Duke Energy
Carolinas

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June 23, 2008

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC (Duke)
Catawba Nuclear Station, Unit 1
Docket Number 50-413
Operating Report for Cycle 17 Operation with Mixed Oxide (MOX) Fuel Lead Assemblies

Reference: Letter from NRC to H.B. Barron, Duke, "Final Safety Evaluation for Duke Topical Report DPC-NE-1005P, "Nuclear Design Methodology Using CASMO-4/SIMULATE-3 MOX"," dated August 20, 2004

The reference letter constituted the NRC staff's Safety Evaluation (SE) associated with Duke's use of MOX lead assemblies at Catawba. In Section 1.0 of the SE (item 4), the NRC stipulated that Duke will prepare an operating report for each operating cycle with MOX fuel lead assemblies and for each unit operating with partial MOX fuel cores until the equilibrium cycle is reached. Each operating report will contain comparisons of predicted to measured monthly power distribution maps and monthly boron concentration letdown values. Duke will provide each cycle operating report to the NRC within 60 days of the end of the fuel cycle.

Pursuant to the above requirement, this letter provides the associated report.

This submittal contains information that is proprietary to Duke. The specific information that is proprietary in Attachment 1 is identified by enclosure in brackets. In accordance with 10 CFR 2.390, Duke requests that this information be withheld from public disclosure. Attachment 2 is a redacted version of the

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report with proprietary information removed. An affidavit is included that attests to the proprietary nature of the information in this submittal.

There are no regulatory commitments contained in this submittal. Inquiries on this matter should be directed to L.J. Rudy at (803) 701-3084.

Very truly yours,

James R. Morris

LJR/s

Attachments

xc (with attachments):

L.A. Reyes, Administrator, Region II
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Document Control File 801.01
RGC Date File
ELL-EC050
NCMPA-1
NCEMC
PMPA
SREC

AFFIDAVIT OF James R. Morris

1. I am Vice President of Duke Energy Carolinas, LLC (Duke), and as such have the responsibility of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear plant licensing and am authorized to apply for its withholding on behalf of Duke.

2. I am making this affidavit in conformance with the provisions of 10 CFR 2.390 of the regulations of the Nuclear Regulatory Commission (NRC) and in conjunction with Duke's application for withholding which accompanies this affidavit.

3. I have knowledge of the criteria used by Duke in designating information as proprietary or confidential.

4. Pursuant to 10 CFR 2.390, Duke seeks to protect from disclosure specific analytical information contained in the document "Special Operation Report for Catawba Unit 1 Cycle 17 with Mixed Oxide Fuel Lead Assemblies."

5. Pursuant to the provisions of 10 CFR 2.390(b)(4), the following is furnished for consideration by the NRC in determining whether the proprietary information sought to be protected should be withheld from public disclosure:

   (i) The information is of a type that is customarily held in confidence by Duke. This information is proprietary to Duke, and Duke seeks to protect it as such. The information consists of analysis methodology details, analysis results, and supporting data that provide a competitive advantage to Duke. Duke submits that a rational basis therefore exists for treatment of this information as proprietary.

   (ii) The information was transmitted to the NRC in confidence and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the NRC.

   (iii) The information sought to be withheld is not available from public sources to the best of Duke's knowledge and belief.

   (iv) Public disclosure of the proprietary information Duke seeks to protect is likely to cause substantial harm to Duke's competitive position within the meaning of 10 CFR 2.390(b)(4)(v). The proprietary information has substantial commercial value to Duke. For example:

      (a) Duke uses this information to reduce vendor and consultant expenses associated with supporting the operation and licensing of its nuclear power plants.

      (b) Duke could sell the information to nuclear utilities, vendors, and consultants for the purpose of supporting the operation and licensing of other nuclear power plants.

      (c) The subject information could only be duplicated by competitors at similar expense to that incurred by Duke.

(d) Public disclosure of this information is likely to cause harm to Duke because it would allow competitors in the nuclear industry to benefit from the results of a significant development program without requiring a commensurate expense or allowing Duke to recoup a portion of its expenditures or benefit from the sale of the information.

For all of the reasons discussed above, Duke requests that this proprietary information be withheld from public disclosure in its entirety.

I affirm that I, James R. Morris, am the person who subscribed my name to the foregoing, and that all of the matters and facts herein are true and correct to the best of my knowledge.

James R. Morris, Vice President

Sworn to and subscribed before me this 23 day of June, 2008.

Witness my hand and official seal.

Notary Public

My commission expires: 7-10-2012

SEAL

Attachment 2

Non-Proprietary Version of Catawba Unit 1 Cycle 17 Operating Report

Special Operation Report for
Catawba Unit 1 Cycle 17 with
Mixed Oxide Fuel Lead Assemblies

Introduction

Duke utilized the core design methodology defined in reference 1 for Catawba Unit 1 Cycle 17 (C1C17) which contains four mixed oxide (MOX) fuel lead assemblies. In reference 2 the Nuclear Regulatory Commission (NRC) transmitted the safety evaluation which documented NRC approval of reference 1. That safety evaluation identified Duke commitments to submit a startup report and an operation report for each fuel cycle containing MOX fuel.

The startup report identified in reference 3 compares predicted to measured data from zero power physics tests and power distribution maps taken during initial power escalation of C1C17. The startup report also describes the core arrangement, fuel assembly batch characteristics, burnable poison loading, control rod locations, incore detector locations, and MOX fuel assembly placement.

The operation report to follow compares measured to predicted data from monthly power distribution maps and soluble boron concentration letdown. MOX fuel lead assemblies are located in core locations C-08, H-03, H-13, and N-08. All 4 MOX lead assemblies are located in instrumented core locations.

Flux Maps

Flux maps taken after the initial power escalation are tabulated below. All maps were taken at 100 %FP with steady state core conditions. Figures 1 through 18 compare predicted and measured assembly average relative power factors. All acceptance criteria were met for all assemblies for each flux map taken.

Flux Map	EFPD	%FP
FCM/1/17/004	11	100
FCM/1/17/013	31	100
FCM/1/17/014	57	100
FCM/1/17/015	85	100
FCM/1/17/016	113	100
FCM/1/17/017	141	100
FCM/1/17/018	169	100
FCM/1/17/019	197	100
FCM/1/17/020	225	100
FCM/1/17/021	246	100
FCM/1/17/022	281	100
FCM/1/17/023	309	100
FCM/1/17/024	337	100
FCM/1/17/025	365	100
FCM/1/17/026	393	100
FCM/1/17/027	421	100
FCM/1/17/028	449	100
FCM/1/17/029	477	100

Soluble Boron Letdown

A comparison of measured and predicted reactivity letdown is performed at approximately 30 EFPD intervals throughout the cycle depletion. Each measured boron concentration is normalized to hot full power, equilibrium xenon and samarium, a reference hot moderator temperature, all control rods out of core, and a reference boron-10 content in the soluble boron. The table below summarizes soluble boron letdown measurements and compares each to the predicted value. The acceptance criterion of 50 PPMB is easily achieved for all measurements.

Cycle Exposure EFPD	Measured PPMB	Predicted PPMB	Difference PPMB
4			-2
15			-19
22			-17
29			-21
36			-11
43			-15
50			-12
78			-7
104			-9
132			0
160			-5
188			-5
216			1
244			-6
272			-5
300			-6
328			-2
351			4
384			-1
412			3
440			2
469			2

Conclusion

Inclusion of four MOX fuel lead assemblies was accomplished without significant perturbation to the normal low enriched uranium fuel management techniques. Flux map power distribution measurements compared well with prediction. The MOX fuel lead assemblies operated at power levels that are representative of uranium oxide fuel, but were never the highest power assembly in the core.

References

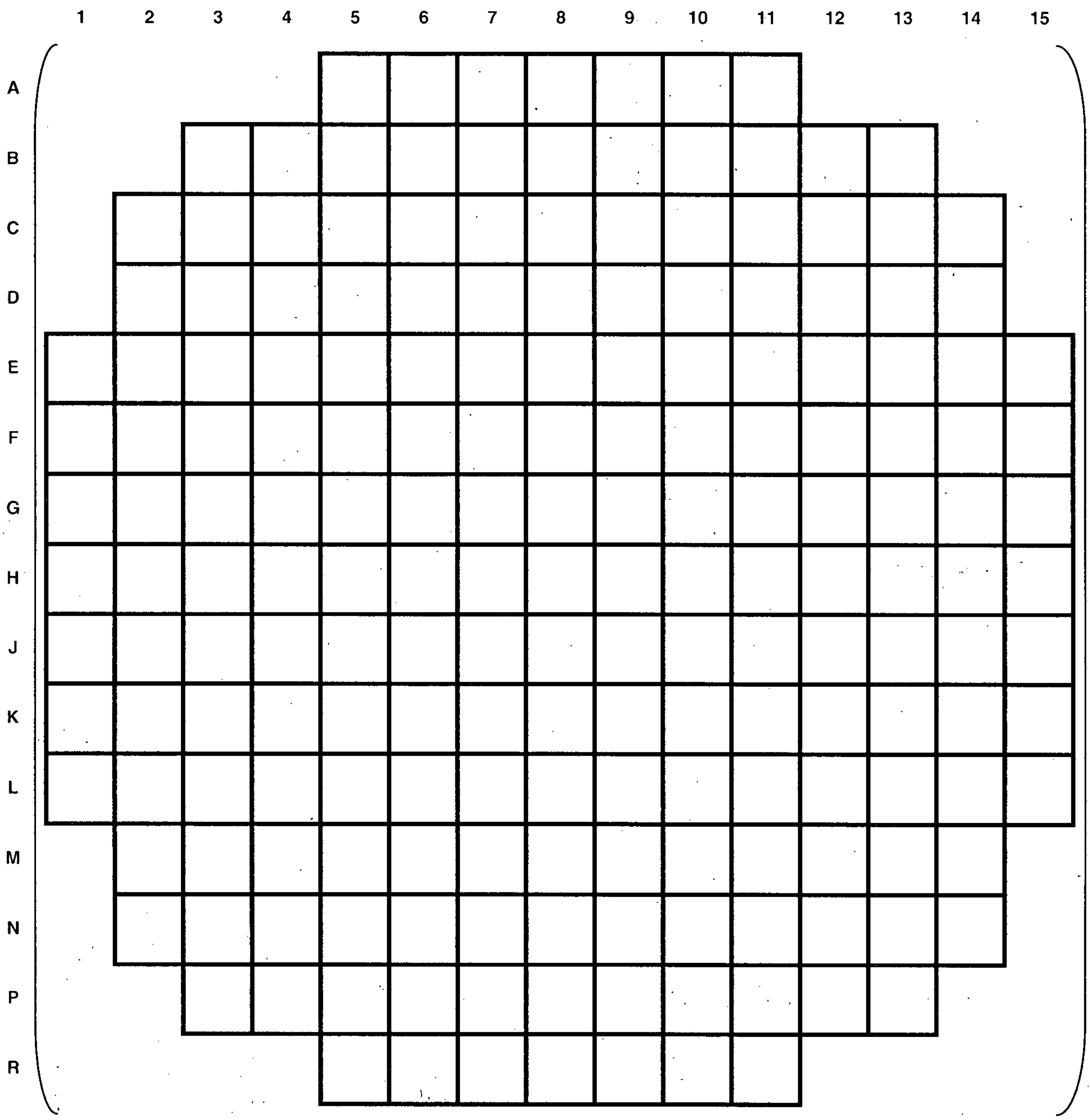
1. DPC-NE-1005-P-A, Nuclear Design Methodology Using CASMO-4 / SIMULATE-3 MOX, Duke Power Company, August 2004.

