

CORE OPERATING LIMITS REPORT
SURRY 2 CYCLE 13 PATTERN UG
Revision 1

July, 1995

1.0 CORE OPERATING LIMITS REPORT

The Surry 2 Cycle 13 Core Operating Limits Report (COLR) has been revised to reflect changes in COLR parameters impacted by the implementation of the core uprate (increase in thermal power from 2441 MW to 2546 MW) for Surry Power Station Unit 2.

Accident reanalyses for core uprate utilized a maximum positive moderator temperature coefficient of +6 pcm/°F versus the previous analysis value of +3 pcm/°F. Technical Specifications 3.1.E and 5.3.A.6.b place an upper limit of +6 pcm/°F on the MTC. Section 2.1 of this COLR has been revised to incorporate the +6 pcm/°F value.

The increase in power requires that a reduction in the FAH limit be made to ensure that the LOPAR fuel still meets thermal-hydraulic requirements. To accommodate this without unnecessarily penalizing the SIF fuel, separate FAH limits for LOPAR and SIF fuel have been established which ensure DNB limits are met for the applicable fuel type. This change is reflected in COLR section 2.4 Nuclear Enthalpy Rise Hot Channel Factor - FAH(N).

This Core Operating Limits Report for Surry Unit 2 Cycle 13 operation at uprate conditions has been prepared in accordance with the requirements of Technical Specification (TS) 6.2.C.

The Technical Specifications affected by this report are:

- TS 3.1.E and TS 5.3.A.6.b - Moderator Temperature Coefficient
- TS 3.12.A.2 and TS 3.12.A.3 - Control Bank Insertion Limits
- TS 3.12.B.1 and TS 3.12.B.2 - Power Distribution Limits

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 Technical Specification 6.2.C.

2.1 Moderator Temperature Coefficient (TS 3.1.E and TS 5.3.A.6.b)

2.1.1 The Moderator Temperature Coefficient (MTC) limits are:

+6.0 pcm/°F at less than 50 percent of RATED POWER, or

+6.0 pcm/°F at 50% of Rated Power and linearly decreasing to 0 pcm/°F at Rated Power

2.2 Control Bank Insertion Limits (TS 3.12.A.2)

2.2.1 The control rod banks shall be limited in physical insertion as shown in Figure 1.

2.3 Heat Flux Hot Channel Factor-FQ(Z) (TS 3.12.B.1)

$$FQ(Z) \leq \frac{CFQ}{P} * K(Z) \text{ FOR } P > 0.5$$

$$FQ(Z) \leq \frac{CFQ}{0.5} * K(Z) \text{ for } P \leq 0.5$$

$$\text{where: } P = \frac{\text{THERMAL POWER}}{\text{RATED POWER}}$$

2.3.1 CFQ = 2.32

2.3.2 K(Z) is provided in Figure 2.

2.4 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(N)$ (TS 3.12.B.1)

$$F_{\Delta H}(N) \leq CFDH * (1 + PFDH * (1 - P))$$

where: $P = \frac{\text{THERMAL POWER}}{\text{RATED POWER}}$

2.4.1.a $CFDH = 1.56$ for Surry Improved fuel (SIF)

2.4.1.b $CFDH = 1.346$ for LOPAR fuel

2.4.2 $PFDH = 0.3$

FIGURE 1
CONTROL BANK INSERTION LIMITS

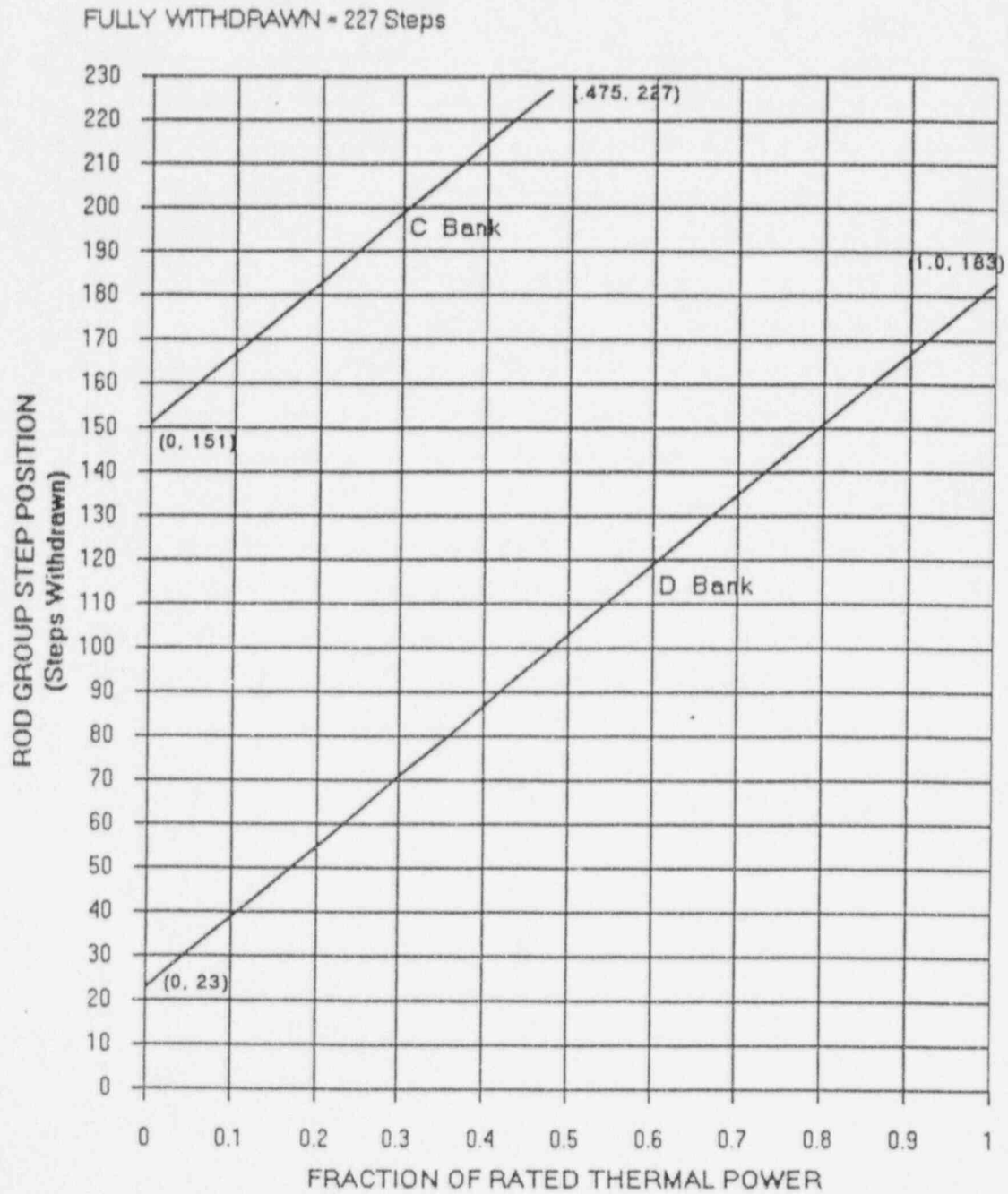


FIGURE 2
K(Z) - NORMALIZED FQ AS A FUNCTION OF CORE HEIGHT

