WOLF CREEK
NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION
CYCLE 10

CORE OPERATING LIMITS REPORT
Revision 1

November 14, 1997

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WOLF CREEK
NUCLEAR OPERATING CORPORATION

1.0 CORE OPERATING LIMITS REPORT

The CORE OPERATING LIMITS REPORT (COLR) for Wolf Creek Generating Station Cycle 10 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 - $F_Q(Z)$
- 3.2.3 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}^N$
- 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 -50 pcm/deg F.

(Tech Spec 4.1.1.3.b)

The 300 PPM MTC Surveillance Limit is -41 pcm/deg F (all rods withdrawn, Rated Thermal Power condition).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The shutdown rods shall be fully withdrawn (i.e., positioned within the interval of ≥ 222 and ≤ 231 steps withdrawn).

2.3 Control Rod Insertion Limits

(Tech Spec 3.1.3.6)

The Control Bank Insertion Limits are specified in Figure 1.

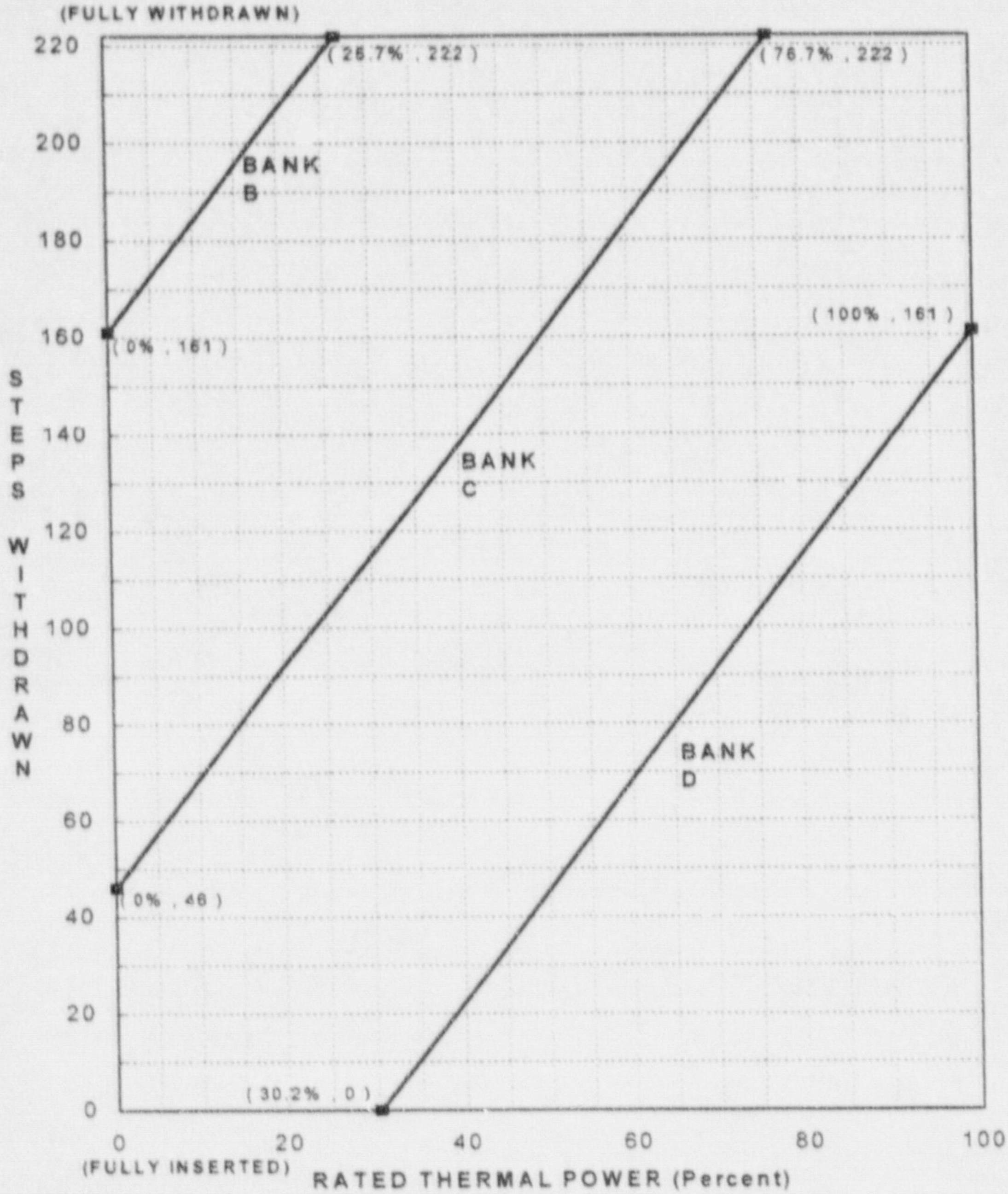

Figure 1

Rod Bank Insertion Limits Versus Thermal Power-Four Loop Operation

Fully Withdrawn shall be the condition where control rods are at a position within the interval of ≥ 222 and ≤ 231 steps withdrawn.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.

