Maria Korsnick
Site Vice President

R.E. Ginna Nuclear Power Plant, LLC
1503 Lake Road
Ontario, New York 14519-9364
585.771.3494
585.771.3943 Fax
maria.korsnick@constellation.com

Constellation Energy
Generation Group

September 26, 2005

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: **R.E. Ginna Nuclear Power Plant**
Docket No. 50-244

Transmittal of Core Operating Limits Report (COLR)

In accordance with the R.E. Ginna Nuclear Power Plant Improved Technical Specification 5.6.5, which requires the submittal of revisions to the COLR, the attached report is hereby submitted. Should there be any questions, please contact George Wrobel at (585) 771-3535 or george.wrobel@constellation.com.

Very truly yours,

Mary G. Korsnick

Enclosure

cc: S. J. Collins, NRC
P. D. Milano, NRC
Resident Inspector, NRC

A001

1001403

Constellation Energy
R.E. Ginna Nuclear Power Plant

R.E. Ginna Nuclear Power Plant

Core Operating Limits Report
COLR

Cycle 32

Revision 1

Responsible Manager: George Wrobel

Effective Date: 9-21-2005
9/21/2005

Controlled Copy No. _______

Record Cat.# 4.43.2

1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for the R.E. Ginna Nuclear Power Plant has been prepared in accordance with the requirements of Technical Specification 5.6.5.

The Technical Specifications affected by this report are listed below:

2.1	Safety Limits (SLs)
3.1.1	SHUTDOWN MARGIN (SDM)
3.1.3	MODERATOR TEMPERATURE COEFFICIENT (MTC)
3.1.5	Shutdown Bank Insertion Limit
3.1.6	Control Bank Insertion Limits
3.2.1	Heat Flux Hot Channel Factor ($F_Q(Z)$)
3.2.2	Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)
3.2.3	AXIAL FLUX DIFFERENCE (AFD)
3.3.1	Reator Trip System (RTS)
3.4.1	RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits
3.9.1	Boron Concentration

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using the NRC approved methodologies specified in Technical Specification 5.6.5. All items that appear in capitalized type are defined in Technical Specification 1.1, Definitions.

2.1 SAFETY LIMITS (SLs)[1]

(2.1)

2.1.1 In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) average temperature, and pressurizer pressure shall not exceed the SLs specified in Figure COLR - 1.

2.2 SHUTDOWN MARGIN[1]

(LCO 3.1.1)

2.2.1 The SHUTDOWN MARGIN in MODE 2 with K_{eff} < 1.0 and MODES 3 and 4 shall be greater than or equal to the limits specified in Figure COLR - 2 for the number of reactor coolant pumps in operation (non main feedwater operation).

2.2.2 The SHUTDOWN MARGIN in MODE 4 when both reactor coolant pumps are not OPERABLE and in operation and in MODE 5 shall be greater than or equal to the one loop operation curve of Figure COLR - 2.

2.2.3 The SHUTDOWN MARGIN required in LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, LCO 3.1.8, and LCO 3.4.5 shall be greater than the limits specified in Figure COLR - 2 for the number of reactor coolant pumps in operation and the status of the main feedwater system.

2.3 MODERATOR TEMPERATURE COEFFICIENT[1]

(LCO 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL ARO/HZP - MTC shall be less positive than +5.0 pcm/°F for power levels below 70% RTP and less than or equal to 0 pcm/°F for power levels at or above 70% RTP.

The EOL ARO/RTP - MTC shall be less negative than –42.9 pcm/°F.

where:

ARO stands for All Rods Out

BOL stands for Beginning of Cycle Life

EOL stands for End of Cycle Life

HZP stands for Hot Zero Power

RTP stands for RATED THERMAL POWER

2.4 Shutdown Bank Insertion Limit[1]

(LCO 3.1.5)

2.4.1 The shutdown bank shall be fully withdrawn which is defined as ≥ 221 steps.

2.5 Control Bank Insertion Limits[1]

(LCO 3.1.6)

2.5.1 The control banks shall be limited in physical insertion as shown in Figure COLR - 3.

2.5.2 The control banks shall be moved sequentially with a 100 (± 5) step overlap between successive banks.

2.6 Heat Flux Hot Channel Factor ($F_Q(Z)$)[2]

(LCO 3.2.1)

