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CORE OPERATING LIMITS REPORT - CYCLE 18, REVISION 0
SALEM GENERATING STATION UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272

In accordance with section 6.9.1.9 of the Salem Unit 1 Technical Specifications, PSEG Nuclear LLC submits Revision 0 of the Core Operating Limits Report (COLR) for Salem Unit 1 Cycle 18 (NFS-0249, Rev. 0) in Attachment 1 to this letter.

Should you have any questions regarding this submittal, please contact Mr. E. Villar at (856) 339-5456.

Sincerely,

Carl Fricker
Salem Plant Manager

Attachment

A001

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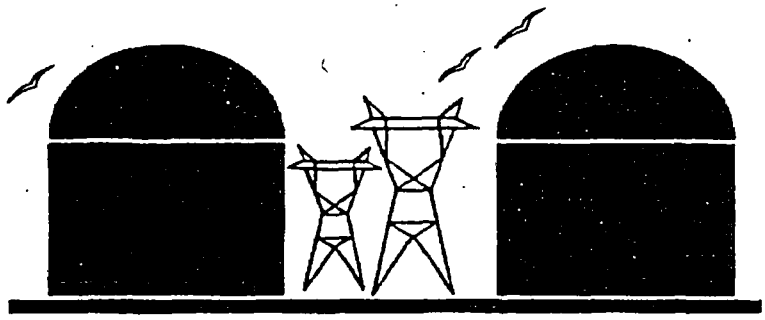
CORE OPERATING LIMITS REPORT - CYCLE 18
REVISION 0

PSEG Nuclear LLC

NFS-0249
Revision 0
July 2005

Core Operating Limits Report for Salem Unit 1, Cycle 18



PREPARED: Joseph P Dascanio DATE: 7/21/2005
Joseph P. Dascanio
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REVIEWED: Corie Reeves DATE: 7/21/2005
Corie A. Reeves
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Thomas K. Ross
Supervisor, SR&SA

APPROVED: M M Mannion DATE: 7/25/2005
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1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for Salem Unit 1 Cycle 18 has been prepared in accordance with the requirements of Technical Specification 6.9.1.9.

The Technical Specifications affected by this report are listed below:

3/4.1.1.4	Moderator Temperature Coefficient
3/4.1.3.5	Control Rod Insertion Limits
3/4.2.1	Axial Flux Difference
3/4.2.2	Heat Flux Hot Channel Factor - $F_Q(Z)$
3/4.2.3	Nuclear Enthalpy Rise Hot Channel Factor - $F^N_{\Delta H}$
3/4.9.1	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 6.9.1.9.

2.1 Moderator Temperature Coefficient (Specification 3/4.1.1.4)

2.1.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO/HZP-MTC shall be less positive than or equal to 0 $\Delta k/k/°F$.

The EOL/ARO/RTP-MTC shall be less negative than or equal to -4.4×10^{-4} $\Delta k/k/°F$.

2.1.2 The MTC Surveillance limit is:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -3.7×10^{-4} $\Delta k/k/°F$.

where: BOL stands for Beginning of Cycle Life

ARO stands for All Rods Out

HZP stands for Hot Zero THERMAL POWER

EOL stands for End of Cycle Life

RTP stands for Rated THERMAL POWER

2.2 Control Rod Insertion Limits (Specification 3/4.1.3.5)

2.2.1 The control rod banks shall be limited in physical insertion as shown in Figure 1.

2.3 Axial Flux Difference (Specification 3/4.2.1)

[Constant Axial Offset Control (CAOC) Methodology]

2.3.1 The Axial Flux Difference (AFD) target band shall be the more restrictive of (+6%, -9%) or the target band as defined in Reference 2.

2.3.2 The AFD Acceptable Operation Limits are provided in Figure 2.

2.4 Heat Flux Hot Channel Factor - $F_Q(Z)$ (Specification 3/4.2.2)

[F_{xy} Methodology]