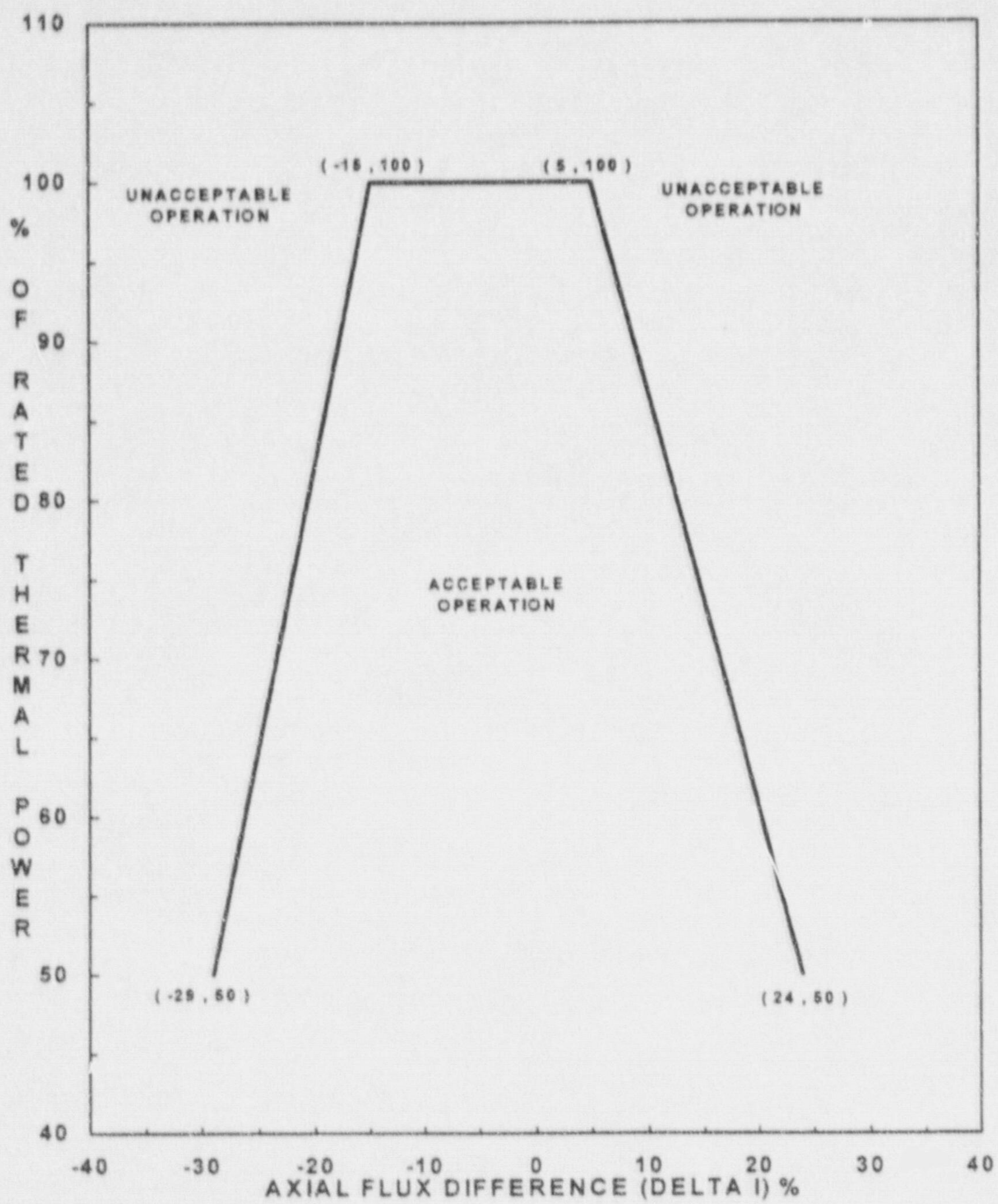

Figure 2

Axial Flux Difference Limits as a Function of Rated Thermai Power

2.5 Heat Flux Hot Channel Factor - $F_Q(Z)$

(Tech Spec 3.2.2)

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

$$F_Q(Z) \leq \frac{F_Q^{RTP}}{0.5} * K(Z), \quad \text{for P} \leq 0.5$$

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

F_Q^{RTP} = the $F_Q(Z)$ Limit at RATED THERMAL POWER (RTP)

= 2.50, and

$K(Z)$ is defined in Figure 3.

(Tech Spec 4.2.2.2.c)

$$F_Q^M(Z) \leq \frac{\left[F_Q^{RTP}\right]\left[K(Z)\right]}{\left[P\right]\left[W(Z)\right]} \quad \text{for P} > 0.5$$

$$F_Q^M(Z) \leq \frac{\left[F_Q^{RTP}\right]\left[K(Z)\right]}{\left[W(Z)\right]\left[0.5\right]} \quad \text{for P} \leq 0.5$$

W(Z) = Ratio of the F_Q from normal operation transients to the F_Q at steady state conditions

(Tech Spec 4.2.2.2.e.1)

With measurements indicating

$$\underset{\text{over z}}{\text{maximum}} \left(\frac{F_Q^M(Z)}{K(Z)} \right)$$

has increased since the previous determination of $F_Q^M(Z)$, $F_Q^M(Z)$ shall be increased over that specified in 4.2.2.2.c by an appropriate factor, the F_Q Penalty Factor.

See Appendix A for:

