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1.0 DEFINITIONS

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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1.0 DEFINITIONS (Continued)

PURGE - PURGING

1.33 PURGE or PURGING is the process of discharging air from the Containment utilizing the Containment Purge Supply and Purge Exhaust Systems.

LIQUID RADWASTE TREATMENT SYSTEM

1.34 The LIQUID RADWASTE TREATMENT SYSTEM is the system used to reduce radioactive materials in liquid effluents by filtering, demineralizing, and providing holdup or decay of the radioactive wastes for the purpose of reducing the total radioactivity prior to release to the environment. 99

CORE OPERATING LIMITS REPORT - COLR

1.35 The CORE OPERATING LIMITS REPORT (COLR) is the unit-specific document that provides core operating limits for the current reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9. Plant operation within these core operating limits is addressed in individual Specifications.

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.1 SAFETY LIMITS

REACTOR CORE

2.1.1 The combination of THERMAL POWER, pressurizer pressure, and the highest operating loop coolant temperature (T_{avg}) shall not exceed the limits shown in Figures 2.1-1 and 2.1-2 for 4 and 3 loop operation, respectively.

APPLICABILITY: MODES 1 and 2.

ACTION:

Whenever the point defined by the combination of the highest operating loop average temperature and THERMAL POWER has exceeded the appropriate pressurizer pressure line, be in HOT STANDBY within 1 hour.

REACTOR COOLANT SYSTEM PRESSURE

2.1.2 The Reactor Coolant System pressure shall not exceed 2735 psig.

APPLICABILITY: MODES 1, 2, 3, 4 and 5.

ACTION:

MODES 1 and 2

Whenever the Reactor Coolant System pressure has exceeded 2735 psig, be in HOT STANDBY with the Reactor Coolant System pressure within its limit within 1 hour.

MODES 3, 4 and 5

Whenever the Reactor Coolant System pressure has exceeded 2735 psig, reduce the Reactor Coolant System pressure to within its limit within 5 minutes.

Amendment No.

Replace with new Figure 2.1-1
(see next page)

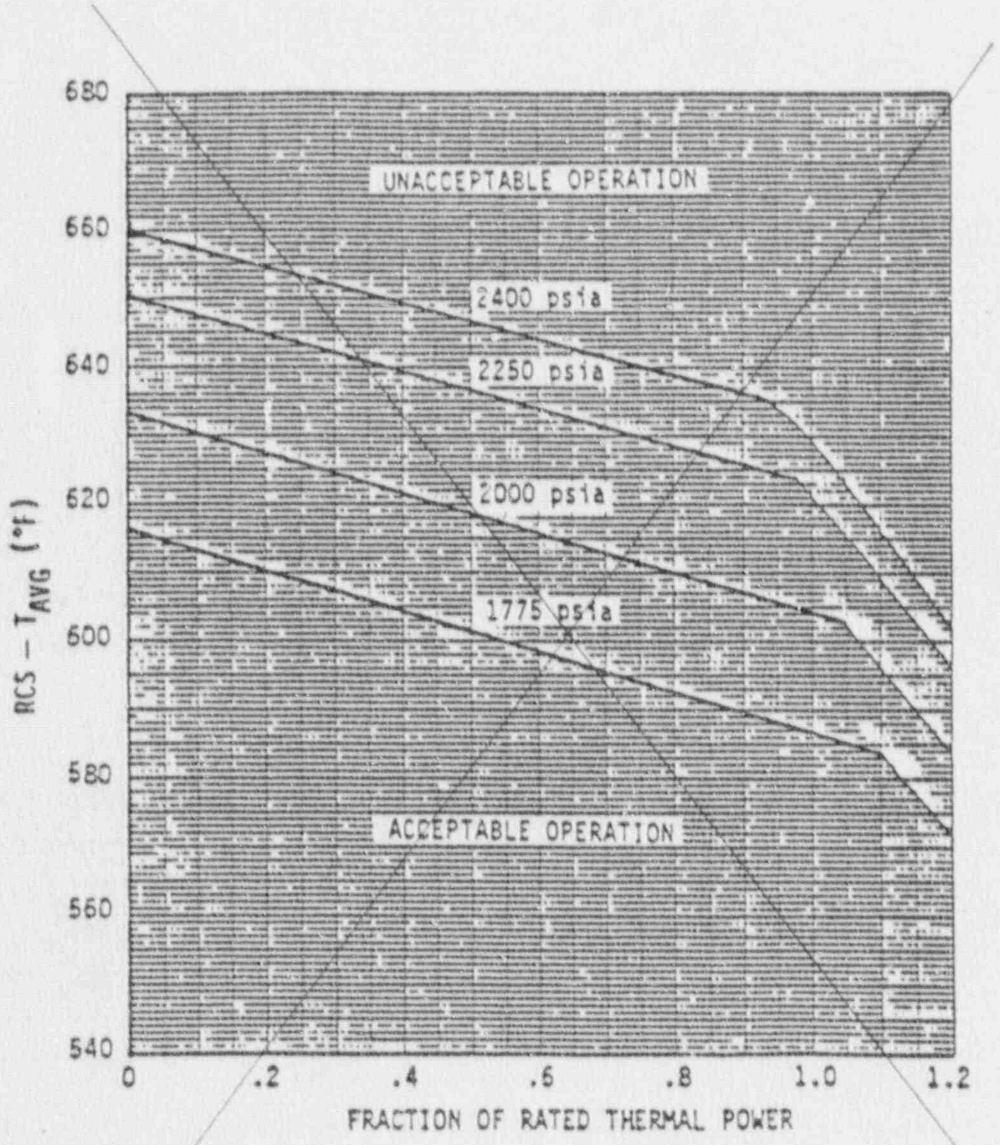

FIGURE 2.1-1 REACTOR CORE SAFETY LIMIT - FOUR LOOPS IN OPERATION

TROJAN UNIT 1

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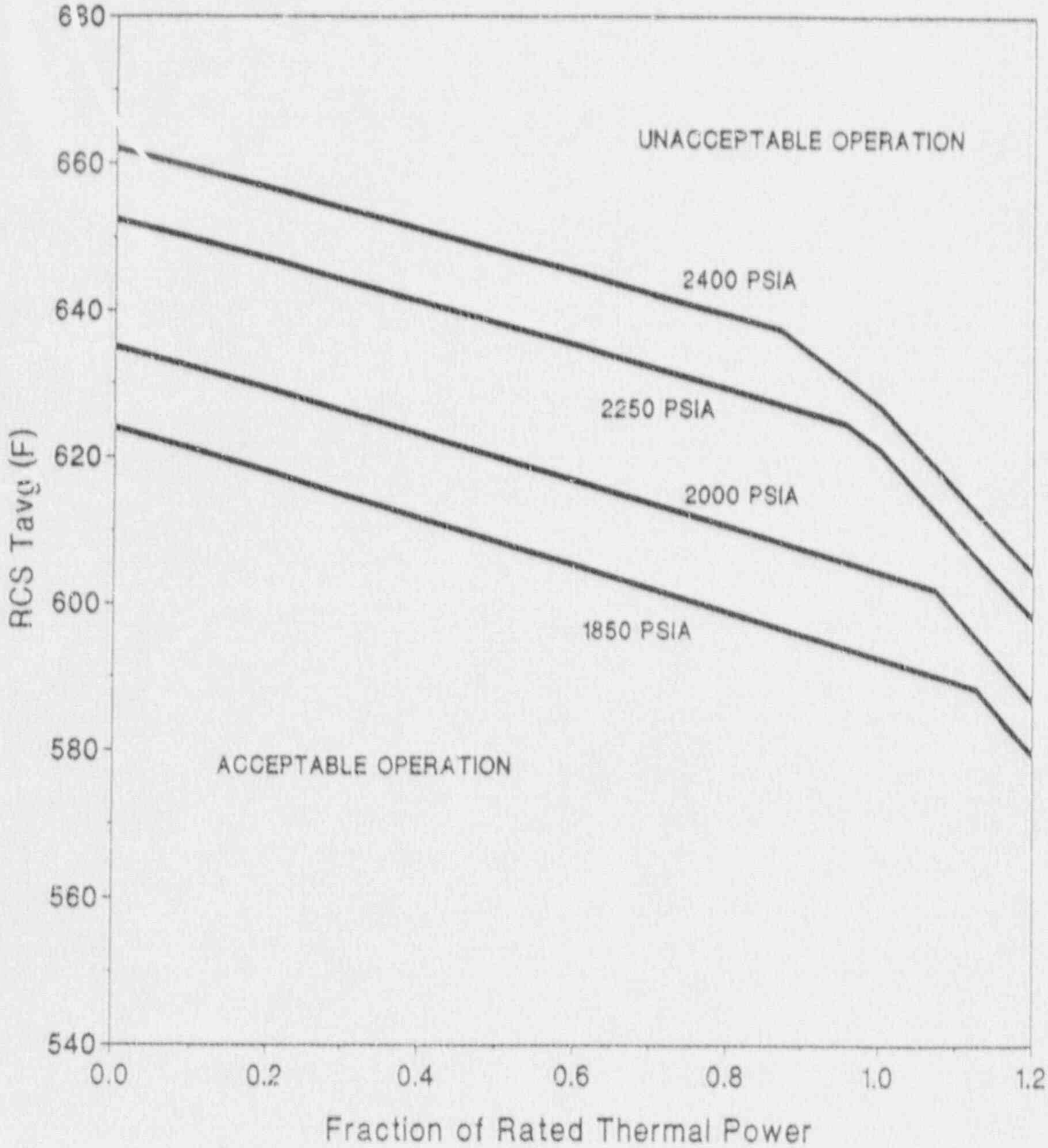
Figure 2.1-1 Reactor Core Safety Limits - Four Loops in Operation



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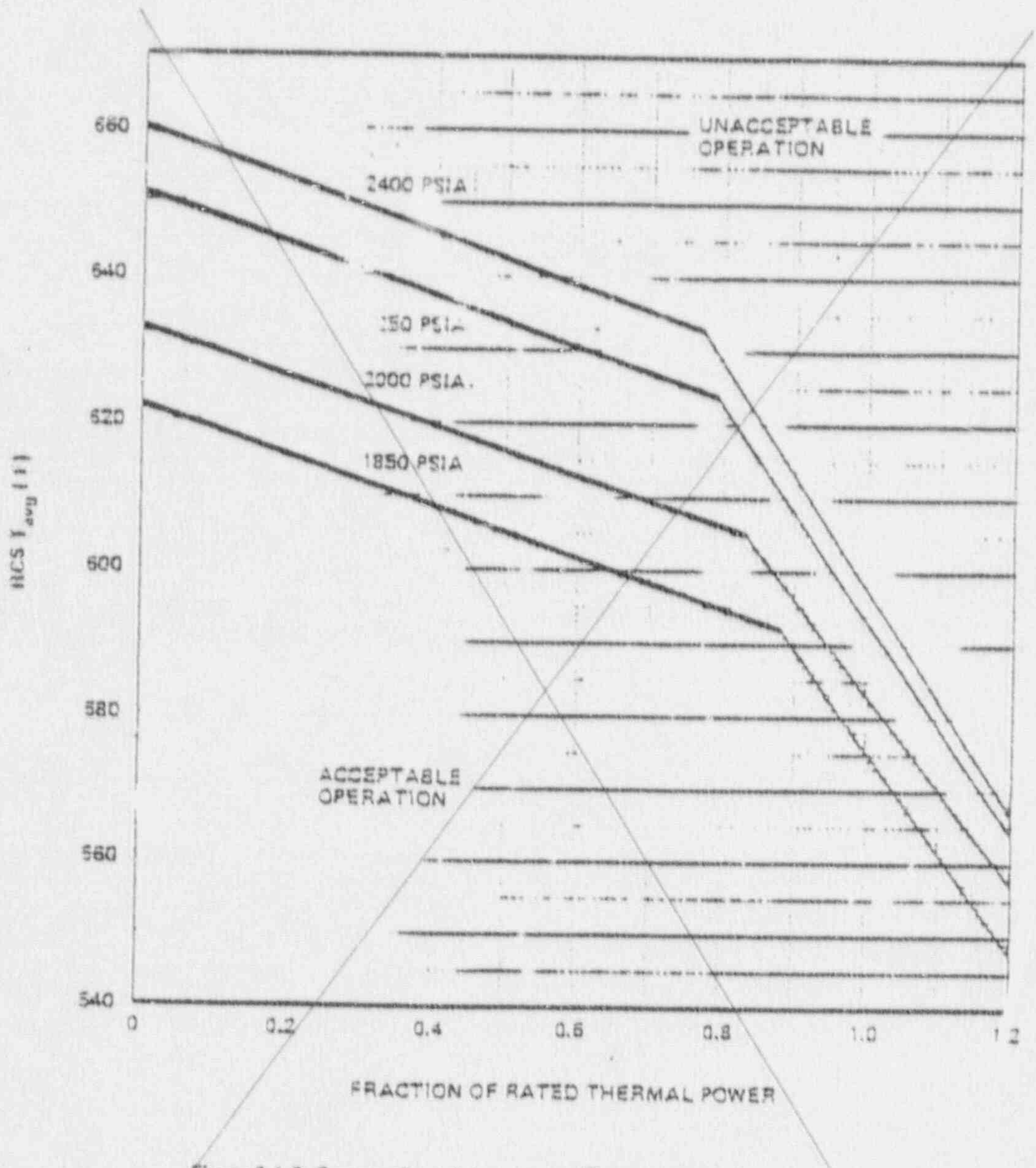

Figure 2.1-2 Reactor Core Safety Limit—Three Loops in Operation.

