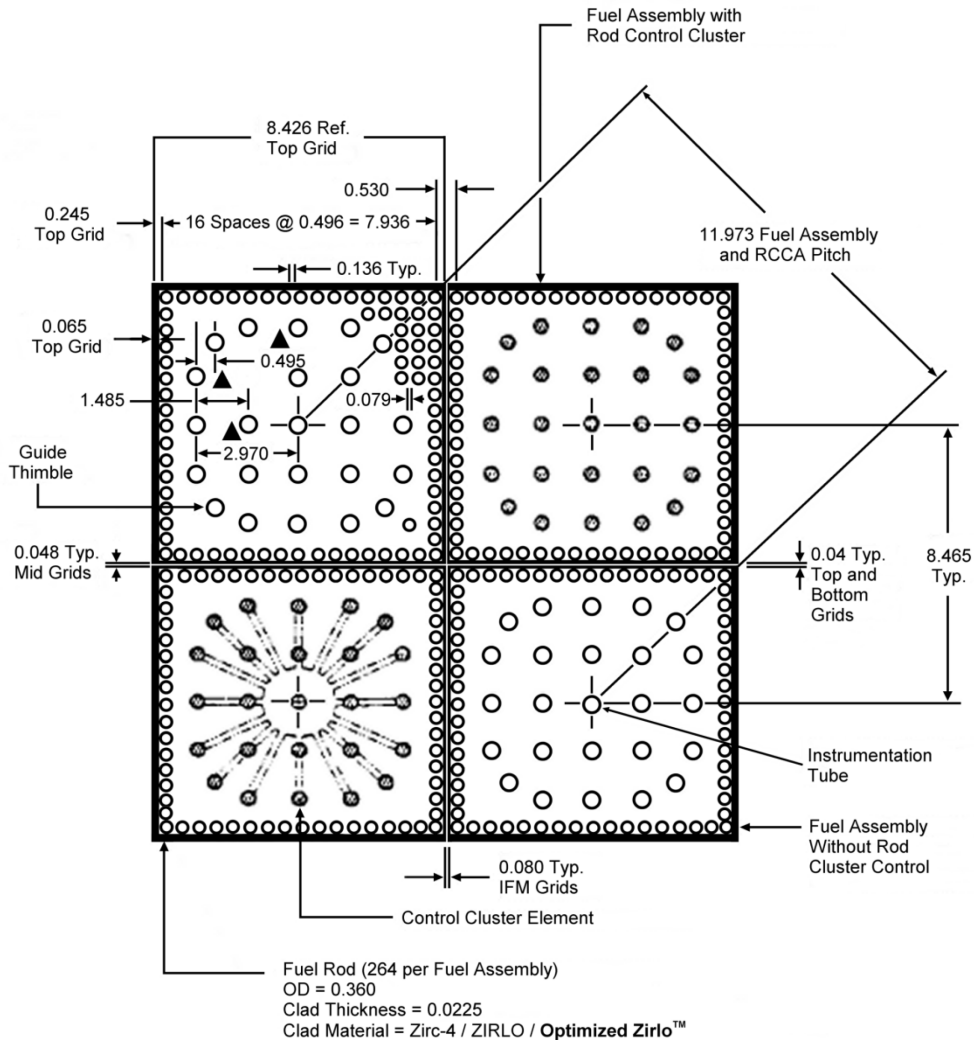


UFSAR Revision 30.0



INDIANA AND MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT

Revised: 26.0
Chapter: 3
Sheet: 1 of 1



▲ Guide Thimble Dimensions
at Top Nozzle Adaptor Plate

Dimensions are in Inches (Nominal)

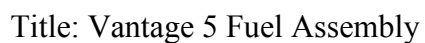
UFSAR Figure: 3.2-1

Change Description:
UCR-2052, Rev. 0

Unit: 2

Title: Fuel Assembly Cross Section 17 x 17 Vantage 5 Update

Revised: 27.0
 Chapter: 3
 Sheet: 1 of 1

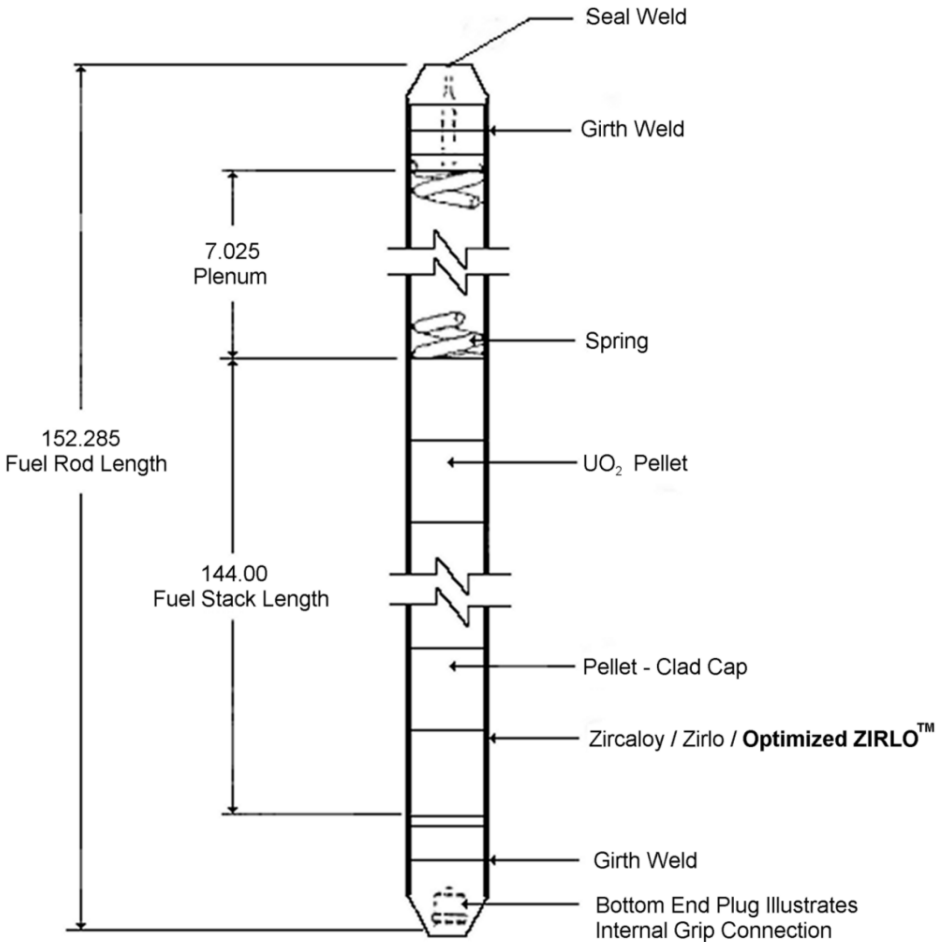


UFSAR Revision 30.0



INDIANA AND MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT

Revised: 26.0
Chapter: 3
Sheet: 1 of 1



17 X 17 FUEL ROD ASSEMBLY

Specific Dimensions Depend on Design Variables Such as
Prepressurization, Power History, and Discharge Burnup

Dimensions are in Inches (Nominal)

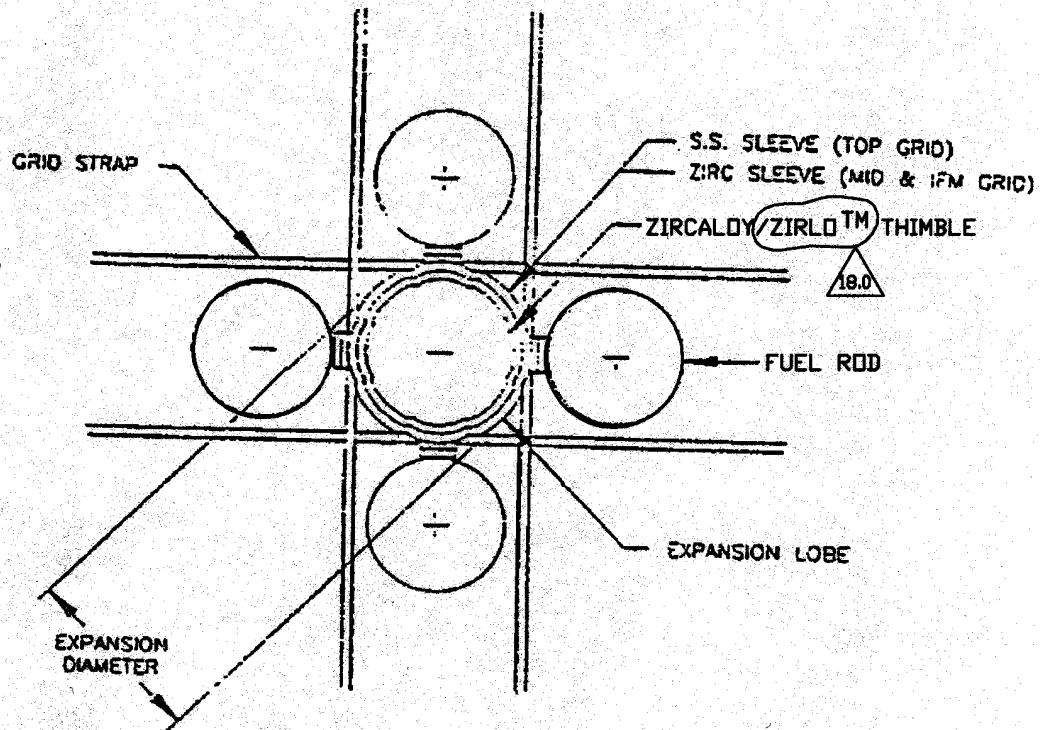
UFSAR Figure: 3.2-3

Change Description:
UCR-2052, Rev. 0

Unit: 2

Title: 17 X 17 Fuel Rod Assembly

UFSAR Revision 30.0



GRID EXPANSION JOINT DESIGN

Revision: **19.0**

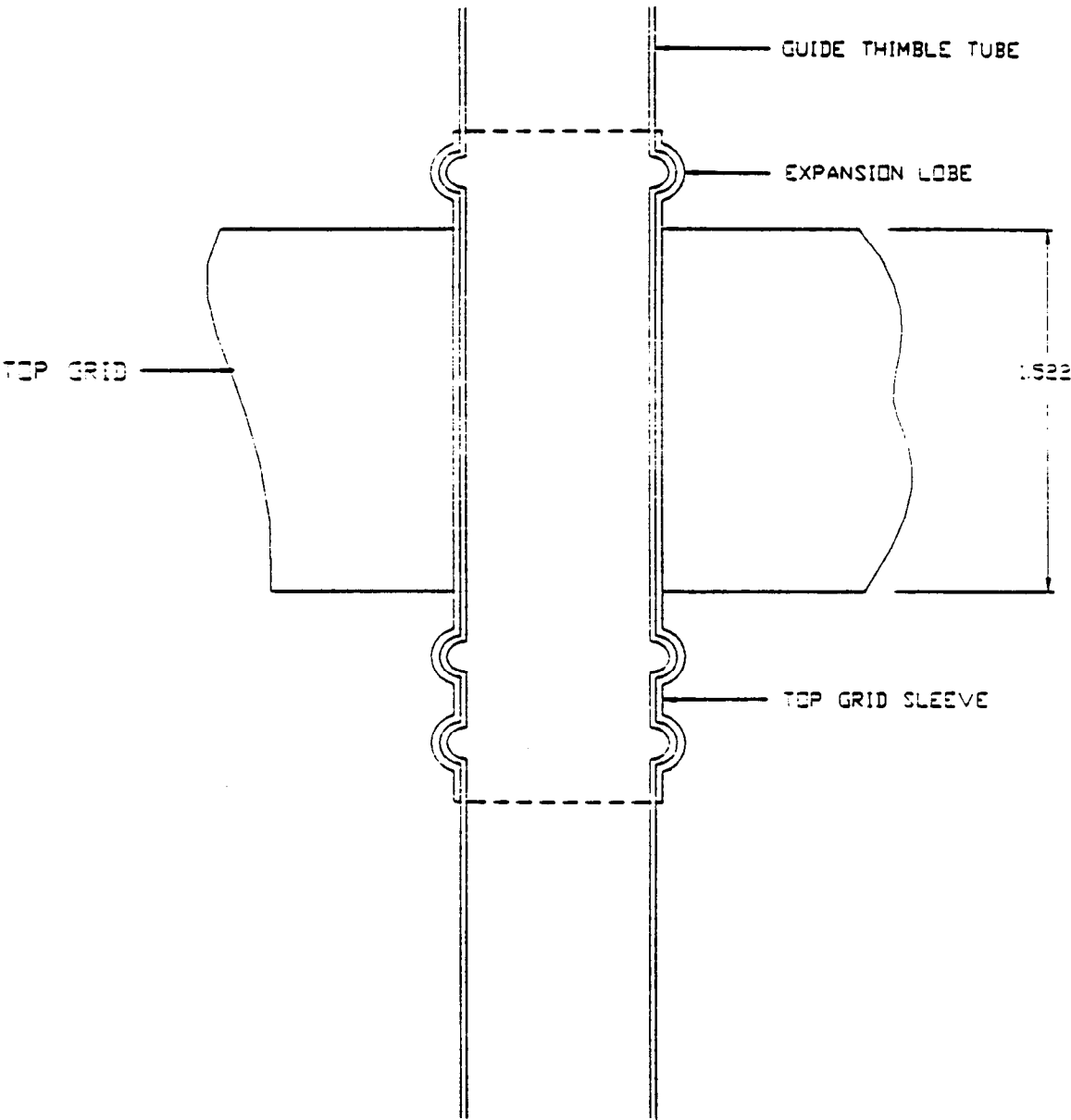
Change Description: **UCR-1703**

**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **D.C. Cook Unit 2
Plan View**

UFSAR Figure: **3.2-4**

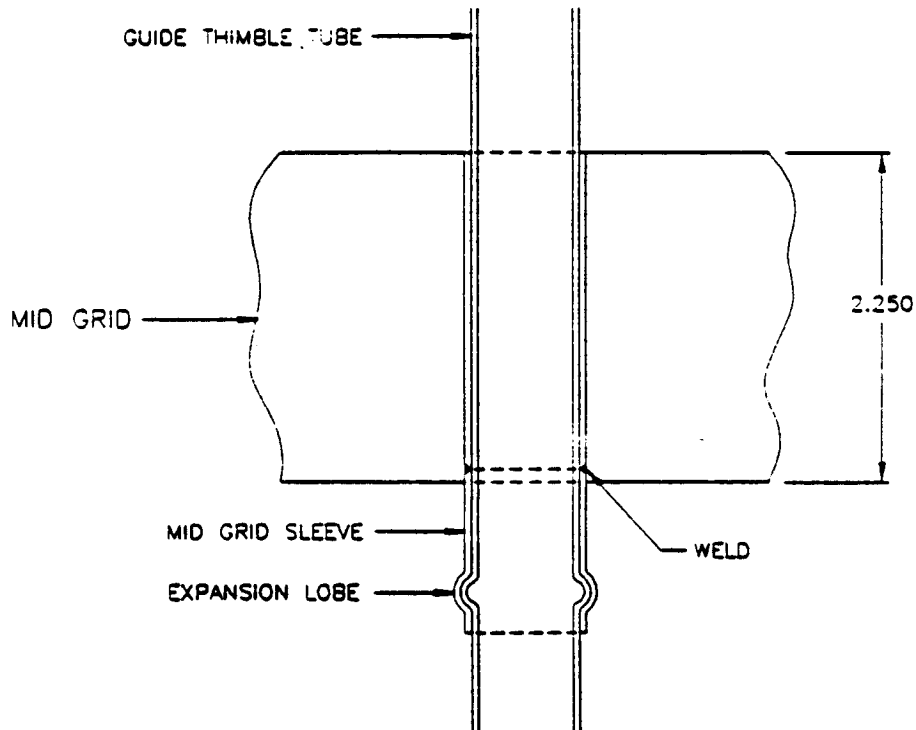
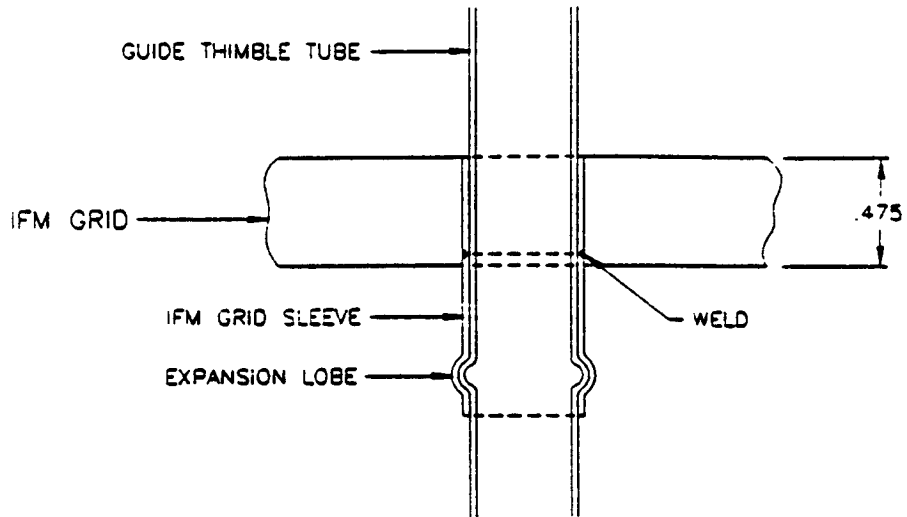
Sheet 1 of 1



REV. 05/91

D.C. COOK UNIT 2
TOP GRID TO THIMBLE ATTACHMENT
FIGURE 3.2-5

UFSAR Revision 30.0



DIMENSIONS ARE IN INCHES (NOMINAL)

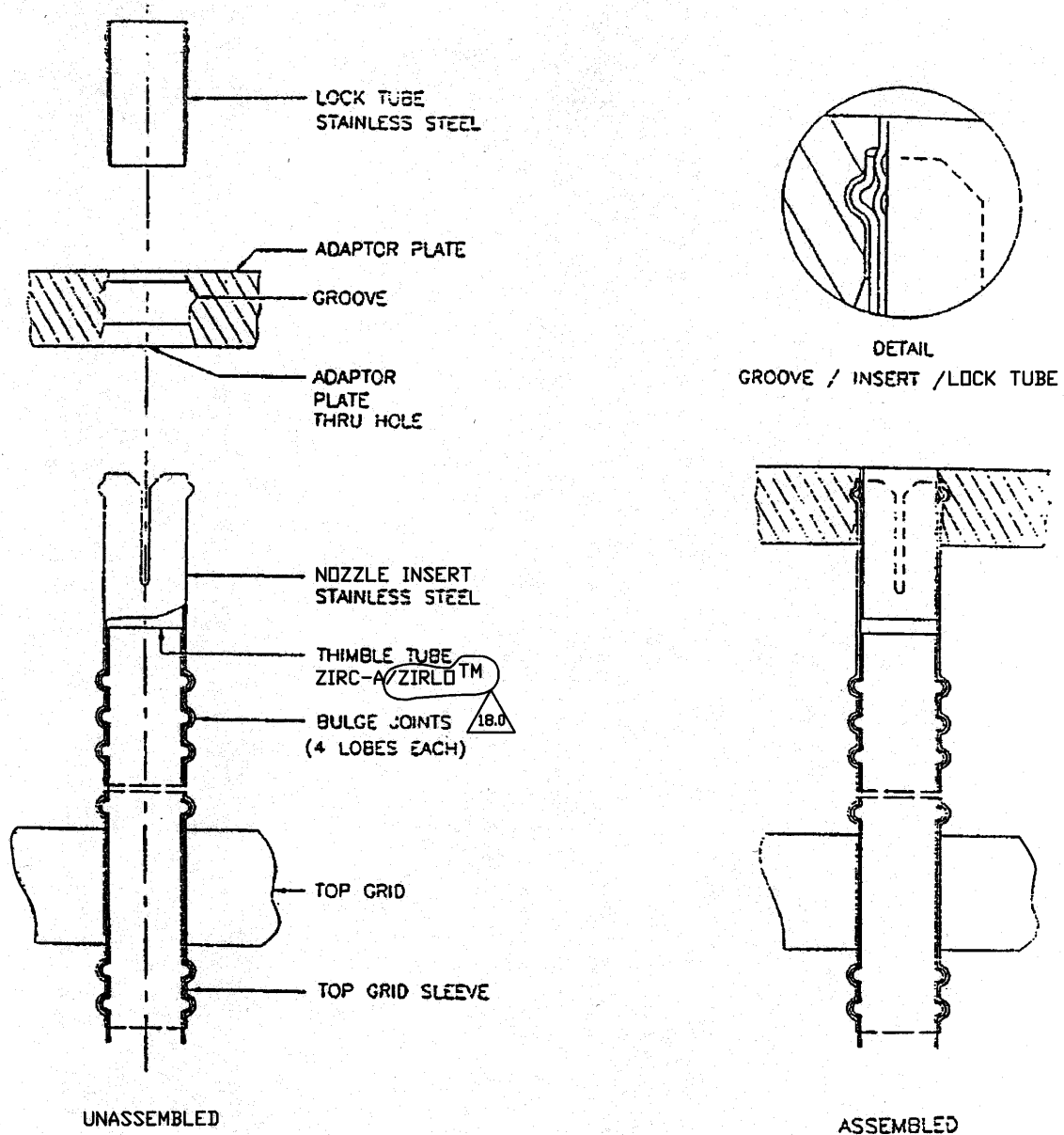
REV. 05/91

D.C. COOK UNIT 2

GRID TO THIMBLE ATTACHMENT JOINTS

FIGURE 3.2-5A

UFSAR Revision 30.0



Revision: **19.0**

Change Description: **UCR-1703**

**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **D. C. Cook Unit 2
Top Nozzle to Thimble Attachment**

UFSAR Figure: **3.2-6**

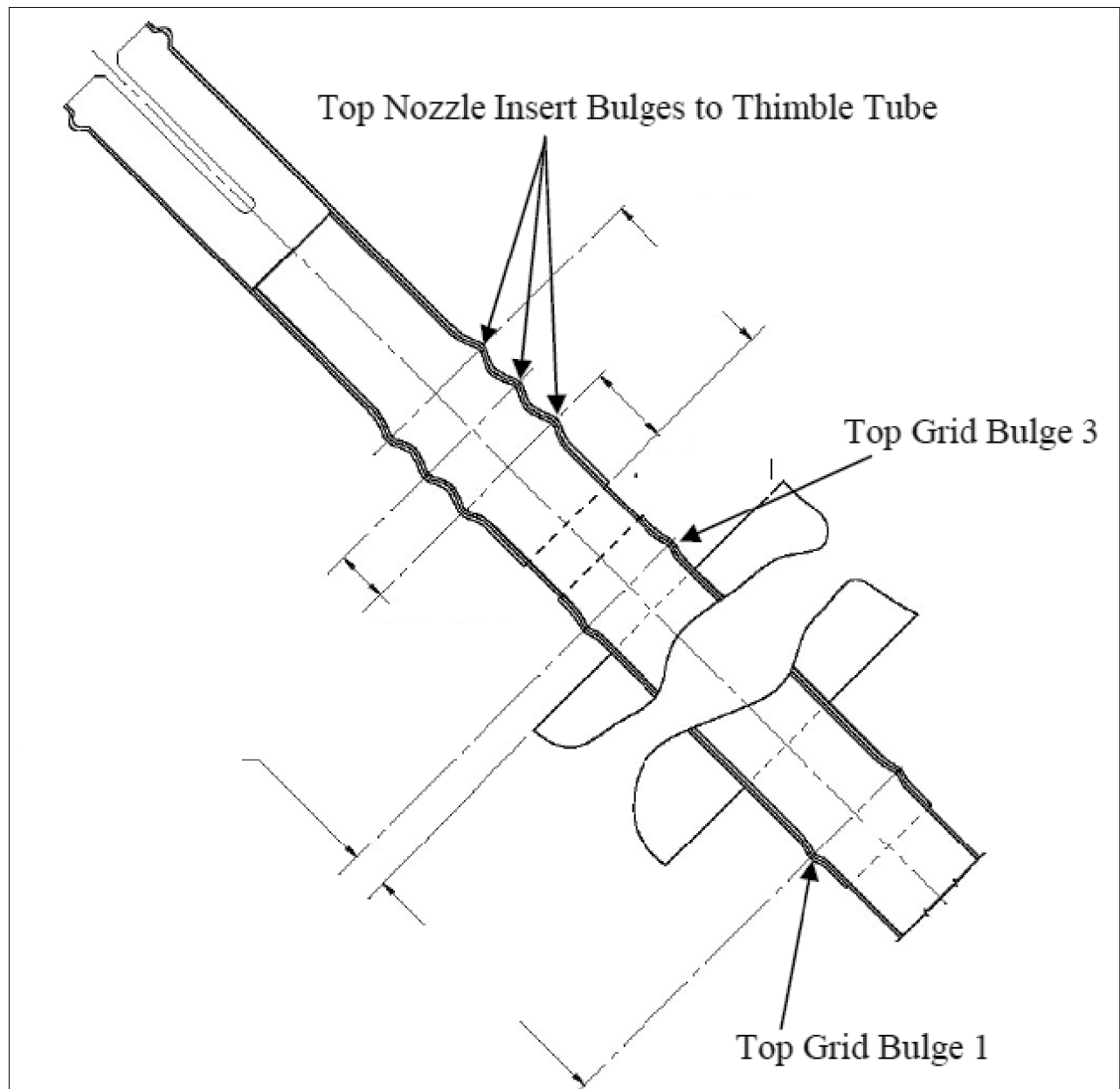
Sheet 1 of 1

UFSAR Revision 30.0



INDIANA MICHIGAN POWER
D. C. COOK NUCLEAR PLANT
UPDATED FINAL SAFETY ANALYSIS REPORT

Revised: 29.0
Chapter: 3
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UFSAR Figure: 3.2-6A

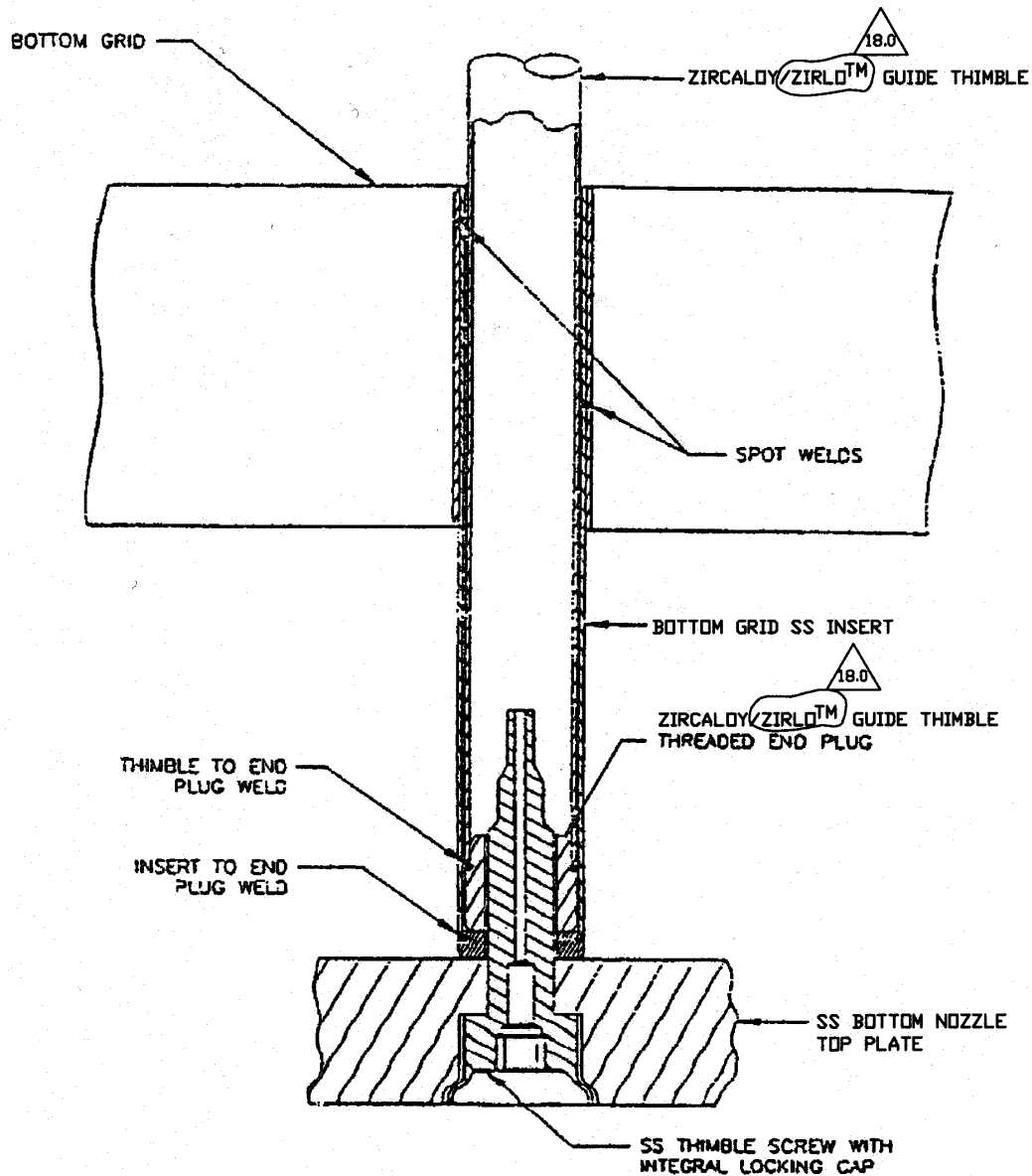
Change Description:
UCR-2330,, Rev. 0

Unit: 2

Title: Top Nozzle and Top Grid* Attachment Illustration

- * There is a double top grid bulge configuration starting with the Unit 2 fresh fuel in Cycle 24, where a triple top grid bulge configuration was the previous configuration.

