

Proposed Technical Specification Changes

Unit 1 Technical Specifications

### 3/4.2 POWER DISTRIBUTION LIMITS

#### AXIAL FLUX DIFFERENCE (AFD)

#### LIMITING CONDITION FOR OPERATION

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3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within a  $\pm 5\%$  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  $\pm 5\%$  target band about the target flux difference and with THERMAL POWER:
  1. Above 84% 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 84% of RATED THERMAL POWER.
  2. Between 50% and 84% of RATED THERMAL POWER:
    - a) POWER OPERATION may continue provided:
      - 1) The indicated AFD has not been outside of the  $\pm 5\%$  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 less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.
    - b) Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 16 hour of operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

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\*See Special Test Exception 3.10.2.

## POWER DISTRIBUTION LIMITS

### LIMITING CONDITION FOR OPERATION (Continued)

- b. THERMAL POWER shall not be increased above 84% of RATED THERMAL POWER unless the indicated AFD is within the  $\pm 5\%$  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  $\pm 5\%$  target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

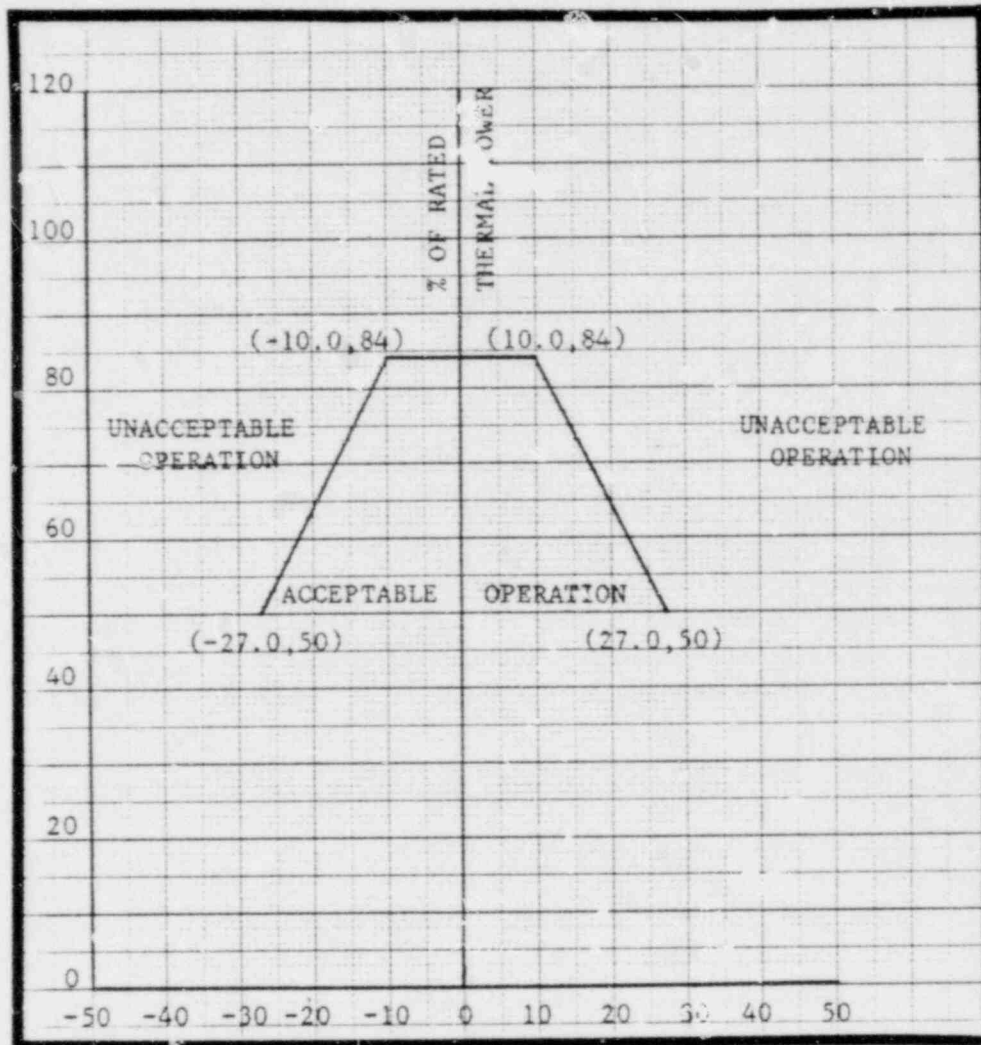
### SURVEILLANCE REQUIREMENTS

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:
  - 1. At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
  - 2. At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.
- b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, 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.

