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DUKE POWER

August 25, 1988

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

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
McGuire 2/Cycle 5 Reload-Peaking Factor Limit Report

Gentlemen:

The McGuire Unit 2 end of cycle 4 refueling outage has been completed with cycle 5 startup (initial criticality) achieved on July 26, 1988. This reload was accomplished under the provisions of 10CFR 50.59.

Pursuant to Technical Specification 6.9.1.9, attached is the Peaking Factor Limit Report for McGuire Unit 2/Cycle 5. This report provides the W(Z) functions that are to be used for RAOC operation during Cycle 5. Note that no Base Load operation analysis was performed for this cycle, and therefore the W(Z) functions for Base Load operation and the value for APLND are not being provided. For RAOC operation, a set of data covering three specific burnup steps is provided which permits the determination of W(Z) at any cycle burnup through the use of three point interpolation. Figures 1-3 are the W(Z) functions appropriate for RAOC operation. The appropriate W(Z) function is used to confirm that the heat flux hot channel factor, $Fq(z)$, will be limited to the values specified in the Technical Specifications.

Very truly yours,

A handwritten signature in cursive script that reads "Hal B. Tucker".

Hal B. Tucker

PbN/108/mmf

Attachment

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xc: Dr. J. Nelson Grace, Regional Administrator
U.S. Nuclear Regulatory Commission - Region II
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Mr. Darl Hood, Project Manager
Office of Nuclear Reactor Regulation
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Washington, D.C. 20555

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

PEAKING FACTOR LIMIT REPORT FOR MCGUIRE UNIT 2 CYCLE 5

RAOC OPERATION

This Peaking Factor Limit Report is provided in accordance with Paragraph 6.9.1.9 of the McGuire Unit 2 Technical Specifications.

The McGuire Unit 2 Cycle 5 elevation dependent $W(z)$ values for RAOC operation at beginning, middle, and near end-of-life are shown in Figures 1 through 3, respectively. This information is sufficient to determine $W(z)$ versus core height for Cycle 5 burnups in the range of 0 MWD/MTU to 13500 MWD/MTU through the use of three point interpolation.

$W(z)$ values for RAOC operation were calculated using the method described in Part B of Reference 1.

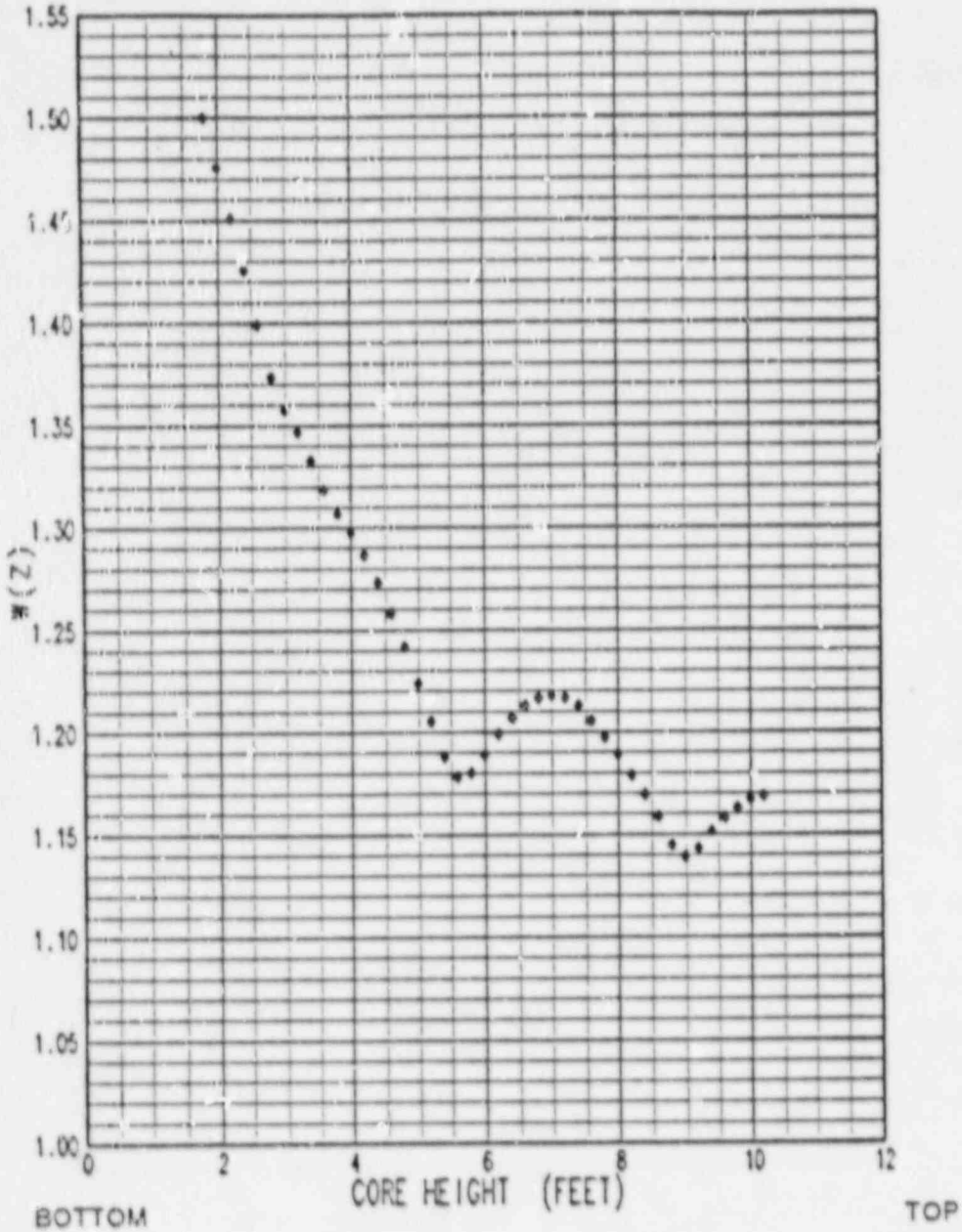
The appropriate $W(z)$ function is used to confirm that the heat flux hot channel factor, $F_q(z)$, will be limited to the Technical Specification values of:

