3/4.2 POWER DISTRIBUTION LIMITS

AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) 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% or .9xAPL** (whichever is less) 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% or .9xAPL (whichever is less) of RATED THERMAL POWER.

2. Between 50% and 90% or .9xAPL (whichever is less) 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 pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained

*See Special Test Exception 3.10.2

**APL is the Allowable Power Level defined in Section 3.2.6

LIMITING CONDITION OF OPERATION (Continued)

within the limits of Figure 3.2-1. A total of 16 hours operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

c) Surveillance testing of the APDMS may be performed pursuant to Specification 4.3.3.6.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 6 hours of operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

b. THERMAL POWER shall not be increased above 90% or .9xAPL (whichever is less) 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:

1. At least once per 7 days with 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.

SURVEILLANCE REQUIREMENTS (Continued)

4.2.1.2 The indicated AFD shall be considered outside of its $\pm5\%$ 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. Penalty deviation outside of the $\pm5\%$ target band shall be accumulated on a time basis of:

a. A penalty deviation of 1 minute for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and

b. A penalty deviation of ½ minute for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels below 50% of RATED THERMAL POWER.

4.2.1.3 The target axial flux difference of each OPERABLE EXCORE channel shall be determined in conjunction with the measurement of $F_Q^M(Z)$, as defined in Section 4.2.2.2.c. The provisions of Specification 4.0.4 are not applicable.