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TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Power Range, Neutron Flux	Low Setpoint - ≤ 25% of RATED THERMAL POWER	Low Setpoint - ≤ 26% of RATED THERMAL POWER
	High Setpoint - ≤ 109% of RATED THERMAL POWER	High Setpoint - ≤ 110% of RATED THERMAL POWER
3. Power Range, Neutron Flux, High Positive Rate	≤ 5% of RATED THERMAL POWER with a time constant ≥ 2 seconds	≤ 5.5% of RATED THERMAL POWER with a time constant ≥ 2 seconds
4. Power Range, Neutron Flux, High Negative Rate	≤ 5% of RATED THERMAL POWER with a time constant ≥ 2 seconds	≤ 5.5% of RATED THERMAL POWER with a time constant ≥ 2 seconds
5. Intermediate Range, Neutron Flux	≤ 25% of RATED THERMAL POWER	≤ 30% of RATED THERMAL POWER
6. Source Range, Neutron Flux	≤ 10^5 counts per second	≤ 1.3 x 10^5 counts per second
7. Overtemperature ΔT	See Note 1	See Note 3
8. Overpower ΔT	See Note 2	See Note 4
9. Pressurizer Pressure--Low	≥ 1865 psig	≥ 1855 psig
10. Pressurizer Pressure--High	≤ 2385 psig	≤ 2395 psig
11. Pressurizer Water Level--High	≤ 92% of instrument span	≤ 93% of instrument span
12. Loss of Flow	≥ 90% of design flow per loop*	≥ 89% of design flow per loop*

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*Design Flow is ~~92,925~~ 90,000 gpm per loop.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

NOTE 1: Overtemperature $\Delta T \leq \Delta T_o \left[K_1 - K_2 \left[\frac{1+\tau_1 S}{1+\tau_2 S}\right] (T-T') + K_3(P-P') - f_1(\Delta I)\right]$

where: ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

T' $\leq$ 584.7°F (indicated T_{avg} at RATED THERMAL POWER)

P = Pressurizer pressure, psig

P' = 2235 psig (indicated RCS nominal operating pressure)

$\frac{1+\tau_1 S}{1+\tau_2 S}$ = The function generated by the lead-lag controller for T_{avg} dynamic compensation

τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg} τ_1 - 30 secs, τ_2 = 4 secs.

S = Laplace transform operator

Operation with 4 Loops

K_1 = 1.28

K_2 = 0.02109 per °F

K_3 = 0.00100 per psi

Operation with 3 Loops

K_1 = 1.17

K_2 = 0.02109 per °F

K_3 = 0.00100 per psi

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

and f_1 (ΔI) is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for $q_t - q_b$ between -44 percent and $+1$ percent, $f_1(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds -44 percent, the ΔT trip setpoint shall be automatically reduced by 2.20 percent of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds $+1$ percent, the ΔT trip setpoint shall be automatically reduced by 1.91 percent of its value at RATED THERMAL POWER.

NOTE 2: Overpower $\Delta T \leq \Delta T_o \left[K_4 - K_5 \left[\frac{\tau_3 S}{1+\tau_3 S}\right] T - K_6 (T - T") - f_2(\Delta I)\right]$

where: ΔT_o = Indicated ΔT at rated power

T = Average temperature, °F

$T"$ = Indicated T_{avg} at RATED THERMAL POWER $\leq$ 584.7°F

K_4 = 1.08

K_5 = 0.02/°F for increasing average temperature

K_6 = 0.00137/°F for $T > T"$; $K_6 = 0$ for $T \leq T"$

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

$\frac{\tau_3 S}{1+\tau_3 S}$ = The function generated by the rate lag controller for T_{avg} dynamic compensation

τ_3 = Time constant utilized in the rate lag controller for T_{avg}
τ_3 = 10 secs

S = Laplace transform operator

INSERT (See next page)

$f_2(\Delta I) = 0$ for all ΔI

NOTE 3: The channel's maximum trip point shall not exceed its computed trip point by more than 1.3 percent of ΔI span. 153

NOTE 4: The channel's maximum trip point shall not exceed its computed trip point by more than 3.0 percent of ΔI span. 153

and $f_2(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during Plant startup tests such that:

(i) for $q_t - q_b$ between -33 percent and +25 percent, $f_2(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and q_t and q_b is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds -33 percent, the ΔT trip setpoint shall be automatically reduced by 2.8 percent of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitute of $(q_t - q_b)$ exceeds +25 percent, the ΔT trip setpoint shall be automatically reduced by 1.91 percent of its value at RATED THERMAL POWER.

(Insert on page 2-9)

2.1 SAFETY LIMITS

BASES

2.1.1 REACTOR CORE

The restrictions of this safety limit prevent overheating of the fuel and possible cladding perforation which would result in the release of fission products to the reactor coolant. Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime where the heat transfer coefficient is large and the cladding surface temperature is slightly above the coolant saturation temperature.

Operation above the upper boundary of the nucleate boiling regime could result in excessive cladding temperatures because of the onset of departure from nucleate boiling (DNB) and the resultant sharp reduction in heat transfer coefficient. DNB is not a directly measurable parameter during operation and therefore THERMAL POWER and Reactor Coolant Temperature and Pressure have been related to DNB. This relation has been developed to predict the DNB flux and the location of DNB for axially uniform and non-uniform heat flux distributions. The local DNB heat flux ratio, DNBR, defined as the ratio of the heat flux that would cause DNB at a particular core location to the local heat flux, is indicative of the margin to DNB.

The DNB design basis is that there must be at least a 95 percent probability with 95 percent confidence that DNB will not occur when the minimum DNBR is at the DNBR limit.

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In meeting this design basis, uncertainties in plant operating parameters, nuclear and thermal parameters, and fuel fabrication parameters are considered statistically such that there is at least a 95 percent confidence that the minimum DNBR for the limiting rod is greater than or equal to the DNBR limit. The uncertainties in the above plant parameters are used to determine the plant DNBR uncertainty. This DNBR uncertainty, combined with the correlation DNBR limit, establishes a design DNBR value which must be met in plant safety analyses using values of input parameters without uncertainties.

The curves of Figures 2.1-1 and 2.1-2 show the loci of points of THERMAL POWER, Reactor Coolant System pressure, and average temperature for which the calculated DNBR is no less than the design DNBR value or the average enthalpy at the vessel exit is less than the enthalpy of saturated liquid.

SAFETY LIMITS

BASES

The curves are based on an enthalpy rise hot channel factor, $F^N_{\Delta H}$, of 1.56 and a reference cosine with a peak of 1.55 for axial power shape. An allowance is included for an increase in $F^N_{\Delta H}$ at reduced power based on the expression:

$$F^N_{\Delta H} = 1.56\ [1 + 0.3\ (1-P)]$$

where P is the fraction of RATED THERMAL POWER

These limiting heat flux conditions are higher than those calculated for the range of all control rods fully withdrawn to the maximum allowable control rod insertion assuming the axial power imbalance is within the limits of the f(ΔI) function of the Overtemperature ΔT trip. When the axial power imbalance is not within the tolerance, the axial power imbalance effect on the Overtemperature ΔT trips will reduce the setpoints to provide protection consistent with core safety limits.

2.1.2 REACTOR COOLANT SYSTEM PRESSURE

The restriction of this Safety Limit protects the integrity of the Reactor Coolant System from overpressurization and thereby prevents the release of radionuclides contained in the reactor coolant from reaching the containment atmosphere.

The reactor pressure vessel and pressurizer are designed to Section III of the ASME Code for Nuclear Power Plant which permits a maximum transient pressure of 110% (2735 psig) of design pressure. The Reactor Coolant System piping, valves and fittings, are designed to ANSI B 31.7-1969, which permits a maximum transient pressure of 120% (2985 psig) of component design pressure. The Safety Limit of 2735 psig is therefore consistent with the design criteria and associated code requirements.

The entire Reactor Coolant System is hydrotested at 3107 psig to demonstrate integrity prior to initial operation.

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be $\geq$ 1.6% $\Delta k/k$.

APPLICABILITY: MODES 1, 2*, 3, 4, and 5.

ACTION:

With the SHUTDOWN MARGIN < 1.6% $\Delta k/k$, immediately initiate and continue boration at $\geq$ 30 gpm of 7000 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be $\geq$ 1.6% $\Delta k/k$:

a. Within one hour after detection of an inoperable control rod(s) in accordance with Specification 3.1.3.1.a, and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s).

b. When in MODES 1 or 2#, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

c. When in MODE 2##, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.5.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at maximum insertion limit of Specification 3.1.3.5.

---

* See Special Test Exception 3.10.1.

\# With $K_{eff} \geq 1.0$.

\##With $K_{eff} < 1.0$.

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3, 4, or 5, at least once per 24 hours by consideration of the following factors: 64

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration, and
6. Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within ± 1% Δk/k at least once per 31 Effective Full Power Days (EFPD). This comparision shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

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REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - T_{avg} ≤350°F

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be ≥1.6% Δk/k.

APPLICABILITY. MODES 4 and 5.

ACTION:

With the SHUTDOWN MARGIN <1.6% Δk/k, immediately initiate and continue boration at ≥30 gpm of ≥7000 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be ≥1.6% Δk/k:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

b. At least once per 24 hours by consideration of the following factors:

1. Reactor Coolant System boron concentration,

2. Control rod position,

3. Reactor Coolant System average temperature,

4. Fuel burnup based on gross thermal energy generation,

5. Xenon concentration, and

6. Samarium concentration.

(Insert on page 3/4 1-3)

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.5 The control banks shall be limited in physical insertion as shown in Figures 3.1-1 and 3.1-2. specified in the Core Operating Limits Report (COLR).

APPLICABILITY: MODES 1* and 2*#.

ACTION:

With the control banks inserted beyond the above insertion limits specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2, either:

a. Restore the control banks to within the limits within two hours, or

b. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank group position using the above figures insertion limits specified in the COLR, or

c. Be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.5 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify the individual rod positions at least once per 4 hours.

*See Special Test Exceptions 3.10.2 and 3.10.4.
#With $K_{eff} \geq 1.0$.

