DPR-66

BEAVER VALLEY UNIT 1

CYCLE 12

CORE OPERATING LIMITS REPORT

This Core Operating Limits Report provides the cycle specific parameter limits developed in accordance with the NRC approved methodologies specified in Technical Specification Administrative Control 6.9.1.12.

Specification 3.1.3.5 Shutdown Rod Insertion Limits

The shutdown rods shall be withdrawn to at least 225 steps.

Specification 3.1.3.6 Control Rod Insertion Limits

Control Banks A and B shall be withdrawn to at least 225 steps.

Control Banks C and D shall be limited in physical insertion as shown in Figure 1.

Specification 3.2.1 Axial Flux Difference

NOTE: The target band is ±7% about the target flux from 0% to 100% RATED THERMAL POWER.

The indicated Axial Flux Difference:

a. Above 90% RATED THERMAL POWER shall be maintained within the ±7% target band about the target flux difference.

b. Between 50% and 90% RATED THERMAL POWER is within the limits shown on Figure 2.

c. Below 50% RATED THERMAL POWER may deviate outside the target band.

Specification 3.2.2 $F_Q(Z)$ and $F_{xy}$ Limits

$$F_Q(Z) \leq \frac{CFQ}{P} * K(Z) \qquad \text{for } P > 0.5$$

$$F_Q(Z) \leq \frac{CFQ}{0.5} * K(Z) \qquad \text{for } P \leq 0.5$$

Where: CFQ = 2.4 P = $\frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$

K(Z) = the function obtained from Figure 3.

The $F_{xy}$ limits [$F_{xy}(L)$] for RATED THERMAL POWER within specific core planes shall be:

$F_{xy}(L) = F_{xy}(RTP) \quad (1 + PFXY * (1-P))$

Where: For all core planes containing D-BANK:

$F_{xy}(RTP) \leq 1.71$

For unrodded core planes:

$F_{xy}(RTP) \leq 1.82$ from 1.8 ft. elevation to 9.40 ft. elevation

$F_{xy}(RTP) \leq 1.76$ from 9.40 ft. elevation to 10.20 ft. elevation

$PFXY = 0.2$

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

Figure 4 provides the maximum total peaking factor times relative power ($F_Q^T * P_{rel}$) as a function of axial core height during normal core operation.