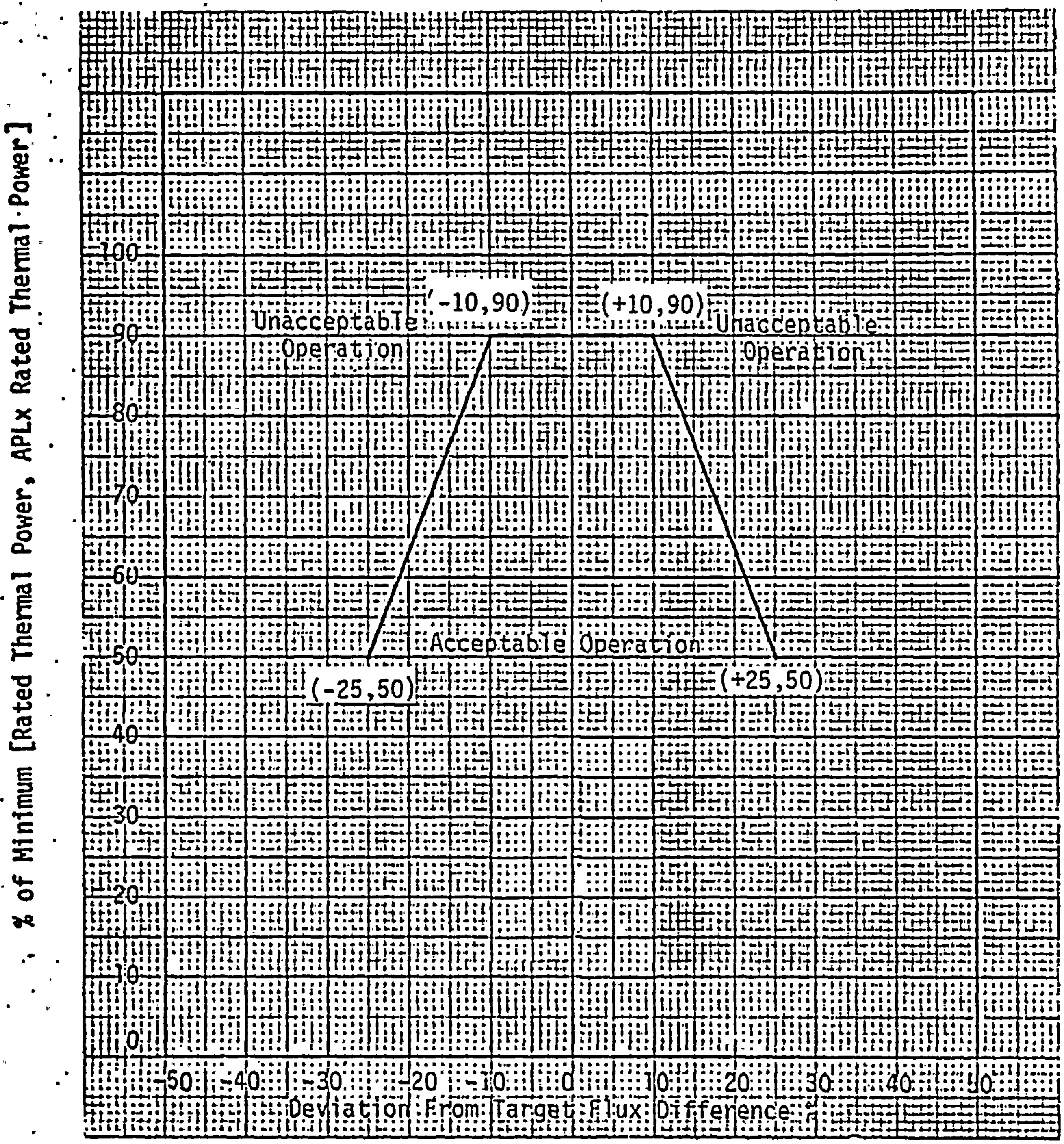

Figure 3.2-1 ALLOWABLE DEVIATION FROM TARGET FLUX DIFFERENCE

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

LIMITING CONDITION FOR OPERATION

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

$$F_Q(Z,\ell) \leq \frac{[F_Q^L(E_\ell)]}{P} [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z,\ell) \leq 2 [F_Q^L(E_\ell)] [K(Z)] \text{ for } P \leq 0.5$$

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

$F_Q^L(E_\ell)$ is the exposure dependent F_Q limit for rod ℓ and is defined on Figure 3.2-3a for Exxon Nuclear fuel, Figure 3.2-3b for Westinghouse fuel and page 3/4 2-15. E_ℓ is the maximum pellet exposure in rod ℓ. K(Z) is the function obtained from Figure 3.2-2 for a given core height location.
F_Q is defined as the $F_Q(Z,\ell)$ with the smallest margin or the greatest excess of the limit.

APPLICABILITY: MODE 1

ACTION:

With F_Q exceeding its limit:

a. Comply with either of the following ACTIONS:

1. Reduce THERMAL POWER at least 1% for each 1% F_Q exceeds the limit within 15 mimutes 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 ΔT Trip Setpoints have been reduced at least 1% for each 1% F_Q exceeds the limit. The Overpower ΔT Trip Setpoint reduction shall be performed with the reactor subcritical.

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 $\bar{R}$.

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 is demonstrated through incore mapping to be within its limit.

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_Q(Z,\ell)$ shall be determined to be 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 $F_Q(Z,\ell)$ 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. Satisfying the following relationship at the time of the target flux determination.

$$F_Q^M(Z) \leq \frac{F_Q^L(Z)}{PxEp(Z)} [K(Z)]/[V(Z)] \quad \text{for} \quad P > .5$$

$$F_Q^M(Z) \leq \frac{2F_Q^L(Z)}{Ep(Z)} [K(Z)]/[V(Z)] \quad \text{for} \quad P \leq .5$$

where: $F_Q^M(Z) = F_Q(Z,\ell)$ at ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum

$F_Q^L(Z) = F_Q^L(E_\ell)$ at ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum

$F_Q^M(Z)$ and $F_Q^L(Z)$ are functions of core height, Z, and correspond at each Z to the rod ℓ for which $\frac{F_Q(Z,\ell)}{T(E)}$ is a maximum at that Z. V(Z) is the function defined in Figure 3.2-3, K(Z) is defined in Figure 3.2-2, T(E) is defined in Figures 3.2-3a and 3.2-3b, P is the fraction of RATED THERMAL POWER. Ep(Z) is an uncertainty factor to account for the reduction in the $F_Q^L(E_\ell)$ curve due to an accumulation of exposure prior to the next flux map.

$$Ep(Z) = 1.00 \text{ for } T(E) = 1.0 \text{ or } T(E) = .846$$

$$Ep(Z) = 1 + [.014 \times F_Q^M(Z)] \text{ for } 1.0 > T(E) > .846$$

d. Measuring $F_Q(Z,\ell)$ in conjunction with a target flux difference determination, according to the following schedule:

1. Upon achieving equilibrium conditions after exceeding by 10% or more of RATED THERMAL POWER, the THERMAL POWER at which $F_Q(Z,\ell)$ was last determined*, or

2. At least once per 31 effective full power days, whichever occurs first.

*During power escalation at the beginning of each cycle, the design target may be used until a power level for extended operation has been achieved.

e. With successive measurements indicating an increase in peak pin power, $F_{\Delta H}$, with exposure, either of the following additional actions shall be taken.

