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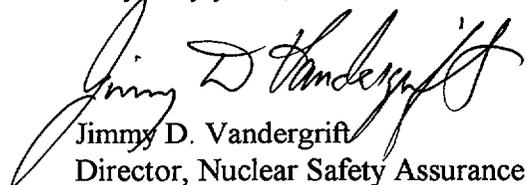
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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
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ANO-2 Cycle 15 Core Operating Limits Report

Gentlemen:

Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specification 6.9.5 requires submittal of the Core Operating Limits Report (COLR) for each reload cycle. Attached is Revision 0 of the COLR for ANO-2 Cycle 15. This fulfills the reporting requirement for the referenced technical specification. Should you have any questions, please contact me.

Very truly yours,


Jimmy D. Vandergrift
Director, Nuclear Safety Assurance

JDV/nbm

A001

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ENTERGY OPERATIONS
ARKANSAS NUCLEAR ONE - UNIT 2
CORE OPERATING LIMITS REPORT
FOR CYCLE 15

**CORE OPERATING LIMITS REPORT
FOR CYCLE 15**

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ARKANSAS NUCLEAR ONE - UNIT 2
CORE OPERATING LIMITS REPORT
FOR CYCLE 15

I. INTRODUCTION

This CORE OPERATING LIMITS REPORT (COLR) has been prepared in accordance with the requirements of Arkansas Nuclear One - Unit 2 (ANO-2) Technical Specification 6.9.5 for ANO-2's Cycle 15. This is Revision 0 of the Cycle 15 COLR.

II. SUMMARY OF CHANGES

Listed below are the changes to the COLR from the latest revision of the Cycle 14 COLR.

- Modified the second EFPD breakpoint in the Core Operating Limit for Moderator Temperature Coefficient (MTC) that specifies where a less positive (burnup dependent) MTC was credited in the safety analyses. Changed 332.5 EFPD to 311.6 EFPD.

III. AFFECTED TECHNICAL SPECIFICATIONS

- 1) 3/4.1.1.1 Shutdown Margin - $T_{avg} > 200^{\circ}\text{F}$
- 2) 3/4.1.1.2 Shutdown Margin - $T_{avg} \leq 200^{\circ}\text{F}$
- 3) 3.1.1.4 Moderator Temperature Coefficient
- 4) 3.1.3.1 CEA Position
- 5) 3.1.3.6 Regulating CEA Insertion Limits
- 6) 3/4.2.1 Linear Heat Rate
- 7) 3.2.3 Azimuthal Power Tilt - T_q
- 8) 3/4.2.4 DNBR Margin
- 9) 3.2.7 Axial Shape Index

IV. CORE OPERATING LIMITS

The cycle-specific operating limits for the specifications listed are presented below.

1) 3/4.1.1.1 - SHUTDOWN MARGIN- $T_{avg} > 200^{\circ}\text{F}$

The SHUTDOWN MARGIN shall be greater than or equal to 5.0 % $\Delta k/k$ in Modes 1, 2, 3, and 4.

2) 3/4.1.1.2 - SHUTDOWN MARGIN - $T_{avg} \leq 200^{\circ}\text{F}$

The SHUTDOWN MARGIN shall be greater than or equal to 5.0% $\Delta k/k$ in Mode 5.

3) 3.1.1.4 - MODERATOR TEMPERATURE COEFFICIENT

The Moderator Temperature Coefficient (MTC) shall be in accordance with Figure 1. The Beginning of Cycle (BOC) positive COLR MTC limit line of Figure 1 is from BOC to 166.4 EFPD. From 311.6 EFPD to End of Cycle (EOC) the positive COLR MTC limit line is linear from an MTC of $0.0 \text{ E-}4 \Delta k/k/^{\circ}\text{F}$ at 0% power to an MTC of $-1.0 \text{ E-}4 \Delta k/k/^{\circ}\text{F}$ at 100% power which is bounded by the BOC positive MTC limit. Between 166.4 EFPD and 311.6 EFPD the positive MTC limit may be interpolated linearly with burnup.

4) 3.1.3.1 - CEA POSITION

With one or more CEAs trippable but misaligned from any other CEAs in its group by more than the Technical Specification 3.1.3.1 allowed value, the minimum required core power reduction for Modes 1 and 2 is specified in Figure 2.

