VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

April 23, 2009

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001

Serial No. 09-269
NLOS/vlh
Docket No. 50-280
License No. DPR-32

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNIT 1
CYCLE 23 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 1 Cycle 23 Pattern NXS, 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-S1C23, Revision 0

CORE OPERATING LIMITS REPORT
Surry 1 Cycle 23 Pattern NXS

1.0 INTRODUCTION

This Core Operating Limits Report (COLR) for Surry Unit 1 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.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 - 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-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 (W 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 (W Proprietary)

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

2d. 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)

3.1.1 The Moderator Temperature Coefficient (MTC) limits are:

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

+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 <u>Heat Flux Hot Channel Factor-FQ(z)</u> (TS 3.12.B.1)

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

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

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

3.3.1 $CFQ = 2.32$

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

3.4 <u>Nuclear Enthalpy Rise Hot Channel Factor-FΔH(N)</u> (TS 3.12.B.1)

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

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

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

3.4.2 $PFDH = 0.3$

Figure A-1

SURRY UNIT 1 CYCLE 23
ROD GROUP INSERTION LIMITS

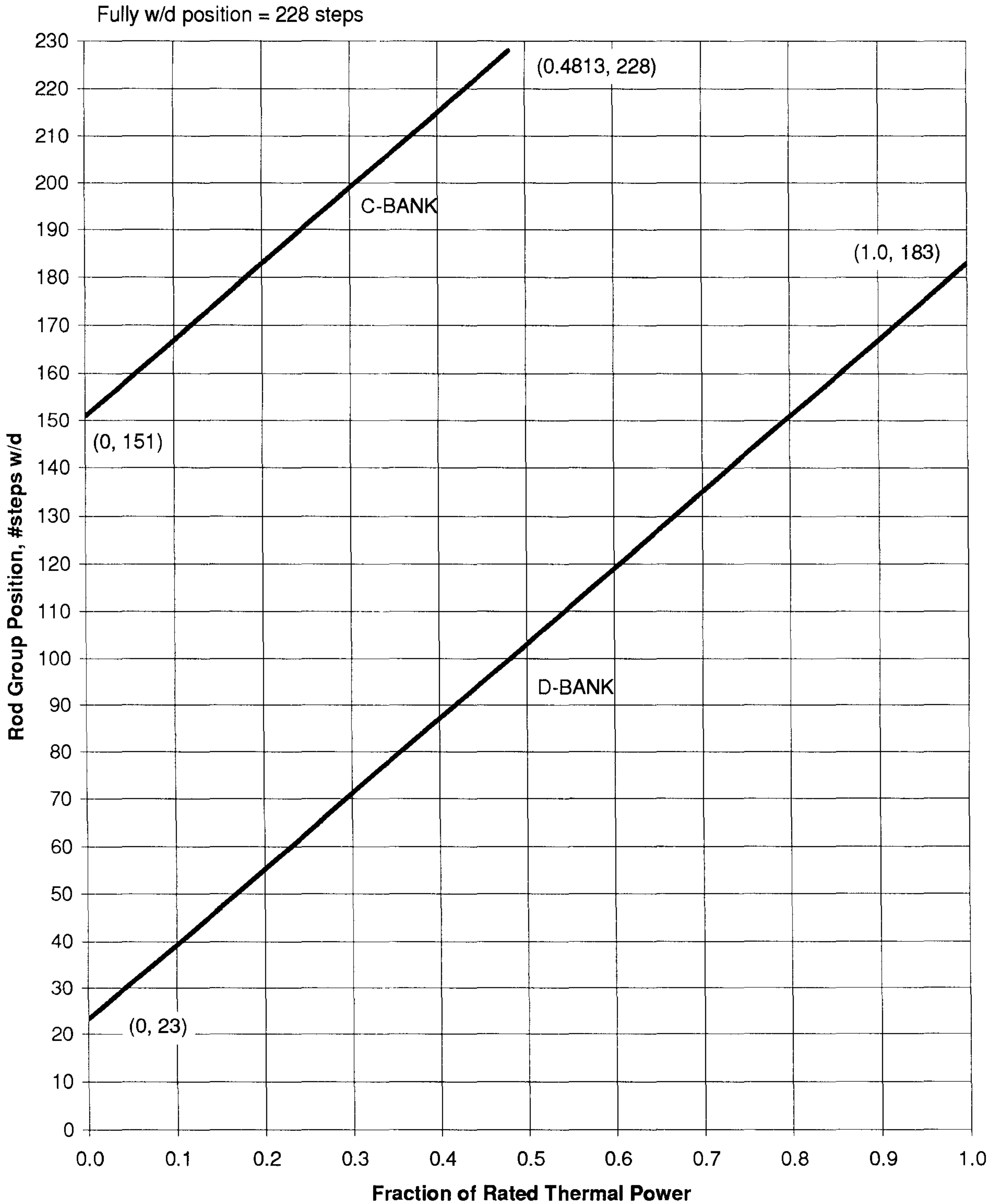
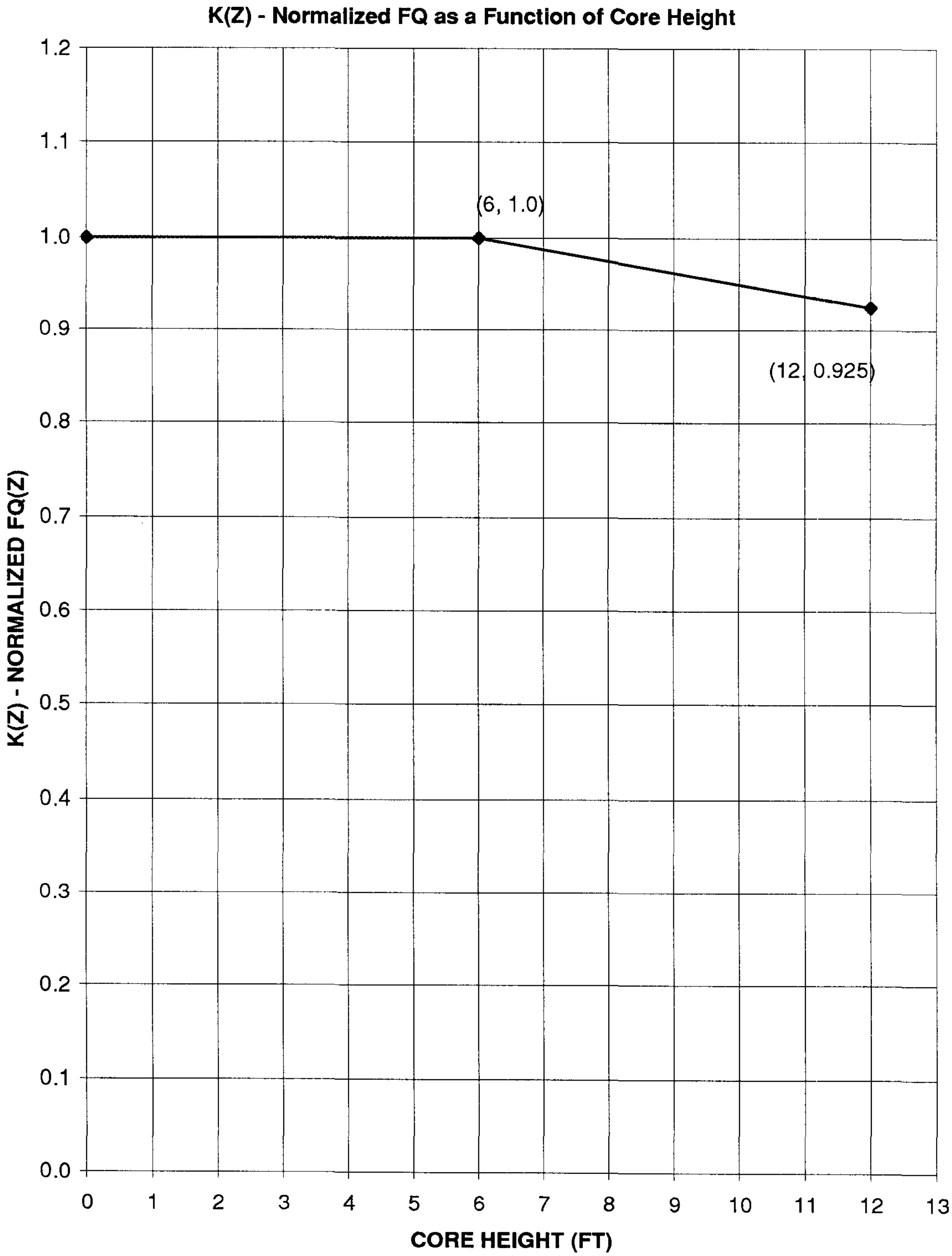


Figure A-2


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