4.2.1.2 The indicated AFD shall be considered outside of its  $\pm 5\%$  target band when at least 2 OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the  $\pm 5\%$  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 between 15% and 50% of RATED THERMAL POWER.



FLUX DIFFERENCE ( $\Delta I$ ) %

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

POWER DISTRIBUTION LIMITS

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

LIMITING CONDITION FOR OPERATION

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

$$F_Q(Z) \leq \frac{[2.14]}{P} [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z) \leq [4.28] [K(Z)] \text{ for } P \leq 0.5$$

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

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

APPLICABILITY: MODE 1.

ACTION:

With  $F_Q(Z)$  exceeding its limit:

a. Comply with either of the following ACTIONS:

1. 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 POWER OPERATION may proceed provided the Overpower  $\Delta T$  Trip Setpoints have been reduced at least 1% for each 1%  $F_Q(Z)$  exceeds the limit. The Overpower  $\Delta T$  Trip Setpoint reduction shall be performed with the reactor in at least HOT STANDBY.
2. Reduce THERMAL POWER as necessary to meet the limits of Specification 3.2.6 using the APDMS with the latest incore map and updated R.

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

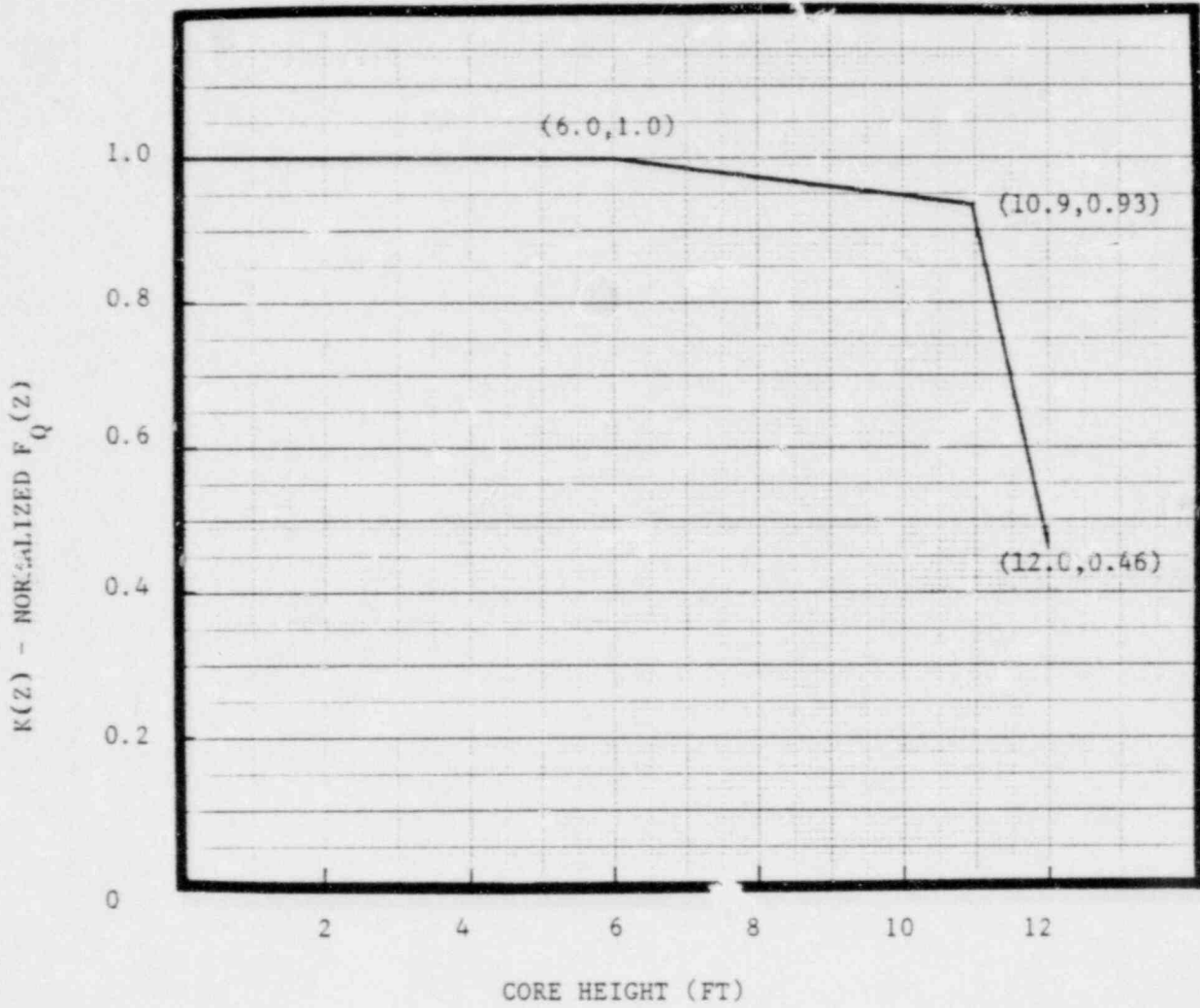


Figure 3.2-2  $K(Z)$  - Normalized  $F_Q(Z)$  as a Function of Core Height

POWER DISTRIBUTION LIMITS

AXIAL POWER DISTRIBUTION

LIMITING CONDITION FOR OPERATION

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3.2.6 The axial power distribution shall be limited by the following relationship:

$$[F_j(Z)]_S = \frac{[2.14] [K(Z)]}{(\bar{R}_j)(P_L)(1.03)(1 + \sigma_j)(1.07)}$$

Where:

- a.  $F_j(Z)$  is the normalized axial power distribution from thimble  $j$  at core elevation  $Z$ .
- b.  $P_L$  is the fraction of RATED THERMAL POWER.
- c.  $K(Z)$  is the function obtained from Figure 3.2-2 for a given core height location.
