would cause DNB at a particular core location to the actual heat flux at that location, is indicative of the margin to DNB. The minimum value of the DNBR during steady state operation, normal operational transients, and anticipated transients is limited to 1.19. A DNBR of 1.19 corresponds to a 95% probability at a 95% confidence level that DNB will not occur, which is considered an appropriate margin to DNB for all operating conditions. (1)

The curves of Figure 1-1 represent the loci of points of reactor thermal power (either neutron flux instruments of ΔT instruments), reactor coolant system pressure, and cold leg temperature for which the DNBR is 1.19. The area of safe operation is below these lines.

The reactor core safety limits are based on radial peaks limited by the CEA insertion limits in Section 2-10 and axial shapes within the axial power distribution trip limits in Figure 1-2 and a total unrodded planar radial peak of 1.67. The LSSS in Figure 1-3 is based on the assumption that the unrodded integrated total radial peak (F_R^T) is 1.62. This peaking factor is slightly higher (more conservative) than the maximum predicted unrodded total radial peak during core life, excluding measurement uncertainty.

Flow maldistribution effects for operation under less than full reactor coolant flow have been evaluated via model tests.(2) The flow model data established the maldistribution factors and hot channel inlet temperature for the thermal analyses that were used to establish the safe operating envelopes presented in Figure 1-1. The reactor protective system is designed to prevent any anticipated combination of transient conditions for reactor coolant system temperature, pressure and thermal power level that would result in a DNBR of less than 1.19.(3)

References

(1) USAR, Section 3.6.7
(2) USAR, Section 1.4.6
(3) USAR, Section 3.6.2

ATTACHMENT A

(ii) Be in at least hot standby within the next 6 hours.

(2) Total Integrated Radial Peaking Factor

The calculated value of F_R^T defined by $F_R^T = F_R(1+T_q)$ shall be limited to ≤ 1.62. F_R is determined from a power distribution map with no part length CEA's inserted and with all full length CEA's at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump conbination. The azimuthal tilt, T_q, is the measured value of T_q at the time F_R is determined.

With $F_R^T > 1.62$ within 6 hours:

(a) Reduce power to bring power and F_R^T within the limits of Figure 2-9, withdraw the full length CEA's to or beyond the Long Term Steady State Insertion Limits of Specification 2.10.2(7), and fully withdraw the PLCEA's, or

(b) Be in at least hot standby.

