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August 5, 1987

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

ULNRC-1569

Gentlemen:

DOCKET NUMBER 50-483  
CALLAWAY PLANT  
CYCLE 3 PEAKING FACTOR LIMIT REPORT  
Reference: "Vantage 5 Licensing Amendment Request",  
ULNRC-1470, dated March 31, 1987

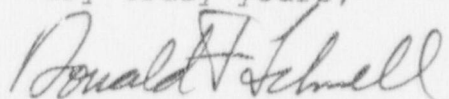
In accordance with the proposed Callaway Technical Specification 6.9.1.9 (as contained in the referenced submittal), Attachment 1 to this letter provides the required Cycle 3 Peaking Factor Limit Report. This report is being submitted now to assure submittal within the required sixty days prior to cycle startup. The report summarizes the  $W(z)$  functions that are to be used in proposed Callaway Technical Specifications 4.2.2.2, 4.2.2.3, and 4.2.2.4 (contained in the referenced submittal) for  $F_Q$  surveillance.

Since significant margin exists between the analytically determined maximum  $F_Q^T(z) * P_{rel}$  values and their limit, Restricted Axial Flux Difference Operation (RAFDO) is not expected to be required for Cycle 3. For this reason, values of  $W(z)$  for RAFDO operation, defined as  $W(z)_{RAFDO}$ , are not supplied for Cycle 3.

The terminology in the Peaking Factor Limit Report is consistent with the proposed Technical Specification changes as given in the referenced submittal letter.

If there are any questions please do not hesitate to contact us.

Very truly yours,

  
Donald F. Schnell

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Attachment

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Peaking Factor Limit Report for Callaway Cycle 3  
CAOC Normal Operation

This Peaking Factor Limit Report is provided in accordance with Section 6.9.1.9 of the Callaway Nuclear Plant Technical Specifications.

The Callaway Cycle 3 elevation dependent  $W(z)$  values for CAOC normal operation (NO) near beginning, middle, and end of cycle are shown in Figures 1-3, respectively. This information is sufficient to determine the height dependent  $W(z)_{NO}$  values for Cycle 3 burnups in the range of 0 MWD/MTU to 18200 MWD/MTU through the use of three point interpolation. These values are provided assuming CAOC operation with a +3, -12 percent  $\Delta I$  band about the target flux difference. Figure 4 includes a  $W(z)_{NO}$  function that is bounding for all Cycle 3 burnups. The bounding  $W(z)_{NO}$  value is conservative to use for any Cycle 3 burnup, however, additional margin can be obtained by using the burnup dependent values.

For Cycle 3, margin exists between the maximum calculated  $F_Q^T(z) * P_{rel}$  values and the  $F_Q^T(z) * P_{rel}$  limit. Therefore the Restricted Axial Flux Difference Operation (RAFDO) portion of the  $F_Q$  surveillance Technical Specification is not expected to be used for Cycle 3. As such, the minimum allowable power level for RAFDO operation,  $APL^{ND}$ , for Callaway Cycle 3 is 100 percent of rated thermal power. No values of  $W(z)_{RAFDO}$  are provided for Cycle 3.

The  $W(z)$  values were calculated using the method described in Part b of Reference 1.

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:

$$F_Q(z) \leq \frac{2.32 (K(z))}{P} \quad \text{for } P > .50$$

$$F_Q(z) \leq 4.64 (K(z)) \quad \text{for } P \leq .50$$

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 analysis are met, along with the ECCS acceptance criteria of 10CFR50.46.

