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Regulatory Docket File

April 26, 1976

Mr. Dennis L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Unit 2, License No. DPR-19
Proposed Technical Specification Change
for Reload 2 (Cycle 5), NRC Dkt. 50-237

Reference (a): D. L. Ziemann letter of April 20, 1976
to R. L. Bolger

Dear Mr. Ziemann:

Enclosed are the responses to the questions of reference (a) which pertain to the subject Technical Specification change.

The answer to Question 10 as submitted was based on a telephone conversation with Mr. Silver of your staff. There are some differences between the question as received in reference (a) and as understood per the April 9, 1976 telephone conversation. Please advise if additional information is required for this item.

One (1) signed original and 39 copies are provided for your use.

Very truly yours,

G. A. Abrell
Nuclear Licensing Administrator
Boiling Water Reactors

Enclosure: 7 Sheets (40 copies)

NRC DOCKET NO 50-237

NRC QUESTIONS ON DRESDEN-2 RELOAD-2 LICENSING SUBMITTAL (NEDO-21145)

Question1:

Provide a table of transient input parameters. Include the information specified in Table 6-1 of Appendix A to NEDO-20360, as amended.

Response 1:

Transient Input Parameters

PARAMETER	UNIT	VALUE
Thermal Power	(MWt)	2527 @ 104.5% (Dresden)
Rated Steam Flow	(lb/hr)	9.77×10^6 @ 104.5%
Rated Core Flow	(lb/hr)	98×10^6 @ 100%
Dome Pressure	(psig)	1005
Turbine Pressure	(psig)	945
RV Setpoint (1 TR + 4 Electromatics)	(psig + 1%)	1125 - 1135
RV/Capacity (at setpoint)	(no/%)	5/29.2
RV Time Delay	(sec.)	0.65
RV Stroke Time	(sec.)	0.20
SV Setpoint	(psig + 1%)	1240 - 1260
SV/Capacity	(no/%)	8/53.8
Void Coefficient	(¢/%)	- 8.77
Void Fraction	(%)	33.67
Doppler Coefficient	(%/°F)	-0.214
Average Fuel Temperature	(°F)	1151

Scram Reactivity Curve - Special Report 29: Supplement B, see Figure 1

Scram Worth - Special Report 29: Supplement B, see Section 4.1

Question 2:
Provide an EOC full power scram reactivity curve for Reload 2.

Response 2:
See Figure 1 attached.

Question 3:
Provide a table summarizing the transient analysis (see Table 6-2 of Appendix A to NECO-20360 as amended).

Response 3:
Transient Data Summary

TRANSIENT	POWER (%)	CORE FLOW (%)	$\hat{\epsilon}$ (%)	$\hat{Q}/A$ (%)	$\hat{P}_{SL}$ (PSIG)	$\hat{P}_V$ (PSIG)	ΔCPR 7x7 - 8x8
TT-W/O-BP-TS	90	100	255	104.5	1213	1243	.23 - .29
Loss of FW Heater	100	100	115	114.7	1005	1053	.15 - .17
Inadvertent HPCI	100	100	119	114	1005	1053	* *

* The inadvertent HPCI pump startup transient is not as severe as the loss of a 100°F feedwater heater transient.

Question 4:

Provide a list, with values of the design conservatism factors (DCF) that are used in the transient analysis.

Response 4:

Void Coefficient:	Nominal	-6.50¢/%
	Used in Analysis	-8.77¢/%
Doppler Coefficient:	Nominal	-0.237¢/°F
	Used in Analysis	-0.214¢/°F
Scram Reactivity:	Nominal	-38.05$
	Used in Analysis	-30.44$

Question 5:

Provide curves, for BOL and EOC, of the void coefficient of reactivity as a function of void fraction.

Response 5:

See Figure 2 attached.

Question 6:

Provide a curve indicating the variation of the linear heat generation rate with rod position as part of the results for the rod withdrawal error analysis. Data should be provided for the worst affected 7x7 and 8x8 fuel bundles.

Response 6:

See Figure 3 attached.

Question 7:

Describe the extent, if any, of fuel shuffles for initial and Reload No. 1 fuel bundles. If fuel shuffles are to be made, discuss the applicability of the transient and accident analyses presented for Reload No. 2.

Response 7:

The loading pattern for reload 2 involved the shuffling of initial and reload fuel. Attached Figure 4 shows the design reference loading pattern for D-2, reload 2. The unexposed reload bundles are placed in the octant symmetric positions as shown; cycle 2 reload fuel types were shuffled from R-2 type positions to the positions shown. Initial core bundles were also shuffled. All reload licensing calculations are based on this loading pattern.

