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July 1, 2003

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

**Subject: McGuire Nuclear Station,**  
**Docket No.50-370**  
**Unit 2 Cycle 15**  
**Core Operating Limits Report (COLR)**

**Pursuant to McGuire Technical Specification 5.6.5.d, please find enclosed Revision 22 to the McGuire Unit 2, Cycle 15 Core Operating Limits Report (COLR).**

**Questions regarding this submittal should be directed to Kay Crane, McGuire Regulatory Compliance at (704) 875-4306.**

**Gary R. Peterson**

**Attachment**

ADD1

**U. S. Nuclear Regulatory Commission**

**July 1, 2003**

**Page 2**

**cc: Mr. R. E. Martin, Project Manager  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555**

**Mr. Luis Reyes, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
Atlanta Federal Center  
61 Forsyth St., SW, Suite 23T85  
Atlanta, GA 30323**

**Mr. Scott Shaeffer  
Senior Resident Inspector  
McGuire Nuclear Station**

**McGuire Unit 2 Cycle 15**  
**Core Operating Limits Report**  
**Revision 22**

**June 2003**

Calculation Number: MCC-1553.05-00-0358  
Revision 1

**Duke Power Company**

		Date
Prepared By:	<u>David S. Bortz</u>	<u>6/2/03</u>
Checked By:	<u>Tim P. Pech</u>	<u>6/2/2003</u>
Checked By:	<u>D. Byers</u>	<u>6/2/03</u>
Approved By:	<u>P.M. Abraham</u>	<u>6/3/03</u>

**QA Condition 1**

**INSPECTION OF ENGINEERING INSTRUCTIONS**

Inspection Waived By: P. M. Alshaban  
 (Sponsor)

Date: 6/3/03

<u>CATAWBA</u>		
	Inspection Waived	
MCE (Mechanical & Civil)	<input type="checkbox"/>	Inspected By/Date: _____
RES (Electrical Only)	<input type="checkbox"/>	Inspected By/Date: _____
RES (Reactor)	<input type="checkbox"/>	Inspected By/Date: _____
MOD	<input type="checkbox"/>	Inspected By/Date: _____
Other ( _____ )	<input type="checkbox"/>	Inspected By/Date: _____

<u>OCONEE</u>		
	Inspection Waived	
MCE (Mechanical & Civil)	<input type="checkbox"/>	Inspected By/Date: _____
RES (Electrical Only)	<input type="checkbox"/>	Inspected By/Date: _____
RES (Reactor)	<input type="checkbox"/>	Inspected By/Date: _____
MOD	<input type="checkbox"/>	Inspected By/Date: _____
Other ( _____ )	<input type="checkbox"/>	Inspected By/Date: _____

<u>MCGUIRE</u>		
	Inspection Waived	
MCE (Mechanical & Civil)	<input checked="" type="checkbox"/>	Inspected By/Date: _____
RES (Electrical Only)	<input checked="" type="checkbox"/>	Inspected By/Date: _____
RES (Reactor)	<input checked="" type="checkbox"/>	Inspected By/Date: _____
MOD	<input checked="" type="checkbox"/>	Inspected By/Date: _____
Other ( _____ )	<input type="checkbox"/>	Inspected By/Date: _____

## McGuire 2 Cycle 15 Core Operating Limits Report

### IMPLEMENTATION INSTRUCTIONS FOR REVISION 22

Revision 22 of the McGuire Unit 2 COLR revises the EOC MTC LCO and Surveillance MTC limits specified in COLR Section 2.3 and updates the methodology reference list included in COLR Section 1.1 to reflect recent approvals to NRC approved methods. The following EOC MTC limits are being revised to increase operational margin to these limits.

- HFP ARO 0 ppmb Limiting Condition for Operation (LCO) limit
- HFP ARO 300 ppmb MTC Surveillance Limit
- HFP ARO 60 ppmb MTC Surveillance Limit

The following topical reports have recently received NRC approval since the initial issuance of the M2C15 COLR. The reference list included in Section 1.1 of the COLR is being updated to include the recent NRC approval to revisions to the following topical reports.

- DPC-NF-2010A, "Duke Power Company McGuire Nuclear Station Catawba Nuclear Station Nuclear Physics Methodology for Reload Design".
- DPC-NE-2011PA, "Duke Power Company Nuclear Design Methodology for Core Operating Limits of Westinghouse Reactors"
- DPC-NE-2009-P-A, "Westinghouse Fuel Transition Report," (DPC Proprietary).