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

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

where: $$P = \frac{THERMAL\ POWER}{RATED\ THERMAL\ POWER}$$

2.4.1 $F_Q^{RTP} = 2.40$

2.4.2 K(Z) is provided in Figure 3.

2.4.3 $F_{xy}^{L} = F_{xy}^{RTP}[1.0 + PF_{xy}(1.0 - P)]$

where: $F_{xy}^{RTP} = 1.75$ for unrodded top core planes 1 through 21

1.81 for unrodded bottom core planes 22 through 61

2.13 for core plane containing Bank D control rods

$PF_{xy} = 0.3$

2.4.4 If the Power Distribution Monitoring System (PDMS) is used for core power distribution surveillance and is OPERABLE, as defined in Technical Specification 3.3.3.14, the uncertainty, U_{FQ}, to be applied to the Heat Flux Hot Channel Factor $F_Q(z)$ shall be calculated by the following formula:

$$U_{FQ} = \left(1.0 + \frac{U_Q}{100.0}\right) \bullet U_e$$

where:

U_Q = Uncertainty for power peaking factor as defined in equation 5-19 of Reference 1.
U_e = Engineering uncertainty factor.
= 1.03

Note: U_{FQ}= PDMS Surveillance Report Core Monitor Fxy Uncertainty in %.

2.4.5 If the INCORE movable detectors are used for core power distribution surveillance, the uncertainty, U_{FQ}, to be applied to the Heat Flux Hot Channel Factor $F_Q(z)$ shall be calculated by the following formula:

$$U_{FQ} = U_{qu} \bullet U_e$$

where:

U_{qu} = Base F_Q measurement uncertainty.
= 1.05
U_e = Engineering uncertainty factor.
= 1.03

2.5 Nuclear Enthalpy Rise Hot Channel Factor - $F^N\Delta H$ (Specification 3/4.2.3)

$$F^N\Delta_H = F\Delta_H^{RTP}\,[1.0 + PF\Delta_H\,(1.0 - P)]$$

where: $$P = \frac{THERMAL\ POWER}{RATED\ THERMAL\ POWER}$$

2.5.1 $F\Delta_H^{RTP}(RFA\ with\ IFMs) = 1.65$

2.5.2 $PF\Delta_H = 0.3$

2.5.3 If the Power Distribution Monitoring System (PDMS) is used for core power distribution surveillance and is OPERABLE, as defined in Technical Specification 3.3.3.14, the uncertainty, $U_{F\Delta H}$, to be applied to the Nuclear Enthalpy Rise Hot Channel Factor, $F_{\Delta H}^N$, shall be calculated by the following formula:

$$U_{F\Delta H} = 1.0 + \frac{U_{\Delta H}}{100.0}$$

where:

$U_{\Delta H}$ = Uncertainty for enthalpy rise as defined in equation 5-19 of Reference 1.

2.5.4 If the INCORE movable detectors are used for core power distribution surveillance, the uncertainty, $U_{F\Delta H}$, to be applied to the Nuclear Enthalpy Rise Hot Channel Factor $F_{\Delta H}^N$ shall be calculated by the following formula:

$$U_{F\Delta H} = U_{F\Delta Hm}$$

where:

$U_{F\Delta Hm}$ =Base $F_{\Delta H}$ measurement uncertainty.
= 1.04

2.6 Boron Concentration (Specification 3/4.9.1)

A Mode 6 boron concentration, maintained at or above 2196 ppm in the Reactor Coolant System, the fuel storage pool, the refueling canal, and the refueling cavity ensures the most restrictive of the following reactivity conditions is met:

a) A K-effective (K_{eff}) of 0.95 or less at All Rods In (ARI), Cold Zero Power (CZP) conditions with a 1% Δk/k uncertainty added.

b) A K_{eff} of 0.99 or less at All Rods Out (ARO), CZP conditions with a 1% Δk/k uncertainty added.

c) A boron concentration of greater than or equal to 2000 ppm, which includes a 50 ppm conservative allowance for uncertainties.

