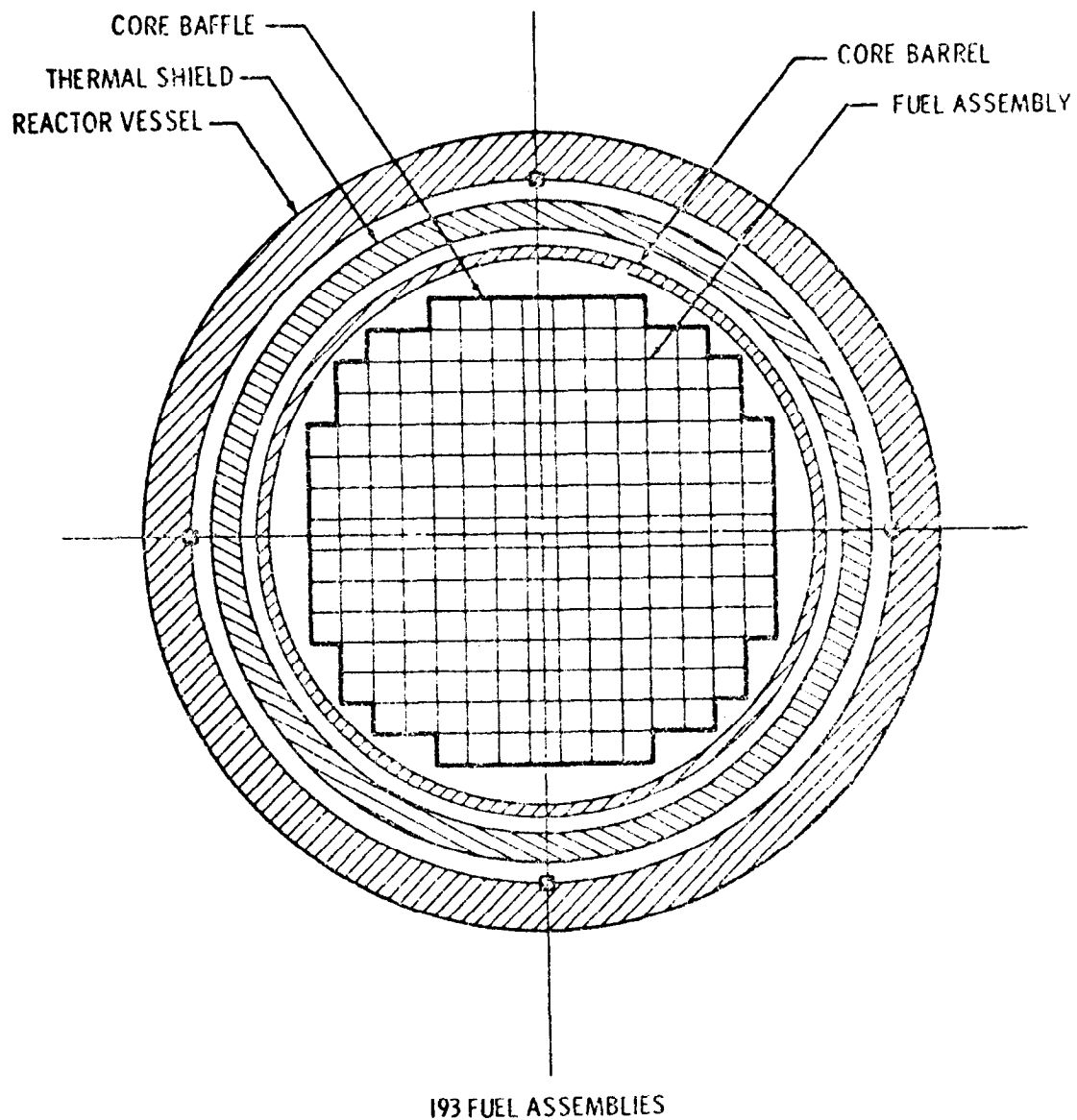
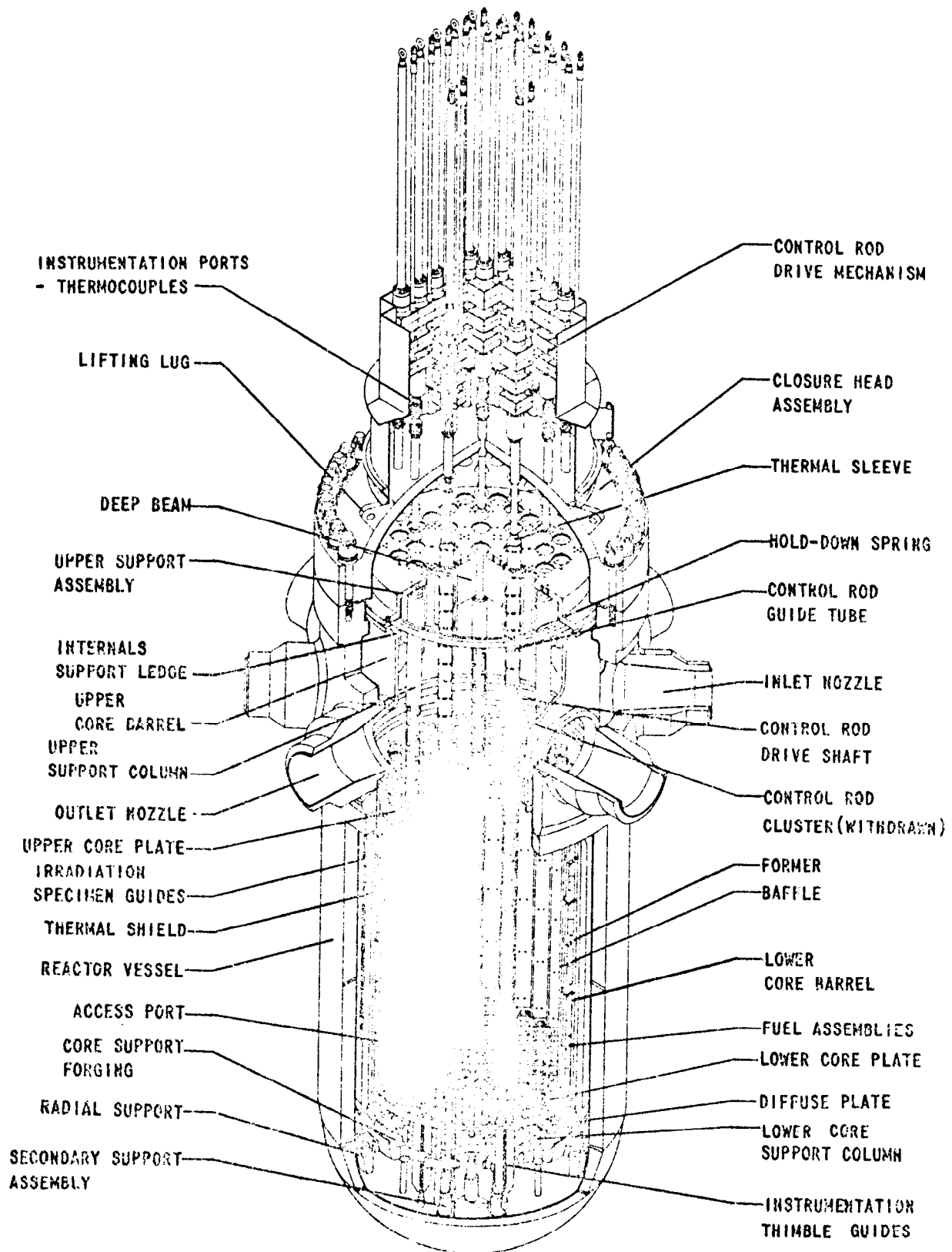




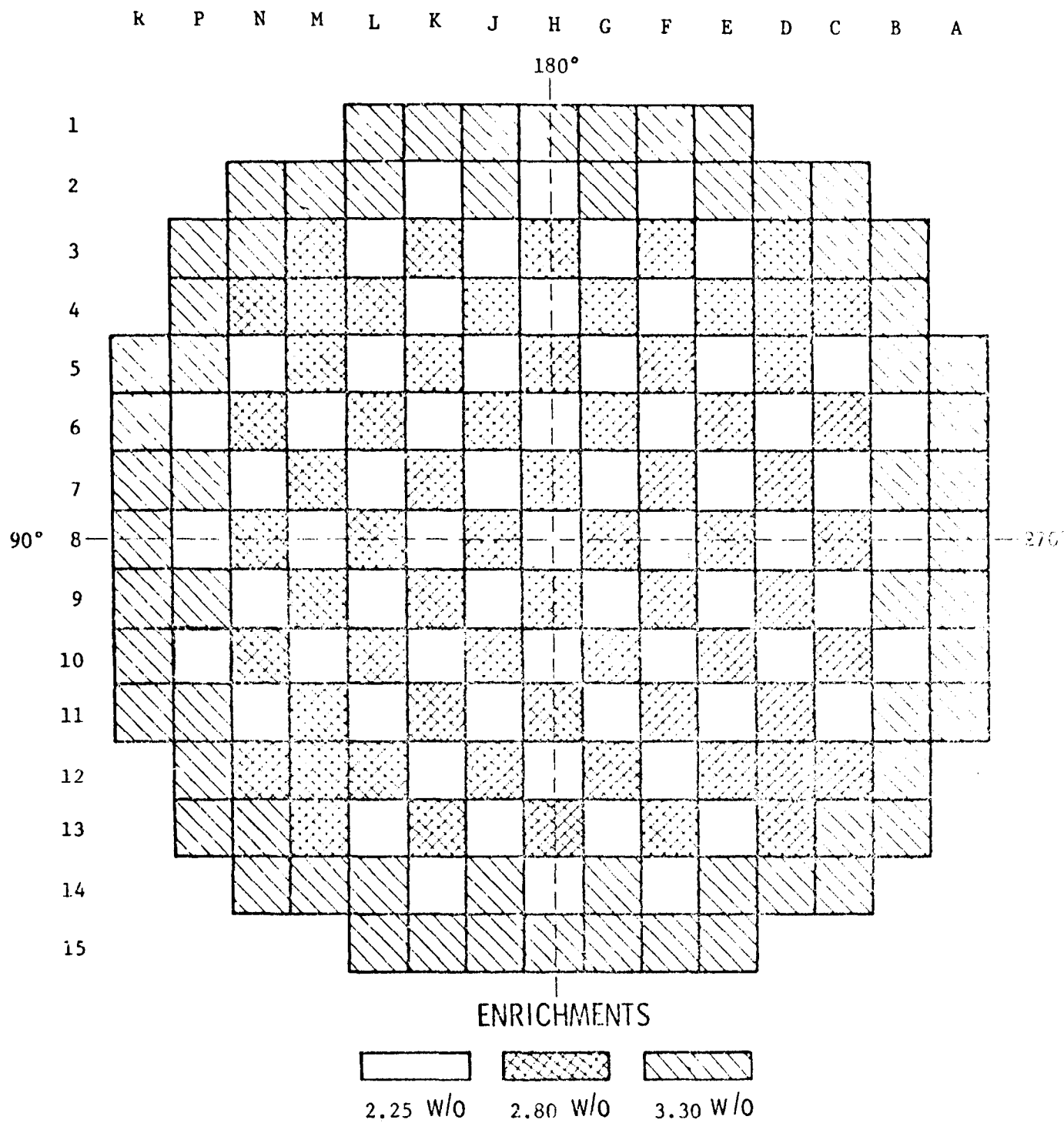
CORE CROSS SECTION
Figure 3.2.1-1
July, 1982