2.6.1 $F_Q(Z) \leq ((F_Q) * K(Z) / P)$ when $P > 0.5$

$F_Q(Z) \leq ((F_Q) * K(Z) / 0.5)$ when $P \leq 0.5$

where:

Z is the height in the core,

$F_Q = 2.45$,

K(Z) is provided in Figure COLR - 4, and

P = THERMAL POWER / RATED THERMAL POWER

2.7 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)[1]

(LCO 3.2.2)

2.7.1 $F^{N}_{\Delta H} \leq F^{RTP}_{\Delta H} * (1 + PF_{\Delta H} * (1-P))$

where:

$F^{RTP}_{\Delta H} = 1.75$,

$PF_{\Delta H} = 0.3$, and

P = THERMAL POWER / RATED THERMAL POWER

2.8 AXIAL FLUX DIFFERENCE[3]

(LCO 3.2.3)

2.8.1 The AXIAL FLUX DIFFERENCE (AFD) target band is ± 5%. The actual target bands are provided by Procedure RE-11.1.

2.8.2 The AFD acceptable operation limits are provided in Figure COLR - 5.

2.9 Reactor Trip System (RTS) Setpoints[5]

(LCO 3.3.1)

2.9.1 Overtemperature ΔT Setpoint Parameter Values

Parameter	Value
Overtemperature ΔT reactor trip setpoint	$K_1 \leq 1.20$
Overtemperature ΔT reactor trip depressurization setpoint penalty coefficient	$K_2 \geq 0.000900$/psi
Overtemperature ΔT reactor trip heatup setpoint coefficient	$K_3 \geq 0.0209$/°F penalty
Measured lead time constant	$\tau_1 \geq 25$ seconds
Measured lag time constant	$\tau_2 \leq 5$ seconds

f(ΔI) constants $f(\Delta I) = 0$ when $q_t - q_b$ is $\leq +13\%$ RTP

$f(\Delta I) = 1.3 \{(q_t - q_b) - 13\}$ when $q_t - q_b$ is $> +13\%$ RTP

2.9.2 Overpower ΔT Setpoint Parameter Values

Parameter	Value
Overpower ΔT reactor trip setpoint	$K_4 \leq 1.077$
Overpower ΔT reactor trip heatup setpoint penalty coefficient	$K_5 = 0$/°F for $T < T'$ ≥ 0.0011/°F for $T \geq T'$
Overpower ΔT reactor trip thermal time delay setpoint penalty	$K_6 \geq 0.0262$/°F for increasing T $= 0.00$/°F for decreasing T
Measured impulse/lag time constant	$\tau_3 \leq 10$ seconds

f(ΔI) constants $f(\Delta I) = 0$ when $q_t - q_b$ is $\leq +13\%$ RTP

$f(\Delta I) = 1.3 \{(q_t - q_b) - 13\}$ when $q_t - q_b$ is $> +13\%$ RTP

2.10 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits[4]

(LCO 3.4.1)

2.10.1 The pressurizer pressure shall be ≥ 2205 psig.

2.10.2 The RCS average temperature shall be ≤ 577.5 °F.

2.10.3 The RCS total flow rate shall be ≥ 177,300 gpm (includes 4% minimum flow uncertainty per Revised Thermal Design Methodology).

2.11 Boron Concentration[1]

(LCO 3.9.1)

2.11.1 The boron concentrations of the hydraulically coupled Reactor Coolant System, the refueling canal, and the refueling cavity shall be ≥ 2300 ppm.

3.0 REFERENCES

1. WCAP-9272-P-A, Westinghouse Reload Safety Evaluation Methodology, July 1985.

2. WCAP-10054-P-A and WCAP-10081-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985.

3. WCAP-10924-P-A, Volume 1, Revision 1, "Westinghouse Large-Break LOCA Best-Estimate Methodology, Volume 1: Model Description and Validation Responses to NRC Questions," and Addenda 1,2,3, December 1988.

4. WCAP-10924-P-A, Volume 2, Revision 2, "Westinghouse Large-Break LOCA Best-Estimate Methodology, Volume 2: Application to Two-Loop PWRs Equipped with Upper Plenum Injection," and Addendum 1, December 1988.