UFSAR Revision 30.0



Revision: **19.0**

Change Description: **UCR-1703**

**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **D.C. Cook Unit 2
Guide Thimble to Bottom Nozzle Joint**

UFSAR Figure: **3.2-7**

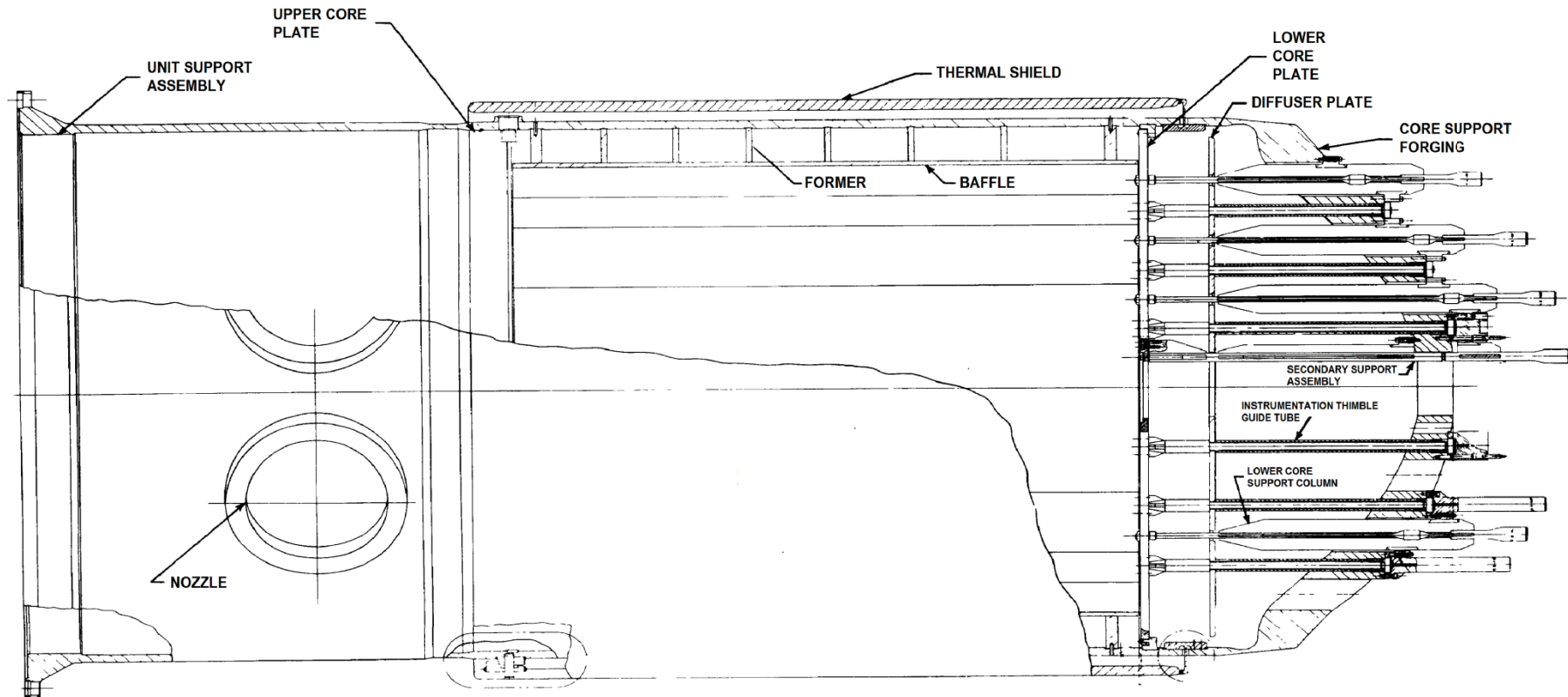
Sheet 1 of 1

UFSAR Revision 30.0



INDIANA MICHIGAN POWER D. C. COOK NUCLEAR PLANT UPDATED FINAL SAFETY ANALYSIS REPORT

Revised: 29.0
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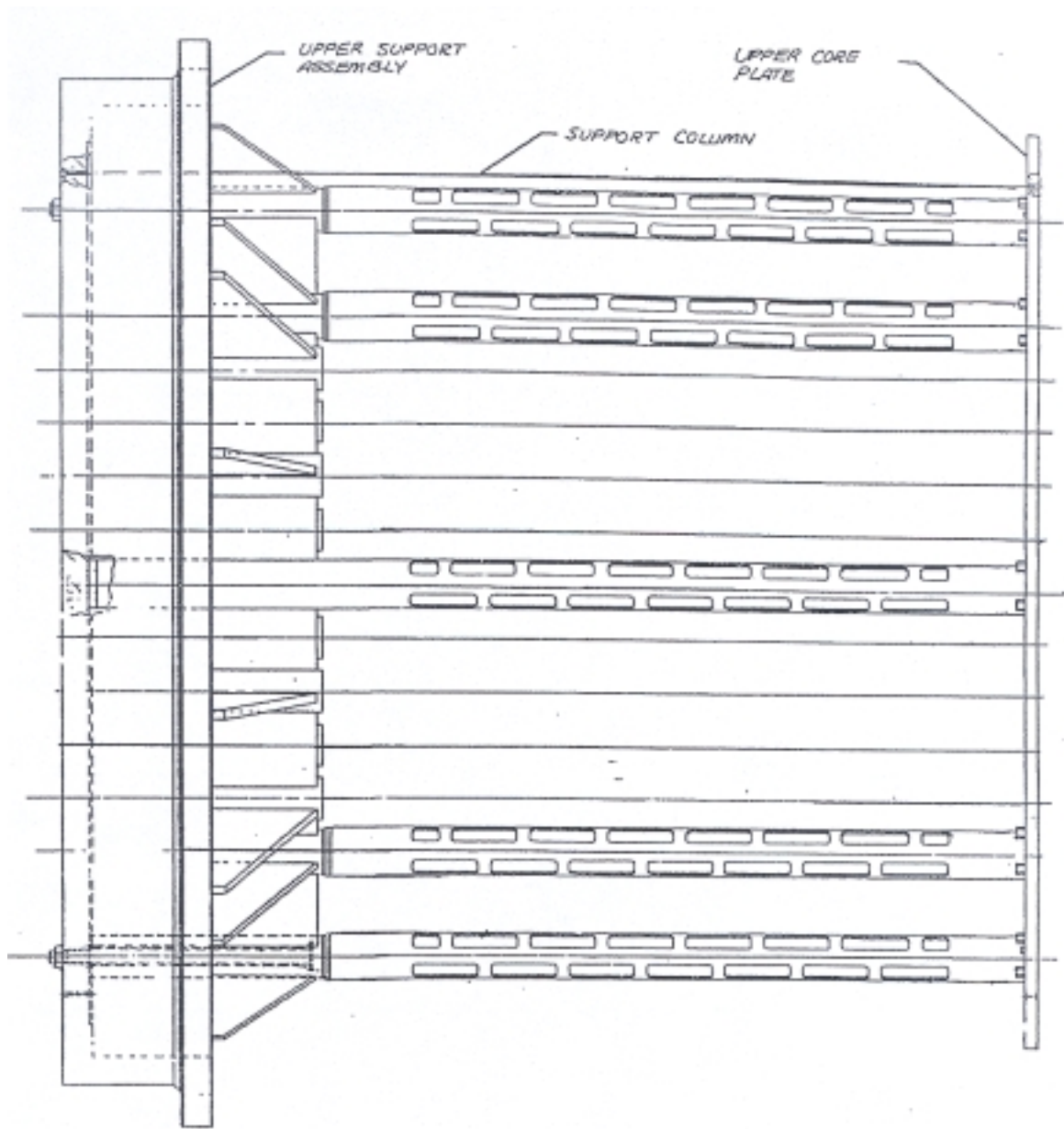


UFSAR Figure: 3.2-8

Change Description:
UCR-2221, Rev. 0

Unit: 2

Title: Typical Core Barrel Assembly



Revision: 19.1	Change Description: UCR-1727		
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN		Title: Upper Core Support Structure	
		UFSAR Figure: 3.2-9	Sheet 1 of 1

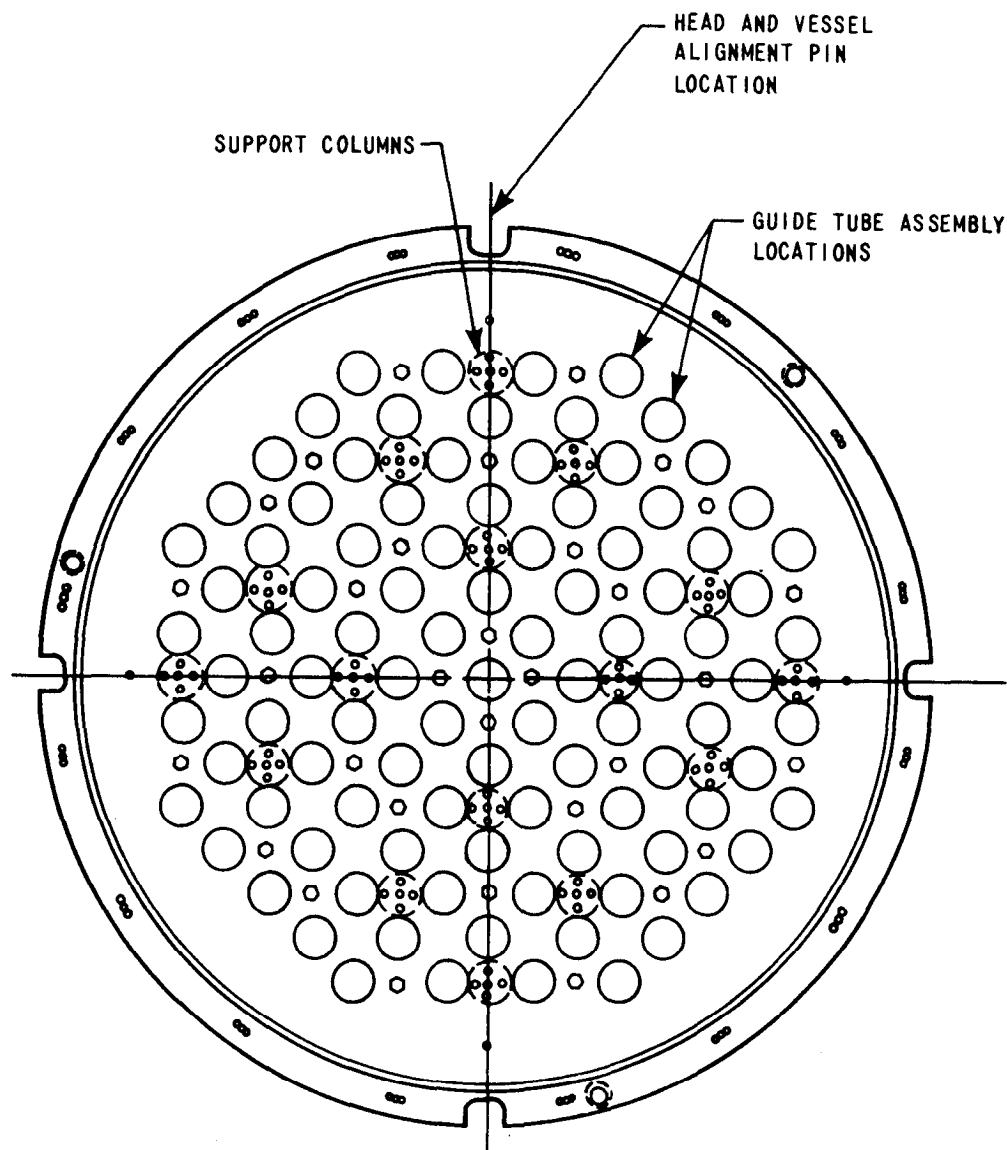
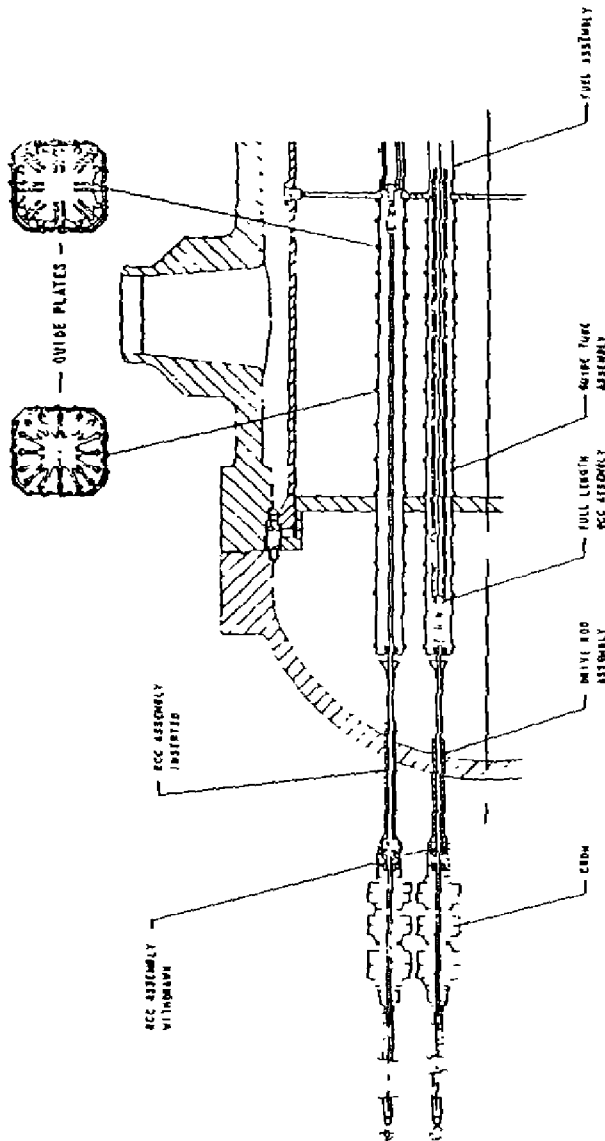


Figure 3.2-10 Plan View of Upper Core Support Structure



UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE TYPICAL FULL LENGTH ROD CLUSTER CONTROL AND DRIVE ROD ASSEMBLY WITH INTERFACING COMPONENTS		
	DWG. NO. FSAR FIG. 3.2-11		SH 1 of 1

160.949

1.838 Dia. Max.

378 IN

CENTER POST - RUB BED

0.362 Dia. Max.

0.381 DIA

0.38 TRAVEL

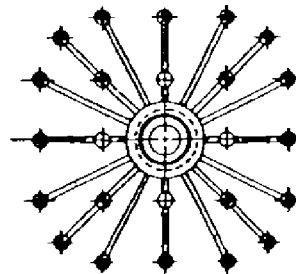
378 IN

1.470 Dia. Max.

137.50

635.00 INCH LENGTH

ARAGONITE
80% SILVER
15% INDIUM
5% CARBON



16.4

REVISÉD PER 99-UFSAR-1243

REV. NO.

DESCRIPTION

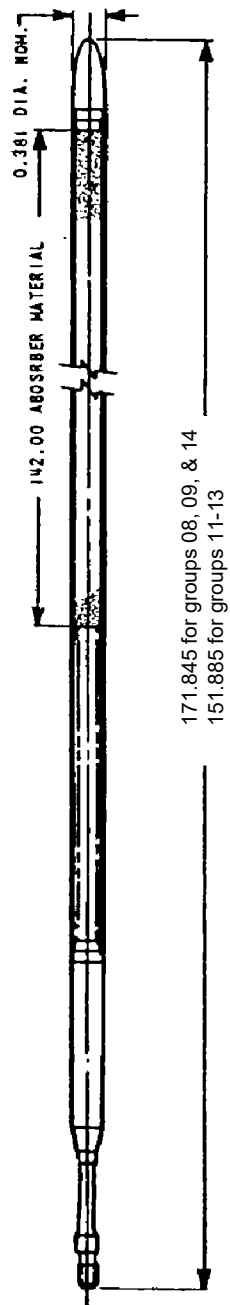
REVISIONS

AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

**TITLE FULL LENGTH ROD CLUSTER CONTROL
ASSEMBLY OUTLINE**

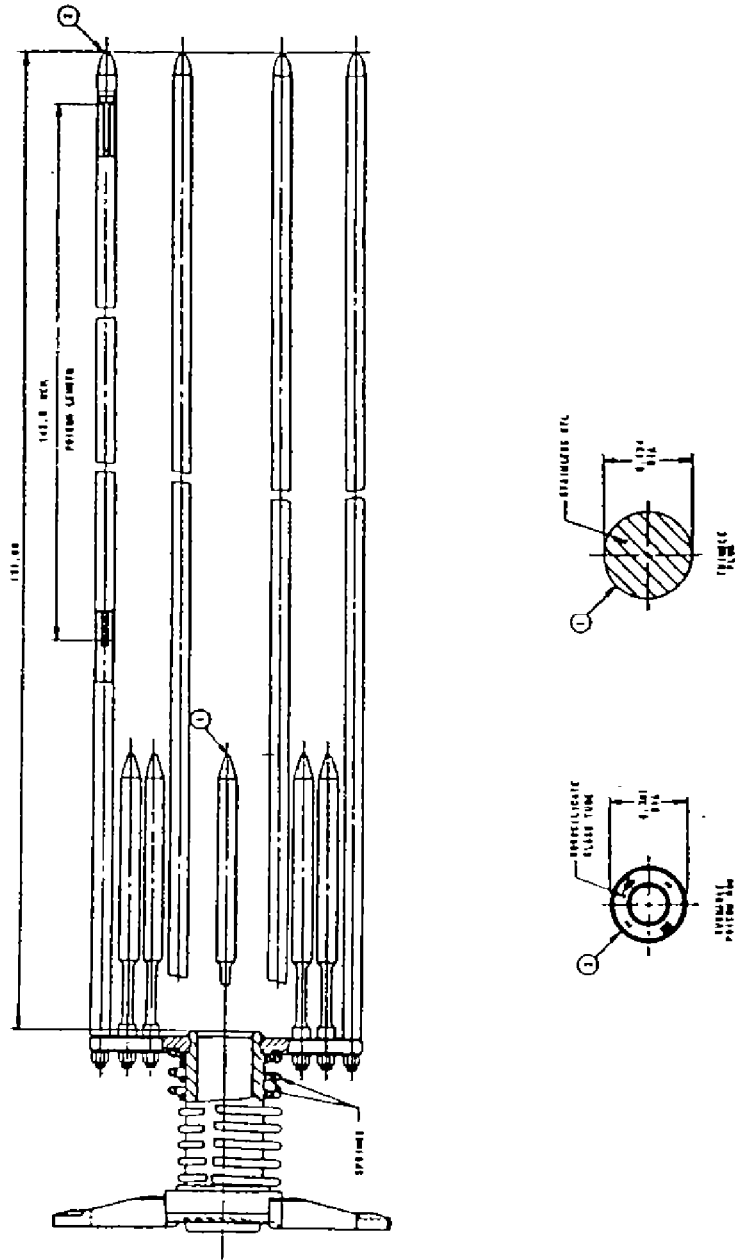
DWG. NO. **FSAR FIG. 3.2-12**

SH 1 of 1



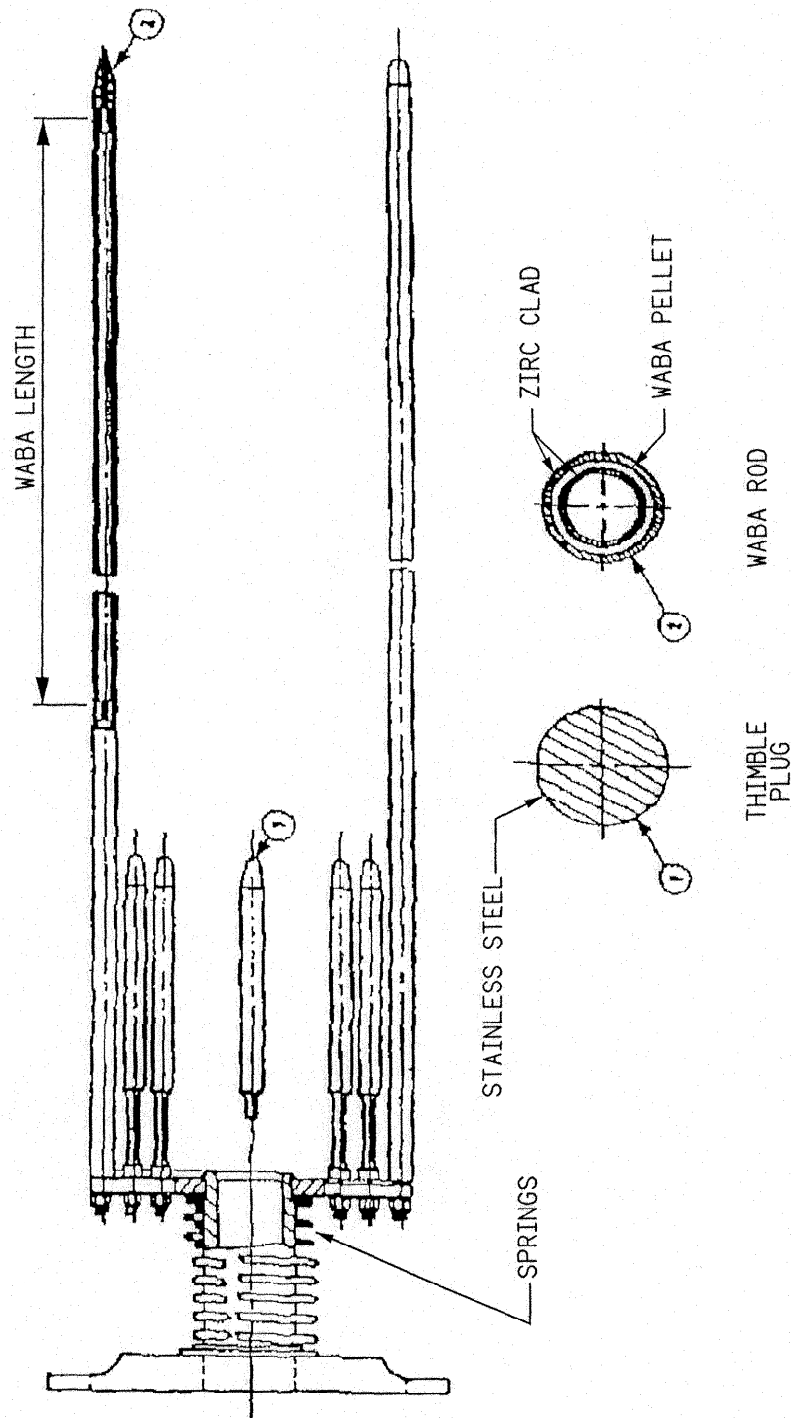
UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE FULL LENGTH ABSORBER ROD		
	DWG. NO. FSAR FIG. 3.2-13		SH 1 of 1



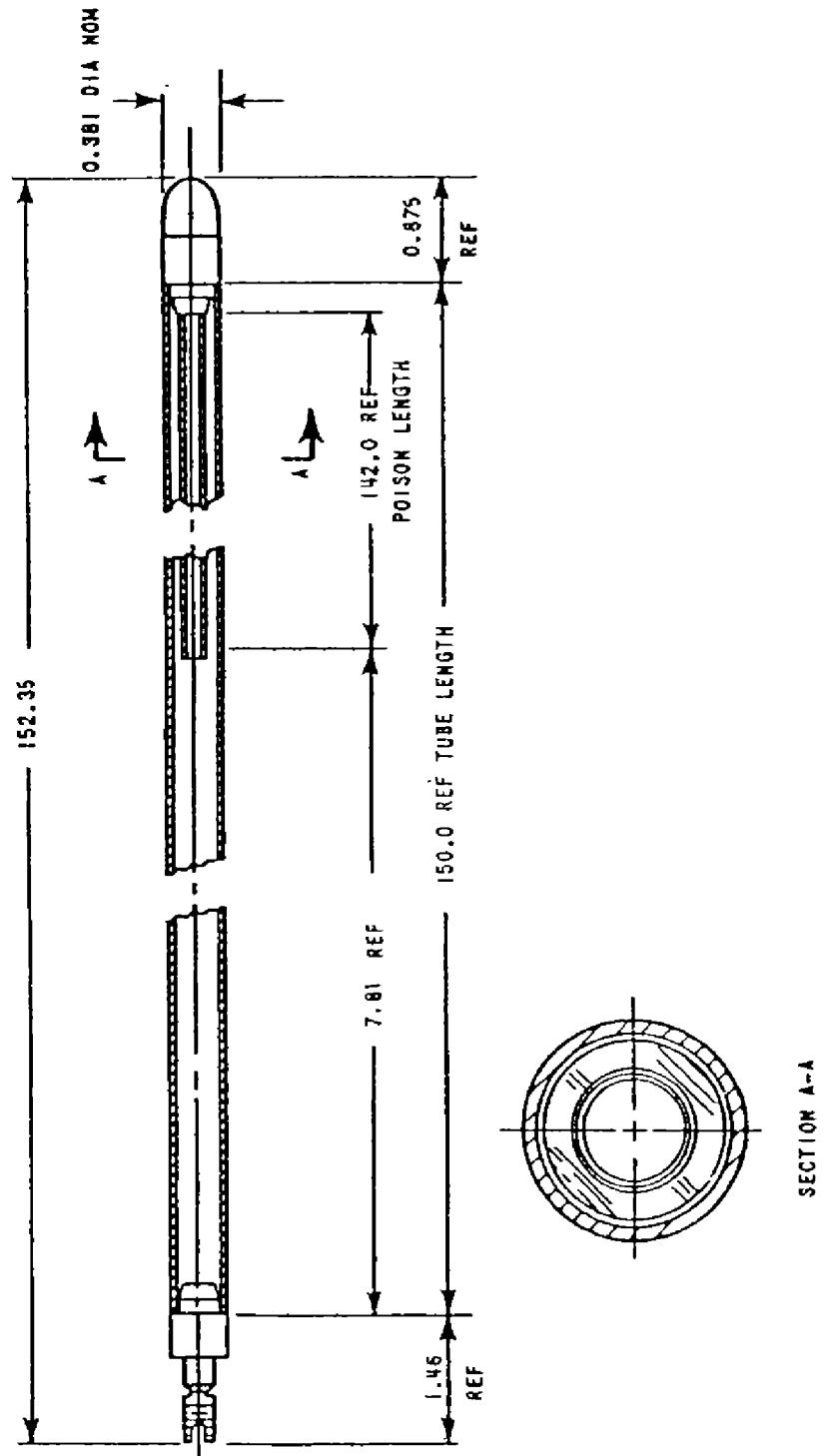
UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE TYPICAL BURNABLE POISON ASSEMBLY		
	DWG. NO. FSAR FIG. 3.2 - 15A		SH 1 of 1



19.2 REVISED PER UCR-1743

DATE		NO.	DESCRIPTION			DR.	CHK'D.	APP'D.
FILENAME: fsar-fig-3-2-15b 19-2.dgn (raster file): fsar-fig-3-2-15b 19-2.tif				REVISIONS				
OTHER:				TITLE - WET ANNULAR BURNABLE ABSORBER (WABA) ASSEMBLY			UNIT NO. 2	
							SH. 1 OF 1	
REF. DWGS:								
DR.	CK'D.	APP'D.	DATE:	DRAWING NO. FSAR FIG. 3.2-15B			REV. NO.	<div>19.2</div>

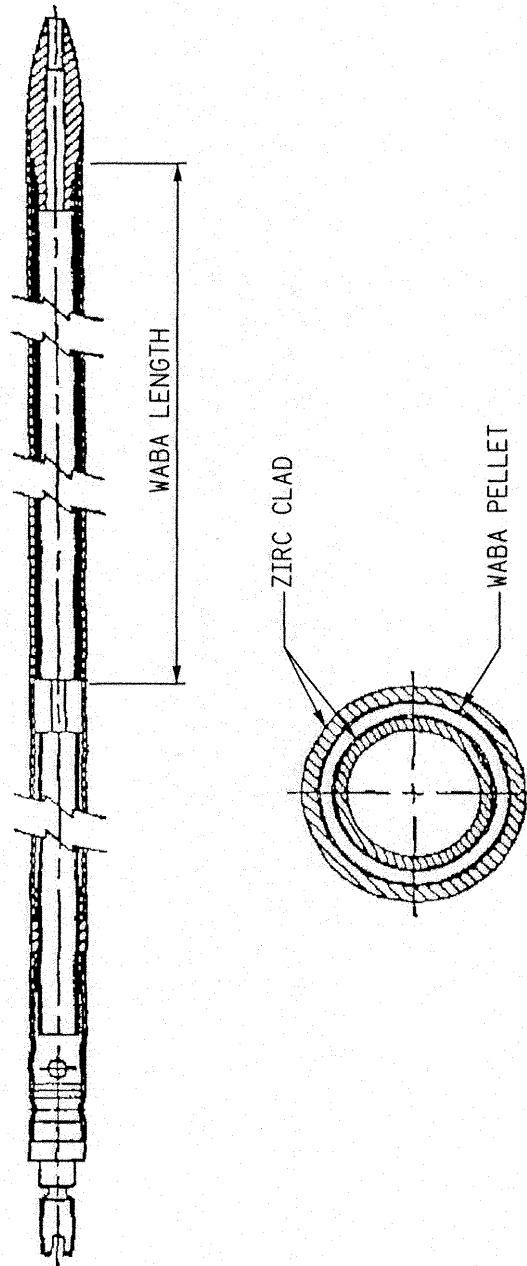


UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE TYPICAL BURNABLE POISON ROD CROSS SECTION		
	DWG. NO. FSAR FIG. 3.2-16A		SH 1 of 1



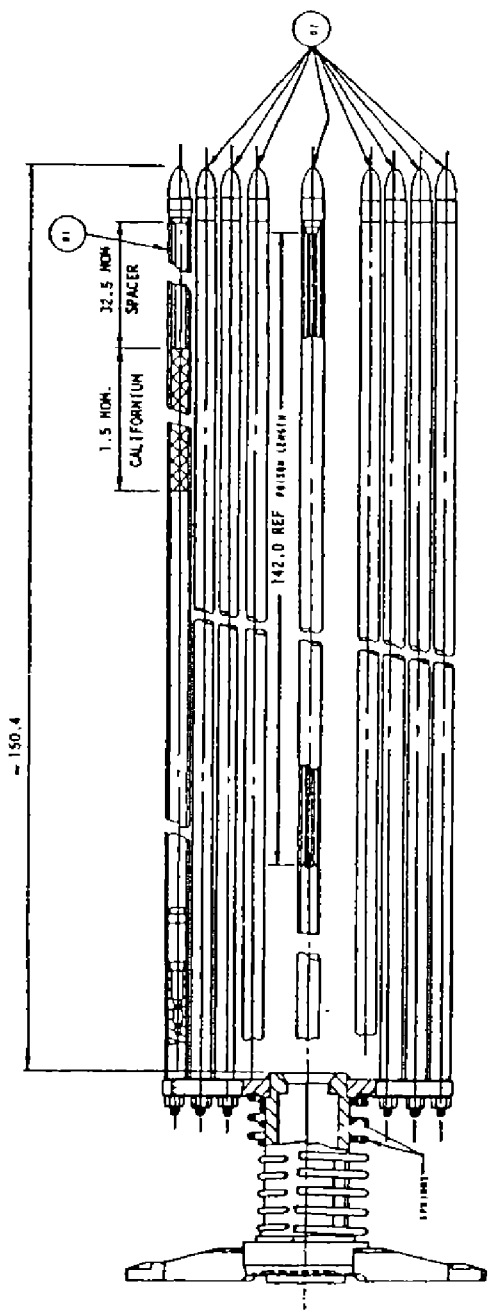
UFSAR Revision 30.0



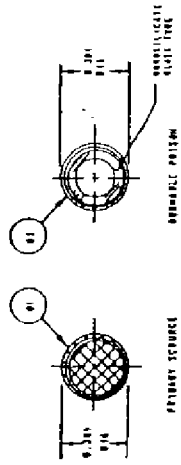
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OTHER:		REVISIONS		UNIT NO. 2	
REF. DWGS:		TITLE - BA ROD CROSS SECTION (WET ANNULAR BURNABLE ABSORBER)		SH. 1 OF 1	
DR.	CK'D.	APP'D.	DATE:	DRAWING NO. FSAR FIG. 3.2-16B	
				REV. NO.	19.2

HISTORICAL

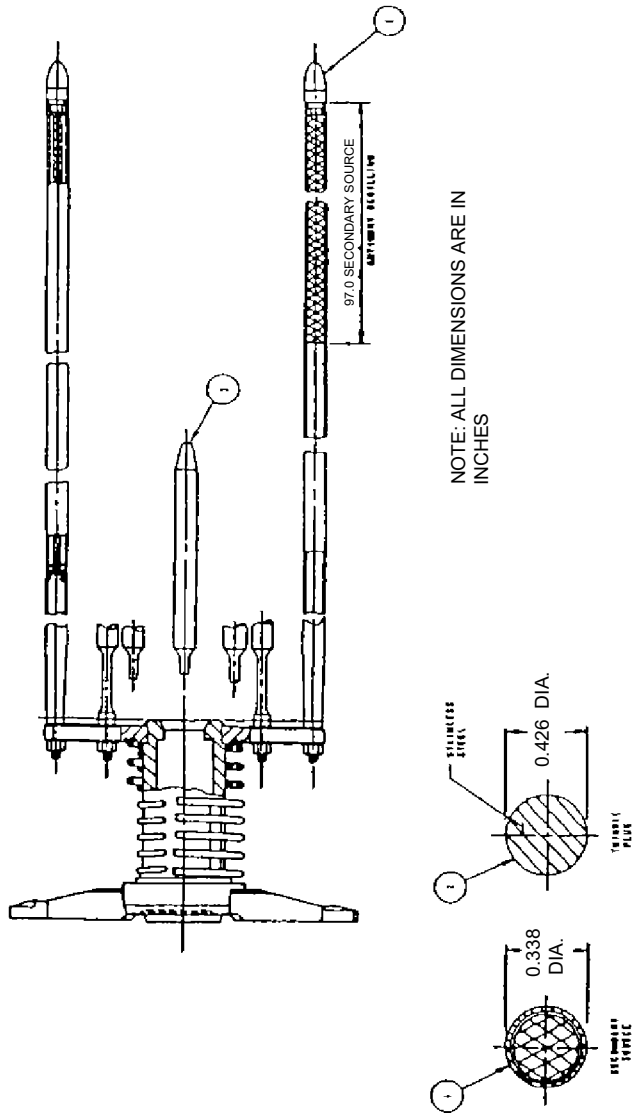


NOTE: ALL DIMENSIONS ARE IN INCHES



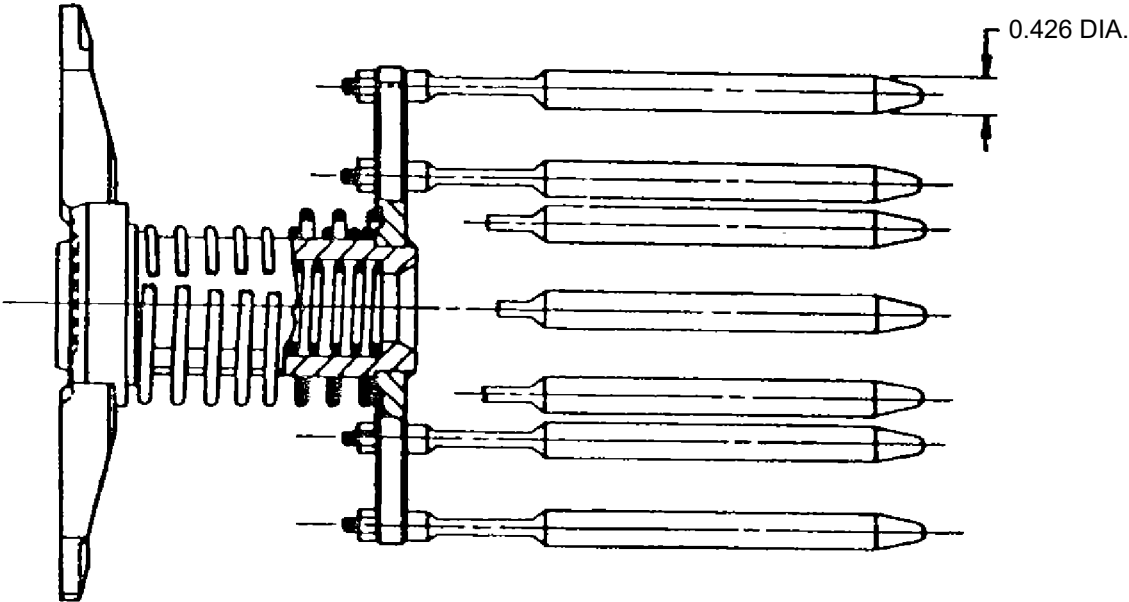
UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE PRIMARY SOURCE ASSEMBLY		
	DWG. NO. FSAR FIG. 3.2-17		SH 1 of 1



