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A. Giambusso	1 signed			X	X

CLASS	UNCLASS	PROP INFO	INPUT	NO CYS REC'D	DOCKET NO:
	XXX			1	50-269

DESCRIPTION:
Ltr re our 8-20-73 ltr.....trans the following:

ENCLOSURES:
Power Distribution Comparison Status Report for Oconee Nuclear Station Unit #1

DO NOT REMOVE

ACKNOWLEDGED
(1 Orig cy rec'd)

PLANT NAME: Oconee Unit #1

FOR ACTION/INFORMATION 1-8-74

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✓1 - NSIC(BUCHANAN)	1-W. PENNINGTON, Rm E-201 GT	BROOKHAVEN NAT. LAB
1 - ASLB(YORE/SAYRE/ WOODARD/"H" ST.	1-CONSULTANT'S NEWMARK/BLUME/AGBABIAN	1-AGMED(Ruth Gussman) RM-B-127, GT.
✓16 - CYS ACRS ~~HOLDING~~ SENT TO LIC. ASST. 1-8-74 GOULBOURNE	1-GERALD ULRIKSON...ORNL	✓1-RD..MULLER..F-309 GT

Regulatory Docket File

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28201

A. C. THIES
SENIOR VICE PRESIDENT
PRODUCTION AND TRANSMISSION

P. O. BOX 2178

December 21, 1973

Mr. Angelo Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
Office of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: Oconee Nuclear Station
Unit 1
Docket No. 50-269

Dear Mr. Giambusso:

Please find attached a copy of "Power Distribution Comparison Status Report." This report is in response to Mr. R. C. DeYoung's letter of August 20, 1973 and provides comparisons of the power distributions measured before and after repatching of the control rod drives at 91.5 effective full power days with Babcock & Wilcox Company's PDQ computer code predictions.

Very truly yours,

A. C. Thies

A. C. Thies

ACT:vr

Attachment

OCONEE NUCLEAR STATION
UNIT 1

Power Distribution Comparison
Status Report

On November 20, 1973, Oconee Nuclear Station, Unit 1, was shut down with a core average burnup of 91.5 effective full power days (EFPD). During this shutdown, in accordance with design provisions, the control rod assemblies assigned to transient Control Rod Group 7 and safety Control Rod Group 4 were interchanged. Figures 1 and 2 present the control rod assembly group configurations for the intervals 0-to-91.5 EFPD and 91.5-to-191.5±10 EFPD, respectively.

A comparison of measured and predicted radial power distributions, representative of the interval prior to the control rod group interchange, is given in Figure 3. It can be seen that the measured and predicted peak radial power factors agree within 3.3 percent. Figure 4 presents a power distribution comparison for a core average burnup of 97.5 EFPD, i.e., after the control rod group interchange at 91.5 EFPD. For this case the difference between the measured and predicted peak radial power factors is approximately 0.7 percent. The average absolute percent difference between the measured and predicted radial power factors, for assemblies having radial power factors within five percent of the measured peak radial power factor, is shown as a function of burnup in Figure 5.

The measured core power distributions were obtained using the fixed incore detectors. The location of these detectors is shown in Oconee FSAR Figure 7-18. The measured data were corrected, where possible, by replacing signals from inoperative detectors with values obtained by interpolation or extrapolation of signals from adjacent detectors. As indicated in Figures 3 and 4, however, one detector string was completely inoperative and no measured value is available.

Predicted power distributions were obtained from two-dimensional PDQ thermal-hydraulic feedback calculations, using a standard two zone representation for each fuel assembly in one-quarter core geometry.

As can be seen in the attached figures, the measured and predicted core power distributions agree quite well. Particularly, it is apparent that the control rod group interchange at 91.5 EFPD did not adversely affect the validity of the PDQ predicted core power distributions.

CONTROL ROD GROUP LOCATION

(0 to 91.5 EFPD)