Specification 3.2.3 FNDH

$FNDH \leq CFDH * (1 + PFDH * (1-P))$

Where: $CFDH = 1.62$

$PFDH = 0.3$

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

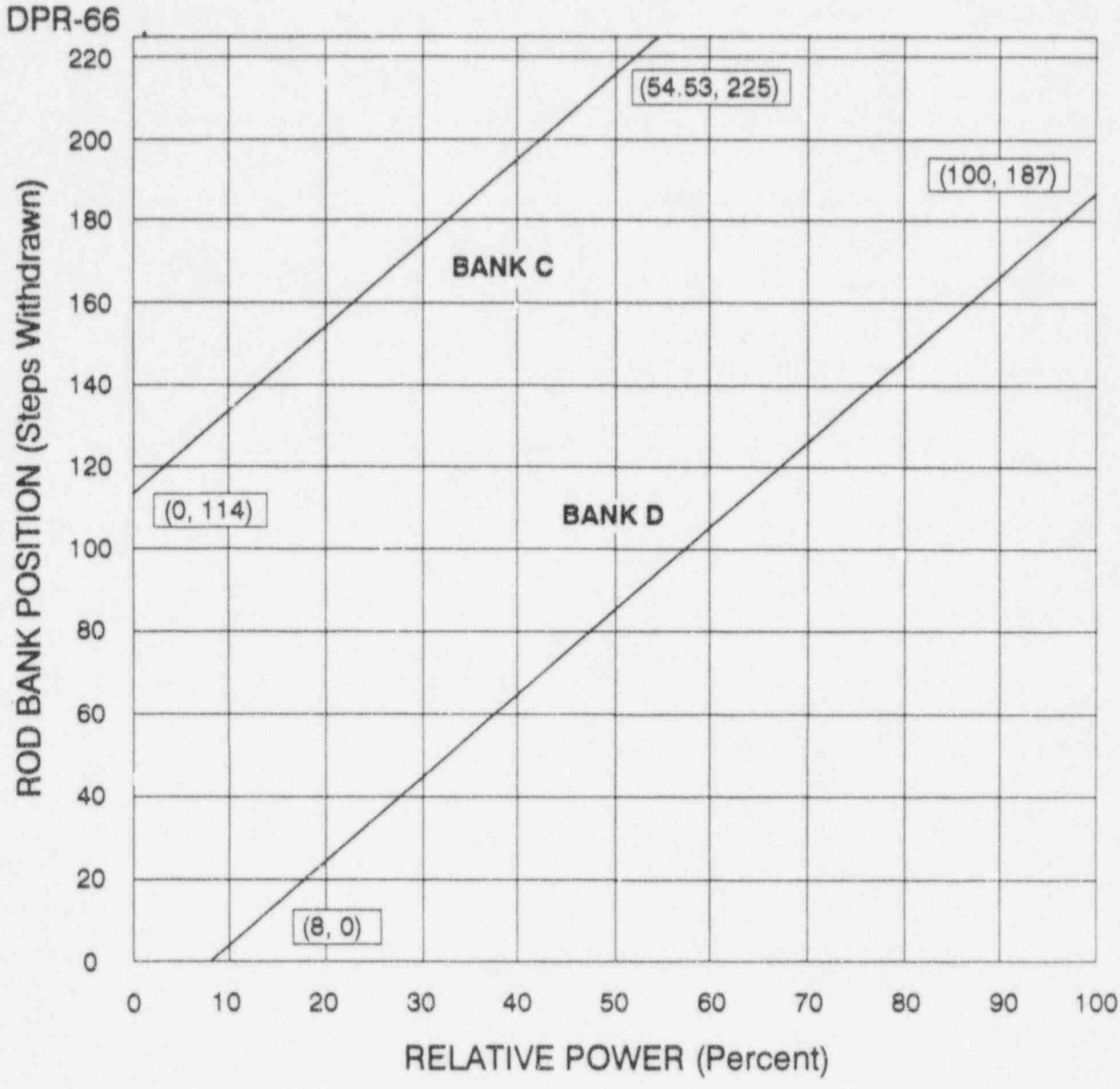