$$F_q(z) \leq \frac{2.32}{P} [K(z)] \text{ for } P > 0.50 \text{ and}$$

$$F_q(z) \leq 4.64 [K(z)] \text{ for } P \leq 0.50$$

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

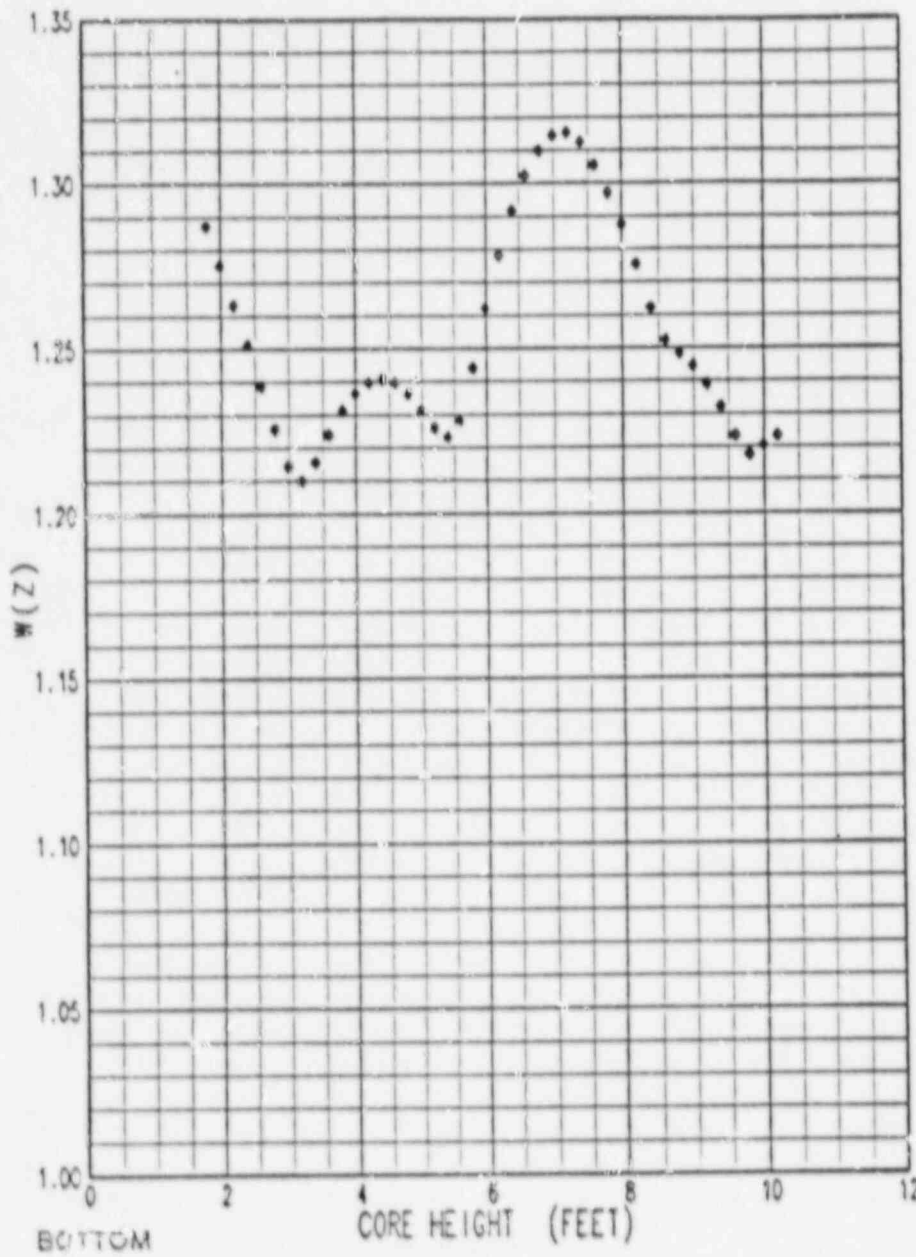
- (1) WCAP-10216-P-A, Relaxation of Constant Axial Control - F_q Surveillance Technical Specification