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



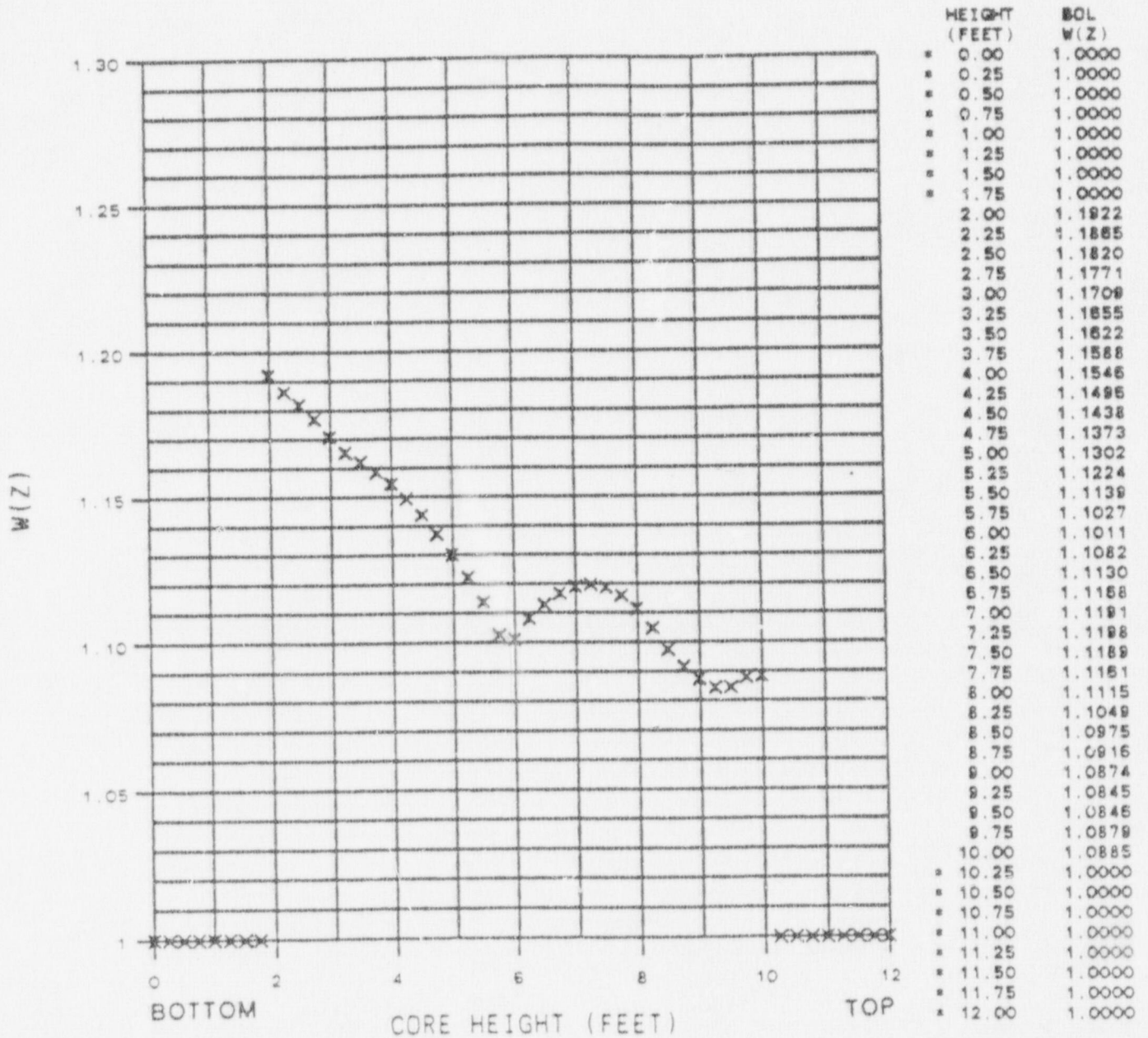


FIGURE 1  
Callaway Unit 1 Cycle 3  
W(z) at 150 MWD/MTU  
