

reactivity insertion upon ejection greater than 0.3% k/k at rated power. Inoperable rod worth shall be determined within 4 weeks.

- b. A control rod shall be considered inoperable if
 - (a) the rod cannot be moved by the CRDM, or
 - (b) the rod is misaligned from its bank by more than 15 inches, or
 - (c) the rod drop time is not met.
- c. If a control rod cannot be moved by the drive mechanism, shutdown margin shall be increased by boron addition to compensate for the withdrawn worth of the inoperable rod.

5. CONTROL ROD POSITION INDICATION

If either the power range channel deviation alarm or the rod deviation monitor alarm are not operable, rod positions shall be logged once per shift and after a load change greater than 10% of rated power. If both alarms are inoperable for two hours or more, the nuclear overpower trip shall be reset to 93% of rated power.

6. POWER DISTRIBUTION LIMITS

- a. Hot channel factors:

With steam generator tube plugging $\leq 25\%$, the hot channel factors (defined in the basis) must meet the following limits at all times except during low power physics tests:

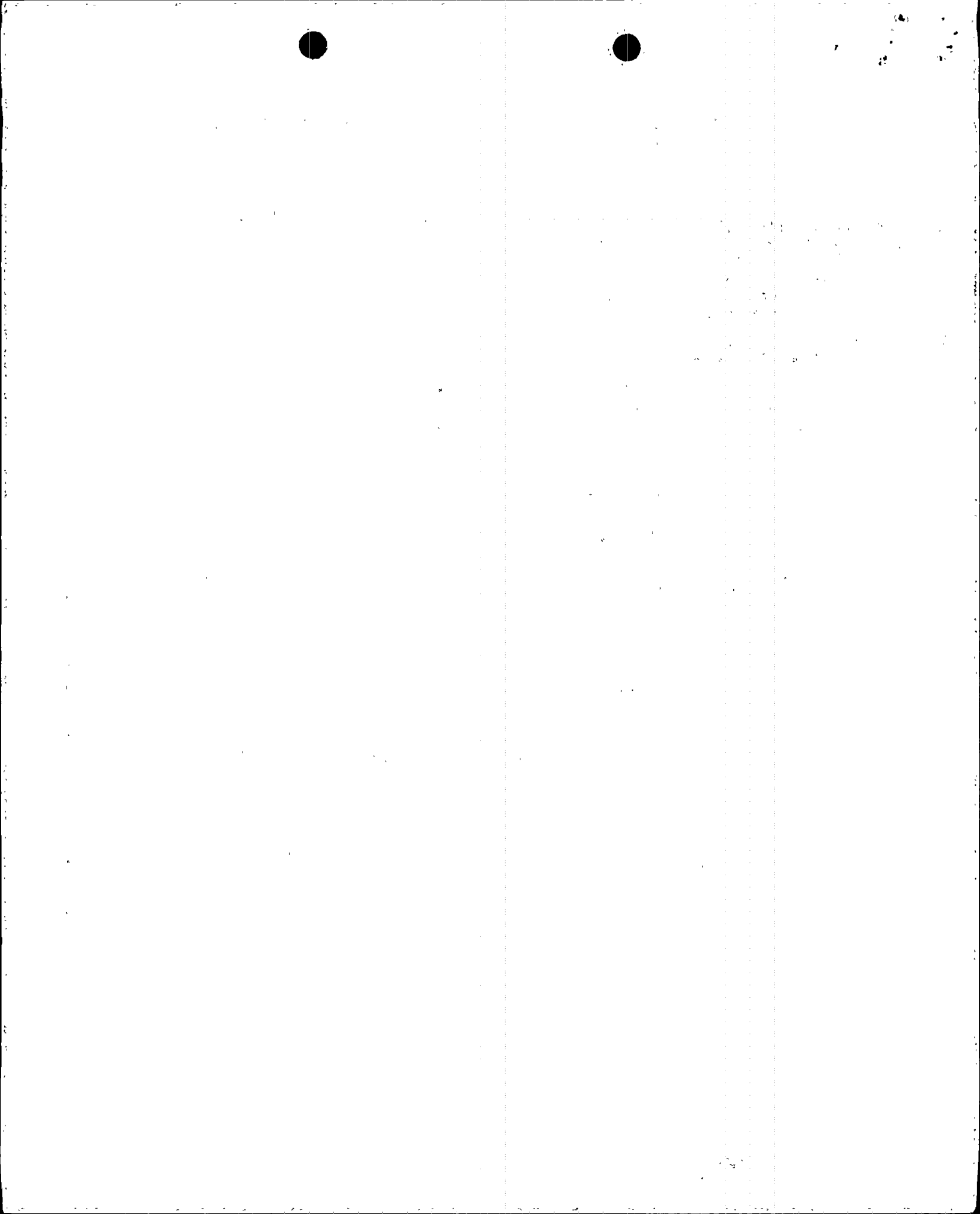
$$F_q(Z) \leq (1.93/P) \times K(Z), \text{ for } P > .5$$

