

**DUKE POWER COMPANY**

P.O. BOX 33189  
CHARLOTTE, N.C. 28242

HAL B. TUCKER  
VICE PRESIDENT  
NUCLEAR PRODUCTION

TELEPHONE  
(704) 373-4531

July 20, 1984

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief  
Licensing Branch No. 4

Subject: McGuire Nuclear Station  
Docket Nos. 50-369 and 50-370  
Base Load Operation Technical Specifications

Dear Mr. Denton:

My letter of June 14, 1984 submitted proposed license amendments to Facility Operating Licenses NPF-9 and NPF-17 for McGuire Nuclear Station, Units 1 and 2, respectively. The amendments (which were subsequently approved on June 21, 1984) expanded the Power Distribution Limits section of the McGuire Unit 1 Technical Specifications to include Base Load Operation in addition to the previously approved RAOC Operation.

The McGuire 1 Cycle 2 Peaking Factor Limit Report format and content were amended to provide information which permits the exact determination of  $W(z)$  versus core height as a function of cycle burnup through the use of three point interpolation of three sets of burnup specific data. The report provides the elevation dependent  $W(z)$  values that are to be used as inputs to define the appropriate fitting coefficients for  $W(z)$  interpolations to be performed as a function of cycle burnup and axial elevation for RAOC and Base Load Operation, and the value for  $APL^{ND}$ . The June 14, 1984 submittal (Attachment 2A) included an amended McGuire Unit 1/Cycle 2 Peaking Factor Limit Report which contained the  $W(z)$  functions for RAOC Operation during Cycle 2 and Base Load Operation in the Cycle 2 burnup range of 1200 to 6000 MWD/MTU, and indicated that the base load  $W(z)$  functions for the remainder of Cycle 2 (Burnups greater than 6000 MWD/MTU) would be submitted in July, 1984.

Attached is the Peaking Factor Limit Report for McGuire Unit 1/Cycle 2 Base Load Operation in the Cycle 2 burnup range of 1200 to 10,200 MWD/MTU. This information has been derived for Base Load Operation with a  $\pm 3$  percent AFD about a measured target in the power interval from 80 to 100 percent of rated thermal power. The  $W(z)$  functions for Cycle 2 burnups of 1200, 3000, and 6000 MWD/MTU were previously transmitted in the June 14, 1984 submittal. These functions are included in Figures 1-3 of the attached report for completeness.  $W(z)$  functions for the remainder of Cycle 2 (8000 and 9500 MWD/MTU) are given in figures 4 and 5. Using the  $W(z)$  functions shown in figures 1-5, the  $W(z)$  values for Cycle burnups between 1200 and 10,200 MWD/MTU can be determined using three point interpolation (for three point interpolation, the  $W(z)$  values from the three burnup steps closest to the measured burnup are used).

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In addition, the June 14, 1984 submittal indicated that the application contained one Class III License Amendment for McGuire Unit 1 and one Class I Amendment for McGuire Unit 2 (pursuant to 10 CFR 170.22), and that consequently a check in the amount of \$4,400.00 would be forwarded separately in accordance with 10 CFR 170.12. This check is enclosed.

Very truly yours,

*H. B. Tucker*  
Hal B. Tucker

PBN:glb

Attachment

Enclosure

cc: (w/attachment)

Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30323

Mr. Dayne Brown, Chief  
Radiation Protection Branch  
Division of Facility Services  
Department of Human Resources  
P. O. Box 12200  
Raleigh, North Carolina 27605

Mr. W. T. Orders  
Senior Resident Inspector  
McGuire Nuclear Station

PEAKING FACTOR LIMIT REPORT FOR MCGUIRE UNIT 1, CYCLE 2  
BASE LOAD OPERATION

This Peaking Factor Limit Report is provided in accordance with Paragraph 6.9.1.9 of the McGuire Unit 1 Technical Specifications.

The McGuire Unit 1, Cycle 2 elevation dependent  $W(z)$  values for base load operation between 80% and 100% of rated thermal power with a  $\pm 3$  percent AFD about a measured target value at 1200, 3000, 6000, 8000, and 9500 MWD/MTU Cycle 2 burnups are shown in Figures 1 through 5 respectively. This information is sufficient to determine  $W(z)$  versus core height for cycle 2 burnups in the range of 1200 MWD/MTU to 10,200 MWD/MTU through the use of three point interpolation.  $W(z)$  was calculated using the method described in Part B of Reference 1.