1. $F_Q^M(Z)$ shall be increased by 2% over that specified in 4.2.2.2.c, or

2. $F_Q^M(Z)$ shall be measured and a target axial flux difference re-established at least once per 7 effective full power days until 2 successive maps indicate that the peak pin power, $F_{\Delta H}$, is not increasing.

f. With the relationships specified in (c) above not being satisfied either of the following actions shall be taken:

1. Place the core in an equilibrium condition where the limit in (c) is satisfied and remeasure the target axial flux difference.

2. Comply with the requirements of Specification 3.2.2 for $F_Q(Z,\ell)$ exceeding its limit by the percent calculated with the following expression.

$$\left[\left[\text{max. over } Z \text{ of } \frac{F_Q^M(Z) \times V(Z) \times Ep(Z)}{\frac{F_Q^L(E_\ell)}{P} \times [K(Z)]}\right] - 1\right] \times 100 \quad P \geq .5$$

g. The limits specified in (c) and (f) above are not applicable in the following core plane regions:

1. Lower core region 0 to 10% inclusive.

2. Upper core region 90% to 100% inclusive.

4.2.2.3 When using the movable incore detectors to obtain a power distribution map, an overall measured $F_Q(Z,\ell)$ shall be obtained from the map and increased by 3% to account for manufacturing tolerance and further increased by 5% to account for measurement uncertainty.