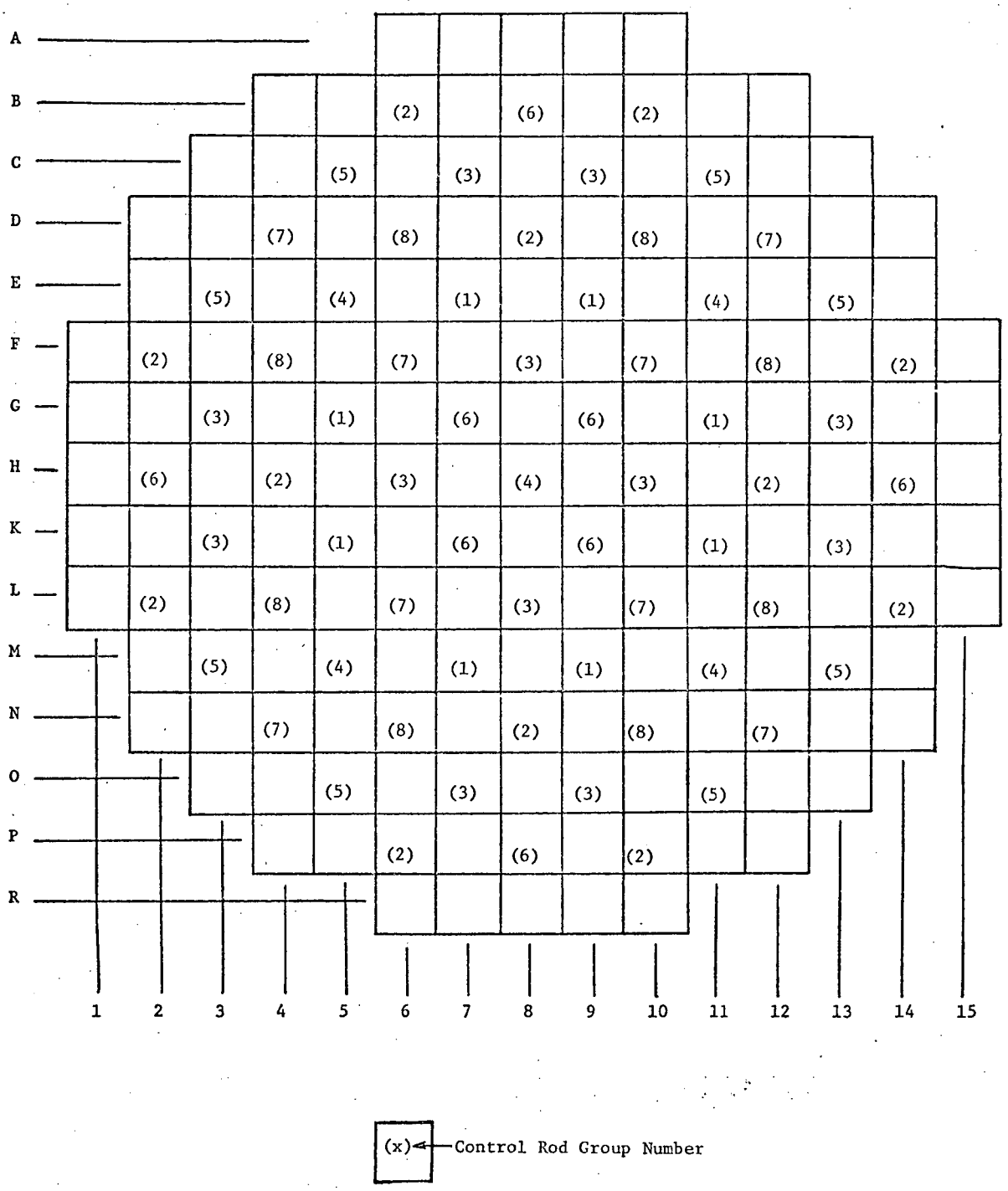

Figure 1

CONTROL ROD GROUP LOCATION

(91.5 to 191.5 ± 10 EFPD)