Question 8:

Discuss the applicability of the transient analysis of Dresden Station Report Number 29: Supplement B to Reload Number 2 for Quad Cities Unit 1 for which data (e.g., void coefficient of reactivity) may differ significantly.

Response 8:

NOTE: Dresden Station Special Report Number 29, Supplement B, is the basic report for the transient analyses applied to Dresden 2, 3 and Quad Cities 1, 2. This transient analysis was updated in the QC-2, R-1 License submittal, NEDO-20693, to include the more negative void coefficient calculated by the new method. This document is given as reference 4 in the D-2, R-2 document NEDO-21145.

The controlling parameters of the transient analyses (e.g., scram reactivity, void coefficient and doppler coefficient) for the Dresden Unit 2 Reload 2 reference core configuration have been reviewed and compared to those used in the above mentioned analyses. These analyses used a void coefficient of -8.77¢/% while for Dresden-2 Cycle 5 the calculated void coefficient is -6.48¢/%. The Cycle 5 value is less negative, therefore, the previously analysis is valid for this reload. The Doppler coefficient is essentially the same value. The previous analysis used -0.214¢/°F while the value calculated for Cycle 5 is -0.227¢/°F. Therefore, there is no significant change due to the Doppler coefficient. The scram reactivity calculated for EOC-5 is given in Figure 1. This curve has a better characteristic shape than the curve used in the analysis (Special Report No. 29, Supplement B, Figure 1). Based on this comparison, the previous transient analyses remain applicable to Dresden 2 for Cycle 5.

Question 9:

Are finger springs used on 8D262 bundles?

What is the percent bypass flow for 8D262 bundles?

Response 9:

No. In this reload, finger springs are used on the 8D250 bundles only.

The bypass flow for the 8D262 bundle is the same as the bypass flow of the other bundles in the core that do not have finger springs.

Question 10:

What scram reactivity was used in the over-pressure transient analysis resulting from MSIV closure with high neutron flux scram?

Response 10:

See Figure 1 attached.

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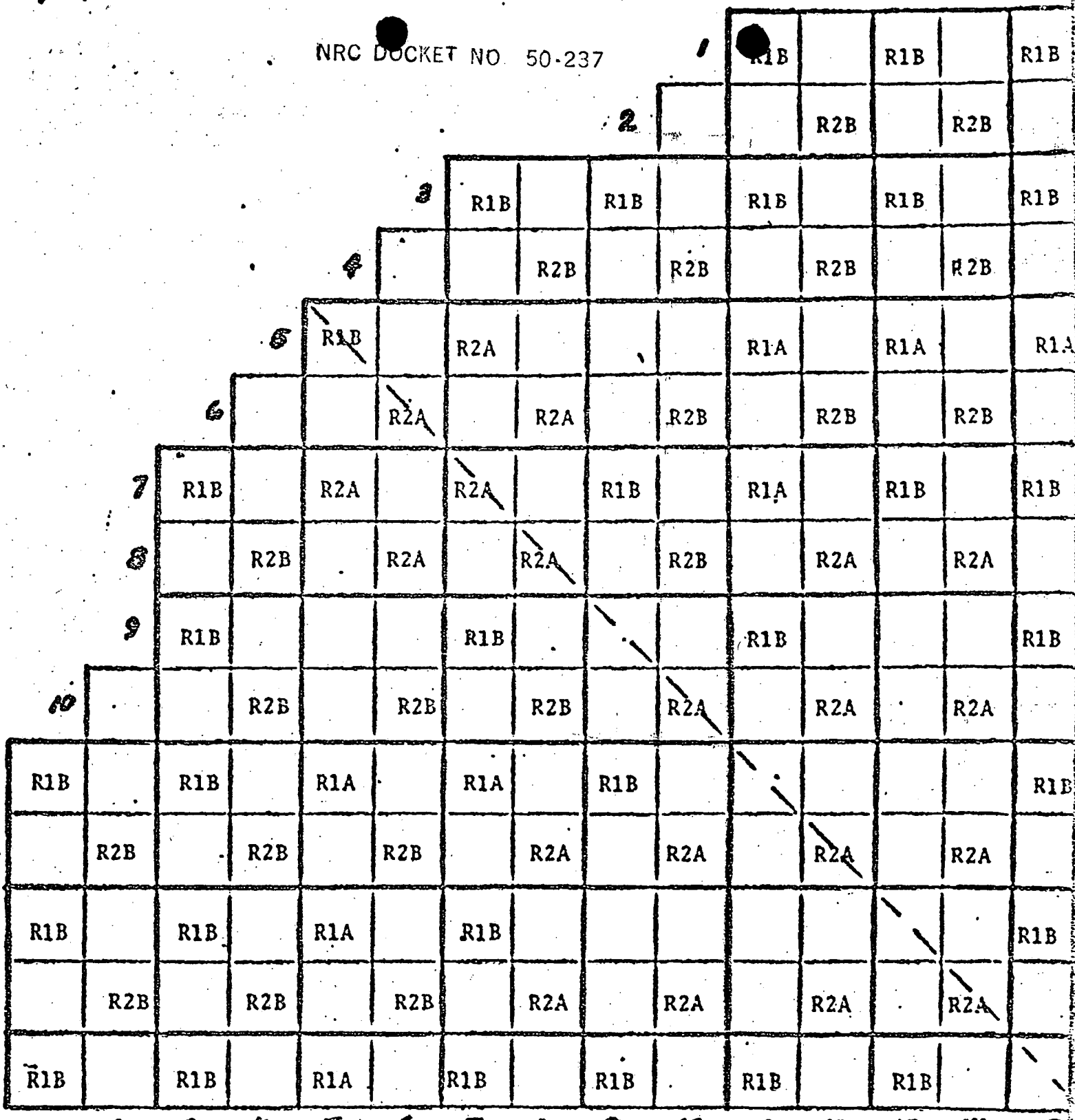