Reactor Vessel and Internals

Figure 3.2.1-2

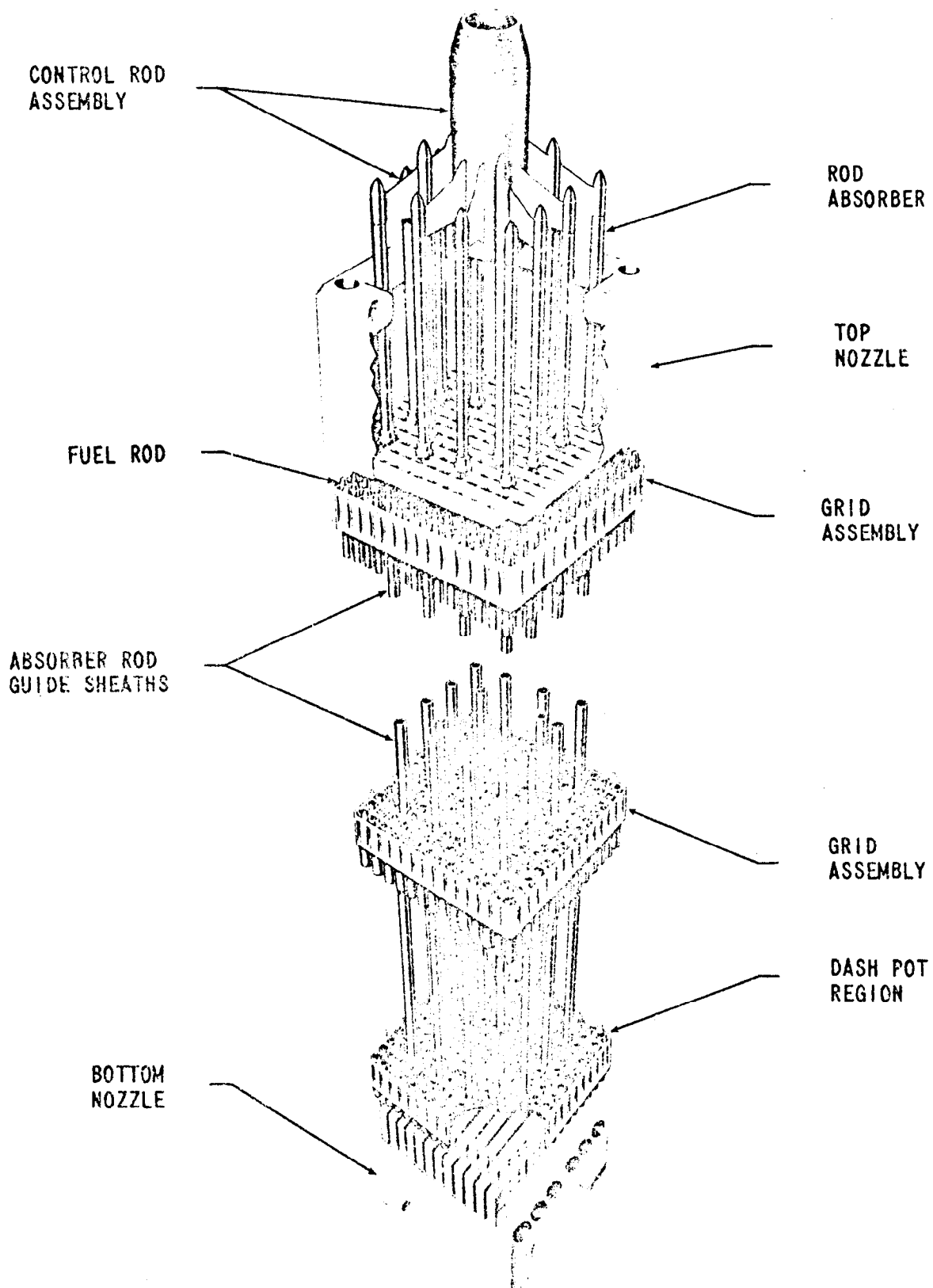
July, 1982



FUEL LOADING ARRANGEMENT

Figure 3.2.1-3

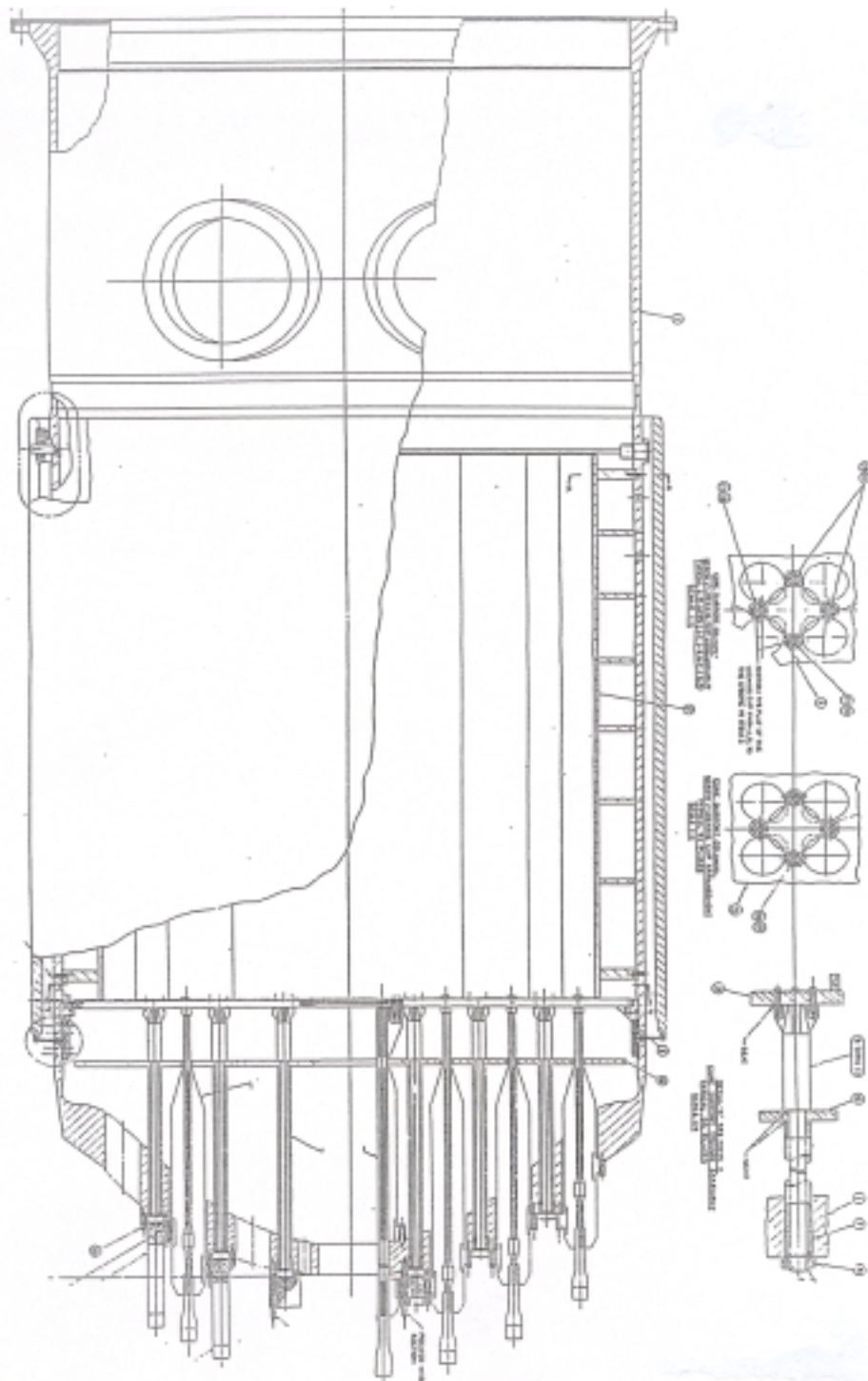
July, 1982



TYPICAL ROD CLUSTER CONTROL ASSEMBLY

Figure 3.2.1-4

July, 1982



Revision: **19.1**

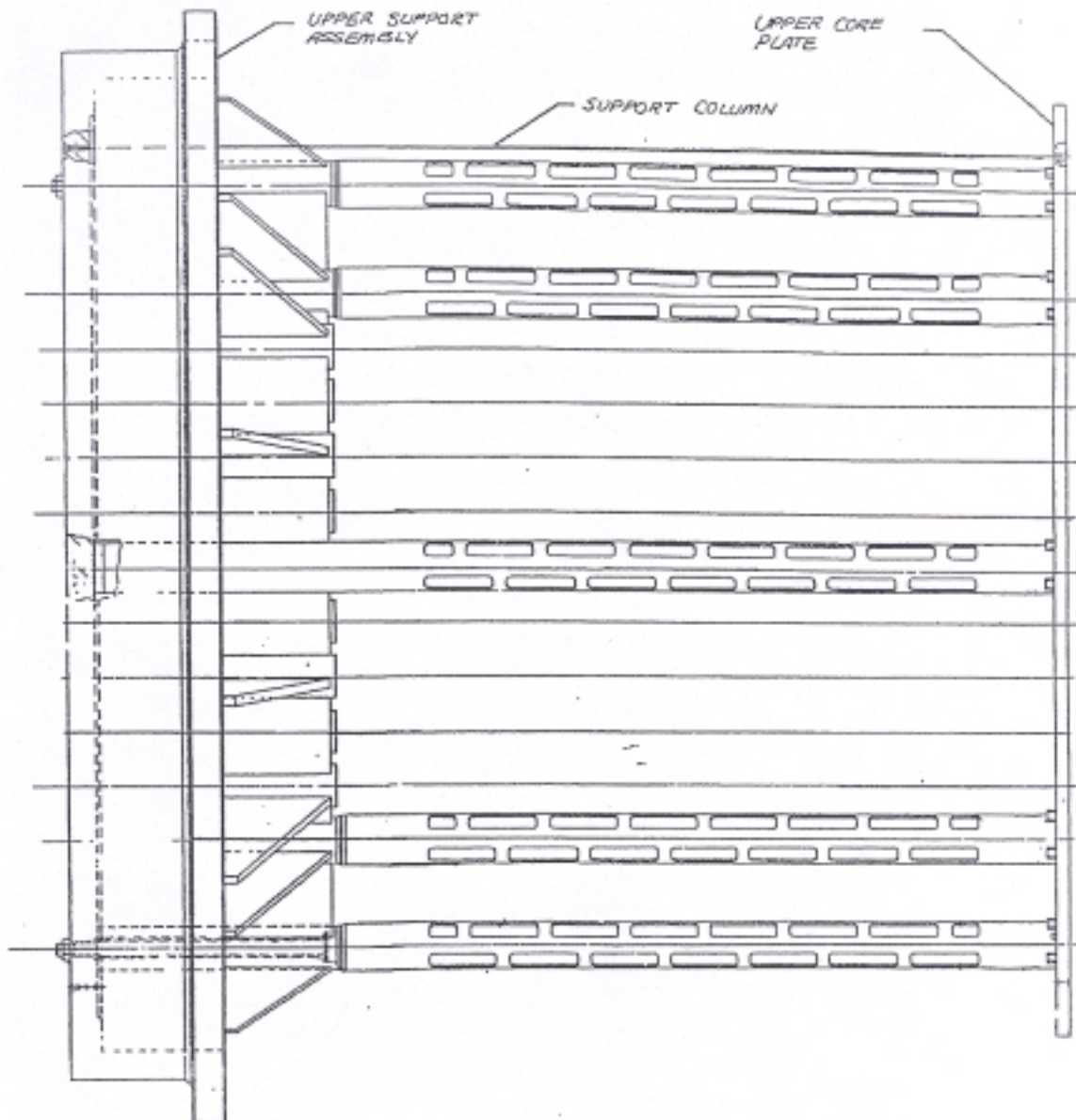
Change Description: **UCR-1727**

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

Title: **D. C. Cook Unit 1
Core Barrel Assembly**

UFSAR Figure: **3.2.1-5**

Sheet 1 of 1



Revision: **19.1**

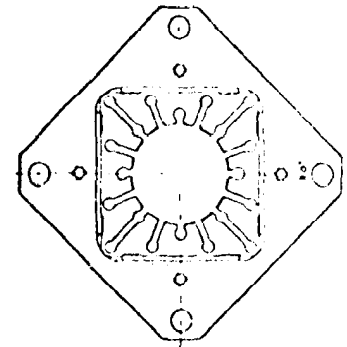
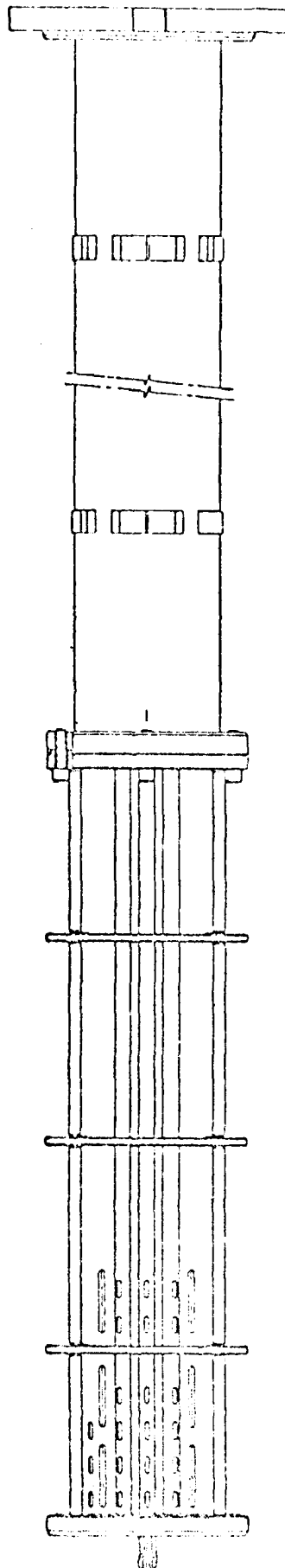
Change Description: **UCR-1727**

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

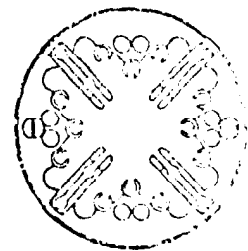
Title: **Upper Core Support Structure**

UFSAR Figure: **3.2.1-6**

Sheet 1 of 1



TOP VIEW



BOTTOM VIEW

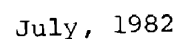
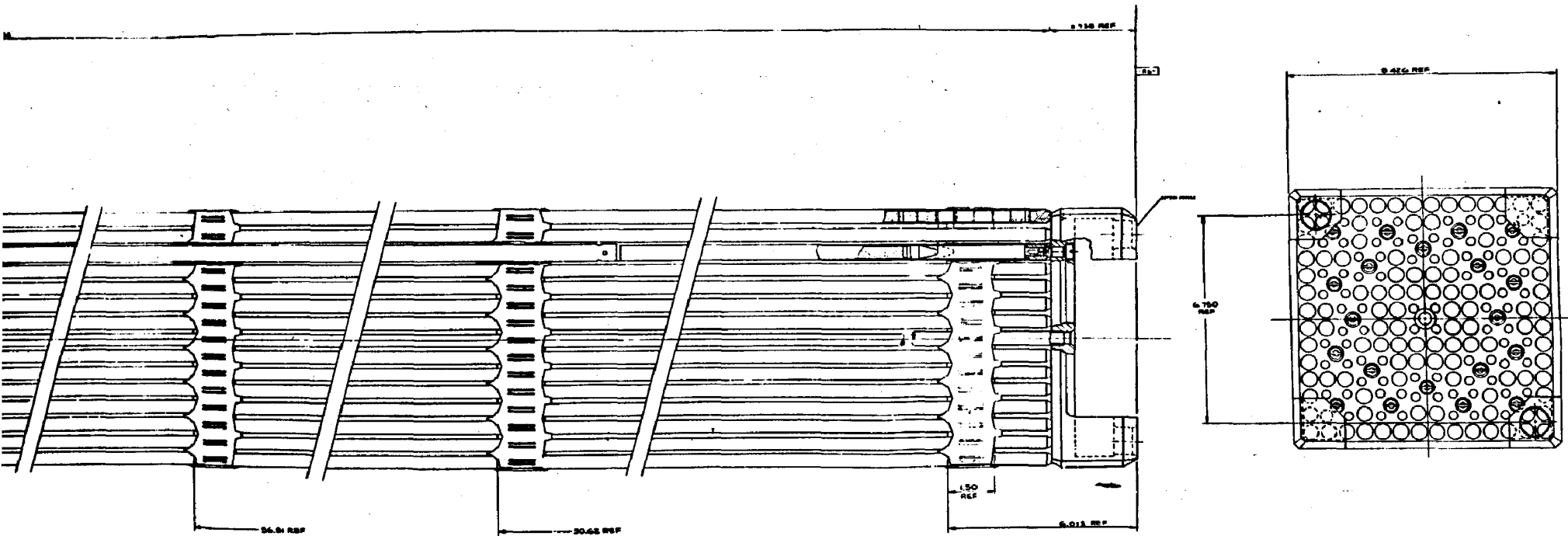


Figure 3.2.1-8



FUEL ASSEMBLY OUTLINE

Figure 3.2.1-9

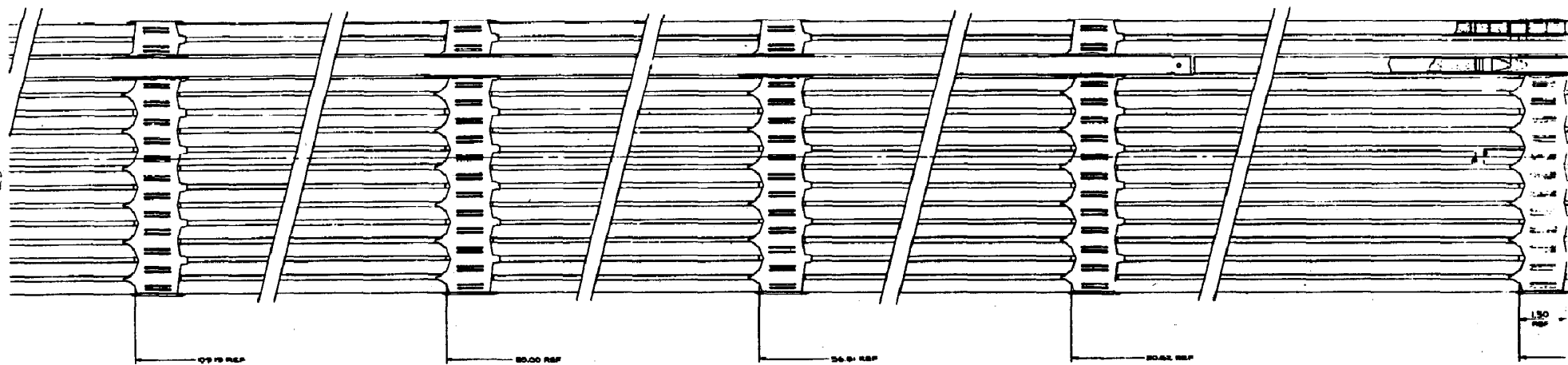
July 1982

66

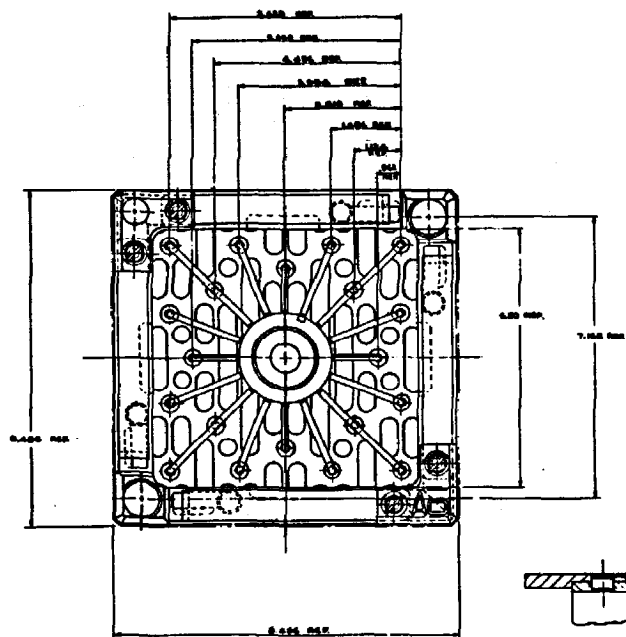
66

66

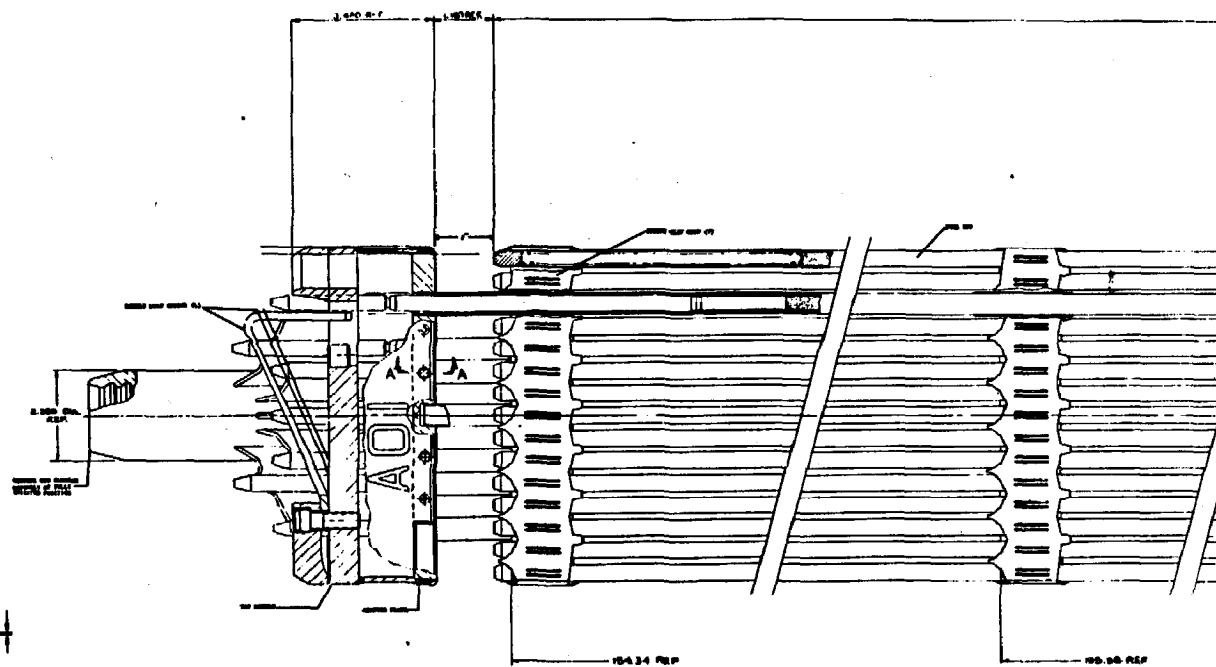
24.190 REF FUEL ROD LENGTH

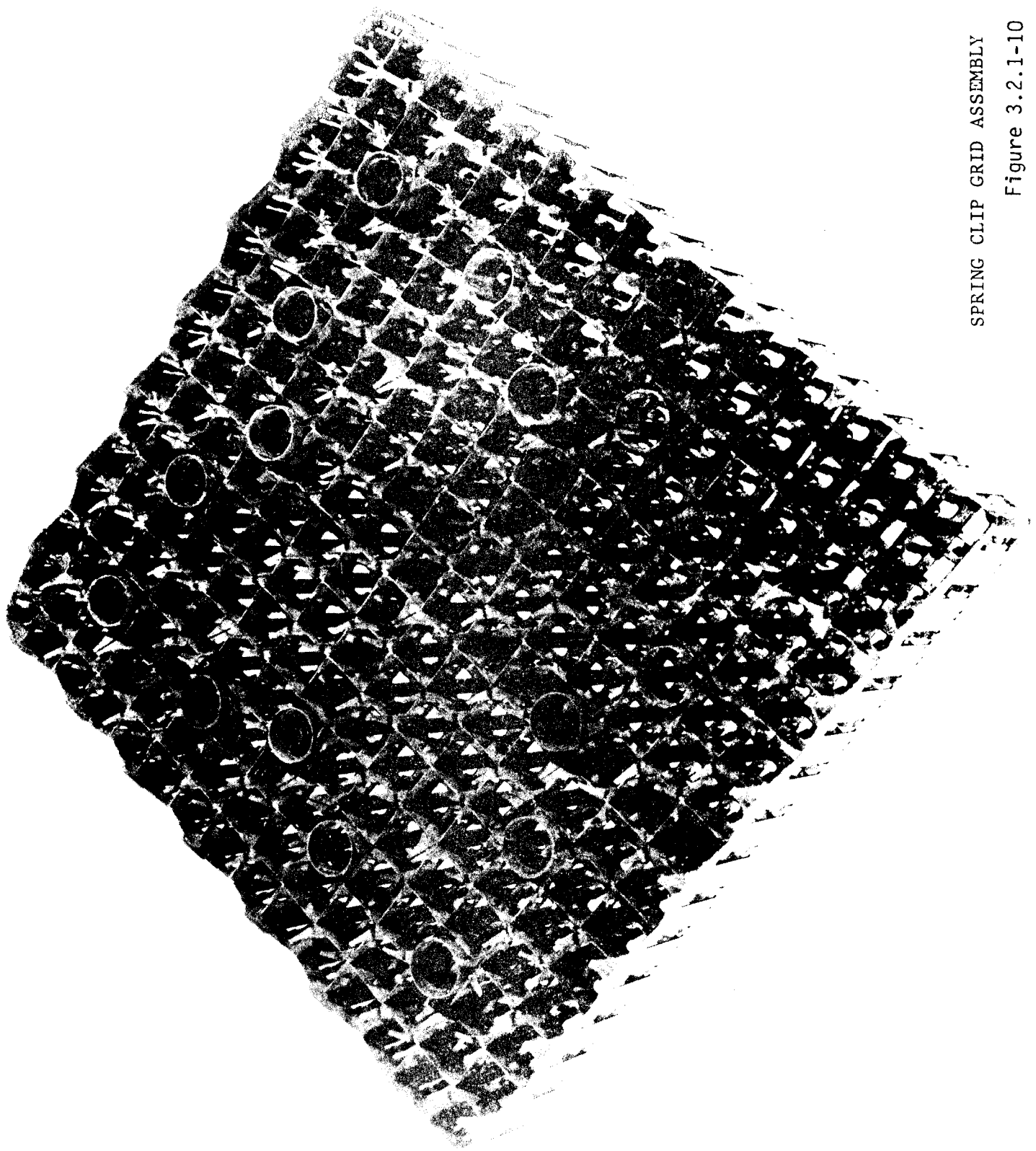


2000



SECTION AA
SCALE 2:1

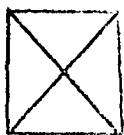
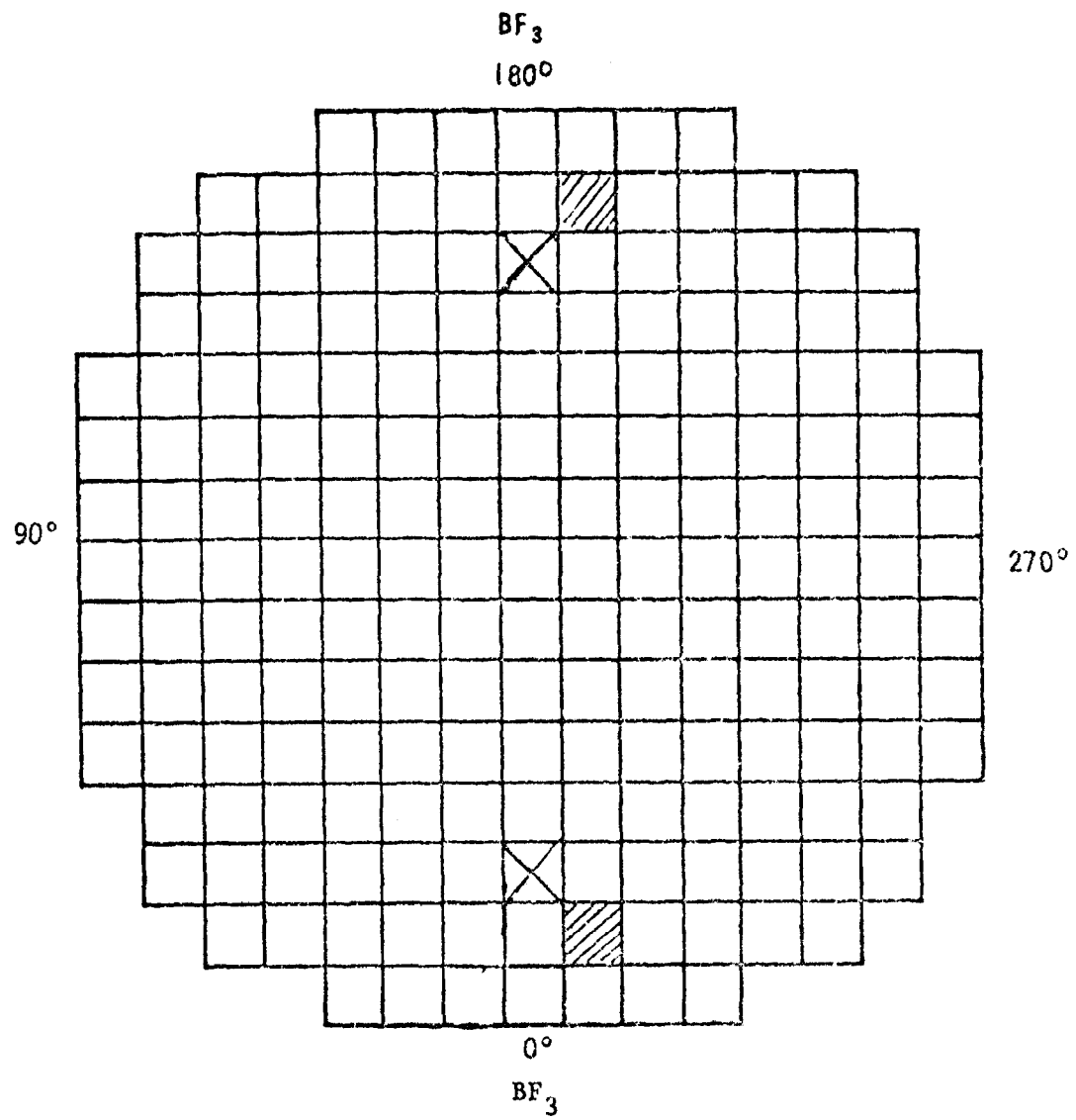