The minimum allowable power level for base load operation,  $APL^{ND}$ , for McGuire 1 Cycle 2 is 80 percent of rated thermal power. The appropriate  $W(z)$  function is used to confirm that the heat flux hot channel factor,  $F_Q(z)$  will be limited to the Technical Specification values of:

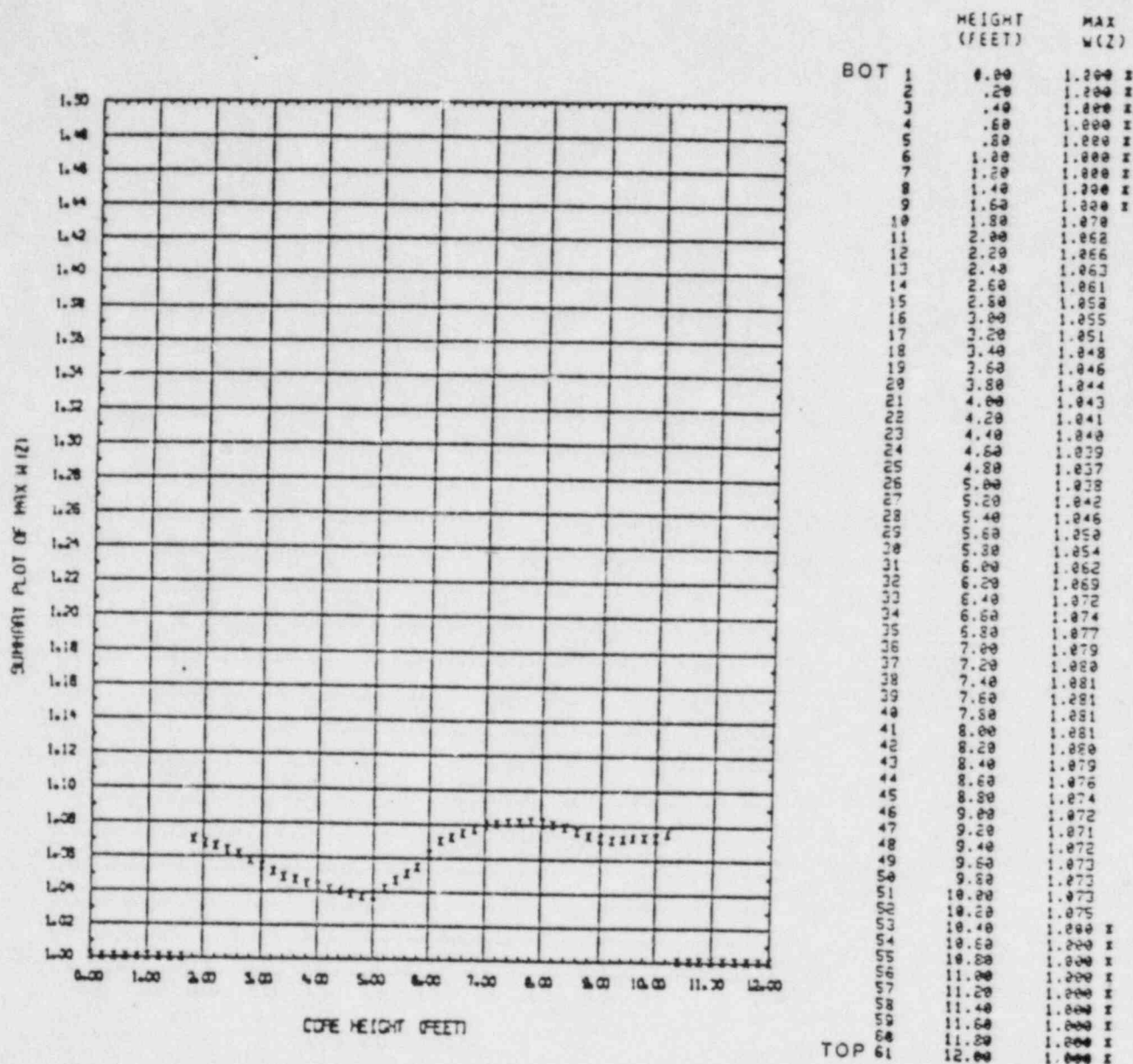
$$F_Q(z) \leq \frac{2.15}{P} [K(z)] \text{ for } P > 0.50 \text{ and}$$

$$F_Q(z) \leq 4.30 [K(z)] \text{ for } P \leq 0.50$$

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The appropriate elevation dependent  $W(z)$  values, when applied to a power distribution measured under equilibrium conditions, demonstrates that the initial conditions assumed in the LOCA are met, along with the ECCS acceptance criteria of 10CFR50.46.