5) 3.1.3.6 - REGULATING CEA INSERTION LIMITS

The regulating CEA groups (Groups 6 & P) shall be limited to the withdrawal and insertion limits shown on Figure 3. Figure 3 assumes that Groups 1 through 5 are at or above the Programmed Insertion Limit.

6) 3/4.2.1 - LINEAR HEAT RATE

With COLSS out of service, the linear heat rate shall be maintained ≤ 13.5 kW/ft.

7) 3.2.3 - AZIMUTHAL POWER TILT- T_q

The measured AZIMUTHAL POWER TILT shall be maintained ≤ 0.03 .

8) 3/4.2.4 - DNBR MARGIN

The DNBR limit shall be maintained by one of the following methods:

- a) With COLSS in service and neither CEAC operable - Maintain COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by 13%.
- b) With COLSS out of service and at least one CEAC operable - Operate within the Region of Acceptable Operation shown on Figure 4, using any operable CPC channel.
- c) With COLSS out of service and neither CEAC operable - Operate within the Region of Acceptable Operation shown on Figure 5, using any operable CPC channel.

9) 3.2.7 - AXIAL SHAPE INDEX

The core average AXIAL SHAPE INDEX (ASI) shall be maintained within the following limits:

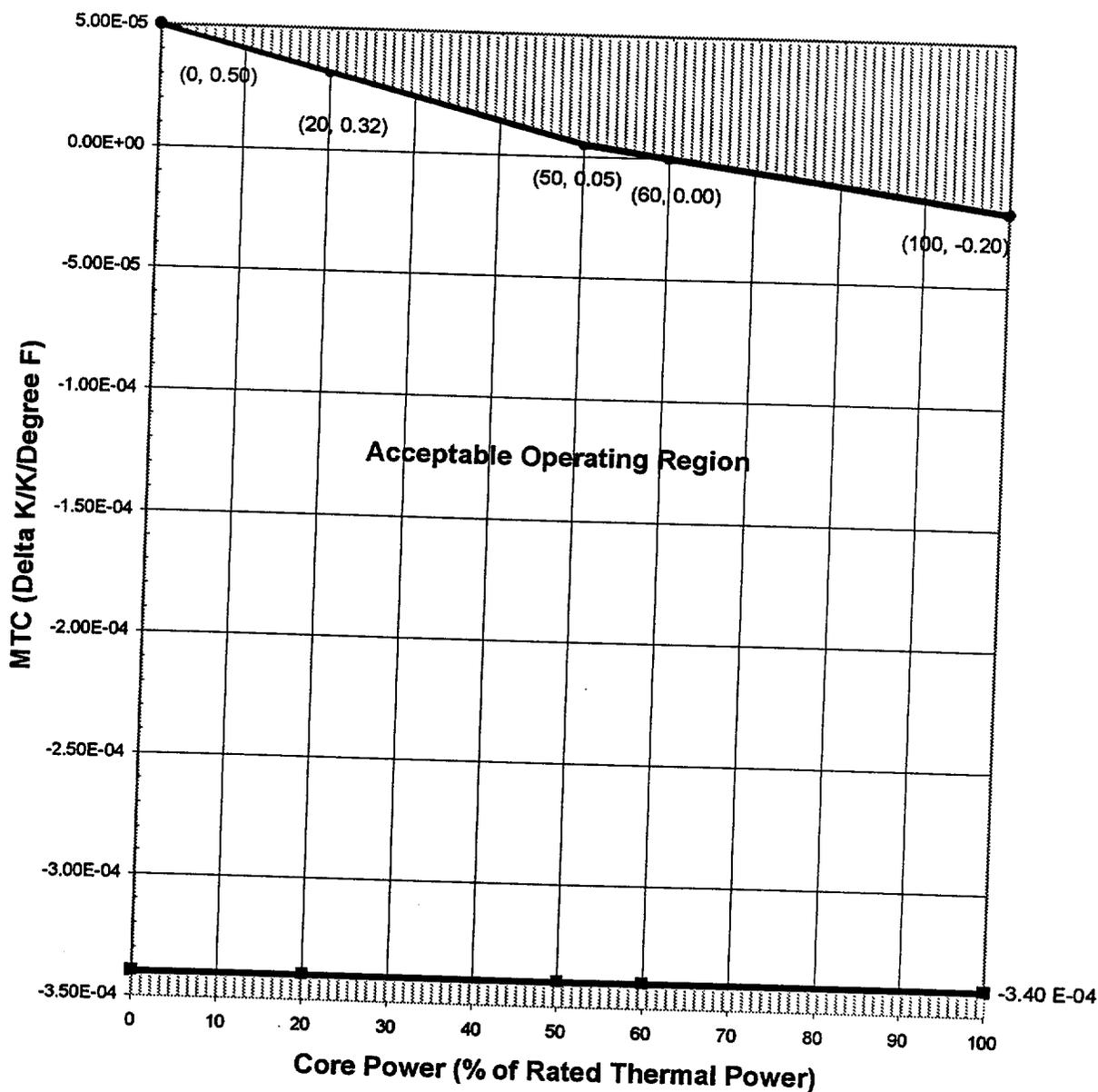
- a) COLSS IN SERVICE
 $- 0.27 \leq ASI \leq + 0.27$
- b) COLSS OUT OF SERVICE (CPC)
 $- 0.20 \leq ASI \leq + 0.20$

