 1.4575	* 3.0979 *	
14	* 1.9272	* 1.9380	* 1.8989	* 1.1744	* .9663	* .8232	*	
	* 1.3719	* 1.3687	* 1.4101	* 2.0951	* 2.5689	* 3.0429	*	
15	* .8422	* .8747	* .8447	* .5544	* F-SUB-Q			
	* 2.8302	* 2.7032	* 2.8239	* 4.3653	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 106 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6949	* 1.3946	* 1.5315	* 1.4744	* 1.8391	* 1.5041	* 1.8790	* .8313 *
	* 1.5859	* 1.9128	* 1.7369	* 1.7852	* 1.4323	* 1.7473	* 1.4035	* 2.8664 *
9	* 1.3946	* 1.6831	* 1.6347	* 1.7562	* 1.6533	* 1.7464	* 1.8875	* .8668 *
	* 1.9128	* 1.5827	* 1.6260	* 1.5171	* 1.5993	* 1.5158	* 1.4006	* 2.7254 *
10	* 1.5315	* 1.6340	* 1.6426	* 1.6678	* 1.7385	* 1.6527	* 1.8513	* .8367 *
	* 1.7369	* 1.6267	* 1.6240	* 1.6015	* 1.5328	* 1.6142	* 1.4380	* 2.8423 *
11	* 1.4744	* 1.7566	* 1.6683	* 1.7195	* 1.6818	* 1.8435	* 1.1599	* .5466 *
	* 1.7852	* 1.5168	* 1.6010	* 1.5637	* 1.6096	* 1.4649	* 2.1095	* 4.4102 *
12	* 1.8391	* 1.6545	* 1.7394	* 1.6824	* 1.6366	* 1.8688	* .9574 *	
	* 1.4323	* 1.5983	* 1.5321	* 1.6090	* 1.6751	* 1.4628	* 2.5651	*
13	* 1.5041	* 1.7491	* 1.6541	* 1.8444	* 1.8695	* 1.8622	* .7991 *	
	* 1.7473	* 1.5136	* 1.6129	* 1.4642	* 1.4623	* 1.4715	* 3.0895	*
14	* 1.8790	* 1.8900	* 1.8529	* 1.1607	* .9578	* .8154	*	
	* 1.4036	* 1.3988	* 1.4368	* 2.1081	* 2.5643	* 3.0344	*	
15	* .8313	* .8674	* .8372	* .5469	* F-SUB-Q			
	* 2.8664	* 2.7237	* 2.8409	* 4.4073	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6793	* 1.3679	* 1.5096	* 1.4500	* 1.8272	* 1.4806	* 1.8718	* .8059 *
	* 1.4747	* 1.8032	* 1.6345	* 1.6899	* 1.3426	* 1.6539	* 1.3122	* 2.7586 *
9	* 1.3679	* 1.6681	* 1.6138	* 1.7427	* 1.6317	* 1.7306	* 1.8807	* .8337 *
	* 1.8032	* 1.4824	* 1.5303	* 1.4207	* 1.5085	* 1.4244	* 1.3084	* 2.6440 *
10	* 1.5096	* 1.6130	* 1.6214	* 1.6462	* 1.7243	* 1.6336	* 1.8443	* .8066 *
	* 1.6345	* 1.5310	* 1.5287	* 1.5072	* 1.4365	* 1.5168	* 1.3410	* 2.7468 *
11	* 1.4500	* 1.7431	* 1.6468	* 1.7057	* 1.6636	* 1.8346	* 1.1256	* .5270 *
	* 1.6899	* 1.4204	* 1.5067	* 1.4634	* 1.5102	* 1.3646	* 2.0160	* 4.2514 *
12	* 1.8272	* 1.6329	* 1.7252	* 1.6641	* 1.6201	* 1.8624	* .9226 *	
	* 1.3426	* 1.5075	* 1.4358	* 1.5096	* 1.5620	* 1.3565	* 2.4691	*
13	* 1.4806	* 1.7334	* 1.6350	* 1.8356	* 1.8631	* 1.8580	* .7733 *	
	* 1.6539	* 1.4223	* 1.5156	* 1.3640	* 1.3560	* 1.3610	* 2.9542	*
14	* 1.8718	* 1.8833	* 1.8459	* 1.1264	* .9228	* .7888	*	
	* 1.3122	* 1.3068	* 1.3399	* 2.0146	* 2.4684	* 2.9022	*	
15	* .8059	* .8342	* .8071	* .5274	* F-SUB-Q			
	* 2.7586	* 2.6427	* 2.7454	* 4.2485	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 107 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6299	* 1.3272	* 1.4679	* 1.4077	* 1.7764	* 1.4391	* 1.8224	* .7813
	* 1.4158	* 1.7376	* 1.5771	* 1.6368	* 1.2980	* 1.6006	* 1.2672	* 2.6813
9	* 1.3272	* 1.6223	* 1.5701	* 1.6933	* 1.5858	* 1.6866	* 1.8316	* .8083
	* 1.7376	* 1.4310	* 1.4772	* 1.3733	* 1.4594	* 1.3740	* 1.2627	* 2.5691
10	* 1.4679	* 1.5693	* 1.5773	* 1.6003	* 1.6761	* 1.5900	* 1.7974	* .7823
	* 1.5771	* 1.4778	* 1.4757	* 1.4557	* 1.3882	* 1.4630	* 1.2915	* 2.6658
11	* 1.4077	* 1.6936	* 1.6008	* 1.6576	* 1.6180	* 1.7838	* 1.0929	* .5103
	* 1.6368	* 1.3730	* 1.4553	* 1.4114	* 1.4529	* 1.3121	* 1.9465	* 4.1274
12	* 1.7764	* 1.5870	* 1.6770	* 1.6185	* 1.5762	* 1.8115	* .8943	*
	* 1.2980	* 1.4583	* 1.3875	* 1.4523	* 1.4960	* 1.3005	* 2.3803	*
13	* 1.4391	* 1.6893	* 1.5914	* 1.7847	* 1.8122	* 1.8108	* .7499	*
	* 1.6006	* 1.3719	* 1.4619	* 1.3115	* 1.3001	* 1.3021	* 2.8462	*
14	* 1.8224	* 1.8341	* 1.7990	* 1.0937	* .8946	* .7649	*	*
	* 1.2672	* 1.2611	* 1.2905	* 1.9451	* 2.3796	* 2.7964	*	*
15	* .7813	* .8088	* .7827	* .5106	* F-SUB-Q			
	* 2.6813	* 2.5679	* 2.6644	* 4.1246	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5393	* 1.2699	* 1.4026	* 1.3429	* 1.6772	* 1.3755	* 1.7210	* .7552
	* 1.4182	* 1.7184	* 1.5657	* 1.6294	* 1.3040	* 1.5906	* 1.2737	* 2.6391
9	* 1.2699	* 1.5390	* 1.4987	* 1.6000	* 1.5102	* 1.6076	* 1.7301	* .7878
	* 1.7184	* 1.4314	* 1.4683	* 1.3788	* 1.4547	* 1.3681	* 1.2684	* 2.5077
10	* 1.4026	* 1.4980	* 1.5060	* 1.5247	* 1.5860	* 1.5166	* 1.7013	* .7624
	* 1.5657	* 1.4690	* 1.4665	* 1.4492	* 1.3919	* 1.4546	* 1.2938	* 2.6007
11	* 1.3429	* 1.6003	* 1.5252	* 1.5677	* 1.5394	* 1.6815	* 1.0584	* .4954
	* 1.6294	* 1.3786	* 1.4487	* 1.4141	* 1.4433	* 1.3166	* 1.9057	* 4.0415
12	* 1.6772	* 1.5114	* 1.5869	* 1.5399	* 1.4985	* 1.7064	* .8698	*
	* 1.3040	* 1.4537	* 1.3912	* 1.4428	* 1.4844	* 1.3028	* 2.3159	*
13	* 1.3755	* 1.6102	* 1.5180	* 1.6824	* 1.7070	* 1.7097	* .7267	*
	* 1.5906	* 1.3660	* 1.4534	* 1.3159	* 1.3023	* 1.2993	* 2.7752	*
14	* 1.7210	* 1.7325	* 1.7028	* 1.0591	* .8701	* .7417	*	*
	* 1.2737	* 1.2668	* 1.2927	* 1.9043	* 2.3152	* 2.7249	*	*
15	* .7552	* .7884	* .7628	* .4957	* F-SUB-Q			
	* 2.6391	* 2.5061	* 2.5995	* 4.0388	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 108 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4684	* 1.2136	* 1.3491	* 1.2800	* 1.5949	* 1.3130	* 1.6365	* .7085 *
	* 1.4222	* 1.7234	* 1.5593	* 1.6384	* 1.3144	* 1.5972	* 1.2833	* 2.7014 *
9	* 1.2136	* 1.4738	* 1.4383	* 1.5246	* 1.4432	* 1.5375	* 1.6449	* .7348 *
	* 1.7234	* 1.4322	* 1.4656	* 1.3860	* 1.4585	* 1.3702	* 1.2779	* 2.5816 *
10	* 1.3491	* 1.4376	* 1.4459	* 1.4594	* 1.5113	* 1.4522	* 1.6215	* .7104 *
	* 1.5593	* 1.4663	* 1.4630	* 1.4496	* 1.3992	* 1.4546	* 1.2996	* 2.6791 *
11	* 1.2800	* 1.5249	* 1.4599	* 1.4928	* 1.4689	* 1.5973	* .9924	* .4648 *
	* 1.6384	* 1.3857	* 1.4492	* 1.4215	* 1.4458	* 1.3252	* 1.9468	* 4.1355 *
12	* 1.5949	* 1.4443	* 1.5121	* 1.4694	* 1.4280	* 1.6171	* .8114	* .3144 *
	* 1.3144	* 1.4575	* 1.3985	* 1.4453	* 1.4878	* 1.3127	* 2.3762	* .6778 *
13	* 1.3130	* 1.5400	* 1.4535	* 1.5981	* 1.6177	* 1.6226	* .6778	* 1.5972 *
	* 1.5972	* 1.3681	* 1.4534	* 1.3245	* 1.3122	* 1.3065	* 2.8459	* 1.6365 *
14	* 1.6365	* 1.6472	* 1.6230	* .9931	* .8117	* .6912	* 1.2833	* 1.2762 *
	* 1.2833	* 1.2762	* 1.2986	* 1.9455	* 2.3755	* 2.7968	* 1.2986	* 1.9455 *
15	* .7085	* .7353	* .7109	* .4651	* F-SUB-Q			
	* 2.7014	* 2.5801	* 2.6777	* 4.1328	* M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3288	* 1.1202	* 1.2385	* 1.1728	* 1.4300	* 1.1976	* 1.4640	* .6506 *
	* 1.5186	* 1.8050	* 1.6420	* 1.7292	* 1.4168	* 1.6934	* 1.3869	* 2.8503 *
9	* 1.1202	* 1.3366	* 1.3188	* 1.3799	* 1.3174	* 1.3951	* 1.4711	* .6719 *
	* 1.8050	* 1.5267	* 1.5448	* 1.4794	* 1.5439	* 1.4593	* 1.3813	* 2.7359 *
10	* 1.2385	* 1.3182	* 1.3198	* 1.3391	* 1.3681	* 1.3241	* 1.4529	* .6480 *
	* 1.6420	* 1.5456	* 1.5491	* 1.5261	* 1.4933	* 1.5417	* 1.4017	* 2.8463 *
11	* 1.1728	* 1.3802	* 1.3395	* 1.3508	* 1.3348	* 1.4317	* .9037	* .4245 *
	* 1.7292	* 1.4792	* 1.5257	* 1.5171	* 1.5346	* 1.4272	* 2.0685	* 4.3917 *
12	* 1.4300	* 1.3184	* 1.3688	* 1.3353	* 1.2935	* 1.4437	* .7421	* 1.4168 *
	* 1.4168	* 1.5429	* 1.4926	* 1.5340	* 1.5851	* 1.4187	* 2.5128	* 1.4168 *
13	* 1.1976	* 1.3974	* 1.3252	* 1.4324	* 1.4443	* 1.4414	* .6143	* 1.6934 *
	* 1.6934	* 1.4571	* 1.5404	* 1.4265	* 1.4181	* 1.4193	* 3.0378	* 1.4571 *
14	* 1.4640	* 1.4731	* 1.4541	* .9042	* .7423	* .6261	* 1.3869	* 1.3795 *
	* 1.3869	* 1.3795	* 1.4006	* 2.0673	* 2.5121	* 2.9868	* 1.4006	* 2.0673 *
15	* .6506	* .6724	* .6484	* .4247	* F-SUB-Q			
	* 2.8503	* 2.7340	* 2.8449	* 4.3889	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 109 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 125 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1450 *	* .9226 *	* 1.0035 *	* .9588 *	* 1.2114 *	* .9641 *	* 1.2445 *	* .5387 *
	* 1.7176 *	* 2.1351 *	* 1.9744 *	* 2.0596 *	* 1.6302 *	* 2.0492 *	* 1.5902 *	* 3.3633 *
9	* .9226 *	* 1.1516 *	* 1.0729 *	* 1.2124 *	* 1.0500 *	* 1.1156 *	* 1.2525 *	* .5559 *
	* 2.1351 *	* 1.7208 *	* 1.8490 *	* 1.6365 *	* 1.8908 *	* 1.7769 *	* 1.5814 *	* 3.2292 *
10	* 1.0035 *	* 1.0725 *	* 1.0365 *	* 1.0987 *	* 1.1801 *	* 1.0674 *	* 1.1776 *	* .5293 *
	* 1.9744 *	* 1.8498 *	* 1.9197 *	* 1.8104 *	* 1.6856 *	* 1.8626 *	* 1.6846 *	* 3.4038 *
11	* .9588 *	* 1.2127 *	* 1.0990 *	* 1.1714 *	* 1.0601 *	* 1.2257 *	* .7390 *	* .3492 *
	* 2.0596 *	* 1.6362 *	* 1.8099 *	* 1.7013 *	* 1.8809 *	* 1.6223 *	* 2.4672 *	* 5.2219 *
12	* 1.2114 *	* 1.0507 *	* 1.1807 *	* 1.0604 *	* 1.0055 *	* 1.2327 *	* .6196 *	
	* 1.6302 *	* 1.8896 *	* 1.6848 *	* 1.8803 *	* 1.9841 *	* 1.6167 *	* 2.9362 *	
13	* .9641 *	* 1.1174 *	* 1.0682 *	* 1.2262 *	* 1.2332 *	* 1.1160 *	* .4940 *	
	* 2.0492 *	* 1.7741 *	* 1.8612 *	* 1.6216 *	* 1.6161 *	* 1.7859 *	* 3.6880 *	
14	* 1.2445 *	* 1.2539 *	* 1.1785 *	* .7395 *	* .6198 *	* .5031 *		
	* 1.5902 *	* 1.5797 *	* 1.6833 *	* 2.4658 *	* 2.9353 *	* 3.6285 *		
15	* .5387 *	* .5564 *	* .5296 *	* .3494 *	F-SUB-Q			
	* 3.3633 *	* 3.2271 *	* 3.4023 *	* 5.2188 *	M-SUB-Q			

AT 75% POWER, 125 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4795 *	* .4079 *	* .4066 *	* .4206 *	* .5015 *	* .4174 *	* .4582 *	* .2317 *
	* 4.0146 *	* 4.7271 *	* 4.7594 *	* 4.5951 *	* 3.8507 *	* 4.6320 *	* 4.2216 *	* 7.6662 *
9	* .4079 *	* .4730 *	* .4316 *	* .5021 *	* .4261 *	* .4348 *	* .4596 *	* .2343 *
	* 4.7271 *	* 4.0883 *	* 4.4892 *	* 3.8597 *	* 4.5482 *	* 4.4526 *	* 4.2115 *	* 7.5112 *
10	* .4066 *	* .4314 *	* .4084 *	* .4461 *	* .4993 *	* .4280 *	* .4280 *	* .2200 *
	* 4.7594 *	* 4.4905 *	* 4.7540 *	* 4.3511 *	* 3.8865 *	* 4.5360 *	* 4.5294 *	* 8.0278 *
11	* .4206 *	* .5023 *	* .4462 *	* .4942 *	* .4220 *	* .4734 *	* .3147 *	* .1520 *
	* 4.5951 *	* 3.8586 *	* 4.3500 *	* 3.9351 *	* 4.6087 *	* 4.1043 *	* 5.6720 *	* 11.7750 *
12	* .5015 *	* .4263 *	* .4996 *	* .4221 *	* .3965 *	* .4521 *	* .2601 *	
	* 3.8507 *	* 4.5456 *	* 3.8848 *	* 4.6073 *	* 4.9129 *	* 4.3048 *	* 6.8546 *	
13	* .4174 *	* .4355 *	* .4283 *	* .4736 *	* .4523 *	* .3980 *	* .2032 *	
	* 4.6320 *	* 4.4460 *	* 4.5326 *	* 4.1025 *	* 4.3031 *	* 4.8958 *	* 8.7881 *	
14	* .4582 *	* .4601 *	* .4283 *	* .3149 *	* .2602 *	* .2064 *		
	* 4.2216 *	* 4.2070 *	* 4.5259 *	* 5.6693 *	* 6.8513 *	* 8.6701 *		
15	* .2317 *	* .2345 *	* .2202 *	* .1521 *	F-SUB-Q			
	* 7.6662 *	* 7.5069 *	* 8.0234 *	* 11.7672 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 110 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .3708 *	* .4157 *	* .4518 *	* .4728 *	* .5474 *	* .4694 *	* .4886 *	* .2677 *
	* 3.9754 *	* 4.5688 *	* 4.3728 *	* 4.1538 *	* 3.6262 *	* 4.1938 *	* 4.1323 *	* 6.7938 *
9	* .4157 *	* .5003 *	* .4752 *	* .5406 *	* .4723 *	* .4690 *	* .4854 *	* .2670 *
	* 4.5688 *	* 4.0693 *	* 4.1743 *	* 3.6879 *	* 4.1454 *	* 4.1951 *	* 4.1601 *	* 6.7806 *
10	* .4518 *	* .4751 *	* .4504 *	* .4797 *	* .5250 *	* .4502 *	* .4446 *	* .2459 *
	* 4.3728 *	* 4.1749 *	* 4.4958 *	* 4.1158 *	* 3.7895 *	* 4.3410 *	* 4.4374 *	* 7.2537 *
11	* .4728 *	* .5407 *	* .4799 *	* .5032 *	* .4149 *	* .4417 *	* .3166 *	* .1777 *
	* 4.1538 *	* 3.6873 *	* 4.1150 *	* 4.0161 *	* 4.7470 *	* 4.4338 *	* 5.6608 *	* 9.9948 *
12	* .5474 *	* .4725 *	* .5252 *	* .4149 *	* .3196 *	* .3496 *	* .2374 *	
	* 3.6262 *	* 4.1438 *	* 3.7882 *	* 4.7464 *	* 4.9216 *	* 4.5969 *	* 6.9466 *	
13	* .4694 *	* .4698 *	* .4505 *	* .4418 *	* .3496 *	* .2954 *	* .1700 *	
	* 4.1938 *	* 4.1876 *	* 4.3382 *	* 4.4331 *	* 4.5969 *	* 5.0933 *	* 8.8129 *	
14	* .4886 *	* .4860 *	* .4449 *	* .3167 *	* .2374 *	* .1734 *		
	* 4.1323 *	* 4.1556 *	* 4.4349 *	* 5.6600 *	* 6.9487 *	* 8.6764 *		
15	* .2677 *	* .2671 *	* .2459 *	* .1778 *	F-SUB-Q			
	* 6.7938 *	* 6.7793 *	* 7.2526 *	* 9.9927 *	M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .7822 *	* .8724 *	* 1.0213 *	* 1.0012 *	* 1.1824 *	* 1.0026 *	* 1.1783 *	* .5911 *
	* 1.9177 *	* 2.2296 *	* 1.9992 *	* 2.0278 *	* 1.7353 *	* 2.0224 *	* 1.7646 *	* 3.1737 *
9	* .8724 *	* 1.0793 *	* 1.0771 *	* 1.1774 *	* 1.0751 *	* 1.0879 *	* 1.1737 *	* .6062 *
	* 2.2296 *	* 1.9333 *	* 1.8969 *	* 1.7511 *	* 1.8837 *	* 1.8695 *	* 1.7556 *	* 3.0557 *
10	* 1.0213 *	* 1.0769 *	* 1.0438 *	* 1.0841 *	* 1.1034 *	* 1.0326 *	* 1.0840 *	* .5656 *
	* 1.9992 *	* 1.8973 *	* 1.9922 *	* 1.8765 *	* 1.8603 *	* 1.9581 *	* 1.8780 *	* 3.2473 *
11	* 1.0012 *	* 1.1776 *	* 1.0843 *	* 1.0532 *	* .9505 *	* 1.0236 *	* .7032 *	* .3866 *
	* 2.0278 *	* 1.7508 *	* 1.8761 *	* 1.9674 *	* 2.0933 *	* 1.9498 *	* 2.6350 *	* 4.7494 *
12	* 1.1824 *	* 1.0755 *	* 1.1038 *	* .9507 *	* .7126 *	* .8503 *	* .5406 *	
	* 1.7353 *	* 1.8830 *	* 1.8597 *	* 2.0930 *	* 2.1841 *	* 1.9314 *	* 3.1156 *	
13	* 1.0026 *	* 1.0895 *	* 1.0333 *	* 1.0238 *	* .8504 *	* .7434 *	* .4036 *	
	* 2.0224 *	* 1.8668 *	* 1.9568 *	* 1.9495 *	* 1.9313 *	* 2.1246 *	* 3.7974 *	
14	* 1.1783 *	* 1.1748 *	* 1.0845 *	* .7032 *	* .5405 *	* .4061 *		
	* 1.7646 *	* 1.7539 *	* 1.8770 *	* 2.6348 *	* 3.1164 *	* 3.7897 *		
15	* .5911 *	* .6065 *	* .5656 *	* .3867 *	F-SUB-Q			
	* 3.1737 *	* 3.0543 *	* 3.2471 *	* 4.7485 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 111 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9408	* 1.0558	* 1.2405	* 1.2168	* 1.4159	* 1.2316	* 1.3987	* .7150
	* 1.6606	* 1.8863	* 1.6861	* 1.7094	* 1.4817	* 1.6825	* 1.4964	* 2.6397
9	* 1.0558	* 1.2925	* 1.3045	* 1.3578	* 1.3349	* 1.3380	* 1.3923	* .7447
	* 1.8863	* 1.6483	* 1.6013	* 1.5529	* 1.5539	* 1.5478	* 1.5013	* 2.5204
10	* 1.2405	* 1.3043	* 1.3015	* 1.3136	* 1.3176	* 1.2656	* 1.3213	* .7016
	* 1.6861	* 1.6015	* 1.6179	* 1.5838	* 1.6017	* 1.6362	* 1.5762	* 2.6726
11	* 1.2168	* 1.3582	* 1.3139	* 1.2560	* 1.1770	* 1.2131	* .8708	* .4692
	* 1.7094	* 1.5524	* 1.5835	* 1.6877	* 1.7202	* 1.6767	* 2.1819	* 4.0104
12	* 1.4159	* 1.3355	* 1.3180	* 1.1773	* .8878	* 1.0127	* .6631	*
	* 1.4817	* 1.5532	* 1.6012	* 1.7199	* 1.7725	* 1.6652	* 2.5960	*
13	* 1.2316	* 1.3398	* 1.2664	* 1.2134	* 1.0129	* .9444	* .5019	*
	* 1.6825	* 1.5457	* 1.6351	* 1.6764	* 1.6650	* 1.7171	* 3.1280	*
14	* 1.3987	* 1.3937	* 1.3221	* .8708	* .6630	* .5108	*	*
	* 1.4964	* 1.4998	* 1.5754	* 2.1818	* 2.5964	* 3.0868	*	*
15	* .7150	* .7450	* .7018	* .4693	* F-SUB-Q			
	* 2.6397	* 2.5195	* 2.6724	* 4.0097	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0688	* 1.1638	* 1.3725	* 1.3509	* 1.6190	* 1.3664	* 1.6056	* .7761
	* 1.4992	* 1.7576	* 1.5673	* 1.5827	* 1.3302	* 1.5552	* 1.3312	* 2.4832
9	* 1.1638	* 1.4650	* 1.4511	* 1.5505	* 1.4905	* 1.5020	* 1.5994	* .8067
	* 1.7576	* 1.4951	* 1.4795	* 1.3978	* 1.4299	* 1.4116	* 1.3363	* 2.3780
10	* 1.3725	* 1.4508	* 1.4492	* 1.4664	* 1.5026	* 1.4162	* 1.5134	* .7629
	* 1.5673	* 1.4798	* 1.4918	* 1.4587	* 1.4448	* 1.5030	* 1.4112	* 2.5208
11	* 1.3509	* 1.5508	* 1.4668	* 1.4298	* 1.3215	* 1.3995	* .9586	* .5082
	* 1.5827	* 1.3974	* 1.4584	* 1.5256	* 1.5746	* 1.4928	* 2.0414	* 3.8114
12	* 1.6190	* 1.4912	* 1.5030	* 1.3218	* .9915	* 1.1720	* .7260	*
	* 1.3302	* 1.4293	* 1.4444	* 1.5743	* 1.6198	* 1.4770	* 2.4472	*
13	* 1.3664	* 1.5039	* 1.4171	* 1.3999	* 1.1722	* 1.1018	* .5542	*
	* 1.5552	* 1.4097	* 1.5019	* 1.4925	* 1.4768	* 1.5259	* 2.9352	*
14	* 1.6056	* 1.6010	* 1.5143	* .9586	* .7259	* .5657	*	*
	* 1.3312	* 1.3350	* 1.4104	* 2.0411	* 2.4474	* 2.8884	*	*
15	* .7761	* .8072	* .7630	* .5083	* F-SUB-Q			
	* 2.4832	* 2.3769	* 2.5207	* 3.8105	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 112 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1419	* 1.2197	* 1.4335	* 1.4180	* 1.7218	* 1.4286	* 1.7110	* .8139 *
	* 1.4599	* 1.7374	* 1.5549	* 1.5551	* 1.2892	* 1.5337	* 1.2868	* 2.4420 *
9	* 1.2197	* 1.5524	* 1.5225	* 1.6582	* 1.5660	* 1.5802	* 1.7063	* .8476 *
	* 1.7374	* 1.4661	* 1.4605	* 1.3524	* 1.4035	* 1.3845	* 1.2911	* 2.3350 *
10	* 1.4335	* 1.5222	* 1.5191	* 1.5476	* 1.6035	* 1.4912	* 1.6113	* .8021 *
	* 1.5549	* 1.4608	* 1.4754	* 1.4297	* 1.3991	* 1.4728	* 1.3665	* 2.4755 *
11	* 1.4180	* 1.6585	* 1.5479	* 1.5225	* 1.4060	* 1.5088	* 1.0169	* .5319 *
	* 1.5551	* 1.3520	* 1.4294	* 1.4860	* 1.5379	* 1.4373	* 1.9893	* 3.7579 *
12	* 1.7218	* 1.5668	* 1.6041	* 1.4064	* 1.0608	* 1.2791	* .7779	* .7779 *
	* 1.2892	* 1.4028	* 1.3987	* 1.5376	* 1.5840	* 1.4183	* 2.3898	* .7779 *
13	* 1.4286	* 1.5823	* 1.4922	* 1.5092	* 1.2795	* 1.2039	* .5966	* .5966 *
	* 1.5337	* 1.3827	* 1.4718	* 1.4370	* 1.4180	* 1.4717	* 2.8747	* .5966 *
14	* 1.7110	* 1.7080	* 1.6122	* 1.0170	* .7779	* .6093		
	* 1.2868	* 1.2899	* 1.3657	* 1.9890	* 2.3898	* 2.8271		
15	* .8139	* .8479	* .8022	* .5321	* F-SUB-Q			
	* 2.4420	* 2.3342	* 2.4753	* 3.7570	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2115	* 1.2635	* 1.4705	* 1.4565	* 1.7773	* 1.4611	* 1.7686	* .8383 *
	* 1.4680	* 1.7589	* 1.5795	* 1.5713	* 1.2939	* 1.5503	* 1.2834	* 2.4456 *
9	* 1.2635	* 1.6069	* 1.5664	* 1.7215	* 1.6084	* 1.6228	* 1.7654	* .8761 *
	* 1.7589	* 1.4774	* 1.4762	* 1.3532	* 1.4174	* 1.3908	* 1.2869	* 2.3302 *
10	* 1.4705	* 1.5660	* 1.5625	* 1.5998	* 1.6656	* 1.5379	* 1.6681	* .8299 *
	* 1.5795	* 1.4765	* 1.4914	* 1.4389	* 1.4017	* 1.4862	* 1.3677	* 2.4745 *
11	* 1.4565	* 1.7217	* 1.6002	* 1.5826	* 1.4737	* 1.5901	* 1.0629	* .5492 *
	* 1.5713	* 1.3530	* 1.4386	* 1.4917	* 1.5408	* 1.4325	* 1.9954	* 3.7978 *
12	* 1.7773	* 1.6091	* 1.6661	* 1.4741	* 1.1313	* 1.3784	* .8273	* .8273 *
	* 1.2939	* 1.4167	* 1.4012	* 1.5405	* 1.5951	* 1.4160	* 2.3888	* .8273 *
13	* 1.4611	* 1.6249	* 1.5389	* 1.5906	* 1.3788	* 1.3021	* .6410	* .6410 *
	* 1.5503	* 1.3889	* 1.4852	* 1.4322	* 1.4157	* 1.4763	* 2.8865	* .6410 *
14	* 1.7686	* 1.7671	* 1.6690	* 1.0631	* .8274	* .6542		
	* 1.2834	* 1.2857	* 1.3669	* 1.9950	* 2.3887	* 2.8404		
15	* .8383	* .8765	* .8300	* .5494	* F-SUB-Q			
	* 2.4456	* 2.3293	* 2.4742	* 3.7968	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 113 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3554	* 1.3181	* 1.5106	* 1.4899	* 1.8323	* 1.4887	* 1.8254	* .8497 *
	* 1.4802	* 1.7870	* 1.6238	* 1.6125	* 1.3159	* 1.5912	* 1.2954	* 2.5123 *
9	* 1.3181	* 1.6683	* 1.6122	* 1.7857	* 1.6483	* 1.6635	* 1.8245	* .8855 *
	* 1.7870	* 1.5039	* 1.5126	* 1.3714	* 1.4507	* 1.4169	* 1.2988	* 2.4023 *
10	* 1.5106	* 1.6118	* 1.6077	* 1.6515	* 1.7280	* 1.5854	* 1.7277	* .8413 *
	* 1.6238	* 1.5129	* 1.5278	* 1.4693	* 1.4232	* 1.5188	* 1.3858	* 2.5547 *
11	* 1.4899	* 1.7859	* 1.6519	* 1.6474	* 1.5546	* 1.6869	* 1.0962	* .5590 *
	* 1.6125	* 1.3711	* 1.4690	* 1.5067	* 1.5469	* 1.4284	* 2.0563	* 3.9387 *
12	* 1.8323	* 1.6491	* 1.7286	* 1.5550	* 1.2479	* 1.5272	* .8718 *	
	* 1.3159	* 1.4500	* 1.4227	* 1.5466	* 1.6144	* 1.4183	* 2.4404 *	
13	* 1.4887	* 1.6656	* 1.5864	* 1.6875	* 1.5276	* 1.4411	* .6841 *	
	* 1.5912	* 1.4150	* 1.5178	* 1.4280	* 1.4180	* 1.4829	* 2.9554 *	
14	* 1.8254	* 1.8262	* 1.7286	* 1.0964	* .8718	* .6990	*	
	* 1.2954	* 1.2977	* 1.3850	* 2.0557	* 2.4402	* 2.9050	*	
15	* .8497	* .8859	* .8415	* .5592	* F-SUB-Q			
	* 2.5123	* 2.4014	* 2.5543	* 3.9375	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6329	* 1.3750	* 1.5394	* 1.5116	* 1.8661	* 1.5047	* 1.8592	* .8593 *
	* 1.5155	* 1.8393	* 1.7015	* 1.6859	* 1.3691	* 1.6641	* 1.3398	* 2.6160 *
9	* 1.3750	* 1.7137	* 1.6451	* 1.8279	* 1.6736	* 1.6887	* 1.8605	* .8943 *
	* 1.8393	* 1.5404	* 1.5804	* 1.4232	* 1.5144	* 1.4735	* 1.3432	* 2.5060 *
10	* 1.5394	* 1.6447	* 1.6400	* 1.6893	* 1.7719	* 1.6196	* 1.7692	* .8522 *
	* 1.7015	* 1.5808	* 1.5964	* 1.5310	* 1.4778	* 1.5830	* 1.4364	* 2.6675 *
11	* 1.5116	* 1.8282	* 1.6897	* 1.7164	* 1.6272	* 1.7737	* 1.1278	* .5689 *
	* 1.6859	* 1.4229	* 1.5307	* 1.5333	* 1.5812	* 1.4529	* 2.1347	* 4.1264 *
12	* 1.8661	* 1.6744	* 1.7724	* 1.6276	* 1.4550	* 1.6859	* .9182 *	
	* 1.3691	* 1.5136	* 1.4773	* 1.5808	* 1.6480	* 1.4394	* 2.4958 *	
13	* 1.5047	* 1.6908	* 1.6206	* 1.7742	* 1.6863	* 1.5818	* .7301 *	
	* 1.6641	* 1.4716	* 1.5819	* 1.4525	* 1.4390	* 1.5111	* 3.0311 *	
14	* 1.8592	* 1.8623	* 1.7702	* 1.1280	* .9183	* .7459	*	
	* 1.3398	* 1.3419	* 1.4356	* 2.1342	* 2.4956	* 2.9792	*	
15	* .8593	* .8947	* .8524	* .5690	* F-SUB-Q			
	* 2.6160	* 2.5050	* 2.6670	* 4.1251	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 114 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7650	* 1.4507	* 1.5746	* 1.5293	* 1.8980	* 1.5179	* 1.8908	* .8634 *
	* 1.5799	* 1.9234	* 1.7922	* 1.7821	* 1.4384	* 1.7583	* 1.4001	* 2.7652 *
9	* 1.4507	* 1.7618	* 1.6744	* 1.8678	* 1.6988	* 1.7112	* 1.8942	* .8965 *
	* 1.9234	* 1.6014	* 1.6678	* 1.4920	* 1.5972	* 1.5482	* 1.4035	* 2.6562 *
10	* 1.5746	* 1.6739	* 1.6691	* 1.7224	* 1.8106	* 1.6504	* 1.8080	* .8578 *
	* 1.7922	* 1.6682	* 1.6844	* 1.6126	* 1.5513	* 1.6666	* 1.5035	* 2.8248 *
11	* 1.5293	* 1.8681	* 1.7227	* 1.7819	* 1.6861	* 1.8487	* 1.1507	* .5739 *
	* 1.7821	* 1.4916	* 1.6123	* 1.5804	* 1.6381	* 1.4975	* 2.2118	* 4.3895 *
12	* 1.8980	* 1.6996	* 1.8112	* 1.6865	* 1.5643	* 1.8071	* .9515 *	
	* 1.4384	* 1.5964	* 1.5507	* 1.6377	* 1.7102	* 1.4822	* 2.6060 *	
13	* 1.5179	* 1.7133	* 1.6513	* 1.8492	* 1.8076	* 1.6946	* .7651 *	
	* 1.7583	* 1.5461	* 1.6655	* 1.4971	* 1.4818	* 1.5568	* 3.1582 *	
14	* 1.8908	* 1.8959	* 1.8089	* 1.1510	* .9515	* .7819	*	
	* 1.4001	* 1.4022	* 1.5027	* 2.2112	* 2.6057	* 3.1032	*	
15	* .8634	* .8970	* .8580	* .5741	* F-SUB-Q			
	* 2.7652	* 2.6550	* 2.8244	* 4.3879	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7937	* 1.4713	* 1.5772	* 1.5259	* 1.8855	* 1.5106	* 1.8779	* .8704 *
	* 1.6889	* 2.0435	* 1.8980	* 1.9228	* 1.5564	* 1.8973	* 1.5100	* 2.9357 *
9	* 1.4713	* 1.7802	* 1.6729	* 1.8615	* 1.6958	* 1.7039	* 1.8829	* .9094 *
	* 2.0435	* 1.7057	* 1.7848	* 1.6136	* 1.7250	* 1.6670	* 1.5133	* 2.8031 *
10	* 1.5772	* 1.6724	* 1.6687	* 1.7237	* 1.8094	* 1.6513	* 1.8027	* .8734 *
	* 1.8980	* 1.7854	* 1.7931	* 1.7205	* 1.6581	* 1.7849	* 1.6218	* 2.9769 *
11	* 1.5259	* 1.8618	* 1.7240	* 1.7944	* 1.7026	* 1.8652	* 1.1751	* .5830 *
	* 1.9228	* 1.6133	* 1.7202	* 1.6663	* 1.7256	* 1.5816	* 2.2961	* 4.6101 *
12	* 1.8855	* 1.6966	* 1.8100	* 1.7030	* 1.5966	* 1.8452	* .9858 *	
	* 1.5564	* 1.7241	* 1.6575	* 1.7253	* 1.8185	* 1.5773	* 2.7068 *	
13	* 1.5106	* 1.7060	* 1.6522	* 1.8657	* 1.8457	* 1.7350	* .7967 *	
	* 1.8973	* 1.6650	* 1.7839	* 1.5812	* 1.5769	* 1.6570	* 3.2957 *	
14	* 1.8779	* 1.8846	* 1.8037	* 1.1754	* .9859	* .8133	*	
	* 1.5100	* 1.5119	* 1.6208	* 2.2955	* 2.7064	* 3.2422	*	
15	* .8704	* .9099	* .8736	* .5831	* F-SUB-Q			
	* 2.9357	* 2.8020	* 2.9764	* 4.6087	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 115 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8406	* 1.4931	* 1.5980	* 1.5381	* 1.9197	* 1.5202	* 1.9150	* .8659 *
	* 1.7595	* 2.1499	* 1.9958	* 2.0596	* 1.6516	* 2.0322	* 1.5931	* 3.1711 *
9	* 1.4931	* 1.8225	* 1.6950	* 1.9012	* 1.7176	* 1.7261	* 1.9216	* .8996 *
	* 2.1499	* 1.7781	* 1.8756	* 1.6887	* 1.8384	* 1.7723	* 1.5958	* 3.0453 *
10	* 1.5980	* 1.6944	* 1.6920	* 1.7491	* 1.8477	* 1.6754	* 1.8425	* .8631 *
	* 1.9958	* 1.8761	* 1.8826	* 1.8051	* 1.7239	* 1.8724	* 1.7004	* 3.2408 *
11	* 1.5381	* 1.9015	* 1.7495	* 1.8418	* 1.7368	* 1.9191	* 1.1762	* .5795 *
	* 2.0596	* 1.6884	* 1.8047	* 1.7293	* 1.8030	* 1.6390	* 2.4433	* 4.9296 *
12	* 1.9197	* 1.7183	* 1.8484	* 1.7372	* 1.6344	* 1.9111	* .9890	* .9890 *
	* 1.6516	* 1.8376	* 1.7233	* 1.8026	* 1.8959	* 1.6294	* 2.8777	* 2.8777 *
13	* 1.5202	* 1.7281	* 1.6763	* 1.9197	* 1.9116	* 1.7987	* .8029	* .8029 *
	* 2.0322	* 1.7701	* 1.8714	* 1.6386	* 1.6290	* 1.7172	* 3.5041	* 3.5041 *
14	* 1.9150	* 1.9234	* 1.8434	* 1.1765	* .9891	* .8203		
	* 1.5931	* 1.5943	* 1.6995	* 2.4425	* 2.8774	* 3.4440		
15	* .8659	* .8999	* .8634	* .5797	* F-SUB-Q			
	* 3.1711	* 3.0445	* 3.2401	* 4.9280	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8472	* 1.4930	* 1.5960	* 1.5353	* 1.9218	* 1.5154	* 1.9194	* .8648 *
	* 1.8122	* 2.2098	* 2.0483	* 2.1220	* 1.7161	* 2.1461	* 1.7128	* 3.4167 *
9	* 1.4930	* 1.8273	* 1.6943	* 1.9062	* 1.7173	* 1.7263	* 1.9270	* .8983 *
	* 2.2098	* 1.8234	* 1.9244	* 1.7357	* 1.8974	* 1.8884	* 1.7118	* 3.2818 *
10	* 1.5960	* 1.6937	* 1.6925	* 1.7511	* 1.8563	* 1.6773	* 1.8494	* .8622 *
	* 2.0483	* 1.9250	* 1.9401	* 1.8626	* 1.7872	* 1.9522	* 1.7898	* 3.4735 *
11	* 1.5353	* 1.9065	* 1.7514	* 1.8525	* 1.7441	* 1.9340	* 1.1801	* .5792 *
	* 2.1220	* 1.7354	* 1.8623	* 1.7956	* 1.8818	* 1.7227	* 2.5699	* 5.2389 *
12	* 1.9218	* 1.7181	* 1.8571	* 1.7445	* 1.6458	* 1.9332	* .9957	* .9957 *
	* 1.7161	* 1.8965	* 1.7865	* 1.8814	* 2.0141	* 1.7244	* 3.0570	* 3.0570 *
13	* 1.5154	* 1.7284	* 1.6781	* 1.9345	* 1.9336	* 1.8212	* .8099	* .8099 *
	* 2.1461	* 1.8860	* 1.9511	* 1.7222	* 1.7240	* 1.8162	* 3.7171	* 3.7171 *
14	* 1.9194	* 1.9287	* 1.8503	* 1.1805	* .9958	* .8273		
	* 1.7128	* 1.7102	* 1.7888	* 2.5689	* 3.0566	* 3.6539		
15	* .8648	* .8987	* .8624	* .5794	* F-SUB-Q			
	* 3.4167	* 3.2807	* 3.4727	* 5.2369	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 116 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8233	* 1.4759	* 1.5755	* 1.5185	* 1.8954	* 1.4976	* 1.8960	* .8643
	* 1.8116	* 2.2046	* 2.0448	* 2.1107	* 1.7113	* 2.1313	* 1.7048	* 3.3700
9	* 1.4759	* 1.8017	* 1.6745	* 1.8814	* 1.6981	* 1.7075	* 1.9043	* .9016
	* 2.2046	* 1.8242	* 1.9175	* 1.7323	* 1.8896	* 1.8755	* 1.7015	* 3.2234
10	* 1.5755	* 1.6739	* 1.6736	* 1.7328	* 1.8367	* 1.6601	* 1.8286	* .8681
	* 2.0448	* 1.9181	* 1.9338	* 1.8549	* 1.7815	* 1.9436	* 1.7829	* 3.3900
11	* 1.5185	* 1.8818	* 1.7331	* 1.8340	* 1.7297	* 1.9167	* 1.1849	* .5793
	* 2.1107	* 1.7320	* 1.8545	* 1.7907	* 1.8738	* 1.7175	* 2.5245	* 5.1574
12	* 1.8954	* 1.6988	* 1.8375	* 1.7301	* 1.6362	* 1.9207	* 1.0039	*
	* 1.7113	* 1.8887	* 1.7808	* 1.8733	* 2.0088	* 1.7299	* 3.0011	*
13	* 1.4976	* 1.7096	* 1.6610	* 1.9172	* 1.9212	* 1.8115	* .8178	*
	* 2.1313	* 1.8732	* 1.9424	* 1.7170	* 1.7295	* 1.8397	* 3.6970	*
14	* 1.8960	* 1.9060	* 1.8295	* 1.1853	* 1.0040	* .8344	*	*
	* 1.7048	* 1.7000	* 1.7820	* 2.5236	* 3.0006	* 3.6390	*	*
15	* .8643	* .9021	* .8683	* .5795	* F-SUB-Q			
	* 3.3700	* 3.2221	* 3.3893	* 5.1555	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8353	* 1.4717	* 1.5744	* 1.5158	* 1.9104	* 1.4938	* 1.9174	* .8534
	* 1.7704	* 2.1618	* 1.9947	* 2.0545	* 1.6524	* 2.0689	* 1.6314	* 3.2904
9	* 1.4717	* 1.8118	* 1.6766	* 1.8993	* 1.7015	* 1.7150	* 1.9265	* .8854
	* 2.1618	* 1.7745	* 1.8665	* 1.6736	* 1.8371	* 1.8132	* 1.6323	* 3.1636
10	* 1.5744	* 1.6760	* 1.6764	* 1.7377	* 1.8556	* 1.6652	* 1.8498	* .8508
	* 1.9947	* 1.8671	* 1.8847	* 1.8061	* 1.7256	* 1.8912	* 1.7182	* 3.3460
11	* 1.5158	* 1.8997	* 1.7380	* 1.8534	* 1.7378	* 1.9409	* 1.1712	* .5690
	* 2.0545	* 1.6733	* 1.8057	* 1.7397	* 1.8316	* 1.6687	* 2.4902	* 5.0402
12	* 1.9104	* 1.7023	* 1.8564	* 1.7382	* 1.6461	* 1.9498	* .9896	*
	* 1.6524	* 1.8363	* 1.7249	* 1.8311	* 1.9680	* 1.6788	* 2.9568	*
13	* 1.4938	* 1.7171	* 1.6661	* 1.9415	* 1.9503	* 1.8392	* .8076	*
	* 2.0689	* 1.8110	* 1.8901	* 1.6682	* 1.6785	* 1.7790	* 3.6190	*
14	* 1.9174	* 1.9283	* 1.8508	* 1.1716	* .9897	* .8248	*	*
	* 1.6314	* 1.6308	* 1.7173	* 2.4893	* 2.9565	* 3.5588	*	*
15	* .8534	* .8857	* .8511	* .5692	* F-SUB-Q			
	* 3.2904	* 3.1626	* 3.3452	* 5.0385	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 117 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8246	* 1.4562	* 1.5593	* 1.5029	* 1.9023	* 1.4801	* 1.9147	* .8455
	* 1.6193	* 1.9853	* 1.8384	* 1.9049	* 1.5291	* 1.9229	* 1.5111	* 3.0508
9	* 1.4562	* 1.7997	* 1.6638	* 1.8925	* 1.6900	* 1.7067	* 1.9244	* .8743
	* 1.9853	* 1.6239	* 1.7236	* 1.5444	* 1.7001	* 1.6805	* 1.5092	* 2.9403
10	* 1.5593	* 1.6631	* 1.6641	* 1.7266	* 1.8503	* 1.6552	* 1.8475	* .8411
	* 1.8384	* 1.7242	* 1.7384	* 1.6685	* 1.5857	* 1.7454	* 1.5809	* 3.0939
11	* 1.5029	* 1.8928	* 1.7269	* 1.8483	* 1.7295	* 1.9397	* 1.1608	* .5611
	* 1.9049	* 1.5442	* 1.6682	* 1.5932	* 1.6785	* 1.5220	* 2.2873	* 4.6635
12	* 1.9023	* 1.6908	* 1.8511	* 1.7299	* 1.6405	* 1.9522	* .9793	
	* 1.5291	* 1.6994	* 1.5851	* 1.6781	* 1.7981	* 1.5269	* 2.7172	
13	* 1.4801	* 1.7087	* 1.6560	* 1.9402	* 1.9527	* 1.8425	* .8010	
	* 1.9229	* 1.6787	* 1.7446	* 1.5216	* 1.5265	* 1.6181	* 3.3224	
14	* 1.9147	* 1.9262	* 1.8484	* 1.1613	* .9794	* .8181		
	* 1.5111	* 1.5080	* 1.5802	* 2.2864	* 2.7169	* 3.2672		
15	* .8455	* .8748	* .8414	* .5613	* F-SUB-Q			
	* 3.0508	* 2.9388	* 3.0932	* 4.6619	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8013	* 1.4346	* 1.5373	* 1.4833	* 1.8808	* 1.4611	* 1.8971	* .8363 *
	* 1.5031	* 1.8495	* 1.7146	* 1.7680	* 1.4162	* 1.7868	* 1.3993	* 2.8341 *
9	* 1.4346	* 1.7747	* 1.6429	* 1.8708	* 1.6690	* 1.6892	* 1.9072	* .8676 *
	* 1.8495	* 1.5117	* 1.6057	* 1.4369	* 1.5831	* 1.5561	* 1.3960	* 2.7221 *
10	* 1.5373	* 1.6422	* 1.6431	* 1.7058	* 1.8308	* 1.6363	* 1.8307	* .8335 *
	* 1.7146	* 1.6063	* 1.6198	* 1.5535	* 1.4729	* 1.6237	* 1.4658	* 2.8605 *
11	* 1.4833	* 1.8711	* 1.7061	* 1.8289	* 1.7104	* 1.9225	* 1.1516	* .5549 *
	* 1.7680	* 1.4367	* 1.5533	* 1.4792	* 1.5589	* 1.4086	* 2.1180	* 4.3409 *
12	* 1.8808	* 1.6698	* 1.8316	* 1.7108	* 1.6246	* 1.9377	* .9733 *	
	* 1.4162	* 1.5824	* 1.4724	* 1.5586	* 1.6632	* 1.4081	* 2.5069 *	
13	* 1.4611	* 1.6911	* 1.6371	* 1.9230	* 1.9382	* 1.8297	* .7953 *	
	* 1.7868	* 1.5545	* 1.6229	* 1.4082	* 1.4077	* 1.4898	* 3.0647 *	
14	* 1.8971	* 1.9089	* 1.8316	* 1.1521	* .9734	* .8120 *		
	* 1.3993	* 1.3949	* 1.4651	* 2.1172	* 2.5066	* 3.0147 *		
15	* .8363	* .8680	* .8337	* .5551	* F-SUB-Q			
	* 2.8341	* 2.7211	* 2.8598	* 4.3394	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 118 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7602	* 1.4050	* 1.5047	* 1.4558	* 1.8405	* 1.4344	* 1.8594	* .8295 *
	* 1.5343	* 1.8875	* 1.7514	* 1.7965	* 1.4428	* 1.8176	* 1.4252	* 2.8579 *
9	* 1.4050	* 1.7327	* 1.6105	* 1.8287	* 1.6362	* 1.6600	* 1.8695	* .8637 *
	* 1.8875	* 1.5480	* 1.6331	* 1.4638	* 1.6085	* 1.5803	* 1.4208	* 2.7341 *
10	* 1.5047	* 1.6098	* 1.6102	* 1.6724	* 1.7907	* 1.6056	* 1.7943	* .8317 *
	* 1.7514	* 1.6337	* 1.6518	* 1.5803	* 1.5055	* 1.6501	* 1.4878	* 2.8602 *
11	* 1.4558	* 1.8291	* 1.6727	* 1.7887	* 1.6782	* 1.8843	* 1.1445	* .5506 *
	* 1.7965	* 1.4636	* 1.5800	* 1.5131	* 1.5896	* 1.4359	* 2.1310	* 4.3661 *
12	* 1.8405	* 1.6370	* 1.7914	* 1.6786	* 1.5966	* 1.9012	* .9693 *	
	* 1.4428	* 1.6078	* 1.5049	* 1.5892	* 1.6883	* 1.4308	* 2.5158 *	
13	* 1.4344	* 1.6618	* 1.6064	* 1.8848	* 1.9017	* 1.7972	* .7926 *	
	* 1.8176	* 1.5786	* 1.6493	* 1.4355	* 1.4304	* 1.5109	* 3.0706 *	
14	* 1.8594	* 1.8712	* 1.7953	* 1.1450	* .9695	* .8081	*	
	* 1.4252	* 1.4197	* 1.4871	* 2.1301	* 2.5154	* 3.0248	*	
15	* .8295	* .8641	* .8319	* .5508	F-SUB-Q			
	* 2.8579	* 2.7330	* 2.8598	* 4.3645	M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7551	* 1.3873	* 1.4906	* 1.4395	* 1.8390	* 1.4189	* 1.8638	* .8099 *
	* 1.4225	* 1.7728	* 1.6422	* 1.6933	* 1.3454	* 1.7142	* 1.3258	* 2.7341 *
9	* 1.3873	* 1.7262	* 1.5976	* 1.8273	* 1.6235	* 1.6527	* 1.8743	* .8373 *
	* 1.7728	* 1.4417	* 1.5317	* 1.3633	* 1.5097	* 1.4797	* 1.3207	* 2.6339 *
10	* 1.4906	* 1.5969	* 1.5971	* 1.6598	* 1.7874	* 1.5947	* 1.7982	* .8058 *
	* 1.6422	* 1.5323	* 1.5487	* 1.4818	* 1.4009	* 1.5447	* 1.3806	* 2.7531 *
11	* 1.4395	* 1.8276	* 1.6601	* 1.7847	* 1.6665	* 1.8866	* 1.1171	* .5338 *
	* 1.6933	* 1.3630	* 1.4816	* 1.4103	* 1.4884	* 1.3334	* 2.0274	* 4.1903 *
12	* 1.8390	* 1.6243	* 1.7882	* 1.6669	* 1.5873	* 1.9063	* .9409 *	
	* 1.3454	* 1.5090	* 1.4004	* 1.4880	* 1.5778	* 1.3287	* 2.4168 *	
13	* 1.4189	* 1.6545	* 1.5955	* 1.8872	* 1.9068	* 1.8028	* .7709 *	
	* 1.7142	* 1.4781	* 1.5439	* 1.3330	* 1.3284	* 1.4024	* 2.9469 *	
14	* 1.8638	* 1.8761	* 1.7992	* 1.1175	* .9410	* .7870	*	
	* 1.3258	* 1.3196	* 1.3800	* 2.0265	* 2.4165	* 2.8991	*	
15	* .8099	* .8376	* .8060	* .5340	F-SUB-Q			
	* 2.7341	* 2.6333	* 2.7525	* 4.1887	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 119 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7158	* 1.3545	* 1.4578	* 1.4068	* 1.8003	* 1.3884	* 1.8279	* .7908 *
	* 1.3575	* 1.7000	* 1.5776	* 1.6313	* 1.2930	* 1.6502	* 1.2723	* 2.6409 *
9	* 1.3545	* 1.6863	* 1.5634	* 1.7863	* 1.5874	* 1.6214	* 1.8386	* .8177 *
	* 1.7000	* 1.3820	* 1.4719	* 1.3111	* 1.4526	* 1.4196	* 1.2668	* 2.5431 *
10	* 1.4578	* 1.5627	* 1.5621	* 1.6231	* 1.7455	* 1.5615	* 1.7639	* .7870 *
	* 1.5776	* 1.4725	* 1.4887	* 1.4244	* 1.3471	* 1.4828	* 1.3226	* 2.6557 *
11	* 1.4068	* 1.7866	* 1.6235	* 1.7421	* 1.6295	* 1.8481	* 1.0922	* .5204 *
	* 1.6313	* 1.3109	* 1.4242	* 1.3546	* 1.4272	* 1.2742	* 1.9462	* 4.0450 *
12	* 1.8003	* 1.5882	* 1.7462	* 1.6299	* 1.5545	* 1.8686	* .9189	* .7908 *
	* 1.2930	* 1.4519	* 1.3466	* 1.4268	* 1.5045	* 1.2666	* 2.3169	* .7908 *
13	* 1.3884	* 1.6232	* 1.5623	* 1.8486	* 1.8691	* 1.7694	* .7531	* .7908 *
	* 1.6502	* 1.4181	* 1.4821	* 1.2739	* 1.2663	* 1.3371	* 2.8258	* .7908 *
14	* 1.8279	* 1.8403	* 1.7649	* 1.0927	* .9190	* .7687		
	* 1.2723	* 1.2658	* 1.3220	* 1.9453	* 2.3166	* 2.7803		
15	* .7908	* .8180	* .7873	* .5206	* F-SUB-Q			
	* 2.6409	* 2.5426	* 2.6551	* 4.0435	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6319	* 1.3013	* 1.4014	* 1.3518	* 1.7132	* 1.3374	* 1.7397	* .7692 *
	* 1.3512	* 1.6781	* 1.5588	* 1.6138	* 1.2898	* 1.6291	* 1.2699	* 2.5853 *
9	* 1.3013	* 1.6037	* 1.5017	* 1.6944	* 1.5209	* 1.5580	* 1.7502	* .8016 *
	* 1.6781	* 1.3781	* 1.4555	* 1.3123	* 1.4404	* 1.4038	* 1.2639	* 2.4701 *
10	* 1.4014	* 1.5010	* 1.4993	* 1.5555	* 1.6541	* 1.4989	* 1.6799	* .7733 *
	* 1.5588	* 1.4561	* 1.4733	* 1.4106	* 1.3488	* 1.4666	* 1.3180	* 2.5721 *
11	* 1.3518	* 1.6947	* 1.5558	* 1.6505	* 1.5595	* 1.7567	* 1.0660	* .5087 *
	* 1.6138	* 1.3120	* 1.4103	* 1.3555	* 1.4139	* 1.2693	* 1.8928	* 3.9369 *
12	* 1.7132	* 1.5217	* 1.6548	* 1.5598	* 1.4909	* 1.7755	* .8999	* .7692 *
	* 1.2898	* 1.4397	* 1.3483	* 1.4136	* 1.4836	* 1.2594	* 2.2416	* .7692 *
13	* 1.3374	* 1.5597	* 1.4997	* 1.7572	* 1.7760	* 1.6848	* .7363	* .7692 *
	* 1.6291	* 1.4022	* 1.4658	* 1.2689	* 1.2591	* 1.3255	* 2.7354	* .7692 *
14	* 1.7397	* 1.7518	* 1.6808	* 1.0664	* .9000	* .7506		
	* 1.2699	* 1.2628	* 1.3174	* 1.8920	* 2.2413	* 2.6951		
15	* .7692	* .8020	* .7736	* .5089	* F-SUB-Q			
	* 2.5853	* 2.4691	* 2.5712	* 3.9355	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 120 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5614	* 1.2478	* 1.3516	* 1.2928	* 1.6380	* 1.2827	* 1.6642	* .7252 *
	* 1.3522	* 1.6770	* 1.5498	* 1.6186	* 1.2937	* 1.6298	* 1.2726	* 2.6350 *
9	* 1.2478	* 1.5353	* 1.4447	* 1.6162	* 1.4573	* 1.4966	* 1.6746	* .7521 *
	* 1.6770	* 1.3796	* 1.4513	* 1.3184	* 1.4411	* 1.4016	* 1.2662	* 2.5298 *
10	* 1.3516	* 1.4440	* 1.4422	* 1.4917	* 1.5721	* 1.4400	* 1.6086	* .7233 *
	* 1.5498	* 1.4520	* 1.4684	* 1.4103	* 1.3581	* 1.4631	* 1.3190	* 2.6419 *
11	* 1.2928	* 1.6166	* 1.4920	* 1.5666	* 1.4922	* 1.6773	* 1.0041	* .4792 *
	* 1.6186	* 1.3182	* 1.4101	* 1.3676	* 1.4151	* 1.2720	* 1.9265	* 4.0165 *
12	* 1.6380	* 1.4581	* 1.5727	* 1.4926	* 1.4274	* 1.6930	* .8436 *	
	* 1.2937	* 1.4404	* 1.3577	* 1.4148	* 1.4821	* 1.2624	* 2.2913 *	
13	* 1.2827	* 1.4985	* 1.4408	* 1.6778	* 1.6935	* 1.6095	* .6902 *	
	* 1.6298	* 1.4000	* 1.4623	* 1.2717	* 1.2620	* 1.3257	* 2.7948 *	
14	* 1.6642	* 1.6762	* 1.6095	* 1.0045	* .8437	* .7042 *		
	* 1.2726	* 1.2651	* 1.3183	* 1.9258	* 2.2910	* 2.7510 *		
15	* .7252	* .7525	* .7236	* .4794	* F-SUB-Q			
	* 2.6350	* 2.5288	* 2.6412	* 4.0150	* M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4050	* 1.1464	* 1.2421	* 1.1808	* 1.4671	* 1.1715	* 1.4879	* .6630 *
	* 1.4524	* 1.7652	* 1.6314	* 1.7144	* 1.3956	* 1.7267	* 1.3764	* 2.7940 *
9	* 1.1464	* 1.3865	* 1.3236	* 1.4520	* 1.3296	* 1.3622	* 1.4979	* .6853 *
	* 1.7652	* 1.4773	* 1.5318	* 1.4188	* 1.5267	* 1.4905	* 1.3687	* 2.6915 *
10	* 1.2421	* 1.3230	* 1.3181	* 1.3643	* 1.4124	* 1.3158	* 1.4410	* .6590 *
	* 1.6314	* 1.5324	* 1.5534	* 1.4899	* 1.4610	* 1.5478	* 1.4244	* 2.8116 *
11	* 1.1808	* 1.4522	* 1.3646	* 1.4037	* 1.3588	* 1.4994	* .9126	* .4378 *
	* 1.7144	* 1.4186	* 1.4897	* 1.4742	* 1.5013	* 1.3742	* 2.0520	* 4.2667 *
12	* 1.4671	* 1.3303	* 1.4129	* 1.3591	* 1.2943	* 1.5078	* .7683 *	
	* 1.3956	* 1.5259	* 1.4606	* 1.5010	* 1.5788	* 1.3682	* 2.4350 *	
13	* 1.1715	* 1.3639	* 1.3164	* 1.4998	* 1.5083	* 1.4350	* .6260 *	
	* 1.7267	* 1.4886	* 1.5470	* 1.3738	* 1.3678	* 1.4356	* 2.9826 *	
14	* 1.4879	* 1.4993	* 1.4418	* .9129	* .7683 *			
	* 1.3764	* 1.3674	* 1.4236	* 2.0513	* 2.4346	* 2.9364 *		
15	* .6630	* .6858	* .6592	* .4379	* F-SUB-Q			
	* 2.7940	* 2.6901	* 2.8110	* 4.2651	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 121 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 200 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1568 *	* .9379 *	* 1.0077 *	* .9589 *	* 1.1966 *	* .9442 *	* 1.2163 *	* .5424 *
	* 1.7198 *	* 2.1010 *	* 1.9581 *	* 2.0567 *	* 1.6674 *	* 2.0868 *	* 1.6411 *	* 3.3370 *
9	* .9379 *	* 1.1778 *	* 1.0750 *	* 1.2280 *	* 1.0546 *	* 1.0902 *	* 1.2249 *	* .5590 *
	* 2.1010 *	* 1.6997 *	* 1.8364 *	* 1.6325 *	* 1.8731 *	* 1.8134 *	* 1.6310 *	* 3.2228 *
10	* 1.0077 *	* 1.0746 *	* 1.0383 *	* 1.1098 *	* 1.2060 *	* 1.0620 *	* 1.1600 *	* .5335 *
	* 1.9581 *	* 1.8371 *	* 1.9192 *	* 1.7823 *	* 1.6656 *	* 1.8673 *	* 1.7240 *	* 3.3923 *
11	* .9589 *	* 1.2282 *	* 1.1100 *	* 1.2036 *	* 1.0749 *	* 1.2252 *	* .7393 *	* .3593 *
	* 2.0567 *	* 1.6322 *	* 1.7821 *	* 1.6719 *	* 1.8459 *	* 1.6369 *	* 2.4712 *	* 5.0846 *
12	* 1.1966 *	* 1.0551 *	* 1.2063 *	* 1.0752 *	* 1.0059 *	* 1.2314 *	* .6308 *	
	* 1.6674 *	* 1.8723 *	* 1.6650 *	* 1.8455 *	* 1.9768 *	* 1.6312 *	* 2.8933 *	
13	* .9442 *	* 1.0915 *	* 1.0626 *	* 1.2255 *	* 1.2317 *	* 1.1118 *	* .5027 *	
	* 2.0868 *	* 1.8110 *	* 1.8663 *	* 1.6366 *	* 1.6307 *	* 1.8053 *	* 3.6272 *	
14	* 1.2163 *	* 1.2260 *	* 1.1606 *	* .7395 *	* .6309 *	* .5121 *		
	* 1.6411 *	* 1.6296 *	* 1.7232 *	* 2.4703 *	* 2.8927 *	* 3.5753 *		
15	* .5424 *	* .5593 *	* .5337 *	* .3594 *	F-SUB-Q			
	* 3.3370 *	* 3.2212 *	* 3.3917 *	* 5.0828 *	M-SUB-Q			

AT 75% POWER, 200 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4926 *	* .4199 *	* .4162 *	* .4259 *	* .5035 *	* .4166 *	* .4587 *	* .2352 *
	* 3.9471 *	* 4.5902 *	* 4.6270 *	* 4.5248 *	* 3.8715 *	* 4.6257 *	* 4.2516 *	* 7.5386 *
9	* .4199 *	* .4867 *	* .4399 *	* .5131 *	* .4336 *	* .4339 *	* .4605 *	* .2379 *
	* 4.5902 *	* 4.0108 *	* 4.3782 *	* 3.8127 *	* 4.4438 *	* 4.4463 *	* 4.2367 *	* 7.4172 *
10	* .4162 *	* .4398 *	* .4180 *	* .4566 *	* .5121 *	* .4336 *	* .4333 *	* .2245 *
	* 4.6270 *	* 4.3793 *	* 4.6475 *	* 4.2226 *	* 3.8242 *	* 4.4622 *	* 4.5085 *	* 7.9006 *
11	* .4259 *	* .5132 *	* .4567 *	* .5097 *	* .4333 *	* .4834 *	* .3193 *	* .1582 *
	* 4.5248 *	* 3.8120 *	* 4.2219 *	* 3.8499 *	* 4.4629 *	* 4.0527 *	* 5.5966 *	* 11.3305 *
12	* .5035 *	* .4338 *	* .5123 *	* .4334 *	* .4058 *	* .4621 *	* .2674 *	
	* 3.8715 *	* 4.4420 *	* 3.8231 *	* 4.4620 *	* 4.7834 *	* 4.2432 *	* 6.6842 *	
13	* .4166 *	* .4345 *	* .4338 *	* .4835 *	* .4623 *	* .4076 *	* .2098 *	
	* 4.6257 *	* 4.4405 *	* 4.4598 *	* 4.0516 *	* 4.2420 *	* 4.8117 *	* 8.5118 *	
14	* .4587 *	* .4609 *	* .4335 *	* .3194 *	* .2675 *	* .2131 *		
	* 4.2516 *	* 4.2332 *	* 4.5063 *	* 5.5951 *	* 6.6817 *	* 8.4170 *		
15	* .2352 *	* .2380 *	* .2245 *	* .1582 *	F-SUB-Q			
	* 7.5386 *	* 7.4143 *	* 7.8983 *	* 11.3259 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 122 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4320 *	* .4908 *	* .5334 *	* .5563 *	* .6406 *	* .5525 *	* .5811 *	* .3275 *
	* 3.5104 *	* 3.9303 *	* 3.7789 *	* 3.6195 *	* 3.2932 *	* 3.6747 *	* 3.6980 *	* 5.6974 *
9	* .4908 *	* .5881 *	* .5605 *	* .6375 *	* .5573 *	* .5551 *	* .5783 *	* .3265 *
	* 3.9303 *	* 3.6499 *	* 3.6140 *	* 3.3203 *	* 3.5932 *	* 3.6423 *	* 3.7137 *	* 5.7562 *
10	* .5334 *	* .5604 *	* .5347 *	* .5709 *	* .6247 *	* .5389 *	* .5373 *	* .3036 *
	* 3.7789 *	* 3.6146 *	* 3.8511 *	* 3.5285 *	* 3.3731 *	* 3.7092 *	* 3.9033 *	* 6.2207 *
11	* .5563 *	* .6376 *	* .5710 *	* .6016 *	* .4980 *	* .5339 *	* .3831 *	* .2279 *
	* 3.6195 *	* 3.3199 *	* 3.5280 *	* 3.5492 *	* 4.0031 *	* 3.8978 *	* 4.8853 *	* 8.1785 *
12	* .6406 *	* .5575 *	* .6249 *	* .4981 *	* .3780 *	* .4218 *	* .2937 *	
	* 3.2932 *	* 3.5921 *	* 3.3724 *	* 4.0026 *	* 4.1180 *	* 4.0132 *	* 5.8478 *	
13	* .5525 *	* .5559 *	* .5392 *	* .5340 *	* .4218 *	* .3626 *	* .2144 *	
	* 3.6747 *	* 3.6370 *	* 3.7076 *	* 3.8974 *	* 4.0133 *	* 4.4082 *	* 7.3123 *	
14	* .5811 *	* .5789 *	* .5375 *	* .3831 *	* .2936 *	* .2182 *		
	* 3.6980 *	* 3.7105 *	* 3.9020 *	* 4.8855 *	* 5.8497 *	* 7.2892 *		
15	* .3275 *	* .3265 *	* .3036 *	* .2279 *	F-SUB-Q			
	* 5.6974 *	* 5.7587 *	* 6.2213 *	* 8.1786 *	M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .8563 *	* .9592 *	* 1.1170 *	* 1.1001 *	* 1.2836 *	* 1.0934 *	* 1.2914 *	* .6760 *
	* 1.8404 *	* 2.0515 *	* 1.8595 *	* 1.8872 *	* 1.6941 *	* 1.9077 *	* 1.7148 *	* 2.8459 *
9	* .9592 *	* 1.2111 *	* 1.1787 *	* 1.3034 *	* 1.1806 *	* 1.1925 *	* 1.2873 *	* .6919 *
	* 2.0515 *	* 1.8107 *	* 1.7638 *	* 1.6726 *	* 1.7506 *	* 1.7500 *	* 1.7043 *	* 2.7766 *
10	* 1.1170 *	* 1.1785 *	* 1.1468 *	* 1.2046 *	* 1.2559 *	* 1.1460 *	* 1.2026 *	* .6494 *
	* 1.8595 *	* 1.7641 *	* 1.8450 *	* 1.7173 *	* 1.7291 *	* 1.8008 *	* 1.7955 *	* 2.9858 *
11	* 1.1001 *	* 1.3035 *	* 1.2048 *	* 1.2079 *	* 1.0715 *	* 1.1408 *	* .7903 *	* .4617 *
	* 1.8872 *	* 1.6724 *	* 1.7171 *	* 1.8065 *	* 1.8885 *	* 1.8518 *	* 2.4433 *	* 4.1643 *
12	* 1.2836 *	* 1.1809 *	* 1.2562 *	* 1.0716 *	* .7977 *	* .9500 *	* .6236 *	
	* 1.6941 *	* 1.7501 *	* 1.7288 *	* 1.8884 *	* 1.9784 *	* 1.8235 *	* 2.7981 *	
13	* 1.0934 *	* 1.1938 *	* 1.1465 *	* 1.1409 *	* .9500 *	* .8415 *	* .4714 *	
	* 1.9077 *	* 1.7480 *	* 1.8000 *	* 1.8517 *	* 1.8235 *	* 1.9933 *	* 3.3857 *	
14	* 1.2914 *	* 1.2883 *	* 1.2029 *	* .7902 *	* .6233 *	* .4748 *		
	* 1.7148 *	* 1.7032 *	* 1.7950 *	* 2.4436 *	* 2.7989 *	* 3.4113 *		
15	* .6760 *	* .6922 *	* .6493 *	* .4617 *	F-SUB-Q			
	* 2.8459 *	* 2.7774 *	* 2.9863 *	* 4.1645 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 123 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0319	* 1.1276	* 1.3111	* 1.3009	* 1.5387	* 1.2963	* 1.5421	* .8035 *
	* 1.5837	* 1.7733	* 1.6144	* 1.6276	* 1.4407	* 1.6355	* 1.4390	* 2.4017 *
9	* 1.1276	* 1.4064	* 1.3878	* 1.5323	* 1.4251	* 1.4186	* 1.5378	* .8348 *
	* 1.7733	* 1.5861	* 1.5227	* 1.4489	* 1.4788	* 1.4906	* 1.4398	* 2.3248 *
10	* 1.3111	* 1.3876	* 1.3804	* 1.4280	* 1.4686	* 1.3616	* 1.4409	* .7905 *
	* 1.6144	* 1.5229	* 1.5417	* 1.4738	* 1.5108	* 1.5451	* 1.5245	* 2.4927 *
11	* 1.3009	* 1.5324	* 1.4282	* 1.3919	* 1.2969	* 1.3661	* .9597	* .5444 *
	* 1.6276	* 1.4488	* 1.4737	* 1.5872	* 1.5815	* 1.5672	* 2.0525	* 3.6027 *
12	* 1.5387	* 1.4255	* 1.4689	* 1.2971	* .9738	* 1.1429	* .7539	* .7539 *
	* 1.4407	* 1.4784	* 1.5105	* 1.5813	* 1.6600	* 1.5463	* 2.3499	* 2.3499 *
13	* 1.2963	* 1.4200	* 1.3621	* 1.3662	* 1.1430	* 1.0302	* .5690	* .5690 *
	* 1.6355	* 1.4891	* 1.5444	* 1.5671	* 1.5463	* 1.6602	* 2.8531	* 2.8531 *
14	* 1.5421	* 1.5389	* 1.4413	* .9596	* .7537	* .5784		
	* 1.4390	* 1.4389	* 1.5241	* 2.0527	* 2.3504	* 2.8486		
15	* .8035	* .8351	* .7904	* .5443	* F-SUB-Q			
	* 2.4017	* 2.3255	* 2.4931	* 3.6029	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1377	* 1.2092	* 1.4098	* 1.4058	* 1.7037	* 1.3938	* 1.7164	* .8540 *
	* 1.4637	* 1.6813	* 1.5327	* 1.5378	* 1.3274	* 1.5499	* 1.3123	* 2.2927 *
9	* 1.2092	* 1.5499	* 1.5024	* 1.7092	* 1.5462	* 1.5425	* 1.7123	* .8868 *
	* 1.6813	* 1.4680	* 1.4356	* 1.3252	* 1.3906	* 1.3943	* 1.3137	* 2.2222 *
10	* 1.4098	* 1.5021	* 1.4928	* 1.5543	* 1.6325	* 1.4778	* 1.6042	* .8372 *
	* 1.5327	* 1.4358	* 1.4524	* 1.3817	* 1.3831	* 1.4529	* 1.3953	* 2.3977 *
11	* 1.4058	* 1.7094	* 1.5545	* 1.5592	* 1.4177	* 1.5260	* 1.0268	* .5746 *
	* 1.5378	* 1.3250	* 1.3815	* 1.4420	* 1.4743	* 1.4284	* 1.9577	* 3.4874 *
12	* 1.7037	* 1.5466	* 1.6329	* 1.4179	* 1.0563	* 1.2831	* .8033	* .8033 *
	* 1.3274	* 1.3902	* 1.3828	* 1.4741	* 1.5545	* 1.4080	* 2.2518	* 2.2518 *
13	* 1.3938	* 1.5439	* 1.4784	* 1.5262	* 1.2832	* 1.1553	* .6068	* .6068 *
	* 1.5499	* 1.3930	* 1.4522	* 1.4283	* 1.4079	* 1.5163	* 2.7389	* 2.7389 *
14	* 1.7164	* 1.7134	* 1.6047	* 1.0266	* .8031	* .6193		
	* 1.3123	* 1.3129	* 1.3949	* 1.9579	* 2.2521	* 2.7235		
15	* .8540	* .8870	* .8371	* .5746	* F-SUB-Q			
	* 2.2927	* 2.2229	* 2.3982	* 3.4875	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 124 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1747	* 1.2347	* 1.4329	* 1.4334	* 1.7527	* 1.4155	* 1.7711	* .8729 *
	* 1.4562	* 1.6886	* 1.5465	* 1.5420	* 1.3183	* 1.5608	* 1.3001	* 2.2948 *
9	* 1.2347	* 1.5965	* 1.5355	* 1.7716	* 1.5828	* 1.5748	* 1.7675	* .9060 *
	* 1.6886	* 1.4560	* 1.4403	* 1.3084	* 1.3883	* 1.3977	* 1.3018	* 2.2257 *
10	* 1.4329	* 1.5352	* 1.5228	* 1.5951	* 1.7029	* 1.5107	* 1.6569	* .8562 *
	* 1.5465	* 1.4406	* 1.4612	* 1.3779	* 1.3551	* 1.4518	* 1.3803	* 2.3999 *
11	* 1.4334	* 1.7717	* 1.5953	* 1.6300	* 1.4604	* 1.5838	* 1.0559	* .5850 *
	* 1.5420	* 1.3083	* 1.3777	* 1.4130	* 1.4674	* 1.4100	* 1.9465	* 3.4972 *
12	* 1.7527	* 1.5832	* 1.7033	* 1.4606	* 1.0907	* 1.3388	* .8288 *	
	* 1.3183	* 1.3880	* 1.3548	* 1.4672	* 1.5551	* 1.3895	* 2.2467 *	
13	* 1.4155	* 1.5761	* 1.5112	* 1.5839	* 1.3390	* 1.2062	* .6269 *	
	* 1.5608	* 1.3965	* 1.4513	* 1.4099	* 1.3894	* 1.4997	* 2.7402 *	
14	* 1.7711	* 1.7685	* 1.6574	* 1.0558	* .8286	* .6402	*	
	* 1.3001	* 1.3011	* 1.3800	* 1.9467	* 2.2469	* 2.7233	*	
15	* .8729	* .9064	* .8561	* .5849	* F-SUB-Q			
	* 2.2948	* 2.2262	* 2.4004	* 3.4972	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1916	* 1.2480	* 1.4325	* 1.4345	* 1.7586	* 1.4106	* 1.7782	* .8767 *
	* 1.4857	* 1.7297	* 1.5934	* 1.5831	* 1.3487	* 1.6040	* 1.3232	* 2.3359 *
9	* 1.2480	* 1.6100	* 1.5406	* 1.7870	* 1.5871	* 1.5746	* 1.7756	* .9102 *
	* 1.7297	* 1.4775	* 1.4771	* 1.3330	* 1.4237	* 1.4279	* 1.3241	* 2.2651 *
10	* 1.4325	* 1.5403	* 1.5262	* 1.6041	* 1.7264	* 1.5153	* 1.6671	* .8650 *
	* 1.5934	* 1.4774	* 1.4989	* 1.4100	* 1.3780	* 1.4903	* 1.4075	* 2.4326 *
11	* 1.4345	* 1.7872	* 1.6043	* 1.6570	* 1.4766	* 1.6059	* 1.0703	* .5878 *
	* 1.5831	* 1.3329	* 1.4098	* 1.4291	* 1.4951	* 1.4338	* 1.9865	* 3.5905 *
12	* 1.7585	* 1.5875	* 1.7268	* 1.4768	* 1.1109	* 1.3679	* .8459 *	
	* 1.3487	* 1.4233	* 1.3777	* 1.4949	* 1.5964	* 1.4185	* 2.2889 *	
13	* 1.4106	* 1.5758	* 1.5157	* 1.6060	* 1.3681	* 1.2362	* .6452 *	
	* 1.6040	* 1.4267	* 1.4898	* 1.4337	* 1.4184	* 1.5359	* 2.7975 *	
14	* 1.7782	* 1.7766	* 1.6675	* 1.0702	* .8458	* .6577 *		
	* 1.3232	* 1.3234	* 1.4072	* 1.9866	* 2.2889	* 2.7850 *		
15	* .8767	* .9105	* .8649	* .5878	* F-SUB-Q			
	* 2.3359	* 2.2657	* 2.4331	* 3.5905	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 125 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2286	* 1.2576	* 1.4386	* 1.4349	* 1.7687	* 1.4045	* 1.7899	* .8692 *
	* 1.5135	* 1.7739	* 1.6568	* 1.6458	* 1.3921	* 1.6690	* 1.3565	* 2.4305 *
9	* 1.2576	* 1.6427	* 1.5495	* 1.8098	* 1.5933	* 1.5761	* 1.7888	* .9015 *
	* 1.7739	* 1.4937	* 1.5319	* 1.3699	* 1.4757	* 1.4756	* 1.3578	* 2.3605 *
10	* 1.4386	* 1.5491	* 1.5354	* 1.6153	* 1.7564	* 1.5240	* 1.6846	* .8552 *
	* 1.6568	* 1.5322	* 1.5545	* 1.4599	* 1.4153	* 1.5450	* 1.4467	* 2.5500 *
11	* 1.4349	* 1.8099	* 1.6155	* 1.6965	* 1.5032	* 1.6429	* 1.0735	* .5841 *
	* 1.6458	* 1.3697	* 1.4597	* 1.4431	* 1.5218	* 1.4534	* 2.0774	* 3.7732 *
12	* 1.7687	* 1.5937	* 1.7567	* 1.5034	* 1.1360	* 1.4231	* .8585 *	
	* 1.3921	* 1.4753	* 1.4150	* 1.5216	* 1.6403	* 1.4459	* 2.3713 *	
13	* 1.4045	* 1.5772	* 1.5244	* 1.6431	* 1.4232	* 1.2932	* .6598 *	
	* 1.6690	* 1.4744	* 1.5445	* 1.4533	* 1.4457	* 1.5677	* 2.9081 *	
14	* 1.7899	* 1.7898	* 1.6849	* 1.0734	* .8584	* .6731	*	
	* 1.3565	* 1.3571	* 1.4464	* 2.0774	* 2.3713	* 2.8932	*	
15	* .8692	* .9018	* .8551	* .5841	* F-SUB-Q			
	* 2.4305	* 2.3611	* 2.5505	* 3.7731	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3282	* 1.2855	* 1.4430	* 1.4322	* 1.7680	* 1.3943	* 1.7875	* .8634 *
	* 1.5568	* 1.8330	* 1.7480	* 1.7353	* 1.4622	* 1.7613	* 1.4178	* 2.5529 *
9	* 1.2855	* 1.6747	* 1.5550	* 1.8206	* 1.5943	* 1.5706	* 1.7884	* .8945 *
	* 1.8330	* 1.5368	* 1.6133	* 1.4348	* 1.5533	* 1.5492	* 1.4192	* 2.4835 *
10	* 1.4430	* 1.5545	* 1.5422	* 1.6223	* 1.7784	* 1.5289	* 1.6913	* .8509 *
	* 1.7480	* 1.6137	* 1.6376	* 1.5351	* 1.4815	* 1.6263	* 1.5146	* 2.6868 *
11	* 1.4322	* 1.8207	* 1.6225	* 1.7354	* 1.5371	* 1.6821	* 1.0829	* .5839 *
	* 1.7353	* 1.4347	* 1.5350	* 1.4825	* 1.5697	* 1.4944	* 2.1750	* 3.9894 *
12	* 1.7680	* 1.5946	* 1.7787	* 1.5373	* 1.2114	* 1.5138	* .8836 *	
	* 1.4622	* 1.5529	* 1.4813	* 1.5695	* 1.6892	* 1.4840	* 2.4479 *	
13	* 1.3943	* 1.5717	* 1.5293	* 1.6822	* 1.5140	* 1.3773	* .6877 *	
	* 1.7613	* 1.5480	* 1.6258	* 1.4943	* 1.4839	* 1.6141	* 3.0092 *	
14	* 1.7875	* 1.7894	* 1.6916	* 1.0829	* .8835	* .7014	*	
	* 1.4178	* 1.4185	* 1.5143	* 2.1750	* 2.4478	* 2.9940	*	
15	* .8634	* .8948	* .8508	* .5839	* F-SUB-Q			
	* 2.5529	* 2.4842	* 2.6872	* 3.9893	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 126 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5668	* 1.3284	* 1.4609	* 1.4326	* 1.7736	* 1.3877	* 1.7904	* .8558 *
	* 1.6229	* 1.9184	* 1.8207	* 1.8434	* 1.5454	* 1.8715	* 1.4918	* 2.7132 *
9	* 1.3284	* 1.7286	* 1.5660	* 1.8382	* 1.5995	* 1.5692	* 1.7936	* .8855 *
	* 1.9184	* 1.5956	* 1.7107	* 1.5125	* 1.6466	* 1.6379	* 1.4933	* 2.6443 *
10	* 1.4609	* 1.5655	* 1.5548	* 1.6337	* 1.8082	* 1.5390	* 1.7043	* .8451 *
	* 1.8207	* 1.7112	* 1.7271	* 1.6264	* 1.5377	* 1.7234	* 1.5957	* 2.8623 *
11	* 1.4326	* 1.8384	* 1.6338	* 1.7854	* 1.5822	* 1.7381	* 1.0928	* .5822 *
	* 1.8434	* 1.5124	* 1.6263	* 1.5374	* 1.6359	* 1.5514	* 2.2684	* 4.2688 *
12	* 1.7736	* 1.5998	* 1.8084	* 1.5824	* 1.3617	* 1.6465	* .9116 *	
	* 1.5454	* 1.6462	* 1.5375	* 1.6357	* 1.7634	* 1.5394	* 2.5687 *	
13	* 1.3877	* 1.5702	* 1.5394	* 1.7382	* 1.6467	* 1.4898	* .7181 *	
	* 1.8715	* 1.6367	* 1.7229	* 1.5514	* 1.5392	* 1.6744	* 3.1586 *	
14	* 1.7904	* 1.7945	* 1.7046	* 1.0927	* .9114	* .7336	*	
	* 1.4918	* 1.4926	* 1.5954	* 2.2684	* 2.5687	* 3.1376	*	
15	* .8558	* .8856	* .8450	* .5822	* F-SUB-Q			
	* 2.7132	* 2.6456	* 2.8627	* 4.2686	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6772	* 1.3828	* 1.4660	* 1.4210	* 1.7496	* 1.3702	* 1.7609	* .8553 *
	* 1.7298	* 2.0250	* 1.9244	* 1.9896	* 1.6742	* 2.0208	* 1.6120	* 2.8834 *
9	* 1.3828	* 1.7455	* 1.5599	* 1.8204	* 1.5865	* 1.5499	* 1.7662	* .8878 *
	* 2.0250	* 1.6865	* 1.8143	* 1.6308	* 1.7778	* 1.7660	* 1.6133	* 2.8023 *
10	* 1.4660	* 1.5594	* 1.5481	* 1.6271	* 1.8046	* 1.5321	* 1.6857	* .8546 *
	* 1.9244	* 1.8149	* 1.8297	* 1.7270	* 1.6270	* 1.8307	* 1.7254	* 3.0176 *
11	* 1.4210	* 1.8205	* 1.6272	* 1.7986	* 1.6000	* 1.7546	* 1.1121	* .5879 *
	* 1.9896	* 1.6307	* 1.7268	* 1.6228	* 1.7266	* 1.6427	* 2.3567	* 4.4825 *
12	* 1.7496	* 1.5869	* 1.8048	* 1.6001	* 1.4476	* 1.7111	* .9484 *	
	* 1.6742	* 1.7773	* 1.6268	* 1.7264	* 1.8781	* 1.6427	* 2.6715 *	
13	* 1.3702	* 1.5509	* 1.5324	* 1.7546	* 1.7113	* 1.5518	* .7558 *	
	* 2.0208	* 1.7647	* 1.8302	* 1.6427	* 1.6425	* 1.7870	* 3.2937 *	
14	* 1.7609	* 1.7671	* 1.6860	* 1.1120	* .9483	* .7699	*	
	* 1.6120	* 1.6125	* 1.7251	* 2.3567	* 2.6715	* 3.2808	*	
15	* .8553	* .8881	* .8546	* .5879	* F-SUB-Q			
	* 2.8834	* 2.8031	* 3.0179	* 4.4824	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 127 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7436	* 1.4118	* 1.4876	* 1.4258	* 1.7685	* 1.3690	* 1.7795	* .8450 *
	* 1.7977	* 2.1338	* 2.0197	* 2.1202	* 1.7776	* 2.1659	* 1.7040	* 3.1147 *
9	* 1.4118	* 1.7920	* 1.5747	* 1.8510	* 1.5983	* 1.5571	* 1.7866	* .8747 *
	* 2.1338	* 1.7531	* 1.9067	* 1.6996	* 1.8693	* 1.8803	* 1.7049	* 3.0363 *
10	* 1.4876	* 1.5742	* 1.5646	* 1.6426	* 1.8404	* 1.5454	* 1.7112	* .8388 *
	* 2.0197	* 1.9073	* 1.9209	* 1.8133	* 1.6939	* 1.9241	* 1.8075	* 3.2894 *
11	* 1.4258	* 1.8511	* 1.6427	* 1.8435	* 1.6312	* 1.8021	* 1.1098	* .5821 *
	* 2.1202	* 1.6995	* 1.8133	* 1.6868	* 1.8063	* 1.7069	* 2.5100	* 4.7976 *
12	* 1.7685	* 1.5986	* 1.8407	* 1.6313	* 1.4929	* 1.7814	* .9533 *	
	* 1.7776	* 1.8689	* 1.6937	* 1.8061	* 1.9612	* 1.7016	* 2.8453 *	
13	* 1.3690	* 1.5581	* 1.5457	* 1.8022	* 1.7816	* 1.6196	* .7642 *	
	* 2.1659	* 1.8790	* 1.9236	* 1.7069	* 1.7015	* 1.8556	* 3.5120 *	
14	* 1.7795	* 1.7875	* 1.7114	* 1.1098	* .9532	* .7802	*	
	* 1.7040	* 1.7041	* 1.8073	* 2.5099	* 2.8453	* 3.4905	*	
15	* .8450	* .8750	* .8387	* .5821	* F-SUB-Q			
	* 3.1147	* 3.0371	* 3.2899	* 4.7975	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7632	* 1.4218	* 1.4901	* 1.4212	* 1.7652	* 1.3600	* 1.7741	* .8407 *
	* 1.8371	* 2.1748	* 2.0542	* 2.1551	* 1.8176	* 2.2532	* 1.8084	* 3.3350 *
9	* 1.4218	* 1.8044	* 1.5746	* 1.8537	* 1.5951	* 1.5509	* 1.7827	* .8698 *
	* 2.1748	* 1.7860	* 1.9397	* 1.7342	* 1.9122	* 1.9740	* 1.8012	* 3.2462 *
10	* 1.4901	* 1.5741	* 1.5645	* 1.6426	* 1.8473	* 1.5439	* 1.7114	* .8356 *
	* 2.0542	* 1.9403	* 1.9628	* 1.8558	* 1.7425	* 1.9856	* 1.8786	* 3.4641 *
11	* 1.4212	* 1.8538	* 1.6427	* 1.8551	* 1.6383	* 1.8146	* 1.1125	* .5812 *
	* 2.1551	* 1.7341	* 1.8557	* 1.7375	* 1.8678	* 1.7766	* 2.6087	* 5.0157 *
12	* 1.7652	* 1.5954	* 1.8475	* 1.6384	* 1.5058	* 1.8050	* .9614 *	
	* 1.8176	* 1.9117	* 1.7424	* 1.8676	* 2.0525	* 1.7922	* 2.9851 *	
13	* 1.3600	* 1.5517	* 1.5442	* 1.8146	* 1.8052	* 1.6443	* .7746 *	
	* 2.2532	* 1.9727	* 1.9851	* 1.7766	* 1.7920	* 1.9633	* 3.7133 *	
14	* 1.7741	* 1.7835	* 1.7116	* 1.1126	* .9613	* .7898	*	
	* 1.8084	* 1.8004	* 1.8784	* 2.6085	* 2.9851	* 3.6956	*	
15	* .8407	* .8701	* .8356	* .5812	* F-SUB-Q			
	* 3.3350	* 3.2470	* 3.4646	* 5.0155	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 128 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7521	* 1.4255	* 1.4778	* 1.4077	* 1.7423	* 1.3445	* 1.7491	* .8394
	* 1.8412	* 2.1603	* 2.0577	* 2.1542	* 1.8225	* 2.2522	* 1.8113	* 3.2785
9	* 1.4255	* 1.7912	* 1.5614	* 1.8327	* 1.5787	* 1.5328	* 1.7587	* .8703
	* 2.1603	* 1.7895	* 1.9402	* 1.7394	* 1.9148	* 1.9751	* 1.8052	* 3.1917
10	* 1.4778	* 1.5608	* 1.5499	* 1.6290	* 1.8312	* 1.5296	* 1.6905	* .8422
	* 2.0577	* 1.9408	* 1.9665	* 1.8565	* 1.7461	* 1.9884	* 1.8853	* 3.4011
11	* 1.4077	* 1.8328	* 1.6290	* 1.8417	* 1.6271	* 1.7999	* 1.1183	* .5819
	* 2.1542	* 1.7393	* 1.8564	* 1.7413	* 1.8716	* 1.7839	* 2.5793	* 4.9677
12	* 1.7423	* 1.5790	* 1.8314	* 1.6272	* 1.4978	* 1.7961	* .9721	*
	* 1.8225	* 1.9143	* 1.7459	* 1.8714	* 2.0596	* 1.8010	* 2.9468	*
13	* 1.3445	* 1.5336	* 1.5298	* 1.7999	* 1.7963	* 1.6384	* .7855	*
	* 2.2522	* 1.9738	* 1.9880	* 1.7839	* 1.8009	* 1.9768	* 3.6665	*
14	* 1.7491	* 1.7595	* 1.6906	* 1.1183	* .9720	* .7999	*	*
	* 1.8113	* 1.8044	* 1.8851	* 2.5791	* 2.9468	* 3.6539	*	*
15	* .8394	* .8705	* .8422	* .5819	* F-SUB-Q			
	* 3.2785	* 3.1926	* 3.4013	* 4.9676	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7724	* 1.4189	* 1.4821	* 1.4072	* 1.7552	* 1.3393	* 1.7646	* .8284
	* 1.8124	* 2.1531	* 2.0256	* 2.1176	* 1.7789	* 2.2095	* 1.7523	* 3.2306
9	* 1.4189	* 1.8127	* 1.5661	* 1.8532	* 1.5831	* 1.5364	* 1.7752	* .8564
	* 2.1531	* 1.7544	* 1.9074	* 1.6988	* 1.8816	* 1.9300	* 1.7506	* 3.1532
10	* 1.4821	* 1.5655	* 1.5552	* 1.6344	* 1.8519	* 1.5331	* 1.7077	* .8241
	* 2.0256	* 1.9081	* 1.9353	* 1.8279	* 1.7109	* 1.9580	* 1.8389	* 3.3992
11	* 1.4072	* 1.8533	* 1.6345	* 1.8636	* 1.6361	* 1.8210	* 1.1053	* .5720
	* 2.1176	* 1.6987	* 1.8278	* 1.7099	* 1.8498	* 1.7542	* 2.5782	* 4.9494
12	* 1.7552	* 1.5834	* 1.8521	* 1.6362	* 1.5058	* 1.8217	* .9587	*
	* 1.7789	* 1.8812	* 1.7107	* 1.8497	* 2.0388	* 1.7672	* 2.9655	*
13	* 1.3393	* 1.5372	* 1.5333	* 1.8209	* 1.8218	* 1.6628	* .7752	*
	* 2.2095	* 1.9288	* 1.9576	* 1.7542	* 1.7670	* 1.9399	* 3.6881	*
14	* 1.7646	* 1.7759	* 1.7078	* 1.1054	* .9586	* .7907	*	*
	* 1.7523	* 1.7498	* 1.8388	* 2.5780	* 2.9656	* 3.6693	*	*
15	* .8284	* .8567	* .8240	* .5720	* F-SUB-Q			
	* 3.2306	* 3.1540	* 3.3996	* 4.9493	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 129 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7756	* 1.4150	* 1.4775	* 1.4014	* 1.7535	* 1.3304	* 1.7641	* .8227 *
	* 1.6809	* 1.9969	* 1.8846	* 1.9819	* 1.6609	* 2.0665	* 1.6394	* 3.0184 *
9	* 1.4150	* 1.8161	* 1.5624	* 1.8558	* 1.5788	* 1.5315	* 1.7754	* .8481 *
	* 1.9969	* 1.6289	* 1.7811	* 1.5884	* 1.7620	* 1.8036	* 1.6355	* 2.9525 *
10	* 1.4775	* 1.5617	* 1.5510	* 1.6310	* 1.8551	* 1.5283	* 1.7084	* .8173 *
	* 1.8846	* 1.7817	* 1.8070	* 1.7110	* 1.5973	* 1.8309	* 1.7152	* 3.1614 *
11	* 1.4014	* 1.8558	* 1.6311	* 1.8676	* 1.6344	* 1.8239	* 1.0989	* .5659 *
	* 1.9819	* 1.5883	* 1.7110	* 1.5941	* 1.7234	* 1.6306	* 2.3979	* 4.5877 *
12	* 1.7535	* 1.5791	* 1.8553	* 1.6346	* 1.5033	* 1.8272	* .9523 *	
	* 1.6609	* 1.7616	* 1.5972	* 1.7233	* 1.9009	* 1.6456	* 2.7465 *	
13	* 1.3304	* 1.5323	* 1.5285	* 1.8238	* 1.8273	* 1.6684	* .7707 *	
	* 2.0665	* 1.8026	* 1.8306	* 1.6306	* 1.6455	* 1.7988	* 3.4021 *	
14	* 1.7641	* 1.7761	* 1.7085	* 1.0989	* .9522	* .7868 *		
	* 1.6394	* 1.6349	* 1.7151	* 2.3977	* 2.7466	* 3.3825 *		
15	* .8227	* .8483	* .8173	* .5659	* F-SUB-Q			
	* 3.0184	* 2.9537	* 3.1618	* 4.5876	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7709	* 1.4110	* 1.4698	* 1.3936	* 1.7458	* 1.3211	* 1.7563	* .8187 *
	* 1.5485	* 1.8443	* 1.7443	* 1.8274	* 1.5304	* 1.9124	* 1.5142	* 2.7924 *
9	* 1.4110	* 1.8117	* 1.5555	* 1.8496	* 1.5703	* 1.5235	* 1.7682	* .8459 *
	* 1.8443	* 1.5025	* 1.6479	* 1.4663	* 1.6284	* 1.6655	* 1.5086	* 2.7245 *
10	* 1.4698	* 1.5549	* 1.5430	* 1.6239	* 1.8504	* 1.5202	* 1.7015	* .8147 *
	* 1.7443	* 1.6486	* 1.6733	* 1.5829	* 1.4739	* 1.6949	* 1.5819	* 2.9108 *
11	* 1.3936	* 1.8497	* 1.6239	* 1.8633	* 1.6271	* 1.8181	* 1.0969	* .5636 *
	* 1.8274	* 1.4662	* 1.5829	* 1.4698	* 1.5924	* 1.5031	* 2.2102	* 4.2453 *
12	* 1.7458	* 1.5706	* 1.8505	* 1.6272	* 1.4961	* 1.8230	* .9518	*
	* 1.5304	* 1.6280	* 1.4739	* 1.5923	* 1.7547	* 1.5132	* 2.5242	*
13	* 1.3211	* 1.5242	* 1.5204	* 1.8181	* 1.8231	* 1.6644	* .7712	*
	* 1.9124	* 1.6647	* 1.6947	* 1.5032	* 1.5131	* 1.6546	* 3.1238	*
14	* 1.7563	* 1.7689	* 1.7016	* 1.0970	* .9517	* .7856	*	*
	* 1.5142	* 1.5081	* 1.5818	* 2.2100	* 2.5242	* 3.1121	*	*
15	* .8187	* .8462	* .8147	* .5635	* F-SUB-Q			
	* 2.7924	* 2.7252	* 2.9113	* 4.2453	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 130 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7549	* 1.4126	* 1.4579	* 1.3835	* 1.7284	* 1.3135	* 1.7373	* .8201 *
	* 1.5616	* 1.8433	* 1.7598	* 1.8390	* 1.5447	* 1.9254	* 1.5319	* 2.7938 *
9	* 1.4126	* 1.7941	* 1.5438	* 1.8308	* 1.5569	* 1.5107	* 1.7496	* .8487 *
	* 1.8433	* 1.5184	* 1.6566	* 1.4773	* 1.6391	* 1.6801	* 1.5248	* 2.7205 *
10	* 1.4579	* 1.5432	* 1.5294	* 1.6119	* 1.8330	* 1.5077	* 1.6834	* .8229 *
	* 1.7598	* 1.6572	* 1.6869	* 1.5909	* 1.4868	* 1.7043	* 1.5940	* 2.8812 *
11	* 1.3835	* 1.8309	* 1.6119	* 1.8462	* 1.6138	* 1.8006	* 1.1014	* .5650 *
	* 1.8390	* 1.4773	* 1.5909	* 1.4847	* 1.6075	* 1.5185	* 2.2015	* 4.2227 *
12	* 1.7284	* 1.5572	* 1.8332	* 1.6139	* 1.4835	* 1.8059	* .9582	*
	* 1.5447	* 1.6388	* 1.4867	* 1.6074	* 1.7693	* 1.5251	* 2.5086	*
13	* 1.3136	* 1.5114	* 1.5078	* 1.8006	* 1.8061	* 1.6489	* .7769	*
	* 1.9254	* 1.6793	* 1.7040	* 1.5185	* 1.5250	* 1.6666	* 3.0996	*
14	* 1.7373	* 1.7503	* 1.6835	* 1.1015	* .9581	* .7906	*	
	* 1.5319	* 1.5243	* 1.5939	* 2.2013	* 2.5087	* 3.0913	*	
15	* .8201	* .8490	* .8229	* .5650	* F-SUB-Q			
	* 2.7938	* 2.7214	* 2.8815	* 4.2227	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7760	* 1.4031	* 1.4633	* 1.3860	* 1.7478	* 1.3106	* 1.7602	* .8104 *
	* 1.4281	* 1.7215	* 1.6311	* 1.7144	* 1.4266	* 1.8039	* 1.4135	* 2.6461 *
9	* 1.4031	* 1.8162	* 1.5513	* 1.8558	* 1.5650	* 1.5198	* 1.7730	* .8357 *
	* 1.7215	* 1.3954	* 1.5371	* 1.3592	* 1.5217	* 1.5608	* 1.4057	* 2.5857 *
10	* 1.4633	* 1.5506	* 1.5368	* 1.6197	* 1.8560	* 1.5143	* 1.7057	* .8054 *
	* 1.6311	* 1.5377	* 1.5645	* 1.4758	* 1.3665	* 1.5810	* 1.4665	* 2.7509 *
11	* 1.3860	* 1.8558	* 1.6198	* 1.8690	* 1.6236	* 1.8239	* 1.0879	* .5545 *
	* 1.7144	* 1.3591	* 1.4758	* 1.3644	* 1.4860	* 1.3935	* 2.0721	* 4.0104 *
12	* 1.7478	* 1.5653	* 1.8561	* 1.6237	* 1.4911	* 1.8312	* .9420	*
	* 1.4266	* 1.5214	* 1.3664	* 1.4859	* 1.6351	* 1.3995	* 2.3786	*
13	* 1.3106	* 1.5204	* 1.5145	* 1.8239	* 1.8314	* 1.6715	* .7626	*
	* 1.8039	* 1.5600	* 1.5808	* 1.3935	* 1.3994	* 1.5287	* 2.9447	*
14	* 1.7602	* 1.7737	* 1.7058	* 1.0880	* .9419	* .7781	*	
	* 1.4135	* 1.4052	* 1.4665	* 2.0720	* 2.3786	* 2.9287	*	
15	* .8104	* .8358	* .8053	* .5545	* F-SUB-Q			
	* 2.6461	* 2.5867	* 2.7513	* 4.0103	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 131 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7715	* 1.3967	* 1.4575	* 1.3796	* 1.7437	* 1.3045	* 1.7570	* .8058 *
	* 1.3383	* 1.6218	* 1.5417	* 1.6252	* 1.3488	* 1.7114	* 1.3362	* 2.5155 *
9	* 1.3967	* 1.8105	* 1.5462	* 1.8514	* 1.5590	* 1.5158	* 1.7704	* .8309 *
	* 1.6218	* 1.3155	* 1.4536	* 1.2838	* 1.4404	* 1.4767	* 1.3280	* 2.4574 *
10	* 1.4575	* 1.5455	* 1.5305	* 1.6140	* 1.8507	* 1.5089	* 1.7028	* .8008 *
	* 1.5417	* 1.4542	* 1.4804	* 1.3955	* 1.2895	* 1.4947	* 1.3839	* 2.6118 *
11	* 1.3796	* 1.8514	* 1.6140	* 1.8632	* 1.6172	* 1.8206	* 1.0830	* .5504 *
	* 1.6252	* 1.2838	* 1.3955	* 1.2861	* 1.4018	* 1.3098	* 1.9579	* 3.8092 *
12	* 1.7437	* 1.5593	* 1.8508	* 1.6173	* 1.4853	* 1.8288	* .9373	*
	* 1.3488	* 1.4401	* 1.2894	* 1.4017	* 1.5352	* 1.3115	* 2.2409	*
13	* 1.3045	* 1.5165	* 1.5090	* 1.8205	* 1.8289	* 1.6692	* .7585	*
	* 1.7114	* 1.4760	* 1.4945	* 1.3099	* 1.3114	* 1.4352	* 2.7760	*
14	* 1.7570	* 1.7711	* 1.7028	* 1.0831	* .9371	* .7739	*	
	* 1.3362	* 1.3275	* 1.3839	* 1.9577	* 2.2409	* 2.7611	*	
15	* .8058	* .8311	* .8007	* .5504	* F-SUB-Q			
	* 2.5155	* 2.4584	* 2.6123	* 3.8091	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7297	* 1.3876	* 1.4339	* 1.3576	* 1.7045	* 1.2912	* 1.7156	* .8025 *
	* 1.3000	* 1.5511	* 1.4913	* 1.5738	* 1.3140	* 1.6488	* 1.3033	* 2.4095 *
9	* 1.3876	* 1.7646	* 1.5209	* 1.8036	* 1.5313	* 1.4909	* 1.7294	* .8316 *
	* 1.5511	* 1.2824	* 1.4069	* 1.2539	* 1.3966	* 1.4302	* 1.2941	* 2.3423 *
10	* 1.4339	* 1.5202	* 1.5029	* 1.5861	* 1.8037	* 1.4841	* 1.6625	* .8062 *
	* 1.4913	* 1.4075	* 1.4352	* 1.3514	* 1.2577	* 1.4462	* 1.3483	* 2.4732 *
11	* 1.3576	* 1.8037	* 1.5862	* 1.8155	* 1.5863	* 1.7778	* 1.0830	* .5508 *
	* 1.5738	* 1.2539	* 1.3514	* 1.2537	* 1.3578	* 1.2728	* 1.8619	* 3.6277 *
12	* 1.7045	* 1.5316	* 1.8038	* 1.5864	* 1.4581	* 1.7854	* .9414	*
	* 1.3140	* 1.3963	* 1.2576	* 1.3577	* 1.4831	* 1.2716	* 2.1173	*
13	* 1.2912	* 1.4916	* 1.4842	* 1.7778	* 1.7855	* 1.6296	* .7616	*
	* 1.6488	* 1.4295	* 1.4460	* 1.2728	* 1.2715	* 1.3902	* 2.6201	*
14	* 1.7156	* 1.7301	* 1.6625	* 1.0830	* .9413	* .7750	*	
	* 1.3033	* 1.2937	* 1.3483	* 1.8618	* 2.1174	* 2.6130	*	
15	* .8025	* .8318	* .8062	* .5508	* F-SUB-Q			
	* 2.4095	* 2.3433	* 2.4734	* 3.6277	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 132 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A	
8	* 1.6993	* 1.3458	* 1.4128	* 1.3300	* 1.6763	* 1.2640	* 1.6876	* .7752	*
	* 1.2683	* 1.5320	* 1.4537	* 1.5436	* 1.2833	* 1.6192	* 1.2724	* 2.3999	*
9	* 1.3458	* 1.7276	* 1.4960	* 1.7699	* 1.5048	* 1.4683	* 1.7018	* .8015	*
	* 1.5320	* 1.2564	* 1.3736	* 1.2262	* 1.3648	* 1.3951	* 1.2627	* 2.3380	*
10	* 1.4128	* 1.4954	* 1.4792	* 1.5571	* 1.7634	* 1.4592	* 1.6365	* .7725	*
	* 1.4537	* 1.3742	* 1.4004	* 1.3220	* 1.2339	* 1.4121	* 1.3147	* 2.4828	*
11	* 1.3300	* 1.7700	* 1.5571	* 1.7740	* 1.5562	* 1.7468	* 1.0457	* .5312	*
	* 1.5436	* 1.2262	* 1.3220	* 1.2301	* 1.3273	* 1.2414	* 1.8512	* 3.6193	*
12	* 1.6763	* 1.5051	* 1.7635	* 1.5563	* 1.4317	* 1.7535	* .9051	*	
	* 1.2833	* 1.3645	* 1.2338	* 1.3272	* 1.4477	* 1.2390	* 2.1123	*	
13	* 1.2640	* 1.4690	* 1.4594	* 1.7468	* 1.7537	* 1.6007	* .7315	*	
	* 1.6192	* 1.3944	* 1.4119	* 1.2415	* 1.2389	* 1.3539	* 2.6148	*	
14	* 1.6876	* 1.7026	* 1.6365	* 1.0457	* .9049	* .7456	*		
	* 1.2724	* 1.2622	* 1.3147	* 1.8511	* 2.1123	* 2.6035	*		
15	* .7752	* .8018	* .7724	* .5311	* F-SUB-Q				
	* 2.3999	* 2.3386	* 2.4833	* 3.6193	* M-SUB-Q				