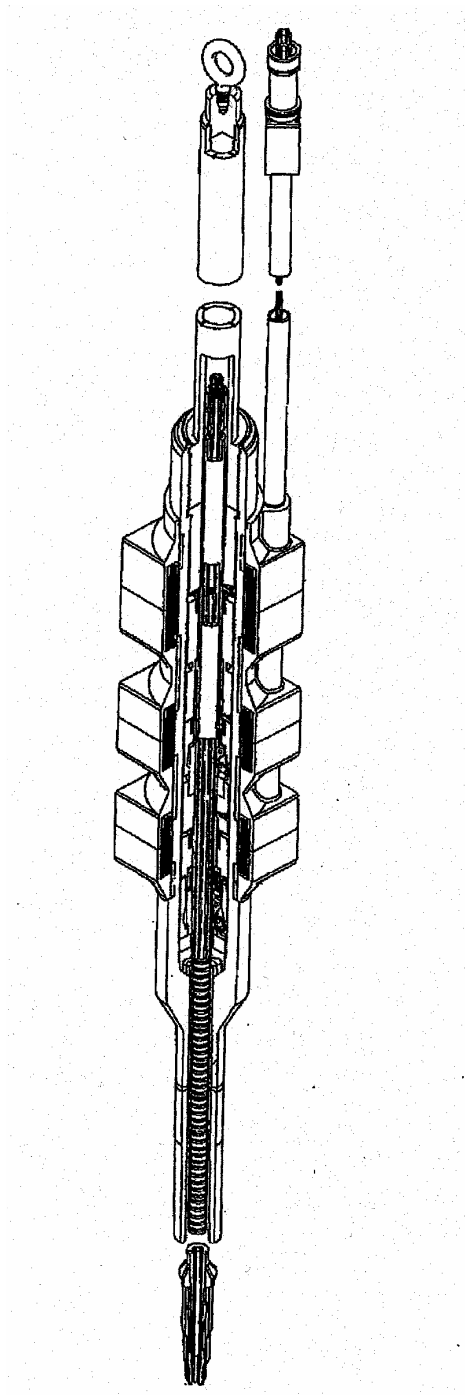
UNIT 2

16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE SECONDARY SOURCE ASSEMBLY		
	DWG. NO. FSAR FIG. 3.2 - 18		SH 1 of 1



UNIT 2

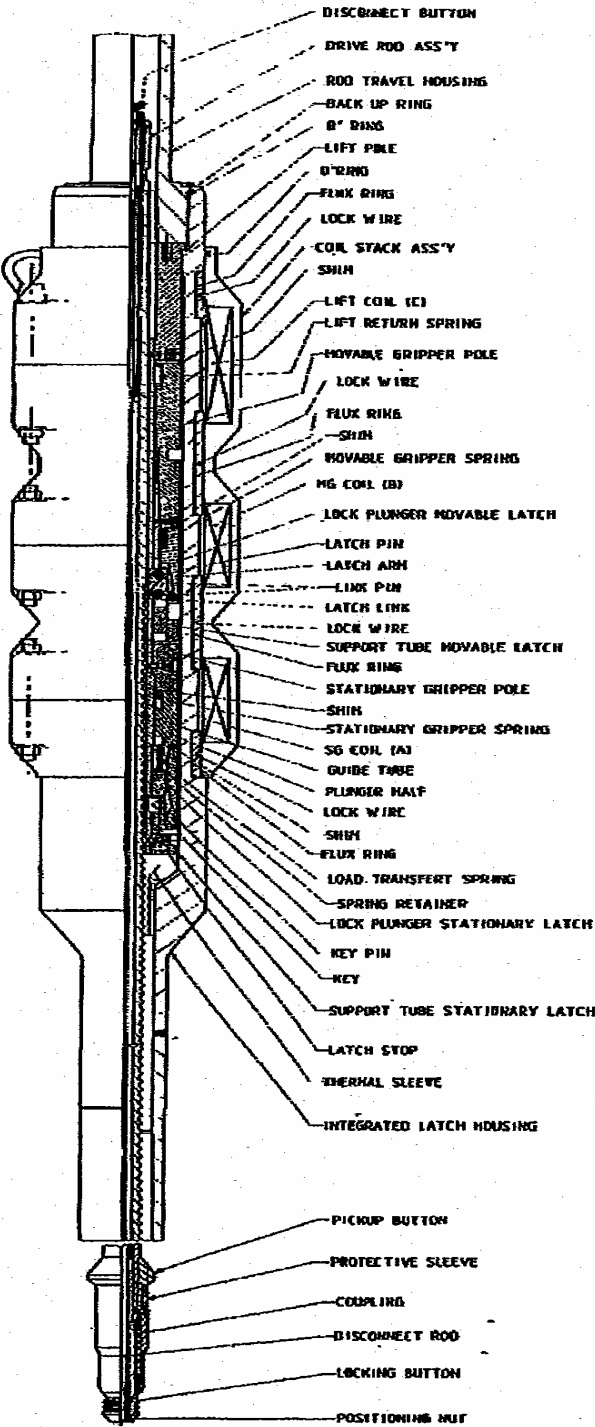
16.4	REVISED PER 99-UFSAR-1243		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE THIMBLE PLUG ASSEMBLY		
	DWG. NO. FSAR FIG. 3.2-19		SH 1 of 1



Revision: 21.2	Change Description: UCR-1836
-----------------------	-------------------------------------

AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	Title: Full Length Control Rod Drive Mechanism	
	UFSAR Figure: 3.2-20	Sheet 1 of 1

UFSAR Revision 30.0



Revision: 21.2

Change Description: UCR-1836

AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

Title: Full Length Control Rod Drive Mechanism
Schematic

UFSAR Figure: 3.2-21

Sheet 1 of 1

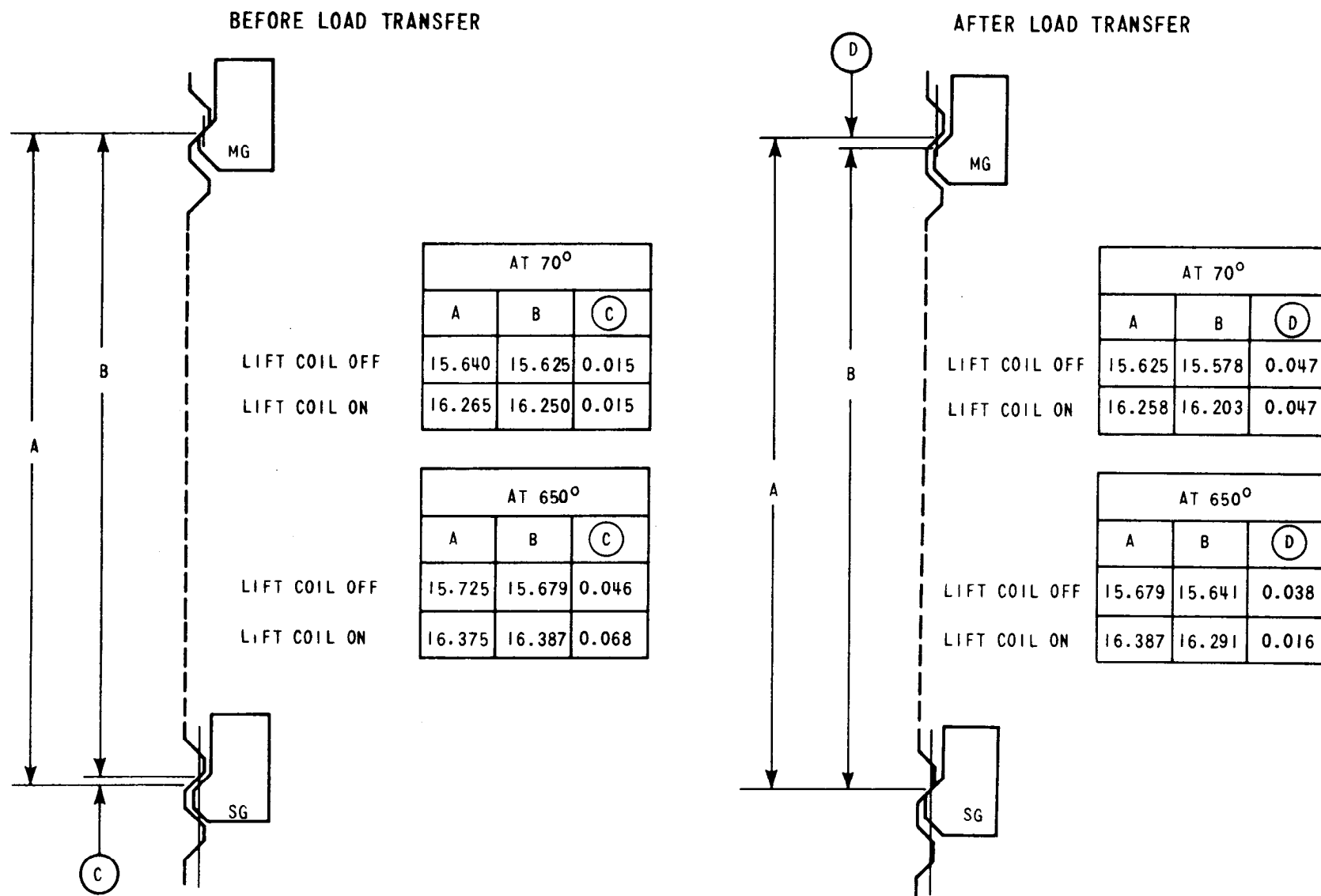


Figure 3.2-23 Nominal Latch Clearance at Minimum and Maximum Temperature

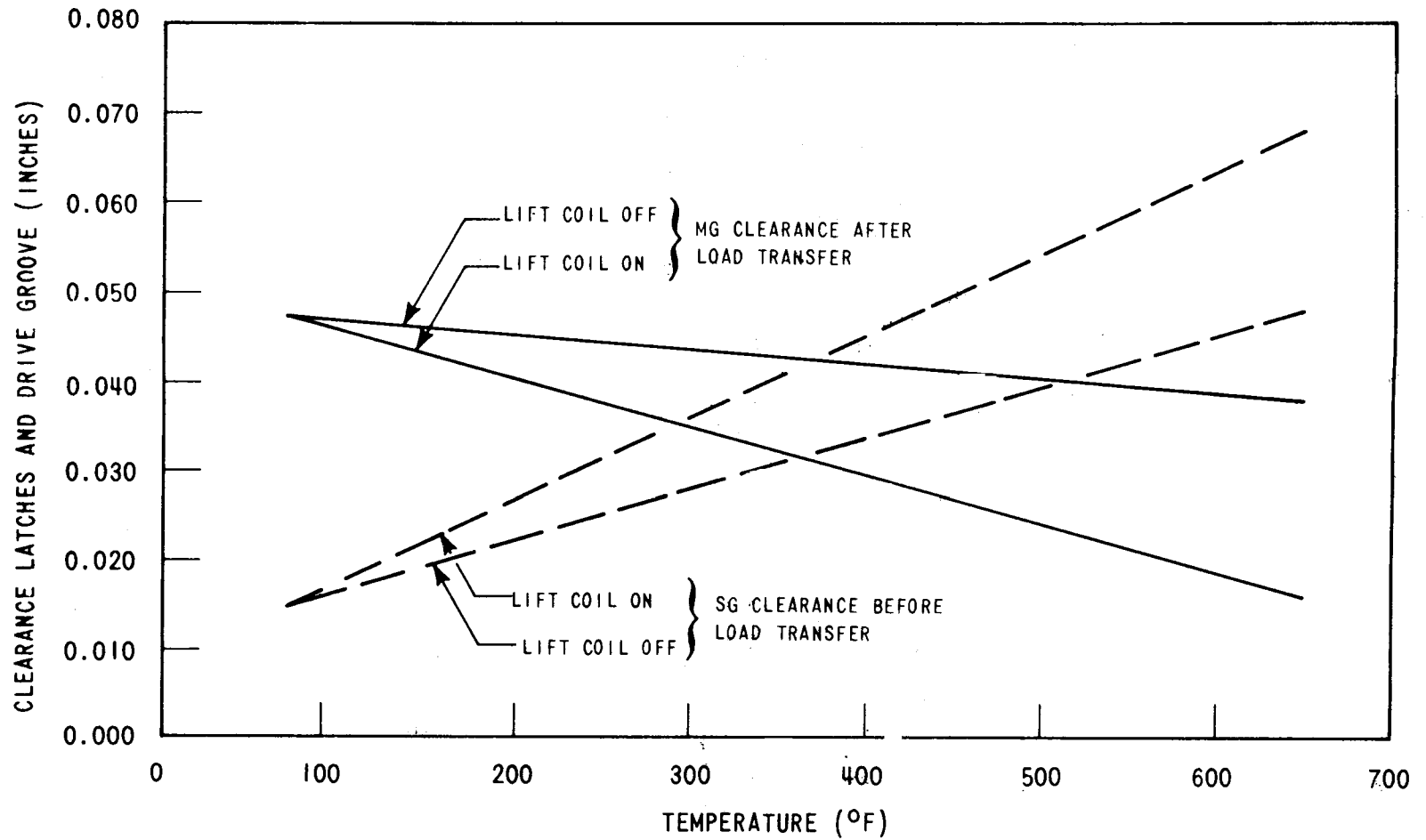
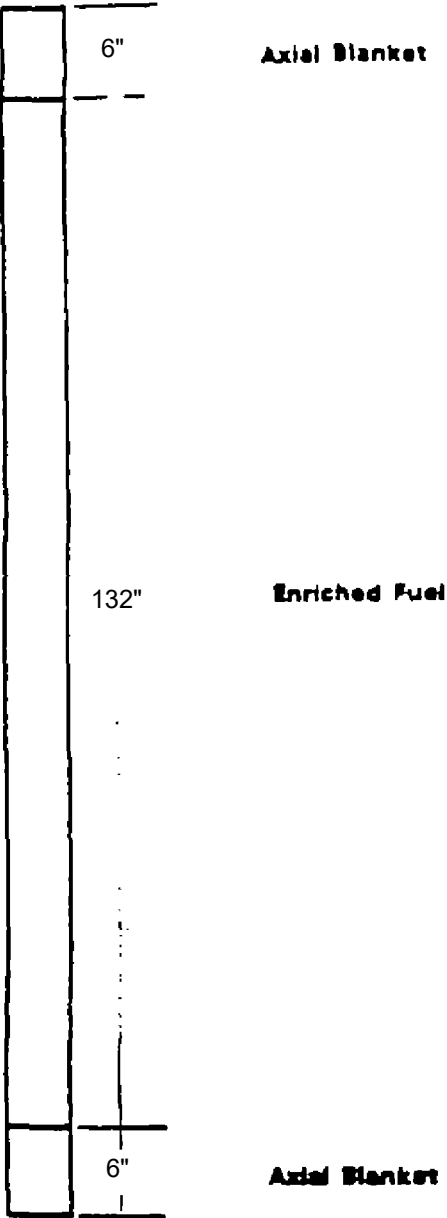


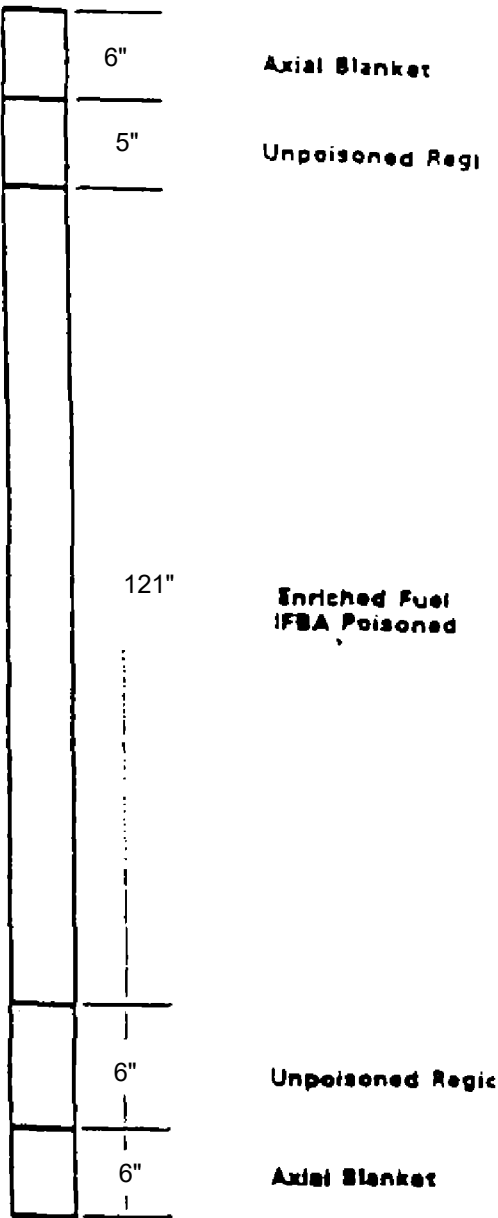
Figure 3.2-24 Control Rod Drive Mechanism Latch Clearance Thermal Effect

UFSAR Revision 30.0

Unpoisoned Fuel Rod



Poisoned Fuel Rod



UNIT 2

16.4

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REV. NO.

DESCRIPTION

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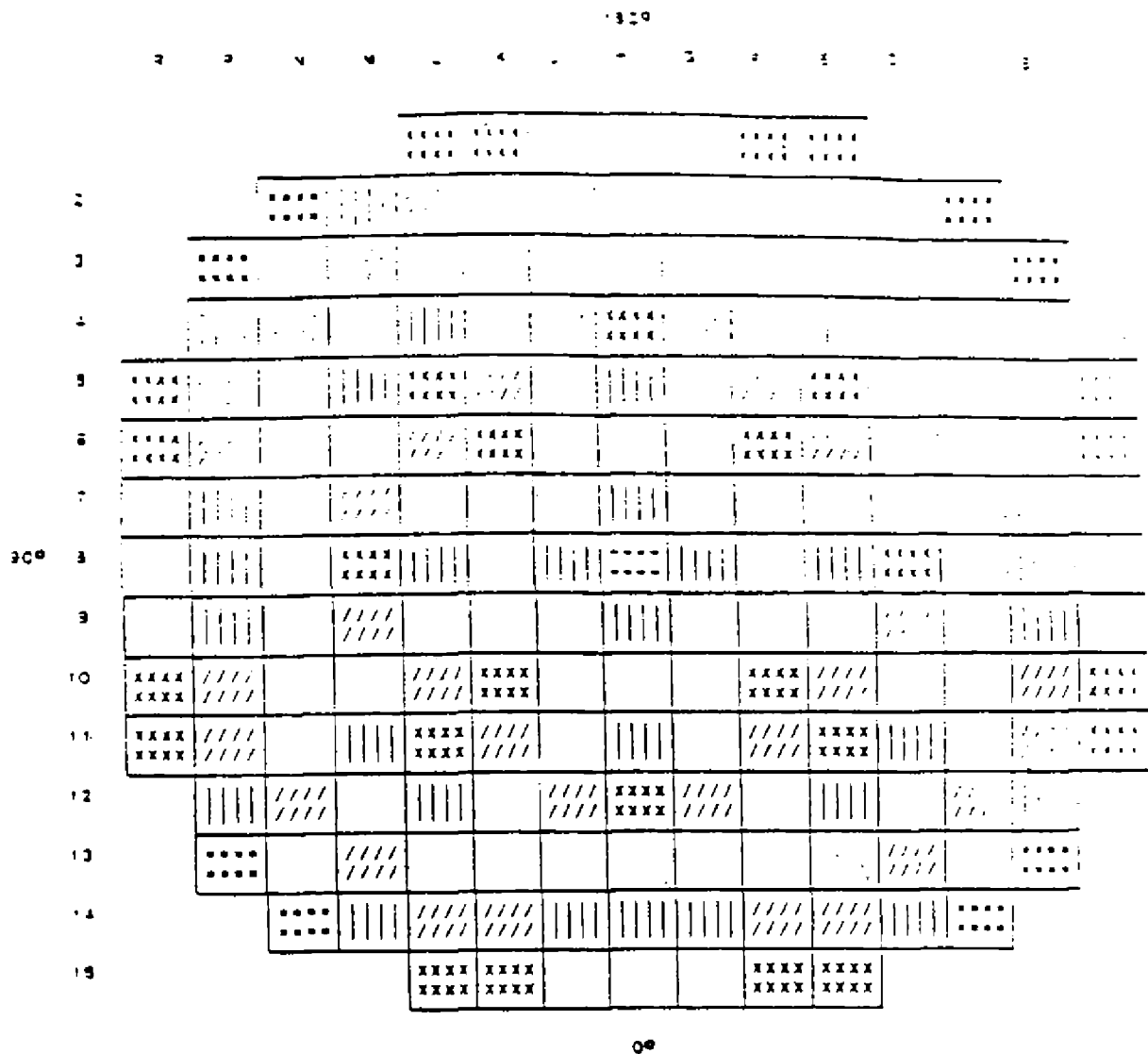
AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

TITLE
Typical Axial Zoning of Uranium
Enrichment and IFBA Poisoning

DWG. NO. FSAR FIG. 3.3-1

SH 1 of 1

UFSAR Revision 30.0

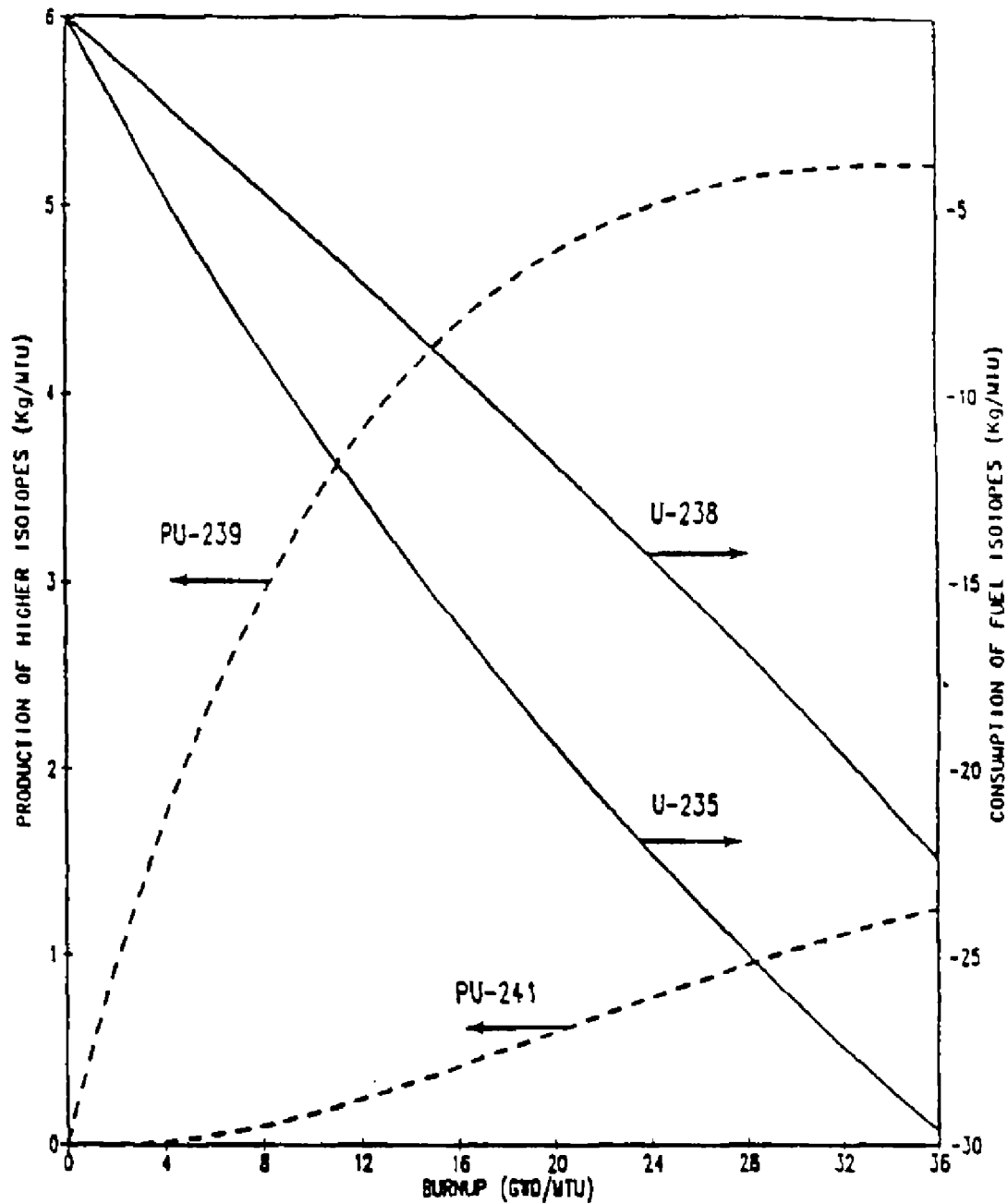


KEY

	REGION 7 (TWICE-BURNED ASSEMBLIES)		REGION 10A (FEED ASSEMBLIES)
	REGION 8 (TWICE-BURNED ASSEMBLIES)		REGION 10B (FEED ASSEMBLIES)
	REGION 9 (ONCE-BURNED ASSEMBLIES)		REGION 10C (FEED ASSEMBLY)

UNIT 2

16.4	REVISED PER 99-UFSAR-1242		
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE EXAMPLE LOW LEAKAGE FUEL LOADING ARRANGEMENT		
	DWG. NO. FSAR FIG. 3.3-2		SH 1 of 1



UNIT 2

16.4

REVISED PER 99-UFSAR-1242

REV. NO.

DESCRIPTION

REVISIONS

AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

TITLE **TYPICAL PRODUCTION AND
CONSUMPTION OF HIGHER ISOTOPES**

DWG. NO. **FSAR FIG. 3.3 - 3**

SH 1 of 1

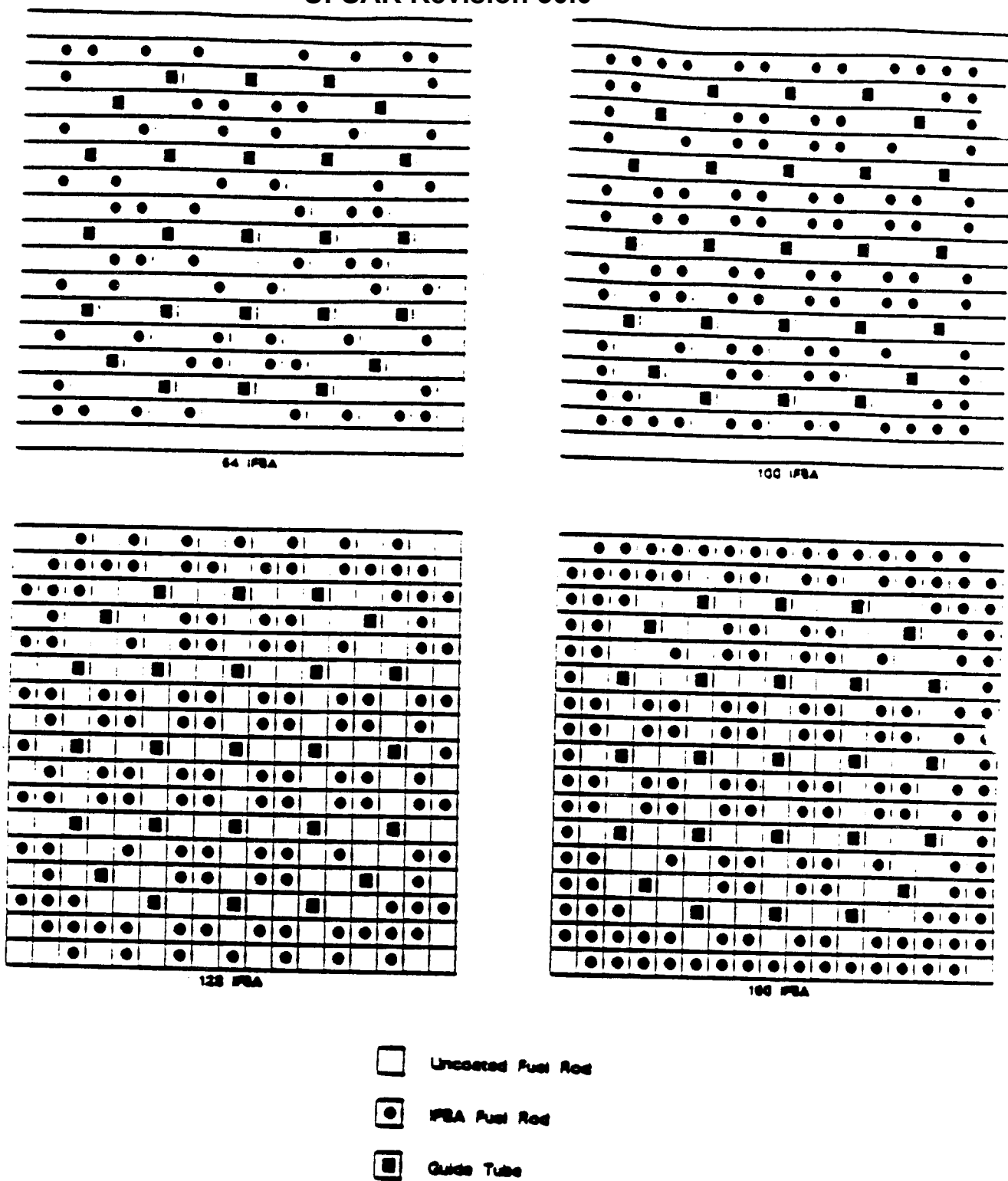


Figure 3.3-4 Example IFBA Arrangements Within an Assembly

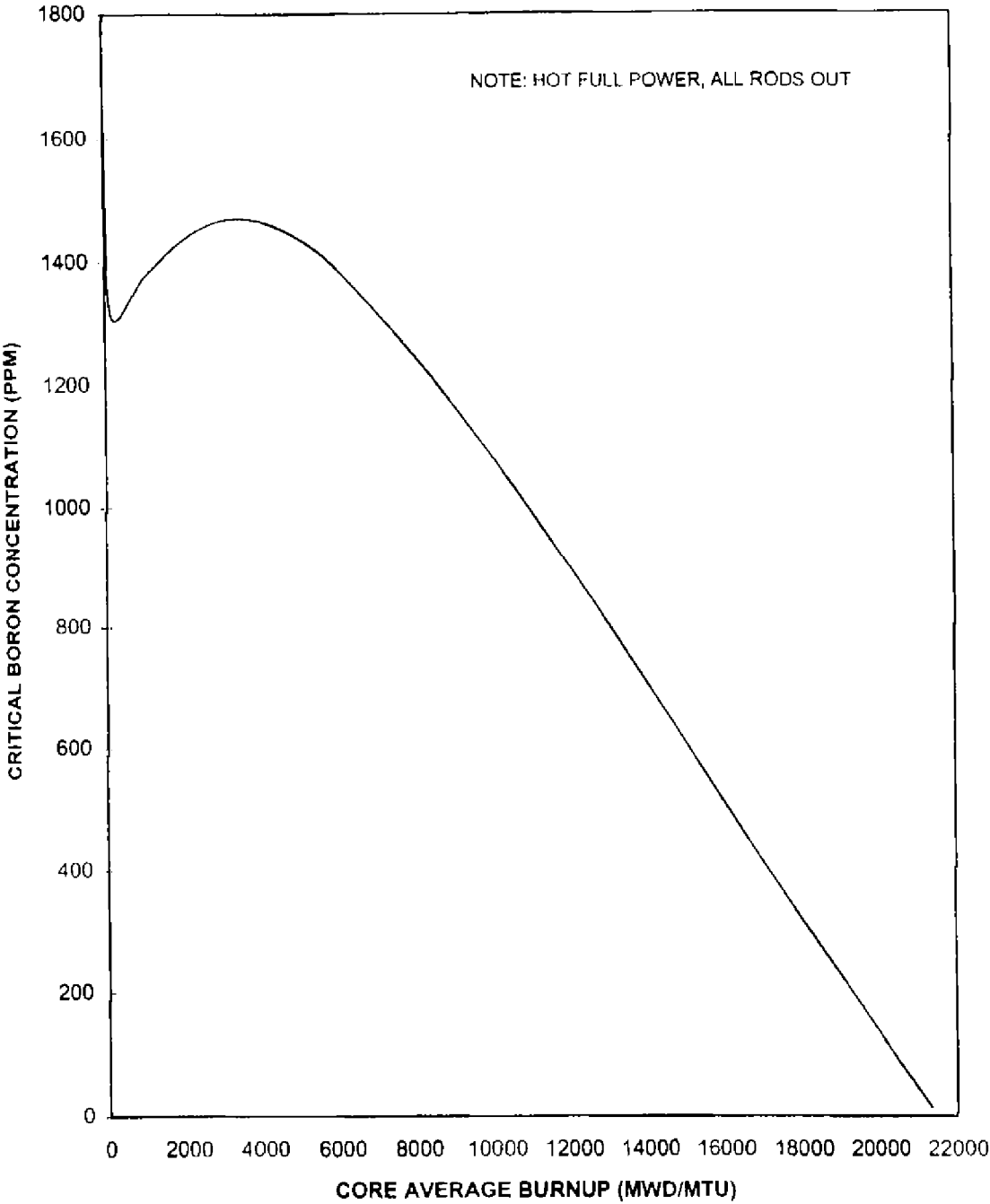
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8

NUMBER OF BURNABLE ABSORBER RODS
SECONDARY SOURCE ROD

UNIT 2

July 1991



UNIT 2

16.4

REVISED PER 99-UFSAR-1242

REV. NO.