2. Letter, Robert E. Martin (USNRC) to H.B. Barron (Duke), Final Safety Evaluation for Duke Topical Report DPC-NE-1005-P, Nuclear Design Methodology Using CASMO-4/ SIMULATE-3 MOX, August 20, 2004.

3. Letter, James R. Morris (Duke) to U. S. Nuclear Regulatory Commission, Catawba Unit 1 Cycle 17 Startup Report, February 28, 2007.

Figure 1

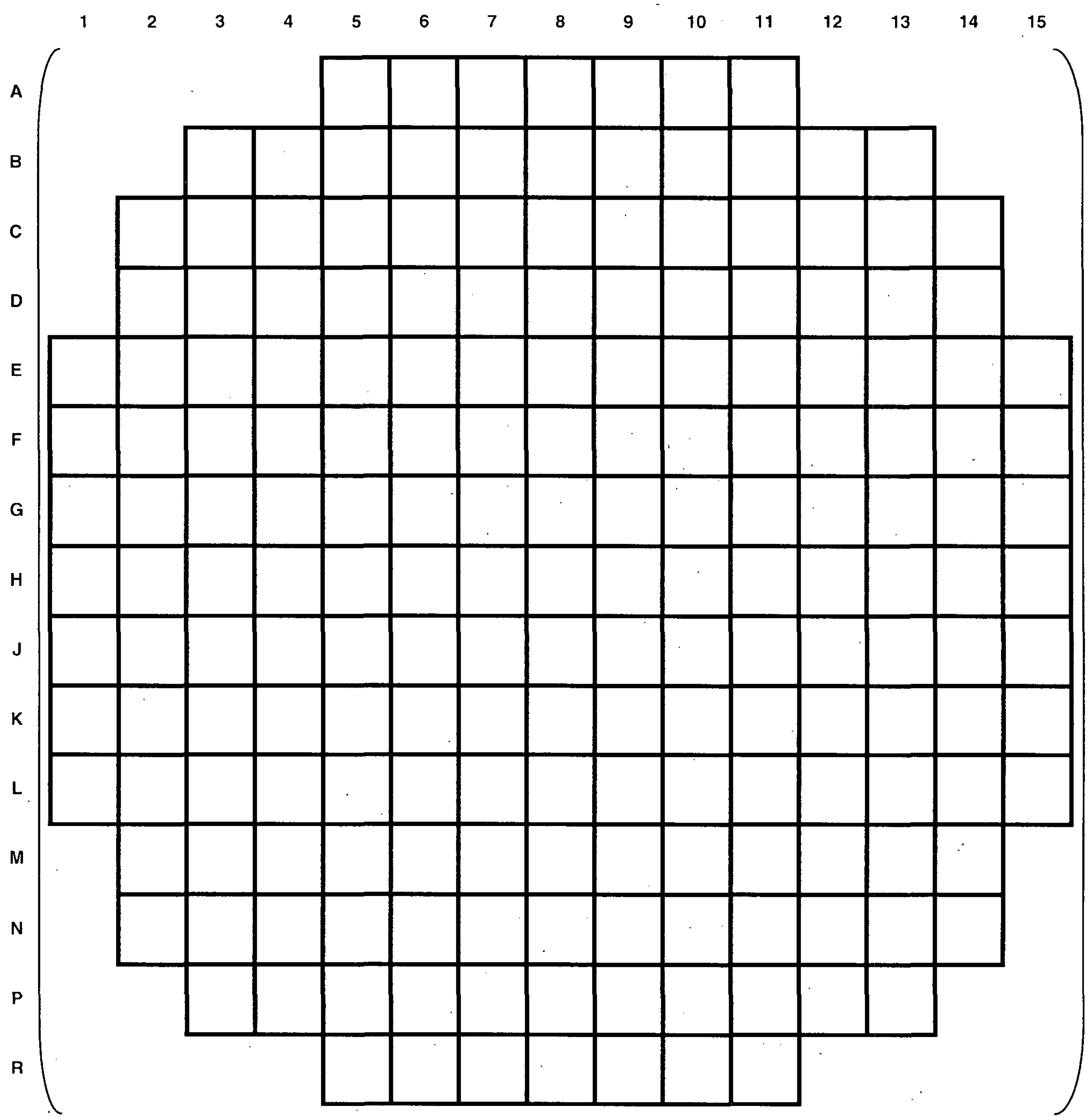
FCM/1/17/004 BJMJ 12Jan07
11 EFPD 100 %FP



	Deviation
RMS	1.3%
Core Max	-4.4% at H-15
MOX Max	-4.2% at N-08

Figure 2

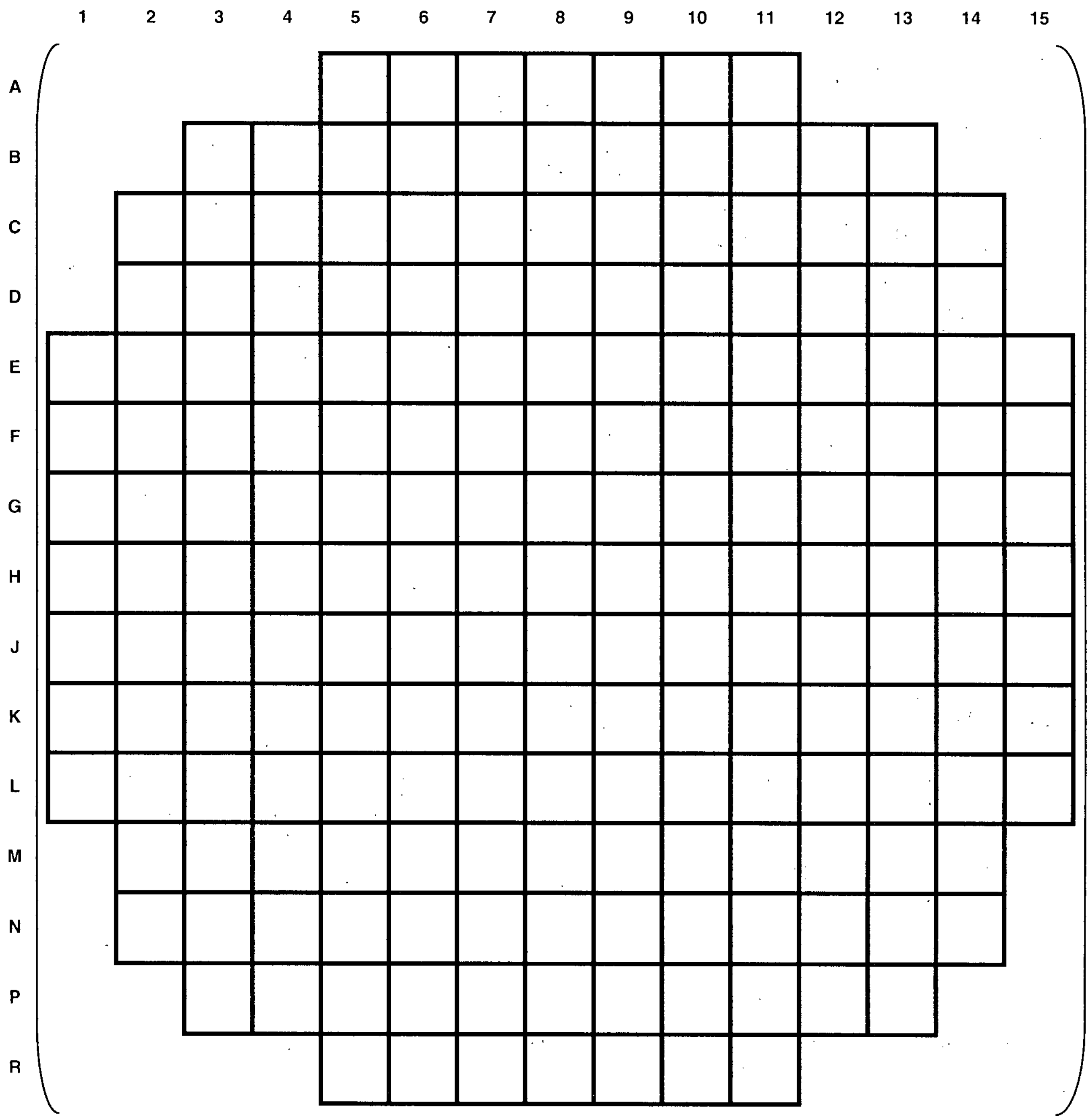
FCM/1/17/013 MWJR 01Feb07
31 EFPD 100 %FP