$$F_q(Z) \leq (3.86) \times K(Z), \text{ for } P \leq .5$$

$$F_H^N \leq 1.55 [1 + 0.2 (1-P)]$$

Where P is the fraction of rated power at which the core is operating; K(Z) is the function given in Figure 3.2-3; Z is the core height location of F_q .

If F_q , as predicted by approved physics calculations, exceeds 1.93, the power will be limited to the rated power multiplied by the ratio of 1.93 divided by the predicted F_q , or augmented surveillance of hot channel factors shall be implemented.



- b. Following initial loading before the reactor is operated above 75% of rated power and at regular effective full rated power monthly intervals thereafter, power distribution maps, using the movable detector system shall be made, to confirm that the hot channel factor limits of the specification are satisfied. For the purpose of this comparison,

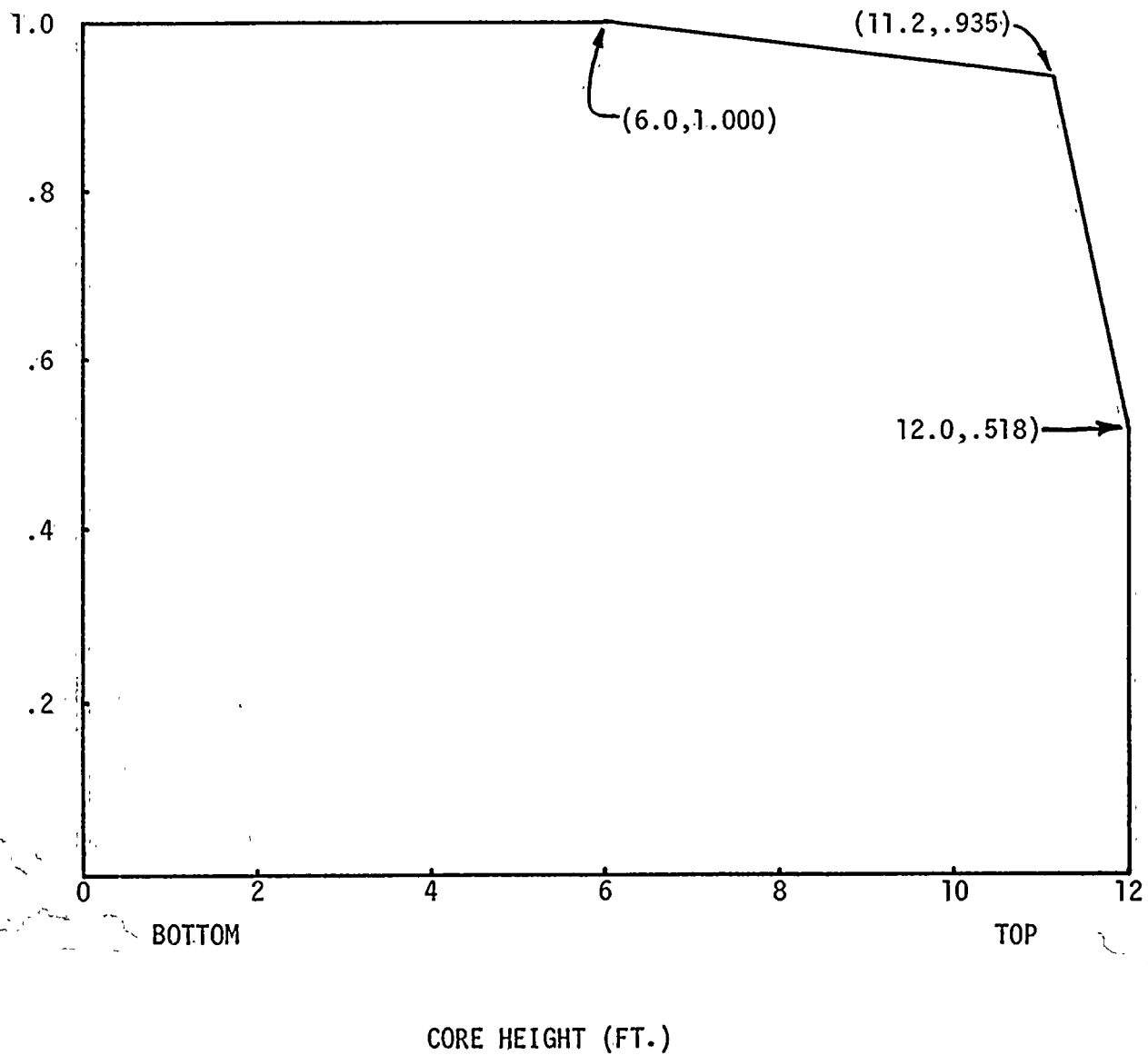
- (1) The measurement of total peaking factor, F_{Meas} , shall be increased by three percent to account for q manufacturing tolerances and further increased by five percent to account for measurement error.
- (2) The measurement of the enthalpy rise hot channel factor, $F_{H_2}^N$, shall be increased by four percent to account for measurement error.

