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WOLF CREEK NUCLEAR OPERATING CORPORATION

Wolf Creek Generating Station
Cycle 8
Core Operating Limits Report
Revision 0

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CYCLE 8

CORE OPERATING LIMITS REPORT
Revision 0

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1.0 CORE OPERATING LIMITS REPORT

The CORE OPERATING LIMITS REPORT (COLR) for Wolf Creek Generating Station Cycle 8 has been prepared in accordance with the requirements of Technical Specification 6.9.1.9.

The core operating limits that are included in the COLR affect the following Technical Specifications:

- 3.1.1.3.b Moderator Temperature Coefficient (MTC) EOL Limit
- 3.1.3.5 Shutdown Rod Insertion Limit
- 3.1.3.6 Control Rod Insertion Limit
- 3.2.1 Axial Flux Difference (AFD)
- 3.2.2 Heat Flux Hot Channel Factor - $F_Q(x, y, z)$
- 3.2.3 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(x, y)$
- 3.9.1.b Refueling Boron Concentration

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the subsections below:

2.1 Moderator Temperature Coefficient (MTC) EOL Limit

(Tech Spec 3.1.1.3.b)

The EOL MTC shall be less negative than -41 pcm/deg F.

(Tech Spec 4.1.1.3.b)

The 300 PPM MTC Surveillance Limit is -32 pcm/deg F (all rods withdrawn, Rated Thermal Power condition).

2.2 Shutdown Rod Insertion Limit

(Tech Spec 3.1.3.5)

The shutdown rods shall be fully withdrawn, as defined in Figure 1.

2.3 Control Rod Insertion Limits

(Tech Spec 3.1.3.6)

The Control Bank Insertion Limits are specified in Figure 1.