SPRING CLIP GRID ASSEMBLY

Figure 3.2.1-10

July, 1982



Burnable Poison (12)
Secondary Source (4)



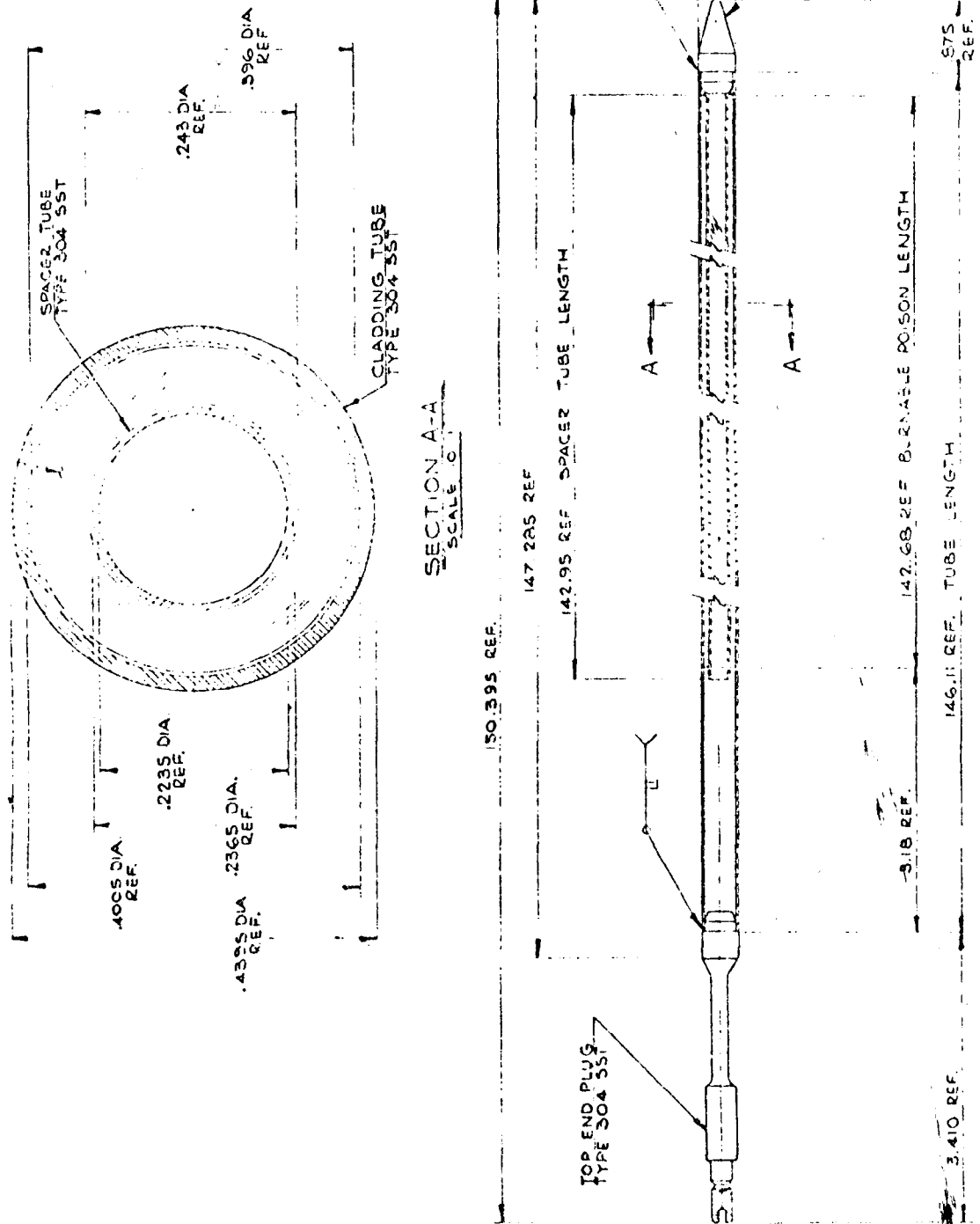
Burnable Poison (19)
Primary Source (1)

NEUTRON SOURCE LOCATIONS

Figure 3.2.1-11

July, 1982

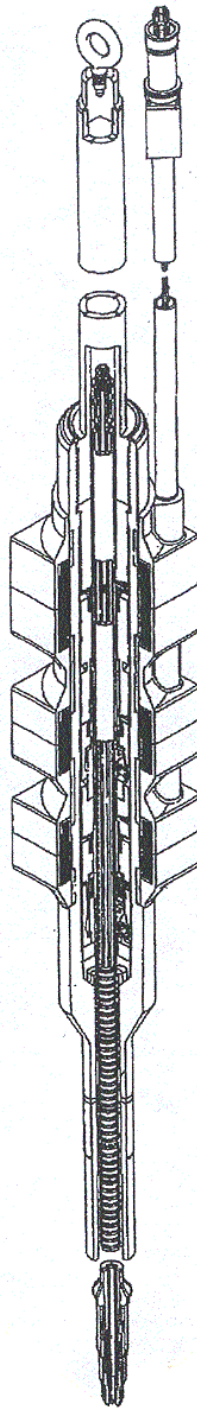
BURNABLE POISON BORSILICATE GLASS TUBING



Burnable Poison

July, 1982

Figure 3.2.1-12



Revision: **21**

Change Description: **UCR-1812, Rev. 1**

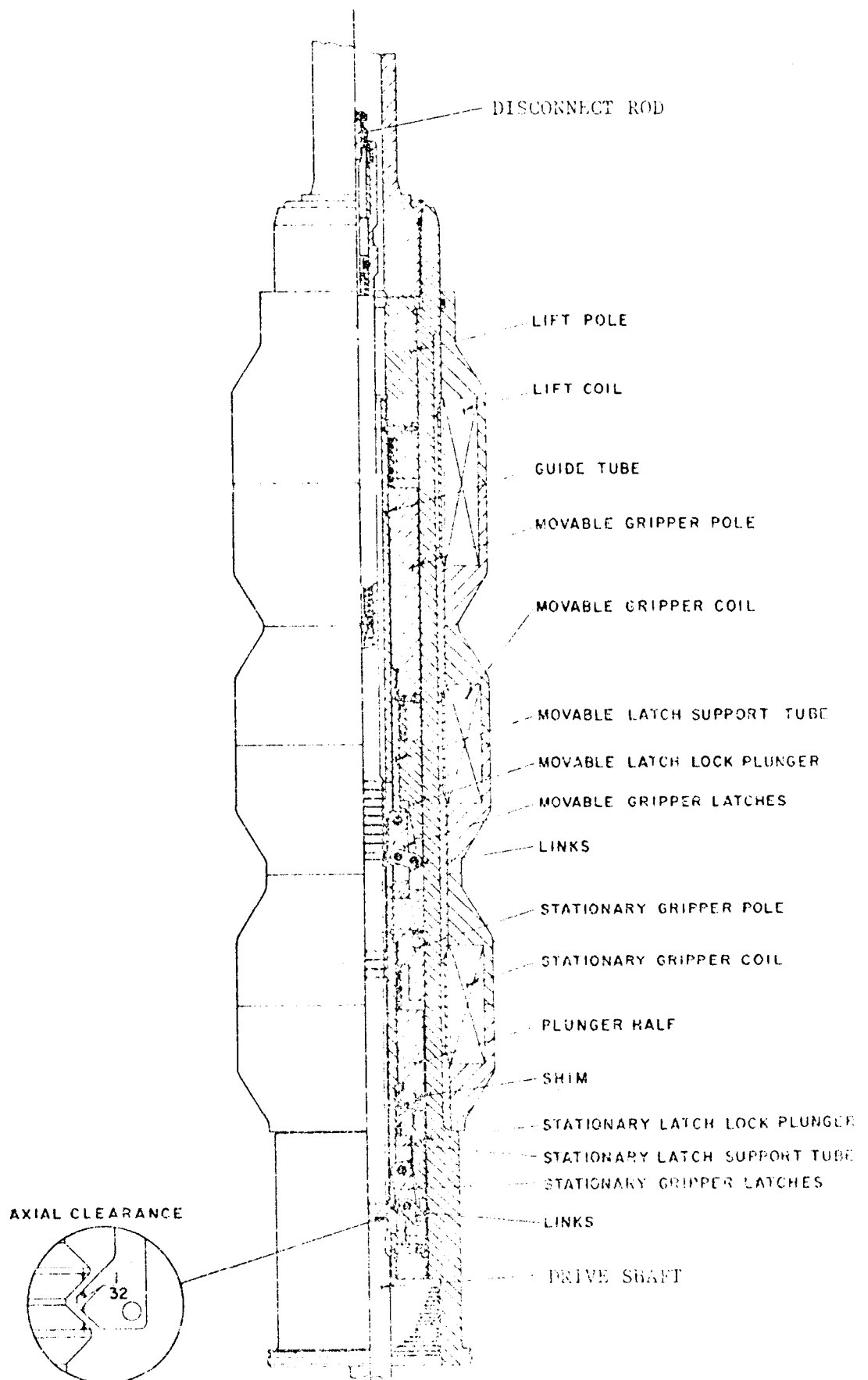
UNIT 1

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

Title: **Control Rod Drive Mechanism Assembly**

UFSAR Figure: **3.2.1-13**

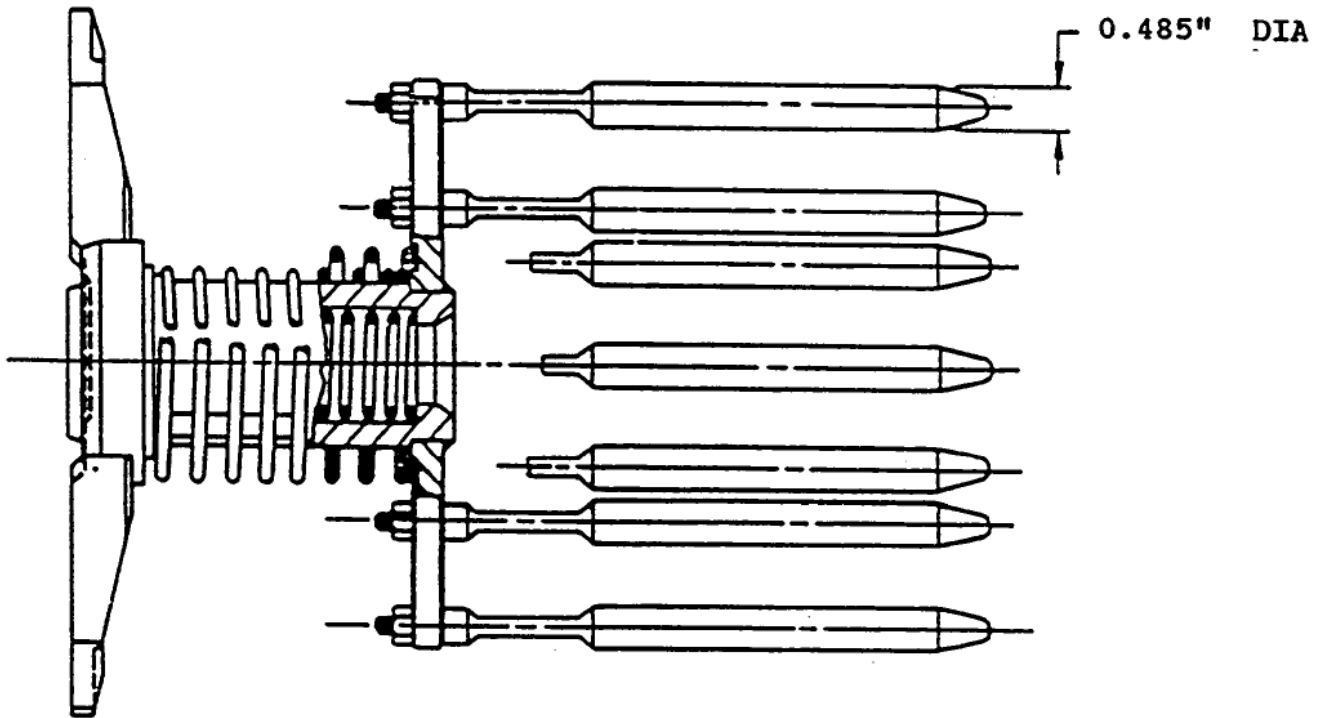
Sheet 1 of 1



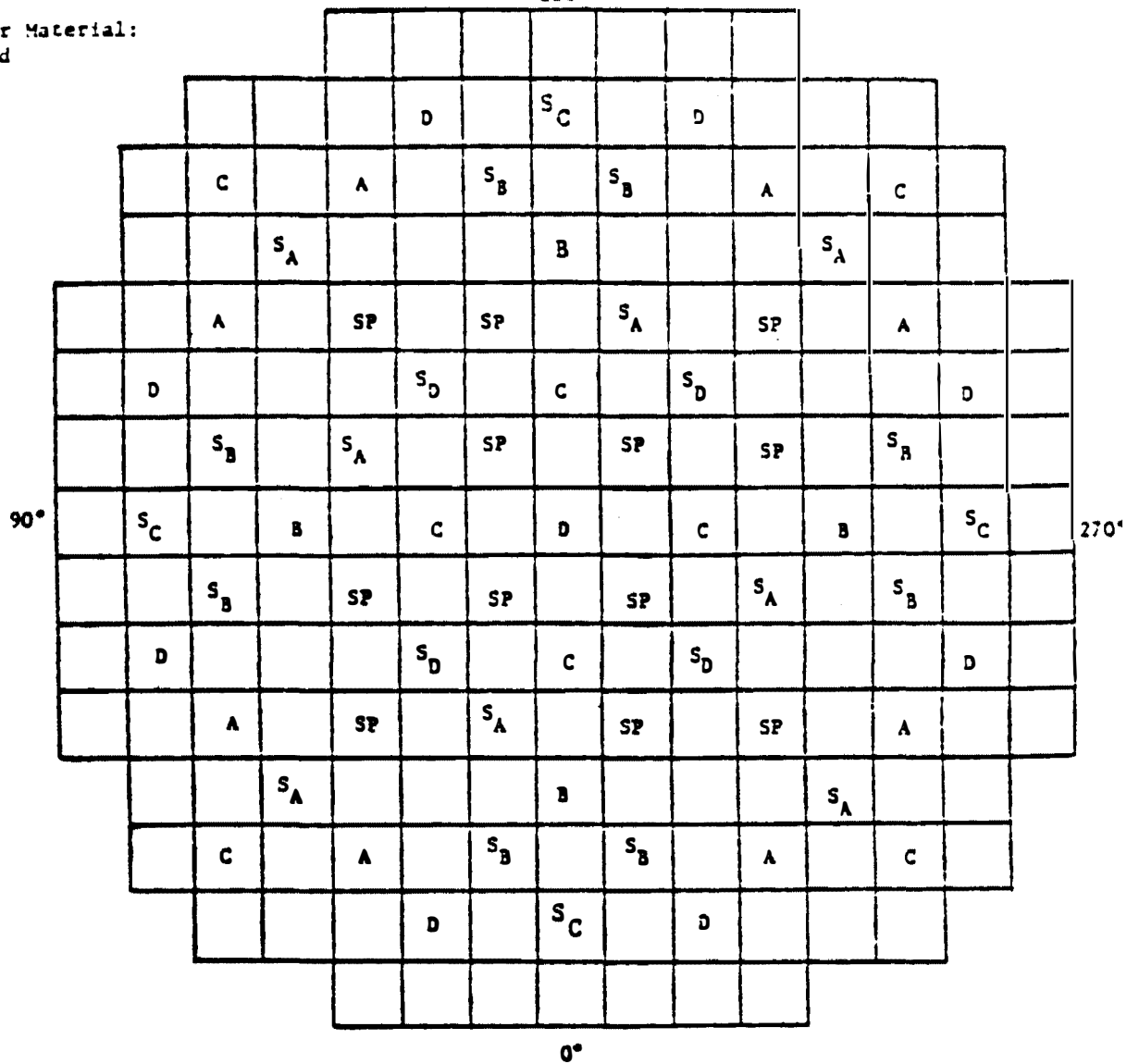
July, 1982

CONTROL ROD DRIVE MECHANISM SCHEMATIC

Figure 3.2.1-14



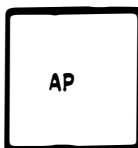
Absorber Material:
Ag-In-Cd



<u>Bank</u>	<u>Number of Rod Clusters</u>
S _A	8
S _B	8
S _C	4
S _D	4
A	8
B	4
C	8
D	9
PL	0
SP (spare rod locations)	12

FIGURE 3.3.1-1

1.116						
1.023	1.094					
1.099	0.964	1.119				
1.078	1.138	1.063	1.142			
1.217	1.087	1.156	0.978	1.197		
1.220	1.205	1.168	1.108	0.959	1.015	
1.073	1.016	1.057	1.009	0.858	0.487	
0.736	0.833	0.710	0.611			



AP - ASSEMBLY POWER

Figure 3.3.1-2 CYCLE 1 ASSEMBLYWISE POWER (BOL)

July, 1984

1.175						
1.215	1.162					
1.159	1.158	1.144				
1.187	1.138	1.181	1.126			
1.125	1.174	1.119	1.102	1.203		
1.153	1.082	1.161	1.047	0.951	0.976	
0.968	1.000	0.956	0.964	0.817	0.500	
0.730	0.781	0.677	0.576			

AP

AP - ASSEMBLY POWER

Figure 3.3.1- 3 CYCLE 1 ASSEMBLYWISE POWER (MOL)

July, 1984

1.072						
1.163	1.080					
1.088	1.150	1.077				
1.171	1.079	1.162	1.093			
1.066	1.144	1.074	1.153	1.213		
1.144	1.047	1.147	1.036	1.051	1.028	
0.969	1.064	0.934	0.990	0.855	0.557	
0.773	0.809	0.732	0.600			

