



OCT 03 2012

L-2012-356  
10 CFR 50.36

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

Re: Turkey Point Unit 4  
Docket No. 50-251  
Revised Core Operating Limits Report

References:

1. Letter from M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2012-180), "Turkey Point Unit 4 Revised Core Operating Limits Report," April 21, 2012.
2. Letter from M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2012-355), "Turkey Point Unit 4, Nuclear Fuel Pellet Thermal Conductivity Degradation Impact on Current Turkey Point Unit 4 Cycle 26 BE LOCA Analysis Using the 1996 CQD Methodology – 10 CFR 50.46 30-Day Special Report," October 3, 2012.

Florida Power & Light (FPL) letter L-2012-180 (Reference 1), submitted a revision to the Unit 4 Cycle 26 Core Operating Limits Report (COLR) due to implementation of Amendment 243.

In accordance with Technical Specification 6.9.1.7, the attached revised Core Operating Limits Report (COLR) is provided for Turkey Point Unit 4 Cycle 26, superseding the COLR transmitted by Reference 1. The revision to the Turkey Point Unit 4 Cycle 26 COLR includes changes to accommodate the impact of the fuel pellet thermal conductivity degradation (TCD) as described in Reference 2.

Should there be any questions, please contact Robert Tomonto, Licensing Manager, at 305-246-7327.

Very truly yours,

Michael Kiley  
Site Vice President  
Turkey Point Nuclear Plant

Attachment

cc: Regional Administrator, Region II, USNRC  
Senior Resident Inspector, USNRC, Turkey Point Plant

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**TURKEY POINT UNIT 4 CYCLE 26 COLR**

**Appendix A**

**Revised**

**Turkey Point Unit 4 Cycle 26  
Core Operating Limits Report (COLR)**

## TURKEY POINT UNIT 4 CYCLE 26 COLR

### 1.0 INTRODUCTION

This Core Operating Limits Report for Turkey Point Unit 4 Cycle 26 has been prepared in accordance with the requirements of Technical Specification 6.9.1.7.

The Technical Specifications (TS) affected by this report are listed below with the section and page for each one of the TS addressed in this COLR document.

<b><u>Section Technical Specification</u></b>			<b><u>Page</u></b>
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## TURKEY POINT UNIT 4 CYCLE 26 COLR

### 2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in the Introduction are presented below and listed sequentially by Technical Specification (TS). These limits have been developed using the NRC-approved methodologies specified in TS 6.9.1.7.

#### 2.1 Reactor Core Safety Limits – Three Loops in Operation (TS 2.1.1)

- **Figure A1**(page 14B-A6) In Modes 1 and 2, the combination of Thermal Power, reactor coolant system highest loop average temperature and pressurizer pressure shall not exceed the limits in Figure A1.

#### 2.2 Reactor Trip System Instrumentation Setpoints (TS 2.2.1)

##### NOTE 1 on TS Table 2.2-1 Overtemperature $\Delta T$

- $\tau_1 = 0s, \tau_2 = 0s$  Lead/Lag compensator on measured  $\Delta T$
- $\tau_3 = 0s$  Lag compensator on measured  $\Delta T$
- $K_1 = 1.24$
- $K_2 = 0.017/^\circ F$
- $\tau_4 = 25s, \tau_5 = 3s$  Time constants utilized in the lead-lag compensator for  $T_{avg}$
- $\tau_6 = 0s$  Lag compensator on measured  $T_{avg}$
- $T' \leq 577.2 \text{ }^\circ F$  Nominal  $T_{avg}$  at RATED THERMAL POWER
- $K_3 = 0.001/psig$
- $P' \geq 2235 \text{ psig}$  Nominal RCS operating pressure
- $f_1(\Delta I) = 0$  for  $q_t - q_b$  between  $- 50\%$  and  $+ 2\%$ .