- d.  $\bar{R}_j$ , for thimble  $j$ , is determined from at least  $n=6$  incore flux maps covering the full configuration of permissible rod patterns above 94% of RATED THERMAL POWER in accordance with:

$$\bar{R}_j = \frac{1}{n} \sum_{i=1}^n R_{ij}$$

Where:

$$R_{ij} = \frac{F_{Qi}^{Meas}}{[F_{ij}(Z)]_{Max}}$$

and  $[F_{ij}(Z)]_{Max}$  is the maximum value of the normalized axial distribution at elevation  $Z$  from thimble  $j$  in map  $i$  which had a measured peaking factor without uncertainties or densification allowance of  $F_Q^{Meas}$ .



## POWER DISTRIBUTION LIMITS

### LIMITING CONDITION FOR OPERATION (Continued)

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- e.  $\sigma_j$  is the standard deviation associated with thimble j, expressed as a fraction or percentage of  $R_j$ , and is derived from n flux maps from the relationship below, or 0.02, (2%) whichever is greater.

$$\sigma_j = \frac{\left[ \frac{1}{n-1} \sum_{i=1}^n (\bar{R}_j - R_{ij})^2 \right]^{1/2}}{\bar{R}_j}$$

- f. The factor 1.07 is comprised of 1.02 and 1.05 to account for the axial power distribution instrumentation accuracy and the measurement uncertainty associated with  $\bar{V}_Q$  using the movable detector system, respectively.
- g. The factor 1.03 is the engineering uncertainty factor.

APPLICABILITY: MODE 1 ABOVE 94% OF RATED THERMAL POWER<sup>#</sup>.

ACTION:

- a. With a  $F_j(Z)$  factor exceeding  $[F_j(Z)]_S$  by less than or equal to 4 percent, reduce THERMAL POWER one percent for every percent by which the  $F_j(Z)$  factor exceeds its limit within 15 minutes and within the next two hours either reduce the  $F_j(Z)$  factor to within its limit or reduce THERMAL POWER to 94% or less of RATED THERMAL POWER.
- b. With a  $F_j(Z)$  factor exceeding  $[F_j(Z)]_S$  by greater than 4 percent, reduce THERMAL POWER to 94% or less of RATED THERMAL POWER within 15 minutes.

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<sup>#</sup> The APDMS may be out of service when surveillance for determining power distribution maps is being performed.