AP

AP - ASSEMBLY POWER

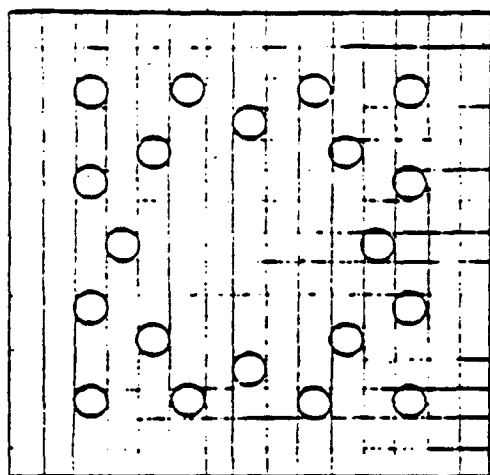
Figure 3.3.1-4 CYCLE 1 ASSEMBLYWISE POWER (EOL)

July, 1984

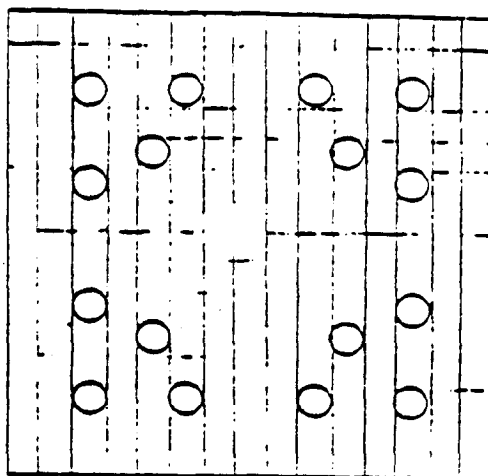
				9		9		9					
		8		12		20		20		12		8	
	8		20		12		12		12		20		8
		20		20		16		16		20		20	
	12		20		20		16		20		20		12
9		12		20		16		16		20		12	9
	20		16		16		16		16		16		20
9		12		16		16		16		16		12	9
	20		16		16		16		16		16		20
9		12		20		16		16		20		12	9
	12		20		20		16		20		20		12
		20		20		16		16		20		20	
	8		20		12		12		12		20		8
		8		12		20		20		12		8	
				9		9		9					

Distribution of Burnable Poison Rods -
Number of B. P. Rods per Assembly
(1436 total)
Unit 1, Cycle 1