Blank - Initial Core
R1A - Reload 1 (7D230)
R1B - Reload 1 (8D250)
R2A - Reload 2 (8D250)
R2B - Reload 2 (8D262)

FIGURE 4

Dresden-2 Reload 2
Fuel Bundle Locations
(GEBS Notation)

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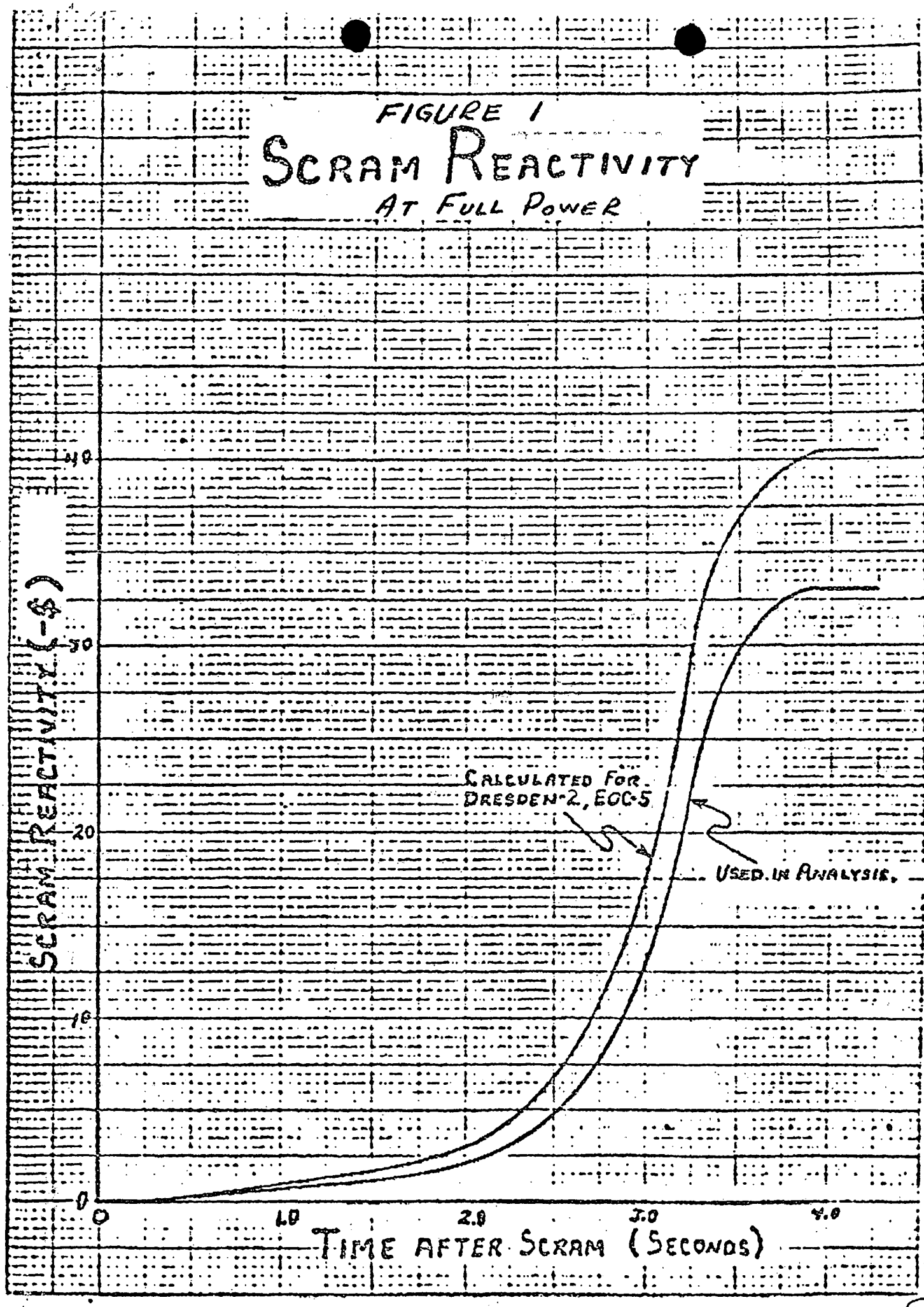
FIGURE 1