**For each percent that the magnitude of  $q_t - q_b$  exceeds  $- 50\%$ , the  $\Delta T$  Trip Setpoint shall be automatically reduced by  $0.0\%$  of its value at RATED THERMAL POWER; and**

**For each percent that the magnitude of  $q_t - q_b$  exceeds  $+ 2\%$ , the  $\Delta T$  Trip Setpoint shall be automatically reduced by  $2.19\%$  of its value at RATED THERMAL POWER.**

Where  $q_t$  and  $q_b$  are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and  $q_t + q_b$  is total THERMAL POWER in percent of RATED THERMAL POWER.

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### NOTE 3 on TS Table 2.2-1 Overpower $\Delta T$

- $K_4 \leq 1.10$
- $K_5 \geq 0.02/^\circ\text{F}$  For increasing average temperature
- $K_5 = 0.0$  For decreasing average temperature
- $\tau_7 \geq 10 \text{ s}$  Time constants utilized in the lead-lag compensator for  $T_{\text{avg}}$
- $K_6 = 0.0016/^\circ\text{F}$  For  $T > T''$
- $K_6 = 0.0$  For  $T \leq T''$
- $T'' \leq 577.2^\circ\text{F}$  Nominal  $T_{\text{avg}}$  at RATED THERMAL POWER
- $f_2(\Delta I) = 0$  For all  $\Delta I$

### 2.3 Shutdown Margin Limit for MODES 1, 2, 3 and 4 (TS 3.1.1.1)

- Figure A2 (page 14B-A7)

### 2.4 Shutdown Margin Limit for MODE 5 (TS 3.1.1.2)

- $\geq 1\% \Delta k/k$

### 2.5 Moderator temperature coefficient (MTC) (TS 3.1.1.3)

- $\leq + 5.0 \times 10^{-5} \Delta k/k/^\circ\text{F}$  BOL, HZP, ARO and from HZP to 70% Rated Thermal Power (RTP)
- From 70% RTP to 100% RTP the MTC decreasing linearly from  $\leq + 5.0 \times 10^{-5} \Delta k/k/^\circ\text{F}$  to  $\leq 0.0 \times 10^{-5} \Delta k/k/^\circ\text{F}$
- Less negative than  $- 35.0 \times 10^{-5} \Delta k/k/^\circ\text{F}$  EOL, RTP, ARO

### 2.6 Moderator temperature coefficient (MTC) Surveillance at 300 ppm (TS 4.1.1.3)

- Less negative than  $- 30.0 \times 10^{-5} \Delta k/k/^\circ\text{F}$  Within 7 EFPD of reaching equilibrium boron concentration of 300 ppm.

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### 2.7 Analog Rod Position Indication System (TS 3.1.3.2)

- **Figure A3** (page 14B-A8) The All Rods Out (ARO) position for all shutdown Banks and Control Banks is defined to be 228 steps withdrawn.

### 2.8 Control Rod Insertion Limits (TS 3.1.3.6)

- **Figure A3** (page 14B-A8) The control rod banks shall be limited in physical insertion as specified in Figure A3 for ARO =228 steps withdrawn.

### 2.9 Axial Flux Difference (TS 3.2.1)

- **Figure A4** (page 14B-A9)

### 2.10 Heat Flux Hot Channel Factor $F_Q(Z)$ (TS 3.2.2)

- $[FQ]^L = 2.47$
- $K(z) = 1.0$  For  $0' \leq z \leq 12'$  where  $z$  is core height in ft

### 2.11 Nuclear Enthalpy Rise Hot Channel Factor (TS 3.2.3)

- $F_{\Delta H}^{RTP} = 1.63$
- $PF_{\Delta H} = 0.3$

### 2.12 DNB Parameters (TS 3.2.5)

- $RCS \text{ Tavg} \leq 581.2 \text{ } ^\circ\text{F}$
- **Pressurizer Pressure  $\geq 2200$  psig**