## POWER DISTRIBUTION LIMITS

### SURVEILLANCE REQUIREMENTS

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4.2.6.1  $F_j(Z)$  shall be determined to be within its limit by:

- a. Either using the APDMS to monitor the thimbles required per Specification 3.3.3.8 at the following frequencies.
  1. At least once per 8 hours, and
  2. Immediately and at intervals of 10, 30, 60, 90, 120, 240 and 480 minutes following:
    - a) Increasing the THERMAL POWER above 94% of RATED THERMAL POWER, or
    - b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.
- b. Or using the movable incore detectors at the following frequencies when the APDMS is inoperable:
  1. At least once per 8 hours, and
  2. At intervals of 30, 60, 90, 120, 240 and 480 minutes following:
    - a) Increasing the THERMAL POWER above 94% of RATED THERMAL POWER, or
    - b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

4.2.6.2 When the movable incore detectors are used to monitor  $F_j(Z)$ , at least 2 thimbles shall be monitored and an  $F_j(Z)$  accuracy equivalent to that obtained from the APDMS shall be maintained.

### 3/4.2 POWER DISTRIBUTION LIMITS

#### BASES

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The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (a) maintaining the minimum DNBR in the core  $\geq 1.30$  during normal operation and in short term transients, and (b) limiting the fission gas release, fuel pellet temperature & 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:

- $F_Q(Z)$  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.
- $F_{\Delta H}^N$  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 assure that the  $F_Q(Z)$  upper bound envelope of 2.14 times the normalized axial peaking factor is not exceeded during either normal operation or in the event of xenon redistribution following power changes.

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.

## POWER DISTRIBUTION LIMITS

### BASES

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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% and 84% of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 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 excor detector outputs and provides an alarm message immediately if the AFD for at least 2 OPERABLE excor channels are outside the target band and the THERMAL POWER is greater than 84% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 84% and 15% and 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.

Figure B 3/4 2-1 shows a typical monthly target band.

## POWER DISTRIBUTION LIMITS

### BASES

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#### 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 DNER of 1.30 throughout each analyzed transient.

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.

#### 3/4.2.6 AXIAL POWER DISTRIBUTION

The limit on axial power distribution ensures that  $F_Q$  will be controlled and monitored on a more exact basis through use of the APDMS when operating above 94% of RATED THERMAL POWER. This additional limitation on  $F_Q$  is necessary in order to provide assurance that peak clad temperatures will remain below the ECCS acceptance criteria limit of 2200°F in the event of a LOCA.

Unit 2 Technical Specifications

### 3/4.2 POWER DISTRIBUTION LIMITS

#### AXIAL FLUX DIFFERENCE (AFD)

#### LIMITING CONDITION FOR OPERATION

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3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within a  $\pm 5\%$  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  $\pm 5\%$  target band about the target flux difference and with THERMAL POWER:
  1. Above 82% 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 82% of RATED THERMAL POWER.
  2. Between 50% and 82% of RATED THERMAL POWER:
    - a) POWER OPERATION may continue provided:
      - 1) The indicated AFD has not been outside of the  $\pm 5\%$  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 less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.
    - b) Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 16 hours of operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

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\*See Special Test Exception 3.10.2.

## POWER DISTRIBUTION LIMITS

### LIMITING CONDITION FOR OPERATION (Continued)

- b. THERMAL POWER shall not be increased above 82% of RATED THERMAL POWER unless the indicated AFD is within the  $\pm 5\%$  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  $\pm 5\%$  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:
  - 1. At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
  - 2. At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.
- b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, 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.

4.2.1.2 The indicated AFD shall be considered outside of its  $\pm 5\%$  target band when at least 2 OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the  $\pm 5\%$  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 between 15% and 50% of RATED THERMAL POWER.