(1) WCAP-10216-P-A, Relaxation of Constant Axial Control -  $F_Q$  Surveillance Technical Specification.



\* Top and bottom 15 % excluded as per Technical Specification 4.2.2.4.9

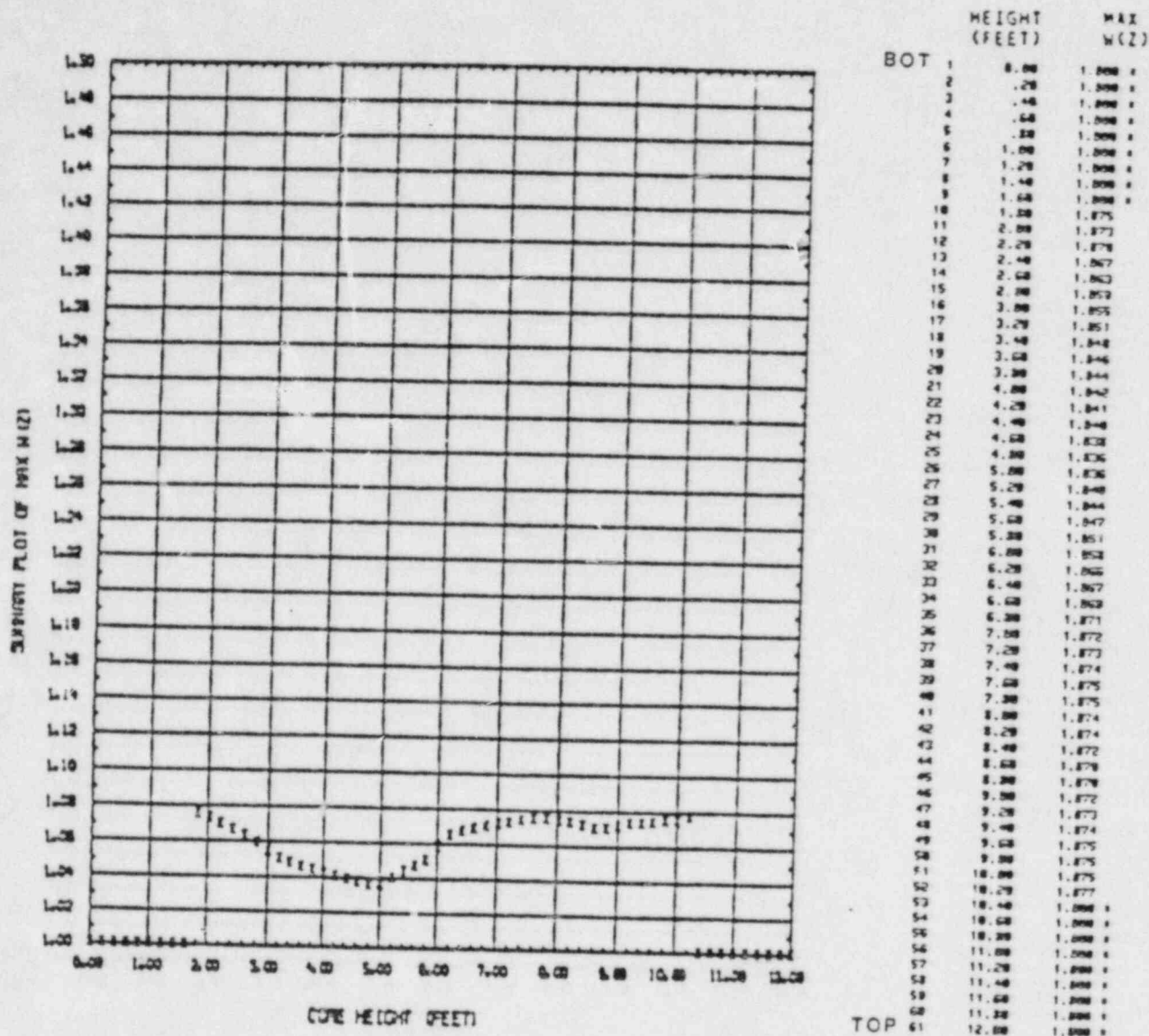
FIGURE 1

McGUIRE, UNIT 1, CYCLE 2

BASELOAD W(Z) FOR POWERS BETWEEN 80% AND 100% OF RATED THERMAL POWER  
WITHIN  $\pm 3$  PERCENT AFD OF THE MEASURED TARGET