AT 75% POWER, 350 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5706	* 1.2620	* 1.3305	* 1.2443	* 1.5497	* 1.1874	* 1.5555	* .7236 *
	* 1.3262	* 1.5804	* 1.4942	* 1.5973	* 1.3431	* 1.6697	* 1.3353	* 2.4931 *
9	* 1.2620	* 1.5910	* 1.4044	* 1.6299	* 1.4061	* 1.3751	* 1.5695	* .7476 *
	* 1.5804	* 1.3183	* 1.4160	* 1.2868	* 1.4134	* 1.4426	* 1.3244	* 2.4307 *
10	* 1.3305	* 1.4038	* 1.3868	* 1.4577	* 1.6172	* 1.3687	* 1.5108	* .7207 *
	* 1.4942	* 1.4165	* 1.4453	* 1.3660	* 1.2998	* 1.4566	* 1.3774	* 2.5806 *
11	* 1.2443	* 1.6299	* 1.4578	* 1.6261	* 1.4507	* 1.6095	* .9744	* .4967 *
	* 1.5973	* 1.2868	* 1.3659	* 1.2961	* 1.3762	* 1.3018	* 1.9232	* 3.7556 *
12	* 1.5497	* 1.4064	* 1.6173	* 1.4508	* 1.3356	* 1.6109	* .8438	* *
	* 1.3431	* 1.4131	* 1.2997	* 1.3761	* 1.5001	* 1.3019	* 2.1929	* *
13	* 1.1874	* 1.3760	* 1.3689	* 1.6095	* 1.6111	* 1.4723	* .6807	* *
	* 1.6697	* 1.4417	* 1.4563	* 1.3018	* 1.3018	* 1.4212	* 2.7195	* *
14	* 1.5555	* 1.5703	* 1.5110	* .9743	* .8437	* .6947	* *	
	* 1.3353	* 1.3238	* 1.3773	* 1.9232	* 2.1929	* 2.7046	* *	
15	* .7236	* .7479	* .7207	* .4967	* F-SUB-Q			
	* 2.4931	* 2.4313	* 2.5810	* 3.7556	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 133 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 350 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2826	* 1.0555	* 1.1143	* 1.0378	* 1.2614	* .9922	* 1.2686	* .6009
	* 1.5785	* 1.8375	* 1.7361	* 1.8635	* 1.6042	* 1.9455	* 1.5926	* 2.9294
9	* 1.0555	* 1.3370	* 1.1731	* 1.3465	* 1.1446	* 1.1394	* 1.2785	* .6177
	* 1.8375	* 1.5230	* 1.6492	* 1.5128	* 1.6878	* 1.6946	* 1.5819	* 2.8695
10	* 1.1143	* 1.1727	* 1.1328	* 1.2124	* 1.3360	* 1.1388	* 1.2287	* .5940
	* 1.7361	* 1.6497	* 1.7208	* 1.5956	* 1.5273	* 1.7024	* 1.6478	* 3.0551
11	* 1.0378	* 1.3465	* 1.2125	* 1.3437	* 1.1775	* 1.3073	* .8026	* .4179
	* 1.8635	* 1.5127	* 1.5955	* 1.5221	* 1.6471	* 1.5565	* 2.2755	* 4.3615
12	* 1.2614	* 1.1449	* 1.3361	* 1.1776	* 1.0806	* 1.3061	* .7000	*
	* 1.6042	* 1.6874	* 1.5272	* 1.6470	* 1.8029	* 1.5604	* 2.5751	*
13	* .9922	* 1.1403	* 1.1389	* 1.3073	* 1.3062	* 1.1852	* .5615	*
	* 1.9455	* 1.6932	* 1.7021	* 1.5565	* 1.5602	* 1.7163	* 3.2145	*
14	* 1.2686	* 1.2791	* 1.2288	* .8026	* .6999	* .5725	*	*
	* 1.5926	* 1.5812	* 1.6477	* 2.2754	* 2.5749	* 3.1991	*	*
15	* .6009	* .6179	* .5939	* .4179	* F-SUB-Q			
	* 2.9294	* 2.8704	* 3.0557	* 4.3615	* M-SUB-Q			

AT 75% POWER, 350 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5831	* .5007	* .4919	* .4901	* .5710	* .4690	* .5171	* .2749
	* 3.3819	* 3.7746	* 3.8250	* 3.8437	* 3.4545	* 4.0144	* 3.8046	* 6.2540
9	* .5007	* .5781	* .5131	* .5929	* .5001	* .4891	* .5200	* .2783
	* 3.7746	* 3.4218	* 3.6649	* 3.3409	* 3.7546	* 3.8406	* 3.7865	* 6.2200
10	* .4919	* .5130	* .4884	* .5298	* .5952	* .4970	* .4976	* .2650
	* 3.8250	* 3.6660	* 3.8792	* 3.5472	* 3.3347	* 3.7934	* 3.9622	* 6.6908
11	* .4901	* .5929	* .5298	* .5950	* .5040	* .5549	* .3688	* .1941
	* 3.8437	* 3.3408	* 3.5471	* 3.3397	* 3.7382	* 3.5696	* 4.8281	* 9.1888
12	* .5710	* .5002	* .5952	* .5041	* .4692	* .5295	* .3143	*
	* 3.4545	* 3.7538	* 3.3345	* 3.7380	* 4.0361	* 3.7439	* 5.5971	*
13	* .4690	* .4895	* .4971	* .5549	* .5296	* .4708	* .2494	*
	* 4.0144	* 3.8370	* 3.7925	* 3.5695	* 3.7433	* 4.2079	* 7.0682	*
14	* .5171	* .5202	* .4977	* .3688	* .3144	* .2532	*	*
	* 3.8046	* 3.7846	* 3.9616	* 4.8280	* 5.5956	* 7.0657	*	*
15	* .2749	* .2784	* .2650	* .1941	* F-SUB-Q			
	* 6.2540	* 6.2223	* 6.6913	* 9.1881	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 134 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5006 *	* .5753 *	* .6271 *	* .6531 *	* .7504 *	* .6521 *	* .6921 *	* .4021 *
	* 3.0703 *	* 3.3892 *	* 3.2666 *	* 3.1447 *	* 2.9442 *	* 3.1930 *	* 3.2556 *	* 4.6533 *
9	* .5753 *	* .6882 *	* .6573 *	* .7473 *	* .6554 *	* .6588 *	* .6883 *	* .4002 *
	* 3.3892 *	* 3.2500 *	* 3.1313 *	* 2.9641 *	* 3.1107 *	* 3.1479 *	* 3.2703 *	* 4.7095 *
10	* .6271 *	* .6572 *	* .6294 *	* .6705 *	* .7351 *	* .6395 *	* .6446 *	* .3748 *
	* 3.2666 *	* 3.1318 *	* 3.3185 *	* 3.0508 *	* 2.9949 *	* 3.1818 *	* 3.4075 *	* 5.1318 *
11	* .6531 *	* .7474 *	* .6706 *	* .7076 *	* .5876 *	* .6345 *	* .4614 *	* .2899 *
	* 3.1447 *	* 2.9639 *	* 3.0506 *	* 3.1474 *	* 3.4258 *	* 3.4082 *	* 4.0818 *	* 6.6550 *
12	* .7504 *	* .6555 *	* .7352 *	* .5876 *	* .4393 *	* .5013 *	* .3586 *	
	* 2.9442 *	* 3.1100 *	* 2.9944 *	* 3.4255 *	* 3.4827 *	* 3.4933 *	* 4.7959 *	
13	* .6521 *	* .6596 *	* .6397 *	* .6345 *	* .5012 *	* .4367 *	* .2659 *	
	* 3.1930 *	* 3.1441 *	* 3.1807 *	* 3.4081 *	* 3.4936 *	* 3.8138 *	* 5.9273 *	
14	* .6921 *	* .6888 *	* .6448 *	* .4614 *	* .3584 *	* .2704 *		
	* 3.2556 *	* 3.2682 *	* 3.4068 *	* 4.0797 *	* 4.7977 *	* 5.9920 *		
15	* .4021 *	* .4002 *		* .3748 *	* .2899 *	F-SUB-Q		
	* 4.6533 *	* 4.7119 *	* 5.1315 *	* 6.6553 *	M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9139 *	* 1.0430 *	* 1.2150 *	* 1.1969 *	* 1.3884 *	* 1.1938 *	* 1.4164 *	* .7700 *
	* 1.7579 *	* 1.9002 *	* 1.7336 *	* 1.7658 *	* 1.6369 *	* 1.7861 *	* 1.6356 *	* 2.4988 *
9	* 1.0430 *	* 1.3328 *	* 1.2798 *	* 1.4220 *	* 1.2858 *	* 1.3059 *	* 1.4119 *	* .7856 *
	* 1.9002 *	* 1.7102 *	* 1.6475 *	* 1.6001 *	* 1.6317 *	* 1.6311 *	* 1.6299 *	* 2.4534 *
10	* 1.2150 *	* 1.2795 *	* 1.2467 *	* 1.3150 *	* 1.3927 *	* 1.2586 *	* 1.3279 *	* .7416 *
	* 1.7336 *	* 1.6478 *	* 1.7232 *	* 1.5938 *	* 1.6264 *	* 1.6654 *	* 1.7000 *	* 2.6573 *
11	* 1.1969 *	* 1.4221 *	* 1.3151 *	* 1.3389 *	* 1.1736 *	* 1.2505 *	* .8809 *	* .5440 *
	* 1.7658 *	* 1.5999 *	* 1.5937 *	* 1.6964 *	* 1.7377 *	* 1.7575 *	* 2.2039 *	* 3.6536 *
12	* 1.3884 *	* 1.2860 *	* 1.3929 *	* 1.1737 *	* .8596 *	* 1.0350 *	* .7048 *	
	* 1.6369 *	* 1.6314 *	* 1.6262 *	* 1.7376 *	* 1.8159 *	* 1.7220 *	* 2.4675 *	
13	* 1.1938 *	* 1.3070 *	* 1.2590 *	* 1.2506 *	* 1.0350 *	* .9292 *	* .5395 *	
	* 1.7861 *	* 1.6295 *	* 1.6649 *	* 1.7576 *	* 1.7221 *	* 1.8673 *	* 2.9619 *	
14	* 1.4164 *	* 1.4127 *	* 1.3281 *	* .8807 *	* .7045 *	* .5434 *		
	* 1.6356 *	* 1.6290 *	* 1.6997 *	* 2.2029 *	* 2.4682 *	* 3.0239 *		
15	* .7700 *	* .7859 *	* .7414 *	* .5439 *	F-SUB-Q			
	* 2.4988 *	* 2.4544 *	* 2.6574 *	* 3.6538 *	M-SUB-Q			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 135 of 312**

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

	H	G	F	E	D	C	B	A
8	1.0775	1.1903	1.3721	1.3652	1.6142	1.3600	1.6499	.8899
	1.5556	1.6981	1.5585	1.5733	1.4295	1.5871	1.4061	2.1675
9	1.1903	1.4991	1.4553	1.6356	1.4956	1.4959	1.6435	.9234
	1.6981	1.5392	1.4677	1.4112	1.4249	1.4365	1.4072	2.1039
10	1.3721	1.4550	1.4427	1.5049	1.5882	1.4399	1.5459	.8776
	1.5585	1.4679	1.4899	1.4118	1.4489	1.4795	1.4808	2.2741
11	1.3652	1.6357	1.5050	1.5249	1.3729	1.4608	1.0402	.6209
	1.5733	1.4111	1.4117	1.5084	1.5035	1.5194	1.8985	3.2551
12	1.6142	1.4958	1.5885	1.3730	1.0198	1.2185	.8311	
	1.4295	1.4246	1.4487	1.5034	1.5858	1.4947	2.1185	
13	1.3600	1.4970	1.4403	1.4609	1.2185	1.0970	.6312	
	1.5871	1.4354	1.4790	1.5194	1.4947	1.6121	2.5685	
14	1.6499	1.6443	1.5462	1.0399	.8308	.6415		
	1.4061	1.4065	1.4806	1.8976	2.1189	2.5990		
15	.8899	.9237	.8774	.6208	F-SUB-Q			
	2.1675	2.1046	2.2741	3.2553	M-SUB-Q			

	H	G	F	E	D	C	B	A
8	* 1.1605	* 1.2444	* 1.4367	* 1.4344	* 1.7312	* 1.4238	* 1.7820	* .9243
	* 1.4756	* 1.6447	* 1.5121	* 1.5208	* 1.3530	* 1.5368	* 1.3144	* 2.1064
9	* 1.2444	* 1.6234	* 1.5313	* 1.7684	* 1.5795	* 1.5823	* 1.7758	* .9558
	* 1.6447	* 1.4434	* 1.4159	* 1.3243	* 1.3697	* 1.3743	* 1.3166	* 2.0533
10	* 1.4367	* 1.5310	* 1.5176	* 1.5913	* 1.7290	* 1.5188	* 1.6705	* .9057
	* 1.5121	* 1.4161	* 1.4352	* 1.3552	* 1.3517	* 1.4241	* 1.3899	* 2.2341
11	* 1.4344	* 1.7685	* 1.5915	* 1.6592	* 1.4584	* 1.5799	* 1.0836	* .6392
	* 1.5208	* 1.3242	* 1.3551	* 1.4079	* 1.4354	* 1.4242	* 1.8492	* 3.2128
12	* 1.7312	* 1.5798	* 1.7292	* 1.4585	* 1.0806	* 1.3294	* .8612	*
	* 1.3530	* 1.3694	* 1.3516	* 1.4353	* 1.5216	* 1.3997	* 2.0783	*
13	* 1.4238	* 1.5832	* 1.5192	* 1.5800	* 1.3295	* 1.1952	* .6539	*
	* 1.5368	* 1.3734	* 1.4238	* 1.4242	* 1.3997	* 1.5122	* 2.5269	*
14	* 1.7820	* 1.7765	* 1.6708	* 1.0833	* .8609	* .6670	*	*
	* 1.3144	* 1.3161	* 1.3897	* 1.8483	* 2.0786	* 2.5479	*	*
15	* .9243	* .9560	* .9055	* .6392	* F-SUB-Q			
	* 2.1064	* 2.0542	* 2.2342	* 3.2130	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 136 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1724	* 1.2482	* 1.4300	* 1.4330	* 1.7390	* 1.4166	* 1.7965	* .9260
	* 1.4936	* 1.6773	* 1.5479	* 1.5474	* 1.3686	* 1.5713	* 1.3250	* 2.1386
9	* 1.2482	* 1.6414	* 1.5300	* 1.7858	* 1.5783	* 1.5833	* 1.7915	* .9589
	* 1.6773	* 1.4575	* 1.4437	* 1.3332	* 1.3923	* 1.3978	* 1.3272	* 2.0823
10	* 1.4300	* 1.5297	* 1.5144	* 1.5945	* 1.7527	* 1.5174	* 1.6852	* .9084
	* 1.5479	* 1.4439	* 1.4650	* 1.3748	* 1.3541	* 1.4459	* 1.3991	* 2.2664
11	* 1.4330	* 1.7859	* 1.5947	* 1.6815	* 1.4651	* 1.5963	* 1.0897	* .6376
	* 1.5474	* 1.3331	* 1.3748	* 1.4126	* 1.4548	* 1.4348	* 1.8677	* 3.2662
12	* 1.7390	* 1.5785	* 1.7528	* 1.4652	* 1.0901	* 1.3492	* .8659	*
	* 1.3686	* 1.3921	* 1.3540	* 1.4547	* 1.5493	* 1.4098	* 2.1106	*
13	* 1.4166	* 1.5840	* 1.5176	* 1.5963	* 1.3493	* 1.2139	* .6602	*
	* 1.5713	* 1.3971	* 1.4456	* 1.4348	* 1.4097	* 1.5250	* 2.5641	*
14	* 1.7965	* 1.7922	* 1.6854	* 1.0894	* .8657	* .6732	*	*
	* 1.3250	* 1.3267	* 1.3990	* 1.8667	* 2.1107	* 2.5862	*	*
15	* .9260	* .9592	* .9082	* .6375	* F-SUB-Q			
	* 2.1386	* 2.0831	* 2.2666	* 3.2663	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1616	* 1.2372	* 1.4036	* 1.4100	* 1.7131	* 1.3893	* 1.7727	* .9160
	* 1.5385	* 1.7267	* 1.6102	* 1.6043	* 1.4157	* 1.6291	* 1.3638	* 2.1966
9	* 1.2372	* 1.6253	* 1.5065	* 1.7661	* 1.5529	* 1.5580	* 1.7688	* .9487
	* 1.7267	* 1.4958	* 1.4958	* 1.3751	* 1.4437	* 1.4420	* 1.3648	* 2.1382
10	* 1.4036	* 1.5062	* 1.4896	* 1.5721	* 1.7365	* 1.4939	* 1.6649	* .9048
	* 1.6102	* 1.4961	* 1.5183	* 1.4232	* 1.3957	* 1.5004	* 1.4416	* 2.3132
11	* 1.4100	* 1.7662	* 1.5722	* 1.6668	* 1.4469	* 1.5806	* 1.0833	* .6296
	* 1.6043	* 1.3750	* 1.4231	* 1.4559	* 1.5004	* 1.4771	* 1.9256	* 3.3855
12	* 1.7131	* 1.5532	* 1.7367	* 1.4470	* 1.0833	* 1.3409	* .8641	*
	* 1.4157	* 1.4434	* 1.3956	* 1.5003	* 1.6079	* 1.4575	* 2.1696	*
13	* 1.3893	* 1.5587	* 1.4942	* 1.5806	* 1.3410	* 1.2091	* .6614	*
	* 1.6291	* 1.4413	* 1.5001	* 1.4772	* 1.4574	* 1.5813	* 2.6460	*
14	* 1.7727	* 1.7694	* 1.6650	* 1.0832	* .8639	* .6736	*	*
	* 1.3638	* 1.3643	* 1.4415	* 1.9245	* 2.1697	* 2.6718	*	*
15	* .9160	* .9490	* .9046	* .6295	* F-SUB-Q			
	* 2.1966	* 2.1390	* 2.3132	* 3.3856	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 137 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1582	* 1.2210	* 1.3873	* 1.3906	* 1.6981	* 1.3659	* 1.7606	* .8975 *
	* 1.5775	* 1.7850	* 1.6848	* 1.6784	* 1.4716	* 1.7044	* 1.4071	* 2.2963 *
9	* 1.2210	* 1.6249	* 1.4910	* 1.7585	* 1.5356	* 1.5391	* 1.7581	* .9281 *
	* 1.7850	* 1.5228	* 1.5619	* 1.4256	* 1.5069	* 1.4990	* 1.4085	* 2.2399 *
10	* 1.3873	* 1.4907	* 1.4746	* 1.5561	* 1.7329	* 1.4782	* 1.6575	* .8816 *
	* 1.6848	* 1.5622	* 1.5860	* 1.4857	* 1.4457	* 1.5661	* 1.4914	* 2.4420 *
11	* 1.3906	* 1.7586	* 1.5562	* 1.6656	* 1.4383	* 1.5798	* 1.0678	* .6165 *
	* 1.6784	* 1.4255	* 1.4857	* 1.4842	* 1.5400	* 1.5101	* 2.0267	* 3.5787 *
12	* 1.6981	* 1.5358	* 1.7331	* 1.4384	* 1.0730	* 1.3484	* .8536 *	
	* 1.4716	* 1.5066	* 1.4456	* 1.5399	* 1.6639	* 1.4970	* 2.2663 *	
13	* 1.3659	* 1.5397	* 1.4784	* 1.5798	* 1.3485	* 1.2218	* .6565 *	
	* 1.7044	* 1.4982	* 1.5658	* 1.5102	* 1.4969	* 1.6241	* 2.7688 *	
14	* 1.7606	* 1.7587	* 1.6576	* 1.0677	* .8534	* .6694	*	
	* 1.4071	* 1.4080	* 1.4914	* 2.0254	* 2.2663	* 2.7926	*	
15	* .8975	* .9284	* .8814	* .6164	* F-SUB-Q			
	* 2.2963	* 2.2408	* 2.4421	* 3.5788	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1717	* 1.2183	* 1.3750	* 1.3738	* 1.6804	* 1.3444	* 1.7424	* .8846 *
	* 1.6243	* 1.8453	* 1.7679	* 1.7741	* 1.5503	* 1.8015	* 1.4741	* 2.4149 *
9	* 1.2183	* 1.6264	* 1.4791	* 1.7480	* 1.5196	* 1.5203	* 1.7415	* .9135 *
	* 1.8453	* 1.5698	* 1.6496	* 1.4995	* 1.5912	* 1.5767	* 1.4758	* 2.3599 *
10	* 1.3750	* 1.4787	* 1.4628	* 1.5433	* 1.7267	* 1.4656	* 1.6464	* .8694 *
	* 1.7679	* 1.6499	* 1.6764	* 1.5686	* 1.5201	* 1.6534	* 1.5655	* 2.5773 *
11	* 1.3738	* 1.7480	* 1.5434	* 1.6651	* 1.4386	* 1.5847	* 1.0628	* .6097 *
	* 1.7741	* 1.4994	* 1.5686	* 1.5308	* 1.5937	* 1.5578	* 2.1238	* 3.7916 *
12	* 1.6804	* 1.5198	* 1.7268	* 1.4387	* 1.0804	* 1.3714	* .8585 *	
	* 1.5503	* 1.5909	* 1.5200	* 1.5936	* 1.7184	* 1.5417	* 2.3439 *	
13	* 1.3444	* 1.5209	* 1.4658	* 1.5846	* 1.3715	* 1.2506	* .6661 *	
	* 1.8015	* 1.5760	* 1.6531	* 1.5578	* 1.5416	* 1.6766	* 2.8705 *	
14	* 1.7424	* 1.7420	* 1.6465	* 1.0627	* .8583	* .6791	*	
	* 1.4741	* 1.4753	* 1.5655	* 2.1225	* 2.3439	* 2.8950	*	
15	* .8846	* .9138	* .8692	* .6096	* F-SUB-Q			
	* 2.4149	* 2.3608	* 2.5774	* 3.7917	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 138 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2540	* 1.2321	* 1.3752	* 1.3651	* 1.6745	* 1.3307	* 1.7350	* .8724 *
	* 1.6910	* 1.9294	* 1.8434	* 1.8847	* 1.6392	* 1.9131	* 1.5510	* 2.5640 *
9	* 1.2321	* 1.6488	* 1.4791	* 1.7509	* 1.5140	* 1.5102	* 1.7359	* .8988 *
	* 1.9294	* 1.6297	* 1.7460	* 1.5833	* 1.6879	* 1.6666	* 1.5529	* 2.5127 *
10	* 1.3752	* 1.4787	* 1.4634	* 1.5417	* 1.7353	* 1.4646	* 1.6474	* .8580 *
	* 1.8434	* 1.7465	* 1.7640	* 1.6637	* 1.5915	* 1.7528	* 1.6496	* 2.7466 *
11	* 1.3651	* 1.7510	* 1.5417	* 1.6833	* 1.4614	* 1.6138	* 1.0641	* .6041 *
	* 1.8847	* 1.5832	* 1.6637	* 1.5903	* 1.6623	* 1.6186	* 2.2173	* 4.0567 *
12	* 1.6745	* 1.5142	* 1.7354	* 1.4614	* 1.1391	* 1.4468	* .8752 *	
	* 1.6392	* 1.6876	* 1.5915	* 1.6623	* 1.7934	* 1.5997	* 2.4573 *	
13	* 1.3307	* 1.5107	* 1.4647	* 1.6138	* 1.4469	* 1.3224	* .6865 *	
	* 1.9131	* 1.6658	* 1.7525	* 1.6187	* 1.5996	* 1.7384	* 3.0098 *	
14	* 1.7350	* 1.7364	* 1.6475	* 1.0639	* .8751	* .6993	*	
	* 1.5510	* 1.5524	* 1.6496	* 2.2159	* 2.4573	* 3.0384	*	
15	* .8724	* .8988	* .8578	* .6040	* F-SUB-Q			
	* 2.5640	* 2.5144	* 2.7466	* 4.0567	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4305	* 1.2622	* 1.3769	* 1.3516	* 1.6479	* 1.3116	* 1.7029	* .8708 *
	* 1.7978	* 2.0201	* 1.9423	* 2.0284	* 1.7710	* 2.0575	* 1.6708	* 2.7147 *
9	* 1.2622	* 1.6529	* 1.4712	* 1.7309	* 1.4980	* 1.4890	* 1.7057	* .9013 *
	* 2.0201	* 1.7192	* 1.8438	* 1.6946	* 1.8127	* 1.7911	* 1.6728	* 2.6492 *
10	* 1.3769	* 1.4708	* 1.4547	* 1.5327	* 1.7214	* 1.4556	* 1.6263	* .8677 *
	* 1.9423	* 1.8443	* 1.8645	* 1.7571	* 1.6805	* 1.8524	* 1.7790	* 2.8819 *
11	* 1.3516	* 1.7309	* 1.5327	* 1.6903	* 1.4832	* 1.6317	* 1.0834	* .6096 *
	* 2.0284	* 1.6946	* 1.7571	* 1.6776	* 1.7536	* 1.7122	* 2.2955	* 4.2450 *
12	* 1.6479	* 1.4982	* 1.7215	* 1.4833	* 1.2466	* 1.5447	* .9179 *	
	* 1.7710	* 1.8124	* 1.6805	* 1.7535	* 1.9067	* 1.7030	* 2.5437 *	
13	* 1.3116	* 1.4895	* 1.4557	* 1.6317	* 1.5448	* 1.4014	* .7287 *	
	* 2.0575	* 1.7903	* 1.8522	* 1.7122	* 1.7029	* 1.8503	* 3.1258 *	
14	* 1.7029	* 1.7062	* 1.6263	* 1.0833	* .9177	* .7416	*	
	* 1.6708	* 1.6723	* 1.7790	* 2.2940	* 2.5437	* 3.1582	*	
15	* .8708	* .9015	* .8675	* .6096	* F-SUB-Q			
	* 2.7147	* 2.6503	* 2.8818	* 4.2450	* M-SUB-Q			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 139 of 312**

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

	H	G	F	E	D	C	B	A
8	1.6070	1.3261	1.4058	1.3547	1.6627	1.3090	1.7178	.8595
	1.8640	2.1324	2.0327	2.1482	1.8759	2.1944	1.7613	2.9221
9	1.3261	1.7104	1.4864	1.7573	1.5083	1.4937	1.7227	.8867
	2.1324	1.7836	1.9332	1.7643	1.9019	1.9020	1.7630	2.8622
10	1.4058	1.4859	1.4709	1.5461	1.7540	1.4693	1.6503	.8508
	2.0327	1.9337	1.9538	1.8429	1.7452	1.9430	1.8576	3.1333
11	1.3547	1.7573	1.5461	1.7406	1.5247	1.6890	1.0845	.6045
	2.1482	1.7643	1.8429	1.7436	1.8320	1.7767	2.4387	4.5299
12	1.6627	1.5085	1.7541	1.5247	1.3783	1.6546	.9302	
	1.8759	1.9017	1.7453	1.8319	1.9884	1.7634	2.7106	
13	1.3090	1.4942	1.4693	1.6889	1.6547	1.5025	.7483	
	2.1944	1.9012	1.9428	1.7768	1.7633	1.9194	3.3279	
14	1.7178	1.7232	1.6502	1.0844	.9301	.7624		
	1.7613	1.7625	1.8577	2.4371	2.7106	3.3586		
15	.8595	.8870	.8506	.6044	F-SUB-Q			
	2.9221	2.8632	3.1333	4.5299	M-SUB-Q			

	H	G	F	E	D	C	B	A
8	1.6568	1.3573	1.4172	1.3518	1.6602	1.3013	1.7128	.8557
	1.9554	2.2220	2.1090	2.2238	1.9483	2.3175	1.8840	3.1274
9	1.3573	1.7379	1.4901	1.7618	1.5070	1.4885	1.7192	.8824
	2.2220	1.8595	2.0058	1.8385	1.9827	2.0202	1.8848	3.0652
10	1.4172	1.4896	1.4744	1.5486	1.7655	1.4712	1.6529	.8491
	2.1090	2.0064	2.0363	1.9253	1.8342	2.0396	1.9578	3.3209
11	1.3518	1.7618	1.5486	1.7612	1.5421	1.7132	1.0926	.6057
	2.2238	1.8385	1.9253	1.8382	1.9345	1.8808	2.5693	4.7602
12	1.6602	1.5072	1.7654	1.5421	1.4136	1.7021	.9480	
	1.9483	1.9824	1.8343	1.9344	2.1064	1.8623	2.8687	
13	1.3013	1.4889	1.4713	1.7131	1.7021	1.5515	.7684	
	2.3175	2.0195	2.0394	1.8809	1.8622	2.0251	3.5156	
14	1.7128	1.7196	1.6528	1.0925	.9478	.7831		
	1.8840	1.8844	1.9579	2.5676	2.8687	3.5469		
15	.8557	.8827	.8489	.6056	F-SUB-Q			
	3.1274	3.0663	3.3209	4.7602	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 140 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6628	* 1.3766	* 1.4133	* 1.3418	* 1.6409	* 1.2909	* 1.6903	* .8555 *
	* 1.9273	* 2.1638	* 2.0772	* 2.1872	* 1.9229	* 2.2780	* 1.8674	* 3.0624 *
9	* 1.3766	* 1.7371	* 1.4819	* 1.7458	* 1.4941	* 1.4733	* 1.6979	* .8849 *
	* 2.1638	* 1.8318	* 1.9747	* 1.8152	* 1.9551	* 1.9897	* 1.8606	* 2.9897 *
10	* 1.4133	* 1.4814	* 1.4648	* 1.5397	* 1.7549	* 1.4615	* 1.6363	* .8583 *
	* 2.0772	* 1.9753	* 2.0088	* 1.8960	* 1.8123	* 2.0107	* 1.9339	* 3.2053 *
11	* 1.3418	* 1.7458	* 1.5397	* 1.7566	* 1.5386	* 1.7082	* 1.1035	* .6087 *
	* 2.1872	* 1.8152	* 1.8960	* 1.8138	* 1.9095	* 1.8650	* 2.4988	* 4.6383 *
12	* 1.6409	* 1.4943	* 1.7548	* 1.5386	* 1.4181	* 1.7080	* .9688	* .9688 *
	* 1.9229	* 1.9549	* 1.8124	* 1.9094	* 2.1014	* 1.8747	* 2.7943	* 2.7943 *
13	* 1.2909	* 1.4737	* 1.4615	* 1.7081	* 1.7081	* 1.5614	* .7877	* .7877 *
	* 2.2780	* 1.9891	* 2.0105	* 1.8651	* 1.8747	* 2.0494	* 3.4605	* 3.4605 *
14	* 1.6903	* 1.6983	* 1.6362	* 1.1034	* .9686	* .8014	* .8014	* .8014 *
	* 1.8674	* 1.8601	* 1.9340	* 2.4972	* 2.7943	* 3.4976	* 3.4976	* 3.4976 *
15	* .8555	* .8851	* .8582	* .6086	* F-SUB-Q			
	* 3.0624	* 2.9909	* 3.2051	* 4.6384	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6877	* 1.3733	* 1.4209	* 1.3418	* 1.6526	* 1.2841	* 1.7047	* .8448 *
	* 1.8684	* 2.1334	* 2.0242	* 2.1291	* 1.8570	* 2.2120	* 1.7852	* 2.9753 *
9	* 1.3733	* 1.7620	* 1.4882	* 1.7648	* 1.4989	* 1.4767	* 1.7134	* .8707 *
	* 2.1334	* 1.7741	* 1.9207	* 1.7529	* 1.9003	* 1.9231	* 1.7850	* 2.9181 *
10	* 1.4209	* 1.4877	* 1.4712	* 1.5447	* 1.7779	* 1.4658	* 1.6539	* .8401 *
	* 2.0242	* 1.9213	* 1.9559	* 1.8465	* 1.7541	* 1.9583	* 1.8656	* 3.1795 *
11	* 1.3418	* 1.7648	* 1.5447	* 1.7776	* 1.5495	* 1.7309	* 1.0928	* .5998 *
	* 2.1291	* 1.7529	* 1.8466	* 1.7596	* 1.8618	* 1.8078	* 2.4728	* 4.5918 *
12	* 1.6526	* 1.4991	* 1.7778	* 1.5495	* 1.4305	* 1.7384	* .9566	* .9566 *
	* 1.8570	* 1.9001	* 1.7542	* 1.8617	* 2.0497	* 1.8146	* 2.7844	* 2.7844 *
13	* 1.2841	* 1.4770	* 1.4658	* 1.7307	* 1.7385	* 1.5920	* .7812	* .7812 *
	* 2.2120	* 1.9225	* 1.9582	* 1.8079	* 1.8146	* 1.9840	* 3.4410	* 3.4410 *
14	* 1.7047	* 1.7138	* 1.6537	* 1.0927	* .9564	* .7954	* .7954	* .7954 *
	* 1.7852	* 1.7846	* 1.8657	* 2.4711	* 2.7844	* 3.4755	* 3.4755	* 3.4755 *
15	* .8448	* .8710	* .8399	* .5997	* F-SUB-Q			
	* 2.9753	* 2.9191	* 3.1795	* 4.5918	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 141 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6949	* 1.3721	* 1.4198	* 1.3374	* 1.6516	* 1.2767	* 1.7047	* .8400
	* 1.7688	* 2.0188	* 1.9158	* 2.0226	* 1.7594	* 2.0983	* 1.6937	* 2.8205
9	* 1.3721	* 1.7695	* 1.4866	* 1.7679	* 1.4957	* 1.4729	* 1.7141	* .8625
	* 2.0188	* 1.6796	* 1.8254	* 1.6701	* 1.8125	* 1.8235	* 1.6915	* 2.7752
10	* 1.4198	* 1.4861	* 1.4689	* 1.5426	* 1.7831	* 1.4625	* 1.6559	* .8339
	* 1.9158	* 1.8260	* 1.8595	* 1.7611	* 1.6683	* 1.8661	* 1.7740	* 3.0019
11	* 1.3374	* 1.7679	* 1.5426	* 1.7821	* 1.5496	* 1.7356	* 1.0885	* .5949
	* 2.0226	* 1.6702	* 1.7612	* 1.6754	* 1.7711	* 1.7175	* 2.3432	* 4.3254
12	* 1.6516	* 1.4958	* 1.7830	* 1.5496	* 1.4310	* 1.7471	* .9533	*
	* 1.7594	* 1.8123	* 1.6684	* 1.7711	* 1.9498	* 1.7247	* 2.6318	*
13	* 1.2767	* 1.4732	* 1.4625	* 1.7355	* 1.7472	* 1.6017	* .7793	*
	* 2.0983	* 1.8230	* 1.8661	* 1.7177	* 1.7247	* 1.8804	* 3.2455	*
14	* 1.7047	* 1.7144	* 1.6557	* 1.0884	* .9531	* .7933	*	*
	* 1.6937	* 1.6912	* 1.7741	* 2.3417	* 2.6319	* 3.2791	*	*
15	* .8400	* .8624	* .8337	* .5948	* F-SUB-Q			
	* 2.8205	* 2.7771	* 3.0019	* 4.3253	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6940	* 1.3741	* 1.4160	* 1.3318	* 1.6455	* 1.2692	* 1.6983	* .8372
	* 1.6292	* 1.8581	* 1.7711	* 1.8654	* 1.6238	* 1.9434	* 1.5677	* 2.6100
9	* 1.3741	* 1.7700	* 1.4824	* 1.7640	* 1.4892	* 1.4664	* 1.7082	* .8625
	* 1.8581	* 1.5473	* 1.6875	* 1.5390	* 1.6716	* 1.6866	* 1.5638	* 2.5587
10	* 1.4160	* 1.4818	* 1.4632	* 1.5375	* 1.7799	* 1.4564	* 1.6508	* .8335
	* 1.7711	* 1.6881	* 1.7219	* 1.6281	* 1.5403	* 1.7262	* 1.6325	* 2.7620
11	* 1.3318	* 1.7639	* 1.5374	* 1.7804	* 1.5445	* 1.7320	* 1.0888	* .5938
	* 1.8654	* 1.5390	* 1.6282	* 1.5452	* 1.6374	* 1.5847	* 2.1590	* 3.9933
12	* 1.6455	* 1.4893	* 1.7798	* 1.5445	* 1.4264	* 1.7455	* .9547	*
	* 1.6238	* 1.6714	* 1.5404	* 1.6373	* 1.8010	* 1.5877	* 2.4195	*
13	* 1.2692	* 1.4667	* 1.4563	* 1.7318	* 1.7456	* 1.6009	* .7816	*
	* 1.9434	* 1.6862	* 1.7262	* 1.5849	* 1.5877	* 1.7293	* 2.9773	*
14	* 1.6983	* 1.7085	* 1.6506	* 1.0888	* .9545	* .7960	*	*
	* 1.5677	* 1.5635	* 1.6327	* 2.1575	* 2.4195	* 3.0066	*	*
15	* .8372	* .8627	* .8333	* .5938	* F-SUB-Q			
	* 2.6100	* 2.5597	* 2.7621	* 3.9934	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 142 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6847	* 1.3826	* 1.4091	* 1.3258	* 1.6326	* 1.2682	* 1.6833	* .8410 *
	* 1.6383	* 1.8481	* 1.7811	* 1.8749	* 1.6382	* 1.9540	* 1.5858	* 2.6084 *
9	* 1.3826	* 1.7604	* 1.4753	* 1.7509	* 1.4799	* 1.4574	* 1.6935	* .8686 *
	* 1.8481	* 1.5573	* 1.6919	* 1.5485	* 1.6812	* 1.7004	* 1.5804	* 2.5500 *
10	* 1.4091	* 1.4747	* 1.4541	* 1.5302	* 1.7670	* 1.4482	* 1.6368	* .8452 *
	* 1.7811	* 1.6925	* 1.7302	* 1.6324	* 1.5510	* 1.7315	* 1.6445	* 2.7279 *
11	* 1.3258	* 1.7509	* 1.5301	* 1.7698	* 1.5356	* 1.7193	* 1.0971	* .5976 *
	* 1.8749	* 1.5485	* 1.6325	* 1.5559	* 1.6489	* 1.5980	* 2.1422	* 3.9593 *
12	* 1.6326	* 1.4801	* 1.7669	* 1.5356	* 1.4181	* 1.7331	* .9668	*
	* 1.6382	* 1.6810	* 1.5510	* 1.6489	* 1.8132	* 1.5990	* 2.3930	*
13	* 1.2682	* 1.4577	* 1.4481	* 1.7191	* 1.7332	* 1.5899	* .7911	*
	* 1.9540	* 1.7000	* 1.7315	* 1.5981	* 1.5989	* 1.7401	* 2.9442	*
14	* 1.6833	* 1.6938	* 1.6366	* 1.0970	* .9666	* .8045	*	*
	* 1.5858	* 1.5802	* 1.6447	* 2.1407	* 2.3931	* 2.9776	*	*
15	* .8410	* .8688	* .8451	* .5975	* F-SUB-Q			
	* 2.6084	* 2.5511	* 2.7277	* 3.9594	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7097	* 1.3766	* 1.4197	* 1.3319	* 1.6544	* 1.2657	* 1.7093	* .8341 *
	* 1.4939	* 1.7232	* 1.6457	* 1.7451	* 1.5118	* 1.8290	* 1.4621	* 2.4651 *
9	* 1.3766	* 1.7885	* 1.4872	* 1.7790	* 1.4917	* 1.4695	* 1.7200	* .8571 *
	* 1.7232	* 1.4266	* 1.5667	* 1.4232	* 1.5584	* 1.5783	* 1.4561	* 2.4217 *
10	* 1.4197	* 1.4866	* 1.4657	* 1.5417	* 1.7965	* 1.4584	* 1.6627	* .8289 *
	* 1.6457	* 1.5673	* 1.6016	* 1.5123	* 1.4207	* 1.6042	* 1.5114	* 2.6029 *
11	* 1.3319	* 1.7789	* 1.5417	* 1.7954	* 1.5494	* 1.7454	* 1.0868	* .5890 *
	* 1.7451	* 1.4232	* 1.5123	* 1.4272	* 1.5205	* 1.4634	* 2.0126	* 3.7487 *
12	* 1.6544	* 1.4918	* 1.7963	* 1.5494	* 1.4296	* 1.7617	* .9518	*
	* 1.5118	* 1.5583	* 1.4208	* 1.5205	* 1.6694	* 1.4636	* 2.2644	*
13	* 1.2657	* 1.4697	* 1.4583	* 1.7452	* 1.7618	* 1.6161	* .7794	*
	* 1.8290	* 1.5780	* 1.6042	* 1.4636	* 1.4636	* 1.5914	* 2.7868	*
14	* 1.7093	* 1.7203	* 1.6625	* 1.0867	* .9516	* .7926	*	*
	* 1.4621	* 1.4559	* 1.5116	* 2.0112	* 2.2645	* 2.8185	*	*
15	* .8341	* .8568	* .8287	* .5890	* F-SUB-Q			
	* 2.4651	* 2.4239	* 2.6029	* 3.7487	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 143 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7176	* 1.3810	* 1.4242	* 1.3349	* 1.6610	* 1.2678	* 1.7168	* .8352 *
	* 1.3891	* 1.6100	* 1.5459	* 1.6451	* 1.4224	* 1.7267	* 1.3757	* 2.3300 *
9	* 1.3810	* 1.7978	* 1.4926	* 1.7877	* 1.4964	* 1.4746	* 1.7279	* .8585 *
	* 1.6100	* 1.3335	* 1.4733	* 1.3364	* 1.4669	* 1.4865	* 1.3693	* 2.2878 *
10	* 1.4242	* 1.4919	* 1.4700	* 1.5472	* 1.8055	* 1.4632	* 1.6703	* .8302 *
	* 1.5459	* 1.4739	* 1.5069	* 1.4217	* 1.3312	* 1.5083	* 1.4192	* 2.4565 *
11	* 1.3349	* 1.7876	* 1.5472	* 1.8045	* 1.5545	* 1.7538	* 1.0895	* .5892 *
	* 1.6451	* 1.3364	* 1.4218	* 1.3347	* 1.4254	* 1.3673	* 1.8906	* 3.5372 *
12	* 1.6610	* 1.4965	* 1.8054	* 1.5545	* 1.4338	* 1.7708	* .9541 *	
	* 1.4224	* 1.4668	* 1.3313	* 1.4254	* 1.5532	* 1.3568	* 2.1161 *	
13	* 1.2678	* 1.4748	* 1.4631	* 1.7536	* 1.7708	* 1.6242	* .7811 *	
	* 1.7267	* 1.4862	* 1.5083	* 1.3675	* 1.3568	* 1.4754	* 2.5976 *	
14	* 1.7168	* 1.7282	* 1.6701	* 1.0895	* .9539	* .7942 *		
	* 1.3757	* 1.3691	* 1.4194	* 1.8893	* 2.1162	* 2.6275 *		
15	* .8352	* .8582	* .8300	* .5891	* F-SUB-Q			
	* 2.3300	* 2.2899	* 2.4566	* 3.5372	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6997	* 1.3926	* 1.4180	* 1.3304	* 1.6441	* 1.2737	* 1.6965	* .8418 *
	* 1.3231	* 1.5067	* 1.4692	* 1.5692	* 1.3658	* 1.6408	* 1.3256	* 2.2081 *
9	* 1.3926	* 1.7786	* 1.4862	* 1.7671	* 1.4883	* 1.4671	* 1.7079	* .8708 *
	* 1.5067	* 1.2717	* 1.4020	* 1.2798	* 1.3996	* 1.4227	* 1.3178	* 2.1542 *
10	* 1.4180	* 1.4856	* 1.4614	* 1.5416	* 1.7836	* 1.4575	* 1.6507	* .8474 *
	* 1.4692	* 1.4025	* 1.4354	* 1.3513	* 1.2721	* 1.4356	* 1.3631	* 2.2969 *
11	* 1.3304	* 1.7671	* 1.5416	* 1.7876	* 1.5450	* 1.7351	* 1.1029	* .5971 *
	* 1.5692	* 1.2799	* 1.3514	* 1.2710	* 1.3537	* 1.3035	* 1.7690	* 3.3295 *
12	* 1.6441	* 1.4884	* 1.7835	* 1.5450	* 1.4252	* 1.7505	* .9734	*
	* 1.3658	* 1.3994	* 1.2722	* 1.3537	* 1.4743	* 1.2935	* 1.9591	*
13	* 1.2737	* 1.4673	* 1.4574	* 1.7349	* 1.7506	* 1.6050	* .7945	*
	* 1.6408	* 1.4224	* 1.4357	* 1.3036	* 1.2935	* 1.4071	* 2.4123	*
14	* 1.6965	* 1.7082	* 1.6505	* 1.1028	* .9732	* .8076	*	
	* 1.3256	* 1.3176	* 1.3633	* 1.7678	* 1.9591	* 2.4404	*	
15	* .8418	* .8710	* .8473	* .5970	* F-SUB-Q			
	* 2.2081	* 2.1551	* 2.2967	* 3.3297	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 144 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6981	* 1.3697	* 1.4177	* 1.3246	* 1.6446	* 1.2614	* 1.6979	* .8262 *
	* 1.2625	* 1.4615	* 1.4028	* 1.5046	* 1.3027	* 1.5807	* 1.2635	* 2.1537 *
9	* 1.3697	* 1.7743	* 1.4854	* 1.7667	* 1.4873	* 1.4666	* 1.7099	* .8523 *
	* 1.4615	* 1.2156	* 1.3388	* 1.2209	* 1.3365	* 1.3583	* 1.2556	* 2.1062 *
10	* 1.4177	* 1.4847	* 1.4618	* 1.5396	* 1.7811	* 1.4567	* 1.6527	* .8245 *
	* 1.4028	* 1.3393	* 1.3699	* 1.2909	* 1.2147	* 1.3708	* 1.2988	* 2.2581 *
11	* 1.3246	* 1.7667	* 1.5395	* 1.7832	* 1.5430	* 1.7360	* 1.0814	* .5850 *
	* 1.5046	* 1.2210	* 1.2910	* 1.2148	* 1.2928	* 1.2421	* 1.7227	* 3.2573 *
12	* 1.6446	* 1.4875	* 1.7810	* 1.5430	* 1.4228	* 1.7509	* .9492 *	
	* 1.3027	* 1.3364	* 1.2147	* 1.2928	* 1.4090	* 1.2326	* 1.9188 *	
13	* 1.2614	* 1.4669	* 1.4567	* 1.7358	* 1.7509	* 1.6039	* .7753 *	
	* 1.5807	* 1.3580	* 1.3708	* 1.2423	* 1.2325	* 1.3422	* 2.3617 *	
14	* 1.6979	* 1.7102	* 1.6525	* 1.0813	* .9490	* .7885	*	
	* 1.2635	* 1.2554	* 1.2990	* 1.7216	* 1.9188	* 2.3879	*	
15	* .8262	* .8525	* .8243	* .5849	* F-SUB-Q			
	* 2.1537	* 2.1070	* 2.2582	* 3.2573	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6087	* 1.3044	* 1.3641	* 1.2677	* 1.5613	* 1.2121	* 1.6067	* .7865 *
	* 1.2827	* 1.4784	* 1.4054	* 1.5153	* 1.3217	* 1.5863	* 1.2865	* 2.1851 *
9	* 1.3044	* 1.6758	* 1.4268	* 1.6691	* 1.4245	* 1.4053	* 1.6187	* .8102 *
	* 1.4784	* 1.2389	* 1.3430	* 1.2438	* 1.3446	* 1.3664	* 1.2777	* 2.1402 *
10	* 1.3641	* 1.4262	* 1.4022	* 1.4744	* 1.6771	* 1.3980	* 1.5655	* .7855 *
	* 1.4054	* 1.3435	* 1.3762	* 1.2988	* 1.2416	* 1.3767	* 1.3215	* 2.2900 *
11	* 1.2677	* 1.6690	* 1.4744	* 1.6814	* 1.4735	* 1.6429	* 1.0299	* .5586 *
	* 1.5153	* 1.2438	* 1.2988	* 1.2398	* 1.3037	* 1.2637	* 1.7450	* 3.2997 *
12	* 1.5613	* 1.4246	* 1.6771	* 1.4735	* 1.3600	* 1.6530	* .9053 *	
	* 1.3217	* 1.3445	* 1.2416	* 1.3037	* 1.4204	* 1.2569	* 1.9420 *	
13	* 1.2121	* 1.4057	* 1.3980	* 1.6427	* 1.6531	* 1.5131	* .7365 *	
	* 1.5863	* 1.3660	* 1.3767	* 1.2638	* 1.2568	* 1.3706	* 2.4013 *	
14	* 1.6067	* 1.6191	* 1.5653	* 1.0297	* .9051	* .7513	*	
	* 1.2865	* 1.2774	* 1.3217	* 1.7439	* 1.9420	* 2.4210	*	
15	* .7865	* .8104	* .7853	* .5585	* F-SUB-Q			
	* 2.1851	* 2.1412	* 2.2900	* 3.2997	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 145 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 75% POWER, 460 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3499	* 1.1243	* 1.1826	* 1.0916	* 1.3109	* 1.0494	* 1.3453	* .6695
	* 1.4827	* 1.6639	* 1.5744	* 1.7088	* 1.5279	* 1.7810	* 1.4922	* 2.5006
9	* 1.1243	* 1.4251	* 1.2335	* 1.4102	* 1.2007	* 1.2069	* 1.3547	* .6878
	* 1.6639	* 1.4116	* 1.5083	* 1.4281	* 1.5484	* 1.5462	* 1.4829	* 2.4557
10	* 1.1826	* 1.2330	* 1.1877	* 1.2690	* 1.4189	* 1.2056	* 1.3125	* .6641
	* 1.5744	* 1.5088	* 1.5771	* 1.4635	* 1.4232	* 1.5497	* 1.5315	* 2.6395
11	* 1.0916	* 1.4102	* 1.2690	* 1.4168	* 1.2384	* 1.3719	* .8708	* .4834
	* 1.7088	* 1.4281	* 1.4636	* 1.4264	* 1.5046	* 1.4688	* 2.0086	* 3.7228
12	* 1.3109	* 1.2008	* 1.4189	* 1.2384	* 1.1418	* 1.3778	* .7690	*
	* 1.5279	* 1.5482	* 1.4232	* 1.5046	* 1.6435	* 1.4641	* 2.2258	*
13	* 1.0494	* 1.2074	* 1.2056	* 1.3718	* 1.3779	* 1.2658	* .6260	*
	* 1.7810	* 1.5453	* 1.5496	* 1.4689	* 1.4640	* 1.5920	* 2.7539	*
14	* 1.3453	* 1.3551	* 1.3125	* .8707	* .7689	* .6382	*	*
	* 1.4922	* 1.4825	* 1.5317	* 2.0073	* 2.2257	* 2.7774	*	*
15	* .6695	* .6880	* .6639	* .4833	* F-SUB-Q			
	* 2.5006	* 2.4567	* 2.6396	* 3.7228	* M-SUB-Q			

AT 75% POWER, 460 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6532	* .5654	* .5550	* .5478	* .6343	* .5283	* .5876	* .3240
	* 2.9887	* 3.2294	* 3.2707	* 3.3242	* 3.0829	* 3.4566	* 3.3323	* 5.0583
9	* .5654	* .6491	* .5740	* .6578	* .5590	* .5535	* .5907	* .3281
	* 3.2294	* 3.0153	* 3.1582	* 2.9818	* 3.2406	* 3.2878	* 3.3167	* 5.0394
10	* .5550	* .5739	* .5468	* .5902	* .6630	* .5599	* .5692	* .3142
	* 3.2707	* 3.1591	* 3.3391	* 3.0653	* 2.9645	* 3.2525	* 3.4459	* 5.4620
11	* .5478	* .6578	* .5901	* .6624	* .5649	* .6242	* .4246	* .2369
	* 3.3242	* 2.9819	* 3.0653	* 2.9694	* 3.2134	* 3.1474	* 4.0265	* 7.4509
12	* .6343	* .5591	* .6630	* .5649	* .5297	* .5992	* .3668	*
	* 3.0829	* 3.2401	* 2.9646	* 3.2134	* 3.4529	* 3.2820	* 4.5655	*
13	* .5283	* .5538	* .5599	* .6242	* .5993	* .5406	* .2953	*
	* 3.4566	* 3.2855	* 3.2522	* 3.1475	* 3.2816	* 3.6411	* 5.7170	*
14	* .5876	* .5909	* .5692	* .4245	* .3668	* .2997	*	*
	* 3.3323	* 3.3156	* 3.4460	* 4.0240	* 4.5643	* 5.7918	*	*
15	* .3240	* .3281	* .3142	* .2368	* F-SUB-Q			
	* 5.0583	* 5.0419	* 5.4615	* 7.4505	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 146 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4739 *	* .5665 *	* .6122 *	* .6319 *	* .7363 *	* .6298 *	* .6340 *	* .3303 *
	* 3.6982 *	* 4.2722 *	* 4.1772 *	* 4.0228 *	* 3.4464 *	* 4.0501 *	* 4.0565 *	* 7.1772 *
9	* .5665 *	* .6758 *	* .6442 *	* .7212 *	* .6265 *	* .6173 *	* .6287 *	* .3304 *
	* 4.2722 *	* 3.8192 *	* 3.9870 *	* 3.5368 *	* 4.0544 *	* 4.1331 *	* 4.0890 *	* 7.0856 *
10	* .6122 *	* .6441 *	* .6032 *	* .6316 *	* .6686 *	* .5735 *	* .5576 *	* .2992 *
	* 4.1771 *	* 3.9878 *	* 4.2934 *	* 4.0765 *	* 3.7849 *	* 4.3936 *	* 4.5266 *	* 7.7226 *
11	* .6319 *	* .7214 *	* .6318 *	* .6338 *	* .5252 *	* .5333 *	* .3890 *	* .2018 *
	* 4.0228 *	* 3.5359 *	* 4.0755 *	* 4.0420 *	* 4.7707 *	* 4.4342 *	* 5.9365 *	* 11.3483 *
12	* .7363 *	* .6268 *	* .6691 *	* .5254 *	* .3731 *	* .3951 *	* .2664 *	
	* 3.4464 *	* 4.0520 *	* 3.7826 *	* 4.7695 *	* 5.0525 *	* 4.6716 *	* 7.3001 *	
13	* .6298 *	* .6188 *	* .5741 *	* .5337 *	* .3952 *	* .3148 *	* .1786 *	
	* 4.0501 *	* 4.1231 *	* 4.3891 *	* 4.4325 *	* 4.6712 *	* 5.2738 *	* 9.5110 *	
14	* .6340 *	* .6298 *	* .5582 *	* .3892 *	* .2664 *	* .1827 *		
	* 4.0565 *	* 4.0823 *	* 4.5216 *	* 5.9331 *	* 7.3015 *	* 9.3070 *		
15	* .3303 *	* .3306 *	* .2994 *	* .2020 *	F-SUB-Q			
	* 7.1772 *	* 7.0823 *	* 7.7176 *	* 11.3408 *	M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0124 *	* 1.2122 *	* 1.4325 *	* 1.3554 *	* 1.6371 *	* 1.3791 *	* 1.5979 *	* .7305 *
	* 1.7201 *	* 2.0496 *	* 1.8458 *	* 1.9386 *	* 1.6021 *	* 1.9073 *	* 1.6652 *	* 3.3570 *
9	* 1.2122 *	* 1.4882 *	* 1.5045 *	* 1.5829 *	* 1.4505 *	* 1.4780 *	* 1.5893 *	* .7544 *
	* 2.0496 *	* 1.7923 *	* 1.7596 *	* 1.6680 *	* 1.8131 *	* 1.7851 *	* 1.6636 *	* 3.1991 *
10	* 1.4325 *	* 1.5041 *	* 1.4522 *	* 1.4569 *	* 1.4221 *	* 1.3570 *	* 1.4285 *	* .6984 *
	* 1.8458 *	* 1.7601 *	* 1.8461 *	* 1.8212 *	* 1.8496 *	* 1.9231 *	* 1.8224 *	* 3.4095 *
11	* 1.3554 *	* 1.5831 *	* 1.4571 *	* 1.3494 *	* 1.1907 *	* 1.2828 *	* .8839 *	* .4444 *
	* 1.9386 *	* 1.6677 *	* 1.8209 *	* 1.9564 *	* 2.0833 *	* 1.8898 *	* 2.7045 *	* 5.3314 *
12	* 1.6371 *	* 1.4514 *	* 1.4228 *	* 1.1911 *	* .8359 *	* .9868 *	* .6110 *	
	* 1.6021 *	* 1.8119 *	* 1.8486 *	* 2.0828 *	* 2.1686 *	* 1.8928 *	* 3.2678 *	
13	* 1.3791 *	* 1.4814 *	* 1.3585 *	* 1.2835 *	* .9871 *	* .8332 *	* .4345 *	
	* 1.9073 *	* 1.7811 *	* 1.9210 *	* 1.8891 *	* 1.8925 *	* 2.1100 *	* 4.0190 *	
14	* 1.5979 *	* 1.5916 *	* 1.4300 *	* .8843 *	* .6110 *	* .4370 *		
	* 1.6652 *	* 1.6612 *	* 1.8205 *	* 2.7032 *	* 3.2683 *	* 4.0000 *		
15	* .7305 *	* .7550 *	* .6989 *	* .4446 *	F-SUB-Q			
	* 3.3570 *	* 3.1965 *	* 3.4077 *	* 5.3281 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 147 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1014	* 1.4124	* 1.6863	* 1.5362	* 1.6194	* 1.5972	* 1.7032	* .8108 *
	* 1.8008	* 1.8662	* 1.6046	* 1.7571	* 1.6578	* 1.6828	* 1.5793	* 3.0606 *
9	* 1.4124	* 1.6664	* 1.7367	* 1.6373	* 1.7025	* 1.7362	* 1.6607	* .8467 *
	* 1.8662	* 1.6284	* 1.5587	* 1.6548	* 1.5806	* 1.5492	* 1.6186	* 2.8919 *
10	* 1.6863	* 1.7363	* 1.7597	* 1.6807	* 1.5555	* 1.5900	* 1.6065	* .8061 *
	* 1.6046	* 1.5590	* 1.5432	* 1.6090	* 1.7230	* 1.6811	* 1.6576	* 3.0170 *
11	* 1.5362	* 1.6374	* 1.6810	* 1.5316	* 1.3620	* 1.3106	* 1.0187	* .5149 *
	* 1.7571	* 1.6547	* 1.6088	* 1.7608	* 1.8088	* 1.9472	* 2.4069	* 4.7146 *
12	* 1.6194	* 1.7049	* 1.5573	* 1.3626	* .9805	* 1.0220	* .6811	*
	* 1.6578	* 1.5784	* 1.7211	* 1.8086	* 1.8285	* 1.8785	* 2.9975	*
13	* 1.5972	* 1.7404	* 1.5919	* 1.3115	* 1.0224	* 1.0073	* .5126	*
	* 1.6828	* 1.5455	* 1.6791	* 1.9465	* 1.8781	* 1.7871	* 3.4825	*
14	* 1.7032	* 1.6633	* 1.6083	* 1.0191	* .6811	* .5215	*	*
	* 1.5793	* 1.6161	* 1.6558	* 2.4059	* 2.9977	* 3.4252	*	*
15	* .8108	* .8474	* .8066	* .5152	* F-SUB-Q			
	* 3.0606	* 2.8898	* 3.0153	* 4.7116	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1885	* 1.4986	* 1.8022	* 1.6238	* 1.7286	* 1.6965	* 1.8375	* .8192 *
	* 1.7201	* 1.8357	* 1.5438	* 1.7102	* 1.5976	* 1.6273	* 1.4999	* 3.0606 *
9	* 1.4986	* 1.7978	* 1.8571	* 1.7644	* 1.8135	* 1.8654	* 1.7918	* .8558 *
	* 1.8357	* 1.5511	* 1.4982	* 1.5777	* 1.5256	* 1.4800	* 1.5380	* 2.8919 *
10	* 1.8022	* 1.8567	* 1.8959	* 1.7936	* 1.6759	* 1.7066	* 1.7466	* .8281 *
	* 1.5438	* 1.4986	* 1.4695	* 1.5489	* 1.6457	* 1.6106	* 1.5663	* 3.0170 *
11	* 1.6238	* 1.7645	* 1.7939	* 1.6509	* 1.4411	* 1.4056	* 1.0581	* .5298 *
	* 1.7102	* 1.5776	* 1.5486	* 1.6796	* 1.7386	* 1.8730	* 2.3885	* 4.7146 *
12	* 1.7286	* 1.8163	* 1.6779	* 1.4417	* 1.0389	* 1.0936	* .6921	*
	* 1.5976	* 1.5231	* 1.6438	* 1.7384	* 1.7503	* 1.8025	* 2.9975	*
13	* 1.6965	* 1.8701	* 1.7088	* 1.4066	* 1.0941	* 1.1152	* .5368	*
	* 1.6273	* 1.4768	* 1.6086	* 1.8723	* 1.8020	* 1.6661	* 3.4323	*
14	* 1.8375	* 1.7946	* 1.7486	* 1.0586	* .6922	* .5477	*	*
	* 1.4999	* 1.5357	* 1.5645	* 2.3873	* 2.9977	* 3.3673	*	*
15	* .8192	* .8565	* .8286	* .5302	* F-SUB-Q			
	* 3.0606	* 2.8898	* 3.0153	* 4.7116	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 148 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2282	* 1.5131	* 1.8188	* 1.6355	* 1.7642	* 1.7120	* 1.8788	* .8211 *
	* 1.7990	* 1.9015	* 1.5881	* 1.7612	* 1.6215	* 1.6709	* 1.5200	* 3.2082 *
9	* 1.5131	* 1.8334	* 1.8805	* 1.7991	* 1.8323	* 1.8931	* 1.8337	* .8610 *
	* 1.9015	* 1.5792	* 1.5358	* 1.6061	* 1.5632	* 1.5085	* 1.5574	* 3.0215 *
10	* 1.8188	* 1.8800	* 1.9203	* 1.8142	* 1.7098	* 1.7319	* 1.7928	* .8358 *
	* 1.5881	* 1.5362	* 1.5052	* 1.5893	* 1.6696	* 1.6419	* 1.5793	* 3.1025 *
11	* 1.6355	* 1.7992	* 1.8144	* 1.6833	* 1.4628	* 1.4381	* 1.0735	* .5309 *
	* 1.7612	* 1.6061	* 1.5891	* 1.7113	* 1.7804	* 1.9023	* 2.4339	* 4.8673 *
12	* 1.7642	* 1.8352	* 1.7120	* 1.4634	* 1.0653	* 1.1318	* .7011	* .7011 *
	* 1.6215	* 1.5605	* 1.6675	* 1.7801	* 1.7928	* 1.8267	* 3.1364	* 3.1364 *
13	* 1.7120	* 1.8973	* 1.7341	* 1.4392	* 1.1324	* 1.1659	* .5492	* .5492 *
	* 1.6709	* 1.5052	* 1.6397	* 1.9016	* 1.8264	* 1.6721	* 3.5116	* 3.5116 *
14	* 1.8788	* 1.8366	* 1.7950	* 1.0741	* .7014	* .5611		
	* 1.5200	* 1.5550	* 1.5774	* 2.4324	* 3.1358	* 3.4408		
15	* .8211	* .8618	* .8364	* .5313	* F-SUB-Q			
	* 3.2082	* 3.0193	* 3.1006	* 4.8636	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2506	* 1.5046	* 1.8054	* 1.6240	* 1.7633	* 1.7013	* 1.8809	* .8194 *
	* 1.8895	* 1.9950	* 1.6629	* 1.8442	* 1.6846	* 1.7437	* 1.5739	* 3.3363 *
9	* 1.5046	* 1.8300	* 1.8722	* 1.7966	* 1.8226	* 1.8907	* 1.8370	* .8610 *
	* 1.9950	* 1.6463	* 1.6029	* 1.6711	* 1.6320	* 1.5646	* 1.6113	* 3.1354 *
10	* 1.8054	* 1.8717	* 1.9114	* 1.8061	* 1.7094	* 1.7285	* 1.7997	* .8363 *
	* 1.6629	* 1.6034	* 1.5720	* 1.6582	* 1.7367	* 1.7104	* 1.6330	* 3.2144 *
11	* 1.6240	* 1.7967	* 1.8064	* 1.6824	* 1.4651	* 1.4443	* 1.0785	* .5285 *
	* 1.8442	* 1.6710	* 1.6580	* 1.7801	* 1.8674	* 1.9849	* 2.5286	* 5.0938 *
12	* 1.7633	* 1.8256	* 1.7116	* 1.4657	* 1.0830	* 1.1529	* .7089	* .7089 *
	* 1.6846	* 1.6290	* 1.7345	* 1.8670	* 1.8840	* 1.9058	* 3.2773	* 3.2773 *
13	* 1.7013	* 1.8950	* 1.7308	* 1.4455	* 1.1535	* 1.1939	* .5581	* .5581 *
	* 1.7437	* 1.5611	* 1.7082	* 1.9839	* 1.9056	* 1.7410	* 3.6753	* 3.6753 *
14	* 1.8809	* 1.8400	* 1.8020	* 1.0792	* .7093	* .5703		
	* 1.5739	* 1.6087	* 1.6310	* 2.5268	* 3.2763	* 3.6001		
15	* .8194	* .8618	* .8369	* .5289	* F-SUB-Q			
	* 3.3363	* 3.1330	* 3.2122	* 5.0896	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 149 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2633	* 1.5002	* 1.8016	* 1.6189	* 1.7690	* 1.6974	* 1.8941	* .8103
	* 1.9662	* 2.0867	* 1.7594	* 1.9536	* 1.7708	* 1.8415	* 1.6435	* 3.5445
9	* 1.5002	* 1.8368	* 1.8724	* 1.8047	* 1.8217	* 1.8967	* 1.8497	* .8499
	* 2.0867	* 1.7312	* 1.6917	* 1.7555	* 1.7214	* 1.6415	* 1.6832	* 3.3378
10	* 1.8016	* 1.8718	* 1.9125	* 1.8073	* 1.7194	* 1.7333	* 1.8154	* .8274
	* 1.7594	* 1.6922	* 1.6573	* 1.7489	* 1.8227	* 1.8004	* 1.7068	* 3.4226
11	* 1.6189	* 1.8048	* 1.8076	* 1.6922	* 1.4740	* 1.4596	* 1.0732	* .5215
	* 1.9536	* 1.7555	* 1.7486	* 1.8696	* 1.9616	* 2.0612	* 2.6901	* 5.4558
12	* 1.7690	* 1.8249	* 1.7217	* 1.4747	* 1.0923	* 1.1753	* .7060	*
	* 1.7708	* 1.7181	* 1.8202	* 1.9612	* 1.9778	* 1.9886	* 3.4926	*
13	* 1.6974	* 1.9011	* 1.7357	* 1.4608	* 1.1759	* 1.2259	* .5612	*
	* 1.8415	* 1.6377	* 1.7979	* 2.0598	* 1.9884	* 1.8154	* 3.9072	*
14	* 1.8941	* 1.8527	* 1.8177	* 1.0741	* .7064	* .5737	*	*
	* 1.6435	* 1.6803	* 1.7046	* 2.6879	* 3.4914	* 3.8263	*	*
15	* .8103	* .8507	* .8281	* .5220	* F-SUB-Q			
	* 3.5445	* 3.3353	* 3.4201	* 5.4510	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2590	* 1.4884	* 1.7886	* 1.6066	* 1.7619	* 1.6852	* 1.8911	* .8033
	* 2.1010	* 2.2413	* 1.9030	* 2.1138	* 1.9060	* 1.9870	* 1.7605	* 3.8197
9	* 1.4884	* 1.8297	* 1.8624	* 1.7992	* 1.8109	* 1.8910	* 1.8470	* .8413
	* 2.2413	* 1.8660	* 1.8260	* 1.8902	* 1.8561	* 1.7619	* 1.8031	* 3.6034
10	* 1.7886	* 1.8618	* 1.9033	* 1.7992	* 1.7163	* 1.7286	* 1.8166	* .8203
	* 1.9030	* 1.8266	* 1.7878	* 1.8864	* 1.9590	* 1.9352	* 1.8279	* 3.6955
11	* 1.6066	* 1.7993	* 1.7994	* 1.6895	* 1.4745	* 1.4637	* 1.0696	* .5172
	* 2.1138	* 1.8901	* 1.8861	* 2.0121	* 2.0784	* 2.1829	* 2.8805	* 5.9069
12	* 1.7619	* 1.8142	* 1.7187	* 1.4752	* 1.0944	* 1.1861	* .7066	*
	* 1.9060	* 1.8525	* 1.9563	* 2.0779	* 2.1032	* 2.1160	* 3.7259	*
13	* 1.6852	* 1.8955	* 1.7310	* 1.4649	* 1.1868	* 1.2473	* .5663	*
	* 1.9870	* 1.7577	* 1.9324	* 2.1813	* 2.1151	* 1.9330	* 4.1934	*
14	* 1.8911	* 1.8500	* 1.8190	* 1.0705	* .7070	* .5787	*	*
	* 1.7605	* 1.7998	* 1.8255	* 2.8783	* 3.7244	* 4.1074	*	*
15	* .8033	* .8420	* .8211	* .5177	* F-SUB-Q			
	* 3.8197	* 3.6006	* 3.6926	* 5.9013	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 150 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2625	* 1.4839	* 1.7841	* 1.6010	* 1.7621	* 1.6791	* 1.8952	* .7953 *
	* 2.2899	* 2.4255	* 2.0678	* 2.2904	* 2.0415	* 2.1329	* 1.8761	* 4.0996 *
9	* 1.4839	* 1.8327	* 1.8612	* 1.8031	* 1.8073	* 1.8918	* 1.8509	* .8308 *
	* 2.4255	* 2.0237	* 1.9810	* 2.0412	* 1.9939	* 1.8841	* 1.9224	* 3.8781 *
10	* 1.7841	* 1.8605	* 1.9031	* 1.7994	* 1.7218	* 1.7312	* 1.8252	* .8129 *
	* 2.0678	* 1.9816	* 1.9394	* 2.0417	* 2.0978	* 2.0716	* 1.9489	* 3.9695 *
11	* 1.6010	* 1.8032	* 1.7997	* 1.6967	* 1.4837	* 1.4770	* 1.0676	* .5129 *
	* 2.2904	* 2.0412	* 2.0414	* 2.1716	* 2.2417	* 2.3469	* 3.1152	* 6.3548 *
12	* 1.7621	* 1.8108	* 1.7242	* 1.4844	* 1.1021	* 1.2062	* .7092	* .7092 *
	* 2.0415	* 1.9900	* 2.0949	* 2.2413	* 2.2725	* 2.2670	* 4.0449	* 4.0449 *
13	* 1.6791	* 1.8963	* 1.7337	* 1.4783	* 1.2069	* 1.2803	* .5741	* .5741 *
	* 2.1329	* 1.8796	* 2.0686	* 2.3453	* 2.2668	* 2.0656	* 4.5311	* 4.5311 *
14	* 1.8952	* 1.8544	* 1.8277	* 1.0686	* .7097	* .5868		
	* 1.8761	* 1.9189	* 1.9463	* 3.1125	* 4.0431	* 4.4377		
15	* .7953	* .8315	* .8136	* .5134	* F-SUB-Q			
	* 4.0996	* 3.8751	* 3.9663	* 6.3485	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2525	* 1.4678	* 1.7567	* 1.5763	* 1.7301	* 1.6510	* 1.8594	* .7934 *
	* 2.5508	* 2.6952	* 2.2797	* 2.5232	* 2.2380	* 2.3328	* 2.0562	* 4.4046 *
9	* 1.4678	* 1.8042	* 1.8352	* 1.7742	* 1.7779	* 1.8634	* 1.8197	* .8332 *
	* 2.6952	* 2.2319	* 2.1800	* 2.2501	* 2.1833	* 2.0575	* 2.1027	* 4.1431 *
10	* 1.7567	* 1.8345	* 1.8769	* 1.7761	* 1.6957	* 1.7108	* 1.7999	* .8160 *
	* 2.2797	* 2.1807	* 2.1333	* 2.2458	* 2.2979	* 2.2571	* 2.1246	* 4.2281 *
11	* 1.5763	* 1.7742	* 1.7764	* 1.6747	* 1.4793	* 1.4669	* 1.0766	* .5148 *
	* 2.5232	* 2.2501	* 2.2455	* 2.3935	* 2.4971	* 2.5945	* 3.3467	* 6.7673 *
12	* 1.7301	* 1.7815	* 1.6980	* 1.4800	* 1.1168	* 1.2178	* .7290	* .7290 *
	* 2.2380	* 2.1790	* 2.2947	* 2.4966	* 2.5326	* 2.5231	* 4.4021	* 4.4021 *
13	* 1.6510	* 1.8678	* 1.7133	* 1.4682	* 1.2185	* 1.3053	* .5946	* .5946 *
	* 2.3328	* 2.0527	* 2.2538	* 2.5925	* 2.5229	* 2.2979	* 4.9456	* 4.9456 *
14	* 1.8594	* 1.8232	* 1.8024	* 1.0776	* .7295	* .6081		
	* 2.0562	* 2.0987	* 2.1218	* 3.3434	* 4.4001	* 4.8404		
15	* .7934	* .8340	* .8168	* .5153	* F-SUB-Q			
	* 4.4046	* 4.1398	* 4.2244	* 6.7604	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 151 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3123	* 1.4924	* 1.7749	* 1.5869	* 1.7479	* 1.6582	* 1.8846	* .7831
	* 2.8026	* 2.9877	* 2.4399	* 2.6947	* 2.3683	* 2.4800	* 2.1577	* 4.7224
9	* 1.4924	* 1.8363	* 1.8570	* 1.8028	* 1.7920	* 1.8820	* 1.8453	* .8188
	* 2.9877	* 2.3801	* 2.3290	* 2.3889	* 2.3186	* 2.1735	* 2.2109	* 4.4658
10	* 1.7749	* 1.8563	* 1.9011	* 1.7984	* 1.7249	* 1.7342	* 1.8322	* .8051
	* 2.4399	* 2.3298	* 2.2776	* 2.3941	* 2.4282	* 2.3929	* 2.2394	* 4.5718
11	* 1.5869	* 1.8028	* 1.7987	* 1.7104	* 1.5263	* 1.5151	* 1.0798	* .5113
	* 2.6947	* 2.3888	* 2.3937	* 2.5381	* 2.7222	* 2.8214	* 3.6237	* 7.3379
12	* 1.7479	* 1.7956	* 1.7274	* 1.5271	* 1.1708	* 1.2989	* .7421	*
	* 2.3683	* 2.3139	* 2.4248	* 2.7216	* 2.7691	* 2.7547	* 4.9221	*
13	* 1.6582	* 1.8865	* 1.7367	* 1.5164	* 1.2997	* 1.4083	* .6181	*
	* 2.4800	* 2.1684	* 2.3894	* 2.8194	* 2.7535	* 2.5109	* 5.5417	*
14	* 1.8846	* 1.8489	* 1.8347	* 1.0809	* .7425	* .6315	*	*
	* 2.1577	* 2.2066	* 2.2363	* 3.6200	* 4.9198	* 5.4293	*	*
15	* .7831	* .8196	* .8059	* .5119	* F-SUB-Q			
	* 4.7224	* 4.4623	* 4.5679	* 7.3303	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4590	* 1.5162	* 1.7868	* 1.5847	* 1.7444	* 1.6507	* 1.8819	* .7787
	* 2.8716	* 3.0642	* 2.6523	* 2.9330	* 2.5598	* 2.6841	* 2.3228	* 5.0838
9	* 1.5162	* 1.8470	* 1.8622	* 1.8084	* 1.7879	* 1.8800	* 1.8455	* .8143
	* 3.0642	* 2.5815	* 2.5339	* 2.5939	* 2.5095	* 2.3433	* 2.3798	* 4.8089
10	* 1.7868	* 1.8614	* 1.9071	* 1.8043	* 1.7322	* 1.7418	* 1.8409	* .8032
	* 2.6523	* 2.5349	* 2.4765	* 2.6014	* 2.6214	* 2.5803	* 2.4081	* 4.9208
11	* 1.5847	* 1.8084	* 1.8046	* 1.7267	* 1.5740	* 1.5523	* 1.0936	* .5134
	* 2.9330	* 2.5938	* 2.6010	* 2.7472	* 2.8863	* 2.9763	* 3.9083	* 7.8952
12	* 1.7444	* 1.7916	* 1.7347	* 1.5748	* 1.2898	* 1.4252	* .7735	*
	* 2.5598	* 2.5044	* 2.6177	* 2.8856	* 2.9579	* 2.9458	* 5.2914	*
13	* 1.6507	* 1.8846	* 1.7443	* 1.5536	* 1.4260	* 1.5337	* .6559	*
	* 2.6841	* 2.3378	* 2.5765	* 2.9739	* 2.9444	* 2.7261	* 6.0289	*
14	* 1.8819	* 1.8491	* 1.8435	* 1.0947	* .7740	* .6698	*	*
	* 2.3228	* 2.3751	* 2.4048	* 3.9042	* 5.2886	* 5.9085	*	*
15	* .7787	* .8151	* .8040	* .5139	* F-SUB-Q			
	* 5.0838	* 4.8050	* 4.9164	* 7.8869	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 152 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5789	* 1.5265	* 1.7819	* 1.5683	* 1.7193	* 1.6284	* 1.8534	* .7765 *
	* 2.9149	* 3.1020	* 2.6143	* 2.8806	* 2.5569	* 2.6915	* 2.3627	* 5.1504 *
9	* 1.5265	* 1.8344	* 1.8487	* 1.7908	* 1.7662	* 1.8585	* 1.8220	* .8148 *
	* 3.1020	* 2.5495	* 2.4941	* 2.5688	* 2.5162	* 2.3773	* 2.4233	* 4.8628 *
10	* 1.7819	* 1.8479	* 1.8937	* 1.7928	* 1.7173	* 1.7324	* 1.8261	* .8064 *
	* 2.6143	* 2.4951	* 2.4500	* 2.5832	* 2.6562	* 2.6397	* 2.4857	* 5.0227 *
11	* 1.5683	* 1.7908	* 1.7930	* 1.7209	* 1.6057	* 1.5686	* 1.1110	* .5167 *
	* 2.8806	* 2.5688	* 2.5828	* 2.7501	* 2.9160	* 3.0121	* 3.9840	* 8.2008 *
12	* 1.7193	* 1.7698	* 1.7198	* 1.6065	* 1.5193	* 1.5283	* .8112 *	
	* 2.5569	* 2.5114	* 2.6522	* 2.9152	* 2.9890	* 2.9807	* 5.2599 *	
13	* 1.6284	* 1.8630	* 1.7349	* 1.5700	* 1.5291	* 1.6373	* .6968 *	
	* 2.6915	* 2.3718	* 2.6356	* 3.0096	* 2.9792	* 2.7561	* 6.0130 *	
14	* 1.8534	* 1.8256	* 1.8287	* 1.1121	* .8117	* .7122 *		
	* 2.3627	* 2.4193	* 2.4820	* 3.9797	* 5.2568	* 5.8885 *		
15	* .7765	* .8156	* .8072	* .5173	* F-SUB-Q			
	* 5.1504	* 4.8586	* 5.0176	* 8.1909	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6473	* 1.5461	* 1.8016	* 1.5742	* 1.7312	* 1.6308	* 1.8728	* .7647 *
	* 2.8338	* 3.0279	* 2.4883	* 2.7476	* 2.4283	* 2.5693	* 2.2341	* 4.9959 *
9	* 1.5461	* 1.8610	* 1.8651	* 1.8140	* 1.7749	* 1.8716	* 1.8423	* .7989 *
	* 3.0279	* 2.4128	* 2.3702	* 2.4314	* 2.3964	* 2.2573	* 2.2934	* 4.7395 *
10	* 1.8016	* 1.8643	* 1.9126	* 1.8099	* 1.7417	* 1.7521	* 1.8535	* .7939 *
	* 2.4883	* 2.3711	* 2.3260	* 2.4556	* 2.5154	* 2.5074	* 2.3506	* 4.8884 *
11	* 1.5742	* 1.8140	* 1.8102	* 1.7522	* 1.6517	* 1.6149	* 1.1116	* .5116 *
	* 2.7476	* 2.4314	* 2.4552	* 2.6014	* 2.8090	* 2.8843	* 3.8568	* 7.9748 *
12	* 1.7312	* 1.7786	* 1.7442	* 1.6521	* 1.6070	* 1.6158	* .8211 *	
	* 2.4283	* 2.3915	* 2.5116	* 2.8084	* 2.8808	* 2.8423	* 5.1068 *	
13	* 1.6308	* 1.8762	* 1.7546	* 1.6162	* 1.6166	* 1.7446	* .7182 *	
	* 2.5693	* 2.2520	* 2.5035	* 2.8821	* 2.8410	* 2.6160	* 5.7759 *	
14	* 1.8728	* 1.8460	* 1.8562	* 1.1128	* .8215	* .7331 *		
	* 2.2341	* 2.2896	* 2.3470	* 3.8520	* 5.1041	* 5.6639 *		
15	* .7647	* .7997	* .7948	* .5122	* F-SUB-Q			
	* 4.9959	* 4.7353	* 4.8832	* 7.9648	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 153 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6596	* 1.5432	* 1.7970	* 1.5647	* 1.7232	* 1.6188	* 1.8678	* .7560 *
	* 2.5831	* 2.7734	* 2.3721	* 2.6188	* 2.3115	* 2.4536	* 2.1234	* 4.7487 *
9	* 1.5432	* 1.8595	* 1.8597	* 1.8120	* 1.7656	* 1.8652	* 1.8392	* .7875 *
	* 2.7734	* 2.2916	* 2.2570	* 2.3099	* 2.2848	* 2.1506	* 2.1801	* 4.5187 *
10	* 1.7970	* 1.8588	* 1.9086	* 1.8062	* 1.7414	* 1.7510	* 1.8559	* .7856 *
	* 2.3721	* 2.2579	* 2.2146	* 2.3378	* 2.3863	* 2.3854	* 2.2288	* 4.6407 *
11	* 1.5647	* 1.8120	* 1.8065	* 1.7560	* 1.6749	* 1.6294	* 1.1104	* .5079 *
	* 2.6188	* 2.3099	* 2.3374	* 2.4428	* 2.5598	* 2.6222	* 3.5516	* 7.5164 *
12	* 1.7232	* 1.7694	* 1.7440	* 1.6754	* 1.6380	* 1.6503	* .8278	* .7560 *
	* 2.3115	* 2.2802	* 2.3828	* 2.5592	* 2.6267	* 2.5871	* 4.6923	* 4.7487 *
13	* 1.6188	* 1.8698	* 1.7535	* 1.6307	* 1.6511	* 1.7961	* .7312	* .7875 *
	* 2.4536	* 2.1456	* 2.3819	* 2.6202	* 2.5859	* 2.3777	* 5.3027	* 4.5187 *
14	* 1.8678	* 1.8429	* 1.8586	* 1.1117	* .8283	* .7462		
	* 2.1234	* 2.1765	* 2.2257	* 3.5477	* 4.6896	* 5.2010		
15	* .7560	* .7883	* .7864	* .5085	* F-SUB-Q			
	* 4.7486	* 4.5150	* 4.6361	* 7.5074	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6470	* 1.5268	* 1.7789	* 1.5464	* 1.7046	* 1.5990	* 1.8485	* .7476 *
	* 2.3768	* 2.5487	* 2.1442	* 2.3679	* 2.0900	* 2.2243	* 1.9200	* 4.2949 *
9	* 1.5268	* 1.8423	* 1.8417	* 1.7957	* 1.7461	* 1.8472	* 1.8221	* .7814 *
	* 2.5487	* 2.0648	* 2.0373	* 2.0815	* 2.0671	* 1.9449	* 1.9694	* 4.0734 *
10	* 1.7789	* 1.8408	* 1.8908	* 1.7901	* 1.7270	* 1.7370	* 1.8423	* .7796 *
	* 2.1442	* 2.0381	* 1.9981	* 2.1063	* 2.1496	* 2.1472	* 2.0049	* 4.1833 *
11	* 1.5464	* 1.7957	* 1.7903	* 1.7436	* 1.6741	* 1.6239	* 1.1069	* .5041 *
	* 2.3679	* 2.0815	* 2.1059	* 2.2141	* 2.3615	* 2.4115	* 3.2497	* 6.7797 *
12	* 1.7046	* 1.7499	* 1.7295	* 1.6745	* 1.6408	* 1.6556	* .8313	* .7521 *
	* 2.0900	* 2.0629	* 2.1465	* 2.3609	* 2.4254	* 2.3865	* 4.3254	* 4.7901 *
13	* 1.5990	* 1.8518	* 1.7395	* 1.6252	* 1.6564	* 1.8104	* .7371	
	* 2.2243	* 1.9405	* 2.1440	* 2.4096	* 2.3854	* 2.1861	* 4.8827	
14	* 1.8485	* 1.8258	* 1.8450	* 1.1082	* .8318	* .7521		
	* 1.9200	* 1.9664	* 2.0020	* 3.2460	* 4.3230	* 4.7901		
15	* .7476	* .7822	* .7805	* .5047	* F-SUB-Q			
	* 4.2949	* 4.0699	* 4.1789	* 6.7716	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 154 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6135	* 1.4984	* 1.7453	* 1.5174	* 1.6711	* 1.5689	* 1.8104	* .7421 *
	* 2.3690	* 2.5379	* 2.1216	* 2.3431	* 2.0734	* 2.2043	* 1.9070	* 4.2186 *
9	* 1.4984	* 1.8051	* 1.8082	* 1.7602	* 1.7132	* 1.8143	* 1.7868	* .7779 *
	* 2.5379	* 2.0448	* 2.0127	* 2.0619	* 2.0480	* 1.9247	* 1.9543	* 3.9891 *
10	* 1.7453	* 1.8073	* 1.8562	* 1.7586	* 1.6938	* 1.7076	* 1.8091	* .7768 *
	* 2.1216	* 2.0135	* 1.9743	* 2.0810	* 2.1302	* 2.1209	* 1.9834	* 4.0895 *
11	* 1.5174	* 1.7602	* 1.7588	* 1.7109	* 1.6523	* 1.5967	* 1.1030	* .5016 *
	* 2.3431	* 2.0619	* 2.0807	* 2.1903	* 2.3489	* 2.4035	* 3.1775	* 6.6305 *
12	* 1.6711	* 1.7170	* 1.6963	* 1.6527	* 1.6214	* 1.6348	* .8352 *	
	* 2.0734	* 2.0437	* 2.1271	* 2.3484	* 2.4142	* 2.3812	* 4.2360 *	
13	* 1.5689	* 1.8188	* 1.7100	* 1.5981	* 1.6356	* 1.7931	* .7401 *	
	* 2.2043	* 1.9203	* 2.1177	* 2.4015	* 2.3800	* 2.1895	* 4.8275 *	
14	* 1.8104	* 1.7904	* 1.8117	* 1.1043	* .8358	* .7557 *		
	* 1.9070	* 1.9509	* 1.9806	* 3.1736	* 4.2335	* 4.7322 *		
15	* .7421	* .7787	* .7776	* .5022	* F-SUB-Q			
	* 4.2186	* 3.9857	* 4.0854	* 6.6225	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6186	* 1.4906	* 1.7421	* 1.5110	* 1.6735	* 1.5623	* 1.8196	* .7253 *
	* 2.1352	* 2.2890	* 1.9243	* 2.1329	* 1.8811	* 2.0116	* 1.7249	* 3.9326 *
9	* 1.4906	* 1.8112	* 1.8070	* 1.7673	* 1.7105	* 1.8156	* 1.7950	* .7561 *
	* 2.2890	* 1.8435	* 1.8228	* 1.8604	* 1.8623	* 1.7468	* 1.7673	* 3.7394 *
10	* 1.7421	* 1.8061	* 1.8559	* 1.7572	* 1.7010	* 1.7078	* 1.8184	* .7569 *
	* 1.9243	* 1.8237	* 1.7867	* 1.8853	* 1.9233	* 1.9215	* 1.7885	* 3.8167 *
11	* 1.5110	* 1.7672	* 1.7575	* 1.7186	* 1.6556	* 1.6073	* 1.0823	* .4894 *
	* 2.1329	* 1.8604	* 1.8850	* 1.9718	* 2.1315	* 2.1542	* 2.9242	* 6.1621 *
12	* 1.6735	* 1.7143	* 1.7036	* 1.6560	* 1.6250	* 1.6499	* .8140 *	
	* 1.8811	* 1.8584	* 1.9204	* 2.1304	* 2.1922	* 2.1576	* 3.9670 *	
13	* 1.5623	* 1.8202	* 1.7103	* 1.6086	* 1.6501	* 1.8120	* .7268 *	
	* 2.0116	* 1.7428	* 1.9186	* 2.1524	* 2.1565	* 1.9727	* 4.4861 *	
14	* 1.8196	* 1.7986	* 1.8210	* 1.0836	* .8145	* .7413 *		
	* 1.7249	* 1.7639	* 1.7860	* 2.9205	* 3.9647	* 4.4024 *		
15	* .7253	* .7569	* .7577	* .4900	* F-SUB-Q			
	* 3.9326	* 3.7361	* 3.8128	* 6.1546	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 155 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5962	* 1.4692	* 1.7194	* 1.4895	* 1.6504	* 1.5403	* 1.7957	* .7131 *
	* 1.9564	* 2.1231	* 1.7810	* 1.9805	* 1.7517	* 1.8740	* 1.6064	* 3.6856 *
9	* 1.4692	* 1.7880	* 1.7844	* 1.7450	* 1.6875	* 1.7932	* 1.7718	* .7435 *
	* 2.1231	* 1.7028	* 1.6855	* 1.7226	* 1.7318	* 1.6234	* 1.6436	* 3.5028 *
10	* 1.7194	* 1.7835	* 1.8326	* 1.7351	* 1.6794	* 1.6865	* 1.7954	* .7446 *
	* 1.7810	* 1.6864	* 1.6519	* 1.7443	* 1.7823	* 1.7797	* 1.6574	* 3.5649 *
11	* 1.4895	* 1.7450	* 1.7353	* 1.6971	* 1.6355	* 1.5874	* 1.0663	* .4813 *
	* 1.9805	* 1.7227	* 1.7440	* 1.8190	* 1.9563	* 1.9920	* 2.6949	* 5.7298 *
12	* 1.6504	* 1.6912	* 1.6819	* 1.6359	* 1.6055	* 1.6302	* .8019	* *
	* 1.7517	* 1.7281	* 1.7797	* 1.9558	* 2.0027	* 1.9746	* 3.6498	* *
13	* 1.5403	* 1.7976	* 1.6890	* 1.5888	* 1.6304	* 1.7908	* .7161	* *
	* 1.8740	* 1.6196	* 1.7770	* 1.9904	* 1.9736	* 1.8123	* 4.1372	* *
14	* 1.7957	* 1.7754	* 1.7980	* 1.0676	* .8023	* .7303	* *	* *
	* 1.6064	* 1.6405	* 1.6551	* 2.6917	* 3.6477	* 4.0605	* *	* *
15	* .7131	* .7443	* .7454	* .4819	* F-SUB-Q			
	* 3.6856	* 3.4997	* 3.5612	* 5.7229	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5419	* 1.4324	* 1.6744	* 1.4509	* 1.5960	* 1.5003	* 1.7316	* .7054 *
	* 1.8801	* 1.9785	* 1.6788	* 1.8821	* 1.6829	* 1.7880	* 1.5487	* 3.4736 *
9	* 1.4324	* 1.7294	* 1.7366	* 1.6877	* 1.6410	* 1.7421	* 1.7106	* .7409 *
	* 1.9785	* 1.6210	* 1.5979	* 1.6460	* 1.6525	* 1.5512	* 1.5806	* 3.2764 *
10	* 1.6744	* 1.7357	* 1.7821	* 1.6890	* 1.6234	* 1.6403	* 1.7332	* .7404 *
	* 1.6788	* 1.5987	* 1.5668	* 1.6537	* 1.7046	* 1.6910	* 1.5878	* 3.3321 *
11	* 1.4509	* 1.6876	* 1.6892	* 1.6408	* 1.5894	* 1.5321	* 1.0548	* .4777 *
	* 1.8821	* 1.6461	* 1.6535	* 1.7297	* 1.8633	* 1.8890	* 2.4981	* 5.3369 *
12	* 1.5959	* 1.6446	* 1.6258	* 1.5898	* 1.5607	* 1.5701	* .7993	* *
	* 1.6829	* 1.6490	* 1.7021	* 1.8624	* 1.9028	* 1.8896	* 3.3935	* *
13	* 1.5003	* 1.7464	* 1.6427	* 1.5334	* 1.5708	* 1.7225	* .7080	* *
	* 1.7880	* 1.5477	* 1.6886	* 1.8874	* 1.8887	* 1.7330	* 3.8603	* *
14	* 1.7316	* 1.7140	* 1.7357	* 1.0559	* .7998	* .7227	* *	* *
	* 1.5487	* 1.5776	* 1.5855	* 2.4953	* 3.3915	* 3.7848	* *	* *
15	* .7054	* .7416	* .7411	* .4782	* F-SUB-Q			
	* 3.4736	* 3.2736	* 3.3289	* 5.3307	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 156 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5244	* 1.4159	* 1.6556	* 1.4333	* 1.5704	* 1.4807	* 1.7052	* .6867
	* 1.7334	* 1.8575	* 1.5753	* 1.7838	* 1.6098	* 1.7031	* 1.4792	* 3.3652
9	* 1.4159	* 1.7034	* 1.7151	* 1.6629	* 1.6207	* 1.7181	* 1.6818	* .7173
	* 1.8575	* 1.5331	* 1.5103	* 1.5620	* 1.5705	* 1.4772	* 1.5103	* 3.1907
10	* 1.6556	* 1.7142	* 1.7584	* 1.6690	* 1.5997	* 1.6200	* 1.7016	* .7147
	* 1.5753	* 1.5111	* 1.4822	* 1.5624	* 1.6180	* 1.6010	* 1.5136	* 3.2462
11	* 1.4333	* 1.6628	* 1.6692	* 1.6169	* 1.5681	* 1.5104	* 1.0229	* .4636
	* 1.7838	* 1.5621	* 1.5622	* 1.6324	* 1.7404	* 1.7743	* 2.3929	* 5.1467
12	* 1.5704	* 1.6242	* 1.6020	* 1.5685	* 1.5389	* 1.5442	* .7725	*
	* 1.6098	* 1.5673	* 1.6157	* 1.7396	* 1.7887	* 1.7836	* 3.2431	*
13	* 1.4807	* 1.7223	* 1.6223	* 1.5116	* 1.5449	* 1.6812	* .6814	*
	* 1.7031	* 1.4738	* 1.5987	* 1.7728	* 1.7827	* 1.6612	* 3.7524	*
14	* 1.7052	* 1.6852	* 1.7040	* 1.0240	* .7729	* .6949	*	*
	* 1.4792	* 1.5074	* 1.5114	* 2.3902	* 3.2414	* 3.6832	*	*
15	* .6867	* .7181	* .7155	* .4641	* F-SUB-Q			
	* 3.3652	* 3.1879	* 3.2430	* 5.1408	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4627	* 1.3570	* 1.5690	* 1.3723	* 1.4969	* 1.4100	* 1.6139	* .6731
	* 1.6105	* 1.8155	* 1.5675	* 1.7682	* 1.5488	* 1.7023	* 1.4884	* 3.2797
9	* 1.3570	* 1.6073	* 1.6280	* 1.5704	* 1.5404	* 1.6247	* 1.5894	* .6983
	* 1.8155	* 1.5357	* 1.5064	* 1.5673	* 1.5697	* 1.4861	* 1.5204	* 3.1299
10	* 1.5690	* 1.6272	* 1.6541	* 1.5886	* 1.5121	* 1.5368	* 1.5986	* .6881
	* 1.5675	* 1.5071	* 1.4915	* 1.5528	* 1.6236	* 1.6009	* 1.5288	* 3.2146
11	* 1.3723	* 1.5703	* 1.5889	* 1.5267	* 1.4875	* 1.4374	* .9817	* .4436
	* 1.7682	* 1.5673	* 1.5526	* 1.6318	* 1.7125	* 1.6984	* 2.3525	* 5.1129
12	* 1.4969	* 1.5435	* 1.5142	* 1.4878	* 1.4530	* 1.4662	* .7532	*
	* 1.5488	* 1.5668	* 1.6214	* 1.7117	* 1.7708	* 1.7539	* 3.1272	*
13	* 1.4100	* 1.6286	* 1.5389	* 1.4385	* 1.4669	* 1.5585	* .6460	*
	* 1.7023	* 1.4827	* 1.5988	* 1.6972	* 1.7531	* 1.6692	* 3.7037	*
14	* 1.6139	* 1.5924	* 1.6008	* .9827	* .7536	* .6580	*	*
	* 1.4884	* 1.5176	* 1.5267	* 2.3500	* 3.1254	* 3.6393	*	*
15	* .6731	* .6990	* .6888	* .4441	* F-SUB-Q			
	* 3.2797	* 3.1272	* 3.2115	* 5.1073	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 157 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4576	* 1.1793	* 1.3099	* 1.1831	* 1.4887	* 1.2002	* 1.4874	* .6044 *
	* 1.6105	* 1.9942	* 1.7978	* 1.9585	* 1.5488	* 1.9244	* 1.5541	* 3.5315 *
9	* 1.1793	* 1.4414	* 1.3813	* 1.4752	* 1.2842	* 1.3691	* 1.4977	* .6306 *
	* 1.9942	* 1.6378	* 1.7008	* 1.5893	* 1.8123	* 1.6976	* 1.5491	* 3.3541 *
10	* 1.3099	* 1.3806	* 1.3347	* 1.3514	* 1.3668	* 1.2889	* 1.3963	* .6023 *
	* 1.7978	* 1.7016	* 1.7722	* 1.7477	* 1.7357	* 1.8321	* 1.6830	* 3.5461 *
11	* 1.1831	* 1.4754	* 1.3516	* 1.3603	* 1.2478	* 1.4213	* .8609	* .3830 *
	* 1.9585	* 1.5891	* 1.7475	* 1.7672	* 1.9353	* 1.6984	* 2.5732	* 5.7137 *
12	* 1.4887	* 1.2854	* 1.3679	* 1.2483	* 1.1713	* 1.4010	* .6862	* .6862 *
	* 1.5488	* 1.8107	* 1.7343	* 1.9344	* 2.1008	* 1.7592	* 3.2951	* 3.2951 *
13	* 1.2002	* 1.3722	* 1.2906	* 1.4224	* 1.4017	* 1.2661	* .5457	* .5457 *
	* 1.9244	* 1.6939	* 1.8297	* 1.6972	* 1.7583	* 1.9629	* 4.2004	* 4.2004 *
14	* 1.4874	* 1.5000	* 1.3981	* .8618	* .6866	* .5558		
	* 1.5541	* 1.5467	* 1.6808	* 2.5705	* 3.2932	* 4.1273		
15	* .6044	* .6313	* .6029	* .3834	* F-SUB-Q			
	* 3.5315	* 3.3511	* 3.5428	* 5.7076	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6147	* .5265	* .5279	* .5274	* .6220	* .5198	* .5472	* .2677 *
	* 3.6748	* 4.3012	* 4.2924	* 4.2508	* 3.5879	* 4.3013	* 4.0816	* 7.7330 *
9	* .5265	* .6037	* .5545	* .6201	* .5255	* .5335	* .5486	* .2726 *
	* 4.3012	* 3.7531	* 4.0815	* 3.6370	* 4.2724	* 4.2091	* 4.0838	* 7.5253 *
10	* .5279	* .5543	* .5202	* .5504	* .5972	* .5179	* .5038	* .2549 *
	* 4.2924	* 4.0830	* 4.3741	* 4.1325	* 3.8105	* 4.4013	* 4.5036	* 8.1196 *
11	* .5274	* .6203	* .5506	* .5904	* .5047	* .5500	* .3710	* .1696 *
	* 4.2508	* 3.6361	* 4.1307	* 3.8948	* 4.5739	* 4.2223	* 5.7669	* 12.5095 *
12	* .6220	* .5259	* .5976	* .5049	* .4651	* .5156	* .2951	* .2951 *
	* 3.5879	* 4.2692	* 3.8079	* 4.5720	* 5.0762	* 4.6093	* 7.3924	* 7.3924 *
13	* .5198	* .5345	* .5185	* .5504	* .5158	* .4479	* .2269	* .2269 *
	* 4.3013	* 4.2008	* 4.3962	* 4.2192	* 4.6066	* 5.3440	* 9.7674	* 9.7674 *
14	* .5472	* .5494	* .5045	* .3713	* .2953	* .2305		
	* 4.0816	* 4.0778	* 4.4979	* 5.7617	* 7.3867	* 9.6222		
15	* .2677	* .2729	* .2552	* .1698	* F-SUB-Q			
	* 7.7330	* 7.5184	* 8.1113	* 12.4956	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 158 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4040 *	* .4801 *	* .5241 *	* .5478 *	* .6423 *	* .5470 *	* .5637 *	* .2965 *
	* 4.1967 *	* 4.8625 *	* 4.7535 *	* 4.5200 *	* 3.8488 *	* 4.5375 *	* 4.4444 *	* 7.7699 *
9	* .4801 *	* .5797 *	* .5529 *	* .6266 *	* .5458 *	* .5418 *	* .5585 *	* .2960 *
	* 4.8625 *	* 4.3445 *	* 4.5266 *	* 3.9601 *	* 4.5326 *	* 4.5819 *	* 4.4828 *	* 7.6874 *
10	* .5241 *	* .5528 *	* .5184 *	* .5464 *	* .5911 *	* .5066 *	* .4978 *	* .2682 *
	* 4.7535 *	* 4.5275 *	* 4.8727 *	* 4.5577 *	* 4.1731 *	* 4.8455 *	* 4.9370 *	* 8.3680 *
11	* .5478 *	* .6268 *	* .5466 *	* .5586 *	* .4616 *	* .4775 *	* .3463 *	* .1829 *
	* 4.5200 *	* 3.9590 *	* 4.5561 *	* 4.4703 *	* 5.2444 *	* 4.8163 *	* 6.4798 *	* 12.1818 *
12	* .6423 *	* .5461 *	* .5914 *	* .4618 *	* .3321 *	* .3572 *	* .2411 *	
	* 3.8488 *	* 4.5299 *	* 4.1707 *	* 5.2430 *	* 5.4952 *	* 5.0402 *	* 7.8592 *	
13	* .5470 *	* .5431 *	* .5071 *	* .4778 *	* .3573 *	* .2881 *	* .1636 *	
	* 4.5375 *	* 4.5715 *	* 4.8409 *	* 4.8146 *	* 5.0397 *	* 5.6552 *	* 10.1781 *	
14	* .5637 *	* .5594 *	* .4984 *	* .3465 *	* .2411 *	* .1672 *		
	* 4.4444 *	* 4.4763 *	* 4.9319 *	* 6.4764 *	* 7.8607 *	* 9.9605 *		
15	* .2965 *	* .2962 *	* .2684 *	* .1830 *	F-SUB-Q			
	* 7.7699 *	* 7.6843 *	* 8.3632 *	* 12.1744 *	M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .8850 *	* 1.0468 *	* 1.2465 *	* 1.2019 *	* 1.4564 *	* 1.2237 *	* 1.4422 *	* .6728 *
	* 1.9212 *	* 2.2975 *	* 2.0717 *	* 2.1334 *	* 1.7570 *	* 2.0961 *	* 1.8008 *	* 3.5485 *
9	* 1.0468 *	* 1.3007 *	* 1.3133 *	* 1.4087 *	* 1.2944 *	* 1.3249 *	* 1.4342 *	* .6913 *
	* 2.2974 *	* 1.9908 *	* 1.9692 *	* 1.8283 *	* 1.9826 *	* 1.9402 *	* 1.7965 *	* 3.3967 *
10	* 1.2465 *	* 1.3130 *	* 1.2685 *	* 1.2867 *	* 1.2817 *	* 1.2198 *	* 1.2928 *	* .6384 *
	* 2.0717 *	* 1.9697 *	* 2.0638 *	* 2.0115 *	* 2.0040 *	* 2.0882 *	* 1.9645 *	* 3.6291 *
11	* 1.2019 *	* 1.4089 *	* 1.2869 *	* 1.2059 *	* 1.0705 *	* 1.1677 *	* .8008 *	* .4107 *
	* 2.1334 *	* 1.8279 *	* 2.0108 *	* 2.1013 *	* 2.2438 *	* 2.0265 *	* 2.9049 *	* 5.6209 *
12	* 1.4564 *	* 1.2952 *	* 1.2823 *	* 1.0709 *	* .7616 *	* .9108 *	* .5653 *	
	* 1.7570 *	* 1.9814 *	* 2.0030 *	* 2.2432 *	* 2.3283 *	* 2.0154 *	* 3.4522 *	
13	* 1.2237 *	* 1.3276 *	* 1.2211 *	* 1.1683 *	* .9111 *	* .7741 *	* .4046 *	
	* 2.0961 *	* 1.9363 *	* 2.0860 *	* 2.0258 *	* 2.0151 *	* 2.2383 *	* 4.2445 *	
14	* 1.4422 *	* 1.4362 *	* 1.2941 *	* .8011 *	* .5653 *	* .4070 *		
	* 1.8008 *	* 1.7940 *	* 1.9626 *	* 2.9036 *	* 3.4528 *	* 4.2212 *		
15	* .6728 *	* .6919 *	* .6387 *	* .4109 *	F-SUB-Q			
	* 3.5485 *	* 3.3942 *	* 3.6274 *	* 5.6177 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 159 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9990	* 1.2493	* 1.5000	* 1.4105	* 1.5643	* 1.4709	* 1.6086	* .7796
	* 1.8709	* 2.0193	* 1.7661	* 1.8675	* 1.6785	* 1.7861	* 1.6340	* 3.1008
9	* 1.2493	* 1.5059	* 1.5600	* 1.5171	* 1.5697	* 1.5998	* 1.5698	* .8108
	* 2.0193	* 1.7651	* 1.6993	* 1.7387	* 1.6763	* 1.6412	* 1.6710	* 2.9415
10	* 1.5000	* 1.5596	* 1.5687	* 1.5298	* 1.4612	* 1.4710	* 1.5176	* .7649
	* 1.7661	* 1.6996	* 1.6932	* 1.7304	* 1.8028	* 1.7780	* 1.7157	* 3.1009
11	* 1.4105	* 1.5176	* 1.5300	* 1.4152	* 1.2784	* 1.2558	* .9584	* .4901
	* 1.8675	* 1.7382	* 1.7301	* 1.8669	* 1.8967	* 1.9573	* 2.4953	* 4.8384
12	* 1.5643	* 1.5718	* 1.4620	* 1.2789	* .9233	* 1.0042	* .6593	*
	* 1.6785	* 1.6740	* 1.8009	* 1.8964	* 1.9190	* 1.9065	* 3.0391	*
13	* 1.4709	* 1.6031	* 1.4726	* 1.2566	* 1.0046	* .9683	* .4929	*
	* 1.7861	* 1.6379	* 1.7761	* 1.9565	* 1.9061	* 1.8453	* 3.5812	*
14	* 1.6086	* 1.5722	* 1.5192	* .9587	* .6594	* .5014	*	*
	* 1.6340	* 1.6684	* 1.7139	* 2.4943	* 3.0393	* 3.5208	*	*
15	* .7796	* .8115	* .7654	* .4903	* F-SUB-Q			
	* 3.1008	* 2.9396	* 3.0992	* 4.8355	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1119	* 1.3532	* 1.6339	* 1.5215	* 1.7350	* 1.6047	* 1.7927	* .8183
	* 1.7693	* 1.9494	* 1.6723	* 1.7867	* 1.5606	* 1.6858	* 1.5065	* 3.0346
9	* 1.3532	* 1.6625	* 1.7016	* 1.6686	* 1.7175	* 1.7668	* 1.7507	* .8501
	* 1.9494	* 1.6480	* 1.6056	* 1.6318	* 1.5796	* 1.5288	* 1.5407	* 2.8838
10	* 1.6339	* 1.7012	* 1.7204	* 1.6664	* 1.6133	* 1.6163	* 1.7001	* .8109
	* 1.6723	* 1.6060	* 1.5892	* 1.6365	* 1.6783	* 1.6687	* 1.5777	* 3.0143
11	* 1.5215	* 1.6692	* 1.6667	* 1.5639	* 1.3926	* 1.3931	* 1.0261	* .5189
	* 1.7867	* 1.6313	* 1.6363	* 1.7423	* 1.7844	* 1.8260	* 2.4088	* 4.7191
12	* 1.7350	* 1.7200	* 1.6151	* 1.3931	* 1.0096	* 1.1161	* .6950	*
	* 1.5606	* 1.5773	* 1.6764	* 1.7842	* 1.7992	* 1.7727	* 2.9897	*
13	* 1.6047	* 1.7704	* 1.6182	* 1.3940	* 1.1166	* 1.1075	* .5317	*
	* 1.6858	* 1.5257	* 1.6667	* 1.8252	* 1.7723	* 1.6785	* 3.4480	*
14	* 1.7927	* 1.7536	* 1.7020	* 1.0266	* .6952	* .5425	*	*
	* 1.5065	* 1.5382	* 1.5760	* 2.4077	* 2.9895	* 3.3808	*	*
15	* .8183	* .8508	* .8114	* .5192	* F-SUB-Q			
	* 3.0346	* 2.8818	* 3.0128	* 4.7161	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 160 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1790	* 1.3890	* 1.6755	* 1.5652	* 1.8128	* 1.6538	* 1.8756	* .8416 *
	* 1.7799	* 1.9887	* 1.6994	* 1.8103	* 1.5554	* 1.7027	* 1.4967	* 3.0682 *
9	* 1.3890	* 1.7246	* 1.7529	* 1.7366	* 1.7726	* 1.8341	* 1.8346	* .8775 *
	* 1.9887	* 1.6555	* 1.6234	* 1.6339	* 1.5935	* 1.5312	* 1.5287	* 2.9063 *
10	* 1.6755	* 1.7525	* 1.7703	* 1.7172	* 1.6814	* 1.6744	* 1.7839	* .8384 *
	* 1.6994	* 1.6237	* 1.6079	* 1.6542	* 1.6779	* 1.6778	* 1.5647	* 3.0361 *
11	* 1.5652	* 1.7372	* 1.7175	* 1.6258	* 1.4449	* 1.4598	* 1.0655	* .5324 *
	* 1.8103	* 1.6333	* 1.6539	* 1.7472	* 1.7970	* 1.8159	* 2.4214	* 4.7982 *
12	* 1.8128	* 1.7753	* 1.6834	* 1.4456	* 1.0623	* 1.1873	* .7236 *	
	* 1.5554	* 1.5911	* 1.6759	* 1.7967	* 1.8114	* 1.7608	* 3.0132 *	
13	* 1.6538	* 1.8379	* 1.6765	* 1.4608	* 1.1879	* 1.1866	* .5574 *	
	* 1.7027	* 1.5280	* 1.6757	* 1.8150	* 1.7603	* 1.6544	* 3.4627 *	
14	* 1.8756	* 1.8377	* 1.7859	* 1.0661	* .7238	* .5695		
	* 1.4967	* 1.5261	* 1.5629	* 2.4200	* 3.0127	* 3.3910		
15	* .8416	* .8782	* .8390	* .5328	* F-SUB-Q			
	* 3.0682	* 2.9044	* 3.0344	* 4.7949	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2087	* 1.3988	* 1.6861	* 1.5812	* 1.8442	* 1.6720	* 1.9117	* .8568 *
	* 1.8475	* 2.0761	* 1.7815	* 1.8909	* 1.6119	* 1.7757	* 1.5458	* 3.1741 *
9	* 1.3988	* 1.7450	* 1.7696	* 1.7635	* 1.7921	* 1.8627	* 1.8722	* .8947 *
	* 2.0761	* 1.7261	* 1.6962	* 1.6972	* 1.6615	* 1.5873	* 1.5771	* 3.0022 *
10	* 1.6861	* 1.7691	* 1.7861	* 1.7354	* 1.7098	* 1.6987	* 1.8225	* .8550 *
	* 1.7815	* 1.6966	* 1.6808	* 1.7265	* 1.7401	* 1.7414	* 1.6136	* 3.1388 *
11	* 1.5812	* 1.7641	* 1.7357	* 1.6504	* 1.4717	* 1.4930	* 1.0903	* .5402 *
	* 1.8909	* 1.6966	* 1.7262	* 1.8166	* 1.8629	* 1.8642	* 2.4999	* 4.9943 *
12	* 1.8442	* 1.7949	* 1.7119	* 1.4724	* 1.0951	* 1.2293	* .7460 *	
	* 1.6119	* 1.6589	* 1.7380	* 1.8625	* 1.8816	* 1.8163	* 3.1057 *	
13	* 1.6720	* 1.8666	* 1.7009	* 1.4941	* 1.2300	* 1.2357	* .5772 *	
	* 1.7757	* 1.5839	* 1.7392	* 1.8632	* 1.8157	* 1.6996	* 3.5723 *	
14	* 1.9117	* 1.8754	* 1.8246	* 1.0909	* .7463	* .5896 *		
	* 1.5458	* 1.5744	* 1.6117	* 2.4982	* 3.1048	* 3.4989 *		
15	* .8568	* .8955	* .8556	* .5406	* F-SUB-Q			
	* 3.1741	* 3.0001	* 3.1368	* 4.9904	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 161 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2290	* 1.4078	* 1.7003	* 1.5967	* 1.8772	* 1.6890	* 1.9522	* .8604 *
	* 1.9163	* 2.1659	* 1.8893	* 2.0025	* 1.6921	* 1.8777	* 1.6148	* 3.3723 *
9	* 1.4078	* 1.7703	* 1.7889	* 1.7940	* 1.8137	* 1.8929	* 1.9128	* .8971 *
	* 2.1659	* 1.8196	* 1.7941	* 1.7837	* 1.7538	* 1.6659	* 1.6470	* 3.1951 *
10	* 1.7003	* 1.7884	* 1.8063	* 1.7567	* 1.7425	* 1.7250	* 1.8646	* .8584 *
	* 1.8893	* 1.7946	* 1.7770	* 1.8240	* 1.8250	* 1.8298	* 1.6842	* 3.3389 *
11	* 1.5967	* 1.7947	* 1.7570	* 1.6802	* 1.5001	* 1.5306	* 1.1008	* .5413 *
	* 2.0025	* 1.7830	* 1.8236	* 1.9092	* 1.9394	* 1.9193	* 2.6112	* 5.3329 *
12	* 1.8772	* 1.8166	* 1.7447	* 1.5008	* 1.1155	* 1.2699	* .7547	* .7547 *
	* 1.6921	* 1.7510	* 1.8227	* 1.9387	* 1.9593	* 1.8782	* 3.2757	* 3.2757 *
13	* 1.6890	* 1.8970	* 1.7272	* 1.5317	* 1.2707	* 1.2857	* .5890	* .5890 *
	* 1.8777	* 1.6624	* 1.8274	* 1.9181	* 1.8775	* 1.7584	* 3.7681	* 3.7681 *
14	* 1.9522	* 1.9162	* 1.8669	* 1.1016	* .7550	* .6018		
	* 1.6148	* 1.6441	* 1.6822	* 2.6094	* 3.2747	* 3.6899		
15	* .8604	* .8978	* .8590	* .5417	* F-SUB-Q			
	* 3.3723	* 3.1929	* 3.3367	* 5.3284	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2357	* 1.4084	* 1.7024	* 1.6008	* 1.8904	* 1.6938	* 1.9708	* .8634 *
	* 2.0374	* 2.3137	* 2.0492	* 2.1677	* 1.8218	* 2.0289	* 1.7308	* 3.6311 *
9	* 1.4084	* 1.7790	* 1.7949	* 1.8058	* 1.8208	* 1.9073	* 1.9325	* .8987 *
	* 2.3137	* 1.9564	* 1.9417	* 1.9223	* 1.8938	* 1.7896	* 1.7646	* 3.4467 *
10	* 1.7024	* 1.7944	* 1.8135	* 1.7652	* 1.7580	* 1.7381	* 1.8872	* .8613 *
	* 2.0492	* 1.9422	* 1.9219	* 1.9711	* 1.9623	* 1.9674	* 1.8035	* 3.6016 *
11	* 1.6008	* 1.8065	* 1.7655	* 1.6944	* 1.5174	* 1.5535	* 1.1107	* .5434 *
	* 2.1677	* 1.9215	* 1.9708	* 2.0292	* 2.0420	* 2.0169	* 2.7684	* 5.7458 *
12	* 1.8904	* 1.8238	* 1.7603	* 1.5181	* 1.1302	* 1.2992	* .7658	* .7658 *
	* 1.8218	* 1.8906	* 1.9598	* 2.0412	* 2.0697	* 1.9762	* 3.4655	* 3.4655 *
13	* 1.6938	* 1.9114	* 1.7404	* 1.5547	* 1.3000	* 1.3253	* .6024	* .6024 *
	* 2.0289	* 1.7857	* 1.9648	* 2.0156	* 1.9754	* 1.8569	* 4.0098	* 4.0098 *
14	* 1.9708	* 1.9360	* 1.8895	* 1.1115	* .7661	* .6154		
	* 1.7308	* 1.7614	* 1.8012	* 2.7664	* 3.4642	* 3.9273		
15	* .8634	* .8995	* .8620	* .5439	* F-SUB-Q			
	* 3.6311	* 3.4443	* 3.5990	* 5.7408	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 162 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2517	* 1.4154	* 1.7100	* 1.6070	* 1.9069	* 1.7002	* 1.9916	* .8627 *
	* 2.2225	* 2.5262	* 2.2094	* 2.3186	* 1.9335	* 2.1597	* 1.8281	* 3.8609 *
9	* 1.4154	* 1.7953	* 1.8061	* 1.8215	* 1.8307	* 1.9236	* 1.9545	* .8955 *
	* 2.5262	* 2.0971	* 2.0905	* 2.0467	* 2.0177	* 1.8975	* 1.8654	* 3.6760 *
10	* 1.7100	* 1.8056	* 1.8262	* 1.7784	* 1.7786	* 1.7553	* 1.9134	* .8613 *
	* 2.2094	* 2.0911	* 2.0680	* 2.1172	* 2.0853	* 2.0906	* 1.9077	* 3.8335 *
11	* 1.6070	* 1.8222	* 1.7788	* 1.7157	* 1.5425	* 1.5844	* 1.1202	* .5441 *
	* 2.3186	* 2.0458	* 2.1168	* 2.1652	* 2.1954	* 2.1609	* 2.9762	* 6.1476 *
12	* 1.9069	* 1.8338	* 1.7809	* 1.5432	* 1.1515	* 1.3394	* .7780	* .7780 *
	* 1.9335	* 2.0143	* 2.0826	* 2.1945	* 2.2318	* 2.1154	* 3.7523	* 3.7523 *
13	* 1.7002	* 1.9277	* 1.7577	* 1.5857	* 1.3402	* 1.3794	* .6191	* .6191 *
	* 2.1597	* 1.8935	* 2.0878	* 2.1596	* 2.1146	* 1.9792	* 4.3209	* 4.3209 *
14	* 1.9916	* 1.9580	* 1.9158	* 1.1211	* .7784	* .6325		
	* 1.8282	* 1.8621	* 1.9053	* 2.9738	* 3.7508	* 4.2310		
15	* .8627	* .8962	* .8621	* .5446	* F-SUB-Q			
	* 3.8609	* 3.6735	* 3.8307	* 6.1420	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2620	* 1.4132	* 1.6937	* 1.5911	* 1.8820	* 1.6830	* 1.9658	* .8665 *
	* 2.4812	* 2.8012	* 2.4320	* 2.5318	* 2.1125	* 2.3515	* 1.9980	* 4.1366 *
9	* 1.4132	* 1.7788	* 1.7912	* 1.7984	* 1.8116	* 1.9066	* 1.9337	* .9050 *
	* 2.8012	* 2.3330	* 2.2954	* 2.2420	* 2.1996	* 2.0648	* 2.0335	* 3.9124 *
10	* 1.6937	* 1.7906	* 1.8119	* 1.7661	* 1.7638	* 1.7466	* 1.8998	* .8713 *
	* 2.4320	* 2.2962	* 2.2701	* 2.3229	* 2.2734	* 2.2686	* 2.0728	* 4.0677 *
11	* 1.5911	* 1.7991	* 1.7664	* 1.7060	* 1.5540	* 1.5893	* 1.1396	* .5506 *
	* 2.5318	* 2.2411	* 2.3225	* 2.4010	* 2.4396	* 2.3850	* 3.2261	* 6.5203 *
12	* 1.8820	* 1.8147	* 1.7661	* 1.5548	* 1.1859	* 1.3734	* .8102	* .8102 *
	* 2.1125	* 2.1958	* 2.2704	* 2.4382	* 2.4858	* 2.3551	* 4.0773	* 4.0773 *
13	* 1.6830	* 1.9107	* 1.7489	* 1.5905	* 1.3743	* 1.4300	* .6504	* .6504 *
	* 2.3515	* 2.0605	* 2.2656	* 2.3834	* 2.3541	* 2.2002	* 4.7103	* 4.7103 *
14	* 1.9658	* 1.9372	* 1.9022	* 1.1406	* .8106	* .6648		
	* 1.9980	* 2.0299	* 2.0702	* 3.2235	* 4.0756	* 4.6097		
15	* .8665	* .9057	* .8720	* .5511	* F-SUB-Q			
	* 4.1366	* 3.9096	* 4.0646	* 6.5142	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 163 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3793	* 1.4478	* 1.7168	* 1.6036	* 1.9105	* 1.6940	* 2.0000	* .8594 *
	* 2.7322	* 3.1104	* 2.5901	* 2.6970	* 2.2294	* 2.4982	* 2.0901	* 4.4173 *
9	* 1.4478	* 1.8182	* 1.8175	* 1.8279	* 1.8305	* 1.9324	* 1.9691	* .8928 *
	* 3.1104	* 2.4754	* 2.4403	* 2.3659	* 2.3338	* 2.1759	* 2.1317	* 4.2042 *
10	* 1.7168	* 1.8168	* 1.8397	* 1.7935	* 1.8011	* 1.7767	* 1.9431	* .8631 *
	* 2.5901	* 2.4411	* 2.4120	* 2.4646	* 2.3992	* 2.4015	* 2.1784	* 4.3855 *
11	* 1.6036	* 1.8287	* 1.7938	* 1.7499	* 1.6168	* 1.6566	* 1.1503	* .5497 *
	* 2.6970	* 2.3649	* 2.4642	* 2.5592	* 2.6614	* 2.5967	* 3.5187	* 7.0470 *
12	* 1.9105	* 1.8337	* 1.8035	* 1.6175	* 1.2816	* 1.4950	* .8334	*
	* 2.2294	* 2.3297	* 2.3961	* 2.6603	* 2.7164	* 2.5587	* 4.5472	*
13	* 1.6940	* 1.9365	* 1.7790	* 1.6579	* 1.4958	* 1.5678	* .6829	*
	* 2.4982	* 2.1714	* 2.3983	* 2.5949	* 2.5577	* 2.3988	* 5.2661	*
14	* 2.0000	* 1.9726	* 1.9456	* 1.1513	* .8339	* .6974	*	*
	* 2.0901	* 2.1280	* 2.1757	* 3.5153	* 4.5453	* 5.1580	*	*
15	* .8594	* .8936	* .8639	* .5503	* F-SUB-Q			
	* 4.4173	* 4.2012	* 4.3820	* 7.0403	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5723	* 1.4762	* 1.7216	* 1.6001	* 1.9091	* 1.6882	* 2.0002	* .8565 *
	* 2.8005	* 3.1878	* 2.7917	* 2.9180	* 2.4026	* 2.6969	* 2.2433	* 4.7395 *
9	* 1.4762	* 1.8316	* 1.8231	* 1.8297	* 1.8278	* 1.9333	* 1.9725	* .8899 *
	* 3.1878	* 2.6372	* 2.6446	* 2.5525	* 2.5191	* 2.3388	* 2.2875	* 4.5121 *
10	* 1.7216	* 1.8224	* 1.8460	* 1.8006	* 1.8115	* 1.7879	* 1.9560	* .8629 *
	* 2.7917	* 2.6455	* 2.6132	* 2.6675	* 2.5821	* 2.5826	* 2.3354	* 4.7047 *
11	* 1.6001	* 1.8298	* 1.8009	* 1.7692	* 1.6704	* 1.7137	* 1.1679	* .5531 *
	* 2.9180	* 2.5514	* 2.6671	* 2.7231	* 2.8111	* 2.7353	* 3.7828	* 7.5585 *
12	* 1.9091	* 1.8310	* 1.8139	* 1.6712	* 1.5149	* 1.6404	* .8706	*
	* 2.4026	* 2.5147	* 2.5788	* 2.8098	* 2.8859	* 2.7209	* 4.8593	*
13	* 1.6882	* 1.9375	* 1.7901	* 1.7150	* 1.6412	* 1.7086	* .7252	*
	* 2.6969	* 2.3339	* 2.5792	* 2.7333	* 2.7196	* 2.5915	* 5.6992	*
14	* 2.0002	* 1.9761	* 1.9585	* 1.1690	* .8711	* .7404	*	*
	* 2.2433	* 2.2836	* 2.3325	* 3.7791	* 4.8570	* 5.5842	*	*
15	* .8565	* .8907	* .8637	* .5537	* F-SUB-Q			
	* 4.7395	* 4.5088	* 4.7009	* 7.5512	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 164 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6682	* 1.4826	* 1.7134	* 1.5792	* 1.8790	* 1.6655	* 1.9690	* .8544 *
	* 2.8472	* 3.2318	* 2.7225	* 2.8221	* 2.3476	* 2.6351	* 2.2235	* 4.6818 *
9	* 1.4826	* 1.8160	* 1.8063	* 1.8092	* 1.8038	* 1.9108	* 1.9467	* .8915 *
	* 3.2318	* 2.6042	* 2.5634	* 2.4855	* 2.4659	* 2.3174	* 2.2772	* 4.4445 *
10	* 1.7134	* 1.8056	* 1.8296	* 1.7858	* 1.7944	* 1.7770	* 1.9391	* .8669 *
	* 2.7225	* 2.5643	* 2.5434	* 2.6045	* 2.5579	* 2.5779	* 2.3519	* 4.6807 *
11	* 1.5792	* 1.8092	* 1.7861	* 1.7604	* 1.6939	* 1.7365	* 1.1851	* .5565 *
	* 2.8221	* 2.4844	* 2.6040	* 2.7159	* 2.8402	* 2.7657	* 3.7714	* 7.6657 *
12	* 1.8790	* 1.8070	* 1.7968	* 1.6947	* 1.6262	* 1.7222	* .9075 *	
	* 2.3476	* 2.4616	* 2.5543	* 2.8389	* 2.9155	* 2.7510	* 4.8273 *	
13	* 1.6655	* 1.9149	* 1.7792	* 1.7379	* 1.7231	* 1.7963	* .7641 *	
	* 2.6351	* 2.3126	* 2.5742	* 2.7636	* 2.7497	* 2.6204	* 5.6793 *	
14	* 1.9690	* 1.9502	* 1.9416	* 1.1863	* .9080	* .7806	*	
	* 2.2235	* 2.2731	* 2.3487	* 3.7672	* 4.8247	* 5.5611	*	
15	* .8544	* .8922	* .8677	* .5571	* F-SUB-Q			
	* 4.6818	* 4.4411	* 4.6763	* 7.6571	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7127	* 1.4957	* 1.7220	* 1.5769	* 1.8883	* 1.6607	* 1.9847	* .8402 *
	* 2.7503	* 3.1316	* 2.6126	* 2.7158	* 2.2407	* 2.5340	* 2.1139	* 4.5613 *
9	* 1.4957	* 1.8334	* 1.8130	* 1.8246	* 1.8053	* 1.9188	* 1.9635	* .8721 *
	* 3.1316	* 2.4841	* 2.4558	* 2.3721	* 2.3650	* 2.2135	* 2.1658	* 4.3547 *
10	* 1.7220	* 1.8123	* 1.8382	* 1.7942	* 1.8126	* 1.7894	* 1.9629	* .8512 *
	* 2.6126	* 2.4567	* 2.4357	* 2.4954	* 2.4386	* 2.4652	* 2.2356	* 4.5804 *
11	* 1.5769	* 1.8246	* 1.7945	* 1.7830	* 1.7257	* 1.7802	* 1.1808	* .5493 *
	* 2.7158	* 2.3710	* 2.4950	* 2.5888	* 2.7270	* 2.6388	* 3.6605	* 7.4950 *
12	* 1.8883	* 1.8086	* 1.8150	* 1.7268	* 1.6819	* 1.7902	* .9108 *	
	* 2.2407	* 2.3607	* 2.4352	* 2.7256	* 2.8076	* 2.6229	* 4.6862 *	
13	* 1.6607	* 1.9230	* 1.7917	* 1.7816	* 1.7910	* 1.8836	* .7779 *	
	* 2.5340	* 2.2088	* 2.4616	* 2.6369	* 2.6218	* 2.4877	* 5.4669 *	
14	* 1.9847	* 1.9671	* 1.9654	* 1.1820	* .9113	* .7939	*	
	* 2.1139	* 2.1619	* 2.2325	* 3.6569	* 4.6840	* 5.3587	*	
15	* .8402	* .8729	* .8520	* .5498	* F-SUB-Q			
	* 4.5613	* 4.3513	* 4.5759	* 7.4864	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 165 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7094	* 1.4851	* 1.7053	* 1.5578	* 1.8709	* 1.6398	* 1.9708	* .8278 *
	* 2.5389	* 2.9024	* 2.4611	* 2.5616	* 2.1138	* 2.3994	* 1.9913	* 4.2929 *
9	* 1.4851	* 1.8199	* 1.7960	* 1.8115	* 1.7860	* 1.9035	* 1.9515	* .8564 *
	* 2.9023	* 2.3283	* 2.3115	* 2.2296	* 2.2343	* 2.0912	* 2.0392	* 4.1110 *
10	* 1.7053	* 1.7952	* 1.8225	* 1.7790	* 1.8021	* 1.7777	* 1.9560	* .8386 *
	* 2.4611	* 2.3125	* 2.2916	* 2.3475	* 2.2891	* 2.3204	* 2.0980	* 4.3071 *
11	* 1.5578	* 1.8115	* 1.7793	* 1.7749	* 1.7310	* 1.7860	* 1.1726	* .5423 *
	* 2.5616	* 2.2287	* 2.3471	* 2.4217	* 2.5109	* 2.4239	* 3.3921	* 7.0078 *
12	* 1.8709	* 1.7893	* 1.8045	* 1.7318	* 1.6932	* 1.8085	* .9094	* .9094 *
	* 2.1138	* 2.2304	* 2.2860	* 2.5094	* 2.5861	* 2.4090	* 4.3476	* 4.3476 *
13	* 1.6398	* 1.9077	* 1.7800	* 1.7874	* 1.8094	* 1.9157	* .7831	* .7831 *
	* 2.3994	* 2.0870	* 2.3173	* 2.4221	* 2.4079	* 2.2822	* 5.0647	* 5.0647 *
14	* 1.9708	* 1.9551	* 1.9586	* 1.1738	* .9099	* .7991		
	* 1.9913	* 2.0356	* 2.0953	* 3.3886	* 4.3453	* 4.9653		
15	* .8278	* .8571	* .8394	* .5429	* F-SUB-Q			
	* 4.2929	* 4.1080	* 4.3033	* 7.0001	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6813	* 1.4585	* 1.6743	* 1.5278	* 1.8372	* 1.6088	* 1.9376	* .8136 *
	* 2.3683	* 2.7104	* 2.2555	* 2.3496	* 1.9363	* 2.2010	* 1.8233	* 3.9389 *
9	* 1.4585	* 1.7885	* 1.7645	* 1.7813	* 1.7535	* 1.8727	* 1.9206	* .8447 *
	* 2.7104	* 2.1305	* 2.1154	* 2.0432	* 2.0482	* 1.9130	* 1.8651	* 3.7593 *
10	* 1.6743	* 1.7637	* 1.7915	* 1.7491	* 1.7741	* 1.7505	* 1.9283	* .8268 *
	* 2.2555	* 2.1162	* 2.0969	* 2.1481	* 2.0940	* 2.1212	* 1.9157	* 3.9399 *
11	* 1.5278	* 1.7813	* 1.7494	* 1.7482	* 1.7152	* 1.7674	* 1.1601	* .5345 *
	* 2.3496	* 2.0423	* 2.1477	* 2.2133	* 2.3399	* 2.2559	* 3.1197	* 6.4146 *
12	* 1.8372	* 1.7567	* 1.7765	* 1.7160	* 1.6789	* 1.7965	* .9055	* .9055 *
	* 1.9363	* 2.0446	* 2.0912	* 2.3385	* 2.4173	* 2.2486	* 4.0479	* 4.0479 *
13	* 1.6088	* 1.8768	* 1.7527	* 1.7687	* 1.7973	* 1.9105	* .7813	* .7813 *
	* 2.2010	* 1.9091	* 2.1183	* 2.2543	* 2.2475	* 2.1229	* 4.7176	* 4.7176 *
14	* 1.9376	* 1.9241	* 1.9309	* 1.1613	* .9060	* .7970		
	* 1.8233	* 1.8618	* 1.9131	* 3.1162	* 4.0458	* 4.6260		
15	* .8136	* .8454	* .8277	* .5351	* F-SUB-Q			
	* 3.9389	* 3.7564	* 3.9361	* 6.4075	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 166 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6309	* 1.4216	* 1.6270	* 1.4854	* 1.7827	* 1.5656	* 1.8809	* .8006 *
	* 2.3934	* 2.7291	* 2.2693	* 2.3634	* 1.9539	* 2.2153	* 1.8405	* 3.9306 *
9	* 1.4216	* 1.7353	* 1.7159	* 1.7296	* 1.7050	* 1.8233	* 1.8665	* .8342 *
	* 2.7291	* 2.1453	* 2.1253	* 2.0618	* 2.0624	* 1.9241	* 1.8797	* 3.7372 *
10	* 1.6270	* 1.7152	* 1.7425	* 1.7020	* 1.7241	* 1.7050	* 1.8762	* .8170 *
	* 2.2693	* 2.1262	* 2.1069	* 2.1579	* 2.1092	* 2.1291	* 1.9262	* 3.9116 *
11	* 1.4854	* 1.7297	* 1.7023	* 1.6991	* 1.6764	* 1.7229	* 1.1453	* .5270 *
	* 2.3634	* 2.0609	* 2.1576	* 2.2260	* 2.3600	* 2.2779	* 3.0875	* 6.3751 *
12	* 1.7827	* 1.7082	* 1.7264	* 1.6772	* 1.6418	* 1.7554	* .9001	* .9001 *
	* 1.9539	* 2.0587	* 2.1063	* 2.3585	* 2.4366	* 2.2715	* 4.0193	* .9001 *
13	* 1.5656	* 1.8273	* 1.7072	* 1.7242	* 1.7563	* 1.8713	* .7760	* .7760 *
	* 2.2153	* 1.9202	* 2.1262	* 2.2762	* 2.2704	* 2.1523	* 4.7221	* .7760 *
14	* 1.8809	* 1.8699	* 1.8787	* 1.1465	* .9006	* .7922		
	* 1.8405	* 1.8763	* 1.9236	* 3.0839	* 4.0171	* 4.6274		
15	* .8006	* .8350	* .8178	* .5276	* F-SUB-Q			
	* 3.9306	* 3.7344	* 3.9080	* 6.3680	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6142	* 1.3922	* 1.6028	* 1.4603	* 1.7654	* 1.5379	* 1.8682	* .7738 *
	* 2.1950	* 2.5065	* 2.0975	* 2.1969	* 1.8030	* 2.0616	* 1.6952	* 3.7280 *
9	* 1.3922	* 1.7194	* 1.6928	* 1.7147	* 1.6803	* 1.8025	* 1.8529	* .8010 *
	* 2.5065	* 1.9694	* 1.9617	* 1.9004	* 1.9119	* 1.7787	* 1.7308	* 3.5679 *
10	* 1.6028	* 1.6920	* 1.7198	* 1.6789	* 1.7097	* 1.6835	* 1.8640	* .7865 *
	* 2.0975	* 1.9626	* 1.9438	* 1.9923	* 1.9402	* 1.9662	* 1.7682	* 3.7181 *
11	* 1.4603	* 1.7147	* 1.6792	* 1.6849	* 1.6586	* 1.7112	* 1.1103	* .5080 *
	* 2.1969	* 1.8996	* 1.9919	* 2.0417	* 2.1664	* 2.0800	* 2.8930	* 6.0344 *
12	* 1.7654	* 1.6835	* 1.7120	* 1.6594	* 1.6235	* 1.7458	* .8662	* .8662 *
	* 1.8030	* 1.9084	* 1.9375	* 2.1649	* 2.2482	* 2.0894	* 3.8198	* .8662 *
13	* 1.5379	* 1.8065	* 1.6857	* 1.7125	* 1.7467	* 1.8671	* .7522	* .7522 *
	* 2.0616	* 1.7750	* 1.9635	* 2.0784	* 2.0884	* 1.9695	* 4.4557	* .7522 *
14	* 1.8682	* 1.8564	* 1.8665	* 1.1115	* .8667	* .7671		
	* 1.6952	* 1.7276	* 1.7658	* 2.8896	* 3.8177	* 4.3704		
15	* .7738	* .8017	* .7873	* .5085	* F-SUB-Q			
	* 3.7280	* 3.5652	* 3.7146	* 6.0275	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 167 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5672	* 1.3511	* 1.5584	* 1.4169	* 1.7140	* 1.4927	* 1.8153	* .7492 *
	* 2.0376	* 2.3573	* 1.9801	* 2.0871	* 1.7135	* 1.9611	* 1.6119	* 3.5664 *
9	* 1.3511	* 1.6721	* 1.6465	* 1.6676	* 1.6321	* 1.7530	* 1.8011	* .7757 *
	* 2.3573	* 1.8546	* 1.8510	* 1.8037	* 1.8152	* 1.6875	* 1.6432	* 3.4117 *
10	* 1.5584	* 1.6457	* 1.6727	* 1.6325	* 1.6620	* 1.6369	* 1.8127	* .7619 *
	* 1.9801	* 1.8518	* 1.8343	* 1.8809	* 1.8354	* 1.8593	* 1.6725	* 3.5451 *
11	* 1.4169	* 1.6677	* 1.6327	* 1.6384	* 1.6127	* 1.6630	* 1.0772	* .4919 *
	* 2.0871	* 1.8029	* 1.8806	* 1.9220	* 2.0351	* 1.9546	* 2.7240	* 5.7291 *
12	* 1.7140	* 1.6352	* 1.6643	* 1.6134	* 1.5790	* 1.6979	* .8401 *	
	* 1.7135	* 1.8119	* 1.8329	* 2.0338	* 2.0898	* 1.9459	* 3.5785 *	
13	* 1.4927	* 1.7569	* 1.6390	* 1.6643	* 1.6987	* 1.8171	* .7297 *	
	* 1.9611	* 1.6840	* 1.8567	* 1.9531	* 1.9449	* 1.8415	* 4.1817 *	
14	* 1.8153	* 1.8044	* 1.8151	* 1.0784	* .8405	* .7441 *		
	* 1.6119	* 1.6402	* 1.6703	* 2.7209	* 3.5767	* 4.1020 *		
15	* .7492	* .7764	* .7627	* .4924	* F-SUB-Q			
	* 3.5664	* 3.4091	* 3.5418	* 5.7227	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4856	* 1.2971	* 1.4916	* 1.3528	* 1.6224	* 1.4273	* 1.7157	* .7258 *
	* 1.9949	* 2.2538	* 1.9172	* 2.0355	* 1.6885	* 1.9143	* 1.5930	* 3.4474 *
9	* 1.2971	* 1.5886	* 1.5736	* 1.5835	* 1.5572	* 1.6702	* 1.7043	* .7580 *
	* 2.2538	* 1.8029	* 1.7946	* 1.7742	* 1.7732	* 1.6518	* 1.6197	* 3.2682 *
10	* 1.4916	* 1.5729	* 1.5983	* 1.5599	* 1.5761	* 1.5622	* 1.7155	* .7431 *
	* 1.9172	* 1.7954	* 1.7791	* 1.8243	* 1.7968	* 1.8094	* 1.6418	* 3.3936 *
11	* 1.3528	* 1.5835	* 1.5602	* 1.5552	* 1.5360	* 1.5733	* 1.0446	* .4786 *
	* 2.0355	* 1.7734	* 1.8241	* 1.8685	* 1.9721	* 1.9059	* 2.5844	* 5.4668 *
12	* 1.6224	* 1.5602	* 1.5782	* 1.5367	* 1.5057	* 1.6064	* .8204 *	
	* 1.6885	* 1.7700	* 1.7944	* 1.9712	* 2.0283	* 1.9036	* 3.4029 *	
13	* 1.4273	* 1.6738	* 1.5642	* 1.5745	* 1.6072	* 1.7147	* .7078 *	
	* 1.9142	* 1.6484	* 1.8070	* 1.9044	* 1.9027	* 1.7984	* 3.9840 *	
14	* 1.7157	* 1.7075	* 1.7177	* 1.0456	* .8208	* .7226 *		
	* 1.5930	* 1.6168	* 1.6396	* 2.5817	* 3.4012	* 3.9041 *		
15	* .7258	* .7586	* .7438	* .4791	* F-SUB-Q			
	* 3.4474	* 3.2658	* 3.3907	* 5.4609	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 168 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4292	* 1.2484	* 1.4427	* 1.3018	* 1.5534	* 1.3707	* 1.6451	* .6867 *
	* 1.9009	* 2.1634	* 1.8500	* 1.9920	* 1.6626	* 1.8805	* 1.5683	* 3.4481 *
9	* 1.2484	* 1.5305	* 1.5188	* 1.5243	* 1.4990	* 1.6050	* 1.6323	* .7126 *
	* 2.1634	* 1.7468	* 1.7415	* 1.7384	* 1.7351	* 1.6200	* 1.5941	* 3.2887 *
10	* 1.4427	* 1.5180	* 1.5429	* 1.5056	* 1.5142	* 1.5047	* 1.6422	* .6982 *
	* 1.8500	* 1.7423	* 1.7263	* 1.7705	* 1.7548	* 1.7663	* 1.6107	* 3.4084 *
11	* 1.3018	* 1.5244	* 1.5058	* 1.4967	* 1.4759	* 1.5060	* .9869	* .4526 *
	* 1.9920	* 1.7376	* 1.7702	* 1.8105	* 1.8945	* 1.8406	* 2.5493	* 5.4273 *
12	* 1.5534	* 1.5018	* 1.5162	* 1.4766	* 1.4473	* 1.5363	* .7717	* .6867 *
	* 1.6626	* 1.7319	* 1.7525	* 1.8937	* 1.9614	* 1.8509	* 3.3512	* 3.4481 *
13	* 1.3707	* 1.6084	* 1.5066	* 1.5071	* 1.5371	* 1.6329	* .6645	* .7126 *
	* 1.8805	* 1.6166	* 1.7639	* 1.8392	* 1.8501	* 1.7735	* 3.9840	* 3.2887 *
14	* 1.6451	* 1.6353	* 1.6444	* .9878	* .7721	* .6775		
	* 1.5683	* 1.5913	* 1.6086	* 2.5467	* 3.3496	* 3.9089		
15	* .6867	* .7133	* .6988	* .4530	* F-SUB-Q			
	* 3.4481	* 3.2860	* 3.4053	* 5.4216	* M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3245	* 1.1709	* 1.3345	* 1.2151	* 1.4206	* 1.2655	* 1.4997	* .6450 *
	* 1.9245	* 2.1770	* 1.8891	* 2.0336	* 1.7332	* 1.9444	* 1.6434	* 3.5152 *
9	* 1.1709	* 1.4044	* 1.4056	* 1.3972	* 1.3819	* 1.4719	* 1.4867	* .6658 *
	* 2.1770	* 1.8023	* 1.7863	* 1.7969	* 1.7945	* 1.6852	* 1.6699	* 3.3697 *
10	* 1.3345	* 1.4049	* 1.4190	* 1.3961	* 1.3850	* 1.3866	* 1.4904	* .6481 *
	* 1.8891	* 1.7871	* 1.7821	* 1.8123	* 1.8235	* 1.8251	* 1.6887	* 3.5089 *
11	* 1.2151	* 1.3972	* 1.3963	* 1.3723	* 1.3593	* 1.3820	* .9144	* .4193 *
	* 2.0336	* 1.7961	* 1.8120	* 1.8675	* 1.9296	* 1.8936	* 2.6013	* 5.5788 *
12	* 1.4206	* 1.3844	* 1.3867	* 1.3599	* 1.3263	* 1.4042	* .7224	* .6658 *
	* 1.7332	* 1.7913	* 1.8212	* 1.9287	* 2.0034	* 1.8961	* 3.3694	* 3.3697 *
13	* 1.2655	* 1.4750	* 1.3883	* 1.3830	* 1.4048	* 1.4657	* .6103	* .6481 *
	* 1.9444	* 1.6817	* 1.8229	* 1.8923	* 1.8952	* 1.8428	* 4.0625	* 3.5089 *
14	* 1.4997	* 1.4894	* 1.4922	* .9152	* .7228	* .6217		
	* 1.6434	* 1.6670	* 1.6866	* 2.5988	* 3.3677	* 3.9890		
15	* .6450	* .6665	* .6487	* .4197	* F-SUB-Q			
	* 3.5152	* 3.3668	* 3.5059	* 5.5732	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 169 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 50 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2262 *	.9857 *	1.0879 *	1.0180 *	1.2947 *	1.0352 *	1.3206 *	.5514 *
	* 1.9766 *	2.4582 *	2.2225 *	2.3382 *	1.8322 *	2.2939 *	1.8032 *	3.9798 *
9	* .9857 *	1.2215 *	1.1581 *	1.2741 *	1.1121 *	1.1958 *	1.3292 *	.5706 *
	* 2.4582 *	1.9886 *	2.0830 *	1.8928 *	2.1508 *	1.9998 *	1.7988 *	3.8045 *
10	* 1.0879 *	1.1575 *	1.1195 *	1.1591 *	1.2171 *	1.1281 *	1.2414 *	.5434 *
	* 2.2225 *	2.0840 *	2.1708 *	2.0973 *	2.0125 *	2.1576 *	1.9543 *	4.0447 *
11	* 1.0180 *	1.2744 *	1.1595 *	1.2067 *	1.1015 *	1.2744 *	.7679 *	.3501 *
	* 2.3382 *	1.8922 *	2.0965 *	2.0585 *	2.2652 *	1.9631 *	2.9742 *	6.4476 *
12	* 1.2947 *	1.1130 *	1.2179 *	1.1020 *	1.0421 *	1.2693 *	.6257 *	
	* 1.8322 *	2.1491 *	2.0110 *	2.2642 *	2.4485 *	2.0138 *	3.7351 *	
13	* 1.0352 *	1.1982 *	1.1294 *	1.2752 *	1.2699 *	1.1495 *	.4984 *	
	* 2.2939 *	1.9959 *	2.1551 *	1.9618 *	2.0129 *	2.2442 *	4.7639 *	
14	* 1.3206 *	1.3311 *	1.2428 *	.7686 *	.6260 *	.5076 *		
	* 1.8033 *	1.7963 *	1.9521 *	2.9714 *	3.7331 *	4.6784 *		
15	* .5514 *	.5711 *	.5439 *	.3505 *	F-SUB-Q			
	* 3.9798 *	3.8015 *	4.0415 *	6.4413 *	M-SUB-Q			