	Deviation
RMS	1.5%
Core Max	-4.2% at H-15
MOX Max	-3.9% at N-08

Figure 3

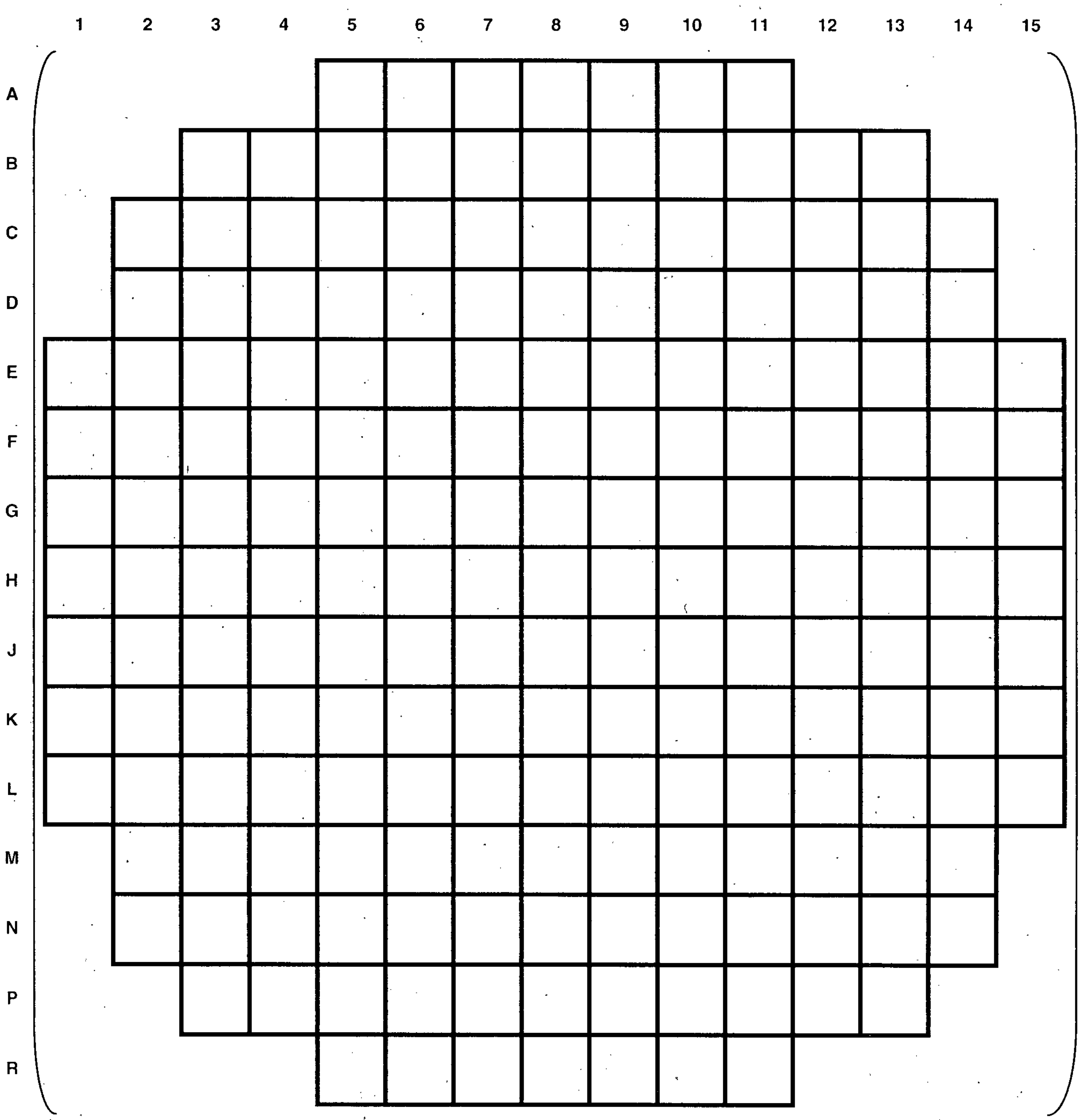
FCM/1/17/014 MWJS 27Feb07
57 EFPD 100 %FP



	Deviation
RMS	1.4%
Core Max	-4.2% at H-15
MOX Max	-3.7% at N-08

Figure 4

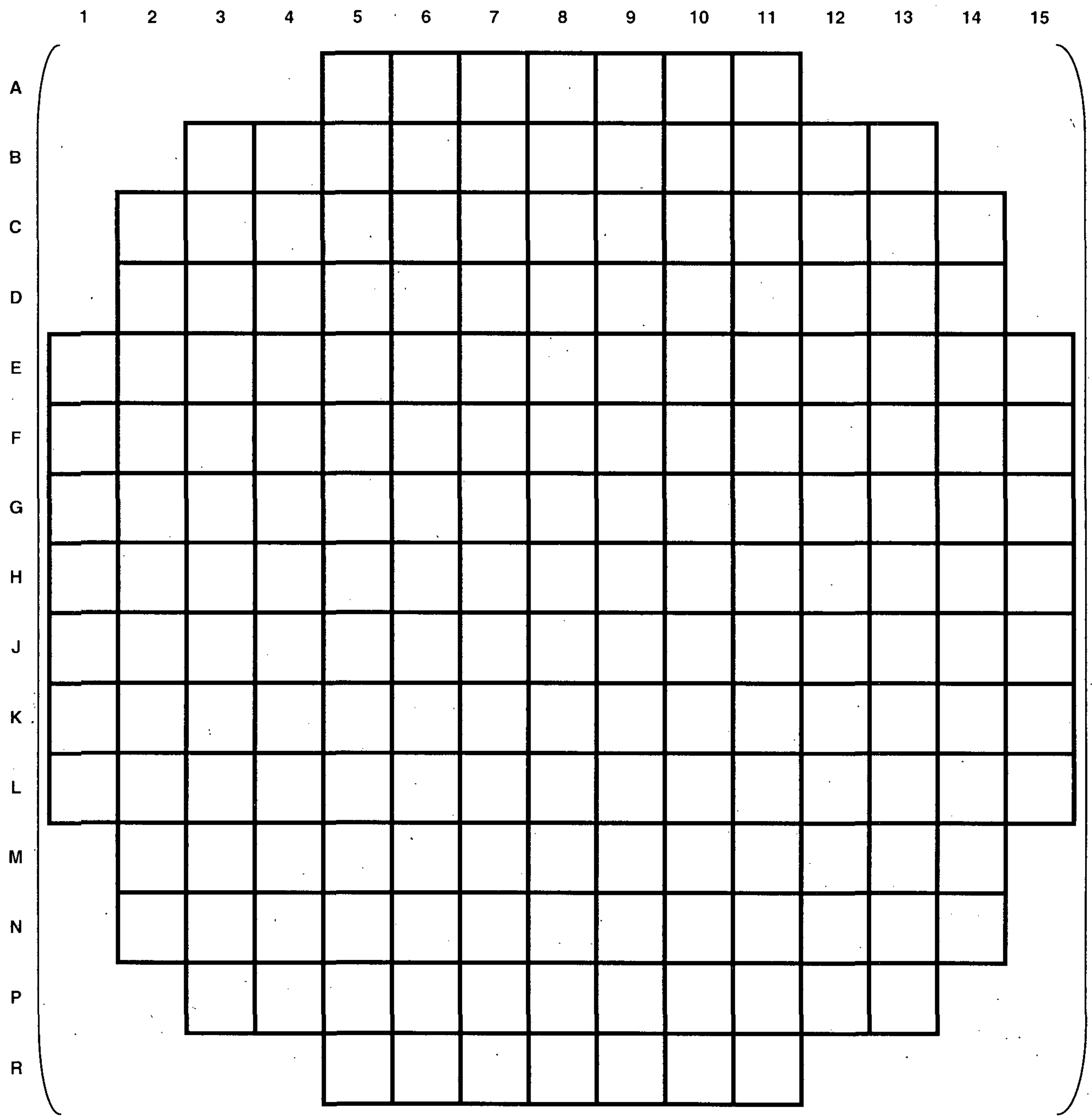
FCM/1/17/015 MWJT 29Mar07
85 EFPD 100 %FP



	Deviation
RMS	1.3%
Core Max	-4.7% at H-15
MOX Max	-4.0% at N-08

Figure 5

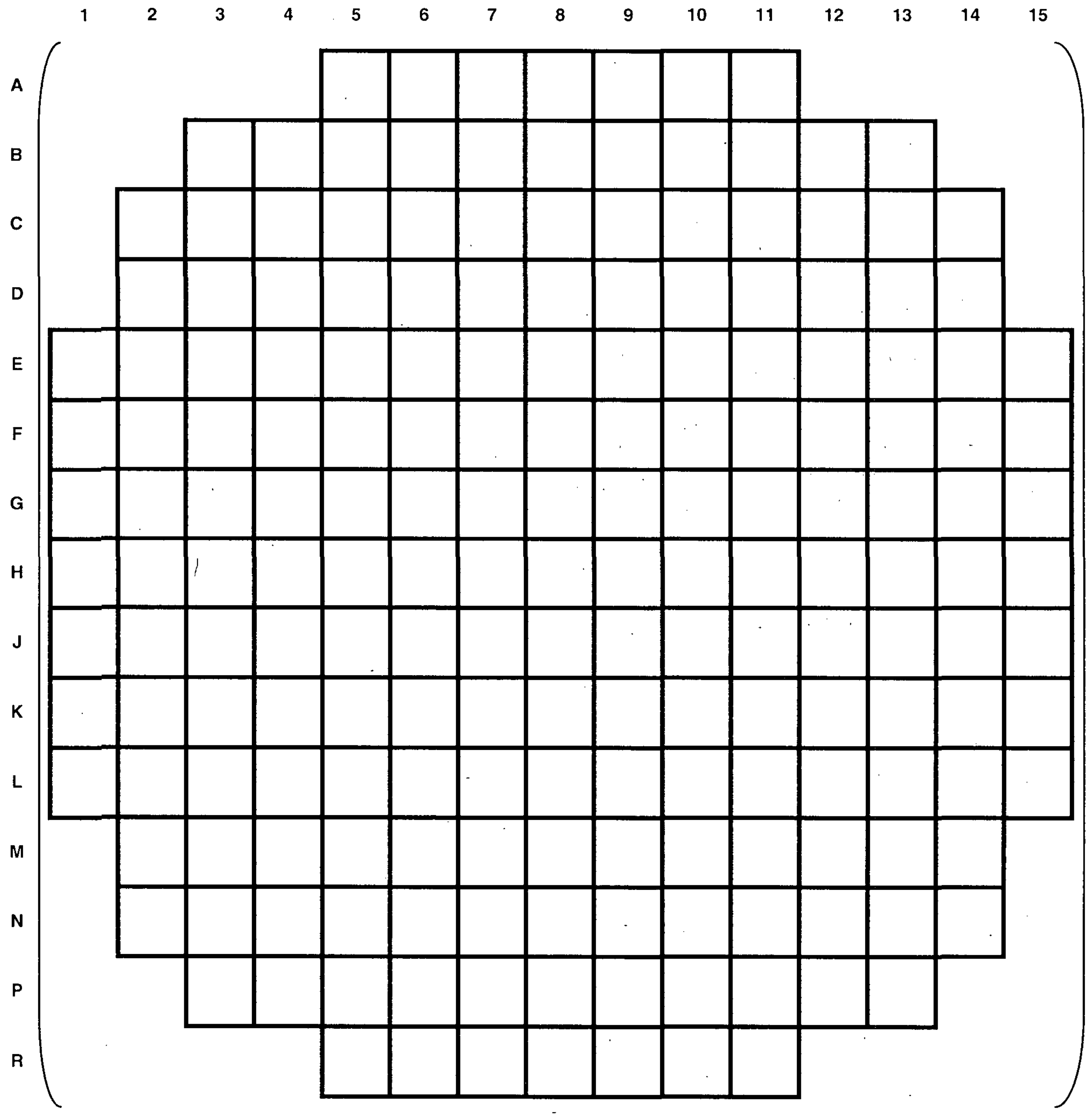
FCM/1/17/016 MWJV 26Apr07
113 EFPD 100 %FP