V. **LIST OF FIGURES**

- Figure 1. Moderator Temperature Coefficient
- Figure 2. Required Power Reduction After CEA Deviation
- Figure 3. CEA Insertion Limits Versus Thermal Power
- Figure 4. DNBR Margin Operating Limit Based on Core Protection Calculators (COLSS Out of Service, CEAC Operable)
- Figure 5. DNBR Margin Operating Limit Based on Core Protection Calculators (COLSS Out of Service, Both CEACs Inoperable)

FIGURE 1

Moderator Temperature Coefficient



Note:

Per Technical Specification 3.1.1.4.a. and b., the Moderator Temperature Coefficient (MTC) maximum upper design limit shall be less positive than $+0.5 \times 10^{-4} \Delta k/k/^{\circ}F$ whenever THERMAL POWER is $\leq 70\%$ of RATED THERMAL POWER and less positive than $0.0 \times 10^{-4} \Delta k/k/^{\circ}F$ whenever THERMAL POWER is $> 70\%$ of RATED THERMAL POWER. Therefore, the actual MTC must be less than the COLR upper limit at zero power. At all other powers, the actual MTC may be equal to the COLR upper limit.

FIGURE 2

REQUIRED POWER REDUCTION AFTER CEA DEVIATION*

*When core power is reduced to 60% of rated power per this limit curve, further reduction is not required