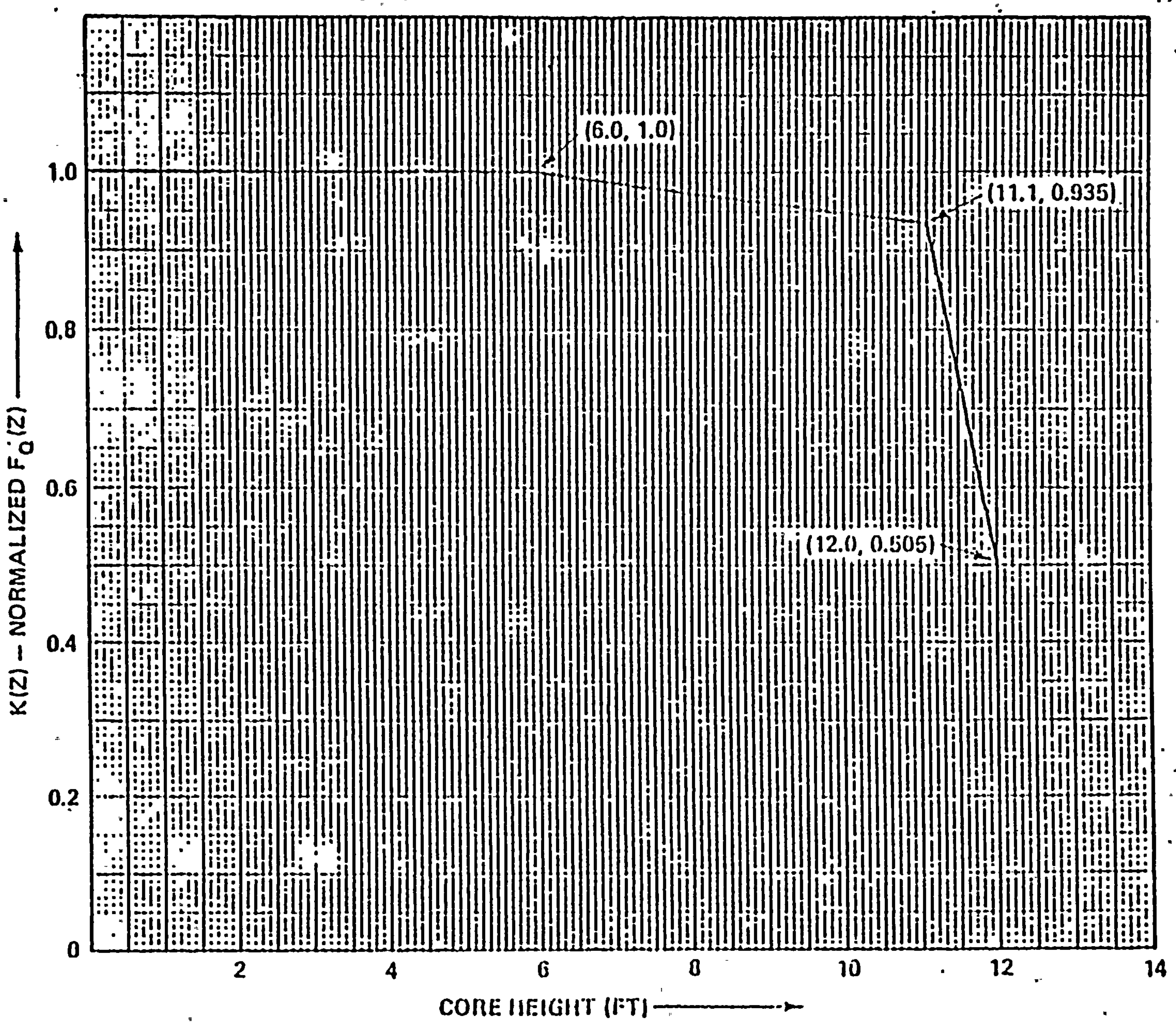

FIGURE 3.2-2 K(Z) – NORMALIZED $F_Q(Z)$ AS A FUNCTION OF CORE HEIGHT

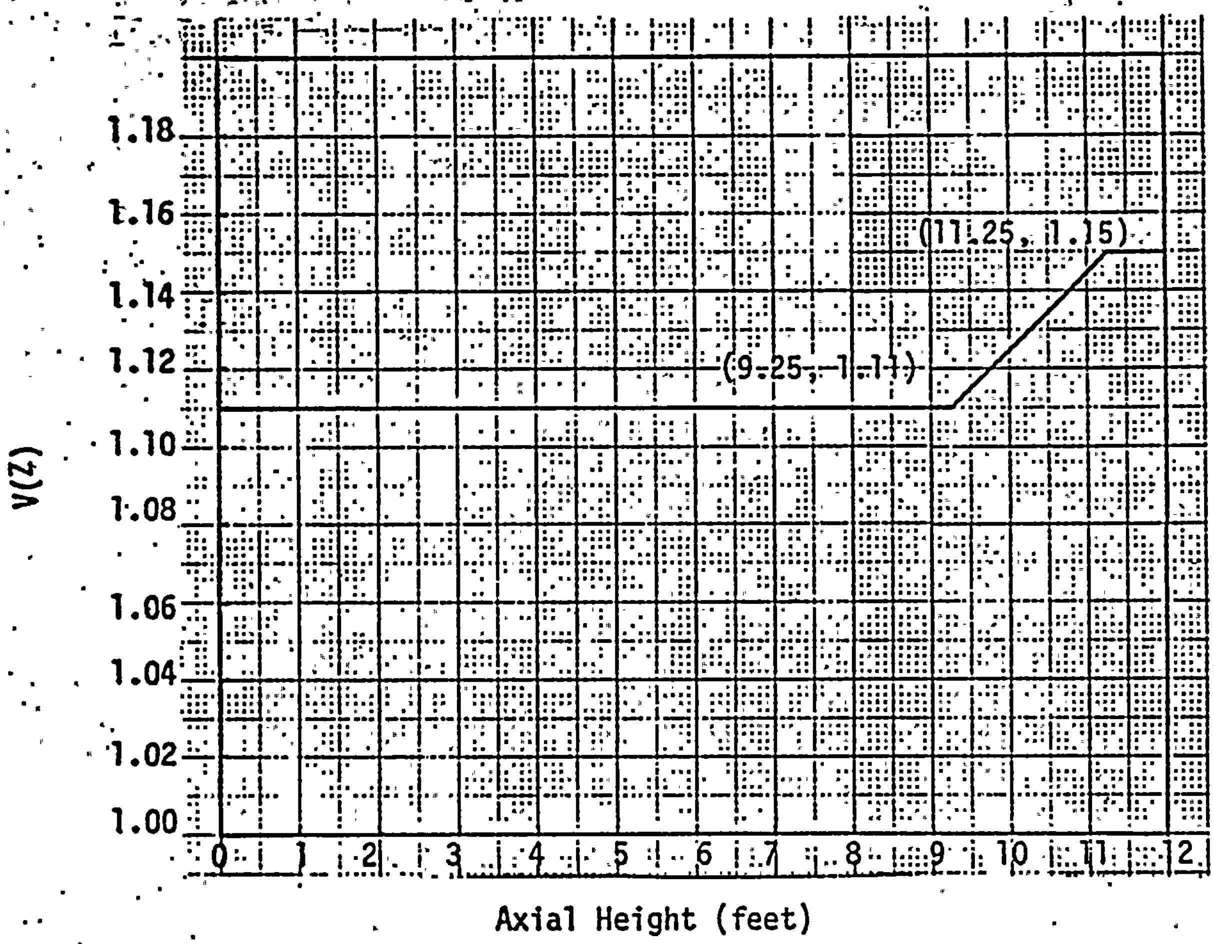

Figure 3.2-3 V(Z) As A Function Of Core Height

NUCLEAR ENTHALPY HOT CHANNEL FACTOR - $F^N_{\Delta H}$

LIMITING CONDITION FOR OPERATION

3.2.3 $F^N_{\Delta H}$ shall be limited by the following relationship:

$$F^N_{\Delta H} \leq 1.51\ [1.0 + 0.2\ (1-P)]$$

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

APPLICABILITY: MODE 1

ACTION:

With $F^N_{\Delta H}$ exceeding its limit:

a. 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 $\leq$ 55% of RATED THERMAL POWER within the next 4 hours,

b. Demonstrate thru in-core mapping that $F^N_{\Delta H}$ is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours, and

c. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION may proceed provided that $F^N_{\Delta H}$ is demonstrated through in-core mapping to be within its limit at a nominal 50% of RATED THERMAL POWER prior to exceeding this THERMAL POWER, at a nominal 75% of RATED THERMAL POWER prior to exceeding this THERMAL power and within 24 hours after attaining 95% or greater RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.2.3.1 $F^N_{\Delta H}$ shall be determined to be within its limit by using the movable 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.

c. The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 The measured $F^N_{\Delta H}$ of 4.2.3.1 above, shall be increased by 4% for measurement uncertainty.

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 shutdown or control 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.

2. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or

*See Special Test Exception 3.10.2.

LIMITING CONDITION FOR OPERATION (Continued)

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.