DESCRIPTION

REVISIONS

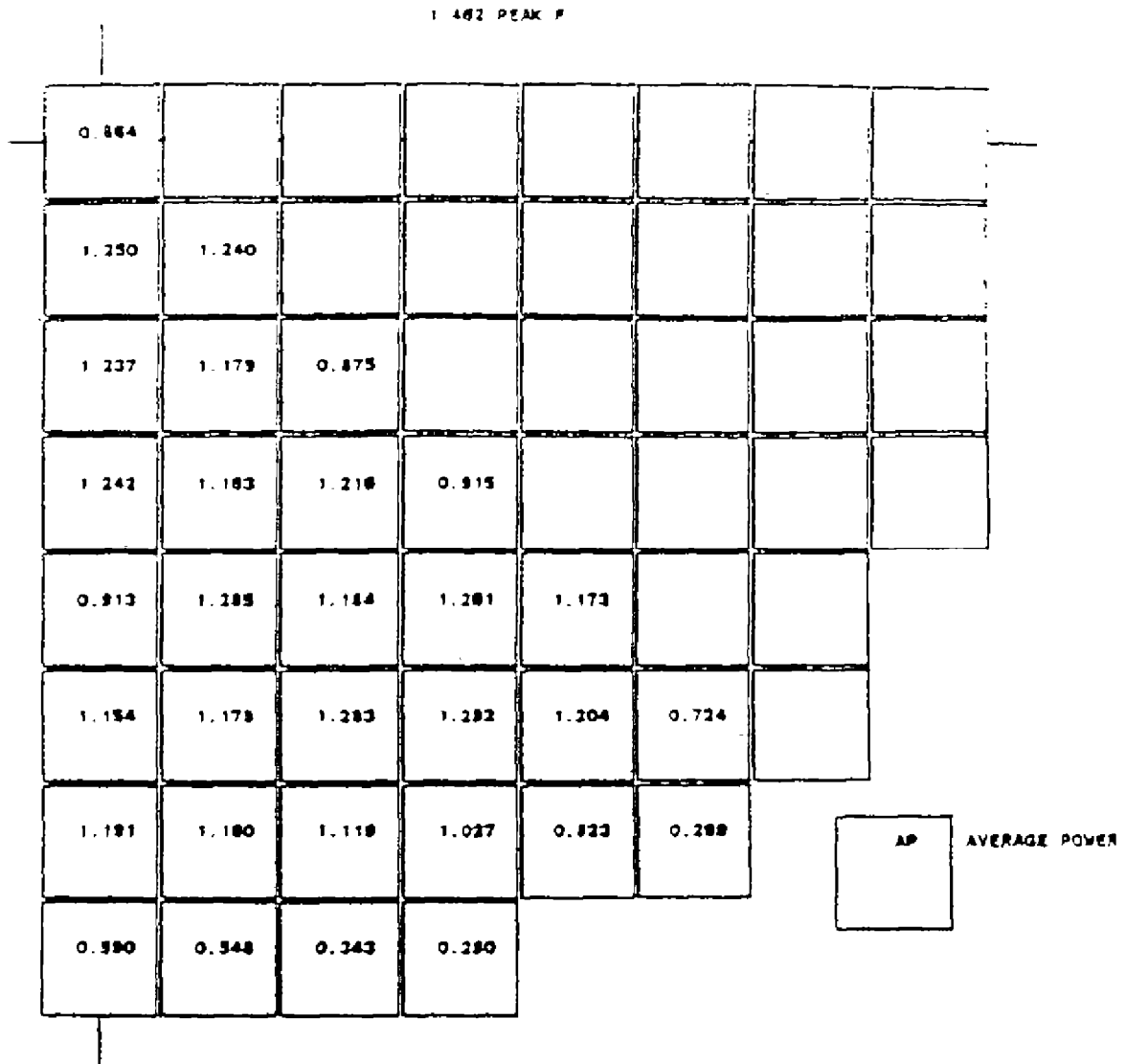
AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

TITLE **EXAMPLE BORON CONCENTRATION OVER
CYCLE LENGTH**

DWG. NO. **FSAR FIG. 3.3-6**

SH 1 of 1

UFSAR Revision 30.0



UNIT 2

16.4

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REV. NO.

DESCRIPTION

REVISIONS

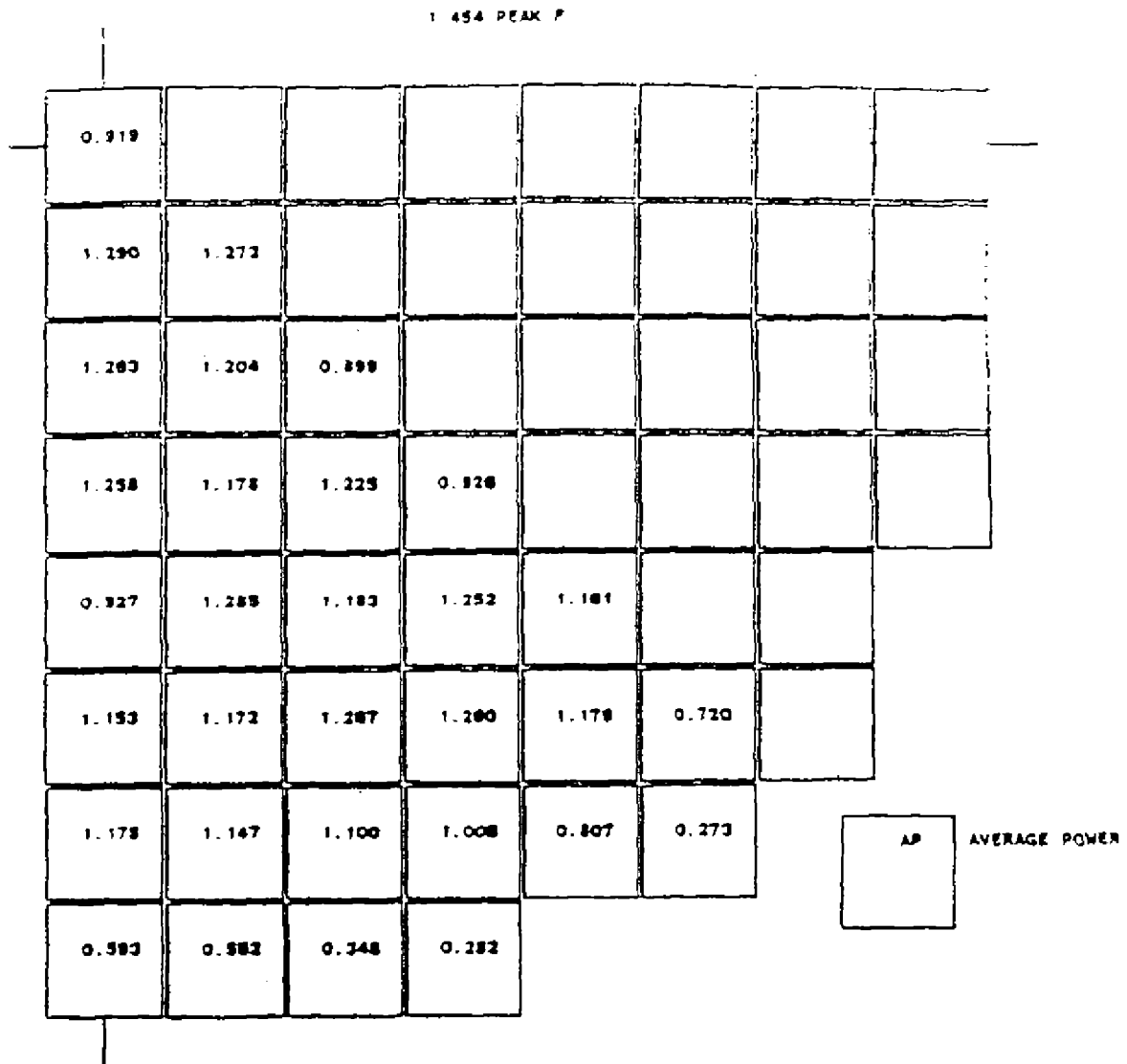
AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

TITLE TYPICAL NORMALIZED POWER DENSITY DISTRIBUTION AT
BEGINNING-OF-LIFE UNRODDED CORE, HOT FULL POWER, NO
XENON

DWG. NO. FSAR FIG. 3.3-7

SH 1 of 1

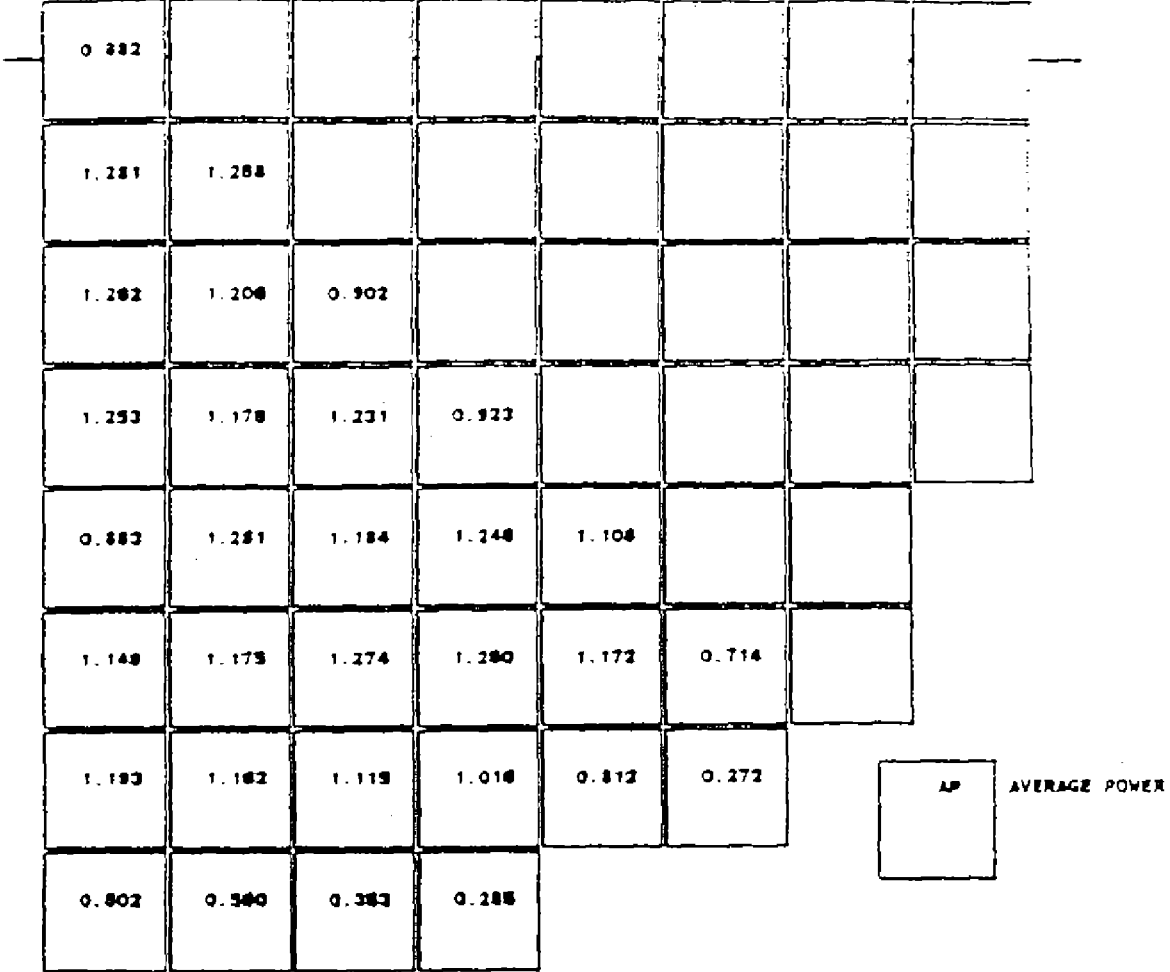
UFSAR Revision 30.0



UNIT 2

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|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL NORMALIZED POWER DENSITY DISTRIBUTION AT
BEGINNING-OF-LIFE UNRODDED CORE, HOT FULL POWER,
EQUILIBRIUM XENON | | |
| | DWG. NO. FSAR FIG. 3.3-8 | | SH 1 of 1 |

1.456 PEAK P

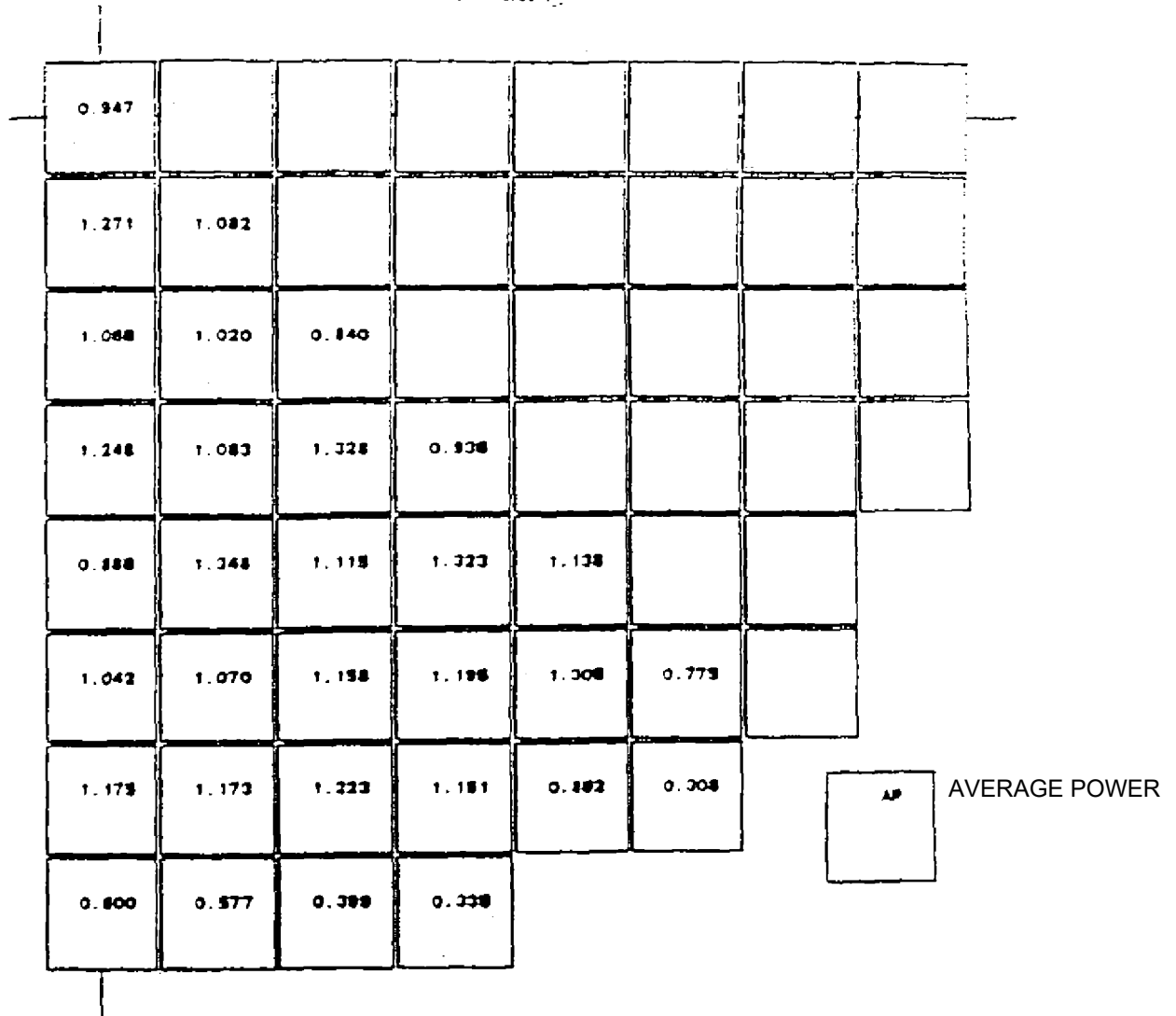


UNIT 2

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| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE | TYPICAL NORMALIZED POWER DENSITY DISTRIBUTION NEAR
BEGINNING-OF-LIFE GROUP D AT INSERTION LIMIT, HOT FULL
POWER, EQUILIBRIUM XENON | |
| | DWG. NO. FSAR FIG. 3.3-9 | | SH 1 of 1 |

UFSAR Revision 30.0

1.467 PEAK P.

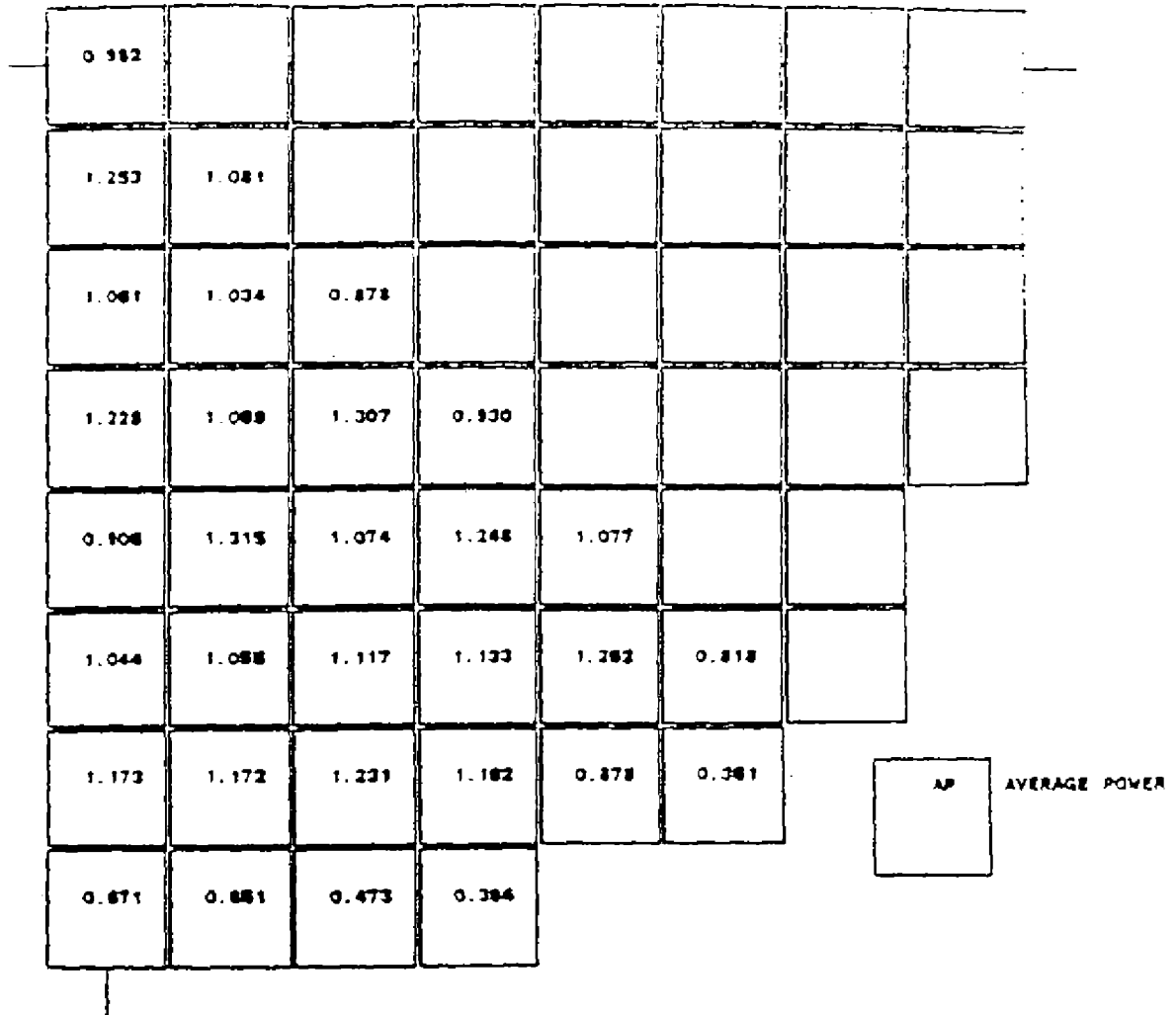


UNIT 2

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|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL NORMALIZED POWER DENSITY DISTRIBUTION AT
MIDDLE-OF-LIFE UNRODDED CORE, HOT FULL POWER,
EQUILIBRIUM XENON. | | |
| | DWG. NO. FSAR FIG. 3.3-10 | | SH 1 of 1 |

UFSAR Revision 30.0

1.385 PEAK P



UNIT 2

| | | | |
|---|--|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL NORMALIZED POWER DENSITY DISTRIBUTION NEAR
END-OF-LIFE UNRODDED CORE, HOT FULL POWER,
EQUILIBRIUM XENON. | | |
| | DWG. NO. FSAR FIG. 3.3-11 | | SH 1 of 1 |

UFSAR Revision 30.0

| |
|--|
| 1.27 |
| 1.18 1.12 |
| 1.16 1.14 1.19 |
| 1.17 1.17 1.32 XXX |
| 1.19 1.21 1.36 1.40 1.33 |
| 1.20 1.29 XXX 1.37 1.37 XXX |
| 1.19 1.21 1.32 1.25 1.26 1.36 1.28 |
| 1.18 1.21 1.32 1.24 1.26 1.36 1.28 1.28 |
| 1.18 1.28 XXX 1.32 1.34 XXX 1.36 1.37 XXX |
| 1.18 1.20 1.31 1.24 1.25 1.36 1.28 1.28 1.38 1.30 |
| 1.18 1.20 1.31 1.25 1.26 1.36 1.27 1.28 1.38 1.30 1.30 |
| 1.18 1.28 XXX 1.36 1.36 XXX 1.37 1.37 XXX 1.39 1.40 XXX |
| 1.17 1.19 1.34 1.38 1.32 1.37 1.27 1.28 1.37 1.29 1.30 1.42 1.37 |
| 1.14 1.15 1.29 XXX 1.39 1.38 1.27 1.27 1.38 1.28 1.30 1.42 1.45 XXX |
| 1.14 1.11 1.16 1.30 1.36 XXX 1.35 1.35 XXX 1.37 1.38 XXX 1.42 1.37 1.23 |
| 1.14 1.09 1.11 1.16 1.21 1.30 1.24 1.24 1.32 1.25 1.26 1.34 1.26 1.22 1.18 1.17 |
| 1.22 1.14 1.13 1.15 1.18 1.21 1.21 1.22 1.22 1.23 1.23 1.24 1.23 1.21 1.20 1.22 1.31 |

UNIT 2

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|---|--|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL RODWISE POWER DISTRIBUTION IN A TYPICAL ASSEMBLY (ASSEMBLY G-12) NEAR BEGINNING-OF-LIFE, HOT FULL POWER, EQUILIBRIUM XENON, UNRODDED CORE. | | |
| | DWG. NO. FSAR FIG. 3.3-12 | | SH 1 of 1 |

UFSAR Revision 30.0

| |
|--|
| 1.32 |
| 1.31 1.24 |
| 1.31 1.26 1.26 |
| 1.31 1.27 1.31 XXX |
| 1.32 1.29 1.32 1.34 1.32 |
| 1.33 1.31 XXX 1.33 1.34 XXX |
| 1.32 1.29 1.32 1.30 1.31 1.34 1.32 |
| 1.32 1.29 1.31 1.29 1.30 1.33 1.32 1.32 |
| 1.31 1.30 XXX 1.31 1.32 XXX 1.34 1.34 XXX |
| 1.32 1.29 1.31 1.29 1.30 1.33 1.32 1.32 1.34 1.32 |
| 1.32 1.28 1.31 1.29 1.30 1.33 1.32 1.32 1.34 1.32 1.32 |
| 1.31 1.30 XXX 1.32 1.32 XXX 1.33 1.34 XXX 1.34 1.34 XXX |
| 1.30 1.27 1.30 1.32 1.30 1.33 1.30 1.31 1.33 1.31 1.31 1.34 1.33 |
| 1.29 1.24 1.28 XXX 1.31 1.32 1.30 1.30 1.32 1.30 1.31 1.34 1.34 XXX |
| 1.27 1.22 1.23 1.27 1.30 XXX 1.31 1.32 XXX 1.32 1.32 XXX 1.33 1.31 1.28 |
| 1.27 1.21 1.21 1.24 1.28 1.30 1.28 1.29 1.31 1.29 1.29 1.32 1.29 1.27 1.25 1.24 |
| 1.28 1.25 1.25 1.27 1.29 1.30 1.30 1.31 1.31 1.31 1.32 1.32 1.31 1.30 1.29 1.29 1.31 |

UNIT 2

| | | | |
|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL RODWISE POWER DISTRIBUTION IN A TYPICAL ASSEMBLY (ASSEMBLY G-12) NEAR END-OF-LIFE, HOT FULL POWER EQUILIBRIUM XENON, UNRODDED CORE. | | |
| | DWG. NO. FSAR FIG. 3.3-13 | | SH 1 of 1 |

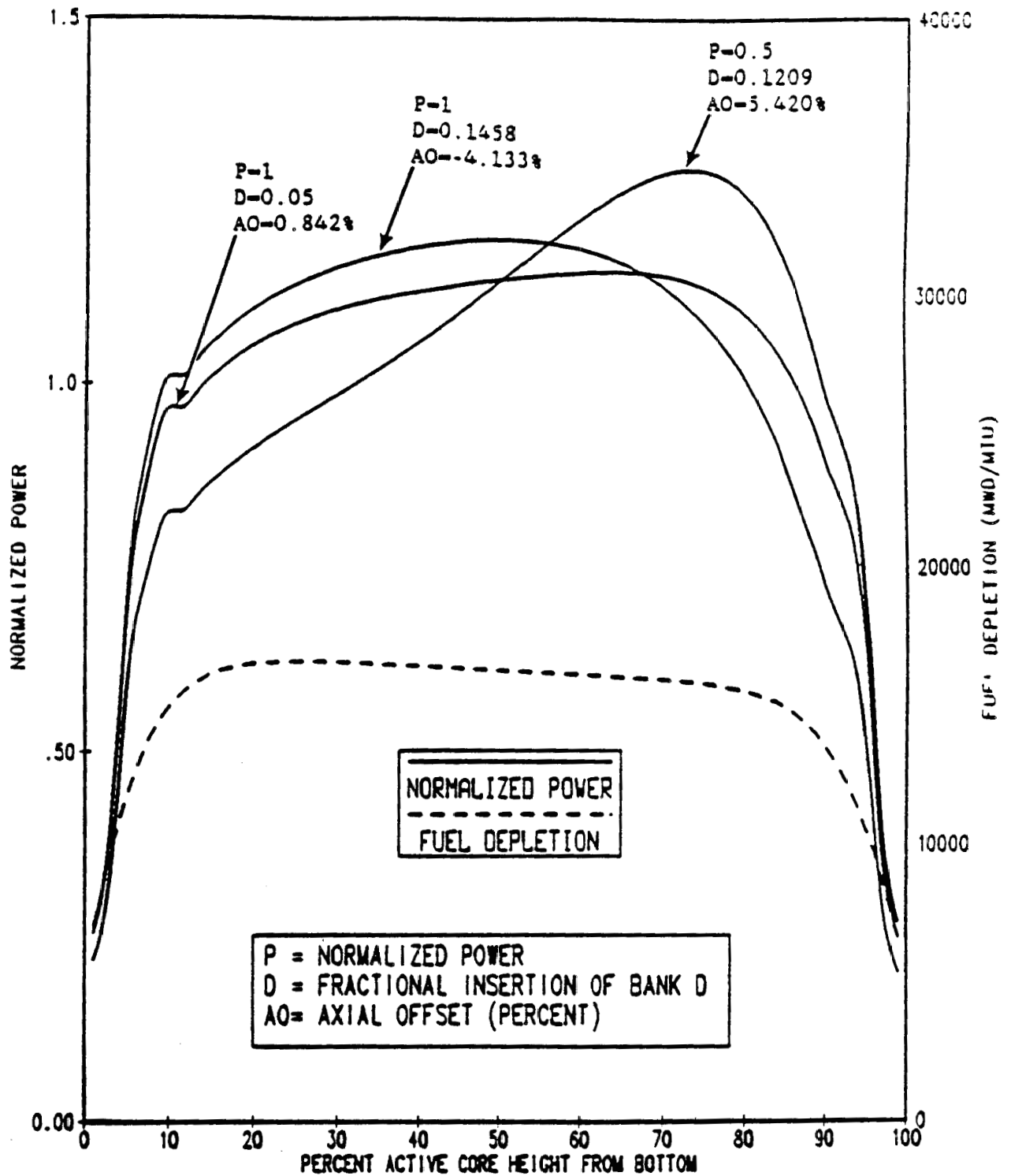
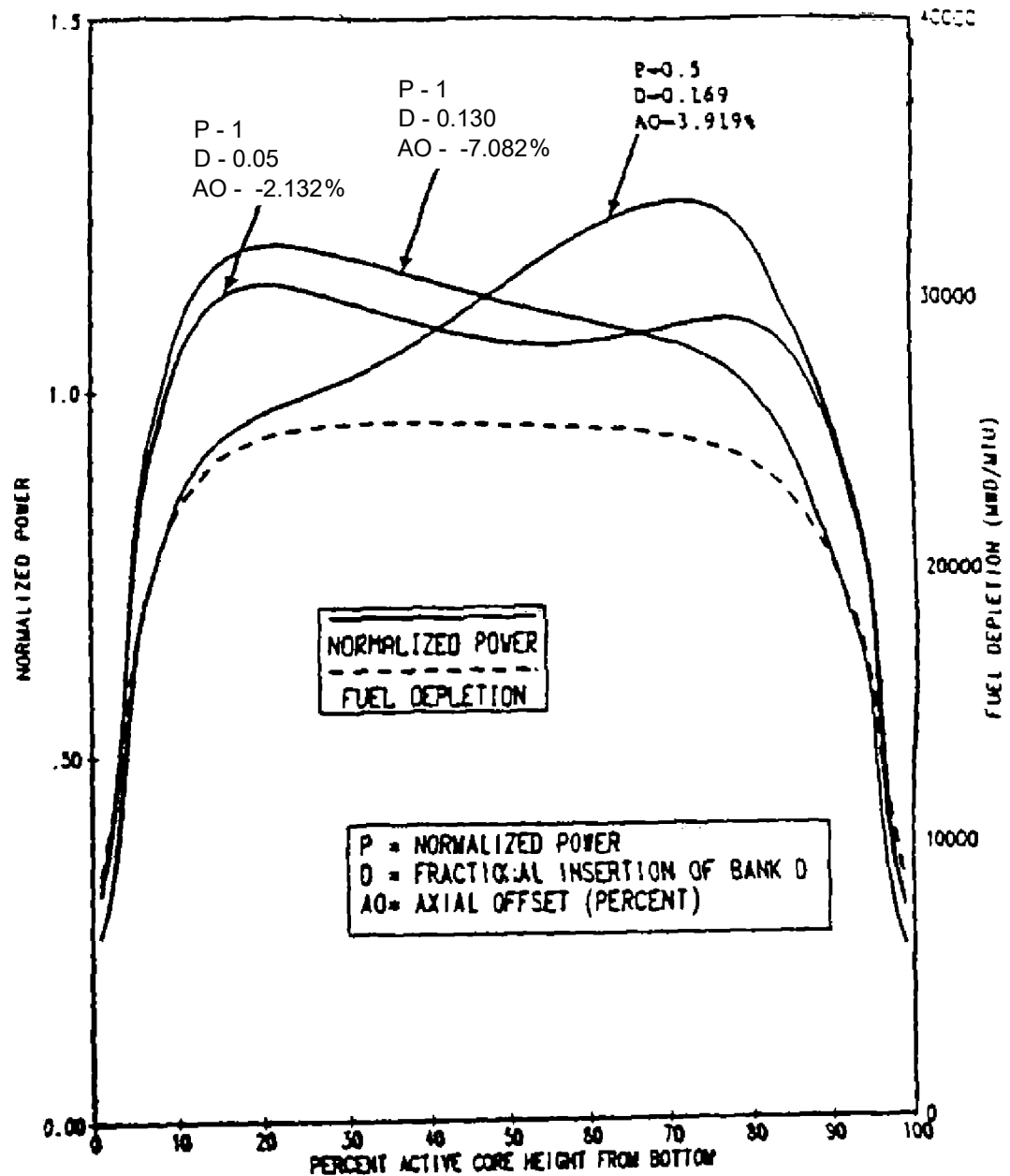