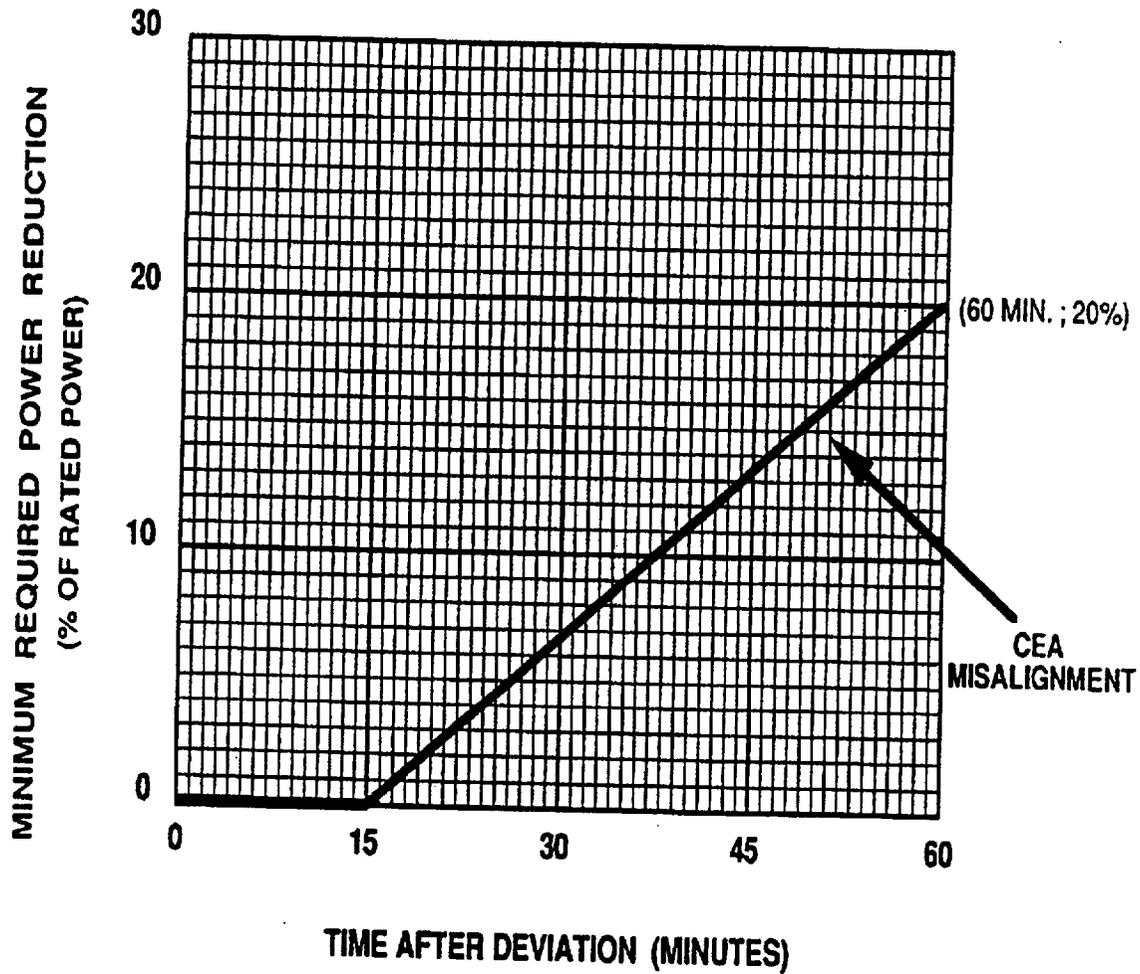
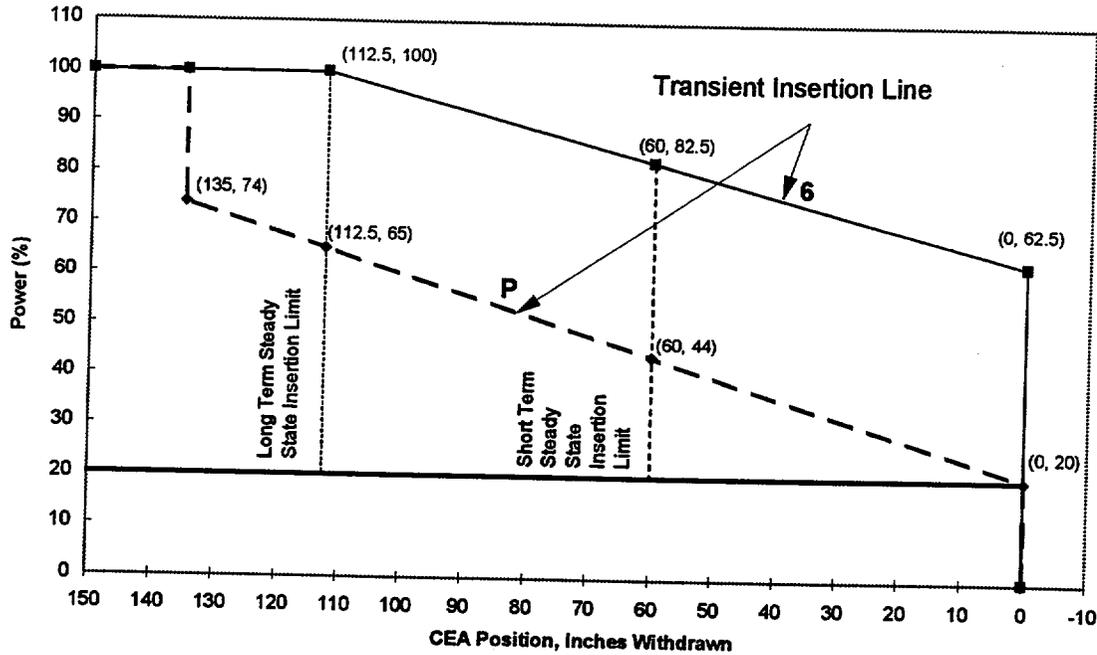


FIGURE 3

CEA INSERTION LIMITS VERSUS THERMAL POWER

Groups 6 and P PDIL



Note: Regulating Groups 1 through 5 at or above the Programmed Insertion Limit.