SCRAM REACTIVITY AT FULL POWER



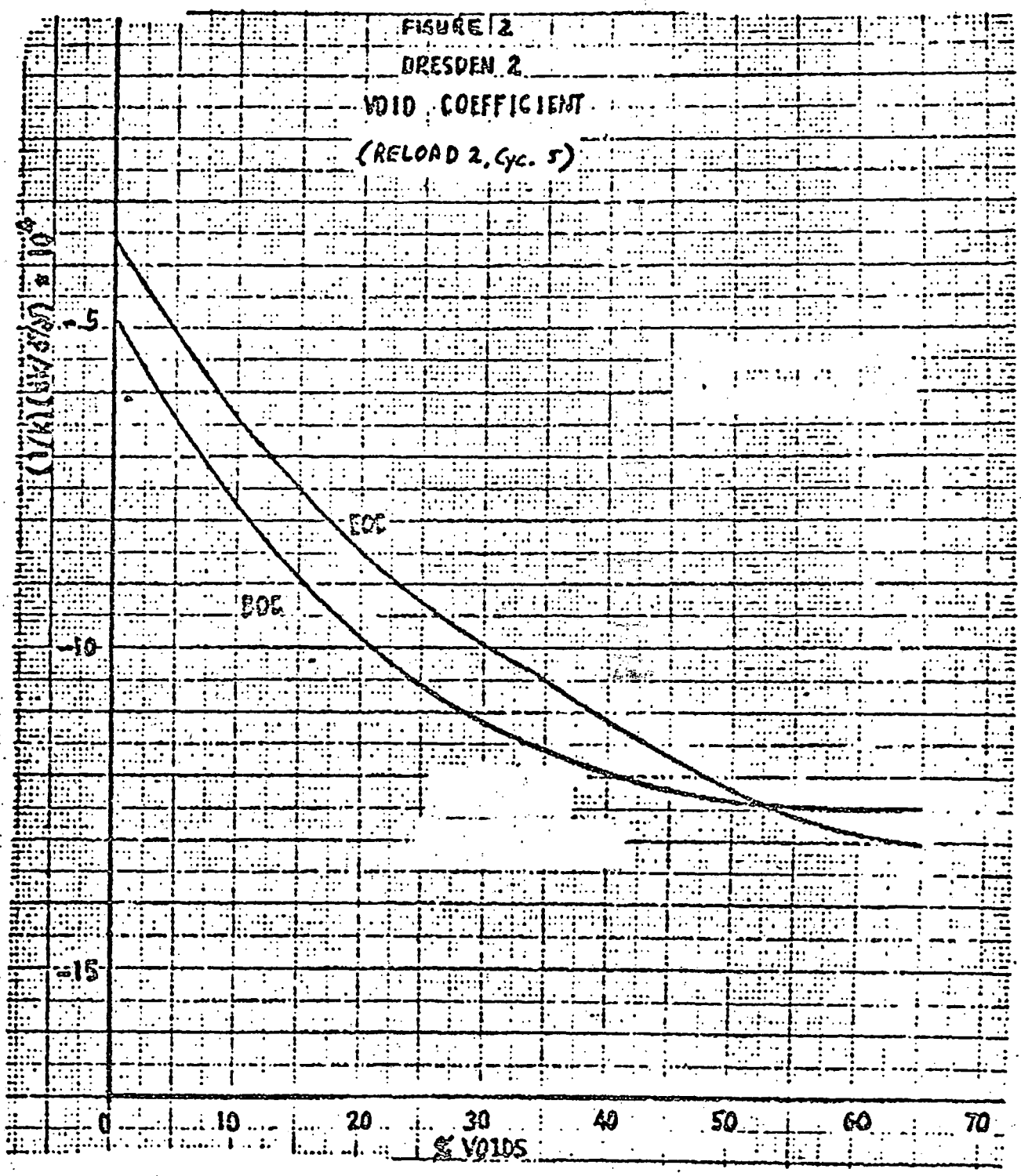
(4)