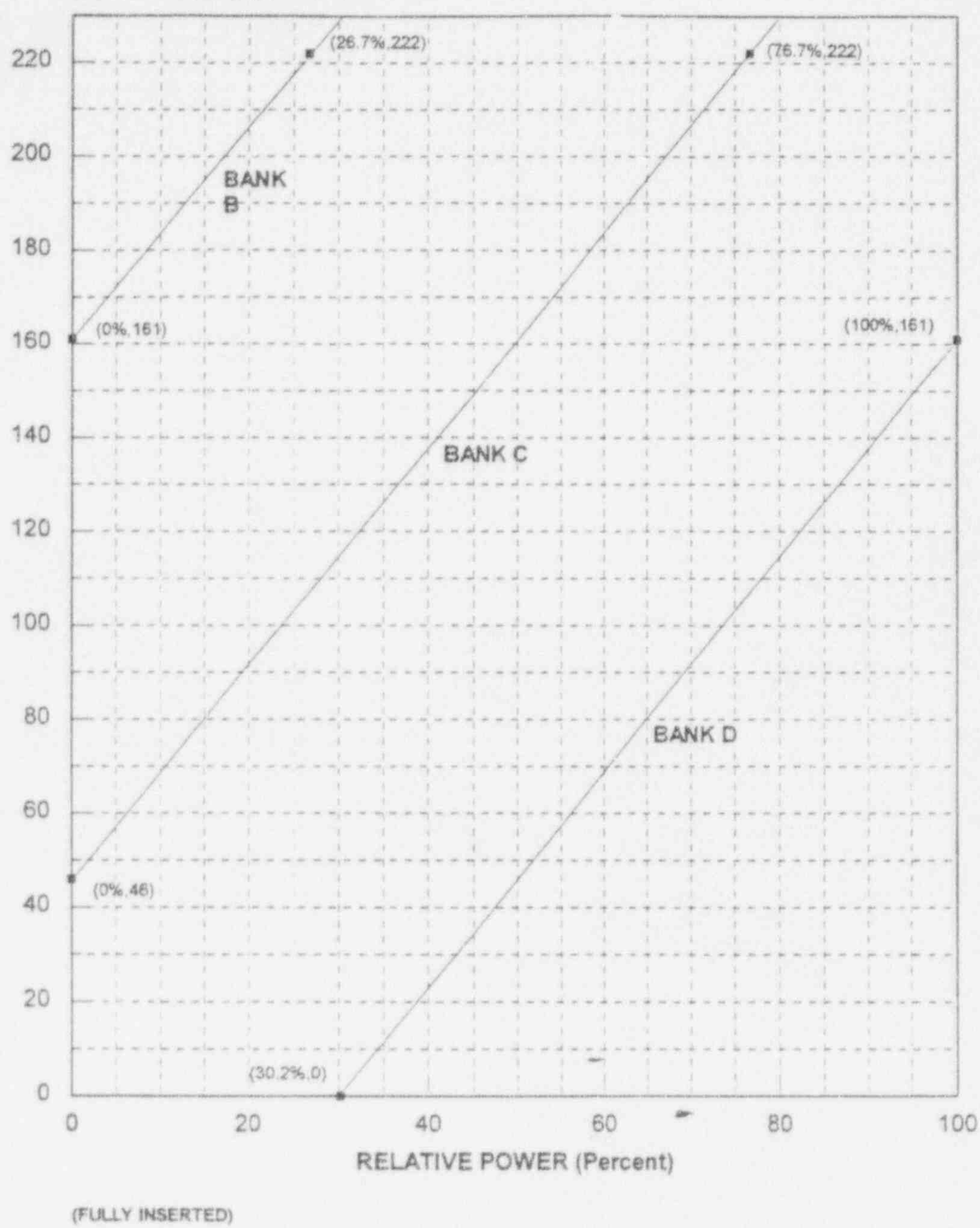

FIGURE 1

ROD BANK INSERTION LIMIT VERSUS
THERMAL POWER-FOUR LOOP OPERATION

Fully Withdrawn shall be the condition where control rods are at a position within the interval of $\geq$ 222 and $\leq$ 231 steps withdrawn.

2.4 Axial Flux Difference (AFD)

(Tech Spec 3.2.1)

The indicated Axial Flux Difference (AFD) allowed operational space is defined by Figure 2.

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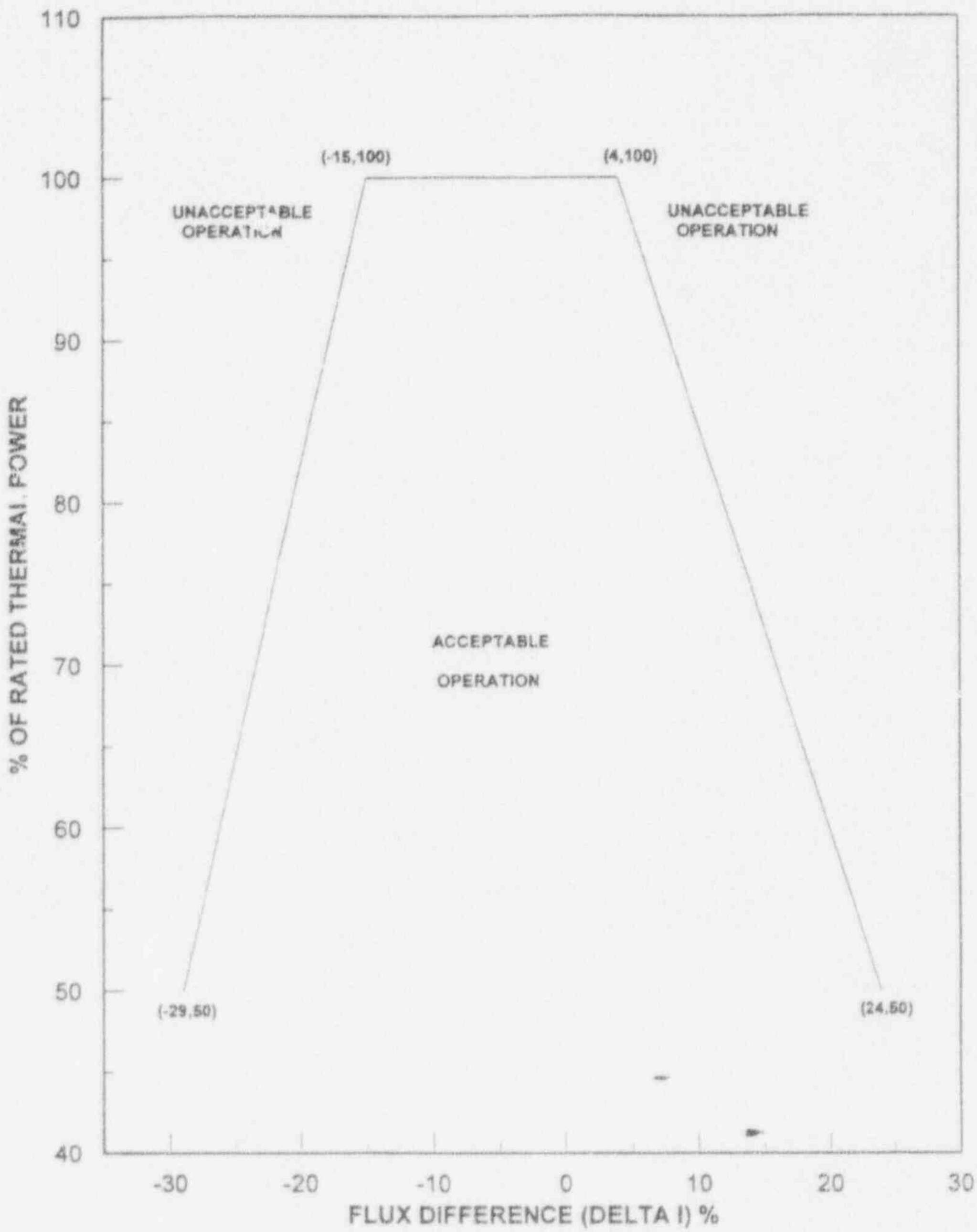