FIGURE 4

**DNBR MARGIN OPERATING LIMIT BASED
ON CORE PROTECTION CALCULATORS
(COLSS OUT OF SERVICE, CEAC OPERABLE)**

**ANO-2 Cycle Independent COOS Limit
Minimum 1 CEAC Operable**

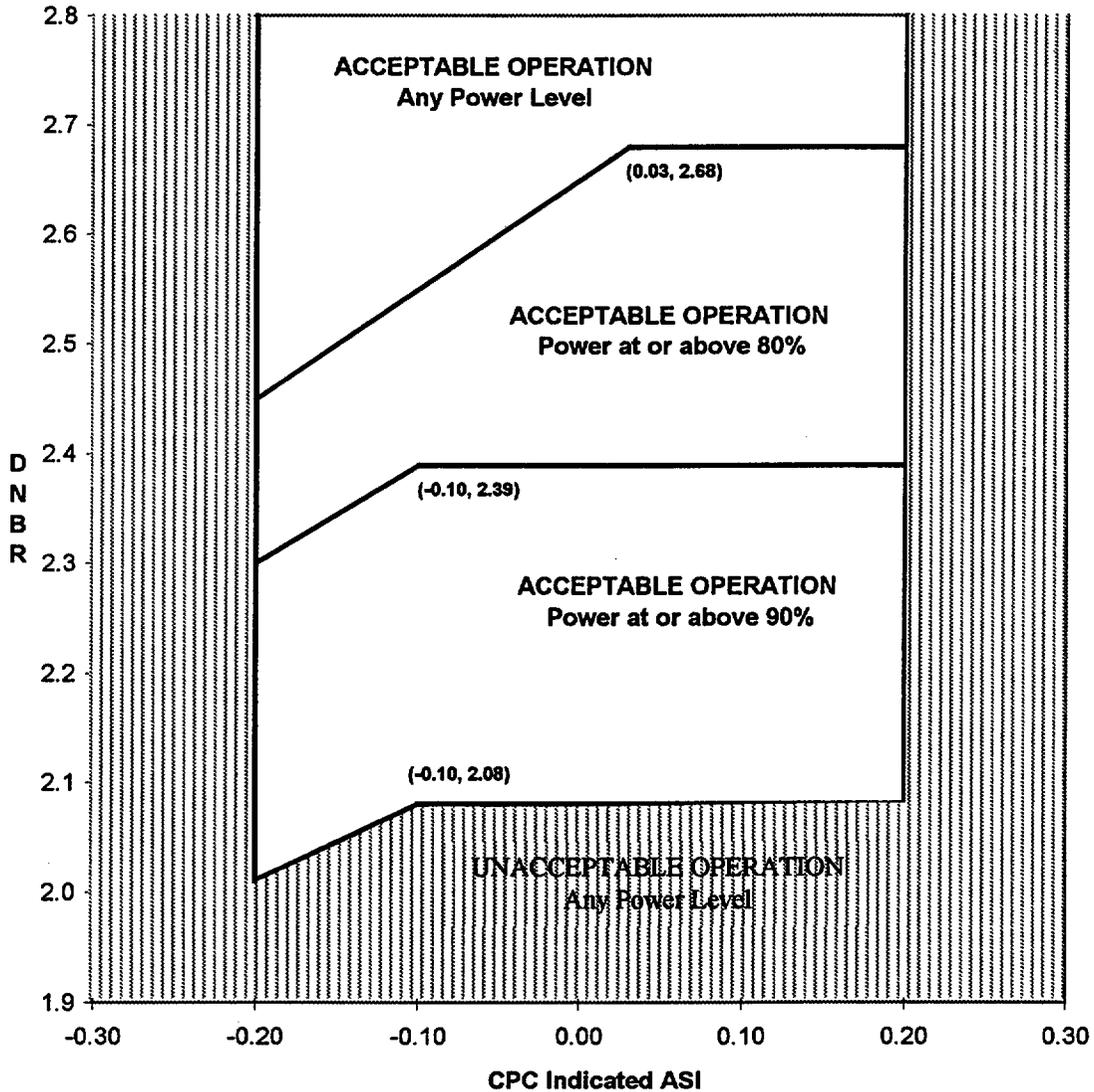


FIGURE 5

**DNBR MARGIN OPERATING LIMIT BASED
ON CORE PROTECTION CALCULATORS**

(COLSS OUT OF SERVICE, BOTH CEACS INOPERABLE)

**ANO-2 Cycle Independent COOS Limit
Both CEACs Inoperable**