Figure 3.3.1-11
July, 1984

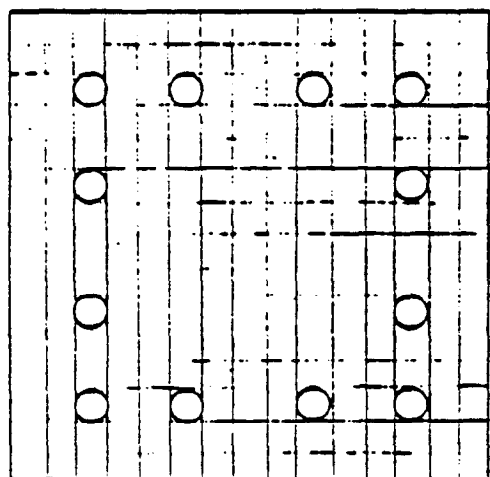


20 Rods

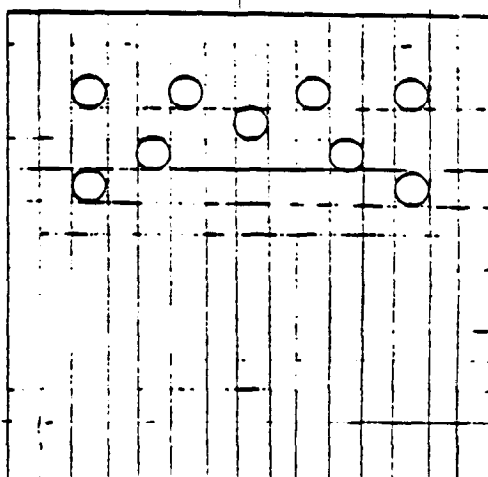


16 Rods

Core Center

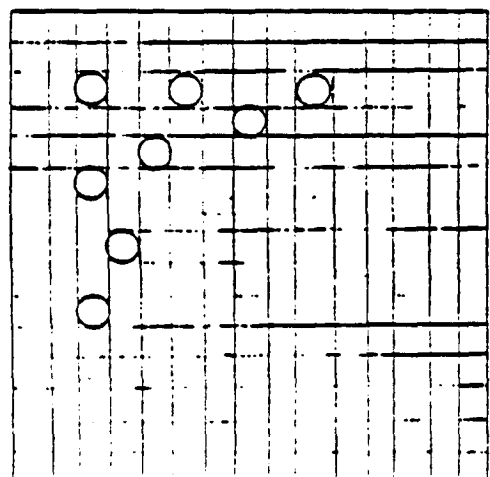


12 Rods



9 Rods

Core Center



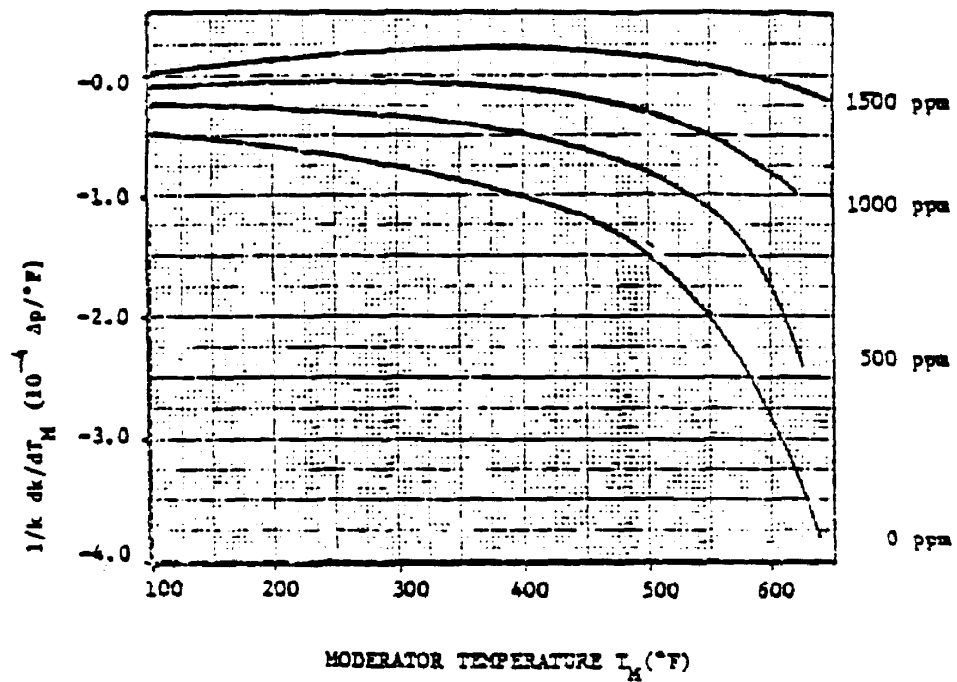
8 Rods

Arrangement of Burnable Poison
Rods Within an Assembly

Unit 1, Cycle 1

Figure 3.3.1-12

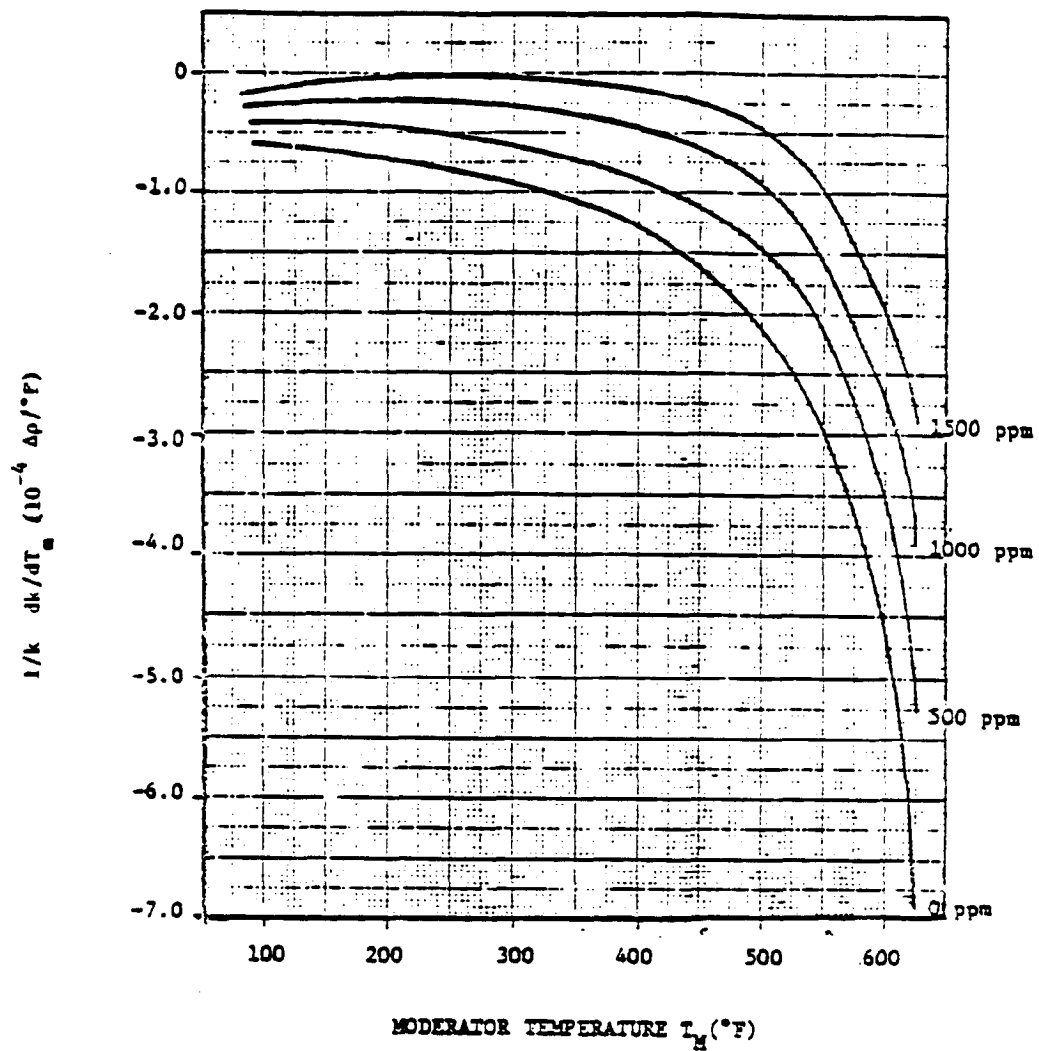
July, 1984



MODERATOR TEMPERATURE
COEFFICIENT VS. MODERATOR
TEMPERATURE
BOL, NO CONTROL RODS INSERTED

Figure 3.3.1- 13

July, 1984

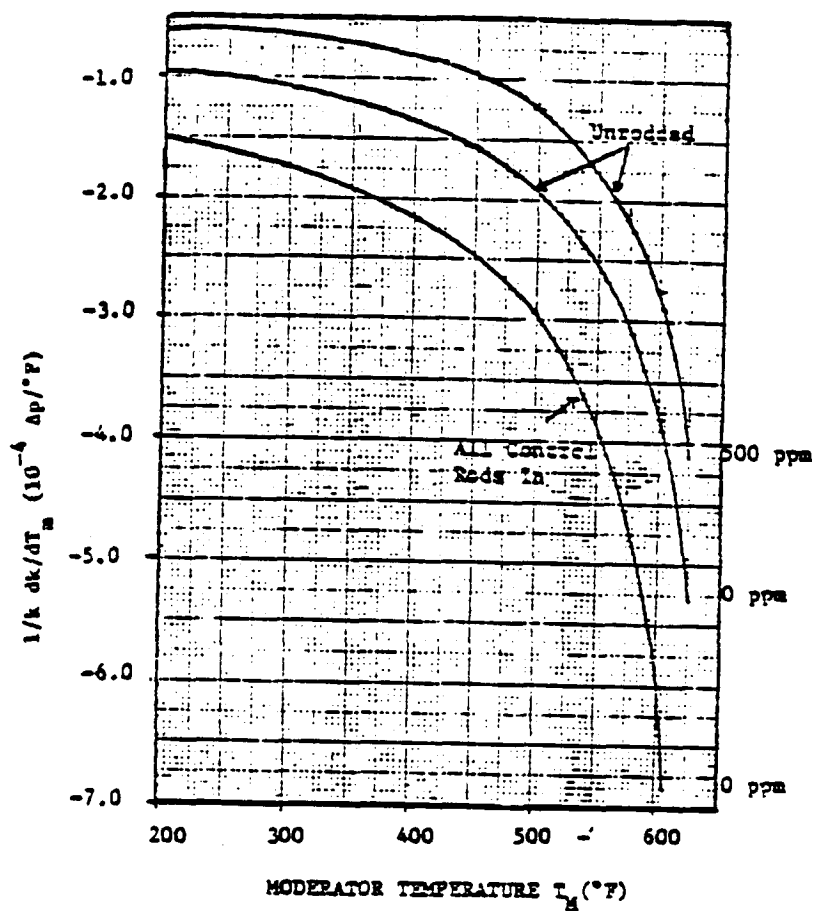


MODERATOR TEMPERATURE COEFFICIENT
VS. MODERATOR TEMPERATURE

BOL, ALL CONTROL RODS INSERTED

Figure 3.3.1-14

July, 1984



MODERATOR TEMPERATURE COEFFICIENT
VS. MODERATOR TEMPERATURE
EOL

Figure 3.3.1-15

July, 1984

Doppler Coefficient vs. Resonance Effective Temperature

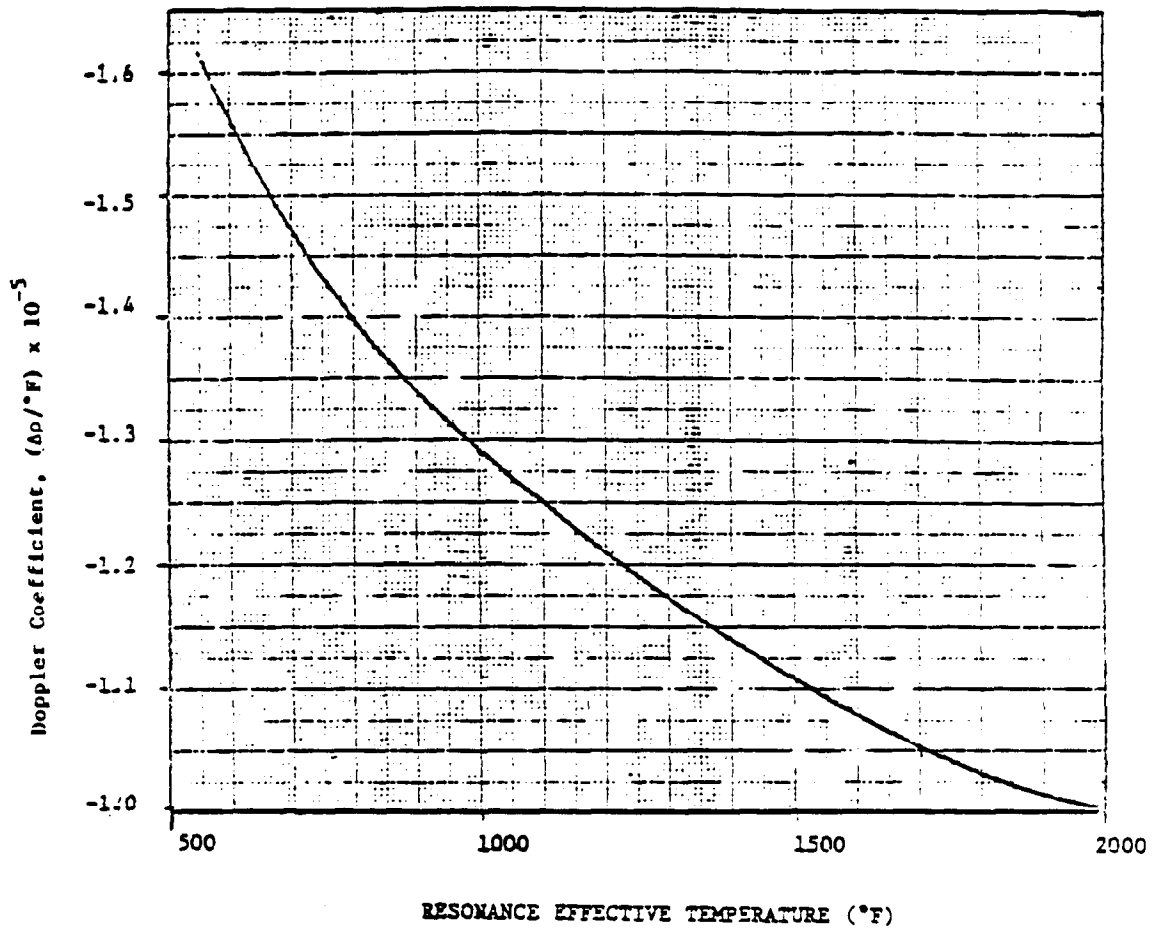


Figure 3.3.1- 16

July, 1984

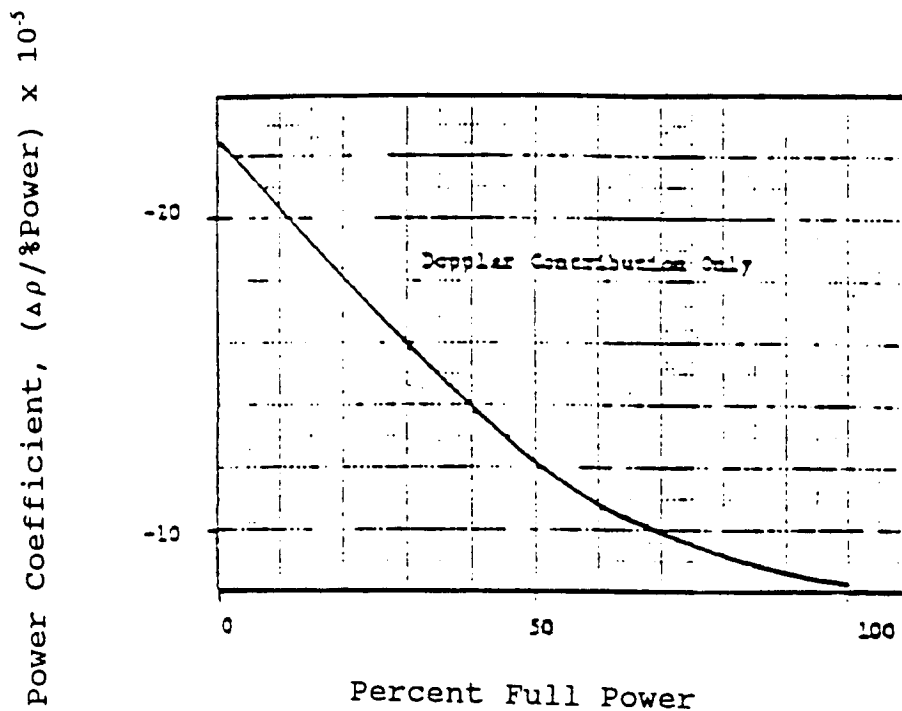
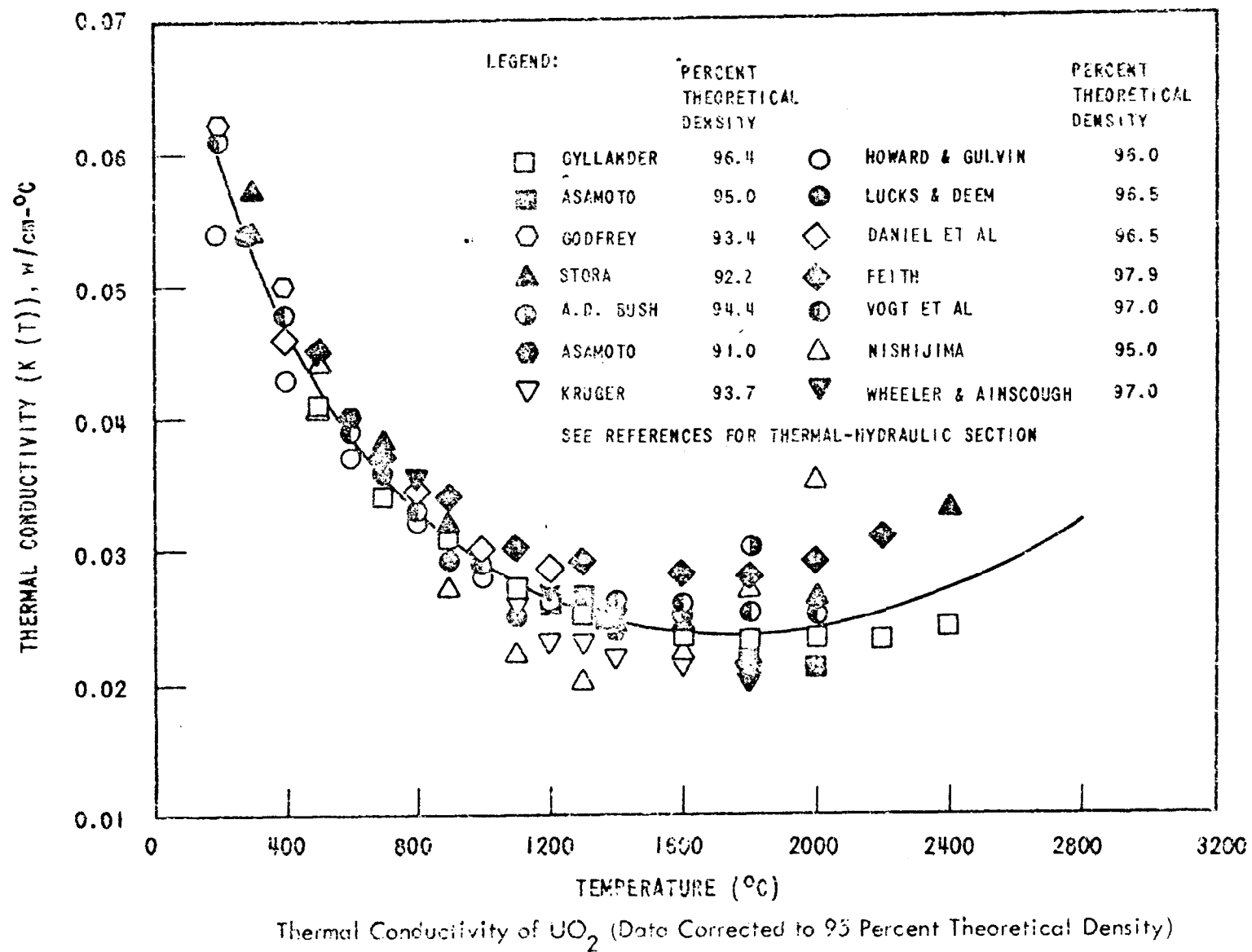
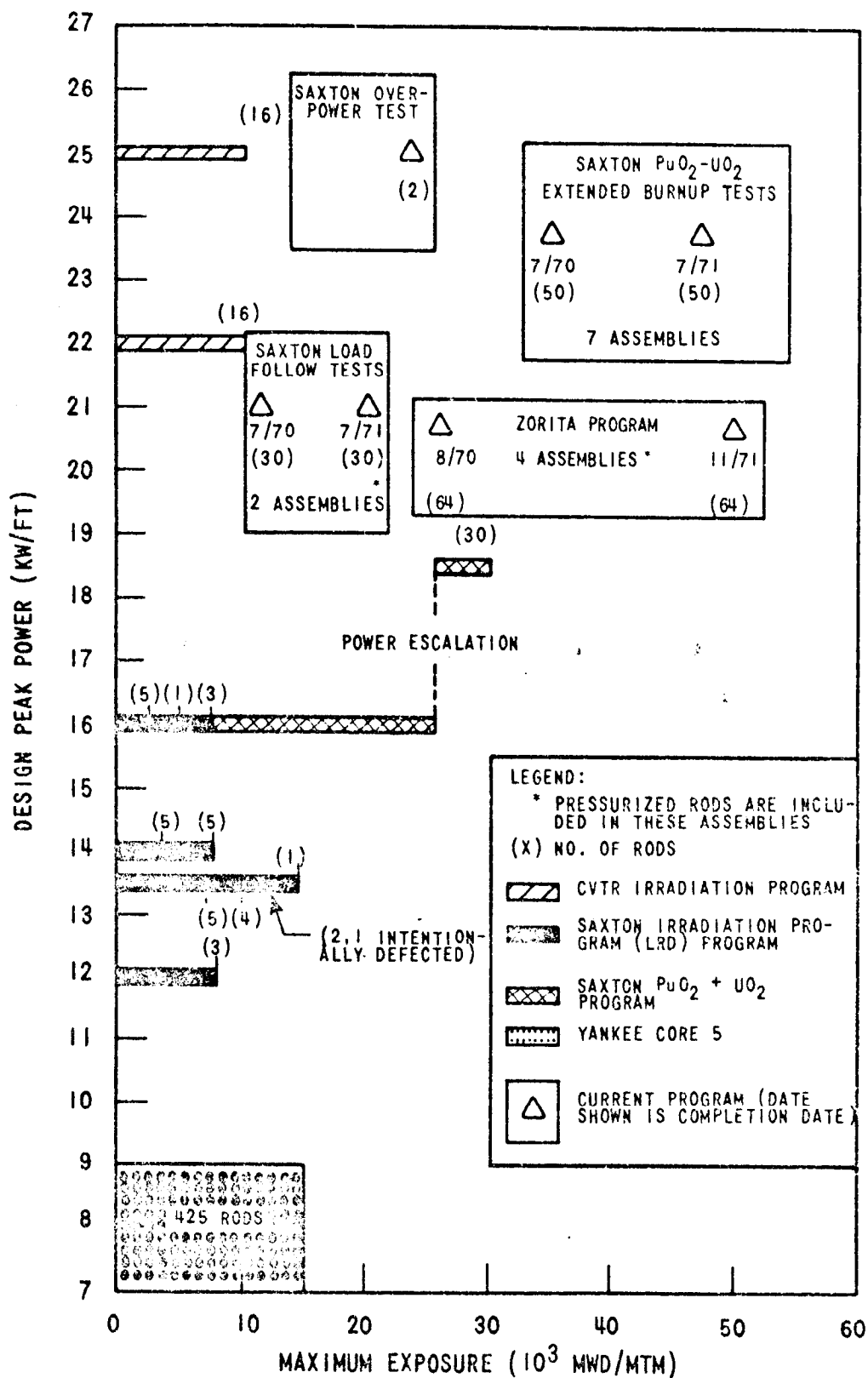


Figure 3.3.1-17: Doppler Contributions to the Power Coefficient vs. Power Level July, 1992
UNIT 1