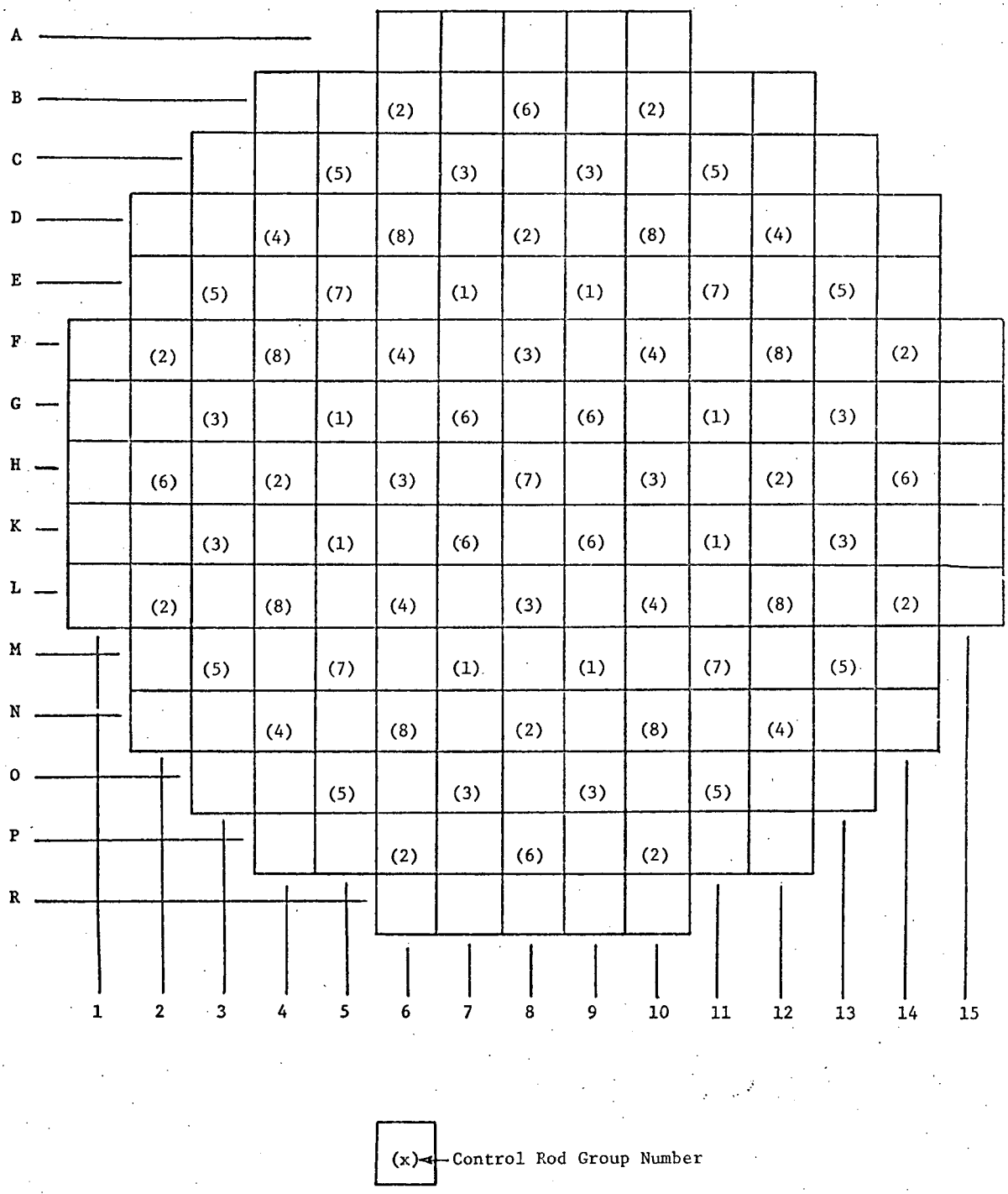

Figure 2

COMPARISON OF MEASURED AND CALCULATED RADIAL CORE POWER DISTRIBUTIONS

1.46 1.42	1.42 1.40	1.38 1.41	1.52 1.47	1.52 1.49	1.40 1.41	1.13 1.06	0.66 0.60
	1.24 1.28	1.33 1.26	1.37 1.37	1.35 1.44	1.36 1.35	1.05 1.08	0.59 0.58
		0.79 0.77	1.20 1.20	1.18 1.19	1.18 1.17	0.89 0.91	0.43 0.42
			1.14 1.15	1.07 1.03	0.94 0.93	* 0.62	
				0.56 0.54	0.66 0.61	0.36 0.35	
					0.35 0.34		

*Inoperative Detector

x.xx — Measured
y.yy — Calculated (PDQ)

CONDITIONS

	Measured	Calculated
Core Average Burnup (EFPD)	48.4	48.4
Power Level (%FP)	95	95
Boron Concentration (ppm)	925	925
Control Rod Group Position (%wd)		
Group 1-5	100	100
Group 6	79	79
Group 7	7	0
Group 8	17	37.5

Figure 3

COMPARISON OF MEASURED AND CALCULATED
RADIAL CORE POWER DISTRIBUTIONS

0.61 0.62	1.03 1.03	1.24 1.30	1.42 1.43	1.42 1.41	1.25 1.27	0.92 0.84	0.59 0.52
	0.98 1.03	1.31 1.31	1.35 1.39	1.33 1.38	1.18 1.26	0.95 0.97	0.55 0.52
		1.35 1.34	1.21 1.23	1.19 1.16	1.20 1.16	0.89 0.89	0.40 0.41
			0.71 0.73	1.16 1.08	1.07 1.06	* 0.68	
				1.20 1.09	0.95 0.87	0.48 0.43	
					0.55 0.50		

