Dominion Resources Services, Inc.
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Dominion

October 20, 2003

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 03-518
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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNIT 1
CYCLE 19 CORE OPERATING LIMITS REPORT

Pursuant to Surry Technical Specification 6.2.C, attached is a copy of Revision 1 of the Virginia Electric and Power Company's (Dominion) Core Operating Limits Report for Surry Unit 1 Cycle 19 Pattern EM. The revised Core Operating Limits Report is being provided as part of implementation activities for changes to the Technical Specifications approved by a letter from Mr. C. Gratton (USNRC) to Mr. D. A. Christian (Dominion), entitled "Surry Units 1 and 2 – Issuance of Amendments Re: Revisions of the Core Operating Limits Report References (TAC Nos. MB9502 and MB9503)," dated August 27, 2003. The changes to the Technical Specifications removed dates and revision numbers in the Administrative Requirements section, and relocated the dates and revision numbers to the cycle-specific Core Operating Limits Report.

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
Nuclear Licensing and Operations Support
Dominion Resources Services, Inc.
for Virginia Electric and Power Company

Attachment

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

A001

cc: U. S. Nuclear Regulatory Commission
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Mr. G. J. McCoy
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Surry Power Station

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

September 2003

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. Surry 1 Cycle 19 was designed under VEP-FRD-42 Rev. 1-A. Approval and implementation of VEP-FRD-42 Revision 2.1-A has been determined to not impact the analyses performed in support of Surry 1 Cycle 19. VEP-FRD-42 Rev. 2.1-A appropriately and accurately defines the methodologies employed in the analyses supporting Surry 1 Cycle 19.

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% 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.

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

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

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

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

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)