AT 50% POWER, 50 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5066 *	.4325 *	.4331 *	.4441 *	.5288 *	.4424 *	.4772 *	.2375 *
	* 4.5979 *	5.3920 *	5.3754 *	5.1887 *	4.3420 *	5.1996 *	4.8200 *	8.9616 *
9	* .4325 *	.5000 *	.4589 *	.5245 *	.4463 *	.4587 *	.4783 *	.2404 *
	* 5.3920 *	4.6638 *	5.0674 *	4.4305 *	5.1866 *	5.0381 *	4.8247 *	8.7706 *
10	* .4331 *	.4587 *	.4323 *	.4667 *	.5151 *	.4460 *	.4411 *	.2249 *
	* 5.3754 *	5.0689 *	5.4168 *	5.0179 *	4.5550 *	5.2704 *	5.3042 *	9.4700 *
11	* .4441 *	.5247 *	.4669 *	.5078 *	.4350 *	.4835 *	.3244 *	.1518 *
	* 5.1887 *	4.4295 *	5.0160 *	4.6735 *	5.4976 *	4.9726 *	6.7983 *	14.4142 *
12	* .5288 *	.4466 *	.5155 *	.4352 *	.4063 *	.4580 *	.2625 *	
	* 4.3420 *	5.1830 *	4.5522 *	5.4952 *	6.0201 *	5.3754 *	8.6069 *	
13	* .4424 *	.4595 *	.4465 *	.4838 *	.4582 *	.4007 *	.2034 *	
	* 5.1996 *	5.0290 *	5.2649 *	4.9693 *	5.3727 *	6.1984 *	11.2772 *	
14	* .4772 *	.4790 *	.4417 *	.3247 *	.2627 *	.2066 *		
	* 4.8200 *	4.8182 *	5.2981 *	6.7929 *	8.6011 *	11.1047 *		
15	* .2375 *	.2406 *	.2251 *	.1520 *	F-SUB-Q			
	* 8.9616 *	8.7635 *	9.4615 *	14.3997 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 170 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .3697 *	* .4327 *	* .4779 *	* .5044 *	* .5934 *	* .5048 *	* .5039 *	* .2754 *
	* 4.5921 *	* 5.3539 *	* 5.2382 *	* 4.9401 *	* 4.1946 *	* 4.9443 *	* 4.7591 *	* 8.1988 *
9	* .4327 *	* .5282 *	* .5047 *	* .5808 *	* .5052 *	* .5033 *	* .5215 *	* .2774 *
	* 5.3539 *	* 4.7786 *	* 4.9783 *	* 4.2957 *	* 4.9284 *	* 4.9546 *	* 4.7967 *	* 8.1431 *
10	* .4779 *	* .5046 *	* .4653 *	* .5071 *	* .5566 *	* .4759 *	* .4716 *	* .2544 *
	* 5.2382 *	* 4.9793 *	* 5.3371 *	* 4.9316 *	* 4.4595 *	* 5.1904 *	* 5.2310 *	* 8.8284 *
11	* .5044 *	* .5809 *	* .5073 *	* .5248 *	* .4313 *	* .4569 *	* .3269 *	* .1769 *
	* 4.9401 *	* 4.2946 *	* 4.9301 *	* 4.7693 *	* 5.5618 *	* 5.0687 *	* 6.8625 *	* 12.6372 *
12	* .5934 *	* .5054 *	* .5569 *	* .4314 *	* .3157 *	* .3451 *	* .2326 *	
	* 4.1946 *	* 4.9257 *	* 4.4573 *	* 5.5607 *	* 5.7662 *	* 5.2562 *	* 8.1891 *	
13	* .5048 *	* .5044 *	* .4764 *	* .4571 *	* .3452 *	* .2826 *	* .1601 *	
	* 4.9443 *	* 4.9442 *	* 5.1857 *	* 5.0672 *	* 5.2558 *	* 5.8570 *	* 10.4848 *	
14	* .5039 *	* .5223 *	* .4720 *	* .3271 *	* .2326 *	* .1635 *		
	* 4.7591 *	* 4.7904 *	* 5.2265 *	* 6.8598 *	* 8.1912 *	* 10.2887 *		
15	* .2754 *	* .2776 *	* .2545 *	* .1769 *	F-SUB-Q			
	* 8.1988 *	* 8.1406 *	* 8.8247 *	* 12.6314 *	M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .8120 *	* .9482 *	* 1.1353 *	* 1.1141 *	* 1.3426 *	* 1.1316 *	* 1.3411 *	* .6405 *
	* 2.1165 *	* 2.5213 *	* 2.2860 *	* 2.3173 *	* 1.9187 *	* 2.2788 *	* 1.9412 *	* 3.7071 *
9	* .9482 *	* 1.1883 *	* 1.2006 *	* 1.3138 *	* 1.2046 *	* 1.2330 *	* 1.3367 *	* .6579 *
	* 2.5213 *	* 2.1660 *	* 2.1649 *	* 1.9704 *	* 2.1439 *	* 2.0942 *	* 1.9338 *	* 3.5629 *
10	* 1.1353 *	* 1.2003 *	* 1.1588 *	* 1.1981 *	* 1.2099 *	* 1.1467 *	* 1.2157 *	* .6093 *
	* 2.2860 *	* 2.1654 *	* 2.2628 *	* 2.1591 *	* 2.1287 *	* 2.2344 *	* 2.1001 *	* 3.8085 *
11	* 1.1141 *	* 1.3141 *	* 1.1985 *	* 1.1317 *	* 1.0201 *	* 1.1101 *	* .7582 *	* .3988 *
	* 2.3173 *	* 1.9699 *	* 2.1585 *	* 2.2087 *	* 2.3672 *	* 2.1437 *	* 3.0661 *	* 5.8041 *
12	* 1.3426 *	* 1.2053 *	* 1.2104 *	* 1.0205 *	* .7305 *	* .8785 *	* .5494 *	
	* 1.9187 *	* 2.1427 *	* 2.1276 *	* 2.3666 *	* 2.4453 *	* 2.1131 *	* 3.5688 *	
13	* 1.1316 *	* 1.2353 *	* 1.1478 *	* 1.1106 *	* .8787 *	* .7523 *	* .3958 *	
	* 2.2788 *	* 2.0904 *	* 2.2324 *	* 2.1431 *	* 2.1129 *	* 2.3362 *	* 4.3709 *	
14	* 1.3411 *	* 1.3384 *	* 1.2167 *	* .7584 *	* .5494 *	* .3982 *		
	* 1.9412 *	* 1.9314 *	* 2.0984 *	* 3.0652 *	* 3.5696 *	* 4.3533 *		
15	* .6405 *	* .6583 *	* .6096 *	* .3990 *	F-SUB-Q			
	* 3.7071 *	* 3.5607 *	* 3.8073 *	* 5.8016 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 171 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9528	* 1.1501	* 1.3853	* 1.3498	* 1.5535	* 1.3934	* 1.5609	* .7717
	* 1.9163	* 2.1556	* 1.9222	* 1.9638	* 1.7011	* 1.8967	* 1.6929	* 3.1250
9	* 1.1501	* 1.4156	* 1.4565	* 1.4830	* 1.4912	* 1.5218	* 1.5355	* .8026
	* 2.1556	* 1.8859	* 1.8289	* 1.7906	* 1.7752	* 1.7344	* 1.7164	* 2.9741
10	* 1.3853	* 1.4562	* 1.4562	* 1.4495	* 1.4334	* 1.4087	* 1.4745	* .7524
	* 1.9222	* 1.8293	* 1.8322	* 1.8349	* 1.8486	* 1.8662	* 1.7758	* 3.1591
11	* 1.3498	* 1.4834	* 1.4497	* 1.3646	* 1.2526	* 1.2654	* .9336	* .4850
	* 1.9638	* 1.7901	* 1.8347	* 1.9443	* 1.9554	* 1.9317	* 2.5568	* 4.9005
12	* 1.5535	* 1.4931	* 1.4341	* 1.2530	* .9052	* 1.0235	* .6643	*
	* 1.7011	* 1.7730	* 1.8478	* 1.9550	* 1.9886	* 1.9055	* 3.0257	*
13	* 1.3934	* 1.5245	* 1.4100	* 1.2660	* 1.0238	* .9547	* .4910	*
	* 1.8967	* 1.7315	* 1.8645	* 1.9311	* 1.9052	* 1.8934	* 3.6146	*
14	* 1.5609	* 1.5376	* 1.4758	* .9338	* .6644	* .4993	*	*
	* 1.6929	* 1.7141	* 1.7743	* 2.5560	* 3.0260	* 3.5613	*	*
15	* .7717	* .8032	* .7528	* .4852	* F-SUB-Q			
	* 3.1250	* 2.9724	* 3.1580	* 4.8983	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0717	* 1.2574	* 1.5257	* 1.4853	* 1.7650	* 1.5432	* 1.7753	* .8314
	* 1.7614	* 2.0397	* 1.7983	* 1.8402	* 1.5424	* 1.7633	* 1.5289	* 2.9797
9	* 1.2574	* 1.5853	* 1.6091	* 1.6697	* 1.6580	* 1.7053	* 1.7539	* .8639
	* 2.0397	* 1.7343	* 1.7051	* 1.6398	* 1.6452	* 1.5915	* 1.5441	* 2.8405
10	* 1.5257	* 1.6088	* 1.6142	* 1.6036	* 1.6108	* 1.5683	* 1.6813	* .8139
	* 1.7983	* 1.7055	* 1.7008	* 1.7078	* 1.6968	* 1.7269	* 1.6029	* 3.0076
11	* 1.4853	* 1.6703	* 1.6038	* 1.5345	* 1.3899	* 1.4412	* 1.0179	* .5220
	* 1.8402	* 1.6393	* 1.7075	* 1.7817	* 1.8060	* 1.7500	* 2.4183	* 4.6953
12	* 1.7650	* 1.6602	* 1.6116	* 1.3904	* .9998	* 1.1642	* .7158	*
	* 1.5424	* 1.6431	* 1.6959	* 1.8056	* 1.8355	* 1.7178	* 2.9033	*
13	* 1.5432	* 1.7083	* 1.5698	* 1.4420	* 1.1647	* 1.1013	* .5357	*
	* 1.7633	* 1.5888	* 1.7252	* 1.7494	* 1.7174	* 1.6978	* 3.4278	*
14	* 1.7753	* 1.7563	* 1.6828	* 1.0183	* .7158	* .5468	*	*
	* 1.5289	* 1.5420	* 1.6015	* 2.4175	* 2.9034	* 3.3660	*	*
15	* .8314	* .8645	* .8143	* .5222	* F-SUB-Q			
	* 2.9797	* 2.8388	* 3.0066	* 4.6930	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 172 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1293	* 1.2989	* 1.5765	* 1.5466	* 1.8663	* 1.6047	* 1.8765	* .8680 *
	* 1.7472	* 2.0574	* 1.8106	* 1.8345	* 1.5136	* 1.7609	* 1.5014	* 2.9653 *
9	* 1.2989	* 1.6580	* 1.6703	* 1.7587	* 1.7265	* 1.7866	* 1.8630	* .9035 *
	* 2.0574	* 1.7255	* 1.7088	* 1.6161	* 1.6390	* 1.5775	* 1.5088	* 2.8218 *
10	* 1.5765	* 1.6699	* 1.6740	* 1.6683	* 1.6983	* 1.6373	* 1.7795	* .8511 *
	* 1.8106	* 1.7092	* 1.7052	* 1.7052	* 1.6709	* 1.7141	* 1.5708	* 2.9899 *
11	* 1.5466	* 1.7593	* 1.6685	* 1.6122	* 1.4568	* 1.5318	* 1.0683	* .5416 *
	* 1.8345	* 1.6156	* 1.7046	* 1.7647	* 1.7943	* 1.7114	* 2.3861	* 4.6877 *
12	* 1.8663	* 1.7289	* 1.6992	* 1.4574	* 1.0538	* 1.2462	* .7542 *	
	* 1.5136	* 1.6368	* 1.6700	* 1.7938	* 1.8221	* 1.6767	* 2.8814 *	
13	* 1.6047	* 1.7898	* 1.6389	* 1.5326	* 1.2467	* 1.1822	* .5656 *	
	* 1.7609	* 1.5748	* 1.7125	* 1.7108	* 1.6762	* 1.6587	* 3.4044 *	
14	* 1.8765	* 1.8656	* 1.7812	* 1.0687	* .7543	* .5777 *		
	* 1.5014	* 1.5067	* 1.5694	* 2.3851	* 2.8812	* 3.3411 *		
15	* .8680	* .9041	* .8515	* .5419	* F-SUB-Q			
	* 2.9653	* 2.8204	* 2.9888	* 4.6853	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1661	* 1.3150	* 1.5936	* 1.5730	* 1.9109	* 1.6296	* 1.9258	* .8896 *
	* 1.7993	* 2.1338	* 1.8701	* 1.8834	* 1.5419	* 1.8065	* 1.5212	* 3.0152 *
9	* 1.3150	* 1.6862	* 1.6940	* 1.7980	* 1.7544	* 1.8234	* 1.9153	* .9280 *
	* 2.1338	* 1.7733	* 1.7582	* 1.6502	* 1.6825	* 1.6082	* 1.5272	* 2.8627 *
10	* 1.5936	* 1.6936	* 1.6971	* 1.6960	* 1.7388	* 1.6688	* 1.8267	* .8738 *
	* 1.8702	* 1.7586	* 1.7551	* 1.7474	* 1.7043	* 1.7559	* 1.5941	* 3.0317 *
11	* 1.5730	* 1.7985	* 1.6966	* 1.6472	* 1.4934	* 1.5802	* 1.0997	* .5530 *
	* 1.8834	* 1.6496	* 1.7468	* 1.8031	* 1.8452	* 1.7453	* 2.4274	* 4.8010 *
12	* 1.9109	* 1.7568	* 1.7398	* 1.4940	* 1.0954	* 1.2993	* .7822 *	
	* 1.5419	* 1.6801	* 1.7033	* 1.8446	* 1.8770	* 1.7112	* 2.9453 *	
13	* 1.6296	* 1.8265	* 1.6705	* 1.5812	* 1.2999	* 1.2348	* .5881 *	
	* 1.8065	* 1.6054	* 1.7542	* 1.7446	* 1.7106	* 1.6952	* 3.4890 *	
14	* 1.9258	* 1.9180	* 1.8284	* 1.1002	* .7824	* .6006 *		
	* 1.5212	* 1.5251	* 1.5926	* 2.4262	* 2.9448	* 3.4243 *		
15	* .8896	* .9286	* .8742	* .5533	* F-SUB-Q			
	* 3.0152	* 2.8611	* 3.0304	* 4.7983	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 173 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2024	* 1.3275	* 1.6087	* 1.5918	* 1.9519	* 1.6478	* 1.9744	* .8966 *
	* 1.8609	* 2.2230	* 1.9645	* 1.9732	* 1.5990	* 1.8907	* 1.5659	* 3.1560 *
9	* 1.3275	* 1.7140	* 1.7150	* 1.8332	* 1.7779	* 1.8555	* 1.9650	* .9335 *
	* 2.2230	* 1.8498	* 1.8410	* 1.7152	* 1.7581	* 1.6698	* 1.5718	* 3.0029 *
10	* 1.6087	* 1.7145	* 1.7184	* 1.7233	* 1.7763	* 1.6971	* 1.8718	* .8793 *
	* 1.9645	* 1.8415	* 1.8369	* 1.8235	* 1.7689	* 1.8300	* 1.6458	* 3.1861 *
11	* 1.5918	* 1.8338	* 1.7239	* 1.6809	* 1.5271	* 1.6281	* 1.1129	* .5554 *
	* 1.9732	* 1.7147	* 1.8228	* 1.8746	* 1.9146	* 1.7857	* 2.5484	* 5.0708 *
12	* 1.9519	* 1.7804	* 1.7773	* 1.5277	* 1.1277	* 1.3513	* .7944 *	
	* 1.5990	* 1.7556	* 1.7679	* 1.9140	* 1.9475	* 1.7589	* 3.0909 *	
13	* 1.6478	* 1.8588	* 1.6988	* 1.6291	* 1.3520	* 1.2885	* .6009 *	
	* 1.8907	* 1.6669	* 1.8282	* 1.7849	* 1.7583	* 1.7491	* 3.6675 *	
14	* 1.9744	* 1.9678	* 1.8736	* 1.1134	* .7946	* .6139	*	
	* 1.5659	* 1.5696	* 1.6443	* 2.5469	* 3.0903	* 3.5979	*	
15	* .8966	* .9341	* .8797	* .5558	* F-SUB-Q			
	* 3.1560	* 3.0013	* 3.1846	* 5.0677	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2149	* 1.3283	* 1.6095	* 1.5964	* 1.9670	* 1.6513	* 1.9953	* .9008 *
	* 1.9713	* 2.3677	* 2.1172	* 2.1205	* 1.7084	* 2.0298	* 1.6631	* 3.3703 *
9	* 1.3283	* 1.7221	* 1.7198	* 1.8462	* 1.7845	* 1.8679	* 1.9871	* .9364 *
	* 2.3677	* 1.9851	* 1.9790	* 1.8348	* 1.8861	* 1.7820	* 1.6689	* 3.2122 *
10	* 1.6095	* 1.7193	* 1.7238	* 1.7334	* 1.7921	* 1.7081	* 1.8930	* .8827 *
	* 2.1172	* 1.9796	* 1.9736	* 1.9543	* 1.8895	* 1.9585	* 1.7500	* 3.4107 *
11	* 1.5964	* 1.8469	* 1.7340	* 1.6950	* 1.5443	* 1.6545	* 1.1219	* .5574 *
	* 2.1205	* 1.8342	* 1.9536	* 1.9980	* 2.0107	* 1.8712	* 2.7078	* 5.4437 *
12	* 1.9670	* 1.7863	* 1.7931	* 1.5449	* 1.1453	* 1.3826	* .8052 *	
	* 1.7084	* 1.8834	* 1.8884	* 2.0101	* 2.0544	* 1.8446	* 3.2579 *	
13	* 1.6513	* 1.8712	* 1.7098	* 1.6555	* 1.3832	* 1.3238	* .6122 *	
	* 2.0298	* 1.7789	* 1.9565	* 1.8703	* 1.8439	* 1.8429	* 3.8909 *	
14	* 1.9953	* 1.9899	* 1.8948	* 1.1226	* .8054	* .6253	*	
	* 1.6631	* 1.6666	* 1.7483	* 2.7065	* 3.2572	* 3.8173	*	
15	* .9008	* .9370	* .8832	* .5578	* F-SUB-Q			
	* 3.3703	* 3.2104	* 3.4090	* 5.4403	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 174 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2239	* 1.3295	* 1.6118	* 1.5995	* 1.9825	* 1.6538	* 2.0152	* .8998
	* 2.1472	* 2.5828	* 2.3102	* 2.3007	* 1.8412	* 2.1973	* 1.7847	* 3.6422
9	* 1.3295	* 1.7328	* 1.7258	* 1.8597	* 1.7908	* 1.8792	* 2.0080	* .9327
	* 2.5828	* 2.1484	* 2.1547	* 1.9809	* 2.0408	* 1.9206	* 1.7909	* 3.4822
10	* 1.6118	* 1.7253	* 1.7307	* 1.7436	* 1.8083	* 1.7194	* 1.9140	* .8816
	* 2.3102	* 2.1553	* 2.1474	* 2.1199	* 2.0405	* 2.1132	* 1.8794	* 3.6895
11	* 1.5995	* 1.8603	* 1.7442	* 1.7109	* 1.5609	* 1.6828	* 1.1269	* .5565
	* 2.3007	* 1.9802	* 2.1192	* 2.1356	* 2.1630	* 2.0023	* 2.9051	* 5.8998
12	* 1.9825	* 1.7921	* 1.8093	* 1.5616	* 1.1574	* 1.4127	* .8117	*
	* 1.8412	* 2.0379	* 2.0394	* 2.1623	* 2.2136	* 1.9700	* 3.5267	*
13	* 1.6538	* 1.8824	* 1.7211	* 1.6838	* 1.4134	* 1.3595	* .6216	*
	* 2.1973	* 1.9173	* 2.1110	* 2.0013	* 1.9693	* 1.9673	* 4.1956	*
14	* 2.0152	* 2.0109	* 1.9158	* 1.1276	* .8119	* .6351	*	*
	* 1.7847	* 1.7884	* 1.8776	* 2.9035	* 3.5259	* 4.1153	*	*
15	* .8998	* .9334	* .8821	* .5568	F-SUB-Q			
	* 3.6422	* 3.4799	* 3.6877	* 5.8958	M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2116	* 1.3202	* 1.5909	* 1.5822	* 1.9526	* 1.6342	* 1.9881	* .9022
	* 2.3986	* 2.8634	* 2.5440	* 2.5116	* 2.0169	* 2.3978	* 1.9569	* 3.9223
9	* 1.3202	* 1.7102	* 1.7059	* 1.8345	* 1.7689	* 1.8584	* 1.9827	* .9428
	* 2.8634	* 2.3881	* 2.3702	* 2.1691	* 2.2285	* 2.0971	* 1.9604	* 3.7171
10	* 1.5909	* 1.7053	* 1.7120	* 1.7275	* 1.7885	* 1.7044	* 1.8937	* .8910
	* 2.5440	* 2.3709	* 2.3627	* 2.3206	* 2.2325	* 2.2992	* 2.0492	* 3.9248
11	* 1.5822	* 1.8351	* 1.7282	* 1.6942	* 1.5560	* 1.6760	* 1.1400	* .5613
	* 2.5116	* 2.1683	* 2.3197	* 2.3556	* 2.3914	* 2.2076	* 3.1497	* 6.2711
12	* 1.9526	* 1.7702	* 1.7895	* 1.5566	* 1.1686	* 1.4194	* .8325	*
	* 2.0169	* 2.2253	* 2.2312	* 2.3903	* 2.4654	* 2.1947	* 3.8279	*
13	* 1.6342	* 1.8617	* 1.7061	* 1.6771	* 1.4201	* 1.3733	* .6401	*
	* 2.3978	* 2.0936	* 2.2968	* 2.2065	* 2.1939	* 2.1907	* 4.5764	*
14	* 1.9881	* 1.9854	* 1.8955	* 1.1408	* .8328	* .6545	*	*
	* 1.9569	* 1.9577	* 2.0473	* 3.1479	* 3.8269	* 4.4856	*	*
15	* .9022	* .9435	* .8916	* .5616	F-SUB-Q			
	* 3.9223	* 3.7149	* 3.9228	* 6.2668	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 175 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2448	* 1.3313	* 1.6041	* 1.5896	* 1.9802	* 1.6398	* 2.0195	* .8945
	* 2.6399	* 3.1815	* 2.7245	* 2.6955	* 2.1416	* 2.5673	* 2.0570	* 4.2052
9	* 1.3313	* 1.7383	* 1.7231	* 1.8599	* 1.7827	* 1.8771	* 2.0158	* .9281
	* 3.1815	* 2.5392	* 2.5320	* 2.3066	* 2.3828	* 2.2252	* 2.0627	* 4.0180
10	* 1.6041	* 1.7225	* 1.7301	* 1.7483	* 1.8184	* 1.7259	* 1.9292	* .8799
	* 2.7245	* 2.5329	* 2.5217	* 2.4798	* 2.3738	* 2.4525	* 2.1660	* 4.2584
11	* 1.5896	* 1.8608	* 1.7489	* 1.7265	* 1.5915	* 1.7293	* 1.1423	* .5580
	* 2.6955	* 2.3057	* 2.4789	* 2.5391	* 2.6268	* 2.4063	* 3.4363	* 6.8192
12	* 1.9802	* 1.7840	* 1.8194	* 1.5921	* 1.1945	* 1.4809	* .8420	*
	* 2.1416	* 2.3793	* 2.3725	* 2.6257	* 2.6998	* 2.3825	* 4.2737	*
13	* 1.6398	* 1.8804	* 1.7276	* 1.7304	* 1.4816	* 1.4489	* .6558	*
	* 2.5673	* 2.2215	* 2.4500	* 2.4052	* 2.3816	* 2.3896	* 5.1164	*
14	* 2.0195	* 2.0186	* 1.9311	* 1.1430	* .8423	* .6698	*	*
	* 2.0570	* 2.0601	* 2.1640	* 3.4340	* 4.2726	* 5.0196	*	*
15	* .8945	* .9287	* .8804	* .5584	* F-SUB-Q			
	* 4.2052	* 4.0160	* 4.2561	* 6.8145	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3055	* 1.3492	* 1.6058	* 1.5858	* 1.9789	* 1.6331	* 2.0200	* .8919
	* 2.7072	* 3.2595	* 2.9496	* 2.9087	* 2.3186	* 2.7923	* 2.2230	* 4.5439
9	* 1.3492	* 1.7491	* 1.7266	* 1.8634	* 1.7797	* 1.8760	* 2.0185	* .9255
	* 3.2595	* 2.6991	* 2.7440	* 2.4897	* 2.5906	* 2.4106	* 2.2272	* 4.3422
10	* 1.6058	* 1.7260	* 1.7342	* 1.7551	* 1.8270	* 1.7336	* 1.9389	* .8796
	* 2.9496	* 2.7449	* 2.7437	* 2.6983	* 2.5761	* 2.6577	* 2.3394	* 4.6004
11	* 1.5858	* 1.8644	* 1.7557	* 1.7421	* 1.6276	* 1.7725	* 1.1572	* .5610
	* 2.9087	* 2.4886	* 2.6973	* 2.6803	* 2.7571	* 2.5311	* 3.7124	* 7.3638
12	* 1.9789	* 1.7810	* 1.8280	* 1.6283	* 1.2566	* 1.5627	* .8719	*
	* 2.3186	* 2.5868	* 2.5747	* 2.7561	* 2.8802	* 2.5425	* 4.5577	*
13	* 1.6331	* 1.8793	* 1.7352	* 1.7735	* 1.5634	* 1.5439	* .6887	*
	* 2.7923	* 2.4066	* 2.6550	* 2.5298	* 2.5415	* 2.5779	* 5.5264	*
14	* 2.0200	* 2.0214	* 1.9408	* 1.1579	* .8722	* .7032	*	*
	* 2.2230	* 2.2243	* 2.3373	* 3.7099	* 4.5563	* 5.4238	*	*
15	* .8919	* .9261	* .8802	* .5614	* F-SUB-Q			
	* 4.5439	* 4.3399	* 4.5979	* 7.3588	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 176 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4448	* 1.3673	* 1.5942	* 1.5689	* 1.9492	* 1.6125	* 1.9919	* .8903
	* 2.7524	* 3.3043	* 2.8650	* 2.8196	* 2.2535	* 2.7081	* 2.1958	* 4.4553
9	* 1.3673	* 1.7414	* 1.7147	* 1.8416	* 1.7591	* 1.8552	* 1.9930	* .9296
	* 3.3043	* 2.6725	* 2.6605	* 2.4190	* 2.5176	* 2.3732	* 2.2086	* 4.2393
10	* 1.5942	* 1.7140	* 1.7228	* 1.7461	* 1.8137	* 1.7258	* 1.9244	* .8860
	* 2.8650	* 2.6614	* 2.6610	* 2.6230	* 2.5129	* 2.6348	* 2.3406	* 4.5374
11	* 1.5689	* 1.8425	* 1.7467	* 1.7393	* 1.6614	* 1.8041	* 1.1785	* .5658
	* 2.8196	* 2.4180	* 2.6220	* 2.6927	* 2.7862	* 2.5610	* 3.6826	* 7.4095
12	* 1.9492	* 1.7603	* 1.8147	* 1.6621	* 1.3775	* 1.6799	* .9154	*
	* 2.2535	* 2.5139	* 2.5114	* 2.7852	* 2.9098	* 2.5724	* 4.5317	*
13	* 1.6125	* 1.8584	* 1.7274	* 1.8051	* 1.6806	* 1.6557	* .7337	*
	* 2.7081	* 2.3692	* 2.6320	* 2.5596	* 2.5713	* 2.6081	* 5.5050	*
14	* 1.9919	* 1.9958	* 1.9262	* 1.1793	* .9157	* .7496	*	*
	* 2.1958	* 2.2055	* 2.3382	* 3.6797	* 4.5303	* 5.3999	*	*
15	* .8903	* .9303	* .8866	* .5662	* F-SUB-Q			
	* 4.4553	* 4.2366	* 4.5347	* 7.4037	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6899	* 1.4081	* 1.6052	* 1.5690	* 1.9651	* 1.6097	* 2.0115	* .8781
	* 2.6569	* 3.1963	* 2.7633	* 2.7233	* 2.1558	* 2.6150	* 2.0934	* 4.3475
9	* 1.4081	* 1.7696	* 1.7282	* 1.8630	* 1.7644	* 1.8649	* 2.0154	* .9106
	* 3.1963	* 2.5600	* 2.5619	* 2.3179	* 2.4251	* 2.2764	* 2.1051	* 4.1669
10	* 1.6052	* 1.7275	* 1.7367	* 1.7626	* 1.8379	* 1.7434	* 1.9540	* .8716
	* 2.7633	* 2.5628	* 2.5617	* 2.5246	* 2.4066	* 2.5309	* 2.2323	* 4.4561
11	* 1.5690	* 1.8634	* 1.7632	* 1.7804	* 1.7160	* 1.8785	* 1.1826	* .5611
	* 2.7233	* 2.3170	* 2.5236	* 2.5787	* 2.6812	* 2.4496	* 3.5884	* 7.2667
12	* 1.9651	* 1.7657	* 1.8389	* 1.7167	* 1.6014	* 1.8289	* .9364	*
	* 2.1558	* 2.4215	* 2.4052	* 2.6803	* 2.8109	* 2.4593	* 4.4119	*
13	* 1.6097	* 1.8680	* 1.7451	* 1.8795	* 1.8296	* 1.7968	* .7631	*
	* 2.6150	* 2.2727	* 2.5282	* 2.4484	* 2.4583	* 2.4885	* 5.3261	*
14	* 2.0115	* 2.0181	* 1.9559	* 1.1834	* .9367	* .7789	*	*
	* 2.0934	* 2.1022	* 2.2300	* 3.5859	* 4.4106	* 5.2290	*	*
15	* .8781	* .9112	* .8722	* .5615	* F-SUB-Q			
	* 4.3475	* 4.1647	* 4.4532	* 7.2608	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 177 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7448	* 1.4349	* 1.6035	* 1.5554	* 1.9540	* 1.5932	* 2.0031	* .8677 *
	* 2.4522	* 2.9644	* 2.5894	* 2.5598	* 2.0265	* 2.4667	* 1.9657	* 4.0770 *
9	* 1.4349	* 1.7698	* 1.7211	* 1.8592	* 1.7515	* 1.8542	* 2.0097	* .8970 *
	* 2.9644	* 2.3861	* 2.3992	* 2.1710	* 2.2828	* 2.1428	* 1.9752	* 3.9202 *
10	* 1.6035	* 1.7204	* 1.7303	* 1.7581	* 1.8359	* 1.7402	* 1.9554	* .8622 *
	* 2.5894	* 2.4001	* 2.3988	* 2.3653	* 2.2494	* 2.3743	* 2.0885	* 4.1749 *
11	* 1.5554	* 1.8597	* 1.7587	* 1.7963	* 1.7377	* 1.9105	* 1.1843	* .5572 *
	* 2.5598	* 2.1701	* 2.3645	* 2.3939	* 2.4730	* 2.2505	* 3.3270	* 6.7715 *
12	* 1.9540	* 1.7528	* 1.8369	* 1.7385	* 1.6605	* 1.9000	* .9504	* .9504 *
	* 2.0265	* 2.2795	* 2.2482	* 2.4719	* 2.5886	* 2.2565	* 4.0902	* 4.0902 *
13	* 1.5932	* 1.8574	* 1.7418	* 1.9115	* 1.9008	* 1.8730	* .7839	* .7839 *
	* 2.4668	* 2.1395	* 2.3720	* 2.2493	* 2.2556	* 2.2830	* 4.9322	* 4.9322 *
14	* 2.0031	* 2.0123	* 1.9573	* 1.1852	* .9507	* .8000		
	* 1.9657	* 1.9727	* 2.0866	* 3.3246	* 4.0890	* 4.8427		
15	* .8677	* .8978	* .8628	* .5576	* F-SUB-Q			
	* 4.0770	* 3.9176	* 4.1725	* 6.7663	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7427	* 1.4276	* 1.5850	* 1.5313	* 1.9247	* 1.5674	* 1.9753	* .8549 *
	* 2.2911	* 2.7712	* 2.3816	* 2.3546	* 1.8612	* 2.2694	* 1.8035	* 3.7502 *
9	* 1.4276	* 1.7500	* 1.6991	* 1.8359	* 1.7250	* 1.8290	* 1.9835	* .8873 *
	* 2.7712	* 2.1919	* 2.2032	* 1.9958	* 2.0993	* 1.9667	* 1.8113	* 3.5926 *
10	* 1.5850	* 1.6983	* 1.7090	* 1.7372	* 1.8149	* 1.7211	* 1.9357	* .8531 *
	* 2.3816	* 2.2041	* 2.2030	* 2.1716	* 2.0645	* 2.1773	* 1.9127	* 3.8287 *
11	* 1.5313	* 1.8363	* 1.7378	* 1.7858	* 1.7330	* 1.9079	* 1.1801	* .5523 *
	* 2.3546	* 1.9950	* 2.1708	* 2.2044	* 2.3060	* 2.0955	* 3.0556	* 6.2129 *
12	* 1.9247	* 1.7263	* 1.8159	* 1.7337	* 1.6731	* 1.9163	* .9577	* .9577 *
	* 1.8612	* 2.0962	* 2.0634	* 2.3050	* 2.4209	* 2.1061	* 3.8062	* 3.8062 *
13	* 1.5674	* 1.8321	* 1.7227	* 1.9089	* 1.9171	* 1.8961	* .7934	* .7934 *
	* 2.2694	* 1.9636	* 2.1751	* 2.0944	* 2.1053	* 2.1267	* 4.5992	* 4.5992 *
14	* 1.9753	* 1.9862	* 1.9375	* 1.1809	* .9581	* .8095		
	* 1.8035	* 1.8088	* 1.9109	* 3.0531	* 3.8050	* 4.5169		
15	* .8549	* .8879	* .8537	* .5527	* F-SUB-Q			
	* 3.7502	* 3.5906	* 3.8263	* 6.2080	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 178 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7019	* 1.3987	* 1.5471	* 1.4941	* 1.8710	* 1.5289	* 1.9220	* .8429 *
	* 2.3239	* 2.8030	* 2.4057	* 2.3769	* 1.8848	* 2.2921	* 1.8255	* 3.7553 *
9	* 1.3987	* 1.7052	* 1.6580	* 1.7871	* 1.6814	* 1.7848	* 1.9307	* .8790 *
	* 2.8030	* 2.2157	* 2.2221	* 2.0211	* 2.1216	* 1.9850	* 1.8321	* 3.5788 *
10	* 1.5471	* 1.6572	* 1.6684	* 1.6964	* 1.7693	* 1.6822	* 1.8890	* .8459 *
	* 2.4057	* 2.2229	* 2.2227	* 2.1895	* 2.0867	* 2.1936	* 1.9302	* 3.8100 *
11	* 1.4941	* 1.7875	* 1.6970	* 1.7464	* 1.7016	* 1.8693	* 1.1711	* .5469 *
	* 2.3769	* 2.0203	* 2.1887	* 2.2252	* 2.3322	* 2.1233	* 3.0329	* 6.1947 *
12	* 1.8710	* 1.6827	* 1.7703	* 1.7023	* 1.6513	* 1.8877	* .9581	* .9581 *
	* 1.8848	* 2.1185	* 2.0855	* 2.3311	* 2.4465	* 2.1353	* 3.7924	* 3.7924 *
13	* 1.5289	* 1.7878	* 1.6838	* 1.8703	* 1.8885	* 1.8743	* .7957	* .7957 *
	* 2.2921	* 1.9819	* 2.1914	* 2.1221	* 2.1344	* 2.1576	* 4.6038	* 4.6038 *
14	* 1.9220	* 1.9333	* 1.8908	* 1.1719	* .9584	* .8119		
	* 1.8255	* 1.8296	* 1.9284	* 3.0304	* 3.7911	* 4.5212		
15	* .8429	* .8796	* .8465	* .5472	* F-SUB-Q			
	* 3.7553	* 3.5765	* 3.8078	* 6.1899	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6889	* 1.3745	* 1.5248	* 1.4669	* 1.8547	* 1.5010	* 1.9082	* .8151 *
	* 2.1455	* 2.6085	* 2.2389	* 2.2233	* 1.7465	* 2.1459	* 1.6902	* 3.5757 *
9	* 1.3745	* 1.6897	* 1.6353	* 1.7716	* 1.6562	* 1.7633	* 1.9184	* .8434 *
	* 2.6085	* 2.0471	* 2.0659	* 1.8743	* 1.9790	* 1.8464	* 1.6950	* 3.4357 *
10	* 1.5248	* 1.6345	* 1.6456	* 1.6731	* 1.7532	* 1.6605	* 1.8781	* .8143 *
	* 2.2389	* 2.0668	* 2.0656	* 2.0367	* 1.9322	* 2.0384	* 1.7819	* 3.6420 *
11	* 1.4669	* 1.7720	* 1.6737	* 1.7333	* 1.6862	* 1.8622	* 1.1370	* .5276 *
	* 2.2233	* 1.8737	* 2.0359	* 2.0554	* 2.1517	* 1.9458	* 2.8577	* 5.8970 *
12	* 1.8547	* 1.6575	* 1.7542	* 1.6867	* 1.6384	* 1.8870	* .9264	* .9264 *
	* 1.7465	* 1.9760	* 1.9311	* 2.1507	* 2.2647	* 1.9669	* 3.6119	* 3.6119 *
13	* 1.5010	* 1.7663	* 1.6621	* 1.8632	* 1.8878	* 1.8777	* .7741	* .7741 *
	* 2.1459	* 1.8435	* 2.0364	* 1.9448	* 1.9661	* 1.9836	* 4.3663	* 4.3663 *
14	* 1.9082	* 1.9210	* 1.8798	* 1.1378	* .9268	* .7897		
	* 1.6902	* 1.6926	* 1.7802	* 2.8553	* 3.6107	* 4.2889		
15	* .8151	* .8439	* .8148	* .5279	* F-SUB-Q			
	* 3.5757	* 3.4340	* 3.6397	* 5.8923	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 179 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6365	* 1.3316	* 1.4793	* 1.4196	* 1.7962	* 1.4534	* 1.8494	* .7874 *
	* 1.9993	* 2.4492	* 2.1305	* 2.1290	* 1.6717	* 2.0566	* 1.6186	* 3.4447 *
9	* 1.3316	* 1.6395	* 1.5865	* 1.7162	* 1.6041	* 1.7110	* 1.8596	* .8148 *
	* 2.4492	* 1.9423	* 1.9656	* 1.7925	* 1.8935	* 1.7648	* 1.6215	* 3.3083 *
10	* 1.4793	* 1.5857	* 1.5965	* 1.6217	* 1.6992	* 1.6110	* 1.8234	* .7873 *
	* 2.1305	* 1.9665	* 1.9656	* 1.9406	* 1.8426	* 1.9424	* 1.6983	* 3.4972 *
11	* 1.4196	* 1.7166	* 1.6222	* 1.6808	* 1.6376	* 1.8069	* 1.1018	* .5100 *
	* 2.1290	* 1.7919	* 1.9399	* 1.9512	* 2.0367	* 1.8410	* 2.7090	* 5.6413 *
12	* 1.7962	* 1.6053	* 1.7001	* 1.6382	* 1.5931	* 1.8337	* .8979	* .8979 *
	* 1.6717	* 1.8906	* 1.8416	* 2.0358	* 2.1225	* 1.8468	* 3.4067	* 3.4067 *
13	* 1.4534	* 1.7139	* 1.6125	* 1.8079	* 1.8345	* 1.8292	* .7514	* .7514 *
	* 2.0566	* 1.7620	* 1.9405	* 1.8400	* 1.8460	* 1.8645	* 4.1213	* 4.1213 *
14	* 1.8494	* 1.8621	* 1.8251	* 1.1026	* .8982	* .7665		
	* 1.6186	* 1.6193	* 1.6967	* 2.7068	* 3.4057	* 4.0487		
15	* .7874	* .8153	* .7879	* .5104	* F-SUB-Q			
	* 3.4447	* 3.3066	* 3.4951	* 5.6368	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5403	* 1.2699	* 1.4082	* 1.3484	* 1.6875	* 1.3825	* 1.7369	* .7575 *
	* 1.9773	* 2.3964	* 2.0826	* 2.0976	* 1.6664	* 2.0272	* 1.6166	* 3.3678 *
9	* 1.2699	* 1.5492	* 1.5081	* 1.6145	* 1.5206	* 1.6222	* 1.7465	* .7905 *
	* 2.3964	* 1.9059	* 1.9250	* 1.7815	* 1.8683	* 1.7441	* 1.6175	* 3.2060 *
10	* 1.4082	* 1.5074	* 1.5180	* 1.5384	* 1.6009	* 1.5296	* 1.7172	* .7641 *
	* 2.0826	* 1.9259	* 1.9253	* 1.9046	* 1.8233	* 1.9089	* 1.6848	* 3.3798 *
11	* 1.3484	* 1.6149	* 1.5389	* 1.5835	* 1.5525	* 1.6963	* 1.0631	* .4935 *
	* 2.0976	* 1.7809	* 1.9039	* 1.9172	* 1.9944	* 1.8186	* 2.5947	* 5.4404 *
12	* 1.6875	* 1.5217	* 1.6018	* 1.5531	* 1.5099	* 1.7211	* .8711	* .8711 *
	* 1.6664	* 1.8655	* 1.8223	* 1.9934	* 2.0788	* 1.8275	* 3.2766	* 3.2766 *
13	* 1.3825	* 1.6249	* 1.5310	* 1.6972	* 1.7218	* 1.7214	* .7267	* .7267 *
	* 2.0272	* 1.7413	* 1.9070	* 1.8176	* 1.8268	* 1.8358	* 3.9602	* 3.9602 *
14	* 1.7369	* 1.7490	* 1.7188	* 1.0638	* .8714	* .7417		
	* 1.6166	* 1.6153	* 1.6831	* 2.5927	* 3.2755	* 3.8880		
15	* .7576	* .7911	* .7646	* .4939	* F-SUB-Q			
	* 3.3678	* 3.2038	* 3.3780	* 5.4362	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 180 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4617	* 1.2075	* 1.3471	* 1.2779	* 1.5949	* 1.3118	* 1.6408	* .7066 *
	* 1.9255	* 2.3193	* 2.0454	* 2.0919	* 1.6682	* 2.0234	* 1.6213	* 3.4295 *
9	* 1.2075	* 1.4755	* 1.4391	* 1.5295	* 1.4444	* 1.5413	* 1.6497	* .7331 *
	* 2.3193	* 1.8734	* 1.8964	* 1.7772	* 1.8583	* 1.7370	* 1.6211	* 3.2828 *
10	* 1.3471	* 1.4384	* 1.4491	* 1.4639	* 1.5166	* 1.4558	* 1.6263	* .7082 *
	* 2.0454	* 1.8973	* 1.8965	* 1.8821	* 1.8116	* 1.8878	* 1.6783	* 3.4549 *
11	* 1.2779	* 1.5299	* 1.4644	* 1.4994	* 1.4732	* 1.6022	* .9916	* .4609 *
	* 2.0919	* 1.7765	* 1.8814	* 1.8893	* 1.9491	* 1.7867	* 2.6061	* 5.4905 *
12	* 1.5949	* 1.4455	* 1.5174	* 1.4737	* 1.4313	* 1.6221	* .8089	* .7066 *
	* 1.6682	* 1.8555	* 1.8106	* 1.9482	* 2.0546	* 1.8179	* 3.2854	* .7066 *
13	* 1.3118	* 1.5439	* 1.4571	* 1.6030	* 1.6228	* 1.6250	* .6749	* .7066 *
	* 2.0234	* 1.7342	* 1.8861	* 1.7857	* 1.8172	* 1.8358	* 4.0233	* .7066 *
14	* 1.6408	* 1.6521	* 1.6279	* .9922	* .8091	* .6883		
	* 1.6213	* 1.6188	* 1.6767	* 2.6041	* 3.2844	* 3.9533		
15	* .7066	* .7337	* .7087	* .4612	* F-SUB-Q			
	* 3.4295	* 3.2808	* 3.4528	* 5.4865	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3144	* 1.1077	* 1.2289	* 1.1630	* 1.4200	* 1.1884	* 1.4573	* .6448 *
	* 2.0109	* 2.3850	* 2.1268	* 2.1986	* 1.7927	* 2.1397	* 1.7494	* 3.6099 *
9	* 1.1077	* 1.3294	* 1.3108	* 1.3748	* 1.3094	* 1.3885	* 1.4648	* .6660 *
	* 2.3850	* 1.9730	* 1.9823	* 1.8942	* 1.9612	* 1.8459	* 1.7484	* 3.4702 *
10	* 1.2289	* 1.3102	* 1.3138	* 1.3339	* 1.3634	* 1.3182	* 1.4467	* .6419 *
	* 2.1268	* 1.9832	* 1.9921	* 1.9652	* 1.9191	* 1.9862	* 1.8009	* 3.6541 *
11	* 1.1630	* 1.3751	* 1.3343	* 1.3474	* 1.3300	* 1.4261	* .8972	* .4185 *
	* 2.1986	* 1.8935	* 1.9646	* 1.9955	* 2.0390	* 1.9006	* 2.7314	* 5.7747 *
12	* 1.4200	* 1.3104	* 1.3641	* 1.3306	* 1.2879	* 1.4385	* .7354	* .6419 *
	* 1.7927	* 1.9598	* 1.9181	* 2.0379	* 2.1435	* 1.9234	* 3.4127	* .6419 *
13	* 1.1884	* 1.3909	* 1.3194	* 1.4268	* 1.4390	* 1.4341	* .6082	* .6419 *
	* 2.1397	* 1.8429	* 1.9845	* 1.8996	* 1.9226	* 1.9481	* 4.1959	* .6419 *
14	* 1.4573	* 1.4669	* 1.4480	* .8978	* .7356	* .6199		
	* 1.7494	* 1.7460	* 1.7993	* 2.7295	* 3.4117	* 4.1252		
15	* .6448	* .6666	* .6423	* .4188	* F-SUB-Q			
	* 3.6099	* 3.4678	* 3.6520	* 5.7705	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 181 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 125 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1235 *	* .9052 *	* .9877 *	* .9432 *	* 1.1929 *	* .9488 *	* 1.2283 *	* .5298 *
	* 2.2515 *	* 2.7896 *	* 2.5414 *	* 2.6168 *	* 2.0667 *	* 2.5921 *	* 2.0084 *	* 4.2609 *
9	* .9052 *	* 1.1351 *	* 1.0576 *	* 1.1972 *	* 1.0360 *	* 1.1008 *	* 1.2366 *	* .5469 *
	* 2.7896 *	* 2.2258 *	* 2.3662 *	* 2.0905 *	* 2.4036 *	* 2.2507 *	* 2.0033 *	* 4.0971 *
10	* .9877 *	* 1.0571 *	* 1.0230 *	* 1.0852 *	* 1.1667 *	* 1.0539 *	* 1.1622 *	* .5204 *
	* 2.5414 *	* 2.3672 *	* 2.4633 *	* 2.3250 *	* 2.1811 *	* 2.3980 *	* 2.1648 *	* 4.3647 *
11	* .9432 *	* 1.1974 *	* 1.0855 *	* 1.1586 *	* 1.0477 *	* 1.2103 *	* .7282 *	* .3419 *
	* 2.6168 *	* 2.0899 *	* 2.3243 *	* 2.2256 *	* 2.4713 *	* 2.1472 *	* 3.2379 *	* 6.8337 *
12	* 1.1929 *	* 1.0367 *	* 1.1673 *	* 1.0481 *	* .9926 *	* 1.2176 *	* .6095 *	
	* 2.0667 *	* 2.4020 *	* 2.1799 *	* 2.4705 *	* 2.6647 *	* 2.1767 *	* 3.9606 *	
13	* .9488 *	* 1.1026 *	* 1.0547 *	* 1.2108 *	* 1.2180 *	* 1.1013 *	* .4856 *	
	* 2.5921 *	* 2.2471 *	* 2.3959 *	* 2.1463 *	* 2.1759 *	* 2.4290 *	* 5.0430 *	
14	* 1.2283 *	* 1.2381 *	* 1.1631 *	* .7286 *	* .6097 *	* .4945 *		
	* 2.0084 *	* 2.0010 *	* 2.1630 *	* 3.2357 *	* 3.9592 *	* 4.9617 *		
15	* .5298 *	* .5473 *	* .5207 *	* .3421 *	* F-SUB-Q			
	* 4.2609 *	* 4.0944 *	* 4.3625 *	* 6.8290 *	* M-SUB-Q			

