ATTACHMENT 3

Core Operating Limits Report

(COLR)

1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for Zion Unit 1 Cycle 14 has been prepared in accordance with the requirements of Zion Technical Specification 6.6.1.F.

The Technical Specifications affected by this report are:

LCO	3.2.1.C.3 3.2.1.D.1	Shutdown Bank Insertion Limit
LCO	3.2.1.C.3 3.2.1.D.1	Control Bank Insertion Limit
LCO	3.2.2.A.1.1	Heat Flux Hot Channel Factor - $F_Q(Z)$
LCO	3.2.2.A.1.1	Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$
LCO	3.2.2.A.2.2.c(2) 3.2.2.A.4 3.2.2.A.6.1	Axial Flux Difference (ΔI Target Band)

2.0   OPERATING LIMITS

The cycle specific parameter limits for the LCOs specified in Section 1.0 are presented in the subsections which follow. These limits have been developed using the NRC-approved methodologies specified in Technical Specification 6.6.1.F.

2.1   Shutdown Bank Insertion Limits (LCO 3.2.1.C.3 and 3.2.1.D.1)

The Shutdown Banks shall be fully withdrawn when the reactor is approaching criticality or is critical.

2.2   Control Bank Insertion Limits (LCO 3.2.1.C.3 and 3.2.1.D.1)

The Control Bank Insertion Limits are specified by Figure 2.2-1.

The sequence for Control Bank Withdrawal shall be Control Bank A, Control Bank B, Control Bank C, and Control Bank D.

Successive Control Banks shall overlap by 50 steps.

Zion Unit 1 Cycle 14
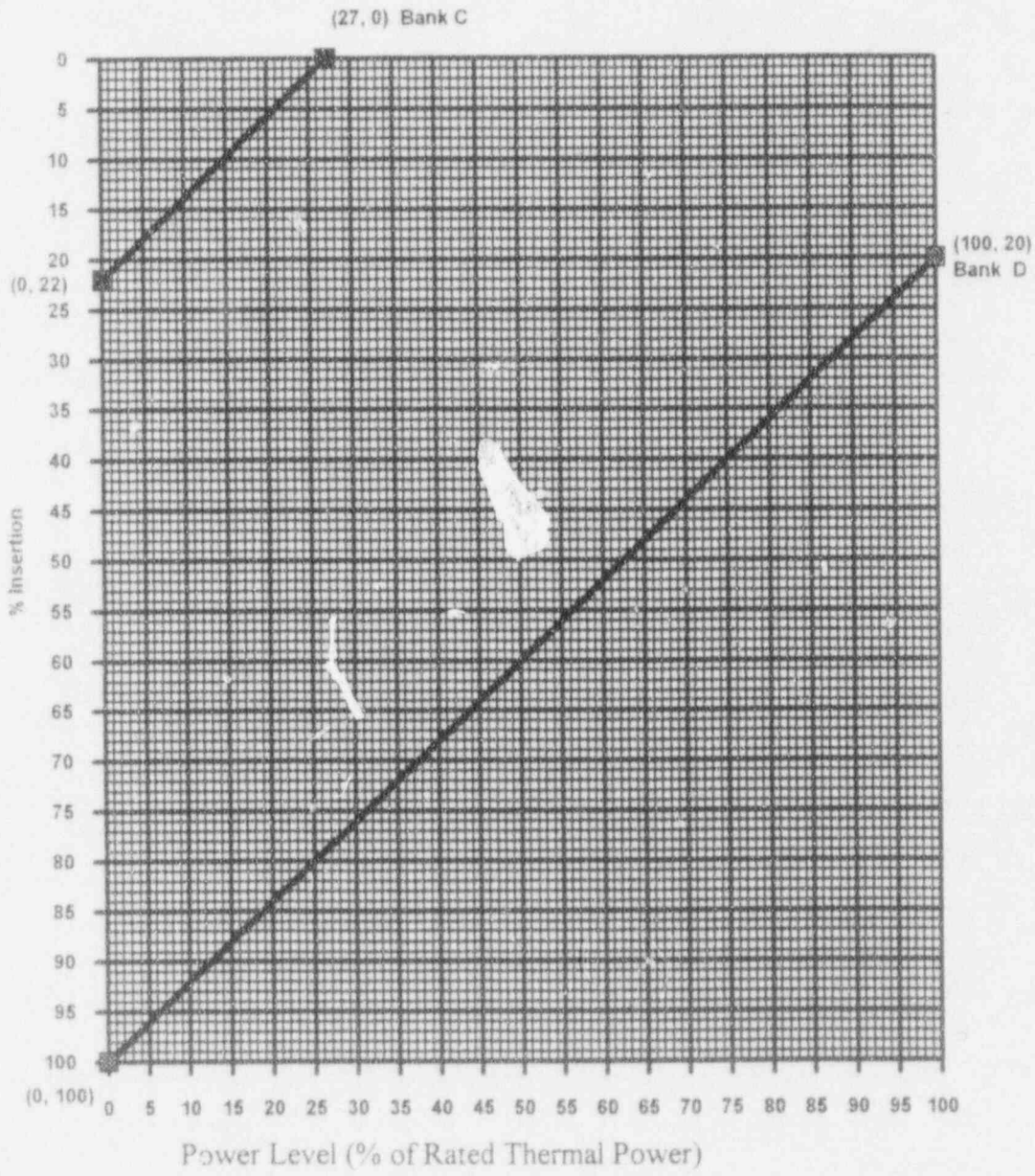
Banks A and B Fully Withdrawn

Figure 2.2-1   Control Bank Insertion Limits
vs. rated Thermal Power

2.3B   <u>Heat Flux Hot Channel Factor</u> - $F_Q(Z)$ (F_Q Methodology)