5. WCAP-10924-P-A, Volume 1, Revision 1, Addendum 4, "Westinghouse Large-Break LOCA Best-Estimate Methodology, Volume 1: Model Description and Validation, Addendum 4: Model Revisions," March 1991.

6. WCAP-13677-P-A, "10 CFR 50.46 Evaluation Model Report: WCOBRA/TRAC Two-Loop Upper Plenum Injection Model Updates to Support ZIRLO™ Cladding Option," February 1994.

7. WCAP-12610-P-A, "VANTAGE + Fuel Assembly Reference Core Report," April 1995.

8. WCAP-8385, "Power Distribution Control and Load Following Procedures - Topical Report,", September 1974.

9. WCAP-11397-P-A, "Revised Thermal Design Procedure", April 1989.

10. WCAP-8745, "Design Basis for the Thermal Overpower Delta T and Thermal Overtemperature Delta T Trip Functions", March 1977.

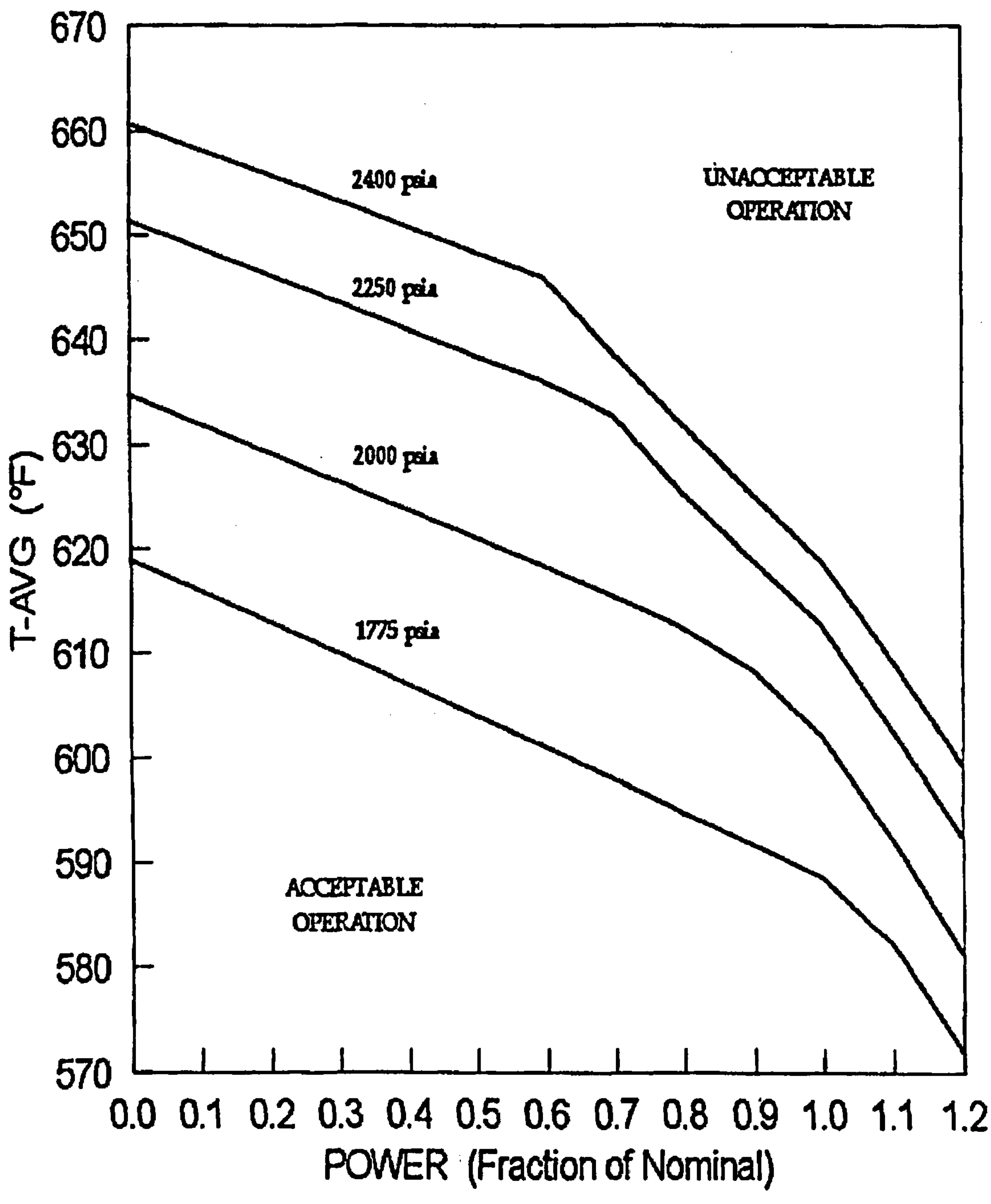
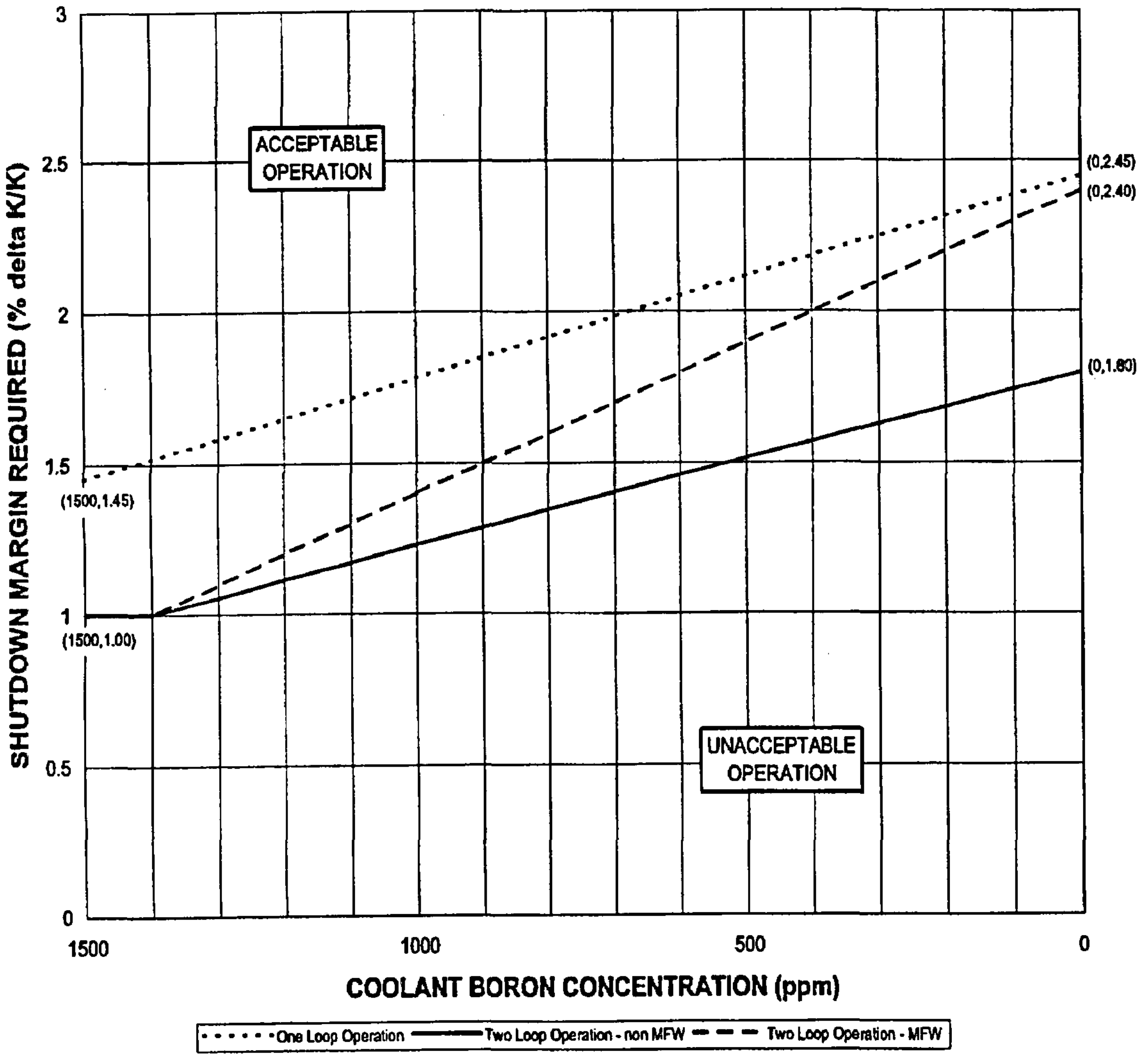