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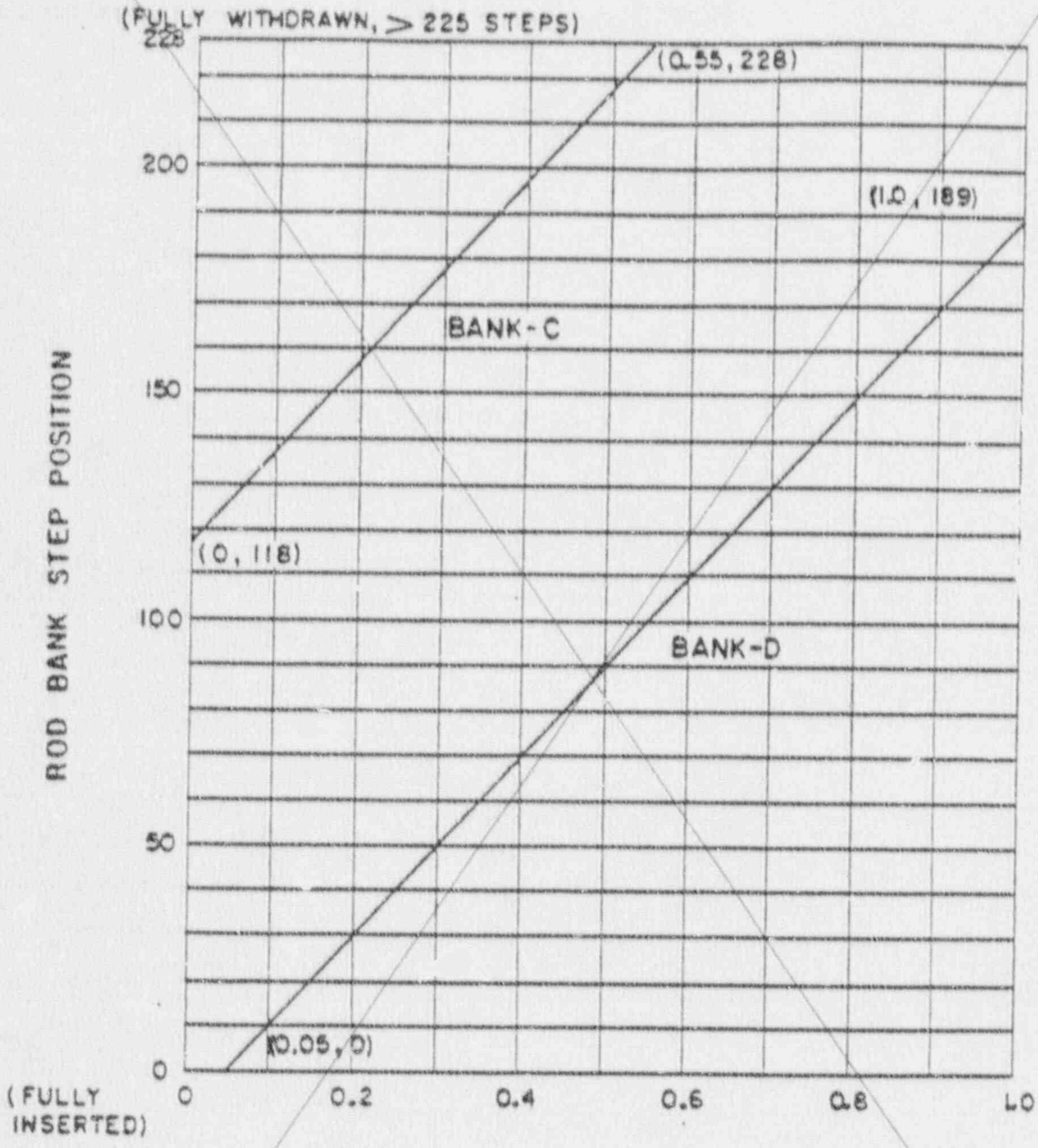

FIGURE 3.1-1

ROD BANK INSERTION LIMITS VERSUS THERMAL POWER
FOUR LOOP OPERATION

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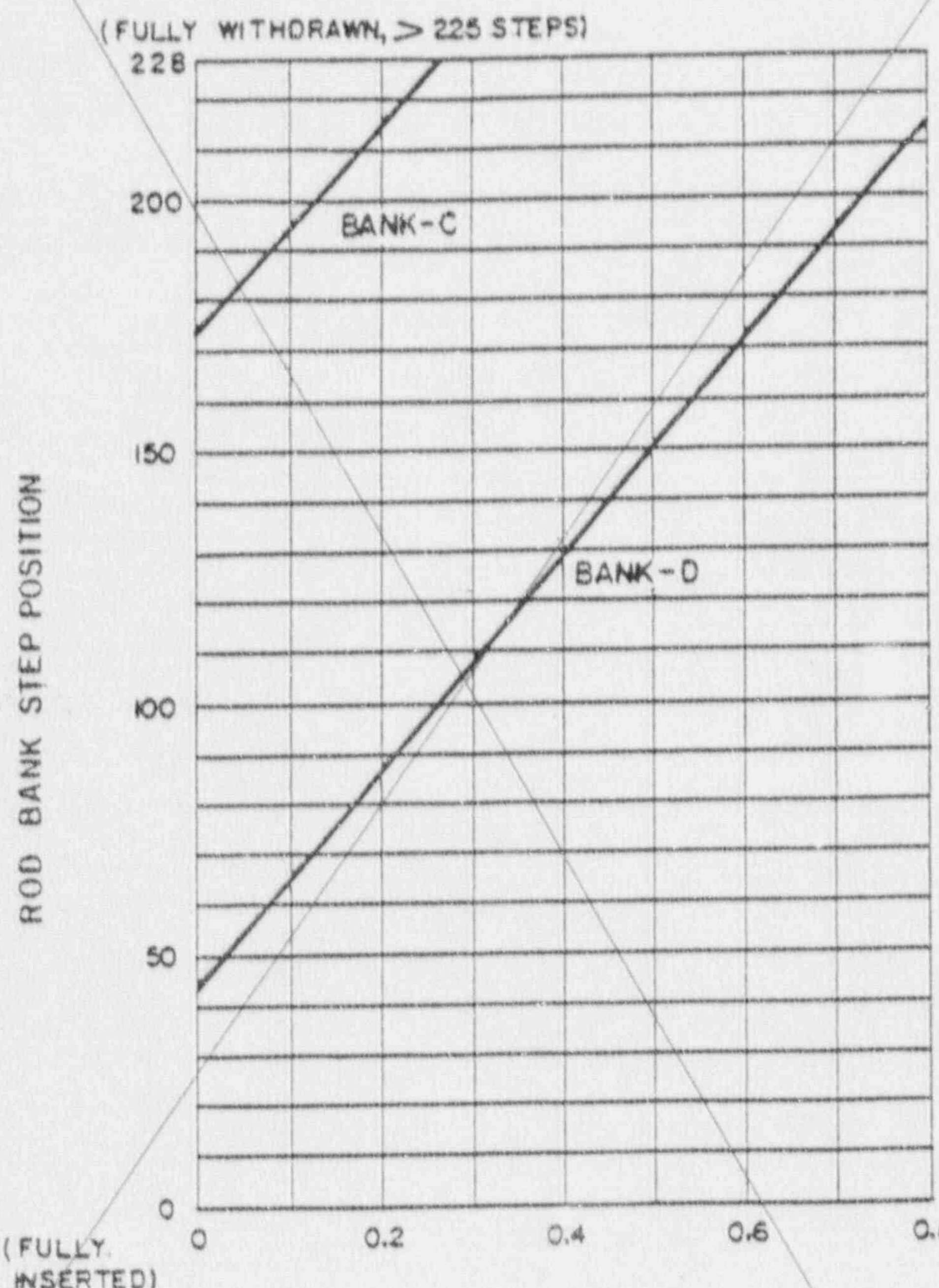

FIGURE 3.1-2

ROD BANK INSERTION LIMITS VERSUS THERMAL POWER
THREE LOOP OPERATION

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REACTIVITY CONTROL SYSTEMS

PART LENGTH ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 This Specification has been deleted due to the removal of part length rods from the reactor.

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SURVEILLANCE REQUIREMENTS

4.1.3.6 This Specification has been deleted due to the removal of part length rods from the reactor.

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3/4.2 POWER DISTRIBUTION LIMITS

AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE shall be maintained within a ±5% target band (flux difference units) about the target flux difference.

APPLICABILITY: MODE 1 ABOVE 50% RATED THERMAL POWER*

ACTION:

a. With the indicated AXIAL FLUX DIFFERENCE outside of the ±5% target band about the target flux difference and with THERMAL POWER:

1. Above 90% of RATED THERMAL POWER, within 15 minutes:

a) Either restore the indicated AFD to within the target band limits, or

b) Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER.

2. Between 50% and 90% of RATED THERMAL POWER:

a) POWER OPERATION may continue provided:

1) The indicated AFD has not been outside of the ±5% target band for more than 1# hour penalty deviation cumulative during the previous 24 hours, and

2) The indicated AFD is within the limits shown on Figure 3.2-1. Otherwise, reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes and reduce the Power Range Neutron Flux-High Trip Setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

b) Surveillance testing of the Power Range Neutron Flux Channels may be performed for up to 10 hours pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. No penalty deviation shall be accumulated during this surveillance testing.

*See Special Test Exception 3.10.2.
#A 2-hour penalty deviation is permissible during tests performed as part of the Augmented Startup Test Program.

Replace with new section 3.2.1
(see next page)

1
4
2

3/4.2 POWER DISTRIBUTION LIMITS

AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE shall be maintained within the acceptable limits specified in the CORE OPERATING LIMITS REPORT (COLR).

APPLICABILITY: MODE 1, ABOVE 50% RATED THERMAL POWER.*

ACTION:

a. For operation with the indicated AFD outside of the limits specified in the COLR, within 2 hours:

   1. Either restore the indicated AFD to within the limits specified in the COLR, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER, and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 12 hours.

b. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD is within the limits specified in the COLR.

*See Special Test Exceptions Specification 3.10.2.

Insert as new section 3.2.1

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

b. THERMAL POWER shall not be increased above 90% of RATED THERMAL POWER unless the indicated AFD is within the ±5% target band and ACTION 2.a)1), above has been satisfied.

c. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD has not been outside of the ±5% target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

a. Monitoring the indicated AFD for each OPERABLE excore channel at least once per 7 days when the AFD Monitor Alarm is OPERABLE, and

b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per 30 minutes when the AXIAL FLUX DIFFERENCE Monitor Alarm is inoperable. The logged values of the indicated AXIAL FLUX DIFFERENCE shall be assumed to exist during the interval preceding each logging. 14

4.2.1.2 The indicated AFD shall be considered outside of its ±5% target band when at least 2 of 4 or 2 of 3 OPERABLE excore channels are indicating the AFD to be outside the target band. POWER OPERATION outside of the ±5% target band shall be accumulated on a time basis of:

a. One minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and

b. One-half minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels below 50% of RATED THERMAL POWER.

Replace with new Section 4.2.1.1
(See next page)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated Axial Flux Difference (AFD) shall be determined to be within its limits during POWER OPERATION above 50% of RATED THERMAL POWER by:

a. Monitoring the indicated AFD for each OPERABLE excore channel at least once per 7 days when the AFD Monitor Alarm is OPERABLE.

b. Monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour when the AFD Monitor Alarm is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

4.2.1.2 The indicated AFD shall be considered outside of its limits when at least two OPERABLE excore channels are indicating the AFD to be outside the limits.

Insert as new section 4.2.1.1

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

4.2.1.3 The target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days. 70

4.2.1.4 The target flux difference shall be updated at least once per 31 Effective Full Power Days by either determining the target flux difference pursuant to 4.2.1.3 above or by linear interpolation between the most recently measured value and 0 percent at the end of the cycle life.