1200 MWD/MTU





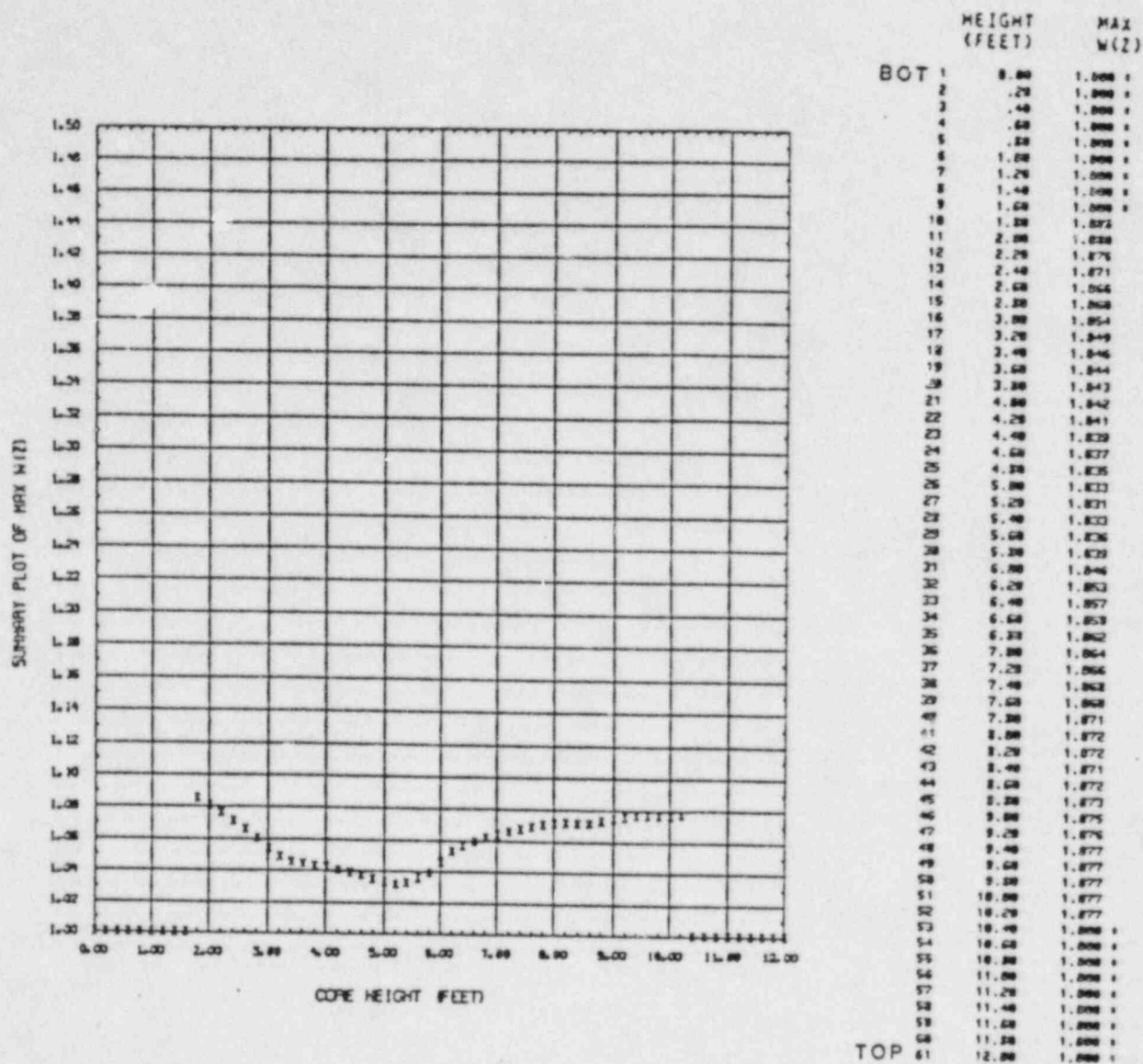
\* Top and bottom 15 % excluded as per Technical Specification 4.2.2.4.g

FIGURE 2

McGUIRE UNIT 1, CYCLE 2

BASELOAD W(z) FOR POWERS BETWEEN 80% AND 100% OF RATED THERMAL POWER  
WITHIN  $\pm 3$  PERCENT AFD OF THE MEASURED TARGET