Figure COLR - 1
Reactor Safety Limits

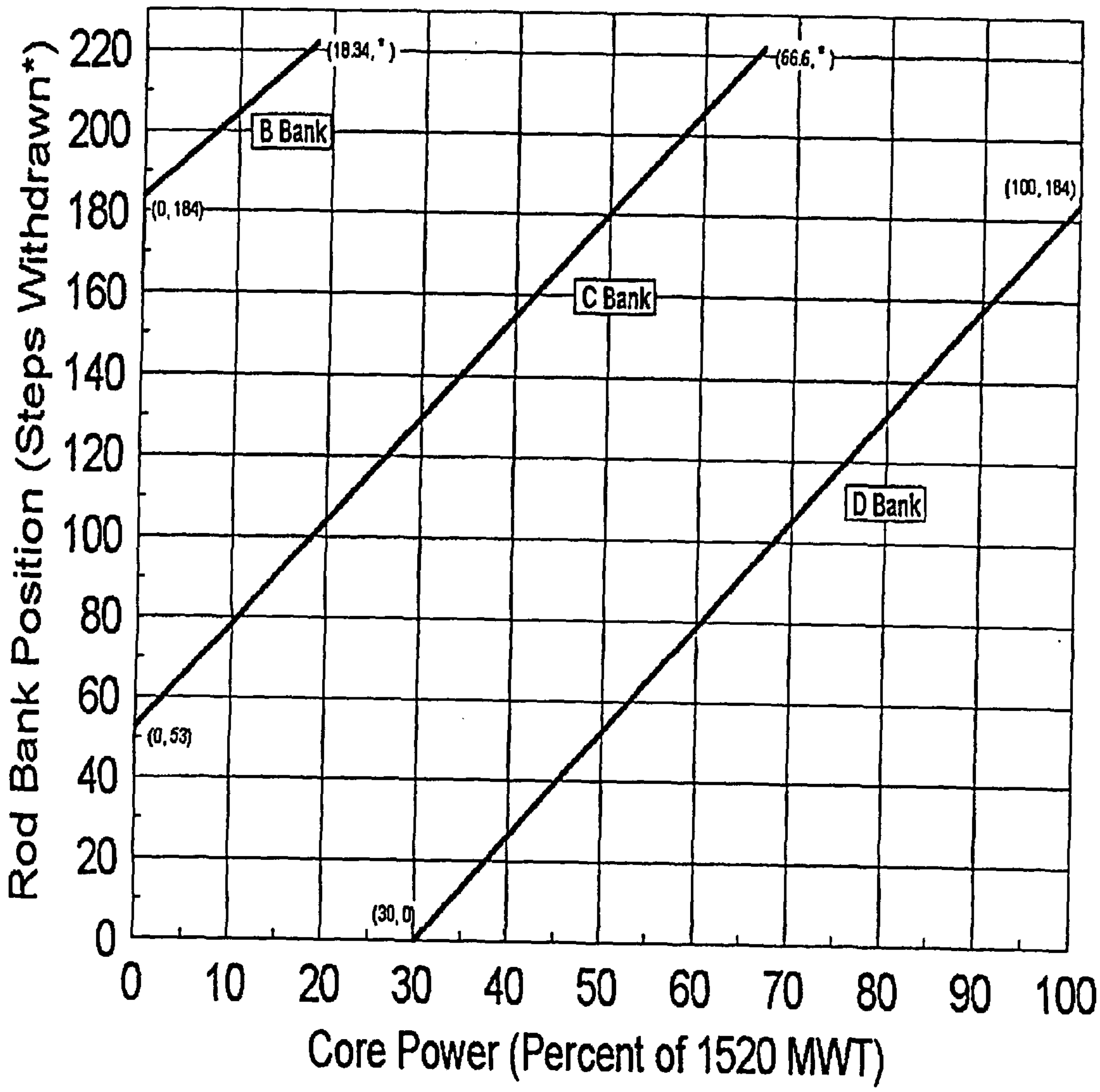


NOTE:

Two Loop Operation - non MFW means that the main feedwater system is not supplying the steam generators.