FIGURE 2

DRESDEN 2

VOID COEFFICIENT

(RELOAD 2, Cyc. 5)



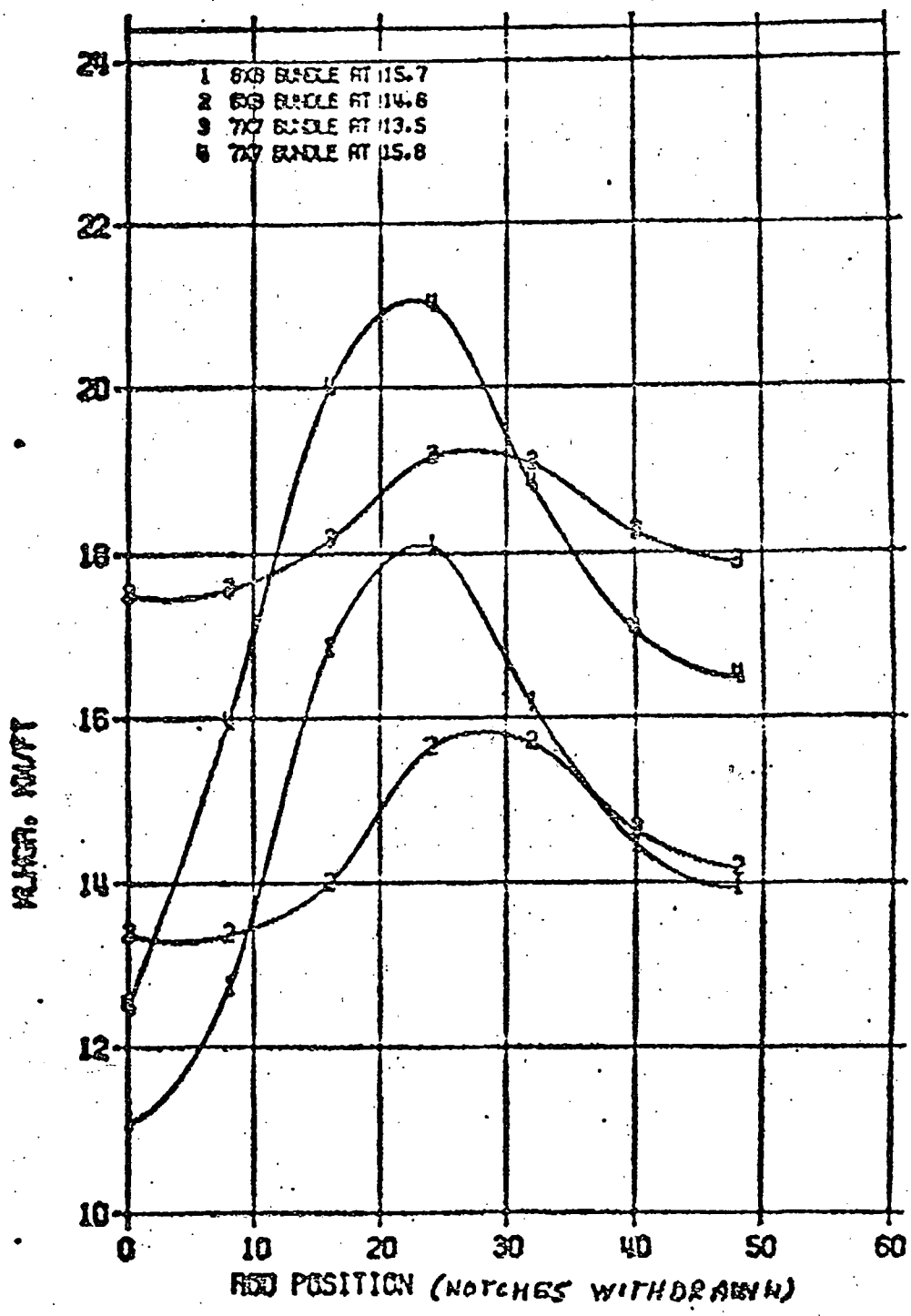


FIGURE 3 MLHGR vs ROD WITHDRAWAL