Figure 3.4.1-1

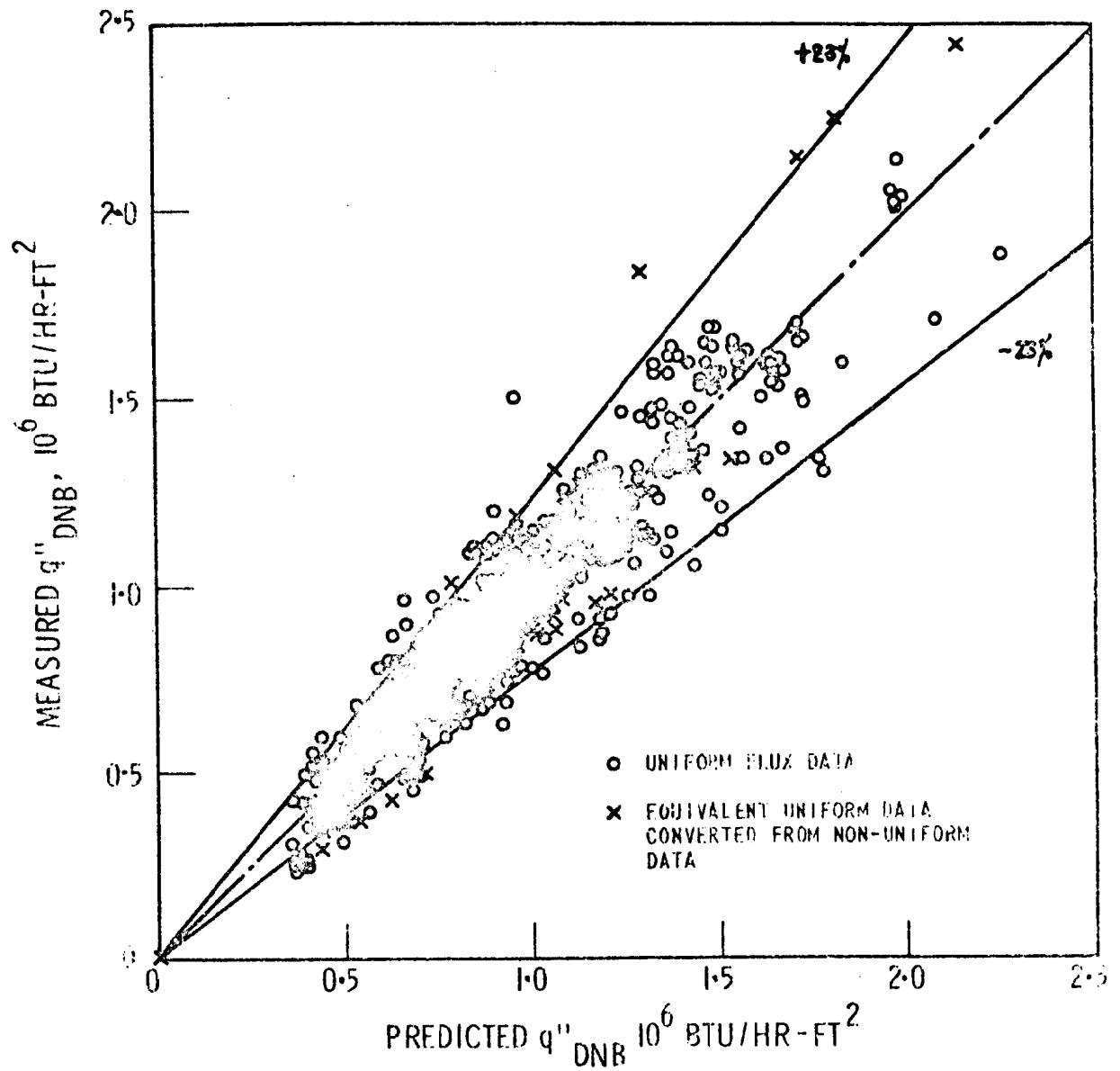




High Power Fuel Rod Experimental Program

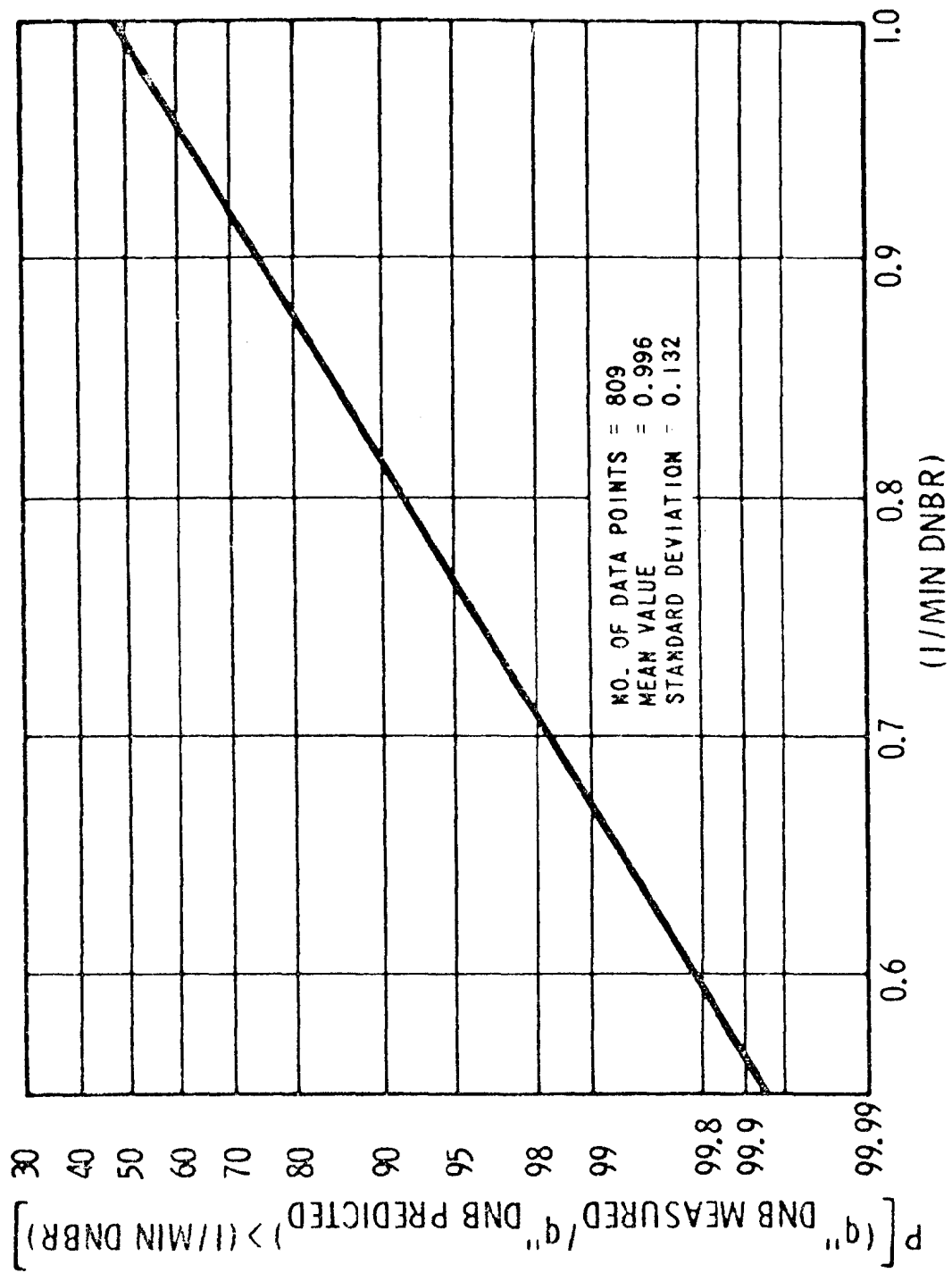
Figure 3.4.1-2

July, 1982



COMPARISON OF W-3 PREDICTION AND UNIFORM FLUX DATA

Figure 3.4.1-3
 July, 1982

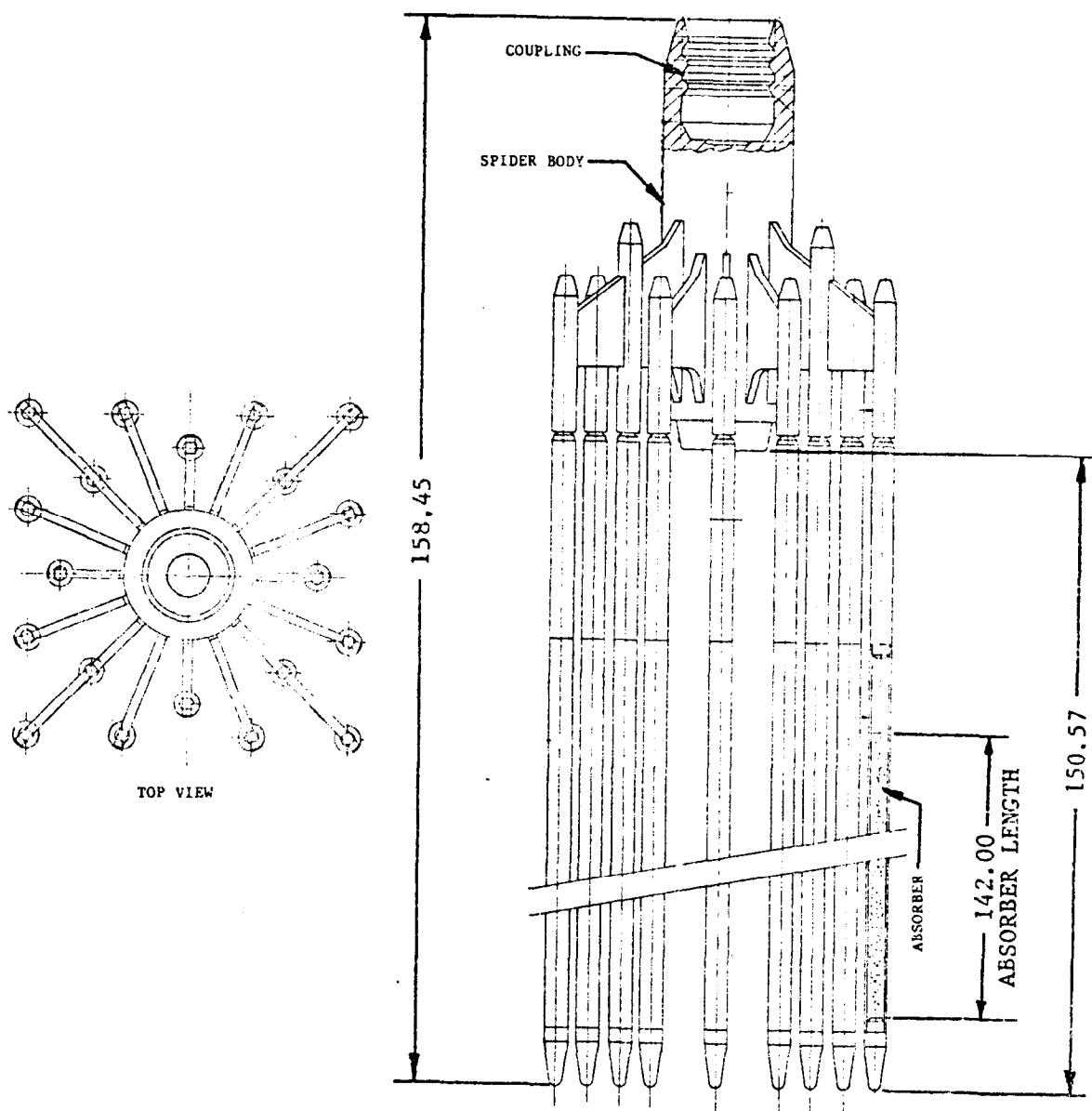


W-3 CORRELATION PROBABILITY DISTRIBUTION CURVE

W-3 CORRELATION PROBABILITY DISTRIBUTION CURVE

Figure 3.4.1-4

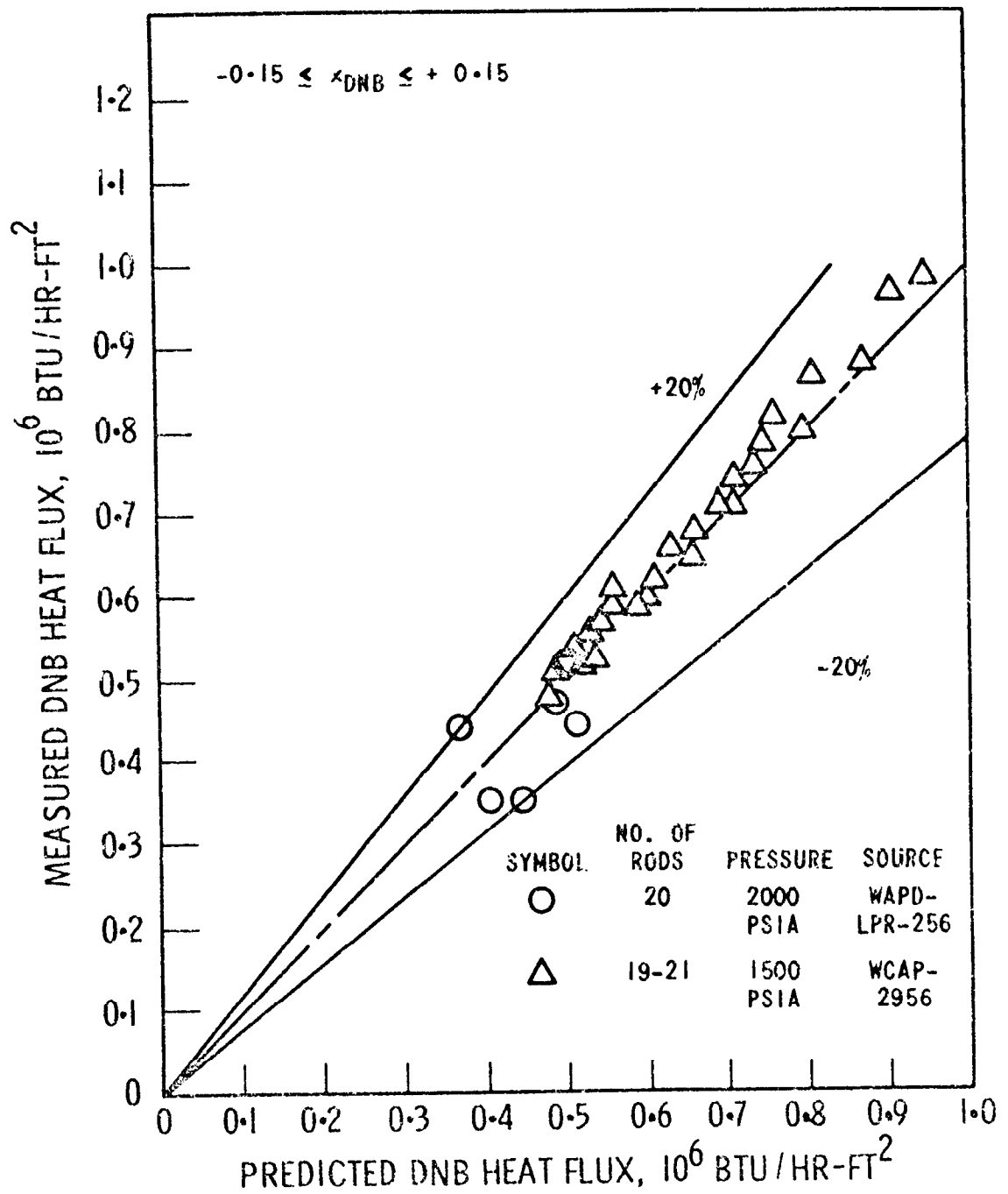
July, 1982



ROD CONTROL CLUSTER ASSEMBLY OUTLINE

Figure 3.4.1-4a

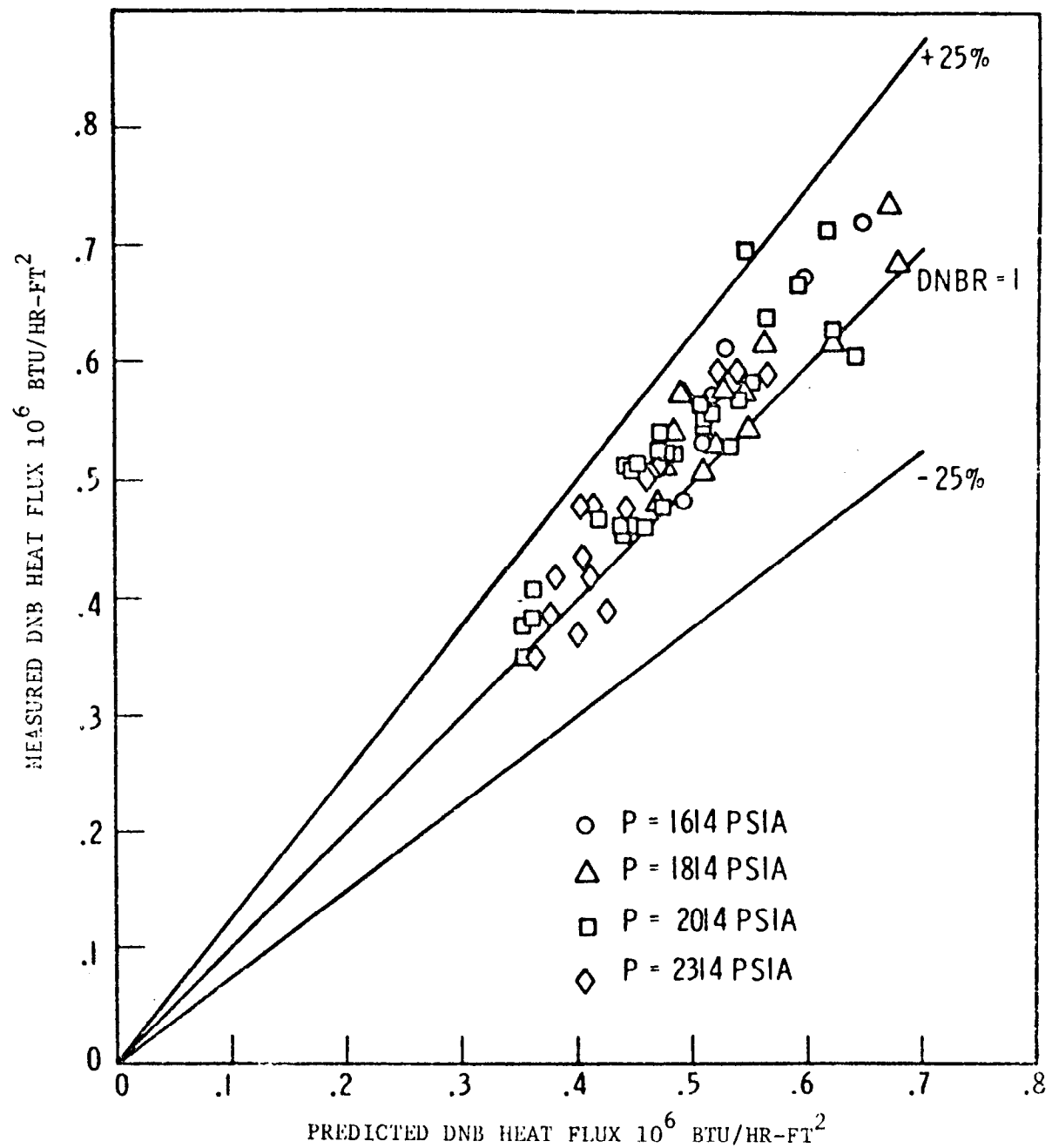
July, 1982



COMPARISON OF W-3 CORRELATION WITH ROD BUNDLE DNB DATA
(SIMPLE GRID WITHOUT MIXING VANE)

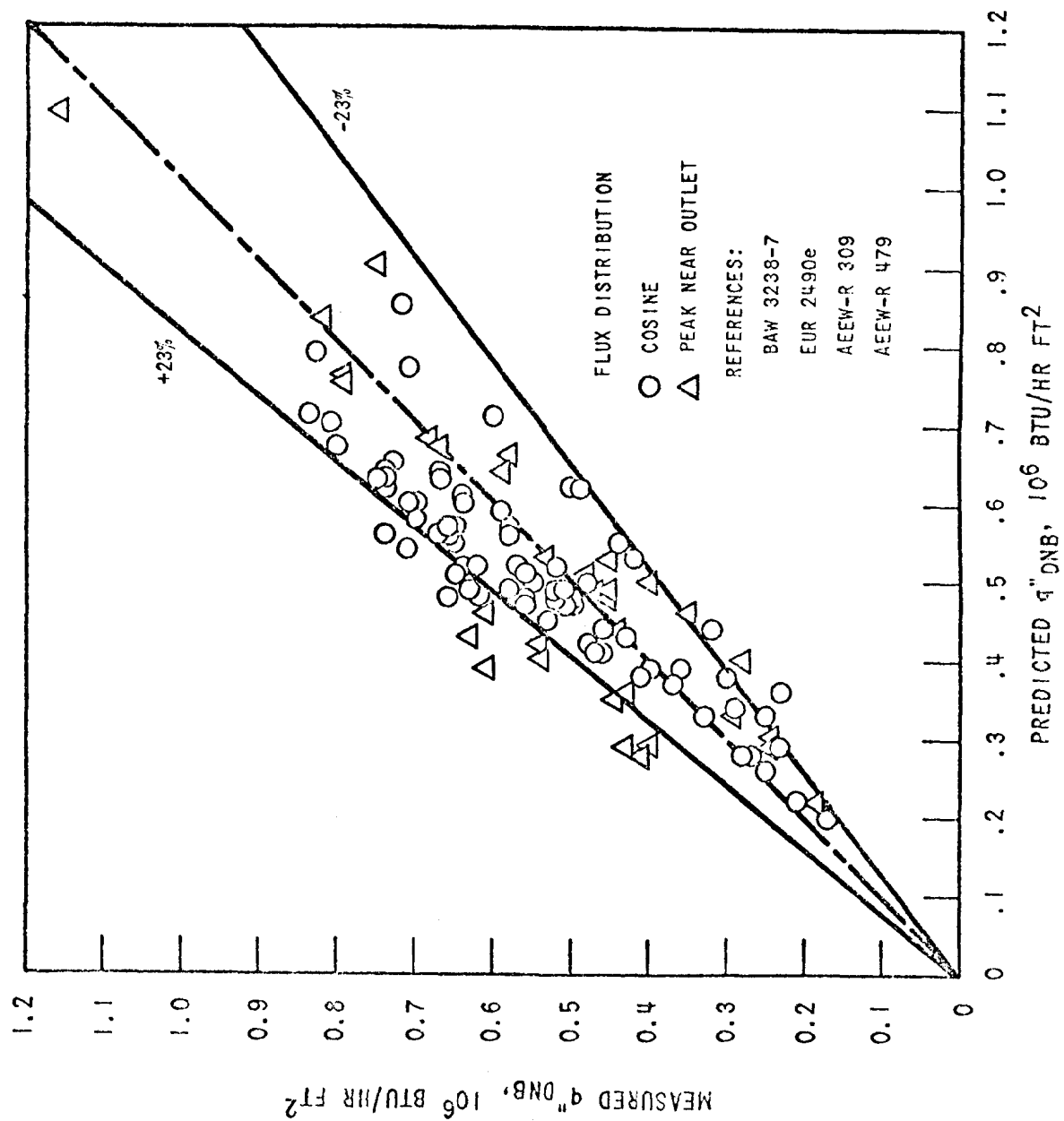
Figure 3.4.1-5

July, 1982



COMPARISON OF W-3 CORRELATION WITH ROD BUNDLE DNB DATA
(SIMPLE GRID WITH MIXING VANE)

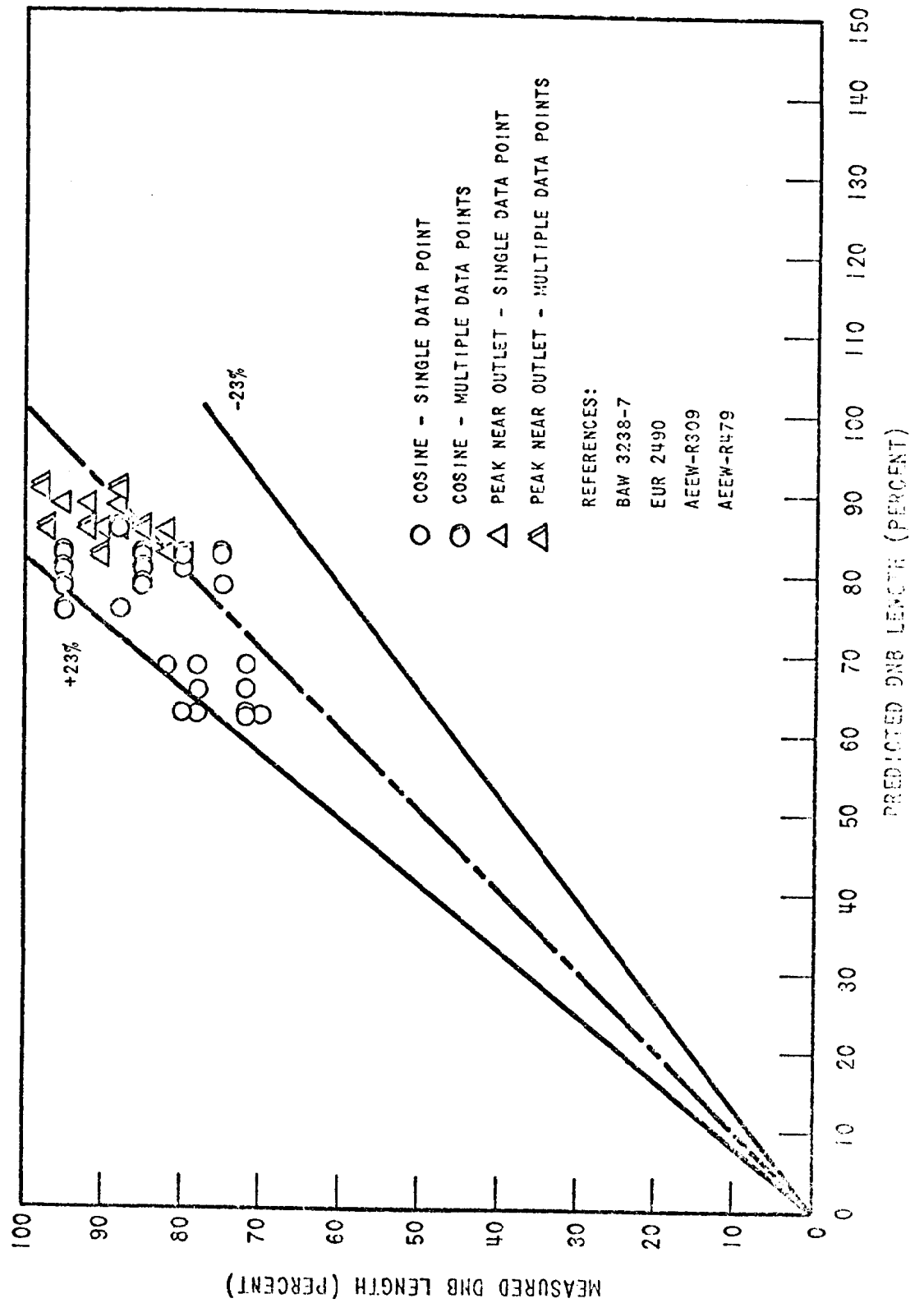
Figure 3.4.1-6
July, 1982



COMPARISON OF NON-UNIFORM DNB DATA WITH W-3 PREDICTIONS

Figure 3.4.1-7

July, 1982



COMPARISON OF W-3 PREDICTION WITH MEASURED DNB LOCATION

Figure 3.4.1-8

July, 1982

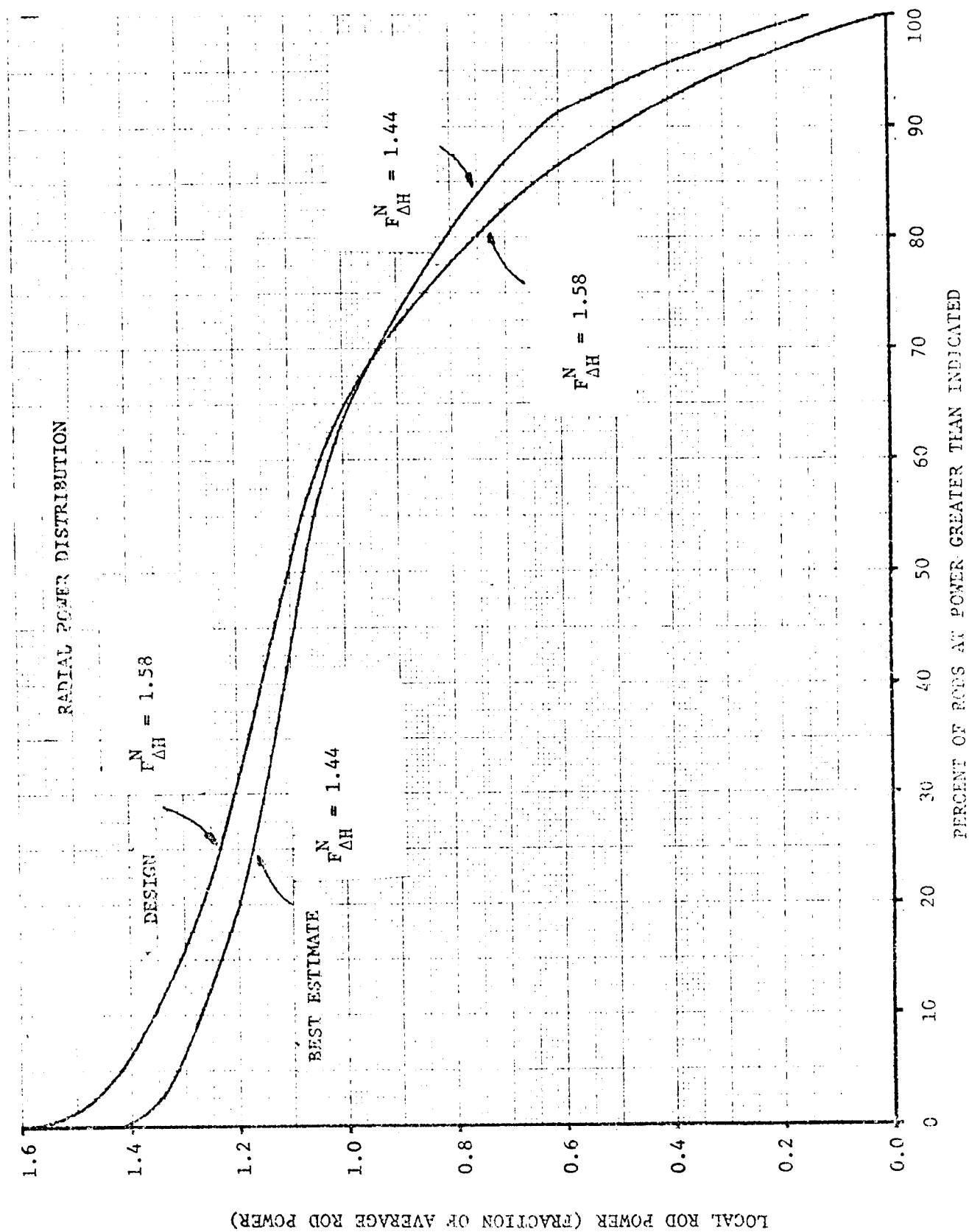
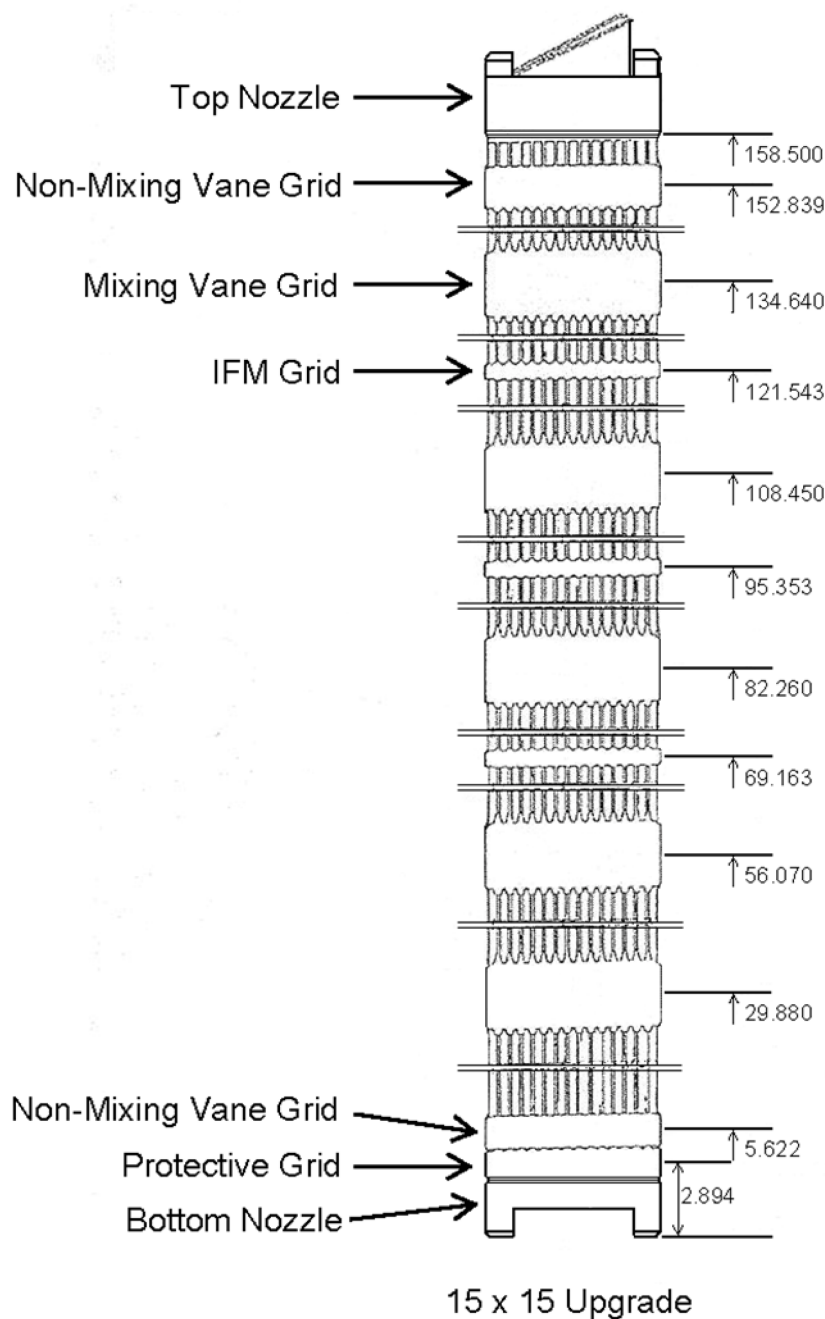