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. 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.

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 and THERMAL POWER is > 75 percent of RATED THERMAL POWER.

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 parameter 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

4.2.5.1 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 Reactor Coolant System total flow rate shall be determined to be within its limit by measurement at least once per 18 months.

TABLE 3.2-1

DNB PARAMETERS

PARAMETER	LIMITS: 4 Loops In Operation	LIMITS: 3 Loops In Operation
Reactor Coolant System T_{avg}	$\leq$ 571.8°F	$\leq$ 571.8°F
Pressurizer Pressure	$\geq$ 2220 psia*	$\geq$ 2220 psia*
Reactor Coolant System Total Flow Rate	$\geq 1.350 \times 10^8$ lbs/hr	$\geq 0.9917 \times 10^8$ lbs/hr

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

AXIAL POWER DISTRIBUTION

LIMITING CONDITION FOR OPERATION

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

$$[F_j(Z)]_S = \frac{[1.95]\ [K(Z)]}{(\overline{R}_j)\ (P_L)\ (1.03)\ (1 + \sigma_j)\ (1.07)\ F_p}$$

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. $\overline{R}_j$, for thimble j, is determined from at least n=6 in-core flux maps covering the full configuration of permissible rod patterns above 100% or APL (whichever is less) of RATED THERMAL POWER. in accordance with:

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

Where:

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

R_{ij} and its associated σ_j may be calculated on a full core or a limiting fuel batch basis as defined on page B3/4 3-3 of basis.

e. $F_{Qi\ell}^{Meas}$ is the limiting total peaking factor in flux map i. The limiting total peaking factor is that factor with least margin to the $F_Q^L(E)$ curve defined in Figure 3.2-3a for Exxon Nuclear Company fuel and in Figure 3.2-3b for Westinghouse fuel.