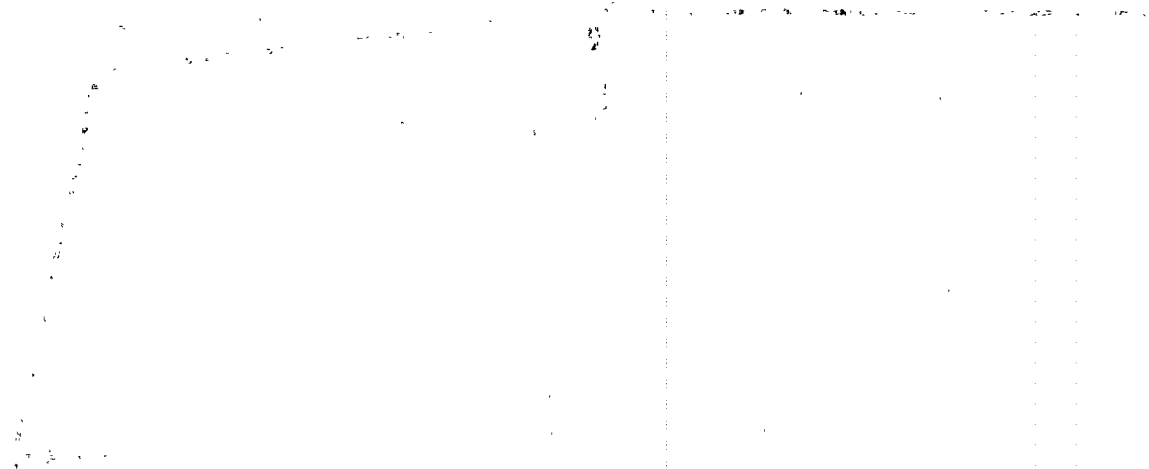
If either measured hot channel factor exceeds its limit specified under Item 6a, the reactor power shall be reduced so as not to exceed a fraction of the rated value equal to the ratio of the F_q or $F_{H_2}^N$ limit to measured value, whichever is less, and the high neutron flux trip setpoint shall be reduced by the same ratio. If subsequent in-core mapping cannot, within a 24 hour period, demonstrate that the hot channel factors are met, the reactor shall be brought to a hot shutdown condition with return to power authorized only for the purpose of physics testing. The reactor may be returned to higher power levels when measurements indicate that hot channel factors are within limits.

- c. The reference equilibrium indicated axial flux difference as a function of power level (called the target flux difference) shall be measured at least once per effective full power quarter. If the axial flux difference has not been measured in the last effective full power month, the target flux difference must be updated monthly by linear interpolation using the most recent measured value and the value predicted for the end of the cycle life.
- d. Except during physics tests or during excore calibration procedures and as modified by items 6e through 6g below, the indicated axial flux difference shall be maintained within a $\pm 5\%$ band about the target flux difference (this defines the target band on axial flux difference).
- e. If the indicated axial flux difference at a power level greater than 90% of rated power deviates.

HOT CHANNEL FACTOR
NORMALIZED OPERATING ENVELOPE

(for $\leq 25\%$ steam generator tube plugging and $F_q=1.93$)





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