Figure 3.3-14 Example Axial Power Shapes Occurring at BOL

UFSAR Revision 30.0



UNIT 2

| | | | |
|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE
EXAMPLE AXIAL POWER SHAPES
OCCURRING AT MOL | | |
| | DWG. NO. FSAR FIG. 3.3-15 | | SH 1 of 1 |

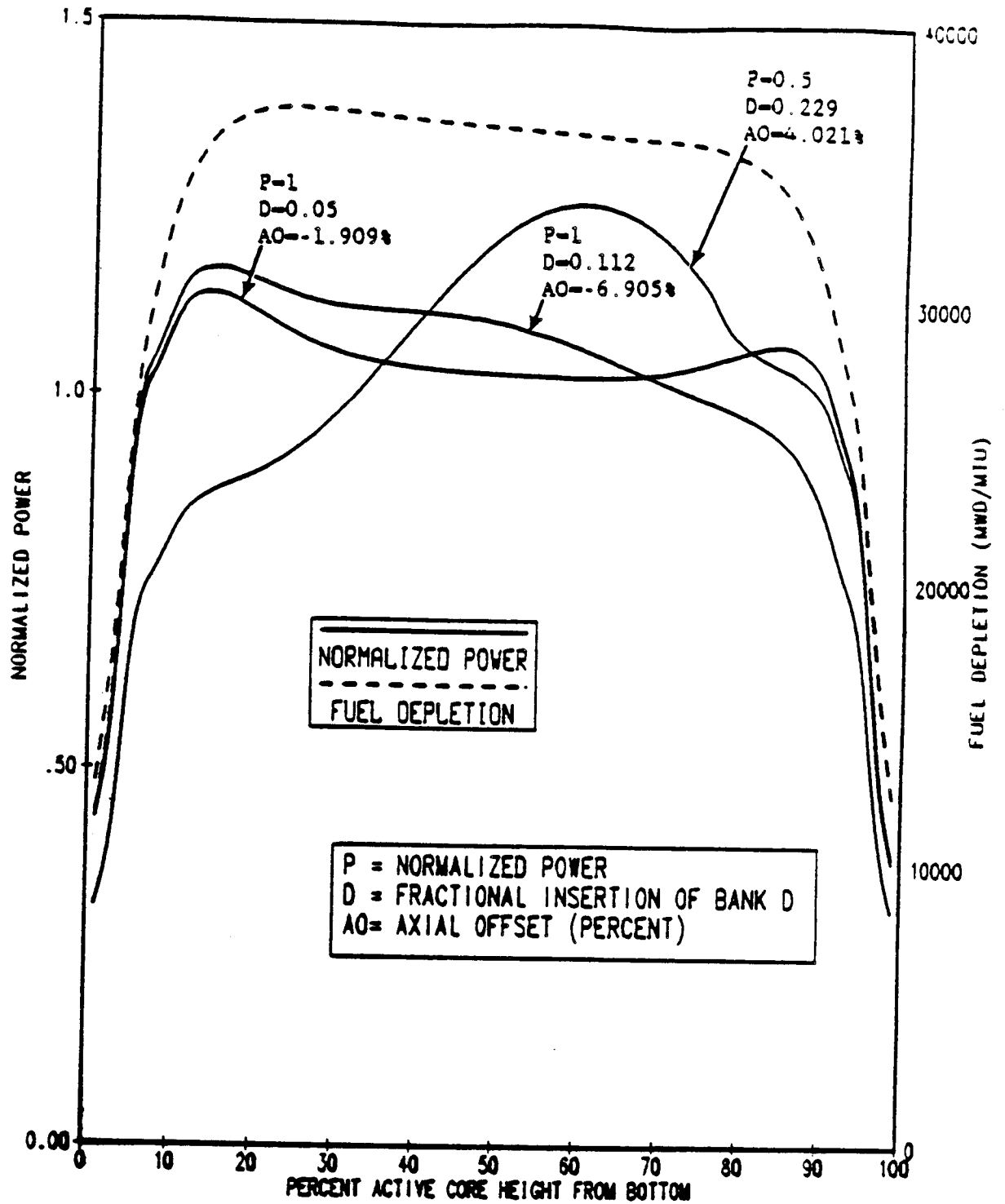
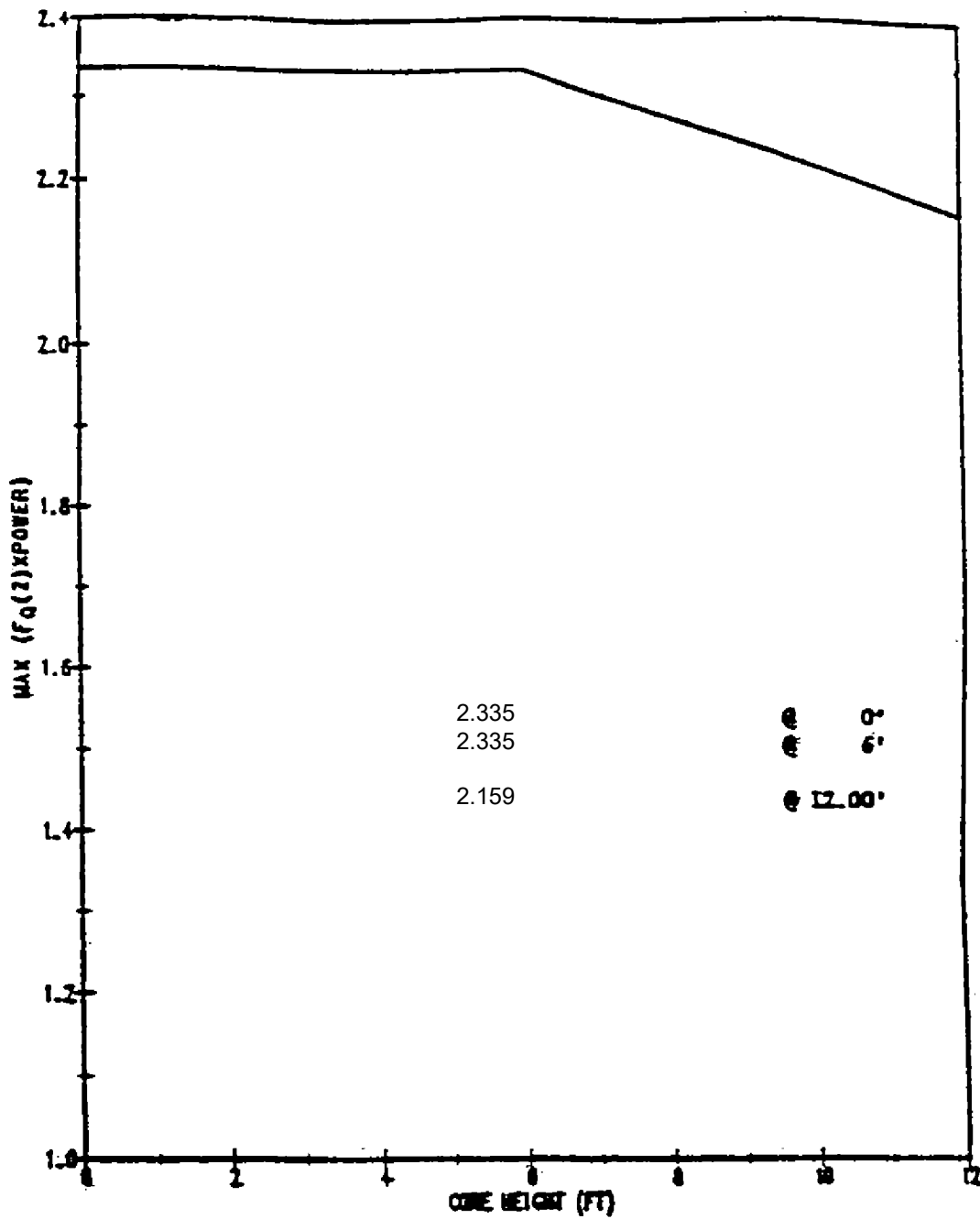
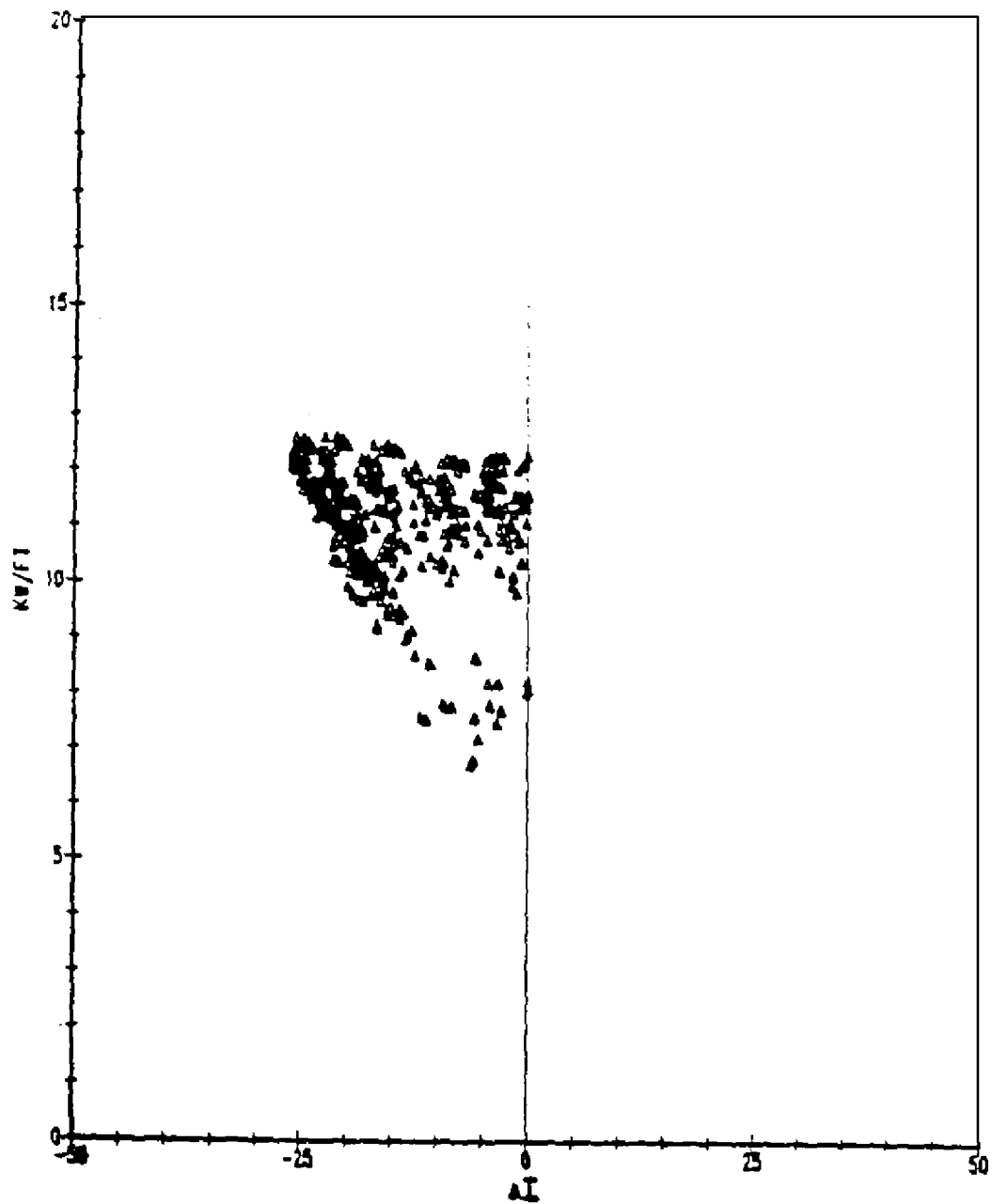


Figure 3.3-16 Example Axial Power Shapes Occurring at EOL



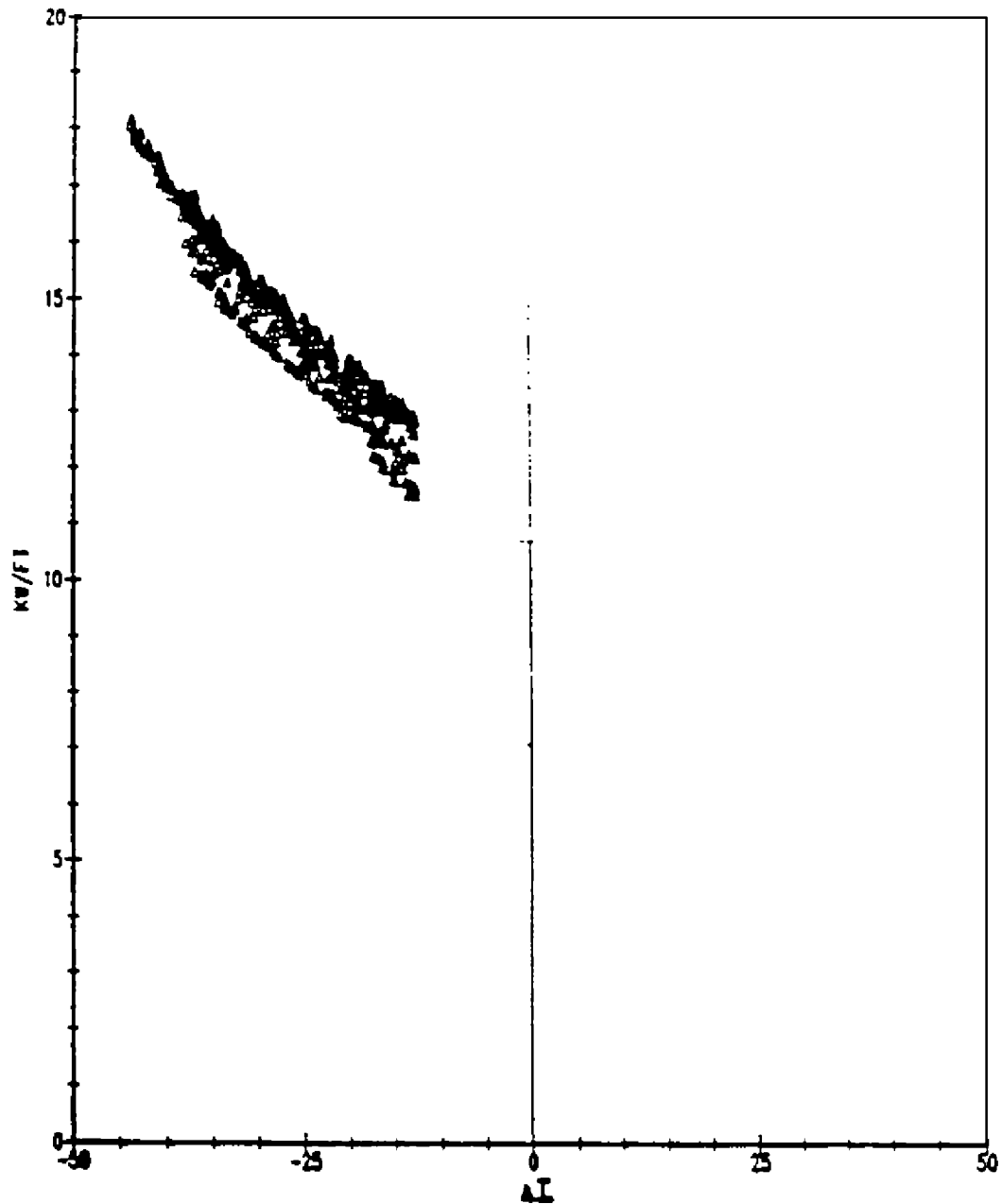
UNIT 2

| | | | |
|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE MAXIMUM F_q(Z) x POWER VERSUS AXIAL
HEIGHT (Z) DURING NORMAL OPERATION | | |
| | DWG. NO. FSAR FIG. 3.3-20 | | SH 1 of 1 |



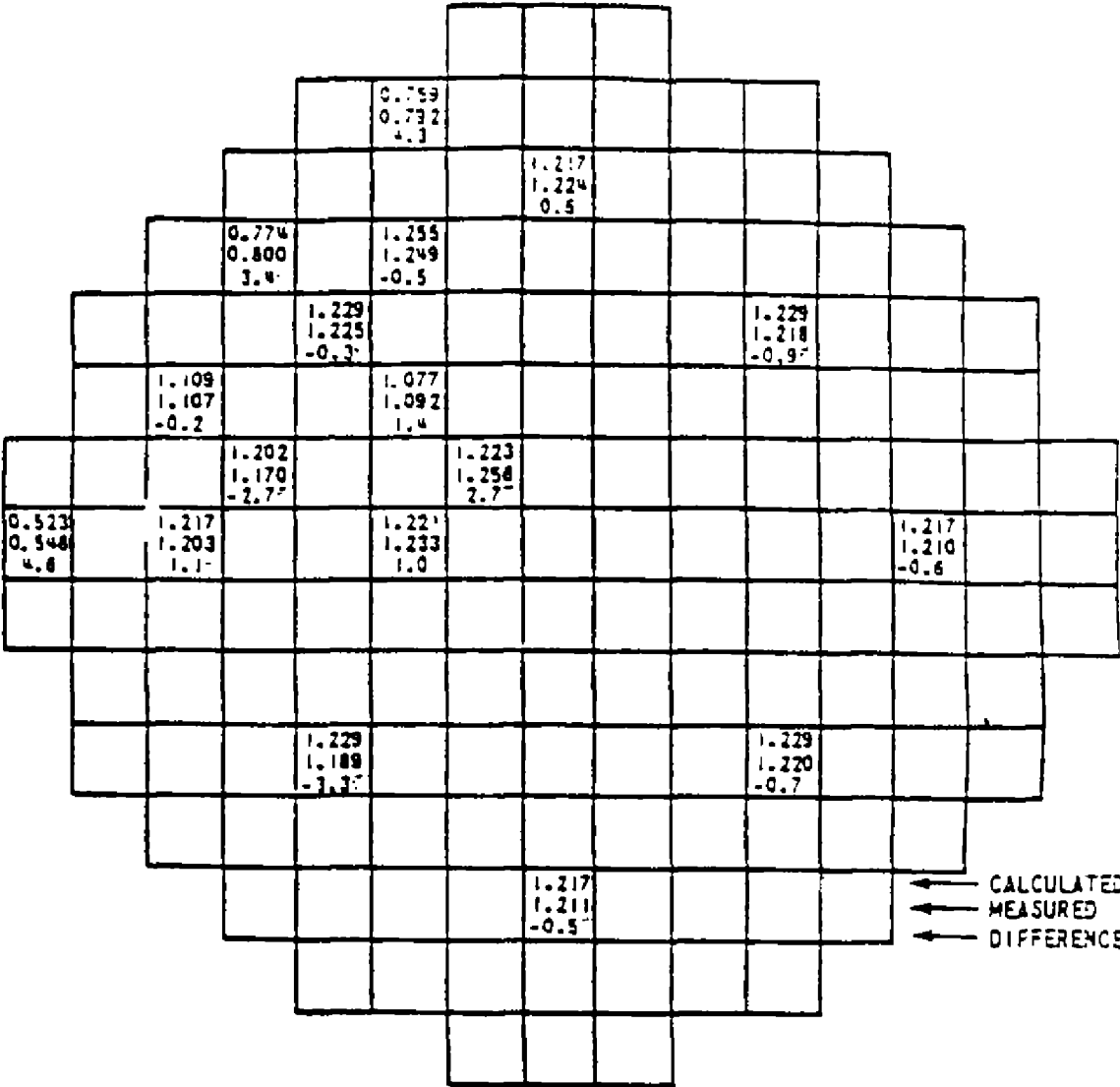
UNIT 2

| | | | |
|---|--|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE TYPICAL PEAK LINEAR POWER DURING CONTROL ROD
MALFUNCTION OVERPOWER TRANSIENTS | | |
| | DWG. NO. FSAR FIG. 3.3-21 | | SH 1 of 1 |



UNIT 2

| | | | |
|---|---------------------------|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE | TYPICAL PEAK LINEAR POWER DURING BORATION/DILUTION
OVERPOWER TRANSIENTS | |
| | DWG. NO. FSAR FIG. 3.3-22 | | SH 1 of 1 |

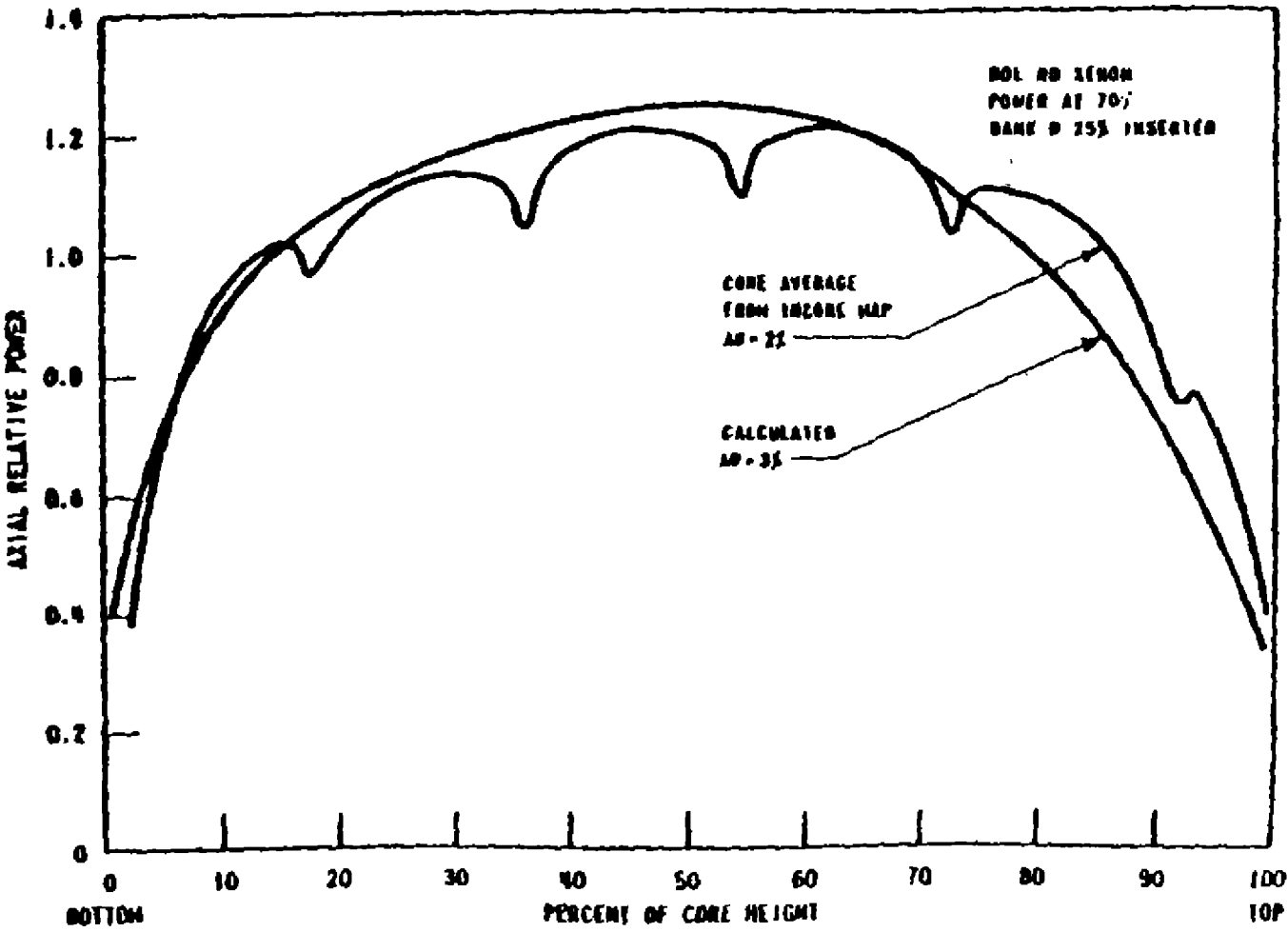


← CALCULATED
← MEASURED
← DIFFERENCE

PEAKING FACTORS
 $\bar{F}_2 = 1.5$
 $F_{\Delta H}^R = 1.357$
 $F_q^R = 2.07$ LOCATED AT
M-8 SOUTH

UNIT 2

| | | | |
|---|---------------------------|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE | ILLUSTRATION OF A COMPARISON BETWEEN CALCULATED AND MEASURED RELATIVE FUEL ASSEMBLY POWER DISTRIBUTION | |
| | DWG. NO. FSAR FIG. 3.3-23 | | SH 1 of 1 |



UNIT 2

| | | | |
|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE
COMPARISON OF TYPICAL CALCULATED
AND MEASURED AXIAL SHAPE | | |
| | DWG. NO. FSAR FIG. 3.3-24 | | SH 1 of 1 |