	Deviation
RMS	1.2%
Core Max	-4.4% at H-15
MOX Max	-3.8% at N-08

Figure 6

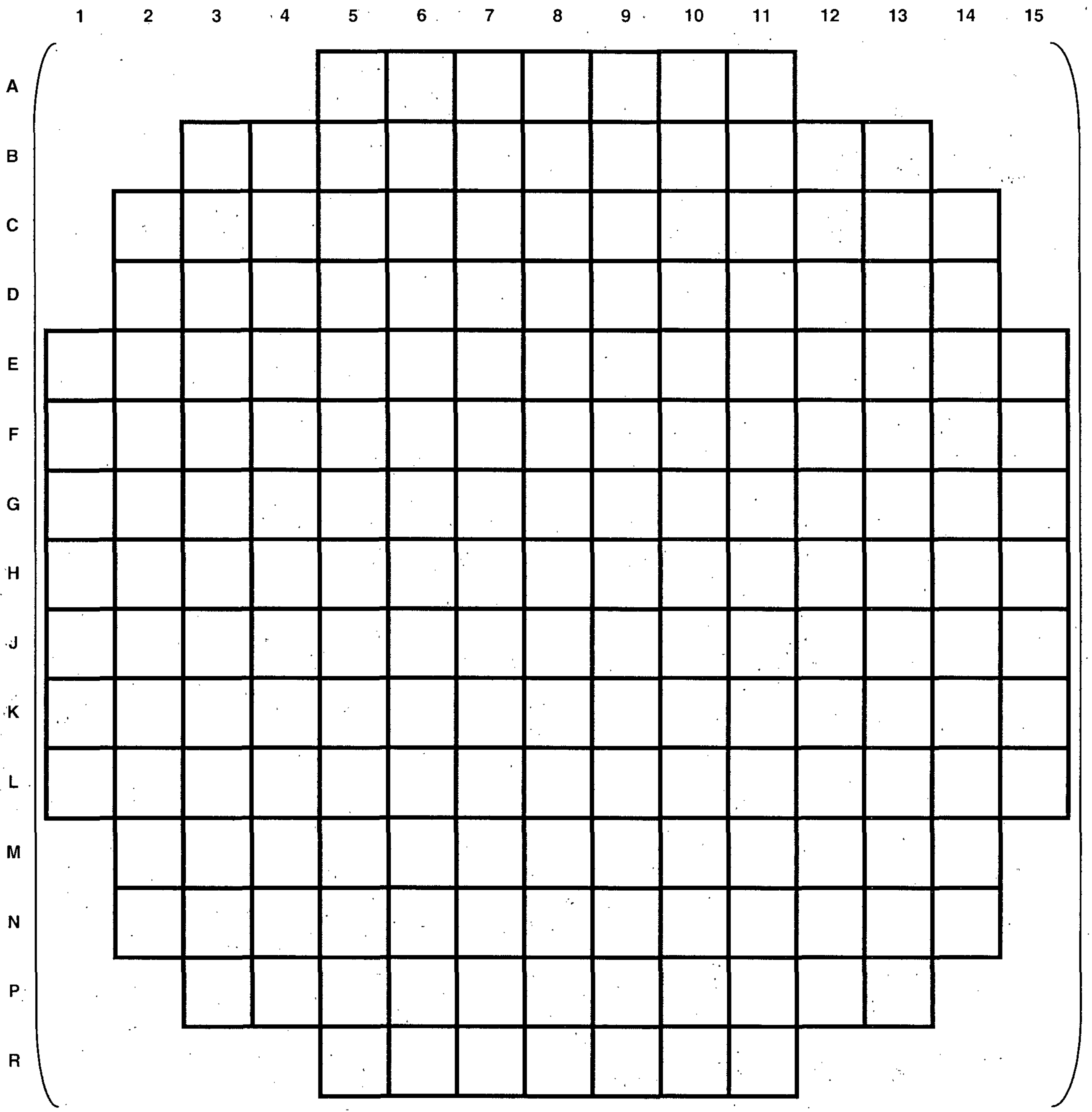
FCM/1/17/017 MWJB 24May07
141 EFPD 100 %FP



	Deviation
RMS	1.1%
Core Max	-4.7% at H-15
MOX Max	-3.4% at N-08

Figure 7

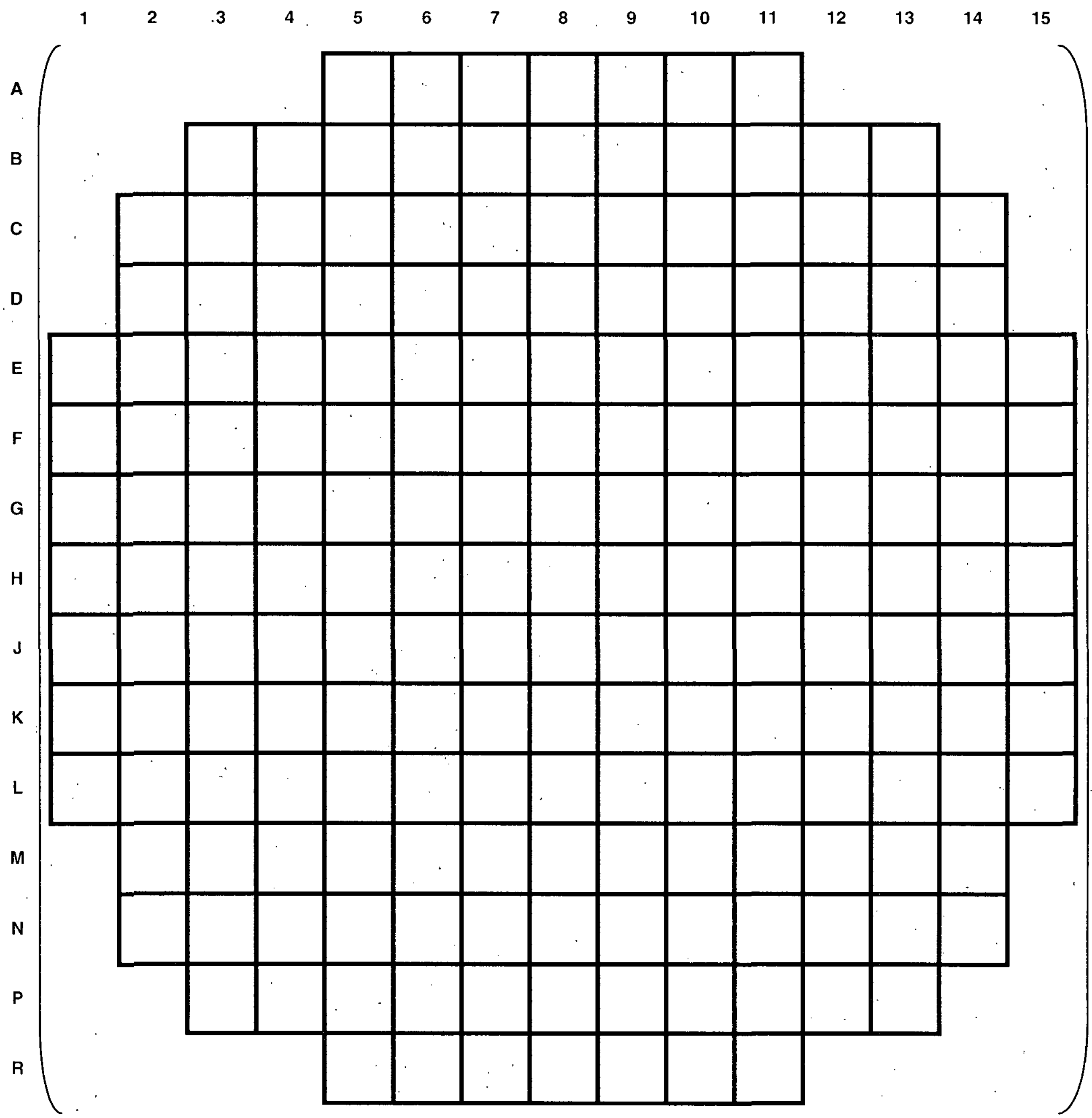
FCM/1/17/018 MWJW 21Jun07
169 EFPD 100 %FP