LIMITING CONDITION FOR OPERATION (Continued)

T(E) is the ratio of the exposure dependent $F_Q^L(E)$ to 1.95 and is defined in Figure 3.2-3a for fuel supplied by Exxon Nuclear Company and in Figure 3.2-3b for fuel supplied by Westinghouse Electric Corporation.

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

σ_j is the standard deviation associated with thimble j, expressed as a fraction or percentage of $\overline{R}_j$, and is derived from n flux maps from the relationship below, or 0.02, (2%) whichever is greater.

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

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.

The factor 1.03 is the engineering uncertainty factor.

g. F_p is an uncertainty factor for Exxon fuel to account for the reduction in the $F_Q^L(E)$ curve due to an accumulation of exposure prior to the next flux map. This correction is only required when the T(E) for the limiting fuel segment is less than 1.0. The following F_p factor shall apply:

$F_p = 1.0$ for $T(E) = 1.0$

$F_p = 1.0 + 0.005 \times W$ for $T(E) < 1.0$
where W is the number of effective full power weeks (rounded up to the next highest integer) since the last full core flux map.

LIMITING CONDITION FOR OPERATION (Continued)

APPLICABILITY: Mode 1 above the percent of RATED THERMAL POWER indicated by the relationship.#

$$APL = \text{min over Z of } \frac{\frac{F_Q^L(E_\ell)}{P} K(Z)}{F_Q(Z,\ell) \times V(Z) \times Ep(Z)} \times 100\% \qquad P > .5$$

where $F_Q(Z,\ell)$ is the measured $F_Q(Z,\ell)$, including a 3% manufacturing tolerance uncertainty and a 5% measurement uncertainty, at the time of target flux determination from a power distribution map using the movable incore detectors.

ACTION:

a. With a $F_j(Z)$ factor exceeding $[F_j(Z)]_S$ by $\leq$ 4 percent reduce THERMAL POWER 1 percent for every percent by which the $F_j(Z)$ factor exceeds its limit within 15 minutes and within the next 2 hours either reduce the $F_j(Z)$ factor to within its limit or reduce THERMAL POWER to APL or less of RATED THERMAL POWER.

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

The APDMS may be out of service: 1) when incore maps are being taken as part of the Augmented Startup Test Program or 2) when surveillance for determining power distribution maps is being performed.

SURVEILLANCE REQUIREMENTS

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 3.3.3.6 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 APL of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any 1 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 APL of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any 1 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.