NO

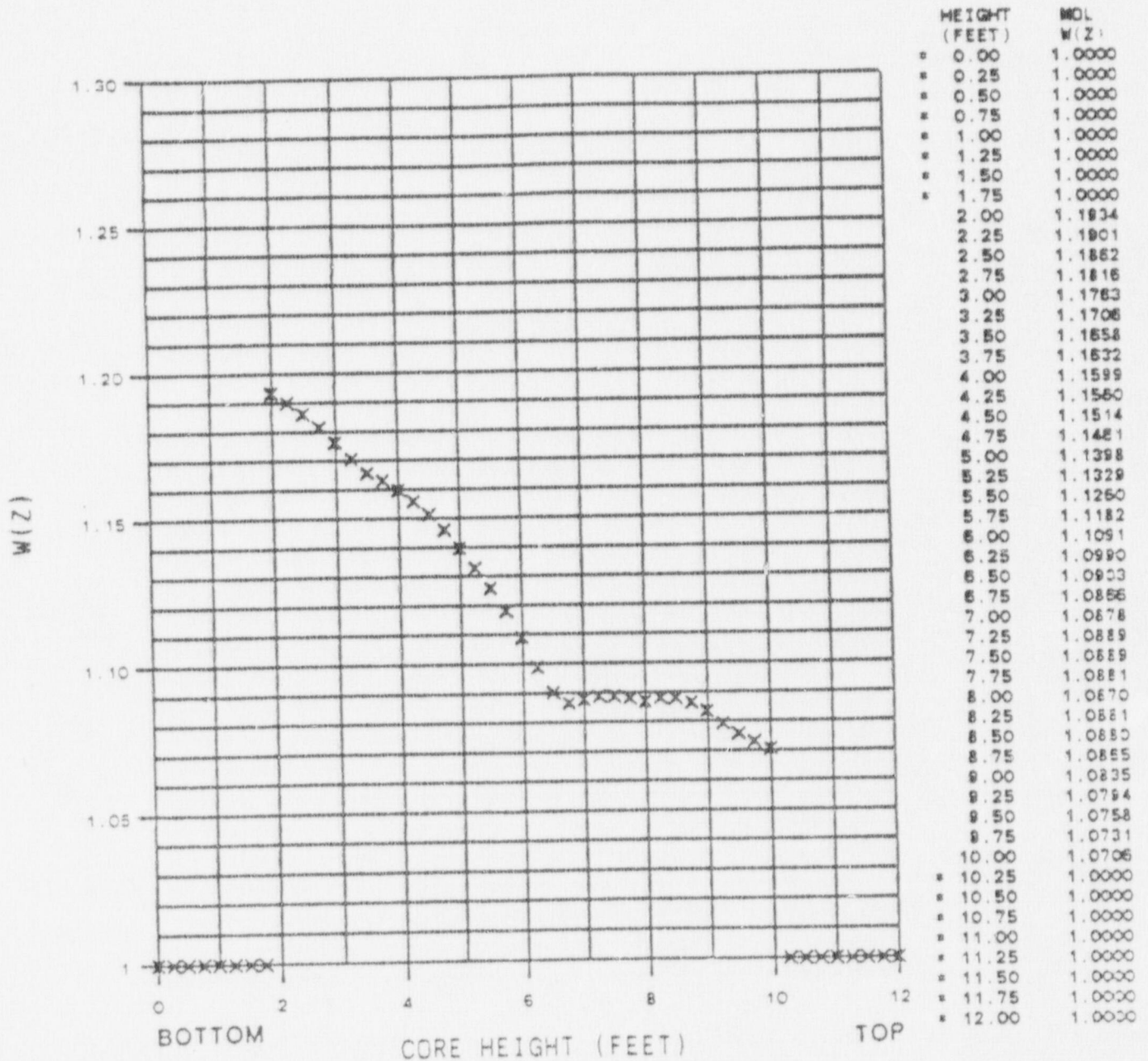


FIGURE 2  
Callaway Unit 1 Cycle 3  
W(z) at 8000 MWD/MTU  
NO

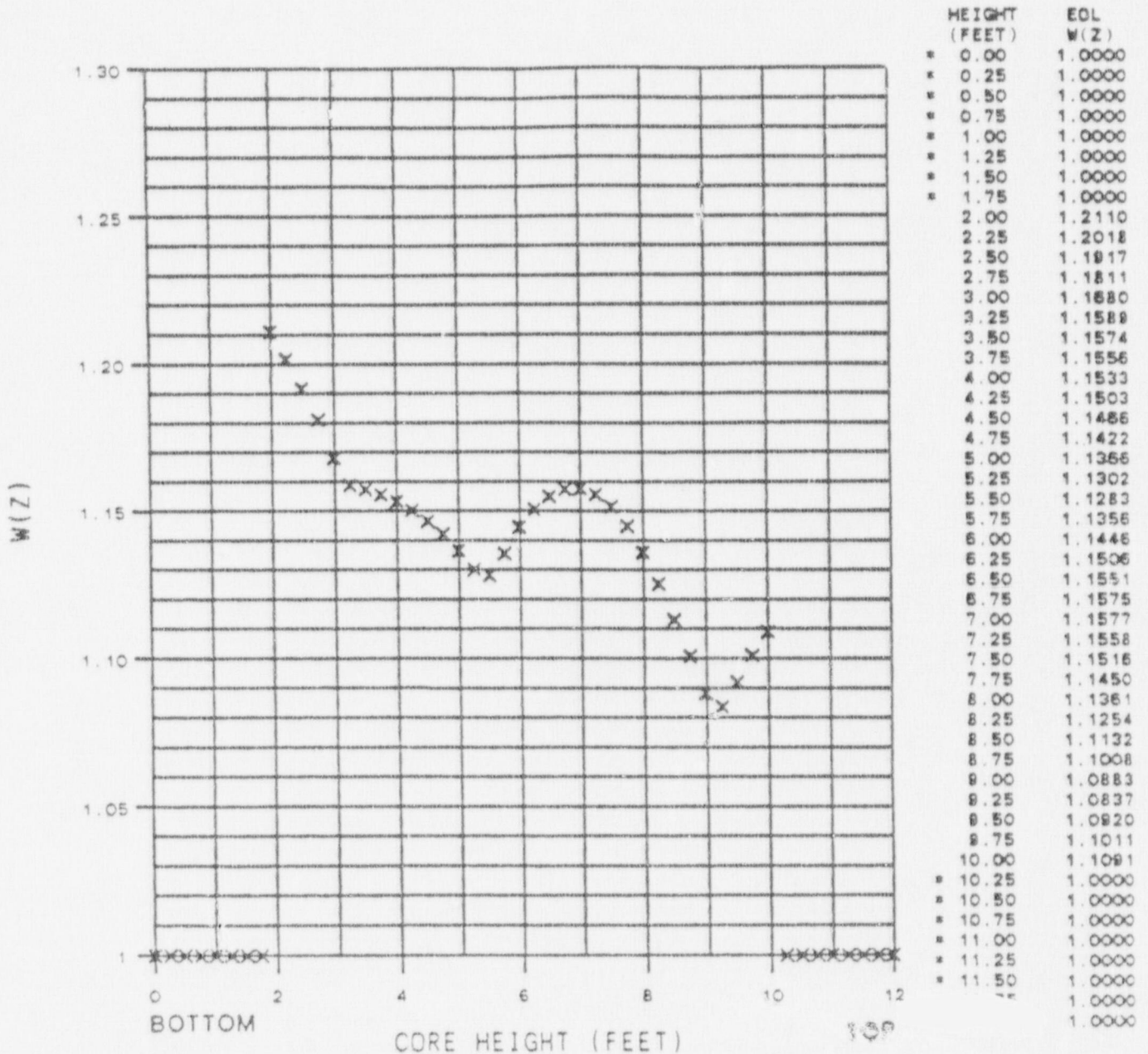