Two Loop Operation - MFW means that the main feedwater system is supplying the steam generators.

Figure COLR - 2
REQUIRED SHUTDOWN MARGIN



*The fully withdrawn position is defined as ≥ 221 steps.

Figure COLR - 3
CONTROL BANK INSERTION LIMITS

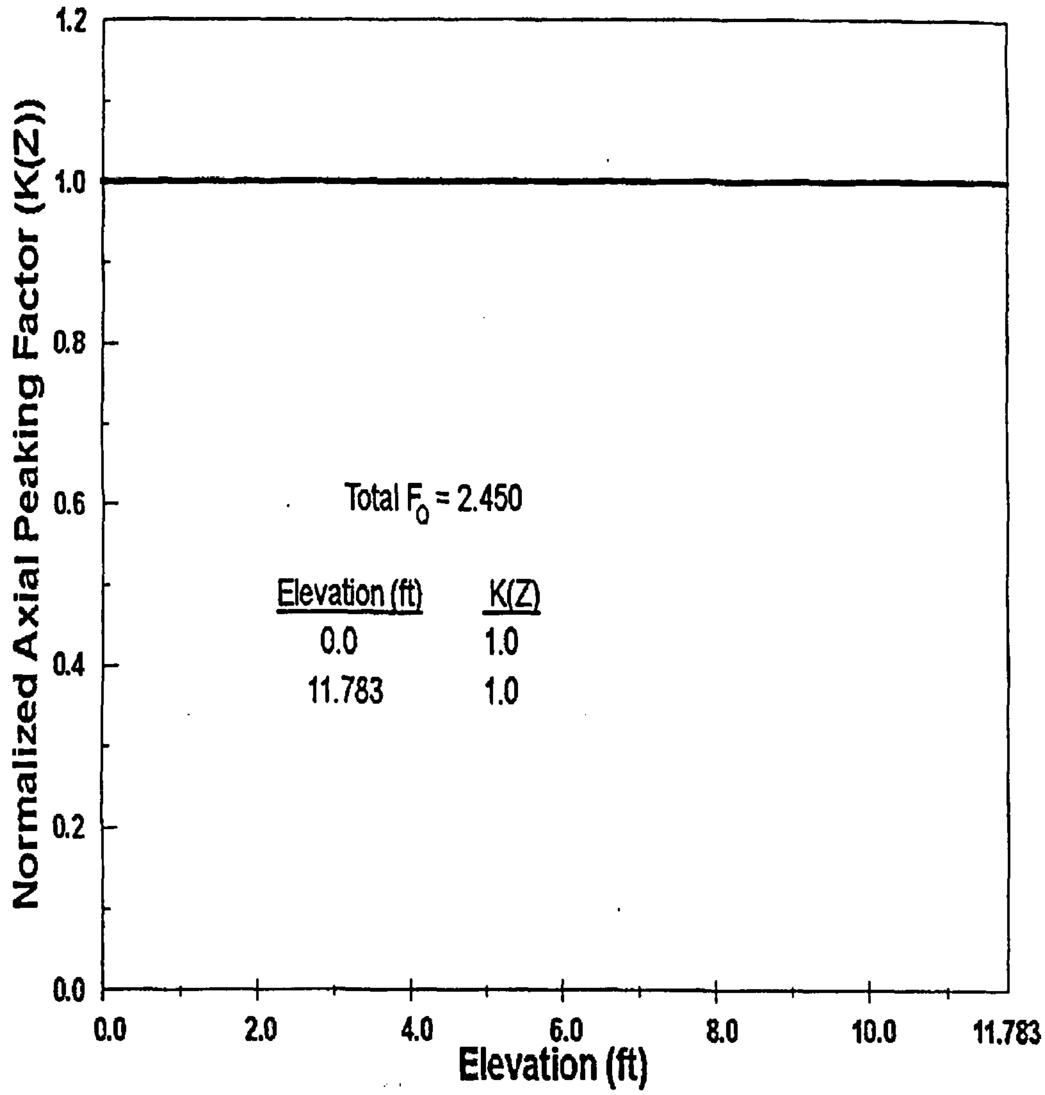


FIGURE 3

Figure COLR - 4
K(Z) - NORMALIZED $F_Q(Z)$ AS A FUNCTION OF CORE HEIGHT