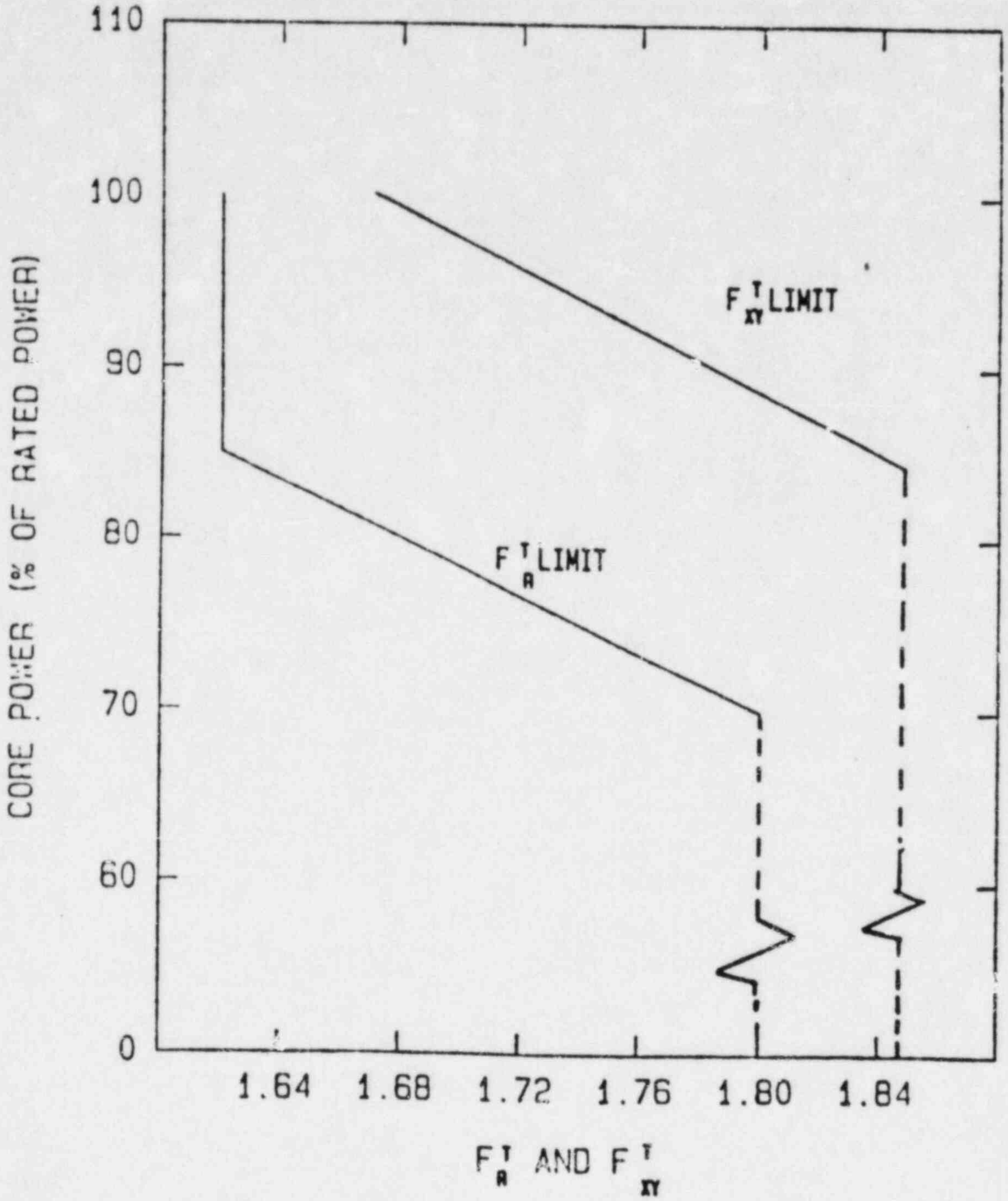
(3) Total Planar Radial Peaking Factor

The calculated value of $F_{xy}T$ defined as $F_{xy}T = F_{xy}(1+T_q)$ shall be limited to ≤ 1.67. F_{xy} is determined from a power distribution map with no part length CEA's inserted and with all full length CEA's at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump conbination. The azimuthal tilt, T_q, is the measured value of T_q at the time F_{xy} is determined.

With $F_{xy}T > 1.67$ within 6 hours:

(a) Reduce power to bring power and $F_{xy}T$ within the limits of Figure 2-9, withdraw the full length CEA's to or beyond the Long Term Steady State Insertion Limits of Specification 2.10.2(7), and fully withdraw the PLCEA's, or

(b) Be in at least hot standby.



F^T_R, F^T_{XY} and Core Power Limitations	Omaha Public Power District Fort Calhoun Station-Unit No. 1	Figure 2-9

JUSTIFICATION

The early shutdown of the Cycle 7 core resulted in an end-of-cycle burnup of 9725 MWD/T rather than the design value of 10,500 MWD/T. The early shutdown necessitated a verification of the Cycle 8 safety analysis to assure its validity for this lower Cycle 7 burnup. The lower Cycle 7 exposure resulted in an increase in the predicted values of the bank 4 inserted values of F_R and F_{xy}. To account for these increases, it was necessary to increase the values of the bank 4 inserted radial peaking factors used in the Cycle 8 safety analysis. The bank 4 inserted value of F_R used in the safety analysis is increased from 1.61 to 1.65 and the bank 4 inserted value of F_{xy} used in the safety analysis is increased from 1.69 to 1.74.

All safety analyses and Technical Specifications were shown to be valid for these higher peaking factors with the exception of the Technical Specification on the Total Planar Radial Peaking Factor ($F_{xy}T$) and the $F_{xy}T$ versus Core Power Limitations of Figure 2-9. To assure the validity of the Cycle 8 safety analysis, it is necessary to reduce the $F_{xy}T$ limitation to 1.67 and revise Figure 2-9 for this lower limit.

No operating problems are anticipated with lowering the allowable $F_{xy}T$ value since the predicted value of F_{xy} is less than the proposed limit.

ATTACHMENT B