FIGURE 2
WOLF CREEK UNIT 1
AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER

2.5 Heat Flux Hot Channel Factor - $F_Q(x, y, z)$

(Tech Spec 3.2.2)

$$F_Q^{MA}(x,y,z) \leq \frac{F_Q^{RTP}}{P} * K(z), \quad \text{for } P > 0.5$$

$$F_Q^{MA}(x,y,z) \leq \frac{F_Q^{RTP}}{0.5} * K(z), \quad \text{for } P \leq 0.5$$

where, $P = \dfrac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$,

F_Q^{RTP} = the F_Q at RATED THERMAL POWER

= 2.50, and

K(z) is defined in Figure 3.

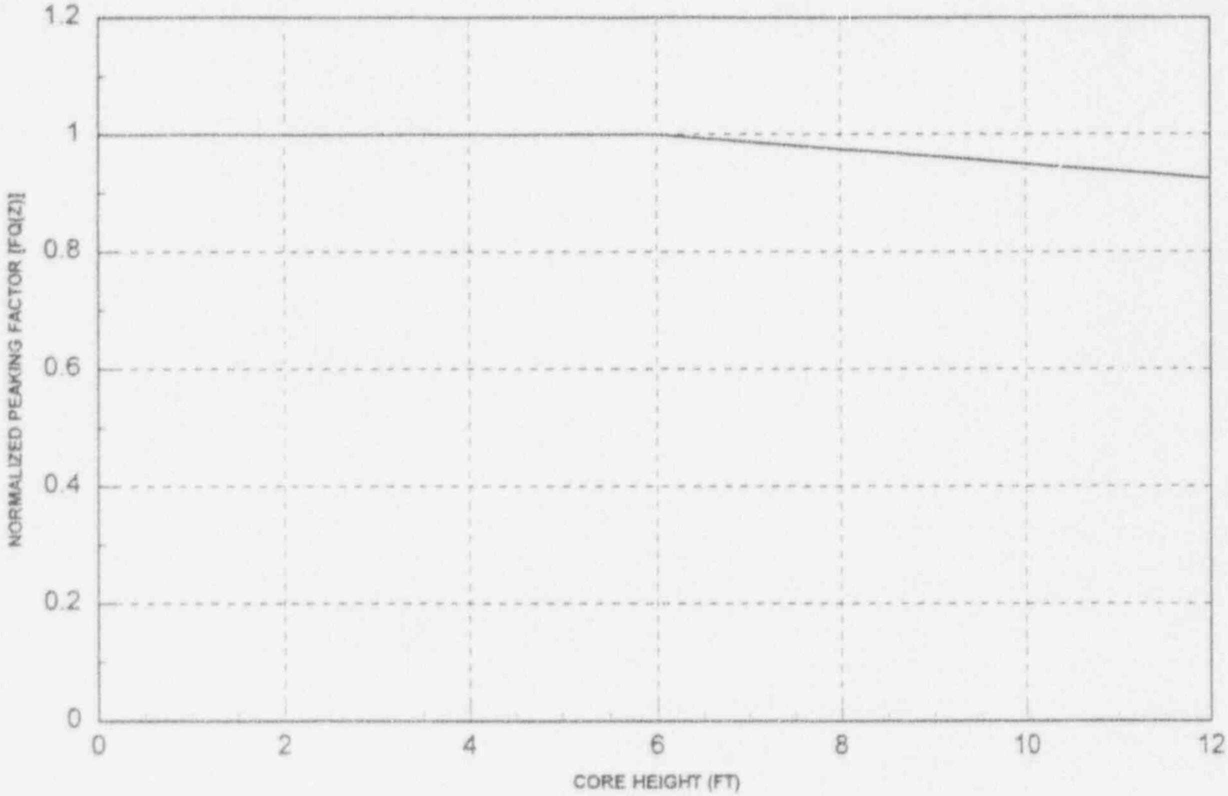
(Tech Spec 4.2.2.2.d)