3000 MWd/MTU



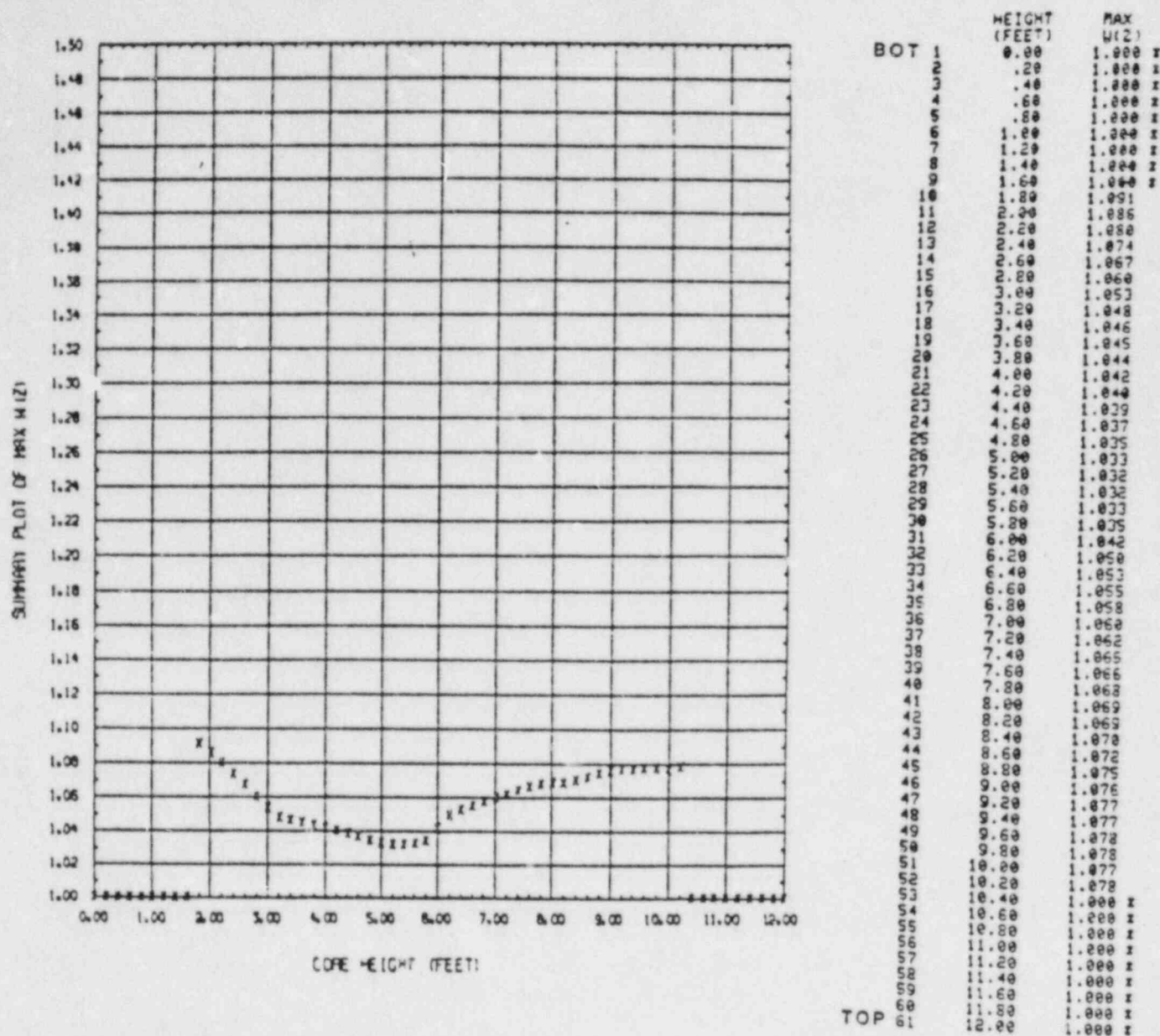
x Top and bottom 15 % excluded as per Technical Specification 4.2.2.4.g

FIGURE 3

McGUIRE UNIT 1, CYCLE 2

BASELOAD W(z) FOR POWERS BETWEEN 80% AND 100% OF RATED THERMAL POWER  
WITHIN  $\pm 3$  PERCENT AFD OF THE MEASURED TARGET