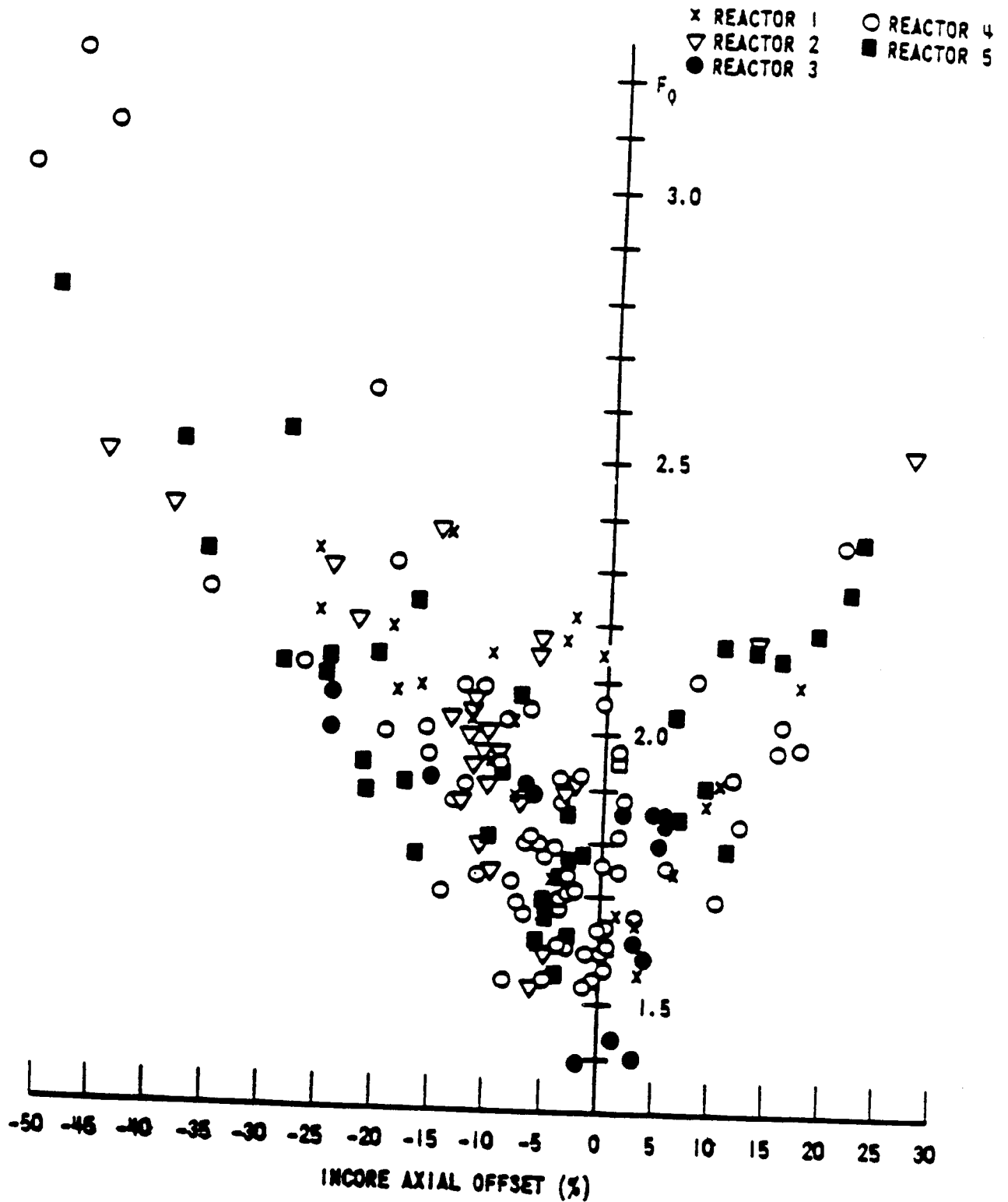
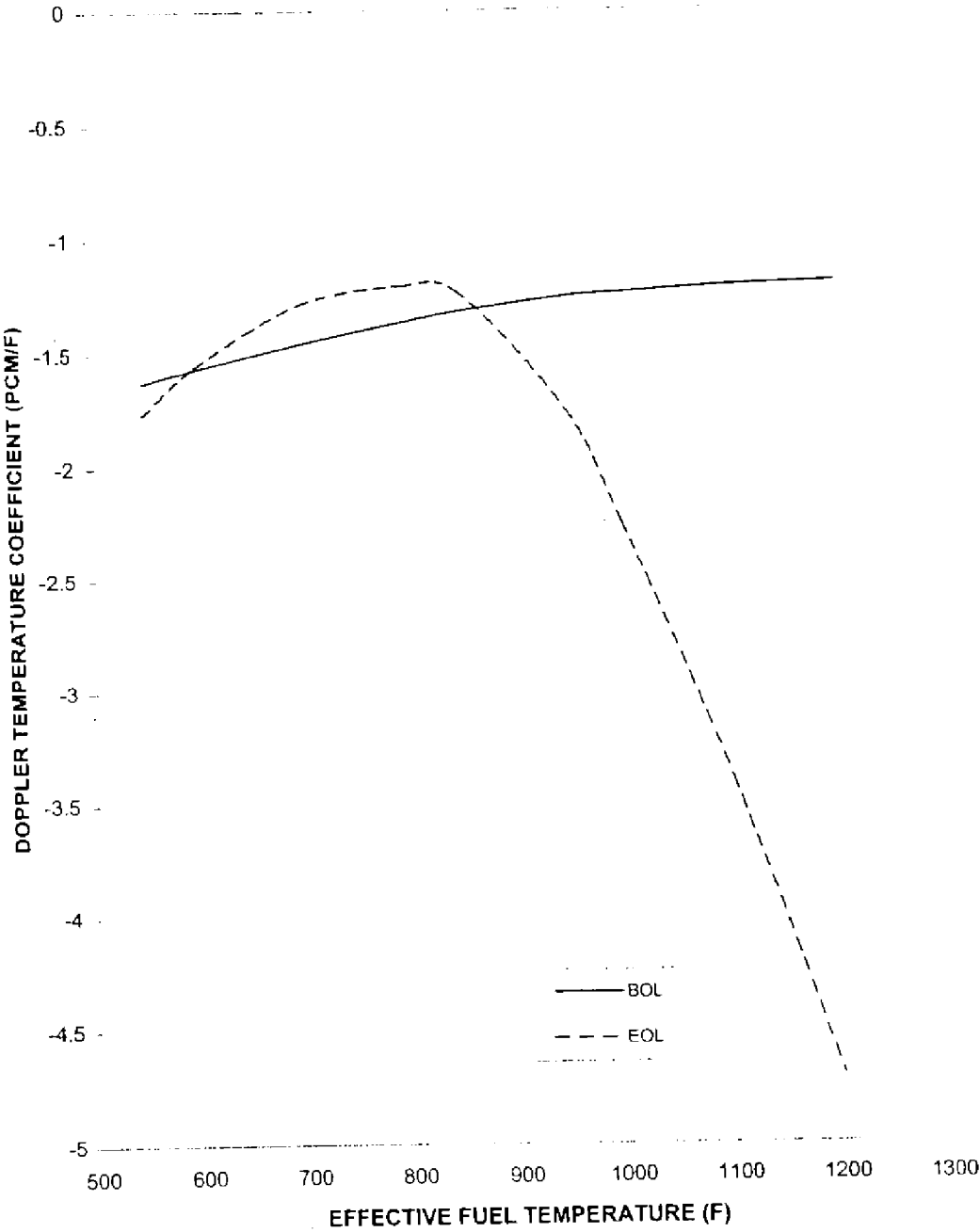
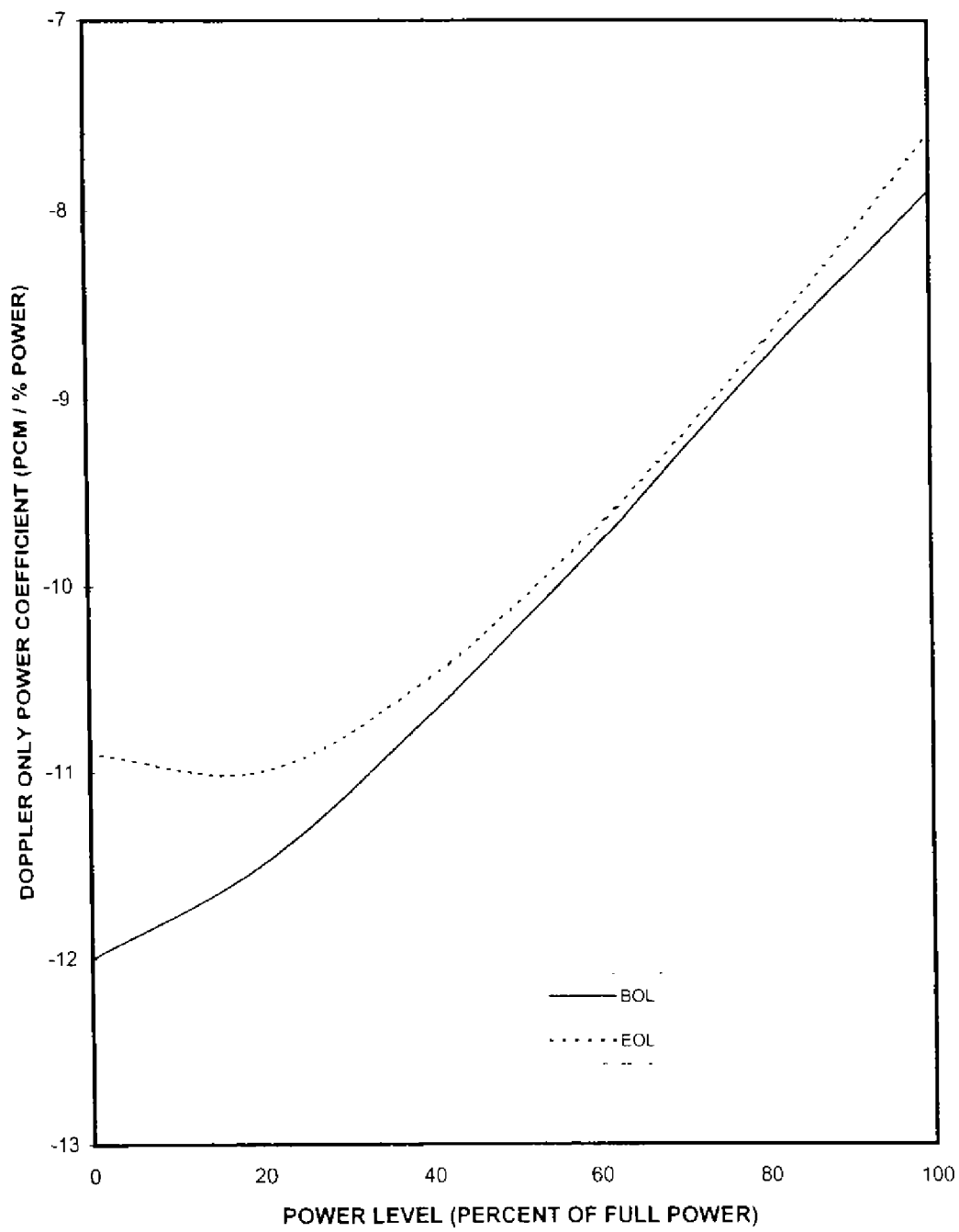


Figure 3.3-25 Measured Values of F_Q for Full Power Rod Configurations



UNIT 2

| | | | |
|---|--|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE
EXAMPLE DOPPLER TEMPERATURE
COEFFICIENT AT BOL AND EOL | | |
| | DWG. NO. FSAR FIG. 3.3-26 | | SH 1 of 1 |



UNIT 2

| | | | |
|---|---|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE
EXAMPLE DOPPLER ONLY POWER
COEFFICIENT AT BOL AND EOL | | |
| | DWG. NO. FSAR FIG. 3.3-27 | | SH 1 of 1 |

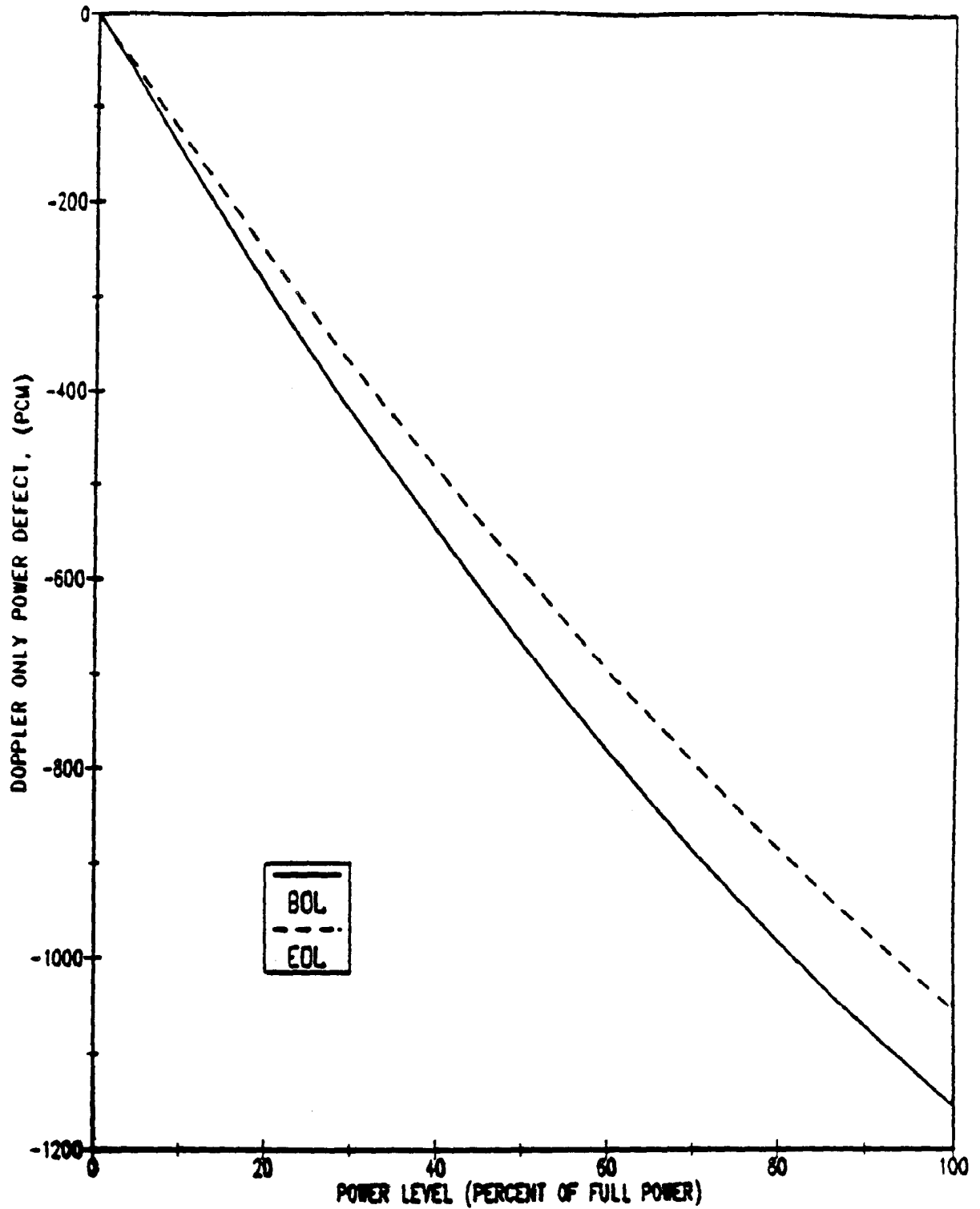


Figure 3.3-28 Example Doppler Only Power Defect - BOL, EOL

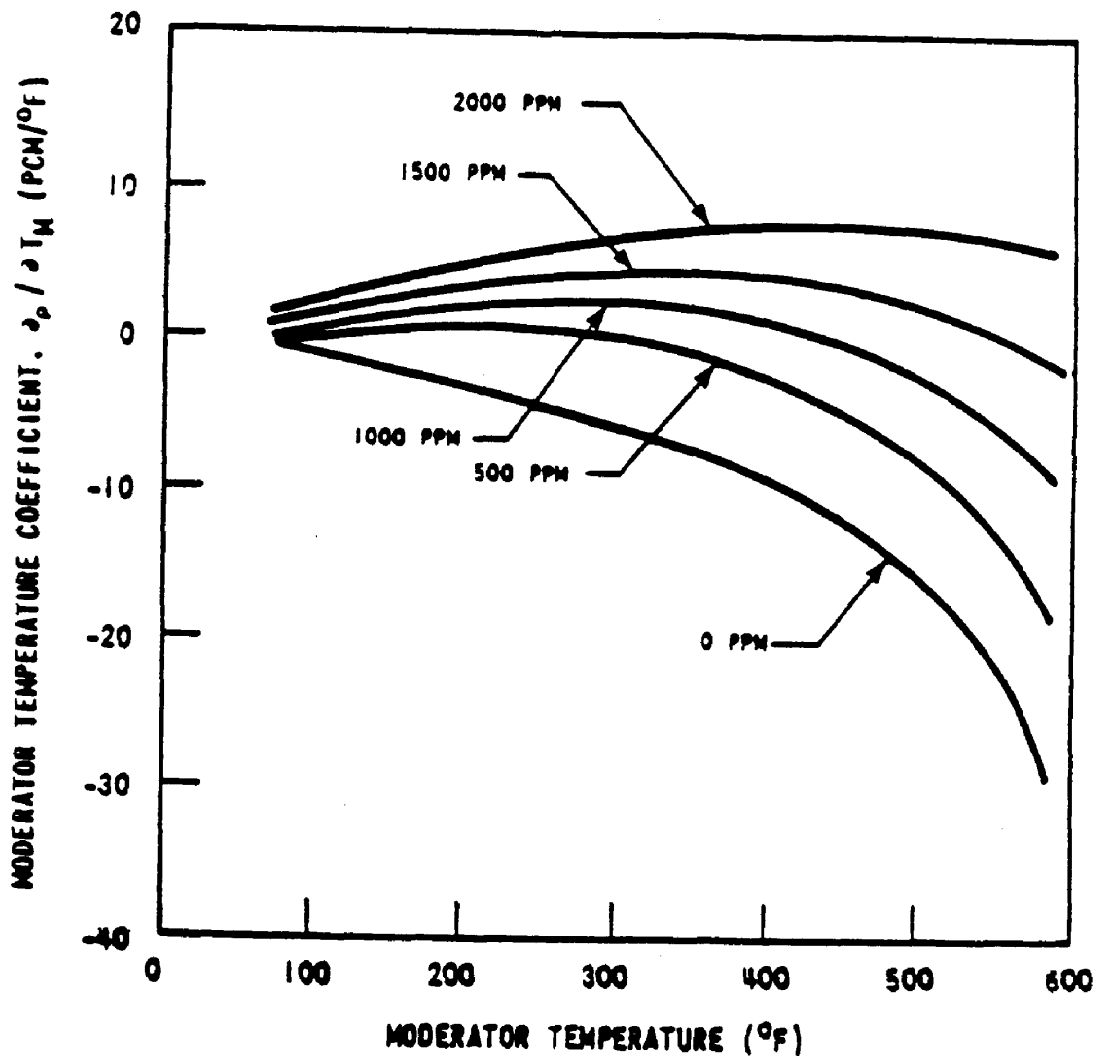


Figure 3.3-29 Example Moderator Temperature Coefficient - BOL, No Rods

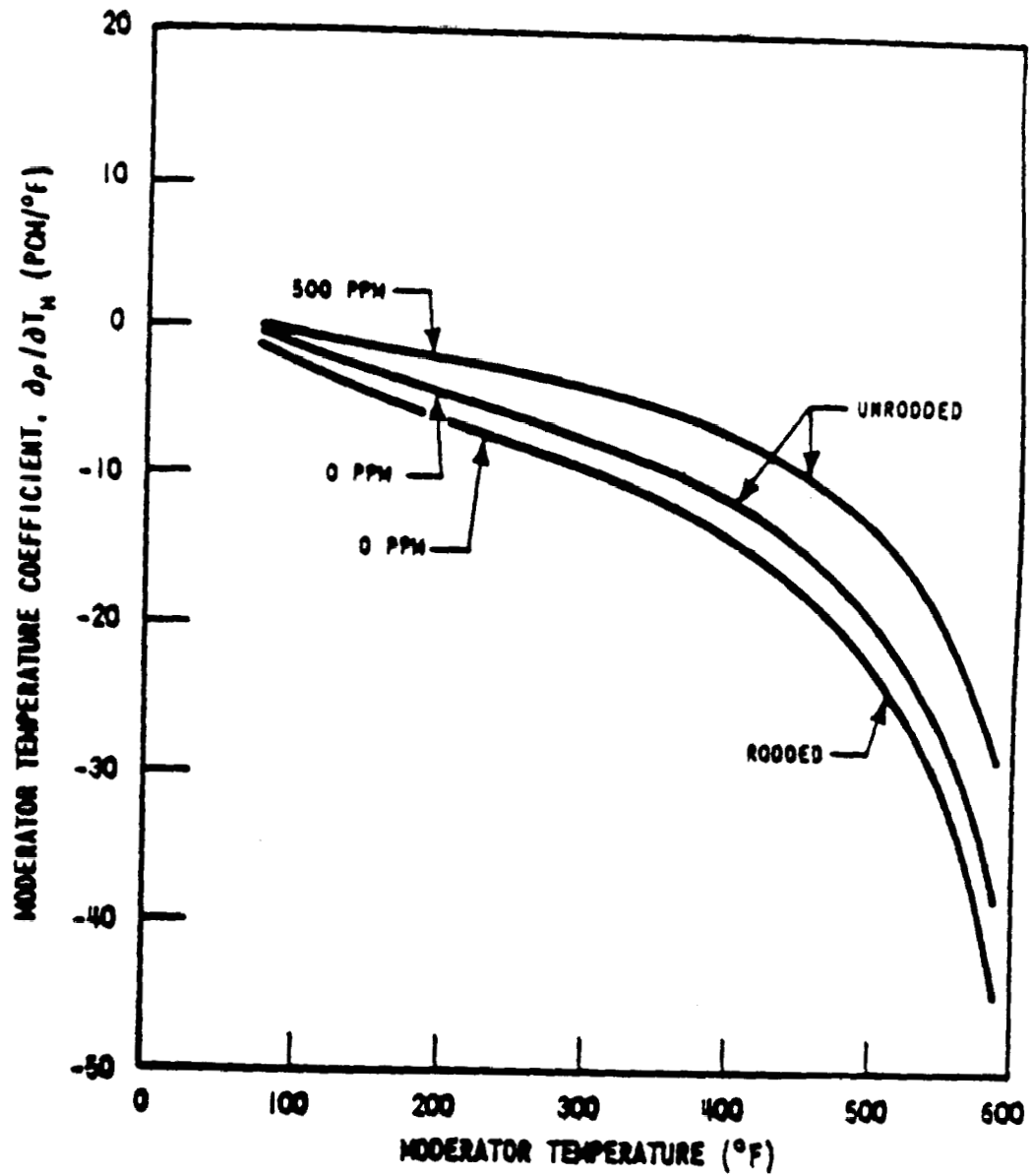
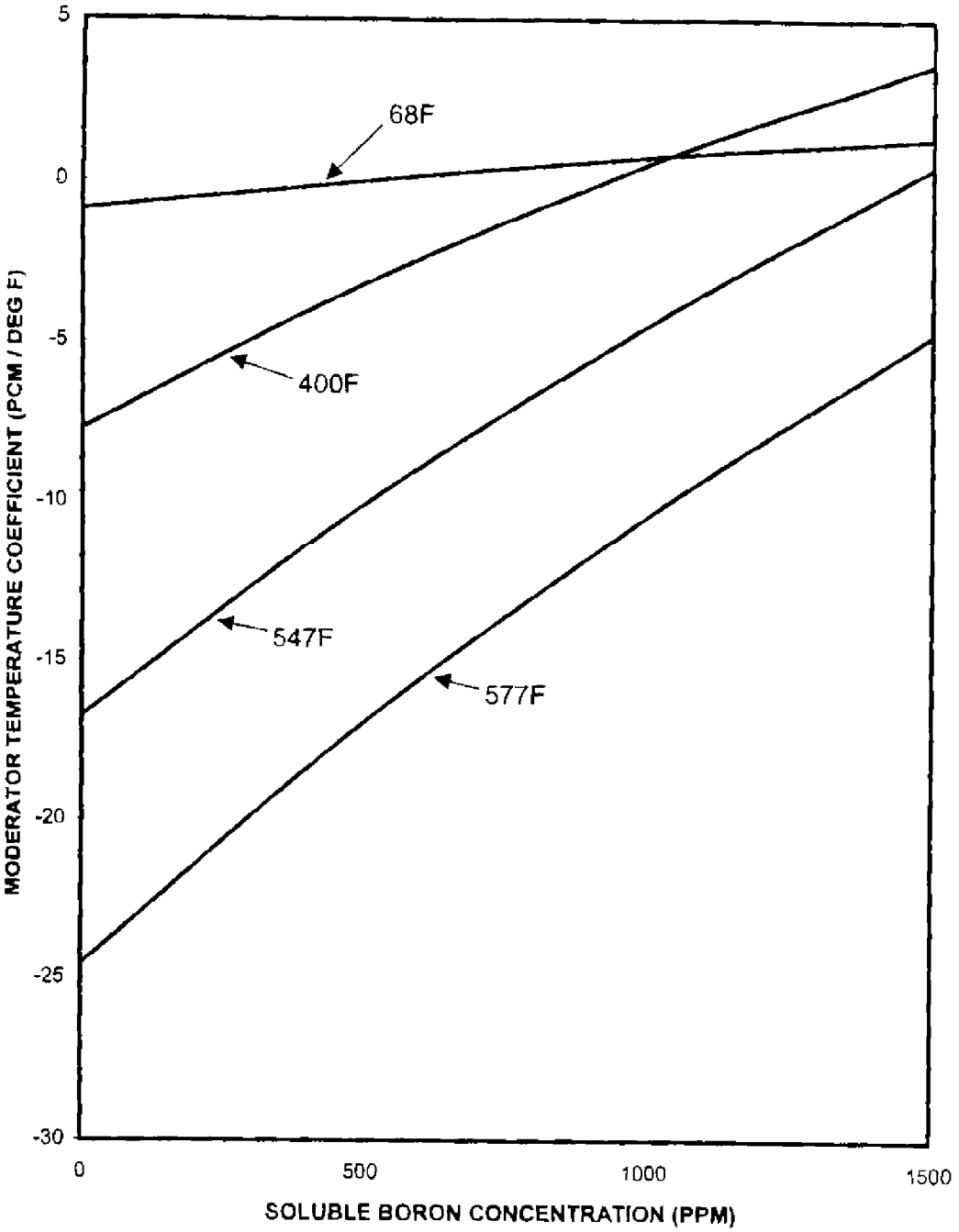
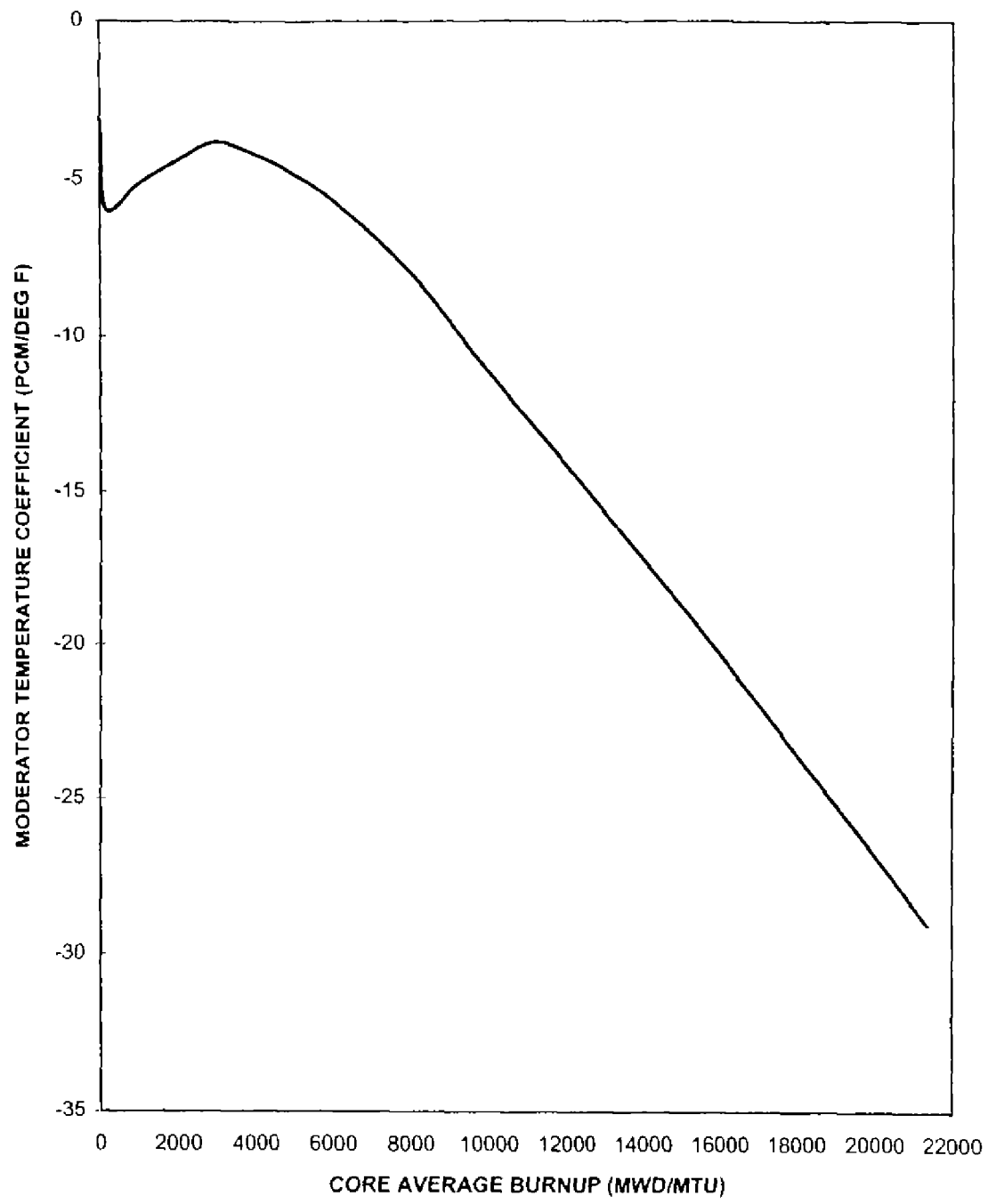


Figure 3.3-30 Example Moderator Temperature Coefficient - EOL



UNIT 2

| | | | |
|---|---------------------------|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE | EXAMPLE MODERATOR TEMPERATURE COEFFICIENT AS A
FUNCTION OF BORON CONCENTRATION - BOL, NO RODS | |
| | DWG. NO. FSAR FIG. 3.3-31 | | SH 1 of 1 |



UNIT 2

| | | | |
|---|---------------------------|--|-----------|
| 16.4 | REVISED PER 99-UFSAR-1242 | | |
| REV. NO. | DESCRIPTION | | |
| REVISIONS | | | |
| AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN | TITLE | EXAMPLE HOT FULL POWER MODERATOR TEMPERATURE
COEFFICIENT (AT THE CRITICAL BORON CONCENTRATION)
VERSUS BURNUP | |
| | DWG. NO. FSAR FIG. 3.3-32 | | SH 1 of 1 |

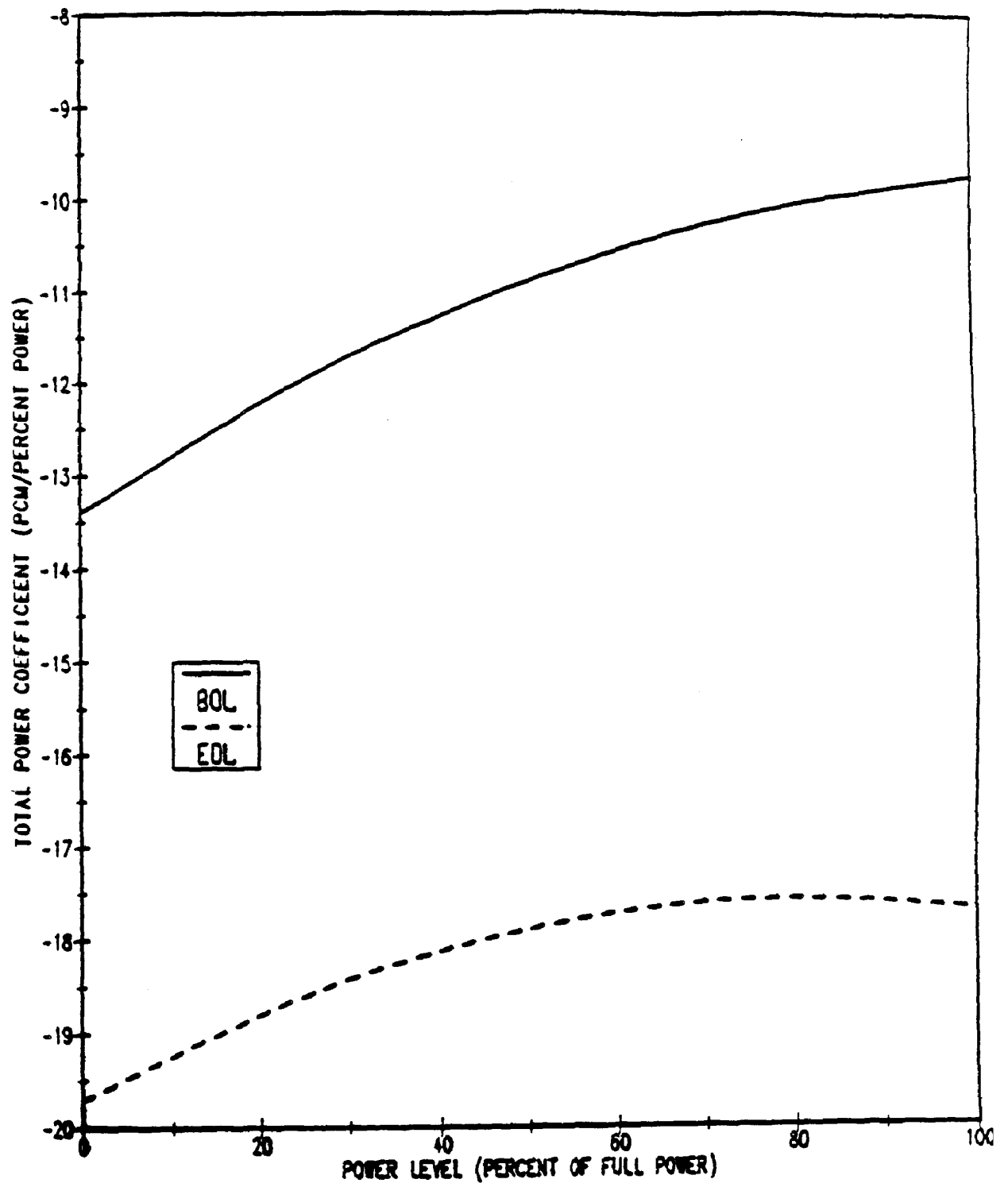


Figure 3.3-33 Example Total Power Coefficient at BOL and EOL

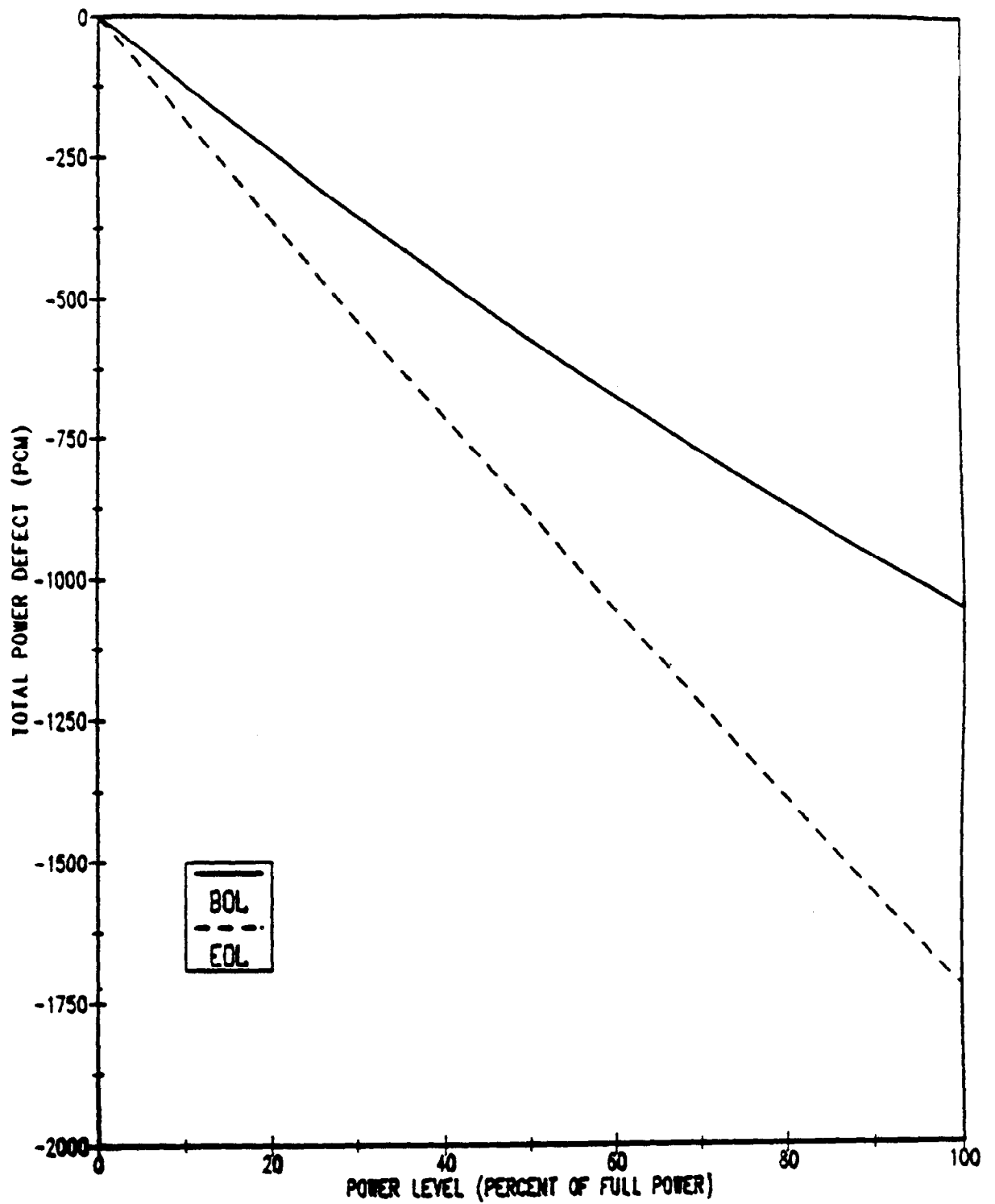
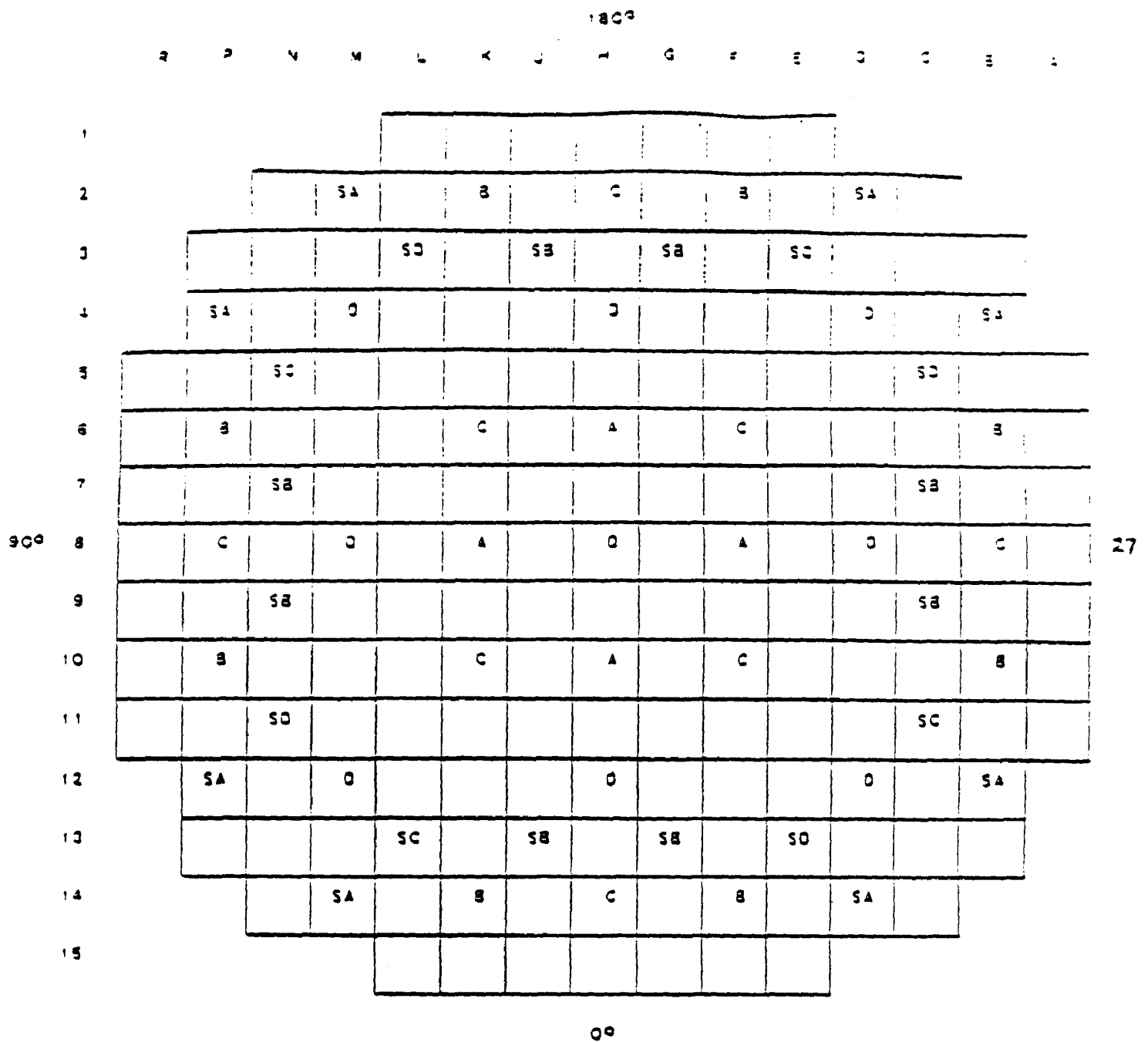