3.0 REFERENCES

1. WCAP-12472-P-A, BEACON Core Monitoring and Operations Support System, August 1994.

2. S1.RE-RA.ZZ-0011(Q), Tables.

FIGURE 1

ROD BANK INSERTION LIMITS vs. THERMAL POWER

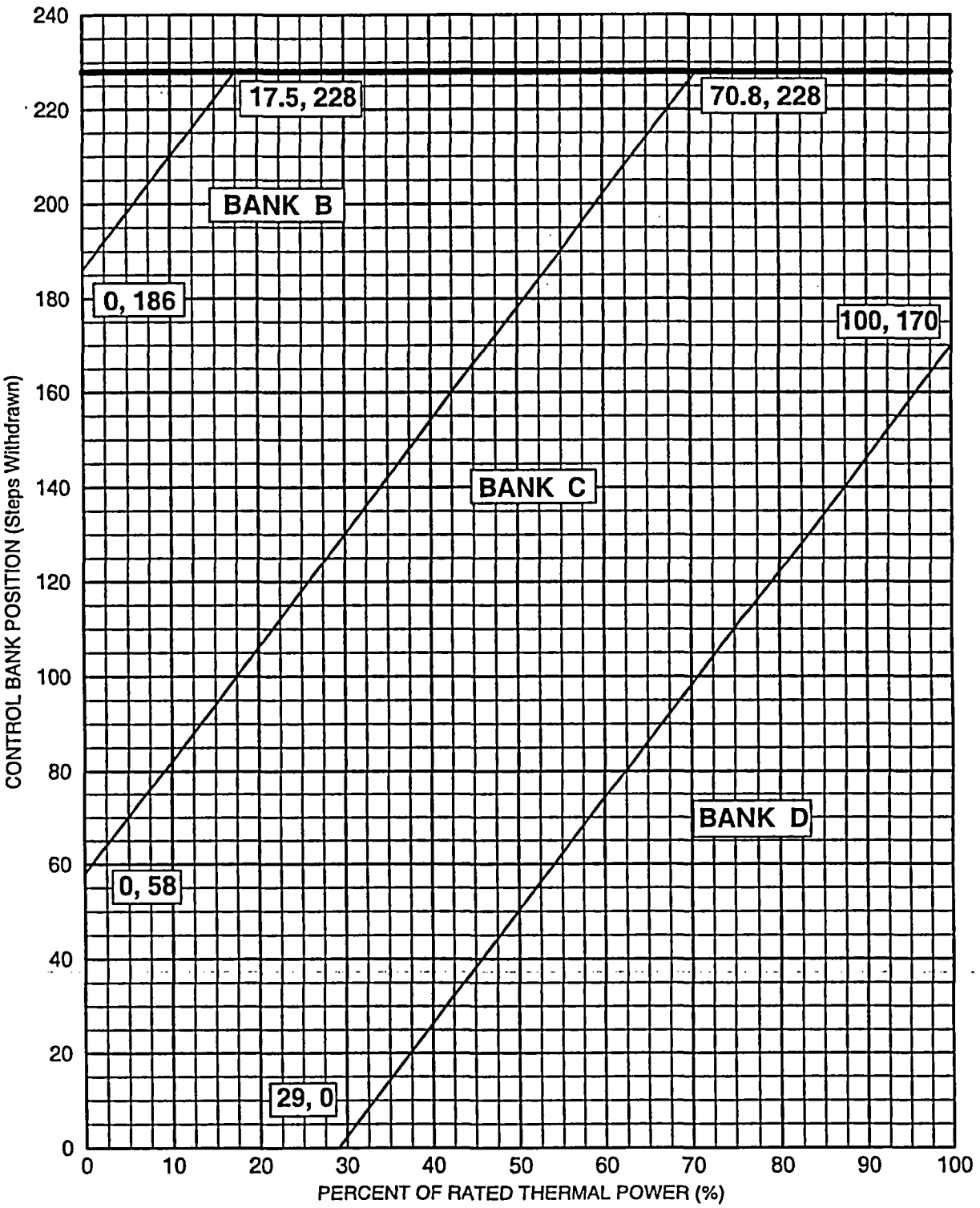


FIGURE 2

AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF
RATED THERMAL POWER

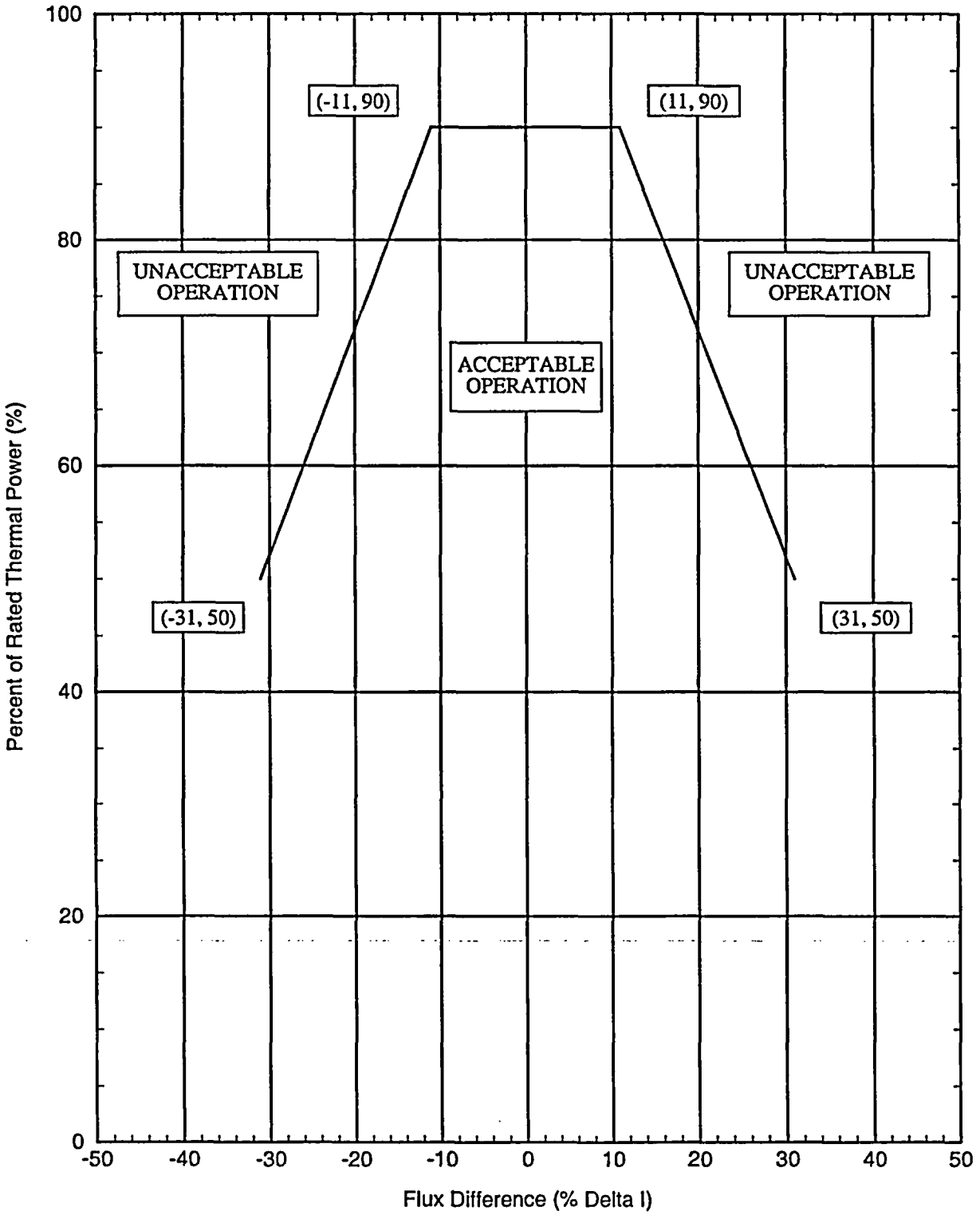
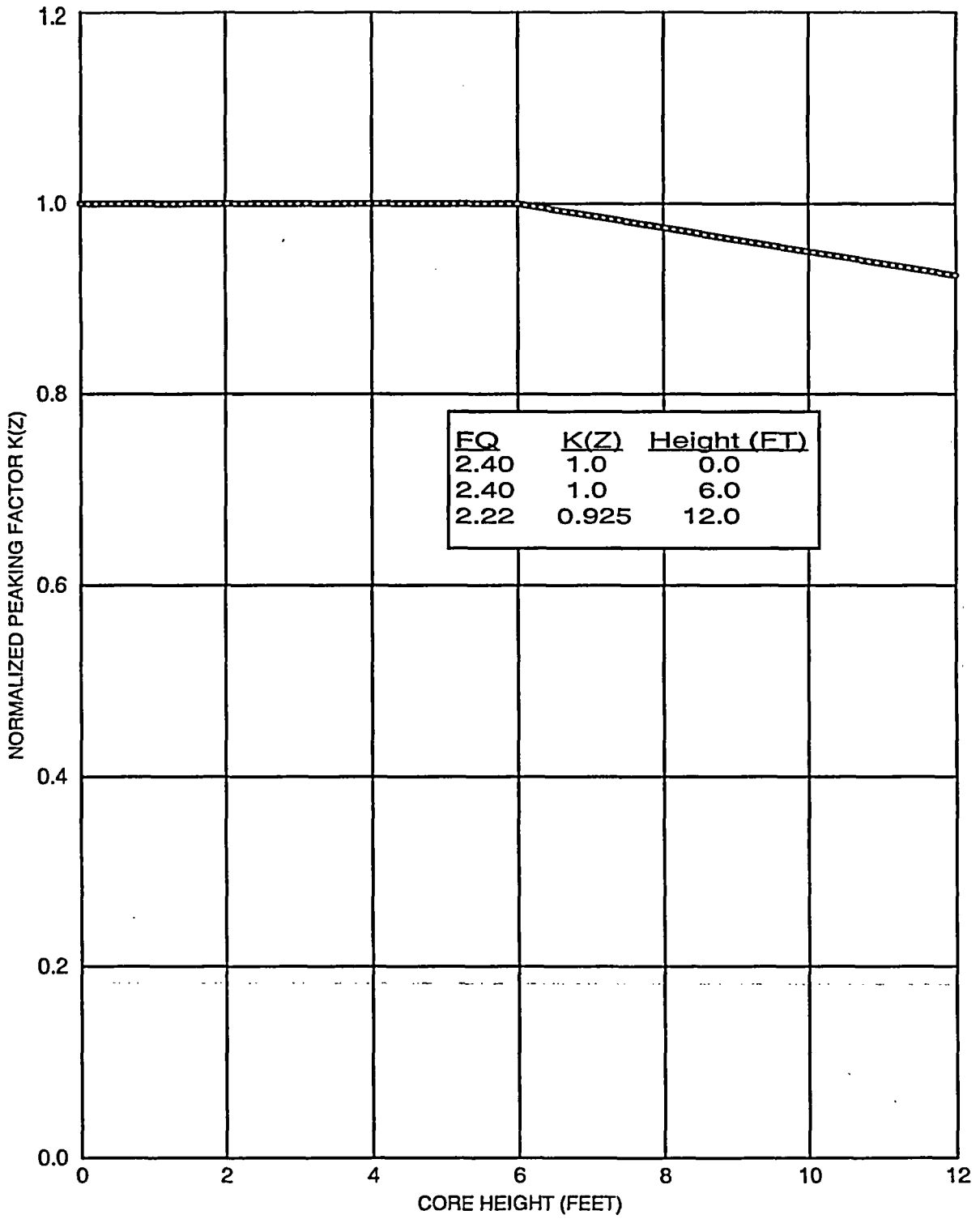