	Deviation
RMS	1.2%
Core Max	-4.2% at H-15
MOX Max	-3.7% at N-08

Figure 8

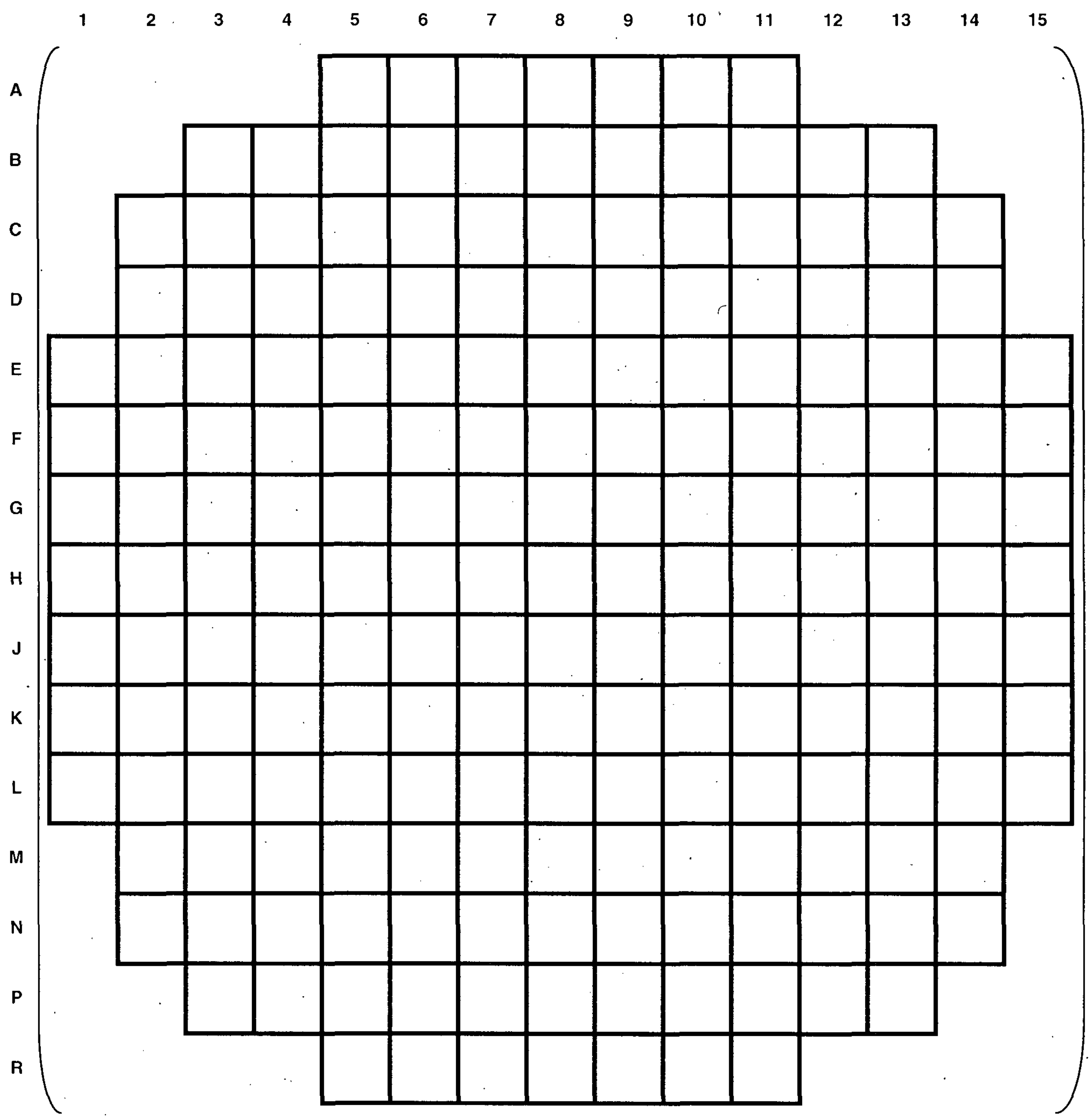
FCM/1/17/019 MWJX 19Jul07
197 EFPD 100 %FP



	Deviation
RMS	1.1%
Core Max	-3.9% at H-15
MOX Max	-3.3% at N-08

Figure 9

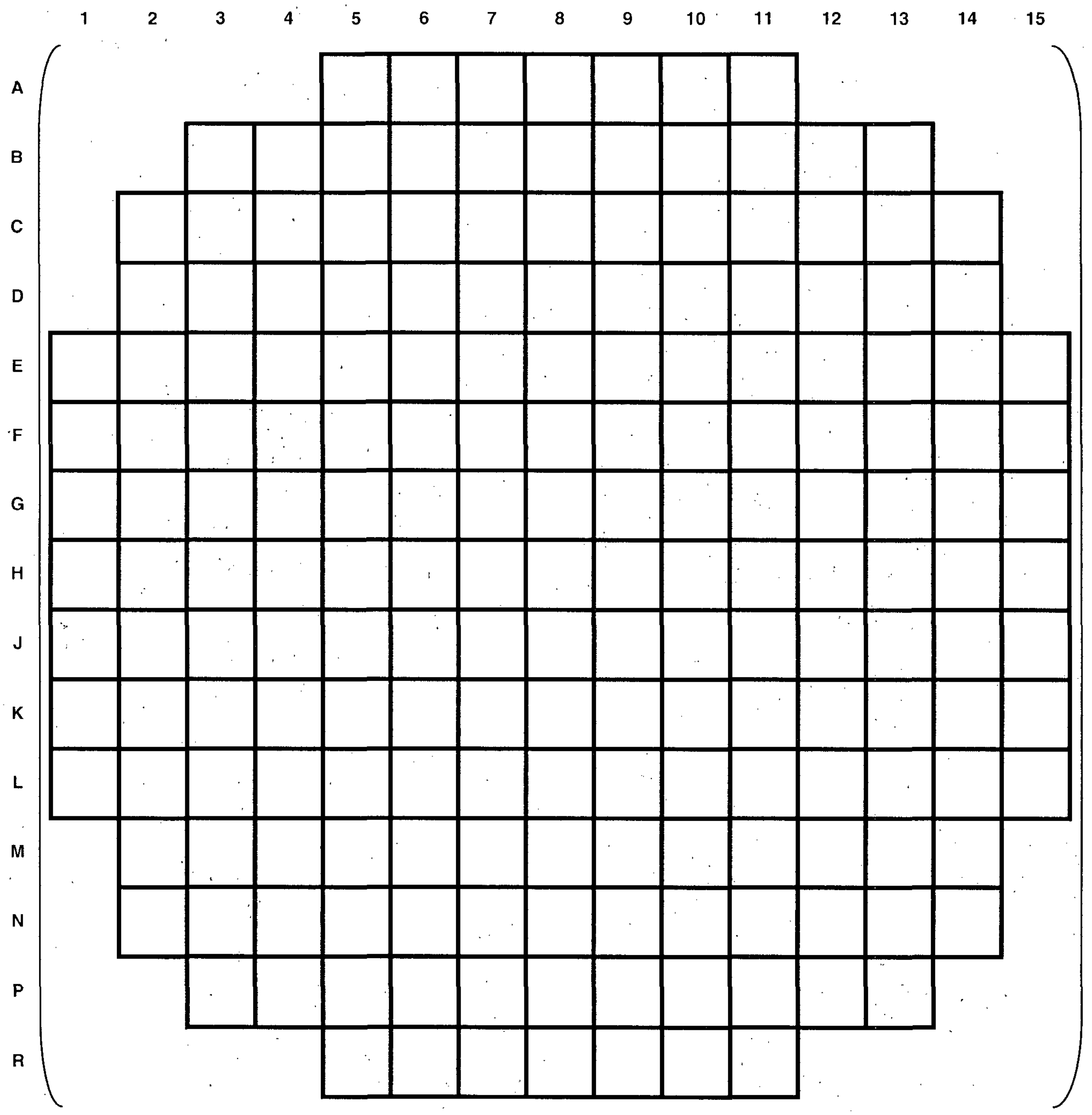
FCM/1/17/020 MWJZ 16Aug07
225 EFPD 100 %FP