TURKEY POINT UNIT 4 CYCLE 26 COLR

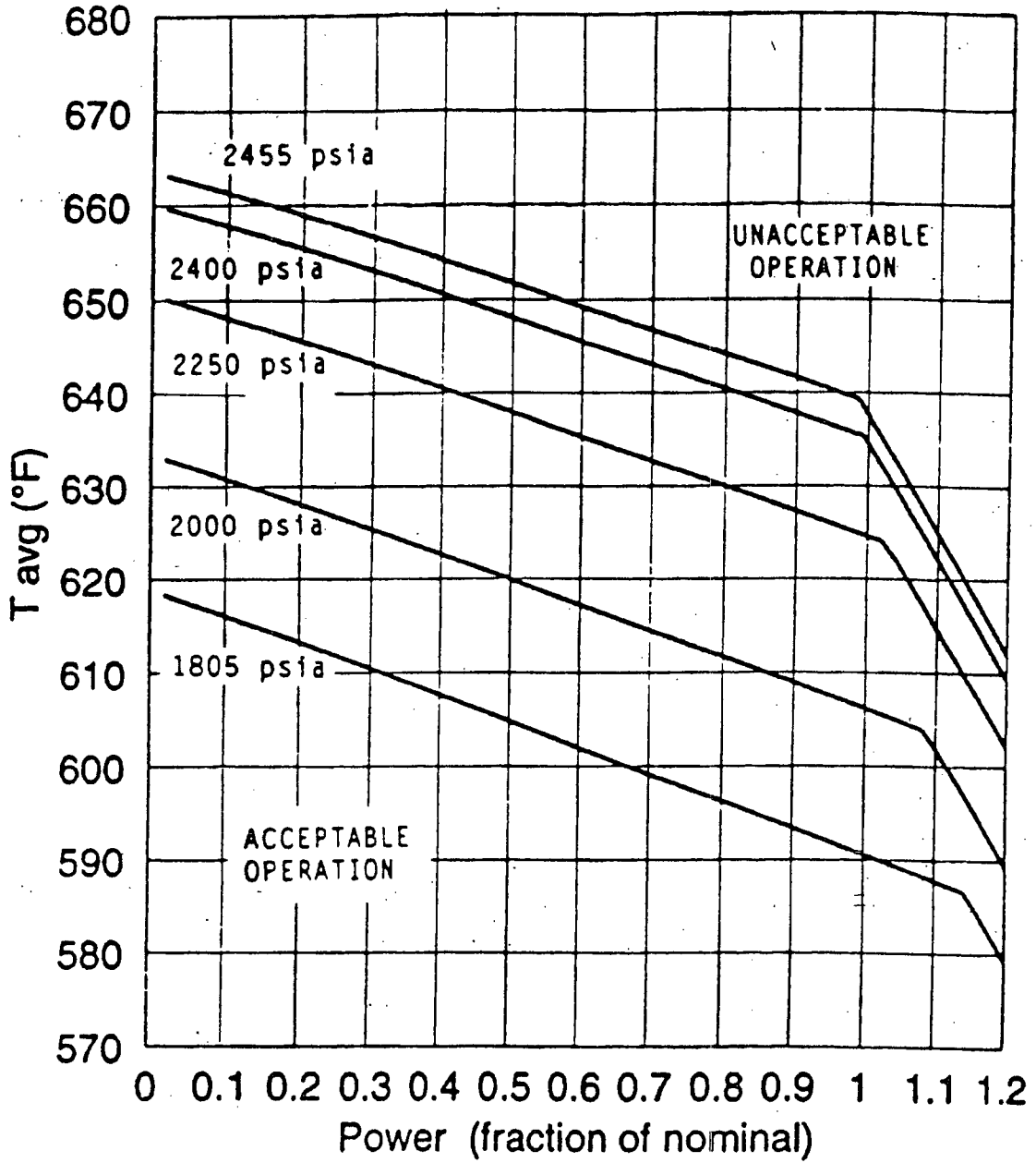


FIGURE A1

Reactor Core Safety Limit – Three Loops in Operation

TURKEY POINT UNIT 4 CYCLE 26 COLR

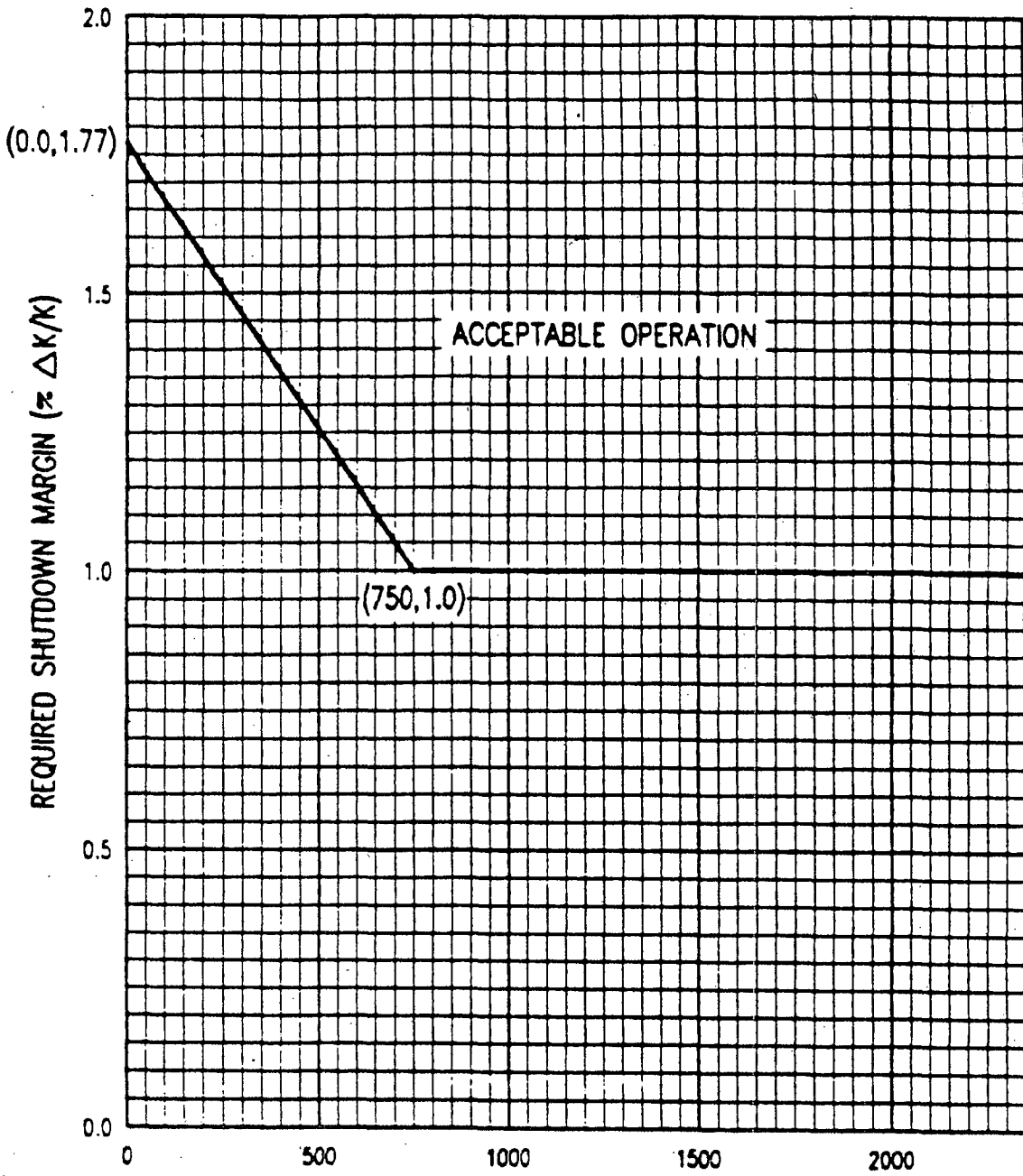


