VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 16, 2006

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNIT 2
CYCLE 21 CORE OPERATING LIMITS REPORT

Pursuant to Surry Technical Specification 6.2.C, enclosed is a copy of Dominion's Core Operating Limits Report (COLR) for Surry Unit 2 Cycle 21 Pattern KB, Revision 0.

If you have any questions or require additional information, please contact Mr. Gary Miller at (804) 273-2771.

Very truly yours,

C. L. Funderburk, Director
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Dominion Resources Services, Inc. for
Virginia Electric and Power Company

Enclosure

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

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CORE OPERATING LIMITS REPORT
Surry 2 Cycle 21 Pattern KB
Revision 0

September 2006

1.0 INTRODUCTION

This Core Operating Limits Report (COLR) for Surry Unit 2 Cycle 21 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 REFERENCES

1. VEP-FRD-42, Rev. 2.1-A, "Reload Nuclear Design Methodology," August 2003

   (Methodology for TS 3.1.E and TS 5.3.A.6.b - Moderator Temperature Coefficient; TS 3.12.A.2 and 3.12.A.3 - Control Bank Insertion Limit; TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor and Nuclear Enthalpy Rise Hot Channel Factor)

2a. WCAP-9220-P-A, Rev. 1, "Westinghouse ECCS Evaluation Model - 1981 Version," February 1982 (W Proprietary)

   (Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

2b. WCAP-9561-P-A, ADD. 3, Rev. 1, "BART A-1: A Computer Code for the Best Estimate Analysis of Reflood Transients-Special Report: Thimble Modeling in W ECCS Evaluation Model," July 1986 (W Proprietary)

   (Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

2c. WCAP-10266-P-A, Rev. 2, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," March 1987 (W Proprietary)

   (Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

2d. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985 (W Proprietary)
   (Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

2e. WCAP-10079-P-A, "NOTRUMP, A Nodal Transient Small Break and General Network Code," August 1985 (W Proprietary)

   (Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

2f. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (Westinghouse Proprietary)

(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Heat Flux Hot Channel Factor)

3a. VEP-NE-2-A, "Statistical DNBR Evaluation Methodology," June 1987

(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Nuclear Enthalpy Rise Hot Channel Factor)

3b. VEP-NE-3-A, "Qualification of the WRB-1 CHF Correlation in the Virginia Power COBRA Code," July 1990

(Methodology for TS 3.12.B.1 and TS 3.12.B.2 - Nuclear Enthalpy Rise Hot Channel Factor)

3.0 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.

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

3.1.1 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 percent of RATED POWER and linearly decreasing to 0 pcm/°F at RATED POWER

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

3.2.1 The control rod banks shall be limited in physical insertion as shown in Figure A-1.

3.2.2 The rod insertion limit for the A and B control banks is the fully withdrawn position as shown on Figure A-1.

3.3 **Heat Flux Hot Channel Factor-FQ(z)** (TS 3.12.B.1)

$$FQ(z) \leq \frac{CFQ}{P} K(z) \; for \; P > 0.5$$

$$FQ(z) \leq \frac{CFQ}{0.5} K(z) \; for \; P \leq 0.5$$

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

3.3.1 $CFQ = 2.32$

3.3.2 $K(z)$ is provided in Figure A-2.

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

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

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

3.4.1 $CFDH$ = 1.56 for Surry Improved Fuel (SIF)