	Deviation
RMS	1.1%
Core Max	-4.3% at H-15
MOX Max	-3.5% at N-08

Figure 10

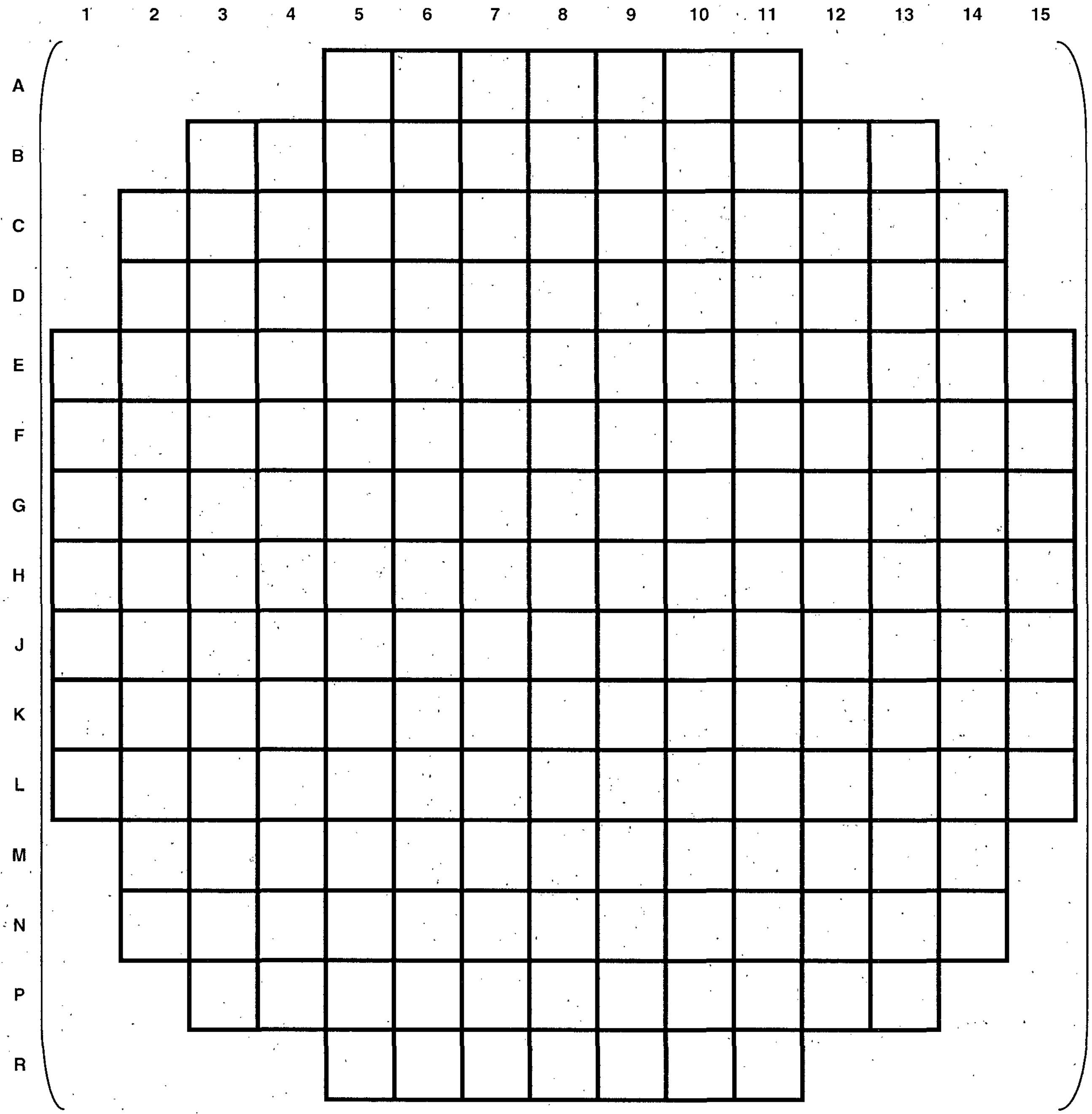
FCM/1/17/021 MWKB 06Sep07
246 EFPD 100 %FP



	Deviation
RMS	1.1%
Core Max	-3.8% at H-15
MOX Max	-2.8% at N-08

Figure 11

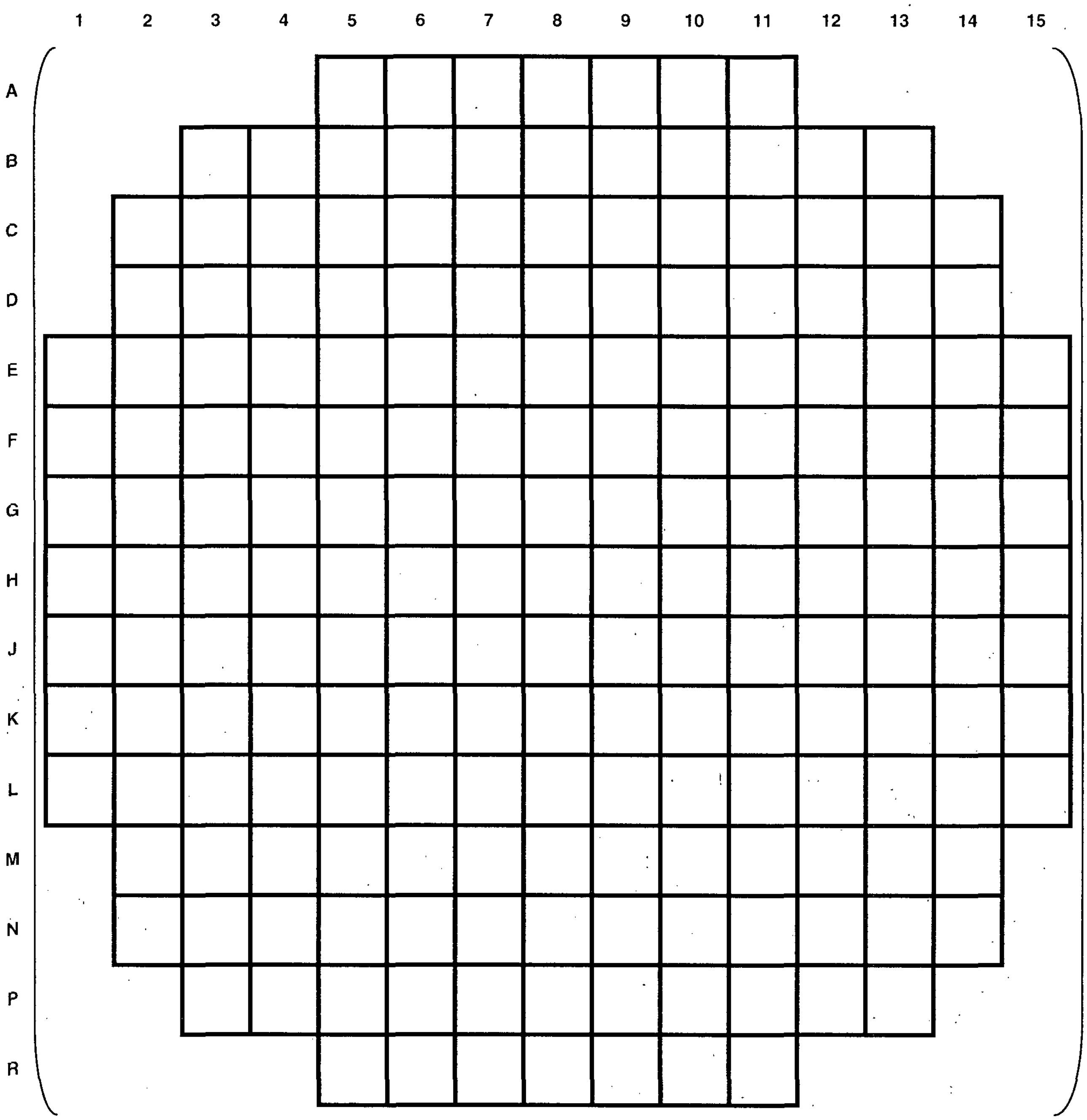
FCM/1/17/022 MWNS 07Nov07
281 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-3.7% at B-13
MOX Max	-2.7% at N-08

Figure 12

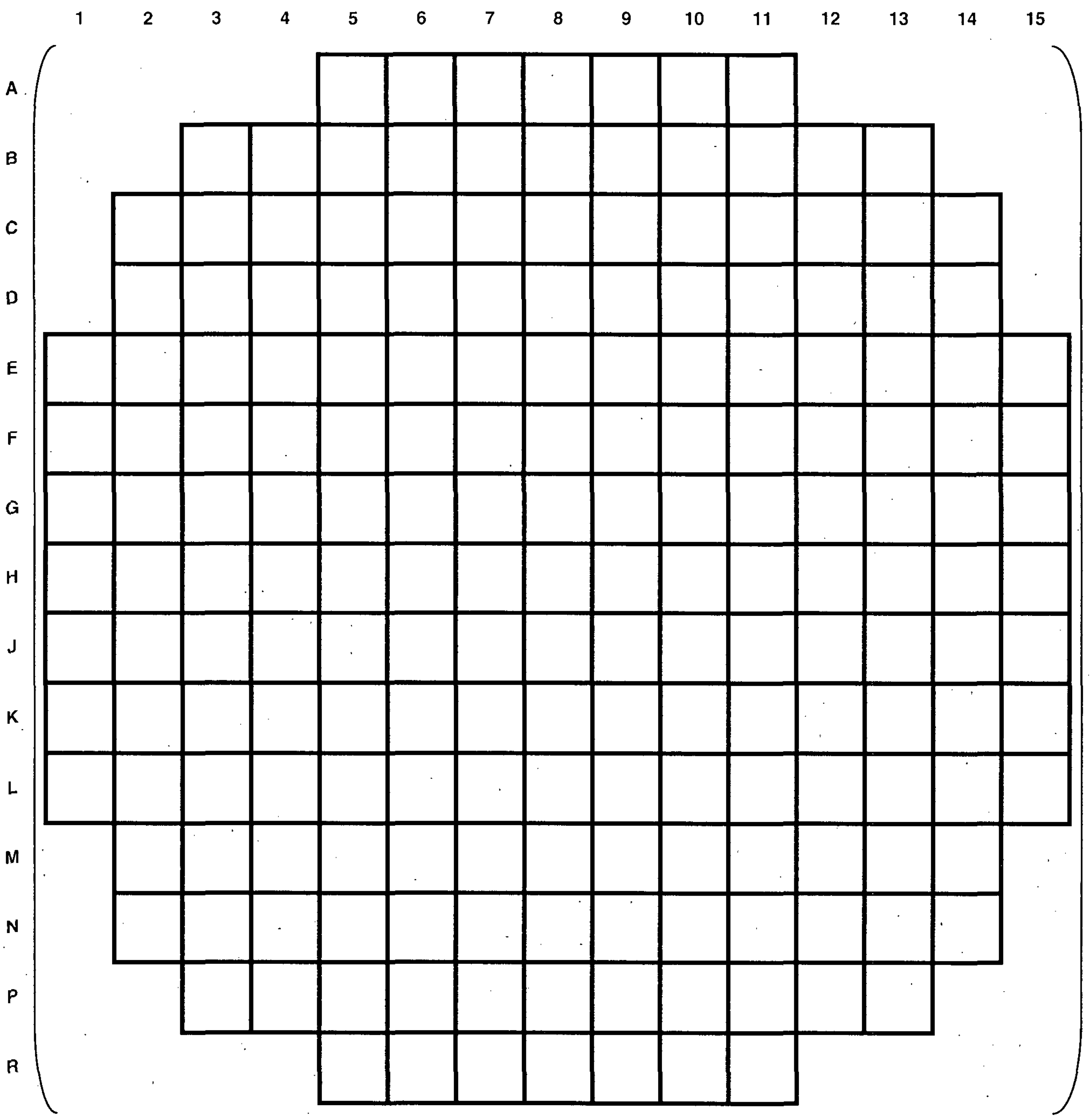
FCM/1/17/023 MWKD 08Nov07
309 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-4.0% at H-15
MOX Max	-2.7% at N-08

