

The specified flow rates for curves 1, 2, and 3 of the Axial Power Imbalance Protective Limits given in the COLR correspond to the expected minimum flow rates with four pumps, three pumps, and one pump in each loop, respectively.

The curve of Figure 2.1-1 is the most restrictive of all possible reactor coolant pump-maximum thermal power combinations shown in Figure 2.1-3. The curves of Figure 2.1-3 represent the conditions at which the DNBR limit is predicted at the maximum possible thermal power for the number of reactor coolant pumps in operation or the local quality at the point of minimum DNBR is equal to 22 percent, (BAW-2), or 26 percent (BWC) whichever condition is more restrictive. The curves of Figures 2.1-1 and 2.1-3 were developed assuming a reactor coolant design flow rate of 102% of 352,000 gpm. However, a higher minimum flow rate (105.5% of 352,000 gpm) is specified in order to offset transition core effects due to the introduction of the Mark-B12 fuel design with fine mesh debris filter.

The maximum thermal power for each reactor coolant pump operating condition (four pump, three pump, and one pump in each loop) given in the COLR is due to a power level trip produced by the flux-flow ratio multiplied by the minimum flow rate for the given pump combination plus the maximum calibration and instrumentation error.

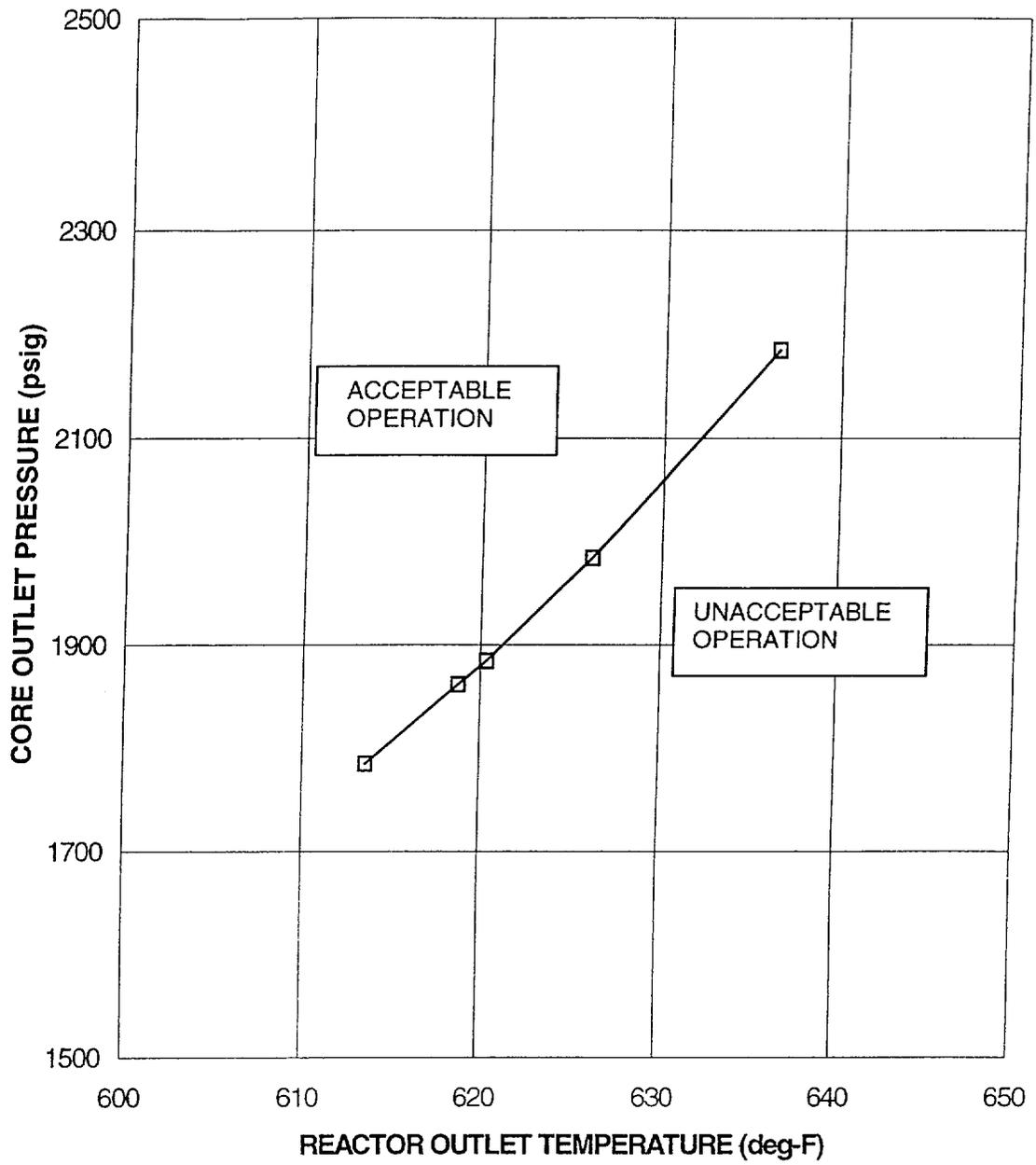
Using a local quality limit of 22 percent (BAW-2), or 26 percent (BWC) at the point of minimum DNBR as a basis for curves 2 and 3 of Figure 2.1-3 is a conservative criterion even though the quality at the exit is higher than the quality at the point of minimum DNBR.