| HEIGHT (FT.) | BOL W(Z) |
|--------------|----------|
| 0.0000 | 1.0000 |
| 0.2000 | 1.0000 |
| 0.4000 | 1.0000 |
| 0.6000 | 1.0000 |
| 0.8000 | 1.0000 |
| 1.0000 | 1.0000 |
| 1.2000 | 1.0000 |
| 1.4000 | 1.0000 |
| 1.6000 | 1.0000 |
| 1.8000 | 1.5000 |
| 2.0000 | 1.4757 |
| 2.2000 | 1.4509 |
| 2.4000 | 1.4257 |
| 2.6000 | 1.3991 |
| 2.8000 | 1.3732 |
| 3.0000 | 1.3575 |
| 3.2000 | 1.3468 |
| 3.4000 | 1.3328 |
| 3.6000 | 1.3187 |
| 3.8000 | 1.3069 |
| 4.0000 | 1.2976 |
| 4.2000 | 1.2866 |
| 4.4000 | 1.2732 |
| 4.6000 | 1.2583 |
| 4.8000 | 1.2418 |
| 5.0000 | 1.2239 |
| 5.2000 | 1.2052 |
| 5.4000 | 1.1881 |
| 5.6000 | 1.1781 |
| 5.8000 | 1.1800 |
| 6.0000 | 1.1889 |
| 6.2000 | 1.1992 |
| 6.4000 | 1.2070 |
| 6.6000 | 1.2127 |
| 6.8000 | 1.2165 |
| 7.0000 | 1.2179 |
| 7.2000 | 1.2169 |
| 7.4000 | 1.2127 |
| 7.6000 | 1.2053 |
| 7.8000 | 1.1975 |
| 8.0000 | 1.1890 |
| 8.2000 | 1.1787 |
| 8.4000 | 1.1694 |
| 8.6000 | 1.1587 |
| 8.8000 | 1.1447 |
| 9.0000 | 1.1389 |
| 9.2000 | 1.1430 |
| 9.4000 | 1.1513 |
| 9.6000 | 1.1580 |
| 9.8000 | 1.1626 |
| 10.0000 | 1.1671 |
| 10.2000 | 1.1687 |
| 10.4000 | 1.0000 |
| 10.6000 | 1.0000 |
| 10.8000 | 1.0000 |
| 11.0000 | 1.0000 |
| 11.2000 | 1.0000 |
| 11.4000 | 1.0000 |
| 11.6000 | 1.0000 |
| 11.8000 | 1.0000 |
| 12.0000 | 1.0000 |

