VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 12, 2009

U. S. Nuclear Regulatory Commission
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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNIT 2
CYCLE 23 CORE OPERATING LIMITS REPORT REVISION 0

Pursuant to Surry Technical Specification (TS) 6.2.C, enclosed is a copy of Dominion's Core Operating Limits Report (COLR) for Surry Unit 2 Cycle 23 Pattern BOA, Revision 0.

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

Sincerely,

C. L. Funderburk, Director
Nuclear Licensing and Operations Support
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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COLR-S2C23, Revision 0

CORE OPERATING LIMITS REPORT
Surry 2 Cycle 23 Pattern BOA

1.0 INTRODUCTION

This Core Operating Limits Report (COLR) for Surry Unit 2 Cycle 23 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 - Moderator Temperature Coefficient
TS 3.12.A.1, TS 3.12.A.2, TS 3.12.A.3, and TS 3.12.C.3.b.1.b - Control Bank Insertion Limits
TS 3.12.B.1 and TS 3.12.B.2 - Power Distribution Limits
TS 3.12.A.1.a, TS 3.12.A.2.a, and TS 3.12.G - Shutdown Margin

2.0 REFERENCES

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

   (Methodology for TS 3.1.E - Moderator Temperature Coefficient; TS 3.12.A.1, TS 3.12.A.2, TS 3.12.A.3, and TS 3.12.C.3.b.1.b - 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; TS 3.12.A.1.a, TS 3.12.A.2.a, and TS 3.12.G – Shutdown Margin)

2a. WCAP-16009-P-A, "Realistic Large Break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)," (Westinghouse Proprietary), January 2005

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

2b. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985 (Westinghouse Proprietary)

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

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

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

2d. WCAP-12610-P-A, "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, Rev. 0, "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, Rev. 0, "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)

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.1, TS 3.12.A.2, and TS 3.12.C.3.b.1.b)

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.

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

3.3 Shutdown Margin (TS 3.12.A.1.a, TS 3.12.A.2.a, and TS 3.12.G)

3.3.1 Whenever the reactor is subcritical the shutdown margin (SDM) shall be $\geq$1.77 %Δk/k.

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

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

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

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

3.4.1 $CFQ = 2.32$

3.4.2 $K(z)$ is provided in Figure A-2.

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

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

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

3.5.1 $CFDH = 1.56$ for Surry Improved Fuel (SIF)