Figure 3.3-34 Example Total Power Defect at BOL and EOL

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| | FUNCTION | NUMBER OF
ROD CLUSTERS |
|---------------|----------|---------------------------|
| SHUTDOWN BANK | SA | 8 |
| SHUTDOWN BANK | SB | 8 |
| SHUTDOWN BANK | SC & SD | 4 & 4 |
| CONTROL BANK | A | 4 |
| CONTROL BANK | B | 8 |
| CONTROL BANK | C | 8 |
| CONTROL BANK | D | 9 |

Figure 3.3-35 Rod Cluster Control Assembly Pattern

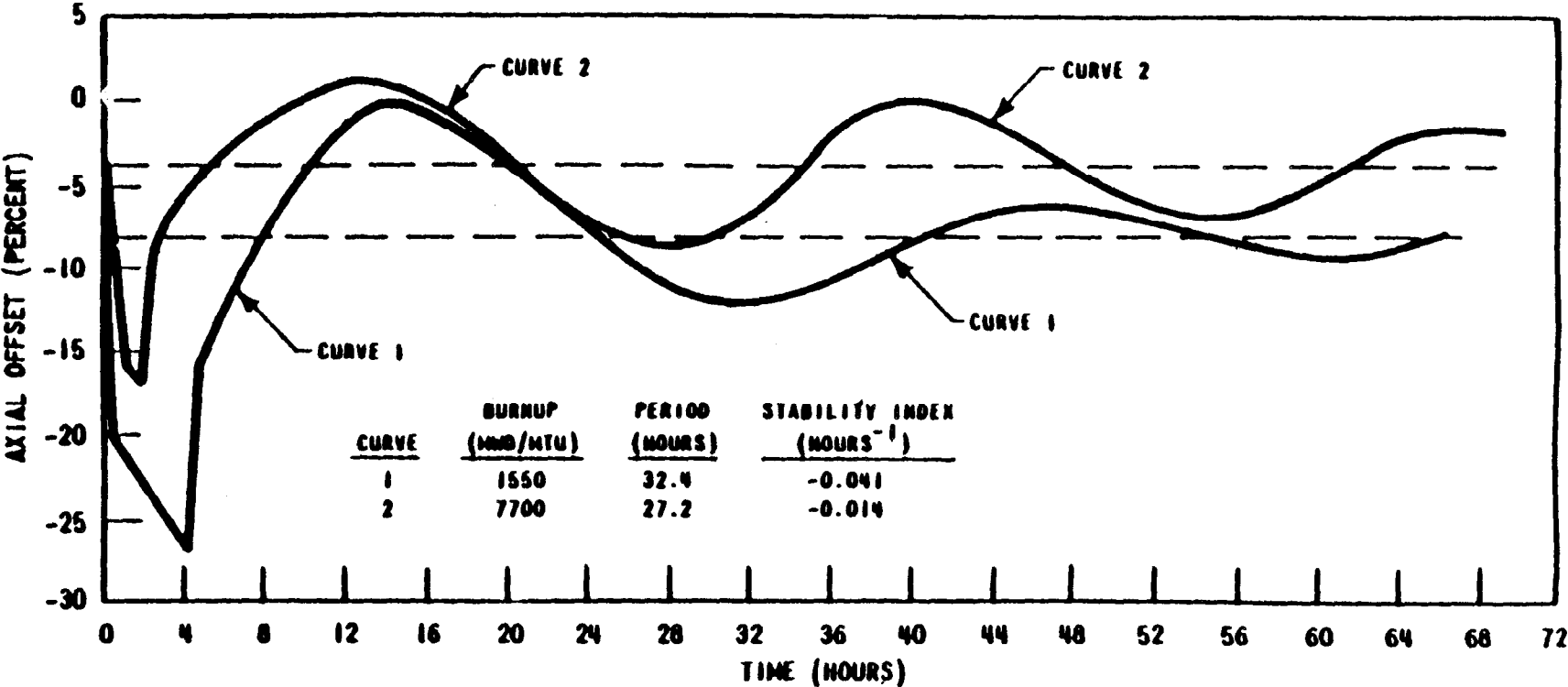


Figure 3.3-36 Axial Offset Versus Time PWR Core With a 12-Ft Height and 121 Assemblies

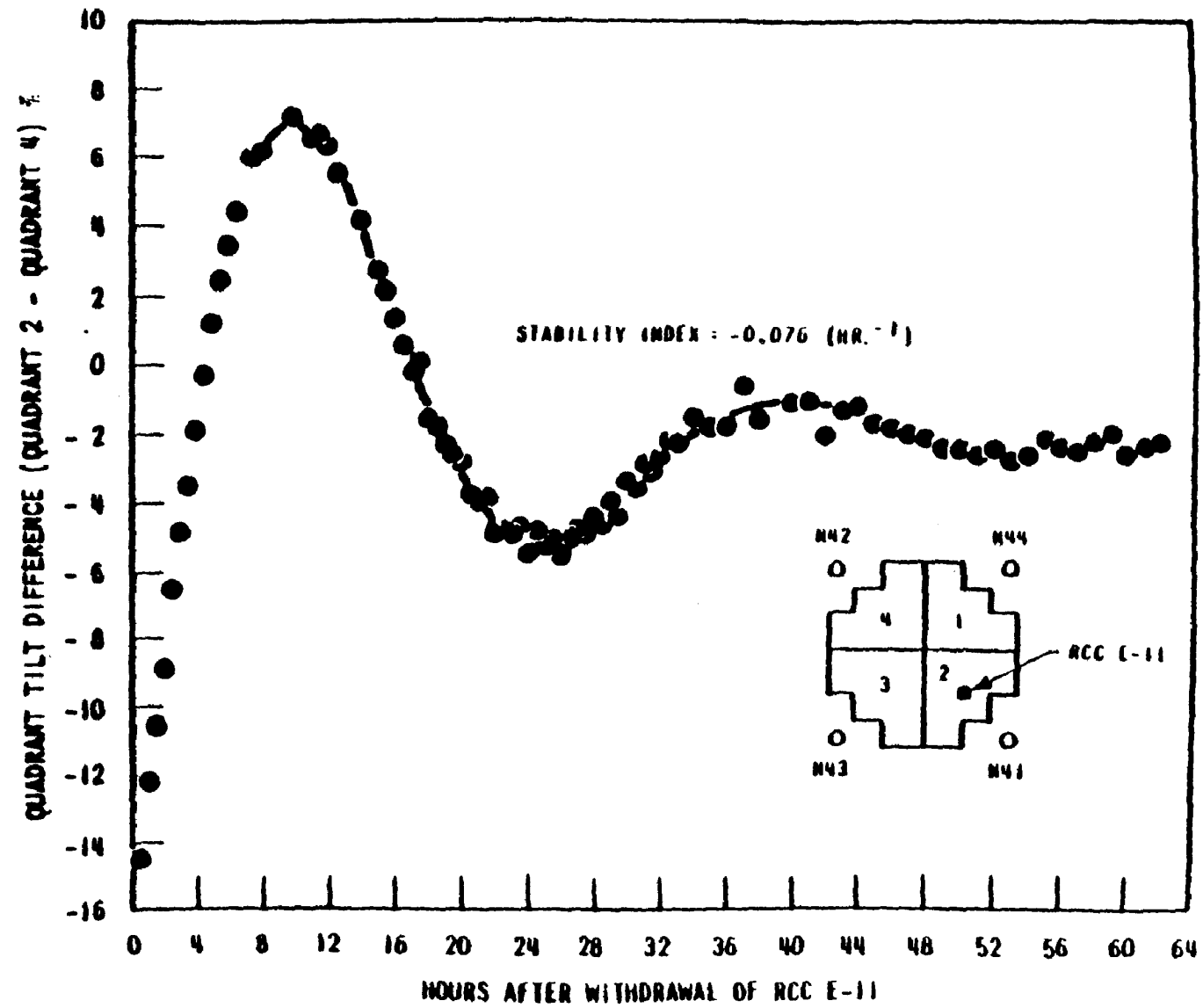


Figure 3.3-37 XY Xenon Test Thermocouple Response Quadrant Tilt Difference Versus Time

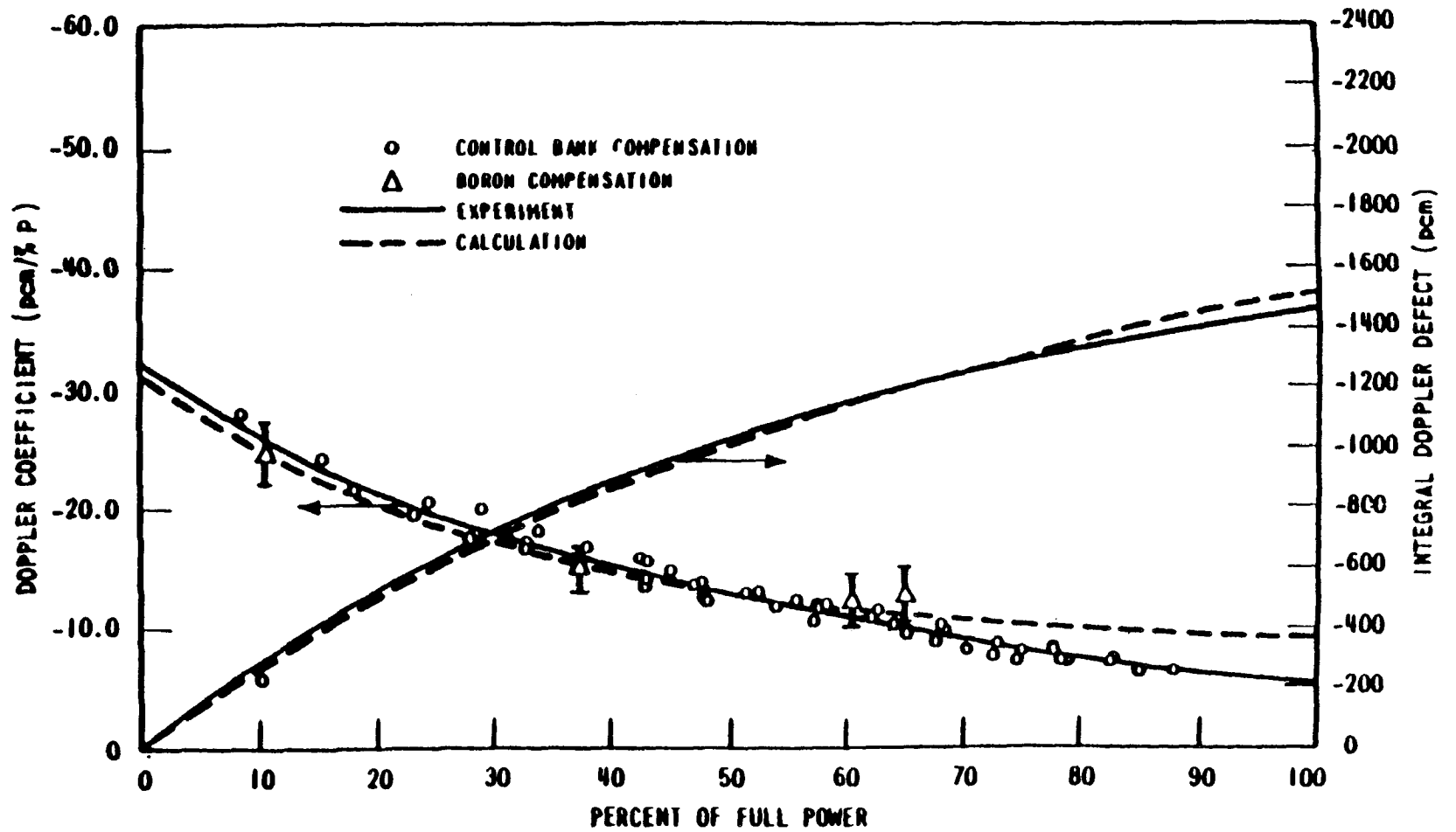


Figure 3.3-38 Calculated and Measured Doppler Defect and Coefficients at BOL Two-Loop Plant, 121 Assemblies, 12-Ft Core

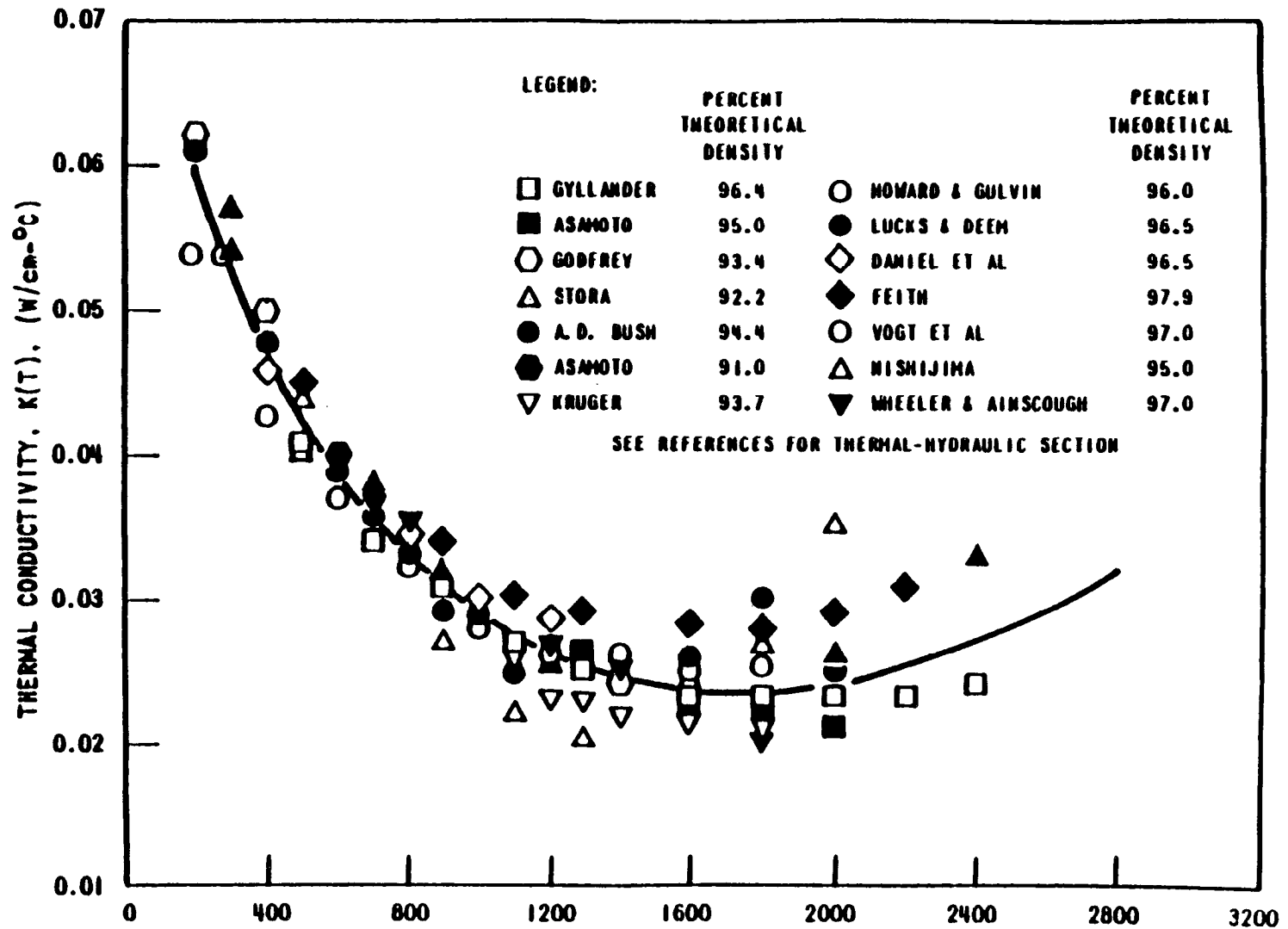


Figure 3.4-1 Thermal Conductivity of UO_2 (Data Corrected to 95% Theoretical Density)

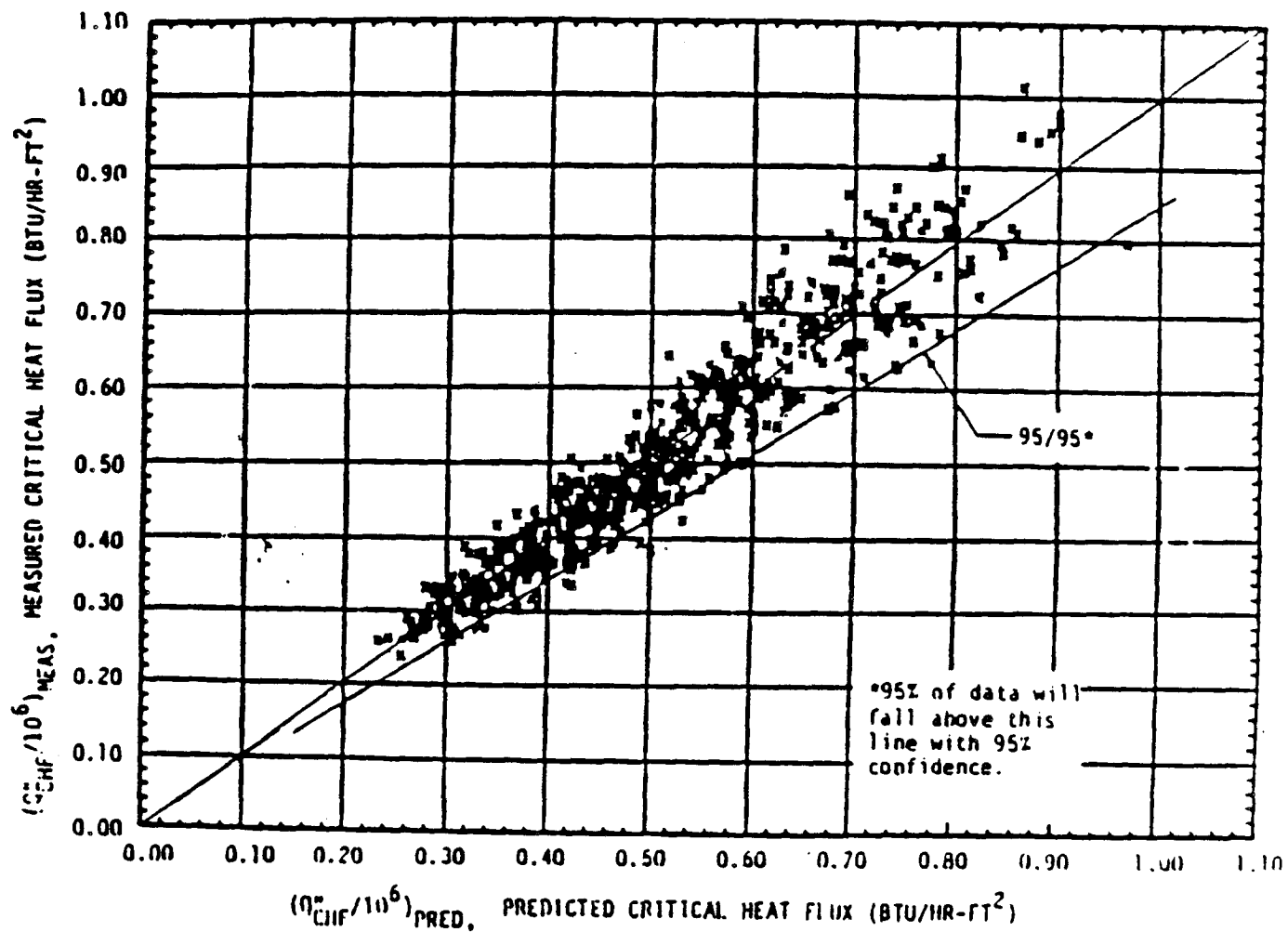
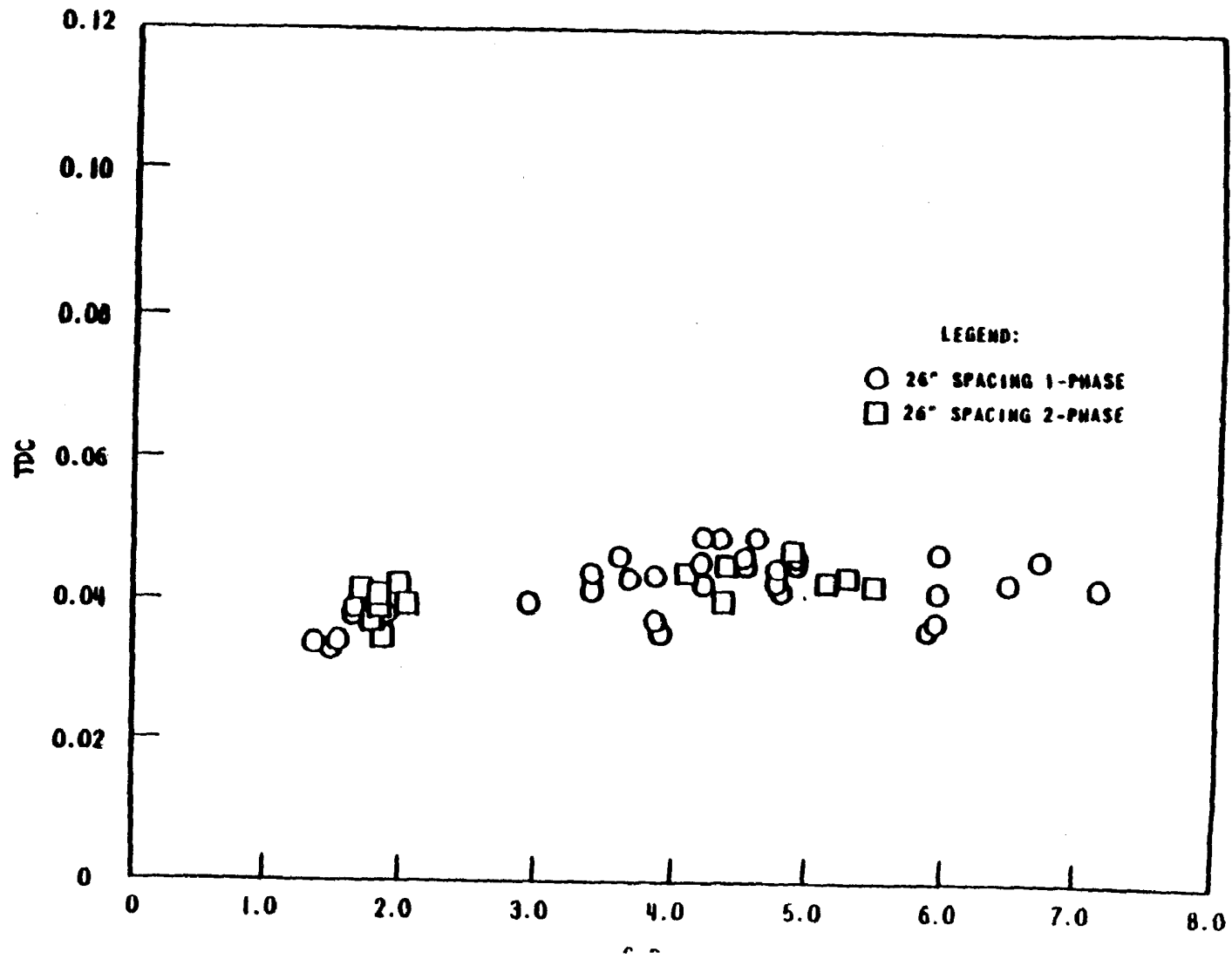


