VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 21, 2003

United States Nuclear Regulatory Commission
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VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 1
CYCLE 19 CORE OPERATING LIMITS REPORT

Pursuant to Surry Technical Specification 6.2.C, attached is a copy of the Virginia Electric and Power Company's (Dominion) Core Operating Limits Report for Surry Unit 1 Cycle 19 Pattern EM, Revision 0.

If you have any questions or require additional information, please contact us.

Very truly yours,

C. L. Funderburk, Director
Nuclear Licensing and Operations Support

Attachment

Commitment Summary: There are no new commitments as a result of this letter.

A001

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CORE OPERATING LIMITS REPORT
Surry 1 Cycle 19 Pattern EM
Revision 0

May 2003

Virginia Electric and Power Company (Dominion)

1.0 INTRODUCTION

This Core Operating Limits Report (COLR) for Surry Unit 1 Cycle 19 has been prepared in accordance with the requirements of Technical Specification 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)

$$FQ(z) \le \frac{CFQ}{P} K(z) \text{ for } P > 0.5$$

$$FQ(z) \le \frac{CFQ}{0.5} K(z) \text{ for } P \le 0.5$$

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

2.3.1 $CFQ = 2.32$

2.3.2 $K(z)$ is provided in Figure 2.

2.4 Nuclear Enthalpy Rise Hot Channel Factor-FΔH(N) (TS 3.12.B.1)

$$F\Delta H(N) \le CFDH \times \{1 + PFDH(1 - P)\}$$

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

2.4.1 $CFDH = 1.56$ for Surry Improved Fuel (SIF)