3.4.2 $PFDH = 0.3$

Figure A-1

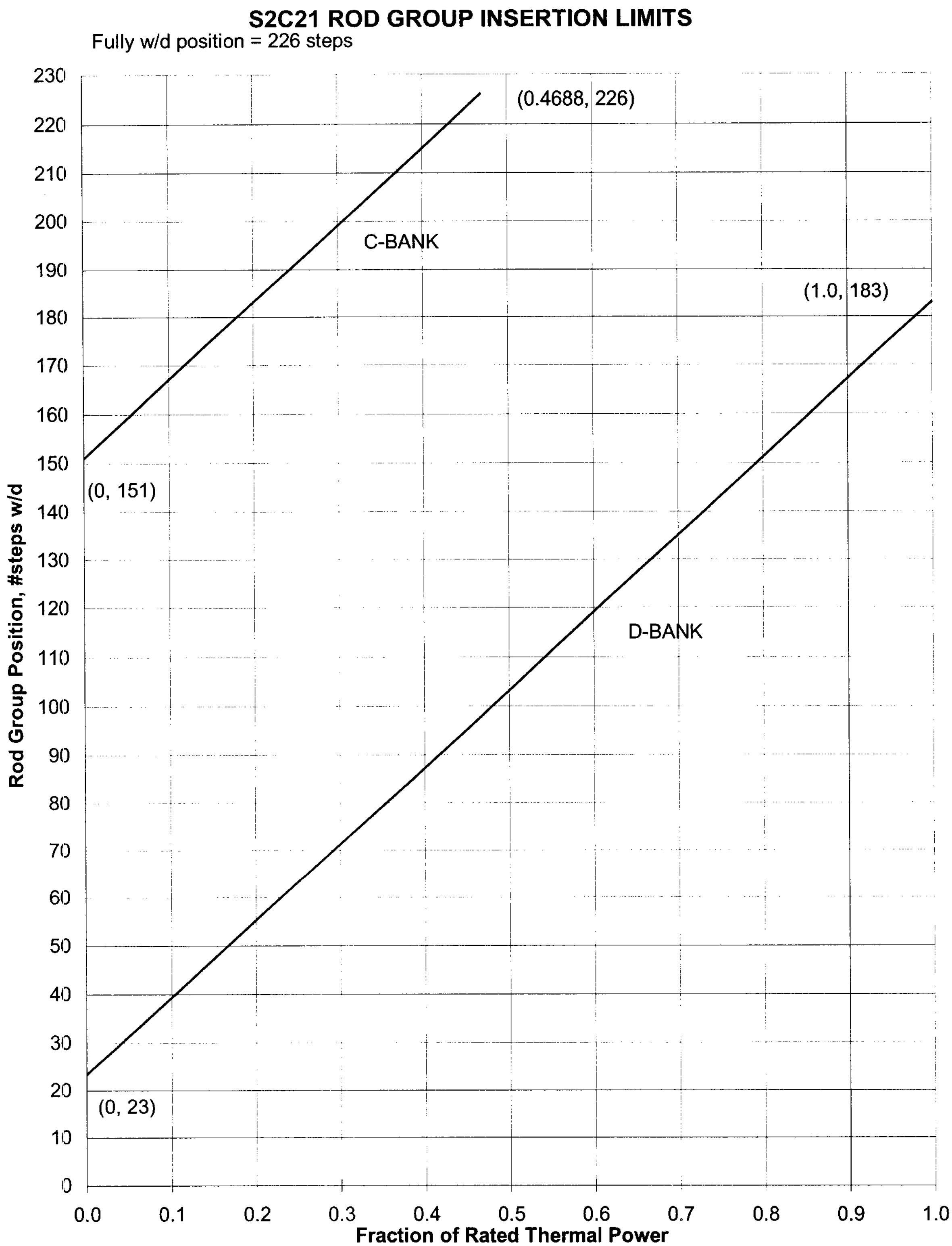
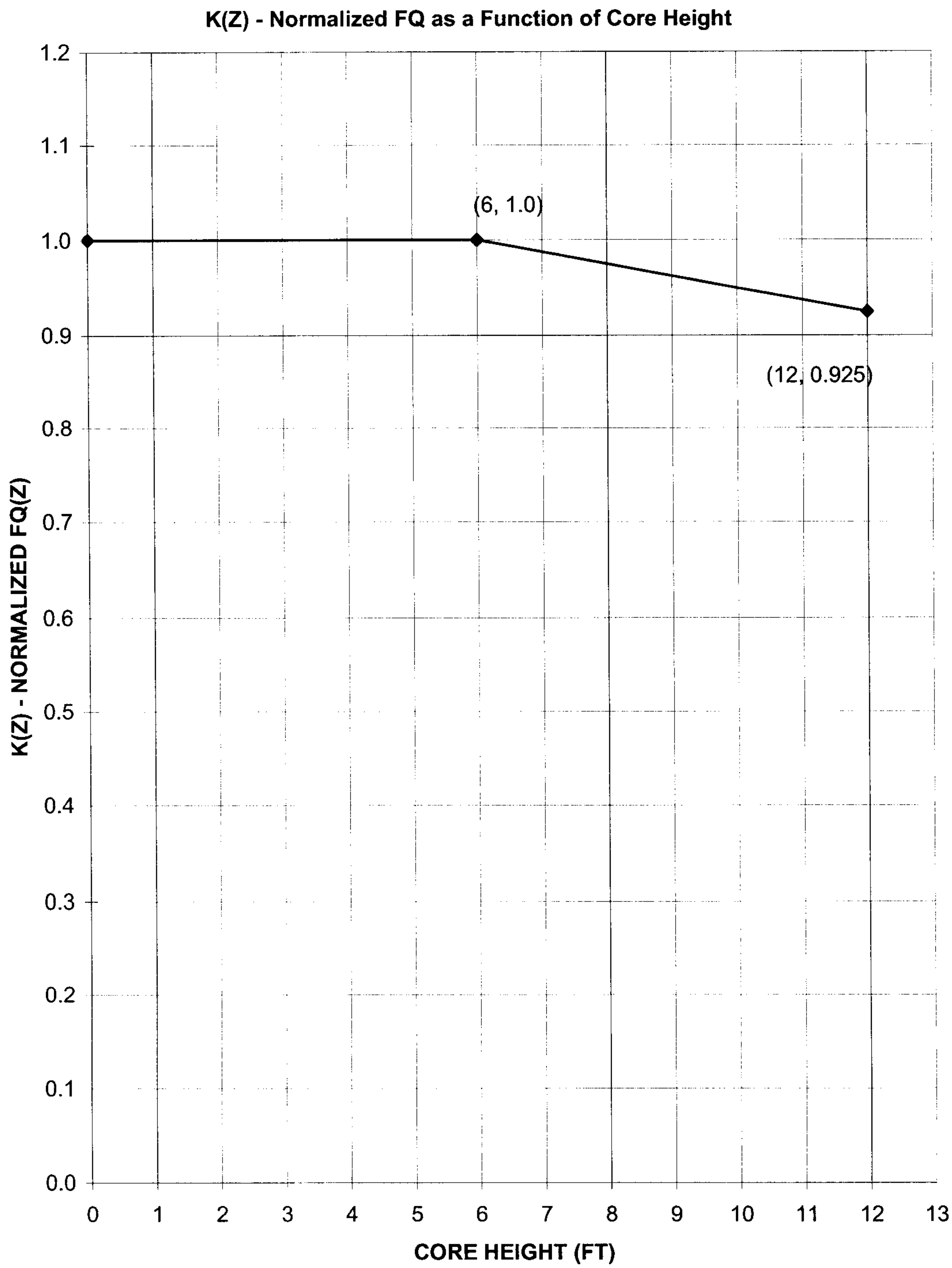

S2C21 ROD GROUP INSERTION LIMITS
Fully w/d position = 226 steps
(0.4688, 226)
C-BANK
(1.0, 183)
(0, 151)
D-BANK
(0, 23)
Rod Group Position, #steps w/d
Fraction of Rated Thermal Power
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

Figure A-2


K(Z) - Normalized FQ as a Function of Core Height
K(Z) - NORMALIZED FQ(Z)
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
(6, 1.0)
(12, 0.925)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
CORE HEIGHT (FT)