FIGURE 1
 MCGUIRE UNIT 2 CYCLE 5
 RAOC W(Z) AT 150 MWD/MTU

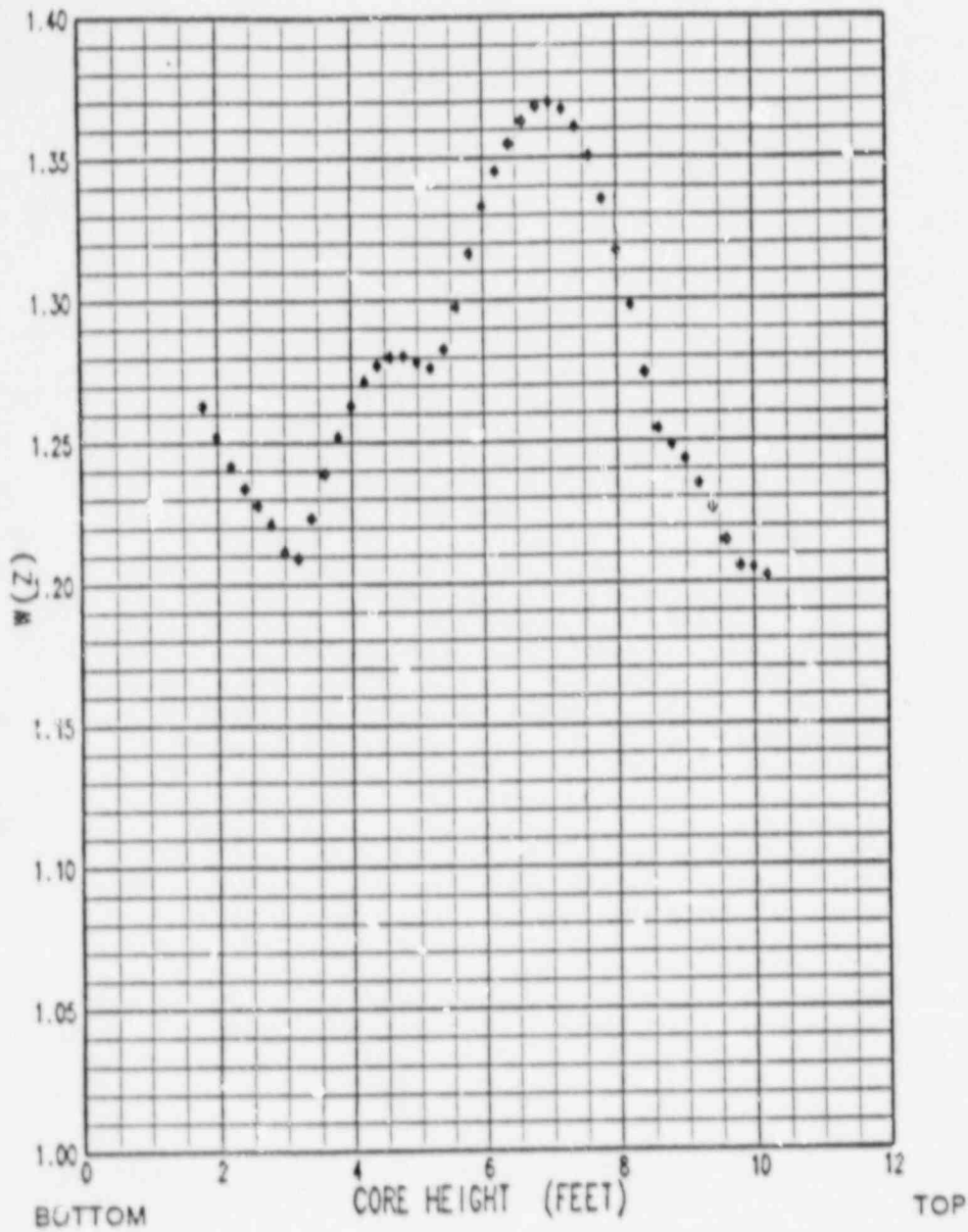
TOP AND BOTTOM 15% EXCLUDED AS PER TECH SPEC 4.2.2.2.G