*Inoperative Detector

x.xx — Measured
y.yy — Calculated (PDQ)

CONDITIONS

	Measured	Calculated
Core Average Burnup (EFPD)	97.5	97.5
Power Level (%FP)	75	75
Boron Concentration (ppm)	827	827
Control Rod Group Position (%wd)		
Groups 1-5	100	100
Group 6	51	51
Group 7	0	0
Group 8	7.6	37.5

Figure 4

COMPARISON OF MEASURED AND PREDICTED RADIAL POWER FACTORS

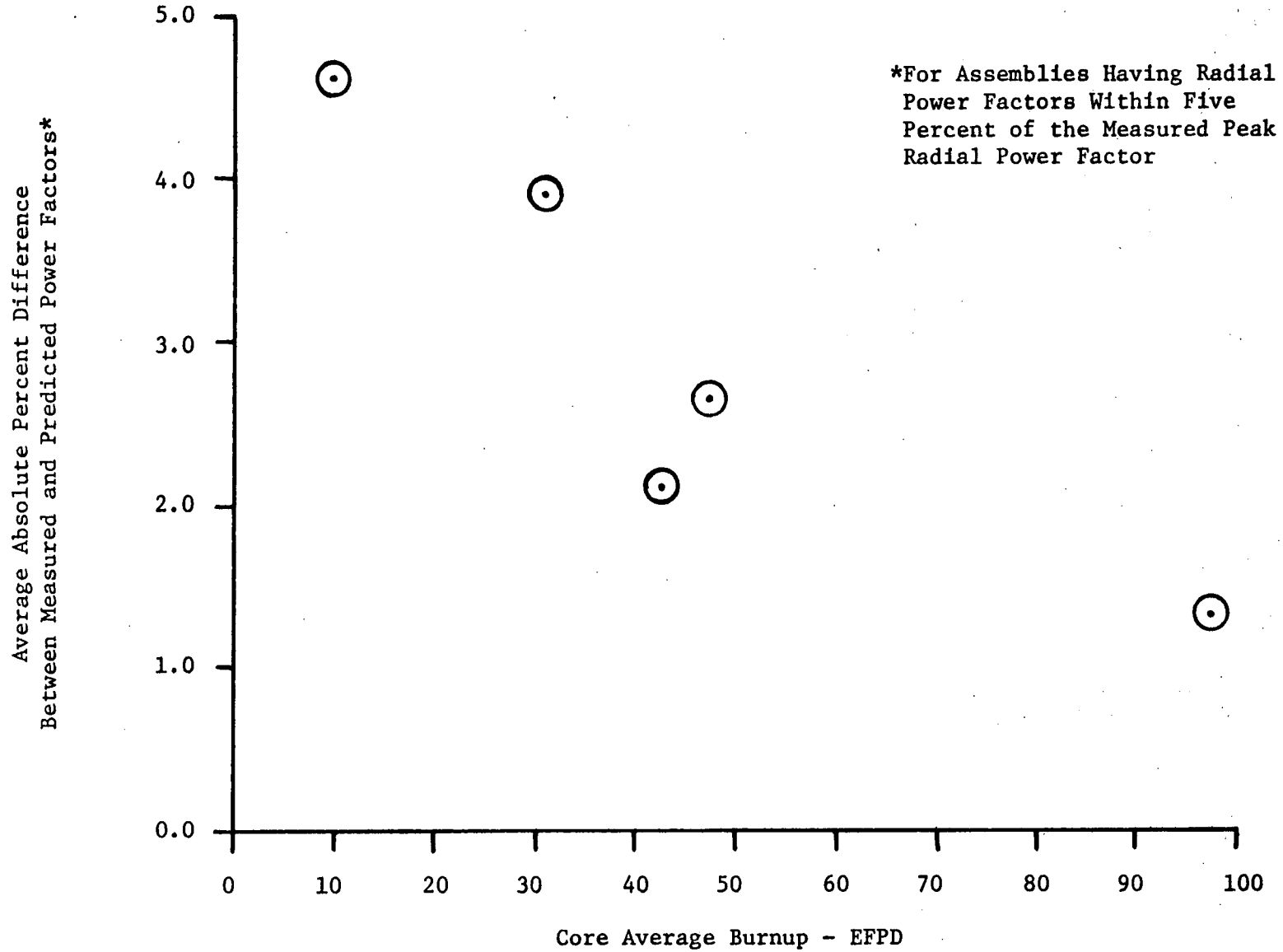

Figure 5