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PSEG
Nuclear LLC

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United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

CORE OPERATING LIMITS REPORT - CYCLE 13
SALEM GENERATING STATION UNIT NO. 2
FACILITY OPERATING LICENSE DPR-75
DOCKET NO. 50-311

In accordance with section 6.9.1.9 of the Salem Unit 2 Technical Specifications, PSEG Nuclear LLC submits Revision 0 of the Core Operating Limits Report (COLR) for Salem Unit 2 Cycle 13 (NFS-0209, Rev. 0) in Attachment 1 to this letter.

Should you have any questions, please contact Mr. Paul Duke at (856) 339-1466.

Sincerely,

G. Salamon
Manager - Nuclear Safety & Licensing

Attachment

A001

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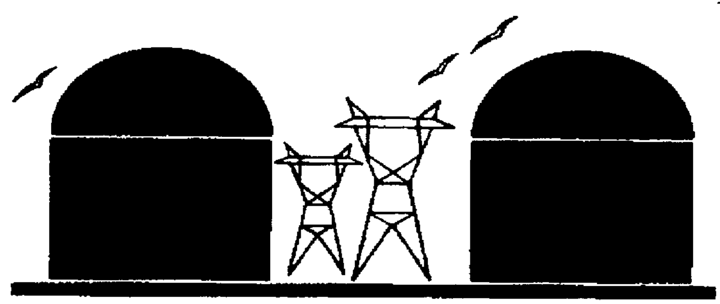
PSEG Nuclear LLC

NFS-0209
Revision 0
January 2002

Core Operating Limits Report for Salem Unit 2, Cycle 13



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1.0 CORE OPERATING LIMITS REPORT

This Core Operating Limits Report (COLR) for Salem Unit 2 Cycle 13 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:

3/4.1.1.3	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 - $F^N_{\Delta H}$

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 3/4.1.1.3)

2.1.1 The Moderator Temperature Coefficient (MTC) limits are:

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

The EOL/ARO/RTP-MTC shall be less negative than -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 is +6%, -9%.

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: $F_{xy}^{RTP} = 1.78$ for unrodded core planes 1 through 31

1.82 for unrodded core planes 32 through 61

2.13 for the core planes 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: $P = \dfrac{THERMAL\ POWER}{RATED\ THERMAL\ POWER}$

2.5.1 $F_{\Delta H}^{RTP}$(RFA with IFM) = 1.65 and $F_{\Delta H}^{RTP}$(V5H without IFM) = 1.57