6000 MWd/MTU



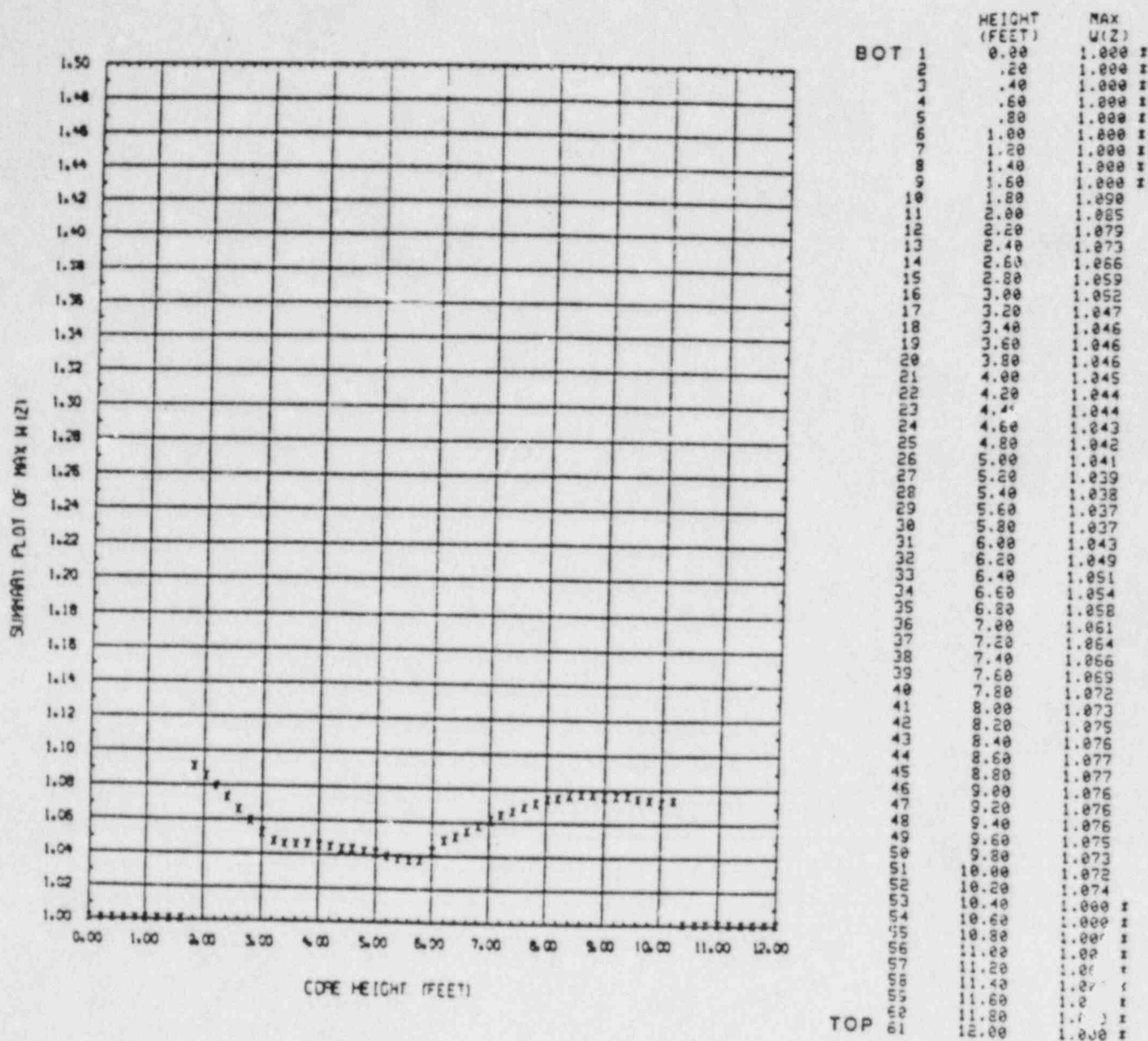
\* Top and bottom 15 % excluded as per Technical Specification 4.2.2.4.g

FIGURE 4

McGUIRE UNIT 1, CYCLE 2

BASELOAD  $W(z)$  FOR POWERS BETWEEN 80% AND 100% OF RATED THERMAL POWER  
WITHIN  $\pm 3$  PERCENT AFD OF THE MEASURED TARGET

8000 MWD/MTU



\* Top and bottom 15 % excluded as per Technical Specification 4.2.2.4.g

FIGURE 5

McGUIRE UNIT 1, CYCLE 2

BASELOAD W(Z) FOR POWERS BETWEEN 80% AND 100% OF RATED THERMAL POWER  
WITHIN  $\pm 3$  PERCENT AFD OF THE MEASURED TARGET

9500 MWD/MTU