ATTACHMENT 2

BY2C4 Core Operating Limits Report

Byron Unit 2 Cycle 4
Operating Limit Report - Fxy Portion

This Radial Peaking Factor Limit Report is provided in accordance with Paragraph 6.9.1.9 of the Byron Unit 2 Nuclear Plant Technical Specifications.

The Fxy limits for RATED THERMAL POWER within specified core planes for Cycle 4 shall be:

a. For the lower core region from greater than or equal to 0% to less than or equal to 50%:

1. For all core planes containing bank "D" control rods:

$$F_{xy}^{RTP} \leq 1.990, \text{ for } Bu \leq 8000 \text{ MWD/MTU}$$
$$\leq 1.990, \text{ for } Bu > 8000 \text{ MWD/MTU}$$

2. For all unrodded core planes:

$$F_{xy}^{RTP} \leq 1.784, \text{ for } Bu \leq 8000 \text{ MWD/MTU}$$
$$\leq 1.656, \text{ for } Bu > 8000 \text{ MWD/MTU}$$

b. For the upper core region from greater than 50% to less than or equal to 100%:

1. For all planes containing bank "D" control rods:

$$F_{xy}^{RTP} \leq 1.952, \text{ for } Bu \leq 8000 \text{ MWD/MTU}$$
$$\leq 1.952 \text{ for } Bu > 8000 \text{ MWD/MTU}$$

2. For all unrodded core planes:

$$F_{xy}^{RTP} \leq 1.732, \text{ for } Bu \leq 8000 \text{ MWD/MTU}$$
$$\leq 1.778, \text{ for } Bu > 8000 \text{ MWD/MTU}$$

These Fxy(z) limits were used to confirm that the heat flux hot channel factor FQ(z) will be limited to the Technical Specification values of:

$$F_Q(z) \leq \left[\frac{2.50}{P}\right] [K(z)] \quad \text{for } P > 0.5 \text{ and,}$$

$$F_Q(z) \leq [5.00] [K(z)] \quad \text{for } P \leq 0.5$$

assuming the most limiting axial power distributions expected to result from the insertion and removal of Control Banks C and D during operation, including the accompanying variations in the axial xenon and power distributions as described in the "Power Distribution Control and Load Following Procedures", WCAP-8403, September, 1974. Therefore, these F_{xy} limits provide assurance that the initial conditions assumed in the LOCA analysis are met, along with the ECCS acceptance criteria of 10 CFR 50.46.

See Figures 1 and 2 for plots of $[F_Q^T \cdot P_{Rel}]$ vs. Axial Core Height.