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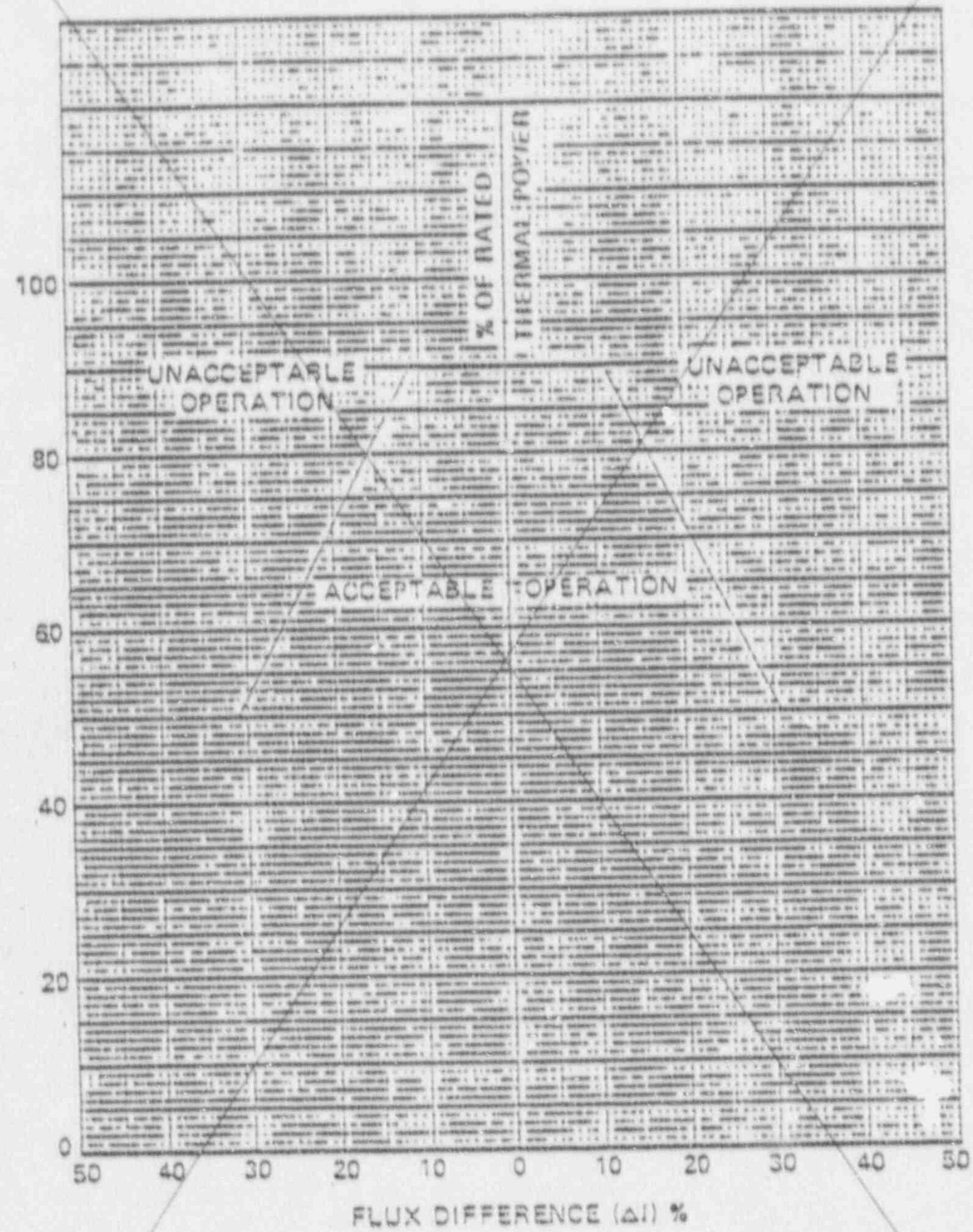

FIGURE 3.2-1 AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER

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POWER DISTRIBUTION LIMITS

HEAT FLUX HOT CHANNEL FACTOR-$F_Q(Z)$

LIMITING CONDITION FOR OPERATION

3.2.2 $F_Q(Z)$ shall be limited by the following relationships:

$$F_Q(Z) \leq \left[\frac{2.50}{P}\right] [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z) \leq [(5.00)] [K(Z)] \text{ for } P \leq 0.5$$

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

and K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

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APPLICABILITY: MODE 1

ACTION:

With $F_Q(Z)$ exceeding its limit:

a. Reduce THERMAL POWER at least 1% for each 1% $F_Q(Z)$ exceeds the limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent STARTUP and POWER OPERATION may proceed provided the Overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% $F_Q(Z)$ exceeds the limit. The Overpower ΔT Trip Setpoint reduction shall be performed with the reactor subcritical.

b. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; THERMAL POWER may then be increased provided $F_Q(Z)$ is demonstrated through incore mapping to be within its limit.

Replace with new Section 3.2.2
(See next page)

POWER DISTRIBUTION LIMITS

HEAT FLUX HOT CHANNEL FACTOR - $F_Q(X,Y,Z)$

LIMITING CONDITION FOR OPERATION

3.2.2 $F_Q(X,Y,Z)$ shall be maintained within the acceptable limits specified in the CORE OPERATING LIMITS REPORT (COLR).

APPLICABILITY: MODE 1

ACTION:

With $F_Q(X,Y,Z)$ exceeding the limit specified in the COLR:

a. Reduce THERMAL POWER at least 1% for each 1% $F_Q(X,Y,Z)$ exceeds the limit within 15 minutes, and similarly reduce the following:

   1. Administratively reduce the allowable power at each point along the AFD limit lines within 15 minutes, and

   2. the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.

b. POWER OPERATION may proceed for up to 48 hours. Subsequent POWER OPERATION may proceed provided the overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% $F_Q(X,Y,Z)$ exceeds the limit specified in the COLR.

c. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced limit required by ACTION a. and b., above; THERMAL POWER may then be increased provided $F_Q(X,Y,Z)$ is demonstrated through incore mapping to be within its limit specified in the COLR.

Insert as new section 3.2.2

Insert new section 4.2.2.2 (See attached page)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 F_{xy} shall be evaluated to determine if $F_Q(Z)$ is within its limit by:

a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Increasing the measured F_{xy} component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties.

c. Comparing the F_{xy} computed (F_{xy}^C) obtained in b, above to.

1. The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) for the appropriate measured core planes given in e and f below, and

2. The relationship:

$$F_{xy}^L = F_{xy}^{RTP} [1+0.2(1-P)]$$

where F_{xy}^L is the limit for fractional THERMAL POWER operation expressed as a function of F_{xy}^{RTP} and P is the fraction of RATED THERMAL POWER at which F_{xy} was measured.

d. Remeasuring F_{xy} according to the following schedule:

1. When F_{xy}^C is greater than the F_{xy}^{RTP} limit for the appropriate measured core plane but less than the F_{xy}^L relationship, additional power distribution maps shall be taken and F_{xy}^C compared to F_{xy}^{RTP} and F_{xy}^L:

a) Either within 24 hours after exceeding by 20% of RATED THERMAL POWER or greater, the THERMAL POWER at which F_{xy}^C was last determined, or

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POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_Q^M(X,Y,Z)$ shall be evaluated to determine if $F_Q(X,Y,Z)$ is within its limit by:

a. Using the movable incore detectors to obtain a power distribution map ($F_Q^M(X,Y,Z)$*) at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Satisfying the following relationship:

$$F_Q^M(X,Y,Z) \leq \text{BQNOM}(X,Y,Z)$$

where BQNOM(X,Y,Z)** represents the nominal design increased by an allowance for the expected deviation between the nominal design and the measurement.

The BQNOM(X,Y,Z) factors are not applicable in the following core plane regions as measured in percent of core height from the bottom of the fuel:

1. Lower core region from 0 to 15%, inclusive.

2. Upper core region from 85 to 100%, inclusive.

c. If the above relationship is not satisfied, then

1. For that location, calculate the % margin to the maximum allowable design as follows:

$$\%\ \text{AFD Margin} = \left(1 - \frac{F_Q^M(X,Y,Z)}{\text{BQDES}(X,Y,Z)}\right) \times 100\%$$

$$\%\ f_2(\Delta I)\ \text{Margin} = \left(1 - \frac{F_Q^M(X,Y,Z)}{\text{BCDES}(X,Y,Z)}\right) \times 100\%$$

where BQDES(X,Y,Z)** and BCDES(X,Y,Z)** represent the maximum allowable design peaking factors which insure that the licensing criteria will be preserved for operation within Limiting Condition for Operation limits, and include allowances for the calculational and measurement uncertainties.

---

* No additional uncertainties are required in the following equations for $F_Q(X,Y,Z)$, because the limits include uncertainties.

** Provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

Insert as new Section 4.2.2.2
(page 3/4 2-4)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

2. Find the minimum margin of all locations examined in 4.2.2.2.c.1 above.

   AFD min margin = minimum % margin value of all locations examined.

   $f_2(\Delta I)$ OPΔT min margin = minimum % margin value of all locations examined.

3. If the AFD min margin in 4.2.2.2.c.1 above is <0, the following actions shall be taken.

   (a) Within 2 hours, administratively reduce the negative AFD limit lines at each power level by:

   Reduced AFD^{Limit} = [AFD^{Limit} from CORE OPERATING LIMITS REPORT (COLR)] + absolute value of ($NSLOPE^{AFD*}$% x AFD min margin of 4.2.2.2.c.2)

   (b) Within 2 hours, administratively reduce the positive AFD limit lines at each power level by:

   Reduced AFD^{Limit} = (AFD^{Limit} from COLR) - absolute value of ($PSLOPE^{AFD*}$ % x AFD min margin)

4. If the $f_2(\Delta I)$ min margin in 4.2.2.2.c.1 above is <0, the following actions shall be taken:

   (a) Within 48 hours, reduce the OPΔT negative $f_2(\Delta I)$ breakpoint limit by:

   Reduced OPΔT negative $f_2(\Delta I)$ breakpoint limit = $f_2(\Delta I)$ limit of Table 2.2-1) + absolute value of ($NSLOPE^{f_2(\Delta I)**}$ % x $f_2(\Delta I)$ min margin)

---

* $NSLOPE^{AFD}$ and $PSLOPE^{AFD}$ are the amount of AFD adjustment required to compensate for each 1% that $F_Q(X,Y,Z)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

** $NSLOPE^{f_2(\Delta I)}$ and $PSLOPE^{f_2(\Delta I)}$ are the amounts of the OPΔT $f_2(\Delta I)$ limit adjustment required to compensate for each 1% that $F_Q(X,Y,Z)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

(Insert as new page 3/4 2-5)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

b) At least once per 31 EFPD, whichever occurs first.

2. When the F_{xy}^{C} is less than or equal to the F_{xy}^{RTP} limit for the appropriate measured core plane, additional power distribution maps shall be taken and F_{xy}^{C} compared to F_{xy}^{RTP} and F_{xy}^{L} at least once per 31 EFPD.

e. Changes in the F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) shall be provided for all core planes containing bank "D" control rods and all unrodded core planes in a Radial Peaking Factor Limit Report per Specification 6.9.1.7.

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f. The F_{xy} limits of e, above, are not applicable in the following core plane regions as measured in percent of core height from the bottom of the fuel:

1. Lower core region from 0 to 15%, inclusive.
2. Upper core region from 86 to 100% inclusive.
3. Grid plane regions at 17.8 ± 2%, 32.1 ± 2%, 47.4 ± 2%, 60.6 ±2% and 74.9 ± 2%, inclusive.
4. Core plane regions within ± 2% of core height (± 2.88 inches) about the bank demand position of the bank "D" rods.

g. Evaluating the effects of F_{xy} on $F_Q(Z)$ to determine if $F_Q(Z)$ is within its limit whenever F_{xy}^{C} exceeds F_{xy}^{L}.

4.2.2.3 $F_Q(Z)$ shall be measured at least once per 31 EFPD. When $F_Q(Z)$ is measured, an overall measured value shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

Replace contents of this page
(See next page)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

(b) Within 48 hours, reduce the OPΔT positive $f_2(\Delta I)$ breakpoint limit by:

Reduced OPΔT positive $f_2(\Delta I)$ breakpoint limit
= ($f_2(\Delta I)$ limit of Table 2.2-1) - absolute value of
($PSLOPE^{f_2(\Delta I)}$** % x $f_2(\Delta I)$ min margin)

d. Measuring $F_Q^M(X,Y,Z)$ according to the following schedule:

1. At least once per 31 Effective Full Power Days or,

2. At each time the QUADRANT POWER TILT RATIO indicated by the excore detectors is normalized using incore detector measurements.

e. With two measurements extrapolated to 31 EFPD beyond the most recent measurement yielding $F_Q^M(X,Y,Z)$ > BQNOM(X,Y,Z), either of the following actions specified shall be taken.