This revision should become effective within 5 working days of receipt.

**McGuire 2 Cycle 15 Core Operating Limits Report**

**REVISION LOG**

<u>Revision</u>	<u>Issuance Date</u>	<u>Effective Pages</u>	<u>COLR</u>
Revisions 0-2	Superseded	N/A	M2C09
Revisions 3-6	Superseded	N/A	M2C10
Revisions 7-12	Superseded	N/A	M2C11
Revision 13-15	Superseded	N/A	M2C12
Revision 16-17	Superseded	N/A	M2C13
Revision 18-20	Superseded	N/A	M2C14
Revision 21	February 12, 2002	5, 6, and 10-29	M2C15 – Orig. Issue
Revision 22	June 2, 2003	1, 1a, 2-4 and 7-9	M2C15 – Rev. 1

**McGuire 2 Cycle 15 Core Operating Limits Report**

**INSERTION SHEET FOR REVISION 22**

**Remove pages**  
**Pages 1-4 and 7-9**

**Insert Rev. 22 pages**  
**Pages 1, 1a, 2-4 and 7-9**

## McGuire 2 Cycle 15 Core Operating Limits Report

8. DPC-NE-3002A, "FSAR Chapter 15 System Transient Analysis Methodology".

Revision 3

SER Date: February 5, 1999

9. DPC-NE-2004P-A, "Duke Power Company McGuire and Catawba Nuclear Stations Core Thermal-Hydraulic Methodology using VIPRE-01," (DPC Proprietary).

Revision 1

SER Date: February 20, 1997

10. DPC-NE-2005P-A, "Thermal Hydraulic Statistical Core Design Methodology," (DPC Proprietary).

Revision 1

SER Date: November 7, 1996

11. DPC-NE-2008P-A, "Fuel Mechanical Reload Analysis Methodology Using TACO3," (DPC Proprietary).

Revision 0

SER Date: April 3, 1995

12. DPC-NE-2009-P-A, "Westinghouse Fuel Transition Report," (DPC Proprietary).

Revision 2

SER Date: December 18, 2002

13. DPC-NE-1004A, "Nuclear Design Methodology Using CASMO-3/SIMULATE-3P."

Revision 1

SER Date: April 26, 1996

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

Revision 1

Report Date: SER Dated October 1, 2002

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

Revision 1

Report Date: SER Dated October 1, 2002



## McGuire 2 Cycle 15 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 the NRC approved methodologies specified in Section 1.1.

### 2.1 Requirements for Operational Mode 6

The following condition is required for operational mode 6.

2.1.1 The Reactivity Condition requirement for operational mode 6 is that  $k_{\text{eff}}$  must be less than, or equal to 0.95.

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

2.2.1 For TS 3.1.1, SDM shall be  $\geq 1.3\% \Delta K/K$  in mode 2 with  $k_{\text{eff}} < 1.0$  and in modes 3 and 4.

2.2.2 For TS 3.1.1, SDM shall be  $\geq 1.0\% \Delta K/K$  in mode 5.

2.2.3 For TS 3.1.4, SDM shall be  $\geq 1.3\% \Delta K/K$  in modes 1 and 2.

2.2.4 For TS 3.1.5, SDM shall be  $\geq 1.3\% \Delta K/K$  in mode 1 and mode 2 with any control bank not fully inserted.

2.2.5 For TS 3.1.6, SDM shall be  $\geq 1.3\% \Delta K/K$  in mode 1 and mode 2 with  $K_{\text{eff}} \geq 1.0$ .

2.2.6 For TS 3.1.8, SDM shall be  $\geq 1.3\% \Delta K/K$  in mode 2 during Physics Testing.

### 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 1. The BOC, ARO, HZP MTC shall be less positive than  $0.7E-04 \Delta K/K/^\circ F$ .

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

## McGuire 2 Cycle 15 Core Operating Limits Report

### 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  $-3.65E-04 \Delta K/K/^\circ F$ .

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

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

Where: BOC = Beginning of Cycle (Burnup corresponding to the most positive MTC)  
EOC = End of Cycle  
ARO = All Rods Out  
HZP = Hot Zero 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 226 steps. Shutdown banks are withdrawn in sequence and with no overlap.

## 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 2. Specific control bank withdrawal and overlap limits as a function of the fully withdrawn position are shown in Table 1.