ZNLD/1764/6

FIGURE 1
BYRON 2 CYCLE 4
Fxy LIMIT ANALYSIS - BU ≤ 8000

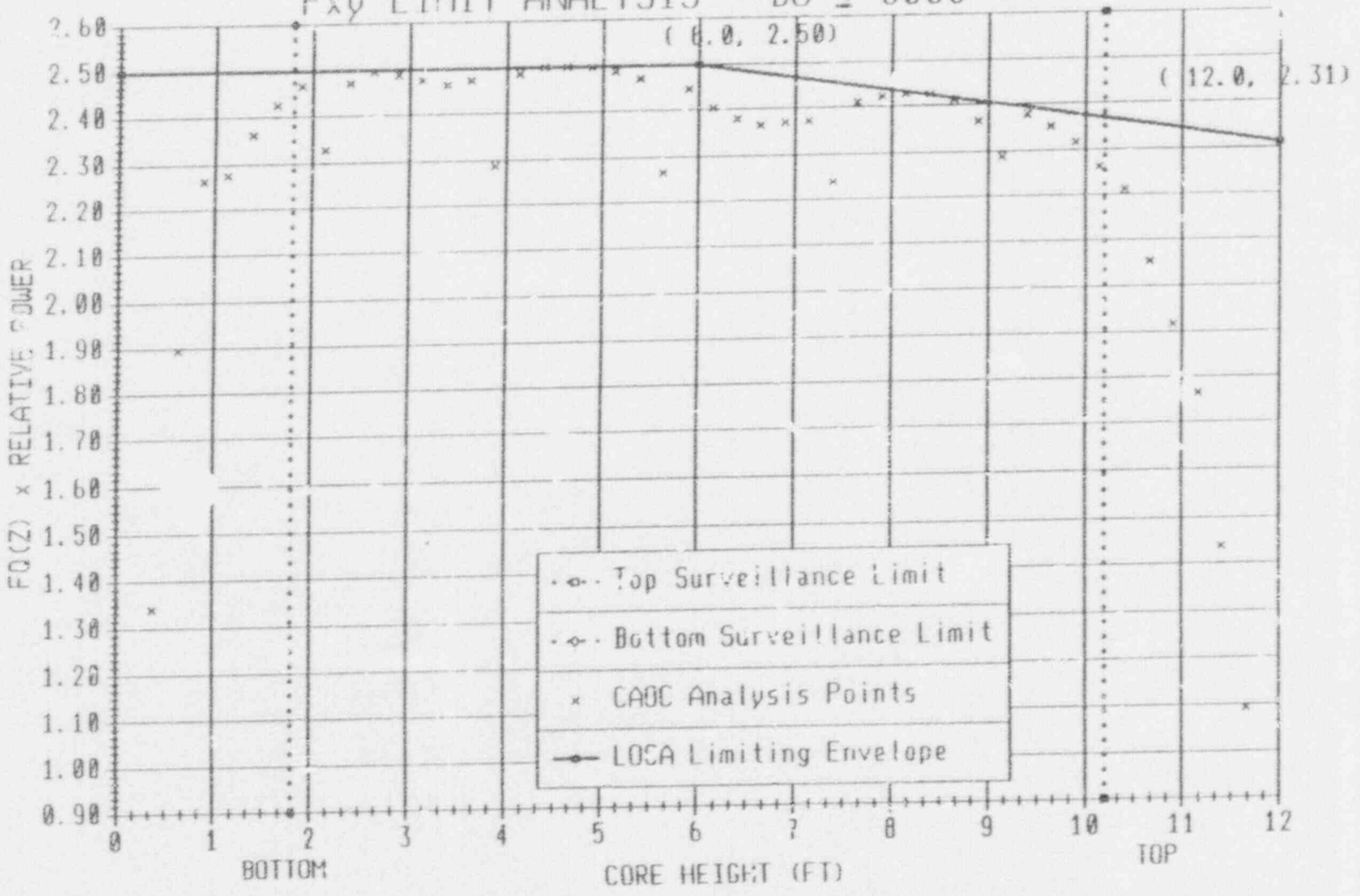
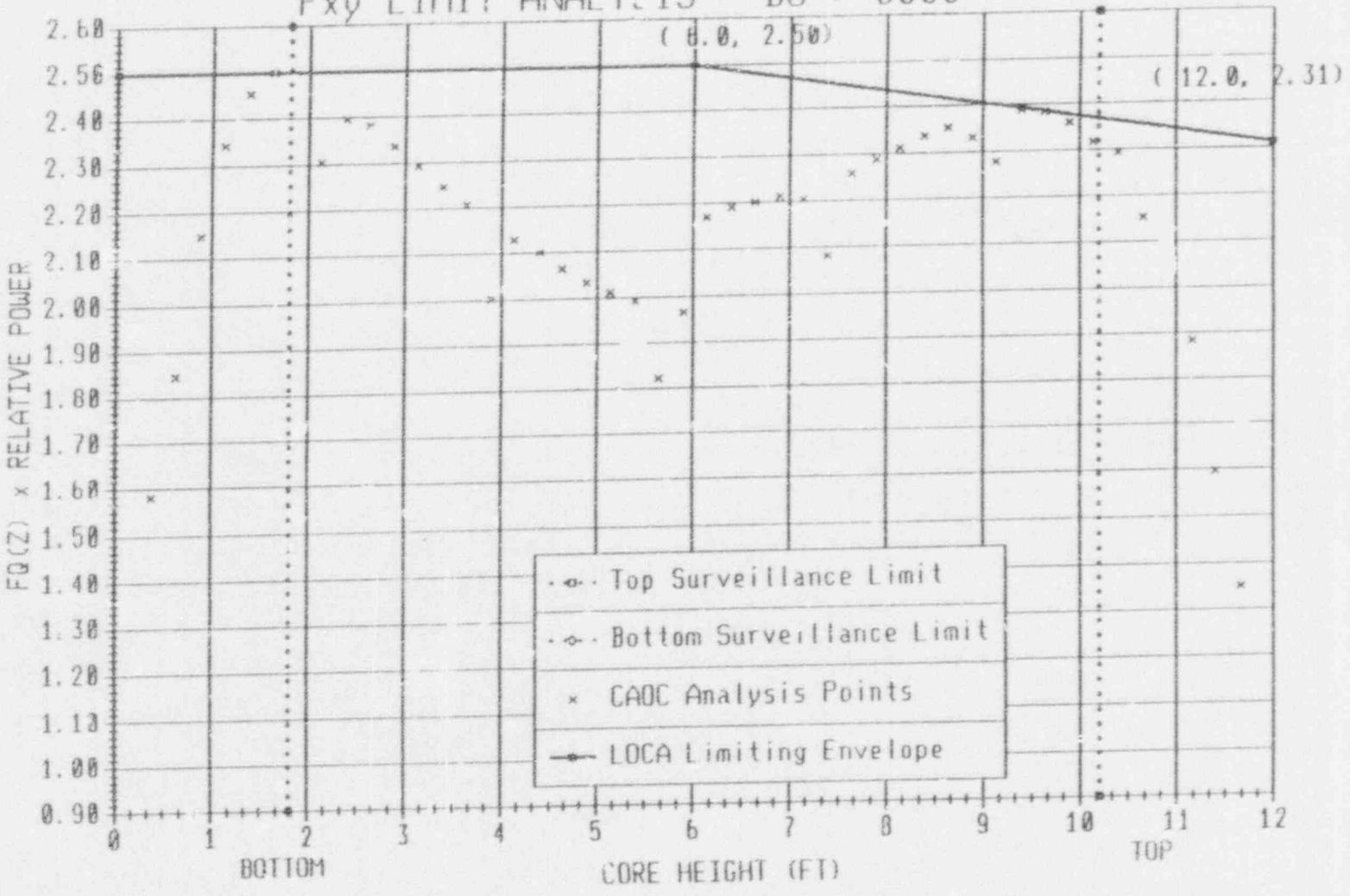


FIGURE 2
BYRON 2 CYCLE 4
Fxy LIMIT ANALYSIS - BU > 8000



ATTACHMENT 3

References

1. Westinghouse WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," dated October 1985.

2. CECo/NFS topical report NFSR-0081, "Benchmark of PWR Nuclear Design Methods using the PHOENIX-P and ANC Codes," (dated July 1990) submitted for NRC review by letter from J. Silady to T. E. Murley dated July 13, 1990.

3. NRC SER on CECo's PHOENIX/ANC Topical (Ref. 2) dated March 11, 1991.

4. Westinghouse topical report WCAP-11596-P-A, "Qualification of the PHOENIX/ANC Nuclear Design System for Pressurized Water Reactor Cores," dated September 1986.

5. Westinghouse topical report WCAP-10965-P-A, "ANC: Westinghouse Advanced Nodal Computer Code," dated September 1986.

6. CECo submittal, R.A. Chrzanwski to T.E. Murley, "Byron Station Units 1 and 2 Application to Facility Operating License NPF-37 and NPF-66," dated July 31, 1989.

7. NRC letter from L.N. Olshan to T.E. Kovach, Amendment No. 36 "Use of vANTAGE 5 Fuel," dated January 31, 1990.