AT 50% POWER, 125 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4645 *	* .3953 *	* .3948 *	* .4086 *	* .4873 *	* .4057 *	* .4457 *	* .2250 *
	* 5.2333 *	* 6.1480 *	* 6.1305 *	* 5.8556 *	* 4.8938 *	* 5.8811 *	* 5.3548 *	* 9.7385 *
9	* .3953 *	* .4596 *	* .4196 *	* .4888 *	* .4146 *	* .4231 *	* .4471 *	* .2276 *
	* 6.1480 *	* 5.2789 *	* 5.7555 *	* 4.9468 *	* 5.8269 *	* 5.6646 *	* 5.3567 *	* 9.5735 *
10	* .3948 *	* .4195 *	* .3976 *	* .4344 *	* .4863 *	* .4168 *	* .4163 *	* .2137 *
	* 6.1305 *	* 5.7571 *	* 6.1156 *	* 5.5981 *	* 5.0131 *	* 5.8562 *	* 5.8371 *	* 10.3115 *
11	* .4086 *	* .4889 *	* .4346 *	* .4817 *	* .4112 *	* .4609 *	* .3061 *	* .1472 *
	* 5.8556 *	* 4.9455 *	* 5.5965 *	* 5.1404 *	* 6.0423 *	* 5.4237 *	* 7.4428 *	* 15.4003 *
12	* .4873 *	* .4149 *	* .4866 *	* .4114 *	* .3862 *	* .4401 *	* .2527 *	
	* 4.8938 *	* 5.8233 *	* 5.0107 *	* 6.0403 *	* 6.5800 *	* 5.8062 *	* 9.2500 *	
13	* .4057 *	* .4237 *	* .4171 *	* .4611 *	* .4403 *	* .3872 *	* .1973 *	
	* 5.8811 *	* 5.6559 *	* 5.8516 *	* 5.4211 *	* 5.8038 *	* 6.6581 *	* 11.9984 *	
14	* .4457 *	* .4476 *	* .4166 *	* .3063 *	* .2528 *	* .2004 *		
	* 5.3548 *	* 5.3508 *	* 5.8322 *	* 7.4388 *	* 9.2453 *	* 11.8373 *		
15	* .2250 *	* .2277 *	* .2138 *	* .1472 *	* F-SUB-Q			
	* 9.7385 *	* 9.5676 *	* 10.3052 *	* 15.3892 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 182 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .3571 *	* .4109 *	* .4553 *	* .4876 *	* .5710 *	* .4719 *	* .4117 *	* .2130 *
	* 4.6014 *	* 5.3353 *	* 5.1988 *	* 4.9143 *	* 4.2424 *	* 4.9379 *	* 4.7739 *	* 8.0641 *
9	* .4109 *	* .4791 *	* .4709 *	* .5586 *	* .4891 *	* .4750 *	* .4723 *	* .2462 *
	* 5.3353 *	* 4.8166 *	* 4.9378 *	* 4.3213 *	* 4.8815 *	* 4.9268 *	* 4.8061 *	* 8.0472 *
10	* .4553 *	* .4708 *	* .3908 *	* .4811 *	* .5433 *	* .4684 *	* .4585 *	* .2413 *
	* 5.1988 *	* 4.9385 *	* 5.2907 *	* 4.8429 *	* 4.4402 *	* 5.1046 *	* 5.1885 *	* 8.6948 *
11	* .4876 *	* .5587 *	* .4813 *	* .4927 *	* .4228 *	* .4622 *	* .3270 *	* .1795 *
	* 4.9143 *	* 4.3203 *	* 4.8418 *	* 4.7244 *	* 5.4343 *	* 5.0314 *	* 6.7576 *	* 12.1809 *
12	* .5710 *	* .4894 *	* .5436 *	* .4229 *	* .3171 *	* .3571 *	* .2412 *	
	* 4.2424 *	* 4.8791 *	* 4.4384 *	* 5.4334 *	* 5.6125 *	* 5.1801 *	* 8.0328 *	
13	* .4719 *	* .4759 *	* .4688 *	* .4623 *	* .3571 *	* .2985 *	* .1697 *	
	* 4.9379 *	* 4.9171 *	* 5.1007 *	* 5.0304 *	* 5.1799 *	* 5.7490 *	* 10.1853 *	
14	* .4117 *	* .4728 *	* .4588 *	* .3271 *	* .2412 *	* .1731 *		
	* 4.7739 *	* 4.8006 *	* 5.1849 *	* 6.7560 *	* 8.0350 *	* 10.0267 *		
15	* .2130 *	* .2463 *	* .2414 *	* .1796 *	F-SUB-Q			
	* 8.0641 *	* 8.0453 *	* 8.6926 *	* 12.1772 *	M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .7796 *	* .8980 *	* 1.0739 *	* 1.0719 *	* 1.2816 *	* 1.0557 *	* 1.0732 *	* .5200 *
	* 2.1743 *	* 2.5512 *	* 2.3125 *	* 2.3360 *	* 1.9757 *	* 2.3194 *	* 1.9907 *	* 3.6895 *
9	* .8980 *	* 1.1007 *	* 1.1212 *	* 1.2615 *	* 1.1586 *	* 1.1412 *	* 1.2060 *	* .5923 *
	* 2.5512 *	* 2.2001 *	* 2.1820 *	* 1.9963 *	* 2.1561 *	* 2.1224 *	* 1.9826 *	* 3.5644 *
10	* 1.0739 *	* 1.1210 *	* .9495 *	* 1.1414 *	* 1.1909 *	* 1.1149 *	* 1.1640 *	* .5804 *
	* 2.3125 *	* 2.1824 *	* 2.2899 *	* 2.1456 *	* 2.1238 *	* 2.2385 *	* 2.1374 *	* 3.8068 *
11	* 1.0719 *	* 1.2617 *	* 1.1417 *	* 1.0974 *	* 1.0107 *	* 1.1068 *	* .7496 *	* .4014 *
	* 2.3360 *	* 1.9959 *	* 2.1452 *	* 2.2025 *	* 2.3415 *	* 2.1639 *	* 3.0693 *	* 5.6787 *
12	* 1.2816 *	* 1.1592 *	* 1.1914 *	* 1.0110 *	* .7311 *	* .8936 *	* .5634 *	
	* 1.9757 *	* 2.1551 *	* 2.1229 *	* 2.3411 *	* 2.4306 *	* 2.1296 *	* 3.5413 *	
13	* 1.0557 *	* 1.1435 *	* 1.1158 *	* 1.1071 *	* .8938 *	* .7736 *	* .4122 *	
	* 2.3194 *	* 2.1188 *	* 2.2367 *	* 2.1636 *	* 2.1294 *	* 2.3469 *	* 4.3184 *	
14	* 1.0732 *	* 1.2071 *	* 1.1648 *	* .7497 *	* .5633 *	* .4149 *		
	* 1.9907 *	* 1.9805 *	* 2.1361 *	* 3.0688 *	* 3.5420 *	* 4.3090 *		
15	* .5200 *	* .5928 *	* .5805 *	* .4015 *	F-SUB-Q			
	* 3.6895 *	* 3.5626 *	* 3.8063 *	* 5.6771 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 183 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9488	* 1.1059	* 1.3279	* 1.3217	* 1.5539	* 1.3305	* 1.4496	* .7102
	* 1.8883	* 2.1622	* 1.9458	* 1.9653	* 1.6861	* 1.9257	* 1.6925	* 3.0740
9	* 1.1059	* 1.3443	* 1.3950	* 1.4828	* 1.4597	* 1.4386	* 1.4833	* .7531
	* 2.1622	* 1.9018	* 1.8382	* 1.7695	* 1.7752	* 1.7545	* 1.6973	* 2.9354
10	* 1.3279	* 1.3947	* 1.3408	* 1.4178	* 1.4316	* 1.3841	* 1.4433	* .7395
	* 1.9458	* 1.8385	* 1.8554	* 1.8081	* 1.8313	* 1.8673	* 1.7911	* 3.1289
11	* 1.3217	* 1.4833	* 1.4182	* 1.3220	* 1.2655	* 1.3182	* .9361	* .4926
	* 1.9653	* 1.7689	* 1.8077	* 1.9360	* 1.9270	* 1.8673	* 2.5374	* 4.7873
12	* 1.5539	* 1.4604	* 1.4322	* 1.2658	* .9186	* 1.0685	* .6923	*
	* 1.6861	* 1.7743	* 1.8306	* 1.9266	* 1.9741	* 1.8421	* 2.9574	*
13	* 1.3305	* 1.4408	* 1.3852	* 1.3187	* 1.0688	* .9815	* .5121	*
	* 1.9257	* 1.7518	* 1.8658	* 1.8670	* 1.8419	* 1.9003	* 3.5626	*
14	* 1.4496	* 1.4851	* 1.4443	* .9362	* .6922	* .5212	*	*
	* 1.6925	* 1.6953	* 1.7898	* 2.5370	* 2.9577	* 3.5153	*	*
15	* .7102	* .7535	* .7397	* .4928	* F-SUB-Q			
	* 3.0740	* 2.9342	* 3.1283	* 4.7860	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0793	* 1.2248	* 1.4794	* 1.4747	* 1.7875	* 1.4950	* 1.7562	* .8231
	* 1.7240	* 2.0382	* 1.8232	* 1.8339	* 1.5257	* 1.7944	* 1.5177	* 2.9141
9	* 1.2248	* 1.5656	* 1.5704	* 1.7038	* 1.6383	* 1.6508	* 1.7572	* .8582
	* 2.0382	* 1.7383	* 1.7122	* 1.6057	* 1.6466	* 1.6135	* 1.5229	* 2.7906
10	* 1.4794	* 1.5701	* 1.5597	* 1.5996	* 1.6432	* 1.5535	* 1.6656	* .8166
	* 1.8232	* 1.7124	* 1.7244	* 1.6786	* 1.6647	* 1.7291	* 1.6163	* 2.9728
11	* 1.4747	* 1.7044	* 1.6001	* 1.5393	* 1.4204	* 1.5141	* 1.0291	* .5351
	* 1.8339	* 1.6051	* 1.6782	* 1.7650	* 1.7814	* 1.6788	* 2.3930	* 4.5802
12	* 1.7875	* 1.6392	* 1.6438	* 1.4209	* 1.0223	* 1.2219	* .7512	*
	* 1.5257	* 1.6458	* 1.6641	* 1.7810	* 1.8212	* 1.6523	* 2.8180	*
13	* 1.4950	* 1.6533	* 1.5547	* 1.5147	* 1.2222	* 1.1286	* .5577	*
	* 1.7944	* 1.6110	* 1.7277	* 1.6784	* 1.6520	* 1.7073	* 3.3777	*
14	* 1.7562	* 1.7593	* 1.6668	* 1.0293	* .7512	* .5694	*	*
	* 1.5177	* 1.5212	* 1.6151	* 2.3925	* 2.8182	* 3.3232	*	*
15	* .8231	* .8587	* .8168	* .5352	* F-SUB-Q			
	* 2.9141	* 2.7892	* 2.9724	* 4.5788	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 184 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1389	* 1.2745	* 1.5403	* 1.5452	* 1.8981	* 1.5663	* 1.8949	* .8789 *
	* 1.7103	* 2.0524	* 1.8377	* 1.8300	* 1.5023	* 1.7977	* 1.4881	* 2.9045 *
9	* 1.2745	* 1.6607	* 1.6456	* 1.8159	* 1.7176	* 1.7456	* 1.8902	* .9157 *
	* 2.0524	* 1.7289	* 1.7176	* 1.5771	* 1.6415	* 1.6063	* 1.4929	* 2.7770 *
10	* 1.5403	* 1.6453	* 1.6406	* 1.6847	* 1.7484	* 1.6277	* 1.7717	* .8622 *
	* 1.8377	* 1.7179	* 1.7315	* 1.6710	* 1.6369	* 1.7211	* 1.5898	* 2.9623 *
11	* 1.5452	* 1.8164	* 1.6852	* 1.6389	* 1.4946	* 1.6101	* 1.0816	* .5576 *
	* 1.8300	* 1.5766	* 1.6706	* 1.7459	* 1.7729	* 1.6448	* 2.3634	* 4.5795 *
12	* 1.8981	* 1.7185	* 1.7490	* 1.4951	* 1.0759	* 1.3000	* .7893 *	
	* 1.5023	* 1.6406	* 1.6363	* 1.7726	* 1.8133	* 1.6158	* 2.7997 *	
13	* 1.5663	* 1.7481	* 1.6290	* 1.6107	* 1.3004	* 1.1981	* .5845 *	
	* 1.7977	* 1.6039	* 1.7198	* 1.6444	* 1.6154	* 1.6764	* 3.3639 *	
14	* 1.8949	* 1.8923	* 1.7729	* 1.0818	* .7893	* .5971	*	
	* 1.4881	* 1.4913	* 1.5887	* 2.3629	* 2.7996	* 3.3075	*	
15	* .8789	* .9161	* .8624	* .5577	* F-SUB-Q			
	* 2.9045	* 2.7760	* 2.9618	* 4.5780	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1649	* 1.3005	* 1.5614	* 1.5739	* 1.9441	* 1.5928	* 1.9551	* .9068 *
	* 1.7623	* 2.1287	* 1.9031	* 1.8734	* 1.5287	* 1.8529	* 1.5154	* 2.9662 *
9	* 1.3005	* 1.6977	* 1.6756	* 1.8666	* 1.7490	* 1.7839	* 1.9485	* .9471 *
	* 2.1287	* 1.7786	* 1.7700	* 1.6056	* 1.6793	* 1.6471	* 1.5192	* 2.8261 *
10	* 1.5614	* 1.6752	* 1.6708	* 1.7225	* 1.7959	* 1.6584	* 1.8176	* .8879 *
	* 1.9031	* 1.7703	* 1.7858	* 1.7121	* 1.6630	* 1.7515	* 1.6168	* 3.0145 *
11	* 1.5739	* 1.8670	* 1.7230	* 1.6815	* 1.5298	* 1.6552	* 1.1107	* .5691 *
	* 1.8734	* 1.6051	* 1.7117	* 1.7861	* 1.8228	* 1.6817	* 2.3704	* 4.6296 *
12	* 1.9441	* 1.7499	* 1.7966	* 1.5302	* 1.1057	* 1.3407	* .8125 *	
	* 1.5287	* 1.6784	* 1.6624	* 1.8223	* 1.8725	* 1.6546	* 2.8671 *	
13	* 1.5928	* 1.7864	* 1.6597	* 1.6559	* 1.3411	* 1.2331	* .6020 *	
	* 1.8529	* 1.6446	* 1.7502	* 1.6813	* 1.6542	* 1.7234	* 3.4586 *	
14	* 1.9551	* 1.9506	* 1.8189	* 1.1110	* .8126	* .6146 *		
	* 1.5154	* 1.5176	* 1.6157	* 2.3698	* 2.8668	* 3.4028 *		
15	* .9068	* .9476	* .8881	* .5693	* F-SUB-Q			
	* 2.9662	* 2.8249	* 3.0139	* 4.6279	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 185 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1923	* 1.3086	* 1.5749	* 1.5893	* 1.9789	* 1.6058	* 2.0006	* .9134
	* 1.8293	* 2.2235	* 1.9585	* 1.9264	* 1.5580	* 1.8974	* 1.5400	* 3.0704
9	* 1.3086	* 1.7269	* 1.6953	* 1.9077	* 1.7694	* 1.8094	* 1.9942	* .9507
	* 2.2235	* 1.8239	* 1.8162	* 1.6284	* 1.7226	* 1.6798	* 1.5394	* 2.9306
10	* 1.5749	* 1.6948	* 1.6903	* 1.7479	* 1.8327	* 1.6802	* 1.8549	* .8907
	* 1.9585	* 1.8166	* 1.8353	* 1.7468	* 1.6907	* 1.7968	* 1.6377	* 3.1010
11	* 1.5893	* 1.9080	* 1.7484	* 1.7149	* 1.5581	* 1.6969	* 1.1184	* .5696
	* 1.9264	* 1.6279	* 1.7463	* 1.8157	* 1.8834	* 1.7323	* 2.4596	* 4.8146
12	* 1.9789	* 1.7704	* 1.8334	* 1.5586	* 1.1273	* 1.3834	* .8198	*
	* 1.5580	* 1.7217	* 1.6900	* 1.8829	* 1.9530	* 1.7083	* 3.0212	*
13	* 1.6058	* 1.8120	* 1.6814	* 1.6976	* 1.3839	* 1.2710	* .6083	*
	* 1.8974	* 1.6773	* 1.7954	* 1.7317	* 1.7078	* 1.7859	* 3.6483	*
14	* 2.0006	* 1.9963	* 1.8562	* 1.1187	* .8199	* .6216	*	*
	* 1.5400	* 1.5378	* 1.6366	* 2.4588	* 3.0209	* 3.5855	*	*
15	* .9134	* .9512	* .8910	* .5698	* F-SUB-Q			
	* 3.0704	* 2.9294	* 3.1003	* 4.8127	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2154	* 1.3082	* 1.5714	* 1.5879	* 1.9847	* 1.6015	* 2.0128	* .9143
	* 1.9407	* 2.3708	* 2.0764	* 2.0398	* 1.6419	* 2.0054	* 1.6015	* 3.2007
9	* 1.3082	* 1.7324	* 1.6958	* 1.9188	* 1.7689	* 1.8119	* 2.0070	* .9500
	* 2.3708	* 1.9198	* 1.9189	* 1.7106	* 1.8217	* 1.7628	* 1.6037	* 3.0642
10	* 1.5714	* 1.6954	* 1.6905	* 1.7523	* 1.8436	* 1.6824	* 1.8650	* .8901
	* 2.0764	* 1.9193	* 1.9357	* 1.8432	* 1.7786	* 1.8994	* 1.7175	* 3.2629
11	* 1.5879	* 1.9192	* 1.7528	* 1.7245	* 1.5695	* 1.7150	* 1.1210	* .5687
	* 2.0398	* 1.7102	* 1.8427	* 1.9097	* 1.9931	* 1.8238	* 2.6091	* 5.1060
12	* 1.9847	* 1.7699	* 1.8444	* 1.5700	* 1.1477	* 1.4131	* .8253	*
	* 1.6419	* 1.8207	* 1.7779	* 1.9926	* 2.0690	* 1.7994	* 3.1962	*
13	* 1.6015	* 1.8144	* 1.6837	* 1.7157	* 1.4136	* 1.2965	* .6144	*
	* 2.0054	* 1.7602	* 1.8979	* 1.8233	* 1.7990	* 1.8915	* 3.8861	*
14	* 2.0128	* 2.0091	* 1.8663	* 1.1213	* .8255	* .6279	*	*
	* 1.6015	* 1.6020	* 1.7163	* 2.6082	* 3.1957	* 3.8190	*	*
15	* .9143	* .9505	* .8904	* .5689	* F-SUB-Q			
	* 3.2007	* 3.0630	* 3.2621	* 5.1039	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 186 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2317	* 1.3033	* 1.5668	* 1.5827	* 1.9886	* 1.5942	* 2.0211	* .9086 *
	* 2.1153	* 2.5877	* 2.2486	* 2.2083	* 1.7671	* 2.1679	* 1.7083	* 3.4430 *
9	* 1.3033	* 1.7371	* 1.6942	* 1.9275	* 1.7655	* 1.8110	* 2.0159	* .9416 *
	* 2.5877	* 2.0667	* 2.0729	* 1.8369	* 1.9680	* 1.8932	* 1.7116	* 3.3066 *
10	* 1.5668	* 1.6937	* 1.6889	* 1.7531	* 1.8505	* 1.6825	* 1.8723	* .8840 *
	* 2.2486	* 2.0734	* 2.0901	* 1.9890	* 1.9128	* 2.0497	* 1.8404	* 3.5260 *
11	* 1.5827	* 1.9280	* 1.7536	* 1.7323	* 1.5775	* 1.7310	* 1.1178	* .5638 *
	* 2.2083	* 1.8364	* 1.9885	* 2.0542	* 2.1529	* 1.9590	* 2.8331	* 5.5548 *
12	* 1.9886	* 1.7665	* 1.8513	* 1.5780	* 1.1601	* 1.4389	* .8254 *	
	* 1.7671	* 1.9669	* 1.9120	* 2.1523	* 2.2397	* 1.9318	* 3.4733 *	
13	* 1.5942	* 1.8135	* 1.6837	* 1.7317	* 1.4395	* 1.3203	* .6175 *	
	* 2.1679	* 1.8904	* 2.0481	* 1.9585	* 1.9312	* 2.0304	* 4.2110 *	
14	* 2.0211	* 2.0180	* 1.8736	* 1.1182	* .8255	* .6312	*	
	* 1.7083	* 1.7098	* 1.8391	* 2.8319	* 3.4728	* 4.1371	*	
15	* .9086	* .9422	* .8843	* .5640	* F-SUB-Q			
	* 3.4430	* 3.3049	* 3.5251	* 5.5524	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2153	* 1.2955	* 1.5388	* 1.5582	* 1.9498	* 1.5667	* 1.9821	* .9060 *
	* 2.3640	* 2.8709	* 2.5217	* 2.4694	* 1.9823	* 2.4223	* 1.9053	* 3.7704 *
9	* 1.2955	* 1.7051	* 1.6672	* 1.8929	* 1.7347	* 1.7799	* 1.9778	* .9446 *
	* 2.8709	* 2.3187	* 2.3198	* 2.0597	* 2.2031	* 2.1110	* 1.9091	* 3.6002 *
10	* 1.5388	* 1.6667	* 1.6615	* 1.7280	* 1.8212	* 1.6561	* 1.8391	* .8891 *
	* 2.5217	* 2.3204	* 2.3398	* 2.2231	* 2.1402	* 2.2911	* 2.0558	* 3.8382 *
11	* 1.5582	* 1.8933	* 1.7285	* 1.7044	* 1.5594	* 1.7074	* 1.1213	* .5645 *
	* 2.4694	* 2.0592	* 2.2226	* 2.2862	* 2.3706	* 2.1676	* 3.1052	* 6.0628 *
12	* 1.9498	* 1.7356	* 1.8219	* 1.5598	* 1.1619	* 1.4277	* .8354 *	
	* 1.9823	* 2.2019	* 2.1394	* 2.3700	* 2.5017	* 2.1597	* 3.7833 *	
13	* 1.5667	* 1.7823	* 1.6573	* 1.7080	* 1.4282	* 1.3127	* .6266 *	
	* 2.4223	* 2.1079	* 2.2894	* 2.1669	* 2.1591	* 2.2694	* 4.6043 *	
14	* 1.9821	* 1.9799	* 1.8404	* 1.1217	* .8355	* .6397	*	
	* 1.9053	* 1.9072	* 2.0544	* 3.1040	* 3.7827	* 4.5289	*	
15	* .9060	* .9451	* .8893	* .5647	* F-SUB-Q			
	* 3.7705	* 3.5987	* 3.8372	* 6.0603	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 187 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2261	* 1.2860	* 1.5401	* 1.5555	* 1.9641	* 1.5616	* 2.0014	* .8935
	* 2.6016	* 3.1892	* 2.7540	* 2.6910	* 2.1412	* 2.6380	* 2.0513	* 4.1398
9	* 1.2860	* 1.7205	* 1.6716	* 1.9127	* 1.7369	* 1.7851	* 1.9984	* .9263
	* 3.1892	* 2.5192	* 2.5290	* 2.2234	* 2.3934	* 2.2866	* 2.0542	* 3.9749
10	* 1.5401	* 1.6710	* 1.6663	* 1.7341	* 1.8377	* 1.6623	* 1.8583	* .8708
	* 2.7540	* 2.5297	* 2.5504	* 2.4191	* 2.3141	* 2.4855	* 2.2105	* 4.2385
11	* 1.5555	* 1.9132	* 1.7346	* 1.7219	* 1.5724	* 1.7355	* 1.1107	* .5562
	* 2.6910	* 2.2228	* 2.4185	* 2.4940	* 2.6142	* 2.3706	* 3.4261	* 6.6835
12	* 1.9641	* 1.7378	* 1.8384	* 1.5728	* 1.1626	* 1.4598	* .8296	*
	* 2.1412	* 2.3920	* 2.3132	* 2.6135	* 2.7491	* 2.3526	* 4.2343	*
13	* 1.5616	* 1.7875	* 1.6635	* 1.7362	* 1.4603	* 1.3464	* .6257	*
	* 2.6380	* 2.2834	* 2.4836	* 2.3699	* 2.3520	* 2.4838	* 5.1668	*
14	* 2.0014	* 2.0005	* 1.8596	* 1.1111	* .8297	* .6394	*	*
	* 2.0513	* 2.0522	* 2.2091	* 3.4246	* 4.2336	* 5.0776	*	*
15	* .8935	* .9267	* .8711	* .5564	* F-SUB-Q			
	* 4.1398	* 3.9737	* 4.2373	* 6.6807	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2306	* 1.2833	* 1.5316	* 1.5451	* 1.9552	* 1.5479	* 1.9929	* .8877
	* 2.6527	* 3.2470	* 2.9943	* 2.9411	* 2.3502	* 2.9155	* 2.2523	* 4.5419
9	* 1.2833	* 1.7179	* 1.6649	* 1.9085	* 1.7258	* 1.7746	* 1.9914	* .9201
	* 3.2470	* 2.6733	* 2.7699	* 2.4462	* 2.6335	* 2.5171	* 2.2545	* 4.3622
10	* 1.5316	* 1.6643	* 1.6600	* 1.7291	* 1.8353	* 1.6568	* 1.8555	* .8662
	* 2.9943	* 2.7707	* 2.8057	* 2.6728	* 2.5503	* 2.7405	* 2.4252	* 4.6498
11	* 1.5451	* 1.9090	* 1.7296	* 1.7223	* 1.5776	* 1.7468	* 1.1127	* .5550
	* 2.9411	* 2.4455	* 2.6722	* 2.5910	* 2.7199	* 2.4868	* 3.7603	* 7.3272
12	* 1.9552	* 1.7268	* 1.8360	* 1.5780	* 1.1712	* 1.4824	* .8389	*
	* 2.3502	* 2.6320	* 2.5494	* 2.7192	* 2.9220	* 2.5043	* 4.5001	*
13	* 1.5479	* 1.7770	* 1.6580	* 1.7475	* 1.4829	* 1.3746	* .6372	*
	* 2.9155	* 2.5136	* 2.7385	* 2.4860	* 2.5036	* 2.6711	* 5.5602	*
14	* 1.9929	* 1.9934	* 1.8567	* 1.1131	* .8390	* .6511	*	*
	* 2.2523	* 2.2523	* 2.4237	* 3.7586	* 4.4993	* 5.4657	*	*
15	* .8877	* .9206	* .8665	* .5552	* F-SUB-Q			
	* 4.5419	* 4.3606	* 4.6485	* 7.3240	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 188 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2434	* 1.2888	* 1.5152	* 1.5265	* 1.9238	* 1.5254	* 1.9604	* .8843
	* 2.6982	* 3.2947	* 2.9305	* 2.8553	* 2.2868	* 2.8317	* 2.2386	* 4.4692
9	* 1.2888	* 1.7014	* 1.6487	* 1.8830	* 1.7025	* 1.7499	* 1.9607	* .9208
	* 3.2947	* 2.6807	* 2.6897	* 2.3812	* 2.5607	* 2.4872	* 2.2483	* 4.2800
10	* 1.5152	* 1.6482	* 1.6440	* 1.7144	* 1.8168	* 1.6415	* 1.8338	* .8713
	* 2.9305	* 2.6905	* 2.7259	* 2.5949	* 2.4816	* 2.7108	* 2.4389	* 4.5943
11	* 1.5265	* 1.8834	* 1.7148	* 1.7094	* 1.5817	* 1.7494	* 1.1245	* .5573
	* 2.8553	* 2.3808	* 2.5942	* 2.6308	* 2.7572	* 2.5254	* 3.7381	* 7.3875
12	* 1.9238	* 1.7035	* 1.8175	* 1.5821	* 1.1971	* 1.5122	* .8629	*
	* 2.2868	* 2.5592	* 2.4807	* 2.7565	* 2.9639	* 2.5443	* 4.4942	*
13	* 1.5254	* 1.7522	* 1.6426	* 1.7501	* 1.5127	* 1.4128	* .6629	*
	* 2.8317	* 2.4838	* 2.7087	* 2.5246	* 2.5436	* 2.7149	* 5.5566	*
14	* 1.9604	* 1.9627	* 1.8350	* 1.1249	* .8630	* .6764	*	*
	* 2.2386	* 2.2461	* 2.4373	* 3.7362	* 4.4934	* 5.4687	*	*
15	* .8843	* .9213	* .8715	* .5575	* F-SUB-Q			
	* 4.4692	* 4.2782	* 4.5930	* 7.3839	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3500	* 1.3064	* 1.5272	* 1.5277	* 1.9416	* 1.5221	* 1.9800	* .8727
	* 2.6057	* 3.1887	* 2.8316	* 2.7633	* 2.1939	* 2.7427	* 2.1386	* 4.3677
9	* 1.3064	* 1.7320	* 1.6626	* 1.9093	* 1.7102	* 1.7577	* 1.9828	* .9040
	* 3.1887	* 2.5713	* 2.5943	* 2.2805	* 2.4718	* 2.3931	* 2.1473	* 4.2068
10	* 1.5272	* 1.6620	* 1.6584	* 1.7298	* 1.8412	* 1.6573	* 1.8630	* .8562
	* 2.8316	* 2.5951	* 2.6296	* 2.5026	* 2.3818	* 2.6136	* 2.3309	* 4.5266
11	* 1.5277	* 1.9098	* 1.7302	* 1.7634	* 1.6295	* 1.8138	* 1.1276	* .5525
	* 2.7633	* 2.2799	* 2.5019	* 2.5269	* 2.6628	* 2.4239	* 3.6537	* 7.2607
12	* 1.9416	* 1.7111	* 1.8419	* 1.6300	* 1.2763	* 1.6311	* .8822	*
	* 2.1939	* 2.4704	* 2.3808	* 2.6621	* 2.8624	* 2.4324	* 4.3681	*
13	* 1.5221	* 1.7600	* 1.6584	* 1.8144	* 1.6317	* 1.5297	* .6882	*
	* 2.7427	* 2.3899	* 2.6117	* 2.4232	* 2.4318	* 2.5840	* 5.3605	*
14	* 1.9800	* 1.9848	* 1.8642	* 1.1281	* .8824	* .7030	*	*
	* 2.1386	* 2.1452	* 2.3293	* 3.6517	* 4.3674	* 5.2708	*	*
15	* .8727	* .9044	* .8565	* .5528	* F-SUB-Q			
	* 4.3677	* 4.2054	* 4.5250	* 7.2571	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 189 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6065	* 1.3428	* 1.5309	* 1.5220	* 1.9400	* 1.5114	* 1.9781	* .8654 *
	* 2.3789	* 2.9271	* 2.6535	* 2.6041	* 2.0691	* 2.5948	* 2.0154	* 4.1032 *
9	* 1.3428	* 1.7482	* 1.6669	* 1.9160	* 1.7104	* 1.7528	* 1.9834	* .8941 *
	* 2.9271	* 2.3889	* 2.4316	* 2.1388	* 2.3307	* 2.2587	* 2.0215	* 3.9625 *
10	* 1.5309	* 1.6662	* 1.6635	* 1.7356	* 1.8503	* 1.6630	* 1.8733	* .8505 *
	* 2.6535	* 2.4324	* 2.4636	* 2.3486	* 2.2299	* 2.4541	* 2.1827	* 4.2413 *
11	* 1.5220	* 1.9164	* 1.7360	* 1.8065	* 1.6761	* 1.8731	* 1.1385	* .5517 *
	* 2.6041	* 2.1383	* 2.3481	* 2.3092	* 2.4368	* 2.2082	* 3.3645	* 6.7507 *
12	* 1.9400	* 1.7113	* 1.8509	* 1.6765	* 1.4564	* 1.7779	* .9124	* .9124 *
	* 2.0691	* 2.3295	* 2.2291	* 2.4362	* 2.6158	* 2.2139	* 4.0149	* 4.0149 *
13	* 1.5114	* 1.7551	* 1.6641	* 1.8737	* 1.7785	* 1.6587	* .7237	* .7237 *
	* 2.5948	* 2.2561	* 2.4525	* 2.2075	* 2.2133	* 2.3528	* 4.9248	* 4.9248 *
14	* 1.9781	* 1.9854	* 1.8744	* 1.1390	* .9126	* .7392		
	* 2.0154	* 2.0196	* 2.1814	* 3.3630	* 4.0143	* 4.8424		
15	* .8654	* .8947	* .8508	* .5519	* F-SUB-Q			
	* 4.1032	* 3.9605	* 4.2401	* 6.7477	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7387	* 1.3937	* 1.5357	* 1.5106	* 1.9260	* 1.4967	* 1.9624	* .8577 *
	* 2.1990	* 2.7102	* 2.4176	* 2.3725	* 1.8816	* 2.3662	* 1.8325	* 3.7395 *
9	* 1.3937	* 1.7515	* 1.6633	* 1.9084	* 1.7017	* 1.7397	* 1.9698	* .8892 *
	* 2.7102	* 2.1787	* 2.2120	* 1.9450	* 2.1237	* 2.0548	* 1.8371	* 3.5998 *
10	* 1.5357	* 1.6625	* 1.6620	* 1.7325	* 1.8534	* 1.6610	* 1.8694	* .8472 *
	* 2.4176	* 2.2128	* 2.2419	* 2.1362	* 2.0270	* 2.2317	* 1.9816	* 3.8550 *
11	* 1.5106	* 1.9088	* 1.7329	* 1.8305	* 1.7041	* 1.9097	* 1.1495	* .5524 *
	* 2.3725	* 1.9445	* 2.1357	* 2.1325	* 2.2522	* 2.0376	* 3.0748	* 6.1358 *
12	* 1.9260	* 1.7026	* 1.8542	* 1.7046	* 1.5677	* 1.8741	* .9421	* .9421 *
	* 1.8816	* 2.1225	* 2.0263	* 2.2516	* 2.4270	* 2.0491	* 3.7033	* 3.7033 *
13	* 1.4967	* 1.7419	* 1.6620	* 1.9103	* 1.8746	* 1.7511	* .7551	* .7551 *
	* 2.3662	* 2.0524	* 2.2302	* 2.0370	* 2.0486	* 2.1752	* 4.5559	* 4.5559 *
14	* 1.9624	* 1.9717	* 1.8705	* 1.1500	* .9423	* .7710		
	* 1.8325	* 1.8354	* 1.9805	* 3.0733	* 3.7027	* 4.4812		
15	* .8577	* .8897	* .8476	* .5527	* F-SUB-Q			
	* 3.7395	* 3.5984	* 3.8537	* 6.1331	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 190 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7576	* 1.4048	* 1.5241	* 1.4897	* 1.8913	* 1.4734	* 1.9252	* .8521 *
	* 2.2074	* 2.7161	* 2.4189	* 2.3711	* 1.8854	* 2.3673	* 1.8373	* 3.7089 *
9	* 1.4048	* 1.7370	* 1.6439	* 1.8770	* 1.6783	* 1.7132	* 1.9340	* .8870 *
	* 2.7161	* 2.1823	* 2.2097	* 1.9502	* 2.1254	* 2.0537	* 1.8411	* 3.5565 *
10	* 1.5240	* 1.6432	* 1.6438	* 1.7125	* 1.8317	* 1.6430	* 1.8425	* .8492 *
	* 2.4189	* 2.2105	* 2.2409	* 2.1330	* 2.0278	* 2.2291	* 1.9824	* 3.7943 *
11	* 1.4897	* 1.8774	* 1.7129	* 1.8187	* 1.7020	* 1.9069	* 1.1576	* .5537 *
	* 2.3711	* 1.9498	* 2.1325	* 2.1468	* 2.2596	* 2.0461	* 3.0230	* 6.0591 *
12	* 1.8913	* 1.6792	* 1.8325	* 1.7025	* 1.5929	* 1.8993	* .9630 *	
	* 1.8854	* 2.1242	* 2.0271	* 2.2590	* 2.4307	* 2.0579	* 3.6605 *	
13	* 1.4734	* 1.7152	* 1.6439	* 1.9075	* 1.8999	* 1.7822	* .7783 *	
	* 2.3673	* 2.0514	* 2.2275	* 2.0455	* 2.0574	* 2.1886	* 4.5142 *	
14	* 1.9252	* 1.9359	* 1.8436	* 1.1581	* .9631	* .7935	*	
	* 1.8373	* 1.8395	* 1.9813	* 3.0214	* 3.6598	* 4.4465	*	
15	* .8521	* .8874	* .8495	* .5539	* F-SUB-Q			
	* 3.7089	* 3.5550	* 3.7934	* 6.0565	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7793	* 1.4059	* 1.5215	* 1.4770	* 1.8933	* 1.4591	* 1.9294	* .8323 *
	* 2.0245	* 2.5138	* 2.2334	* 2.1998	* 1.7328	* 2.1991	* 1.6854	* 3.4970 *
9	* 1.4059	* 1.7533	* 1.6388	* 1.8824	* 1.6710	* 1.7070	* 1.9398	* .8605 *
	* 2.5138	* 1.9995	* 2.0382	* 1.7883	* 1.9659	* 1.8956	* 1.6876	* 3.3766 *
10	* 1.5215	* 1.6380	* 1.6395	* 1.7076	* 1.8395	* 1.6395	* 1.8523	* .8249 *
	* 2.2334	* 2.0390	* 2.0671	* 1.9688	* 1.8636	* 2.0546	* 1.8139	* 3.5978 *
11	* 1.4770	* 1.8828	* 1.7080	* 1.8315	* 1.7067	* 1.9290	* 1.1389	* .5403 *
	* 2.1998	* 1.7878	* 1.9683	* 1.9535	* 2.0686	* 1.8595	* 2.8242	* 5.7201 *
12	* 1.8933	* 1.6719	* 1.8403	* 1.7071	* 1.6108	* 1.9364	* .9491 *	
	* 1.7328	* 1.9648	* 1.8630	* 2.0681	* 2.2364	* 1.8823	* 3.4511 *	
13	* 1.4591	* 1.7090	* 1.6404	* 1.9296	* 1.9369	* 1.8223	* .7721 *	
	* 2.1991	* 1.8935	* 2.0532	* 1.8589	* 1.8818	* 1.9982	* 4.2553 *	
14	* 1.9294	* 1.9417	* 1.8534	* 1.1394	* .9492	* .7882	*	
	* 1.6854	* 1.6860	* 1.8129	* 2.8227	* 3.4505	* 4.1860	*	
15	* .8323	* .8608	* .8252	* .5406	* F-SUB-Q			
	* 3.4970	* 3.3757	* 3.5967	* 5.7175	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 191 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7502	* 1.3807	* 1.4932	* 1.4445	* 1.8533	* 1.4273	* 1.8894	* .8122 *
	* 1.8726	* 2.3428	* 2.1090	* 2.0883	* 1.6425	* 2.0892	* 1.5986	* 3.3369 *
9	* 1.3807	* 1.7225	* 1.6067	* 1.8422	* 1.6356	* 1.6733	* 1.9006	* .8400 *
	* 2.3428	* 1.8835	* 1.9248	* 1.6939	* 1.8649	* 1.7959	* 1.5993	* 3.2203 *
10	* 1.4932	* 1.6059	* 1.6075	* 1.6729	* 1.8005	* 1.6079	* 1.8180	* .8063 *
	* 2.1090	* 1.9256	* 1.9526	* 1.8613	* 1.7635	* 1.9404	* 1.7141	* 3.4229 *
11	* 1.4445	* 1.8426	* 1.6733	* 1.7950	* 1.6758	* 1.8981	* 1.1177	* .5286 *
	* 2.0883	* 1.6935	* 1.8609	* 1.8456	* 1.9479	* 1.7451	* 2.6507	* 5.4249 *
12	* 1.8533	* 1.6365	* 1.8013	* 1.6763	* 1.5897	* 1.9127	* .9341 *	
	* 1.6425	* 1.8638	* 1.7629	* 1.9474	* 2.0800	* 1.7513	* 3.2309 *	
13	* 1.4273	* 1.6752	* 1.6088	* 1.8987	* 1.9132	* 1.8052	* .7622 *	
	* 2.0892	* 1.7938	* 1.9391	* 1.7446	* 1.7509	* 1.8622	* 3.9807 *	
14	* 1.8894	* 1.9024	* 1.8190	* 1.1182	* .9342	* .7781	*	
	* 1.5987	* 1.5979	* 1.7131	* 2.6493	* 3.2304	* 3.9162	*	
15	* .8122	* .8402	* .8066	* .5288	* F-SUB-Q			
	* 3.3369	* 3.2195	* 3.4219	* 5.4225	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6669	* 1.3285	* 1.4360	* 1.3864	* 1.7606	* 1.3725	* 1.7931	* .7884 *
	* 1.8376	* 2.2823	* 2.0469	* 2.0397	* 1.6192	* 2.0403	* 1.5816	* 3.2361 *
9	* 1.3285	* 1.6403	* 1.5425	* 1.7454	* 1.5654	* 1.6041	* 1.8042	* .8218 *
	* 2.2823	* 1.8382	* 1.8715	* 1.6725	* 1.8255	* 1.7579	* 1.5807	* 3.0979 *
10	* 1.4360	* 1.5418	* 1.5425	* 1.6020	* 1.7054	* 1.5423	* 1.7287	* .7914 *
	* 2.0469	* 1.8723	* 1.8996	* 1.8136	* 1.7326	* 1.8889	* 1.6869	* 3.2766 *
11	* 1.3864	* 1.7458	* 1.6024	* 1.7012	* 1.6048	* 1.8053	* 1.0914	* .5172 *
	* 2.0397	* 1.6722	* 1.8133	* 1.8041	* 1.8911	* 1.7083	* 2.5172	* 5.1895 *
12	* 1.7606	* 1.5663	* 1.7062	* 1.6052	* 1.5283	* 1.8213	* .9175 *	
	* 1.6192	* 1.8245	* 1.7319	* 1.8906	* 2.0230	* 1.7191	* 3.0868 *	
13	* 1.3725	* 1.6060	* 1.5431	* 1.8059	* 1.8218	* 1.7241	* .7485 *	
	* 2.0403	* 1.7559	* 1.8876	* 1.7077	* 1.7186	* 1.8202	* 3.7951 *	
14	* 1.7931	* 1.8060	* 1.7296	* 1.0919	* .9176	* .7630	*	
	* 1.5816	* 1.5793	* 1.6859	* 2.5161	* 3.0863	* 3.7388	*	
15	* .7884	* .8223	* .7918	* .5174	* F-SUB-Q			
	* 3.2361	* 3.0965	* 3.2753	* 5.1873	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 192 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5918	* 1.2715	* 1.3816	* 1.3217	* 1.6772	* 1.3116	* 1.7079	* .7407 *
	* 1.7904	* 2.2077	* 2.0020	* 2.0253	* 1.6103	* 2.0248	* 1.5751	* 3.2763 *
9	* 1.2715	* 1.5674	* 1.4797	* 1.6595	* 1.4950	* 1.5353	* 1.7191	* .7684 *
	* 2.2077	* 1.8017	* 1.8397	* 1.6612	* 1.8082	* 1.7421	* 1.5727	* 3.1507 *
10	* 1.3816	* 1.4790	* 1.4796	* 1.5316	* 1.6151	* 1.4769	* 1.6494	* .7381 *
	* 2.0020	* 1.8404	* 1.8650	* 1.7895	* 1.7193	* 1.8585	* 1.6696	* 3.3347 *
11	* 1.3217	* 1.6598	* 1.5319	* 1.6108	* 1.5318	* 1.7195	* 1.0259	* .4863 *
	* 2.0253	* 1.6609	* 1.7891	* 1.7779	* 1.8471	* 1.6702	* 2.5183	* 5.2153 *
12	* 1.6772	* 1.4958	* 1.6157	* 1.5322	* 1.4611	* 1.7338	* .8593	*
	* 1.6103	* 1.8071	* 1.7187	* 1.8466	* 1.9912	* 1.6979	* 3.0796	*
13	* 1.3116	* 1.5372	* 1.4778	* 1.7200	* 1.7343	* 1.6453	* .7016	*
	* 2.0248	* 1.7400	* 1.8573	* 1.6697	* 1.6974	* 1.8062	* 3.8330	*
14	* 1.7079	* 1.7208	* 1.6504	* 1.0263	* .8594	* .7159	*	
	* 1.5751	* 1.5712	* 1.6686	* 2.5171	* 3.0790	* 3.7726	*	
15	* .7407	* .7688	* .7383	* .4865	* F-SUB-Q			
	* 3.2763	* 3.1494	* 3.3336	* 5.2131	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4264	* 1.1636	* 1.2643	* 1.2014	* 1.4946	* 1.1922	* 1.5186	* .6740 *
	* 1.8786	* 2.2788	* 2.0719	* 2.1325	* 1.7299	* 2.1364	* 1.6992	* 3.4634 *
9	* 1.1636	* 1.4097	* 1.3494	* 1.4839	* 1.3572	* 1.3900	* 1.5293	* .6969 *
	* 2.2788	* 1.9051	* 1.9237	* 1.7748	* 1.9078	* 1.8452	* 1.6948	* 3.3409 *
10	* 1.2643	* 1.3488	* 1.3461	* 1.3939	* 1.4439	* 1.3429	* 1.4704	* .6695 *
	* 2.0719	* 1.9245	* 1.9540	* 1.8743	* 1.8342	* 1.9505	* 1.7894	* 3.5304 *
11	* 1.2014	* 1.4841	* 1.3942	* 1.4364	* 1.3886	* 1.5301	* .9287	* .4426 *
	* 2.1325	* 1.7744	* 1.8739	* 1.8907	* 1.9359	* 1.7820	* 2.6448	* 5.4840 *
12	* 1.4946	* 1.3579	* 1.4444	* 1.3889	* 1.3196	* 1.5378	* .7800	*
	* 1.7298	* 1.9067	* 1.8336	* 1.9354	* 2.0762	* 1.8029	* 3.2160	*
13	* 1.1922	* 1.3918	* 1.3436	* 1.5305	* 1.5383	* 1.4614	* .6346	*
	* 2.1364	* 1.8428	* 1.9492	* 1.7815	* 1.8023	* 1.9124	* 4.0005	*
14	* 1.5186	* 1.5308	* 1.4712	* .9290	* .7801	* .6474	*	
	* 1.6992	* 1.6931	* 1.7884	* 2.6437	* 3.2155	* 3.9382	*	
15	* .6740	* .6974	* .6697	* .4428	* F-SUB-Q			
	* 3.4634	* 3.3392	* 3.5294	* 5.4817	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 193 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 200 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1671 *	* .9459 *	* 1.0190 *	* .9693 *	* 1.2106 *	* .9543 *	* 1.2326 *	* .5480 *
	* 2.2058 *	* 2.6884 *	* 2.4686 *	* 2.5561 *	* 2.0672 *	* 2.5826 *	* 2.0277 *	* 4.1370 *
9	* .9459 *	* 1.1930 *	* 1.0887 *	* 1.2457 *	* 1.0689 *	* 1.1044 *	* 1.2417 *	* .5648 *
	* 2.6884 *	* 2.1517 *	* 2.2982 *	* 2.0381 *	* 2.3374 *	* 2.2466 *	* 2.0207 *	* 4.0011 *
10	* 1.0190 *	* 1.0882 *	* 1.0530 *	* 1.1259 *	* 1.2245 *	* 1.0765 *	* 1.1752 *	* .5387 *
	* 2.4686 *	* 2.2991 *	* 2.4066 *	* 2.2352 *	* 2.1030 *	* 2.3485 *	* 2.1651 *	* 4.2545 *
11	* .9693 *	* 1.2460 *	* 1.1261 *	* 1.2226 *	* 1.0907 *	* 1.2416 *	* .7478 *	* .3613 *
	* 2.5561 *	* 2.0377 *	* 2.2348 *	* 2.1313 *	* 2.3628 *	* 2.1111 *	* 3.1646 *	* 6.5042 *
12	* 1.2106 *	* 1.0694 *	* 1.2249 *	* 1.0909 *	* 1.0188 *	* 1.2476 *	* .6368 *	
	* 2.0672 *	* 2.3362 *	* 2.1022 *	* 2.3622 *	* 2.5810 *	* 2.1351 *	* 3.7974 *	
13	* .9543 *	* 1.1059 *	* 1.0771 *	* 1.2419 *	* 1.2480 *	* 1.1251 *	* .5069 *	
	* 2.5826 *	* 2.2435 *	* 2.3471 *	* 2.1105 *	* 2.1345 *	* 2.3855 *	* 4.8205 *	
14	* 1.2326 *	* 1.2428 *	* 1.1758 *	* .7480 *	* .6369 *	* .5163 *		
	* 2.0277 *	* 2.0190 *	* 2.1640 *	* 3.1633 *	* 3.7965 *	* 4.7516 *		
15	* .5480 *	* .5652 *	* .5388 *	* .3614 *	* F-SUB-Q			
	* 4.1370 *	* 3.9990 *	* 4.2535 *	* 6.5016 *	* M-SUB-Q			

AT 50% POWER, 200 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4913 *	* .4189 *	* .4159 *	* .4256 *	* .5034 *	* .4164 *	* .4589 *	* .2349 *
	* 5.0385 *	* 5.8443 *	* 5.8335 *	* 5.6420 *	* 4.8140 *	* 5.7467 *	* 5.2771 *	* 9.3756 *
9	* .4189 *	* .4866 *	* .4401 *	* .5139 *	* .4341 *	* .4341 *	* .4608 *	* .2377 *
	* 5.8443 *	* 5.0734 *	* 5.4909 *	* 4.7763 *	* 5.5647 *	* 5.5341 *	* 5.2722 *	* 9.2537 *
10	* .4159 *	* .4400 *	* .4186 *	* .4574 *	* .5131 *	* .4341 *	* .4334 *	* .2241 *
	* 5.8335 *	* 5.4923 *	* 5.8506 *	* 5.3113 *	* 4.8172 *	* 5.6283 *	* 5.6801 *	* 9.9300 *
11	* .4256 *	* .5140 *	* .4575 *	* .5109 *	* .4342 *	* .4838 *	* .3193 *	* .1575 *
	* 5.6420 *	* 4.7754 *	* 5.3104 *	* 4.9039 *	* 5.7055 *	* 5.2209 *	* 7.1693 *	* 14.4916 *
12	* .5034 *	* .4343 *	* .5133 *	* .4343 *	* .4062 *	* .4623 *	* .2670 *	
	* 4.8140 *	* 5.5624 *	* 4.8157 *	* 5.7042 *	* 6.2353 *	* 5.5678 *	* 8.7833 *	
13	* .4164 *	* .4347 *	* .4343 *	* .4840 *	* .4624 *	* .4075 *	* .2093 *	
	* 5.7467 *	* 5.5266 *	* 5.6250 *	* 5.2194 *	* 5.5662 *	* 6.3631 *	* 11.3059 *	
14	* .4589 *	* .4612 *	* .4336 *	* .3194 *	* .2671 *	* .2126 *		
	* 5.2771 *	* 5.2676 *	* 5.6770 *	* 7.1672 *	* 8.7798 *	* 11.1802 *		
15	* .2349 *	* .2378 *	* .2242 *	* .1576 *	* F-SUB-Q			
	* 9.3756 *	* 9.2497 *	* 9.9267 *	* 14.4851 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 194 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .3910 *	* .4449 *	* .4915 *	* .5302 *	* .6178 *	* .5007 *	* .4187 *	* .2140 *
	* 4.1018 *	* 4.6351 *	* 4.4973 *	* 4.2890 *	* 3.8663 *	* 4.3507 *	* 4.3011 *	* 6.7994 *
9	* .4449 *	* .5114 *	* .5029 *	* .6075 *	* .5339 *	* .5164 *	* .5050 *	* .2693 *
	* 4.6351 *	* 4.3048 *	* 4.2778 *	* 3.8856 *	* 4.2396 *	* 4.3018 *	* 4.3174 *	* 6.8663 *
10	* .4915 *	* .5028 *	* .4066 *	* .5274 *	* .6052 *	* .5258 *	* .5104 *	* .2664 *
	* 4.4973 *	* 4.2786 *	* 4.5301 *	* 4.1465 *	* 3.9433 *	* 4.3405 *	* 4.5873 *	* 7.4952 *
11	* .5302 *	* .6076 *	* .5275 *	* .5545 *	* .4851 *	* .5390 *	* .3783 *	* .2168 *
	* 4.2890 *	* 3.8850 *	* 4.1459 *	* 4.1583 *	* 4.6219 *	* 4.3192 *	* 5.5705 *	* 9.7420 *
12	* .6178 *	* .5341 *	* .6053 *	* .4852 *	* .3669 *	* .4309 *	* .2962 *	
	* 3.8663 *	* 4.2382 *	* 3.9423 *	* 4.6213 *	* 4.7729 *	* 4.6081 *	* 6.7442 *	
13	* .5007 *	* .5168 *	* .5261 *	* .5391 *	* .4309 *	* .3740 *	* .2177 *	
	* 4.3507 *	* 4.2949 *	* 4.3386 *	* 4.3188 *	* 4.6082 *	* 5.0715 *	* 8.6249 *	
14	* .4187 *	* .5054 *	* .5106 *	* .3783 *	* .2960 *	* .2216 *		
	* 4.3011 *	* 4.3133 *	* 4.5854 *	* 5.5709 *	* 6.7465 *	* 8.5970 *		
15	* .2140 *	* .2694 *	* .2664 *	* .2168 *	* F-SUB-Q			
	* 6.7994 *	* 6.8691 *	* 7.4955 *	* 9.7422 *	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .7986 *	* .9082 *	* 1.0770 *	* 1.0941 *	* 1.2917 *	* 1.0344 *	* .9535 *	* .4595 *
	* 2.0972 *	* 2.3592 *	* 2.1475 *	* 2.1720 *	* 1.9301 *	* 2.1952 *	* 1.9357 *	* 3.3112 *
9	* .9082 *	* 1.1051 *	* 1.1077 *	* 1.2928 *	* 1.1821 *	* 1.1436 *	* 1.1765 *	* .5930 *
	* 2.3592 *	* 2.0745 *	* 2.0242 *	* 1.8957 *	* 2.0019 *	* 1.9954 *	* 1.9310 *	* 3.2468 *
10	* 1.0770 *	* 1.1074 *	* .8815 *	* 1.1638 *	* 1.2727 *	* 1.1658 *	* 1.1898 *	* .5947 *
	* 2.1475 *	* 2.0246 *	* 2.1115 *	* 1.9553 *	* 1.9609 *	* 2.0589 *	* 2.0484 *	* 3.5086 *
11	* 1.0941 *	* 1.2930 *	* 1.1640 *	* 1.1644 *	* 1.0884 *	* 1.1977 *	* .8089 *	* .4533 *
	* 2.1720 *	* 1.8954 *	* 1.9550 *	* 2.0536 *	* 2.1311 *	* 2.0506 *	* 2.7562 *	* 4.9344 *
12	* 1.2917 *	* 1.1825 *	* 1.2730 *	* 1.0886 *	* .7979 *	* .9993 *	* .6473 *	
	* 1.9301 *	* 2.0013 *	* 1.9604 *	* 2.1308 *	* 2.2334 *	* 2.0387 *	* 3.2268 *	
13	* 1.0344 *	* 1.1445 *	* 1.1663 *	* 1.1978 *	* .9994 *	* .8926 *	* .4907 *	
	* 2.1952 *	* 1.9929 *	* 2.0579 *	* 2.0505 *	* 2.0386 *	* 2.2385 *	* 3.9141 *	
14	* .9535 *	* 1.1773 *	* 1.1902 *	* .8088 *	* .6471 *	* .4943 *		
	* 1.9357 *	* 1.9295 *	* 2.0477 *	* 2.7566 *	* 3.2276 *	* 3.9432 *		
15	* .4595 *	* .5933 *	* .5947 *	* .4533 *	* F-SUB-Q			
	* 3.3112 *	* 3.2476 *	* 3.5091 *	* 4.9346 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 195 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .9786	* 1.0956	* 1.2977	* 1.3253	* 1.5838	* 1.2647	* 1.2130	* .5859
	* 1.8044	* 2.0382	* 1.8593	* 1.8684	* 1.6376	* 1.8777	* 1.6294	* 2.8011
9	* 1.0956	* 1.3176	* 1.3474	* 1.5531	* 1.4611	* 1.3785	* 1.4529	* .7376
	* 2.0382	* 1.8201	* 1.7430	* 1.6387	* 1.6857	* 1.6960	* 1.6295	* 2.7110
10	* 1.2977	* 1.3472	* 1.1135	* 1.4190	* 1.5235	* 1.4124	* 1.4602	* .7481
	* 1.8593	* 1.7432	* 1.7632	* 1.6737	* 1.7150	* 1.7630	* 1.7365	* 2.9220
11	* 1.3253	* 1.5533	* 1.4192	* 1.3993	* 1.3433	* 1.4537	* .9979	* .5447
	* 1.8684	* 1.6385	* 1.6734	* 1.7807	* 1.7830	* 1.7513	* 2.3180	* 4.2762
12	* 1.5838	* 1.4615	* 1.5240	* 1.3435	* .9852	* 1.2085	* .7896	*
	* 1.6376	* 1.6852	* 1.7145	* 1.7828	* 1.8711	* 1.7296	* 2.7089	*
13	* 1.2647	* 1.3795	* 1.4130	* 1.4539	* 1.2086	* 1.0961	* .5952	*
	* 1.8777	* 1.6940	* 1.7621	* 1.7511	* 1.7295	* 1.8641	* 3.2967	*
14	* 1.2130	* 1.4538	* 1.4607	* .9977	* .7894	* .6052	*	*
	* 1.6294	* 1.6282	* 1.7359	* 2.3183	* 2.7093	* 3.2909	*	*
15	* .5859	* .7380	* .7481	* .5446	* F-SUB-Q			
	* 2.8011	* 2.7117	* 2.9223	* 4.2763	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1014	* 1.2048	* 1.4320	* 1.4623	* 1.7907	* 1.4061	* 1.4713	* .7014
	* 1.6845	* 1.9519	* 1.7803	* 1.7800	* 1.5217	* 1.7948	* 1.4985	* 2.6945
9	* 1.2048	* 1.5134	* 1.5107	* 1.7779	* 1.6202	* 1.5268	* 1.6845	* .8133
	* 1.9519	* 1.6938	* 1.6568	* 1.5111	* 1.5964	* 1.6004	* 1.4995	* 2.6112
10	* 1.4320	* 1.5104	* 1.2927	* 1.5948	* 1.7362	* 1.5601	* 1.6655	* .8228
	* 1.7803	* 1.6571	* 1.6753	* 1.5823	* 1.5773	* 1.6717	* 1.6026	* 2.8317
11	* 1.4623	* 1.7781	* 1.5950	* 1.6110	* 1.4912	* 1.6375	* 1.0802	* .5847
	* 1.7800	* 1.5109	* 1.5821	* 1.6335	* 1.6788	* 1.6118	* 2.2261	* 4.1576
12	* 1.7907	* 1.6207	* 1.7367	* 1.4914	* 1.0804	* 1.3581	* .8434	*
	* 1.5217	* 1.5959	* 1.5769	* 1.6786	* 1.7680	* 1.5903	* 2.6196	*
13	* 1.4060	* 1.5279	* 1.5607	* 1.6377	* 1.3583	* 1.2243	* .6328	*
	* 1.7948	* 1.5987	* 1.6709	* 1.6116	* 1.5901	* 1.7190	* 3.1927	*
14	* 1.4713	* 1.6854	* 1.6660	* 1.0800	* .8433	* .6461	*	*
	* 1.4985	* 1.4984	* 1.6021	* 2.2263	* 2.6198	* 3.1743	*	*
15	* .7014	* .8139	* .8227	* .5847	* F-SUB-Q			
	* 2.6945	* 2.6120	* 2.8322	* 4.1577	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 196 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1586	* 1.2649	* 1.4924	* 1.5214	* 1.8781	* 1.4786	* 1.7465	* .8244 *
	* 1.7054	* 1.9946	* 1.8262	* 1.8134	* 1.5363	* 1.8371	* 1.5082	* 2.7362 *
9	* 1.2649	* 1.6277	* 1.5993	* 1.8893	* 1.6920	* 1.6270	* 1.8159	* .8796 *
	* 1.9946	* 1.7000	* 1.6898	* 1.5164	* 1.6198	* 1.6301	* 1.5096	* 2.6532 *
10	* 1.4924	* 1.5989	* 1.5199	* 1.6882	* 1.8382	* 1.6196	* 1.7612	* .8748 *
	* 1.8262	* 1.6901	* 1.7133	* 1.6038	* 1.5702	* 1.6972	* 1.6111	* 2.8776 *
11	* 1.5214	* 1.8895	* 1.6885	* 1.7256	* 1.5551	* 1.7068	* 1.1206	* .6044 *
	* 1.8134	* 1.5163	* 1.6036	* 1.6283	* 1.7001	* 1.6132	* 2.2450	* 4.2255 *
12	* 1.8781	* 1.6924	* 1.8387	* 1.5553	* 1.1237	* 1.4106	* .8676	* 1.5363
	* 1.5363	* 1.6193	* 1.5699	* 1.6999	* 1.7987	* 1.5965	* 2.6559	* 1.4786
13	* 1.4786	* 1.6285	* 1.6202	* 1.7070	* 1.4108	* 1.2639	* .6472	* 1.8371
	* 1.8371	* 1.6286	* 1.6965	* 1.6130	* 1.5963	* 1.7291	* 3.2446	* 1.6285
14	* 1.7465	* 1.8169	* 1.7617	* 1.1206	* .8675	* .6611	* 1.5082	* 1.5086
	* 1.5082	* 1.5086	* 1.6107	* 2.2451	* 2.6560	* 3.2241	* 1.6107	* 2.2451
15	* .8244	* .8800	* .8748	* .6044	* F-SUB-Q	* 2.7362	* 2.6539	* 2.8781
	* 2.7362	* 2.6539	* 2.8781	* 4.2255	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1833	* 1.2990	* 1.5171	* 1.5443	* 1.9106	* 1.5111	* 1.8925	* .9055 *
	* 1.7799	* 2.0895	* 1.9199	* 1.8867	* 1.5939	* 1.9282	* 1.5690	* 2.8436 *
9	* 1.2990	* 1.6941	* 1.6411	* 1.9398	* 1.7189	* 1.6876	* 1.9026	* .9443 *
	* 2.0895	* 1.7643	* 1.7698	* 1.5725	* 1.6822	* 1.7016	* 1.5694	* 2.7568 *
10	* 1.5171	* 1.6407	* 1.6142	* 1.7304	* 1.8778	* 1.6389	* 1.8009	* .9096 *
	* 1.9199	* 1.7701	* 1.7937	* 1.6690	* 1.6096	* 1.7557	* 1.6683	* 2.9745 *
11	* 1.5443	* 1.9400	* 1.7306	* 1.7767	* 1.5785	* 1.7249	* 1.1386	* .6131 *
	* 1.8867	* 1.5723	* 1.6688	* 1.6842	* 1.7715	* 1.6757	* 2.3234	* 4.3886 *
12	* 1.9106	* 1.7194	* 1.8783	* 1.5788	* 1.1409	* 1.4196	* .8752	* 1.5939
	* 1.5939	* 1.6817	* 1.6092	* 1.7713	* 1.8893	* 1.6681	* 2.7659	* 1.6817
13	* 1.5111	* 1.6892	* 1.6394	* 1.7251	* 1.4198	* 1.2657	* .6520	* 1.9282
	* 1.9282	* 1.7001	* 1.7550	* 1.6755	* 1.6679	* 1.8129	* 3.3869	* 1.7001
14	* 1.8925	* 1.9039	* 1.8014	* 1.1386	* .8752	* .6648	* 1.5690	* 1.5684
	* 1.5690	* 1.5684	* 1.6679	* 2.3234	* 2.7659	* 3.3713	* 1.6679	* 2.3234
15	* .9055	* .9446	* .9095	* .6131	* F-SUB-Q	* 2.8436	* 2.7575	* 2.9749
	* 2.8436	* 2.7575	* 2.9749	* 4.3885	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 197 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1975	* 1.3066	* 1.5294	* 1.5525	* 1.9323	* 1.5224	* 1.9551	* .9283 *
	* 1.8662	* 2.2042	* 2.0009	* 1.9711	* 1.6538	* 2.0069	* 1.6263	* 2.9965 *
9	* 1.3066	* 1.7349	* 1.6608	* 1.9746	* 1.7315	* 1.7170	* 1.9559	* .9637 *
	* 2.2042	* 1.8336	* 1.8392	* 1.6211	* 1.7527	* 1.7668	* 1.6219	* 2.9036 *
10	* 1.5294	* 1.6604	* 1.6426	* 1.7495	* 1.9054	* 1.6475	* 1.8302	* .9121 *
	* 2.0009	* 1.8397	* 1.8643	* 1.7324	* 1.6660	* 1.8333	* 1.7205	* 3.1166 *
11	* 1.5525	* 1.9748	* 1.7498	* 1.8129	* 1.5889	* 1.7387	* 1.1339	* .6095 *
	* 1.9711	* 1.6209	* 1.7322	* 1.7490	* 1.8546	* 1.7550	* 2.4614	* 4.6261 *
12	* 1.9323	* 1.7320	* 1.9058	* 1.5891	* 1.1396	* 1.4267	* .8662 *	
	* 1.6538	* 1.7522	* 1.6657	* 1.8543	* 1.9989	* 1.7510	* 2.9498 *	
13	* 1.5224	* 1.7184	* 1.6481	* 1.7389	* 1.4269	* 1.2680	* .6425 *	
	* 2.0069	* 1.7652	* 1.8326	* 1.7548	* 1.7508	* 1.9047	* 3.6205 *	
14	* 1.9551	* 1.9571	* 1.8307	* 1.1339	* .8661	* .6555	*	
	* 1.6263	* 1.6209	* 1.7200	* 2.4614	* 2.9498	* 3.6015	*	
15	* .9283	* .9641	* .9121	* .6095	* F-SUB-Q			
	* 2.9965	* 2.9043	* 3.1170	* 4.6259	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1976	* 1.3023	* 1.5216	* 1.5434	* 1.9262	* 1.5129	* 1.9657	* .9323 *
	* 1.9896	* 2.3594	* 2.1433	* 2.1043	* 1.7600	* 2.1453	* 1.7118	* 3.1551 *
9	* 1.3023	* 1.7406	* 1.6559	* 1.9751	* 1.7225	* 1.7156	* 1.9636	* .9654 *
	* 2.3594	* 1.9545	* 1.9647	* 1.7245	* 1.8676	* 1.8747	* 1.7107	* 3.0666 *
10	* 1.5216	* 1.6554	* 1.6388	* 1.7438	* 1.9060	* 1.6371	* 1.8296	* .9092 *
	* 2.1433	* 1.9652	* 1.9892	* 1.8506	* 1.7569	* 1.9427	* 1.8268	* 3.3161 *
11	* 1.5434	* 1.9753	* 1.7440	* 1.8164	* 1.5813	* 1.7312	* 1.1250	* .6043 *
	* 2.1043	* 1.7243	* 1.8504	* 1.8612	* 1.9813	* 1.8749	* 2.6177	* 4.8951 *
12	* 1.9262	* 1.7230	* 1.9064	* 1.5816	* 1.1319	* 1.4195	* .8571 *	
	* 1.7600	* 1.8671	* 1.7566	* 1.9811	* 2.1341	* 1.8627	* 3.1487 *	
13	* 1.5129	* 1.7169	* 1.6376	* 1.7314	* 1.4198	* 1.2595	* .6351 *	
	* 2.1453	* 1.8731	* 1.9420	* 1.8747	* 1.8625	* 2.0336	* 3.8807 *	
14	* 1.9657	* 1.9648	* 1.8301	* 1.1250	* .8570	* .6479 *		
	* 1.7118	* 1.7097	* 1.8264	* 2.6177	* 3.1486	* 3.8607 *		
15	* .9323	* .9657	* .9091	* .6043	* F-SUB-Q			
	* 3.1551	* 3.0674	* 3.3165	* 4.8948	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 198 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2028	* 1.2916	* 1.5099	* 1.5292	* 1.9160	* 1.4973	* 1.9629	* .9238 *
	* 2.1661	* 2.5755	* 2.3010	* 2.2528	* 1.8748	* 2.3013	* 1.8418	* 3.4189 *
9	* 1.2916	* 1.7416	* 1.6452	* 1.9704	* 1.7083	* 1.7050	* 1.9603	* .9547 *
	* 2.5755	* 2.1159	* 2.1082	* 1.8319	* 1.9961	* 2.0141	* 1.8371	* 3.3305 *
10	* 1.5099	* 1.6447	* 1.6280	* 1.7315	* 1.9033	* 1.6233	* 1.8237	* .8978 *
	* 2.3010	* 2.1088	* 2.1411	* 1.9746	* 1.8756	* 2.0821	* 1.9359	* 3.5646 *
11	* 1.5292	* 1.9706	* 1.7317	* 1.8153	* 1.5711	* 1.7247	* 1.1106	* .5944 *
	* 2.2528	* 1.8317	* 1.9744	* 1.9827	* 2.1482	* 2.0229	* 2.8343	* 5.2845 *
12	* 1.9160	* 1.7087	* 1.9037	* 1.5713	* 1.1265	* 1.4194	* .8456 *	
	* 1.8748	* 1.9956	* 1.8752	* 2.1479	* 2.3232	* 2.0144	* 3.4390 *	
13	* 1.4973	* 1.7063	* 1.6238	* 1.7249	* 1.4196	* 1.2580	* .6263 *	
	* 2.3013	* 2.0124	* 2.0814	* 2.0227	* 2.0141	* 2.1981	* 4.2374 *	
14	* 1.9629	* 1.9614	* 1.8242	* 1.1106	* .8455	* .6400	*	
	* 1.8418	* 1.8360	* 1.9355	* 2.8341	* 3.4389	* 4.2087	*	
15	* .9238	* .9548	* .8978	* .5944	* F-SUB-Q			
	* 3.4189	* 3.3321	* 3.5650	* 5.2842	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1999	* 1.2824	* 1.4759	* 1.4973	* 1.8669	* 1.4636	* 1.9137	* .9173 *
	* 2.4283	* 2.8516	* 2.5423	* 2.4856	* 2.0764	* 2.5249	* 2.0039	* 3.6550 *
9	* 1.2824	* 1.7017	* 1.6115	* 1.9208	* 1.6696	* 1.6669	* 1.9113	* .9504 *
	* 2.8516	* 2.3357	* 2.3204	* 2.0271	* 2.2063	* 2.1953	* 2.0001	* 3.5466 *
10	* 1.4759	* 1.6110	* 1.5924	* 1.6954	* 1.8564	* 1.5869	* 1.7777	* .8986 *
	* 2.5424	* 2.3210	* 2.3516	* 2.1777	* 2.0806	* 2.3044	* 2.1319	* 3.7994 *
11	* 1.4973	* 1.9210	* 1.6956	* 1.7725	* 1.5418	* 1.6846	* 1.1050	* .5907 *
	* 2.4856	* 2.0269	* 2.1775	* 2.2006	* 2.3863	* 2.2621	* 3.0956	* 5.7391 *
12	* 1.8669	* 1.6700	* 1.8568	* 1.5420	* 1.1290	* 1.3979	* .8469 *	
	* 2.0764	* 2.2057	* 2.0802	* 2.3860	* 2.5979	* 2.2562	* 3.7593 *	
13	* 1.4636	* 1.6681	* 1.5874	* 1.6848	* 1.3981	* 1.2371	* .6292 *	
	* 2.5249	* 2.1935	* 2.3037	* 2.2619	* 2.2559	* 2.4612	* 4.6268 *	
14	* 1.9137	* 1.9124	* 1.7781	* 1.1050	* .8469	* .6410	*	
	* 2.0039	* 1.9990	* 2.1314	* 3.0953	* 3.7592	* 4.6084	*	
15	* .9173	* .9508	* .8986	* .5907	* F-SUB-Q			
	* 3.6550	* 3.5476	* 3.7996	* 5.7387	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 199 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2110	* 1.2636	* 1.4667	* 1.4830	* 1.8636	* 1.4463	* 1.9141	* .8983
	* 2.6244	* 3.1119	* 2.8193	* 2.7646	* 2.2889	* 2.7989	* 2.1769	* 4.0382
9	* 1.2636	* 1.7112	* 1.6021	* 1.9249	* 1.6583	* 1.6561	* 1.9125	* .9280
	* 3.1119	* 2.5311	* 2.5707	* 2.2284	* 2.4466	* 2.4109	* 2.1764	* 3.9348
10	* 1.4667	* 1.6016	* 1.5835	* 1.6851	* 1.8639	* 1.5761	* 1.7798	* .8724
	* 2.8193	* 2.5714	* 2.6042	* 2.4154	* 2.2943	* 2.5549	* 2.3324	* 4.2661
11	* 1.4830	* 1.9251	* 1.6853	* 1.7809	* 1.5360	* 1.6899	* 1.0824	* .5765
	* 2.7646	* 2.2282	* 2.4152	* 2.4207	* 2.6304	* 2.4877	* 3.4813	* 6.4458
12	* 1.8636	* 1.6588	* 1.8642	* 1.5362	* 1.1215	* 1.4121	* .8293	*
	* 2.2889	* 2.4459	* 2.2939	* 2.6301	* 2.8703	* 2.4774	* 4.2234	*
13	* 1.4463	* 1.6573	* 1.5765	* 1.6900	* 1.4123	* 1.2508	* .6172	*
	* 2.7989	* 2.4091	* 2.5541	* 2.4876	* 2.4771	* 2.7120	* 5.2307	*
14	* 1.9141	* 1.9135	* 1.7801	* 1.0825	* .8292	* .6302	*	*
	* 2.1769	* 2.1752	* 2.3319	* 3.4810	* 4.2233	* 5.1984	*	*
15	* .8983	* .9283	* .8723	* .5765	* F-SUB-Q			
	* 4.0382	* 3.9358	* 4.2666	* 6.4454	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2048	* 1.2513	* 1.4481	* 1.4631	* 1.8409	* 1.4234	* 1.8905	* .8867
	* 2.6609	* 3.1646	* 2.9824	* 2.9816	* 2.4819	* 3.0545	* 2.4244	* 4.4987
9	* 1.2513	* 1.6976	* 1.5837	* 1.9056	* 1.6369	* 1.6336	* 1.8897	* .9154
	* 3.1646	* 2.5694	* 2.7761	* 2.4259	* 2.6709	* 2.6739	* 2.4303	* 4.3919
10	* 1.4481	* 1.5831	* 1.5647	* 1.6654	* 1.8472	* 1.5559	* 1.7602	* .8613
	* 2.9824	* 2.7769	* 2.8295	* 2.6382	* 2.4904	* 2.8359	* 2.6209	* 4.7877
11	* 1.4631	* 1.9057	* 1.6655	* 1.7665	* 1.5211	* 1.6761	* 1.0716	* .5698
	* 2.9816	* 2.4257	* 2.6380	* 2.4798	* 2.6809	* 2.5524	* 3.8086	* 7.2408
12	* 1.8409	* 1.6373	* 1.8476	* 1.5213	* 1.1136	* 1.4067	* .8240	*
	* 2.4819	* 2.6701	* 2.4901	* 2.6807	* 2.9631	* 2.5768	* 4.3808	*
13	* 1.4234	* 1.6347	* 1.5562	* 1.6762	* 1.4069	* 1.2486	* .6158	*
	* 3.0544	* 2.6720	* 2.8349	* 2.5523	* 2.5765	* 2.8441	* 5.4774	*
14	* 1.8905	* 1.8907	* 1.7605	* 1.0717	* .8239	* .6280	*	*
	* 2.4244	* 2.4291	* 2.6205	* 3.8082	* 4.3808	* 5.4509	*	*
15	* .8867	* .9157	* .8613	* .5698	* F-SUB-Q			
	* 4.4987	* 4.3929	* 4.7883	* 7.2402	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 200 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1905	* 1.2447	* 1.4219	* 1.4380	* 1.8019	* 1.3960	* 1.8482	* .8789 *
	* 2.7347	* 3.2180	* 2.9760	* 2.9214	* 2.4399	* 2.9946	* 2.3782	* 4.3498 *
9	* 1.2447	* 1.6670	* 1.5580	* 1.8681	* 1.6069	* 1.6013	* 1.8485	* .9092 *
	* 3.2180	* 2.6405	* 2.7188	* 2.3846	* 2.6214	* 2.6199	* 2.3846	* 4.2391 *
10	* 1.4219	* 1.5575	* 1.5381	* 1.6380	* 1.8116	* 1.5287	* 1.7241	* .8619 *
	* 2.9760	* 2.7196	* 2.7748	* 2.5858	* 2.4767	* 2.7852	* 2.5800	* 4.6069 *
11	* 1.4380	* 1.8682	* 1.6382	* 1.7346	* 1.5000	* 1.6487	* 1.0694	* .5669 *
	* 2.9214	* 2.3845	* 2.5856	* 2.5510	* 2.7567	* 2.6315	* 3.8068	* 7.1132 *
12	* 1.8019	* 1.6073	* 1.8119	* 1.5002	* 1.1095	* 1.3902	* .8286	* .8286 *
	* 2.4399	* 2.6207	* 2.4763	* 2.7564	* 3.0516	* 2.6601	* 4.4379	* .8286 *
13	* 1.3960	* 1.6023	* 1.5290	* 1.6488	* 1.3903	* 1.2379	* .6224	* .6224 *
	* 2.9946	* 2.6181	* 2.7844	* 2.6314	* 2.6598	* 2.9380	* 5.5511	* .6224 *
14	* 1.8482	* 1.8494	* 1.7244	* 1.0694	* .8285	* .6338		
	* 2.3782	* 2.3834	* 2.5796	* 3.8065	* 4.4378	* 5.5316		
15	* .8789	* .9095	* .8620	* .5669	* F-SUB-Q			
	* 4.3498	* 4.2403	* 4.6070	* 7.1128	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2040	* 1.2367	* 1.4226	* 1.4322	* 1.8070	* 1.3842	* 1.8542	* .8632 *
	* 2.6971	* 3.2042	* 2.9073	* 2.8583	* 2.3685	* 2.9357	* 2.3020	* 4.2986 *
9	* 1.2367	* 1.6884	* 1.5593	* 1.8826	* 1.6059	* 1.5971	* 1.8560	* .8905 *
	* 3.2042	* 2.5871	* 2.6504	* 2.3069	* 2.5571	* 2.5535	* 2.3076	* 4.2024 *
10	* 1.4226	* 1.5587	* 1.5405	* 1.6391	* 1.8304	* 1.5284	* 1.7355	* .8405 *
	* 2.9073	* 2.6513	* 2.7050	* 2.5215	* 2.3927	* 2.7170	* 2.4967	* 4.5971 *
11	* 1.4322	* 1.8827	* 1.6392	* 1.7558	* 1.5080	* 1.6699	* 1.0572	* .5570 *
	* 2.8583	* 2.3068	* 2.5213	* 2.5139	* 2.7299	* 2.5963	* 3.7670	* 7.0691 *
12	* 1.8070	* 1.6062	* 1.8307	* 1.5081	* 1.1078	* 1.4193	* .8226	* .8226 *
	* 2.3685	* 2.5564	* 2.3923	* 2.7296	* 3.0289	* 2.6192	* 4.4178	* .8226 *
13	* 1.3842	* 1.5981	* 1.5287	* 1.6699	* 1.4195	* 1.2714	* .6218	* .6218 *
	* 2.9357	* 2.5517	* 2.7162	* 2.5963	* 2.6190	* 2.8740	* 5.4863	* .6218 *
14	* 1.8542	* 1.8569	* 1.7357	* 1.0573	* .8225	* .6343		
	* 2.3020	* 2.3065	* 2.4963	* 3.7665	* 4.4178	* 5.4586		
15	* .8632	* .8909	* .8405	* .5570	* F-SUB-Q			
	* 4.2986	* 4.2034	* 4.5975	* 7.0686	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 201 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2361	* 1.2449	* 1.4235	* 1.4271	* 1.8038	* 1.3731	* 1.8483	* .8553
	* 2.4156	* 2.8810	* 2.7194	* 2.7286	* 2.2604	* 2.8090	* 2.1981	* 4.0996
9	* 1.2449	* 1.7063	* 1.5611	* 1.8877	* 1.6035	* 1.5892	* 1.8520	* .8802
	* 2.8810	* 2.3292	* 2.5249	* 2.1993	* 2.4430	* 2.4416	* 2.2032	* 4.0188
10	* 1.4235	* 1.5604	* 1.5429	* 1.6404	* 1.8405	* 1.5287	* 1.7377	* .8338
	* 2.7194	* 2.5257	* 2.5780	* 2.4086	* 2.2781	* 2.5963	* 2.3796	* 4.3778
11	* 1.4271	* 1.8878	* 1.6405	* 1.7776	* 1.5247	* 1.6934	* 1.0597	* .5541
	* 2.7286	* 2.1991	* 2.4085	* 2.2677	* 2.4637	* 2.3332	* 3.4832	* 6.6677
12	* 1.8038	* 1.6039	* 1.8408	* 1.5248	* 1.1291	* 1.4646	* .8352	*
	* 2.2604	* 2.4424	* 2.2779	* 2.4636	* 2.7267	* 2.3503	* 3.9953	*
13	* 1.3731	* 1.5901	* 1.5290	* 1.6934	* 1.4647	* 1.3216	* .6381	*
	* 2.8090	* 2.4401	* 2.5958	* 2.3332	* 2.3502	* 2.5810	* 4.9679	*
14	* 1.8483	* 1.8528	* 1.7379	* 1.0598	* .8351	* .6514	*	*
	* 2.1981	* 2.2023	* 2.3793	* 3.4829	* 3.9954	* 4.9390	*	*
15	* .8553	* .8804	* .8337	* .5541	* F-SUB-Q			
	* 4.0996	* 4.0204	* 4.3783	* 6.6675	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3411	* 1.2721	* 1.4309	* 1.4253	* 1.8004	* 1.3655	* 1.8392	* .8512
	* 2.1849	* 2.6061	* 2.4593	* 2.4403	* 2.0251	* 2.5210	* 1.9738	* 3.6624
9	* 1.2721	* 1.7351	* 1.5679	* 1.8921	* 1.6038	* 1.5826	* 1.8451	* .8782
	* 2.6061	* 2.1053	* 2.2480	* 1.9643	* 2.1842	* 2.1895	* 1.9755	* 3.5806
10	* 1.4309	* 1.5673	* 1.5502	* 1.6461	* 1.8555	* 1.5339	* 1.7387	* .8339
	* 2.4593	* 2.2488	* 2.2953	* 2.1482	* 2.0299	* 2.3143	* 2.1219	* 3.8925
11	* 1.4253	* 1.8922	* 1.6462	* 1.8120	* 1.5574	* 1.7301	* 1.0744	* .5575
	* 2.4403	* 1.9642	* 2.1481	* 2.0509	* 2.2331	* 2.1131	* 3.1393	* 5.9231
12	* 1.8004	* 1.6041	* 1.8557	* 1.5576	* 1.2093	* 1.5569	* .8665	*
	* 2.0251	* 2.1837	* 2.0296	* 2.2329	* 2.4798	* 2.1363	* 3.6168	*
13	* 1.3655	* 1.5835	* 1.5341	* 1.7301	* 1.5570	* 1.4078	* .6717	*
	* 2.5210	* 2.1882	* 2.3139	* 2.1132	* 2.1361	* 2.3451	* 4.5028	*
14	* 1.8392	* 1.8459	* 1.7388	* 1.0745	* .8664	* .6843	*	*
	* 1.9738	* 1.9748	* 2.1217	* 3.1390	* 3.6168	* 4.4858	*	*
15	* .8512	* .8785	* .8339	* .5575	* F-SUB-Q			
	* 3.6624	* 3.5815	* 3.8931	* 5.9229	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 202 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5819	* 1.3185	* 1.4512	* 1.4239	* 1.7901	* 1.3620	* 1.8210	* .8539 *
	* 2.1398	* 2.5280	* 2.4006	* 2.3772	* 1.9789	* 2.4565	* 1.9340	* 3.5469 *
9	* 1.3185	* 1.7736	* 1.5740	* 1.8875	* 1.6023	* 1.5735	* 1.8291	* .8828 *
	* 2.5280	* 2.0673	* 2.1872	* 1.9184	* 2.1297	* 2.1387	* 1.9343	* 3.4610 *
10	* 1.4512	* 1.5733	* 1.5559	* 1.6508	* 1.8654	* 1.5386	* 1.7325	* .8465 *
	* 2.4006	* 2.1880	* 2.2361	* 2.0903	* 1.9816	* 2.2537	* 2.0739	* 3.7323 *
11	* 1.4239	* 1.8876	* 1.6509	* 1.8439	* 1.5959	* 1.7709	* 1.0996	* .5662 *
	* 2.3772	* 1.9183	* 2.0902	* 2.0145	* 2.1910	* 2.0756	* 3.0254	* 5.7057 *
12	* 1.7901	* 1.6027	* 1.8656	* 1.5960	* 1.3511	* 1.6800	* .9117	* .9117 *
	* 1.9789	* 2.1293	* 1.9814	* 2.1908	* 2.4328	* 2.0990	* 3.4946	* 3.4946 *
13	* 1.3620	* 1.5743	* 1.5388	* 1.7708	* 1.6801	* 1.5120	* .7172	* .7172 *
	* 2.4565	* 2.1376	* 2.2533	* 2.0756	* 2.0989	* 2.3110	* 4.3577	* 4.3577 *
14	* 1.8210	* 1.8299	* 1.7326	* 1.0997	* .9116	* .7299		
	* 1.9340	* 1.9335	* 2.0737	* 3.0251	* 3.4946	* 4.3459		
15	* .8539	* .8831	* .8466	* .5662	* F-SUB-Q			
	* 3.5469	* 3.4621	* 3.7325	* 5.7056	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7547	* 1.3941	* 1.4878	* 1.4351	* 1.8180	* 1.3630	* 1.8472	* .8450 *
	* 1.9167	* 2.3061	* 2.1524	* 2.1508	* 1.7747	* 2.2352	* 1.7348	* 3.2652 *
9	* 1.3941	* 1.8440	* 1.5985	* 1.9277	* 1.6223	* 1.5873	* 1.8575	* .8708 *
	* 2.3061	* 1.8391	* 1.9681	* 1.7131	* 1.9193	* 1.9308	* 1.7334	* 3.1973 *
10	* 1.4878	* 1.5977	* 1.5816	* 1.6751	* 1.9142	* 1.5616	* 1.7679	* .8326 *
	* 2.1524	* 1.9689	* 2.0120	* 1.8814	* 1.7658	* 2.0287	* 1.8534	* 3.4616 *
11	* 1.4351	* 1.9277	* 1.6751	* 1.9095	* 1.6486	* 1.8438	* 1.1049	* .5623 *
	* 2.1508	* 1.7130	* 1.8814	* 1.7907	* 1.9614	* 1.8465	* 2.7543	* 5.2561 *
12	* 1.8180	* 1.6227	* 1.9143	* 1.6487	* 1.4740	* 1.8052	* .9300	* .9300 *
	* 1.7747	* 1.9189	* 1.7656	* 1.9612	* 2.1971	* 1.8808	* 3.2179	* 3.2179 *
13	* 1.3630	* 1.5881	* 1.5618	* 1.8437	* 1.8053	* 1.6282	* .7387	* .7387 *
	* 2.2352	* 1.9298	* 2.0284	* 1.8465	* 1.8807	* 2.0679	* 4.0334	* 4.0334 *
14	* 1.8472	* 1.8583	* 1.7679	* 1.1050	* .9298	* .7538		
	* 1.7348	* 1.7327	* 1.8533	* 2.7541	* 3.2180	* 4.0115		
15	* .8450	* .8710	* .8326	* .5624	* F-SUB-Q			
	* 3.2652	* 3.1986	* 3.4620	* 5.2558	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 203 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8059	* 1.4266	* 1.5023	* 1.4350	* 1.8195	* 1.3598	* 1.8448	* .8410 *
	* 1.7278	* 2.0935	* 1.9792	* 1.9848	* 1.6352	* 2.0679	* 1.6016	* 3.0310 *
9	* 1.4266	* 1.8690	* 1.6056	* 1.9337	* 1.6249	* 1.5861	* 1.8569	* .8670 *
	* 2.0935	* 1.6845	* 1.8069	* 1.5745	* 1.7678	* 1.7823	* 1.5986	* 2.9666 *
10	* 1.5023	* 1.6049	* 1.5886	* 1.6809	* 1.9263	* 1.5677	* 1.7736	* .8310 *
	* 1.9792	* 1.8077	* 1.8487	* 1.7290	* 1.6210	* 1.8635	* 1.7038	* 3.2039 *
11	* 1.4350	* 1.9338	* 1.6809	* 1.9310	* 1.6688	* 1.8724	* 1.1135	* .5634 *
	* 1.9848	* 1.5745	* 1.7289	* 1.6441	* 1.7999	* 1.6879	* 2.5172	* 4.8480 *
12	* 1.8195	* 1.6252	* 1.9265	* 1.6689	* 1.5125	* 1.8570	* .9480 *	
	* 1.6352	* 1.7674	* 1.6208	* 1.7997	* 1.9894	* 1.7027	* 2.9361	*
13	* 1.3598	* 1.5869	* 1.5679	* 1.8723	* 1.8572	* 1.6816	* .7584 *	
	* 2.0679	* 1.7813	* 1.8632	* 1.6880	* 1.7026	* 1.8763	* 3.6709	*
14	* 1.8448	* 1.8577	* 1.7737	* 1.1135	* .9478	* .7738	*	
	* 1.6016	* 1.5980	* 1.7037	* 2.5169	* 2.9362	* 3.6511	*	
15	* .8410	* .8672	* .8310	* .5634	* F-SUB-Q			
	* 3.0310	* 2.9677	* 3.2043	* 4.8478	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7868	* 1.4348	* 1.4884	* 1.4154	* 1.7808	* 1.3483	* 1.7998	* .8374 *
	* 1.6436	* 1.9611	* 1.8451	* 1.8786	* 1.5593	* 1.9513	* 1.5333	* 2.8497 *
9	* 1.4348	* 1.8368	* 1.5860	* 1.8886	* 1.6004	* 1.5605	* 1.8133	* .8677 *
	* 1.9611	* 1.5951	* 1.7030	* 1.5021	* 1.6741	* 1.6923	* 1.5282	* 2.7747 *
10	* 1.4884	* 1.5853	* 1.5676	* 1.6579	* 1.8859	* 1.5480	* 1.7356	* .8382 *
	* 1.8451	* 1.7036	* 1.7452	* 1.6323	* 1.5385	* 1.7566	* 1.6238	* 2.9710 *
11	* 1.4154	* 1.8887	* 1.6580	* 1.8947	* 1.6503	* 1.8445	* 1.1211	* .5670 *
	* 1.8786	* 1.5020	* 1.6322	* 1.5528	* 1.6938	* 1.5974	* 2.3178	* 4.4976 *
12	* 1.7808	* 1.6007	* 1.8860	* 1.6504	* 1.5055	* 1.8397	* .9651 *	
	* 1.5593	* 1.6737	* 1.5383	* 1.6937	* 1.8833	* 1.6182	* 2.7205 *	
13	* 1.3483	* 1.5613	* 1.5482	* 1.8444	* 1.8399	* 1.6702	* .7752 *	
	* 1.9513	* 1.6913	* 1.7563	* 1.5974	* 1.6181	* 1.7796	* 3.3904 *	
14	* 1.7998	* 1.8140	* 1.7357	* 1.1211	* .9650	* .7889	*	
	* 1.5333	* 1.5277	* 1.6237	* 1.3176	* 2.7206	* 3.3811	*	
15	* .8374	* .8679	* .8382	* .5669	* F-SUB-Q			
	* 2.8497	* 2.7759	* 2.9712	* 4.4975	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 204 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7624	* 1.3958	* 1.4695	* 1.3857	* 1.7489	* 1.3166	* 1.7657	* .8073
	* 1.5546	* 1.8732	* 1.7504	* 1.8104	* 1.4981	* 1.8877	* 1.4767	* 2.8006
9	* 1.3958	* 1.8022	* 1.5606	* 1.8522	* 1.5718	* 1.5338	* 1.7801	* .8348
	* 1.8732	* 1.5157	* 1.6267	* 1.4413	* 1.6059	* 1.6265	* 1.4702	* 2.7321
10	* 1.4695	* 1.5599	* 1.5438	* 1.6275	* 1.8444	* 1.5222	* 1.7071	* .8025
	* 1.7504	* 1.6273	* 1.6652	* 1.5642	* 1.4733	* 1.6789	* 1.5558	* 2.9360
11	* 1.3857	* 1.8522	* 1.6275	* 1.8542	* 1.6223	* 1.8168	* 1.0846	* .5477
	* 1.8104	* 1.4412	* 1.5641	* 1.4831	* 1.6083	* 1.5124	* 2.2524	* 4.3931
12	* 1.7489	* 1.5722	* 1.8445	* 1.6224	* 1.4851	* 1.8166	* .9330	*
	* 1.4981	* 1.6055	* 1.4732	* 1.6082	* 1.7884	* 1.5396	* 2.6291	*
13	* 1.3166	* 1.5346	* 1.5224	* 1.8168	* 1.8167	* 1.6520	* .7505	*
	* 1.8877	* 1.6256	* 1.6786	* 1.5124	* 1.5395	* 1.7027	* 3.3134	*
14	* 1.7657	* 1.7809	* 1.7072	* 1.0846	* .9328	* .7650	*	*
	* 1.4767	* 1.4696	* 1.5557	* 2.2522	* 2.6291	* 3.2990	*	*
15	* .8073	* .8351	* .8025	* .5477	* F-SUB-Q			
	* 2.8006	* 2.7328	* 2.9365	* 4.3930	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6268	* 1.3067	* 1.3815	* 1.2924	* 1.6110	* 1.2326	* 1.6202	* .7509
	* 1.5854	* 1.8888	* 1.7650	* 1.8527	* 1.5524	* 1.9290	* 1.5387	* 2.8886
9	* 1.3067	* 1.6560	* 1.4609	* 1.6993	* 1.4640	* 1.4311	* 1.6348	* .7759
	* 1.8888	* 1.5647	* 1.6535	* 1.4949	* 1.6435	* 1.6679	* 1.5302	* 2.8196
10	* 1.3815	* 1.4602	* 1.4439	* 1.5191	* 1.6861	* 1.4237	* 1.5709	* .7467
	* 1.7650	* 1.6542	* 1.6934	* 1.5956	* 1.5278	* 1.7082	* 1.6126	* 3.0241
11	* 1.2924	* 1.6994	* 1.5192	* 1.6953	* 1.5093	* 1.6710	* 1.0090	* .5116
	* 1.8527	* 1.4949	* 1.5955	* 1.5399	* 1.6424	* 1.5616	* 2.2993	* 4.4973
12	* 1.6110	* 1.4644	* 1.6863	* 1.5094	* 1.3846	* 1.6681	* .8701	*
	* 1.5524	* 1.6431	* 1.5276	* 1.6422	* 1.8118	* 1.5827	* 2.6774	*
13	* 1.2326	* 1.4320	* 1.4239	* 1.6710	* 1.6683	* 1.5205	* .6997	*
	* 1.9290	* 1.6667	* 1.7079	* 1.5616	* 1.5825	* 1.7450	* 3.3668	*
14	* 1.6202	* 1.6356	* 1.5710	* 1.0090	* .8700	* .7141	*	*
	* 1.5387	* 1.5295	* 1.6125	* 2.2992	* 2.6774	* 3.3481	*	*
15	* .7509	* .7763	* .7467	* .5116	* F-SUB-Q			
	* 2.8886	* 2.8202	* 3.0246	* 4.4971	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 205 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 350 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3219	* 1.0876	* 1.1511	* 1.0715	* 1.3029	* 1.0240	* 1.3127	* .6201
	* 1.8724	* 2.1759	* 2.0298	* 2.1523	* 1.8486	* 2.2417	* 1.8334	* 3.3894
9	* 1.0876	* 1.3832	* 1.2135	* 1.3946	* 1.1844	* 1.1784	* 1.3231	* .6372
	* 2.1759	* 1.7865	* 1.9146	* 1.7508	* 1.9543	* 1.9550	* 1.8252	* 3.3259
10	* 1.1511	* 1.2130	* 1.1726	* 1.2556	* 1.3840	* 1.1776	* 1.2699	* .6122
	* 2.0298	* 1.9153	* 2.0039	* 1.8539	* 1.7822	* 1.9862	* 1.9233	* 3.5708
11	* 1.0715	* 1.3947	* 1.2557	* 1.3920	* 1.2181	* 1.3497	* .8274	* .4287
	* 2.1523	* 1.7507	* 1.8538	* 1.7906	* 1.9462	* 1.8526	* 2.6989	* 5.1918
12	* 1.3029	* 1.1846	* 1.3840	* 1.2181	* 1.1150	* 1.3462	* .7191	*
	* 1.8486	* 1.9538	* 1.7820	* 1.9461	* 2.1626	* 1.8839	* 3.1238	*
13	* 1.0240	* 1.1794	* 1.1778	* 1.3497	* 1.3464	* 1.2191	* .5755	*
	* 2.2417	* 1.9533	* 1.9858	* 1.8526	* 1.8837	* 2.0911	* 3.9450	*
14	* 1.3127	* 1.3237	* 1.2700	* .8274	* .7191	* .5868	*	*
	* 1.8334	* 1.8244	* 1.9231	* 2.6987	* 3.1236	* 3.9262	*	*
15	* .6201	* .6374	* .6122	* .4287	* F-SUB-Q			
	* 3.3894	* 3.3266	* 3.5715	* 5.1917	* M-SUB-Q			

AT 50% POWER, 350 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5945	* .5106	* .5023	* .5005	* .5834	* .4790	* .5287	* .2807
	* 3.9959	* 4.4512	* 4.4759	* 4.4544	* 3.9959	* 4.6433	* 4.4019	* 7.2632
9	* .5106	* .5907	* .5245	* .6067	* .5113	* .4998	* .5316	* .2841
	* 4.4512	* 4.0136	* 4.2674	* 3.8822	* 4.3643	* 4.4524	* 4.3903	* 7.2434
10	* .5023	* .5243	* .4996	* .5420	* .6090	* .5080	* .5082	* .2703
	* 4.4759	* 4.2686	* 4.5301	* 4.1357	* 3.8975	* 4.4397	* 4.6420	* 7.8427
11	* .5005	* .6067	* .5420	* .6088	* .5152	* .5665	* .3762	* .1973
	* 4.4544	* 3.8820	* 4.1355	* 3.9318	* 4.4207	* 4.2493	* 5.7336	* 10.9437
12	* .5834	* .5114	* .6090	* .5152	* .4787	* .5397	* .3198	*
	* 3.9959	* 4.3632	* 3.8972	* 4.4204	* 4.8505	* 4.5388	* 6.7998	*
13	* .4790	* .5002	* .5081	* .5665	* .5397	* .4791	* .2533	*
	* 4.6433	* 4.4482	* 4.4386	* 4.2491	* 4.5380	* 5.1405	* 8.6850	*
14	* .5287	* .5319	* .5083	* .3762	* .3198	* .2571	*	*
	* 4.4019	* 4.3880	* 4.6413	* 5.7335	* 6.7980	* 8.6820	*	*
15	* .2807	* .2842	* .2703	* .1973	* F-SUB-Q			
	* 7.2632	* 7.2460	* 7.8430	* 10.9427	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 206 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4494 *	* .5107 *	* .5631 *	* .6072 *	* .7052 *	* .5722 *	* .4762 *	* .2498 *
	* 3.6192 *	* 4.0282 *	* 3.9078 *	* 3.7465 *	* 3.4776 *	* 3.8020 *	* 3.8005 *	* 5.5763 *
9	* .5107 *	* .5850 *	* .5745 *	* .6951 *	* .6146 *	* .5972 *	* .5851 *	* .3224 *
	* 4.0282 *	* 3.8353 *	* 3.7245 *	* 3.4830 *	* 3.6747 *	* 3.7330 *	* 3.8153 *	* 5.6431 *
10	* .5631 *	* .5744 *	* .4597 *	* .6086 *	* .7005 *	* .6138 *	* .6000 *	* .3195 *
	* 3.9078 *	* 3.7252 *	* 3.9192 *	* 3.6008 *	* 3.4783 *	* 3.6644 *	* 4.0233 *	* 6.2139 *
11	* .6072 *	* .6951 *	* .6086 *	* .6469 *	* .5696 *	* .6402 *	* .4529 *	* .2723 *
	* 3.7465 *	* 3.4826 *	* 3.6005 *	* 3.6944 *	* 3.8813 *	* 3.7090 *	* 4.5737 *	* 7.7959 *
12	* .7052 *	* .6147 *	* .7006 *	* .5697 *	* .4314 *	* .5230 *	* .3667 *	
	* 3.4776 *	* 3.6739 *	* 3.4779 *	* 3.8811 *	* 4.0803 *	* 4.0583 *	* 5.3589 *	
13	* .5722 *	* .5976 *	* .6140 *	* .6402 *	* .5230 *	* .4660 *	* .2780 *	
	* 3.8020 *	* 3.7287 *	* 3.6633 *	* 3.7091 *	* 4.0585 *	* 4.4408 *	* 6.9430 *	
14	* .4762 *	* .5854 *	* .6001 *	* .4528 *	* .3665 *	* .2827 *		
	* 3.8005 *	* 3.8126 *	* 4.0223 *	* 4.5715 *	* 5.3611 *	* 7.0208 *		
15	* .2498 *	* .3224 *	* .3195 *	* .2722 *	F-SUB-Q			
	* 5.5763 *	* 5.6458 *	* 6.2133 *	* 7.7967 *	M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .8488 *	* .9651 *	* 1.1387 *	* 1.1591 *	* 1.3593 *	* 1.0888 *	* .9900 *	* .4921 *
	* 2.0108 *	* 2.1924 *	* 2.0048 *	* 2.0361 *	* 1.8696 *	* 2.0600 *	* 1.8481 *	* 2.9089 *
9	* .9651 *	* 1.1830 *	* 1.1671 *	* 1.3749 *	* 1.2588 *	* 1.2207 *	* 1.2481 *	* .6540 *
	* 2.1924 *	* 1.9579 *	* 1.8934 *	* 1.8153 *	* 1.8651 *	* 1.8633 *	* 1.8490 *	* 2.8713 *
10	* 1.1387 *	* 1.1668 *	* .9206 *	* 1.2438 *	* 1.3840 *	* 1.2581 *	* 1.2832 *	* .6592 *
	* 2.0048 *	* 1.8937 *	* 1.9678 *	* 1.8164 *	* 1.8436 *	* 1.8954 *	* 1.9410 *	* 3.1254 *
11	* 1.1591 *	* 1.3750 *	* 1.2439 *	* 1.2790 *	* 1.1862 *	* 1.3115 *	* .8954 *	* .5268 *
	* 2.0361 *	* 1.8152 *	* 1.8162 *	* 1.9267 *	* 1.9669 *	* 1.9129 *	* 2.4480 *	* 4.2646 *
12	* 1.3593 *	* 1.2591 *	* 1.3842 *	* 1.1863 *	* .8722 *	* 1.1142 *	* .7423 *	
	* 1.8696 *	* 1.8647 *	* 1.8433 *	* 1.9668 *	* 2.0636 *	* 1.9390 *	* 2.7936 *	
13	* 1.0888 *	* 1.2214 *	* 1.2584 *	* 1.3116 *	* 1.1142 *	* 1.0193 *	* .5783 *	
	* 2.0600 *	* 1.8613 *	* 1.8949 *	* 1.9129 *	* 1.9391 *	* 2.1135 *	* 3.4538 *	
14	* .9900 *	* 1.2486 *	* 1.2834 *	* .8952 *	* .7419 *	* .5826 *		
	* 1.8481 *	* 1.8479 *	* 1.9407 *	* 2.4470 *	* 2.7945 *	* 3.5255 *		
15	* .4921 *	* .6542 *	* .6591 *	* .5267 *	F-SUB-Q			
	* 2.9089 *	* 2.8724 *	* 3.1254 *	* 4.2651 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 207 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0064	* 1.1166	* 1.3123	* 1.3491	* 1.6109	* 1.2736	* 1.1991	* .5932
	* 1.7759	* 1.9545	* 1.7961	* 1.8079	* 1.6278	* 1.8249	* 1.5922	* 2.5275
9	* 1.1166	* 1.3689	* 1.3593	* 1.6120	* 1.4927	* 1.4066	* 1.4843	* .7826
	* 1.9545	* 1.7538	* 1.6805	* 1.5952	* 1.6228	* 1.6365	* 1.5927	* 2.4527
10	* 1.3123	* 1.3591	* 1.1068	* 1.4545	* 1.6226	* 1.4639	* 1.5209	* .7948
	* 1.7961	* 1.6808	* 1.7049	* 1.6033	* 1.6377	* 1.6876	* 1.6862	* 2.6649
11	* 1.3491	* 1.6121	* 1.4546	* 1.4878	* 1.4072	* 1.5500	* 1.0719	* .6109
	* 1.8079	* 1.5951	* 1.6032	* 1.7040	* 1.7007	* 1.6735	* 2.1157	* 3.8145
12	* 1.6109	* 1.4930	* 1.6228	* 1.4073	* 1.0382	* 1.3141	* .8824	*
	* 1.6278	* 1.6225	* 1.6375	* 1.7006	* 1.7965	* 1.6806	* 2.4270	*
13	* 1.2736	* 1.4074	* 1.4642	* 1.5500	* 1.3142	* 1.2041	* .6795	*
	* 1.8249	* 1.6350	* 1.6871	* 1.6735	* 1.6805	* 1.8219	* 2.9883	*
14	* 1.1991	* 1.4849	* 1.5211	* 1.0716	* .8820	* .6908	*	*
	* 1.5922	* 1.5918	* 1.6860	* 2.1148	* 2.4275	* 3.0231	*	*
15	* .5932	* .7828	* .7946	* .6108	* F-SUB-Q			
	* 2.5275	* 2.4535	* 2.6649	* 3.8148	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0940	* 1.1911	* 1.4026	* 1.4444	* 1.7593	* 1.3610	* 1.3295	* .6460
	* 1.7004	* 1.9108	* 1.7579	* 1.7618	* 1.5545	* 1.7831	* 1.5017	* 2.4754
9	* 1.1911	* 1.5105	* 1.4648	* 1.7769	* 1.6047	* 1.5060	* 1.6455	* .8314
	* 1.9108	* 1.6615	* 1.6352	* 1.5101	* 1.5737	* 1.5793	* 1.5034	* 2.4122
10	* 1.4026	* 1.4645	* 1.1900	* 1.5684	* 1.7843	* 1.5672	* 1.6735	* .8426
	* 1.7579	* 1.6355	* 1.6558	* 1.5524	* 1.5404	* 1.6388	* 1.5960	* 2.6379
11	* 1.4444	* 1.7770	* 1.5686	* 1.6473	* 1.5128	* 1.6891	* 1.1288	* .6385
	* 1.7618	* 1.5100	* 1.5523	* 1.6066	* 1.6387	* 1.5888	* 2.0836	* 3.7967
12	* 1.7593	* 1.6050	* 1.7845	* 1.5129	* 1.1027	* 1.4308	* .9168	*
	* 1.5545	* 1.5734	* 1.5402	* 1.6386	* 1.7393	* 1.5884	* 2.4128	*
13	* 1.3610	* 1.5067	* 1.5675	* 1.6892	* 1.4309	* 1.3045	* .7024	*
	* 1.7831	* 1.5781	* 1.6384	* 1.5889	* 1.5883	* 1.7244	* 2.9637	*
14	* 1.3295	* 1.6461	* 1.6737	* 1.1285	* .9165	* .7165	*	*
	* 1.5017	* 1.5027	* 1.5958	* 2.0827	* 2.4131	* 2.9879	*	*
15	* .6460	* .8317	* .8424	* .6384	* F-SUB-Q			
	* 2.4754	* 2.4133	* 2.6380	* 3.7970	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 208 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1279	* 1.2298	* 1.4346	* 1.4753	* 1.8064	* 1.4011	* 1.4536	* .7202 *
	* 1.7508	* 1.9815	* 1.8308	* 1.8227	* 1.5992	* 1.8540	* 1.5391	* 2.5512 *
9	* 1.2298	* 1.5785	* 1.5146	* 1.8384	* 1.6391	* 1.5375	* 1.7277	* .8679 *
	* 1.9815	* 1.7002	* 1.6963	* 1.5464	* 1.6268	* 1.6330	* 1.5408	* 2.4833 *
10	* 1.4346	* 1.5143	* 1.2743	* 1.6176	* 1.8402	* 1.5945	* 1.7298	* .8783 *
	* 1.8308	* 1.6966	* 1.7187	* 1.6018	* 1.5692	* 1.6907	* 1.6337	* 2.7184 *
11	* 1.4753	* 1.8385	* 1.6177	* 1.7117	* 1.5414	* 1.7198	* 1.1489	* .6485 *
	* 1.8227	* 1.5463	* 1.6017	* 1.6378	* 1.6893	* 1.6283	* 2.1421	* 3.9279 *
12	* 1.8064	* 1.6393	* 1.8404	* 1.5415	* 1.1217	* 1.4500	* .9231 *	
	* 1.5992	* 1.6265	* 1.5690	* 1.6892	* 1.8007	* 1.6272	* 2.4951 *	
13	* 1.4011	* 1.5382	* 1.5948	* 1.7198	* 1.4502	* 1.3153	* .7054 *	
	* 1.8540	* 1.6320	* 1.6903	* 1.6283	* 1.6271	* 1.7681	* 3.0536 *	
14	* 1.4536	* 1.7283	* 1.7300	* 1.1487	* .9229	* .7194	*	
	* 1.5391	* 1.5401	* 1.6335	* 2.1411	* 2.4952	* 3.0795	*	
15	* .7202	* .8683	* .8781	* .6484	* F-SUB-Q			
	* 2.5512	* 2.4842	* 2.7185	* 3.9281	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1444	* 1.2598	* 1.4516	* 1.4867	* 1.8227	* 1.4330	* 1.6324	* .8326 *
	* 1.8449	* 2.0822	* 1.9419	* 1.9150	* 1.6764	* 1.9644	* 1.6200	* 2.6769 *
9	* 1.2598	* 1.6443	* 1.5538	* 1.8738	* 1.6520	* 1.5751	* 1.7940	* .9045 *
	* 2.0822	* 1.7833	* 1.7962	* 1.6214	* 1.7070	* 1.7225	* 1.6202	* 2.6048 *
10	* 1.4516	* 1.5534	* 1.4091	* 1.6526	* 1.8635	* 1.5995	* 1.7580	* .9154 *
	* 1.9419	* 1.7965	* 1.8202	* 1.6849	* 1.6342	* 1.7670	* 1.7102	* 2.8313 *
11	* 1.4867	* 1.8740	* 1.6527	* 1.7444	* 1.5463	* 1.7141	* 1.1559	* .6526 *
	* 1.9150	* 1.6213	* 1.6848	* 1.7173	* 1.7820	* 1.7209	* 2.2488	* 4.1368 *
12	* 1.8227	* 1.6523	* 1.8638	* 1.5464	* 1.1252	* 1.4360	* .9198 *	
	* 1.6764	* 1.7067	* 1.6341	* 1.7819	* 1.9136	* 1.7220	* 2.6330 *	
13	* 1.4330	* 1.5760	* 1.5998	* 1.7141	* 1.4361	* 1.2956	* .6999 *	
	* 1.9644	* 1.7215	* 1.7667	* 1.7209	* 1.7219	* 1.8765	* 3.2224 *	
14	* 1.6324	* 1.7945	* 1.7581	* 1.1557	* .9196	* .7129	*	
	* 1.6200	* 1.6195	* 1.7101	* 2.2476	* 2.6331	* 3.2534	*	
15	* .8326	* .9050	* .9152	* .6525	* F-SUB-Q			
	* 2.6769	* 2.6058	* 2.8312	* 4.1369	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 209 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1580	* 1.2731	* 1.4692	* 1.4962	* 1.8430	* 1.4576	* 1.8499	* .9137
	* 1.9454	* 2.2138	* 2.0389	* 2.0152	* 1.7539	* 2.0564	* 1.6918	* 2.8387
9	* 1.2731	* 1.7093	* 1.5860	* 1.9097	* 1.6648	* 1.6372	* 1.8670	* .9515
	* 2.2138	* 1.8657	* 1.8791	* 1.6891	* 1.7933	* 1.8002	* 1.6864	* 2.7621
10	* 1.4692	* 1.5856	* 1.5541	* 1.6795	* 1.8901	* 1.6047	* 1.7911	* .9263
	* 2.0389	* 1.8795	* 1.9053	* 1.7657	* 1.7056	* 1.8612	* 1.7763	* 2.9893
11	* 1.4962	* 1.9098	* 1.6796	* 1.7898	* 1.5503	* 1.7148	* 1.1470	* .6481
	* 2.0152	* 1.6890	* 1.7656	* 1.7882	* 1.8795	* 1.8265	* 2.4058	* 4.4007
12	* 1.8430	* 1.6651	* 1.8903	* 1.5504	* 1.1164	* 1.4280	* .9007	*
	* 1.7539	* 1.7930	* 1.7055	* 1.8794	* 2.0372	* 1.8203	* 2.8278	*
13	* 1.4576	* 1.6380	* 1.6049	* 1.7148	* 1.4282	* 1.2828	* .6816	*
	* 2.0564	* 1.7991	* 1.8608	* 1.8265	* 1.8202	* 1.9833	* 3.4653	*
14	* 1.8499	* 1.8678	* 1.7912	* 1.1469	* .9005	* .6950	*	*
	* 1.6918	* 1.6858	* 1.7762	* 2.4044	* 2.8278	* 3.4948	*	*
15	* .9137	* .9518	* .9260	* .6480	* F-SUB-Q			
	* 2.8387	* 2.7631	* 2.9894	* 4.4008	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1610	* 1.2772	* 1.4712	* 1.4943	* 1.8443	* 1.4630	* 1.9041	* .9459
	* 2.0750	* 2.3690	* 2.1919	* 2.1659	* 1.8795	* 2.2039	* 1.7860	* 2.9944
9	* 1.2772	* 1.7315	* 1.5943	* 1.9177	* 1.6620	* 1.6607	* 1.9082	* .9787
	* 2.3690	* 1.9921	* 2.0153	* 1.8071	* 1.9272	* 1.9154	* 1.7845	* 2.9231
10	* 1.4712	* 1.5939	* 1.5738	* 1.6828	* 1.8931	* 1.5981	* 1.8020	* .9337
	* 2.1919	* 2.0158	* 2.0424	* 1.8963	* 1.8232	* 1.9887	* 1.8932	* 3.1895
11	* 1.4943	* 1.9178	* 1.6829	* 1.8023	* 1.5420	* 1.7019	* 1.1384	* .6445
	* 2.1659	* 1.8070	* 1.8962	* 1.9160	* 2.0140	* 1.9648	* 2.5733	* 4.6823
12	* 1.8443	* 1.6623	* 1.8932	* 1.5421	* 1.1049	* 1.4103	* .8865	*
	* 1.8795	* 1.9268	* 1.8230	* 2.0139	* 2.1777	* 1.9407	* 3.0238	*
13	* 1.4630	* 1.6615	* 1.5983	* 1.7018	* 1.4105	* 1.2626	* .6683	*
	* 2.2039	* 1.9143	* 1.9884	* 1.9648	* 1.9406	* 2.1202	* 3.7173	*
14	* 1.9041	* 1.9090	* 1.8021	* 1.1382	* .8863	* .6815	*	*
	* 1.7860	* 1.7839	* 1.8931	* 2.5717	* 3.0238	* 3.7487	*	*
15	* .9459	* .9789	* .9335	* .6444	* F-SUB-Q			
	* 2.9944	* 2.9242	* 3.1896	* 4.6823	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 210 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1609	* 1.2714	* 1.4666	* 1.4864	* 1.8414	* 1.4579	* 1.9238	* .9513 *
	* 2.2531	* 2.5839	* 2.3703	* 2.3293	* 2.0112	* 2.3806	* 1.9232	* 3.2443 *
9	* 1.2714	* 1.7399	* 1.5919	* 1.9180	* 1.6535	* 1.6648	* 1.9233	* .9800 *
	* 2.5839	* 2.1551	* 2.1784	* 1.9352	* 2.0669	* 2.0728	* 1.9238	* 3.1777 *
10	* 1.4666	* 1.5914	* 1.5726	* 1.6759	* 1.8912	* 1.5881	* 1.8053	* .9286 *
	* 2.3703	* 2.1790	* 2.2159	* 2.0399	* 1.9493	* 2.1382	* 2.0207	* 3.4552 *
11	* 1.4864	* 1.9181	* 1.6759	* 1.8027	* 1.5304	* 1.6915	* 1.1249	* .6359 *
	* 2.3293	* 1.9351	* 2.0398	* 2.0552	* 2.1882	* 2.1288	* 2.7952	* 5.0696 *
12	* 1.8414	* 1.6538	* 1.8913	* 1.5304	* 1.0913	* 1.3984	* .8714	* .8714 *
	* 2.0112	* 2.0666	* 1.9492	* 2.1881	* 2.3674	* 2.0980	* 3.2978	* 3.2978 *
13	* 1.4579	* 1.6655	* 1.5883	* 1.6914	* 1.3985	* 1.2493	* .6546	* .6546 *
	* 2.3806	* 2.0717	* 2.1378	* 2.1288	* 2.0979	* 2.2892	* 4.0526	* 4.0526 *
14	* 1.9238	* 1.9240	* 1.8054	* 1.1248	* .8712	* .6669		
	* 1.9232	* 1.9231	* 2.0207	* 2.7934	* 3.2978	* 4.0907		
15	* .9513	* .9800	* .9284	* .6358	* F-SUB-Q			
	* 3.2443	* 3.1799	* 3.4553	* 5.0696	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1517	* 1.2679	* 1.4385	* 1.4614	* 1.8008	* 1.4327	* 1.8890	* .9531 *
	* 2.5154	* 2.8394	* 2.6183	* 2.5669	* 2.2262	* 2.6082	* 2.1043	* 3.4867 *
9	* 1.2679	* 1.7065	* 1.5647	* 1.8759	* 1.6200	* 1.6376	* 1.8873	* .9855 *
	* 2.8394	* 2.3896	* 2.3975	* 2.1418	* 2.2858	* 2.2564	* 2.1002	* 3.3967 *
10	* 1.4385	* 1.5643	* 1.5428	* 1.6452	* 1.8482	* 1.5567	* 1.7669	* .9363 *
	* 2.6183	* 2.3982	* 2.4346	* 2.2503	* 2.1638	* 2.3674	* 2.2246	* 3.6737 *
11	* 1.4614	* 1.8760	* 1.6453	* 1.7627	* 1.5010	* 1.6509	* 1.1215	* .6340 *
	* 2.5669	* 2.1417	* 2.2503	* 2.2792	* 2.4268	* 2.3691	* 3.0515	* 5.5040 *
12	* 1.8008	* 1.6202	* 1.8483	* 1.5010	* 1.0862	* 1.3655	* .8731	* .8731 *
	* 2.2262	* 2.2854	* 2.1637	* 2.4267	* 2.6378	* 2.3417	* 3.5804	* 3.5804 *
13	* 1.4327	* 1.6383	* 1.5568	* 1.6509	* 1.3656	* 1.2189	* .6549	* .6549 *
	* 2.6082	* 2.2552	* 2.3670	* 2.3692	* 2.3416	* 2.5535	* 4.4033	* 4.4033 *
14	* 1.8890	* 1.8879	* 1.7669	* 1.1214	* .8730	* .6665		
	* 2.1043	* 2.0995	* 2.2246	* 3.0495	* 3.5804	* 4.4487		
15	* .9531	* .9857	* .9362	* .6340	* F-SUB-Q			
	* 3.4867	* 3.3980	* 3.6734	* 5.5040	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 211 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1628	* 1.2484	* 1.4303	* 1.4470	* 1.7979	* 1.4182	* 1.8939	* .9369 *
	* 2.7322	* 3.1335	* 2.9012	* 2.8537	* 2.4528	* 2.8703	* 2.2836	* 3.8452 *
9	* 1.2484	* 1.7145	* 1.5560	* 1.8774	* 1.6091	* 1.6297	* 1.8919	* .9650 *
	* 3.1335	* 2.5973	* 2.6547	* 2.3566	* 2.5334	* 2.4758	* 2.2833	* 3.7641 *
10	* 1.4303	* 1.5555	* 1.5336	* 1.6332	* 1.8504	* 1.5452	* 1.7701	* .9104 *
	* 2.9012	* 2.6554	* 2.6961	* 2.4976	* 2.3831	* 2.6234	* 2.4330	* 4.1226 *
11	* 1.4470	* 1.8775	* 1.6332	* 1.7654	* 1.4921	* 1.6519	* 1.0979	* .6192 *
	* 2.8537	* 2.3565	* 2.4975	* 2.5130	* 2.6657	* 2.5864	* 3.4410	* 6.1868 *
12	* 1.7979	* 1.6093	* 1.8505	* 1.4921	* 1.0764	* 1.3741	* .8500 *	
	* 2.4528	* 2.5330	* 2.3830	* 2.6656	* 2.9094	* 2.5672	* 4.0248 *	
13	* 1.4182	* 1.6303	* 1.5453	* 1.6518	* 1.3742	* 1.2272	* .6396 *	
	* 2.8703	* 2.4746	* 2.6230	* 2.5866	* 2.5671	* 2.8084	* 4.9659 *	
14	* 1.8939	* 1.8926	* 1.7702	* 1.0978	* .8498	* .6517	*	
	* 2.2836	* 2.2826	* 2.4330	* 3.4387	* 4.0248	* 5.0113	*	
15	* .9369	* .9653	* .9102	* .6192	* F-SUB-Q			
	* 3.8452	* 3.7655	* 4.1225	* 6.1868	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1661	* 1.2364	* 1.4112	* 1.4265	* 1.7745	* 1.3962	* 1.8717	* .9262 *
	* 2.7918	* 3.1834	* 3.0217	* 3.1074	* 2.6837	* 3.1662	* 2.5380	* 4.2632 *
9	* 1.2364	* 1.6995	* 1.5366	* 1.8554	* 1.5862	* 1.6080	* 1.8699	* .9532 *
	* 3.1834	* 2.6337	* 2.8597	* 2.5968	* 2.7931	* 2.7514	* 2.5401	* 4.1797 *
10	* 1.4112	* 1.5361	* 1.5129	* 1.6110	* 1.8293	* 1.5235	* 1.7496	* .8997 *
	* 3.0217	* 2.8606	* 2.8981	* 2.7269	* 2.5831	* 2.9024	* 2.7103	* 4.5832 *
11	* 1.4265	* 1.8555	* 1.6111	* 1.7464	* 1.4746	* 1.6345	* 1.0855	* .6118 *
	* 3.1074	* 2.5968	* 2.7269	* 2.5853	* 2.7384	* 2.6709	* 3.6983	* 6.8872 *
12	* 1.7745	* 1.5864	* 1.8294	* 1.4746	* 1.0727	* 1.3687	* .8422 *	
	* 2.6837	* 2.7926	* 2.5832	* 2.7383	* 3.0302	* 2.6870	* 4.1769 *	
13	* 1.3962	* 1.6086	* 1.5236	* 1.6344	* 1.3688	* 1.2224	* .6353 *	
	* 3.1662	* 2.7502	* 2.9021	* 2.6711	* 2.6869	* 2.9560	* 5.1959 *	
14	* 1.8717	* 1.8705	* 1.7496	* 1.0855	* .8421	* .6475	*	
	* 2.5380	* 2.5394	* 2.7104	* 3.6959	* 4.1769	* 5.2423	*	
15	* .9262	* .9535	* .8995	* .6118	* F-SUB-Q			
	* 4.2632	* 4.1813	* 4.5832	* 6.8871	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 212 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1549	* 1.2284	* 1.3821	* 1.4001	* 1.7333	* 1.3681	* 1.8280	* .9177 *
	* 2.8271	* 3.1839	* 3.0445	* 2.9937	* 2.5951	* 3.0508	* 2.4617	* 4.0651 *
9	* 1.2284	* 1.6656	* 1.5076	* 1.8141	* 1.5525	* 1.5744	* 1.8267	* .9471 *
	* 3.1839	* 2.6663	* 2.7920	* 2.5111	* 2.6977	* 2.6551	* 2.4699	* 3.9777 *
10	* 1.3821	* 1.5070	* 1.4822	* 1.5798	* 1.7887	* 1.4927	* 1.7101	* .9000 *
	* 3.0445	* 2.7928	* 2.8580	* 2.6613	* 2.5620	* 2.8326	* 2.6582	* 4.3668 *
11	* 1.4001	* 1.8141	* 1.5798	* 1.7089	* 1.4481	* 1.6008	* 1.0801	* .6074 *
	* 2.9937	* 2.5111	* 2.6613	* 2.6236	* 2.7794	* 2.7171	* 3.6982	* 6.6836 *
12	* 1.7333	* 1.5527	* 1.7888	* 1.4482	* 1.0678	* 1.3468	* .8450 *	
	* 2.5951	* 2.6973	* 2.5619	* 2.7793	* 3.0791	* 2.7372	* 4.1608 *	
13	* 1.3681	* 1.5749	* 1.4928	* 1.6007	* 1.3469	* 1.2042	* .6383 *	
	* 3.0508	* 2.6540	* 2.8321	* 2.7173	* 2.7371	* 3.0127	* 5.1883 *	
14	* 1.8280	* 1.8272	* 1.7100	* 1.0800	* .8448	* .6494 *		
	* 2.4617	* 2.4693	* 2.6583	* 3.6957	* 4.1608	* 5.2435 *		
15	* .9177	* .9474	* .8998	* .6073	* F-SUB-Q			
	* 4.0651	* 3.9792	* 4.3664	* 6.6836	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1534	* 1.2101	* 1.3749	* 1.3866	* 1.7294	* 1.3523	* 1.8271	* .8990 *
	* 2.8014	* 3.2001	* 2.9282	* 2.8858	* 2.4837	* 2.9466	* 2.3491	* 3.9575 *
9	* 1.2101	* 1.6737	* 1.5001	* 1.8164	* 1.5430	* 1.5639	* 1.8267	* .9245 *
	* 3.2001	* 2.6324	* 2.6822	* 2.3969	* 2.5941	* 2.5509	* 2.3565	* 3.8875 *
10	* 1.3749	* 1.4995	* 1.4750	* 1.5699	* 1.7925	* 1.4830	* 1.7126	* .8737 *
	* 2.9282	* 2.6830	* 2.7461	* 2.5603	* 2.4444	* 2.7243	* 2.5361	* 4.2967 *
11	* 1.3866	* 1.8164	* 1.5699	* 1.7137	* 1.4422	* 1.6056	* 1.0599	* .5939 *
	* 2.8858	* 2.3969	* 2.5603	* 2.5800	* 2.7692	* 2.6965	* 3.6138	* 6.5424 *
12	* 1.7294	* 1.5432	* 1.7925	* 1.4423	* 1.0527	* 1.3563	* .8273 *	
	* 2.4837	* 2.5937	* 2.4444	* 2.7692	* 3.0742	* 2.7126	* 4.2220 *	
13	* 1.3523	* 1.5644	* 1.4830	* 1.6054	* 1.3563	* 1.2181	* .6285 *	
	* 2.9466	* 2.5500	* 2.7240	* 2.6968	* 2.7125	* 2.9811	* 5.2413 *	
14	* 1.8271	* 1.8272	* 1.7125	* 1.0599	* .8271	* .6399 *		
	* 2.3491	* 2.3559	* 2.5362	* 3.6113	* 4.2221	* 5.2935 *		
15	* .8990	* .9247	* .8735	* .5938	* F-SUB-Q			
	* 3.9575	* 3.8889	* 4.2967	* 6.5423	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 213 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1564	* 1.2047	* 1.3666	* 1.3748	* 1.7180	* 1.3372	* 1.8145	* .8884
	* 2.5327	* 2.9005	* 2.7578	* 2.7818	* 2.3912	* 2.8462	* 2.2621	* 3.8174
9	* 1.2047	* 1.6755	* 1.4923	* 1.8102	* 1.5317	* 1.5500	* 1.8153	* .9103
	* 2.9005	* 2.3934	* 2.5792	* 2.3047	* 2.5012	* 2.4610	* 2.2689	* 3.7638
10	* 1.3666	* 1.4917	* 1.4667	* 1.5605	* 1.7883	* 1.4730	* 1.7055	* .8629
	* 2.7578	* 2.5800	* 2.6418	* 2.4675	* 2.3498	* 2.6273	* 2.4388	* 4.1472
11	* 1.3748	* 1.8102	* 1.5605	* 1.7124	* 1.4388	* 1.6068	* 1.0532	* .5875
	* 2.7818	* 2.3046	* 2.4675	* 2.3803	* 2.5286	* 2.4532	* 3.3937	* 6.2933
12	* 1.7180	* 1.5319	* 1.7883	* 1.4388	* 1.0499	* 1.3661	* .8266	*
	* 2.3912	* 2.5008	* 2.3498	* 2.5285	* 2.7911	* 2.4569	* 3.8136	*
13	* 1.3372	* 1.5504	* 1.4730	* 1.6066	* 1.3662	* 1.2333	* .6315	*
	* 2.8462	* 2.4602	* 2.6271	* 2.4535	* 2.4568	* 2.6859	* 4.7116	*
14	* 1.8145	* 1.8158	* 1.7054	* 1.0532	* .8264	* .6428	*	*
	* 2.2621	* 2.2684	* 2.4389	* 3.3914	* 3.8137	* 4.7601	*	*
15	* .8884	* .9102	* .8627	* .5874	* F-SUB-Q			
	* 3.8174	* 3.7664	* 4.1472	* 6.2932	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1795	* 1.2159	* 1.3646	* 1.3678	* 1.7079	* 1.3249	* 1.8000	* .8822
	* 2.2687	* 2.5914	* 2.4687	* 2.5053	* 2.1619	* 2.5762	* 2.0548	* 3.4374
9	* 1.2159	* 1.6847	* 1.4907	* 1.8059	* 1.5246	* 1.5383	* 1.8023	* .9072
	* 2.5914	* 2.1403	* 2.3121	* 2.0765	* 2.2549	* 2.2290	* 2.0583	* 3.3761
10	* 1.3646	* 1.4901	* 1.4647	* 1.5570	* 1.7871	* 1.4689	* 1.6984	* .8612
	* 2.4687	* 2.3129	* 2.3685	* 2.2193	* 2.1134	* 2.3637	* 2.1973	* 3.7052
11	* 1.3678	* 1.8059	* 1.5569	* 1.7176	* 1.4464	* 1.6177	* 1.0594	* .5883
	* 2.5053	* 2.0765	* 2.2193	* 2.1331	* 2.2714	* 2.2028	* 3.0311	* 5.5732
12	* 1.7079	* 1.5248	* 1.7871	* 1.4464	* 1.0680	* 1.3945	* .8420	*
	* 2.1619	* 2.2546	* 2.1134	* 2.2714	* 2.5157	* 2.2120	* 3.4205	*
13	* 1.3249	* 1.5386	* 1.4688	* 1.6176	* 1.3945	* 1.2671	* .6497	*
	* 2.5762	* 2.2285	* 2.3635	* 2.2030	* 2.2120	* 2.4169	* 4.2281	*
14	* 1.8000	* 1.8027	* 1.6982	* 1.0593	* .8418	* .6617	*	*
	* 2.0548	* 2.0579	* 2.1975	* 3.0290	* 3.4206	* 4.2695	*	*
15	* .8822	* .9074	* .8610	* .5882	* F-SUB-Q			
	* 3.4374	* 3.3774	* 3.7053	* 5.5733	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 214 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2576	* 1.2488	* 1.3711	* 1.3659	* 1.6965	* 1.3214	* 1.7809	* .8851
	* 2.1957	* 2.4801	* 2.3907	* 2.4066	* 2.0849	* 2.4754	* 1.9878	* 3.2841
9	* 1.2488	* 1.6998	* 1.4946	* 1.8005	* 1.5215	* 1.5285	* 1.7849	* .9127
	* 2.4801	* 2.0754	* 2.2182	* 1.9993	* 2.1691	* 2.1490	* 1.9899	* 3.2169
10	* 1.3711	* 1.4940	* 1.4679	* 1.5595	* 1.7867	* 1.4708	* 1.6889	* .8749
	* 2.3907	* 2.2190	* 2.2753	* 2.1296	* 2.0328	* 2.2713	* 2.1199	* 3.5010
11	* 1.3659	* 1.8004	* 1.5595	* 1.7281	* 1.4704	* 1.6406	* 1.0817	* .5970
	* 2.4066	* 1.9993	* 2.1297	* 2.0709	* 2.2044	* 2.1410	* 2.8936	* 5.2924
12	* 1.6965	* 1.5216	* 1.7867	* 1.4704	* 1.1345	* 1.4627	* .8815	*
	* 2.0849	* 2.1688	* 2.0329	* 2.2044	* 2.4413	* 2.1525	* 3.2591	*
13	* 1.3214	* 1.5288	* 1.4708	* 1.6404	* 1.4627	* 1.3331	* .6884	*
	* 2.4754	* 2.1485	* 2.2713	* 2.1412	* 2.1525	* 2.3592	* 4.0433	*
14	* 1.7809	* 1.7853	* 1.6888	* 1.0817	* .8813	* .7000	*	*
	* 1.9878	* 1.9895	* 2.1202	* 2.8916	* 3.2591	* 4.0890	*	*
15	* .8851	* .9129	* .8748	* .5969	* F-SUB-Q			
	* 3.2841	* 3.2183	* 3.5007	* 5.2925	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4420	* 1.2867	* 1.4143	* 1.3790	* 1.7244	* 1.3226	* 1.8077	* .8776
	* 1.9442	* 2.2438	* 2.1165	* 2.1485	* 1.8465	* 2.2244	* 1.7613	* 2.9827
9	* 1.2867	* 1.7673	* 1.5224	* 1.8421	* 1.5434	* 1.5431	* 1.8139	* .9007
	* 2.2438	* 1.8299	* 1.9683	* 1.7625	* 1.9288	* 1.9160	* 1.7616	* 2.9358
10	* 1.4143	* 1.5217	* 1.4966	* 1.5859	* 1.8354	* 1.4962	* 1.7251	* .8610
	* 2.1165	* 1.9690	* 2.0190	* 1.8914	* 1.7884	* 2.0176	* 1.8705	* 3.2081
11	* 1.3790	* 1.8420	* 1.5858	* 1.7949	* 1.5309	* 1.7165	* 1.0905	* .5951
	* 2.1485	* 1.7626	* 1.8914	* 1.8254	* 1.9556	* 1.8885	* 2.6040	* 4.8048
12	* 1.7244	* 1.5436	* 1.8354	* 1.5309	* 1.2507	* 1.6211	* .9055	*
	* 1.8465	* 1.9286	* 1.7884	* 1.9556	* 2.1794	* 1.9089	* 2.9769	*
13	* 1.3226	* 1.5434	* 1.4961	* 1.7163	* 1.6211	* 1.4672	* .7176	*
	* 2.2244	* 1.9156	* 2.0176	* 1.8887	* 1.9089	* 2.0884	* 3.6998	*
14	* 1.8077	* 1.8143	* 1.7250	* 1.0904	* .9053	* .7297	*	*
	* 1.7613	* 1.7613	* 1.8707	* 2.6022	* 2.9770	* 3.7418	*	*
15	* .8776	* .9005	* .8608	* .5950	* F-SUB-Q			
	* 2.9827	* 2.9384	* 3.2081	* 4.8047	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 215 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6848	* 1.3659	* 1.4492	* 1.3894	* 1.7371	* 1.3276	* 1.8156	* .8789 *
	* 1.7304	* 2.0044	* 1.9170	* 1.9508	* 1.6751	* 2.0265	* 1.6018	* 2.7252 *
9	* 1.3659	* 1.8248	* 1.5436	* 1.8641	* 1.5584	* 1.5510	* 1.8238	* .9027 *
	* 2.0044	* 1.6482	* 1.7776	* 1.5929	* 1.7479	* 1.7423	* 1.6005	* 2.6804 *
10	* 1.4492	* 1.5429	* 1.5179	* 1.6061	* 1.8636	* 1.5159	* 1.7424	* .8656 *
	* 1.9170	* 1.7782	* 1.8248	* 1.7095	* 1.6123	* 1.8237	* 1.6933	* 2.9216 *
11	* 1.3894	* 1.8640	* 1.6060	* 1.8455	* 1.5794	* 1.7745	* 1.1116	* .6018 *
	* 1.9508	* 1.5929	* 1.7096	* 1.6493	* 1.7675	* 1.7018	* 2.3493	* 4.3583 *
12	* 1.7371	* 1.5586	* 1.8635	* 1.5794	* 1.4085	* 1.7392	* .9426 *	
	* 1.6751	* 1.7477	* 1.6124	* 1.7675	* 1.9479	* 1.7062	* 2.6764 *	
13	* 1.3276	* 1.5513	* 1.5158	* 1.7743	* 1.7392	* 1.5744	* .7557 *	
	* 2.0265	* 1.7419	* 1.8237	* 1.7021	* 1.7062	* 1.8711	* 3.3213 *	
14	* 1.8156	* 1.8241	* 1.7422	* 1.1115	* .9424	* .7683	*	
	* 1.6018	* 1.6003	* 1.6934	* 2.3477	* 2.6765	* 3.3594	*	
15	* .8789	* .9025	* .8654	* .6017	* F-SUB-Q			
	* 2.7252	* 2.6829	* 2.9217	* 4.3582	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7326	* 1.4234	* 1.4647	* 1.3909	* 1.7236	* 1.3361	* 1.7931	* .8858 *
	* 1.6136	* 1.8378	* 1.7580	* 1.8088	* 1.5656	* 1.8749	* 1.5039	* 2.5131 *
9	* 1.4234	* 1.8398	* 1.5488	* 1.8521	* 1.5577	* 1.5446	* 1.8031	* .9159 *
	* 1.8378	* 1.5326	* 1.6419	* 1.4855	* 1.6220	* 1.6233	* 1.5009	* 2.4555 *
10	* 1.4647	* 1.5481	* 1.5219	* 1.6111	* 1.8583	* 1.5208	* 1.7286	* .8860 *
	* 1.7579	* 1.6425	* 1.6886	* 1.5794	* 1.4998	* 1.6843	* 1.5822	* 2.6525 *
11	* 1.3909	* 1.8520	* 1.6111	* 1.8561	* 1.5973	* 1.7880	* 1.1388	* .6151 *
	* 1.8088	* 1.4855	* 1.5794	* 1.5243	* 1.6330	* 1.5807	* 2.1223	* 3.9628 *
12	* 1.7236	* 1.5578	* 1.8582	* 1.5973	* 1.4507	* 1.7778	* .9865 *	
	* 1.5656	* 1.6218	* 1.4998	* 1.6330	* 1.8097	* 1.5921	* 2.4266 *	
13	* 1.3361	* 1.5449	* 1.5208	* 1.7878	* 1.7778	* 1.6167	* .7948 *	
	* 1.8749	* 1.6229	* 1.6843	* 1.5809	* 1.5920	* 1.7420	* 3.0104 *	
14	* 1.7931	* 1.8034	* 1.7284	* 1.1388	* .9862	* .8079	*	
	* 1.5039	* 1.5006	* 1.5824	* 2.1209	* 2.4266	* 3.0454	*	
15	* .8858	* .9161	* .8858	* .6150	* F-SUB-Q			
	* 2.5132	* 2.4565	* 2.6523	* 3.9630	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 216 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7565	* 1.4184	* 1.4748	* 1.3857	* 1.7241	* 1.3219	* 1.7908	* .8678
	* 1.4946	* 1.7245	* 1.6341	* 1.7053	* 1.4700	* 1.7777	* 1.4152	* 2.4167
9	* 1.4184	* 1.8509	* 1.5530	* 1.8548	* 1.5590	* 1.5425	* 1.8022	* .8951
	* 1.7245	* 1.4196	* 1.5342	* 1.3909	* 1.5209	* 1.5281	* 1.4109	* 2.3670
10	* 1.4748	* 1.5523	* 1.5280	* 1.6132	* 1.8648	* 1.5243	* 1.7327	* .8623
	* 1.6341	* 1.5348	* 1.5762	* 1.4782	* 1.4011	* 1.5745	* 1.4821	* 2.5661
11	* 1.3857	* 1.8547	* 1.6132	* 1.8639	* 1.6076	* 1.8041	* 1.1233	* .6052
	* 1.7053	* 1.3909	* 1.4782	* 1.4184	* 1.5149	* 1.4622	* 2.0191	* 3.7877
12	* 1.7241	* 1.5591	* 1.8647	* 1.6076	* 1.4694	* 1.8048	* .9747	*
	* 1.4700	* 1.5207	* 1.4011	* 1.5149	* 1.6815	* 1.4782	* 2.2992	*
13	* 1.3219	* 1.5428	* 1.5243	* 1.8039	* 1.8049	* 1.6432	* .7896	*
	* 1.7777	* 1.5277	* 1.5744	* 1.4623	* 1.4782	* 1.6284	* 2.8766	*
14	* 1.7908	* 1.8025	* 1.7325	* 1.1232	* .9745	* .8031	*	*
	* 1.4152	* 1.4106	* 1.4822	* 2.0178	* 2.2993	* 2.9084	*	*
15	* .8678	* .8954	* .8621	* .6051	* F-SUB-Q			
	* 2.4167	* 2.3678	* 2.5662	* 3.7878	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6698	* 1.3546	* 1.4209	* 1.3237	* 1.6325	* 1.2669	* 1.6879	* .8235
	* 1.4818	* 1.7054	* 1.6046	* 1.6984	* 1.4767	* 1.7680	* 1.4301	* 2.4331
9	* 1.3546	* 1.7501	* 1.4903	* 1.7488	* 1.4905	* 1.4734	* 1.6998	* .8483
	* 1.7054	* 1.4231	* 1.5178	* 1.3993	* 1.5119	* 1.5239	* 1.4240	* 2.3861
10	* 1.4209	* 1.4897	* 1.4652	* 1.5429	* 1.7551	* 1.4613	* 1.6380	* .8199
	* 1.6046	* 1.5183	* 1.5597	* 1.4669	* 1.4108	* 1.5586	* 1.4914	* 2.5769
11	* 1.3237	* 1.7488	* 1.5428	* 1.7582	* 1.5368	* 1.7099	* 1.0706	* .5783
	* 1.6984	* 1.3993	* 1.4670	* 1.4248	* 1.5044	* 1.4641	* 2.0076	* 3.7812
12	* 1.6325	* 1.4907	* 1.7551	* 1.5368	* 1.4103	* 1.7116	* .9341	*
	* 1.4767	* 1.5117	* 1.4108	* 1.5043	* 1.6566	* 1.4740	* 2.2808	*
13	* 1.2669	* 1.4738	* 1.4613	* 1.7097	* 1.7116	* 1.5601	* .7556	*
	* 1.7680	* 1.5234	* 1.5586	* 1.4642	* 1.4740	* 1.6215	* 2.8543	*
14	* 1.6879	* 1.7002	* 1.6379	* 1.0705	* .9339	* .7708	*	*
	* 1.4301	* 1.4237	* 1.4915	* 2.0063	* 2.2808	* 2.8775	*	*
15	* .8235	* .8485	* .8197	* .5782	* F-SUB-Q			
	* 2.4331	* 2.3872	* 2.5769	* 3.7812	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 217 of 312