Figure 3.4.1-9

July, 1982



UFSAR Figure: 3.5.1-1

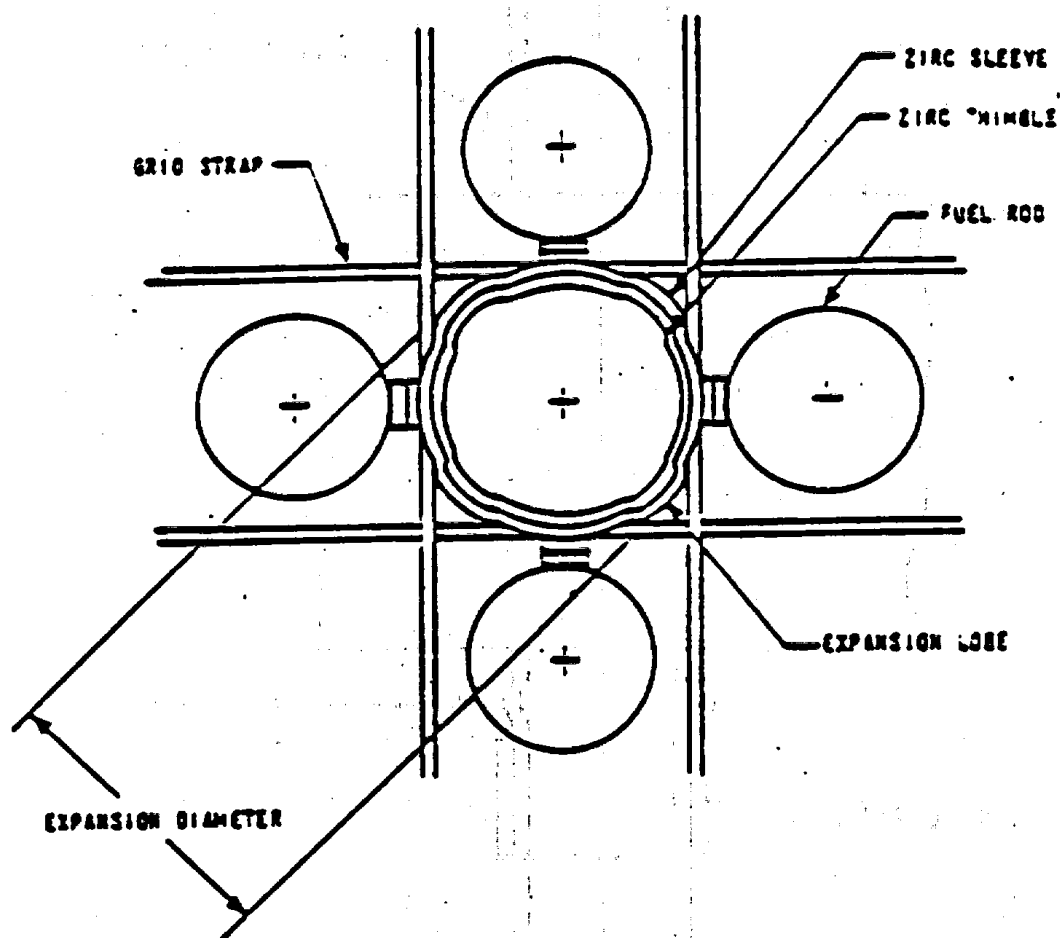
Change Description:
UCR-2042, Rev. 0

Title: **Schematic of Westinghouse 15 x 15 Upgrade Fuel**

Unit: **1**

Last Revised: Revision 25.0

MID GRID EXPANSION JOINT DESIGN



Revision: 24.0

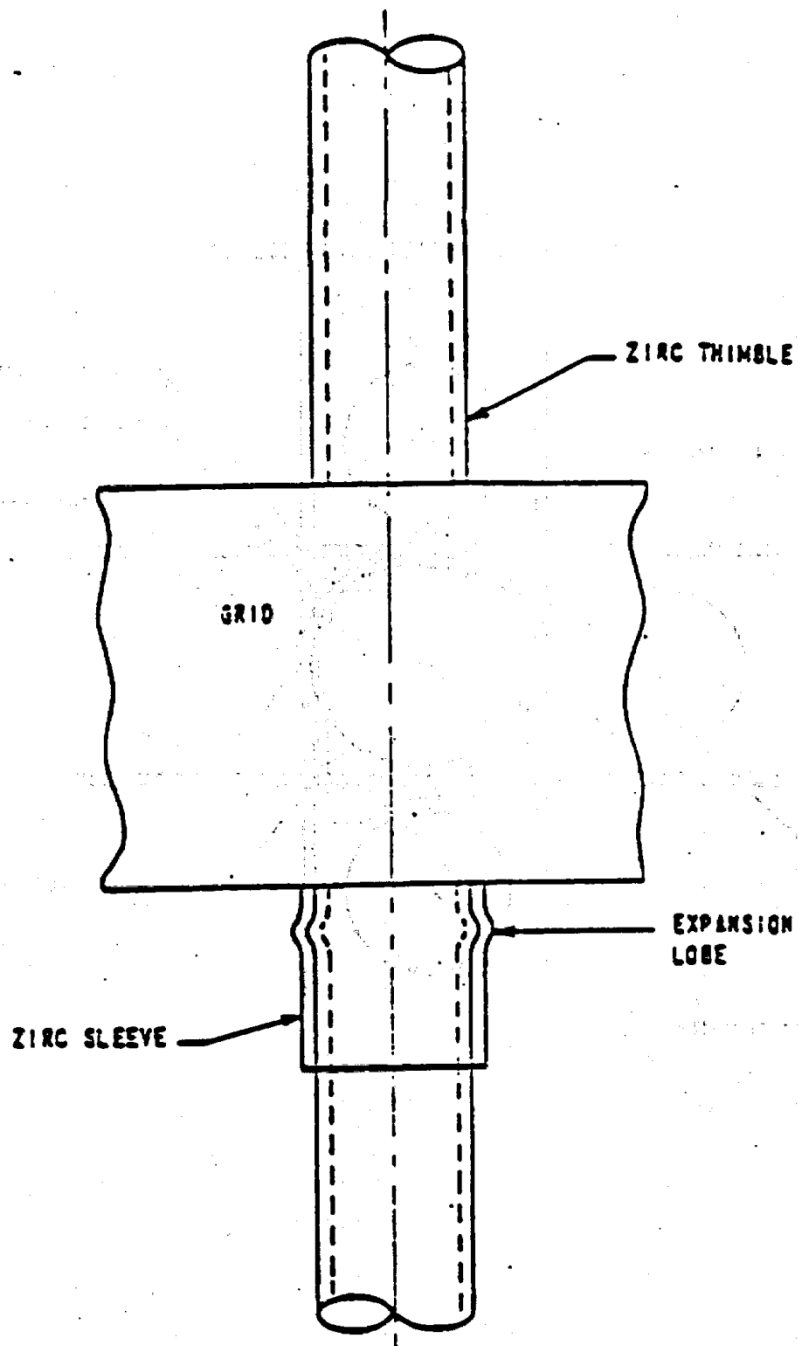
Change Description: UCR-1990, Rev. 0

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

Title: Plan View of Mid Grid to Guide
Thimble Joint (Bottom View)

UFSAR Figure: 3.5.1-2

Sheet 1 of 1



Revision: **24.0**

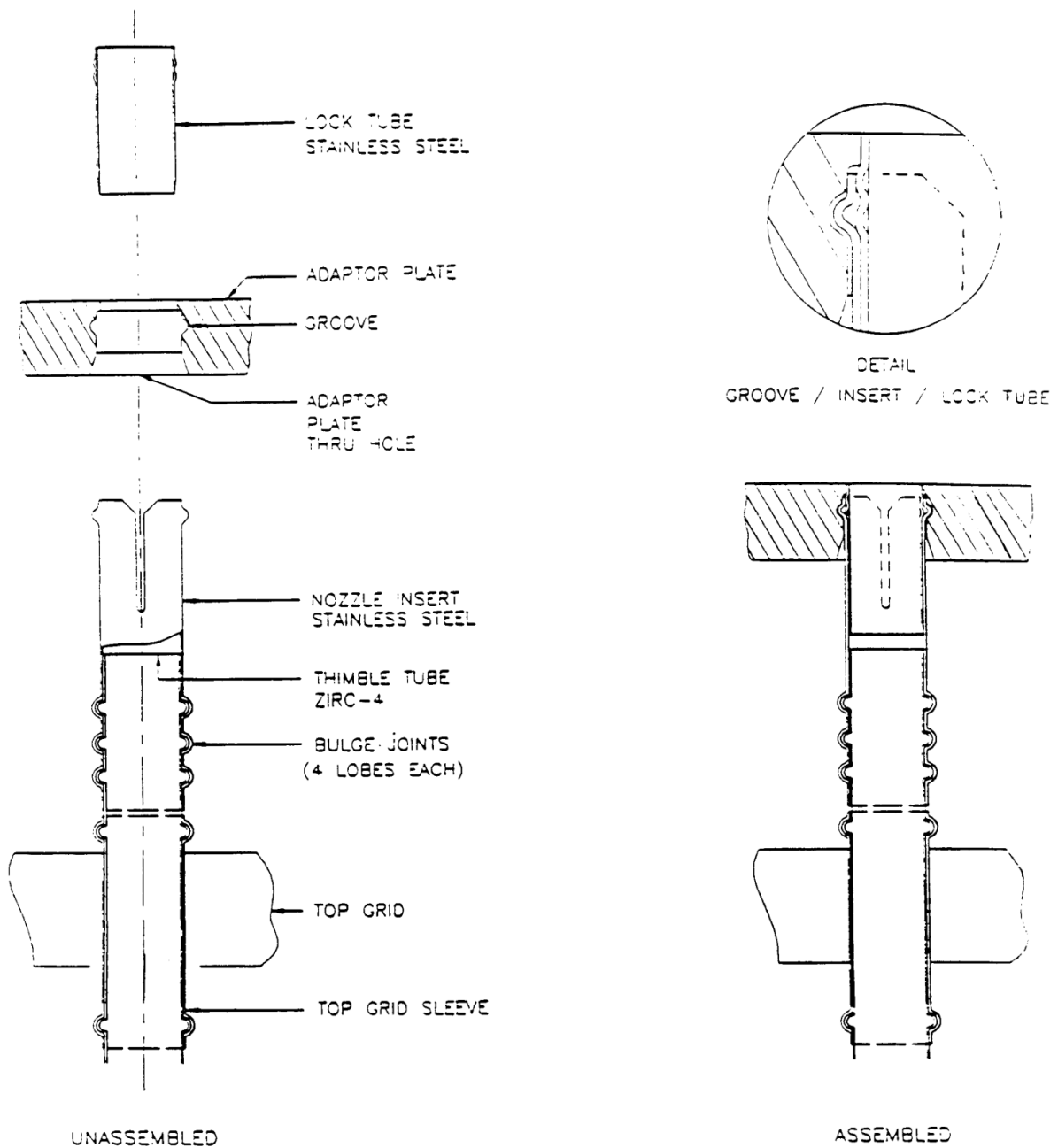
Change Description: **UCR-1990, Rev. 0**

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

Title: **Elevation View of
Mid-Grid to Guide Thimble Joint**

UFSAR Figure: **3.5.1-3**

Sheet 1 of 1



Revision: **24.0**

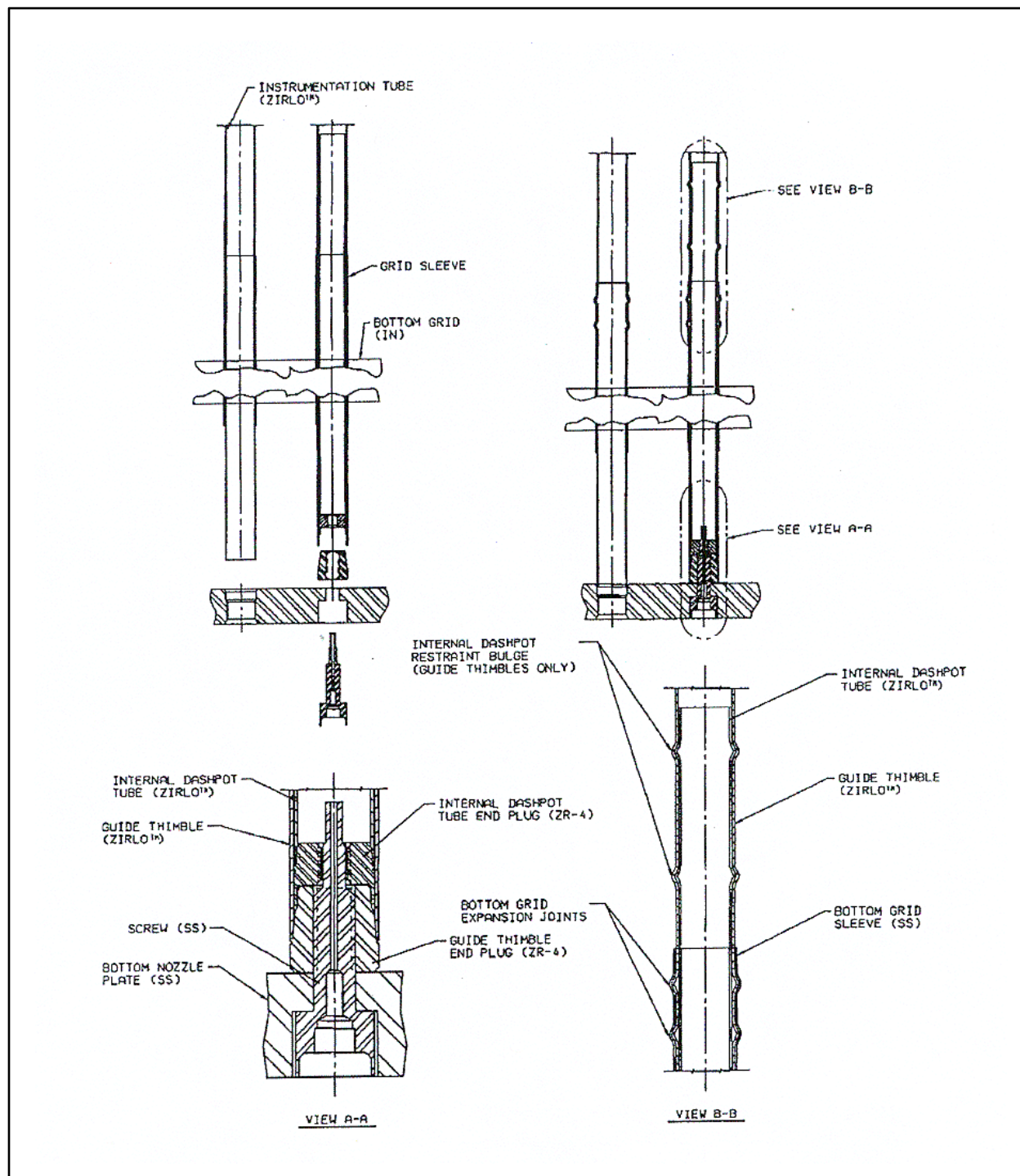
Change Description: **UCR-1990, Rev. 0**

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

Title: **Top Grid to Guide Thimble and
Removable Top Nozzle Attachment**

UFSAR Figure: **3.5.1-4**

Sheet 1 of 1



Revision: **24.0**

Change Description: **UCR-1990, Rev. 0**

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

Title: **Upgrade Fuel Design Guide Thimble
to Bottom Grid and Nozzle Joint**

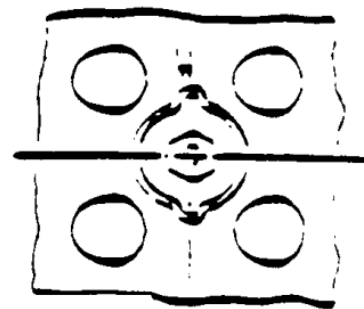
UFSAR Figure: **3.5.1-5**

Sheet 1 of 1

Modified Thimble Screw
With Integral Locking Cap



Cammed
Locking Cap -



Bottom Nozzle

Reconstitutible Bottom Nozzle Design

Revision: **24.0**

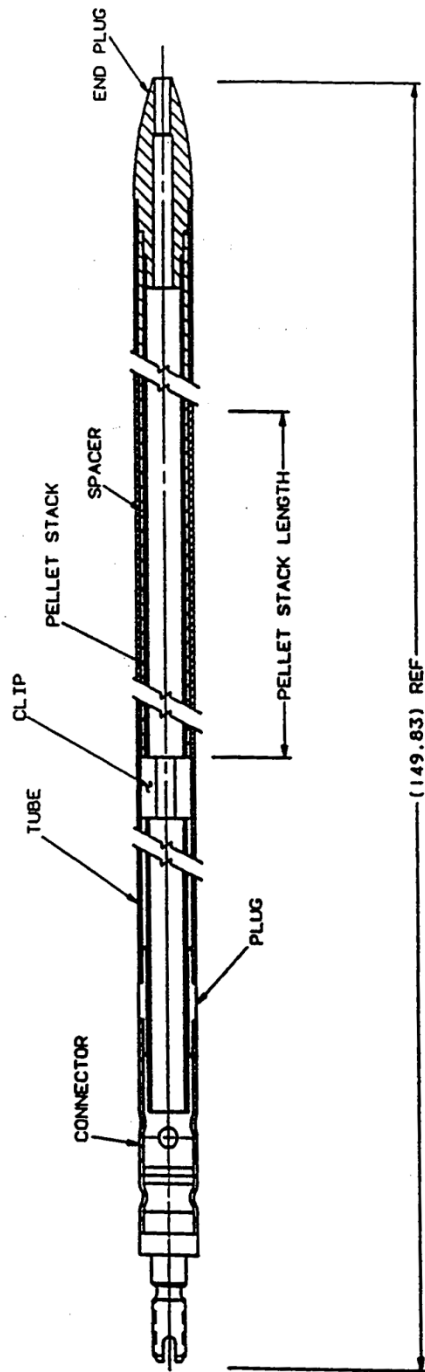
Change Description: **UCR-1990, Rev. 0**