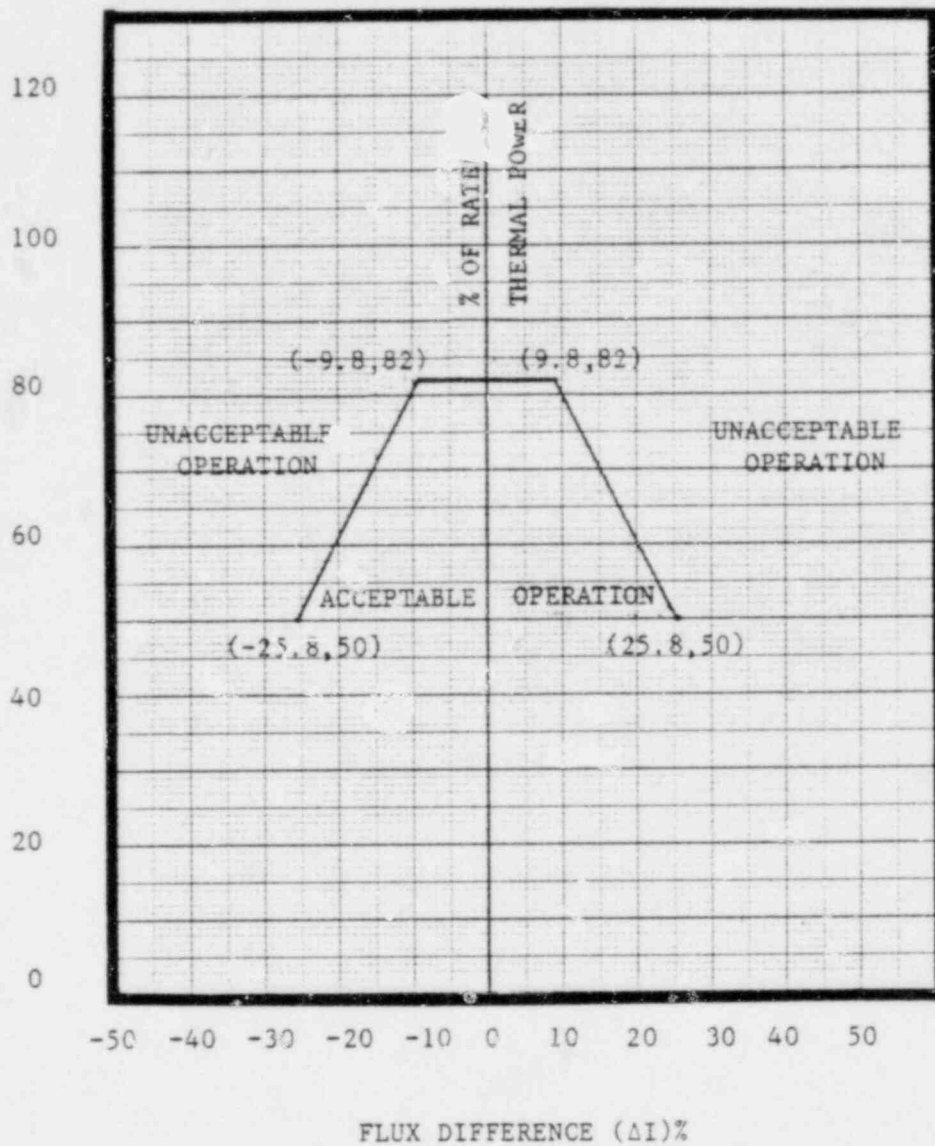


Figure 3.2-1 Axial Flux Difference Limits as a Function of Rated Thermal Power

POWER DISTRIBUTION LIMITS

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

LIMITING CONDITION FOR OPERATION

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

$$F_Q(Z) \leq \frac{[2.14]}{P} [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z) \leq [4.28] [K(Z)] \text{ for } P \leq 0.5$$

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

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

APPLICABILITY: MODE 1.

ACTION:

With  $F_Q(Z)$  exceeding its limit:

a. Comply with either of the following ACTIONS:

1. 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 POWER OPERATION may proceed provided the Overpower  $\Delta T$  Trip Setpoints have been reduced at least 1% for each 1%  $F_Q(Z)$  exceeds the limit. The Overpower  $\Delta T$  Trip Setpoint reduction shall be performed with the reactor in at least HOT STANDBY.
2. Reduce THERMAL POWER as necessary to meet the limits of Specification 3.2.6 using the APDMS with the latest incore map and updated R.