TABLE A-1 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - NORMAL OPERATION

AT 50% POWER, 460 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3968	* 1.1633	* 1.2271	* 1.1337	* 1.3629	* 1.0908	* 1.4040	* .6971
	* 1.6950	* 1.8983	* 1.7760	* 1.9040	* 1.6986	* 1.9761	* 1.6530	* 2.7742
9	* 1.1633	* 1.4812	* 1.2823	* 1.4691	* 1.2495	* 1.2577	* 1.4135	* .7157
	* 1.8983	* 1.5988	* 1.6908	* 1.5968	* 1.7302	* 1.7173	* 1.6464	* 2.7317
10	* 1.2271	* 1.2818	* 1.2351	* 1.3209	* 1.4772	* 1.2538	* 1.3659	* .6899
	* 1.7760	* 1.6914	* 1.7731	* 1.6420	* 1.6036	* 1.7418	* 1.7185	* 2.9550
11	* 1.1337	* 1.4690	* 1.3209	* 1.4743	* 1.2860	* 1.4224	* .9022	* .4988
	* 1.9040	* 1.5968	* 1.6420	* 1.6182	* 1.7136	* 1.6817	* 2.2873	* 4.2306
12	* 1.3629	* 1.2497	* 1.4772	* 1.2860	* 1.1810	* 1.4231	* .7921	*
	* 1.6986	* 1.7299	* 1.6036	* 1.7136	* 1.8999	* 1.7018	* 2.5913	*
13	* 1.0908	* 1.2583	* 1.2538	* 1.4223	* 1.4232	* 1.3034	* .6421	*
	* 1.9761	* 1.7163	* 1.7417	* 1.6819	* 1.7017	* 1.8640	* 3.2368	*
14	* 1.4040	* 1.4139	* 1.3658	* .9021	* .7920	* .6547	*	*
	* 1.6530	* 1.6460	* 1.7186	* 2.2858	* 2.5911	* 3.2645	*	*
15	* .6971	* .7158	* .6897	* .4987	* F-SUB-Q			
	* 2.7742	* 2.7329	* 2.9551	* 4.2306	* M-SUB-Q			

AT 50% POWER, 460 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6689	* .5792	* .5695	* .5628	* .6521	* .5432	* .6056	* .3336
	* 3.3873	* 3.6521	* 3.6727	* 3.6970	* 3.4225	* 3.8301	* 3.6891	* 5.6037
9	* .5792	* .6664	* .5897	* .6768	* .5748	* .5698	* .6086	* .3377
	* 3.6521	* 3.3972	* 3.5308	* 3.3280	* 3.6145	* 3.6483	* 3.6794	* 5.5969
10	* .5695	* .5896	* .5620	* .6069	* .6817	* .5754	* .5852	* .3230
	* 3.6727	* 3.5317	* 3.7432	* 3.4311	* 3.3295	* 3.6468	* 3.8593	* 6.1015
11	* .5628	* .6768	* .6069	* .6808	* .5798	* .6399	* .4353	* .2422
	* 3.6970	* 3.3280	* 3.4311	* 3.3548	* 3.6422	* 3.5850	* 4.5663	* 8.4330
12	* .6521	* .5749	* .6816	* .5798	* .5421	* .6123	* .3744	*
	* 3.4225	* 3.6139	* 3.3295	* 3.6421	* 3.9682	* 3.8053	* 5.2826	*
13	* .5432	* .5701	* .5755	* .6399	* .6123	* .5511	* .3004	*
	* 3.8301	* 3.6457	* 3.6464	* 3.5852	* 3.8048	* 4.2526	* 6.6959	*
14	* .6056	* .6088	* .5852	* .4352	* .3744	* .3049	*	*
	* 3.6891	* 3.6781	* 3.8593	* 4.5635	* 5.2813	* 6.7835	*	*
15	* .3336	* .3377	* .3229	* .2422	* F-SUB-Q			
	* 5.6037	* 5.5996	* 6.1009	* 8.4325	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 218 of 312

TABLE A-2

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.8542	* 3.5208	* 3.6999	* 3.7329	* 3.0314	* 3.8072	* 3.4847	* 6.4198
	* 3.3676	* 4.0200	* 4.2094	* 4.2292	* 3.5449	* 4.3249	* 4.0849	* 7.1337
	* 3.7596	* 4.3458	* 4.5302	* 4.5553	* 3.9717	* 4.6540	* 4.4847	* 7.5756
	* 3.7331	* 4.1778	* 4.3520	* 4.3941	* 3.9910	* 4.4956	* 4.4493	* 7.2260
	* 3.3185	* 3.5916	* 3.7546	* 3.8416	* 3.6494	* 3.9436	* 4.0628	* 6.1058
	* 2.8306	* 3.0460	* 3.1928	* 3.2897	* 3.2003	* 3.3896	* 3.5471	* 5.0245
9	* 3.5208	* 2.9431	* 3.5895	* 2.9898	* 3.7804	* 3.8947	* 3.4829	* 6.2721
	* 4.0200	* 3.4936	* 4.0895	* 3.5203	* 4.2682	* 4.3745	* 4.0839	* 6.9974
	* 4.3458	* 3.9005	* 4.4042	* 3.9272	* 4.5578	* 4.6649	* 4.4790	* 7.4646
	* 4.1778	* 3.9049	* 4.2356	* 3.9364	* 4.3715	* 4.4818	* 4.4357	* 7.1568
	* 3.5916	* 3.5440	* 3.6803	* 3.5939	* 3.7987	* 3.9013	* 4.0518	* 6.1089
	* 3.0460	* 3.0813	* 3.1541	* 3.1578	* 3.2633	* 3.3475	* 3.5592	* 5.0540
10	* 3.6999	* 3.5910	* 3.8297	* 3.6439	* 3.0636	* 3.9107	* 3.7291	* 6.7182
	* 4.2094	* 4.0903	* 4.3450	* 4.1089	* 3.5870	* 4.3744	* 4.3357	* 7.4737
	* 4.5302	* 4.4050	* 4.6696	* 4.3810	* 3.9450	* 4.6427	* 4.6810	* 7.9425
	* 4.3520	* 4.2364	* 4.4800	* 4.1957	* 3.9358	* 4.4387	* 4.5700	* 7.5908
	* 3.7546	* 3.6810	* 3.8663	* 3.6339	* 3.5713	* 3.8294	* 4.1221	* 6.4640
	* 3.1928	* 3.1546	* 3.2994	* 3.1256	* 3.1401	* 3.2856	* 3.6224	* 5.3378
11	* 3.7329	* 2.9896	* 3.6434	* 3.0754	* 3.9090	* 3.3215	* 4.7897	* 9.1974
	* 4.2292	* 3.5199	* 4.1082	* 3.6019	* 4.3872	* 3.8727	* 5.3642	* 10.1274
	* 4.5553	* 3.9266	* 4.3803	* 3.9551	* 4.6258	* 4.2086	* 5.7316	* 10.5766
	* 4.3941	* 3.9359	* 4.1951	* 3.9235	* 4.3937	* 4.1398	* 5.5054	* 9.8926
	* 3.8416	* 3.5936	* 3.6336	* 3.5550	* 3.7587	* 3.7303	* 4.7611	* 8.0277
	* 3.2897	* 3.1576	* 3.1255	* 3.1218	* 3.2138	* 3.2695	* 4.0364	* 6.3828
12	* 3.0314	* 3.7795	* 3.0627	* 3.9083	* 4.1621	* 3.5035	* 5.6808	
	* 3.5449	* 4.2666	* 3.5859	* 4.3865	* 4.6127	* 4.0694	* 6.3012	
	* 3.9717	* 4.5561	* 3.9440	* 4.6252	* 4.8185	* 4.3922	* 6.6503	
	* 3.9910	* 4.3701	* 3.9353	* 4.3932	* 4.5408	* 4.2844	* 6.3235	
	* 3.6494	* 3.7979	* 3.5711	* 3.7585	* 3.8118	* 3.8156	* 5.3115	
	* 3.2003	* 3.2628	* 3.1399	* 3.2136	* 3.2072	* 3.3241	* 4.4167	
13	* 3.8072	* 3.8870	* 3.9080	* 3.3208	* 3.5035	* 3.9507	* 7.3570	
	* 4.3249	* 4.3664	* 4.3717	* 3.8720	* 4.0695	* 4.5411	* 8.1164	
	* 4.6540	* 4.6567	* 4.6402	* 4.2080	* 4.3925	* 4.8189	* 8.4681	
	* 4.4956	* 4.4747	* 4.4366	* 4.1395	* 4.2849	* 4.6372	* 7.9611	
	* 3.9436	* 3.8974	* 3.8281	* 3.7302	* 3.8161	* 4.0711	* 6.5625	
	* 3.3896	* 3.3446	* 3.2849	* 3.2696	* 3.3245	* 3.5669	* 5.3688	
14	* 3.4847	* 3.4785	* 3.7267	* 4.7887	* 5.6828	* 7.2021		
	* 4.0849	* 4.0795	* 4.3332	* 5.3633	* 6.3034	* 7.9455		
	* 4.4847	* 4.4743	* 4.6788	* 5.7311	* 6.6528	* 8.3139		
	* 4.4493	* 4.4316	* 4.5682	* 5.5054	* 6.3258	* 7.8432		
	* 4.0628	* 4.0488	* 4.1212	* 4.7618	* 5.3140	* 6.5088		
	* 3.5471	* 3.5569	* 3.6220	* 4.0364	* 4.4191	* 5.3356		
15	* 6.4198	* 6.2694	* 6.7162	* 9.1949	* 4 EFPD	118 % POWER		
	* 7.1337	* 6.9948	* 7.4718	* 10.1250	* 50 EFPD	118 % POWER		
	* 7.5756	* 7.4624	* 7.9414	* 10.5749	* 125 EFPD	118 % POWER		
	* 7.2260	* 7.1554	* 7.5906	* 9.8920	* 200 EFPD	118 % POWER		
	* 6.1058	* 6.1093	* 6.4652	* 8.0286	* 350 EFPD	118 % POWER		
	* 5.0245	* 5.0547	* 5.3386	* 6.3840	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 219 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3795	* 1.7591	* 1.7049	* 1.8617	* 1.4526	* 1.8603	* 1.4751	* 3.0661
	* 1.6047	* 1.9816	* 1.9133	* 2.0702	* 1.6744	* 2.0785	* 1.7133	* 3.3360
	* 1.8126	* 2.1421	* 2.0664	* 2.2220	* 1.8841	* 2.2374	* 1.9021	* 3.5225
	* 1.8558	* 2.1040	* 2.0321	* 2.1816	* 1.9351	* 2.2097	* 1.9352	* 3.4151
	* 1.8225	* 1.9638	* 1.9084	* 2.0574	* 1.9274	* 2.1065	* 1.9369	* 3.1147
	* 1.7420	* 1.8398	* 1.7931	* 1.9448	* 1.8627	* 1.9864	* 1.8589	* 2.8092
9	* 1.7591	* 1.4195	* 1.6632	* 1.4532	* 1.7570	* 1.7541	* 1.4700	* 2.9035
	* 1.9816	* 1.6515	* 1.8607	* 1.6777	* 1.9451	* 1.9408	* 1.7077	* 3.1766
	* 2.1421	* 1.8445	* 2.0076	* 1.8678	* 2.0807	* 2.0782	* 1.8947	* 3.3735
	* 2.1040	* 1.8750	* 1.9733	* 1.9007	* 2.0326	* 2.0435	* 1.9261	* 3.2888
	* 1.9638	* 1.8374	* 1.8619	* 1.8678	* 1.9064	* 1.9383	* 1.9282	* 3.0329
	* 1.8398	* 1.7352	* 1.7587	* 1.7908	* 1.7984	* 1.8299	* 1.8615	* 2.7505
10	* 1.7049	* 1.6636	* 1.7241	* 1.7054	* 1.5385	* 1.7918	* 1.5536	* 3.0403
	* 1.9133	* 1.8610	* 1.9293	* 1.8917	* 1.7597	* 1.9759	* 1.7923	* 3.3295
	* 2.0664	* 2.0079	* 2.0822	* 2.0114	* 1.9225	* 2.0982	* 1.9611	* 3.5338
	* 2.0321	* 1.9737	* 2.0443	* 1.9614	* 1.9351	* 2.0462	* 1.9700	* 3.4432
	* 1.9084	* 1.8622	* 1.9191	* 1.8336	* 1.8832	* 1.9138	* 1.9532	* 3.1773
	* 1.7931	* 1.7590	* 1.8083	* 1.7240	* 1.7849	* 1.7948	* 1.8894	* 2.9014
11	* 1.8617	* 1.4532	* 1.7053	* 1.5353	* 1.7996	* 1.4745	* 2.2515	* 4.3952
	* 2.0702	* 1.6776	* 1.8913	* 1.7563	* 1.9717	* 1.7025	* 2.4865	* 4.7615
	* 2.2220	* 1.8677	* 2.0111	* 1.9154	* 2.0761	* 1.8691	* 2.6587	* 4.9670
	* 2.1816	* 1.9007	* 1.9612	* 1.9232	* 2.0098	* 1.8823	* 2.6070	* 4.7366
	* 2.0574	* 1.8677	* 1.8335	* 1.8635	* 1.8562	* 1.8536	* 2.4467	* 4.1615
	* 1.9448	* 1.7908	* 1.7240	* 1.7753	* 1.7360	* 1.7827	* 2.2817	* 3.6774
12	* 1.4526	* 1.7563	* 1.5381	* 1.7993	* 1.8762	* 1.4793	* 2.6252	*
	* 1.6744	* 1.9443	* 1.7591	* 1.9714	* 2.0542	* 1.7016	* 2.8621	*
	* 1.8841	* 2.0800	* 1.9220	* 2.0758	* 2.1602	* 1.8566	* 3.0117	*
	* 1.9351	* 2.0320	* 1.9348	* 2.0095	* 2.0903	* 1.8624	* 2.9161	*
	* 1.9274	* 1.9060	* 1.8830	* 1.8560	* 1.9263	* 1.8228	* 2.6520	*
	* 1.8627	* 1.7982	* 1.7848	* 1.7360	* 1.7946	* 1.7470	* 2.4276	*
13	* 1.8603	* 1.7512	* 1.7907	* 1.4742	* 1.4792	* 1.6497	* 3.2063	*
	* 2.0785	* 1.9378	* 1.9747	* 1.7022	* 1.7016	* 1.8788	* 3.4950	*
	* 2.2374	* 2.0752	* 2.0971	* 1.8689	* 1.8567	* 2.0160	* 3.6593	*
	* 2.2097	* 2.0408	* 2.0452	* 1.8822	* 1.8625	* 1.9939	* 3.5201	*
	* 2.1065	* 1.9365	* 1.9135	* 1.8536	* 1.8229	* 1.9220	* 3.1632	*
	* 1.9865	* 1.8285	* 1.7947	* 1.7827	* 1.7471	* 1.8495	* 2.8581	*
14	* 1.4751	* 1.4685	* 1.5528	* 2.2513	* 2.6260	* 3.1923	*	*
	* 1.7133	* 1.7060	* 1.7914	* 2.4863	* 2.8630	* 3.4770	*	*
	* 1.9021	* 1.8931	* 1.9603	* 2.6586	* 3.0127	* 3.6464	*	*
	* 1.9352	* 1.9246	* 1.9693	* 2.6072	* 2.9171	* 3.5152	*	*
	* 1.9369	* 1.9271	* 1.9529	* 2.4471	* 2.6531	* 3.1708	*	*
	* 1.8589	* 1.8605	* 1.8893	* 2.2818	* 2.4287	* 2.8686	*	*
15	* 3.0661	* 2.9019	* 3.0397	* 4.3942	* 4 EFPD 118 % POWER			
	* 3.3360	* 3.1750	* 3.3291	* 4.7605	* 50 EFPD 118 % POWER			
	* 3.5225	* 3.3721	* 3.5337	* 4.9664	* 125 EFPD 118 % POWER			
	* 3.4151	* 3.2878	* 3.4435	* 4.7364	* 200 EFPD 118 % POWER			
	* 3.1147	* 3.0328	* 3.1782	* 4.1620	* 350 EFPD 118 % POWER			
	* 2.8092	* 2.7505	* 2.9021	* 3.6782	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 220 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4441	* 1.6079	* 1.4919	* 1.6704	* 1.5047	* 1.6514	* 1.4099	* 2.8255
	* 1.5634	* 1.7505	* 1.6415	* 1.8161	* 1.6048	* 1.7809	* 1.5668	* 2.9553
	* 1.6438	* 1.8438	* 1.7511	* 1.8937	* 1.6800	* 1.8759	* 1.6724	* 3.0201
	* 1.6199	* 1.7991	* 1.7246	* 1.8469	* 1.6620	* 1.8501	* 1.6665	* 2.8966
	* 1.5854	* 1.7191	* 1.6647	* 1.7846	* 1.6473	* 1.8187	* 1.6522	* 2.6787
	* 1.5609	* 1.6668	* 1.6200	* 1.7442	* 1.6359	* 1.7764	* 1.6228	* 2.4817
9	* 1.6079	* 1.3747	* 1.4810	* 1.4408	* 1.5438	* 1.5274	* 1.4388	* 2.6612
	* 1.7505	* 1.5311	* 1.6175	* 1.6094	* 1.6614	* 1.6545	* 1.5897	* 2.7916
	* 1.8438	* 1.6438	* 1.7099	* 1.7210	* 1.7342	* 1.7360	* 1.6897	* 2.8620
	* 1.7991	* 1.6269	* 1.6771	* 1.6878	* 1.6890	* 1.7050	* 1.6598	* 2.7567
	* 1.7191	* 1.5936	* 1.6206	* 1.6283	* 1.6182	* 1.6669	* 1.6467	* 2.5796
	* 1.6668	* 1.5601	* 1.5815	* 1.5902	* 1.5796	* 1.6247	* 1.6242	* 2.3977
10	* 1.4919	* 1.4813	* 1.4654	* 1.5188	* 1.4741	* 1.5739	* 1.4175	* 2.6977
	* 1.6415	* 1.6177	* 1.6128	* 1.6426	* 1.6326	* 1.6924	* 1.5712	* 2.8557
	* 1.7511	* 1.7102	* 1.7192	* 1.7207	* 1.7275	* 1.7657	* 1.6677	* 2.9475
	* 1.7246	* 1.6774	* 1.6899	* 1.6641	* 1.7189	* 1.7195	* 1.6637	* 2.8500
	* 1.6647	* 1.6209	* 1.6336	* 1.5843	* 1.6429	* 1.6518	* 1.6657	* 2.6753
	* 1.6200	* 1.5817	* 1.5964	* 1.5408	* 1.5898	* 1.6058	* 1.6550	* 2.5087
11	* 1.6704	* 1.4409	* 1.5187	* 1.4547	* 1.5720	* 1.5209	* 2.0093	* 3.8970
	* 1.8161	* 1.6094	* 1.6425	* 1.6283	* 1.6799	* 1.6389	* 2.1434	* 4.1131
	* 1.8937	* 1.7209	* 1.7206	* 1.7429	* 1.7332	* 1.6809	* 2.2271	* 4.2139
	* 1.8469	* 1.6876	* 1.6639	* 1.7268	* 1.6670	* 1.6290	* 2.1663	* 4.0165
	* 1.7846	* 1.6282	* 1.5842	* 1.6283	* 1.5723	* 1.5861	* 2.0653	* 3.6231
	* 1.7442	* 1.5901	* 1.5408	* 1.5723	* 1.5219	* 1.5582	* 1.9755	* 3.3022
12	* 1.5047	* 1.5422	* 1.4731	* 1.5719	* 1.5893	* 1.4659	* 2.4140	*
	* 1.6048	* 1.6597	* 1.6320	* 1.6798	* 1.7027	* 1.6038	* 2.5263	*
	* 1.6800	* 1.7335	* 1.7270	* 1.7330	* 1.7649	* 1.6706	* 2.5634	*
	* 1.6620	* 1.6885	* 1.7186	* 1.6667	* 1.7116	* 1.6136	* 2.4505	*
	* 1.6473	* 1.6179	* 1.6427	* 1.5722	* 1.6332	* 1.5584	* 2.2554	*
	* 1.6359	* 1.5793	* 1.5897	* 1.5218	* 1.5852	* 1.5313	* 2.1153	*
13	* 1.6514	* 1.5245	* 1.5728	* 1.5205	* 1.4657	* 1.3962	* 2.7874	*
	* 1.7809	* 1.6515	* 1.6912	* 1.6385	* 1.6036	* 1.5499	* 2.9596	*
	* 1.8759	* 1.7336	* 1.7646	* 1.6807	* 1.6705	* 1.6366	* 3.0402	*
	* 1.8501	* 1.7030	* 1.7187	* 1.6288	* 1.6136	* 1.6192	* 2.9229	*
	* 1.8187	* 1.6654	* 1.6513	* 1.5860	* 1.5584	* 1.6155	* 2.6974	*
	* 1.7764	* 1.6237	* 1.6057	* 1.5582	* 1.5313	* 1.6136	* 2.5142	*
14	* 1.4099	* 1.4370	* 1.4166	* 2.0092	* 2.4145	* 2.7413	*	*
	* 1.5668	* 1.5878	* 1.5703	* 2.1433	* 2.5268	* 2.9097	*	*
	* 1.6724	* 1.6880	* 1.6669	* 2.2271	* 2.5639	* 2.9963	*	*
	* 1.6665	* 1.6584	* 1.6630	* 2.1665	* 2.4510	* 2.8859	*	*
	* 1.6522	* 1.6458	* 1.6655	* 2.0656	* 2.2561	* 2.6799	*	*
	* 1.6228	* 1.6235	* 1.6549	* 1.9756	* 2.1160	* 2.5019	*	*
15	* 2.8255	* 2.6597	* 2.6971	* 3.8960	* 4 EFPD	118 % POWER		
	* 2.9553	* 2.7902	* 2.8552	* 4.1121	* 50 EFPD	118 % POWER		
	* 3.0201	* 2.8608	* 2.9473	* 4.2133	* 125 EFPD	118 % POWER		
	* 2.8966	* 2.7558	* 2.8500	* 4.0163	* 200 EFPD	118 % POWER		
	* 2.6787	* 2.5795	* 2.6760	* 3.6235	* 350 EFPD	118 % POWER		
	* 2.4817	* 2.3975	* 2.5092	* 3.3028	* 460 EFPD	118 % POWER		

## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 221 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3795	* 1.5777	* 1.4234	* 1.6133	* 1.4382	* 1.5823	* 1.3283	* 2.8255
	* 1.4635	* 1.6744	* 1.5427	* 1.7240	* 1.4790	* 1.6682	* 1.4340	* 2.8847
	* 1.4959	* 1.7294	* 1.6282	* 1.7604	* 1.5117	* 1.7311	* 1.4998	* 2.8715
	* 1.4648	* 1.6815	* 1.6022	* 1.7109	* 1.4888	* 1.7108	* 1.4840	* 2.7385
	* 1.4648	* 1.6317	* 1.5756	* 1.6810	* 1.5095	* 1.7148	* 1.5027	* 2.5619
	* 1.4775	* 1.6131	* 1.5645	* 1.6744	* 1.5301	* 1.7034	* 1.5061	* 2.4071
9	* 1.5777	* 1.3091	* 1.4126	* 1.3642	* 1.4747	* 1.4455	* 1.3534	* 2.6612
	* 1.6744	* 1.4387	* 1.5174	* 1.4899	* 1.5516	* 1.5283	* 1.4526	* 2.7277
	* 1.7294	* 1.5059	* 1.5831	* 1.5613	* 1.5987	* 1.5800	* 1.5073	* 2.7251
	* 1.6815	* 1.4814	* 1.5502	* 1.5196	* 1.5536	* 1.5547	* 1.4775	* 2.6127
	* 1.6317	* 1.4756	* 1.5251	* 1.4850	* 1.5148	* 1.5507	* 1.4957	* 2.4680
	* 1.6131	* 1.4774	* 1.5209	* 1.4847	* 1.5103	* 1.5390	* 1.5058	* 2.3328
10	* 1.4234	* 1.4129	* 1.3880	* 1.4494	* 1.3958	* 1.4928	* 1.3244	* 2.6820
	* 1.5427	* 1.5176	* 1.5064	* 1.5417	* 1.5150	* 1.5729	* 1.4298	* 2.7606
	* 1.6282	* 1.5833	* 1.5867	* 1.5895	* 1.5723	* 1.6181	* 1.4908	* 2.7919
	* 1.6022	* 1.5504	* 1.5598	* 1.5312	* 1.5495	* 1.5770	* 1.4864	* 2.6940
	* 1.5756	* 1.5253	* 1.5356	* 1.4819	* 1.4925	* 1.5472	* 1.5207	* 2.5696
	* 1.5645	* 1.5211	* 1.5325	* 1.4719	* 1.4780	* 1.5342	* 1.5462	* 2.4445
11	* 1.6133	* 1.3642	* 1.4494	* 1.3785	* 1.4947	* 1.4462	* 1.9764	* 3.8805
	* 1.7240	* 1.4899	* 1.5415	* 1.5092	* 1.5641	* 1.5107	* 2.0518	* 3.9942
	* 1.7604	* 1.5611	* 1.5894	* 1.5851	* 1.5815	* 1.5074	* 2.0887	* 4.0209
	* 1.7109	* 1.5195	* 1.5310	* 1.5547	* 1.5255	* 1.4497	* 2.0246	* 3.8261
	* 1.6810	* 1.4849	* 1.4818	* 1.4789	* 1.4643	* 1.4419	* 1.9675	* 3.5115
	* 1.6744	* 1.4847	* 1.4719	* 1.4654	* 1.4491	* 1.4545	* 1.9210	* 3.2616
12	* 1.4382	* 1.4728	* 1.3947	* 1.4945	* 1.5038	* 1.3894	* 2.4140	*
	* 1.4790	* 1.5498	* 1.5138	* 1.5639	* 1.5785	* 1.4726	* 2.4634	*
	* 1.5117	* 1.5980	* 1.5718	* 1.5812	* 1.6108	* 1.4856	* 2.4375	*
	* 1.4888	* 1.5531	* 1.5491	* 1.5253	* 1.5585	* 1.4273	* 2.3147	*
	* 1.5095	* 1.5145	* 1.4923	* 1.4642	* 1.5231	* 1.4146	* 2.1650	*
	* 1.5301	* 1.5101	* 1.4779	* 1.4490	* 1.5125	* 1.4266	* 2.0746	*
13	* 1.5823	* 1.4425	* 1.4916	* 1.4458	* 1.3892	* 1.2827	* 2.7211	*
	* 1.6682	* 1.5258	* 1.5718	* 1.5103	* 1.4724	* 1.3899	* 2.8230	*
	* 1.7311	* 1.5778	* 1.6170	* 1.5071	* 1.4855	* 1.4466	* 2.8558	*
	* 1.7108	* 1.5529	* 1.5762	* 1.4495	* 1.4273	* 1.4345	* 2.7457	*
	* 1.7148	* 1.5495	* 1.5468	* 1.4419	* 1.4146	* 1.4714	* 2.5930	*
	* 1.7034	* 1.5382	* 1.5341	* 1.4545	* 1.4266	* 1.5063	* 2.4734	*
14	* 1.3283	* 1.3516	* 1.3235	* 1.9761	* 2.4145	* 2.6704	*	*
	* 1.4340	* 1.4508	* 1.4289	* 2.0515	* 2.4635	* 2.7690	*	*
	* 1.4998	* 1.5058	* 1.4901	* 2.0886	* 2.4378	* 2.8063	*	*
	* 1.4840	* 1.4762	* 1.4858	* 2.0247	* 2.3150	* 2.7041	*	*
	* 1.5027	* 1.4949	* 1.5205	* 1.9679	* 2.1655	* 2.5657	*	*
	* 1.5061	* 1.5053	* 1.5461	* 1.9211	* 2.0751	* 2.4519	*	*
15	* 2.8255	* 2.6597	* 2.6815	* 3.8792	* 4 EFPD 118 % POWER			
	* 2.8847	* 2.7261	* 2.7601	* 3.9931	* 50 EFPD 118 % POWER			
	* 2.8715	* 2.7238	* 2.7918	* 4.0202	* 125 EFPD 118 % POWER			
	* 2.7385	* 2.6117	* 2.6942	* 3.8258	* 200 EFPD 118 % POWER			
	* 2.5619	* 2.4679	* 2.5703	* 3.5118	* 350 EFPD 118 % POWER			
	* 2.4071	* 2.3329	* 2.4451	* 3.2622	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 222 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4057	* 1.6081	* 1.4413	* 1.6389	* 1.4386	* 1.5986	* 1.3235	* 2.9166
	* 1.4477	* 1.6812	* 1.5435	* 1.7194	* 1.4494	* 1.6565	* 1.4011	* 2.8793
	* 1.4574	* 1.7158	* 1.6149	* 1.7333	* 1.4599	* 1.7017	* 1.4477	* 2.8210
	* 1.4268	* 1.6651	* 1.5888	* 1.6853	* 1.4430	* 1.6860	* 1.4305	* 2.6924
	* 1.4522	* 1.6361	* 1.5826	* 1.6733	* 1.4868	* 1.7134	* 1.4739	* 2.5486
	* 1.4858	* 1.6373	* 1.5906	* 1.6759	* 1.5226	* 1.7146	* 1.4927	* 2.4135
9	* 1.6081	* 1.3148	* 1.4253	* 1.3673	* 1.4881	* 1.4506	* 1.3457	* 2.7365
	* 1.6812	* 1.4294	* 1.5105	* 1.4708	* 1.5387	* 1.5030	* 1.4162	* 2.7147
	* 1.7158	* 1.4748	* 1.5611	* 1.5134	* 1.5684	* 1.5380	* 1.4466	* 2.6720
	* 1.6651	* 1.4486	* 1.5289	* 1.4711	* 1.5229	* 1.5192	* 1.4226	* 2.5642
	* 1.6361	* 1.4627	* 1.5212	* 1.4537	* 1.5006	* 1.5375	* 1.4658	* 2.4556
	* 1.6374	* 1.4758	* 1.5366	* 1.4740	* 1.5139	* 1.5370	* 1.4903	* 2.3347
10	* 1.4413	* 1.4256	* 1.3994	* 1.4621	* 1.3965	* 1.4988	* 1.3139	* 2.7219
	* 1.5435	* 1.5108	* 1.5015	* 1.5326	* 1.4891	* 1.5542	* 1.3923	* 2.7442
	* 1.6149	* 1.5614	* 1.5647	* 1.5592	* 1.5260	* 1.5820	* 1.4368	* 2.7390
	* 1.5888	* 1.5292	* 1.5381	* 1.4995	* 1.5005	* 1.5446	* 1.4352	* 2.6468
	* 1.5826	* 1.5215	* 1.5322	* 1.4691	* 1.4568	* 1.5373	* 1.4917	* 2.5540
	* 1.5906	* 1.5369	* 1.5485	* 1.4794	* 1.4690	* 1.5485	* 1.5357	* 2.4430
11	* 1.6389	* 1.3674	* 1.4620	* 1.3817	* 1.5018	* 1.4418	* 1.9942	* 3.9805
	* 1.7194	* 1.4708	* 1.5325	* 1.4892	* 1.5435	* 1.4742	* 2.0298	* 4.0146
	* 1.7333	* 1.5132	* 1.5589	* 1.5364	* 1.5387	* 1.4470	* 2.0384	* 3.9876
	* 1.6853	* 1.4709	* 1.4993	* 1.5006	* 1.4863	* 1.3895	* 1.9782	* 3.7970
	* 1.6733	* 1.4536	* 1.4690	* 1.4426	* 1.4511	* 1.4136	* 1.9556	* 3.5266
	* 1.6759	* 1.4739	* 1.4794	* 1.4573	* 1.4579	* 1.4515	* 1.9334	* 3.3109
12	* 1.4386	* 1.4860	* 1.3953	* 1.5016	* 1.5101	* 1.3766	* 2.4666	*
	* 1.4494	* 1.5369	* 1.4878	* 1.5432	* 1.5581	* 1.4341	* 2.4447	*
	* 1.4599	* 1.5677	* 1.5255	* 1.5384	* 1.5651	* 1.4190	* 2.3790	*
	* 1.4430	* 1.5224	* 1.5001	* 1.4861	* 1.5177	* 1.3640	* 2.2605	*
	* 1.4868	* 1.5003	* 1.4567	* 1.4509	* 1.5134	* 1.3856	* 2.1547	*
	* 1.5226	* 1.5137	* 1.4690	* 1.4578	* 1.5253	* 1.4217	* 2.0947	*
13	* 1.5986	* 1.4480	* 1.4976	* 1.4414	* 1.3766	* 1.2594	* 2.7394	*
	* 1.6565	* 1.5006	* 1.5530	* 1.4736	* 1.4338	* 1.3404	* 2.7894	*
	* 1.7017	* 1.5359	* 1.5809	* 1.4467	* 1.4187	* 1.3815	* 2.7885	*
	* 1.6860	* 1.5174	* 1.5438	* 1.3893	* 1.3639	* 1.3763	* 2.6874	*
	* 1.7134	* 1.5363	* 1.5369	* 1.4136	* 1.3855	* 1.4445	* 2.5875	*
	* 1.7146	* 1.5363	* 1.5484	* 1.4515	* 1.4216	* 1.5031	* 2.4955	*
14	* 1.3235	* 1.3439	* 1.3129	* 1.9937	* 2.4664	* 2.6854	*	
	* 1.4011	* 1.4144	* 1.3913	* 2.0293	* 2.4446	* 2.7329	*	
	* 1.4477	* 1.4450	* 1.4359	* 2.0381	* 2.3791	* 2.7384	*	
	* 1.4305	* 1.4215	* 1.4346	* 1.9782	* 2.2607	* 2.6447	*	
	* 1.4739	* 1.4651	* 1.4915	* 1.9559	* 2.1550	* 2.5584	*	
	* 1.4927	* 1.4898	* 1.5357	* 1.9333	* 2.0951	* 2.4741	*	
15	* 2.9166	* 2.7350	* 2.7212	* 3.9789	* 4 EFPD	118 % POWER		
	* 2.8793	* 2.7133	* 2.7435	* 4.0132	* 50 EFPD	118 % POWER		
	* 2.8210	* 2.6709	* 2.7388	* 3.9866	* 125 EFPD	118 % POWER		
	* 2.6924	* 2.5635	* 2.6469	* 3.7966	* 200 EFPD	118 % POWER		
	* 2.5486	* 2.4554	* 2.5547	* 3.5269	* 350 EFPD	118 % POWER		
	* 2.4135	* 2.3346	* 2.4436	* 3.3114	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 223 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4568	* 1.6726	* 1.4937	* 1.7001	* 1.4790	* 1.6510	* 1.3555	* 3.0105
	* 1.4790	* 1.7294	* 1.5852	* 1.7587	* 1.4686	* 1.6883	* 1.4142	* 2.9224
	* 1.4738	* 1.7510	* 1.6474	* 1.7569	* 1.4647	* 1.7226	* 1.4491	* 2.8361
	* 1.4430	* 1.6990	* 1.6227	* 1.7108	* 1.4538	* 1.7133	* 1.4322	* 2.7151
	* 1.4795	* 1.6756	* 1.6191	* 1.7101	* 1.5134	* 1.7570	* 1.4947	* 2.5936
	* 1.5241	* 1.6853	* 1.6365	* 1.7128	* 1.5529	* 1.7595	* 1.5178	* 2.4587
9	* 1.6726	* 1.3574	* 1.4722	* 1.4085	* 1.5353	* 1.4873	* 1.3760	* 2.8193
	* 1.7294	* 1.4645	* 1.5446	* 1.4982	* 1.5682	* 1.5201	* 1.4271	* 2.7512
	* 1.7510	* 1.4963	* 1.5853	* 1.5212	* 1.5861	* 1.5453	* 1.4420	* 2.6807
	* 1.6991	* 1.4690	* 1.5547	* 1.4774	* 1.5409	* 1.5337	* 1.4237	* 2.5771
	* 1.6756	* 1.4896	* 1.5530	* 1.4710	* 1.5290	* 1.5669	* 1.4854	* 2.4986
	* 1.6853	* 1.5077	* 1.5675	* 1.4922	* 1.5428	* 1.5679	* 1.5134	* 2.3774
10	* 1.4937	* 1.4726	* 1.4448	* 1.5086	* 1.4350	* 1.5408	* 1.3415	* 2.8037
	* 1.5852	* 1.5449	* 1.5352	* 1.5642	* 1.5099	* 1.5779	* 1.4017	* 2.7831
	* 1.6474	* 1.5856	* 1.5887	* 1.5746	* 1.5339	* 1.5941	* 1.4361	* 2.7509
	* 1.6227	* 1.5551	* 1.5618	* 1.5154	* 1.5053	* 1.5610	* 1.4397	* 2.6645
	* 1.6191	* 1.5533	* 1.5625	* 1.4930	* 1.4656	* 1.5640	* 1.5108	* 2.5864
	* 1.6364	* 1.5678	* 1.5829	* 1.5059	* 1.4937	* 1.5781	* 1.5546	* 2.4678
11	* 1.7001	* 1.4085	* 1.5085	* 1.4224	* 1.5434	* 1.4762	* 2.0463	* 4.1351
	* 1.7587	* 1.4982	* 1.5641	* 1.5151	* 1.5628	* 1.4858	* 2.0522	* 4.1073
	* 1.7569	* 1.5210	* 1.5743	* 1.5403	* 1.5445	* 1.4395	* 2.0416	* 4.0415
	* 1.7108	* 1.4772	* 1.5152	* 1.4989	* 1.4961	* 1.3866	* 1.9870	* 3.8586
	* 1.7101	* 1.4709	* 1.4929	* 1.4536	* 1.4738	* 1.4332	* 1.9770	* 3.6032
	* 1.7128	* 1.4921	* 1.5059	* 1.4834	* 1.4945	* 1.4860	* 1.9662	* 3.3746
12	* 1.4790	* 1.5330	* 1.4337	* 1.5432	* 1.5509	* 1.3996	* 2.5315	*
	* 1.4686	* 1.5662	* 1.5086	* 1.5624	* 1.5794	* 1.4429	* 2.4692	*
	* 1.4647	* 1.5853	* 1.5333	* 1.5442	* 1.5692	* 1.4090	* 2.3792	*
	* 1.4538	* 1.5404	* 1.5048	* 1.4958	* 1.5269	* 1.3587	* 2.2683	*
	* 1.5134	* 1.5287	* 1.4654	* 1.4736	* 1.5473	* 1.4059	* 2.1919	*
	* 1.5529	* 1.5426	* 1.4936	* 1.4944	* 1.5732	* 1.4570	* 2.1433	*
13	* 1.6510	* 1.4845	* 1.5394	* 1.4757	* 1.3995	* 1.2768	* 2.8066	*
	* 1.6883	* 1.5175	* 1.5765	* 1.4852	* 1.4426	* 1.3402	* 2.8158	*
	* 1.7226	* 1.5431	* 1.5930	* 1.4392	* 1.4088	* 1.3721	* 2.7923	*
	* 1.7133	* 1.5319	* 1.5602	* 1.3864	* 1.3585	* 1.3744	* 2.6985	*
	* 1.7570	* 1.5659	* 1.5636	* 1.4332	* 1.4059	* 1.4681	* 2.6328	*
	* 1.7595	* 1.5673	* 1.5778	* 1.4860	* 1.4569	* 1.5416	* 2.5592	*
14	* 1.3555	* 1.3741	* 1.3404	* 2.0456	* 2.5310	* 2.7505	*	*
	* 1.4142	* 1.4252	* 1.4006	* 2.0515	* 2.4688	* 2.7592	*	*
	* 1.4491	* 1.4404	* 1.4352	* 2.0411	* 2.3790	* 2.7422	*	*
	* 1.4322	* 1.4225	* 1.4392	* 1.9868	* 2.2683	* 2.6571	*	*
	* 1.4947	* 1.4847	* 1.5107	* 1.9772	* 2.1921	* 2.6076	*	*
	* 1.5178	* 1.5129	* 1.5546	* 1.9660	* 2.1436	* 2.5401	*	*
15	* 3.0105	* 2.8175	* 2.8027	* 4.1331	* 4 EFPD 118 % POWER			
	* 2.9224	* 2.7496	* 2.7821	* 4.1055	* 50 EFPD 118 % POWER			
	* 2.8361	* 2.6795	* 2.7505	* 4.0402	* 125 EFPD 118 % POWER			
	* 2.7151	* 2.5763	* 2.6645	* 3.8580	* 200 EFPD 118 % POWER			
	* 2.5936	* 2.4983	* 2.5871	* 3.6034	* 350 EFPD 118 % POWER			
	* 2.4587	* 2.3774	* 2.4682	* 3.3750	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 224 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5155	* 1.7516	* 1.5540	* 1.7712	* 1.5274	* 1.7125	* 1.3913	* 3.1568 *
	* 1.5244	* 1.7989	* 1.6392	* 1.8140	* 1.4994	* 1.7362	* 1.4360	* 3.0280 *
	* 1.5067	* 1.8097	* 1.6966	* 1.8022	* 1.4852	* 1.7643	* 1.4594	* 2.9177 *
	* 1.4779	* 1.7584	* 1.6754	* 1.7610	* 1.4812	* 1.7637	* 1.4491	* 2.8043 *
	* 1.5143	* 1.7311	* 1.6726	* 1.7680	* 1.5529	* 1.8204	* 1.5254	* 2.6950 *
	* 1.5581	* 1.7351	* 1.6734	* 1.7646	* 1.5900	* 1.8174	* 1.5465	* 2.5473 *
9	* 1.7516	* 1.4053	* 1.5269	* 1.4547	* 1.5893	* 1.5309	* 1.4117	* 2.9622 *
	* 1.7989	* 1.5051	* 1.5909	* 1.5353	* 1.6099	* 1.5492	* 1.4481	* 2.8557 *
	* 1.8097	* 1.5338	* 1.6257	* 1.5441	* 1.6211	* 1.5687	* 1.4514	* 2.7630 *
	* 1.7584	* 1.5074	* 1.5985	* 1.5001	* 1.5781	* 1.5656	* 1.4396	* 2.6705 *
	* 1.7311	* 1.5237	* 1.6012	* 1.5003	* 1.5742	* 1.6112	* 1.5149	* 2.5991 *
	* 1.7351	* 1.5317	* 1.6067	* 1.5181	* 1.5819	* 1.6077	* 1.5402	* 2.4665 *
10	* 1.5540	* 1.5273	* 1.4969	* 1.5625	* 1.4782	* 1.5901	* 1.3751	* 2.9428 *
	* 1.6392	* 1.5912	* 1.5797	* 1.6080	* 1.5407	* 1.6139	* 1.4214	* 2.8880 *
	* 1.6966	* 1.6260	* 1.6281	* 1.6074	* 1.5577	* 1.6231	* 1.4490	* 2.8377 *
	* 1.6754	* 1.5989	* 1.6033	* 1.5503	* 1.5228	* 1.5962	* 1.4584	* 2.7617 *
	* 1.6726	* 1.6016	* 1.6094	* 1.5338	* 1.4907	* 1.6067	* 1.5411	* 2.7005 *
	* 1.6735	* 1.6071	* 1.6211	* 1.5401	* 1.5098	* 1.6131	* 1.5782	* 2.5697 *
11	* 1.7712	* 1.4548	* 1.5624	* 1.4681	* 1.5936	* 1.5171	* 2.1387	* 4.3672 *
	* 1.8140	* 1.5353	* 1.6078	* 1.5509	* 1.5960	* 1.5101	* 2.1217	* 4.2881 *
	* 1.8022	* 1.5439	* 1.6070	* 1.5608	* 1.5689	* 1.4486	* 2.0972	* 4.1931 *
	* 1.7610	* 1.4998	* 1.5501	* 1.5164	* 1.5258	* 1.4008	* 2.0497	* 4.0177 *
	* 1.7680	* 1.5002	* 1.5338	* 1.4770	* 1.5095	* 1.4561	* 2.0481	* 3.7654 *
	* 1.7646	* 1.5180	* 1.5401	* 1.5053	* 1.5279	* 1.5122	* 2.0188	* 3.4994 *
12	* 1.5274	* 1.5868	* 1.4768	* 1.5934	* 1.6006	* 1.4327	* 2.6635	*
	* 1.4994	* 1.6077	* 1.5393	* 1.5955	* 1.6145	* 1.4630	* 2.5663	*
	* 1.4852	* 1.6202	* 1.5571	* 1.5685	* 1.5902	* 1.4160	* 2.4530	*
	* 1.4811	* 1.5775	* 1.5223	* 1.5256	* 1.5558	* 1.3706	* 2.3450	*
	* 1.5529	* 1.5738	* 1.4905	* 1.5093	* 1.5834	* 1.4268	* 2.2717	*
	* 1.5900	* 1.5817	* 1.5098	* 1.5279	* 1.6159	* 1.4850	* 2.2313	*
13	* 1.7125	* 1.5279	* 1.5885	* 1.5166	* 1.4326	* 1.3039	* 2.9369	*
	* 1.7362	* 1.5465	* 1.6125	* 1.5095	* 1.4628	* 1.3540	* 2.9147	*
	* 1.7643	* 1.5664	* 1.6219	* 1.4482	* 1.4157	* 1.3799	* 2.8746	*
	* 1.7637	* 1.5638	* 1.5954	* 1.4006	* 1.3704	* 1.3904	* 2.7931	*
	* 1.8204	* 1.6102	* 1.6065	* 1.4560	* 1.4267	* 1.4941	* 2.7368	*
	* 1.8174	* 1.6071	* 1.6129	* 1.5122	* 1.4849	* 1.5745	* 2.6684	*
14	* 1.3913	* 1.4096	* 1.3738	* 2.1377	* 2.6629	* 2.8774	*	
	* 1.4360	* 1.4461	* 1.4202	* 2.1207	* 2.5658	* 2.8553	*	
	* 1.4594	* 1.4498	* 1.4481	* 2.0965	* 2.4528	* 2.8215	*	
	* 1.4491	* 1.4384	* 1.4578	* 2.0494	* 2.3449	* 2.7470	*	
	* 1.5254	* 1.5142	* 1.5409	* 2.0482	* 2.2719	* 2.7085	*	
	* 1.5465	* 1.5398	* 1.5782	* 2.0185	* 2.2316	* 2.6453	*	
15	* 3.1568	* 2.9604	* 2.9415	* 4.3647	* 4 EFPD	118 % POWER		
	* 3.0280	* 2.8541	* 2.8869	* 4.2859	* 50 EFPD	118 % POWER		
	* 2.9177	* 2.7619	* 2.8371	* 4.1916	* 125 EFPD	118 % POWER		
	* 2.8043	* 2.6697	* 2.7617	* 4.0169	* 200 EFPD	118 % POWER		
	* 2.6950	* 2.5989	* 2.7012	* 3.7655	* 350 EFPD	118 % POWER		
	* 2.5473	* 2.4664	* 2.5703	* 3.4999	* 460 EFPD	118 % POWER		



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 225 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6077	* 1.8579	* 1.6407	* 1.8680	* 1.5991	* 1.7964	* 1.4493	* 3.3165
	* 1.6109	* 1.9063	* 1.7260	* 1.9033	* 1.5626	* 1.8161	* 1.4890	* 3.1637
	* 1.5835	* 1.9098	* 1.7816	* 1.8831	* 1.5414	* 1.8405	* 1.5047	* 3.0351
	* 1.5560	* 1.8589	* 1.7645	* 1.8470	* 1.5439	* 1.8492	* 1.5008	* 2.9310
	* 1.5900	* 1.8252	* 1.7596	* 1.8569	* 1.6241	* 1.9143	* 1.5864	* 2.8189
	* 1.6115	* 1.8034	* 1.7415	* 1.8426	* 1.6543	* 1.9001	* 1.6006	* 2.6532
9	* 1.8579	* 1.4793	* 1.6069	* 1.5275	* 1.6666	* 1.5971	* 1.4704	* 3.1171
	* 1.9063	* 1.5790	* 1.6685	* 1.6054	* 1.6826	* 1.6087	* 1.5006	* 2.9894
	* 1.9098	* 1.6108	* 1.6999	* 1.6036	* 1.6900	* 1.6248	* 1.4957	* 2.8792
	* 1.8589	* 1.5850	* 1.6766	* 1.5601	* 1.6495	* 1.6300	* 1.4903	* 2.7957
	* 1.8252	* 1.5913	* 1.6801	* 1.5625	* 1.6489	* 1.6837	* 1.5748	* 2.7236
	* 1.8034	* 1.5811	* 1.6727	* 1.5726	* 1.6465	* 1.6702	* 1.5928	* 2.5724
10	* 1.6408	* 1.6074	* 1.5746	* 1.6424	* 1.5472	* 1.6650	* 1.4330	* 3.0970
	* 1.7260	* 1.6689	* 1.6551	* 1.6833	* 1.6047	* 1.6817	* 1.4721	* 3.0259
	* 1.7816	* 1.7004	* 1.7012	* 1.6741	* 1.6148	* 1.6866	* 1.4955	* 2.9600
	* 1.7645	* 1.6770	* 1.6796	* 1.6191	* 1.5796	* 1.6660	* 1.5120	* 2.8930
	* 1.7596	* 1.6805	* 1.6877	* 1.6045	* 1.5496	* 1.6805	* 1.6031	* 2.8344
	* 1.7415	* 1.6731	* 1.6869	* 1.6004	* 1.5569	* 1.6746	* 1.6298	* 2.6780
11	* 1.8680	* 1.5276	* 1.6423	* 1.5418	* 1.6762	* 1.5913	* 2.2532	* 4.6181
	* 1.9033	* 1.6054	* 1.6831	* 1.6192	* 1.6649	* 1.5696	* 2.2202	* 4.5138
	* 1.8831	* 1.6034	* 1.6737	* 1.6205	* 1.6303	* 1.4959	* 2.1850	* 4.3944
	* 1.8470	* 1.5598	* 1.6189	* 1.5742	* 1.5925	* 1.4526	* 2.1444	* 4.2270
	* 1.8569	* 1.5624	* 1.6044	* 1.5358	* 1.5774	* 1.5149	* 2.1459	* 3.9651
	* 1.8426	* 1.5726	* 1.6004	* 1.5507	* 1.5803	* 1.5561	* 2.0925	* 3.6499
12	* 1.5991	* 1.6639	* 1.5456	* 1.6760	* 1.6847	* 1.4995	* 2.8234	*
	* 1.5626	* 1.6802	* 1.6032	* 1.6644	* 1.6826	* 1.5183	* 2.6953	*
	* 1.5414	* 1.6890	* 1.6143	* 1.6299	* 1.6514	* 1.4621	* 2.5622	*
	* 1.5439	* 1.6489	* 1.5792	* 1.5923	* 1.6238	* 1.4209	* 2.4588	*
	* 1.6241	* 1.6486	* 1.5495	* 1.5772	* 1.6576	* 1.4837	* 2.3838	*
	* 1.6543	* 1.6463	* 1.5569	* 1.5802	* 1.6711	* 1.5280	* 2.3059	*
13	* 1.7964	* 1.5938	* 1.6633	* 1.5907	* 1.4994	* 1.3617	* 3.1065	*
	* 1.8161	* 1.6057	* 1.6801	* 1.5688	* 1.5182	* 1.4025	* 3.0572	*
	* 1.8405	* 1.6224	* 1.6853	* 1.4955	* 1.4618	* 1.4248	* 3.0030	*
	* 1.8492	* 1.6282	* 1.6651	* 1.4524	* 1.4208	* 1.4438	* 2.9312	*
	* 1.9143	* 1.6826	* 1.6804	* 1.5148	* 1.4836	* 1.5542	* 2.8724	*
	* 1.9001	* 1.6695	* 1.6744	* 1.5562	* 1.5279	* 1.6234	* 2.7684	*
14	* 1.4493	* 1.4681	* 1.4316	* 2.2520	* 2.8226	* 3.0439	*	*
	* 1.4890	* 1.4983	* 1.4708	* 2.2190	* 2.6947	* 2.9953	*	*
	* 1.5047	* 1.4940	* 1.4945	* 2.1842	* 2.5619	* 2.9476	*	*
	* 1.5008	* 1.4891	* 1.5114	* 2.1440	* 2.4586	* 2.8826	*	*
	* 1.5864	* 1.5741	* 1.6029	* 2.1460	* 2.3840	* 2.8428	*	*
	* 1.6006	* 1.5923	* 1.6298	* 2.0922	* 2.3062	* 2.7441	*	*
15	* 3.3165	* 3.1151	* 3.0954	* 4.6153	* 4 EFPD	118 % POWER		
	* 3.1637	* 2.9877	* 3.0245	* 4.5112	* 50 EFPD	118 % POWER		
	* 3.0351	* 2.8780	* 2.9592	* 4.3927	* 125 EFPD	118 % POWER		
	* 2.9310	* 2.7949	* 2.8928	* 4.2261	* 200 EFPD	118 % POWER		
	* 2.8189	* 2.7234	* 2.8351	* 3.9652	* 350 EFPD	118 % POWER		
	* 2.6532	* 2.5723	* 2.6786	* 3.6503	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 226 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	1.7126	1.9748	1.7365	1.9738	1.6778	1.8895	1.5137	3.5021
	1.7192	2.0345	1.8265	2.0024	1.6331	1.9048	1.5486	3.3222
	1.6853	2.0347	1.8831	1.9799	1.6099	1.9303	1.5624	3.1801
	1.6655	1.9925	1.8778	1.9605	1.6269	1.9607	1.5713	3.1021
	1.6935	1.9465	1.8634	1.9608	1.7058	2.0187	1.6555	2.9711
	1.7010	1.9077	1.8349	1.9445	1.7365	2.0047	1.6693	2.7970
9	1.9748	1.5597	1.6956	1.6074	1.7529	1.6724	1.5368	3.3012
	2.0345	1.6637	1.7592	1.6868	1.7656	1.6796	1.5628	3.1493
	2.0347	1.7061	1.7903	1.6781	1.7741	1.6964	1.5540	3.0269
	1.9925	1.6883	1.7779	1.6411	1.7446	1.7165	1.5600	2.9682
	1.9465	1.6780	1.7739	1.6396	1.7389	1.7664	1.6439	2.8752
	1.9077	1.6550	1.7604	1.6453	1.7314	1.7503	1.6603	2.7188
10	1.7365	1.6962	1.6607	1.7314	1.6242	1.7494	1.4986	3.2796
	1.8265	1.7597	1.7437	1.7724	1.6799	1.7635	1.5344	3.1874
	1.8831	1.7908	1.7905	1.7585	1.6901	1.7677	1.5566	3.1129
	1.8778	1.7784	1.7790	1.7115	1.6585	1.7592	1.5850	3.0741
	1.8634	1.7744	1.7831	1.6931	1.6278	1.7743	1.6778	2.9926
	1.8349	1.7608	1.7745	1.6818	1.6246	1.7566	1.6980	2.8284
11	1.9738	1.6075	1.7312	1.6218	1.7702	1.6736	2.3892	4.9174
	2.0024	1.6868	1.7722	1.7022	1.7548	1.6448	2.3463	4.7832
	1.9799	1.6778	1.7581	1.7006	1.7158	1.5641	2.3053	4.6522
	1.9605	1.6408	1.7112	1.6549	1.6862	1.5272	2.2788	4.5207
	1.9608	1.6395	1.6930	1.6155	1.6684	1.5953	2.2768	4.2118
	1.9445	1.6453	1.6818	1.6195	1.6579	1.6231	2.2026	3.8655
12	1.6778	1.7499	1.6225	1.7699	1.7850	1.5802	3.0102	
	1.6331	1.7630	1.6782	1.7543	1.7794	1.5958	2.8688	
	1.6099	1.7731	1.6895	1.7154	1.7430	1.5303	2.7201	
	1.6269	1.7439	1.6580	1.6858	1.7235	1.4947	2.6253	
	1.7058	1.7386	1.6276	1.6683	1.7619	1.5630	2.5422	
	1.7365	1.7312	1.6246	1.6578	1.7554	1.5910	2.4283	
13	1.8895	1.6690	1.7475	1.6729	1.5801	1.4323	3.3114	
	1.9048	1.6766	1.7618	1.6440	1.5957	1.4710	3.2518	
	1.9303	1.6938	1.7663	1.5636	1.5299	1.4918	3.1876	
	1.9607	1.7146	1.7583	1.5269	1.4945	1.5205	3.1295	
	2.0187	1.7653	1.7739	1.5953	1.5629	1.6379	3.0688	
	2.0047	1.7497	1.7565	1.6232	1.5909	1.6874	2.9143	
14	1.5137	1.5344	1.4971	2.3878	3.0092	3.2442		
	1.5486	1.5605	1.5330	2.3449	2.8679	3.1851		
	1.5624	1.5522	1.5556	2.3044	2.7197	3.1279		
	1.5713	1.5587	1.5843	2.2783	2.6251	3.0764		
	1.6555	1.6432	1.6777	2.2768	2.5424	3.0321		
	1.6693	1.6598	1.6980	2.2023	2.4286	2.8915		
15	3.5021	3.2991	3.2779	4.9141	4 EFPD	118 % POWER		
	3.3222	3.1476	3.1859	4.7803	50 EFPD	118 % POWER		
	3.1801	3.0253	3.1120	4.6502	125 EFPD	118 % POWER		
	3.1021	2.9670	3.0739	4.5196	200 EFPD	118 % POWER		
	2.9711	2.8756	2.9932	4.2118	350 EFPD	118 % POWER		
	2.7970	2.7195	2.8289	3.8659	460 EFPD	118 % POWER		

## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248

Appendix A, Rev. 0

Page 227 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 15 OF 24

(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8588	* 2.1301	* 1.8674	* 2.1206	* 1.8002	* 2.0215	* 1.6201	* 3.6772
	* 1.8628	* 2.1923	* 1.9593	* 2.1422	* 1.7476	* 2.0301	* 1.6509	* 3.4728
	* 1.8261	* 2.1910	* 2.0191	* 2.1130	* 1.7212	* 2.0564	* 1.6619	* 3.3221
	* 1.8114	* 2.1541	* 2.0227	* 2.0997	* 1.7500	* 2.0973	* 1.6825	* 3.2545
	* 1.8359	* 2.0986	* 2.0086	* 2.1072	* 1.8384	* 2.1688	* 1.7754	* 3.1283
	* 1.8456	* 2.0443	* 1.9797	* 2.0919	* 1.8736	* 2.1546	* 1.7904	* 2.9512
9	* 2.1301	* 1.6791	* 1.8191	* 1.7271	* 1.8768	* 1.7840	* 1.6430	* 3.4505
	* 2.1923	* 1.7861	* 1.8818	* 1.8072	* 1.8841	* 1.7845	* 1.6639	* 3.2742
	* 2.1910	* 1.8426	* 1.9140	* 1.7954	* 1.8930	* 1.8017	* 1.6522	* 3.1398
	* 2.1541	* 1.8302	* 1.9108	* 1.7668	* 1.8723	* 1.8347	* 1.6710	* 3.0969
	* 2.0986	* 1.8074	* 1.9063	* 1.7645	* 1.8679	* 1.8911	* 1.7620	* 3.0202
	* 2.0443	* 1.7837	* 1.8940	* 1.7728	* 1.8626	* 1.8740	* 1.7798	* 2.8561
10	* 1.8674	* 1.8198	* 1.7814	* 1.8556	* 1.7406	* 1.8696	* 1.6012	* 3.4434
	* 1.9593	* 1.8823	* 1.8648	* 1.8943	* 1.7945	* 1.8791	* 1.6342	* 3.3299
	* 2.0191	* 1.9145	* 1.9135	* 1.8770	* 1.8085	* 1.8831	* 1.6575	* 3.2445
	* 2.0227	* 1.9113	* 1.9129	* 1.8386	* 1.7852	* 1.8883	* 1.7021	* 3.2111
	* 2.0086	* 1.9068	* 1.9170	* 1.8170	* 1.7458	* 1.9022	* 1.7988	* 3.1330
	* 1.9797	* 1.8946	* 1.9109	* 1.8080	* 1.7481	* 1.8855	* 1.8208	* 2.9549
11	* 2.1206	* 1.7272	* 1.8555	* 1.7433	* 1.9042	* 1.8036	* 2.5189	* 5.1910
	* 2.1422	* 1.8071	* 1.8941	* 1.8242	* 1.8817	* 1.7622	* 2.4652	* 5.0265
	* 2.1130	* 1.7951	* 1.8765	* 1.8200	* 1.8384	* 1.6781	* 2.4200	* 4.8804
	* 2.0997	* 1.7665	* 1.8383	* 1.7859	* 1.8174	* 1.6551	* 2.4092	* 4.7593
	* 2.1072	* 1.7644	* 1.8169	* 1.7358	* 1.7917	* 1.7188	* 2.3999	* 4.4488
	* 2.0919	* 1.7728	* 1.8080	* 1.7402	* 1.7816	* 1.7450	* 2.3204	* 4.0803
12	* 1.8002	* 1.8736	* 1.7388	* 1.9039	* 1.9234	* 1.7076	* 3.1714	*
	* 1.7476	* 1.8813	* 1.7926	* 1.8811	* 1.9130	* 1.7186	* 3.0096	*
	* 1.7212	* 1.8919	* 1.8078	* 1.8379	* 1.8727	* 1.6448	* 2.8533	*
	* 1.7500	* 1.8715	* 1.7846	* 1.8171	* 1.8710	* 1.6238	* 2.7790	*
	* 1.8384	* 1.8675	* 1.7457	* 1.7916	* 1.9012	* 1.6881	* 2.6771	*
	* 1.8736	* 1.8624	* 1.7481	* 1.7815	* 1.8882	* 1.7101	* 2.5447	*
13	* 2.0215	* 1.7802	* 1.8676	* 1.8027	* 1.7074	* 1.5475	* 3.5131	*
	* 2.0301	* 1.7813	* 1.8773	* 1.7613	* 1.7187	* 1.5842	* 3.4355	*
	* 2.0564	* 1.7990	* 1.8817	* 1.6775	* 1.6443	* 1.6060	* 3.3629	*
	* 2.0973	* 1.8327	* 1.8874	* 1.6549	* 1.6236	* 1.6533	* 3.3288	*
	* 2.1688	* 1.8899	* 1.9018	* 1.7188	* 1.6880	* 1.7700	* 3.2356	*
	* 2.1546	* 1.8734	* 1.8853	* 1.7451	* 1.7100	* 1.8110	* 3.0557	*
14	* 1.6201	* 1.6403	* 1.5995	* 2.5172	* 3.1702	* 3.4394	*	*
	* 1.6509	* 1.6614	* 1.6327	* 2.4637	* 3.0086	* 3.3630	*	*
	* 1.6619	* 1.6503	* 1.6564	* 2.4190	* 2.8528	* 3.2975	*	*
	* 1.6825	* 1.6696	* 1.7014	* 2.4087	* 2.7788	* 3.2764	*	*
	* 1.7754	* 1.7612	* 1.7987	* 2.3999	* 2.6773	* 3.2059	*	*
	* 1.7904	* 1.7793	* 1.8209	* 2.3200	* 2.5449	* 3.0344	*	*
15	* 3.6772	* 3.4482	* 3.4414	* 5.1874	* 4 EFPD 118 % POWER			
	* 3.4728	* 3.2723	* 3.3282	* 5.0232	* 50 EFPD 118 % POWER			
	* 3.3221	* 3.1383	* 3.2435	* 4.8782	* 125 EFPD 118 % POWER			
	* 3.2545	* 3.0959	* 3.2108	* 4.7581	* 200 EFPD 118 % POWER			
	* 3.1283	* 3.0199	* 3.1335	* 4.4489	* 350 EFPD 118 % POWER			
	* 2.9512	* 2.8561	* 2.9552	* 4.0807	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 228 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.9460	* 2.2544	* 1.9678	* 2.2329	* 1.8785	* 2.1187	* 1.6799	* 3.9167 *
	* 1.9499	* 2.3092	* 2.0634	* 2.2475	* 1.8168	* 2.1260	* 1.7067	* 3.6826 *
	* 1.9160	* 2.3133	* 2.1288	* 2.2211	* 1.7905	* 2.1571	* 1.7175	* 3.5194 *
	* 1.9151	* 2.2897	* 2.1427	* 2.2186	* 1.8304	* 2.2121	* 1.7468	* 3.4598 *
	* 1.9592	* 2.2593	* 2.1433	* 2.2442	* 1.9400	* 2.3040	* 1.8574	* 3.3432 *
	* 1.9784	* 2.2252	* 2.1292	* 2.2462	* 1.9935	* 2.3055	* 1.8870	* 3.1651 *
9	* 2.2544	* 1.7593	* 1.9117	* 1.8061	* 1.9644	* 1.8590	* 1.7052	* 3.6929 *
	* 2.3092	* 1.8688	* 1.9744	* 1.8862	* 1.9690	* 1.8552	* 1.7218	* 3.4918 *
	* 2.3133	* 1.9258	* 2.0104	* 1.8722	* 1.9827	* 1.8761	* 1.7084	* 3.3502 *
	* 2.2897	* 1.9274	* 2.0167	* 1.8480	* 1.9724	* 1.9213	* 1.7354	* 3.3122 *
	* 2.2593	* 1.9171	* 2.0291	* 1.8606	* 1.9842	* 1.9950	* 1.8442	* 3.2380 *
	* 2.2252	* 1.9021	* 2.0327	* 1.8856	* 1.9948	* 1.9918	* 1.8769	* 3.0755 *
10	* 1.9678	* 1.9123	* 1.8717	* 1.9500	* 1.8153	* 1.9580	* 1.6654	* 3.6771 *
	* 2.0634	* 1.9750	* 1.9559	* 1.9871	* 1.8677	* 1.9634	* 1.6944	* 3.5444 *
	* 2.1288	* 2.0110	* 2.0104	* 1.9702	* 1.8873	* 1.9726	* 1.7201	* 3.4571 *
	* 2.1427	* 2.0173	* 2.0201	* 1.9392	* 1.8705	* 1.9894	* 1.7743	* 3.4414 *
	* 2.1433	* 2.0297	* 2.0411	* 1.9325	* 1.8452	* 2.0201	* 1.8886	* 3.3788 *
	* 2.1292	* 2.0333	* 2.0500	* 1.9375	* 1.8561	* 2.0160	* 1.9249	* 3.2088 *
11	* 2.2329	* 1.8062	* 1.9498	* 1.8255	* 2.0062	* 1.8901	* 2.6949	* 5.5256 *
	* 2.2475	* 1.8862	* 1.9869	* 1.9069	* 1.9769	* 1.8425	* 2.6293	* 5.3591 *
	* 2.2211	* 1.8719	* 1.9698	* 1.9062	* 1.9346	* 1.7510	* 2.5839	* 5.2079 *
	* 2.2186	* 1.8477	* 1.9389	* 1.8773	* 1.9237	* 1.7366	* 2.5854	* 5.1012 *
	* 2.2442	* 1.8605	* 1.9324	* 1.8378	* 1.9101	* 1.8186	* 2.5922	* 4.7936 *
	* 2.2462	* 1.8856	* 1.9375	* 1.8527	* 1.9072	* 1.8534	* 2.5170	* 4.4228 *
12	* 1.8785	* 1.9610	* 1.8133	* 2.0059	* 2.0268	* 1.7865	* 3.4318	*
	* 1.8168	* 1.9661	* 1.8658	* 1.9763	* 2.0077	* 1.7921	* 3.2441	*
	* 1.7905	* 1.9815	* 1.8866	* 1.9341	* 1.9691	* 1.7148	* 3.0716	*
	* 1.8304	* 1.9716	* 1.8699	* 1.9233	* 1.9793	* 1.7023	* 3.0037	*
	* 1.9400	* 1.9838	* 1.8451	* 1.9100	* 2.0283	* 1.7841	* 2.9118	*
	* 1.9935	* 1.9946	* 1.8562	* 1.9071	* 2.0186	* 1.8136	* 2.7821	*
13	* 2.1187	* 1.8551	* 1.9559	* 1.8893	* 1.7863	* 1.6161	* 3.7780	*
	* 2.1260	* 1.8517	* 1.9614	* 1.8416	* 1.7920	* 1.6500	* 3.6849	*
	* 2.1571	* 1.8732	* 1.9712	* 1.7505	* 1.7143	* 1.6755	* 3.6109	*
	* 2.2121	* 1.9192	* 1.9885	* 1.7363	* 1.7020	* 1.7363	* 3.5951	*
	* 2.3040	* 1.9938	* 2.0198	* 1.8186	* 1.7840	* 1.8705	* 3.5218	*
	* 2.3055	* 1.9912	* 2.0159	* 1.8535	* 1.8135	* 1.9186	* 3.3315	*
14	* 1.6799	* 1.7024	* 1.6637	* 2.6930	* 3.4306	* 3.7023	*	
	* 1.7067	* 1.7192	* 1.6928	* 2.6276	* 3.2430	* 3.6099	*	
	* 1.7175	* 1.7064	* 1.7189	* 2.5827	* 3.0711	* 3.5439	*	
	* 1.7468	* 1.7341	* 1.7736	* 2.5847	* 3.0034	* 3.5350	*	
	* 1.8574	* 1.8435	* 1.8885	* 2.5922	* 2.9120	* 3.4816	*	
	* 1.8870	* 1.8764	* 1.9250	* 2.5166	* 2.7824	* 3.3045	*	
15	* 3.9167	* 3.6903	* 3.6748	* 5.5220	* 4 EFPD	118 % POWER		
	* 3.6826	* 3.4897	* 3.5425	* 5.3559	* 50 EFPD	118 % POWER		
	* 3.5194	* 3.3488	* 3.4560	* 5.2054	* 125 EFPD	118 % POWER		
	* 3.4598	* 3.3115	* 3.4410	* 5.0998	* 200 EFPD	118 % POWER		
	* 3.3432	* 3.2376	* 3.3795	* 4.7937	* 350 EFPD	118 % POWER		
	* 3.1651	* 3.0754	* 3.2093	* 4.4232	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 229 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.0416	* 2.3695	* 2.0778	* 2.3487	* 1.9763	* 2.2467	* 1.7755	* 4.0974
	* 2.0422	* 2.4246	* 2.1645	* 2.3487	* 1.9077	* 2.2401	* 1.7979	* 3.8687
	* 2.0084	* 2.4296	* 2.2323	* 2.3285	* 1.8863	* 2.2821	* 1.8086	* 3.7139
	* 2.0160	* 2.4143	* 2.2578	* 2.3496	* 1.9449	* 2.3554	* 1.8474	* 3.6658
	* 2.0841	* 2.4040	* 2.2840	* 2.4017	* 2.0798	* 2.4691	* 1.9778	* 3.5624
	* 2.1291	* 2.3926	* 2.2847	* 2.4163	* 2.1457	* 2.4732	* 2.0145	* 3.3774
9	* 2.3695	* 1.8514	* 2.0210	* 1.9041	* 2.0821	* 1.9662	* 1.8019	* 3.8647
	* 2.4246	* 1.9567	* 2.0727	* 1.9803	* 2.0772	* 1.9563	* 1.8137	* 3.6691
	* 2.4296	* 2.0169	* 2.1161	* 1.9746	* 2.0924	* 1.9808	* 1.7988	* 3.5383
	* 2.4143	* 2.0261	* 2.1340	* 1.9628	* 2.1007	* 2.0384	* 1.8352	* 3.5125
	* 2.4040	* 2.0453	* 2.1693	* 1.9924	* 2.1314	* 2.1316	* 1.9638	* 3.4524
	* 2.3926	* 2.0492	* 2.1848	* 2.0277	* 2.1494	* 2.1339	* 2.0038	* 3.2845
10	* 2.0778	* 2.0218	* 1.9832	* 2.0653	* 1.9193	* 2.0756	* 1.7598	* 3.8601
	* 2.1645	* 2.0733	* 2.0604	* 2.0971	* 1.9738	* 2.0737	* 1.7849	* 3.7313
	* 2.2323	* 2.1168	* 2.1209	* 2.0851	* 1.9917	* 2.0898	* 1.8133	* 3.6550
	* 2.2578	* 2.1347	* 2.1437	* 2.0648	* 1.9858	* 2.1182	* 1.8795	* 3.6533
	* 2.2840	* 2.1700	* 2.1866	* 2.0740	* 1.9710	* 2.1648	* 2.0136	* 3.6050
	* 2.2847	* 2.1855	* 2.2089	* 2.0893	* 1.9990	* 2.1685	* 2.0578	* 3.4283
11	* 2.3487	* 1.9042	* 2.0652	* 1.9234	* 2.1276	* 1.9998	* 2.8387	* 5.7796
	* 2.3487	* 1.9797	* 2.0969	* 2.0043	* 2.0908	* 1.9425	* 2.7760	* 5.5936
	* 2.3285	* 1.9743	* 2.0847	* 2.0126	* 2.0491	* 1.8505	* 2.7336	* 5.4589
	* 2.3496	* 1.9625	* 2.0645	* 1.9916	* 2.0447	* 1.8450	* 2.7472	* 5.3762
	* 2.4017	* 1.9924	* 2.0739	* 1.9654	* 2.0470	* 1.9448	* 2.7700	* 5.0868
	* 2.4163	* 2.0277	* 2.0894	* 1.9991	* 2.0608	* 1.9979	* 2.7018	* 4.7102
12	* 1.9763	* 2.0788	* 1.9174	* 2.1272	* 2.1518	* 1.8965	* 3.5942	*
	* 1.9077	* 2.0741	* 1.9719	* 2.0901	* 2.1274	* 1.8969	* 3.4115	*
	* 1.8863	* 2.0912	* 1.9910	* 2.0486	* 2.0897	* 1.8137	* 3.2517	*
	* 1.9449	* 2.1000	* 1.9852	* 2.0443	* 2.1123	* 1.8105	* 3.1948	*
	* 2.0798	* 2.1310	* 1.9708	* 2.0468	* 2.1809	* 1.9131	* 3.1184	*
	* 2.1457	* 2.1491	* 1.9991	* 2.0607	* 2.1877	* 1.9600	* 2.9999	*
13	* 2.2467	* 1.9621	* 2.0734	* 1.9987	* 1.8963	* 1.7153	* 4.0088	*
	* 2.2401	* 1.9526	* 2.0717	* 1.9415	* 1.8971	* 1.7459	* 3.9106	*
	* 2.2821	* 1.9779	* 2.0883	* 1.8499	* 1.8132	* 1.7754	* 3.8334	*
	* 2.3554	* 2.0363	* 2.1172	* 1.8447	* 1.8102	* 1.8501	* 3.8349	*
	* 2.4691	* 2.1304	* 2.1644	* 1.9449	* 1.9130	* 2.0078	* 3.7758	*
	* 2.4732	* 2.1333	* 2.1684	* 1.9980	* 1.9599	* 2.0745	* 3.5979	*
14	* 1.7755	* 1.7990	* 1.7580	* 2.8368	* 3.5930	* 3.9307	*	*
	* 1.7979	* 1.8110	* 1.7832	* 2.7744	* 3.4106	* 3.8321	*	*
	* 1.8086	* 1.7968	* 1.8121	* 2.7323	* 3.2511	* 3.7633	*	*
	* 1.8474	* 1.8338	* 1.8788	* 2.7464	* 3.1945	* 3.7714	*	*
	* 1.9778	* 1.9631	* 2.0136	* 2.7699	* 3.1187	* 3.7374	*	*
	* 2.0145	* 2.0033	* 2.0579	* 2.7013	* 3.0002	* 3.5677	*	*
15	* 4.0974	* 3.8621	* 3.8580	* 5.7757	* 4 EFPD	118 % POWER		
	* 3.8687	* 3.6669	* 3.7295	* 5.5901	* 50 EFPD	118 % POWER		
	* 3.7139	* 3.5368	* 3.6538	* 5.4566	* 125 EFPD	118 % POWER		
	* 3.6658	* 3.5116	* 3.6528	* 5.3749	* 200 EFPD	118 % POWER		
	* 3.5624	* 3.4520	* 3.6057	* 5.0867	* 350 EFPD	118 % POWER		
	* 3.3774	* 3.2844	* 3.4289	* 4.7106	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 230 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.0473	* 2.3670	* 2.0703	* 2.3394	* 1.9795	* 2.2420	* 1.7932	* 4.1502
	* 2.0257	* 2.3832	* 2.1395	* 2.3171	* 1.8813	* 2.2014	* 1.7839	* 3.8262
	* 1.9956	* 2.3934	* 2.2020	* 2.2889	* 1.8541	* 2.2366	* 1.8051	* 3.6610
	* 2.0198	* 2.3953	* 2.2435	* 2.3162	* 1.9257	* 2.3318	* 1.8761	* 3.6659
	* 2.1122	* 2.4073	* 2.2933	* 2.3975	* 2.0918	* 2.4891	* 2.0536	* 3.6343
	* 2.2484	* 2.4739	* 2.3756	* 2.4978	* 2.2422	* 2.5835	* 2.1745	* 3.5621
9	* 2.3670	* 1.8526	* 2.0101	* 1.9054	* 2.0809	* 1.9832	* 1.8265	* 3.9059
	* 2.3832	* 1.9390	* 2.0469	* 1.9584	* 2.0464	* 1.9431	* 1.8094	* 3.6176
	* 2.3934	* 1.9947	* 2.0850	* 1.9495	* 2.0573	* 1.9695	* 1.8013	* 3.4698
	* 2.3953	* 2.0189	* 2.1138	* 1.9492	* 2.0818	* 2.0549	* 1.8693	* 3.4985
	* 2.4073	* 2.0662	* 2.1742	* 2.0167	* 2.1468	* 2.1898	* 2.0430	* 3.5186
	* 2.4739	* 2.1568	* 2.2732	* 2.1407	* 2.2542	* 2.2743	* 2.1685	* 3.4574
10	* 2.0703	* 2.0109	* 1.9737	* 2.0634	* 1.9363	* 2.0980	* 1.7992	* 3.9267
	* 2.1395	* 2.0476	* 2.0347	* 2.0701	* 1.9570	* 2.0670	* 1.7962	* 3.7081
	* 2.2020	* 2.0857	* 2.0916	* 2.0551	* 1.9668	* 2.0776	* 1.8270	* 3.6148
	* 2.2435	* 2.1144	* 2.1302	* 2.0490	* 1.9928	* 2.1287	* 1.9221	* 3.6563
	* 2.2933	* 2.1749	* 2.2029	* 2.0921	* 2.0217	* 2.2153	* 2.1027	* 3.6707
	* 2.3756	* 2.2739	* 2.3120	* 2.1967	* 2.1433	* 2.3089	* 2.2282	* 3.5997
11	* 2.3394	* 1.9055	* 2.0632	* 1.9394	* 2.1846	* 2.0466	* 2.8819	* 5.9505
	* 2.3171	* 1.9577	* 2.0699	* 1.9948	* 2.1226	* 1.9649	* 2.7599	* 5.6572
	* 2.2889	* 1.9492	* 2.0545	* 2.0023	* 2.0678	* 1.8733	* 2.7114	* 5.5141
	* 2.3162	* 1.9489	* 2.0487	* 2.0043	* 2.0606	* 1.8912	* 2.7561	* 5.4923
	* 2.3975	* 2.0166	* 2.0920	* 2.0203	* 2.1025	* 2.0330	* 2.8308	* 5.2832
	* 2.4978	* 2.1407	* 2.1968	* 2.1479	* 2.2076	* 2.1726	* 2.8646	* 4.9874
12	* 1.9795	* 2.0772	* 1.9341	* 2.1842	* 2.2260	* 2.0001	* 3.7098	*
	* 1.8813	* 2.0433	* 1.9549	* 2.1218	* 2.1747	* 1.9465	* 3.4525	*
	* 1.8541	* 2.0561	* 1.9660	* 2.0671	* 2.1459	* 1.8683	* 3.2669	*
	* 1.9257	* 2.0809	* 1.9922	* 2.0602	* 2.1881	* 1.8885	* 3.2461	*
	* 2.0918	* 2.1464	* 2.0216	* 2.1023	* 2.2887	* 2.0371	* 3.2247	*
	* 2.2422	* 2.2540	* 2.1433	* 2.2076	* 2.3749	* 2.1335	* 3.1734	*
13	* 2.2420	* 1.9791	* 2.0956	* 2.0452	* 1.9999	* 1.8214	* 4.1660	*
	* 2.2014	* 1.9396	* 2.0648	* 1.9638	* 1.9457	* 1.8228	* 4.0082	*
	* 2.2366	* 1.9666	* 2.0760	* 1.8725	* 1.8678	* 1.8508	* 3.9184	*
	* 2.3318	* 2.0529	* 2.1277	* 1.8908	* 1.8882	* 1.9517	* 3.9578	*
	* 2.4891	* 2.1886	* 2.2150	* 2.0330	* 2.0370	* 2.1610	* 3.9603	*
	* 2.5835	* 2.2738	* 2.3088	* 2.1728	* 2.1334	* 2.2550	* 3.8089	*
14	* 1.7932	* 1.8235	* 1.7972	* 2.8795	* 3.7082	* 4.0817	*	*
	* 1.7839	* 1.8067	* 1.7944	* 2.7578	* 3.4510	* 3.9257	*	*
	* 1.8051	* 1.7992	* 1.8257	* 2.7099	* 3.2662	* 3.8451	*	*
	* 1.8761	* 1.8679	* 1.9213	* 2.7553	* 3.2457	* 3.8975	*	*
	* 2.0536	* 2.0423	* 2.1026	* 2.8307	* 3.2250	* 3.9259	*	*
	* 2.1745	* 2.1680	* 2.2284	* 2.8640	* 3.1737	* 3.7836	*	*
15	* 4.1502	* 3.9030	* 3.9238	* 5.9458	* 4 EFPD	118 % POWER		
	* 3.8262	* 3.6152	* 3.7057	* 5.6531	* 50 EFPD	118 % POWER		
	* 3.6610	* 3.4679	* 3.6134	* 5.5113	* 125 EFPD	118 % POWER		
	* 3.6659	* 3.4973	* 3.6558	* 5.4908	* 200 EFPD	118 % POWER		
	* 3.6343	* 3.5183	* 3.6711	* 5.2833	* 350 EFPD	118 % POWER		
	* 3.5621	* 3.4574	* 3.6000	* 4.9879	* 460 EFPD	118 % POWER		

## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248

Appendix A, Rev. 0

Page 231 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 11 OF 24

(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.9569	* 2.2735	* 1.9945	* 2.2426	* 1.8921	* 2.1631	* 1.7131	* 4.0195
	* 1.9444	* 2.3098	* 2.0544	* 2.2179	* 1.8002	* 2.1273	* 1.7041	* 3.7204
	* 1.9087	* 2.3098	* 2.1122	* 2.1906	* 1.7706	* 2.1578	* 1.7184	* 3.5626
	* 1.9217	* 2.3022	* 2.1455	* 2.2172	* 1.8375	* 2.2449	* 1.7819	* 3.5615
	* 2.0153	* 2.3178	* 2.2014	* 2.3058	* 1.9976	* 2.3976	* 1.9528	* 3.5353
	* 2.1150	* 2.3635	* 2.2493	* 2.3672	* 2.1073	* 2.4476	* 2.0349	* 3.4000
9	* 2.2735	* 1.7731	* 1.9383	* 1.8264	* 2.0040	* 1.9019	* 1.7457	* 3.8035
	* 2.3098	* 1.8518	* 1.9661	* 1.8623	* 1.9717	* 1.8646	* 1.7289	* 3.5394
	* 2.3098	* 1.9096	* 1.9967	* 1.8595	* 1.9750	* 1.8873	* 1.7145	* 3.4031
	* 2.3022	* 1.9242	* 2.0234	* 1.8620	* 2.0024	* 1.9658	* 1.7742	* 3.4201
	* 2.3178	* 1.9784	* 2.0922	* 1.9237	* 2.0632	* 2.0978	* 1.9431	* 3.4323
	* 2.3635	* 2.0260	* 2.1511	* 2.0098	* 2.1316	* 2.1438	* 2.0297	* 3.3133
10	* 1.9945	* 1.9390	* 1.9052	* 1.9931	* 1.8589	* 2.0210	* 1.7219	* 3.8207
	* 2.0544	* 1.9668	* 1.9597	* 1.9953	* 1.8790	* 1.9919	* 1.7177	* 3.6250
	* 2.1122	* 1.9973	* 2.0082	* 1.9795	* 1.8817	* 2.0005	* 1.7424	* 3.5404
	* 2.1455	* 2.0240	* 2.0461	* 1.9727	* 1.9062	* 2.0470	* 1.8292	* 3.5797
	* 2.2014	* 2.0929	* 2.1209	* 2.0128	* 1.9322	* 2.1320	* 2.0038	* 3.6025
	* 2.2493	* 2.1518	* 2.1878	* 2.0793	* 2.0113	* 2.1843	* 2.0978	* 3.4763
11	* 2.2426	* 1.8265	* 1.9929	* 1.8608	* 2.1112	* 1.9669	* 2.8158	* 5.8009
	* 2.2179	* 1.8617	* 1.9951	* 1.9111	* 2.0524	* 1.8930	* 2.7023	* 5.5157
	* 2.1906	* 1.8589	* 1.9791	* 1.9235	* 1.9987	* 1.7965	* 2.6567	* 5.3602
	* 2.2172	* 1.8617	* 1.9724	* 1.9217	* 1.9874	* 1.8082	* 2.6947	* 5.3258
	* 2.3058	* 1.9236	* 2.0127	* 1.9313	* 2.0230	* 1.9428	* 2.7683	* 5.1288
	* 2.3672	* 2.0098	* 2.0794	* 2.0200	* 2.0867	* 2.0473	* 2.7499	* 4.8332
12	* 1.8921	* 2.0004	* 1.8567	* 2.1108	* 2.1501	* 1.9182	* 3.6330	*
	* 1.8002	* 1.9689	* 1.8771	* 2.0517	* 2.1046	* 1.8714	* 3.3859	*
	* 1.7706	* 1.9739	* 1.8810	* 1.9980	* 2.0696	* 1.7855	* 3.2088	*
	* 1.8375	* 2.0016	* 1.9056	* 1.9870	* 2.1063	* 1.8009	* 3.1849	*
	* 1.9976	* 2.0628	* 1.9321	* 2.0228	* 2.2044	* 1.9452	* 3.1668	*
	* 2.1073	* 2.1314	* 2.0114	* 2.0867	* 2.2717	* 2.0493	* 3.1013	*
13	* 2.1631	* 1.8979	* 2.0186	* 1.9657	* 1.9180	* 1.7434	* 4.0934	*
	* 2.1273	* 1.8611	* 1.9896	* 1.8918	* 1.8707	* 1.7448	* 3.9291	*
	* 2.1578	* 1.8846	* 1.9990	* 1.7958	* 1.7850	* 1.7679	* 3.8473	*
	* 2.2449	* 1.9638	* 2.0460	* 1.8078	* 1.8006	* 1.8614	* 3.8828	*
	* 2.3976	* 2.0968	* 2.1317	* 1.9428	* 1.9452	* 2.0639	* 3.8912	*
	* 2.4476	* 2.1434	* 2.1842	* 2.0474	* 2.0492	* 2.1913	* 3.7736	*
14	* 1.7131	* 1.7427	* 1.7199	* 2.8135	* 3.6316	* 4.0159	*	*
	* 1.7041	* 1.7262	* 1.7159	* 2.7002	* 3.3847	* 3.8529	*	*
	* 1.7184	* 1.7125	* 1.7412	* 2.6551	* 3.2082	* 3.7791	*	*
	* 1.7819	* 1.7728	* 1.8285	* 2.6937	* 3.1846	* 3.8197	*	*
	* 1.9528	* 1.9424	* 2.0038	* 2.7681	* 3.1671	* 3.8509	*	*
	* 2.0349	* 2.0293	* 2.0980	* 2.7493	* 3.1017	* 3.7462	*	*
15	* 4.0195	* 3.8007	* 3.8180	* 5.7961	* 4 EFPD 118 % POWER			
	* 3.7204	* 3.5372	* 3.6228	* 5.5114	* 50 EFPD 118 % POWER			
	* 3.5626	* 3.4016	* 3.5391	* 5.3573	* 125 EFPD 118 % POWER			
	* 3.5615	* 3.4192	* 3.5792	* 5.3242	* 200 EFPD 118 % POWER			
	* 3.5353	* 3.4320	* 3.6032	* 5.1289	* 350 EFPD 118 % POWER			
	* 3.4000	* 3.3132	* 3.4769	* 4.8336	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 232 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8624	* 2.1689	* 1.9016	* 2.1374	* 1.7946	* 2.0489	* 1.6140	* 3.8100
	* 1.8477	* 2.1975	* 1.9538	* 2.1070	* 1.7005	* 2.0097	* 1.5995	* 3.5163
	* 1.8111	* 2.1933	* 2.0048	* 2.0781	* 1.6704	* 2.0384	* 1.6138	* 3.3523
	* 1.8249	* 2.1856	* 2.0353	* 2.1035	* 1.7348	* 2.1242	* 1.6756	* 3.3517
	* 1.9168	* 2.2094	* 2.0935	* 2.1963	* 1.9036	* 2.2877	* 1.8662	* 3.3713
	* 1.9941	* 2.2312	* 2.1222	* 2.2394	* 1.9919	* 2.3219	* 1.9202	* 3.2296
9	* 2.1689	* 1.6858	* 1.8429	* 1.7342	* 1.9000	* 1.8000	* 1.6474	* 3.6162
	* 2.1975	* 1.7560	* 1.8685	* 1.7644	* 1.8634	* 1.7570	* 1.6242	* 3.3556
	* 2.1933	* 1.8068	* 1.8944	* 1.7587	* 1.8719	* 1.7784	* 1.6102	* 3.2115
	* 2.1856	* 1.8202	* 1.9185	* 1.7578	* 1.8950	* 1.8550	* 1.6697	* 3.2278
	* 2.2094	* 1.8790	* 1.9900	* 1.8371	* 1.9719	* 2.0074	* 1.8565	* 3.2836
	* 2.2312	* 1.9132	* 2.0336	* 1.8961	* 2.0182	* 2.0293	* 1.9142	* 3.1602
10	* 1.9016	* 1.8437	* 1.8087	* 1.8903	* 1.7542	* 1.9119	* 1.6234	* 3.6341
	* 1.9538	* 1.8691	* 1.8577	* 1.8894	* 1.7664	* 1.8750	* 1.6116	* 3.4292
	* 2.0048	* 1.8951	* 1.9050	* 1.8709	* 1.7760	* 1.8857	* 1.6367	* 3.3369
	* 2.0353	* 1.9191	* 1.9402	* 1.8662	* 1.7968	* 1.9355	* 1.7228	* 3.3779
	* 2.0935	* 1.9907	* 2.0203	* 1.9258	* 1.8444	* 2.0396	* 1.9113	* 3.4353
	* 2.1222	* 2.0342	* 2.0721	* 1.9686	* 1.8984	* 2.0675	* 1.9761	* 3.3051
11	* 2.1374	* 1.7343	* 1.8902	* 1.7626	* 1.9943	* 1.8499	* 2.6688	* 5.5063
	* 2.1070	* 1.7638	* 1.8893	* 1.8065	* 1.9253	* 1.7674	* 2.5406	* 5.2145
	* 2.0782	* 1.7581	* 1.8705	* 1.8077	* 1.8757	* 1.6818	* 2.4932	* 5.0656
	* 2.1035	* 1.7575	* 1.8659	* 1.8097	* 1.8743	* 1.7013	* 2.5391	* 5.0411
	* 2.1963	* 1.8371	* 1.9257	* 1.8455	* 1.9367	* 1.8572	* 2.6439	* 4.8831
	* 2.2394	* 1.8961	* 1.9687	* 1.9086	* 1.9771	* 1.9342	* 2.6106	* 4.5632
12	* 1.7946	* 1.8965	* 1.7522	* 1.9939	* 2.0353	* 1.8003	* 3.4550	*
	* 1.7005	* 1.8605	* 1.7645	* 1.9246	* 1.9809	* 1.7507	* 3.1985	*
	* 1.6704	* 1.8707	* 1.7753	* 1.8750	* 1.9518	* 1.6758	* 3.0209	*
	* 1.7348	* 1.8943	* 1.7963	* 1.8739	* 1.9948	* 1.6977	* 3.0052	*
	* 1.9036	* 1.9716	* 1.8443	* 1.9366	* 2.1170	* 1.8651	* 3.0283	*
	* 1.9919	* 2.0180	* 1.8984	* 1.9771	* 2.1566	* 1.9375	* 2.9507	*
13	* 2.0489	* 1.7964	* 1.9098	* 1.8486	* 1.8002	* 1.6358	* 3.8601	*
	* 2.0097	* 1.7538	* 1.8730	* 1.7663	* 1.7500	* 1.6287	* 3.6703	*
	* 2.0384	* 1.7758	* 1.8843	* 1.6811	* 1.6753	* 1.6557	* 3.5928	*
	* 2.1242	* 1.8532	* 1.9346	* 1.7010	* 1.6975	* 1.7499	* 3.6383	*
	* 2.2877	* 2.0065	* 2.0394	* 1.8573	* 1.8651	* 1.9793	* 3.7262	*
	* 2.3219	* 2.0290	* 2.0675	* 1.9344	* 1.9374	* 2.0725	* 3.5940	*
14	* 1.6140	* 1.6447	* 1.6217	* 2.6664	* 3.4536	* 3.7870	*	*
	* 1.5995	* 1.6218	* 1.6100	* 2.5385	* 3.1972	* 3.5990	*	*
	* 1.6138	* 1.6084	* 1.6356	* 2.4917	* 3.0203	* 3.5289	*	*
	* 1.6756	* 1.6685	* 1.7221	* 2.5382	* 3.0049	* 3.5795	*	*
	* 1.8662	* 1.8559	* 1.9113	* 2.6437	* 3.0286	* 3.6853	*	*
	* 1.9202	* 1.9138	* 1.9763	* 2.6100	* 2.9511	* 3.5693	*	*
15	* 3.8100	* 3.6137	* 3.6317	* 5.5017	* 4 EFPD	118 % POWER		
	* 3.5163	* 3.3535	* 3.4270	* 5.2104	* 50 EFPD	118 % POWER		
	* 3.3523	* 3.2096	* 3.3356	* 5.0630	* 125 EFPD	118 % POWER		
	* 3.3517	* 3.2264	* 3.3774	* 5.0396	* 200 EFPD	118 % POWER		
	* 3.3713	* 3.2837	* 3.4360	* 4.8831	* 350 EFPD	118 % POWER		
	* 3.2296	* 3.1610	* 3.3056	* 4.5635	* 460 EFPD	118 % POWER		



## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248

Appendix A, Rev. 0

Page 233 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7591	* 2.0513	* 1.7934	* 2.0158	* 1.6873	* 1.9271	* 1.5139	* 3.5946
	* 1.7471	* 2.0830	* 1.8486	* 1.9891	* 1.5993	* 1.8932	* 1.5015	* 3.3140
	* 1.7097	* 2.0767	* 1.8972	* 1.9590	* 1.5680	* 1.9187	* 1.5107	* 3.1536
	* 1.7140	* 2.0610	* 1.9199	* 1.9770	* 1.6243	* 1.9954	* 1.5649	* 3.1450
	* 1.7951	* 2.0718	* 1.9654	* 2.0631	* 1.7846	* 2.1517	* 1.7435	* 3.1615
	* 1.8716	* 2.0954	* 1.9971	* 2.1102	* 1.8755	* 2.1908	* 1.8078	* 3.0369
9	* 2.0513	* 1.5898	* 1.7341	* 1.6327	* 1.7845	* 1.6856	* 1.5427	* 3.4002
	* 2.0830	* 1.6607	* 1.7640	* 1.6628	* 1.7534	* 1.6468	* 1.5218	* 3.1513
	* 2.0767	* 1.7098	* 1.7887	* 1.6556	* 1.7610	* 1.6657	* 1.5057	* 3.0096
	* 2.0610	* 1.7147	* 1.8057	* 1.6480	* 1.7787	* 1.7341	* 1.5581	* 3.0187
	* 2.0718	* 1.7577	* 1.8670	* 1.7149	* 1.8481	* 1.8784	* 1.7333	* 3.0710
	* 2.0954	* 1.7953	* 1.9138	* 1.7837	* 1.9018	* 1.9114	* 1.8016	* 2.9605
10	* 1.7934	* 1.7348	* 1.7023	* 1.7790	* 1.6498	* 1.7955	* 1.5208	* 3.4140
	* 1.8486	* 1.7646	* 1.7536	* 1.7829	* 1.6637	* 1.7608	* 1.5101	* 3.2192
	* 1.8972	* 1.7894	* 1.7988	* 1.7631	* 1.6724	* 1.7721	* 1.5306	* 3.1268
	* 1.9199	* 1.8064	* 1.8264	* 1.7531	* 1.6830	* 1.8153	* 1.6074	* 3.1581
	* 1.9654	* 1.8676	* 1.8965	* 1.8009	* 1.7194	* 1.9079	* 1.7839	* 3.2152
	* 1.9971	* 1.9144	* 1.9515	* 1.8537	* 1.7845	* 1.9475	* 1.8581	* 3.0984
11	* 2.0158	* 1.6328	* 1.7789	* 1.6589	* 1.8695	* 1.7356	* 2.5041	* 5.2021
	* 1.9891	* 1.6622	* 1.7827	* 1.7038	* 1.8044	* 1.6564	* 2.3843	* 4.9295
	* 1.9590	* 1.6551	* 1.7627	* 1.6992	* 1.7585	* 1.5724	* 2.3345	* 4.7767
	* 1.9770	* 1.6478	* 1.7528	* 1.6943	* 1.7554	* 1.5863	* 2.3714	* 4.7380
	* 2.0631	* 1.7148	* 1.8009	* 1.7196	* 1.8080	* 1.7298	* 2.4635	* 4.5787
	* 2.1102	* 1.7837	* 1.8538	* 1.7933	* 1.8605	* 1.8171	* 2.4432	* 4.2834
12	* 1.6873	* 1.7811	* 1.6478	* 1.8691	* 1.9071	* 1.6811	* 3.2393	*
	* 1.5993	* 1.7506	* 1.6618	* 1.8037	* 1.8567	* 1.6368	* 2.9920	*
	* 1.5680	* 1.7599	* 1.6717	* 1.7578	* 1.8227	* 1.5598	* 2.8177	*
	* 1.6243	* 1.7780	* 1.6825	* 1.7551	* 1.8607	* 1.5776	* 2.7964	*
	* 1.7846	* 1.8478	* 1.7193	* 1.8079	* 1.9775	* 1.7343	* 2.8175	*
	* 1.8755	* 1.9016	* 1.7846	* 1.8605	* 2.0288	* 1.8170	* 2.7570	*
13	* 1.9271	* 1.6821	* 1.7933	* 1.7344	* 1.6810	* 1.5242	* 3.6139	*
	* 1.8932	* 1.6438	* 1.7588	* 1.6554	* 1.6362	* 1.5166	* 3.4352	*
	* 1.9187	* 1.6634	* 1.7708	* 1.5718	* 1.5593	* 1.5382	* 3.3538	*
	* 1.9954	* 1.7325	* 1.8145	* 1.5860	* 1.5774	* 1.6240	* 3.3888	*
	* 2.1517	* 1.8776	* 1.9077	* 1.7299	* 1.7343	* 1.8377	* 3.4549	*
	* 2.1908	* 1.9111	* 1.9475	* 1.8172	* 1.8170	* 1.9405	* 3.3497	*
14	* 1.5139	* 1.5401	* 1.5190	* 2.5018	* 3.2379	* 3.5462	*	*
	* 1.5015	* 1.5194	* 1.5086	* 2.3822	* 2.9907	* 3.3692	*	*
	* 1.5107	* 1.5040	* 1.5295	* 2.3331	* 2.8170	* 3.2949	*	*
	* 1.5649	* 1.5569	* 1.6067	* 2.3705	* 2.7961	* 3.3351	*	*
	* 1.7435	* 1.7328	* 1.7839	* 2.4633	* 2.8177	* 3.4237	*	*
	* 1.8078	* 1.8013	* 1.8583	* 2.4426	* 2.7573	* 3.3247	*	*
15	* 3.5946	* 3.3976	* 3.4115	* 5.1976	* 4 EFPD 118 % POWER			
	* 3.3140	* 3.1491	* 3.2168	* 4.9255	* 50 EFPD 118 % POWER			
	* 3.1536	* 3.0082	* 3.1254	* 4.7740	* 125 EFPD 118 % POWER			
	* 3.1450	* 3.0177	* 3.1575	* 4.7365	* 200 EFPD 118 % POWER			
	* 3.1615	* 3.0707	* 3.2158	* 4.5787	* 350 EFPD 118 % POWER			
	* 3.0369	* 2.9603	* 3.0990	* 4.2838	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 234 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6771	* 1.9520	* 1.7029	* 1.9178	* 1.6049	* 1.8302	* 1.4393	* 3.3893
	* 1.6724	* 1.9845	* 1.7645	* 1.8993	* 1.5274	* 1.8036	* 1.4319	* 3.1301
	* 1.6375	* 1.9851	* 1.8132	* 1.8683	* 1.4965	* 1.8274	* 1.4376	* 2.9748
	* 1.6296	* 1.9597	* 1.8275	* 1.8773	* 1.5431	* 1.8936	* 1.4836	* 2.9571
	* 1.6925	* 1.9427	* 1.8577	* 1.9483	* 1.6855	* 2.0312	* 1.6461	* 2.9563
	* 1.7653	* 1.9564	* 1.8882	* 1.9942	* 1.7743	* 2.0686	* 1.7088	* 2.8403
9	* 1.9520	* 1.5135	* 1.6446	* 1.5525	* 1.6945	* 1.5962	* 1.4638	* 3.1964
	* 1.9845	* 1.5888	* 1.6807	* 1.5907	* 1.6714	* 1.5643	* 1.4482	* 2.9655
	* 1.9851	* 1.6409	* 1.7054	* 1.5828	* 1.6792	* 1.5814	* 1.4317	* 2.8258
	* 1.9597	* 1.6357	* 1.7138	* 1.5666	* 1.6875	* 1.6405	* 1.4762	* 2.8273
	* 1.9427	* 1.6597	* 1.7628	* 1.6189	* 1.7438	* 1.7709	* 1.6354	* 2.8666
	* 1.9564	* 1.6925	* 1.8085	* 1.6851	* 1.7965	* 1.8039	* 1.7022	* 2.7618
10	* 1.7029	* 1.6453	* 1.6144	* 1.6872	* 1.5674	* 1.6978	* 1.4393	* 3.2045
	* 1.7645	* 1.6814	* 1.6722	* 1.6993	* 1.5860	* 1.6703	* 1.4335	* 3.0260
	* 1.8132	* 1.7060	* 1.7150	* 1.6793	* 1.5950	* 1.6825	* 1.4521	* 2.9335
	* 1.8275	* 1.7144	* 1.7342	* 1.6604	* 1.5986	* 1.7172	* 1.5206	* 2.9472
	* 1.8577	* 1.7634	* 1.7919	* 1.6960	* 1.6197	* 1.7979	* 1.6830	* 2.9806
	* 1.8882	* 1.8091	* 1.8456	* 1.7476	* 1.6833	* 1.8374	* 1.7550	* 2.8698
11	* 1.9178	* 1.5526	* 1.6871	* 1.5794	* 1.7719	* 1.6509	* 2.3511	* 4.8935
	* 1.8993	* 1.5902	* 1.6991	* 1.6293	* 1.7140	* 1.5774	* 2.2441	* 4.6499
	* 1.8683	* 1.5823	* 1.6788	* 1.6221	* 1.6716	* 1.4959	* 2.1930	* 4.5017
	* 1.8773	* 1.5664	* 1.6601	* 1.6116	* 1.6644	* 1.5022	* 2.2181	* 4.4475
	* 1.9483	* 1.6189	* 1.6960	* 1.6189	* 1.7014	* 1.6272	* 2.2922	* 4.2846
	* 1.9942	* 1.6852	* 1.7477	* 1.6887	* 1.7530	* 1.7119	* 2.2735	* 4.0055
12	* 1.6049	* 1.6913	* 1.5655	* 1.7716	* 1.8057	* 1.5884	* 3.0313	*
	* 1.5274	* 1.6687	* 1.5842	* 1.7133	* 1.7615	* 1.5543	* 2.8049	*
	* 1.4965	* 1.6781	* 1.5943	* 1.6710	* 1.7224	* 1.4775	* 2.6395	*
	* 1.5431	* 1.6867	* 1.5981	* 1.6641	* 1.7543	* 1.4866	* 2.6099	*
	* 1.6855	* 1.7434	* 1.6196	* 1.7013	* 1.8591	* 1.6272	* 2.6115	*
	* 1.7743	* 1.7963	* 1.6834	* 1.7530	* 1.9095	* 1.7079	* 2.5503	*
13	* 1.8302	* 1.5929	* 1.6956	* 1.6498	* 1.5883	* 1.4374	* 3.3822	*
	* 1.8036	* 1.5614	* 1.6684	* 1.5764	* 1.5537	* 1.4331	* 3.2218	*
	* 1.8274	* 1.5793	* 1.6812	* 1.4952	* 1.4770	* 1.4510	* 3.1382	*
	* 1.8936	* 1.6389	* 1.7164	* 1.5019	* 1.4864	* 1.5268	* 3.1546	*
	* 2.0312	* 1.7701	* 1.7977	* 1.6273	* 1.6271	* 1.7232	* 3.1967	*
	* 2.0686	* 1.8036	* 1.8374	* 1.7120	* 1.7079	* 1.8227	* 3.0970	*
14	* 1.4393	* 1.4613	* 1.4375	* 2.3488	* 3.0299	* 3.3161	*	*
	* 1.4319	* 1.4460	* 1.4320	* 2.2421	* 2.8036	* 3.1578	*	*
	* 1.4376	* 1.4300	* 1.4511	* 2.1916	* 2.6388	* 3.0830	*	*
	* 1.4836	* 1.4751	* 1.5200	* 2.2173	* 2.6096	* 3.1089	*	*
	* 1.6461	* 1.6349	* 1.6830	* 2.2920	* 2.6117	* 3.1712	*	*
	* 1.7088	* 1.7019	* 1.7552	* 2.2729	* 2.5506	* 3.0784	*	*
15	* 3.3893	* 3.1941	* 3.2022	* 4.8892	* 4	EFPD 118 % POWER		
	* 3.1302	* 2.9636	* 3.0238	* 4.6461	* 50	EFPD 118 % POWER		
	* 2.9748	* 2.8242	* 2.9323	* 4.4992	* 125	EFPD 118 % POWER		
	* 2.9571	* 2.8263	* 2.9469	* 4.4462	* 200	EFPD 118 % POWER		
	* 2.9563	* 2.8664	* 2.9809	* 4.2847	* 350	EFPD 118 % POWER		
	* 2.8403	* 2.7618	* 2.8700	* 4.0059	* 460	EFPD 118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 235 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5605	* 1.8351	* 1.5947	* 1.8036	* 1.4993	* 1.7181	* 1.3378	* 3.2555
	* 1.5639	* 1.8843	* 1.6657	* 1.7997	* 1.4347	* 1.7081	* 1.3395	* 3.0211
	* 1.5307	* 1.8826	* 1.7171	* 1.7756	* 1.4070	* 1.7349	* 1.3458	* 2.8719
	* 1.5164	* 1.8502	* 1.7251	* 1.7777	* 1.4444	* 1.7922	* 1.3824	* 2.8386
	* 1.5639	* 1.8296	* 1.7418	* 1.8308	* 1.5656	* 1.9131	* 1.5242	* 2.8143
	* 1.6329	* 1.8504	* 1.7701	* 1.8754	* 1.6505	* 1.9505	* 1.5837	* 2.7018
9	* 1.8351	* 1.4119	* 1.5381	* 1.4465	* 1.5866	* 1.4888	* 1.3608	* 3.0879
	* 1.8843	* 1.4928	* 1.5845	* 1.4951	* 1.5778	* 1.4691	* 1.3544	* 2.8815
	* 1.8826	* 1.5430	* 1.6128	* 1.4909	* 1.5898	* 1.4886	* 1.3392	* 2.7495
	* 1.8502	* 1.5311	* 1.6161	* 1.4654	* 1.5904	* 1.5396	* 1.3746	* 2.7331
	* 1.8296	* 1.5380	* 1.6505	* 1.4990	* 1.6294	* 1.6525	* 1.5134	* 2.7389
	* 1.8504	* 1.5687	* 1.6932	* 1.5623	* 1.6800	* 1.6850	* 1.5768	* 2.6403
10	* 1.5947	* 1.5388	* 1.5087	* 1.5779	* 1.4594	* 1.5840	* 1.3355	* 3.0855
	* 1.6657	* 1.5852	* 1.5761	* 1.6024	* 1.4876	* 1.5701	* 1.3380	* 2.9307
	* 1.7171	* 1.6135	* 1.6218	* 1.5877	* 1.5014	* 1.5868	* 1.3571	* 2.8453
	* 1.7251	* 1.6167	* 1.6344	* 1.5640	* 1.4942	* 1.6140	* 1.4149	* 2.8483
	* 1.7418	* 1.6511	* 1.6755	* 1.5844	* 1.4997	* 1.6798	* 1.5573	* 2.8645
	* 1.7701	* 1.6938	* 1.7268	* 1.6341	* 1.5573	* 1.7172	* 1.6248	* 2.7602
11	* 1.8036	* 1.4466	* 1.5778	* 1.4704	* 1.6515	* 1.5316	* 2.2404	* 4.7095
	* 1.7997	* 1.4946	* 1.6022	* 1.5289	* 1.6072	* 1.4733	* 2.1514	* 4.5019
	* 1.7756	* 1.4904	* 1.5873	* 1.5234	* 1.5697	* 1.3963	* 2.1047	* 4.3647
	* 1.7777	* 1.4651	* 1.5638	* 1.5052	* 1.5610	* 1.3954	* 2.1196	* 4.2957
	* 1.8308	* 1.4990	* 1.5844	* 1.4981	* 1.5844	* 1.5028	* 2.1777	* 4.1123
	* 1.8754	* 1.5623	* 1.6341	* 1.5646	* 1.6336	* 1.5832	* 2.1607	* 3.8381
12	* 1.4993	* 1.5835	* 1.4576	* 1.6512	* 1.6793	* 1.4675	* 2.9146	*
	* 1.4347	* 1.5751	* 1.4859	* 1.6065	* 1.6448	* 1.4453	* 2.7152	*
	* 1.4070	* 1.5887	* 1.5008	* 1.5692	* 1.6097	* 1.3747	* 2.5511	*
	* 1.4444	* 1.5896	* 1.4937	* 1.5607	* 1.6317	* 1.3747	* 2.5060	*
	* 1.5656	* 1.6291	* 1.4997	* 1.5843	* 1.7211	* 1.4929	* 2.4866	*
	* 1.6505	* 1.6799	* 1.5573	* 1.6336	* 1.7720	* 1.5732	* 2.4357	*
13	* 1.7181	* 1.4856	* 1.5819	* 1.5305	* 1.4673	* 1.3250	* 3.2294	*
	* 1.7081	* 1.4663	* 1.5683	* 1.4723	* 1.4452	* 1.3298	* 3.0978	*
	* 1.7349	* 1.4865	* 1.5855	* 1.3956	* 1.3743	* 1.3468	* 3.0200	*
	* 1.7922	* 1.5381	* 1.6132	* 1.3951	* 1.3745	* 1.4106	* 3.0205	*
	* 1.9131	* 1.6518	* 1.6796	* 1.5029	* 1.4929	* 1.5799	* 3.0423	*
	* 1.9505	* 1.6848	* 1.7172	* 1.5833	* 1.5731	* 1.6784	* 2.9529	*
14	* 1.3378	* 1.3584	* 1.3339	* 2.2381	* 2.9132	* 3.1697	*	*
	* 1.3395	* 1.3523	* 1.3365	* 2.1493	* 2.7140	* 3.0390	*	*
	* 1.3458	* 1.3376	* 1.3561	* 2.1032	* 2.5504	* 2.9674	*	*
	* 1.3824	* 1.3735	* 1.4144	* 2.1188	* 2.5057	* 2.9728	*	*
	* 1.5242	* 1.5129	* 1.5573	* 2.1775	* 2.4868	* 3.0096	*	*
	* 1.5837	* 1.5766	* 1.6251	* 2.1602	* 2.4361	* 2.9353	*	*
15	* 3.2555	* 3.0856	* 3.0832	* 4.7052	* 4 EFPD	118 % POWER		
	* 3.0211	* 2.8795	* 2.9285	* 4.4981	* 50 EFPD	118 % POWER		
	* 2.8719	* 2.7483	* 2.8440	* 4.3621	* 125 EFPD	118 % POWER		
	* 2.8386	* 2.7326	* 2.8478	* 4.2943	* 200 EFPD	118 % POWER		
	* 2.8143	* 2.7391	* 2.8650	* 4.1123	* 350 EFPD	118 % POWER		
	* 2.7019	* 2.6416	* 2.7607	* 3.8384	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 236 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4820	* 1.7491	* 1.5155	* 1.7211	* 1.4285	* 1.6370	* 1.2723	* 3.1229 *
	* 1.5007	* 1.8141	* 1.6015	* 1.7363	* 1.3819	* 1.6461	* 1.2873	* 2.9264 *
	* 1.4736	* 1.8197	* 1.6592	* 1.7198	* 1.3598	* 1.6785	* 1.2969	* 2.7899 *
	* 1.4403	* 1.7695	* 1.6528	* 1.7108	* 1.3876	* 1.7251	* 1.3240	* 2.7412 *
	* 1.4518	* 1.7084	* 1.6301	* 1.7181	* 1.4671	* 1.7992	* 1.4272	* 2.6571 *
	* 1.5093	* 1.7172	* 1.6489	* 1.7522	* 1.5406	* 1.8281	* 1.4793	* 2.5424 *
9	* 1.7491	* 1.3426	* 1.4627	* 1.3767	* 1.5105	* 1.4134	* 1.2931	* 2.9615 *
	* 1.8141	* 1.4361	* 1.5225	* 1.4405	* 1.5191	* 1.4096	* 1.3003	* 2.7907 *
	* 1.8197	* 1.4911	* 1.5573	* 1.4419	* 1.5375	* 1.4336	* 1.2898	* 2.6706 *
	* 1.7695	* 1.4626	* 1.5477	* 1.4066	* 1.5299	* 1.4751	* 1.3159	* 2.6385 *
	* 1.7084	* 1.4359	* 1.5440	* 1.4013	* 1.5282	* 1.5495	* 1.4157	* 2.5850 *
	* 1.7172	* 1.4547	* 1.5783	* 1.4539	* 1.5687	* 1.5758	* 1.4719	* 2.4830 *
10	* 1.5155	* 1.4634	* 1.4345	* 1.5005	* 1.3887	* 1.5036	* 1.2673	* 2.9563 *
	* 1.6015	* 1.5232	* 1.5156	* 1.5412	* 1.4309	* 1.5066	* 1.2826	* 2.8357 *
	* 1.6592	* 1.5580	* 1.5660	* 1.5347	* 1.4517	* 1.5301	* 1.3050	* 2.7614 *
	* 1.6528	* 1.5484	* 1.5646	* 1.5020	* 1.4370	* 1.5489	* 1.3536	* 2.7480 *
	* 1.6301	* 1.5446	* 1.5707	* 1.4835	* 1.3997	* 1.5731	* 1.4553	* 2.7017 *
	* 1.6489	* 1.5788	* 1.6115	* 1.5233	* 1.4467	* 1.6031	* 1.5156	* 2.5954 *
11	* 1.7211	* 1.3768	* 1.5004	* 1.3992	* 1.5645	* 1.4542	* 2.1367	* 4.5181 *
	* 1.7363	* 1.4400	* 1.5411	* 1.4708	* 1.5387	* 1.4129	* 2.0730	* 4.3613 *
	* 1.7198	* 1.4415	* 1.5343	* 1.4712	* 1.5083	* 1.3423	* 2.0339	* 4.2424 *
	* 1.7108	* 1.4064	* 1.5017	* 1.4449	* 1.4977	* 1.3317	* 2.0362	* 4.1528 *
	* 1.7182	* 1.4012	* 1.4834	* 1.3963	* 1.4792	* 1.3977	* 2.0400	* 3.8965 *
	* 1.7522	* 1.4539	* 1.5234	* 1.4523	* 1.5202	* 1.4702	* 2.0195	* 3.6267 *
12	* 1.4285	* 1.5074	* 1.3869	* 1.5642	* 1.5875	* 1.3886	* 2.7753	*
	* 1.3819	* 1.5165	* 1.4292	* 1.5381	* 1.5694	* 1.3799	* 2.6161	*
	* 1.3598	* 1.5365	* 1.4510	* 1.5079	* 1.5405	* 1.3174	* 2.4650	*
	* 1.3876	* 1.5292	* 1.4365	* 1.4974	* 1.5536	* 1.3087	* 2.4027	*
	* 1.4671	* 1.5279	* 1.3997	* 1.4791	* 1.6003	* 1.3850	* 2.3269	*
	* 1.5406	* 1.5685	* 1.4468	* 1.5202	* 1.6425	* 1.4561	* 2.2735	*
13	* 1.6370	* 1.4103	* 1.5016	* 1.4532	* 1.3884	* 1.2518	* 3.0805	*
	* 1.6461	* 1.4069	* 1.5048	* 1.4120	* 1.3798	* 1.2681	* 2.9780	*
	* 1.6785	* 1.4315	* 1.5289	* 1.3418	* 1.3170	* 1.2873	* 2.9112	*
	* 1.7251	* 1.4736	* 1.5482	* 1.3315	* 1.3085	* 1.3407	* 2.8984	*
	* 1.7992	* 1.5488	* 1.5729	* 1.3978	* 1.3849	* 1.4659	* 2.8470	*
	* 1.8281	* 1.5756	* 1.6031	* 1.4704	* 1.4560	* 1.5539	* 2.7566	*
14	* 1.2723	* 1.2908	* 1.2657	* 2.1346	* 2.7740	* 3.0240	*	*
	* 1.2873	* 1.2982	* 1.2811	* 2.0710	* 2.6150	* 2.9216	*	*
	* 1.2969	* 1.2882	* 1.3040	* 2.0325	* 2.4644	* 2.8608	*	*
	* 1.3240	* 1.3149	* 1.3530	* 2.0353	* 2.4025	* 2.8529	*	*
	* 1.4272	* 1.4152	* 1.4553	* 2.0398	* 2.3271	* 2.8165	*	*
	* 1.4793	* 1.4717	* 1.5158	* 2.0190	* 2.2739	* 2.7405	*	*
15	* 3.1229	* 2.9592	* 2.9541	* 4.5139	* 4 EFPD	118 %	POWER	
	* 2.9264	* 2.7887	* 2.8335	* 4.3576	* 50 EFPD	118 %	POWER	
	* 2.7899	* 2.6694	* 2.7601	* 4.2399	* 125 EFPD	118 %	POWER	
	* 2.7412	* 2.6380	* 2.7475	* 4.1514	* 200 EFPD	118 %	POWER	
	* 2.6571	* 2.5850	* 2.7023	* 3.8965	* 350 EFPD	118 %	POWER	
	* 2.5424	* 2.4843	* 2.5959	* 3.6269	* 460 EFPD	118 %	POWER	

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 237 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4378	* 1.6827	* 1.4568	* 1.6567	* 1.3853	* 1.5852	* 1.2443	* 2.9799
	* 1.4869	* 1.7739	* 1.5733	* 1.7117	* 1.3717	* 1.6197	* 1.2794	* 2.8489
	* 1.4722	* 1.7948	* 1.6424	* 1.7057	* 1.3591	* 1.6626	* 1.2971	* 2.7355
	* 1.4193	* 1.7307	* 1.6165	* 1.6722	* 1.3652	* 1.6850	* 1.3145	* 2.6674
	* 1.3903	* 1.6150	* 1.5547	* 1.6383	* 1.4057	* 1.7073	* 1.3688	* 2.5080
	* 1.4249	* 1.5946	* 1.5533	* 1.6495	* 1.4583	* 1.7138	* 1.4002	* 2.3683
9	* 1.6827	* 1.3008	* 1.4077	* 1.3334	* 1.4626	* 1.3706	* 1.2624	* 2.8053
	* 1.7739	* 1.4220	* 1.4970	* 1.4310	* 1.4975	* 1.3884	* 1.2898	* 2.6931
	* 1.7948	* 1.4910	* 1.5423	* 1.4415	* 1.5258	* 1.4208	* 1.2890	* 2.5974
	* 1.7307	* 1.4448	* 1.5130	* 1.3899	* 1.4983	* 1.4519	* 1.3058	* 2.5478
	* 1.6150	* 1.3790	* 1.4718	* 1.3480	* 1.4602	* 1.4769	* 1.3566	* 2.4280
	* 1.5946	* 1.3766	* 1.4859	* 1.3767	* 1.4781	* 1.4832	* 1.3924	* 2.2983
10	* 1.4568	* 1.4084	* 1.3841	* 1.4473	* 1.3529	* 1.4571	* 1.2360	* 2.8046
	* 1.5733	* 1.4977	* 1.4902	* 1.5164	* 1.4190	* 1.4818	* 1.2707	* 2.7413
	* 1.6424	* 1.5429	* 1.5505	* 1.5233	* 1.4494	* 1.5157	* 1.3009	* 2.6850
	* 1.6165	* 1.5136	* 1.5312	* 1.4691	* 1.4224	* 1.5195	* 1.3420	* 2.6449
	* 1.5547	* 1.4724	* 1.5001	* 1.4158	* 1.3448	* 1.4998	* 1.3957	* 2.5229
	* 1.5533	* 1.4864	* 1.5198	* 1.4319	* 1.3694	* 1.5075	* 1.4342	* 2.3872
11	* 1.6568	* 1.3335	* 1.4472	* 1.3566	* 1.5140	* 1.4168	* 2.0317	* 4.3092
	* 1.7117	* 1.4305	* 1.5162	* 1.4564	* 1.5147	* 1.4010	* 2.0110	* 4.2301
	* 1.7057	* 1.4412	* 1.5229	* 1.4702	* 1.4941	* 1.3415	* 1.9852	* 4.1415
	* 1.6722	* 1.3896	* 1.4688	* 1.4289	* 1.4674	* 1.3177	* 1.9616	* 4.0084
	* 1.6383	* 1.3480	* 1.4158	* 1.3415	* 1.4130	* 1.3388	* 1.9142	* 3.6647
	* 1.6495	* 1.3768	* 1.4320	* 1.3703	* 1.4308	* 1.3880	* 1.8692	* 3.3661
12	* 1.3853	* 1.4599	* 1.3513	* 1.5137	* 1.5365	* 1.3552	* 2.6186	*
	* 1.3717	* 1.4949	* 1.4173	* 1.5140	* 1.5439	* 1.3659	* 2.5201	*
	* 1.3591	* 1.5248	* 1.4487	* 1.4936	* 1.5238	* 1.3149	* 2.3933	*
	* 1.3652	* 1.4976	* 1.4219	* 1.4671	* 1.5253	* 1.2949	* 2.3038	*
	* 1.4057	* 1.4599	* 1.3447	* 1.4129	* 1.5250	* 1.3249	* 2.1739	*
	* 1.4583	* 1.4780	* 1.3695	* 1.4308	* 1.5433	* 1.3735	* 2.0876	*
13	* 1.5852	* 1.3675	* 1.4551	* 1.4158	* 1.3551	* 1.2212	* 2.9322	*
	* 1.6197	* 1.3856	* 1.4801	* 1.4001	* 1.3658	* 1.2544	* 2.8830	*
	* 1.6626	* 1.4187	* 1.5144	* 1.3410	* 1.3144	* 1.2792	* 2.8329	*
	* 1.6850	* 1.4503	* 1.5188	* 1.3175	* 1.2947	* 1.3231	* 2.7893	*
	* 1.7073	* 1.4762	* 1.4996	* 1.3389	* 1.3249	* 1.4022	* 2.6601	*
	* 1.7138	* 1.4830	* 1.5076	* 1.3881	* 1.3735	* 1.4660	* 2.5383	*
14	* 1.2443	* 1.2601	* 1.2344	* 2.0298	* 2.6174	* 2.8762	*	*
	* 1.2794	* 1.2876	* 1.2692	* 2.0091	* 2.5189	* 2.8257	*	*
	* 1.2971	* 1.2874	* 1.2999	* 1.9839	* 2.3927	* 2.7822	*	*
	* 1.3145	* 1.3048	* 1.3414	* 1.9609	* 2.3035	* 2.7499	*	*
	* 1.3688	* 1.3562	* 1.3957	* 1.9141	* 2.1741	* 2.6388	*	*
	* 1.4002	* 1.3921	* 1.4344	* 1.8688	* 2.0879	* 2.5237	*	*
15	* 2.9799	* 2.8032	* 2.8026	* 4.3052	* 4 EFPD 118 % POWER			
	* 2.8489	* 2.6913	* 2.7393	* 4.2265	* 50 EFPD 118 % POWER			
	* 2.7355	* 2.5959	* 2.6839	* 4.1391	* 125 EFPD 118 % POWER			
	* 2.6674	* 2.5468	* 2.6442	* 4.0071	* 200 EFPD 118 % POWER			
	* 2.5080	* 2.4282	* 2.5231	* 3.6648	* 350 EFPD 118 % POWER			
	* 2.3683	* 2.2984	* 2.3874	* 3.3664	* 460 EFPD 118 % POWER			

## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248

Appendix A, Rev. 0

Page 238 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3715	* 1.6048	* 1.3871	* 1.5811	* 1.3283	* 1.5120	* 1.1926	* 2.8950
	* 1.4605	* 1.7469	* 1.5367	* 1.6816	* 1.3524	* 1.5935	* 1.2597	* 2.8523
	* 1.4636	* 1.7882	* 1.6232	* 1.7019	* 1.3581	* 1.6559	* 1.2965	* 2.7816
	* 1.4017	* 1.7086	* 1.5869	* 1.6539	* 1.3483	* 1.6613	* 1.3000	* 2.6803
	* 1.3332	* 1.5664	* 1.4905	* 1.5792	* 1.3478	* 1.6463	* 1.3126	* 2.4587
	* 1.3425	* 1.5285	* 1.4662	* 1.5637	* 1.3740	* 1.6281	* 1.3176	* 2.2812
9	* 1.6048	* 1.2449	* 1.3416	* 1.2749	* 1.3939	* 1.3135	* 1.2133	* 2.7407
	* 1.7469	* 1.3954	* 1.4645	* 1.4040	* 1.4703	* 1.3626	* 1.2706	* 2.7141
	* 1.7882	* 1.4805	* 1.5263	* 1.4351	* 1.5166	* 1.4130	* 1.2883	* 2.6564
	* 1.7086	* 1.4285	* 1.4884	* 1.3757	* 1.4776	* 1.4285	* 1.2917	* 2.5728
	* 1.5664	* 1.3275	* 1.4121	* 1.2966	* 1.4028	* 1.4161	* 1.3001	* 2.3858
	* 1.5285	* 1.3005	* 1.4024	* 1.2979	* 1.3954	* 1.3989	* 1.3095	* 2.2201
10	* 1.3871	* 1.3422	* 1.3198	* 1.3784	* 1.2935	* 1.3950	* 1.1907	* 2.7483
	* 1.5367	* 1.4651	* 1.4566	* 1.4823	* 1.3961	* 1.4540	* 1.2515	* 2.7655
	* 1.6232	* 1.5270	* 1.5332	* 1.5093	* 1.4443	* 1.5051	* 1.2963	* 2.7482
	* 1.5869	* 1.4891	* 1.5056	* 1.4482	* 1.4136	* 1.4938	* 1.3253	* 2.6802
	* 1.4905	* 1.4126	* 1.4387	* 1.3626	* 1.2977	* 1.4407	* 1.3377	* 2.4944
	* 1.4662	* 1.4029	* 1.4337	* 1.3521	* 1.2914	* 1.4221	* 1.3490	* 2.3198
11	* 1.5811	* 1.2750	* 1.3783	* 1.2975	* 1.4442	* 1.3538	* 1.9783	* 4.2111
	* 1.6816	* 1.4040	* 1.4821	* 1.4288	* 1.4865	* 1.3809	* 2.0138	* 4.2440
	* 1.7019	* 1.4348	* 1.5089	* 1.4658	* 1.4866	* 1.3416	* 2.0154	* 4.2079
	* 1.6539	* 1.3755	* 1.4480	* 1.4214	* 1.4482	* 1.3008	* 1.9699	* 4.0421
	* 1.5792	* 1.2966	* 1.3626	* 1.2952	* 1.3598	* 1.2846	* 1.8744	* 3.6017
	* 1.5637	* 1.2979	* 1.3522	* 1.2933	* 1.3497	* 1.3052	* 1.7989	* 3.2524
12	* 1.3283	* 1.3912	* 1.2920	* 1.4439	* 1.4668	* 1.3101	* 2.5636	*
	* 1.3524	* 1.4677	* 1.3945	* 1.4859	* 1.5189	* 1.3499	* 2.5356	*
	* 1.3581	* 1.5154	* 1.4437	* 1.4861	* 1.5181	* 1.3151	* 2.4415	*
	* 1.3483	* 1.4769	* 1.4132	* 1.4479	* 1.5053	* 1.2814	* 2.3263	*
	* 1.3478	* 1.4025	* 1.2976	* 1.3597	* 1.4652	* 1.2703	* 2.1389	*
	* 1.3740	* 1.3953	* 1.2914	* 1.3496	* 1.4553	* 1.2905	* 2.0207	*
13	* 1.5120	* 1.3108	* 1.3932	* 1.3529	* 1.3099	* 1.1806	* 2.8807	*
	* 1.5935	* 1.3599	* 1.4522	* 1.3800	* 1.3498	* 1.2384	* 2.9042	*
	* 1.6559	* 1.4108	* 1.5039	* 1.3410	* 1.3147	* 1.2760	* 2.8883	*
	* 1.6613	* 1.4270	* 1.4930	* 1.3005	* 1.2812	* 1.3117	* 2.8174	*
	* 1.6463	* 1.4154	* 1.4405	* 1.2847	* 1.2703	* 1.3443	* 2.6200	*
	* 1.6281	* 1.3987	* 1.4222	* 1.3054	* 1.2905	* 1.3786	* 2.4550	*
14	* 1.1926	* 1.2112	* 1.1892	* 1.9765	* 2.5625	* 2.8290	*	*
	* 1.2597	* 1.2685	* 1.2501	* 2.0121	* 2.5345	* 2.8499	*	*
	* 1.2965	* 1.2866	* 1.2953	* 2.0141	* 2.4409	* 2.8390	*	*
	* 1.3000	* 1.2907	* 1.3247	* 1.9692	* 2.3260	* 2.7750	*	*
	* 1.3126	* 1.2997	* 1.3377	* 1.8744	* 2.1391	* 2.5949	*	*
	* 1.3176	* 1.3092	* 1.3492	* 1.7985	* 2.0210	* 2.4396	*	*
15	* 2.8950	* 2.7385	* 2.7461	* 4.2073	* 4 EFPD	118 % POWER		
	* 2.8523	* 2.7121	* 2.7634	* 4.2405	* 50 EFPD	118 % POWER		
	* 2.7816	* 2.6550	* 2.7468	* 4.2055	* 125 EFPD	118 % POWER		
	* 2.6803	* 2.5719	* 2.6797	* 4.0408	* 200 EFPD	118 % POWER		
	* 2.4587	* 2.3855	* 2.4949	* 3.6017	* 350 EFPD	118 % POWER		
	* 2.2812	* 2.2200	* 2.3203	* 3.2527	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 239 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2891	* 1.5884	* 1.3859	* 1.5659	* 1.2566	* 1.5036	* 1.1925	* 2.8129
	* 1.4952	* 1.7699	* 1.5762	* 1.7106	* 1.4005	* 1.6386	* 1.3120	* 2.8916
	* 1.5447	* 1.8519	* 1.6894	* 1.7752	* 1.4449	* 1.7348	* 1.3868	* 2.9041
	* 1.4825	* 1.7725	* 1.6465	* 1.7250	* 1.4304	* 1.7327	* 1.3813	* 2.7996
	* 1.3674	* 1.5867	* 1.5047	* 1.6039	* 1.3831	* 1.6662	* 1.3529	* 2.5076
	* 1.3417	* 1.5191	* 1.4468	* 1.5512	* 1.3717	* 1.6094	* 1.3203	* 2.2808
9	* 1.5884	* 1.2503	* 1.3377	* 1.2783	* 1.3877	* 1.3129	* 1.2144	* 2.6806
	* 1.7699	* 1.4428	* 1.5000	* 1.4491	* 1.5121	* 1.4096	* 1.3239	* 2.7657
	* 1.8519	* 1.5602	* 1.5898	* 1.5128	* 1.5854	* 1.4900	* 1.3783	* 2.7857
	* 1.7725	* 1.5074	* 1.5477	* 1.4564	* 1.5404	* 1.4949	* 1.3716	* 2.6965
	* 1.5867	* 1.3657	* 1.4285	* 1.3334	* 1.4252	* 1.4393	* 1.3395	* 2.4364
	* 1.5191	* 1.3036	* 1.3851	* 1.3024	* 1.3834	* 1.3863	* 1.3109	* 2.2233
10	* 1.3859	* 1.3383	* 1.3273	* 1.3694	* 1.2969	* 1.3924	* 1.2010	* 2.7192
	* 1.5762	* 1.5006	* 1.5005	* 1.5147	* 1.4508	* 1.5040	* 1.3084	* 2.8399
	* 1.6894	* 1.5904	* 1.6043	* 1.5694	* 1.5224	* 1.5807	* 1.3836	* 2.8910
	* 1.6465	* 1.5483	* 1.5692	* 1.5056	* 1.4964	* 1.5550	* 1.4079	* 2.8113
	* 1.5047	* 1.4290	* 1.4576	* 1.3814	* 1.3441	* 1.4612	* 1.3773	* 2.5477
	* 1.4468	* 1.3856	* 1.4184	* 1.3409	* 1.2999	* 1.4067	* 1.3507	* 2.3186
11	* 1.5659	* 1.2784	* 1.3692	* 1.3019	* 1.4422	* 1.2881	* 1.9594	* 4.2059
	* 1.7106	* 1.4486	* 1.5146	* 1.4774	* 1.5312	* 1.4279	* 2.0695	* 4.3741
	* 1.7752	* 1.5126	* 1.5690	* 1.5454	* 1.5664	* 1.4311	* 2.1226	* 4.4230
	* 1.7250	* 1.4562	* 1.5054	* 1.5082	* 1.5127	* 1.3818	* 2.0672	* 4.2396
	* 1.6039	* 1.3334	* 1.3814	* 1.3425	* 1.3872	* 1.3247	* 1.9159	* 3.6765
	* 1.5512	* 1.3024	* 1.3410	* 1.2998	* 1.3408	* 1.3066	* 1.7948	* 3.2449
12	* 1.2566	* 1.3852	* 1.2955	* 1.4419	* 1.4711	* 1.3002	* 2.5039	*
	* 1.4005	* 1.5096	* 1.4492	* 1.5306	* 1.5704	* 1.4042	* 2.5785	*
	* 1.4449	* 1.5844	* 1.5217	* 1.5659	* 1.6050	* 1.4070	* 2.5592	*
	* 1.4304	* 1.5397	* 1.4960	* 1.5124	* 1.5790	* 1.3658	* 2.4374	*
	* 1.3831	* 1.4249	* 1.3440	* 1.3871	* 1.4949	* 1.3126	* 2.1876	*
	* 1.3717	* 1.3832	* 1.2999	* 1.3408	* 1.4455	* 1.2940	* 2.0145	*
13	* 1.5036	* 1.3101	* 1.3908	* 1.2873	* 1.2996	* 1.2100	* 2.8974	*
	* 1.6386	* 1.4068	* 1.5022	* 1.4270	* 1.4036	* 1.3077	* 3.0150	*
	* 1.7348	* 1.4876	* 1.5794	* 1.4305	* 1.4065	* 1.3721	* 3.0574	*
	* 1.7327	* 1.4933	* 1.5542	* 1.3815	* 1.3655	* 1.3986	* 2.9667	*
	* 1.6662	* 1.4384	* 1.4611	* 1.3247	* 1.3125	* 1.3877	* 2.6859	*
	* 1.6094	* 1.3859	* 1.4067	* 1.3067	* 1.2939	* 1.3837	* 2.4578	*
14	* 1.1925	* 1.2124	* 1.1996	* 1.9577	* 2.5027	* 2.8474	*	*
	* 1.3120	* 1.3218	* 1.3070	* 2.0678	* 2.5774	* 2.9603	*	*
	* 1.3868	* 1.3765	* 1.3825	* 2.1214	* 2.5585	* 3.0066	*	*
	* 1.3813	* 1.3705	* 1.4073	* 2.0665	* 2.4371	* 2.9228	*	*
	* 1.3529	* 1.3390	* 1.3773	* 1.9159	* 2.1878	* 2.6573	*	*
	* 1.3203	* 1.3106	* 1.3508	* 1.7946	* 2.0147	* 2.4357	*	*
15	* 2.8129	* 2.6786	* 2.7171	* 4.2021	* 4 EFPD 118 % POWER			
	* 2.8916	* 2.7636	* 2.8381	* 4.3706	* 50 EFPD 118 % POWER			
	* 2.9041	* 2.7839	* 2.8899	* 4.4205	* 125 EFPD 118 % POWER			
	* 2.7996	* 2.6952	* 2.8108	* 4.2382	* 200 EFPD 118 % POWER			
	* 2.5076	* 2.4360	* 2.5482	* 3.6765	* 350 EFPD 118 % POWER			
	* 2.2808	* 2.2234	* 2.3190	* 3.2452	* 460 EFPD 118 % POWER			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 240 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2891	* 1.7263	* 1.5781	* 1.7138	* 1.2566	* 1.6808	* 1.2276	* 3.0038
	* 1.5365	* 2.0020	* 1.8395	* 1.9423	* 1.4600	* 1.9048	* 1.4179	* 3.2368
	* 1.7218	* 2.1581	* 2.0010	* 2.0818	* 1.6388	* 2.0654	* 1.5704	* 3.3773
	* 1.7268	* 2.0737	* 1.9429	* 2.0325	* 1.6797	* 2.0563	* 1.6172	* 3.2929
	* 1.5925	* 1.8065	* 1.7135	* 1.8326	* 1.6156	* 1.9008	* 1.5819	* 2.8877
	* 1.5162	* 1.6732	* 1.5869	* 1.7118	* 1.5505	* 1.7689	* 1.5010	* 2.5529
9	* 1.7263	* 1.3167	* 1.4940	* 1.2810	* 1.5861	* 1.4772	* 1.2205	* 2.8420
	* 2.0020	* 1.5686	* 1.7297	* 1.5020	* 1.7889	* 1.6559	* 1.4084	* 3.0830
	* 2.1581	* 1.7289	* 1.8742	* 1.6467	* 1.9142	* 1.7921	* 1.5589	* 3.2391
	* 2.0737	* 1.7088	* 1.8245	* 1.6462	* 1.8574	* 1.7871	* 1.6050	* 3.1780
	* 1.8065	* 1.5423	* 1.6299	* 1.5321	* 1.6658	* 1.6571	* 1.5704	* 2.8164
	* 1.6732	* 1.4481	* 1.5223	* 1.4610	* 1.5586	* 1.5380	* 1.4922	* 2.4934
10	* 1.5781	* 1.4947	* 1.5604	* 1.5258	* 1.3627	* 1.5766	* 1.3055	* 2.9771
	* 1.8395	* 1.7304	* 1.8070	* 1.7288	* 1.5696	* 1.7667	* 1.5004	* 3.2386
	* 2.0010	* 1.8749	* 1.9578	* 1.8342	* 1.6888	* 1.8831	* 1.6442	* 3.4064
	* 1.9429	* 1.8252	* 1.9059	* 1.7706	* 1.6720	* 1.8439	* 1.6727	* 3.3408
	* 1.7135	* 1.6305	* 1.7000	* 1.5787	* 1.5443	* 1.6714	* 1.6174	* 2.9568
	* 1.5869	* 1.5228	* 1.5906	* 1.4775	* 1.4593	* 1.5509	* 1.5352	* 2.6150
11	* 1.7138	* 1.2809	* 1.5256	* 1.3761	* 1.6365	* 1.2881	* 2.1328	* 4.6871
	* 1.9423	* 1.5016	* 1.7283	* 1.5891	* 1.8168	* 1.4794	* 2.3530	* 5.0260
	* 2.0818	* 1.6464	* 1.8338	* 1.7060	* 1.9022	* 1.6066	* 2.4944	* 5.1911
	* 2.0325	* 1.6460	* 1.7703	* 1.6798	* 1.8278	* 1.6166	* 2.4497	* 4.9866
	* 1.8326	* 1.5321	* 1.5787	* 1.5417	* 1.6255	* 1.5533	* 2.2217	* 4.1961
	* 1.7118	* 1.4610	* 1.4775	* 1.4645	* 1.5162	* 1.4901	* 2.0244	* 3.5870
12	* 1.2566	* 1.5848	* 1.3619	* 1.6359	* 1.7320	* 1.3002	* 2.6322	*
	* 1.4600	* 1.7876	* 1.5687	* 1.8160	* 1.8985	* 1.4721	* 2.8437	*
	* 1.6388	* 1.9131	* 1.6881	* 1.9016	* 1.9930	* 1.5851	* 2.9472	*
	* 1.6797	* 1.8566	* 1.6716	* 1.8274	* 1.9432	* 1.5997	* 2.8519	*
	* 1.6156	* 1.6655	* 1.5442	* 1.6253	* 1.7701	* 1.5490	* 2.5176	*
	* 1.5505	* 1.5584	* 1.4594	* 1.5161	* 1.6472	* 1.4776	* 2.2608	*
13	* 1.6808	* 1.4742	* 1.5748	* 1.2873	* 1.2996	* 1.4253	* 3.2906	*
	* 1.9048	* 1.6527	* 1.7649	* 1.4786	* 1.4715	* 1.5968	* 3.5522	*
	* 2.0654	* 1.7894	* 1.8818	* 1.6060	* 1.5846	* 1.7122	* 3.6789	*
	* 2.0563	* 1.7849	* 1.8431	* 1.6163	* 1.5994	* 1.7287	* 3.5574	*
	* 1.9008	* 1.6558	* 1.6712	* 1.5534	* 1.5489	* 1.6500	* 3.1228	*
	* 1.7689	* 1.5373	* 1.5509	* 1.4902	* 1.4775	* 1.5746	* 2.7647	*
14	* 1.2276	* 1.2188	* 1.3040	* 2.1309	* 2.6309	* 3.2336	*	*
	* 1.4179	* 1.4065	* 1.4989	* 2.3512	* 2.8424	* 3.4878	*	*
	* 1.5704	* 1.5573	* 1.6430	* 2.4931	* 2.9464	* 3.6201	*	*
	* 1.6172	* 1.6038	* 1.6720	* 2.4489	* 2.8513	* 3.5079	*	*
	* 1.5819	* 1.5698	* 1.6173	* 2.2217	* 2.5177	* 3.0911	*	*
	* 1.5010	* 1.4917	* 1.5353	* 2.0240	* 2.2609	* 2.7403	*	*
15	* 3.0037	* 2.8394	* 2.9749	* 4.6829	* 4 EFPD	118 % POWER		
	* 3.2368	* 3.0805	* 3.2367	* 5.0221	* 50 EFPD	118 % POWER		
	* 3.3773	* 3.2372	* 3.4052	* 5.1883	* 125 EFPD	118 % POWER		
	* 3.2929	* 3.1766	* 3.3405	* 4.9851	* 200 EFPD	118 % POWER		
	* 2.8877	* 2.8162	* 2.9574	* 4.1962	* 350 EFPD	118 % POWER		
	* 2.5529	* 2.4934	* 2.6154	* 3.5873	* 460 EFPD	118 % POWER		



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 241 of 312

TABLE A-2 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) NORMAL OPERATION

THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.9045	* 3.6724	* 3.6897	* 3.6466	* 2.8557	* 3.6782	* 3.1564	* 6.4708
	* 3.5178	* 4.3149	* 4.3393	* 4.2068	* 3.3773	* 4.2084	* 3.7028	* 7.1346
	* 3.9373	* 4.6721	* 4.7054	* 4.5406	* 3.7826	* 4.5608	* 4.0712	* 7.5415
	* 3.8858	* 4.4427	* 4.4923	* 4.3834	* 3.8199	* 4.4670	* 4.1031	* 7.3095
	* 3.3217	* 3.6155	* 3.6718	* 3.6798	* 3.3879	* 3.8214	* 3.6745	* 6.0202
	* 2.9484	* 3.1355	* 3.1798	* 3.2160	* 3.0194	* 3.3144	* 3.2256	* 4.9946
9	* 3.6724	* 2.9619	* 3.5093	* 2.8715	* 3.6584	* 3.5819	* 3.1499	* 6.2727
	* 4.3149	* 3.6024	* 4.1017	* 3.4314	* 4.2002	* 4.0630	* 3.6951	* 6.9469
	* 4.6721	* 4.0109	* 4.4404	* 3.7943	* 4.4911	* 4.3764	* 4.0577	* 7.3775
	* 4.4427	* 3.9479	* 4.2547	* 3.7644	* 4.3090	* 4.2839	* 4.0824	* 7.1850
	* 3.6155	* 3.3669	* 3.5207	* 3.2892	* 3.6014	* 3.6496	* 3.6544	* 5.9617
	* 3.1355	* 2.9770	* 3.0722	* 2.9367	* 3.1422	* 3.1492	* 3.2115	* 4.9485
10	* 3.6897	* 3.5104	* 3.7631	* 3.5187	* 2.9530	* 3.7044	* 3.4241	* 6.7156
	* 4.3393	* 4.1028	* 4.3866	* 4.0333	* 3.4863	* 4.1994	* 3.9892	* 7.4345
	* 4.7054	* 4.4416	* 4.7279	* 4.3003	* 3.8078	* 4.4725	* 4.3215	* 7.8756
	* 4.4923	* 4.2559	* 4.5127	* 4.1001	* 3.7616	* 4.3102	* 4.2856	* 7.6496
	* 3.6718	* 3.5218	* 3.7267	* 3.4100	* 3.2789	* 3.6205	* 3.7843	* 6.3269
	* 3.1798	* 3.0731	* 3.2473	* 2.9811	* 2.9224	* 3.1353	* 3.3260	* 5.2351
11	* 3.6466	* 2.8710	* 3.5175	* 2.9999	* 3.8268	* 3.1521	* 4.7049	*10.1466
	* 4.2068	* 3.4304	* 4.0321	* 3.5476	* 4.3179	* 3.6752	* 5.2684	*11.0628
	* 4.5406	* 3.7934	* 4.2994	* 3.8557	* 4.5460	* 3.9694	* 5.6075	*11.4990
	* 4.3834	* 3.7638	* 4.0995	* 3.7864	* 4.3203	* 3.9214	* 5.4423	*10.9451
	* 3.6798	* 3.2891	* 3.4099	* 3.2867	* 3.5850	* 3.4663	* 4.5936	* 8.6597
	* 3.2160	* 2.9367	* 2.9812	* 2.9311	* 3.1188	* 3.0727	* 3.9156	* 6.9696
12	* 2.8557	* 3.6559	* 2.9514	* 3.8253	* 4.1185	* 3.3435	* 5.8416	*
	* 3.3773	* 4.1976	* 3.4844	* 4.3163	* 4.6093	* 3.8613	* 6.4361	*
	* 3.7826	* 4.4887	* 3.8064	* 4.5448	* 4.8335	* 4.1383	* 6.7404	*
	* 3.8199	* 4.3072	* 3.7607	* 4.3195	* 4.6133	* 4.0761	* 6.4746	*
	* 3.3879	* 3.6006	* 3.2788	* 3.5848	* 3.8524	* 3.6157	* 5.3421	*
	* 3.0194	* 3.1417	* 2.9225	* 3.1187	* 3.3332	* 3.1934	* 4.4813	*
13	* 3.6782	* 3.5752	* 3.7006	* 3.1501	* 3.3418	* 3.8208	* 7.5640	*
	* 4.2084	* 4.0561	* 4.1956	* 3.6732	* 3.8596	* 4.3715	* 8.2740	*
	* 4.5608	* 4.3700	* 4.4693	* 3.9680	* 4.1369	* 4.6302	* 8.5955	*
	* 4.4670	* 4.2786	* 4.3080	* 3.9206	* 4.0752	* 4.5198	* 8.2119	*
	* 3.8214	* 3.6464	* 3.6198	* 3.4662	* 3.6152	* 3.9518	* 6.7126	*
	* 3.3144	* 3.1472	* 3.1350	* 3.0728	* 3.1929	* 3.4834	* 5.5541	*
14	* 3.1564	* 3.1457	* 3.4202	* 4.7013	* 5.8376	* 7.4520	*	*
	* 3.7028	* 3.6906	* 3.9854	* 5.2651	* 6.4323	* 8.1476	*	*
	* 4.0712	* 4.0538	* 4.3186	* 5.6052	* 6.7374	* 8.4819	*	*
	* 4.1031	* 4.0794	* 4.2838	* 5.4411	* 6.4722	* 8.1240	*	*
	* 3.6745	* 3.6527	* 3.7840	* 4.5936	* 5.3412	* 6.6746	*	*
	* 3.2256	* 3.2104	* 3.3261	* 3.9150	* 4.4806	* 5.5301	*	*
15	* 6.4708	* 6.2677	* 6.7098	*10.1370	* 4 EFPD	118 % POWER		
	* 7.1346	* 6.9422	* 7.4292	*11.0537	* 50 EFPD	118 % POWER		
	* 7.5415	* 7.3737	* 7.8719	*11.4923	* 125 EFPD	118 % POWER		
	* 7.3095	* 7.1825	* 7.6478	*10.9410	* 200 EFPD	118 % POWER		
	* 6.0202	* 5.9617	* 6.3275	* 8.6591	* 350 EFPD	118 % POWER		
	* 4.9946	* 4.9490	* 5.2354	* 6.9697	* 460 EFPD	118 % POWER		

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 242 of 312

TABLE A-3  
F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 100% POWER, 4 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.3355	* 1.2487	* 1.4135	* 1.2516	* 1.3676	* 1.2813	* 1.4372	* .6306 *
	* 1.3353	* 1.3973	* 1.2696	* 1.4029	* 1.2797	* 1.3456	* 1.2046	* 2.5470 *
9	* 1.2487	* 1.4508	* 1.4507	* 1.4085	* 1.3809	* 1.4346	* 1.4159	* .6589 *
	* 1.3973	* 1.2444	* 1.2276	* 1.2655	* 1.2606	* 1.2091	* 1.2258	* 2.4376 *
10	* 1.4135	* 1.4501	* 1.4721	* 1.4096	* 1.3579	* 1.3651	* 1.4264	* .6534 *
	* 1.2696	* 1.2280	* 1.2110	* 1.2617	* 1.3023	* 1.2886	* 1.2202	* 2.4748 *
11	* 1.2516	* 1.4085	* 1.4098	* 1.3710	* 1.3212	* 1.2847	* .9123	* .4361 *
	* 1.4029	* 1.2655	* 1.2616	* 1.3141	* 1.3369	* 1.3824	* 1.8724	* 3.7110 *
12	* 1.3676	* 1.3831	* 1.3595	* 1.3214	* 1.2865	* 1.3105	* .7086	*
	* 1.2797	* 1.2588	* 1.3009	* 1.3367	* 1.3546	* 1.3413	* 2.3495	*
13	* 1.2813	* 1.4375	* 1.3666	* 1.2855	* 1.3110	* 1.3969	* .6161	*
	* 1.3456	* 1.2069	* 1.2873	* 1.3819	* 1.3409	* 1.2432	* 2.6729	*
14	* 1.4372	* 1.4182	* 1.4279	* .9129	* .7089	* .6284	*	*
	* 1.2046	* 1.2239	* 1.2191	* 1.8717	* 2.3492	* 2.6231	*	*
15	* .6306	* .6595	* .6539	* .4364	* F-DEL-H			
	* 2.5470	* 2.4359	* 2.4738	* 3.7092	* M-DEL-H			

AT 100% POWER, 50 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.3370	* 1.1864	* 1.3213	* 1.2101	* 1.4136	* 1.2523	* 1.4512	* .6529 *
	* 1.3188	* 1.4834	* 1.3510	* 1.4374	* 1.2737	* 1.4010	* 1.2296	* 2.5423 *
9	* 1.1864	* 1.3895	* 1.3737	* 1.3694	* 1.3501	* 1.4070	* 1.4338	* .6783 *
	* 1.4834	* 1.2954	* 1.2882	* 1.3281	* 1.3092	* 1.2694	* 1.2473	* 2.4446 *
10	* 1.3213	* 1.3733	* 1.3800	* 1.3542	* 1.3497	* 1.3353	* 1.4355	* .6629 *
	* 1.3510	* 1.2885	* 1.3022	* 1.3280	* 1.3415	* 1.3548	* 1.2489	* 2.5139 *
11	* 1.2101	* 1.3694	* 1.3543	* 1.3416	* 1.3066	* 1.3474	* .9153	* .4429 *
	* 1.4374	* 1.3276	* 1.3279	* 1.3709	* 1.3736	* 1.3566	* 1.9186	* 3.7776 *
12	* 1.4136	* 1.3521	* 1.3511	* 1.3069	* 1.2715	* 1.3531	* .7316	*
	* 1.2737	* 1.3075	* 1.3402	* 1.3731	* 1.3969	* 1.3393	* 2.3486	*
13	* 1.2523	* 1.4095	* 1.3366	* 1.3481	* 1.3536	* 1.4093	* .6229	*
	* 1.4010	* 1.2672	* 1.3536	* 1.3560	* 1.3389	* 1.2751	* 2.7220	*
14	* 1.4512	* 1.4359	* 1.4369	* .9159	* .7318	* .6352	*	*
	* 1.2296	* 1.2456	* 1.2479	* 1.9179	* 2.3481	* 2.6696	*	*
15	* .6529	* .6788	* .6633	* .4432	* F-DEL-H			
	* 2.5423	* 2.4430	* 2.5129	* 3.7757	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 243 of 312

TABLE A-3 (CONTINUED)

F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 100% POWER, 125 EFPD

	H	G	F	E	D	C	B	A
8	* 1.3608	* 1.1488	* 1.2460	* 1.1857	* 1.4400	* 1.2010	* 1.4398	* .6637
	* 1.3134	* 1.5274	* 1.4267	* 1.4866	* 1.2456	* 1.4524	* 1.2307	* 2.5444
9	* 1.1488	* 1.3545	* 1.3107	* 1.3822	* 1.3108	* 1.3539	* 1.4435	* .6892
	* 1.5274	* 1.3367	* 1.3654	* 1.3132	* 1.3676	* 1.3107	* 1.2306	* 2.4489
10	* 1.2460	* 1.3103	* 1.3074	* 1.3203	* 1.3595	* 1.2956	* 1.4133	* .6656
	* 1.4267	* 1.3658	* 1.3860	* 1.3772	* 1.3517	* 1.3941	* 1.2651	* 2.5479
11	* 1.1857	* 1.3824	* 1.3207	* 1.3375	* 1.3042	* 1.4120	* .9112	* .4474
	* 1.4866	* 1.3130	* 1.3769	* 1.3745	* 1.4014	* 1.2967	* 1.9529	* 3.7451
12	* 1.4400	* 1.3115	* 1.3601	* 1.3046	* 1.2528	* 1.4114	* .7552	*
	* 1.2456	* 1.3669	* 1.3512	* 1.4010	* 1.4340	* 1.2838	* 2.3224	*
13	* 1.2010	* 1.3559	* 1.2965	* 1.4125	* 1.4119	* 1.3937	* .6262	*
	* 1.4524	* 1.3089	* 1.3932	* 1.2962	* 1.2835	* 1.2882	* 2.7635	*
14	* 1.4398	* 1.4452	* 1.4143	* .9115	* .7554	* .6386	*	*
	* 1.2307	* 1.2292	* 1.2643	* 1.9523	* 2.3220	* 2.7094	*	*
15	* .6637	* .6896	* .6659	* .4476	* F-DEL-H			
	* 2.5444	* 2.4476	* 2.5472	* 3.8084	* M-DEL-H			

AT 100% POWER, 200 EFPD

	H	G	F	E	D	C	B	A
8	* 1.3915	* 1.1462	* 1.2204	* 1.1694	* 1.4411	* 1.1555	* 1.4316	* .6650
	* 1.2887	* 1.5350	* 1.4571	* 1.5076	* 1.2466	* 1.5026	* 1.2320	* 2.4849
9	* 1.1462	* 1.3822	* 1.2874	* 1.4251	* 1.2932	* 1.3016	* 1.4367	* .6901
	* 1.5350	* 1.3132	* 1.3900	* 1.2743	* 1.3682	* 1.3366	* 1.2308	* 2.3922
10	* 1.2204	* 1.2870	* 1.2779	* 1.3190	* 1.3837	* 1.2668	* 1.3824	* .6641
	* 1.4571	* 1.3904	* 1.3985	* 1.3759	* 1.3278	* 1.4252	* 1.2891	* 2.4991
11	* 1.1694	* 1.4253	* 1.3192	* 1.3805	* 1.3079	* 1.4432	* .9027	* .4526
	* 1.5076	* 1.2741	* 1.3756	* 1.3321	* 1.3799	* 1.2685	* 1.9401	* 3.6875
12	* 1.4411	* 1.2937	* 1.3842	* 1.3082	* 1.2321	* 1.4403	* .7665	*
	* 1.2466	* 1.3676	* 1.3273	* 1.3796	* 1.4317	* 1.2579	* 2.2430	*
13	* 1.1555	* 1.3030	* 1.2674	* 1.4435	* 1.4406	* 1.3613	* .6254	*
	* 1.5026	* 1.3351	* 1.4246	* 1.2683	* 1.2577	* 1.3172	* 2.7094	*
14	* 1.4316	* 1.4379	* 1.3831	* .9029	* .7665	* .6379	*	*
	* 1.2320	* 1.2298	* 1.2886	* 1.9399	* 2.2430	* 2.6565	*	*
15	* .6650	* .6904	* .6642	* .4527	* F-DEL-H			
	* 2.4849	* 2.3912	* 2.4989	* 3.6869	* M-DEL-H			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 244 of 312**

F-DEL-H &amp; M-DEL-H VALUES - NORMAL OPERATION

	H	G	F	E	D	C	B	A
8	1.3993	1.1513	1.2025	1.1417	1.3995	1.0978	1.3949	.6801
	1.2645	1.5366	1.4822	1.5202	1.2406	1.5464	1.2212	2.4207
9	1.1513	1.4278	1.2611	1.4562	1.2680	1.2361	1.4020	.7032
	1.5366	1.2594	1.4047	1.2148	1.3707	1.3763	1.2197	2.3399
10	1.2025	1.2607	1.2473	1.3048	1.4485	1.2329	1.3518	.6790
	1.4822	1.4051	1.4162	1.3557	1.2396	1.4200	1.2779	2.3901
11	1.1417	1.4563	1.3049	1.4549	1.2992	1.4347	.9002	.4807
	1.5202	1.2147	1.3556	1.2307	1.3612	1.2346	1.9350	3.3913
12	1.3995	1.2683	1.4487	1.2993	1.1970	1.4297	.7860	
	1.2406	1.3704	1.2395	1.3611	1.4435	1.2213	2.1338	
13	1.0978	1.2369	1.2331	1.4347	1.4298	1.3115	.6378	
	1.5464	1.3755	1.4198	1.2346	1.2212	1.3154	2.5897	
14	1.3949	1.4026	1.3519	.9002	.7858	.6499		
	1.2212	1.2191	1.2778	1.9352	2.1344	2.5432		
15	.6801	.7034	.6789	.4807	F-DEL-H			
	2.4207	2.3392	2.3906	3.3917	M-DEL-H			

	H	G	F	E	D	C	B	A
8	* 1.3705	* 1.1411	* 1.1854	* 1.1206	* 1.3573	* 1.0805	* 1.3814	* .7086
	* 1.2670	* 1.5211	* 1.4736	* 1.5196	* 1.2570	* 1.5441	* 1.2383	* 2.2845
9	* 1.1411	* 1.4275	* 1.2340	* 1.4311	* 1.2376	* 1.2185	* 1.3873	* .7305
	* 1.5211	* 1.2592	* 1.4088	* 1.2354	* 1.3774	* 1.3732	* 1.2375	* 2.2131
10	* 1.1854	* 1.2336	* 1.2174	* 1.2737	* 1.4366	* 1.2143	* 1.3446	* .7084
	* 1.4736	* 1.4092	* 1.4229	* 1.3623	* 1.2444	* 1.4185	* 1.2889	* 2.2955
11	* 1.1206	* 1.4311	* 1.2737	* 1.4371	* 1.2723	* 1.4089	* .9139	* .5174
	* 1.5196	* 1.2354	* 1.3623	* 1.2432	* 1.3615	* 1.2574	* 1.8714	* 3.1560
12	* 1.3573	* 1.2377	* 1.4365	* 1.2724	* 1.1746	* 1.4107	* .8090	*
	* 1.2570	* 1.3773	* 1.2443	* 1.3614	* 1.4387	* 1.2382	* 2.0697	*
13	* 1.0805	* 1.2189	* 1.2143	* 1.4088	* 1.4107	* 1.2985	* .6635	*
	* 1.5441	* 1.3727	* 1.4184	* 1.2574	* 1.2381	* 1.3326	* 2.4888	*
14	* 1.3814	* 1.3876	* 1.3445	* .9138	* .8088	* .6752	*	*
	* 1.2383	* 1.2371	* 1.2890	* 1.8718	* 2.0703	* 2.4462	*	*
15	* .7086	* .7306	* .7082	* .5173	* F-DEL-H			
	* 2.2845	* 2.2127	* 2.2962	* 3.1566	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 245 of 312

TABLE A-3 (CONTINUED)

F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 75% POWER, 4 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.2616	* 1.2469	* 1.4351	* 1.2745	* 1.3984	* 1.3124	* 1.4746	* .6369
	* 1.6316	* 1.7242	* 1.4773	* 1.6248	* 1.4886	* 1.5472	* 1.4313	* 3.0579
9	* 1.2469	* 1.4755	* 1.4836	* 1.4389	* 1.4151	* 1.4761	* 1.4521	* .6654
	* 1.7242	* 1.4088	* 1.4213	* 1.4227	* 1.4517	* 1.3921	* 1.4655	* 2.9245
10	* 1.4351	* 1.4830	* 1.5078	* 1.4405	* 1.3812	* 1.3903	* 1.4544	* .6563
	* 1.4773	* 1.4217	* 1.4088	* 1.4715	* 1.4749	* 1.5145	* 1.4657	* 2.9787
11	* 1.2745	* 1.4389	* 1.4407	* 1.3886	* 1.3077	* 1.2801	* .9071	* .4299
	* 1.6248	* 1.4227	* 1.4713	* 1.5109	* 1.6298	* 1.7334	* 2.3095	* 4.5410
12	* 1.3984	* 1.4175	* 1.3830	* 1.3082	* 1.1471	* 1.2533	* .6798	*
	* 1.4886	* 1.4496	* 1.4732	* 1.6295	* 1.6511	* 1.6828	* 2.9717	*
13	* 1.3124	* 1.4793	* 1.3920	* 1.2810	* 1.2538	* 1.3357	* .5820	*
	* 1.5472	* 1.3894	* 1.5129	* 1.7326	* 1.6822	* 1.5587	* 3.3838	*
14	* 1.4746	* 1.4547	* 1.4561	* .9079	* .6801	* .5938	*	*
	* 1.4313	* 1.4632	* 1.4642	* 2.3084	* 2.9713	* 3.3202	*	*
15	* .6369	* .6659	* .6568	* .4303	* F-DEL-H			
	* 3.0579	* 2.9223	* 2.9772	* 4.5380	* M-DEL-H			

AT 75% POWER, 50 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.2229	* 1.1628	* 1.3306	* 1.2299	* 1.4461	* 1.2813	* 1.4905	* .6611
	* 1.6548	* 1.8197	* 1.6119	* 1.6983	* 1.4590	* 1.6160	* 1.4208	* 2.9741
9	* 1.1628	* 1.4043	* 1.3967	* 1.3933	* 1.3817	* 1.4476	* 1.4723	* .6867
	* 1.8197	* 1.5832	* 1.5324	* 1.5365	* 1.5141	* 1.4488	* 1.4472	* 2.8567
10	* 1.3306	* 1.3962	* 1.4055	* 1.3780	* 1.3729	* 1.3594	* 1.4658	* .6674
	* 1.6119	* 1.5328	* 1.5348	* 1.5708	* 1.5783	* 1.5779	* 1.4567	* 2.9588
11	* 1.2299	* 1.3933	* 1.3782	* 1.3555	* 1.3000	* 1.3376	* .9125	* .4376
	* 1.6983	* 1.5360	* 1.5706	* 1.6513	* 1.6855	* 1.6541	* 2.3401	* 4.5131
12	* 1.4461	* 1.3839	* 1.3745	* 1.3005	* 1.1395	* 1.3031	* .7061	*
	* 1.4590	* 1.5119	* 1.5766	* 1.6850	* 1.7120	* 1.6295	* 2.9815	*
13	* 1.2813	* 1.4504	* 1.3608	* 1.3384	* 1.3036	* 1.3569	* .5924	*
	* 1.6160	* 1.4461	* 1.5763	* 1.6533	* 1.6290	* 1.5456	* 3.4543	*
14	* 1.4905	* 1.4747	* 1.4675	* .9132	* .7064	* .6043	*	*
	* 1.4208	* 1.4451	* 1.4554	* 2.3391	* 2.9808	* 3.3869	*	*
15	* .6611	* .6873	* .6678	* .4380	* F-DEL-H			
	* 2.9741	* 2.8548	* 2.9575	* 4.5108	* M-DEL-H			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 246 of 312**

F-DEL-H &amp; M-DEL-H VALUES - NORMAL OPERATION

	H	G	F	E	D	C	B	A
8	* 1.2161	* 1.1003	* 1.2469	* 1.2057	* 1.4743	* 1.2286	* 1.4838	* .6743
	* 1.6251	* 1.9210	* 1.7117	* 1.7303	* 1.4286	* 1.6779	* 1.4243	* 2.9894
9	* 1.1003	* 1.3537	* 1.3281	* 1.4071	* 1.3392	* 1.3933	* 1.4863	* .7001
	* 1.9210	* 1.6426	* 1.6087	* 1.5266	* 1.5647	* 1.4971	* 1.4258	* 2.8726
10	* 1.2469	* 1.3276	* 1.3271	* 1.3417	* 1.3826	* 1.3186	* 1.4454	* .6718
	* 1.7117	* 1.6091	* 1.6214	* 1.6030	* 1.5884	* 1.6214	* 1.4814	* 3.0026
11	* 1.2057	* 1.4074	* 1.3421	* 1.3414	* 1.2992	* 1.4066	* .9097	* .4428
	* 1.7303	* 1.5260	* 1.6026	* 1.6699	* 1.6930	* 1.6054	* 2.3830	* 4.5148
12	* 1.4743	* 1.3400	* 1.3833	* 1.2996	* 1.1114	* 1.3584	* .7311	*
	* 1.4286	* 1.5636	* 1.5877	* 1.6926	* 1.7316	* 1.5844	* 2.8889	*
13	* 1.2286	* 1.3955	* 1.3197	* 1.4072	* 1.3588	* 1.3405	* .5963	*
	* 1.6779	* 1.4949	* 1.6201	* 1.6048	* 1.5839	* 1.5925	* 3.4378	*
14	* 1.4838	* 1.4882	* 1.4465	* .9101	* .7312	* .6083	*	*
	* 1.4243	* 1.4241	* 1.4803	* 2.3823	* 2.8885	* 3.3706	*	*
15	* .6743	* .7005	* .6721	* .4430	* F-DEL-H			
	* 2.9894	* 2.8710	* 3.0018	* 4.5132	* M-DEL-H			

	H	G	F	E	D	C	B	A
8	* 1.2346	* 1.0908	* 1.2189	* 1.1906	* 1.4769	* 1.1819	* 1.4773	* .6765 *
	* 1.5928	* 1.9315	* 1.7614	* 1.7543	* 1.4256	* 1.7348	* 1.4191	* 2.9689 *
9	* 1.0908	* 1.3590	* 1.3048	* 1.4566	* 1.3202	* 1.3389	* 1.4813	* .7019 *
	* 1.9315	* 1.6287	* 1.6423	* 1.4802	* 1.5894	* 1.5478	* 1.4183	* 2.8547 *
10	* 1.2189	* 1.3043	* 1.2969	* 1.3429	* 1.4086	* 1.2880	* 1.4119	* .6708 *
	* 1.7614	* 1.6428	* 1.6625	* 1.6027	* 1.5634	* 1.6514	* 1.4978	* 2.9970 *
11	* 1.1906	* 1.4568	* 1.3432	* 1.3852	* 1.3043	* 1.4387	* .9012	* .4479 *
	* 1.7543	* 1.4799	* 1.6023	* 1.6159	* 1.6913	* 1.5359	* 2.3909	* 4.4450 *
12	* 1.4769	* 1.3208	* 1.4090	* 1.3046	* 1.1022	* 1.3855	* .7417	* *
	* 1.4256	* 1.5886	* 1.5629	* 1.6910	* 1.7530	* 1.5192	* 2.8356	* *
13	* 1.1819	* 1.3405	* 1.2887	* 1.4391	* 1.3859	* 1.3041	* .5943	* *
	* 1.7348	* 1.5459	* 1.6504	* 1.5355	* 1.5189	* 1.5924	* 3.4312	* *
14	* 1.4773	* 1.4826	* 1.4126	* .9014	* .7417	* .6063	* *	* *
	* 1.4191	* 1.4170	* 1.4971	* 2.3906	* 2.8356	* 3.3635	* *	* *
15	* .6765	* .7022	* .6710	* .4480	* F-DEL-H			
	* 2.9689	* 2.8534	* 2.9966	* 4.4442	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 247 of 312

TABLE A-3 (CONTINUED)

F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 75% POWER, 350 EFPD

	H	G	F	E	D	C	B	A
8	* 1.2170	* 1.0968	* 1.2027	* 1.1687	* 1.4423	* 1.1276	* 1.4478	* .6962
	* 1.5823	* 1.8842	* 1.7721	* 1.7700	* 1.4624	* 1.7931	* 1.4464	* 2.8483
9	* 1.0968	* 1.4264	* 1.2848	* 1.5004	* 1.3016	* 1.2760	* 1.4530	* .7195
	* 1.8842	* 1.5662	* 1.6454	* 1.4410	* 1.5944	* 1.5918	* 1.4424	* 2.7504
10	* 1.2027	* 1.2844	* 1.2699	* 1.3362	* 1.4794	* 1.2570	* 1.3850	* .6888
	* 1.7721	* 1.6459	* 1.6691	* 1.5836	* 1.4859	* 1.6630	* 1.5215	* 2.8757
11	* 1.1687	* 1.5005	* 1.3363	* 1.4662	* 1.2957	* 1.4274	* .8988	* .4761
	* 1.7700	* 1.4409	* 1.5834	* 1.5203	* 1.6861	* 1.5329	* 2.3264	* 4.1525
12	* 1.4423	* 1.3019	* 1.4795	* 1.2959	* 1.0787	* 1.3596	* .7558	*
	* 1.4624	* 1.5941	* 1.4857	* 1.6859	* 1.7931	* 1.5152	* 2.6870	*
13	* 1.1276	* 1.2769	* 1.2573	* 1.4274	* 1.3597	* 1.2355	* .5988	*
	* 1.7931	* 1.5907	* 1.6625	* 1.5328	* 1.5151	* 1.6398	* 3.2780	*
14	* 1.4478	* 1.4537	* 1.3852	* .8988	* .7557	* .6102	*	*
	* 1.4464	* 1.4416	* 1.5213	* 2.3267	* 2.6877	* 3.2189	*	*
15	* .6962	* .7197	* .6888	* .4761	* F-DEL-H			
	* 2.8483	* 2.7495	* 2.8761	* 4.1527	* M-DEL-H			

AT 75% POWER, 460 EFPD

	H	G	F	E	D	C	B	A
8	* 1.1867	* 1.0870	* 1.1859	* 1.1528	* 1.4061	* 1.1170	* 1.4450	* .7317
	* 1.5711	* 1.8921	* 1.7980	* 1.7961	* 1.4776	* 1.8245	* 1.4354	* 2.7488
9	* 1.0870	* 1.4244	* 1.2613	* 1.4798	* 1.2758	* 1.2668	* 1.4487	* .7539
	* 1.8921	* 1.5262	* 1.6736	* 1.4329	* 1.6246	* 1.6133	* 1.4304	* 2.6611
10	* 1.1859	* 1.2609	* 1.2423	* 1.3086	* 1.4724	* 1.2425	* 1.3850	* .7238
	* 1.7980	* 1.6740	* 1.7012	* 1.6075	* 1.4586	* 1.6776	* 1.5054	* 2.7698
11	* 1.1528	* 1.4798	* 1.3087	* 1.4472	* 1.2660	* 1.3985	* .9144	* .5145
	* 1.7961	* 1.4328	* 1.6075	* 1.4986	* 1.6712	* 1.5219	* 2.2834	* 3.8744
12	* 1.4061	* 1.2760	* 1.4725	* 1.2661	* 1.0487	* 1.3252	* .7745	*
	* 1.4776	* 1.6244	* 1.4585	* 1.6711	* 1.7749	* 1.4992	* 2.6066	*
13	* 1.1170	* 1.2672	* 1.2426	* 1.3984	* 1.3253	* 1.2071	* .6175	*
	* 1.8245	* 1.6126	* 1.6774	* 1.5219	* 1.4991	* 1.6220	* 3.1563	*
14	* 1.4450	* 1.4491	* 1.3850	* .9143	* .7743	* .6285	*	*
	* 1.4354	* 1.4298	* 1.5053	* 2.2838	* 2.6074	* 3.1020	*	*
15	* .7317	* .7540	* .7236	* .5145	* F-DEL-H			
	* 2.7488	* 2.6606	* 2.7705	* 3.8750	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 248 of 312

TABLE A-3 (CONTINUED)

F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 50% POWER, 4 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.1801	* 1.2482	* 1.4619	* 1.3063	* 1.4424	* 1.3560	* 1.5272	* .6506
	* 1.4948	* 1.6798	* 1.4200	* 1.5736	* 1.4485	* 1.4933	* 1.3715	* 2.9463
9	* 1.2482	* 1.5072	* 1.5252	* 1.4778	* 1.4612	* 1.5316	* 1.5022	* .6793
	* 1.6798	* 1.3659	* 1.3672	* 1.3792	* 1.4019	* 1.3418	* 1.4044	* 2.8646
10	* 1.4619	* 1.5246	* 1.5515	* 1.4790	* 1.4123	* 1.4225	* 1.4916	* .6649
	* 1.4200	* 1.3676	* 1.3529	* 1.4218	* 1.4467	* 1.4725	* 1.4140	* 2.9503
11	* 1.3063	* 1.4778	* 1.4792	* 1.4094	* 1.2909	* 1.2704	* .9029	* 4.258
	* 1.5736	* 1.3792	* 1.4216	* 1.4972	* 1.5845	* 1.6885	* 2.3117	* 4.5793
12	* 1.4424	* 1.4639	* 1.4143	* 1.2915	* 1.0550	* 1.1651	* .6439	*
	* 1.4485	* 1.3996	* 1.4449	* 1.5842	* 1.5984	* 1.6331	* 2.9367	*
13	* 1.3560	* 1.5352	* 1.4244	* 1.2714	* 1.1657	* 1.2323	* .5360	*
	* 1.4933	* 1.3389	* 1.4706	* 1.6878	* 1.6326	* 1.4928	* 3.3337	*
14	* 1.5272	* 1.5051	* 1.4936	* .9037	* .6442	* .5468	*	*
	* 1.3715	* 1.4019	* 1.4124	* 2.3104	* 2.9362	* 3.2702	*	*
15	* .6506	* .6800	* .6655	* .4262	* F-DEL-H			
	* 2.9463	* 2.8623	* 2.9486	* 4.5762	* M-DEL-H			

AT 50% POWER, 50 EFPD								
	H	G	F	E	D	C	B	A
8	* 1.1405	* 1.1522	* 1.3468	* 1.2579	* 1.4901	* 1.3209	* 1.5442	* .6763
	* 1.5979	* 1.7801	* 1.5342	* 1.6280	* 1.4334	* 1.5434	* 1.3894	* 2.9423
9	* 1.1522	* 1.4235	* 1.4261	* 1.4244	* 1.4235	* 1.5008	* 1.5236	* .7022
	* 1.7801	* 1.5280	* 1.4601	* 1.4917	* 1.4462	* 1.3780	* 1.4160	* 2.8244
10	* 1.3468	* 1.4256	* 1.4368	* 1.4077	* 1.4030	* 1.3895	* 1.5050	* .6772
	* 1.5342	* 1.4604	* 1.4576	* 1.4970	* 1.5761	* 1.5197	* 1.4389	* 2.9396
11	* 1.2579	* 1.4250	* 1.4079	* 1.3717	* 1.2868	* 1.3204	* .9105	* .4344
	* 1.6280	* 1.4912	* 1.4968	* 1.6589	* 1.6163	* 1.6538	* 2.3354	* 4.5689
12	* 1.4901	* 1.4259	* 1.4047	* 1.2874	* 1.0567	* 1.2269	* .6744	*
	* 1.4334	* 1.4440	* 1.5743	* 1.6158	* 1.6358	* 1.6175	* 2.8780	*
13	* 1.3209	* 1.5040	* 1.3912	* 1.3214	* 1.2275	* 1.2697	* .5522	*
	* 1.5434	* 1.3752	* 1.5178	* 1.6530	* 1.6169	* 1.5102	* 3.3345	*
14	* 1.5442	* 1.5263	* 1.5069	* .9113	* .6747	* .5633	*	*
	* 1.3894	* 1.4136	* 1.4372	* 2.3342	* 2.8776	* 3.2714	*	*
15	* .6763	* .7028	* .6778	* .4348	* F-DEL-H			
	* 2.9423	* 2.8223	* 2.9380	* 4.5661	* M-DEL-H			



**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 249 of 312**

F-DEL-H &amp; M-DEL-H VALUES - NORMAL OPERATION

	H	G	F	E	D	C	B	A
8	* 1.0918	* 1.0800	* 1.2639	* 1.2392	* 1.5284	* 1.2734	* 1.5503	* .6961
	* 1.6087	* 1.8597	* 1.6478	* 1.6726	* 1.3942	* 1.6343	* 1.3857	* 2.9067
9	* 1.0800	* 1.3679	* 1.3547	* 1.4448	* 1.3829	* 1.4527	* 1.5513	* .7224
	* 1.8597	* 1.6235	* 1.5493	* 1.4978	* 1.5263	* 1.4547	* 1.3883	* 2.7897
10	* 1.2639	* 1.3543	* 1.3537	* 1.3720	* 1.4160	* 1.3517	* 1.4922	* .6869
	* 1.6478	* 1.5497	* 1.5563	* 1.5712	* 1.5605	* 1.5868	* 1.4444	* 2.9388
11	* 1.2392	* 1.4455	* 1.3725	* 1.3571	* 1.2849	* 1.3894	* .9098	* .4415
	* 1.6726	* 1.4971	* 1.5707	* 1.6697	* 1.6542	* 1.5588	* 2.3548	* 4.5443
12	* 1.5284	* 1.3838	* 1.4168	* 1.2854	* 1.0379	* 1.2681	* .6967	*
	* 1.3942	* 1.5242	* 1.5597	* 1.6538	* 1.6798	* 1.5265	* 2.7991	*
13	* 1.2734	* 1.4552	* 1.3530	* 1.3902	* 1.2686	* 1.2409	* .5522	*
	* 1.6343	* 1.4522	* 1.5853	* 1.5583	* 1.5261	* 1.5176	* 3.3255	*
14	* 1.5503	* 1.5535	* 1.4936	* .9103	* .6969	* .5633	*	*
	* 1.3856	* 1.3864	* 1.4431	* 2.3540	* 2.7990	* 3.2624	*	*
15	* .6961	* .7229	* .6873	* .4418	* F-DEL-H			
	* 2.9067	* 2.7880	* 2.9377	* 4.5423	* M-DEL-H			

	H	G	F	E	D	C	B	A
8	* 1.0910	* 1.0620	* 1.2362	* 1.2328	* 1.5407	* 1.2312	* 1.5220	* .6931
	* 1.5770	* 1.8741	* 1.6964	* 1.6933	* 1.3897	* 1.6648	* 1.3785	* 2.8830
9	* 1.0620	* 1.3700	* 1.3344	* 1.5070	* 1.3696	* 1.3999	* 1.5500	* .7228
	* 1.8741	* 1.6244	* 1.5821	* 1.4487	* 1.5507	* 1.5045	* 1.3784	* 2.7675
10	* 1.2362	* 1.3339	* 1.3001	* 1.3798	* 1.4520	* 1.3271	* 1.4634	* .6895
	* 1.6964	* 1.5825	* 1.5953	* 1.5672	* 1.5260	* 1.6147	* 1.4686	* 2.9277
11	* 1.2328	* 1.5074	* 1.3802	* 1.3836	* 1.2926	* 1.4240	* .9051	* .4493
	* 1.6933	* 1.4483	* 1.5667	* 1.6027	* 1.6535	* 1.5062	* 2.3561	* 4.4717
12	* 1.5407	* 1.3704	* 1.4525	* 1.2929	* 1.0231	* 1.2818	* .7063	*
	* 1.3897	* 1.5499	* 1.5254	* 1.6532	* 1.6960	* 1.4790	* 2.7416	*
13	* 1.2312	* 1.4018	* 1.3280	* 1.4245	* 1.2822	* 1.1930	* .5472	*
	* 1.6648	* 1.5024	* 1.6136	* 1.5059	* 1.4787	* 1.5410	* 3.3100	*
14	* 1.5220	* 1.5516	* 1.4644	* .9054	* .7064	* .5583	*	*
	* 1.3785	* 1.3769	* 1.4676	* 2.3557	* 2.7418	* 3.2466	*	*
15	* .6931	* .7231	* .6897	* .4494	* F-DEL-H			
	* 2.8830	* 2.7662	* 2.9272	* 4.4706	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 250 of 312

TABLE A-3 (CONTINUED)

F-DEL-H & M-DEL-H VALUES - NORMAL OPERATION

AT 50% POWER, 350 EFPD

	H	G	F	E	D	C	B	A
8	* 1.0954	* 1.0667	* 1.2124	* 1.2139	* 1.5113	* 1.1710	* 1.4217	* .6891
	* 1.4676	* 1.8560	* 1.7252	* 1.7154	* 1.3908	* 1.7303	* 1.3731	* 2.7947
9	* 1.0667	* 1.4114	* 1.3136	* 1.5605	* 1.3549	* 1.3221	* 1.5020	* .7235
	* 1.8560	* 1.5212	* 1.5962	* 1.3719	* 1.5380	* 1.5347	* 1.3697	* 2.6911
10	* 1.2124	* 1.3131	* 1.2161	* 1.3784	* 1.5281	* 1.3011	* 1.4393	* .7058
	* 1.7252	* 1.5966	* 1.6173	* 1.5271	* 1.4271	* 1.5927	* 1.4597	* 2.8377
11	* 1.2139	* 1.5606	* 1.3786	* 1.4767	* 1.2965	* 1.4297	* .9106	* .4805
	* 1.7154	* 1.3718	* 1.5269	* 1.4923	* 1.6018	* 1.4505	* 2.2020	* 4.0437
12	* 1.5113	* 1.3552	* 1.5283	* 1.2966	* 1.0044	* 1.2674	* .7292	*
	* 1.3908	* 1.5375	* 1.4268	* 1.6016	* 1.6613	* 1.4400	* 2.6441	*
13	* 1.1710	* 1.3231	* 1.3014	* 1.4297	* 1.2675	* 1.1392	* .5590	*
	* 1.7303	* 1.5333	* 1.5922	* 1.4504	* 1.4398	* 1.5583	* 3.2248	*
14	* 1.4217	* 1.5028	* 1.4395	* .9106	* .7291	* .5697	*	*
	* 1.3731	* 1.3687	* 1.4594	* 2.2023	* 2.6447	* 3.1659	*	*
15	* .6891	* .7238	* .7058	* .4805	* F-DEL-H			
	* 2.7947	* 2.6901	* 2.8381	* 4.0440	* M-DEL-H			

AT 50% POWER, 460 EFPD

	H	G	F	E	D	C	B	A
8	* 1.0647	* 1.0590	* 1.1925	* 1.1978	* 1.4745	* 1.1555	* 1.3734	* .7068
	* 1.3849	* 1.8621	* 1.7502	* 1.7408	* 1.4253	* 1.7614	* 1.3818	* 2.6949
9	* 1.0590	* 1.4159	* 1.2849	* 1.5391	* 1.3297	* 1.3008	* 1.4872	* .7467
	* 1.8621	* 1.4777	* 1.6222	* 1.3788	* 1.5648	* 1.5559	* 1.3772	* 2.6014
10	* 1.1925	* 1.2845	* 1.1565	* 1.3487	* 1.5314	* 1.2911	* 1.4420	* .7399
	* 1.7502	* 1.6227	* 1.6463	* 1.5465	* 1.3974	* 1.5989	* 1.4597	* 2.7300
11	* 1.1978	* 1.5392	* 1.3487	* 1.4635	* 1.2740	* 1.4162	* .9342	* .5224
	* 1.7408	* 1.3787	* 1.5464	* 1.4526	* 1.6164	* 1.4419	* 2.1454	* 3.7472
12	* 1.4745	* 1.3299	* 1.5315	* 1.2740	* .9800	* 1.2504	* .7582	*
	* 1.4253	* 1.5645	* 1.3973	* 1.6163	* 1.5876	* 1.4455	* 2.5625	*
13	* 1.1555	* 1.3014	* 1.2912	* 1.4161	* 1.2504	* 1.1322	* .5871	*
	* 1.7614	* 1.5550	* 1.5986	* 1.4420	* 1.4454	* 1.5697	* 3.1150	*
14	* 1.3734	* 1.4875	* 1.4420	* .9341	* .7580	* .5976	*	*
	* 1.3818	* 1.3766	* 1.4596	* 2.1459	* 2.5632	* 3.0612	*	*
15	* .7068	* .7469	* .7398	* .5223	* F-DEL-H			
	* 2.6949	* 2.6008	* 2.7308	* 3.7479	* M-DEL-H			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 251 of 312