Figure 3.4-2 Measured Versus Predicted Critical Heat Flux - WRB2 Correlation

UNIT 2



July 1991

Figure 3.4-3 TDC Versus Reynolds Number for 26" Grid Spacing

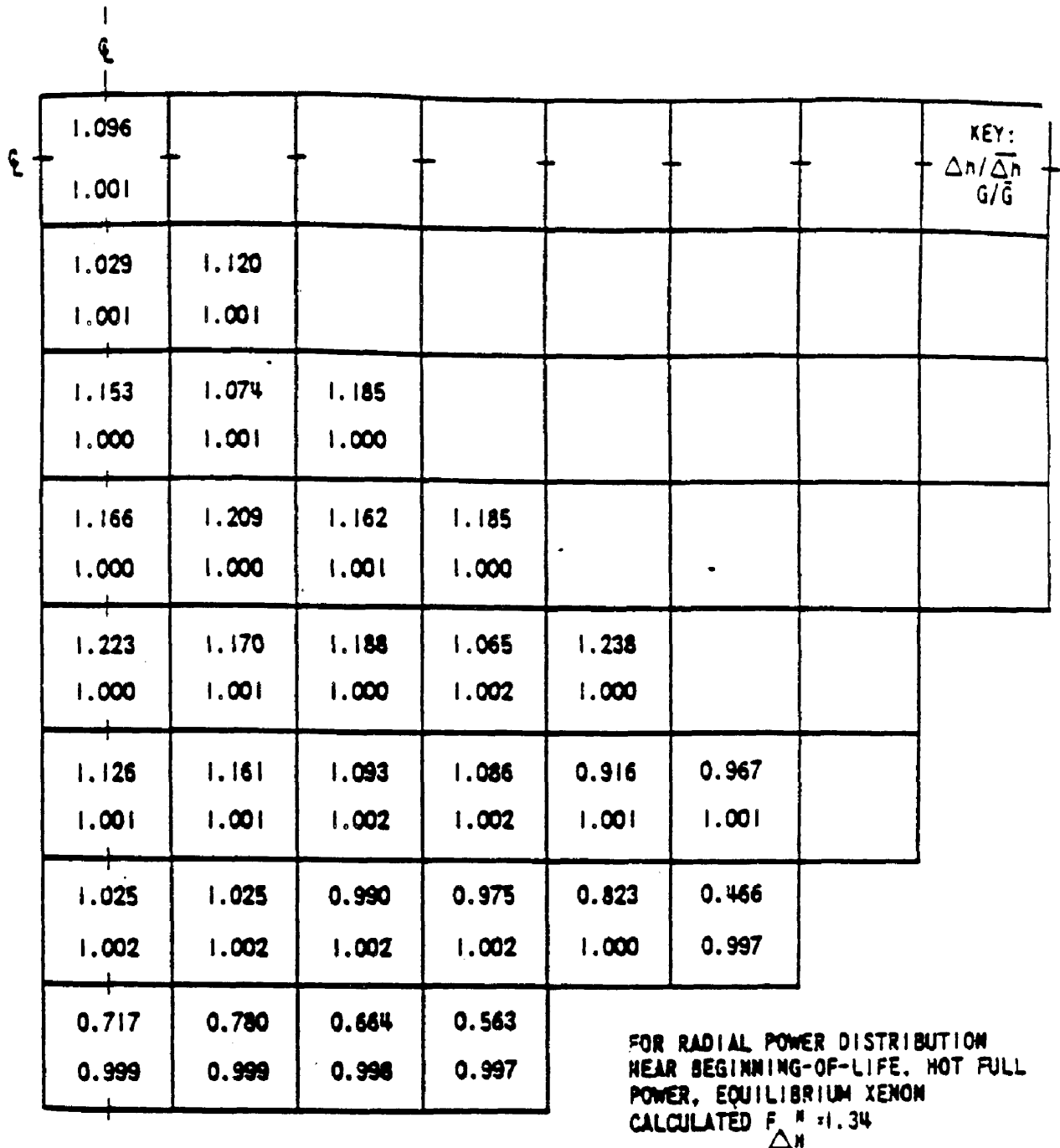


Figure 3.4-4 Normalized Radial Flow and Enthalpy Distribution
at 4-Ft Elevation

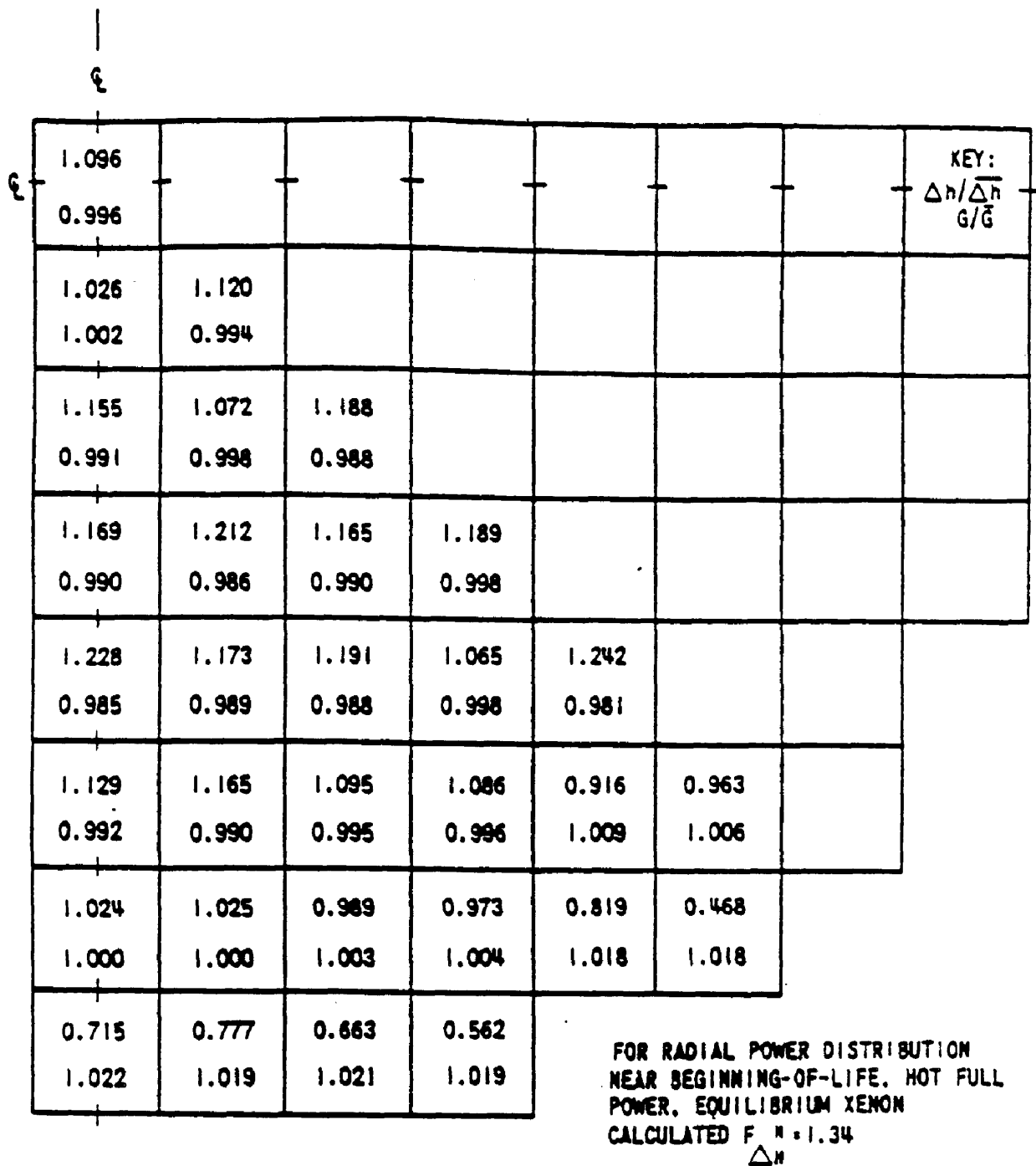


Figure 3.4-5 Normalized Radial Flow and Enthalpy Distribution
at 8-Ft Elevation

UFSAR Revision 30.0

| | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|--|--|
| ε | 1.097 | | | | | | | KEY: |
| | 0.995 | | | | | | | $\frac{\Delta h}{\Delta \bar{h}}$
G/G |
| | 1.026 | 1.121 | | | | | | |
| | 0.999 | 0.993 | | | | | | |
| | 1.157 | 1.073 | 1.189 | | | | | |
| | 0.991 | 0.996 | 0.989 | | | | | |
| | 1.170 | 1.215 | 1.166 | 1.190 | | | | |
| | 0.990 | 0.980 | 0.991 | 0.990 | | | | |
| | 1.231 | 1.175 | 1.193 | 1.066 | 1.243 | | | |
| | 0.987 | 0.990 | 0.989 | 0.997 | 0.987 | | | |
| | 1.130 | 1.165 | 1.095 | 1.087 | 0.914 | 0.961 | | |
| | 0.993 | 0.991 | 0.995 | 0.996 | 1.005 | 1.003 | | |
| | 1.023 | 1.024 | 0.987 | 0.971 | 0.817 | 0.469 | | |
| | 1.000 | 1.000 | 1.002 | 1.003 | 1.011 | 1.030 | | |
| | 0.711 | 0.774 | 0.660 | 0.560 | | | | |
| | 1.016 | 1.013 | 1.019 | 1.025 | | | | |

FOR RADIAL POWER DISTRIBUTION
NEAR BEGINNING-OF-LIFE. HOT FULL
POWER. EQUILIBRIUM XENON
CALCULATED $F^* = 1.34$
 Δh

Figure 3.4-6 Normalized Radial Flow and Enthalpy Distribution
at 12-Ft Elevation - Core Exit

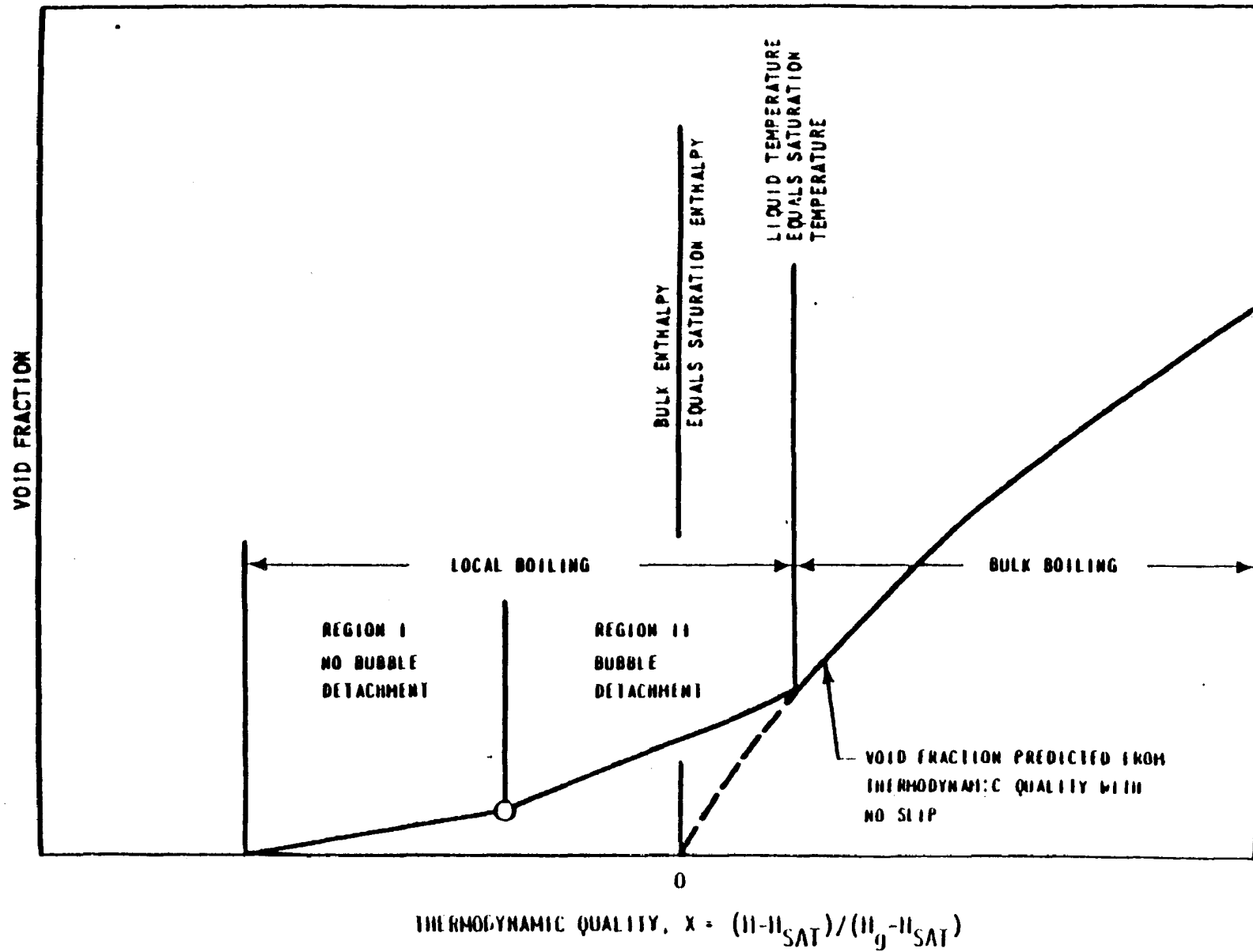


Figure 3.4-7 Void Fraction Versus Thermodynamic Quality
 $(h - h_{SAT}) / (h_g - h_{SAT})$

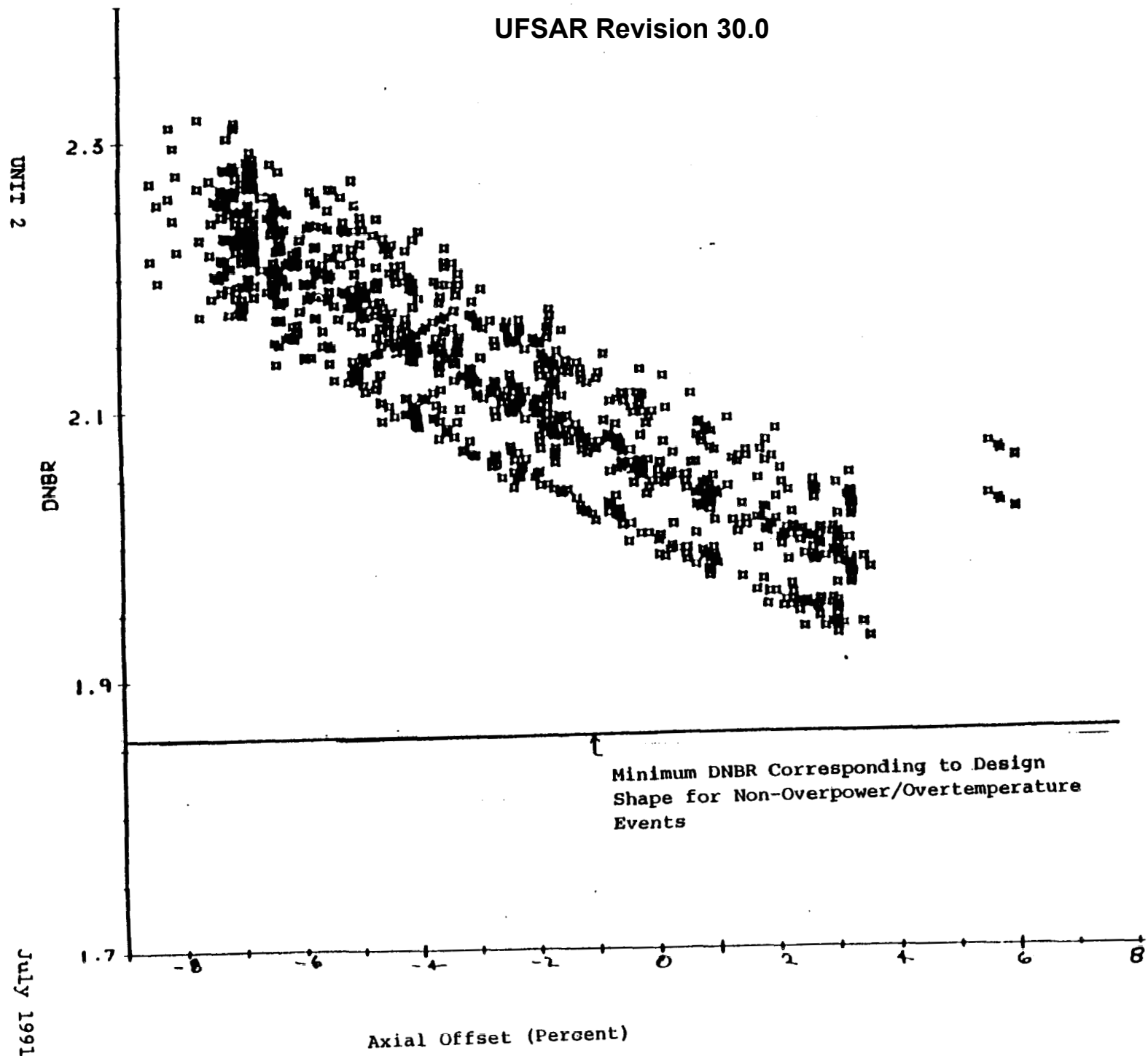


Figure 3.4-8 100% Power Conditions Evaluated at Conditions
Representative of Loss of Flow: All Shapes
Evaluated With $F_{\Delta H}^N = 1.59$

UNIT 2

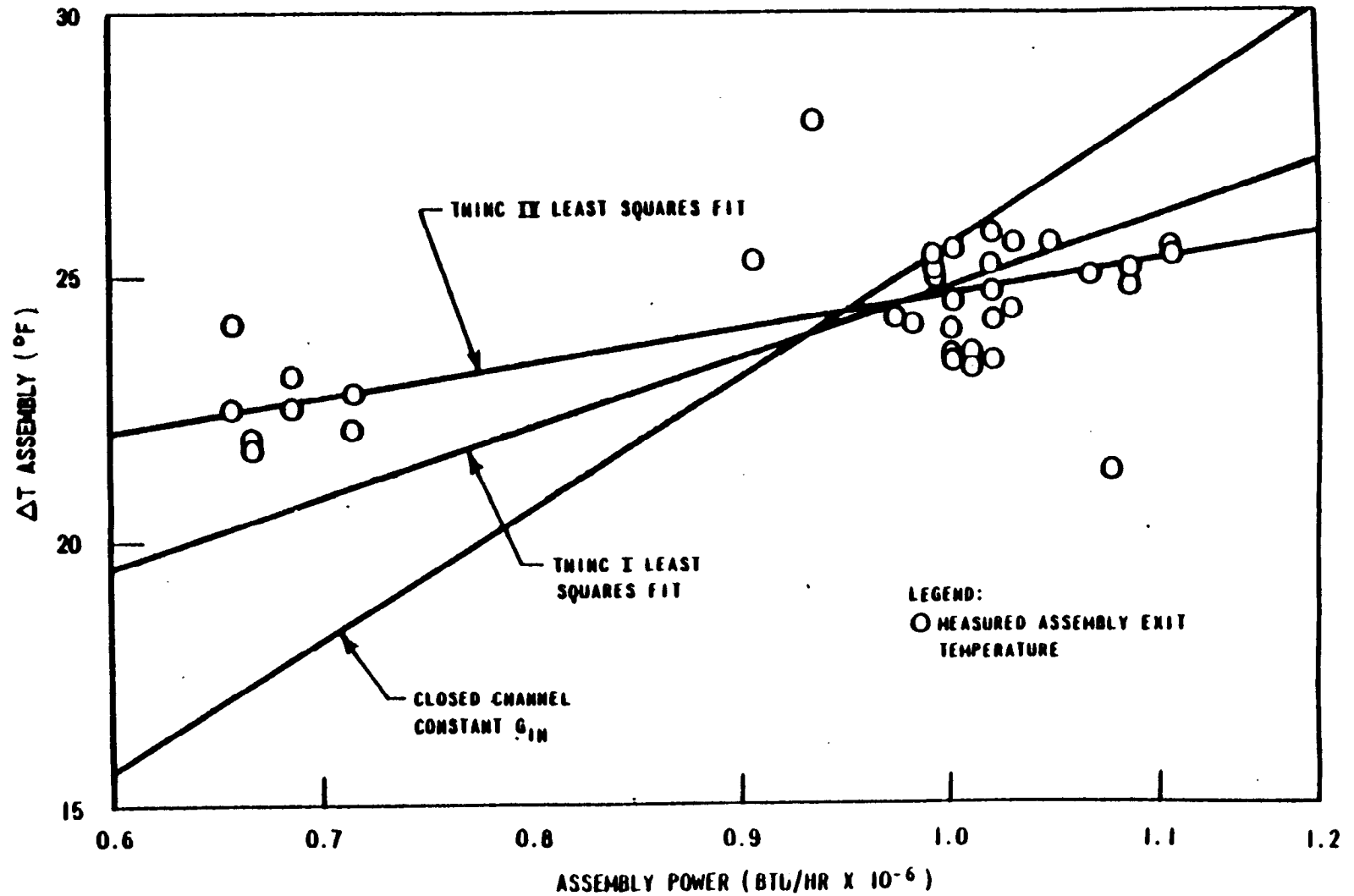


Figure 3.4-9 PWR Natural Circulation Test

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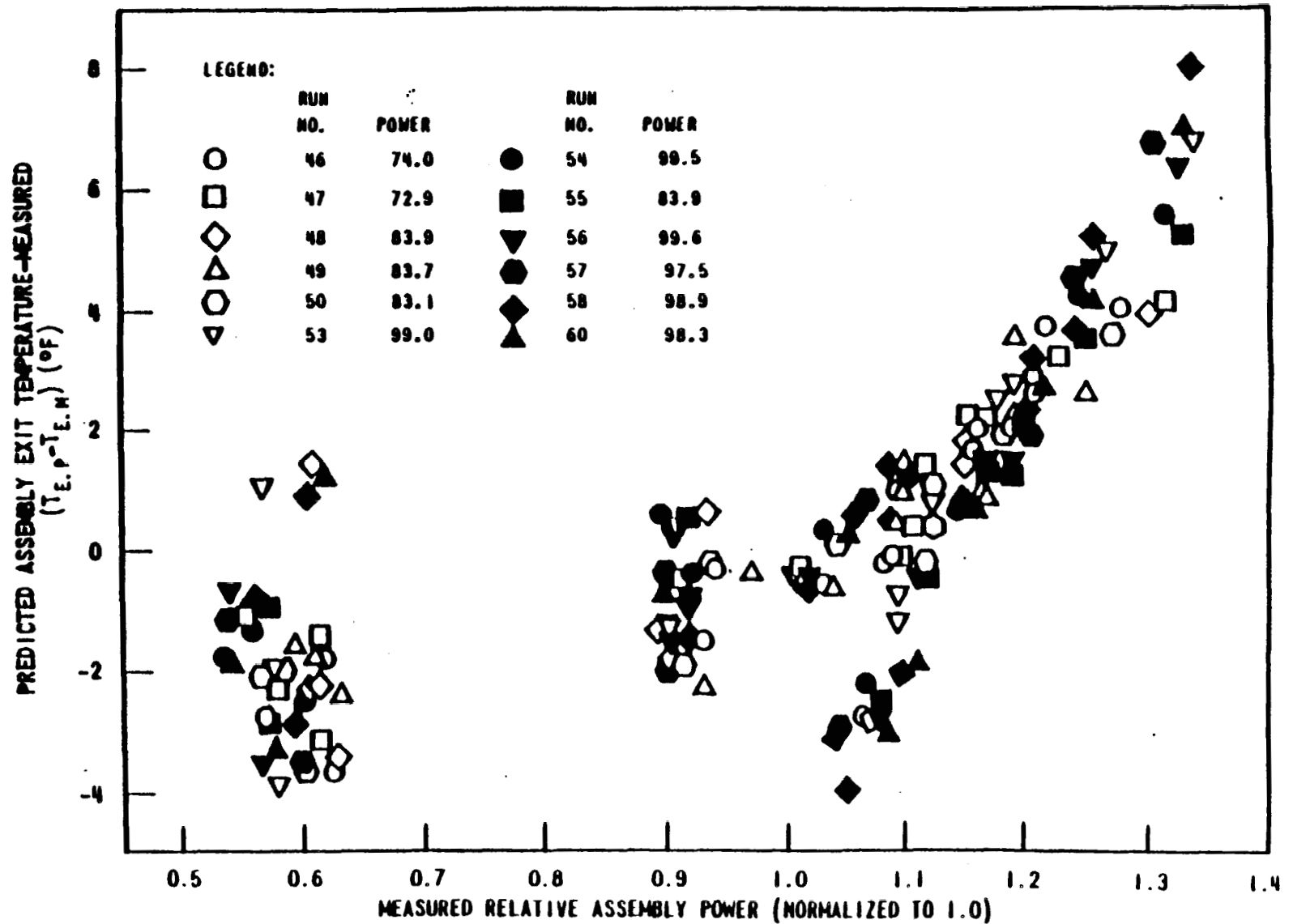


Figure 3.4-10 Comparison of a Representative W Two-Loop Reactor Incore Thermocouple Measurements with THINC-IV Predictions

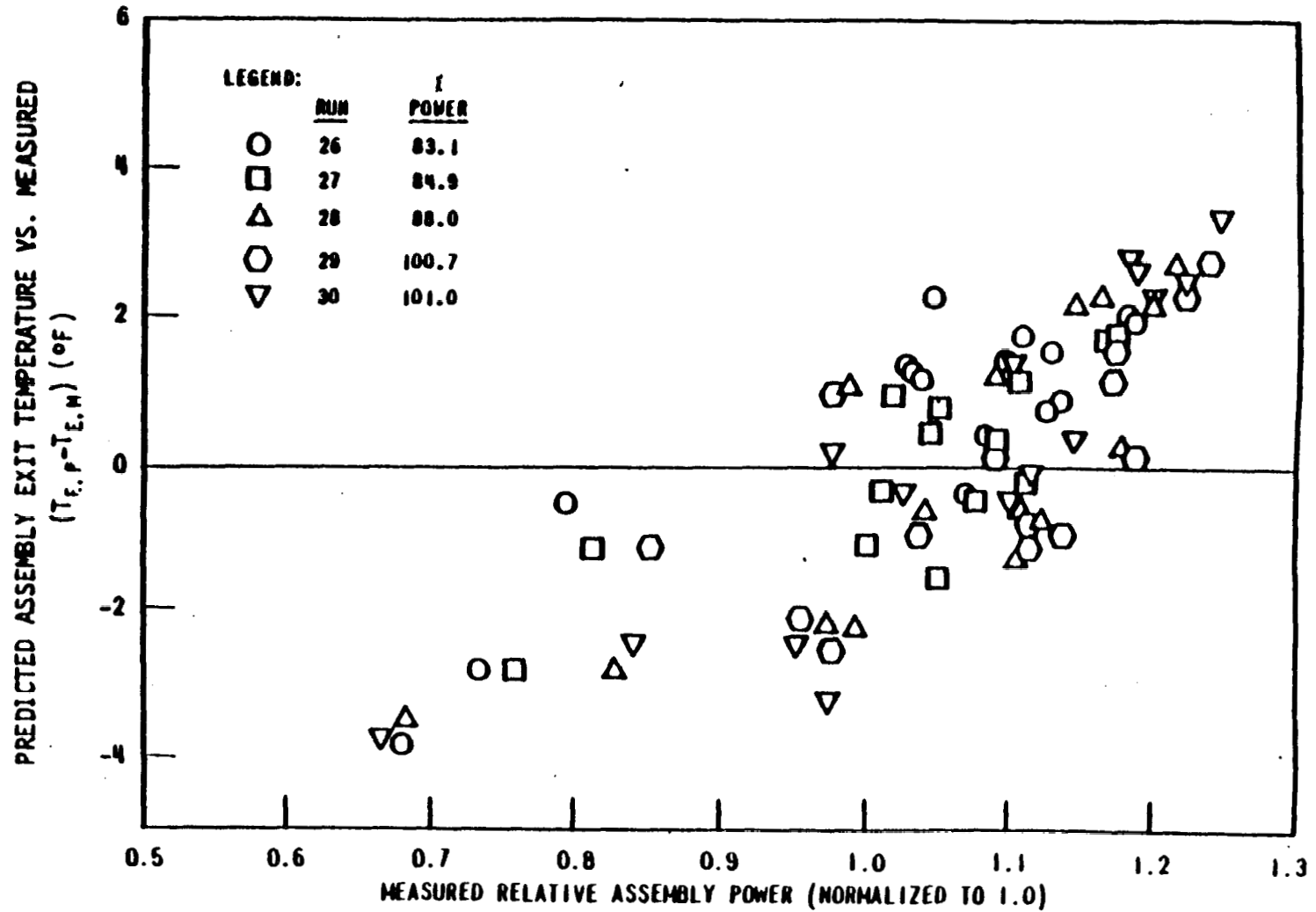


Figure 3.4-11 Comparison of a Representative W Three-Loop Reactor Incore Thermocouple Measurements with THINC-IV Predictions

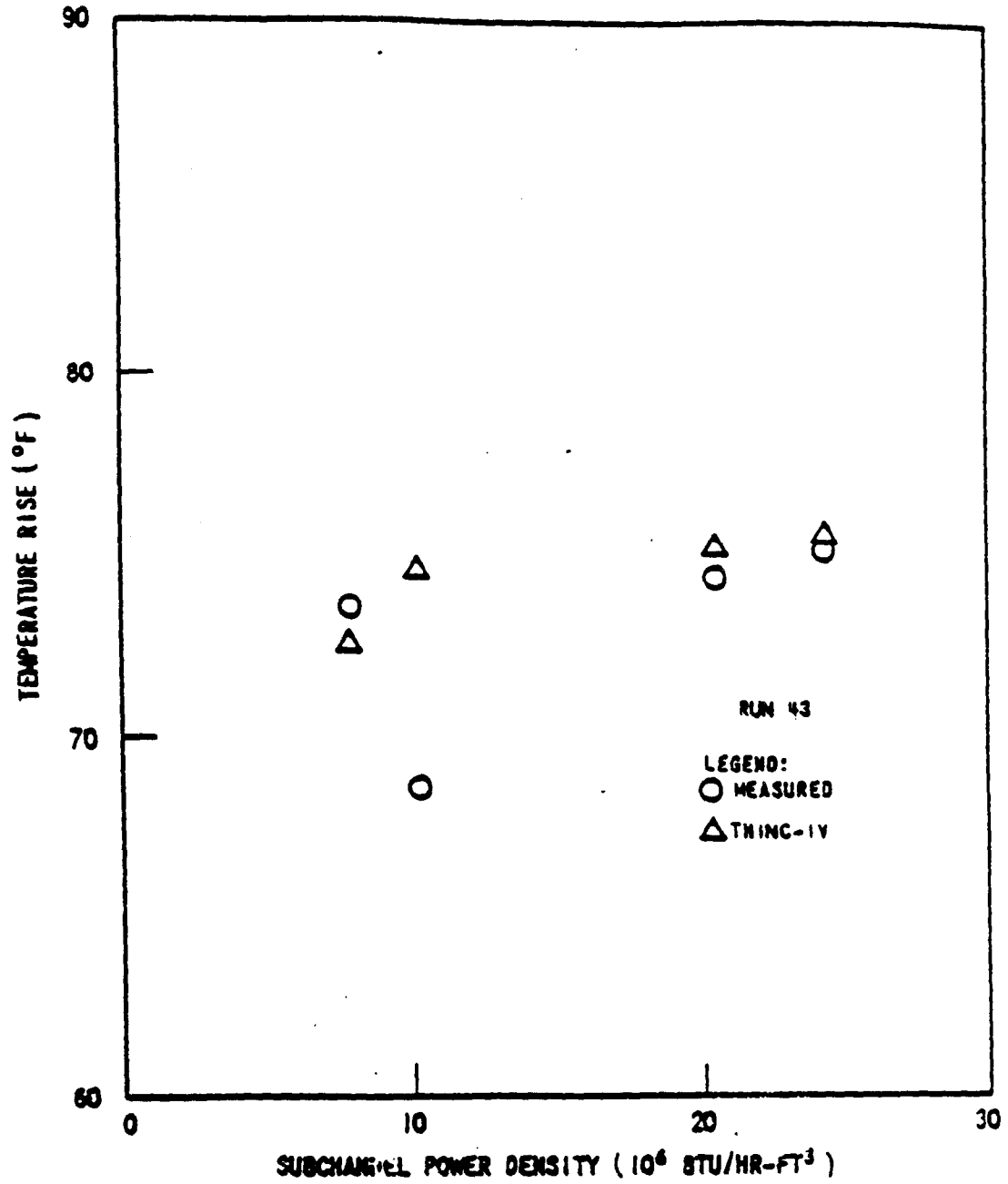


Figure 3.4-12 Hanford Subchannel Temperature Data Comparison with THINC-IV

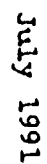


Figure 3.4-13 Hanford Subcritical Temperature Data Comparison with THINC-IV

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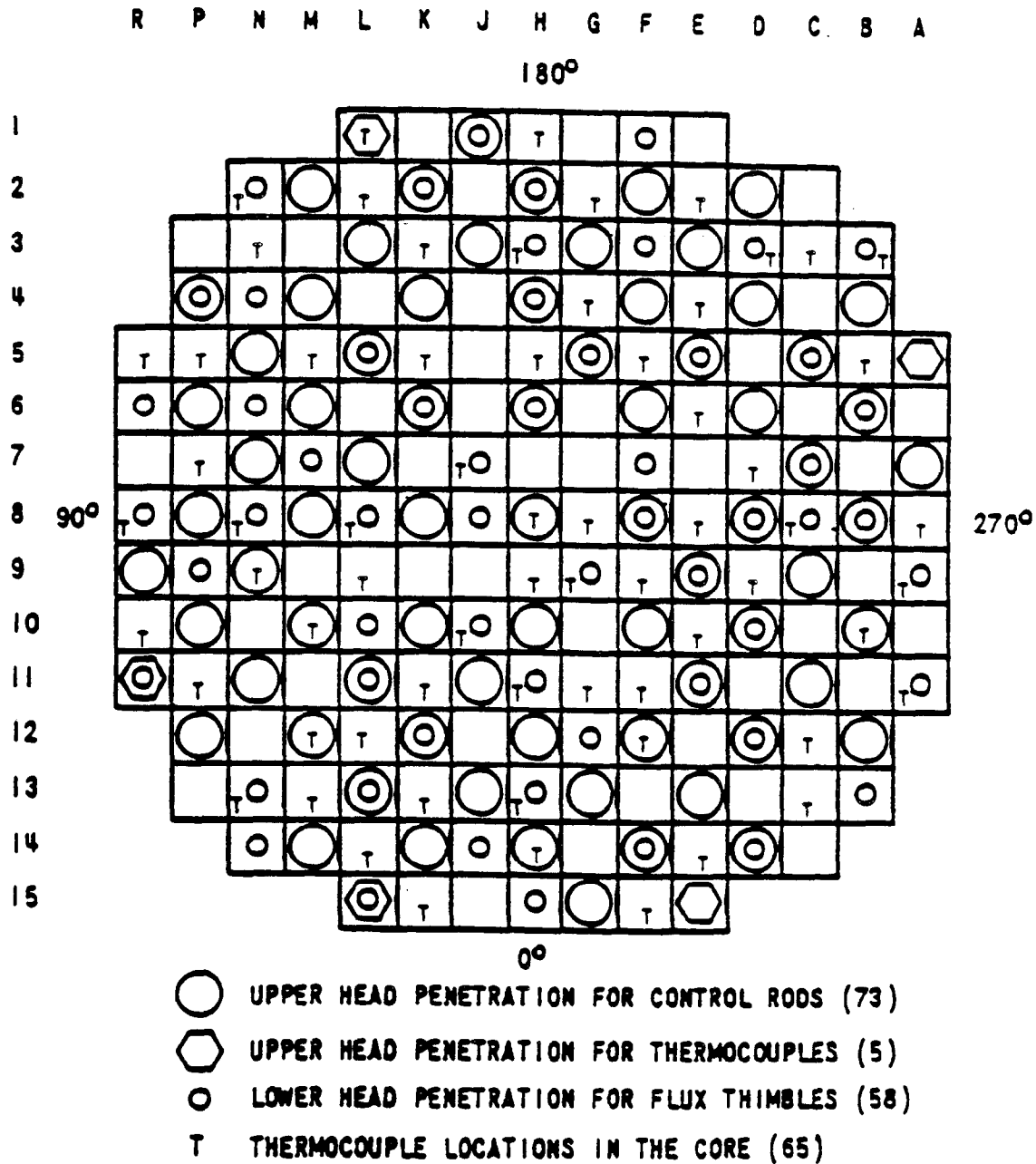


Figure 3.4-14 Distribution of Incore Instrumentation