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

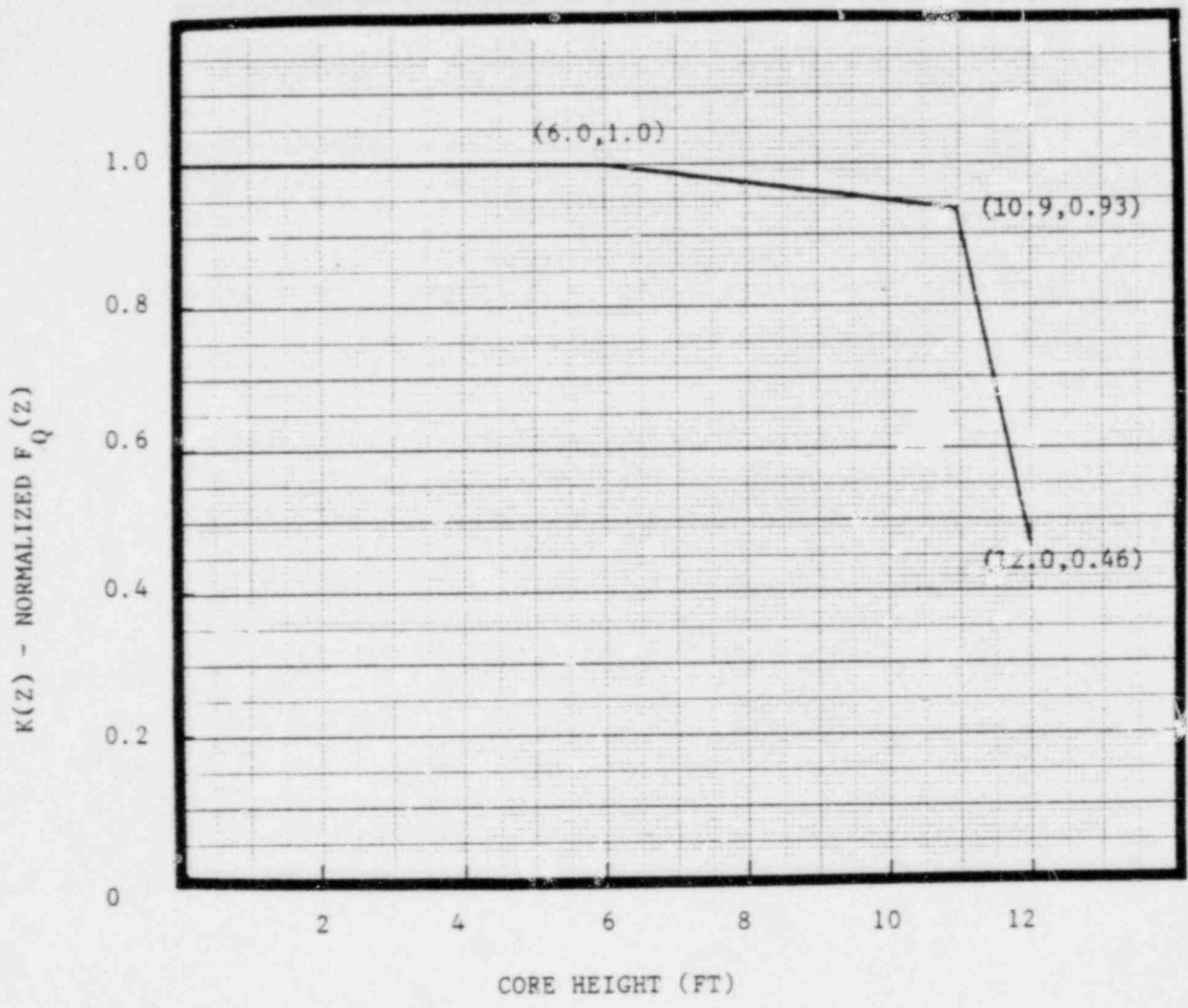


Figure 3.2-2  $K(Z) - \text{Normalized } F_Q(Z)$  as a Function of Core Height

POWER DISTRIBUTION LIMITS

AXIAL POWER DISTRIBUTION

LIMITING CONDITION FOR OPERATION

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3.2.6 The axial power distribution shall be limited by the following relationship:

$$[F_j(Z)]_S = \frac{[2.14] [K(Z)]}{(\bar{R}_j)(P_L)(1.03)(1 + \sigma_j)(1.07)}$$

Where:

- a.  $F_j(Z)$  is the normalized axial power distribution from thimble  $j$  at core elevation  $Z$ .
- b.  $P_L$  is the fraction of RATED THERMAL POWER.
- c.  $K(Z)$  is the function obtained from Figure 3.2-2 for a given core height location.
- d.  $\bar{R}_j$ , for thimble  $j$ , is determined from at least  $n=6$  incore flux maps covering the full configuration of permissible rod patterns above 91% of RATED THERMAL POWER in accordance with:

$$\bar{R}_j = \frac{1}{n} \sum_{i=1}^n R_{ij}$$

Where:

$$R_{ij} = \frac{F_{Oj}^{Meas}}{[F_{ij}(Z)]_{Max}}$$

and  $[F_{ij}(Z)]_{Max}$  is the maximum value of the normalized axial distribution at elevation  $Z$  from thimble  $j$  in map  $i$

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

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which had a measured peaking factor without uncertainties or densification allowance of  $F_Q^{\text{Meas}}$ .