1. $F_Q^M(X,Y,Z)$ shall be increased by 2 percent over that specified in 4.2.2.2.a., or

2. $F_Q^M(X,Y,Z)$ shall be evaluated according to 4.2.2.2 at the time when the margin is projected to result in one of the actions specified in 4.2.2.2.c.3 or 4.2.2.2.c.4

4.2.2.3 When $F_Q(X,Y,Z)$ is measured for reasons other than meeting the requirements of Specification 4.2.2.2 an overall measured $F_Q(X,Y,Z)$ shall be obtained from a power distribution map, increased by 5% to account for measurement uncertainty, and compared to the $F_Q(X,Y,Z)$ limit specified in the COLR according to Specification 3.2.2.

** $NSLOPE^{f_2(\Delta I)}$ and $PSLOPE^{f_2(\Delta I)}$ are the amounts of the OPΔT $f_2(\Delta I)$ limit adjustment required to compensate for each 1% that $F_Q(X,Y,Z)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

Insert as new contents
of page 3/4 2-6

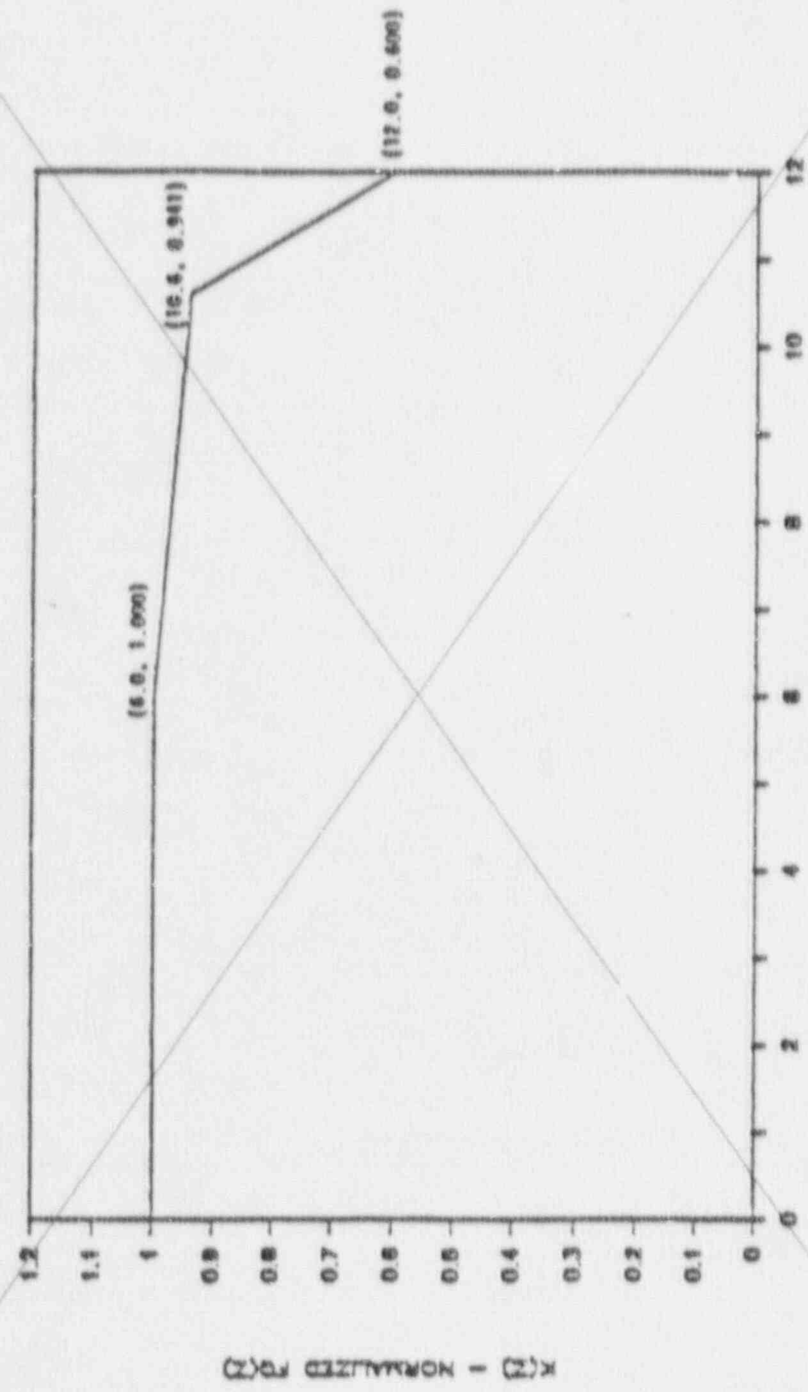

FIGURE 3.2-2

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

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POWER DISTRIBUTION LIMITS

~~RCS FLOWRATE AND F_R~~ Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(X,Y)$

LIMITING CONDITION FOR OPERATION

3.2.3 The combination of indicated Reactor Coolant System (RCS) total flow rate and F_R shall be maintained within the region of allowable operation (above and to the left of the line) shown on Figures 3.2-3 and 3.2-4 for 4- and 3-loop operation, respectively.

Where:

a. $F_R = \frac{F^N_{\Delta H}}{1.56\ (1.0 + 0.3\ (1.0 - P))}$, and

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

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APPLICABILITY: MODE 1

ACTION:

With the combination of RCS total flow rate and F_R outside the region of acceptable operation shown on Figure 3.2-3 or 3.2-4 (as applicable):

a. Within 2 hours:

1. Either restore the combination of RCS flow rate and F_R to within the above limits, or

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER and reduce the Power Range Neutron Flux - High trip setpoint to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

b. Within 24 hours of initially being outside the above limits, verify through incore flux mapping and RCS total flow rate comparison that the combination of F_R and RCS total flow rate are restored to within the above limits, or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours.

Replace with new section 3.2.3
(see next page)

3.2.3 $F_{\Delta H}(X,Y)$ shall be less than the Maximum Allowable Radial Peaks specified in the CORE OPERATING LIMITS REPORT (COLR).

APPLICABILITY: MODE 1.

ACTION:

With $F_{\Delta H}(X,Y)$ exceeding the limit specified in the COLR:

a. Within 2 hours either:

   1. Restore $F_{\Delta H}(X,Y)$ to within the limit specified in the COLR, or

   2. Reduce the allowable THERMAL POWER from RATED THERMAL POWER at least RRH*% for each 1% that $F_{\Delta H}(X,Y)$ exceeds the limit, and

b. Within 4 hours either:

   1. Restore $F_{\Delta H}(X,Y)$ to within the limit specified in the COLR, or

   2. Reduce the Power Range Neutron Flux-High Trip Setpoint in Table 2.2-1 at least RRH*% for each 1% that $F_{\Delta H}(X,Y)$ exceeds that limit, and

c. Within 48 hours of initially being outside the limit specified in the COLR, either:

   1. Restore $F_{\Delta H}(X,Y)$ to within the limit specified in the COLR, or

   2. Reduce the OTΔT K_1 term in Table 2.2-1 by at least TRH** for each 1% that $F_{\Delta H}(X,Y)$ exceeds the limit, and

---

* RRH is the amount of power reduction required to compensate for each 1% that $F_{\Delta H}(X,Y)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

** TRH is the amount of OTΔT K_1 setpoint reduction required to compensate for each 1% that $F_{\Delta H}(X,Y)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

Insert as new Section 3.2.3

(page 3/4 2-7)

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

3. Verify through incore flux mapping that $F_{\Delta H}(X,Y)$ is restored to within the limit for the reduced THERMAL POWER allowed by ACTION a.2, or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours.

d. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced THERMAL POWER limit required by ACTION a.2. and/or b. and/or c., above; subsequent POWER OPERATION may proceed provided that $F_{\Delta H}(X,Y)$ is demonstrated, through incore flux mapping, to be within the above limit prior to exceeding the following THERMAL POWER levels:

1. A nominal 50% of RATED THERMAL POWER,

2. A nominal 75% of RATED THERMAL POWER, and

3. Within 24 hours of attaining greater than or equal to 95% of RATED THERMAL POWER.

Insert as new page 3/4 2-8

POWER DISTRIBUTION LIMITS

ACTION: (Continued)

c. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced THERMAL POWER limit required by ACTION items a.2 and/or b above; subsequent POWER OPERATION may proceed provided that the combination of R and indicated RCS total flow rate are demonstrated, through incore flux mapping and RCS total flow rate comparison, to be within the region of acceptable operation shown on Figure 3.2-3 or 3.2-4 (as applicable) prior to exceeding the following THERMAL POWER levels:

1. A nominal 50% of RATED THERMAL POWER,

2. A nominal 75% of RATED THERMAL POWER, and

3. Within 24 hours of attaining $\geq$ 95% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 The combination of indicated RCS total flow rate and F_R shall be determined to be within the region of acceptable operation of Figure 3.2-3 and 3.2-4 (as applicable):

a. Prior to operation above 75% of RATED THERMAL POWER after each fuel loading, and

b. At least once per 31 Effective Full Power Days.

Where:

$$F_R = \frac{F^N_{\Delta H}}{1.56\ (1.0 + 0.3\ (1.0 - P))}\text{, and}$$

$F^N_{\Delta H}$ = Measured values of $F^N_{\Delta H}$ obtained by using the movable incore detectors to obtain a power distribution map. The measured values of $F^N_{\Delta H}$ shall be used to calculate F_R since Figures 3.2-3 and 3.2-4 include measurement calculational uncertainties of 3.5% for flow and 4% for incore measurement of $F^N_{\Delta H}$.

4.2.3.3 The RCS total flow rate indicators shall be subjected to a CHANNEL CALIBRATION at least once per 18 months.

4.2.3.4 The RCS total flow rate shall be determined by measurement at least once per 18 months.

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(see next page)

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POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

4.2.3.1 The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 $F_{\Delta H}^{M}(X,Y)$ shall be evaluated to determine if $F_{\Delta H}(X,Y)$ is within its limit by:

a. Using the movable incore detectors to obtain a power distribution map $F_{\Delta H}^{M}(X,Y)$* at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Satisfying the following relationship:

$$\frac{F_{\Delta H}^{M}(X,Y)}{MAP^{M}/AXIAL\ (X,Y)} \leq BHNOM(X,Y)$$

where: BHNOM(X,Y)** represents the nominal design increased by an allowance for the expected deviation between the nominal design and the measurement.

MAP^{M} is the Maximum Allowable Peak** obtained from the measured power distribution.

AXIAL(X,Y) is the axial shape for $F_{\Delta H}^{M}(X,Y)$.

c. If the above relationship is not satisfied, then

1. For the location, calculate the % margin to the maximum allowable design as follows:

$$\%\ F_{\Delta H}\ \text{Margin} = \left(1 - \frac{F_{\Delta H}^{M}(X,Y)}{BHDES(X,Y)}\right) \times 100\%$$

where BHDES(X,Y)** represents the maximum allowable design peaking factor which insures that the licensing criteria will be preserved for operation within the LCO limits, and includes allowences for calculational and measurement uncertainties.

* No additional uncertainties are required in the following equations for $F_{\Delta H}^{M}(X,Y)$, because the limits include uncertainties.

** Provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

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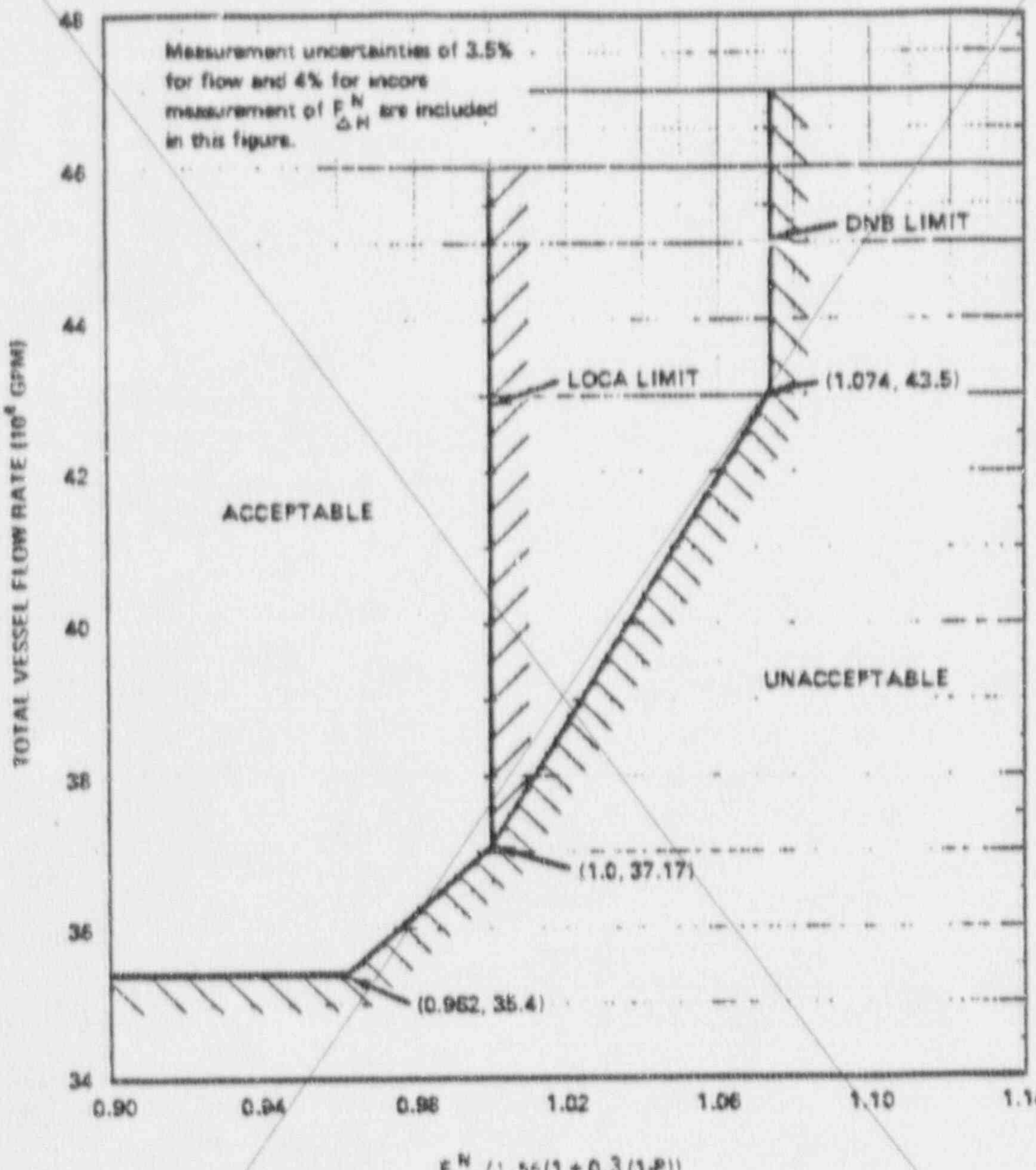

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Figure 3.2-3 Flow vs. $F^N_{\Delta H}$ Limit for 4 Loops in Operation.

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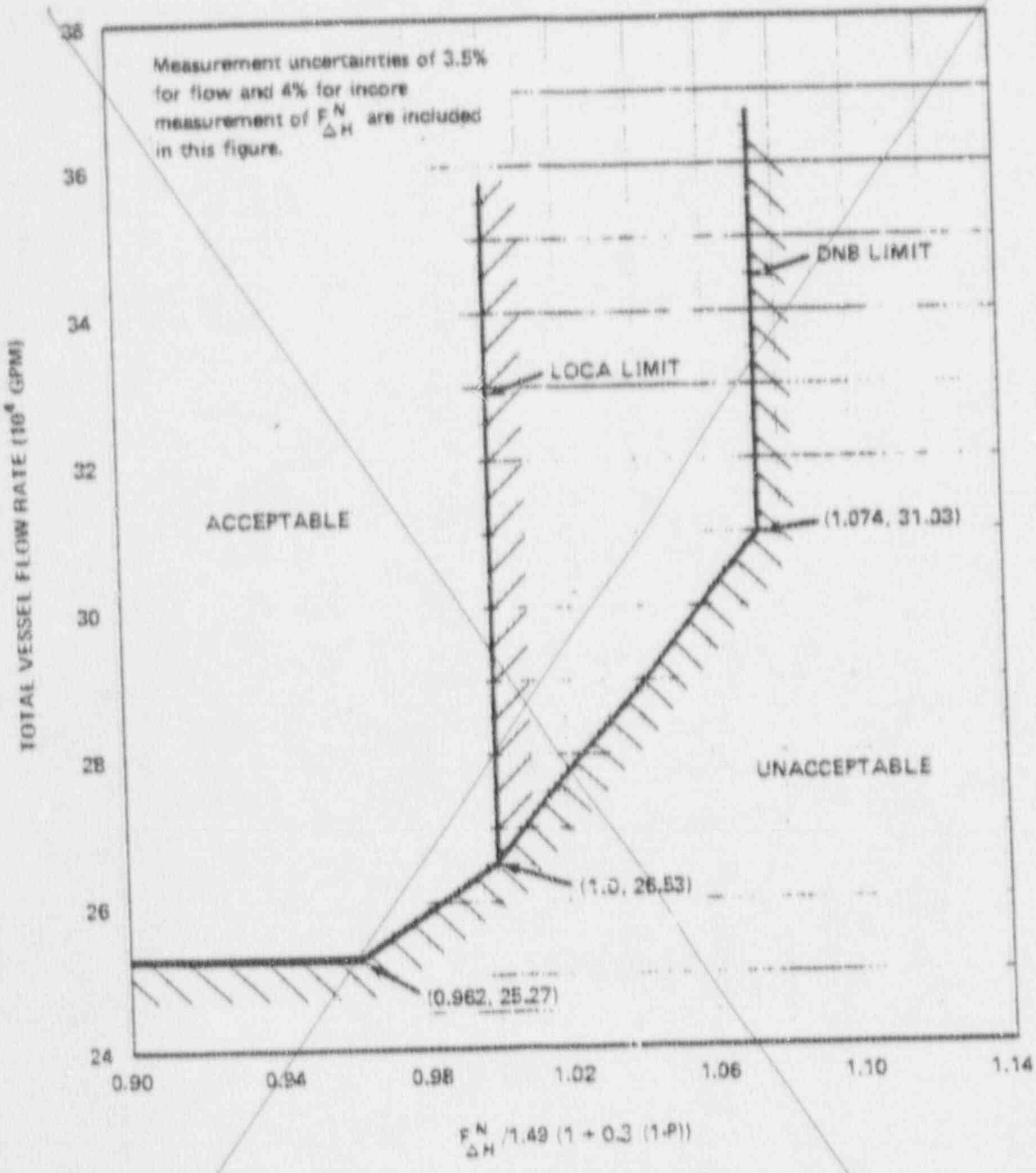

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Figure 3.2-4 Flow vs. $F^N_{\Delta H}$ Limit for 3 Loops in Operation.

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(New page 3/4 2-10)

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

2. Find the minimum margin of all locations examined in 4.2.3.2.c.1 above.

3. If any margin in 4.2.3.2.c.2 above is <0, reduce the allowable THERMAL POWER from RATED THERMAL POWER by RRH*% x most negative margin from 4.2.3.2.c.2 and maintain the requirements of Specification 3.2.3.

d. With two measurements extrapolated to 31 EFPD beyond the most recent measurement yielding ($F_{\Delta H}^M(X,Y)/MAP^M/AXIAL(X,Y)$) > BHFOM(X,Y), either of the following actions shall be taken:

1. $F_{\Delta H}^M(X,Y)$ shall be increased by 2% over that specified in 4.2.3.2.a., or

2. $F_{\Delta H}^M(X,Y)$ shall be evaluated according to 4.2.3.2 at the time when the margin is projected to result in the action specified in 4.2.3.2.c.3.

4.2.3.3 $F_{\Delta H}(X,Y)$ shall be determined to be within its limit by using the incore detectors to obtain a power distribution map:

a. Prior to operation above 75% of RATED THERMAL POWER after each fuel loading, and

b. At least once per 31 Effective Full Power Days, or

c. At each time the QUADRANT POWER TILT RATIO indicated by the excore detectors is normalized using incore data measurements.

* RRH is the amount of power reduction required to compensate for each 1% that $F_{\Delta H}(X,Y)$ exceeds the limit provided in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.7.

POWER DISTRIBUTION LIMITS

QUADRANT POWER TILT RATIO

LIMITING CONDITION FOR OPERATION

3.2.4 THE QUADRANT POWER TILT RATIO shall not exceed 1.02.

APPLICABILITY: MODE 1 ABOVE 50% OF RATED THERMAL POWER*

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.02 but ≤ 1.09:

  1. Within 2 hours:

    a) Either reduce the QUADRANT POWER TILT RATIO to within its limit, or

    b) Reduce THERMAL POWER at least 3% for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.0 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.

  2. Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

  3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL power may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour until verified acceptable at 95% or greater RATED THERMAL POWER.

b. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to misalignment of either a control or shutdown rod:

  1. Reduce THERMAL POWER at least 3% for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.0, within 30 minutes.

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*See Special Test Exception 3.10.2.

Replace with new section 3.2.4
(see next page)

.4 The QUADRANT POWER TILT RATIO shall not exceed 1.03 above 50% of ..ED THERMAL POWER.

APPLICABILITY: MODE 1*,**

ACTION:

a. With the QUADRANT POWER TILT RATIO determined to exceed 1.03 but less than or equal to 1.09:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

(a) The QUADRANT POWER TILT RATIO is reduced to within its its limit, or

(b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Within 2 hours either:

(a) Reduce the QUADRANT POWER TILT RATIO to within its limit, or

(b) Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.03 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that

* See Special Test Exceptions Specification 3.10.2.

** Not applicable until calibration of the excore detectors is completed subsequent to refueling. The calibration will be performed at or below 80% of RATED THERMAL POWER.

(Insert as new section 3.2.4 on page 3/4 2-11)

POWER DISTRIBUTION

LIMITING CONDITION FOR OPERATION (Continued)

2. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High trip Setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour until verified acceptable at 95% or greater RATED THERMAL POWER.

Replaced by new pages 3/4 2-12 and 3/4 2-13 (see next pages)

c. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a control or shutdown rod:

1. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

2. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER: subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour until verified at 95% or greater RATED THERMAL POWER.

d. The provisions of Specification 3.0.4 are not applicable.

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SURVEILLANCE REQUIREMENTS

4.2.4 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE.

b. Calculating the ratio at least once per 12 hours during steady state operation when the alarm is inoperable.

c. Using the movable incore detectors to determine the QUADRANT POWER TILT RATIO at least once per 12 hours when one Power Range Channel is inoperable & THERMAL POWER is > 75 percent of RATED THERMAL POWER.

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

b. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

(a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

(b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1.03, within 30 minutes;

3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limits or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

c. With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod:

1. Calculate the QUADRANT POWER TILT RATIO at least once per hour until either:

(a) The QUADRANT POWER TILT RATIO is reduced to within its limit, or

Insert as new page 3/4 2-12

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

(b) THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER.

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and

3. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

d. The provisions of Specification 3.0.4 are not applicable.