(LCO 3.2.2.A.1.1)

2.3B.1

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

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

where:

$$F_Q^{RTP} = 2.40$$

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

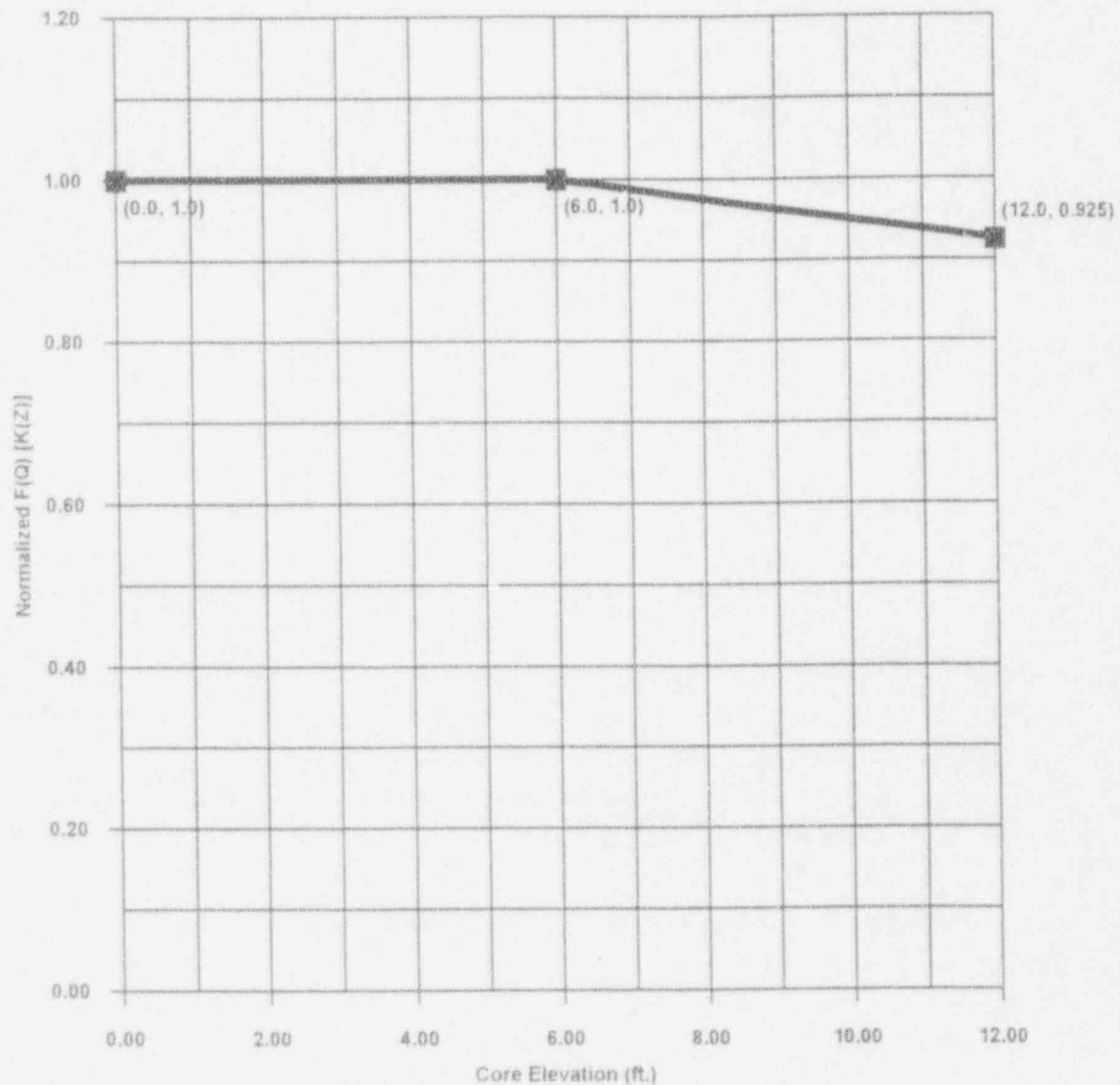$K(Z)$ is provided in Figure 2.3B - 1

Zion Unit 1 Cycle 14 K(Z)

Figure 2.3B-1 K(Z) - Normalized $F_Q(Z)$ as a Function of Core Height

The chart shows Normalized F(Q) [K(Z)] on the vertical axis versus Core Elevation (ft.) on the horizontal axis, with data points at (0.0, 1.0), (6.0, 1.0), and (12.0, 0.925).

2.4   Nuclear Enthalpy Rise Hot Channel Factor - $F^N \Delta H$

(LCO 3.2.2.A.1.1)

2.4.1

$$F_{\Delta H}^N \leq F_{\Delta H}^{RTP} * (1 + PF_{\Delta H} * (1 - P))$$

where: $F_{\Delta H}^{RTP} = 1.65$

$PF_{\Delta H} = 0.3$

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

for $0.02 \leq P \leq 1.00$

2.5   Axial Flux Difference (CAOC Methodology)

(LCO 3.2.2.A.2.2 c(2), 3.2.2.A.4, and 3.2.2.A.6.1)

2.5A.1 The AXIAL FLUX DIFFERENCE (AFD) target band is +6%, -7% of the target
flux difference.

2.5A.2 The AFD acceptance operation limits are an envelope bounded by $+\gamma$ percent and $-\gamma$ percent at a power of 90% of P_T and increasing by +1 percent and -1 percent for each 2 percent of rated power below P_T. $\gamma = 10.8\%$ of P_T rounded to the nearest percent.