FIGURE A2

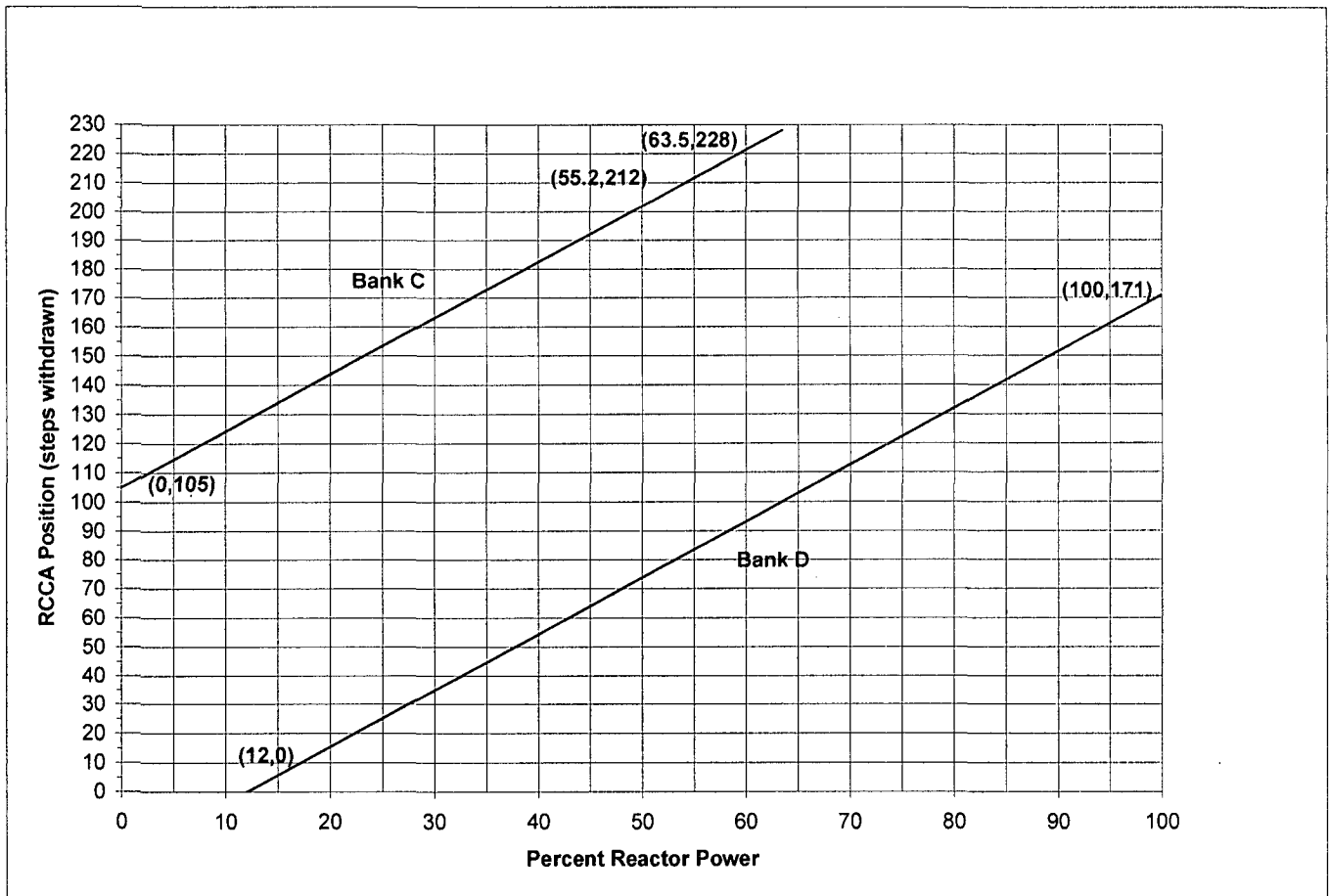
Required Shutdown Margin vs Reactor Coolant  
Boron Concentration



### TURKEY POINT UNIT 4 CYCLE 26 COLR

#### FIGURE A3

Turkey Point Unit 4 Cycle 26 Rod Insertion Limits vs Thermal Power  
ARO = 228 Steps Withdrawn, Overlap = 100 Steps



TURKEY POINT UNIT 4 CYCLE 26 COLR

FIGURE A4

Axial Flux Difference as a Function of Rated Thermal Power  
Turkey Point Unit 4 Cycle 26