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

3.0 REFERENCES

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

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FIGURE 1

ROD BANK INSERTION LIMITS vs. THERMAL POWER

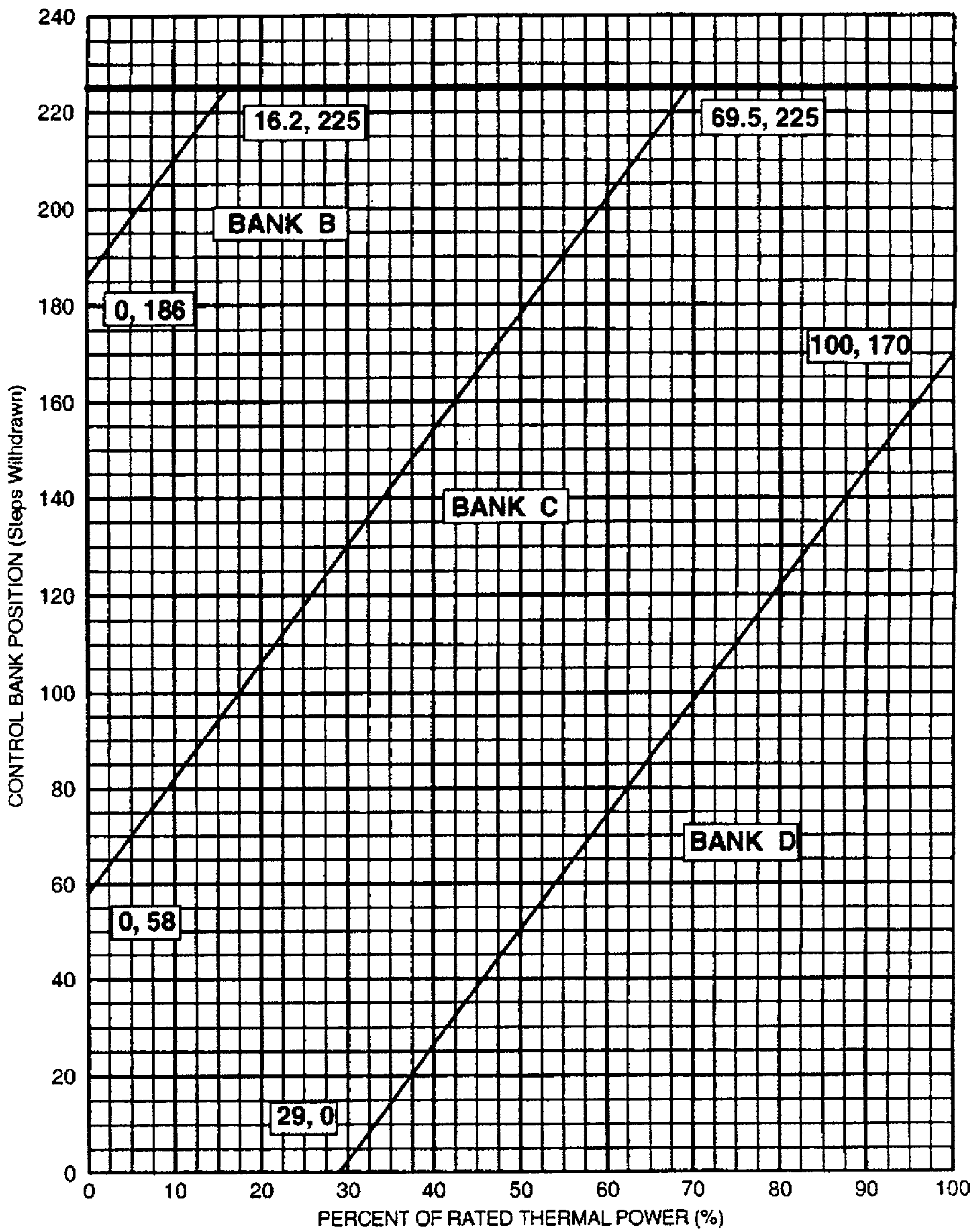

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FIGURE 2

AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER

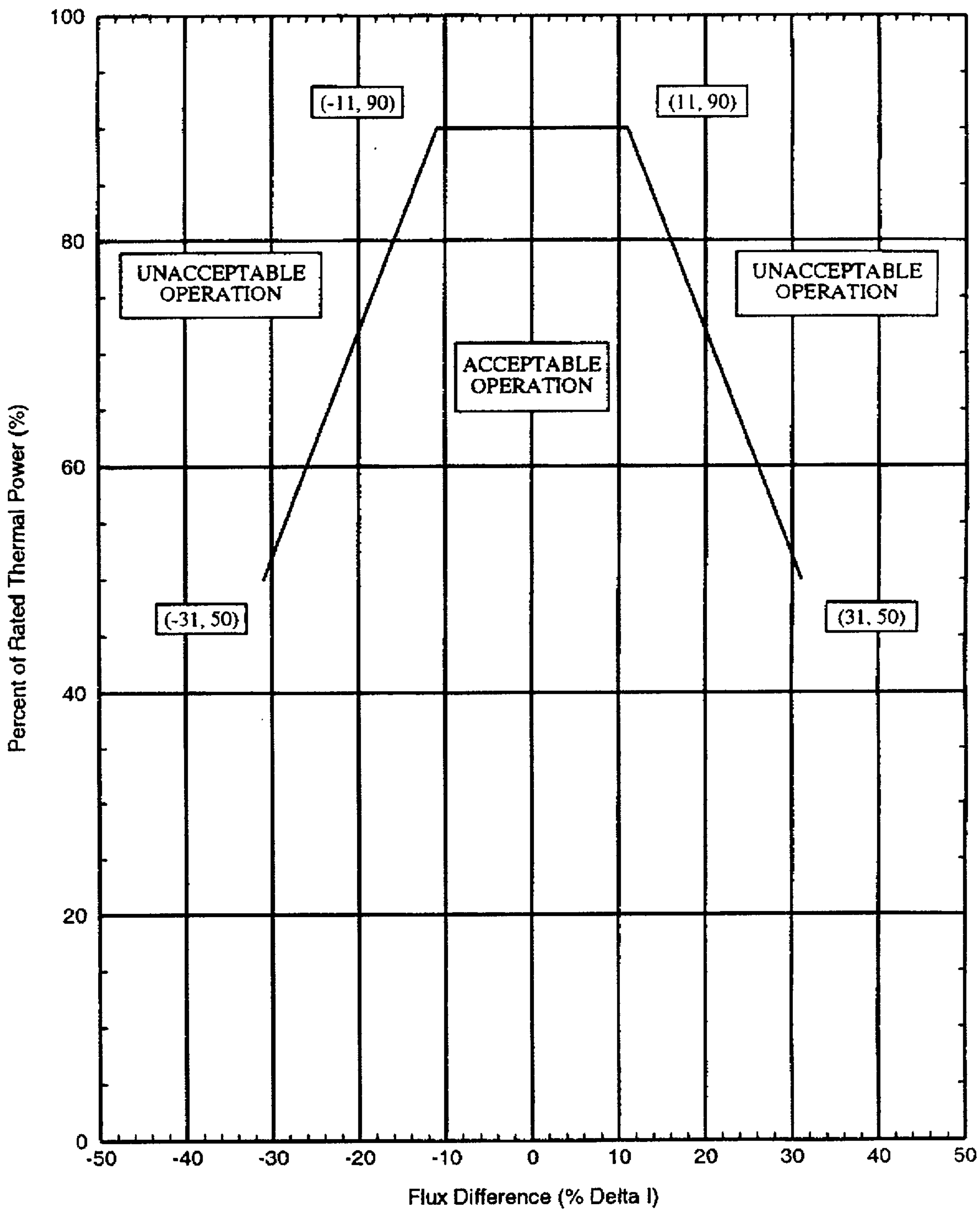

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FIGURE 3

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