**FIGURE 1**

**CONTROL ROD INSERTION LIMITS AS A**

**FUNCTION OF POWER LEVEL**

DPR-66·

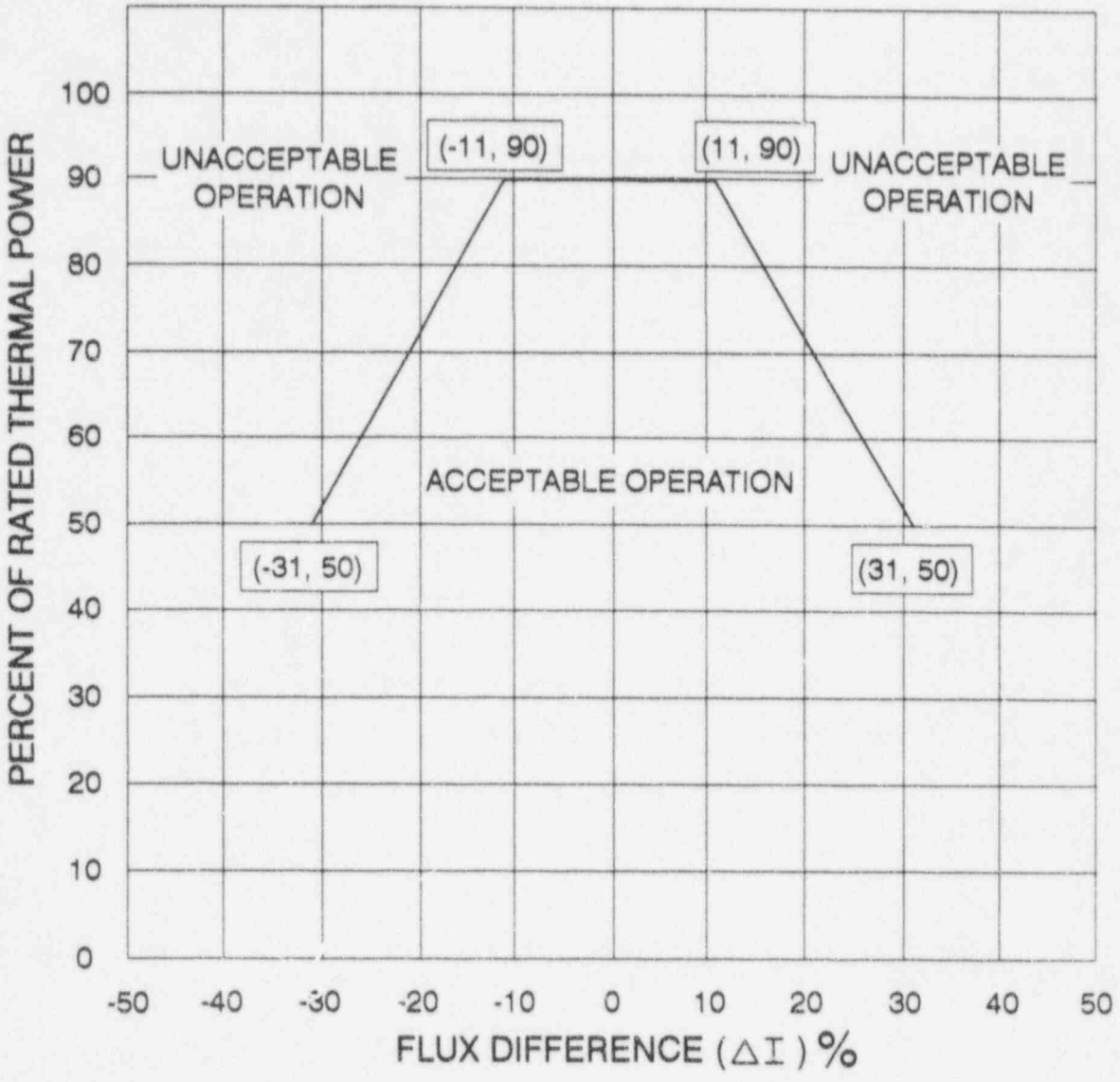


**FIGURE 2**

**AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER**

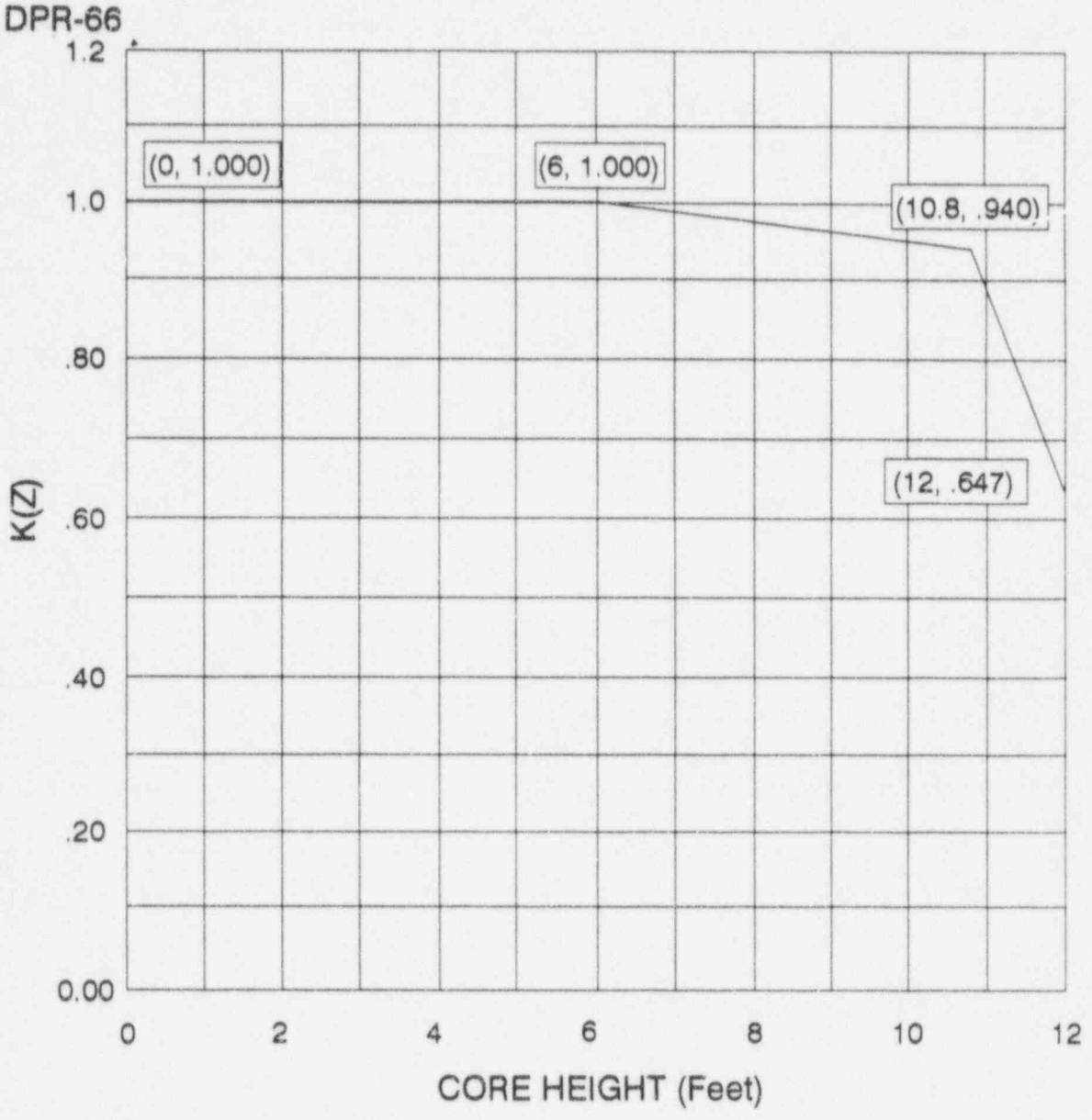