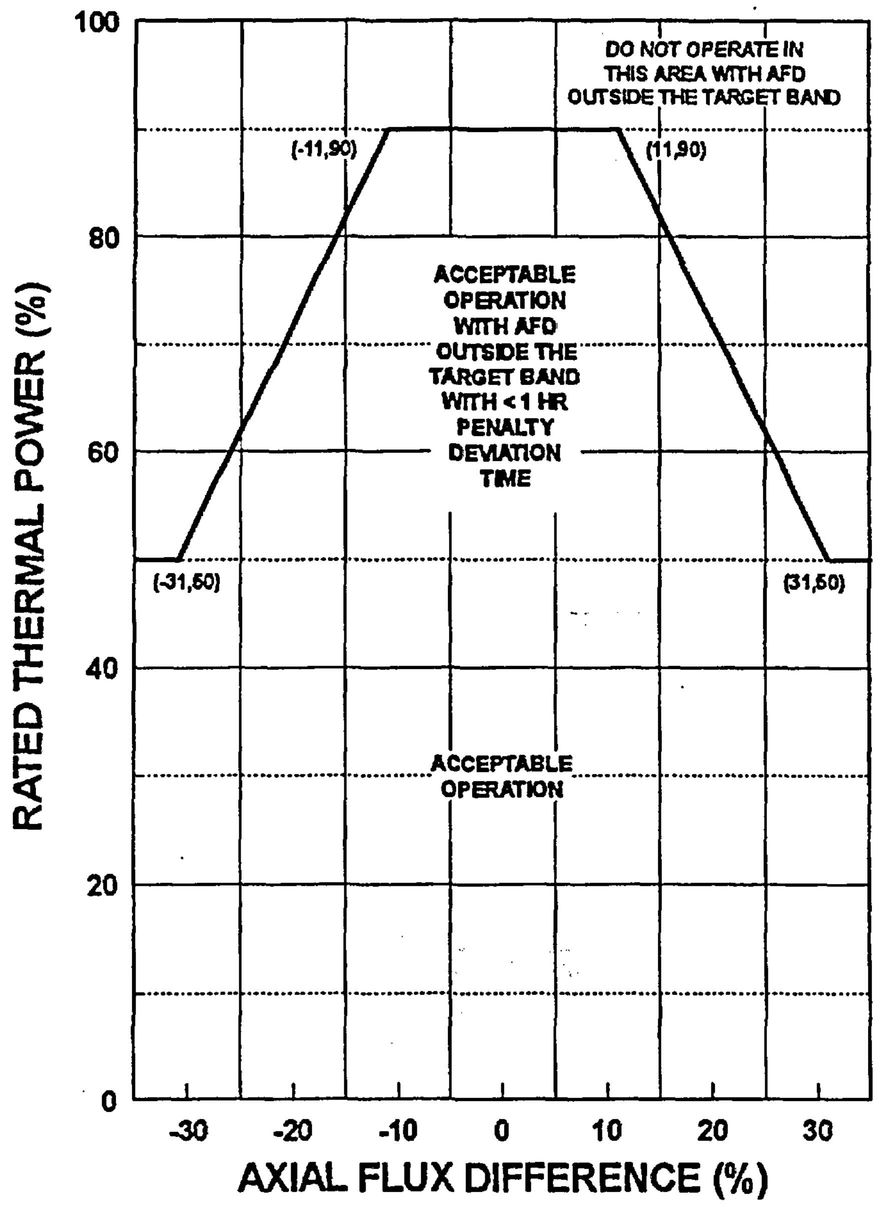


Figure COLR - 5
AXIAL FLUX DIFFERENCE ACCEPTABLE OPERATION LIMITS AS A FUNCTION OF RATED THERMAL POWER

END NOTES

1. (Limits generated using Reference 1)
2. (Limits generated using References 1 through 7)
3. (Limits generated using References 1 and 8)
4. (Limits generated using Reference 9)
5. (Limits generated using Reference 10)