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE, and

b. Calculating the ratio at least once per 12 hours during steady-state operation when the alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from two sets of four symmetric thimble locations or full-core flux map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

(Insert as new page 3/4 2-13

POWER DISTRIBUTION LIMITS

DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2.1:

a. Reactor Coolant System T_{avg}

b. Pressurizer Pressure

c. Reactor Coolant System Total Flow Rate

APPLICABILITY: MODE 1

ACTION:

With any of the above parameters exceeding its limit, restore the parameters to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

4.2.5.1 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

4.2.5.2 The RCS total flow rate indicators shall be subjected to a CHANNEL CALIBRATION at least once per 18 months.

4.2.5.3 The RCS total flow rate shall be determined by measurement at least once per 18 months.

TABLE 3.2-1

DNB PARAMETERS

LIMITS

PARAMETER	4 Loops In Operation	3 Loops In Operation
Reactor Coolant System T_{avg}	$\leq$ 589°F	$\leq$ 580.4°F
Pressurizer Pressure	$\geq$ 2220 psia*+	$\geq$ 2220 psia*
Reactor Coolant System Total Flow Rate	Figure 3.2-3	Figure 3.2-4

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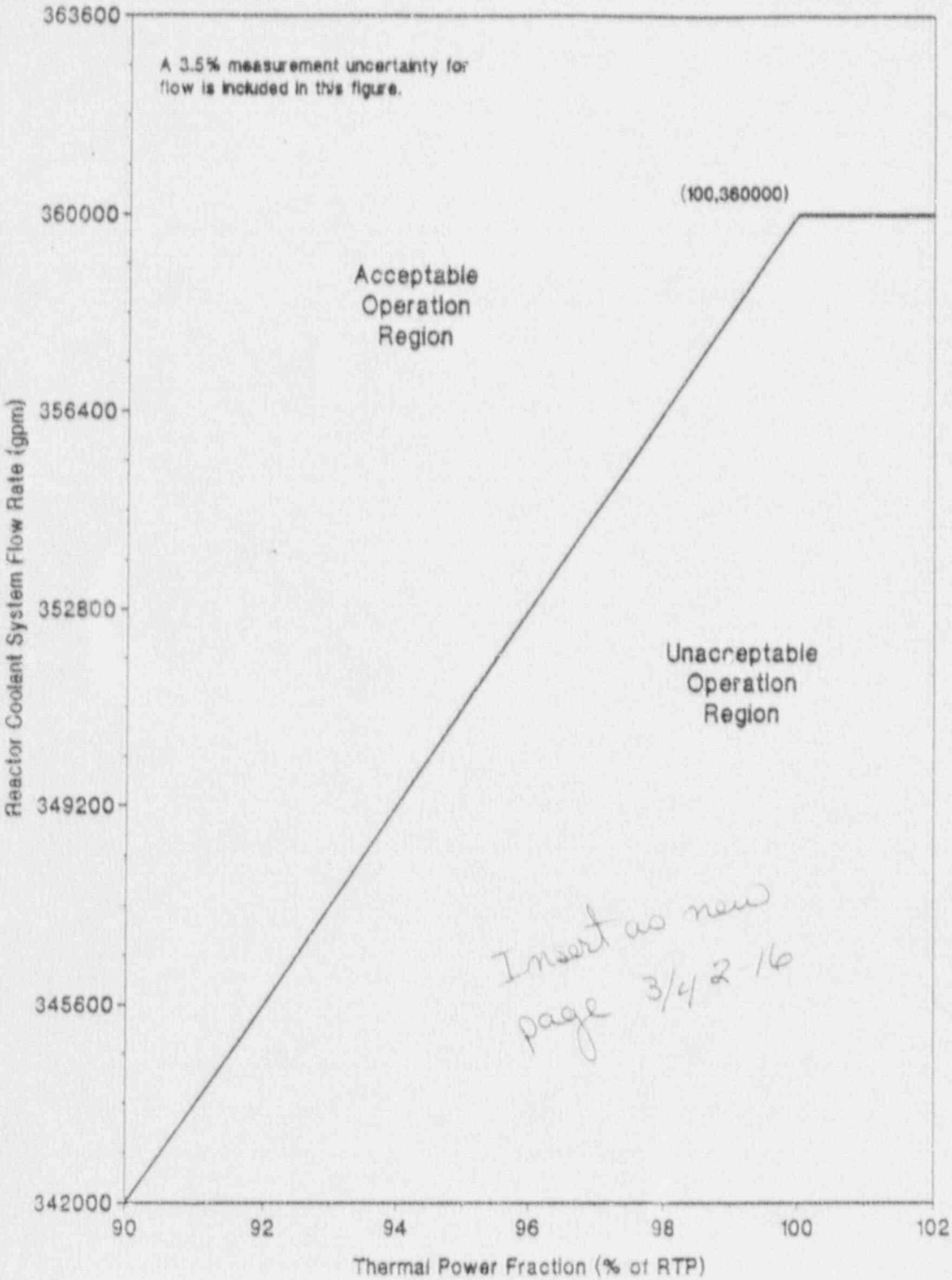
*Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% RATED THERMAL POWER per minute or a THERMAL POWER step increase in excess of 10% RATED THERMAL POWER.

+ Short term ($<$ 2 hours) decreases in pressurizer pressure below this value may occur while the control system is restoring pressurizer pressure to the setpoint value.

Figure 3.2-1 Flow vs. Power for 4 Loops in Operation



3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.1 BORATION CONTROL

3/4.1.1.1 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS T_{avg}. The most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature, and is associated with postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN of 1.6% Δk/k is initially required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN requirement is based upon this limiting condition and is consistent with FSAR accident analysis assumptions. With T_{avg} less than 200°F, the most restrictive reactivity transients resulting from the postulated Boron Dilution Accident are such that a 1.6% Δk/k SHUTDOWN MARGIN is initially required.

3

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3/4.1.1.3 BORON DILUTION

A minimum flow rate of at least 3000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during boron concentration reductions in the Reactor Coolant System. A flow rate of at least 3000 GPM will circulate an equivalent Reactor Coolant System volume of 12,900 cubic feet in approximately 33 minutes. The reactivity change rate associated with boron reductions will therefore be within the capability for operator recognition and control.

3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limitations on MTC are provided to ensure that the assumptions used in the accident and transient analyses remain valid through each fuel cycle. The surveillance requirement for measurement of the MTC at the beginning and towards the end of each fuel cycle is adequate to confirm the MTC value since this coefficient changes slowly due

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3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC) (Continued)

principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured and appropriately compensated MTC value is within the allowable tolerance of the predicted value provides additional assurances that the coefficient will be maintained within its limits during intervals between measurement.

3/4.1.1.5 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 551°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the pressurizer is capable of being in an OPERABLE status with a steam bubble, 3) the reactor pressure vessel is above its minimum NDT temperature and 4) the protective instrumentation is within its normal operating range.

3/4.1.2 BORATION SYSTEMS

114

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, 5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions fo 1.0% Δk/k after xenon decay and cooldown to 200°F. The maximum boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 14,418 gallons of 7000 ppm borated water from the boric acid storage tanks or 74,752 gallons of 2000 ppm borated water from the refueling water storage tank.

The required volume for the boric acid storage tanks (two tanks) of 14,418 gallons has been increased to a value greater than the minimum level indicating range of the storage tanks (741 gallons per tank) to 15,900 gallons. 114 114

REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.2 BORATION SYSTEMS (Continued)

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron inventory in the RWST or the boric acid storage tanks is sufficient (a) to compensate for an inadvertent positive reactivity addition to the Reactor Coolant System of approximately 1% $\Delta k/k$ while in Mode 5 at 200°F; and (b) to maintain a constant RCS reactivity while the temperature is decreased from 200°F to 80°F. In MODE 6, the boron inventory is sufficient to increase the boron concentration to compensate for an inadvertent positive reactivity addition of approximately 1% $\Delta k/k$ while in the refueling mode. These conditions require 8494 usable gallons of 7000-ppm borated water from the boric acid storage tanks or 23,432 usable gallons of 2000-ppm borated water from the refueling water storage tank.

The required volume for the boric acid storage tanks (two tanks) of 8494 gallons has been increased to a value greater than the minimum level indicating range of the storage tanks (741 gallons per tank) to 9976 gallons (rounded to 10,000 gallons). The required RWST volume of 23,432 gallons must be increased to account for nonusable volume due to tank geometry, letdown and vortexing considerations (78,000 gallons), to 101,432 gallons (rounded to 102,000 gallons).

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of a rod ejection accident are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. 115

For purposes of determining compliance with Specification 3.1.3.1, any immovability of a control rod invokes ACTION Statement 3.1.3.1.a. Before utilizing ACTION Statement 3.1.3.1.c, the rod control urgent failure alarm must be illuminated or an electrical problem must be detected in the rod control system. The rod is considered trippable if the rod was demonstrated OPERABLE during the last performance of Surveillance Requirement 4.1.3.1.2 and met the rod drop time criteria of Specification 3.1.3.3 during the last performance of Surveillance Requirement 4.1.3.3. 115

The control rod insertion limit and shutdown rod insertion limits are specified in the Core Operating Limits Report per Specification 6.9.1.7.

greater than or equal to design limit DNBR during

3/4.2 POWER DISTRIBUTION LIMITS

BASES

The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (1) maintaining the calculated DNBR in the core ~~at or above design during~~ normal operation and in short-term transients, and (2) limiting the fission gas release, fuel pellet temperature ~~&~~, and cladding mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definitions of certain hot channel and peaking factors as used in these specifications are as follows:

$F_Q(X,Y,Z)$ ~~$F_Q(Z)$~~ Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods;

$F^N_{\Delta H}(X,Y)$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to the average rod power.

~~$F_{xy}(Z)$ Radial Peaking Factor, is defined as the ratio of peak power density to average power density in the horizontal plane at core elevation Z.~~

3/4.2.1 AXIAL FLUX DIFFERENCE (AFD)

The limits on AXIAL FLUX DIFFERENCE specified in the Core Operating Limits Report assure that the $F_Q(X,Y,Z)$ ~~$F_Q(Z)$~~ upper bound envelope ~~of 2.50 times the normalized axial peaking factor~~ is not exceeded during either normal operation or in the event of xenon redistribution following power changes. 153

~~Target flux difference is determined at equilibrium xenon conditions. The full length rods may be positioned within the core in accordance with their respective insertion limits and should be inserted near their normal position for steady state operation at high power levels. The value of the target flux difference obtained under these conditions divided by the fraction of RATED THERMAL POWER is the target flux difference at RATED THERMAL POWER for the associated core burnup conditions. Target flux differences for other THERMAL POWER levels are obtained by multiplying the RATED THERMAL POWER value by the appropriate fractional THERMAL POWER level. The periodic updating of the target flux difference value is necessary to reflect core burnup considerations.~~

The limiting value of $F_Q(X,Y,Z)$ at Rated Thermal Power and the normalized elevation-dependent $F_Q(X,Y,Z)$ envelope [K(Z)] are specified in the Core Operating Limits Report per Specification 6.9.1.7.

POWER DISTRIBUTION LIMITS

BASES

Although it is intended that the plant will be operated with the AXIAL FLUX DIFFERENCE within the $\pm 5\%$ target band about the target flux difference, during rapid plant THERMAL POWER reductions, control rod motion will cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation will not affect the xenon redistribution sufficiently to change the envelope of peaking factors which may be reached on a subsequent return to RATED THERMAL POWER (with the AFD within the target band) provided the time duration of the deviation is limited. Accordingly, a 1 hour penalty deviation limit cumulative during the previous 24 hours is provided for operation outside of the target band but within the limits of Figure 3.2-1 while at THERMAL POWER levels between 50% & 90% of RATED THERMAL POWER. For THERMAL POWER levels between 15% & 50% of rated THERMAL POWER, deviations of the AFD outside of the target band are less significant. The penalty of 2 hours actual time reflects this reduced significance.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the one minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for at least 2 of 4 or 2 of 3 OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% & 90% and 15% & 50% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively. 114

Figure B 3/4 2-1 shows a typical monthly target band near the beginning of core life.

Contents of this page deleted

The peaking limits are specified in the Core Operating Limits Report per Specification 6.9.1.7.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, RCS FLOWRATE, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, RCS flowrate, and nuclear enthalpy rise hot channel factor ensure that: (1) the design limits on peak local power density and minimum DNBR are not exceeded and (2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance is sufficient to insure that the limits are maintained provided:

a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps, indicated, from the group demand position;

b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.5;

c. The control rod insertion limits of Specification 3.1.3.5 are maintained; and

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

~~$F^N_{\Delta H}$ will be maintained within its limits provided conditions a. through d. above are maintained. As noted on Figures 3.2-3 and 3.2-4, RCS flow rate and $F^N_{\Delta H}$ may be "traded off" against one another (i.e., a low measured RCS flow rate is acceptable if the measured $F^N_{\Delta H}$ is also low) to ensure that the calculated DNBR will not be below the design DNBR value. This tradeoff is allowed up to a maximum $F^N_{\Delta H}$ of 1.56 (1+0.3(1-P)) which is consistent with the initial conditions assumed for the LOCA analysis. The relaxation of $F^N_{\Delta H}$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits.~~

~~When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance for a full core map taken with the incore detector flux mapping system and 3% is the appropriate allowance for manufacturing tolerance. Application of these two penalties in a multiplication fashion is sufficient to provide a correction for the effect of rod bow on F_Q, which has been conservatively estimated as 5% in WCAP-8692, "Fuel Rod Bowing". The appropriate statistical combination of local power, manufacturing tolerance and rod bow uncertainties, results in a penalty on F_Q of 7.68%, whereas multiplying measured values of F_Q by 1.03 x 1.05 results in a penalty of 8.15%.~~

Insert two new paragraphs (see next page)

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When an F_Q measurement is taken, and allowance for measurement uncertainty is made. An allowance of 5% is appropriate for a full-core map taken with the Incore Detector Flux Mapping System, and this allowance is included in the methodology described in BAW-10163P-A ("Core Operating Limit Methodology for Westinghouse-Designed PWRs").