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

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

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

3.4.2 $PFDH = 0.3$

Figure A-1

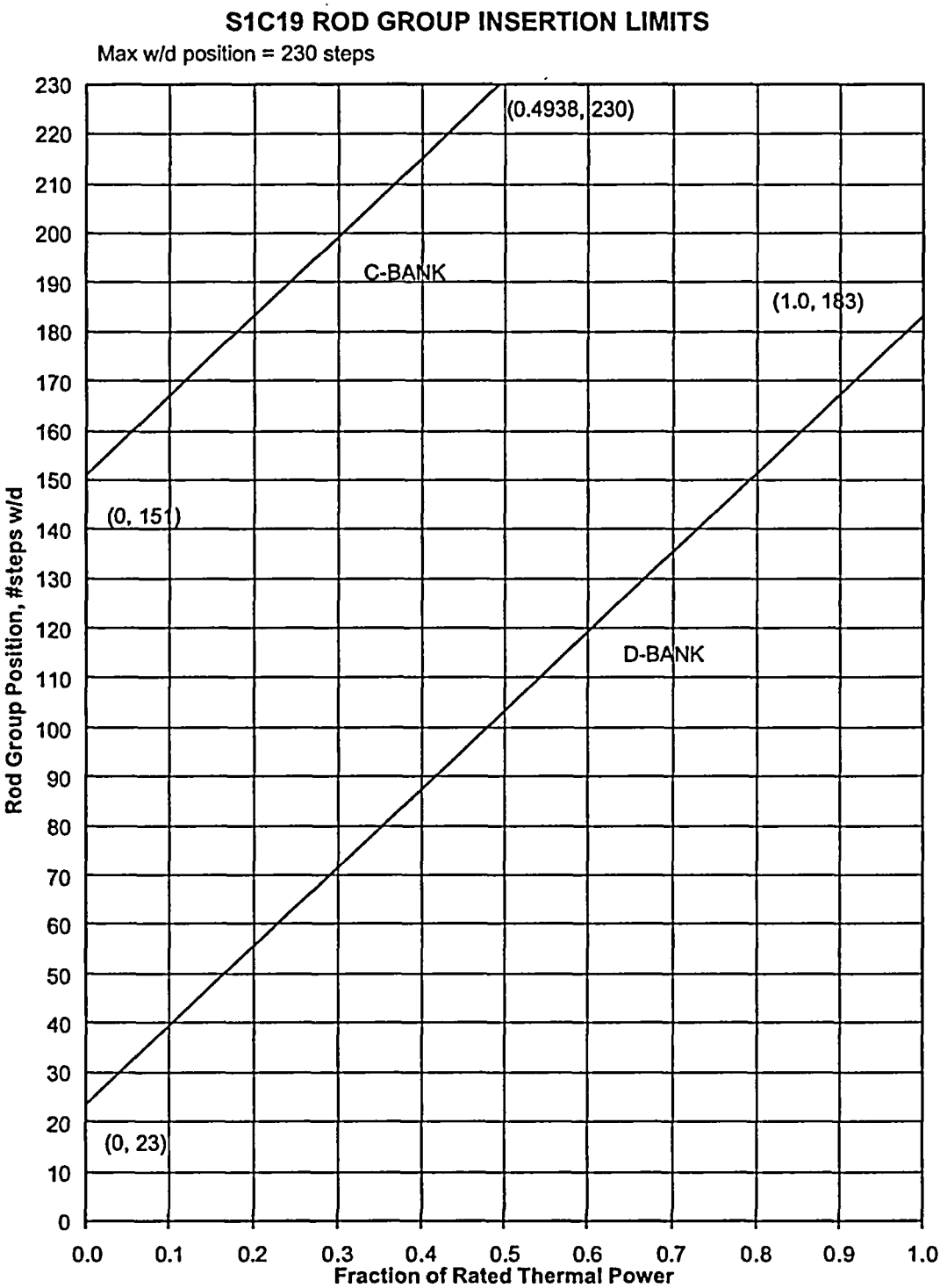
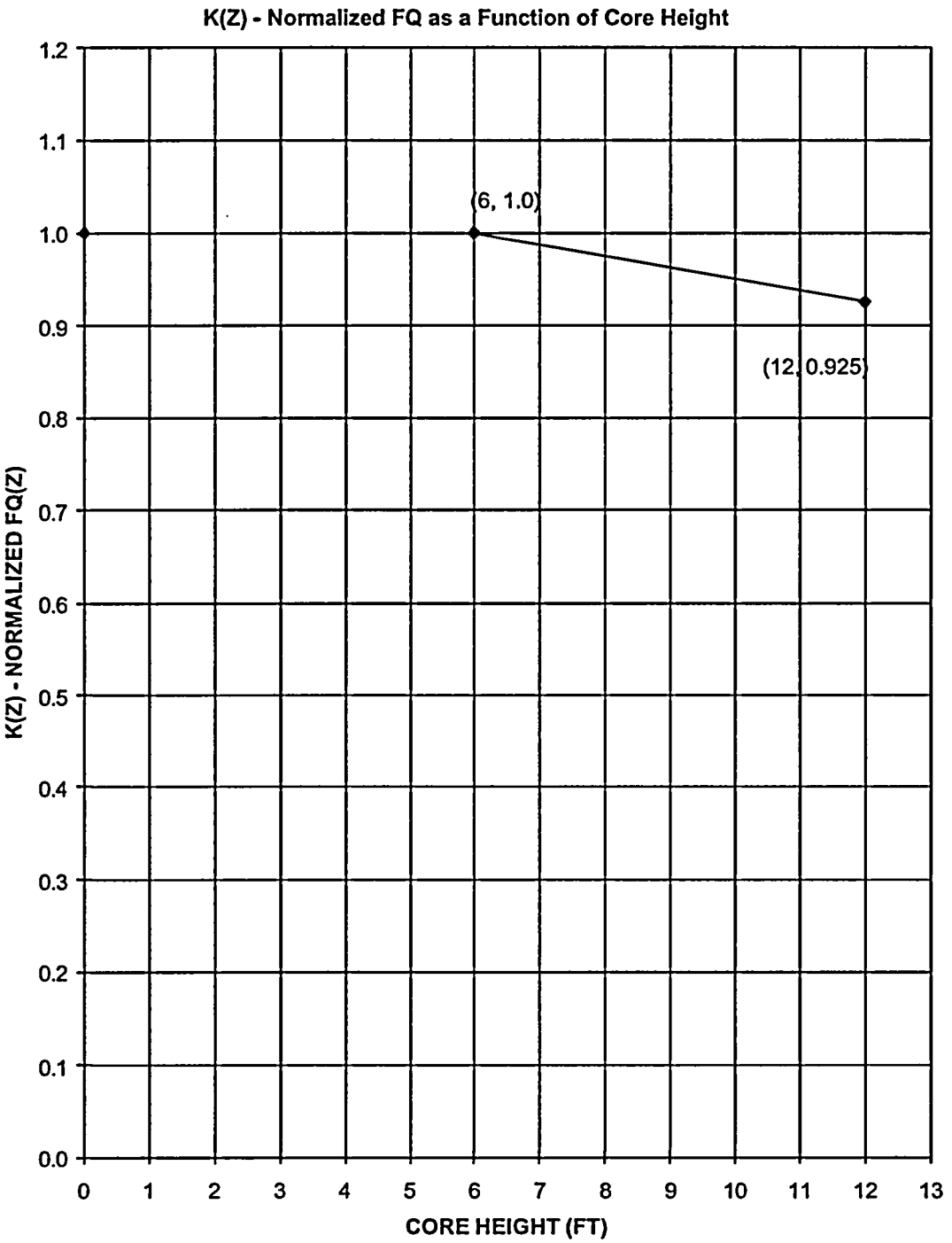

S1C19 ROD GROUP INSERTION LIMITS
Max w/d position = 230 steps
(0.4938, 230)
C-BANK
(1.0, 183)
(0, 151)
D-BANK
(0, 23)
Rod Group Position, #steps w/d
Fraction of Rated Thermal Power
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8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

Figure 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
(6, 1.0)
(12, 0.925)
K(Z) - NORMALIZED FQ(Z)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
CORE HEIGHT (FT)