1. $W(Z)$

1. F_Q Penalty Factor

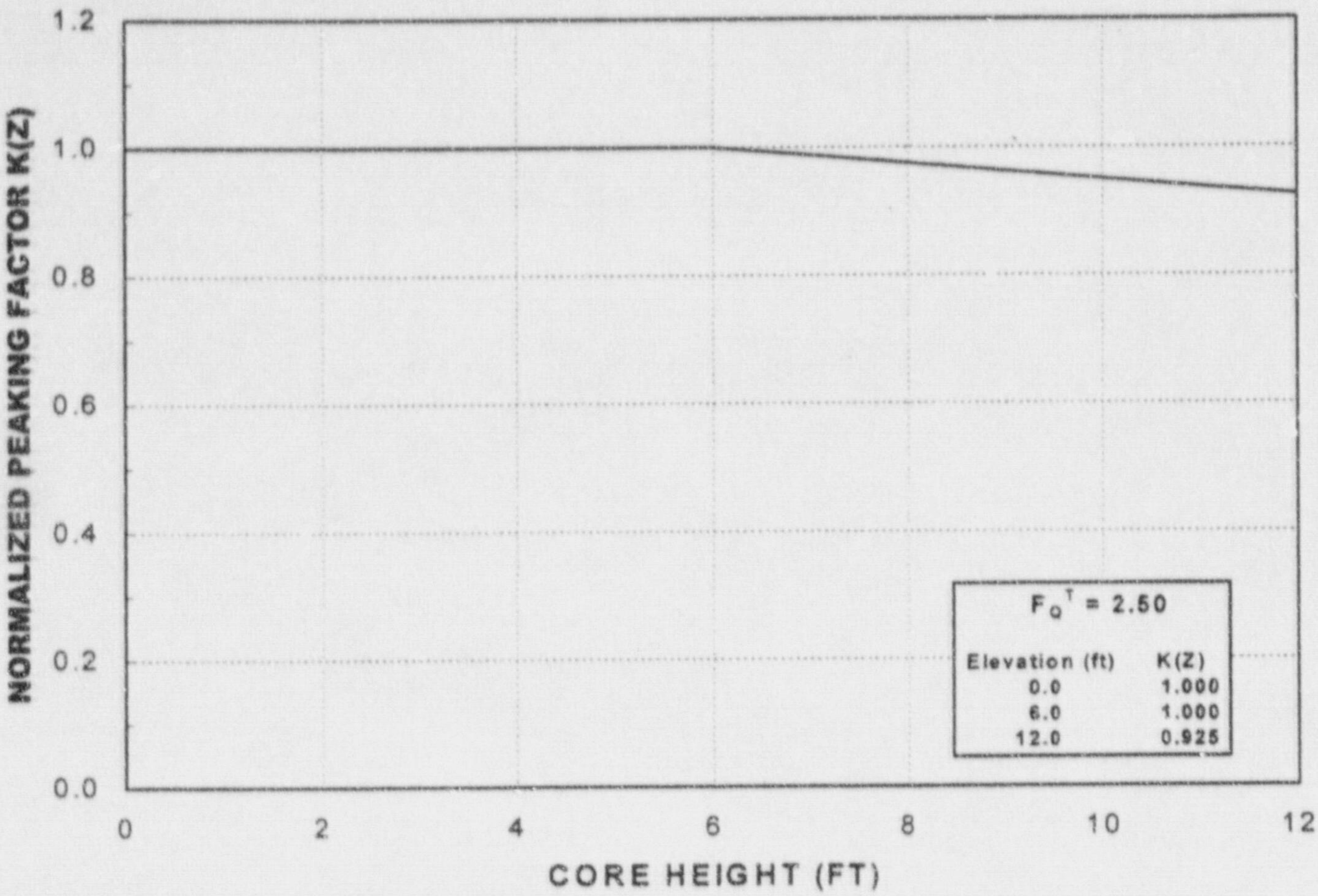

Figure 3

K(Z) - Normalized Peaking Factor Vs. Core Height

2.6 Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}^{N}$

(Tech Spec 3.2.3)

$F_{\Delta H}^{N}$ shall be limited by the following relationship:

$$F_{\Delta H}^{N} \le F_{\Delta H}^{RTP}\left[1.0 + PF_{\Delta H}(1.0 - P)\right]$$

Where,

$F_{\Delta H}^{RTP}$ = The $F_{\Delta H}^{N}$ limit at RATED THERMAL POWER (RTP)

= 1.59

$PF_{\Delta H}$ = the power factor multiplier for $F_{\Delta H}^{N}$

= 0.3

$$P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

$F_{\Delta H}^{N}$ = Measured values of $F_{\Delta H}^{N}$ obtained by using the movable incore detectors to obtain a power distribution map. The measured values of $F_{\Delta H}^{N}$ shall be used since an uncertainty of 4% for incore measurement of $F_{\Delta H}^{N}$ has been included in the above limit.

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.c:

$$W(Z) = \frac{F_Q(Z)^{\text{max transient}}}{F_Q(Z)^{\text{steady state}}}$$

These values are issued in a controlled report which will be provided on request.

Input relating to Specification 4.2.2.2.e.1

Cycle Burnup	$F_Q^M(Z)$ Penalty Factor
0	2.00
21000	2.00

Note: All cycle burnups outside of the above table shall use a 2% penalty factor for compliance with 4.2.2.2.e Surveillance Requirement. Linear interpolation should be used for intermediate cycle burnups.

Technical Specification BASES 3/4.2.5

Cycle 10 Safety Analysis DNB Limit	1.76
WRB-2 Design Limit DNBR	1.23