| HEIGHT (FT.) | MOL W(Z) |
|--------------|----------|
| 0.0000 | 1.0000 |
| 0.2000 | 1.0000 |
| 0.4000 | 1.0000 |
| 0.6000 | 1.0000 |
| 0.8000 | 1.0000 |
| 1.0000 | 1.0000 |
| 1.2000 | 1.0000 |
| 1.4000 | 1.0000 |
| 1.6000 | 1.0000 |
| 1.8000 | 1.2872 |
| 2.0000 | 1.2752 |
| 2.2000 | 1.2632 |
| 2.4000 | 1.2512 |
| 2.6000 | 1.2387 |
| 2.8000 | 1.2257 |
| 3.0000 | 1.2143 |
| 3.2000 | 1.2100 |
| 3.4000 | 1.2156 |
| 3.6000 | 1.2239 |
| 3.8000 | 1.2312 |
| 4.0000 | 1.2364 |
| 4.2000 | 1.2396 |
| 4.4000 | 1.2407 |
| 4.6000 | 1.2396 |
| 4.8000 | 1.2362 |
| 5.0000 | 1.2311 |
| 5.2000 | 1.2259 |
| 5.4000 | 1.2231 |
| 5.6000 | 1.2282 |
| 5.8000 | 1.2440 |
| 6.0000 | 1.2621 |
| 6.2000 | 1.2782 |
| 6.4000 | 1.2916 |
| 6.6000 | 1.3023 |
| 6.8000 | 1.3099 |
| 7.0000 | 1.3143 |
| 7.2000 | 1.3153 |
| 7.4000 | 1.3124 |
| 7.6000 | 1.3054 |
| 7.8000 | 1.2971 |
| 8.0000 | 1.2876 |
| 8.2000 | 1.2754 |
| 8.4000 | 1.2621 |
| 8.6000 | 1.2522 |
| 8.8000 | 1.2483 |
| 9.0000 | 1.2445 |
| 9.2000 | 1.2389 |
| 9.4000 | 1.2320 |
| 9.6000 | 1.2233 |
| 9.8000 | 1.2177 |
| 10.0000 | 1.2204 |
| 10.2000 | 1.2232 |
| 10.4000 | 1.0000 |
| 10.6000 | 1.0000 |
| 10.8000 | 1.0000 |
| 11.0000 | 1.0000 |
| 11.2000 | 1.0000 |
| 11.4000 | 1.0000 |
| 11.6000 | 1.0000 |
| 11.8000 | 1.0000 |
| 12.0000 | 1.0000 |

FIGURE 2
 MCGUIRE UNIT 2 CYCLE 5
 RAOC W(Z) AT 6000 MWD/MTU

TOP AND BOTTOM 15% EXCLUDED AS PER TECH SPEC 4.2.2.2.G



| HEIGHT (FT.) | EOL W(Z) |
|--------------|----------|
| 0.0000 | 1.0000 |
| 0.2000 | 1.0000 |
| 0.4000 | 1.0000 |
| 0.6000 | 1.0000 |
| 0.8000 | 1.0000 |
| 1.0000 | 1.0000 |
| 1.2000 | 1.0000 |
| 1.4000 | 1.0000 |
| 1.6000 | 1.0000 |
| 1.8000 | 1.2629 |
| 2.0000 | 1.2521 |
| 2.2000 | 1.2411 |
| 2.4000 | 1.2336 |
| 2.6000 | 1.2279 |
| 2.8000 | 1.2213 |
| 3.0000 | 1.2115 |
| 3.2000 | 1.2092 |
| 3.4000 | 1.2232 |
| 3.6000 | 1.2390 |
| 3.8000 | 1.2519 |
| 4.0000 | 1.2629 |
| 4.2000 | 1.2714 |
| 4.4000 | 1.2771 |
| 4.6000 | 1.2800 |
| 4.8000 | 1.2804 |
| 5.0000 | 1.2784 |
| 5.2000 | 1.2763 |
| 5.4000 | 1.2826 |
| 5.6000 | 1.2977 |
| 5.8000 | 1.3166 |
| 6.0000 | 1.3330 |
| 6.2000 | 1.3454 |
| 6.4000 | 1.3550 |
| 6.6000 | 1.3629 |
| 6.8000 | 1.3683 |
| 7.0000 | 1.3697 |
| 7.2000 | 1.3672 |
| 7.4000 | 1.3609 |
| 7.6000 | 1.3505 |
| 7.8000 | 1.3352 |
| 8.0000 | 1.3172 |
| 8.2000 | 1.2979 |
| 8.4000 | 1.2740 |
| 8.6000 | 1.2542 |
| 8.8000 | 1.2485 |
| 9.0000 | 1.2433 |
| 9.2000 | 1.2348 |
| 9.4000 | 1.2261 |
| 9.6000 | 1.2147 |
| 9.8000 | 1.2056 |
| 10.0000 | 1.2049 |
| 10.2000 | 1.2022 |
| 10.4000 | 1.0000 |
| 10.6000 | 1.0000 |
| 10.8000 | 1.0000 |
| 11.0000 | 1.0000 |
| 11.2000 | 1.0000 |
| 11.4000 | 1.0000 |
| 11.6000 | 1.0000 |
| 11.8000 | 1.0000 |
| 12.0000 | 1.0000 |

FIGURE 3
 MCGUIRE UNIT 2 CYCLE 5
 RAOC W(Z) AT 12500 MWD/MTU

TOP AND BOTTOM 15% EXCLUDED AS PER TECH SPEC 4.2.2.2.G