TABLE A-4

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5762 *	* .5921 *	* .5926 *	* .5968 *	* .6808 *	* .5837 *	* .5726 *	* .3136 *
	* 2.7779 *	* 3.1667 *	* 3.2917 *	* 3.1651 *	* 2.7507 *	* 3.1893 *	* 3.2183 *	* 5.3693 *
9	* .5921 *	* .6756 *	* .6159 *	* .6831 *	* .5903 *	* .5676 *	* .5716 *	* .3156 *
	* 3.1667 *	* 2.8853 *	* 3.1288 *	* 2.7928 *	* 3.1968 *	* 3.2895 *	* 3.2408 *	* 5.2956 *
10	* .5926 *	* .6158 *	* .5793 *	* .6071 *	* .6512 *	* .5557 *	* .5264 *	* .2928 *
	* 3.2917 *	* 3.1291 *	* 3.3601 *	* 3.1704 *	* 2.9710 *	* 3.4660 *	* 3.5951 *	* 5.7809 *
11	* .5968 *	* .6832 *	* .6072 *	* .6419 *	* .5490 *	* .5711 *	* .4079 *	* .2128 *
	* 3.1651 *	* 2.7924 *	* 3.1699 *	* 3.0456 *	* 3.5363 *	* 3.3373 *	* 4.4135 *	* 8.2754 *
12	* .6808 *	* .5904 *	* .6514 *	* .5491 *	* .4653 *	* .5029 *	* .3269 *	
	* 2.7507 *	* 3.1960 *	* 2.9698 *	* 3.5357 *	* 3.7905 *	* 3.5347 *	* 5.2503 *	
13	* .5837 *	* .5687 *	* .5561 *	* .5713 *	* .5029 *	* .4369 *	* .2444 *	
	* 3.1893 *	* 3.2832 *	* 3.4636 *	* 3.3366 *	* 3.5347 *	* 3.9938 *	* 6.8354 *	
14	* .5726 *	* .5723 *	* .5268 *	* .4080 *	* .3268 *	* .2499 *		
	* 3.2183 *	* 3.2368 *	* 3.5925 *	* 4.4127 *	* 5.2520 *	* 6.6901 *		
15	* .3136 *	* .3158 *	* .2929 *	* .2128 *	F-SUB-Q			
	* 5.3693 *	* 5.2933 *	* 5.7789 *	* 8.2724 *	M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3689 *	* 1.2059 *	* 1.3023 *	* 1.2070 *	* 1.4312 *	* 1.2059 *	* 1.3633 *	* .6613 *
	* 1.3473 *	* 1.5850 *	* 1.5348 *	* 1.5961 *	* 1.3358 *	* 1.5775 *	* 1.3816 *	* 2.6048 *
9	* 1.2059 *	* 1.4138 *	* 1.3430 *	* 1.4150 *	* 1.2761 *	* 1.2681 *	* 1.3639 *	* .6862 *
	* 1.5850 *	* 1.3911 *	* 1.4701 *	* 1.3793 *	* 1.5090 *	* 1.5030 *	* 1.3872 *	* 2.4892 *
10	* 1.3023 *	* 1.3427 *	* 1.2998 *	* 1.3059 *	* 1.3025 *	* 1.2251 *	* 1.2741 *	* .6513 *
	* 1.5348 *	* 1.4704 *	* 1.5279 *	* 1.5090 *	* 1.5186 *	* 1.6008 *	* 1.5175 *	* 2.6571 *
11	* 1.2070 *	* 1.4151 *	* 1.3060 *	* 1.2909 *	* 1.1961 *	* 1.3082 *	* .8778 *	* .4484 *
	* 1.5961 *	* 1.3791 *	* 1.5088 *	* 1.5241 *	* 1.6343 *	* 1.4832 *	* 2.0788 *	* 4.0097 *
12	* 1.4312 *	* 1.2767 *	* 1.3030 *	* 1.1963 *	* 1.0721 *	* 1.2427 *	* .7195 *	
	* 1.3358 *	* 1.5083 *	* 1.5181 *	* 1.6340 *	* 1.7086 *	* 1.4935 *	* 2.4319 *	
13	* 1.2059 *	* 1.2705 *	* 1.2259 *	* 1.3085 *	* 1.2428 *	* 1.0982 *	* .5712 *	
	* 1.5775 *	* 1.5004 *	* 1.5997 *	* 1.4829 *	* 1.4934 *	* 1.6738 *	* 2.9893 *	
14	* 1.3633 *	* 1.3653 *	* 1.2748 *	* .8779 *	* .7194 *	* .5742 *		
	* 1.3816 *	* 1.3857 *	* 1.5166 *	* 2.0786 *	* 2.4326 *	* 2.9761 *		
15	* .6613 *	* .6867 *	* .6514 *	* .4485 *	F-SUB-Q			
	* 2.6049 *	* 2.4879 *	* 2.6565 *	* 4.0084 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 252 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4242	* 1.3871	* 1.5206	* 1.3703	* 1.4095	* 1.3775	* 1.4568	* .7310 *
	* 1.3938	* 1.4362	* 1.3352	* 1.4455	* 1.3721	* 1.3993	* 1.3127	* 2.3897 *
9	* 1.3871	* 1.5192	* 1.5377	* 1.4577	* 1.4739	* 1.4853	* 1.4220	* .7653 *
	* 1.4362	* 1.3347	* 1.3045	* 1.3654	* 1.3188	* 1.3026	* 1.3482	* 2.2584 *
10	* 1.5206	* 1.5374	* 1.5565	* 1.4936	* 1.4041	* 1.4217	* 1.4220	* .7478 *
	* 1.3352	* 1.3048	* 1.2929	* 1.3404	* 1.4158	* 1.3975	* 1.3768	* 2.3472 *
11	* 1.3703	* 1.4577	* 1.4937	* 1.4199	* 1.3889	* 1.3081	* 1.0050	* .5157 *
	* 1.4455	* 1.3654	* 1.3402	* 1.4263	* 1.4212	* 1.5148	* 1.8404	* 3.5361 *
12	* 1.4095	* 1.4754	* 1.4046	* 1.3892	* 1.3421	* 1.3159	* .8039	* .8039 *
	* 1.3721	* 1.3174	* 1.4147	* 1.4211	* 1.4399	* 1.4638	* 2.2175	* 2.2175 *
13	* 1.3775	* 1.4880	* 1.4227	* 1.3085	* 1.3161	* 1.3360	* .6744	* .6744 *
	* 1.3993	* 1.3002	* 1.3964	* 1.5145	* 1.4636	* 1.4123	* 2.5832	* 2.5832 *
14	* 1.4568	* 1.4235	* 1.4229	* 1.0051	* .8038	* .6861		
	* 1.3127	* 1.3467	* 1.3758	* 1.8403	* 2.2179	* 2.5409		
15	* .7310	* .7659	* .7480	* .5158	* F-SUB-Q			
	* 2.3897	* 2.2571	* 2.3466	* 3.5350	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5347	* 1.4762	* 1.6378	* 1.4562	* 1.5098	* 1.4710	* 1.5829	* .7429 *
	* 1.3268	* 1.3953	* 1.2600	* 1.3794	* 1.2962	* 1.3268	* 1.2238	* 2.3833 *
9	* 1.4762	* 1.6451	* 1.6533	* 1.5789	* 1.5795	* 1.6057	* 1.5468	* .7780 *
	* 1.3953	* 1.2539	* 1.2304	* 1.2814	* 1.2470	* 1.2204	* 1.2569	* 2.2522 *
10	* 1.6378	* 1.6529	* 1.6842	* 1.6033	* 1.5145	* 1.5343	* 1.5566	* .7720 *
	* 1.2600	* 1.2306	* 1.2103	* 1.2670	* 1.3249	* 1.3113	* 1.2736	* 2.3043 *
11	* 1.4562	* 1.5789	* 1.6034	* 1.5384	* 1.4886	* 1.4145	* 1.0496	* .5322 *
	* 1.3794	* 1.2815	* 1.2669	* 1.3365	* 1.3409	* 1.4275	* 1.7904	* 3.4714 *
12	* 1.5098	* 1.5812	* 1.5158	* 1.4888	* 1.4602	* 1.4306	* .8237	* .8237 *
	* 1.2962	* 1.2456	* 1.3238	* 1.3407	* 1.3521	* 1.3754	* 2.2065	* 2.2065 *
13	* 1.4710	* 1.6088	* 1.5354	* 1.4150	* 1.4309	* 1.4934	* .7112	* .7112 *
	* 1.3268	* 1.2181	* 1.3102	* 1.4271	* 1.3752	* 1.2902	* 2.4994	* 2.4994 *
14	* 1.5829	* 1.5487	* 1.5577	* 1.0497	* .8237	* .7253		
	* 1.2238	* 1.2555	* 1.2726	* 1.7902	* 2.2066	* 2.4528		
15	* .7429	* .7786	* .7722	* .5323	* F-SUB-Q			
	* 2.3833	* 2.2508	* 2.3038	* 3.4701	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 253 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5765	* 1.4999	* 1.6720	* 1.4815	* 1.5573	* 1.5011	* 1.6363	* .7509 *
	* 1.3203	* 1.3993	* 1.2543	* 1.3769	* 1.2763	* 1.3202	* 1.2017	* 2.3960 *
9	* 1.4999	* 1.6927	* 1.6916	* 1.6261	* 1.6136	* 1.6439	* 1.6017	* .7894 *
	* 1.3993	* 1.2363	* 1.2201	* 1.2639	* 1.2392	* 1.2084	* 1.2329	* 2.2553 *
10	* 1.6720	* 1.6912	* 1.7239	* 1.6393	* 1.5611	* 1.5739	* 1.6149	* .7854 *
	* 1.2543	* 1.2204	* 1.1995	* 1.2574	* 1.3046	* 1.2966	* 1.2446	* 2.2996 *
11	* 1.4815	* 1.6261	* 1.6395	* 1.5843	* 1.5283	* 1.4610	* 1.0739	* .5365 *
	* 1.3769	* 1.2639	* 1.2573	* 1.3203	* 1.3317	* 1.4066	* 1.7804	* 3.4928 *
12	* 1.5573	* 1.6156	* 1.5625	* 1.5285	* 1.5000	* 1.4845	* .8396 *	
	* 1.2763	* 1.2377	* 1.3034	* 1.3316	* 1.3433	* 1.3531	* 2.2105 *	
13	* 1.5011	* 1.6472	* 1.5752	* 1.4616	* 1.4848	* 1.5662	* .7305 *	
	* 1.3202	* 1.2064	* 1.2954	* 1.4062	* 1.3528	* 1.2561	* 2.4876 *	
14	* 1.6363	* 1.6038	* 1.6161	* 1.0742	* .8397	* .7459 *		
	* 1.2017	* 1.2316	* 1.2436	* 1.7800	* 2.2103	* 2.4384 *		
15	* .7509	* .7899	* .7856	* .5367	* F-SUB-Q			
	* 2.3960	* 2.2540	* 2.2990	* 3.4911	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5878	* 1.5022	* 1.6803	* 1.4873	* 1.5752	* 1.5107	* 1.6582	* .7564 *
	* 1.3354	* 1.4179	* 1.2663	* 1.3951	* 1.2846	* 1.3358	* 1.2066	* 2.4225 *
9	* 1.5022	* 1.7071	* 1.7038	* 1.6422	* 1.6250	* 1.6572	* 1.6251	* .7965 *
	* 1.4179	* 1.2444	* 1.2307	* 1.2718	* 1.2519	* 1.2147	* 1.2368	* 2.2756 *
10	* 1.6803	* 1.7034	* 1.7363	* 1.6516	* 1.5784	* 1.5891	* 1.6404	* .7926 *
	* 1.2663	* 1.2310	* 1.2096	* 1.2679	* 1.3111	* 1.3037	* 1.2441	* 2.3171 *
11	* 1.4873	* 1.6422	* 1.6518	* 1.6004	* 1.5447	* 1.4804	* 1.0882	* .5376 *
	* 1.3951	* 1.2718	* 1.2678	* 1.3212	* 1.3425	* 1.4106	* 1.7802	* 3.5364 *
12	* 1.5752	* 1.6271	* 1.5799	* 1.5450	* 1.5163	* 1.5090	* .8520 *	
	* 1.2846	* 1.2503	* 1.3098	* 1.3423	* 1.3557	* 1.3594	* 2.2222 *	
13	* 1.5107	* 1.6607	* 1.5905	* 1.4811	* 1.5094	* 1.6026	* .7423 *	
	* 1.3358	* 1.2127	* 1.3024	* 1.4101	* 1.3590	* 1.2578	* 2.5098 *	
14	* 1.6582	* 1.6273	* 1.6417	* 1.0886	* .8522 *			
	* 1.2066	* 1.2354	* 1.2431	* 1.7795	* 2.2218	* 2.4596 *		
15	* .7564	* .7971	* .7930	* .5379	* F-SUB-Q			
	* 2.4225	* 2.2742	* 2.3162	* 3.5345	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 254 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6073	* 1.5109	* 1.6966	* 1.4994	* 1.5993	* 1.5258	* 1.6904	* .7551 *
	* 1.3341	* 1.4250	* 1.2668	* 1.4106	* 1.2922	* 1.3503	* 1.2083	* 2.4783 *
9	* 1.5109	* 1.7311	* 1.7239	* 1.6678	* 1.6444	* 1.6835	* 1.6570	* .7938 *
	* 1.4250	* 1.2415	* 1.2378	* 1.2747	* 1.2623	* 1.2195	* 1.2379	* 2.3317 *
10	* 1.6966	* 1.7234	* 1.7578	* 1.6719	* 1.6051	* 1.6120	* 1.6736	* .7911 *
	* 1.2668	* 1.2381	* 1.2154	* 1.2741	* 1.3119	* 1.3070	* 1.2405	* 2.3658 *
11	* 1.4994	* 1.6678	* 1.6721	* 1.6261	* 1.5678	* 1.5086	* 1.0916	* .5341 *
	* 1.4106	* 1.2747	* 1.2740	* 1.3140	* 1.3472	* 1.4014	* 1.7899	* 3.6088 *
12	* 1.5993	* 1.6466	* 1.6067	* 1.5680	* 1.5395	* 1.5399	* .8505	* .7551 *
	* 1.2922	* 1.2606	* 1.3106	* 1.3470	* 1.3605	* 1.3571	* 2.2696	* 2.4783 *
13	* 1.5258	* 1.6865	* 1.6134	* 1.5093	* 1.5404	* 1.6439	* .7453	* .7551 *
	* 1.3503	* 1.2173	* 1.3057	* 1.4007	* 1.3567	* 1.2499	* 2.5480	* 2.4783 *
14	* 1.6904	* 1.6594	* 1.6750	* 1.0921	* .8507	* .7614		
	* 1.2083	* 1.2361	* 1.2394	* 1.7891	* 2.2691	* 2.4964		
15	* .7551	* .7944	* .7915	* .5344	* F-SUB-Q			
	* 2.4783	* 2.3302	* 2.3648	* 3.6067	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6130	* 1.5111	* 1.7023	* 1.5030	* 1.6108	* 1.5325	* 1.7073	* .7553 *
	* 1.3531	* 1.4518	* 1.2867	* 1.4380	* 1.3145	* 1.3772	* 1.2252	* 2.5383 *
9	* 1.5111	* 1.7404	* 1.7330	* 1.6793	* 1.6533	* 1.6990	* 1.6742	* .7926 *
	* 1.4518	* 1.2546	* 1.2532	* 1.2908	* 1.2849	* 1.2367	* 1.2533	* 2.3915 *
10	* 1.7023	* 1.7325	* 1.7679	* 1.6816	* 1.6179	* 1.6241	* 1.6920	* .7905 *
	* 1.2867	* 1.2536	* 1.2289	* 1.2883	* 1.3260	* 1.3187	* 1.2507	* 2.4187 *
11	* 1.5030	* 1.6792	* 1.6817	* 1.6376	* 1.5799	* 1.5227	* 1.0946	* .5322 *
	* 1.4380	* 1.2908	* 1.2882	* 1.3294	* 1.3552	* 1.4109	* 1.8165	* 3.6695 *
12	* 1.6108	* 1.6557	* 1.6195	* 1.5802	* 1.5518	* 1.5564	* .8509	* .7553 *
	* 1.3145	* 1.2830	* 1.3247	* 1.3550	* 1.3708	* 1.3640	* 2.2976	* 2.5383 *
13	* 1.5325	* 1.7021	* 1.6256	* 1.5236	* 1.5569	* 1.6688	* .7480	* .7553 *
	* 1.3772	* 1.2344	* 1.3174	* 1.4102	* 1.3636	* 1.2559	* 2.5853	* 2.5383 *
14	* 1.7073	* 1.6767	* 1.6936	* 1.0952	* .8512	* .7640		
	* 1.2252	* 1.2514	* 1.2496	* 1.8155	* 2.2970	* 2.5334		
15	* .7553	* .7932	* .7909	* .5325	* F-SUB-Q			
	* 2.5383	* 2.3899	* 2.4175	* 3.6671	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 255 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6227	* 1.5140	* 1.7114	* 1.5091	* 1.6256	* 1.5418	* 1.7278	* .7532 *
	* 1.3867	* 1.4832	* 1.3044	* 1.4686	* 1.3394	* 1.4080	* 1.2446	* 2.6168 *
9	* 1.5140	* 1.7543	* 1.7454	* 1.6949	* 1.6651	* 1.7170	* 1.6946	* .7883 *
	* 1.4832	* 1.2702	* 1.2726	* 1.3081	* 1.3103	* 1.2571	* 1.2713	* 2.4712 *
10	* 1.7114	* 1.7448	* 1.7813	* 1.6941	* 1.6344	* 1.6387	* 1.7133	* .7877 *
	* 1.3044	* 1.2730	* 1.2467	* 1.3070	* 1.3417	* 1.3346	* 1.2633	* 2.4875 *
11	* 1.5091	* 1.6949	* 1.6943	* 1.6532	* 1.5942	* 1.5402	* 1.0952	* .5286 *
	* 1.4686	* 1.3081	* 1.3068	* 1.3416	* 1.3780	* 1.4304	* 1.8514	* 3.7642 *
12	* 1.6256	* 1.6675	* 1.6361	* 1.5945	* 1.5661	* 1.5754	* .8484	* .7532 *
	* 1.3394	* 1.3082	* 1.3403	* 1.3778	* 1.3957	* 1.3812	* 2.3605	* .7532 *
13	* 1.5418	* 1.7202	* 1.6403	* 1.5411	* 1.5760	* 1.6947	* .7481	* .7532 *
	* 1.4080	* 1.2547	* 1.3333	* 1.4297	* 1.3809	* 1.2667	* 2.6456	* .7532 *
14	* 1.7278	* 1.6972	* 1.7150	* 1.0958	* .8488	* .7642		
	* 1.2446	* 1.2694	* 1.2621	* 1.8502	* 2.3597	* 2.5921		
15	* .7532	* .7889	* .7882	* .5290	* F-SUB-Q			
	* 2.6168	* 2.4696	* 2.4863	* 3.7617	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5974	* 1.4955	* 1.6937	* 1.4938	* 1.6091	* 1.5291	* 1.7104	* .7563 *
	* 1.4469	* 1.5402	* 1.3547	* 1.5285	* 1.3979	* 1.4666	* 1.2981	* 2.6898 *
9	* 1.4955	* 1.7325	* 1.7300	* 1.6757	* 1.6506	* 1.7067	* 1.6799	* .7955 *
	* 1.5402	* 1.3224	* 1.3217	* 1.3618	* 1.3633	* 1.3048	* 1.3224	* 2.5268 *
10	* 1.6937	* 1.7294	* 1.7658	* 1.6801	* 1.6170	* 1.6270	* 1.6995	* .7940 *
	* 1.3547	* 1.3221	* 1.2941	* 1.3557	* 1.3943	* 1.3817	* 1.3086	* 2.5396 *
11	* 1.4938	* 1.6756	* 1.6803	* 1.6344	* 1.5828	* 1.5241	* 1.1020	* .5299 *
	* 1.5285	* 1.3618	* 1.3555	* 1.3928	* 1.4301	* 1.4782	* 1.8838	* 3.8514 *
12	* 1.6091	* 1.6530	* 1.6188	* 1.5831	* 1.5554	* 1.5619	* .8578	* .5299 *
	* 1.3979	* 1.3611	* 1.3928	* 1.4298	* 1.4530	* 1.4383	* 2.4032	* .5299 *
13	* 1.5291	* 1.7099	* 1.6287	* 1.5249	* 1.5625	* 1.6841	* .7542	* .5299 *
	* 1.4666	* 1.3024	* 1.3803	* 1.4773	* 1.4380	* 1.3170	* 2.7097	* .5299 *
14	* 1.7104	* 1.6825	* 1.7013	* 1.1027	* .8582	* .7709		
	* 1.2981	* 1.3204	* 1.3073	* 1.8825	* 2.4023	* 2.6531		
15	* .7563	* .7961	* .7945	* .5303	* F-SUB-Q			
	* 2.6898	* 2.5251	* 2.5382	* 3.8486	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 256 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6198	* 1.5062	* 1.7126	* 1.5074	* 1.6346	* 1.5455	* 1.7454	* .7502 *
	* 1.4745	* 1.5824	* 1.3871	* 1.5688	* 1.4275	* 1.5054	* 1.3190	* 2.8100 *
9	* 1.5062	* 1.7599	* 1.7524	* 1.7043	* 1.6720	* 1.7351	* 1.7133	* .7853 *
	* 1.5824	* 1.3471	* 1.3499	* 1.3844	* 1.3946	* 1.3304	* 1.3431	* 2.6512 *
10	* 1.7126	* 1.7518	* 1.7899	* 1.7021	* 1.6462	* 1.6511	* 1.7338	* .7847 *
	* 1.3871	* 1.3504	* 1.3209	* 1.3840	* 1.4147	* 1.4062	* 1.3249	* 2.6561 *
11	* 1.5074	* 1.7043	* 1.7023	* 1.6627	* 1.6059	* 1.5537	* 1.0963	* .5236 *
	* 1.5688	* 1.3844	* 1.3839	* 1.4150	* 1.4496	* 1.4945	* 1.9534	* 4.0166 *
12	* 1.6346	* 1.6749	* 1.6480	* 1.6062	* 1.5784	* 1.5920	* .8466 *	
	* 1.4275	* 1.3922	* 1.4131	* 1.4493	* 1.4713	* 1.4513	* 2.4994 *	
13	* 1.5455	* 1.7385	* 1.6529	* 1.5547	* 1.5926	* 1.7228	* .7490 *	
	* 1.5054	* 1.3277	* 1.4047	* 1.4937	* 1.4509	* 1.3276	* 2.8062 *	
14	* 1.7454	* 1.7161	* 1.7356	* 1.0971	* .8469	* .7649	*	
	* 1.3190	* 1.3410	* 1.3235	* 1.9521	* 2.4985	* 2.7503	*	
15	* .7502	* .7860	* .7852	* .5240	* F-SUB-Q			
	* 2.8100	* 2.6494	* 2.6545	* 4.0136	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6177	* 1.5013	* 1.7117	* 1.5055	* 1.6384	* 1.5464	* 1.7529	* .7488 *
	* 1.5223	* 1.6342	* 1.4343	* 1.6224	* 1.4831	* 1.5668	* 1.3668	* 2.9270 *
9	* 1.5013	* 1.7610	* 1.7546	* 1.7076	* 1.6744	* 1.7429	* 1.7213	* .7835 *
	* 1.6342	* 1.3920	* 1.3979	* 1.4346	* 1.4489	* 1.3781	* 1.3902	* 2.7618 *
10	* 1.7117	* 1.7539	* 1.7926	* 1.7046	* 1.6506	* 1.6559	* 1.7427	* .7829 *
	* 1.4343	* 1.3985	* 1.3700	* 1.4351	* 1.4643	* 1.4547	* 1.3677	* 2.7623 *
11	* 1.5055	* 1.7076	* 1.7048	* 1.6659	* 1.6103	* 1.5593	* 1.0963	* .5215 *
	* 1.6224	* 1.4346	* 1.4350	* 1.4655	* 1.4972	* 1.5442	* 2.0241	* 4.1705 *
12	* 1.6384	* 1.6773	* 1.6525	* 1.6106	* 1.5831	* 1.5989	* .8457 *	
	* 1.4831	* 1.4464	* 1.4627	* 1.4969	* 1.5186	* 1.4915	* 2.5871 *	
13	* 1.5464	* 1.7464	* 1.6577	* 1.5603	* 1.5995	* 1.7357	* .7491 *	
	* 1.5668	* 1.3753	* 1.4532	* 1.5433	* 1.4913	* 1.3614	* 2.8965 *	
14	* 1.7529	* 1.7241	* 1.7447	* 1.0971	* .8461	* .7648	*	
	* 1.3668	* 1.3880	* 1.3663	* 2.0226	* 2.5861	* 2.8395	*	
15	* .7488	* .7842	* .7835	* .5220	* F-SUB-Q			
	* 2.9270	* 2.7599	* 2.7605	* 4.1673	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 257 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5931	* 1.4827	* 1.6939	* 1.4900	* 1.6219	* 1.5333	* 1.7364	* .7494 *
	* 1.5047	* 1.6106	* 1.4112	* 1.5953	* 1.4597	* 1.5447	* 1.3629	* 2.8962 *
9	* 1.4827	* 1.7401	* 1.7392	* 1.6890	* 1.6600	* 1.7324	* 1.7073	* .7867 *
	* 1.6106	* 1.3718	* 1.3733	* 1.4124	* 1.4305	* 1.3710	* 1.3888	* 2.7261 *
10	* 1.6939	* 1.7385	* 1.7770	* 1.6903	* 1.6339	* 1.6441	* 1.7294	* .7861 *
	* 1.4112	* 1.3738	* 1.3460	* 1.4139	* 1.4559	* 1.4502	* 1.3756	* 2.7394 *
11	* 1.4900	* 1.6890	* 1.6905	* 1.6478	* 1.5988	* 1.5438	* 1.0998	* .5208 *
	* 1.5953	* 1.4125	* 1.4138	* 1.4502	* 1.5087	* 1.5509	* 2.0075	* 4.1827 *
12	* 1.6219	* 1.6629	* 1.6358	* 1.5992	* 1.5724	* 1.5858	* .8515 *	
	* 1.4597	* 1.4281	* 1.4542	* 1.5084	* 1.5411	* 1.5229	* 2.5915 *	
13	* 1.5333	* 1.7359	* 1.6460	* 1.5448	* 1.5864	* 1.7255	* .7527 *	
	* 1.5447	* 1.3684	* 1.4486	* 1.5499	* 1.5223	* 1.4074	* 2.9471 *	
14	* 1.7364	* 1.7101	* 1.7314	* 1.1007	* .8520	* .7691	*	
	* 1.3629	* 1.3865	* 1.3741	* 2.0058	* 2.5903	* 2.8871	*	
15	* .7494	* .7874	* .7867	* .5212	* F-SUB-Q			
	* 2.8962	* 2.7241	* 2.7374	* 4.1790	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6092	* 1.4881	* 1.7069	* 1.4985	* 1.6415	* 1.5444	* 1.7660	* .7416 *
	* 1.4537	* 1.5663	* 1.3670	* 1.5489	* 1.4087	* 1.4977	* 1.3087	* 2.8511 *
9	* 1.4881	* 1.7615	* 1.7558	* 1.7120	* 1.6761	* 1.7555	* 1.7356	* .7748 *
	* 1.5663	* 1.3230	* 1.3280	* 1.3605	* 1.3835	* 1.3210	* 1.3339	* 2.6963 *
10	* 1.7069	* 1.7550	* 1.7955	* 1.7068	* 1.6577	* 1.6631	* 1.7587	* .7751 *
	* 1.3670	* 1.3285	* 1.3004	* 1.3668	* 1.4009	* 1.3990	* 1.3199	* 2.7054 *
11	* 1.4985	* 1.7119	* 1.7069	* 1.6705	* 1.6170	* 1.5684	* 1.0913	* .5131 *
	* 1.5489	* 1.3605	* 1.3666	* 1.3961	* 1.4538	* 1.4884	* 1.9726	* 4.1263 *
12	* 1.6415	* 1.6792	* 1.6597	* 1.6173	* 1.5907	* 1.6109	* .8380 *	
	* 1.4087	* 1.3810	* 1.3992	* 1.4535	* 1.4843	* 1.4603	* 2.5628 *	
13	* 1.5444	* 1.7592	* 1.6650	* 1.5694	* 1.6115	* 1.7599	* .7460 *	
	* 1.4977	* 1.3184	* 1.3975	* 1.4874	* 1.4597	* 1.3443	* 2.8934 *	
14	* 1.7660	* 1.7386	* 1.7608	* 1.0923	* .8384	* .7613	*	
	* 1.3087	* 1.3317	* 1.3184	* 1.9708	* 2.5617	* 2.8379	*	
15	* .7416	* .7755	* .7758	* .5136	* F-SUB-Q			
	* 2.8511	* 2.6943	* 2.7033	* 4.1226	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 258 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6080	* 1.4830	* 1.7060	* 1.4962	* 1.6451	* 1.5445	* 1.7755	* .7376 *
	* 1.4073	* 1.5188	* 1.3228	* 1.4980	* 1.3571	* 1.4462	* 1.2570	* 2.7642 *
9	* 1.4830	* 1.7639	* 1.7579	* 1.7163	* 1.6784	* 1.7635	* 1.7453	* .7681 *
	* 1.5188	* 1.2771	* 1.2829	* 1.3117	* 1.3347	* 1.2713	* 1.2813	* 2.6229 *
10	* 1.7060	* 1.7571	* 1.7986	* 1.7091	* 1.6632	* 1.6679	* 1.7693	* .7697 *
	* 1.3228	* 1.2834	* 1.2559	* 1.3199	* 1.3483	* 1.3482	* 1.2673	* 2.6262 *
11	* 1.4962	* 1.7163	* 1.7093	* 1.6748	* 1.6219	* 1.5752	* 1.0873	* .5086 *
	* 1.4980	* 1.3117	* 1.3198	* 1.3455	* 1.4020	* 1.4312	* 1.9075	* 4.0103 *
12	* 1.6451	* 1.6817	* 1.6653	* 1.6223	* 1.5957	* 1.6206	* .8325 *	
	* 1.3571	* 1.3323	* 1.3467	* 1.4017	* 1.4326	* 1.4044	* 2.4828 *	
13	* 1.5445	* 1.7673	* 1.6699	* 1.5763	* 1.6208	* 1.7752	* .7432 *	
	* 1.4462	* 1.2687	* 1.3466	* 1.4302	* 1.4038	* 1.2887	* 2.7947 *	
14	* 1.7755	* 1.7484	* 1.7715	* 1.0883	* .8329	* .7583	*	
	* 1.2570	* 1.2792	* 1.2659	* 1.9057	* 2.4816	* 2.7418	*	
15	* .7376	* .7688	* .7704	* .5090	* F-SUB-Q			
	* 2.7642	* 2.6209	* 2.6241	* 4.0065	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5985	* 1.4733	* 1.6989	* 1.4889	* 1.6411	* 1.5392	* 1.7738	* .7348 *
	* 1.3692	* 1.4788	* 1.2848	* 1.4567	* 1.3162	* 1.4039	* 1.2170	* 2.6856 *
9	* 1.4733	* 1.7579	* 1.7532	* 1.7120	* 1.6739	* 1.7633	* 1.7448	* .7677 *
	* 1.4788	* 1.2399	* 1.2443	* 1.2723	* 1.2947	* 1.2296	* 1.2396	* 2.5400 *
10	* 1.6989	* 1.7524	* 1.7942	* 1.7048	* 1.6600	* 1.6656	* 1.7695	* .7683 *
	* 1.2848	* 1.2449	* 1.2179	* 1.2799	* 1.3068	* 1.3054	* 1.2249	* 2.5455 *
11	* 1.4889	* 1.7120	* 1.7049	* 1.6705	* 1.6196	* 1.5727	* 1.0862	* .5059 *
	* 1.4567	* 1.2723	* 1.2798	* 1.3048	* 1.3567	* 1.3855	* 1.8457	* 3.8991 *
12	* 1.6411	* 1.6772	* 1.6621	* 1.6200	* 1.5936	* 1.6215	* .8318 *	
	* 1.3162	* 1.2923	* 1.3051	* 1.3564	* 1.3857	* 1.3570	* 2.4001 *	
13	* 1.5392	* 1.7672	* 1.6676	* 1.5738	* 1.6217	* 1.7779	* .7426 *	
	* 1.4039	* 1.2271	* 1.3038	* 1.3845	* 1.3565	* 1.2405	* 2.6987 *	
14	* 1.7738	* 1.7479	* 1.7717	* 1.0872	* .8322	* .7575	*	
	* 1.2170	* 1.2375	* 1.2234	* 1.8439	* 2.3990	* 2.6481	*	
15	* .7348	* .7684	* .7690	* .5063	* F-SUB-Q			
	* 2.6856	* 2.5379	* 2.5433	* 3.8954	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 259 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5772	* 1.4572	* 1.6826	* 1.4749	* 1.6258	* 1.5267	* 1.7570	* .7361 *
	* 1.4532	* 1.5671	* 1.3597	* 1.5423	* 1.3932	* 1.4840	* 1.2879	* 2.8122 *
9	* 1.4572	* 1.7381	* 1.7387	* 1.6940	* 1.6599	* 1.7523	* 1.7302	* .7712 *
	* 1.5671	* 1.3149	* 1.3153	* 1.3482	* 1.3689	* 1.2968	* 1.3100	* 2.6522 *
10	* 1.6826	* 1.7379	* 1.7790	* 1.6908	* 1.6431	* 1.6532	* 1.7555	* .7718 *
	* 1.3597	* 1.3159	* 1.2875	* 1.3527	* 1.3839	* 1.3775	* 1.2931	* 2.6570 *
11	* 1.4749	* 1.6940	* 1.6909	* 1.6526	* 1.6072	* 1.5567	* 1.0893	* .5061 *
	* 1.5423	* 1.3482	* 1.3526	* 1.3826	* 1.4306	* 1.4657	* 1.9278	* 4.0849 *
12	* 1.6258	* 1.6632	* 1.6453	* 1.6075	* 1.5816	* 1.6086	* .8373 *	
	* 1.3932	* 1.3663	* 1.3821	* 1.4303	* 1.4600	* 1.4303	* 2.4950 *	
13	* 1.5267	* 1.7561	* 1.6553	* 1.5578	* 1.6088	* 1.7653	* .7453 *	
	* 1.4840	* 1.2941	* 1.3758	* 1.4647	* 1.4302	* 1.3038	* 2.8099 *	
14	* 1.7570	* 1.7333	* 1.7578	* 1.0904	* .8378	* .7609	*	
	* 1.2879	* 1.3078	* 1.2916	* 1.9259	* 2.4937	* 2.7550	*	
15	* .7361	* .7719	* .7725	* .5066	* F-SUB-Q			
	* 2.8122	* 2.6501	* 2.6549	* 4.0809	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5991	* 1.4668	* 1.7001	* 1.4863	* 1.6484	* 1.5401	* 1.7893	* .7275 *
	* 1.3894	* 1.5130	* 1.3081	* 1.4889	* 1.3372	* 1.4324	* 1.2314	* 2.7732 *
9	* 1.4668	* 1.7644	* 1.7594	* 1.7211	* 1.6784	* 1.7774	* 1.7607	* .7579 *
	* 1.5130	* 1.2595	* 1.2639	* 1.2905	* 1.3175	* 1.2445	* 1.2530	* 2.6304 *
10	* 1.7001	* 1.7585	* 1.8010	* 1.7101	* 1.6695	* 1.6739	* 1.7867	* .7600 *
	* 1.3081	* 1.2645	* 1.2367	* 1.3005	* 1.3252	* 1.3236	* 1.2361	* 2.6287 *
11	* 1.4863	* 1.7210	* 1.7103	* 1.6784	* 1.6261	* 1.5830	* 1.0793	* .4981 *
	* 1.4889	* 1.2905	* 1.3003	* 1.3236	* 1.3722	* 1.4006	* 1.8927	* 4.0420 *
12	* 1.6484	* 1.6818	* 1.6717	* 1.6265	* 1.5999	* 1.6363	* .8216 *	
	* 1.3372	* 1.3149	* 1.3235	* 1.3719	* 1.3980	* 1.3623	* 2.4712 *	
13	* 1.5401	* 1.7814	* 1.6760	* 1.5841	* 1.6365	* 1.7985	* .7361 *	
	* 1.4324	* 1.2418	* 1.3219	* 1.3996	* 1.3622	* 1.2400	* 2.7612 *	
14	* 1.7893	* 1.7639	* 1.7890	* 1.0804	* .8221	* .7507	*	
	* 1.2314	* 1.2508	* 1.2346	* 1.8907	* 2.4700	* 2.7102	*	
15	* .7275	* .7586	* .7607	* .4986	* F-SUB-Q			
	* 2.7732	* 2.6283	* 2.6265	* 4.0380	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 260 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5971	* 1.4646	* 1.7015	* 1.4849	* 1.6481	* 1.5400	* 1.7913	* .7241 *
	* 1.3380	* 1.4609	* 1.2605	* 1.4383	* 1.2906	* 1.3824	* 1.1866	* 2.6931 *
9	* 1.4646	* 1.7653	* 1.7620	* 1.7226	* 1.6793	* 1.7817	* 1.7633	* .7544 *
	* 1.4609	* 1.2146	* 1.2172	* 1.2441	* 1.2705	* 1.1973	* 1.2068	* 2.5541 *
10	* 1.7015	* 1.7611	* 1.8037	* 1.7120	* 1.6705	* 1.6762	* 1.7894	* .7566 *
	* 1.2605	* 1.2179	* 1.1911	* 1.2531	* 1.2779	* 1.2746	* 1.1898	* 2.5520 *
11	* 1.4849	* 1.7226	* 1.7122	* 1.6789	* 1.6263	* 1.5831	* 1.0760	* .4951 *
	* 1.4383	* 1.2441	* 1.2530	* 1.2764	* 1.3202	* 1.3497	* 1.8308	* 3.9345 *
12	* 1.6481	* 1.6828	* 1.6727	* 1.6267	* 1.5999	* 1.6353	* .8174 *	
	* 1.2906	* 1.2679	* 1.2762	* 1.3199	* 1.3427	* 1.3093	* 2.3947 *	
13	* 1.5400	* 1.7857	* 1.6783	* 1.5843	* 1.6355	* 1.7986	* .7320 *	
	* 1.3824	* 1.1947	* 1.2730	* 1.3487	* 1.3092	* 1.1905	* 2.6745 *	
14	* 1.7913	* 1.7665	* 1.7917	* 1.0771	* .8178	* .7464 *		
	* 1.1866	* 1.2046	* 1.1884	* 1.8289	* 2.3935	* 2.6254 *		
15	* .7241	* .7552	* .7573	* .4956	* F-SUB-Q			
	* 2.6931	* 2.5521	* 2.5498	* 3.9305	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5643	* 1.4476	* 1.6819	* 1.4671	* 1.6174	* 1.5227	* 1.7541	* .7258 *
	* 1.3232	* 1.4330	* 1.2362	* 1.4121	* 1.2756	* 1.3560	* 1.1749	* 2.6086 *
9	* 1.4476	* 1.7325	* 1.7409	* 1.6907	* 1.6577	* 1.7585	* 1.7288	* .7617 *
	* 1.4330	* 1.2003	* 1.1944	* 1.2293	* 1.2482	* 1.1757	* 1.1931	* 2.4561 *
10	* 1.6819	* 1.7400	* 1.7810	* 1.6916	* 1.6385	* 1.6549	* 1.7542	* .7621 *
	* 1.2362	* 1.1950	* 1.1693	* 1.2295	* 1.2634	* 1.2509	* 1.1759	* 2.4589 *
11	* 1.4671	* 1.6906	* 1.6917	* 1.6466	* 1.6029	* 1.5495	* 1.0784	* .4972 *
	* 1.4121	* 1.2293	* 1.2294	* 1.2620	* 1.2966	* 1.3360	* 1.7710	* 3.8036 *
12	* 1.6174	* 1.6611	* 1.6407	* 1.6033	* 1.5770	* 1.5963	* .8243 *	
	* 1.2756	* 1.2457	* 1.2618	* 1.2963	* 1.3178	* 1.2963	* 2.3009 *	
13	* 1.5227	* 1.7625	* 1.6571	* 1.5507	* 1.5965	* 1.7547	* .7321 *	
	* 1.3560	* 1.1732	* 1.2493	* 1.3350	* 1.2962	* 1.1787	* 2.5887 *	
14	* 1.7541	* 1.7320	* 1.7565	* 1.0795	* .8248	* .7473 *		
	* 1.1749	* 1.1910	* 1.1744	* 1.7692	* 2.2997	* 2.5385 *		
15	* .7258	* .7624	* .7628	* .4977	* F-SUB-Q			
	* 2.6086	* 2.4542	* 2.4569	* 3.7998	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 261 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5704	* 1.4541	* 1.6904	* 1.4725	* 1.6166	* 1.5274	* 1.7558	* .7168 *
	* 1.2845	* 1.3909	* 1.1988	* 1.3721	* 1.2456	* 1.3180	* 1.1442	* 2.5784 *
9	* 1.4541	* 1.7338	* 1.7478	* 1.6928	* 1.6641	* 1.7639	* 1.7279	* .7481 *
	* 1.3909	* 1.1695	* 1.1596	* 1.1970	* 1.2122	* 1.1421	* 1.1634	* 2.4410 *
10	* 1.6904	* 1.7469	* 1.7868	* 1.6993	* 1.6402	* 1.6613	* 1.7508	* .7463 *
	* 1.1988	* 1.1602	* 1.1360	* 1.1930	* 1.2305	* 1.2150	* 1.1479	* 2.4510 *
11	* 1.4725	* 1.6928	* 1.6994	* 1.6484	* 1.6066	* 1.5515	* 1.0612	* .4889 *
	* 1.3721	* 1.1971	* 1.1929	* 1.2290	* 1.2597	* 1.3001	* 1.7548	* 3.7769 *
12	* 1.6166	* 1.6675	* 1.6424	* 1.6070	* 1.5797	* 1.5898	* .8075	* .8075 *
	* 1.2456	* 1.2097	* 1.2289	* 1.2594	* 1.2808	* 1.2687	* 2.2897	* 2.2897 *
13	* 1.5274	* 1.7679	* 1.6634	* 1.5526	* 1.5905	* 1.7396	* .7142	* .7142 *
	* 1.3180	* 1.1396	* 1.2135	* 1.2992	* 1.2681	* 1.1561	* 2.5854	* 2.5854 *
14	* 1.7558	* 1.7311	* 1.7530	* 1.0623	* .8079	* .7281	*	*
	* 1.1442	* 1.1614	* 1.1465	* 1.7531	* 2.2887	* 2.5383	*	*
15	* .7168	* .7489	* .7470	* .4894	* F-SUB-Q			
	* 2.5784	* 2.4390	* 2.4489	* 3.7732	* M-SUB-Q			

AT 100% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5322	* 1.4170	* 1.6301	* 1.4338	* 1.5681	* 1.4798	* 1.6907	* .7131 *
	* 1.2901	* 1.3991	* 1.2182	* 1.3814	* 1.2574	* 1.3333	* 1.1643	* 2.5437 *
9	* 1.4170	* 1.6643	* 1.6885	* 1.6268	* 1.6099	* 1.6981	* 1.6616	* .7393 *
	* 1.3991	* 1.1942	* 1.1762	* 1.2206	* 1.2277	* 1.1622	* 1.1854	* 2.4244 *
10	* 1.6301	* 1.6877	* 1.7112	* 1.6466	* 1.5771	* 1.6035	* 1.6735	* .7292 *
	* 1.2182	* 1.1767	* 1.1622	* 1.2059	* 1.2545	* 1.2334	* 1.1765	* 2.4620 *
11	* 1.4338	* 1.6268	* 1.6468	* 1.5835	* 1.5500	* 1.5017	* 1.0344	* .4743 *
	* 1.3814	* 1.2207	* 1.2058	* 1.2539	* 1.2788	* 1.3159	* 1.7655	* 3.8247 *
12	* 1.5681	* 1.6129	* 1.5791	* 1.5504	* 1.5172	* 1.5354	* .7988	* .7988 *
	* 1.2574	* 1.2255	* 1.2530	* 1.2785	* 1.3060	* 1.2858	* 2.2698	* 2.2698 *
13	* 1.4798	* 1.7019	* 1.6055	* 1.5028	* 1.5361	* 1.6396	* .6866	* .6866 *
	* 1.3333	* 1.1597	* 1.2319	* 1.3150	* 1.2852	* 1.2006	* 2.6378	* 2.6378 *
14	* 1.6907	* 1.6646	* 1.6757	* 1.0354	* .7992	* .6993	*	*
	* 1.1643	* 1.1833	* 1.1750	* 1.7639	* 2.2687	* 2.5920	*	*
15	* .7131	* .7400	* .7298	* .4747	* F-SUB-Q			
	* 2.5437	* 2.4225	* 2.4600	* 3.8209	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 262 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 100% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5579	* 1.2584	* 1.3881	* 1.2635	* 1.5918	* 1.2830	* 1.5878	* .6506 *
	* 1.2478	* 1.5476	* 1.4089	* 1.5402	* 1.2189	* 1.5139	* 1.2197	* 2.7524 *
9	* 1.2584	* 1.5249	* 1.4629	* 1.5635	* 1.3677	* 1.4599	* 1.5977	* .6787 *
	* 1.5476	* 1.2802	* 1.3358	* 1.2467	* 1.4241	* 1.3304	* 1.2126	* 2.6061 *
10	* 1.3881	* 1.4622	* 1.4096	* 1.4301	* 1.4519	* 1.3720	* 1.4909	* .6486 *
	* 1.4089	* 1.3364	* 1.3892	* 1.3661	* 1.3407	* 1.4192	* 1.3003	* 2.7317 *
11	* 1.2635	* 1.5637	* 1.4303	* 1.4421	* 1.3252	* 1.5171	* .9231	* .4156 *
	* 1.5402	* 1.2466	* 1.3659	* 1.3521	* 1.4723	* 1.2807	* 1.9502	* 4.3126 *
12	* 1.5918	* 1.3689	* 1.4530	* 1.3258	* 1.2476	* 1.4970	* .7395	* .7395 *
	* 1.2189	* 1.4229	* 1.3397	* 1.4717	* 1.5637	* 1.2975	* 2.4182	* .7395 *
13	* 1.2830	* 1.4629	* 1.3737	* 1.5181	* 1.4977	* 1.3562	* .5892	* .5892 *
	* 1.5139	* 1.3276	* 1.4176	* 1.2799	* 1.2968	* 1.4303	* 3.0337	* .5892 *
14	* 1.5878	* 1.6001	* 1.4927	* .9240	* .7400	* .6001	* .6001	* .6001 *
	* 1.2197	* 1.2109	* 1.2988	* 1.9484	* 2.4169	* 2.9809	* 2.9809	* .6001 *
15	* .6506	* .6795	* .6492	* .4160	* F-SUB-Q			* F-SUB-Q
	* 2.7524	* 2.6036	* 2.7295	* 4.3085	* M-SUB-Q			* M-SUB-Q

AT 100% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6754	* .5772	* .5767	* .5787	* .6840	* .5713	* .6022	* .2956 *
	* 2.8536	* 3.3442	* 3.3539	* 3.3307	* 2.8122	* 3.3684	* 3.1868	* 6.0105 *
9	* .5772	* .6595	* .6054	* .6785	* .5764	* .5859	* .6035	* .3011 *
	* 3.3443	* 2.9289	* 3.1935	* 2.8427	* 3.3426	* 3.2820	* 3.1808	* 5.8310 *
10	* .5767	* .6052	* .5670	* .6012	* .6538	* .5678	* .5544	* .2816 *
	* 3.3539	* 3.1946	* 3.4130	* 3.2113	* 2.9490	* 3.3936	* 3.4656	* 6.2452 *
11	* .5787	* .6787	* .6015	* .6452	* .5514	* .6047	* .4086	* .1884 *
	* 3.3307	* 2.8420	* 3.2101	* 2.9929	* 3.5002	* 3.1838	* 4.3675	* 9.4496 *
12	* .6840	* .5768	* .6543	* .5516	* .5104	* .5678	* .3262	* .3262 *
	* 2.8122	* 3.3402	* 2.9472	* 3.4989	* 3.7809	* 3.3894	* 5.4398	* .3262 *
13	* .5713	* .5870	* .5684	* .6051	* .5681	* .4942	* .2512	* .2512 *
	* 3.3684	* 3.2758	* 3.3900	* 3.1816	* 3.3876	* 3.8919	* 7.0635	* .2512 *
14	* .6022	* .6044	* .5551	* .4090	* .3264	* .2552	* .2552	* .2552 *
	* 3.1868	* 3.1764	* 3.4615	* 4.3640	* 5.4359	* 6.9584	* 6.9584	* .2552 *
15	* .2956	* .3014	* .2819	* .1886	* F-SUB-Q			* F-SUB-Q
	* 6.0105	* 5.8261	* 6.2395	* 9.4401	* M-SUB-Q			* M-SUB-Q

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 263 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6252 *	* .6408 *	* .6461 *	* .6448 *	* .7400 *	* .6314 *	* .6249 *	* .3320 *
	* 3.2270 *	* 3.7036 *	* 3.5741 *	* 3.4263 *	* 2.9545 *	* 3.4560 *	* 3.5105 *	* 6.0305 *
9	* .6408 *	* .7355 *	* .6703 *	* .7424 *	* .6377 *	* .6183 *	* .6241 *	* .3342 *
	* 3.7036 *	* 3.2645 *	* 3.4198 *	* 3.0252 *	* 3.4608 *	* 3.5479 *	* 3.5375 *	* 5.9524 *
10	* .6461 *	* .6702 *	* .6329 *	* .6589 *	* .7055 *	* .6035 *	* .5734 *	* .3094 *
	* 3.5741 *	* 3.4205 *	* 3.7046 *	* 3.4781 *	* 3.2242 *	* 3.7459 *	* 3.8762 *	* 6.4279 *
11	* .6448 *	* .7425 *	* .6590 *	* .6957 *	* .5923 *	* .6195 *	* .4353 *	* .2220 *
	* 3.4263 *	* 3.0246 *	* 3.4774 *	* 3.4356 *	* 4.0564 *	* 3.8736 *	* 4.9574 *	* 9.2929 *
12	* .7400 *	* .6379 *	* .7058 *	* .5925 *	* .5023 *	* .5448 *	* .3452 *	
	* 2.9545 *	* 3.4598 *	* 3.2225 *	* 4.0553 *	* 4.4129 *	* 4.0998 *	* 6.2530 *	
13	* .6314 *	* .6196 *	* .6039 *	* .6197 *	* .5449 *	* .4733 *	* .2574 *	
	* 3.4560 *	* 3.5403 *	* 3.7427 *	* 3.8725 *	* 4.0995 *	* 4.6332 *	* 8.1568 *	
14	* .6249 *	* .6250 *	* .5739 *	* .4354 *	* .3451 *	* .2632 *		
	* 3.5105 *	* 3.5324 *	* 3.8727 *	* 4.9553 *	* 6.2547 *	* 7.9825 *		
15	* .3320 *	* .3344 *	* .3096 *	* .2221 *	* F-SUB-Q			
	* 6.0305 *	* 5.9492 *	* 6.4248 *	* 9.2882 *	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5334 *	* 1.3471 *	* 1.4693 *	* 1.3444 *	* 1.6021 *	* 1.3452 *	* 1.5337 *	* .7182 *
	* 1.5288 *	* 1.8091 *	* 1.6239 *	* 1.6918 *	* 1.4064 *	* 1.6688 *	* 1.4748 *	* 2.8763 *
9	* 1.3471 *	* 1.5854 *	* 1.5184 *	* 1.5888 *	* 1.4300 *	* 1.4285 *	* 1.5351 *	* .7456 *
	* 1.8091 *	* 1.5730 *	* 1.5528 *	* 1.4622 *	* 1.5908 *	* 1.5794 *	* 1.4675 *	* 2.7263 *
10	* 1.4693 *	* 1.5180 *	* 1.4722 *	* 1.4737 *	* 1.4521 *	* 1.3762 *	* 1.4309 *	* .7062 *
	* 1.6239 *	* 1.5532 *	* 1.6336 *	* 1.6027 *	* 1.6142 *	* 1.6869 *	* 1.5987 *	* 2.8947 *
11	* 1.3444 *	* 1.5889 *	* 1.4739 *	* 1.4397 *	* 1.3376 *	* 1.4611 *	* .9636 *	* .4786 *
	* 1.6918 *	* 1.4620 *	* 1.6025 *	* 1.7167 *	* 1.8519 *	* 1.6811 *	* 2.3093 *	* 4.4410 *
12	* 1.6021 *	* 1.4307 *	* 1.4528 *	* 1.3379 *	* 1.1982 *	* 1.3859 *	* .7791 *	
	* 1.4064 *	* 1.5900 *	* 1.6136 *	* 1.8515 *	* 1.9354 *	* 1.6914 *	* 2.8392 *	
13	* 1.3452 *	* 1.4316 *	* 1.3773 *	* 1.4616 *	* 1.3861 *	* 1.2265 *	* .6167 *	
	* 1.6688 *	* 1.5763 *	* 1.6855 *	* 1.6806 *	* 1.6913 *	* 1.8919 *	* 3.4963 *	
14	* 1.5337 *	* 1.5370 *	* 1.4320 *	* .9638 *	* .7790 *	* .6201 *		
	* 1.4748 *	* 1.4657 *	* 1.5974 *	* 2.3085 *	* 2.8398 *	* 3.4803 *		
15	* .7182 *	* .7461 *	* .7065 *	* .4788 *	* F-SUB-Q			
	* 2.8763 *	* 2.7245 *	* 2.8936 *	* 4.4390 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 264 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5915	* 1.5561	* 1.7235	* 1.5374	* 1.5790	* 1.5462	* 1.6377	* .7956 *
	* 1.5868	* 1.6396	* 1.4124	* 1.5355	* 1.4506	* 1.4763	* 1.3865	* 2.6034 *
9	* 1.5561	* 1.7147	* 1.7468	* 1.6466	* 1.6608	* 1.6800	* 1.6021	* .8331 *
	* 1.6396	* 1.4283	* 1.3760	* 1.4503	* 1.3888	* 1.3668	* 1.4220	* 2.4592 *
10	* 1.7235	* 1.7464	* 1.7722	* 1.6941	* 1.5724	* 1.6046	* 1.6018	* .8130 *
	* 1.4124	* 1.3762	* 1.3650	* 1.4170	* 1.5032	* 1.4746	* 1.4526	* 2.5571 *
11	* 1.5374	* 1.6466	* 1.6943	* 1.5962	* 1.5592	* 1.4624	* 1.1067	* .5524 *
	* 1.5355	* 1.4503	* 1.4168	* 1.5360	* 1.6073	* 1.7215	* 2.0537	* 3.9257 *
12	* 1.5790	* 1.6628	* 1.5730	* 1.5596	* 1.5057	* 1.4674	* .8720 *	
	* 1.4506	* 1.3871	* 1.5018	* 1.6071	* 1.6283	* 1.6644	* 2.5913 *	
13	* 1.5462	* 1.6836	* 1.6060	* 1.4630	* 1.4677	* 1.4960	* .7305 *	
	* 1.4763	* 1.3639	* 1.4731	* 1.7210	* 1.6641	* 1.5965	* 3.0194 *	
14	* 1.6377	* 1.6043	* 1.6031	* 1.1069	* .8719	* .7432	*	
	* 1.3865	* 1.4201	* 1.4513	* 2.0531	* 2.5915	* 2.9699	*	
15	* .7956	* .8337	* .8134	* .5526	* F-SUB-Q			
	* 2.6034	* 2.4577	* 2.5561	* 3.9238	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7061	* 1.6484	* 1.8475	* 1.6263	* 1.6841	* 1.6441	* 1.7702	* .8046 *
	* 1.5224	* 1.5962	* 1.3460	* 1.4803	* 1.3834	* 1.4127	* 1.3024	* 2.6110 *
9	* 1.6484	* 1.8488	* 1.8697	* 1.7760	* 1.7713	* 1.8075	* 1.7340	* .8431 *
	* 1.5962	* 1.3477	* 1.3102	* 1.3726	* 1.3268	* 1.2928	* 1.3366	* 2.4675 *
10	* 1.8475	* 1.8693	* 1.9095	* 1.8105	* 1.6908	* 1.7237	* 1.7447	* .8359 *
	* 1.3460	* 1.3105	* 1.2878	* 1.3515	* 1.4219	* 1.3988	* 1.3583	* 2.5332 *
11	* 1.6263	* 1.7760	* 1.8107	* 1.7225	* 1.6646	* 1.5740	* 1.1507	* .5682 *
	* 1.4803	* 1.3725	* 1.3514	* 1.4516	* 1.5269	* 1.6349	* 2.0186	* 3.8951 *
12	* 1.6841	* 1.7737	* 1.6925	* 1.6648	* 1.6311	* 1.5878	* .8896 *	
	* 1.3834	* 1.3250	* 1.4204	* 1.5267	* 1.5400	* 1.5763	* 2.5974 *	
13	* 1.6441	* 1.8115	* 1.7253	* 1.5747	* 1.5881	* 1.6642	* .7676 *	
	* 1.4127	* 1.2899	* 1.3974	* 1.6344	* 1.5760	* 1.4698	* 2.9410 *	
14	* 1.7702	* 1.7365	* 1.7463	* 1.1510	* .8897	* .7829	*	
	* 1.3024	* 1.3349	* 1.3570	* 2.0178	* 2.5973	* 2.8858	*	
15	* .8046	* .8437	* .8363	* .5684	* F-SUB-Q			
	* 2.6110	* 2.4658	* 2.5322	* 3.8931	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 265 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7386	* 1.6615	* 1.8702	* 1.6412	* 1.7232	* 1.6639	* 1.8151	* .8080 *
	* 1.5320	* 1.6204	* 1.3607	* 1.4983	* 1.3802	* 1.4256	* 1.2984	* 2.6599 *
9	* 1.6615	* 1.8873	* 1.8970	* 1.8145	* 1.7947	* 1.8348	* 1.7810	* .8496 *
	* 1.6204	* 1.3510	* 1.3202	* 1.3751	* 1.3362	* 1.2976	* 1.3315	* 2.5050 *
10	* 1.8702	* 1.8965	* 1.9381	* 1.8361	* 1.7293	* 1.7539	* 1.7957	* .8448 *
	* 1.3607	* 1.3206	* 1.2980	* 1.3639	* 1.4185	* 1.4019	* 1.3464	* 2.5626 *
11	* 1.6412	* 1.8145	* 1.8363	* 1.7603	* 1.6957	* 1.6133	* 1.1690	* .5693 *
	* 1.4983	* 1.3750	* 1.3638	* 1.4550	* 1.5338	* 1.6294	* 2.0240	* 3.9578 *
12	* 1.7232	* 1.7973	* 1.7311	* 1.6960	* 1.6627	* 1.6352	* .9009	* .9009 *
	* 1.3802	* 1.3343	* 1.4169	* 1.5336	* 1.5476	* 1.5682	* 2.6286	* 2.6286 *
13	* 1.6639	* 1.8391	* 1.7556	* 1.6142	* 1.6356	* 1.7323	* .7833	* .7833 *
	* 1.4256	* 1.2951	* 1.4004	* 1.6288	* 1.5678	* 1.4477	* 2.9567	* 2.9567 *
14	* 1.8151	* 1.7837	* 1.7974	* 1.1694	* .9010	* .8000		
	* 1.2984	* 1.3298	* 1.3451	* 2.0230	* 2.6283	* 2.8976		
15	* .8080	* .8502	* .8452	* .5696	* F-SUB-Q			
	* 2.6599	* 2.5033	* 2.5615	* 3.9555	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7339	* 1.6474	* 1.8600	* 1.6313	* 1.7256	* 1.6571	* 1.8211	* .8069 *
	* 1.5707	* 1.6668	* 1.3961	* 1.5377	* 1.4050	* 1.4575	* 1.3162	* 2.7109 *
9	* 1.6474	* 1.8844	* 1.8909	* 1.8142	* 1.7890	* 1.8333	* 1.7890	* .8501 *
	* 1.6668	* 1.3786	* 1.3495	* 1.4008	* 1.3666	* 1.3174	* 1.3486	* 2.5477 *
10	* 1.8600	* 1.8904	* 1.9318	* 1.8309	* 1.7314	* 1.7529	* 1.8058	* .8455 *
	* 1.3961	* 1.3499	* 1.3262	* 1.3934	* 1.4464	* 1.4310	* 1.3644	* 2.6065 *
11	* 1.6313	* 1.8142	* 1.8311	* 1.7610	* 1.6974	* 1.6192	* 1.1739	* .5661 *
	* 1.5377	* 1.4008	* 1.3932	* 1.4833	* 1.5676	* 1.6561	* 2.0630	* 4.0688 *
12	* 1.7256	* 1.7917	* 1.7333	* 1.6977	* 1.6645	* 1.6467	* .9066	* .9066 *
	* 1.4050	* 1.3646	* 1.4448	* 1.5674	* 1.5838	* 1.5973	* 2.6766	* 2.6766 *
13	* 1.6571	* 1.8369	* 1.7547	* 1.6201	* 1.6472	* 1.7556	* .7896	* .7896 *
	* 1.4575	* 1.3148	* 1.4293	* 1.6554	* 1.5968	* 1.4705	* 3.0228	* 3.0228 *
14	* 1.8211	* 1.7919	* 1.8076	* 1.1744	* .9069	* .8066		
	* 1.3162	* 1.3467	* 1.3630	* 2.0618	* 2.6759	* 2.9616		
15	* .8069	* .8508	* .8459	* .5664	* F-SUB-Q			
	* 2.7109	* 2.5459	* 2.6051	* 4.0660	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 266 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7356	* 1.6382	* 1.8563	* 1.6259	* 1.7325	* 1.6550	* 1.8357	* .7977
	* 1.5924	* 1.6944	* 1.4401	* 1.5884	* 1.4403	* 1.5007	* 1.3404	* 2.8132
9	* 1.6382	* 1.8894	* 1.8908	* 1.8218	* 1.7898	* 1.8414	* 1.8036	* .8388
	* 1.6944	* 1.4141	* 1.3885	* 1.4353	* 1.4057	* 1.3472	* 1.3740	* 2.6493
10	* 1.8563	* 1.8902	* 1.9329	* 1.8322	* 1.7414	* 1.7579	* 1.8218	* .8356
	* 1.4401	* 1.3889	* 1.3633	* 1.4330	* 1.4807	* 1.4688	* 1.3909	* 2.7110
11	* 1.6259	* 1.8218	* 1.8324	* 1.7696	* 1.7039	* 1.6322	* 1.1654	* .5571
	* 1.5884	* 1.4353	* 1.4328	* 1.5199	* 1.5987	* 1.6696	* 2.1426	* 4.2593
12	* 1.7325	* 1.7927	* 1.7433	* 1.7042	* 1.6715	* 1.6626	* .8963	*
	* 1.4403	* 1.4035	* 1.4790	* 1.5984	* 1.6147	* 1.6196	* 2.7737	*
13	* 1.6550	* 1.8451	* 1.7598	* 1.6332	* 1.6632	* 1.7815	* .7852	*
	* 1.5007	* 1.3445	* 1.4670	* 1.6687	* 1.6191	* 1.4846	* 3.1136	*
14	* 1.8357	* 1.8066	* 1.8237	* 1.1661	* .8966	* .8023	*	*
	* 1.3404	* 1.3720	* 1.3894	* 2.1412	* 2.7729	* 3.0498	*	*
15	* .7977	* .8395	* .8361	* .5574	* F-SUB-Q			
	* 2.8132	* 2.6474	* 2.7094	* 4.2561	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7203	* 1.6180	* 1.8387	* 1.6097	* 1.7234	* 1.6416	* 1.8311	* .7891
	* 1.6435	* 1.7571	* 1.5099	* 1.6666	* 1.5032	* 1.5699	* 1.3925	* 2.9455
9	* 1.6180	* 1.8760	* 1.8764	* 1.8115	* 1.7771	* 1.8346	* 1.7999	* .8284
	* 1.7571	* 1.4783	* 1.4527	* 1.4987	* 1.4697	* 1.4018	* 1.4275	* 2.7789
10	* 1.8387	* 1.8757	* 1.9190	* 1.8194	* 1.7339	* 1.7490	* 1.8191	* .8258
	* 1.5099	* 1.4532	* 1.4255	* 1.4986	* 1.5439	* 1.5313	* 1.4448	* 2.8441
11	* 1.6097	* 1.8115	* 1.8196	* 1.7605	* 1.6963	* 1.6280	* 1.1553	* .5493
	* 1.6666	* 1.4987	* 1.4984	* 1.5869	* 1.6361	* 1.7104	* 2.2298	* 4.4832
12	* 1.7234	* 1.7802	* 1.7359	* 1.6966	* 1.6645	* 1.6607	* .8872	*
	* 1.5032	* 1.4673	* 1.5420	* 1.6358	* 1.6560	* 1.6569	* 2.8553	*
13	* 1.6416	* 1.8385	* 1.7509	* 1.6290	* 1.6613	* 1.7867	* .7797	*
	* 1.5699	* 1.3989	* 1.5294	* 1.7094	* 1.6563	* 1.5198	* 3.2148	*
14	* 1.8311	* 1.8029	* 1.8211	* 1.1560	* .8875	* .7965	*	*
	* 1.3925	* 1.4254	* 1.4432	* 2.2283	* 2.8543	* 3.1496	*	*
15	* .7891	* .8291	* .8264	* .5497	* F-SUB-Q			
	* 2.9455	* 2.7769	* 2.8423	* 4.4796	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 267 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7085	* 1.6003	* 1.8240	* 1.5953	* 1.7170	* 1.6300	* 1.8292	* .7778 *
	* 1.7172	* 1.8320	* 1.5941	* 1.7610	* 1.5792	* 1.6542	* 1.4567	* 3.1205 *
9	* 1.6003	* 1.8665	* 1.8645	* 1.8048	* 1.7666	* 1.8295	* 1.7981	* .8144 *
	* 1.8320	* 1.5550	* 1.5306	* 1.5747	* 1.5470	* 1.4695	* 1.4936	* 2.9520 *
10	* 1.8240	* 1.8639	* 1.9078	* 1.8089	* 1.7294	* 1.7418	* 1.8181	* .8134 *
	* 1.5941	* 1.5311	* 1.5010	* 1.5781	* 1.6195	* 1.6071	* 1.5112	* 3.0166 *
11	* 1.5953	* 1.8048	* 1.8091	* 1.7547	* 1.6899	* 1.6261	* 1.1420	* .5396 *
	* 1.7610	* 1.5747	* 1.5779	* 1.6518	* 1.6962	* 1.7678	* 2.3194	* 4.7698 *
12	* 1.7170	* 1.7697	* 1.7315	* 1.6903	* 1.6587	* 1.6601	* .8745	* .8745 *
	* 1.5792	* 1.5442	* 1.6175	* 1.6959	* 1.7192	* 1.7093	* 2.9868	* 2.9868 *
13	* 1.6300	* 1.8334	* 1.7438	* 1.6271	* 1.6607	* 1.7915	* .7710	* .7710 *
	* 1.6542	* 1.4664	* 1.6051	* 1.7667	* 1.7090	* 1.5630	* 3.3495	* 3.3495 *
14	* 1.8292	* 1.8012	* 1.8202	* 1.1428	* .8749	* .7877		
	* 1.4567	* 1.4914	* 1.5094	* 2.3178	* 2.9856	* 3.2810		
15	* .7778	* .8150	* .8140	* .5400	* F-SUB-Q			
	* 3.1205	* 2.9499	* 3.0146	* 4.7657	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6593	* 1.5594	* 1.7799	* 1.5579	* 1.6764	* 1.5943	* 1.7859	* .7715 *
	* 1.8322	* 1.9432	* 1.6966	* 1.9029	* 1.7058	* 1.7831	* 1.5710	* 3.3094 *
9	* 1.5594	* 1.8183	* 1.8223	* 1.7599	* 1.7273	* 1.7929	* 1.7580	* .8118 *
	* 1.9432	* 1.6590	* 1.6521	* 1.7027	* 1.6678	* 1.5794	* 1.6090	* 3.1151 *
10	* 1.7799	* 1.8216	* 1.8646	* 1.7690	* 1.6881	* 1.7056	* 1.7785	* .8099 *
	* 1.6966	* 1.6527	* 1.6144	* 1.6957	* 1.7481	* 1.7276	* 1.6264	* 3.1871 *
11	* 1.5579	* 1.7599	* 1.7692	* 1.7116	* 1.6554	* 1.5877	* 1.1345	* .5346 *
	* 1.9029	* 1.7027	* 1.6955	* 1.7515	* 1.8030	* 1.8691	* 2.4095	* 5.0237 *
12	* 1.6764	* 1.7304	* 1.6902	* 1.6558	* 1.6252	* 1.6242	* .8736	* .8736 *
	* 1.7058	* 1.6648	* 1.7458	* 1.8026	* 1.8290	* 1.8190	* 3.1117	* 3.1117 *
13	* 1.5943	* 1.7968	* 1.7076	* 1.5887	* 1.6249	* 1.7560	* .7679	* .7679 *
	* 1.7831	* 1.5760	* 1.7254	* 1.8679	* 1.8185	* 1.6614	* 3.5012	* 3.5012 *
14	* 1.7859	* 1.7611	* 1.7806	* 1.1354	* .8740	* .7851		
	* 1.5710	* 1.6064	* 1.6245	* 2.4076	* 3.1103	* 3.4273		
15	* .7715	* .8125	* .8106	* .5351	* F-SUB-Q			
	* 3.3094	* 3.1128	* 3.1848	* 5.0196	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 268 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6594	* 1.5486	* 1.7742	* 1.5501	* 1.6794	* 1.5889	* 1.7971	* .7555 *
	* 1.9097	* 2.0428	* 1.7782	* 2.0269	* 1.8043	* 1.8953	* 1.6523	* 3.5714 *
9	* 1.5486	* 1.8215	* 1.8195	* 1.7653	* 1.7253	* 1.7967	* 1.7680	* .7912 *
	* 2.0428	* 1.7296	* 1.7298	* 1.7783	* 1.7685	* 1.6684	* 1.6929	* 3.3770 *
10	* 1.7742	* 1.8188	* 1.8631	* 1.7670	* 1.6951	* 1.7065	* 1.7890	* .7902 *
	* 1.7782	* 1.7305	* 1.6882	* 1.7732	* 1.8272	* 1.8098	* 1.7084	* 3.4498 *
11	* 1.5501	* 1.7653	* 1.7672	* 1.7175	* 1.6566	* 1.5968	* 1.1137	* .5218 *
	* 2.0269	* 1.7783	* 1.7730	* 1.8204	* 1.8691	* 1.9329	* 2.5553	* 5.3605 *
12	* 1.6794	* 1.7285	* 1.6972	* 1.6569	* 1.6266	* 1.6333	* .8513 *	
	* 1.8043	* 1.7652	* 1.8249	* 1.8688	* 1.8993	* 1.8827	* 3.3067 *	
13	* 1.5889	* 1.8007	* 1.7086	* 1.5979	* 1.6340	* 1.7717	* .7530 *	
	* 1.8953	* 1.6647	* 1.8077	* 1.9317	* 1.8820	* 1.7196	* 3.7191 *	
14	* 1.7971	* 1.7711	* 1.7912	* 1.1147	* .8517	* .7691	*	
	* 1.6523	* 1.6899	* 1.7064	* 2.5533	* 3.3054	* 3.6443	*	
15	* .7555	* .7919	* .7909	* .5222	* F-SUB-Q			
	* 3.5714	* 3.3745	* 3.4472	* 5.3560	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6342	* 1.5218	* 1.7477	* 1.5264	* 1.6595	* 1.5671	* 1.7791	* .7443 *
	* 1.9682	* 2.1061	* 1.8352	* 2.0902	* 1.9139	* 2.0273	* 1.7711	* 3.8408 *
9	* 1.5218	* 1.7969	* 1.7953	* 1.7435	* 1.7029	* 1.7783	* 1.7508	* .7793 *
	* 2.1061	* 1.7841	* 1.7852	* 1.8376	* 1.8722	* 1.7891	* 1.8130	* 3.6322 *
10	* 1.7477	* 1.7946	* 1.8387	* 1.7441	* 1.6758	* 1.6868	* 1.7723	* .7783 *
	* 1.8352	* 1.7859	* 1.7461	* 1.8402	* 1.9079	* 1.8991	* 1.8046	* 3.7057 *
11	* 1.5264	* 1.7435	* 1.7443	* 1.6968	* 1.6379	* 1.5802	* 1.0988	* .5132 *
	* 2.0902	* 1.8377	* 1.8400	* 1.8930	* 1.9786	* 2.0382	* 2.7073	* 5.7019 *
12	* 1.6595	* 1.7062	* 1.6780	* 1.6382	* 1.6085	* 1.6177	* .8396 *	
	* 1.9139	* 1.8687	* 1.9054	* 1.9782	* 2.0091	* 1.9831	* 3.5031 *	
13	* 1.5671	* 1.7823	* 1.6889	* 1.5814	* 1.6184	* 1.7595	* .7435 *	
	* 2.0273	* 1.7851	* 1.8968	* 2.0368	* 1.9829	* 1.8074	* 3.9287 *	
14	* 1.7791	* 1.7539	* 1.7746	* 1.0998	* .8401	* .7592	*	
	* 1.7711	* 1.8098	* 1.8023	* 2.7048	* 3.5016	* 3.8506	*	
15	* .7443	* .7800	* .7790	* .5137	* F-SUB-Q			
	* 3.8408	* 3.6295	* 3.7028	* 5.6968	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 269 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5866	* 1.4815	* 1.7042	* 1.4890	* 1.6191	* 1.5311	* 1.7367	* .7352 *
	* 1.9704	* 2.1025	* 1.8294	* 2.0819	* 1.9052	* 2.0140	* 1.7758	* 3.8315 *
9	* 1.4815	* 1.7501	* 1.7532	* 1.6997	* 1.6636	* 1.7412	* 1.7110	* .7721 *
	* 2.1025	* 1.7811	* 1.7771	* 1.8330	* 1.8625	* 1.7792	* 1.8098	* 3.6131 *
10	* 1.7042	* 1.7524	* 1.7956	* 1.7041	* 1.6353	* 1.6503	* 1.7329	* .7712 *
	* 1.8294	* 1.7779	* 1.7387	* 1.8317	* 1.9014	* 1.8881	* 1.7949	* 3.6604 *
11	* 1.4890	* 1.6996	* 1.7043	* 1.6546	* 1.6029	* 1.5424	* 1.0873	* .5060 *
	* 2.0819	* 1.8331	* 1.8315	* 1.8888	* 1.9723	* 2.0331	* 2.6618	* 5.6514 *
12	* 1.6191	* 1.6668	* 1.6374	* 1.6032	* 1.5748	* 1.5818	* .8344	*
	* 1.9052	* 1.8590	* 1.8990	* 1.9718	* 2.0183	* 2.0046	* 3.4774	*
13	* 1.5311	* 1.7451	* 1.6524	* 1.5435	* 1.5825	* 1.7235	* .7372	*
	* 2.0140	* 1.7753	* 1.8857	* 2.0316	* 2.0037	* 1.8521	* 3.9648	*
14	* 1.7367	* 1.7142	* 1.7352	* 1.0883	* .8349	* .7534	*	
	* 1.7758	* 1.8066	* 1.7926	* 2.6593	* 3.4756	* 3.8833	*	
15	* .7352	* .7728	* .7719	* .5065	* F-SUB-Q			
	* 3.8315	* 3.6102	* 3.6572	* 5.6458	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5797	* 1.4654	* 1.6919	* 1.4758	* 1.6149	* 1.5196	* 1.7405	* .7177 *
	* 1.9180	* 2.0545	* 1.7815	* 2.0238	* 1.8312	* 1.9431	* 1.6946	* 3.7397 *
9	* 1.4654	* 1.7460	* 1.7437	* 1.6977	* 1.6550	* 1.7381	* 1.7140	* .7502 *
	* 2.0545	* 1.7251	* 1.7266	* 1.7726	* 1.8028	* 1.7119	* 1.7350	* 3.5419 *
10	* 1.6919	* 1.7429	* 1.7873	* 1.6952	* 1.6352	* 1.6447	* 1.7363	* .7502 *
	* 1.7815	* 1.7274	* 1.6894	* 1.7804	* 1.8347	* 1.8303	* 1.7290	* 3.5905 *
11	* 1.4758	* 1.6977	* 1.6954	* 1.6533	* 1.5977	* 1.5447	* 1.0639	* .4920 *
	* 2.0238	* 1.7727	* 1.7802	* 1.8288	* 1.9199	* 1.9672	* 2.6164	* 5.5165 *
12	* 1.6149	* 1.6583	* 1.6374	* 1.5981	* 1.5700	* 1.5841	* .8102	*
	* 1.8312	* 1.7993	* 1.8323	* 1.9195	* 1.9660	* 1.9322	* 3.4066	*
13	* 1.5196	* 1.7421	* 1.6468	* 1.5458	* 1.5848	* 1.7322	* .7209	*
	* 1.9431	* 1.7082	* 1.8280	* 1.9658	* 1.9314	* 1.7805	* 3.8472	*
14	* 1.7405	* 1.7172	* 1.7386	* 1.0650	* .8107	* .7358	*	
	* 1.6946	* 1.7319	* 1.7268	* 2.6139	* 3.4051	* 3.7732	*	
15	* .7177	* .7509	* .7510	* .4925	* F-SUB-Q			
	* 3.7397	* 3.5390	* 3.5875	* 5.5111	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 270 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5559	* 1.4392	* 1.6659	* 1.4522	* 1.5950	* 1.4974	* 1.7240	* .7043
	* 1.7771	* 1.9124	* 1.6603	* 1.8852	* 1.7020	* 1.8123	* 1.5733	* 3.4833
9	* 1.4392	* 1.7230	* 1.7197	* 1.6773	* 1.6328	* 1.7196	* 1.6980	* .7338
	* 1.9124	* 1.6024	* 1.6086	* 1.6454	* 1.6763	* 1.5917	* 1.6079	* 3.3082
10	* 1.6659	* 1.7189	* 1.7637	* 1.6725	* 1.6169	* 1.6250	* 1.7209	* .7350
	* 1.6603	* 1.6093	* 1.5731	* 1.6550	* 1.6964	* 1.6953	* 1.5961	* 3.3400
11	* 1.4522	* 1.6773	* 1.6727	* 1.6337	* 1.5793	* 1.5291	* 1.0453	* .4813
	* 1.8852	* 1.6454	* 1.6549	* 1.6901	* 1.7661	* 1.8047	* 2.4184	* 5.1311
12	* 1.5950	* 1.6362	* 1.6192	* 1.5796	* 1.5521	* 1.5704	* .7942	*
	* 1.7020	* 1.6731	* 1.6943	* 1.7658	* 1.8078	* 1.7728	* 3.1616	*
13	* 1.4974	* 1.7236	* 1.6272	* 1.5303	* 1.5705	* 1.7214	* .7086	*
	* 1.8123	* 1.5883	* 1.6933	* 1.8035	* 1.7721	* 1.6260	* 3.5573	*
14	* 1.7240	* 1.7013	* 1.7232	* 1.0464	* .7947	* .7230	*	*
	* 1.5733	* 1.6051	* 1.5942	* 2.4160	* 3.1600	* 3.4896	*	*
15	* .7043	* .7345	* .7357	* .4818	* F-SUB-Q			
	* 3.4833	* 3.3056	* 3.3372	* 5.1260	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5252	* 1.4097	* 1.6351	* 1.4248	* 1.5686	* 1.4711	* 1.6975	* .6925
	* 1.6600	* 1.7898	* 1.5511	* 1.7592	* 1.5835	* 1.6887	* 1.4634	* 3.2505
9	* 1.4097	* 1.6928	* 1.6902	* 1.6492	* 1.6050	* 1.6941	* 1.6729	* .7238
	* 1.7898	* 1.4966	* 1.5013	* 1.5357	* 1.5590	* 1.4780	* 1.4929	* 3.0763
10	* 1.6351	* 1.6894	* 1.7337	* 1.6441	* 1.5909	* 1.5992	* 1.6959	* .7240
	* 1.5511	* 1.5020	* 1.4681	* 1.5445	* 1.5826	* 1.5801	* 1.4856	* 3.1023
11	* 1.4248	* 1.6492	* 1.6443	* 1.6066	* 1.5546	* 1.5052	* 1.0301	* .4727
	* 1.7592	* 1.5357	* 1.5443	* 1.5767	* 1.6427	* 1.6798	* 2.2501	* 4.7988
12	* 1.5686	* 1.6083	* 1.5931	* 1.5549	* 1.5279	* 1.5487	* .7832	*
	* 1.5835	* 1.5559	* 1.5806	* 1.6424	* 1.6817	* 1.6478	* 2.9398	*
13	* 1.4711	* 1.6981	* 1.6014	* 1.5064	* 1.5489	* 1.6987	* .6986	*
	* 1.6887	* 1.4749	* 1.5782	* 1.6786	* 1.6471	* 1.5060	* 3.3051	*
14	* 1.6975	* 1.6761	* 1.6982	* 1.0312	* .7836	* .7128	*	*
	* 1.4634	* 1.4902	* 1.4838	* 2.2478	* 2.9384	* 3.2429	*	*
15	* .6925	* .7245	* .7248	* .4732	* F-SUB-Q			
	* 3.2505	* 3.0738	* 3.0994	* 4.7939	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 271 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4843	* 1.3751	* 1.5965	* 1.3917	* 1.5321	* 1.4385	* 1.6574	* .6847
	* 1.6982	* 1.8273	* 1.5795	* 1.7904	* 1.6154	* 1.7210	* 1.4940	* 3.2835
9	* 1.3751	* 1.6502	* 1.6521	* 1.6089	* 1.5688	* 1.6587	* 1.6349	* .7177
	* 1.8273	* 1.5275	* 1.5253	* 1.5652	* 1.5878	* 1.5031	* 1.5210	* 3.0979
10	* 1.5965	* 1.6513	* 1.6942	* 1.6073	* 1.5527	* 1.5646	* 1.6580	* .7178
	* 1.5795	* 1.5260	* 1.4934	* 1.5719	* 1.6122	* 1.6052	* 1.5086	* 3.1166
11	* 1.3917	* 1.6089	* 1.6075	* 1.5672	* 1.5209	* 1.4691	* 1.0192	* .4671
	* 1.7904	* 1.5653	* 1.5717	* 1.6130	* 1.6738	* 1.7178	* 2.2705	* 4.8406
12	* 1.5321	* 1.5721	* 1.5549	* 1.5212	* 1.4950	* 1.5146	* .7783	*
	* 1.6154	* 1.5847	* 1.6101	* 1.6734	* 1.7113	* 1.6795	* 2.9519	*
13	* 1.4385	* 1.6626	* 1.5667	* 1.4703	* 1.5148	* 1.6621	* .6921	*
	* 1.7210	* 1.4999	* 1.6031	* 1.7166	* 1.6787	* 1.5300	* 3.3260	*
14	* 1.6574	* 1.6380	* 1.6603	* 1.0203	* .7787	* .7066	*	*
	* 1.4940	* 1.5183	* 1.5066	* 2.2681	* 2.9503	* 3.2608	*	*
15	* .6847	* .7184	* .7186	* .4676	* F-SUB-Q			
	* 3.2835	* 3.0954	* 3.1138	* 4.8355	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4844	* 1.3650	* 1.5902	* 1.3831	* 1.5319	* 1.4306	* 1.6639	* .6680
	* 1.5679	* 1.7042	* 1.4702	* 1.6746	* 1.5039	* 1.6110	* 1.3854	* 3.1390
9	* 1.3650	* 1.6521	* 1.6479	* 1.6118	* 1.5639	* 1.6581	* 1.6401	* .6962
	* 1.7042	* 1.4163	* 1.4196	* 1.4513	* 1.4815	* 1.3987	* 1.4105	* 2.9783
10	* 1.5902	* 1.6471	* 1.6906	* 1.6026	* 1.5559	* 1.5615	* 1.6633	* .6977
	* 1.4702	* 1.4203	* 1.3891	* 1.4631	* 1.4946	* 1.4928	* 1.3957	* 2.9849
11	* 1.3831	* 1.6118	* 1.6027	* 1.5698	* 1.5173	* 1.4734	* .9964	* .4539
	* 1.6746	* 1.4513	* 1.4629	* 1.4933	* 1.5590	* 1.5895	* 2.1527	* 4.6241
12	* 1.5319	* 1.5673	* 1.5581	* 1.5177	* 1.4911	* 1.5191	* .7540	*
	* 1.5039	* 1.4786	* 1.4926	* 1.5586	* 1.5903	* 1.5531	* 2.8364	*
13	* 1.4306	* 1.6621	* 1.5636	* 1.4745	* 1.5193	* 1.6690	* .6747	*
	* 1.6110	* 1.3957	* 1.4908	* 1.5883	* 1.5531	* 1.4139	* 3.1755	*
14	* 1.6639	* 1.6433	* 1.6656	* .9975	* .7544	* .6881	*	*
	* 1.3854	* 1.4079	* 1.3939	* 2.1504	* 2.8349	* 3.1166	*	*
15	* .6680	* .6969	* .6984	* .4544	* F-SUB-Q			
	* 3.1390	* 2.9758	* 2.9822	* 4.6192	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 272 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4631	* 1.3450	* 1.5698	* 1.3634	* 1.5111	* 1.4110	* 1.6430	* .6566 *
	* 1.4863	* 1.6212	* 1.3967	* 1.5957	* 1.4330	* 1.5351	* 1.3186	* 3.0073 *
9	* 1.3450	* 1.6308	* 1.6277	* 1.5915	* 1.5434	* 1.6387	* 1.6198	* .6844 *
	* 1.6212	* 1.3465	* 1.3485	* 1.3796	* 1.4103	* 1.3291	* 1.3414	* 2.8525 *
10	* 1.5698	* 1.6268	* 1.6698	* 1.5824	* 1.5359	* 1.5421	* 1.6426	* .6860 *
	* 1.3967	* 1.3492	* 1.3194	* 1.3900	* 1.4212	* 1.4176	* 1.3253	* 2.8551 *
11	* 1.3634	* 1.5915	* 1.5826	* 1.5494	* 1.4969	* 1.4538	* .9805	* .4458 *
	* 1.5957	* 1.3797	* 1.3899	* 1.4187	* 1.4752	* 1.5070	* 2.0493	* 4.4217 *
12	* 1.5111	* 1.5467	* 1.5381	* 1.4973	* 1.4710	* 1.4975	* .7408	* .7408 *
	* 1.4330	* 1.4074	* 1.4193	* 1.4749	* 1.5024	* 1.4736	* 2.6986	* 2.6986 *
13	* 1.4110	* 1.6426	* 1.5442	* 1.4549	* 1.4977	* 1.6460	* .6626	* .6626 *
	* 1.5351	* 1.3262	* 1.4157	* 1.5059	* 1.4734	* 1.3412	* 3.0273	* 3.0273 *
14	* 1.6430	* 1.6230	* 1.6449	* .9816	* .7412	* .6757		
	* 1.3186	* 1.3390	* 1.3236	* 2.0471	* 2.6972	* 2.9715		
15	* .6566	* .6851	* .6867	* .4463	* F-SUB-Q			
	* 3.0073	* 2.8501	* 2.8526	* 4.4170	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4150	* 1.3127	* 1.5313	* 1.3300	* 1.4637	* 1.3769	* 1.5875	* .6503 *
	* 1.4548	* 1.5746	* 1.3569	* 1.5521	* 1.4037	* 1.4927	* 1.2946	* 2.8867 *
9	* 1.3127	* 1.5799	* 1.5870	* 1.5417	* 1.5035	* 1.5955	* 1.5670	* .6828 *
	* 1.5746	* 1.3180	* 1.3111	* 1.3504	* 1.3731	* 1.2941	* 1.3148	* 2.7180 *
10	* 1.5313	* 1.5861	* 1.6267	* 1.5429	* 1.4869	* 1.5023	* 1.5887	* .6828 *
	* 1.3569	* 1.3117	* 1.2834	* 1.3510	* 1.3918	* 1.3783	* 1.2978	* 2.7246 *
11	* 1.3300	* 1.5416	* 1.5431	* 1.5000	* 1.4561	* 1.4046	* .9707	* .4426 *
	* 1.5521	* 1.3505	* 1.3509	* 1.3888	* 1.4324	* 1.4758	* 1.9612	* 4.2287 *
12	* 1.4637	* 1.5068	* 1.4890	* 1.4565	* 1.4309	* 1.4426	* .7383	* .7383 *
	* 1.4037	* 1.3703	* 1.3900	* 1.4321	* 1.4573	* 1.4403	* 2.5602	* 2.5602 *
13	* 1.3769	* 1.5993	* 1.5044	* 1.4057	* 1.4427	* 1.5840	* .6548	* .6548 *
	* 1.4927	* 1.2913	* 1.3765	* 1.4747	* 1.4401	* 1.3110	* 2.8900	* 2.8900 *
14	* 1.5875	* 1.5701	* 1.5909	* .9717	* .7387	* .6684		
	* 1.2946	* 1.3124	* 1.2961	* 1.9592	* 2.5588	* 2.8338		
15	* .6503	* .6835	* .6835	* .4431	* F-SUB-Q			
	* 2.8867	* 2.7159	* 2.7223	* 4.2244	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 273 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4030	* 1.3019	* 1.5191	* 1.3181	* 1.4448	* 1.3635	* 1.5686	* .6348 *
	* 1.4037	* 1.5194	* 1.3086	* 1.4995	* 1.3634	* 1.4431	* 1.2541	* 2.8369 *
9	* 1.3019	* 1.5610	* 1.5725	* 1.5239	* 1.4899	* 1.5792	* 1.5459	* .6629 *
	* 1.5194	* 1.2769	* 1.2658	* 1.3076	* 1.3263	* 1.2508	* 1.2753	* 2.6858 *
10	* 1.5191	* 1.5717	* 1.6107	* 1.5298	* 1.4697	* 1.4886	* 1.5649	* .6609 *
	* 1.3086	* 1.2665	* 1.2400	* 1.3034	* 1.3477	* 1.3311	* 1.2599	* 2.6995 *
11	* 1.3181	* 1.5239	* 1.5300	* 1.4826	* 1.4407	* 1.3886	* .9437	* .4304 *
	* 1.4995	* 1.3076	* 1.3033	* 1.3444	* 1.3824	* 1.4270	* 1.9307	* 4.1711 *
12	* 1.4448	* 1.4930	* 1.4718	* 1.4410	* 1.4150	* 1.4211	* .7149	* .6348 *
	* 1.3634	* 1.3236	* 1.3460	* 1.3820	* 1.4067	* 1.3958	* 2.5284	* .6348 *
13	* 1.3635	* 1.5829	* 1.4906	* 1.3897	* 1.4217	* 1.5501	* .6313	* .6313 *
	* 1.4431	* 1.2480	* 1.3294	* 1.4259	* 1.3952	* 1.2762	* 2.8629	* .6313 *
14	* 1.5686	* 1.5488	* 1.5671	* .9447	* .7153	* .6438		
	* 1.2541	* 1.2730	* 1.2583	* 1.9287	* 2.5272	* 2.8105		
15	* .6348	* .6635	* .6615	* .4308	* F-SUB-Q			
	* 2.8369	* 2.6835	* 2.6971	* 4.1669	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3520	* 1.2531	* 1.4462	* 1.2675	* 1.3834	* 1.3042	* 1.4913	* .6245 *
	* 1.4057	* 1.5241	* 1.3263	* 1.5057	* 1.3726	* 1.4562	* 1.2732	* 2.7907 *
9	* 1.2531	* 1.4795	* 1.4996	* 1.4457	* 1.4226	* 1.5004	* 1.4676	* .6478 *
	* 1.5241	* 1.3004	* 1.2807	* 1.3299	* 1.3399	* 1.2699	* 1.2963	* 2.6597 *
10	* 1.4462	* 1.4989	* 1.5223	* 1.4629	* 1.3954	* 1.4184	* 1.4768	* .6386 *
	* 1.3263	* 1.2813	* 1.2655	* 1.3142	* 1.3703	* 1.3478	* 1.2881	* 2.7035 *
11	* 1.2675	* 1.4456	* 1.4631	* 1.4061	* 1.3724	* 1.3272	* .9092	* .4132 *
	* 1.5057	* 1.3299	* 1.3140	* 1.3677	* 1.3988	* 1.4400	* 1.9363	* 4.2093 *
12	* 1.3834	* 1.4254	* 1.3972	* 1.3727	* 1.3417	* 1.3550	* .6994	* .6994 *
	* 1.3726	* 1.3374	* 1.3686	* 1.3984	* 1.4299	* 1.4100	* 2.4967	* .6994 *
13	* 1.3042	* 1.5040	* 1.4203	* 1.3282	* 1.3556	* 1.4427	* .6004	* .6004 *
	* 1.4562	* 1.2671	* 1.3461	* 1.4389	* 1.4093	* 1.3207	* 2.9087	* .6004 *
14	* 1.4913	* 1.4703	* 1.4788	* .9101	* .6998	* .6115		
	* 1.2732	* 1.2940	* 1.2865	* 1.9345	* 2.4954	* 2.8582		
15	* .6245	* .6484	* .6392	* .4136	* F-SUB-Q			
	* 2.7907	* 2.6576	* 2.7012	* 4.2051	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 274 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 75% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3556	* 1.0962	* 1.2148	* 1.1001	* 1.3846	* 1.1163	* 1.3823	* .5635
	* 1.3594	* 1.6855	* 1.5340	* 1.6798	* 1.3304	* 1.6529	* 1.3342	* 3.0176
9	* 1.0962	* 1.3356	* 1.2806	* 1.3677	* 1.1929	* 1.2722	* 1.3916	* .5879
	* 1.6855	* 1.3940	* 1.4548	* 1.3589	* 1.5533	* 1.4542	* 1.3266	* 2.8581
10	* 1.2148	* 1.2800	* 1.2363	* 1.2525	* 1.2682	* 1.1971	* 1.2980	* .5617
	* 1.5340	* 1.4555	* 1.5128	* 1.4889	* 1.4645	* 1.5511	* 1.4239	* 2.9979
11	* 1.1001	* 1.3679	* 1.2527	* 1.2613	* 1.1579	* 1.3212	* .8016	* .3584
	* 1.6798	* 1.3587	* 1.4887	* 1.4767	* 1.6088	* 1.4022	* 2.1380	* 4.7416
12	* 1.3846	* 1.1940	* 1.2692	* 1.1585	* 1.0882	* 1.3029	* .6402	*
	* 1.3304	* 1.5520	* 1.4634	* 1.6081	* 1.7117	* 1.4232	* 2.6574	*
13	* 1.1163	* 1.2750	* 1.1986	* 1.3221	* 1.3035	* 1.1786	* .5096	*
	* 1.6529	* 1.4512	* 1.5492	* 1.4013	* 1.4225	* 1.5722	* 3.3413	*
14	* 1.3823	* 1.3937	* 1.2996	* .8024	* .6406	* .5190	*	*
	* 1.3342	* 1.3246	* 1.4222	* 2.1359	* 2.6559	* 3.2832	*	*
15	* .5635	* .5886	* .5623	* .3587	* F-SUB-Q			
	* 3.0176	* 2.8553	* 2.9954	* 4.7370	* M-SUB-Q			