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

Title: **Bottom Nozzle to
Thimble Tube Connection**

UFSAR Figure: **3.5.1-6**

Sheet 1 of 1



Revision: **24.0**

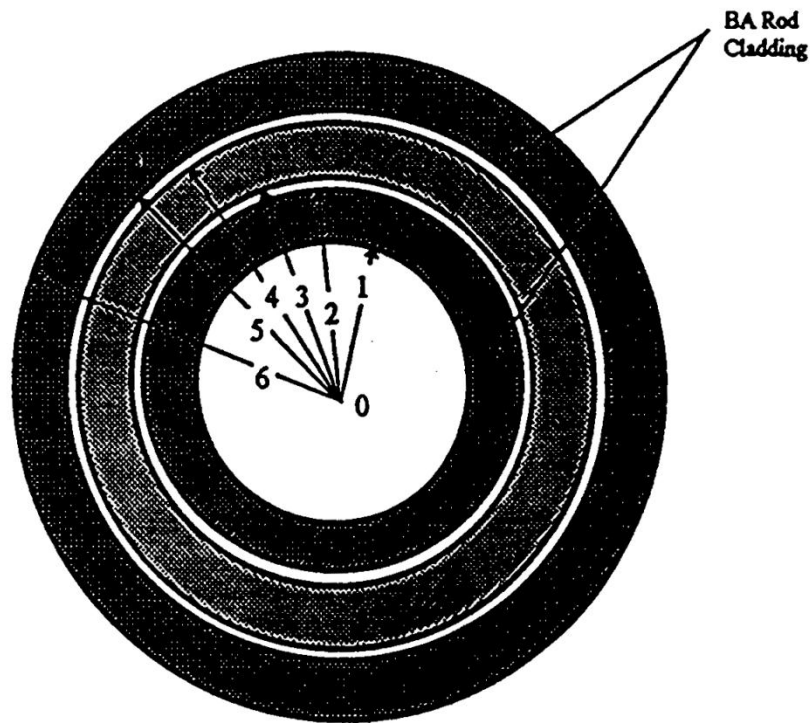
Change Description: **UCR-1990, Rev. 0**

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

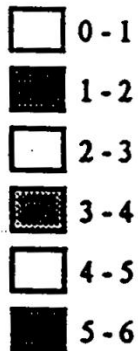
Title: **Wet Annular Burnable
Absorber Rod**

UFSAR Figure: **3.5.1-7**

Sheet 1 of 1



Zone Number



Previous Design BA

Air
Stainless Steel
Air
Borosilicate Glass
Air
Stainless Steel

WABA Design

Water
Zircalloy
Helium
 $\text{Al}_2\text{O}_3\text{-B}_4\text{C}$
Helium
Zircalloy

Revision: **24.0**

Change Description: **UCR-1990, Rev. 0**

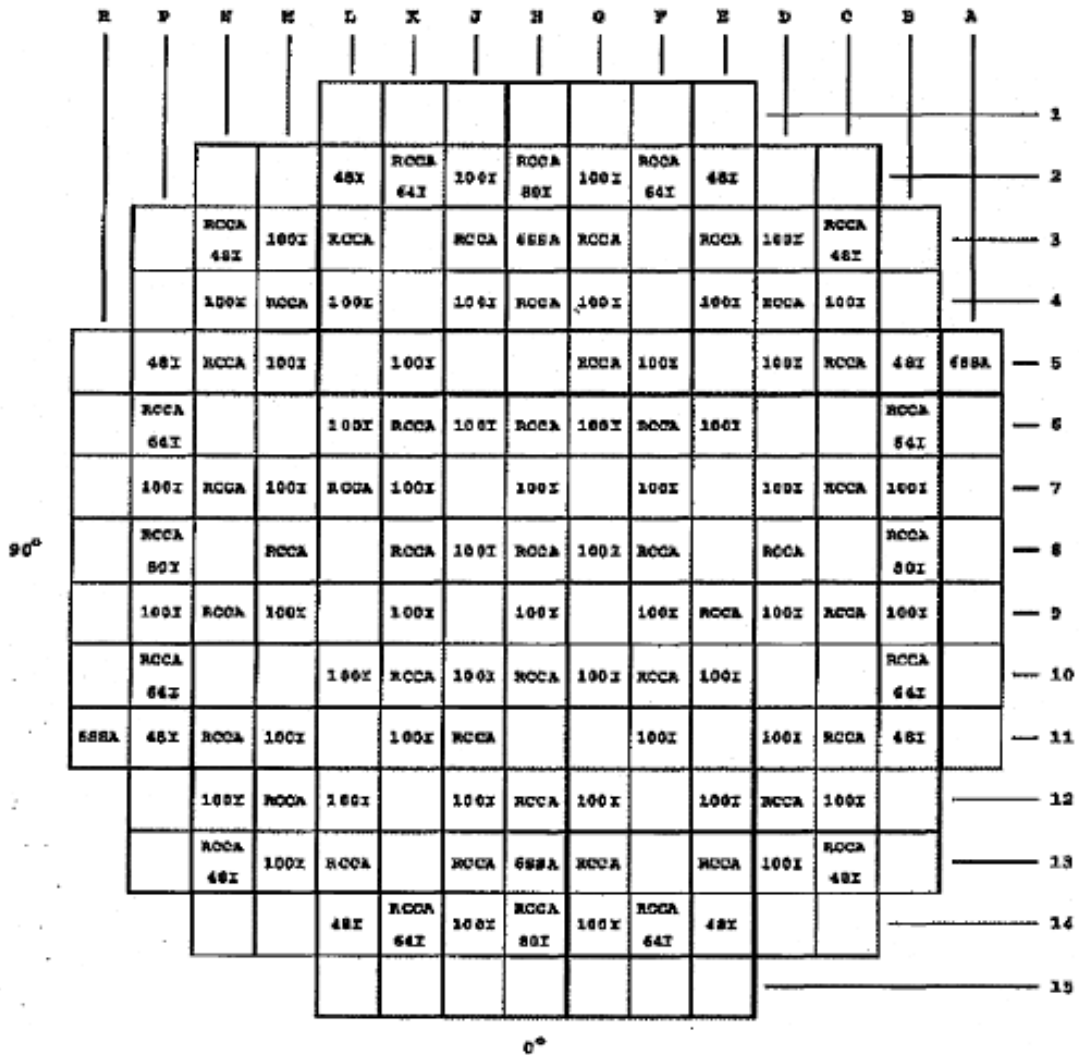
**AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN**

Title: **Comparison of Borosilicate Glass
Absorber Rod with WABA Rod**

UFSAR Figure: **3.5.1-8**

Sheet 1 of 1

**DONALD U. COOK NUCLEAR PLANT UNIT 1, CYCLE 22
CORE COMPONENTS AND FRESH INTEGRAL BA LOCATIONS**



LEGEND

TYPE COMPONENT TYPE
NUM NUMBER OF FRESH LTRA RODS
CORE COMPONENT TYPES
 RCCA - COMPOSITE OR REVERSIBLE ROD
 LTRA - SPHERES OF LANTHANUM OR BERYLLIUM BORON ASSEMBLY

Fuel Assembly Orientation

Reference Hole
Core Pin Hole
Holdown Bar
NOTE: Figures are Top View
 COMPONENT ORIENTATION
 SHOWN IN TABLE 2

Revision: **24.0**

Change Description: **UCR-1990, Rev. 0**

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

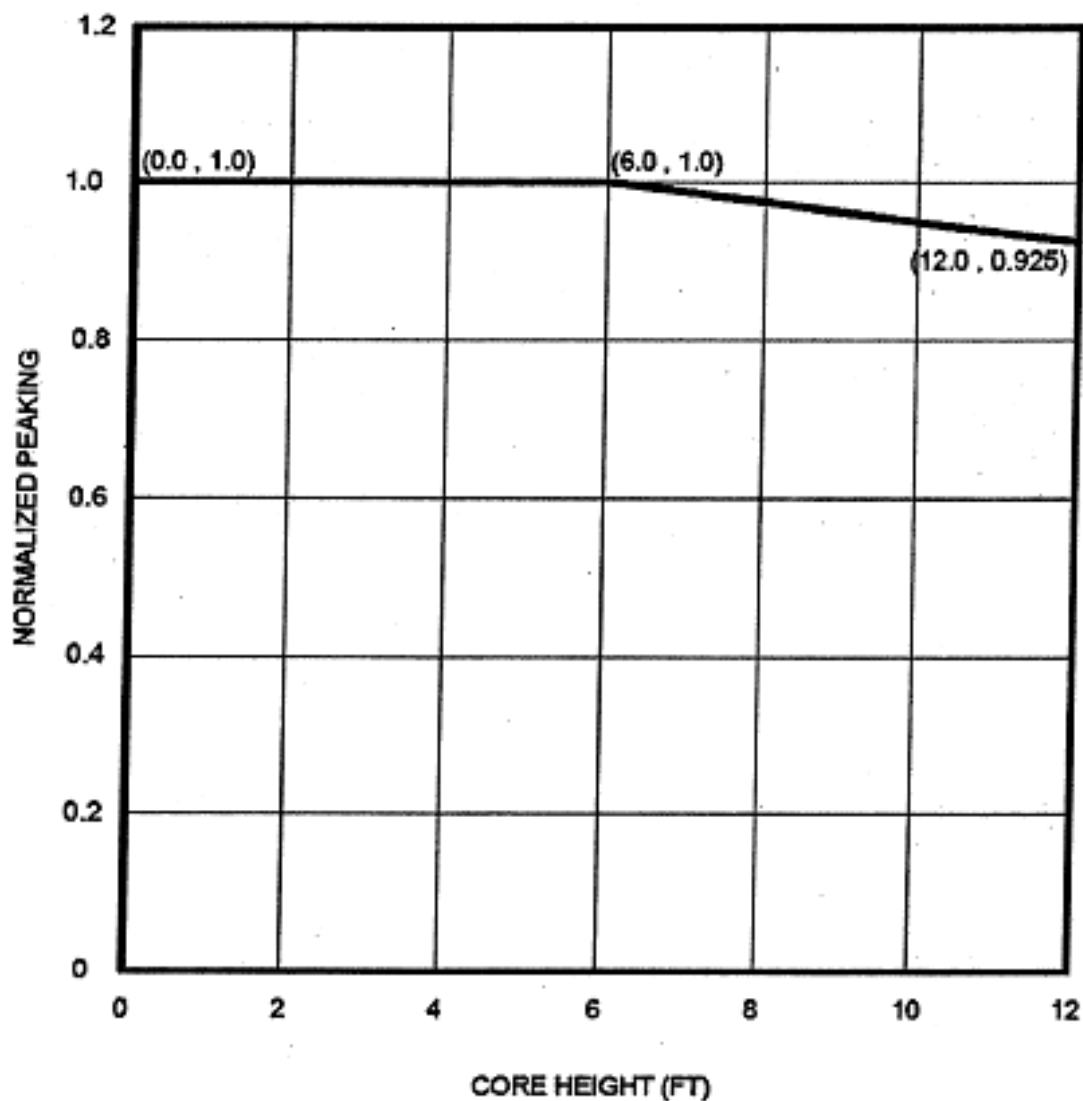
Title: **Example Core Loading Pattern**

UFSAR Figure: **3.5.2-1**

Sheet 1 of 1

Cook Nuclear Plant Unit 1 Cycle 22

$K(Z)$ – NORMALIZED $F_q(Z)$ AS A FUNCTION OF CORE HEIGHT



Revision: **24.0**

Change Description: **UCR-1990, Rev. 0**

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

Title: **$K(Z)$ – Normalized $F_q(Z)$
as a Function of Core Height**

UFSAR Figure: **3.5.2-2**

Sheet 1 of 1

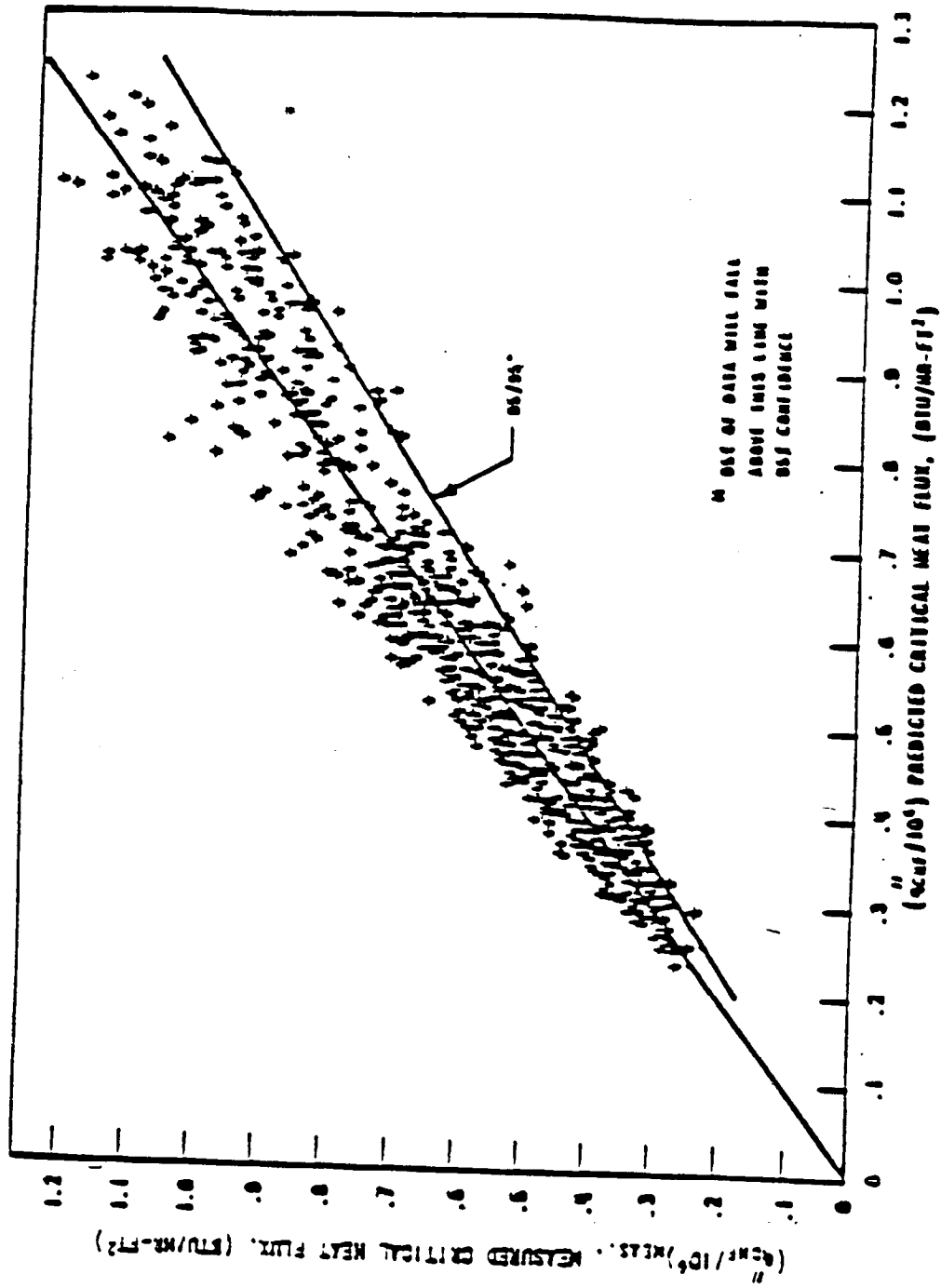


FIGURE 3.5.3-1 Measured versus Predicted Critical Heat Flux - WDH-1 Correlation

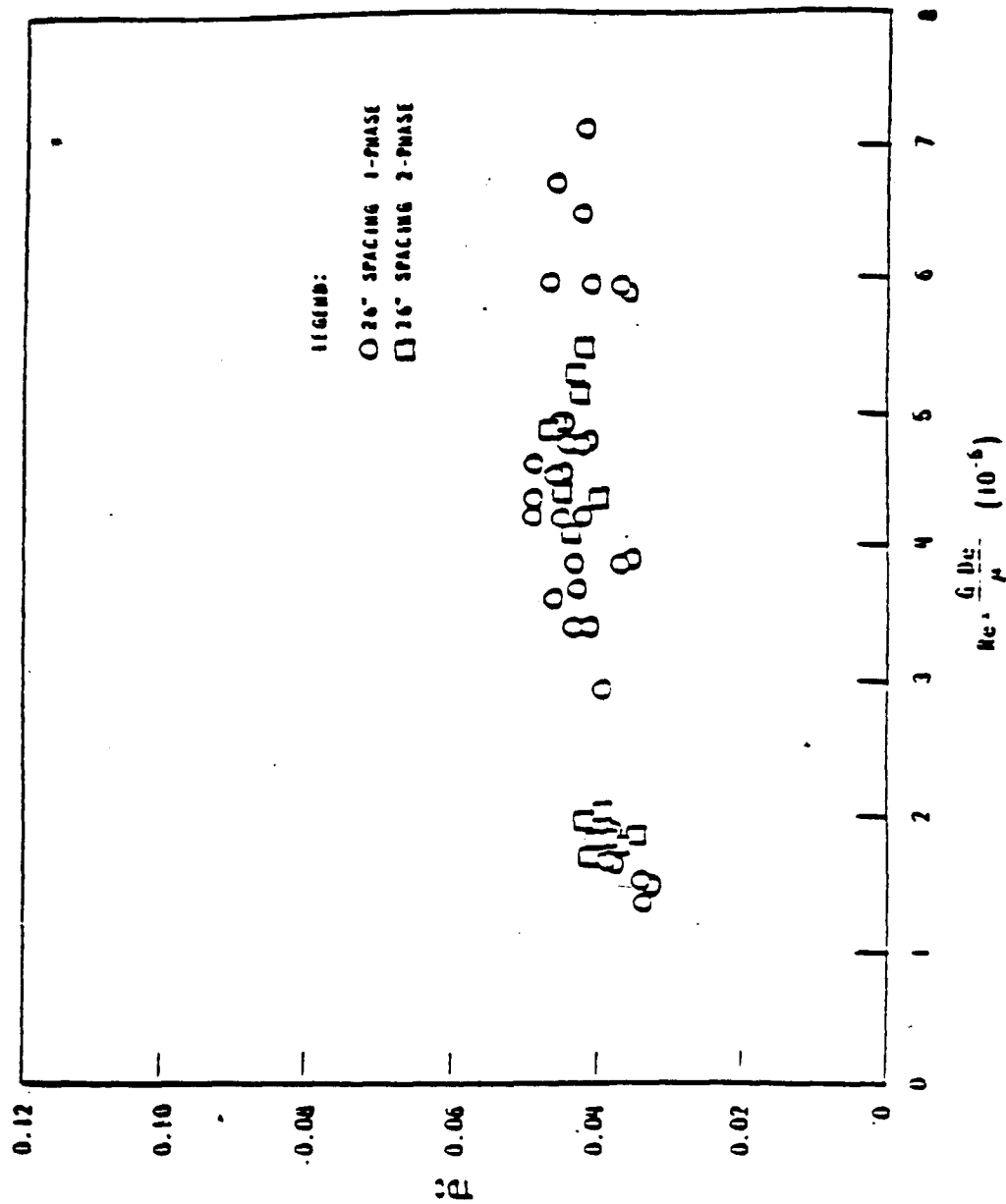


FIGURE 3.5.3-2
TCC versus Reynolds Number for
25" Grid Spacing