Figure 13

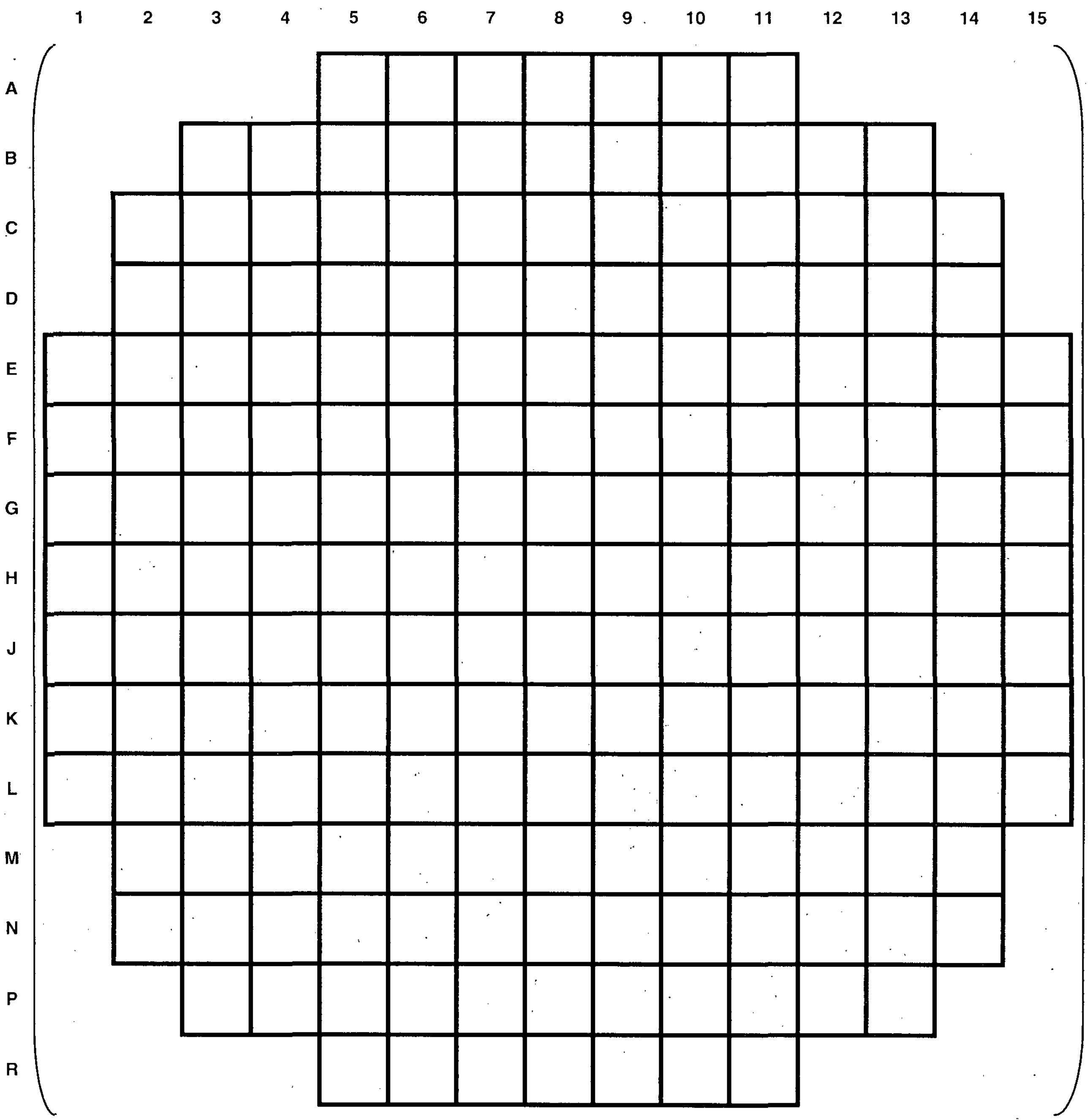
FCM/1/17/024 DBXD 06Dec07
337 EFPD 100 %FP



	Deviation
RMS	0.8%
Core Max	-3.2% at H-15
MOX Max	-2.3% at N-08

Figure 14

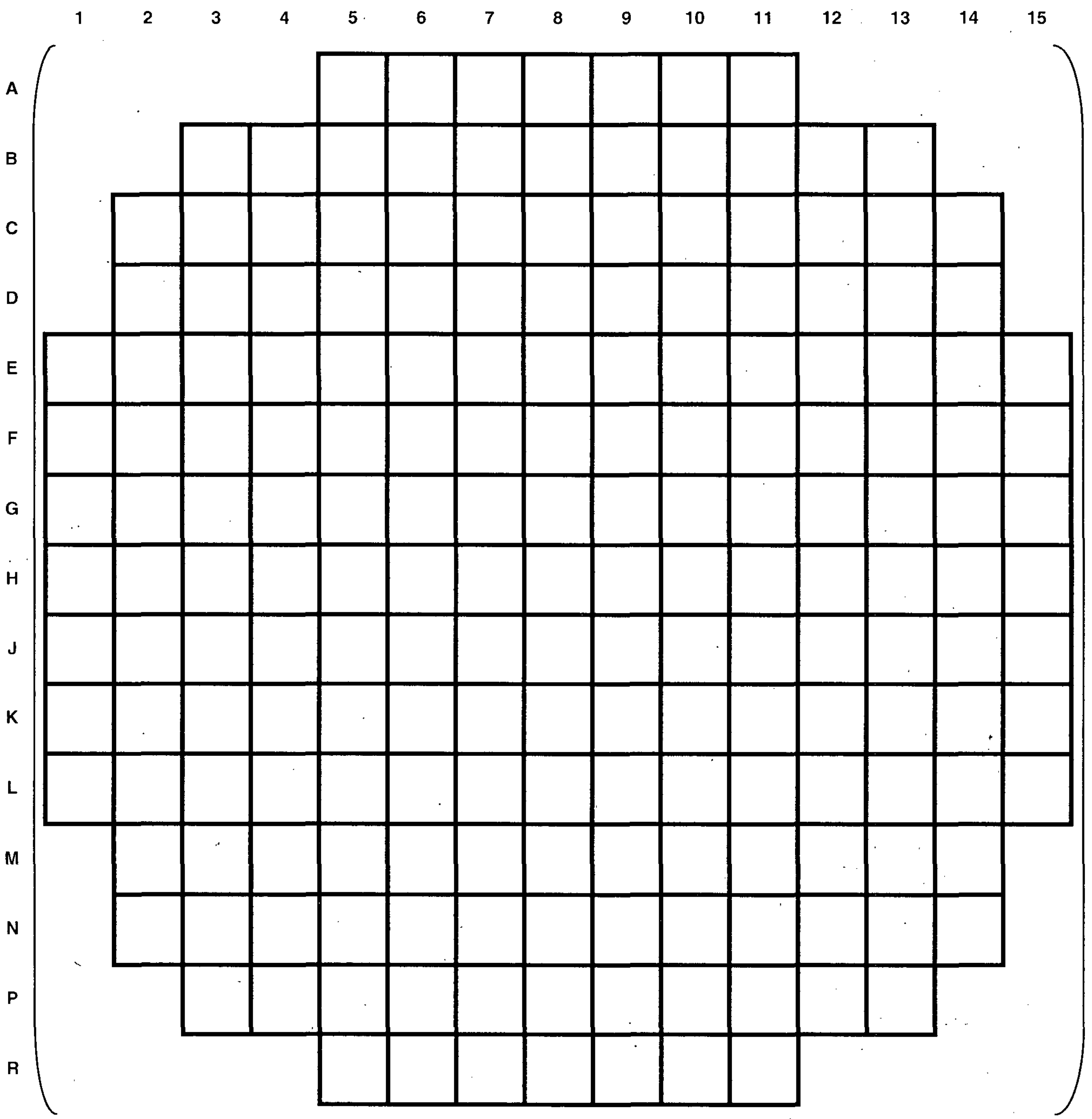
FCM/1/17/025 MWKG 03Jan08
365 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-4.3% at H-15
MOX Max	-2.0% at N-08