See Appendix A for:

1. $F_Q(x, y, z)]^{NOM}$, $F_Q^L(x, y, z)]^{OP}$, and $F_Q^L(x, y, z)]^{RPS}$
2. Op Mar NSLOPE and Op Mar PSLOPE
3. RPS Mar NSLOPE and RPS Mar PSLOPE

FIGURE 3

K(Z)-NORMALIZED PEAKING FACTOR VS. CORE HEIGHT



FQT=2.50

Elevation (ft)	K(Z)
0.0	1.0
6.0	1.0
12.0	0.925

2.6 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(x, y)$

(Tech Spec 3.2.3)

$F_{\Delta H}(x, y)$ shall be limited by the relationship

$$F\Delta HR^{M}(x,y) \leq F\Delta HR^{L}(x,y)$$

See Appendix A for array $F\Delta HR^{L}(x,y)$.

(ACTIONS a, b)

See Appendix A for RRH

(ACTION c)

See Appendix A for TRH

(Tech Spec 4.2.3.2.b)

See Appendix A for array $F\Delta HR^{NOM}(x,y)$

Definitions - $F\Delta HR\ (x,y)$

Limit:

$$F\Delta HR^{L}(x,y)=\frac{F_{\Delta H}^{D}}{MAP^{D}\left[h^{D}(x,y),AX^{D}(x,y)\right]/AX^{D}(x,y)}*\frac{1}{MH(x,y)}$$

where,

$F_{\Delta H}^{D}$ = Design $F_{\Delta H}$ for the assembly at location (x,y),

MAP^{D} = Design Maximum Allowable Peak at $h^{D}(x,y)$ and $AX^{D}(x,y)$,

$h^{D}(x,y)$ = Axial location of the design axial power peak at (x,y),

$AX^{D}(x,y)$ = Ratio of the peak to average axial power at (x,y) for the design power distribution, and

$MH(x,y)$ = Minimum available margin ratio at (x,y)

Measurement:

$$F\Delta HR^{M}(x,y)=\frac{F_{\Delta H}^{M}}{MAP^{M}\left[h^{M}(x,y),AX^{M}(x,y)\right]/AX^{M}(x,y)}$$

where,

$F_{\Delta H}^{M}$ = Measured $F_{\Delta H}$ for the assembly at location (x,y),

MAP^{M} = Maximum Allowable Peak at $h^{M}(x,y)$ and $AX^{M}(x,y)$,

$h^{M}(x,y)$ = Axial location of the measured axial power peak at (x,y), and

$AX^{M}(x,y)$ = Ratio of the peak to average axial power at (x,y) for the measured power distribution.

2.7 Refueling Boron Concentration

(Tech Spec 3.9.1.b)

The refueling boron concentration shall be greater than or equal to 2300 PPM.

APPENDIX A

A. Input relating to Specification 4.2.2.2.d:

1. $F_Q(x, y, z)]^{NOM}$: Nominal design peaking

   $F_Q^L(x, y, z)]^{OP}$: Operational design peaking limit

   $F_Q^L(x, y, z)]^{RPS}$: Reactor Protection Setpoint (RPS) design peaking limit.

   These are a large number of large arrays. They are issued in a controlled report which will be provided on request.

   The design peaking limits include all uncertainties.

2. Op Mar NSLOPE = 2.0% / %margin

   Op Mar PSLOPE = 2.4% / %margin

3. RPS Mar NSLOPE = 1.20% / %margin

   RPS Mar PSLOPE = 1.92% / %margin

APPENDIX A
(Continued)

B. Input relating to Specification 3.2.3:

1. $F\Delta HR^{L}(x,y)$: The maximum allowable radial peak ratio

These are a large number of large arrays. They are issued in a controlled report which will be provided on request.

The design peaking limits include all uncertainties.

2. RRH = 3.33

3. TRH = 0.038

C. Input relating to Specification 4.2.3.2.b:

1. $F\Delta HR^{NOM}(x,y)$: Nominal design radial peak ratio

These are a large number of large arrays. They are issued in a controlled report which will be provided on request.