



December 9, 2004

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

Serial No.: 04-734  
NLOS/VLH  
Docket No.: 50-280  
License No.: DPR-32

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)**  
**SURRY POWER STATION UNIT 1**  
**CYCLE 20 CORE OPERATING LIMITS REPORT**

Pursuant to Surry Technical Specification 6.2.C, attached is a copy of Revision 0 of Dominion's Core Operating Limits Report for Surry Unit 1 Cycle 20 Pattern IT.

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

Very truly yours,

A handwritten signature in black ink, appearing to read "C. L. Funderburk", with a long horizontal line extending to the right.

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.

cc: U. S. Nuclear Regulatory Commission  
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CORE OPERATING LIMITS REPORT  
Surry 1 Cycle 20 Pattern IT  
Revision 0

October 2004

## **1.0 INTRODUCTION**

This Core Operating Limits Report (COLR) for Surry Unit 1 Cycle 20 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% 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)

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

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

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

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)

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

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

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

3.4.2  $PFDH = 0.3$

Figure A-1

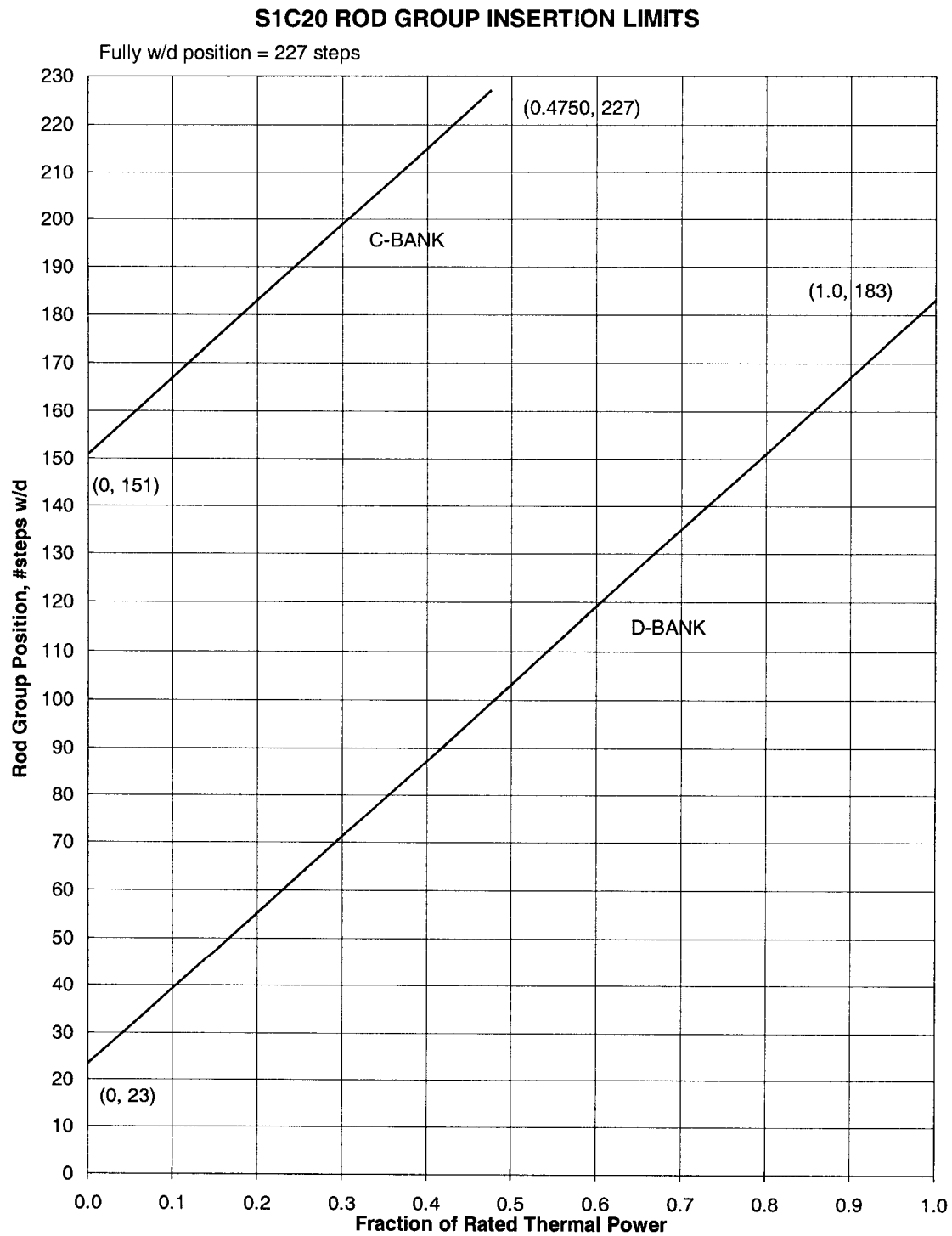


Figure A-2