AT 75% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .5773	* .4941	* .4948	* .4951	* .5843	* .4882	* .5142	* .2519
	* 3.1140	* 3.6490	* 3.6596	* 3.6391	* 3.0747	* 3.6848	* 3.4930	* 6.5974
9	* .4941	* .5657	* .5197	* .5816	* .4932	* .5009	* .5154	* .2566
	* 3.6490	* 3.1957	* 3.4855	* 3.1051	* 3.6538	* 3.5950	* 3.4870	* 6.4018
10	* .4948	* .5195	* .4872	* .5159	* .5602	* .4860	* .4734	* .2399
	* 3.6596	* 3.4867	* 3.7260	* 3.5093	* 3.2255	* 3.7163	* 3.8024	* 6.8606
11	* .4951	* .5817	* .5161	* .5535	* .4730	* .5167	* .3488	* .1600
	* 3.6391	* 3.1044	* 3.5079	* 3.2731	* 3.8297	* 3.4923	* 4.7948	* 10.3958
12	* .5843	* .4936	* .5606	* .4732	* .4367	* .4847	* .2778	*
	* 3.0747	* 3.6511	* 3.2234	* 3.8283	* 4.1471	* 3.7247	* 5.9835	*
13	* .4882	* .5019	* .4866	* .5170	* .4850	* .4214	* .2138	*
	* 3.6848	* 3.5881	* 3.7122	* 3.4899	* 3.7228	* 4.2840	* 7.7847	*
14	* .5142	* .5162	* .4740	* .3491	* .2781	* .2172	*	*
	* 3.4930	* 3.4820	* 3.7979	* 4.7908	* 5.9792	* 7.6690	*	*
15	* .2519	* .2568	* .2402	* .1602	* F-SUB-Q			
	* 6.5974	* 6.3963	* 6.8542	* 10.3851	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 275 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6678 *	* .6830 *	* .6931 *	* .6857 *	* .7908 *	* .6718 *	* .6709 *	* .3469 *
	* 3.6982 *	* 4.2722 *	* 4.1772 *	* 4.0228 *	* 3.4464 *	* 4.0501 *	* 4.0565 *	* 7.1772 *
9	* .6830 *	* .7886 *	* .7203 *	* .7955 *	* .6788 *	* .6625 *	* .6704 *	* .3494 *
	* 4.2722 *	* 3.8192 *	* 3.9870 *	* 3.5368 *	* 4.0544 *	* 4.1331 *	* 4.0890 *	* 7.0856 *
10	* .6931 *	* .7201 *	* .6805 *	* .7041 *	* .7533 *	* .6452 *	* .6148 *	* .3229 *
	* 4.1771 *	* 3.9878 *	* 4.2934 *	* 4.0765 *	* 3.7849 *	* 4.3936 *	* 4.5266 *	* 7.7226 *
11	* .6857 *	* .7955 *	* .7043 *	* .7431 *	* .6299 *	* .6619 *	* .4583 *	* .2290 *
	* 4.0228 *	* 3.5359 *	* 4.0755 *	* 4.0420 *	* 4.7707 *	* 4.4342 *	* 5.9365 *	* 11.3482 *
12	* .7908 *	* .6792 *	* .7537 *	* .6301 *	* .5347 *	* .5816 *	* .3601 *	
	* 3.4464 *	* 4.0520 *	* 3.7826 *	* 4.7695 *	* 5.0525 *	* 4.6716 *	* 7.3001 *	
13	* .6718 *	* .6641 *	* .6458 *	* .6621 *	* .5817 *	* .5055 *	* .2679 *	
	* 4.0501 *	* 4.1231 *	* 4.3891 *	* 4.4325 *	* 4.6712 *	* 5.2738 *	* 9.5110 *	
14	* .6709 *	* .6715 *	* .6154 *	* .4585 *	* .3600 *	* .2740 *		
	* 4.0565 *	* 4.0823 *	* 4.5216 *	* 5.9331 *	* 7.3015 *	* 9.3070 *		
15	* .3469 *	* .3496 *	* .3232 *	* .2291 *	* F-SUB-Q			
	* 7.1772 *	* 7.0823 *	* 7.7176 *	* 11.3408 *	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6919 *	* 1.4838 *	* 1.6338 *	* 1.4756 *	* 1.7654 *	* 1.4779 *	* 1.6998 *	* .7710 *
	* 1.7201 *	* 2.0496 *	* 1.8458 *	* 1.9386 *	* 1.6021 *	* 1.9073 *	* 1.6652 *	* 3.3570 *
9	* 1.4838 *	* 1.7541 *	* 1.6912 *	* 1.7595 *	* 1.5785 *	* 1.5879 *	* 1.7024 *	* .8008 *
	* 2.0496 *	* 1.7923 *	* 1.7596 *	* 1.6680 *	* 1.8131 *	* 1.7851 *	* 1.6636 *	* 3.1991 *
10	* 1.6338 *	* 1.6908 *	* 1.6438 *	* 1.6396 *	* 1.5979 *	* 1.5243 *	* 1.5841 *	* .7572 *
	* 1.8458 *	* 1.7601 *	* 1.8461 *	* 1.8212 *	* 1.8496 *	* 1.9231 *	* 1.8224 *	* 3.4095 *
11	* 1.4756 *	* 1.7596 *	* 1.6398 *	* 1.5853 *	* 1.4759 *	* 1.6096 *	* 1.0449 *	* .5056 *
	* 1.9386 *	* 1.6677 *	* 1.8209 *	* 1.9564 *	* 2.0833 *	* 1.8898 *	* 2.7045 *	* 5.3314 *
12	* 1.7654 *	* 1.5795 *	* 1.5988 *	* 1.4764 *	* 1.3216 *	* 1.5253 *	* .8344 *	
	* 1.6021 *	* 1.8119 *	* 1.8486 *	* 2.0828 *	* 2.1686 *	* 1.8928 *	* 3.2678 *	
13	* 1.4779 *	* 1.5914 *	* 1.5258 *	* 1.6103 *	* 1.5256 *	* 1.3516 *	* .6590 *	
	* 1.9073 *	* 1.7811 *	* 1.9210 *	* 1.8891 *	* 1.8925 *	* 2.1100 *	* 4.0190 *	
14	* 1.6998 *	* 1.7050 *	* 1.5856 *	* 1.0452 *	* .8344 *	* .6627 *		
	* 1.6652 *	* 1.6612 *	* 1.8205 *	* 2.7032 *	* 3.2683 *	* 4.0000 *		
15	* .7710 *	* .8015 *	* .7576 *	* .5059 *	* F-SUB-Q			
	* 3.3570 *	* 3.1965 *	* 3.4077 *	* 5.3281 *	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 276 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7546	* 1.7233	* 1.9276	* 1.7020	* 1.7437	* 1.7117	* 1.8162	* .8569 *
	* 1.8008	* 1.8662	* 1.6046	* 1.7571	* 1.6578	* 1.6828	* 1.5793	* 3.0606 *
9	* 1.7233	* 1.9120	* 1.9577	* 1.8370	* 1.8455	* 1.8734	* 1.7808	* .8976 *
	* 1.8662	* 1.6284	* 1.5587	* 1.6548	* 1.5806	* 1.5492	* 1.6186	* 2.8919 *
10	* 1.9276	* 1.9572	* 1.9918	* 1.8970	* 1.7406	* 1.7871	* 1.7806	* .8751 *
	* 1.6046	* 1.5590	* 1.5432	* 1.6090	* 1.7230	* 1.6811	* 1.6576	* 3.0170 *
11	* 1.7020	* 1.8370	* 1.8972	* 1.7733	* 1.7296	* 1.6152	* 1.2050	* .5863 *
	* 1.7571	* 1.6547	* 1.6088	* 1.7608	* 1.8088	* 1.9472	* 2.4069	* 4.7146 *
12	* 1.7437	* 1.8480	* 1.7414	* 1.7301	* 1.6691	* 1.6172	* .9368 *	
	* 1.6578	* 1.5784	* 1.7211	* 1.8086	* 1.8285	* 1.8785	* 2.9975 *	
13	* 1.7117	* 1.8780	* 1.7889	* 1.6161	* 1.6176	* 1.6547	* .7842 *	
	* 1.6828	* 1.5455	* 1.6791	* 1.9465	* 1.8781	* 1.7871	* 3.4825 *	
14	* 1.8162	* 1.7837	* 1.7825	* 1.2054	* .9368	* .7977	*	
	* 1.5793	* 1.6161	* 1.6558	* 2.4058	* 2.9976	* 3.4252	*	
15	* .8569	* .8983	* .8756	* .5866	* F-SUB-Q			
	* 3.0606	* 2.8898	* 3.0153	* 4.7116	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8734	* 1.8191	* 2.0591	* 1.7943	* 1.8547	* 1.8137	* 1.9551	* .8635 *
	* 1.7523	* 1.8357	* 1.5438	* 1.7102	* 1.5976	* 1.6273	* 1.4999	* 3.1025 *
9	* 1.8191	* 2.0549	* 2.0884	* 1.9749	* 1.9626	* 2.0080	* 1.9199	* .9053 *
	* 1.8357	* 1.5511	* 1.4982	* 1.5777	* 1.5256	* 1.4800	* 1.5380	* 2.9320 *
10	* 2.0591	* 2.0878	* 2.1392	* 2.0205	* 1.8663	* 1.9130	* 1.9322	* .8971 *
	* 1.5438	* 1.4986	* 1.4695	* 1.5489	* 1.6457	* 1.6106	* 1.5663	* 3.0181 *
11	* 1.7943	* 1.9749	* 2.0207	* 1.9082	* 1.8411	* 1.7324	* 1.2490	* .6018 *
	* 1.7102	* 1.5776	* 1.5486	* 1.6796	* 1.7386	* 1.8730	* 2.3885	* 4.7180 *
12	* 1.8547	* 1.9658	* 1.8684	* 1.8414	* 1.8024	* 1.7435	* .9527 *	
	* 1.5976	* 1.5231	* 1.6438	* 1.7384	* 1.7503	* 1.8025	* 3.0436 *	
13	* 1.8137	* 2.0131	* 1.9151	* 1.7334	* 1.7440	* 1.8343	* .8217 *	
	* 1.6273	* 1.4768	* 1.6086	* 1.8723	* 1.8020	* 1.6661	* 3.4323 *	
14	* 1.9551	* 1.9232	* 1.9343	* 1.2495	* .9528	* .8383 *		
	* 1.4999	* 1.5357	* 1.5645	* 2.3873	* 3.0433	* 3.3672 *		
15	* .8635	* .9060	* .8976	* .6022	* F-SUB-Q			
	* 3.1025	* 2.9298	* 3.0165	* 4.7148	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 277 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8958	* 1.8206	* 2.0689	* 1.7981	* 1.8845	* 1.8224	* 1.9907	* .8623
	* 1.7990	* 1.9015	* 1.5881	* 1.7612	* 1.6215	* 1.6709	* 1.5200	* 3.2082
9	* 1.8206	* 2.0832	* 2.1031	* 2.0040	* 1.9740	* 2.0234	* 1.9581	* .9071
	* 1.9015	* 1.5792	* 1.5358	* 1.6061	* 1.5632	* 1.5085	* 1.5574	* 3.0215
10	* 2.0689	* 2.1025	* 2.1555	* 2.0344	* 1.8960	* 1.9327	* 1.9748	* .9017
	* 1.5881	* 1.5362	* 1.5052	* 1.5893	* 1.6696	* 1.6419	* 1.5793	* 3.1025
11	* 1.7981	* 2.0040	* 2.0346	* 1.9371	* 1.8629	* 1.7640	* 1.2610	* .6000
	* 1.7612	* 1.6061	* 1.5891	* 1.7113	* 1.7804	* 1.9023	* 2.4339	* 4.8673
12	* 1.8845	* 1.9774	* 1.8982	* 1.8633	* 1.8250	* 1.7840	* .9595	*
	* 1.6215	* 1.5605	* 1.6675	* 1.7801	* 1.7928	* 1.8267	* 3.1364	*
13	* 1.8224	* 2.0287	* 1.9349	* 1.7651	* 1.7846	* 1.8969	* .8342	*
	* 1.6709	* 1.5052	* 1.6397	* 1.9016	* 1.8264	* 1.6721	* 3.5116	*
14	* 1.9907	* 1.9615	* 1.9770	* 1.2616	* .9597	* .8521	*	*
	* 1.5200	* 1.5550	* 1.5774	* 2.4324	* 3.1358	* 3.4408	*	*
15	* .8623	* .9078	* .9022	* .6004	* F-SUB-Q			
	* 3.2082	* 3.0193	* 3.1006	* 4.8636	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8740	* 1.7886	* 2.0379	* 1.7711	* 1.8702	* 1.7984	* 1.9794	* .8548
	* 1.8895	* 1.9950	* 1.6629	* 1.8442	* 1.6846	* 1.7437	* 1.5739	* 3.3363
9	* 1.7886	* 2.0611	* 2.0764	* 1.9854	* 1.9497	* 2.0061	* 1.9494	* .9009
	* 1.9950	* 1.6463	* 1.6029	* 1.6711	* 1.6320	* 1.5646	* 1.6113	* 3.1354
10	* 2.0379	* 2.0758	* 2.1278	* 2.0096	* 1.8816	* 1.9138	* 1.9681	* .8958
	* 1.6629	* 1.6034	* 1.5720	* 1.6582	* 1.7367	* 1.7104	* 1.6330	* 3.2144
11	* 1.7711	* 1.9854	* 2.0098	* 1.9209	* 1.8485	* 1.7555	* 1.2563	* .5926
	* 1.8442	* 1.6710	* 1.6580	* 1.7801	* 1.8674	* 1.9849	* 2.5286	* 5.0938
12	* 1.8702	* 1.9532	* 1.8839	* 1.8489	* 1.8109	* 1.7816	* .9587	*
	* 1.6846	* 1.6290	* 1.7345	* 1.8670	* 1.8840	* 1.9058	* 3.2773	*
13	* 1.7984	* 2.0106	* 1.9161	* 1.7566	* 1.7823	* 1.9060	* .8349	*
	* 1.7437	* 1.5611	* 1.7082	* 1.9839	* 1.9056	* 1.7410	* 3.6753	*
14	* 1.9794	* 1.9529	* 1.9704	* 1.2570	* .9590	* .8531	*	*
	* 1.5739	* 1.6087	* 1.6310	* 2.5268	* 3.2763	* 3.6001	*	*
15	* .8548	* .9017	* .8964	* .5930	* F-SUB-Q			
	* 3.3363	* 3.1330	* 3.2122	* 5.0896	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 278 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8564	* 1.7598	* 2.0115	* 1.7465	* 1.8583	* 1.7770	* 1.9747	* .8374 *
	* 1.9662	* 2.0867	* 1.7594	* 1.9536	* 1.7708	* 1.8415	* 1.6435	* 3.5445 *
9	* 1.7598	* 2.0446	* 2.0534	* 1.9727	* 1.9297	* 1.9932	* 1.9449	* .8810 *
	* 2.0867	* 1.7312	* 1.6917	* 1.7555	* 1.7214	* 1.6415	* 1.6832	* 3.3378 *
10	* 2.0115	* 2.0528	* 2.1057	* 1.9895	* 1.8731	* 1.8992	* 1.9651	* .8774 *
	* 1.7594	* 1.6922	* 1.6573	* 1.7489	* 1.8227	* 1.8004	* 1.7068	* 3.4226 *
11	* 1.7465	* 1.9728	* 1.9897	* 1.9104	* 1.8366	* 1.7519	* 1.2354	* .5781 *
	* 1.9536	* 1.7555	* 1.7486	* 1.8696	* 1.9616	* 2.0612	* 2.6901	* 5.4558 *
12	* 1.8583	* 1.9333	* 1.8755	* 1.8370	* 1.8000	* 1.7813	* .9394 *	
	* 1.7708	* 1.7181	* 1.8202	* 1.9612	* 1.9778	* 1.9886	* 3.4926 *	
13	* 1.7770	* 1.9978	* 1.9015	* 1.7531	* 1.7820	* 1.9151	* .8230 *	
	* 1.8415	* 1.6377	* 1.7979	* 2.0598	* 1.9884	* 1.8154	* 3.9072 *	
14	* 1.9747	* 1.9485	* 1.9675	* 1.2362	* .9398	* .8411	*	
	* 1.6435	* 1.6803	* 1.7046	* 2.6879	* 3.4914	* 3.8263	*	
15	* .8374	* .8817	* .8780	* .5786	* F-SUB-Q			
	* 3.5445	* 3.3353	* 3.4201	* 5.4510	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8188	* 1.7176	* 1.9683	* 1.7088	* 1.8271	* 1.7419	* 1.9469	* .8199 *
	* 2.1010	* 2.2413	* 1.9030	* 2.1138	* 1.9060	* 1.9870	* 1.7605	* 3.8197 *
9	* 1.7176	* 2.0062	* 2.0130	* 1.9384	* 1.8934	* 1.9622	* 1.9184	* .8612 *
	* 2.2413	* 1.8660	* 1.8260	* 1.8902	* 1.8561	* 1.7619	* 1.8031	* 3.6034 *
10	* 1.9683	* 2.0123	* 2.0647	* 1.9517	* 1.8437	* 1.8672	* 1.9394	* .8583 *
	* 1.9030	* 1.8266	* 1.7878	* 1.8864	* 1.9590	* 1.9352	* 1.8279	* 3.6955 *
11	* 1.7088	* 1.9384	* 1.9520	* 1.8788	* 1.8077	* 1.7279	* 1.2116	* .5645 *
	* 2.1138	* 1.8901	* 1.8861	* 2.0121	* 2.0784	* 2.1829	* 2.8805	* 5.9069 *
12	* 1.8271	* 1.8970	* 1.8461	* 1.8081	* 1.7720	* 1.7597	* .9206 *	
	* 1.9060	* 1.8525	* 1.9563	* 2.0779	* 2.1032	* 2.1160	* 3.7259 *	
13	* 1.7419	* 1.9668	* 1.8695	* 1.7292	* 1.7605	* 1.8992	* .8092 *	
	* 1.9870	* 1.7577	* 1.9324	* 2.1813	* 2.1151	* 1.9330	* 4.1934 *	
14	* 1.9469	* 1.9220	* 1.9418	* 1.2125	* .9210	* .8268	*	
	* 1.7605	* 1.7998	* 1.8255	* 2.8783	* 3.7244	* 4.1074	*	
15	* .8199	* .8620	* .8590	* .5650	* F-SUB-Q			
	* 3.8197	* 3.6006	* 3.6926	* 5.9013	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 279 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7842	* 1.6776	* 1.9275	* 1.6725	* 1.7982	* 1.7080	* 1.9212	* .7994
	* 2.2899	* 2.4255	* 2.0678	* 2.2904	* 2.0415	* 2.1329	* 1.8761	* 4.0996
9	* 1.6776	* 1.9712	* 1.9745	* 1.9072	* 1.8587	* 1.9318	* 1.8929	* .8373
	* 2.4255	* 2.0237	* 1.9810	* 2.0412	* 1.9939	* 1.8841	* 1.9224	* 3.8781
10	* 1.9275	* 1.9738	* 2.0263	* 1.9160	* 1.8167	* 1.8365	* 1.9146	* .8361
	* 2.0678	* 1.9816	* 1.9394	* 2.0417	* 2.0978	* 2.0716	* 1.9489	* 3.9695
11	* 1.6725	* 1.9072	* 1.9163	* 1.8497	* 1.7790	* 1.7053	* 1.1839	* .5487
	* 2.2904	* 2.0412	* 2.0414	* 2.1716	* 2.2417	* 2.3469	* 3.1152	* 6.3548
12	* 1.7982	* 1.8623	* 1.8191	* 1.7794	* 1.7444	* 1.7384	* .8977	*
	* 2.0415	* 1.9900	* 2.0949	* 2.2413	* 2.2725	* 2.2670	* 4.0449	*
13	* 1.7080	* 1.9364	* 1.8388	* 1.7065	* 1.7391	* 1.8815	* .7915	*
	* 2.1329	* 1.8796	* 2.0686	* 2.3453	* 2.2668	* 2.0656	* 4.5311	*
14	* 1.9212	* 1.8965	* 1.9171	* 1.1849	* .8982	* .8088	*	*
	* 1.8761	* 1.9189	* 1.9463	* 3.1125	* 4.0431	* 4.4377	*	*
15	* .7994	* .8381	* .8368	* .5492	* F-SUB-Q			
	* 4.0996	* 3.8751	* 3.9663	* 6.3485	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7105	* 1.6133	* 1.8557	* 1.6121	* 1.7327	* 1.6489	* 1.8511	* .7836
	* 2.5508	* 2.6952	* 2.2797	* 2.5232	* 2.2380	* 2.3328	* 2.0562	* 4.4046
9	* 1.6133	* 1.8949	* 1.9038	* 1.8352	* 1.7934	* 1.8678	* 1.8264	* .8250
	* 2.6952	* 2.2319	* 2.1800	* 2.2501	* 2.1833	* 2.0575	* 2.1027	* 4.1431
10	* 1.8557	* 1.9030	* 1.9533	* 1.8485	* 1.7505	* 1.7744	* 1.8481	* .8229
	* 2.2797	* 2.1807	* 2.1333	* 2.2458	* 2.2979	* 2.2571	* 2.1246	* 4.2281
11	* 1.6121	* 1.8352	* 1.8488	* 1.7810	* 1.7204	* 1.6440	* 1.1621	* .5376
	* 2.5232	* 2.2501	* 2.2455	* 2.3935	* 2.4971	* 2.5945	* 3.3467	* 6.7673
12	* 1.7327	* 1.7969	* 1.7528	* 1.7208	* 1.6872	* 1.6795	* .8865	*
	* 2.2380	* 2.1790	* 2.2947	* 2.4966	* 2.5326	* 2.5231	* 4.4021	*
13	* 1.6489	* 1.8723	* 1.7768	* 1.6452	* 1.6803	* 1.8202	* .7793	*
	* 2.3328	* 2.0527	* 2.2538	* 2.5925	* 2.5229	* 2.2979	* 4.9456	*
14	* 1.8511	* 1.8299	* 1.8505	* 1.1631	* .8870	* .7969	*	*
	* 2.0562	* 2.0987	* 2.1218	* 3.3434	* 4.4001	* 4.8404	*	*
15	* .7836	* .8257	* .8236	* .5381	* F-SUB-Q			
	* 4.4046	* 4.1398	* 4.2244	* 6.7604	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 280 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6878	* 1.5805	* 1.8240	* 1.5822	* 1.7129	* 1.6208	* 1.8377	* .7580 *
	* 2.8026	* 2.9877	* 2.4399	* 2.6947	* 2.3683	* 2.4800	* 2.1577	* 4.7224 *
9	* 1.5805	* 1.8724	* 1.8742	* 1.8158	* 1.7667	* 1.8458	* 1.8119	* .7941 *
	* 2.9877	* 2.3801	* 2.3290	* 2.3889	* 2.3186	* 2.1735	* 2.2109	* 4.4659 *
10	* 1.8240	* 1.8734	* 1.9244	* 1.8209	* 1.7342	* 1.7513	* 1.8340	* .7929 *
	* 2.4399	* 2.3298	* 2.2776	* 2.3941	* 2.4282	* 2.3929	* 2.2394	* 4.5718 *
11	* 1.5822	* 1.8158	* 1.8212	* 1.7631	* 1.6984	* 1.6316	* 1.1262	* .5184 *
	* 2.6947	* 2.3888	* 2.3937	* 2.5381	* 2.7222	* 2.8214	* 3.6237	* 7.3379 *
12	* 1.7129	* 1.7702	* 1.7366	* 1.6988	* 1.6661	* 1.6668	* .8534	* .7580 *
	* 2.3683	* 2.3139	* 2.4248	* 2.7216	* 2.7691	* 2.7547	* 4.9221	* 4.7224 *
13	* 1.6208	* 1.8502	* 1.7536	* 1.6328	* 1.6676	* 1.8123	* .7549	* .7580 *
	* 2.4800	* 2.1684	* 2.3894	* 2.8194	* 2.7535	* 2.5109	* 5.5417	* 4.7224 *
14	* 1.8377	* 1.8154	* 1.8365	* 1.1272	* .8538	* .7711		
	* 2.1577	* 2.2066	* 2.2363	* 3.6200	* 4.9198	* 5.4293		
15	* .7580	* .7949	* .7937	* .5189	* F-SUB-Q			
	* 4.7224	* 4.4623	* 4.5679	* 7.3303	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6394	* 1.5315	* 1.7711	* 1.5364	* 1.6691	* 1.5764	* 1.7939	* .7373 *
	* 2.8716	* 3.0642	* 2.6523	* 2.9330	* 2.5598	* 2.6841	* 2.3228	* 5.0838 *
9	* 1.5315	* 1.8213	* 1.8229	* 1.7682	* 1.7194	* 1.8009	* 1.7693	* .7723 *
	* 3.0642	* 2.5815	* 2.5339	* 2.5939	* 2.5095	* 2.3433	* 2.3798	* 4.8089 *
10	* 1.7711	* 1.8221	* 1.8717	* 1.7717	* 1.6910	* 1.7066	* 1.7914	* .7711 *
	* 2.6523	* 2.5349	* 2.4765	* 2.6014	* 2.6214	* 2.5803	* 2.4081	* 4.9208 *
11	* 1.5364	* 1.7682	* 1.7719	* 1.7179	* 1.6562	* 1.5929	* 1.0967	* .5037 *
	* 2.9330	* 2.5938	* 2.6010	* 2.7472	* 2.8863	* 2.9763	* 3.9083	* 7.8952 *
12	* 1.6691	* 1.7229	* 1.6934	* 1.6566	* 1.6249	* 1.6288	* .8312	* .7373 *
	* 2.5598	* 2.5044	* 2.6177	* 2.8856	* 2.9579	* 2.9458	* 5.2914	* 4.8089 *
13	* 1.5764	* 1.8053	* 1.7090	* 1.5941	* 1.6296	* 1.7748	* .7361	* .7373 *
	* 2.6841	* 2.3378	* 2.5765	* 2.9739	* 2.9444	* 2.7261	* 6.0288	* 4.8089 *
14	* 1.7939	* 1.7728	* 1.7939	* 1.0977	* .8317	* .7517		
	* 2.3228	* 2.3751	* 2.4048	* 3.9042	* 5.2886	* 5.9085		
15	* .7373	* .7730	* .7719	* .5042	* F-SUB-Q			
	* 5.0838	* 4.8050	* 4.9164	* 7.8869	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 281 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5695	* 1.4703	* 1.7020	* 1.4778	* 1.6058	* 1.5185	* 1.7265	* .7189 *
	* 2.9149	* 3.1020	* 2.6143	* 2.8806	* 2.5569	* 2.6915	* 2.3627	* 5.1504 *
9	* 1.4703	* 1.7485	* 1.7541	* 1.6993	* 1.6557	* 1.7376	* 1.7044	* .7554 *
	* 3.1020	* 2.5495	* 2.4941	* 2.5688	* 2.5162	* 2.3773	* 2.4233	* 4.8628 *
10	* 1.7020	* 1.7533	* 1.8013	* 1.7062	* 1.6270	* 1.6459	* 1.7266	* .7542 *
	* 2.6143	* 2.4951	* 2.4500	* 2.5832	* 2.6562	* 2.6397	* 2.4857	* 5.0227 *
11	* 1.4778	* 1.6993	* 1.7065	* 1.6516	* 1.5981	* 1.5332	* 1.0707	* .4904 *
	* 2.8806	* 2.5688	* 2.5828	* 2.7501	* 2.9160	* 3.0121	* 3.9840	* 8.2008 *
12	* 1.6058	* 1.6591	* 1.6293	* 1.5985	* 1.5686	* 1.5707	* .8155 *	
	* 2.5569	* 2.5114	* 2.6522	* 2.9152	* 2.9890	* 2.9807	* 5.2599 *	
13	* 1.5185	* 1.7418	* 1.6482	* 1.5344	* 1.5715	* 1.7140	* .7205 *	
	* 2.6915	* 2.3718	* 2.6356	* 3.0096	* 2.9792	* 2.7561	* 6.0130 *	
14	* 1.7265	* 1.7078	* 1.7290	* 1.0718	* .8160	* .7364	*	
	* 2.3627	* 2.4193	* 2.4820	* 3.9797	* 5.2568	* 5.8885	*	
15	* .7189	* .7561	* .7550	* .4909	* F-SUB-Q			
	* 5.1504	* 4.8586	* 5.0176	* 8.1909	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5408	* 1.4331	* 1.6651	* 1.4437	* 1.5789	* 1.4857	* 1.7054	* .6925 *
	* 2.8338	* 3.0279	* 2.4883	* 2.7476	* 2.4283	* 2.5693	* 2.2341	* 4.9959 *
9	* 1.4331	* 1.7195	* 1.7190	* 1.6730	* 1.6234	* 1.7092	* 1.6830	* .7243 *
	* 3.0279	* 2.4128	* 2.3702	* 2.4314	* 2.3964	* 2.2573	* 2.2934	* 4.7395 *
10	* 1.6651	* 1.7182	* 1.7663	* 1.6725	* 1.6039	* 1.6165	* 1.7051	* .7241 *
	* 2.4883	* 2.3711	* 2.3260	* 2.4556	* 2.5154	* 2.5074	* 2.3506	* 4.8884 *
11	* 1.4437	* 1.6729	* 1.6727	* 1.6270	* 1.5704	* 1.5140	* 1.0335	* .4707 *
	* 2.7476	* 2.4314	* 2.4552	* 2.6014	* 2.8090	* 2.8843	* 3.8568	* 7.9748 *
12	* 1.5789	* 1.6268	* 1.6062	* 1.5708	* 1.5415	* 1.5511	* .7815 *	
	* 2.4283	* 2.3915	* 2.5116	* 2.8084	* 2.8808	* 2.8423	* 5.1068 *	
13	* 1.4857	* 1.7134	* 1.6188	* 1.5152	* 1.5519	* 1.6981	* .6954 *	
	* 2.5693	* 2.2520	* 2.5035	* 2.8821	* 2.8410	* 2.6160	* 5.7759 *	
14	* 1.7054	* 1.6864	* 1.7075	* 1.0346	* .7820	* .7098	*	
	* 2.2341	* 2.2896	* 2.3470	* 3.8520	* 5.1041	* 5.6639	*	
15	* .6925	* .7250	* .7248	* .4712	* F-SUB-Q			
	* 4.9959	* 4.7353	* 4.8832	* 7.9648	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 282 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4962	* 1.3876	* 1.6154	* 1.4003	* 1.5374	* 1.4430	* 1.6652	* .6707 *
	* 2.5831	* 2.7734	* 2.3721	* 2.6188	* 2.3115	* 2.4536	* 2.1234	* 4.7486 *
9	* 1.3876	* 1.6724	* 1.6704	* 1.6291	* 1.5783	* 1.6661	* 1.6432	* .6991 *
	* 2.7734	* 2.2916	* 2.2570	* 2.3099	* 2.2848	* 2.1506	* 2.1801	* 4.5187 *
10	* 1.6154	* 1.6696	* 1.7174	* 1.6260	* 1.5636	* 1.5741	* 1.6655	* .7000 *
	* 2.3721	* 2.2579	* 2.2146	* 2.3378	* 2.3863	* 2.3854	* 2.2288	* 4.6407 *
11	* 1.4003	* 1.6291	* 1.6263	* 1.5848	* 1.5300	* 1.4776	* 1.0016	* .4546 *
	* 2.6188	* 2.3099	* 2.3374	* 2.4428	* 2.5598	* 2.6222	* 3.5516	* 7.5164 *
12	* 1.5374	* 1.5818	* 1.5659	* 1.5303	* 1.5023	* 1.5165	* .7561	* .7561 *
	* 2.3115	* 2.2802	* 2.3828	* 2.5592	* 2.6267	* 2.5871	* 4.6923	* 4.6923 *
13	* 1.4430	* 1.6703	* 1.5763	* 1.4789	* 1.5167	* 1.6635	* .6745	* .6745 *
	* 2.4536	* 2.1456	* 2.3819	* 2.6202	* 2.5859	* 2.3777	* 5.3027	* 5.3027 *
14	* 1.6652	* 1.6466	* 1.6680	* 1.0027	* .7565	* .6883		
	* 2.1234	* 2.1765	* 2.2257	* 3.5477	* 4.6896	* 5.2010		
15	* .6707	* .6998	* .7008	* .4551	* F-SUB-Q			
	* 4.7486	* 4.5150	* 4.6361	* 7.5074	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4467	* 1.3403	* 1.5631	* 1.3550	* 1.4910	* 1.3978	* 1.6165	* .6508 *
	* 2.3768	* 2.5487	* 2.1442	* 2.3679	* 2.0900	* 2.2243	* 1.9200	* 4.2949 *
9	* 1.3403	* 1.6202	* 1.6184	* 1.5793	* 1.5298	* 1.6179	* 1.5961	* .6807 *
	* 2.5487	* 2.0648	* 2.0373	* 2.0815	* 2.0671	* 1.9449	* 1.9694	* 4.0735 *
10	* 1.5631	* 1.6176	* 1.6638	* 1.5757	* 1.5171	* 1.5271	* 1.6180	* .6807 *
	* 2.1442	* 2.0381	* 1.9981	* 2.1063	* 2.1496	* 2.1472	* 2.0049	* 4.1833 *
11	* 1.3550	* 1.5793	* 1.5759	* 1.5370	* 1.4852	* 1.4347	* .9740	* .4408 *
	* 2.3679	* 2.0815	* 2.1059	* 2.2141	* 2.3615	* 2.4115	* 3.2497	* 6.7797 *
12	* 1.4910	* 1.5331	* 1.5194	* 1.4856	* 1.4583	* 1.4749	* .7361	* .7361 *
	* 2.0900	* 2.0629	* 2.1465	* 2.3609	* 2.4254	* 2.3865	* 4.3254	* 4.3254 *
13	* 1.3978	* 1.6220	* 1.5293	* 1.4359	* 1.4751	* 1.6183	* .6565	* .6565 *
	* 2.2243	* 1.9405	* 2.1440	* 2.4096	* 2.3854	* 2.1861	* 4.8827	* 4.8827 *
14	* 1.6165	* 1.5994	* 1.6204	* .9751	* .7365	* .6698		
	* 1.9200	* 1.9664	* 2.0020	* 3.2460	* 4.3230	* 4.7900		
15	* .6508	* .6814	* .6814	* .4413	* F-SUB-Q			
	* 4.2949	* 4.0699	* 4.1789	* 6.7716	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 283 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3890	* 1.2904	* 1.5048	* 1.3056	* 1.4366	* 1.3480	* 1.5565	* .6354
	* 2.3690	* 2.5379	* 2.1216	* 2.3431	* 2.0734	* 2.2043	* 1.9070	* 4.2186
9	* 1.2904	* 1.5577	* 1.5597	* 1.5195	* 1.4746	* 1.5616	* 1.5380	* .6664
	* 2.5379	* 2.0448	* 2.0127	* 2.0619	* 2.0480	* 1.9247	* 1.9543	* 3.9891
10	* 1.5048	* 1.5589	* 1.6031	* 1.5191	* 1.4605	* 1.4733	* 1.5597	* .6662
	* 2.1216	* 2.0135	* 1.9743	* 2.0810	* 2.1302	* 2.1209	* 1.9834	* 4.0895
11	* 1.3056	* 1.5195	* 1.5193	* 1.4788	* 1.4330	* 1.3812	* .9510	* .4302
	* 2.3431	* 2.0619	* 2.0807	* 2.1903	* 2.3489	* 2.4035	* 3.1775	* 6.6305
12	* 1.4366	* 1.4778	* 1.4627	* 1.4334	* 1.4074	* 1.4226	* .7222	*
	* 2.0734	* 2.0437	* 2.1271	* 2.3484	* 2.4142	* 2.3812	* 4.2360	*
13	* 1.3480	* 1.5655	* 1.4754	* 1.3824	* 1.4228	* 1.5613	* .6420	*
	* 2.2043	* 1.9203	* 2.1177	* 2.4015	* 2.3800	* 2.1895	* 4.8275	*
14	* 1.5565	* 1.5412	* 1.5620	* .9521	* .7227	* .6556	*	*
	* 1.9070	* 1.9509	* 1.9806	* 3.1736	* 4.2335	* 4.7322	*	*
15	* .6354	* .6670	* .6670	* .4307	* F-SUB-Q			
	* 4.2186	* 3.9857	* 4.0854	* 6.6225	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3709	* 1.2631	* 1.4783	* 1.2801	* 1.4172	* 1.3223	* 1.5412	* .6120
	* 2.1352	* 2.2890	* 1.9243	* 2.1329	* 1.8811	* 2.0116	* 1.7249	* 3.9326
9	* 1.2631	* 1.5384	* 1.5343	* 1.5016	* 1.4499	* 1.5393	* 1.5219	* .6383
	* 2.2890	* 1.8435	* 1.8228	* 1.8604	* 1.8623	* 1.7468	* 1.7673	* 3.7394
10	* 1.4783	* 1.5335	* 1.5773	* 1.4936	* 1.4438	* 1.4499	* 1.5431	* .6394
	* 1.9243	* 1.8237	* 1.7867	* 1.8853	* 1.9233	* 1.9215	* 1.7885	* 3.8167
11	* 1.2801	* 1.5015	* 1.4937	* 1.4614	* 1.4103	* 1.3668	* .9177	* .4130
	* 2.1329	* 1.8604	* 1.8850	* 1.9718	* 2.1315	* 2.1542	* 2.9242	* 6.1621
12	* 1.4172	* 1.4531	* 1.4459	* 1.4107	* 1.3845	* 1.4076	* .6909	*
	* 1.8811	* 1.8584	* 1.9204	* 2.1304	* 2.1922	* 2.1576	* 3.9670	*
13	* 1.3223	* 1.5432	* 1.4521	* 1.3679	* 1.4078	* 1.5462	* .6180	*
	* 2.0116	* 1.7428	* 1.9186	* 2.1524	* 2.1565	* 1.9727	* 4.4861	*
14	* 1.5412	* 1.5251	* 1.5454	* .9188	* .6913	* .6304	*	*
	* 1.7249	* 1.7639	* 1.7860	* 2.9205	* 3.9647	* 4.4024	*	*
15	* .6120	* .6389	* .6401	* .4134	* F-SUB-Q			
	* 3.9326	* 3.7361	* 3.8128	* 6.1546	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 284 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3341	* 1.2287	* 1.4400	* 1.2457	* 1.3800	* 1.2872	* 1.5019	* .5944
	* 1.9564	* 2.1231	* 1.7810	* 1.9805	* 1.7517	* 1.8740	* 1.6064	* 3.6856
9	* 1.2287	* 1.4989	* 1.4953	* 1.4634	* 1.4120	* 1.5008	* 1.4831	* .6199
	* 2.1231	* 1.7028	* 1.6855	* 1.7226	* 1.7318	* 1.6234	* 1.6436	* 3.5028
10	* 1.4400	* 1.4945	* 1.5372	* 1.4554	* 1.4068	* 1.4131	* 1.5037	* .6210
	* 1.7810	* 1.6864	* 1.6519	* 1.7443	* 1.7823	* 1.7797	* 1.6574	* 3.5649
11	* 1.2457	* 1.4634	* 1.4556	* 1.4237	* 1.3732	* 1.3312	* .8919	* .4008
	* 1.9805	* 1.7227	* 1.7440	* 1.8190	* 1.9563	* 1.9920	* 2.6949	* 5.7298
12	* 1.3800	* 1.4152	* 1.4089	* 1.3735	* 1.3481	* 1.3696	* .6706	*
	* 1.7517	* 1.7281	* 1.7797	* 1.9558	* 2.0027	* 1.9746	* 3.6498	*
13	* 1.2872	* 1.5046	* 1.4151	* 1.3323	* 1.3697	* 1.5046	* .5995	*
	* 1.8740	* 1.6196	* 1.7770	* 1.9904	* 1.9736	* 1.8123	* 4.1372	*
14	* 1.5019	* 1.4862	* 1.5059	* .8929	* .6711	* .6114	*	*
	* 1.6064	* 1.6405	* 1.6551	* 2.6917	* 3.6477	* 4.0604	*	*
15	* .5944	* .6205	* .6217	* .4012	* F-SUB-Q			
	* 3.6856	* 3.4997	* 3.5612	* 5.7229	* M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2750	* 1.1853	* 1.3874	* 1.2006	* 1.3204	* 1.2407	* 1.4330	* .5819
	* 1.8801	* 1.9785	* 1.6788	* 1.8821	* 1.6829	* 1.7880	* 1.5487	* 3.4736
9	* 1.1853	* 1.4343	* 1.4398	* 1.4000	* 1.3586	* 1.4426	* 1.4167	* .6114
	* 1.9785	* 1.6210	* 1.5979	* 1.6460	* 1.6525	* 1.5512	* 1.5806	* 3.2764
10	* 1.3874	* 1.4390	* 1.4786	* 1.4012	* 1.3452	* 1.3593	* 1.4357	* .6110
	* 1.6788	* 1.5987	* 1.5668	* 1.6537	* 1.7046	* 1.6910	* 1.5878	* 3.3321
11	* 1.2006	* 1.4000	* 1.4014	* 1.3615	* 1.3192	* 1.2704	* .8725	* .3935
	* 1.8821	* 1.6461	* 1.6535	* 1.7297	* 1.8633	* 1.8890	* 2.4981	* 5.3369
12	* 1.3204	* 1.3617	* 1.3472	* 1.3195	* 1.2951	* 1.3027	* .6608	*
	* 1.6829	* 1.6490	* 1.7021	* 1.8624	* 1.9028	* 1.8896	* 3.3935	*
13	* 1.2407	* 1.4462	* 1.3613	* 1.2715	* 1.3033	* 1.4292	* .5856	*
	* 1.7880	* 1.5477	* 1.6886	* 1.8874	* 1.8887	* 1.7330	* 3.8603	*
14	* 1.4330	* 1.4196	* 1.4378	* .8735	* .6612	* .5978	*	*
	* 1.5487	* 1.5776	* 1.5855	* 2.4953	* 3.3915	* 3.7848	*	*
15	* .5819	* .6120	* .6117	* .3939	* F-SUB-Q			
	* 3.4736	* 3.2736	* 3.3289	* 5.3307	* M-SUB-Q			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 285 of 312**

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

	H	G	F	E	D	C	B	A
8	1.2494	1.1613	1.3596	1.1756	1.2879	1.2137	1.3988	.5617
	1.7334	1.8575	1.5753	1.7838	1.6098	1.7031	1.4792	3.3652
9	1.1613	1.4002	1.4092	1.3672	1.3298	1.4100	1.3805	.5869
	1.8575	1.5331	1.5103	1.5620	1.5705	1.4772	1.5103	3.1907
10	1.3596	1.4084	1.4460	1.3723	1.3138	1.3304	1.3969	.5848
	1.5753	1.5111	1.4822	1.5624	1.6180	1.6010	1.5136	3.2462
11	1.1756	1.3672	1.3725	1.3295	1.2892	1.2409	.8385	.3785
	1.7838	1.5621	1.5622	1.6324	1.7404	1.7743	2.3929	5.1467
12	1.2879	1.3328	1.3157	1.2895	1.2650	1.2691	.6327	
	1.6098	1.5673	1.6157	1.7396	1.7887	1.7836	3.2431	
13	1.2137	1.4135	1.3323	1.2419	1.2696	1.3814	.5583	
	1.7031	1.4738	1.5987	1.7728	1.7827	1.6612	3.7524	
14	1.3988	1.3833	1.3990	.8394	.6331	.5693		
	1.4792	1.5074	1.5114	2.3902	3.2414	3.6832		
15	.5617	.5874	.5854	.3789	F-SUB-Q			
	3.3652	3.1879	3.2430	5.1408	M-SUB-Q			

	H	G	F	E	D	C	B	A
8	* 1.1902	* 1.1050	* 1.2792	* 1.1176	* 1.2187	* 1.1474	* 1.3144	* .5467
	* 1.6978	* 1.8155	* 1.5675	* 1.7682	* 1.6042	* 1.7023	* 1.4884	* 3.2797
9	* 1.1050	* 1.3117	* 1.3280	* 1.2817	* 1.2548	* 1.3238	* 1.2952	* .5674
	* 1.8155	* 1.5357	* 1.5064	* 1.5673	* 1.5697	* 1.4861	* 1.5204	* 3.1299
10	* 1.2792	* 1.3274	* 1.3501	* 1.2965	* 1.2328	* 1.2528	* 1.3027	* .5591
	* 1.5675	* 1.5071	* 1.4915	* 1.5528	* 1.6236	* 1.6009	* 1.5288	* 3.2146
11	* 1.1176	* 1.2816	* 1.2967	* 1.2461	* 1.2137	* 1.1721	* .7990	* .3597
	* 1.7682	* 1.5673	* 1.5526	* 1.6318	* 1.7125	* 1.7545	* 2.3525	* 5.1129
12	* 1.2187	* 1.2574	* 1.2345	* 1.2140	* 1.1853	* 1.1957	* .6123	*
	* 1.6042	* 1.5668	* 1.6214	* 1.7117	* 1.7708	* 1.7539	* 3.1272	*
13	* 1.1474	* 1.3270	* 1.2545	* 1.1730	* 1.1962	* 1.2704	* .5254	*
	* 1.7023	* 1.4827	* 1.5988	* 1.7531	* 1.7531	* 1.6692	* 3.7037	*
14	* 1.3144	* 1.2978	* 1.3045	* .7998	* .6127	* .5351	*	*
	* 1.4884	* 1.5176	* 1.5267	* 2.3500	* 3.1254	* 3.6393	*	*
15	* .5467	* .5679	* .5597	* .3601	* F-SUB-Q			
	* 3.2797	* 3.1272	* 3.2115	* 5.1073	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 286 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 50% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1786 *	* .9537 *	* 1.0611 *	* .9569 *	* 1.2041 *	* .9708 *	* 1.2039 *	* .4881 *
	* 1.6105 *	* 1.9942 *	* 1.7978 *	* 1.9585 *	* 1.5488 *	* 1.9244 *	* 1.5541 *	* 3.5315 *
9	* .9537 *	* 1.1683 *	* 1.1193 *	* 1.1956 *	* 1.0395 *	* 1.1084 *	* 1.2126 *	* .5093 *
	* 1.9942 *	* 1.6378 *	* 1.7008 *	* 1.5893 *	* 1.8123 *	* 1.6976 *	* 1.5491 *	* 3.3541 *
10	* 1.0611 *	* 1.1188 *	* 1.0823 *	* 1.0957 *	* 1.1077 *	* 1.0440 *	* 1.1305 *	* .4864 *
	* 1.7978 *	* 1.7016 *	* 1.7722 *	* 1.7477 *	* 1.7357 *	* 1.8321 *	* 1.6830 *	* 3.5461 *
11	* .9569 *	* 1.1958 *	* 1.0958 *	* 1.1030 *	* 1.0113 *	* 1.1511 *	* .6964 *	* .3087 *
	* 1.9585 *	* 1.5891 *	* 1.7475 *	* 1.7672 *	* 1.9353 *	* 1.6984 *	* 2.5732 *	* 5.7137 *
12	* 1.2041 *	* 1.0405 *	* 1.1086 *	* 1.0118 *	* .9491 *	* 1.1349 *	* .5545 *	
	* 1.5488 *	* 1.8107 *	* 1.7343 *	* 1.9344 *	* 2.1008 *	* 1.7592 *	* 3.2951 *	
13	* .9708 *	* 1.1109 *	* 1.0454 *	* 1.1520 *	* 1.1355 *	* 1.0254 *	* .4409 *	
	* 1.9244 *	* 1.6939 *	* 1.8297 *	* 1.6972 *	* 1.7583 *	* 1.9629 *	* 4.2004 *	
14	* 1.2039 *	* 1.2145 *	* 1.1320 *	* .6971 *	* .5549 *	* .4491 *		
	* 1.5541 *	* 1.5467 *	* 1.6808 *	* 2.5705 *	* 3.2932 *	* 4.1273 *		
15	* .4881 *	* .5099 *	* .4869 *	* .3091 *	F-SUB-Q			
	* 3.5315 *	* 3.3511 *	* 3.5428 *	* 5.7076 *	M-SUB-Q			

AT 50% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4930 *	* .4225 *	* .4240 *	* .4233 *	* .4990 *	* .4171 *	* .4391 *	* .2146 *
	* 3.6748 *	* 4.3012 *	* 4.2924 *	* 4.2508 *	* 3.5879 *	* 4.3013 *	* 4.0816 *	* 7.7330 *
9	* .4225 *	* .4850 *	* .4456 *	* .4981 *	* .4219 *	* .4283 *	* .4403 *	* .2185 *
	* 4.3012 *	* 3.7531 *	* 4.0815 *	* 3.6370 *	* 4.2724 *	* 4.2091 *	* 4.0838 *	* 7.5253 *
10	* .4240 *	* .4454 *	* .4182 *	* .4423 *	* .4798 *	* .4160 *	* .4044 *	* .2043 *
	* 4.2924 *	* 4.0830 *	* 4.3741 *	* 4.1325 *	* 3.8105 *	* 4.4013 *	* 4.5036 *	* 8.1196 *
11	* .4233 *	* .4982 *	* .4425 *	* .4746 *	* .4058 *	* .4416 *	* .2977 *	* .1358 *
	* 4.2508 *	* 3.6361 *	* 4.1307 *	* 3.8948 *	* 4.5739 *	* 4.2223 *	* 5.7669 *	* 12.5095 *
12	* .4990 *	* .4222 *	* .4801 *	* .4059 *	* .3737 *	* .4140 *	* .2367 *	
	* 3.5879 *	* 4.2692 *	* 3.8079 *	* 4.5720 *	* 5.0762 *	* 4.6093 *	* 7.3924 *	
13	* .4171 *	* .4292 *	* .4164 *	* .4419 *	* .4142 *	* .3598 *	* .1819 *	
	* 4.3013 *	* 4.2008 *	* 4.3962 *	* 4.2192 *	* 4.6066 *	* 5.3440 *	* 9.7674 *	
14	* .4391 *	* .4409 *	* .4049 *	* .2980 *	* .2369 *	* .1848 *		
	* 4.0816 *	* 4.0778 *	* 4.4979 *	* 5.7617 *	* 7.3867 *	* 9.6222 *		
15	* .2146 *	* .2188 *	* .2046 *	* .1359 *	F-SUB-Q			
	* 7.7330 *	* 7.5185 *	* 8.1113 *	* 12.4956 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 287 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .6998 *	* .7142 *	* .7282 *	* .7152 *	* .8277 *	* .7008 *	* .7048 *	* .3572 *
	* 3.6982 *	* 4.2722 *	* 4.1772 *	* 4.0228 *	* 3.4464 *	* 4.0501 *	* 4.0565 *	* 7.1772 *
9	* .7142 *	* .8287 *	* .7577 *	* .8356 *	* .7096 *	* .6948 *	* .7046 *	* .3598 *
	* 4.2722 *	* 3.8192 *	* 3.9870 *	* 3.5368 *	* 4.0544 *	* 4.1331 *	* 4.0890 *	* 7.0856 *
10	* .7282 *	* .7575 *	* .7165 *	* .7380 *	* .7888 *	* .6759 *	* .6453 *	* .3321 *
	* 4.1771 *	* 3.9878 *	* 4.2934 *	* 4.0765 *	* 3.7849 *	* 4.3936 *	* 4.5266 *	* 7.7226 *
11	* .7152 *	* .8356 *	* .7381 *	* .7789 *	* .6577 *	* .6931 *	* .4744 *	* .2333 *
	* 4.0228 *	* 3.5359 *	* 4.0755 *	* 4.0420 *	* 4.7707 *	* 4.4342 *	* 5.9365 *	* 11.3482 *
12	* .8277 *	* .7100 *	* .7893 *	* .6579 *	* .5590 *	* .6088 *	* .3703 *	
	* 3.4464 *	* 4.0520 *	* 3.7826 *	* 4.7695 *	* 5.0525 *	* 4.6716 *	* 7.3001 *	
13	* .7008 *	* .6966 *	* .6766 *	* .6935 *	* .6090 *	* .5293 *	* .2749 *	
	* 4.0501 *	* 4.1231 *	* 4.3891 *	* 4.4325 *	* 4.6712 *	* 5.2738 *	* 9.5110 *	
14	* .7048 *	* .7058 *	* .6461 *	* .4747 *	* .3703 *	* .2812 *		
	* 4.0565 *	* 4.0823 *	* 4.5216 *	* 5.9331 *	* 7.3015 *	* 9.3070 *		
15	* .3572 *	* .3601 *	* .3324 *	* .2334 *	F-SUB-Q			
	* 7.1772 *	* 7.0823 *	* 7.7176 *	* 11.3408 *	M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8232 *	* 1.5975 *	* 1.7722 *	* 1.5834 *	* 1.8993 *	* 1.5862 *	* 1.8379 *	* .8136 *
	* 1.7201 *	* 2.0496 *	* 1.8458 *	* 1.9386 *	* 1.6021 *	* 1.9073 *	* 1.6652 *	* 3.3570 *
9	* 1.5975 *	* 1.8970 *	* 1.8369 *	* 1.9037 *	* 1.7016 *	* 1.7218 *	* 1.8422 *	* .8454 *
	* 2.0496 *	* 1.7923 *	* 1.7596 *	* 1.6680 *	* 1.8131 *	* 1.7851 *	* 1.6636 *	* 3.1991 *
10	* 1.7722 *	* 1.8364 *	* 1.7897 *	* 1.7799 *	* 1.7203 *	* 1.6482 *	* 1.7119 *	* .7983 *
	* 1.8458 *	* 1.7601 *	* 1.8461 *	* 1.8212 *	* 1.8496 *	* 1.9231 *	* 1.8224 *	* 3.4095 *
11	* 1.5834 *	* 1.9038 *	* 1.7802 *	* 1.7084 *	* 1.5922 *	* 1.7333 *	* 1.1112 *	* .5266 *
	* 1.9386 *	* 1.6677 *	* 1.8209 *	* 1.9564 *	* 2.0833 *	* 1.8898 *	* 2.7045 *	* 5.3314 *
12	* 1.8993 *	* 1.7027 *	* 1.7214 *	* 1.5927 *	* 1.4250 *	* 1.6415 *	* .8790 *	
	* 1.6021 *	* 1.8119 *	* 1.8486 *	* 2.0828 *	* 2.1686 *	* 1.8928 *	* 3.2678 *	
13	* 1.5862 *	* 1.7258 *	* 1.6501 *	* 1.7342 *	* 1.6419 *	* 1.4554 *	* .6927 *	
	* 1.9073 *	* 1.7811 *	* 1.9210 *	* 1.8891 *	* 1.8925 *	* 2.1100 *	* 4.0190 *	
14	* 1.8379 *	* 1.8452 *	* 1.7138 *	* 1.1117 *	* .8790 *	* .6967 *		
	* 1.6652 *	* 1.6612 *	* 1.8205 *	* 2.7032 *	* 3.2683 *	* 4.0000 *		
15	* .8136 *	* .8462 *	* .7988 *	* .5269 *	F-SUB-Q			
	* 3.3570 *	* 3.1965 *	* 3.4077 *	* 5.3281 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 288 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8932	* 1.8664	* 2.1041	* 1.8425	* 1.8831	* 1.8519	* 1.9684	* .9081 *
	* 1.8008	* 1.8662	* 1.6046	* 1.7571	* 1.6578	* 1.6828	* 1.5793	* 3.0606 *
9	* 1.8664	* 2.0841	* 2.1404	* 2.0027	* 2.0030	* 2.0386	* 1.9340	* .9515 *
	* 1.8662	* 1.6284	* 1.5587	* 1.6548	* 1.5806	* 1.5492	* 1.6186	* 2.8919 *
10	* 2.1041	* 2.1398	* 2.1836	* 2.0736	* 1.8862	* 1.9440	* 1.9341	* .9269 *
	* 1.6046	* 1.5590	* 1.5432	* 1.6090	* 1.7230	* 1.6811	* 1.6576	* 3.0170 *
11	* 1.8425	* 2.0028	* 2.0739	* 1.9276	* 1.8769	* 1.7467	* 1.2882	* .6140 *
	* 1.7571	* 1.6547	* 1.6088	* 1.7608	* 1.8088	* 1.9472	* 2.4069	* 4.7146 *
12	* 1.8831	* 2.0061	* 1.8872	* 1.8776	* 1.8101	* 1.7457	* .9909 *	
	* 1.6578	* 1.5784	* 1.7211	* 1.8086	* 1.8285	* 1.8785	* 2.9975 *	
13	* 1.8519	* 2.0440	* 1.9463	* 1.7478	* 1.7462	* 1.7903	* .8288 *	
	* 1.6828	* 1.5455	* 1.6791	* 1.9465	* 1.8781	* 1.7871	* 3.4825 *	
14	* 1.9684	* 1.9375	* 1.9364	* 1.2887	* .9910	* .8431	*	
	* 1.5793	* 1.6161	* 1.6558	* 2.4058	* 2.9976	* 3.4252	*	
15	* .9081	* .9523	* .9276	* .6143	* F-SUB-Q			
	* 3.0606	* 2.8898	* 3.0153	* 4.7116	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.0172	* 1.9667	* 2.2440	* 1.9393	* 2.0010	* 1.9587	* 2.1148	* .9137 *
	* 1.7523	* 1.8357	* 1.5438	* 1.7102	* 1.5976	* 1.6273	* 1.4999	* 3.1025 *
9	* 1.9667	* 2.2368	* 2.2797	* 2.1502	* 2.1277	* 2.1811	* 2.0812	* .9583 *
	* 1.8357	* 1.5511	* 1.4982	* 1.5777	* 1.5256	* 1.4800	* 1.5380	* 2.9320 *
10	* 2.2440	* 2.2791	* 2.3419	* 2.2052	* 2.0192	* 2.0777	* 2.0951	* .9493 *
	* 1.5438	* 1.4986	* 1.4695	* 1.5489	* 1.6457	* 1.6106	* 1.5663	* 3.0181 *
11	* 1.9393	* 2.1503	* 2.2055	* 2.0720	* 1.9958	* 1.8707	* 1.3335	* .6299 *
	* 1.7102	* 1.5776	* 1.5486	* 1.6796	* 1.7386	* 1.8730	* 2.3885	* 4.7180 *
12	* 2.0010	* 2.1315	* 2.0217	* 1.9962	* 1.9521	* 1.8791	* 1.0065	*
	* 1.5976	* 1.5231	* 1.6438	* 1.7384	* 1.7503	* 1.8025	* 3.0436	*
13	* 1.9587	* 2.1871	* 2.0803	* 1.8720	* 1.8798	* 1.9818	* .8679 *	
	* 1.6273	* 1.4768	* 1.6086	* 1.8723	* 1.8020	* 1.6661	* 3.4323 *	
14	* 2.1148	* 2.0850	* 2.0976	* 1.3341	* 1.0067	* .8854 *		
	* 1.4999	* 1.5357	* 1.5645	* 2.3873	* 3.0433	* 3.3672 *		
15	* .9137	* .9592	* .9499	* .6303	* F-SUB-Q			
	* 3.1025	* 2.9298	* 3.0165	* 4.7148	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 289 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 2.0320	* 1.9589	* 2.2432	* 1.9341	* 2.0240	* 1.9585	* 2.1433	* .9092
	* 1.7990	* 1.9015	* 1.5881	* 1.7612	* 1.6215	* 1.6709	* 1.5200	* 3.2082
9	* 1.9589	* 2.2568	* 2.2842	* 2.1718	* 2.1298	* 2.1885	* 2.1127	* .9568
	* 1.9015	* 1.5792	* 1.5358	* 1.6061	* 1.5632	* 1.5085	* 1.5574	* 3.0215
10	* 2.2432	* 2.2835	* 2.3478	* 2.2096	* 2.0421	* 2.0890	* 2.1315	* .9508
	* 1.5881	* 1.5362	* 1.5052	* 1.5893	* 1.6696	* 1.6419	* 1.5793	* 3.1025
11	* 1.9341	* 2.1718	* 2.2099	* 2.0941	* 2.0105	* 1.8967	* 1.3411	* .6261
	* 1.7612	* 1.6061	* 1.5891	* 1.7113	* 1.7804	* 1.9023	* 2.4339	* 4.8673
12	* 2.0240	* 2.1338	* 2.0448	* 2.0109	* 1.9676	* 1.9148	* 1.0103	*
	* 1.6215	* 1.5605	* 1.6675	* 1.7801	* 1.7928	* 1.8267	* 3.1364	*
13	* 1.9585	* 2.1938	* 2.0917	* 1.8980	* 1.9155	* 2.0408	* .8782	*
	* 1.6709	* 1.5052	* 1.6397	* 1.9016	* 1.8264	* 1.6721	* 3.5116	*
14	* 2.1433	* 2.1168	* 2.1342	* 1.3418	* 1.0105	* .8972	*	*
	* 1.5200	* 1.5550	* 1.5774	* 2.4324	* 3.1358	* 3.4408	*	*
15	* .9092	* .9576	* .9515	* .6266	* F-SUB-Q			
	* 3.2082	* 3.0193	* 3.1006	* 4.8636	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.9956	* 1.9117	* 2.1942	* 1.8926	* 1.9955	* 1.9199	* 2.1172	* .8964
	* 1.8895	* 1.9950	* 1.6629	* 1.8442	* 1.6846	* 1.7437	* 1.5739	* 3.3363
9	* 1.9117	* 2.2178	* 2.2394	* 2.1371	* 2.0893	* 2.1560	* 2.0894	* .9452
	* 1.9950	* 1.6463	* 1.6029	* 1.6711	* 1.6320	* 1.5646	* 1.6113	* 3.1354
10	* 2.1942	* 2.2387	* 2.3012	* 2.1677	* 2.0137	* 2.0547	* 2.1103	* .9396
	* 1.6629	* 1.6034	* 1.5720	* 1.6582	* 1.7367	* 1.7104	* 1.6330	* 3.2144
11	* 1.8926	* 2.1372	* 2.1680	* 2.0631	* 1.9822	* 1.8757	* 1.3284	* .6153
	* 1.8442	* 1.6710	* 1.6580	* 1.7801	* 1.8674	* 1.9849	* 2.5286	* 5.0938
12	* 1.9955	* 2.0933	* 2.0163	* 1.9826	* 1.9399	* 1.9006	* 1.0042	*
	* 1.6846	* 1.6290	* 1.7345	* 1.8670	* 1.8840	* 1.9058	* 3.2773	*
13	* 1.9199	* 2.1613	* 2.0574	* 1.8771	* 1.9014	* 2.0380	* .8746	*
	* 1.7437	* 1.5611	* 1.7082	* 1.9839	* 1.9056	* 1.7410	* 3.6753	*
14	* 2.1172	* 2.0935	* 2.1130	* 1.3293	* 1.0046	* .8938	*	*
	* 1.5739	* 1.6087	* 1.6310	* 2.5268	* 3.2763	* 3.6001	*	*
15	* .8964	* .9461	* .9404	* .6158	* F-SUB-Q			
	* 3.3363	* 3.1330	* 3.2122	* 5.0896	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 290 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.9612	* 1.8655	* 2.1473	* 1.8512	* 1.9670	* 1.8816	* 2.0953	* .8720 *
	* 1.9662	* 2.0867	* 1.7594	* 1.9536	* 1.7708	* 1.8415	* 1.6435	* 3.5445 *
9	* 1.8655	* 2.1820	* 2.1957	* 2.1061	* 2.0509	* 2.1244	* 2.0680	* .9178 *
	* 2.0867	* 1.7312	* 1.6917	* 1.7555	* 1.7214	* 1.6415	* 1.6832	* 3.3378 *
10	* 2.1473	* 2.1950	* 2.2576	* 2.1279	* 1.9887	* 2.0223	* 2.0903	* .9139 *
	* 1.7594	* 1.6922	* 1.6573	* 1.7489	* 1.8227	* 1.8004	* 1.7068	* 3.4226 *
11	* 1.8512	* 2.1062	* 2.1282	* 2.0355	* 1.9539	* 1.8576	* 1.2968	* .5963 *
	* 1.9536	* 1.7555	* 1.7486	* 1.8696	* 1.9616	* 2.0612	* 2.6901	* 5.4558 *
12	* 1.9670	* 2.0550	* 1.9915	* 1.9544	* 1.9131	* 1.8860	* .9774	* .9774 *
	* 1.7708	* 1.7181	* 1.8202	* 1.9612	* 1.9778	* 1.9886	* 3.4926	* 3.4926 *
13	* 1.8816	* 2.1297	* 2.0250	* 1.8590	* 1.8868	* 2.0322	* .8563	* .8563 *
	* 1.8415	* 1.6377	* 1.7979	* 2.0598	* 1.9884	* 1.8154	* 3.9072	* 3.9072 *
14	* 2.0953	* 2.0721	* 2.0931	* 1.2977	* .9779	* .8753		
	* 1.6435	* 1.6803	* 1.7046	* 2.6879	* 3.4914	* 3.8263		
15	* .8720	* .9187	* .9147	* .5968	* F-SUB-Q			
	* 3.5445	* 3.3353	* 3.4201	* 5.4510	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.9039	* 1.8036	* 2.0807	* 1.7942	* 1.9162	* 1.8272	* 2.0469	* .8469 *
	* 2.1010	* 2.2413	* 1.9030	* 2.1138	* 1.9060	* 1.9870	* 1.7605	* 3.8197 *
9	* 1.8036	* 2.1208	* 2.1315	* 2.0500	* 1.9933	* 2.0713	* 2.0210	* .8899 *
	* 2.2413	* 1.8660	* 1.8260	* 1.8902	* 1.8561	* 1.7619	* 1.8031	* 3.6034 *
10	* 2.0807	* 2.1307	* 2.1920	* 2.0675	* 1.9396	* 1.9695	* 2.0438	* .8868 *
	* 1.9030	* 1.8266	* 1.7878	* 1.8864	* 1.9590	* 1.9352	* 1.8279	* 3.6955 *
11	* 1.7942	* 2.0500	* 2.0678	* 1.9833	* 1.9055	* 1.8157	* 1.2610	* .5777 *
	* 2.1138	* 1.8901	* 1.8861	* 2.0121	* 2.0784	* 2.1829	* 2.8805	* 5.9069 *
12	* 1.9162	* 1.9974	* 1.9423	* 1.9060	* 1.8660	* 1.8468	* .9502	* .9502 *
	* 1.9060	* 1.8525	* 1.9563	* 2.0779	* 2.1032	* 2.1160	* 3.7259	* 3.7259 *
13	* 1.8272	* 2.0766	* 1.9723	* 1.8171	* 1.8476	* 1.9972	* .8352	* .8352 *
	* 1.9870	* 1.7577	* 1.9324	* 2.1813	* 2.1151	* 1.9330	* 4.1934	* 4.1934 *
14	* 2.0469	* 2.0251	* 2.0467	* 1.2620	* .9506	* .8535		
	* 1.7605	* 1.7998	* 1.8255	* 2.8783	* 3.7244	* 4.1074		
15	* .8469	* .8908	* .8876	* .5782	* F-SUB-Q			
	* 3.8197	* 3.6006	* 3.6926	* 5.9013	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 291 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.8491	* 1.7437	* 2.0163	* 1.7384	* 1.8671	* 1.7737	* 1.9995	* .8182 *
	* 2.2899	* 2.4255	* 2.0678	* 2.2904	* 2.0415	* 2.1329	* 1.8761	* 4.0996 *
9	* 1.7437	* 2.0623	* 2.0688	* 1.9964	* 1.9368	* 2.0181	* 1.9740	* .8574 *
	* 2.4255	* 2.0237	* 1.9810	* 2.0412	* 1.9939	* 1.8841	* 1.9224	* 3.8781 *
10	* 2.0163	* 2.0680	* 2.1284	* 2.0086	* 1.8921	* 1.9173	* 1.9972	* .8560 *
	* 2.0678	* 1.9816	* 1.9394	* 2.0417	* 2.0978	* 2.0716	* 1.9489	* 3.9695 *
11	* 1.7384	* 1.9964	* 2.0088	* 1.9330	* 1.8565	* 1.7743	* 1.2205	* .5565 *
	* 2.2904	* 2.0412	* 2.0414	* 2.1716	* 2.2417	* 2.3469	* 3.1152	* 6.3548 *
12	* 1.8671	* 1.9408	* 1.8948	* 1.8570	* 1.8186	* 1.8067	* .9182 *	
	* 2.0415	* 1.9900	* 2.0949	* 2.2413	* 2.2725	* 2.2670	* 4.0449 *	
13	* 1.7737	* 2.0233	* 1.9200	* 1.7758	* 1.8075	* 1.9591	* .8097 *	
	* 2.1329	* 1.8796	* 2.0686	* 2.3453	* 2.2668	* 2.0656	* 4.5311 *	
14	* 1.9995	* 1.9780	* 2.0000	* 1.2216	* .9187	* .8275	*	
	* 1.8761	* 1.9189	* 1.9463	* 3.1125	* 4.0431	* 4.4377	*	
15	* .8182	* .8582	* .8568	* .5571	* F-SUB-Q			
	* 4.0996	* 3.8751	* 3.9663	* 6.3485	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7537	* 1.6593	* 1.9195	* 1.6575	* 1.7798	* 1.6937	* 1.9056	* .7941 *
	* 2.5508	* 2.6952	* 2.2797	* 2.5232	* 2.2380	* 2.3328	* 2.0562	* 4.4046 *
9	* 1.6593	* 1.9607	* 1.9723	* 1.8998	* 1.8482	* 1.9295	* 1.8837	* .8364 *
	* 2.6952	* 2.2319	* 2.1800	* 2.2501	* 2.1833	* 2.0575	* 2.1027	* 4.1431 *
10	* 1.9195	* 1.9715	* 2.0285	* 1.9162	* 1.8034	* 1.8321	* 1.9066	* .8340 *
	* 2.2797	* 2.1807	* 2.1333	* 2.2458	* 2.2979	* 2.2571	* 2.1246	* 4.2281 *
11	* 1.6575	* 1.8998	* 1.9165	* 1.8409	* 1.7759	* 1.6922	* 1.1858	* .5400 *
	* 2.5232	* 2.2501	* 2.2455	* 2.3935	* 2.4971	* 2.5945	* 3.3467	* 6.7673 *
12	* 1.7798	* 1.8521	* 1.8060	* 1.7763	* 1.7401	* 1.7270	* .8979 *	
	* 2.2380	* 2.1790	* 2.2947	* 2.4966	* 2.5326	* 2.5231	* 4.4021 *	
13	* 1.6937	* 1.9345	* 1.8348	* 1.6936	* 1.7278	* 1.8746	* .7893 *	
	* 2.3328	* 2.0527	* 2.2538	* 2.5925	* 2.5229	* 2.2979	* 4.9456 *	
14	* 1.9056	* 1.8876	* 1.9093	* 1.1869	* .8984	* .8073 *		
	* 2.0562	* 2.0987	* 2.1218	* 3.3434	* 4.4001	* 4.8404 *		
15	* .7941	* .8372	* .8349	* .5406	* F-SUB-Q			
	* 4.4046	* 4.1398	* 4.2244	* 6.7604	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 292 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.7109	* 1.6061	* 1.8643	* 1.6080	* 1.7394	* 1.6459	* 1.8700	* .7599 *
	* 2.8026	* 2.9877	* 2.4399	* 2.6947	* 2.3683	* 2.4800	* 2.1577	* 4.7224 *
9	* 1.6061	* 1.9148	* 1.9186	* 1.8579	* 1.7995	* 1.8842	* 1.8471	* .7965 *
	* 2.9877	* 2.3801	* 2.3290	* 2.3889	* 2.3186	* 2.1735	* 2.2109	* 4.4659 *
10	* 1.8643	* 1.9178	* 1.9746	* 1.8653	* 1.7663	* 1.7870	* 1.8701	* .7950 *
	* 2.4399	* 2.3298	* 2.2776	* 2.3941	* 2.4282	* 2.3929	* 2.2394	* 4.5718 *
11	* 1.6080	* 1.8579	* 1.8656	* 1.8015	* 1.7331	* 1.6605	* 1.1365	* .5153 *
	* 2.6947	* 2.3888	* 2.3937	* 2.5381	* 2.7222	* 2.8214	* 3.6237	* 7.3379 *
12	* 1.7394	* 1.8033	* 1.7689	* 1.7335	* 1.6985	* 1.6947	* .8552 *	
	* 2.3683	* 2.3139	* 2.4248	* 2.7216	* 2.7691	* 2.7547	* 4.9221 *	
13	* 1.6459	* 1.8892	* 1.7896	* 1.6619	* 1.6955	* 1.8450	* .7565 *	
	* 2.4800	* 2.1684	* 2.3894	* 2.8194	* 2.7535	* 2.5109	* 5.5417 *	
14	* 1.8700	* 1.8510	* 1.8728	* 1.1376	* .8556	* .7728	*	
	* 2.1577	* 2.2066	* 2.2363	* 3.6200	* 4.9198	* 5.4293	*	
15	* .7599	* .7973	* .7959	* .5158	* F-SUB-Q			
	* 4.7224	* 4.4623	* 4.5679	* 7.3303	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.6422	* 1.5377	* 1.7880	* 1.5428	* 1.6750	* 1.5816	* 1.8035	* .7308 *
	* 2.8716	* 3.0642	* 2.6523	* 2.9330	* 2.5598	* 2.6841	* 2.3228	* 5.0838 *
9	* 1.5377	* 1.8401	* 1.8431	* 1.7874	* 1.7301	* 1.8158	* 1.7819	* .7659 *
	* 3.0642	* 2.5815	* 2.5339	* 2.5939	* 2.5095	* 2.3433	* 2.3798	* 4.8089 *
10	* 1.7880	* 1.8422	* 1.8967	* 1.7926	* 1.7018	* 1.7203	* 1.8045	* .7645 *
	* 2.6523	* 2.5349	* 2.4765	* 2.6014	* 2.6214	* 2.5803	* 2.4081	* 4.9208 *
11	* 1.5428	* 1.7874	* 1.7928	* 1.7343	* 1.6698	* 1.6019	* 1.0940	* .4952 *
	* 2.9330	* 2.5938	* 2.6010	* 2.7472	* 2.8863	* 2.9763	* 3.9083	* 7.8952 *
12	* 1.6750	* 1.7339	* 1.7043	* 1.6702	* 1.6366	* 1.6365	* .8237 *	
	* 2.5598	* 2.5044	* 2.6177	* 2.8856	* 2.9579	* 2.9458	* 5.2914 *	
13	* 1.5816	* 1.8206	* 1.7229	* 1.6033	* 1.6374	* 1.7850	* .7293 *	
	* 2.6841	* 2.3378	* 2.5765	* 2.9739	* 2.9444	* 2.7261	* 6.0288 *	
14	* 1.8035	* 1.7857	* 1.8072	* 1.0951	* .8242	* .7449 *		
	* 2.3228	* 2.3751	* 2.4048	* 3.9042	* 5.2886	* 5.9085 *		
15	* .7308	* .7667	* .7653	* .4957	* F-SUB-Q			
	* 5.0838	* 4.8050	* 4.9164	* 7.8869	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 293 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5531	* 1.4588	* 1.6965	* 1.4657	* 1.5916	* 1.5046	* 1.7140	* .7044 *
	* 2.9149	* 3.1020	* 2.6143	* 2.8806	* 2.5569	* 2.6915	* 2.3627	* 5.1504 *
9	* 1.4588	* 1.7444	* 1.7512	* 1.6962	* 1.6453	* 1.7298	* 1.6950	* .7404 *
	* 3.1020	* 2.5495	* 2.4941	* 2.5688	* 2.5162	* 2.3773	* 2.4233	* 4.8628 *
10	* 1.6965	* 1.7504	* 1.8021	* 1.7046	* 1.6171	* 1.6383	* 1.7172	* .7390 *
	* 2.6143	* 2.4951	* 2.4500	* 2.5832	* 2.6562	* 2.6397	* 2.4857	* 5.0227 *
11	* 1.4657	* 1.6961	* 1.7049	* 1.6467	* 1.5911	* 1.5229	* 1.0554	* .4766 *
	* 2.8806	* 2.5688	* 2.5828	* 2.7501	* 2.9160	* 3.0121	* 3.9840	* 8.2008 *
12	* 1.5916	* 1.6489	* 1.6195	* 1.5915	* 1.5602	* 1.5587	* .7987 *	
	* 2.5569	* 2.5114	* 2.6522	* 2.9152	* 2.9890	* 2.9807	* 5.2599 *	
13	* 1.5046	* 1.7343	* 1.6407	* 1.5242	* 1.5595	* 1.7021	* .7056 *	
	* 2.6915	* 2.3718	* 2.6356	* 3.0096	* 2.9792	* 2.7561	* 6.0130 *	
14	* 1.7140	* 1.6986	* 1.7198	* 1.0565	* .7992	* .7212	*	
	* 2.3627	* 2.4193	* 2.4820	* 3.9797	* 5.2568	* 5.8885	*	
15	* .7044	* .7411	* .7398	* .4771	* F-SUB-Q			
	* 5.1504	* 4.8586	* 5.0176	* 8.1909	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.5056	* 1.4032	* 1.6381	* 1.4136	* 1.5453	* 1.4531	* 1.6714	* .6703 *
	* 2.8338	* 3.0279	* 2.4883	* 2.7476	* 2.4283	* 2.5693	* 2.2341	* 4.9959 *
9	* 1.4032	* 1.6935	* 1.6937	* 1.6485	* 1.5923	* 1.6792	* 1.6522	* .7014 *
	* 3.0279	* 2.4128	* 2.3702	* 2.4314	* 2.3964	* 2.2573	* 2.2934	* 4.7395 *
10	* 1.6381	* 1.6929	* 1.7439	* 1.6492	* 1.5739	* 1.5881	* 1.6739	* .7008 *
	* 2.4883	* 2.3711	* 2.3260	* 2.4556	* 2.5154	* 2.5074	* 2.3506	* 4.8884 *
11	* 1.4136	* 1.6485	* 1.6494	* 1.6014	* 1.5435	* 1.4848	* 1.0061	* .4520 *
	* 2.7476	* 2.4314	* 2.4552	* 2.6014	* 2.8090	* 2.8843	* 3.8568	* 7.9748 *
12	* 1.5453	* 1.5959	* 1.5763	* 1.5439	* 1.5135	* 1.5199	* .7563 *	
	* 2.4283	* 2.3915	* 2.5116	* 2.8084	* 2.8808	* 2.8423	* 5.1068 *	
13	* 1.4531	* 1.6837	* 1.5905	* 1.4861	* 1.5207	* 1.6646	* .6727 *	
	* 2.5693	* 2.2520	* 2.5035	* 2.8821	* 2.8410	* 2.6160	* 5.7759 *	
14	* 1.6714	* 1.6557	* 1.6765	* 1.0073	* .7567	* .6867 *		
	* 2.2341	* 2.2896	* 2.3470	* 3.8520	* 5.1041	* 5.6639 *		
15	* .6703	* .7021	* .7017	* .4526	* F-SUB-Q			
	* 4.9959	* 4.7353	* 4.8832	* 7.9648	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 294 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.4435	* 1.3411	* 1.5684	* 1.3535	* 1.4854	* 1.3930	* 1.6108	* .6412 *
	* 2.5831	* 2.7734	* 2.3721	* 2.6188	* 2.3115	* 2.4536	* 2.1234	* 4.7486 *
9	* 1.3411	* 1.6258	* 1.6241	* 1.5844	* 1.5280	* 1.6152	* 1.5922	* .6687 *
	* 2.7734	* 2.2916	* 2.2570	* 2.3099	* 2.2848	* 2.1506	* 2.1801	* 4.5187 *
10	* 1.5684	* 1.6233	* 1.6731	* 1.5823	* 1.5145	* 1.5261	* 1.6136	* .6692 *
	* 2.3721	* 2.2579	* 2.2146	* 2.3378	* 2.3863	* 2.3854	* 2.2288	* 4.6407 *
11	* 1.3535	* 1.5844	* 1.5825	* 1.5398	* 1.4842	* 1.4306	* .9628	* .4312 *
	* 2.6188	* 2.3099	* 2.3374	* 2.4428	* 2.5598	* 2.6222	* 3.5516	* 7.5164 *
12	* 1.4854	* 1.5315	* 1.5169	* 1.4845	* 1.4558	* 1.4669	* .7227	* .7227 *
	* 2.3115	* 2.2802	* 2.3828	* 2.5592	* 2.6267	* 2.5871	* 4.6923	* 4.6923 *
13	* 1.3930	* 1.6196	* 1.5284	* 1.4319	* 1.4671	* 1.6093	* .6445	* .6445 *
	* 2.4536	* 2.1456	* 2.3819	* 2.6202	* 2.5859	* 2.3777	* 5.3027	* 5.3027 *
14	* 1.6108	* 1.5956	* 1.6162	* .9640	* .7231	* .6577		
	* 2.1234	* 2.1765	* 2.2257	* 3.5477	* 4.6896	* 5.2010		
15	* .6412	* .6693	* .6700	* .4318	* F-SUB-Q			
	* 4.7486	* 4.5150	* 4.6361	* 7.5074	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3783	* 1.2793	* 1.4980	* 1.2932	* 1.4224	* 1.3322	* 1.5435	* .6146 *
	* 2.3768	* 2.5487	* 2.1442	* 2.3679	* 2.0900	* 2.2243	* 1.9200	* 4.2949 *
9	* 1.2793	* 1.5548	* 1.5532	* 1.5162	* 1.4619	* 1.5480	* 1.5264	* .6431 *
	* 2.5487	* 2.0648	* 2.0373	* 2.0815	* 2.0671	* 1.9449	* 1.9694	* 4.0735 *
10	* 1.4980	* 1.5524	* 1.5997	* 1.5134	* 1.4507	* 1.4613	* 1.5471	* .6427 *
	* 2.1442	* 2.0381	* 1.9981	* 2.1063	* 2.1496	* 2.1472	* 2.0049	* 4.1833 *
11	* 1.2932	* 1.5162	* 1.5136	* 1.4743	* 1.4221	* 1.3712	* .9246	* .4132 *
	* 2.3679	* 2.0815	* 2.1059	* 2.2141	* 2.3615	* 2.4115	* 3.2497	* 6.7797 *
12	* 1.4224	* 1.4653	* 1.4530	* 1.4225	* 1.3950	* 1.4082	* .6950	* .6950 *
	* 2.0900	* 2.0629	* 2.1465	* 2.3609	* 2.4254	* 2.3865	* 4.3254	* 4.3254 *
13	* 1.3322	* 1.5521	* 1.4636	* 1.3724	* 1.4083	* 1.5450	* .6195	* .6195 *
	* 2.2243	* 1.9405	* 2.1440	* 2.4096	* 2.3854	* 2.1861	* 4.8827	* 4.8827 *
14	* 1.5435	* 1.5297	* 1.5495	* .9258	* .6954	* .6322		
	* 1.9200	* 1.9664	* 2.0020	* 3.2460	* 4.3230	* 4.7900		
15	* .6146	* .6438	* .6435	* .4137	* F-SUB-Q			
	* 4.2949	* 4.0699	* 4.1789	* 6.7716	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 295 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.3070	* 1.2166	* 1.4237	* 1.2305	* 1.3532	* 1.2684	* 1.4671	* .5928 *
	* 2.3690	* 2.5379	* 2.1216	* 2.3431	* 2.0734	* 2.2043	* 1.9070	* 4.2186 *
9	* 1.2166	* 1.4758	* 1.4776	* 1.4402	* 1.3912	* 1.4746	* 1.4518	* .6219 *
	* 2.5379	* 2.0448	* 2.0127	* 2.0619	* 2.0480	* 1.9247	* 1.9543	* 3.9891 *
10	* 1.4237	* 1.4768	* 1.5214	* 1.4402	* 1.3789	* 1.3916	* 1.4718	* .6214 *
	* 2.1216	* 2.0135	* 1.9743	* 2.0810	* 2.1302	* 2.1209	* 1.9834	* 4.0895 *
11	* 1.2305	* 1.4402	* 1.4404	* 1.4005	* 1.3546	* 1.3034	* .8916	* .3984 *
	* 2.3431	* 2.0619	* 2.0807	* 2.1903	* 2.3489	* 2.4035	* 3.1775	* 6.6305 *
12	* 1.3532	* 1.3944	* 1.3810	* 1.3549	* 1.3291	* 1.3407	* .6736	* .6736 *
	* 2.0734	* 2.0437	* 2.1271	* 2.3484	* 2.4142	* 2.3812	* 4.2360	* 4.2360 *
13	* 1.2684	* 1.4785	* 1.3937	* 1.3046	* 1.3408	* 1.4709	* .5984	* .5984 *
	* 2.2043	* 1.9203	* 2.1177	* 2.4015	* 2.3800	* 2.1895	* 4.8275	* 4.8275 *
14	* 1.4671	* 1.4549	* 1.4742	* .8927	* .6741	* .6111		
	* 1.9070	* 1.9509	* 1.9806	* 3.1736	* 4.2335	* 4.7322		
15	* .5928	* .6226	* .3989	* F-SUB-Q				
	* 4.2186	* 3.9857	* 4.0854	* 6.6225	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2741	* 1.1755	* 1.3808	* 1.1913	* 1.3183	* 1.2284	* 1.4342	* .5640 *
	* 2.1352	* 2.2890	* 1.9243	* 2.1329	* 1.8811	* 2.0116	* 1.7249	* 3.9326 *
9	* 1.1755	* 1.4392	* 1.4349	* 1.4053	* 1.3505	* 1.4347	* 1.4182	* .5884 *
	* 2.2890	* 1.8435	* 1.8228	* 1.8604	* 1.8623	* 1.7468	* 1.7673	* 3.7394 *
10	* 1.3808	* 1.4342	* 1.4776	* 1.3979	* 1.3458	* 1.3519	* 1.4374	* .5891 *
	* 1.9243	* 1.8237	* 1.7867	* 1.8853	* 1.9233	* 1.9215	* 1.7885	* 3.8167 *
11	* 1.1913	* 1.4052	* 1.3981	* 1.3666	* 1.3160	* 1.2734	* .8497	* .3778 *
	* 2.1329	* 1.8604	* 1.8850	* 1.9718	* 2.1315	* 2.1542	* 2.9242	* 6.1621 *
12	* 1.3183	* 1.3536	* 1.3479	* 1.3163	* 1.2906	* 1.3095	* .6365	* .6365 *
	* 1.8811	* 1.8584	* 1.9204	* 2.1304	* 2.1922	* 2.1576	* 3.9670	* 3.9670 *
13	* 1.2284	* 1.4385	* 1.3540	* 1.2746	* 1.3097	* 1.4378	* .5689	* .5689 *
	* 2.0116	* 1.7428	* 1.9186	* 2.1524	* 2.1565	* 1.9727	* 4.4861	* 4.4861 *
14	* 1.4342	* 1.4213	* 1.4397	* .8507	* .6370	* .5803		
	* 1.7249	* 1.7639	* 1.7860	* 2.9205	* 3.9647	* 4.4024		
15	* .5640	* .5890	* .5898	* .3783	* F-SUB-Q			
	* 3.9326	* 3.7361	* 3.8128	* 6.1546	* M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 296 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.2253	* 1.1298	* 1.3286	* 1.1453	* 1.2682	* 1.1811	* 1.3803	* .5413
	* 1.9564	* 2.1231	* 1.7810	* 1.9805	* 1.7517	* 1.8740	* 1.6064	* 3.6856
9	* 1.1298	* 1.3851	* 1.3812	* 1.3528	* 1.2991	* 1.3812	* 1.3649	* .5648
	* 2.1231	* 1.7028	* 1.6855	* 1.7226	* 1.7318	* 1.6234	* 1.6436	* 3.5028
10	* 1.3286	* 1.3805	* 1.4222	* 1.3453	* 1.2953	* 1.3011	* 1.3831	* .5654
	* 1.7810	* 1.6864	* 1.6519	* 1.7443	* 1.7823	* 1.7797	* 1.6574	* 3.5649
11	* 1.1453	* 1.3528	* 1.3455	* 1.3151	* 1.2654	* 1.2250	* .8158	* .3624
	* 1.9805	* 1.7227	* 1.7440	* 1.8190	* 1.9563	* 1.9920	* 2.6949	* 5.7298
12	* 1.2682	* 1.3021	* 1.2974	* 1.2657	* 1.2410	* 1.2581	* .6106	*
	* 1.7517	* 1.7281	* 1.7797	* 1.9558	* 2.0027	* 1.9746	* 3.6498	*
13	* 1.1811	* 1.3849	* 1.3031	* 1.2261	* 1.2583	* 1.3812	* .5453	*
	* 1.8740	* 1.6196	* 1.7770	* 1.9904	* 1.9736	* 1.8123	* 4.1372	*
14	* 1.3803	* 1.3678	* 1.3852	* .8168	* .6109	* .5561	*	*
	* 1.6064	* 1.6405	* 1.6551	* 2.6917	* 3.6477	* 4.0604	*	*
15	* .5413	* .5654	* .5660	* .3628	* F-SUB-Q			
	* 3.6856	* 3.4997	* 3.5612	* 5.7229	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1578	* 1.0780	* 1.2651	* 1.0914	* 1.1993	* 1.1253	* 1.3014	* .5240
	* 1.8801	* 1.9785	* 1.6788	* 1.8821	* 1.6829	* 1.7880	* 1.5487	* 3.4736
9	* 1.0780	* 1.3101	* 1.3144	* 1.2791	* 1.2354	* 1.3118	* 1.2881	* .5507
	* 1.9785	* 1.6210	* 1.5979	* 1.6460	* 1.6525	* 1.5512	* 1.5806	* 3.2764
10	* 1.2651	* 1.3137	* 1.3519	* 1.2801	* 1.2241	* 1.2367	* 1.3045	* .5500
	* 1.6788	* 1.5987	* 1.5668	* 1.6537	* 1.7046	* 1.6910	* 1.5878	* 3.3321
11	* 1.0914	* 1.2791	* 1.2802	* 1.2429	* 1.2012	* 1.1553	* .7890	* .3518
	* 1.8821	* 1.6461	* 1.6535	* 1.7297	* 1.8633	* 1.8890	* 2.4981	* 5.3369
12	* 1.1993	* 1.2382	* 1.2260	* 1.2016	* 1.1780	* 1.1835	* .5947	*
	* 1.6829	* 1.6490	* 1.7021	* 1.8624	* 1.9028	* 1.8896	* 3.3935	*
13	* 1.1253	* 1.3152	* 1.2386	* 1.1564	* 1.1841	* 1.2957	* .5265	*
	* 1.7880	* 1.5477	* 1.6886	* 1.8874	* 1.8887	* 1.7330	* 3.8603	*
14	* 1.3014	* 1.2909	* 1.3066	* .7899	* .5951	* .5375	*	*
	* 1.5487	* 1.5776	* 1.5855	* 2.4953	* 3.3915	* 3.7848	*	*
15	* .5240	* .5512	* .5506	* .3522	* F-SUB-Q			
	* 3.4736	* 3.2736	* 3.3289	* 5.3307	* M-SUB-Q			



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 297 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q & M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.1223	* 1.0442	* 1.2259	* 1.0569	* 1.1567	* 1.0885	* 1.2559	* .5002
	* 1.7334	* 1.8575	* 1.5753	* 1.7838	* 1.6098	* 1.7031	* 1.4792	* 3.3652
9	* 1.0442	* 1.2649	* 1.2720	* 1.2352	* 1.1956	* 1.2674	* 1.2408	* .5228
	* 1.8575	* 1.5331	* 1.5103	* 1.5620	* 1.5705	* 1.4772	* 1.5103	* 3.1907
10	* 1.2259	* 1.2713	* 1.3070	* 1.2394	* 1.1820	* 1.1966	* 1.2546	* .5206
	* 1.5753	* 1.5111	* 1.4822	* 1.5624	* 1.6180	* 1.6010	* 1.5136	* 3.2462
11	* 1.0569	* 1.2351	* 1.2396	* 1.2001	* 1.1604	* 1.1156	* .7498	* .3347
	* 1.7838	* 1.5621	* 1.5622	* 1.6324	* 1.7404	* 1.7743	* 2.3929	* 5.1467
12	* 1.1567	* 1.1983	* 1.1838	* 1.1607	* 1.1374	* 1.1397	* .5632	*
	* 1.6098	* 1.5673	* 1.6157	* 1.7396	* 1.7887	* 1.7836	* 3.2431	*
13	* 1.0885	* 1.2707	* 1.1984	* 1.1166	* 1.1402	* 1.2375	* .4962	*
	* 1.7031	* 1.4738	* 1.5987	* 1.7728	* 1.7827	* 1.6612	* 3.7524	*
14	* 1.2559	* 1.2434	* 1.2565	* .7506	* .5635	* .5061	*	*
	* 1.4792	* 1.5074	* 1.5114	* 2.3902	* 3.2414	* 3.6832	*	*
15	* .5002	* .5234	* .5212	* .3351	* F-SUB-Q			
	* 3.3652	* 3.1879	* 3.2430	* 5.1408	* M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0579	* .9833	* 1.1411	* .9942	* 1.0829	* 1.0180	* 1.1672	* .4818
	* 1.6978	* 1.8155	* 1.5675	* 1.7682	* 1.6042	* 1.7023	* 1.4884	* 3.2797
9	* .9833	* 1.1722	* 1.1858	* 1.1453	* 1.1159	* 1.1768	* 1.1514	* .5002
	* 1.8155	* 1.5357	* 1.5064	* 1.5673	* 1.5697	* 1.4861	* 1.5204	* 3.1299
10	* 1.1411	* 1.1852	* 1.2070	* 1.1580	* 1.0972	* 1.1145	* 1.1569	* .4925
	* 1.5675	* 1.5071	* 1.4915	* 1.5528	* 1.6236	* 1.6009	* 1.5288	* 3.2146
11	* .9942	* 1.1453	* 1.1582	* 1.1126	* 1.0805	* 1.0422	* .7069	* .3149
	* 1.7682	* 1.5673	* 1.5526	* 1.6318	* 1.7125	* 1.7545	* 2.3525	* 5.1129
12	* 1.0829	* 1.1183	* 1.0987	* 1.0808	* 1.0539	* 1.0616	* .5393	*
	* 1.6042	* 1.5668	* 1.6214	* 1.7117	* 1.7708	* 1.7539	* 3.1272	*
13	* 1.0180	* 1.1798	* 1.1161	* 1.0431	* 1.0622	* 1.1251	* .4621	*
	* 1.7023	* 1.4827	* 1.5988	* 1.7531	* 1.7531	* 1.6692	* 3.7037	*
14	* 1.1672	* 1.1537	* 1.1586	* .7077	* .5397	* .4706	*	*
	* 1.4884	* 1.5176	* 1.5267	* 2.3500	* 3.1254	* 3.6393	*	*
15	* .4818	* .5007	* .4931	* .3153	* F-SUB-Q			
	* 3.2797	* 3.1272	* 3.2115	* 5.1073	* M-SUB-Q			

## Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248

Appendix A, Rev. 0

Page 298 of 312

TABLE A-4 (CONTINUED)

F-SUB-Q &amp; M-SUB-Q VALUES (F-SUB-Q OP MARGIN) - POWER ESCALATION

AT 30% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* 1.0362 *	* .8387 *	* .9359 *	* .8408 *	* 1.0581 *	* .8525 *	* 1.0573 *	* .4259 *
	* 1.6105 *	* 1.9942 *	* 1.7978 *	* 1.9585 *	* 1.5488 *	* 1.9244 *	* 1.5541 *	* 3.5315 *
9	* .8387 *	* 1.0319 *	* .9878 *	* 1.0553 *	* .9144 *	* .9741 *	* 1.0653 *	* .4443 *
	* 1.9942 *	* 1.6378 *	* 1.7008 *	* 1.5893 *	* 1.8123 *	* 1.6976 *	* 1.5491 *	* 3.3541 *
10	* .9359 *	* .9873 *	* .9562 *	* .9672 *	* .9759 *	* .9180 *	* .9921 *	* .4241 *
	* 1.7978 *	* 1.7016 *	* 1.7722 *	* 1.7477 *	* 1.7357 *	* 1.8321 *	* 1.6830 *	* 3.5461 *
11	* .8408 *	* 1.0554 *	* .9674 *	* .9727 *	* .8904 *	* 1.0109 *	* .6095 *	* .2676 *
	* 1.9585 *	* 1.5891 *	* 1.7475 *	* 1.7672 *	* 1.9353 *	* 1.6984 *	* 2.5732 *	* 5.7137 *
12	* 1.0581 *	* .9153 *	* .9766 *	* .8908 *	* .8339 *	* .9955 *	* .4834 *	
	* 1.5488 *	* 1.8107 *	* 1.7343 *	* 1.9344 *	* 2.1008 *	* 1.7592 *	* 3.2951 *	
13	* .8525 *	* .9763 *	* .9192 *	* 1.0117 *	* .9961 *	* .8977 *	* .3836 *	
	* 1.9244 *	* 1.6939 *	* 1.8297 *	* 1.6972 *	* 1.7583 *	* 1.9629 *	* 4.2004 *	
14	* 1.0573 *	* 1.0670 *	* .9935 *	* .6101 *	* .4837 *	* .3907 *		
	* 1.5541 *	* 1.5467 *	* 1.6808 *	* 2.5705 *	* 3.2932 *	* 4.1273 *		
15	* .4259 *	* .4448 *	* .4245 *	* .2679 *	F-SUB-Q			
	* 3.5315 *	* 3.3511 *	* 3.5428 *	* 5.7076 *	M-SUB-Q			

AT 30% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8	* .4261 *	* .3655 *	* .3675 *	* .3661 *	* .4310 *	* .3603 *	* .3786 *	* .1843 *
	* 3.6748 *	* 4.3012 *	* 4.2924 *	* 4.2508 *	* 3.5879 *	* 4.3013 *	* 4.0816 *	* 7.7330 *
9	* .3655 *	* .4205 *	* .3863 *	* .4313 *	* .3650 *	* .3698 *	* .3796 *	* .1877 *
	* 4.3012 *	* 3.7531 *	* 4.0815 *	* 3.6370 *	* 4.2724 *	* 4.2091 *	* 4.0838 *	* 7.5253 *
10	* .3675 *	* .3862 *	* .3628 *	* .3833 *	* .4152 *	* .3595 *	* .3485 *	* .1753 *
	* 4.2924 *	* 4.0830 *	* 4.3741 *	* 4.1325 *	* 3.8105 *	* 4.4013 *	* 4.5036 *	* 8.1196 *
11	* .3661 *	* .4315 *	* .3835 *	* .4111 *	* .3516 *	* .3809 *	* .2563 *	* .1160 *
	* 4.2508 *	* 3.6361 *	* 4.1307 *	* 3.8948 *	* 4.5739 *	* 4.2223 *	* 5.7669 *	* 12.5095 *
12	* .4310 *	* .3653 *	* .4155 *	* .3517 *	* .3226 *	* .3565 *	* .2031 *	
	* 3.5879 *	* 4.2692 *	* 3.8079 *	* 4.5720 *	* 5.0762 *	* 4.6093 *	* 7.3924 *	
13	* .3603 *	* .3705 *	* .3599 *	* .3812 *	* .3567 *	* .3097 *	* .1558 *	
	* 4.3013 *	* 4.2008 *	* 4.3962 *	* 4.2192 *	* 4.6066 *	* 5.3440 *	* 9.7674 *	
14	* .3786 *	* .3802 *	* .3490 *	* .2565 *	* .2033 *	* .1583 *		
	* 4.0816 *	* 4.0778 *	* 4.4979 *	* 5.7617 *	* 7.3867 *	* 9.6222 *		
15	* .1843 *	* .1879 *	* .1756 *	* .1161 *	F-SUB-Q			
	* 7.7330 *	* 7.5185 *	* 8.1113 *	* 12.4956 *	M-SUB-Q			

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 299 of 312

TABLE A-5

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 24 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	2.8542	3.5208	3.6999	3.7329	3.0314	3.8072	3.4847	6.4198
9*	3.5208	2.9431	3.5895	2.9898	3.7804	3.8947	3.4829	6.2721
10*	3.6999	3.5910	3.8297	3.6439	3.0636	3.9107	3.7291	6.7182
11*	3.7329	2.9896	3.6434	3.0754	3.9090	3.3215	4.7897	9.1974
12*	3.0314	3.7795	3.0627	3.9083	4.1620	3.5035	5.6808	
13*	3.8072	3.8870	3.9080	3.3208	3.5035	3.9507	7.3570	
14*	3.4847	3.4785	3.7267	4.7887	5.6828	7.2020		
15 *	6.4198	6.2695	6.7162	9.1949				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 23 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	1.3795	1.7591	1.7049	1.8617	1.4526	1.8603	1.4751	3.0661
9*	1.7591	1.4195	1.6632	1.4532	1.7570	1.7541	1.4700	2.9035
10*	1.7049	1.6636	1.7241	1.7054	1.5385	1.7918	1.5536	3.0403
11*	1.8617	1.4532	1.7053	1.5353	1.7996	1.4745	2.2515	4.3952
12*	1.4526	1.7563	1.5381	1.7993	1.8762	1.4793	2.6252	
13*	1.8603	1.7512	1.7907	1.4742	1.4792	1.6497	3.2063	
14*	1.4751	1.4685	1.5528	2.2513	2.6260	3.1923		
15 *	3.0661	2.9019	3.0398	4.3942				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 300 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 22 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.4441	1.6079	1.4919	1.6704	1.5047	1.6514	1.4099	2.8255
9*	1.6079	1.3747	1.4810	1.4408	1.5438	1.5274	1.4388	2.6612
10*	1.4919	1.4813	1.4654	1.5188	1.4741	1.5739	1.4175	2.6977
11*	1.6704	1.4409	1.5187	1.4547	1.5720	1.5209	2.0093	3.8970
12*	1.5047	1.5422	1.4731	1.5719	1.5893	1.4659	2.4140	
13*	1.6514	1.5245	1.5728	1.5205	1.4657	1.3962	2.7874	
14*	1.4099	1.4370	1.4166	2.0092	2.4144	2.7413		
15 *	2.8255	2.6597	2.6971	3.8960				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 21 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.3914	1.5777	1.4234	1.6133	1.4382	1.5823	1.3283	2.8563
9*	1.5777	1.3091	1.4126	1.3642	1.4747	1.4455	1.3534	2.6885
10*	1.4234	1.4129	1.3880	1.4494	1.3958	1.4928	1.3244	2.6820
11*	1.6133	1.3642	1.4494	1.3785	1.4947	1.4462	1.9764	3.8805
12*	1.4382	1.4728	1.3947	1.4945	1.5038	1.3894	2.4296	
13*	1.5823	1.4425	1.4916	1.4458	1.3892	1.2827	2.7211	
14*	1.3283	1.3516	1.3235	1.9761	2.4297	2.6704		
15 *	2.8563	2.6869	2.6815	3.8792				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 301 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 20 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.4057	1.6081	1.4413	1.6389	1.4386	1.5986	1.3235	2.9166
9*	1.6081	1.3148	1.4253	1.3673	1.4881	1.4506	1.3457	2.7365
10*	1.4413	1.4256	1.3994	1.4621	1.3965	1.4988	1.3139	2.7219
11*	1.6389	1.3674	1.4620	1.3817	1.5018	1.4418	1.9942	3.9805
12*	1.4386	1.4860	1.3953	1.5016	1.5101	1.3766	2.4666	
13*	1.5986	1.4480	1.4976	1.4414	1.3766	1.2594	2.7394	
14*	1.3235	1.3439	1.3129	1.9937	2.4664	2.6854		
15 *	2.9166	2.7350	2.7212	3.9789				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 19 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.4568	1.6726	1.4937	1.7001	1.4790	1.6510	1.3555	3.0105
9*	1.6726	1.3574	1.4722	1.4085	1.5353	1.4873	1.3760	2.8193
10*	1.4937	1.4726	1.4448	1.5086	1.4350	1.5408	1.3415	2.8038
11*	1.7001	1.4085	1.5085	1.4224	1.5434	1.4762	2.0463	4.1351
12*	1.4790	1.5330	1.4337	1.5432	1.5509	1.3996	2.5315	
13*	1.6510	1.4845	1.5394	1.4757	1.3995	1.2768	2.8066	
14*	1.3555	1.3741	1.3404	2.0456	2.5310	2.7505		
15 *	3.0105	2.8176	2.8027	4.1331				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 302 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 18 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.5155	1.7516	1.5540	1.7712	1.5274	1.7124	1.3913	3.1568
9*	1.7516	1.4053	1.5269	1.4547	1.5893	1.5309	1.4117	2.9622
10*	1.5540	1.5273	1.4969	1.5625	1.4782	1.5901	1.3751	2.9428
11*	1.7712	1.4548	1.5624	1.4681	1.5936	1.5171	2.1387	4.3672
12*	1.5274	1.5868	1.4768	1.5934	1.6006	1.4327	2.6635	
13*	1.7125	1.5279	1.5885	1.5166	1.4326	1.3039	2.9369	
14*	1.3913	1.4096	1.3738	2.1377	2.6629	2.8774		
15 *	3.1568	2.9604	2.9415	4.3647				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 17 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.6077	1.8579	1.6407	1.8680	1.5991	1.7964	1.4493	3.3165
9*	1.8579	1.4793	1.6069	1.5275	1.6666	1.5971	1.4704	3.1171
10*	1.6408	1.6074	1.5746	1.6424	1.5472	1.6650	1.4330	3.0970
11*	1.8680	1.5276	1.6423	1.5418	1.6762	1.5913	2.2532	4.6181
12*	1.5991	1.6639	1.5456	1.6760	1.6847	1.4995	2.8234	
13*	1.7964	1.5938	1.6633	1.5907	1.4994	1.3617	3.1065	
14*	1.4493	1.4681	1.4316	2.2520	2.8225	3.0439		
15 *	3.3165	3.1151	3.0954	4.6153				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 303 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 16 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.7126	1.9748	1.7365	1.9738	1.6778	1.8895	1.5137	3.5021
9*	1.9748	1.5597	1.6956	1.6074	1.7529	1.6724	1.5368	3.3013
10*	1.7365	1.6962	1.6607	1.7314	1.6242	1.7494	1.4986	3.2796
11*	1.9738	1.6075	1.7313	1.6218	1.7702	1.6736	2.3892	4.9174
12*	1.6778	1.7499	1.6225	1.7699	1.7850	1.5802	3.0102	
13*	1.8895	1.6690	1.7475	1.6729	1.5801	1.4323	3.3114	
14*	1.5137	1.5344	1.4971	2.3878	3.0092	3.2442		
15 *	3.5021	3.2991	3.2779	4.9141				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 15 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.8588	2.1300	1.8674	2.1206	1.8002	2.0214	1.6201	3.6772
9*	2.1300	1.6791	1.8191	1.7271	1.8768	1.7840	1.6430	3.4505
10*	1.8674	1.8198	1.7814	1.8556	1.7406	1.8696	1.6012	3.4434
11*	2.1206	1.7272	1.8555	1.7433	1.9042	1.8036	2.5189	5.1910
12*	1.8002	1.8736	1.7388	1.9039	1.9234	1.7076	3.1714	
13*	2.0214	1.7802	1.8676	1.8027	1.7074	1.5475	3.5131	
14*	1.6201	1.6403	1.5995	2.5172	3.1702	3.4394		
15 *	3.6772	3.4482	3.4414	5.1874				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 304 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 14 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.9460	2.2544	1.9678	2.2329	1.8785	2.1187	1.6799	3.9167
9*	2.2544	1.7593	1.9117	1.8061	1.9644	1.8590	1.7052	3.6929
10*	1.9678	1.9123	1.8717	1.9500	1.8153	1.9580	1.6654	3.6771
11*	2.2329	1.8062	1.9498	1.8255	2.0062	1.8901	2.6949	5.5256
12*	1.8785	1.9610	1.8133	2.0059	2.0268	1.7865	3.4318	
13*	2.1187	1.8551	1.9559	1.8893	1.7863	1.6161	3.7780	
14*	1.6799	1.7024	1.6637	2.6930	3.4306	3.7023		
15 *	3.9167	3.6904	3.6748	5.5220				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 13 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	2.0416	2.3695	2.0778	2.3487	1.9763	2.2467	1.7755	4.0974
9*	2.3695	1.8514	2.0210	1.9041	2.0821	1.9662	1.8019	3.8647
10*	2.0778	2.0218	1.9832	2.0653	1.9193	2.0756	1.7598	3.8601
11*	2.3487	1.9042	2.0652	1.9234	2.1276	1.9998	2.8387	5.7796
12*	1.9763	2.0788	1.9174	2.1272	2.1518	1.8965	3.5942	
13*	2.2467	1.9621	2.0734	1.9987	1.8963	1.7153	4.0088	
14*	1.7755	1.7990	1.7580	2.8368	3.5930	3.9307		
15 *	4.0974	3.8621	3.8580	5.7757				



# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 305 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 12 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	2.0473	2.3670	2.0703	2.3394	1.9795	2.2420	1.7932	4.1502
9*	2.3670	1.8526	2.0101	1.9054	2.0809	1.9832	1.8265	3.9059
10*	2.0703	2.0109	1.9737	2.0634	1.9363	2.0980	1.7992	3.9267
11*	2.3394	1.9055	2.0632	1.9394	2.1846	2.0466	2.8819	5.9505
12*	1.9795	2.0772	1.9341	2.1842	2.2260	2.0001	3.7098	
13*	2.2420	1.9791	2.0956	2.0452	1.9999	1.8214	4.1660	
14*	1.7932	1.8235	1.7972	2.8795	3.7082	4.0817		
15 *	4.1502	3.9030	3.9238	5.9458				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 11 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.9569	2.2735	1.9945	2.2426	1.8921	2.1631	1.7131	4.0195
9*	2.2735	1.7731	1.9383	1.8264	2.0040	1.9019	1.7457	3.8035
10*	1.9945	1.9390	1.9052	1.9931	1.8589	2.0210	1.7219	3.8207
11*	2.2426	1.8265	1.9929	1.8608	2.1112	1.9669	2.8158	5.8009
12*	1.8921	2.0004	1.8567	2.1108	2.1501	1.9182	3.6330	
13*	2.1631	1.8979	2.0186	1.9657	1.9180	1.7434	4.0933	
14*	1.7131	1.7427	1.7199	2.8135	3.6316	4.0159		
15 *	4.0195	3.8007	3.8180	5.7961				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 306 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 10 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.8624	2.1689	1.9016	2.1374	1.7946	2.0489	1.6140	3.8100
9*	2.1689	1.6858	1.8429	1.7342	1.9000	1.8000	1.6474	3.6162
10*	1.9016	1.8437	1.8087	1.8903	1.7542	1.9119	1.6234	3.6341
11*	2.1374	1.7343	1.8902	1.7626	1.9943	1.8499	2.6688	5.5063
12*	1.7946	1.8965	1.7522	1.9939	2.0353	1.8003	3.4550	
13*	2.0489	1.7964	1.9098	1.8486	1.8002	1.6358	3.8601	
14*	1.6140	1.6447	1.6217	2.6664	3.4536	3.7870		
15 *	3.8100	3.6137	3.6317	5.5017				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 9 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****								
8*	1.7591	2.0513	1.7934	2.0158	1.6873	1.9271	1.5139	3.5946
9*	2.0513	1.5898	1.7341	1.6327	1.7845	1.6856	1.5427	3.4002
10*	1.7934	1.7348	1.7023	1.7790	1.6498	1.7955	1.5208	3.4140
11*	2.0158	1.6328	1.7789	1.6589	1.8695	1.7356	2.5041	5.2021
12*	1.6873	1.7811	1.6478	1.8691	1.9071	1.6811	3.2393	
13*	1.9271	1.6821	1.7933	1.7344	1.6810	1.5242	3.6139	
14*	1.5139	1.5401	1.5190	2.5018	3.2379	3.5462		
15 *	3.5946	3.3977	3.4115	5.1976				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 307 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 8 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.6772	1.9520	1.7029	1.9178	1.6049	1.8302	1.4393	3.3892
9*	1.9520	1.5135	1.6446	1.5525	1.6945	1.5962	1.4638	3.1965
10*	1.7029	1.6453	1.6144	1.6872	1.5674	1.6978	1.4393	3.2045
11*	1.9178	1.5526	1.6871	1.5794	1.7719	1.6509	2.3511	4.8935
12*	1.6049	1.6913	1.5655	1.7716	1.8057	1.5884	3.0313	
13*	1.8302	1.5929	1.6956	1.6498	1.5883	1.4374	3.3822	
14*	1.4393	1.4613	1.4375	2.3488	3.0299	3.3161		
15 *	3.3892	3.1941	3.2022	4.8892				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 7 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.5605	1.8351	1.5947	1.8036	1.4993	1.7181	1.3378	3.2555
9*	1.8351	1.4119	1.5381	1.4465	1.5866	1.4888	1.3608	3.0879
10*	1.5947	1.5388	1.5087	1.5779	1.4594	1.5840	1.3355	3.0855
11*	1.8036	1.4466	1.5778	1.4704	1.6515	1.5316	2.2404	4.7095
12*	1.4993	1.5835	1.4576	1.6512	1.6793	1.4675	2.9146	
13*	1.7181	1.4856	1.5819	1.5305	1.4673	1.3250	3.2294	
14*	1.3378	1.3584	1.3339	2.2381	2.9132	3.1697		
15 *	3.2555	3.0856	3.0832	4.7052				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 308 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 6 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.4820	1.7491	1.5155	1.7211	1.4285	1.6370	1.2723	3.1229
9*	1.7491	1.3426	1.4627	1.3767	1.5105	1.4134	1.2931	2.9615
10*	1.5155	1.4634	1.4345	1.5005	1.3887	1.5036	1.2673	2.9563
11*	1.7211	1.3768	1.5004	1.3992	1.5645	1.4542	2.1367	4.5181
12*	1.4285	1.5074	1.3869	1.5642	1.5875	1.3886	2.7753	
13*	1.6370	1.4103	1.5016	1.4532	1.3884	1.2518	3.0805	
14*	1.2723	1.2908	1.2657	2.1346	2.7740	3.0240		
15 *	3.1229	2.9592	2.9541	4.5139				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 5 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
*****	*****	*****	*****	*****	*****	*****	*****	*****
8*	1.4378	1.6827	1.4568	1.6567	1.3853	1.5852	1.2443	2.9799
9*	1.6827	1.3008	1.4077	1.3334	1.4626	1.3706	1.2624	2.8053
10*	1.4568	1.4084	1.3841	1.4473	1.3529	1.4571	1.2360	2.8046
11*	1.6568	1.3335	1.4472	1.3566	1.5140	1.4168	2.0317	4.3092
12*	1.3853	1.4599	1.3513	1.5137	1.5365	1.3552	2.6186	
13*	1.5852	1.3675	1.4551	1.4158	1.3551	1.2212	2.9322	
14*	1.2443	1.2601	1.2344	2.0298	2.6174	2.8762		
15 *	2.9799	2.8032	2.8026	4.3052				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 309 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 4 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	1.3715	1.6048	1.3871	1.5811	1.3283	1.5120	1.1926	2.8950
9*	1.6048	1.2449	1.3416	1.2749	1.3939	1.3135	1.2133	2.7407
10*	1.3871	1.3422	1.3198	1.3784	1.2935	1.3950	1.1907	2.7483
11*	1.5811	1.2750	1.3783	1.2975	1.4443	1.3538	1.9783	4.2111
12*	1.3283	1.3912	1.2920	1.4439	1.4667	1.3101	2.5636	
13*	1.5120	1.3108	1.3932	1.3529	1.3099	1.1806	2.8807	
14*	1.1926	1.2112	1.1892	1.9765	2.5625	2.8290		
15 *	2.8950	2.7385	2.7461	4.2073				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 3 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	1.3551	1.5884	1.3859	1.5659	1.3178	1.5036	1.1925	2.8129
9*	1.5884	1.2503	1.3377	1.2783	1.3877	1.3129	1.2144	2.6806
10*	1.3859	1.3383	1.3273	1.3694	1.2969	1.3924	1.2010	2.7192
11*	1.5659	1.2784	1.3692	1.3019	1.4422	1.3473	1.9594	4.2059
12*	1.3178	1.3852	1.2955	1.4419	1.4711	1.3112	2.5039	
13*	1.5036	1.3101	1.3908	1.3464	1.3107	1.2100	2.8974	
14*	1.1925	1.2124	1.1996	1.9577	2.5027	2.8474		
15 *	2.8129	2.6786	2.7171	4.2021				

# Catawba 1 Cycle 21 Core Operating Limits Report

CNEI-0400-248  
Appendix A, Rev. 0  
Page 310 of 312

TABLE A-5 (CONTINUED)

M-SUB-C VALUES (F-SUB-Q RPS MARGIN) POWER ESCALATION

AT 118% POWER, 4 EFPD, THIS IS LEVEL 2 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	1.2891	1.7263	1.5781	1.7138	1.2566	1.6808	1.2276	3.0037
9*	1.7263	1.3167	1.4940	1.2810	1.5861	1.4772	1.2205	2.8420
10*	1.5781	1.4947	1.5604	1.5258	1.3627	1.5766	1.3055	2.9771
11*	1.7138	1.2809	1.5256	1.3761	1.6365	1.2881	2.1328	4.6871
12*	1.2566	1.5848	1.3619	1.6359	1.7320	1.3002	2.6322	
13*	1.6808	1.4742	1.5748	1.2873	1.2996	1.4253	3.2906	
14*	1.2276	1.2188	1.3040	2.1309	2.6308	3.2336		
15 *	3.0037	2.8395	2.9749	4.6829				

AT 118% POWER, 4 EFPD, THIS IS LEVEL 1 OF 24  
(LEVEL 24 = TOP OF CORE, LEVEL 1 = BOTTOM)

	H	G	F	E	D	C	B	A
8*	2.9045	3.6724	3.6897	3.6466	2.8557	3.6782	3.1564	6.4708
9*	3.6724	2.9619	3.5093	2.8715	3.6584	3.5819	3.1499	6.2727
10*	3.6897	3.5104	3.7631	3.5187	2.9530	3.7044	3.4241	6.7156
11*	3.6466	2.8710	3.5175	2.9999	3.8268	3.1521	4.7049	10.1466
12*	2.8557	3.6559	2.9514	3.8253	4.1185	3.3435	5.8416	
13*	3.6782	3.5752	3.7006	3.1501	3.3418	3.8208	7.5640	
14*	3.1564	3.1457	3.4202	4.7013	5.8375	7.4520		
15 *	6.4708	6.2677	6.7098	10.1370				

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 311 of 312**

	H	G	F	E	D	C	B	A
8	* 1.3357	* 1.2549	* 1.4289	* 1.2569	* 1.3694	* 1.2848	* 1.4404	* .6215
	* 1.6316	* 1.7242	* 1.4773	* 1.6248	* 1.4886	* 1.5472	* 1.4313	* 3.0579
9	* 1.2549	* 1.4646	* 1.4681	* 1.4218	* 1.3886	* 1.4451	* 1.4215	* .6497
	* 1.7242	* 1.4088	* 1.4213	* 1.4227	* 1.4517	* 1.3921	* 1.4655	* 2.9245
10	* 1.4289	* 1.4676	* 1.4932	* 1.4260	* 1.3624	* 1.3738	* 1.4314	* .6438
	* 1.4773	* 1.4217	* 1.4088	* 1.4715	* 1.4749	* 1.5145	* 1.4657	* 2.9787
11	* 1.2569	* 1.4218	* 1.4262	* 1.3804	* 1.3274	* 1.2858	* .9052	* .4259
	* 1.6248	* 1.4227	* 1.4713	* 1.5109	* 1.6298	* 1.7334	* 2.3095	* 4.5410
12	* 1.3694	* 1.3909	* 1.3641	* 1.3277	* 1.2905	* 1.3087	* .6969	*
	* 1.4886	* 1.4496	* 1.4732	* 1.6295	* 1.6511	* 1.6828	* 2.9717	*
13	* 1.2848	* 1.4483	* 1.3755	* 1.2867	* 1.3092	* 1.3953	* .6052	*
	* 1.5472	* 1.3894	* 1.5129	* 1.7326	* 1.6822	* 1.5587	* 3.3838	*
14	* 1.4404	* 1.4240	* 1.4331	* .9059	* .6972	* .6173	*	*
	* 1.4313	* 1.4632	* 1.4642	* 2.3084	* 2.9713	* 3.3202	*	*
15	* .6215	* .6503	* .6443	* .4263	F-DEL-H			
	* 3.0579	* 2.9223	* 2.9772	* 4.5380	M-DEL-H			

**CNEI-0400-248**  
**Appendix A, Rev. 0**  
**Page 312 of 312**

F-DEL-H &amp; M-DEL-H VALUES - POWER ESCALATION

	H	G	F	E	D	C	B	A
8	* 1.3342	* 1.2594	* 1.4426	* 1.2605	* 1.3699	* 1.2867	* 1.4431	* .6129
	* 1.4948	* 1.6798	* 1.4200	* 1.5736	* 1.4485	* 1.4933	* 1.3715	* 2.9463
9	* 1.2594	* 1.4774	* 1.4839	* 1.4341	* 1.3948	* 1.4544	* 1.4268	* .6412
	* 1.6798	* 1.3659	* 1.3672	* 1.3792	* 1.4019	* 1.3418	* 1.4044	* 2.8646
10	* 1.4426	* 1.4833	* 1.5131	* 1.4414	* 1.3664	* 1.3818	* 1.4366	* .6350
	* 1.4200	* 1.3676	* 1.3529	* 1.4218	* 1.4467	* 1.4725	* 1.4140	* 2.9503
11	* 1.2605	* 1.4341	* 1.4416	* 1.3894	* 1.3337	* 1.2872	* .8988	* .4164
	* 1.5736	* 1.3792	* 1.4216	* 1.4972	* 1.5845	* 1.6885	* 2.3117	* 4.5793
12	* 1.3699	* 1.3975	* 1.3682	* 1.3340	* 1.2947	* 1.3079	* .6863	*
	* 1.4485	* 1.3996	* 1.4449	* 1.5842	* 1.5984	* 1.6331	* 2.9367	*
13	* 1.2867	* 1.4578	* 1.3836	* 1.2882	* 1.3084	* 1.3953	* .5956	*
	* 1.4933	* 1.3389	* 1.4706	* 1.6878	* 1.6326	* 1.4928	* 3.3337	*
14	* 1.4431	* 1.4295	* 1.4385	* .8995	* .6866	* .6075	*	*
	* 1.3715	* 1.4019	* 1.4124	* 2.3104	* 2.9362	* 3.2702	*	*
15	* .6129	* .6418	* .6355	* .4168	* F-DEL-H			
	* 2.9463	* 2.8623	* 2.9486	* 4.5762	* M-DEL-H			

	H	G	F	E	D	C	B	A
8	* 1.3336	* 1.2634	* 1.4544	* 1.2636	* 1.3700	* 1.2877	* 1.4450	* .6056
	* 1.4948	* 1.6798	* 1.4200	* 1.5736	* 1.4485	* 1.4933	* 1.3715	* 2.9463
9	* 1.2634	* 1.4891	* 1.4974	* 1.4453	* 1.4001	* 1.4613	* 1.4309	* .6339
	* 1.6798	* 1.3659	* 1.3672	* 1.3792	* 1.4019	* 1.3418	* 1.4044	* 2.8646
10	* 1.4544	* 1.4968	* 1.5303	* 1.4549	* 1.3699	* 1.3882	* 1.4405	* .6274
	* 1.4200	* 1.3676	* 1.3529	* 1.4218	* 1.4467	* 1.4725	* 1.4140	* 2.9503
11	* 1.2636	* 1.4453	* 1.4551	* 1.3978	* 1.3391	* 1.2886	* .8932	* .4081
	* 1.5736	* 1.3792	* 1.4216	* 1.4972	* 1.5845	* 1.6885	* 2.3117	* 4.5793
12	* 1.3700	* 1.4029	* 1.3718	* 1.3394	* 1.2982	* 1.3071	* .6773	*
	* 1.4485	* 1.3996	* 1.4449	* 1.5842	* 1.5984	* 1.6331	* 2.9367	*
13	* 1.2877	* 1.4650	* 1.3902	* 1.2896	* 1.3076	* 1.3946	* .5872	*
	* 1.4933	* 1.3389	* 1.4706	* 1.6878	* 1.6326	* 1.4928	* 3.3337	*
14	* 1.4450	* 1.4338	* 1.4426	* .8940	* .6776	* .5991	*	*
	* 1.3715	* 1.4019	* 1.4124	* 2.3104	* 2.9362	* 3.2702	*	*
15	* .6056	* .6345	* .6280	* .4085	* F-DEL-H			
	* 2.9463	* 2.8623	* 2.9486	* 4.5762	* M-DEL-H			