FIGURE 3

K(Z) - NORMALIZED FQ(Z) AS A FUNCTION OF CORE HEIGHT



Benyak, Darin M.

Comments attached.

From: Headrick, Michael
Sent: Friday, November 04, 2005 7:56 AM
To: Gellrich, George H; Gallivan, Cory J.; Benyak, Darin M.; Marabella, Lee A.; Keenan, Jeffrie J
Subject: NRC Allegation Report Revision

Gentlemen,

Attached is a revised NRC Allegation Investigation report based on comments received from yesterday's meeting. Open questions or places where additional information is needed have bolded comments within the report (see pages 2,3,8 and 9). I have rewritten the Conclusion section and have taken a cut at what notifications cover the issues from the report and additional notifications need to be written. I recommend everybody review the attached document and we can discuss what notifications need to be written next week when we meet. I annotated that this is revision 1 to the report in the footer so we can distinguish between this and the original we reviewed at the meeting yesterday.

Jeff,

I reviewed your comments and most have been addressed with this revision, but some I just need to discuss with you. Let me know when you are available so we can discuss.

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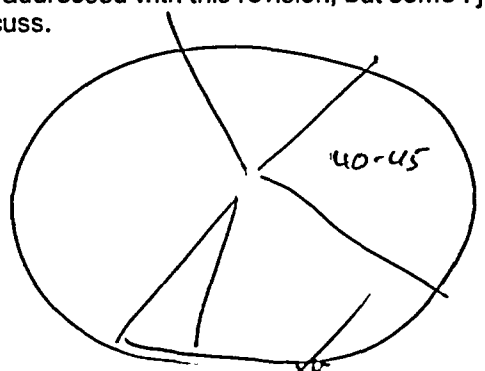
Allegation Investigation Detai..



10
40 weeks
6 wks
< 7