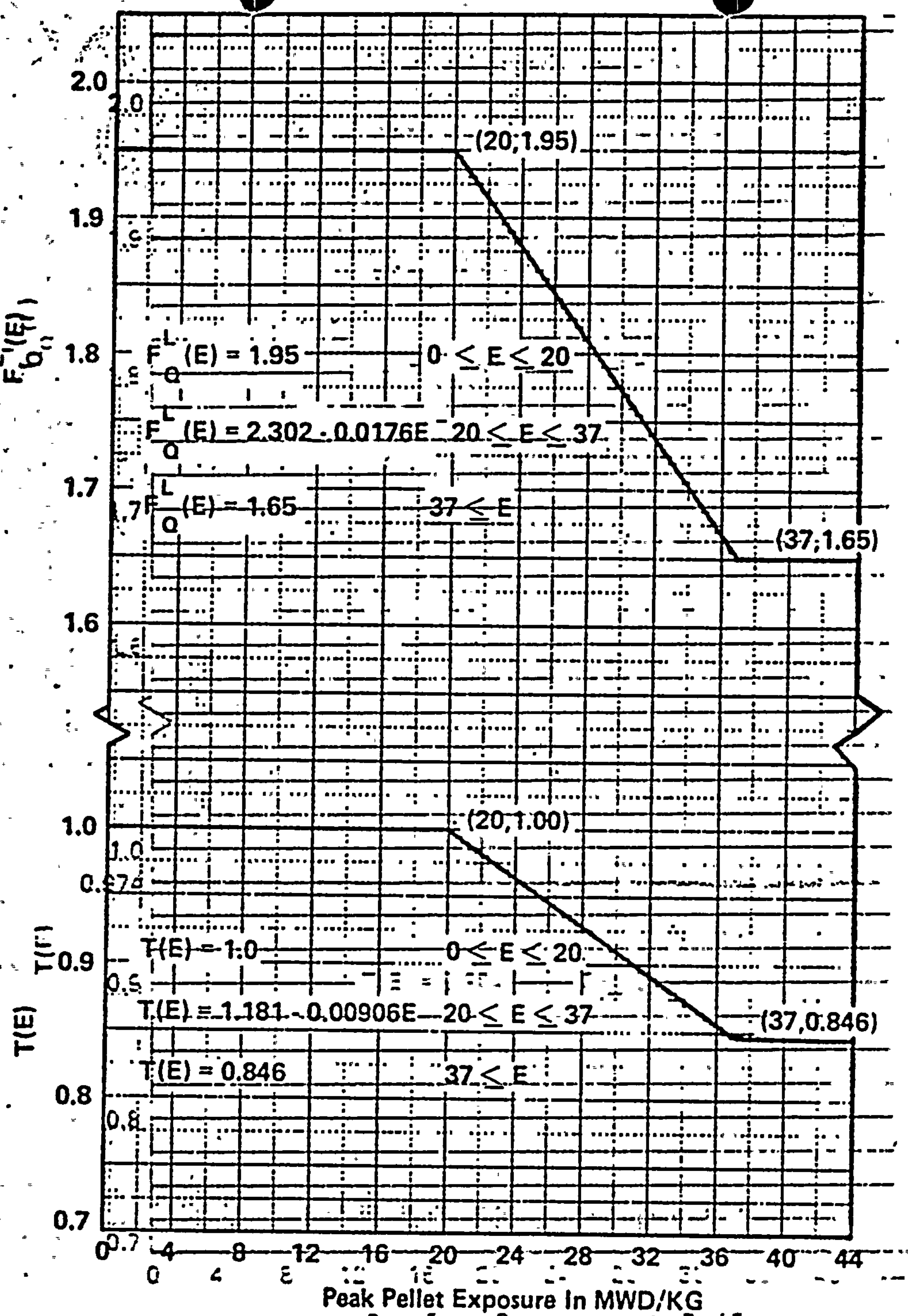

Figure 3.2-3a

Exposure Dependent F_Q Limit, $F_Q^L(E)$, and Normalized Limit T(E) as a Function of Peak Pellet Burnup for Exxon Nuclear Company Fuel.