Figure 15

FCM/1/17/026 MWKH 31Jan08
393 EFPD 100 %FP

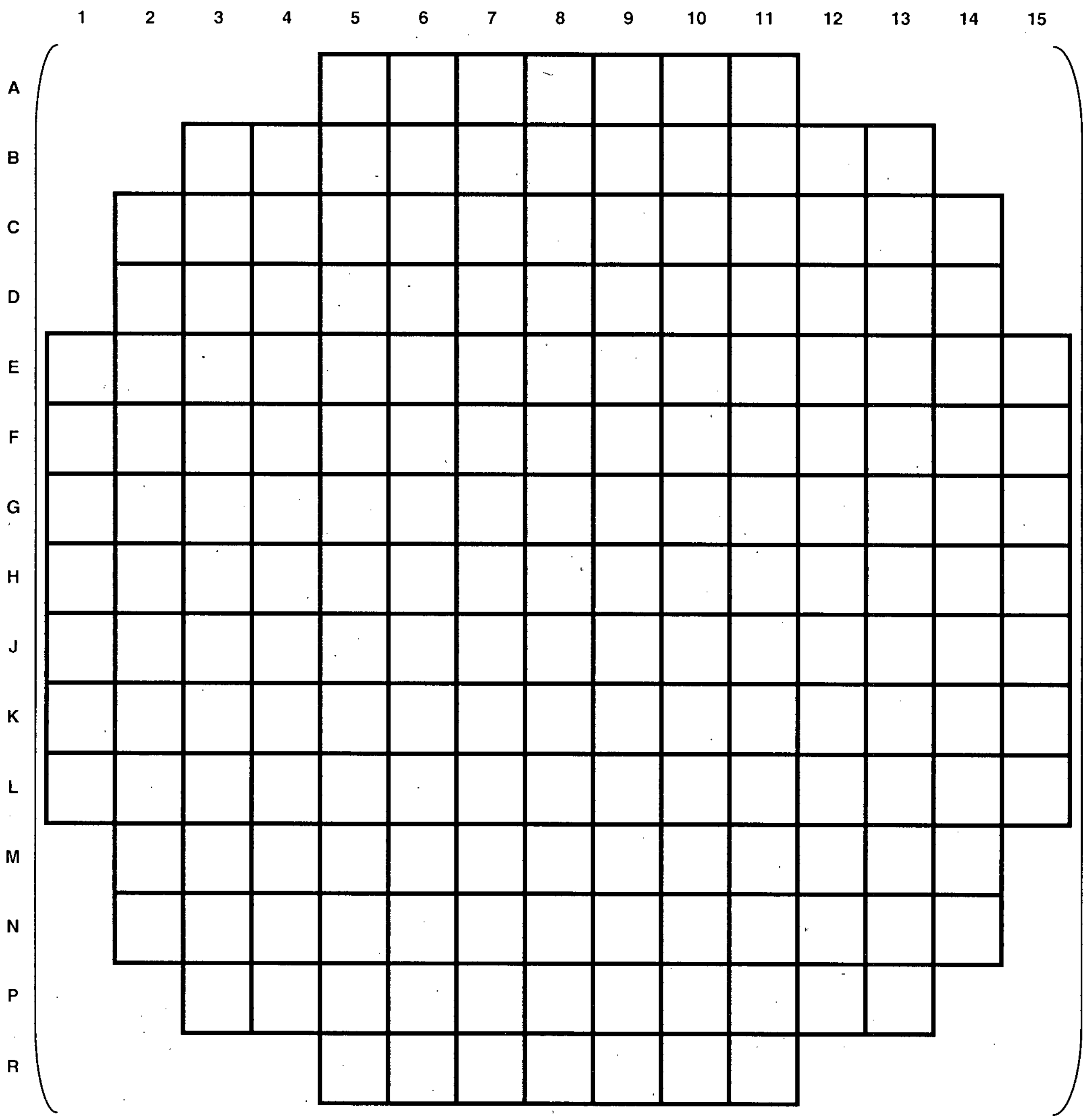


	Deviation
RMS	1.0%
Core Max	-4.1% at B-13
MOX Max	-1.8% at N-08

Figure 16

FCM/1/17/027 MWKC 03Mar08

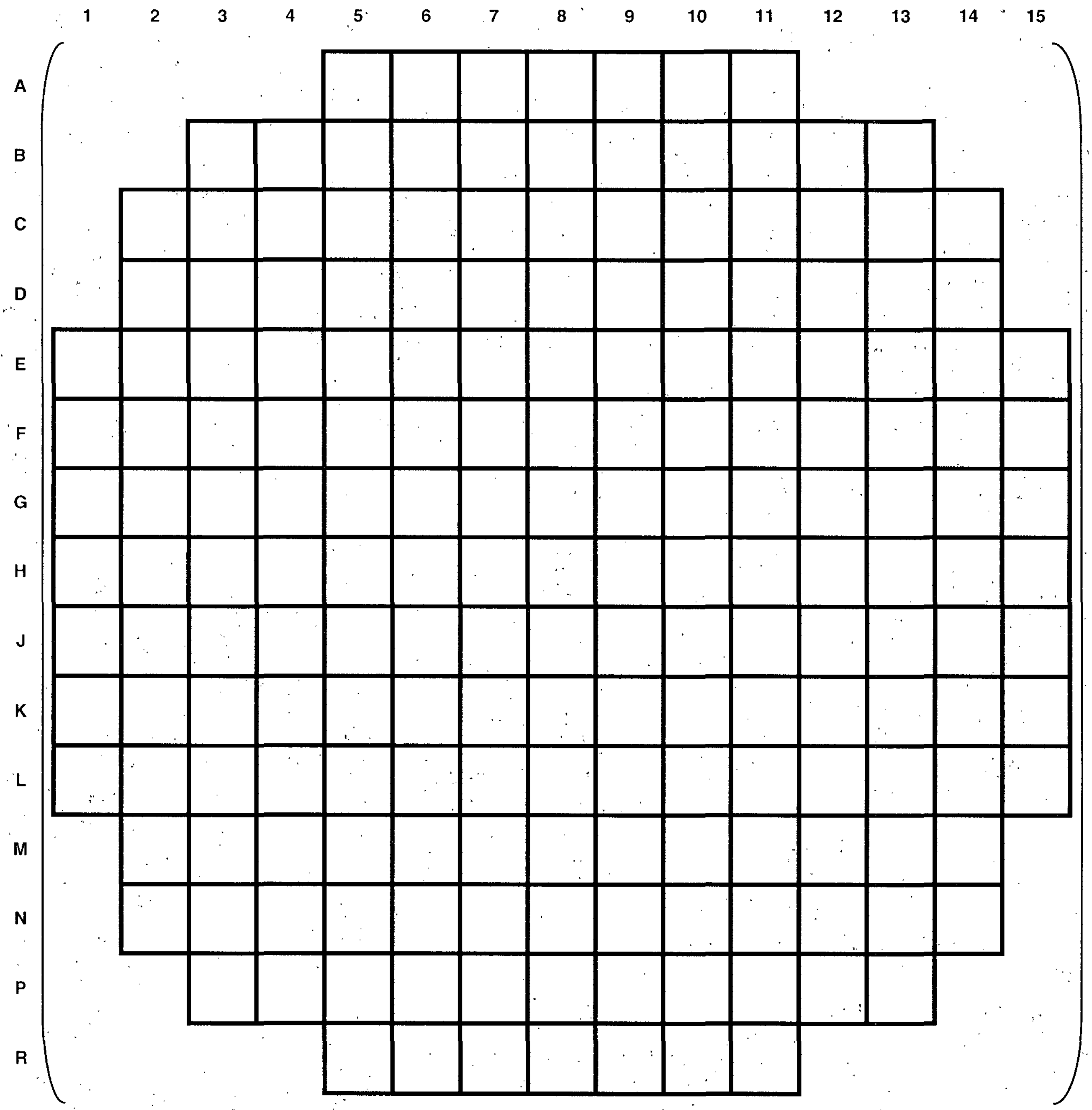
421 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-4.1% at N-02
MOX Max	-1.5% at H-13

Figure 17

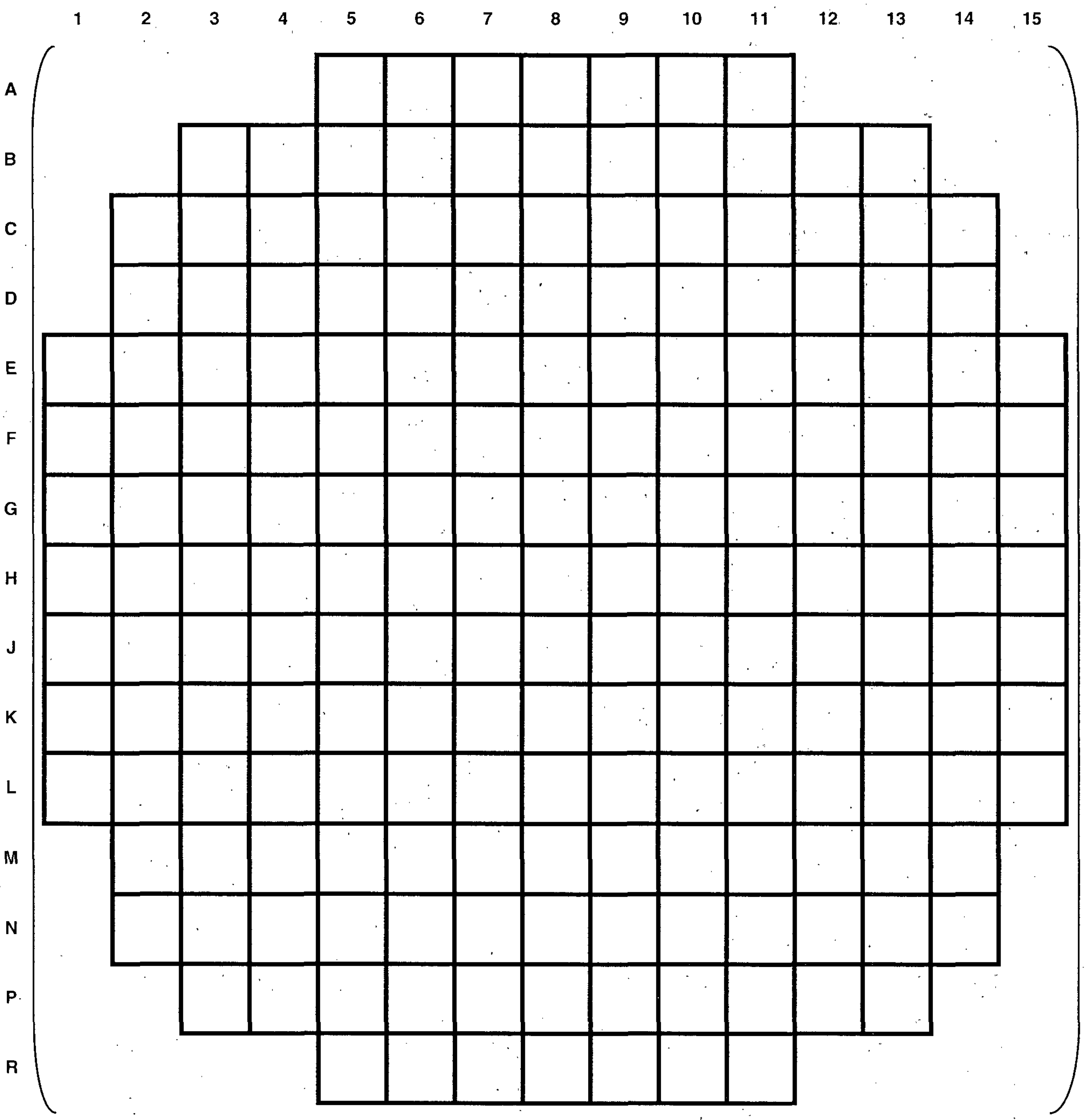
FCM/1/17/028 MWKK 27Mar08
449 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-4.9% at B-13
MOX Max	-1.5% at N-08

Figure 18

FCM/1/17/029 MWKH 24Apr08
477 EFPD 100 %FP



	Deviation
RMS	0.9%
Core Max	-4.5% at L-15
MOX Max	-1.2% at H-03