The hot channel factors, $F_Q^M(X,Y,Z)$ and $F_{\Delta H}^M(X,Y)$, are measured periodically and compared to the nominal design values to provide a reasonable assurance that the core is operating as designed and that the limiting criteria will not be exceeded for operation within the Technical Specification limits of Sections 2.2 (Limiting Safety Systems Settings), 3.1.3 (Movable Control Assemblies), 3.2.1 (Axial Flux Difference), and 3.2.4 (Quadrant Power Tilt Ratio). An allowance is provided to account for the expected deviation between the calculation and the measurement. If the measurement is above the maximum expected value for that location, it is assumed to be not operating as designed and a peaking margin evaluation is performed to provide a basis for decreasing the width of the AFD and f(ΔI) limits and for reducing THERMAL POWER.

(Insert on page B 3/4 2-2)

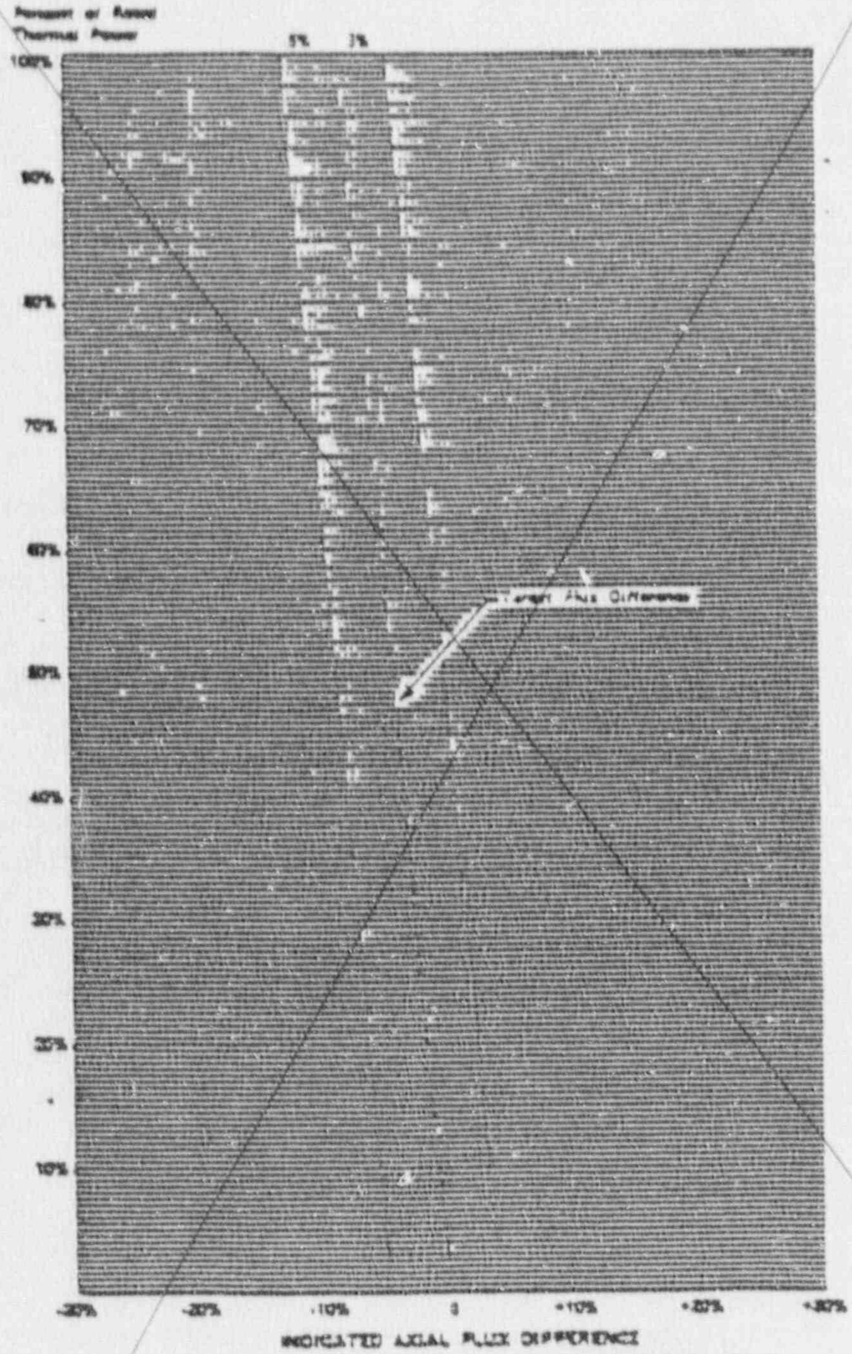

Figure B 3/4 2-1 TYPICAL INDICATED AXIAL FLUX DIFFERENCE VERSUS THERMAL POWER AT BOL

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POWER DISTRIBUTION LIMITS

BASES

When RCS flowrate and $F^N_{\Delta H}$ are measured, no additional allowances are necessary prior to comparison with the limits of Figure 3.2-3 and 3.2-4. Measurement errors of 3.5% for RCS total flow rate and 4% for $F^N_{\Delta H}$ have been allowed for in determination of the design DNBR value.

The safety analysis DNBR values include a 14.4% margin for conservatism. The effect of rod bow on DNBR has been determined to be a <1.5% penalty. The available margin more than offsets the effect of rod bow and no penalty is required on $F^N_{\Delta H}$ or DNBR. 153

3/4.2.4 QUADRANT POWER TILT RATIO

The quadrant power tilt ratio limit assures that no anomaly exists such that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during startup testing and periodically during power operation.

The limit of 1.03 at which corrective action is required provides DNB and linear heat generation rate protection with x-y plane power tilts. A limiting tilt of 1.025 can be tolerated before the margin for uncertainty in F_Q is depleted. The limit of 1.02 was selected to provide an allowance for the uncertainty associated with the indicated power tilt.

The 2-hour time allowance for operation with a tilt condition greater than 1.03 but less than 1.09 is provided to allow identification and correction of a dropped or misaligned control rod. In the event such action does not correct the tilt, the margin for uncertainty on F_Q is reinstated by reducing the power by 3 percent for each percent of tilt in excess of ~~1.0~~ 3 percent.

A limit of 1.03 reflects a peaking effect of 1.045 which is included in the generation of the AFD limits.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of four symmetric thimbles. The two sets of four symmetric thimbles is a unique set of eight detector locations.

(Insert as new paragraph on page B 3/4 2-3)

3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR of greater than or equal to the safety analysis DNBR limit throughout each analyzed transient. 153

The 12-hour periodic surveillance of these parameters thru instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18-month periodic measurement of the RCS total flow rate is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12-hour basis.

INSTRUMENTATION

BASES

RADIATION MONITORING INSTRUMENTATION (Continued)

by the individual channels and 2) the alarm is initiated when the radiation level trip setpoint is exceeded. The Containment high range area radiation monitors (ARM 15A and 15B) were installed in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements" to monitor post-accident Containment gamma radiation levels to 10^7 R/hr. 105

3/4.3.3.2 MOVABLE INCORE DETECTORS

The OPERABILITY of the movable incore detectors with the specified minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the reactor core.

For the purpose of measuring $F_Q(Z)$ or $F^N_{\Delta H}$, a full incore flux map is used. Quarter-core flux maps, as defined in WCAP-8648-A (February 1979) may be used in recalibration of the excore axial flux offset detection system provided that reasonable radial symmetry exists (QUADRANT POWER TILT RATIO less than or equal to 1.02).

Replace with new section (see next page)

3/4.3.3.3 SEISMIC INSTRUMENTATION

The OPERABILITY of the seismic instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility and is consistent with the recommendations of Regulatory Guide 1.12, "Instrumentation for Earthquakes."

3/4.3.3.4 METEOROLOGICAL INSTRUMENTATION

The OPERABILITY of the meteorological instrumentation ensures that sufficient meteorological data is available for estimating potential radiation doses to the public as a result of routine or accidental release of radioactive materials to the atmosphere. This capability is required to evaluate the need for initiating protective mea[illegible]es to protect the health and safety of the public and is consistent with the recommendations of Regulatory Guide 1.23, "Onsite Meteorological Programs."

3/4.3.3.5 REMOTE SHUTDOWN INSTRUMENTATION

The OPERABILITY of the remote shutdown instrumentation ensures that sufficient capability is available to permit shutdown and maintenance of HOT STANDBY of the facility from locations outside of the control room. This capability is required in the event control room habitability is lost and is consistent with General Design Criterion 19 of 10 CFR 50.

The OPERABILITY of the movable incore detectors with the specified minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the core. The OPERABILITY of this system is demonstrated by irradiating each detector used and determining the acceptability of its voltage curve.

For purpose of measuring $F_Q^M(X,Y,Z)$ or $F_{\Delta H}^M(X,Y)$ a full incore flux map is used.

Quarter-core flux maps, as defined in WCAP-8648-A (February 1979), may be used in recalibration of the Excore Neutron Flux Detection System, and full incore flux maps or sysmmetric incore thimbles may be used for monitoring the QUADRANT POWER TILT RATIO when one Power Range Channel is inoperable.

Insert as new Section 3/4 3.3.2

ADMINISTRATIVE CONTROLS

MONTHLY OPERATING REPORT

6.9.1.6 Routine reports of operating statistics and shutdown experience shall be submitted monthly, no later than the 15th of each month following the calendar month covererd by the report.

RADIAL PEAKING FACTOR LIMIT REPORT

6.9.1.7 The F_{xy} limits for Rated Thermal Power (F_{xy}^{RTP}) for all core planes containing bank "D" control rods and all unrodded core planes and the plot of predicted ($F_q^T \cdot P_{Rel}$) vs Axial Core Height with the limit envelope shall be provided to the NRC at least 60 days prior to each cycle initial criticality unless otherwise approved by the Commission by letter.

In addition, in the event that the limit should change requiring a new submittal or an amended submittal to the Peaking Factor Limit Report, it will be submitted 60 days prior to the date the limit would become effective unless otherwise approved by the Commission by letter.

Any information needed to support F_{xy}^{RTP} will be by request from the NRC and need not be included in this report.

Insert new section 6.9.1.7 (see next page)

6.9.1.7 The CORE OPERATING LIMITS REPORT is a Trojan-specific document that provides core operating limits for the current reload cycle.

6.9.1.7.1 Core Operating Limits shall be established prior to each reload cycle, or prior to any remaining part of a reload cycle, for the following:

(1) Control Rod Insertion Limits for Specification 3.1.3.5.

(2) Axial Flux Difference for Specification 3.2.1.

(3) Heat Flux Hot Channel Factor - $F_Q(X,Y,Z)$ for Specification 3.2.2.

(4) Nuclear Enthalpy Rise Hot Channel Factor - $F_{\Delta H}(X,Y)$ for Specification 3.2.3.

6.9.1.7.2 The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically:

(1) BAW-10163P-A, Core Operating Limits Methodology for Westinghouse-Designed PWRs, June 1989.

6.9.1.7.3 The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, ECCS Limits, nuclear limit such as shutdown margin, and transient and accident limits) of the safety analysis are met.

6.9.1.7.4 The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements shall be provided, upon issuance for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

Insert as new Section 6.9.1.7 on page 6-16