- e.  $\sigma_j$  is the standard deviation associated with thimble j, expressed as a fraction or percentage of  $R_j$ , and is derived from n flux maps from the relationship below, or 0.02, (2%) whichever is greater.

$$\sigma_j = \frac{\left[ \frac{1}{n-1} \sum_{i=1}^n (\bar{R}_j - R_{ij})^2 \right]^{1/2}}{\bar{R}_j}$$

- f. The factor 1.07 is comprised of 1.02 and 1.05 to account for the axial power distribution instrumentation accuracy and the measurement uncertainty associated with  $F_Q$  using the movable detector system, respectively.
- g. The factor 1.03 is the engineering uncertainty factor.

APPLICABILITY: MODE 1 ABOVE 91% OF RATED THERMAL POWER<sup>#</sup>.

ACTION:

- a. With a  $F_j(Z)$  factor exceeding  $[F_j(Z)]_S$  by less than or equal to 4 percent, reduce THERMAL POWER one percent for every percent by which

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<sup>#</sup> The APDMS may be out of service when surveillance for determining power distribution maps is being performed.

POWER DISTRIBUTION LIMITS

ACTION (Continued)

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the  $F_j(Z)$  factor exceeds its limit within 15 minutes and within the next two hours either reduce the  $F_j(Z)$  factor to within its limit or reduce THERMAL POWER to 91% or less of RATED THERMAL POWER.

- b. With a  $F_j(Z)$  factor exceeding  $[F_j(Z)]_S$  by greater than 4 percent, reduce THERMAL POWER to 91% or less of RATED THERMAL POWER within 15 minutes.

SURVEILLANCE REQUIREMENTS

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4.2.6.1  $F_j(Z)$  shall be determined to be within its limit by:

- a. Either using the APDMS to monitor the thimbles required per Specification 3.3.3.8 at the following frequencies.
  - 1. At least once per 8 hours, and
  - 2. Immediately and at intervals of 10, 30, 60, 90, 120, 240 and 480 minutes following:
    - a) Increasing the THERMAL POWER above 91% of RATED THERMAL POWER, or
    - b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.
- b. Or using the movable incore detectors at the following frequencies when the APDMS is inoperable:
  - 1. At least once per 8 hours, and
  - 2. At intervals of 30, 60, 90, 120, 240 and 480 minutes following:

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

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- a) Increasing the THERMAL POWER above 91% of RATED THERMAL POWER, or
- b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

4.2.6.2 When the movable incore detectors are used to monitor  $F_j(Z)$ , at least 2 thimbles shall be monitored and an  $F_j(Z)$  accuracy equivalent to that obtained from the APDMS shall be maintained.

### 3/4.2 POWER DISTRIBUTION LIMITS

#### BASES

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The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (a) maintaining the minimum DNBR in the core greater than or equal to 1.30 during normal operation and in short term transients, and (b) limiting the fission gas release, fuel pellet temperature & 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<sup>o</sup>F is not exceeded.

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

$F_Q(Z)$  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.

$F_{\Delta H}^N$  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 assure that the  $F_Q(Z)$  upper bound envelope of 2.14 times the normalized axial peaking factor is not exceeded during either normal operation or in the event of xenon redistribution following power changes.

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



## POWER DISTRIBUTION LIMITS

### BASES

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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.

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% and 82% of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 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 OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 82% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 82% and 15% and 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.

Figure B 3/4 2-1 shows a typical monthly target band.

## POWER DISTRIBUTION LIMITS

### BASES

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#### 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 1.30 throughout each analyzed transient.

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.

#### 3/4.2.6 AXIAL POWER DISTRIBUTION

The limit on axial power distribution ensures that  $F_Q$  will be controlled and monitored on a more exact basis through use of the APDMS when operating above 91% of RATED THERMAL POWER. This additional limitation on  $F_Q$  is necessary in order to provide assurance that peak clad temperatures will remain below the ECCS acceptance criteria limit of 2200°F in the event of a LOCA.