The DNBR as calculated by the BAW-2 or BWC correlation continually increases from the point of minimum DNBR, so that the exit DNBR is always higher and is a function of the pressure.

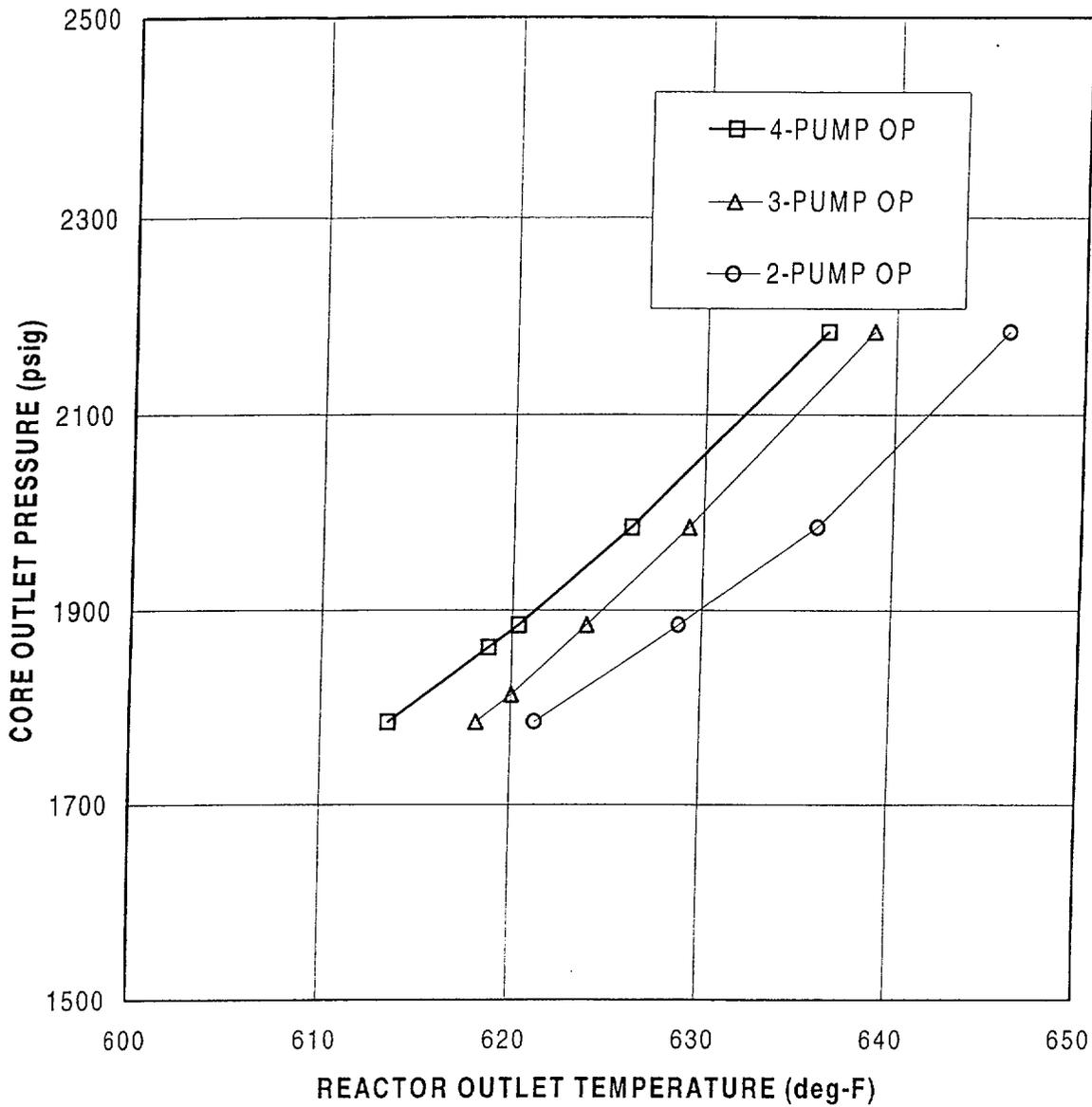
For each curve of Figure 2.1-3, a pressure-temperature point above and to the left of the curve would result in a DNBR greater than 1.30 (BAW-2) or 1.18 (BWC) or a local quality at the point of minimum DNBR less than 22 percent (BAW-2), or 26 percent (BWC) for the particular reactor coolant pump situation. Curve 1 is more restrictive than any other reactor coolant pump situation because any pressure/temperature point above and to the left of this curve will be above and to the left of the other curves.

REFERENCES

- (1) UFSAR, Section 3.2.3.1.1 - "Fuel Assembly Heat Transfer Design"
- (2) BWC Correlation of Critical Heat Flux, BAW-10143P-A, Babcock & Wilcox, Lynchburg, Virginia, April 1985
- (3) UFSAR, Section 3.2.3.1.1.3 - "Nuclear Power Factors"



CORE PROTECTION SAFETY LIMIT
 TMI-1
 FIGURE 2.1-1



RC Pumps	Reactor Coolant Flow (lbs/hr)	Power	Pumps Operating (Type of Limit)
4	138.52X10 ⁶	112%	Four Pumps (DNBR Limit)
3	See COLR	See COLR	Three Pumps (DNBR Limit)
2	See COLR	See COLR	One Pump in Each Loop (Quality Limit)

CORE PROTECTION SAFETY BASES
TMI-1
FIGURE 2.1-3

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