FIGURE 3  
Callaway Unit 1 Cycle 3  
W(z) at 18200 MWD/MTU  
NO

\* Top and Bottom 15% Excluded as per Tech Spec 4.2.2.2G



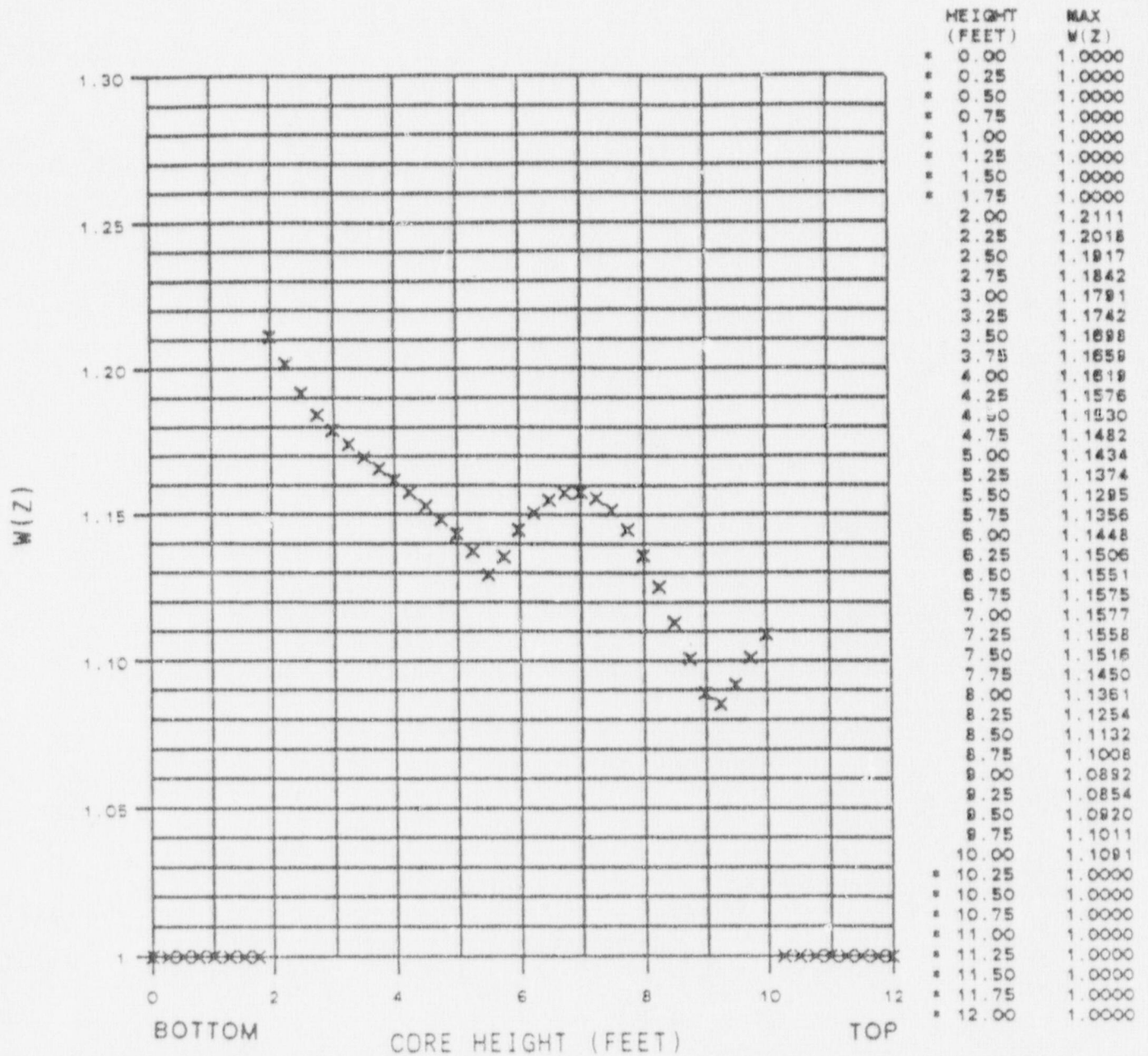


FIGURE 4  
Callaway Unit 1 Cycle 3  
Bounding W(z) for Cycle 3  
NO

\* Top and Bottom 15% Excluded as per Tech Spec 4.2.2.2G