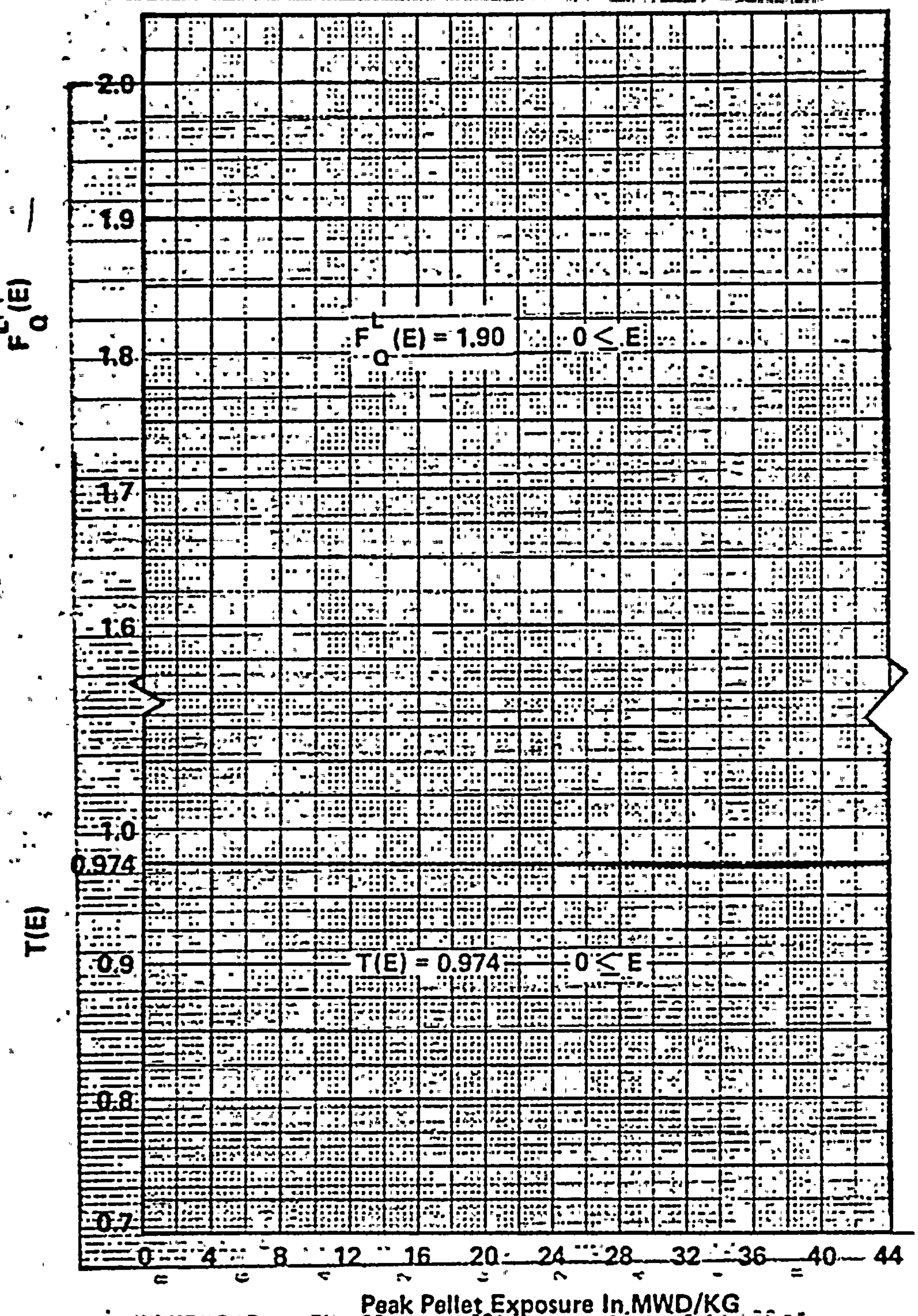

Figure 3.2 - 3b

F_Q Limit, $F_Q^L(E)$, and Normalized Limit T(E) as a Function of Peak Pellet Burnup for Westinghouse Fuel

Although it is intended that the plant will be operated with the AXIAL FLUX DIFFERENCE within the +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 above 50% of RATED THERMAL POWER. For THERMAL POWER levels below 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 1 minute average of each of the OPERABLE excore detector outputs and provides an alarm message 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% or .9 x APL of RATED THERMAL POWER (whichever is less). During operation at THERMAL POWER levels between 15% and 90% or .9 x APL RATED THERMAL POWER (whichever is less), the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively.

The upper bound limit (90% or .9 x APL of RATED THERMAL POWER (whichever is less)) on AXIAL FLUX DIFFERENCE assures that the $F_Q(Z,\ell)$ envelope of 1.95 times K(Z) x T(E) is not exceeded during either normal operation or in the event of xenon redistribution following power changes. The lower bound limit (50% of RATED THERMAL POWER) is based on the fact that at THERMAL POWER levels below 50% of RATED THERMAL POWER, the average linear heat generation rate is ½ of its nominal operating value and below that value, perturbations in localized flux distributions cannot affect the results of ECCS or DNBR analyses in a manner which would adversely affect the health and safety of the public.

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

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 APL 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.

The unit may operate with fuel assemblies supplied by the Exxon Nuclear Company and by Westinghouse Electric Corporation. An F_Q limit has been specified for each of these 2 fuel types.