**FIGURE 3**

**$F_Q^T$ NORMALIZED OPERATING ENVELOPE, K(Z)**

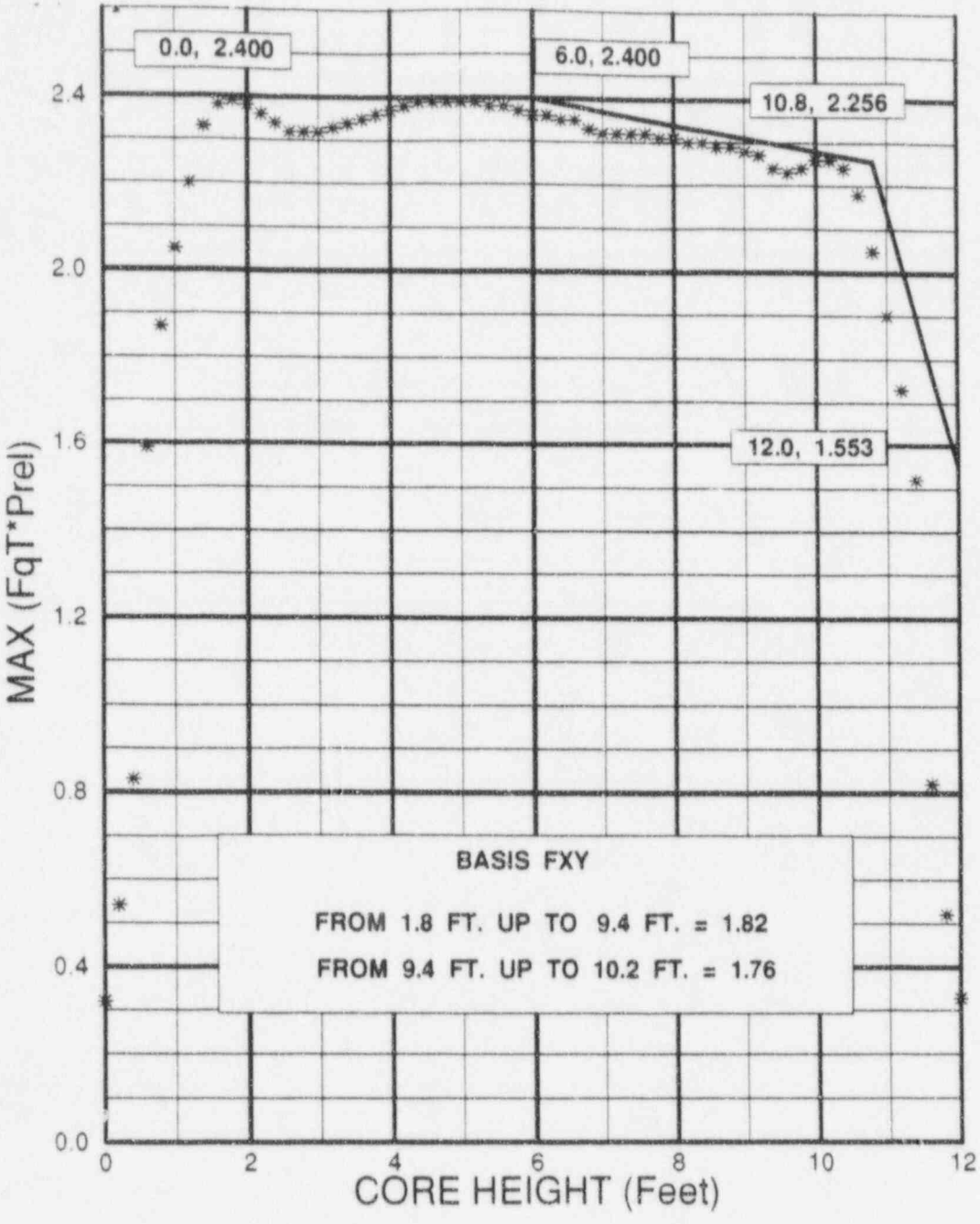


**FIGURE 4**

**MAXIMUM (FqT*Prel) VS. AXIAL CORE HEIGHT DURING NORMAL CORE OPERATION**