2.4.2 $PFDH = 0.3$

Figure 1

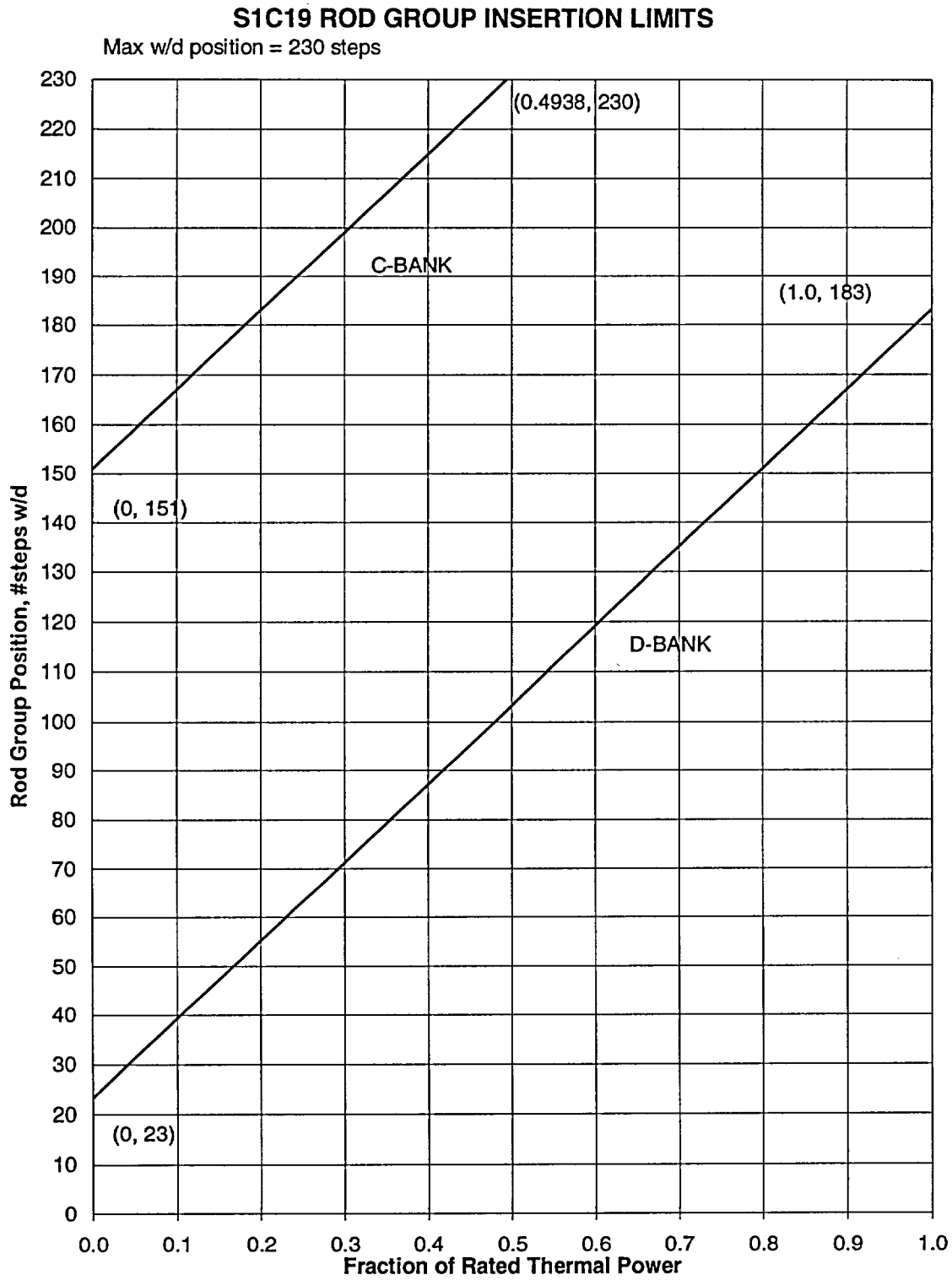
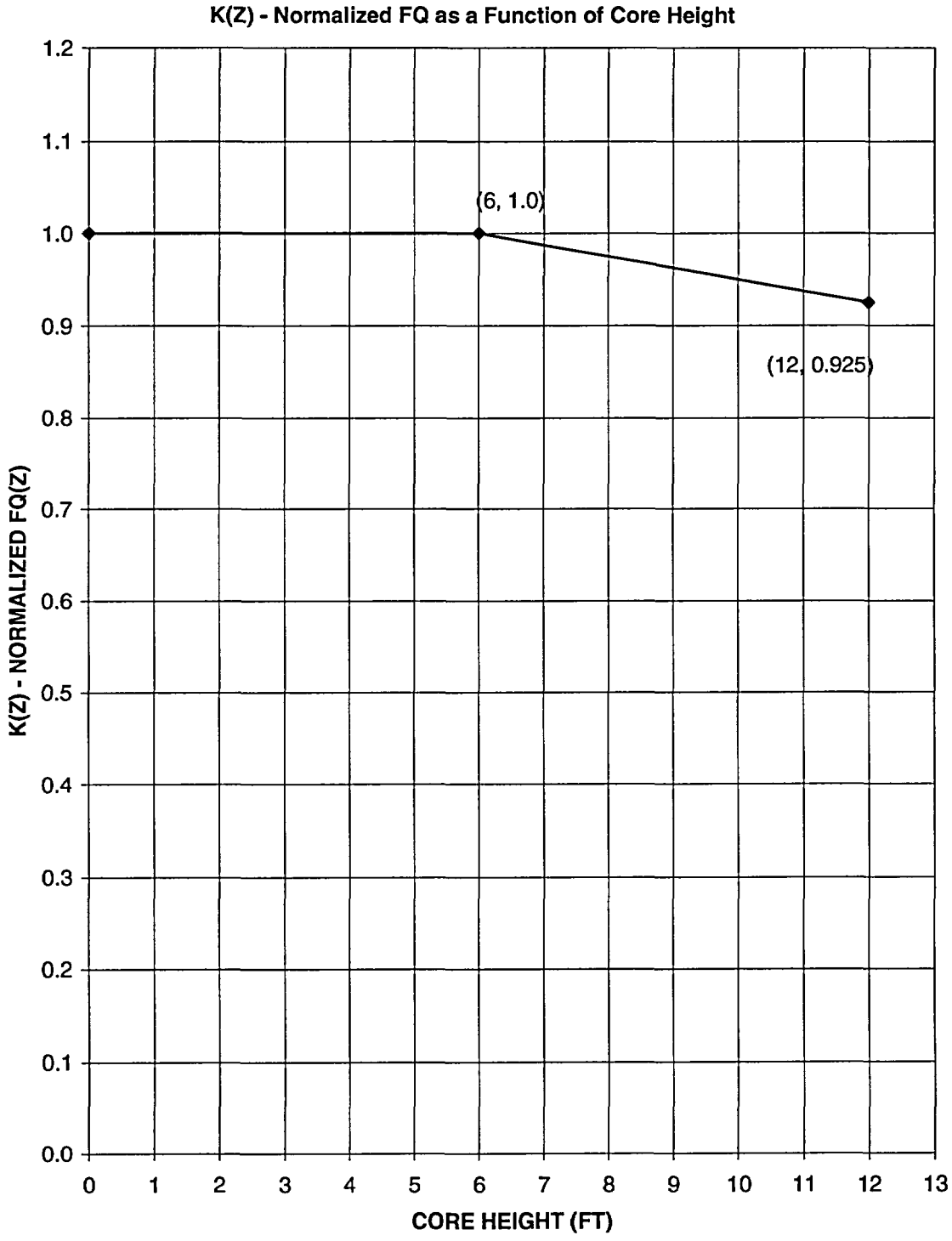

S1C19 ROD GROUP INSERTION LIMITS
Max w/d position = 230 steps
(0.4938, 230)
C-BANK
(1.0, 183)
(0, 151)
D-BANK
(0, 23)
Rod Group Position, #steps w/d
Fraction of Rated Thermal Power
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

Figure 2


K(Z) - Normalized FQ as a Function of Core Height
K(Z) - NORMALIZED FQ(Z)
CORE HEIGHT (FT)
(6, 1.0)
(12, 0.925)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13