3.5.2 $PFDH = 0.3$

Figure A-1

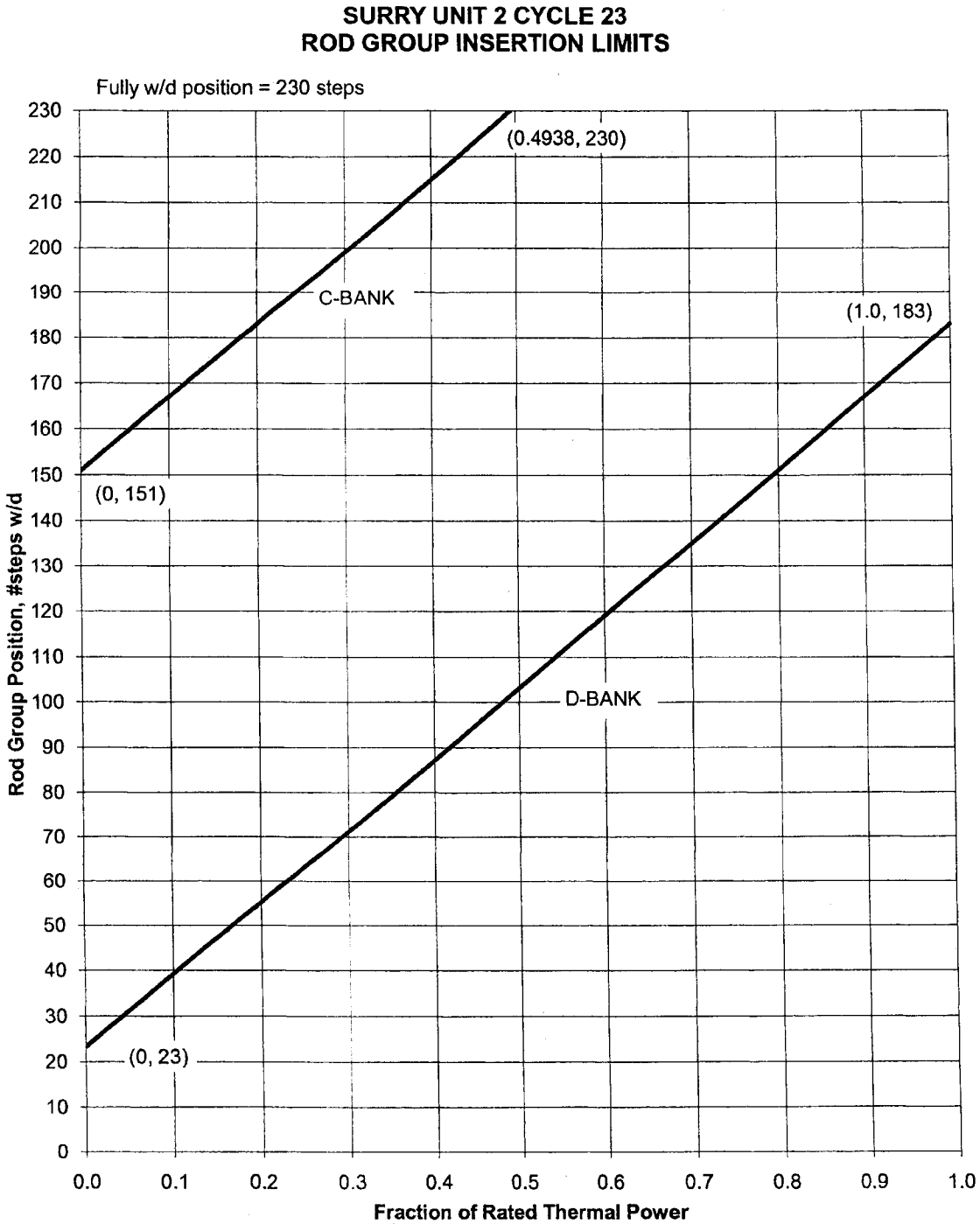
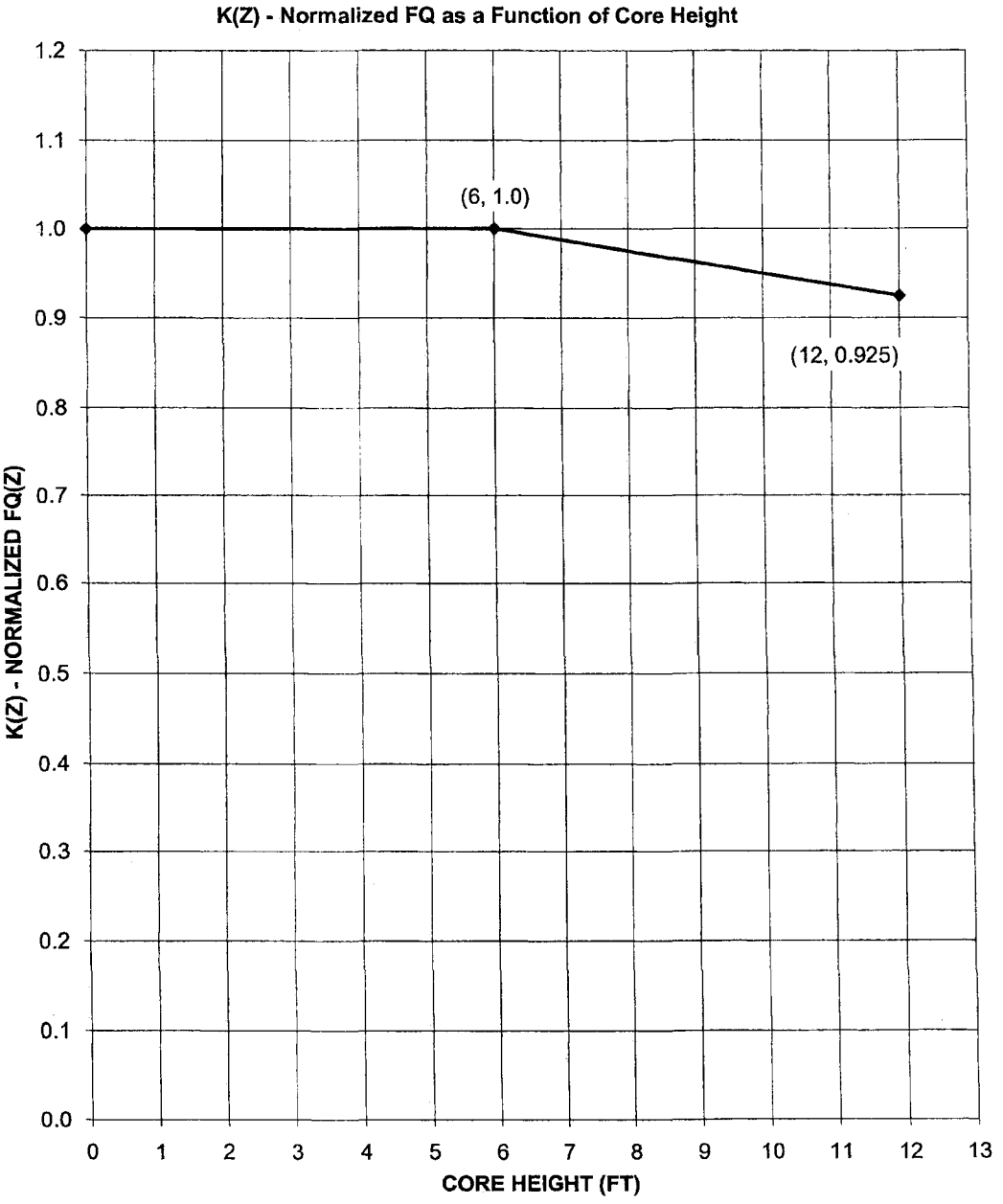

SURRY UNIT 2 CYCLE 23
ROD GROUP INSERTION LIMITS
Fully w/d position = 230 steps
(0.4938, 230)
C-BANK
(1.0, 183)
(0, 151)
D-BANK
(0, 23)
Rod Group Position, #steps w/d
Fraction of Rated Thermal Power
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

Figure A-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