BOOK65R

Notes:
"SORA SOrgente RApida" on front; "SORA Book No. 1" on front
"SORA Book No. 1 1965-1966" on spine; "SORA" on spine

Blank pages: 62, 71, 238, 242, 292-298

-calendar sheet (3/23/64) clipped to inside front cover sheet
-page 7 has 3 sheets (2 taped, 1 loose)
-page 12 has 1 (8.5x11) sheet and 2 thin sheets taped
-page 13 has 2 half sheets clipped at top
-page 16 has 1 (8.5x11) sheet taped
-pages 20, 52, 65, 69, 73 has 1 half sheet taped to each page
-page 42 has 1 sheet taped
-pages 86/87 has thin sheet between pages
-pages 94/95 has calendar sheet (8/10/65) between pages
-page 104 has 2 thin sheets taped
-page 122 has sheet taped
-pages 152/153 has 1 (8.5x11) sheet between pages
-page 162 has 2 thin long sheets clipped at top and 1 small piece of paper taped to the page
-page 165 has 2 thin long sheets taped
-page 174 has 2 thin long sheets taped
-page 186 has 1 (8.5x11) graph sheet attached
-page 243 has 1 small sheet taped
-pages 289 and 290 has 1 photo taped to each page
-page 291 has 1 small sheet taped
-pages 298/299 has 2 pieces of paper between pages
-pages 300/pg opposite 300 has 2 sheets between pages
-inside back cover sheets each have a sheet of paper taped to it

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
August 23, 1999

E-15

MARCH						1964
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

MONDAY

23

MARCH

83

283

3-1625

Be
W
Ni

ts

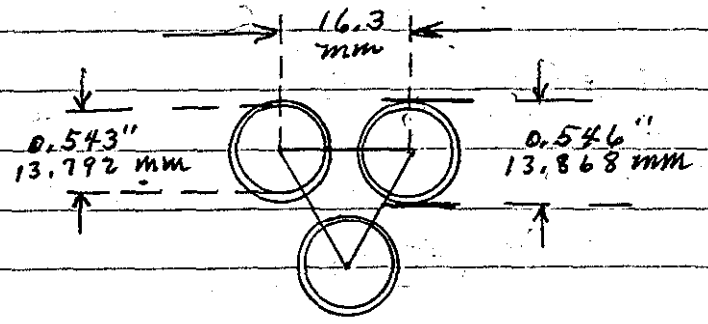
In 150 and 300 Pages

Made in U.S.A

TO REORDER THIS BOOK, SPECIFY NUMBER, RULING AND THICKNESS AS INDICATED ON BACKBONE OF BOOK

A BOORUM & PEASE PRODUCT

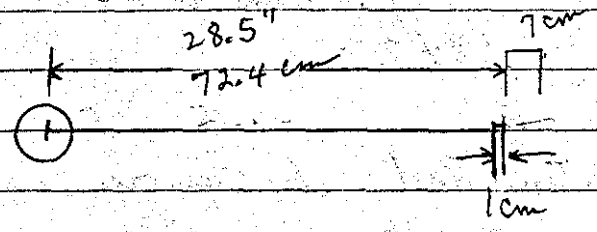
Ti 30 cm x .507" (1.29 cm) - 175.5 gms
Fe 30 cm x .501" (1.27 cm) - 300.0 "



Sect 2 → 1st 1/2" = #1.13

Normal Shutdown p. 104

Fe 3b - 2.865 Kg



175
181
p. 98
pc 99
103
137
139
140

1) Mo Rod (.502" OD) 40 cm = 24 cm Mo + 16 cm Fe = 470 g.

2) Fe Rod " " " = 397 g.

$b_2 = 2.074"$ $c = 4.5 cm$ HOLES { .44 cm X 1.33 X 2; .70 X 1.82 X 4; .70 X 1.25 X 4

3) Fe Rod = 12.55 Kg. $b = 5.5 cm$ X 48 cm long.

$V = 1602.76 cm^3$ $\rho_{Fe} = 7.844$ $a = 7.675 cm$ $b = 2.165"$ $a = 3.022"$ $c = 1.774"$

4) Block Cover Plate = 11.6 Kg. (3 cm X 20 cm X 70 cm)

$\rho_{Al} = 2.762$

5) Be Rod $a = 7.391 cm$ $a = 2.910"$

L = 18.28" 4.704 cm = b $b = 1.852"$

46.43 cm $c = 4.57 cm$ $c = 1.801"$

6 holes { 3/16" dia; 7/16" deep

wt = 2406 gms

V = 1305.83 cm^3 6 (.2 cm^3)

2406
2557
4963

Fe Frame for Be = 2.557 Kg.

$\rho_{Be} = 1.842$

6) Tungsten Rod dimensions same as Fe 3)

wt = 29.2 Kg.

$V = 1602.76 cm^3$

$\rho_W = 18.21$

7) Ni Rod dimensions ~~as~~ same as Fe + W

wt = 14.21 Kg.

$V = 1602.76 cm^3$

$\rho_{Ni} = 8.86$

470 g. Avg. mass of fuel per cm = 27.8697 gms.
Pu = 18.654
Fuel = 0.543" = 1.379 cm diameter
Nominal Design p. 40

Be Block	24 cm X 16 cm X 7 cm	p. 69, p. 125
"	21	129
"	7.3	55
"	11	86→90, 41, 49
"	23.7	207
Fe Block	24 x 11 x 7	p. 131
	X16	133, 209
	X21	134

Core Reactivities
p. 79, 80, 74, 114, 74, 175, 177,

Radial Block more — 86

Block Studies p. 58, 181, 189, 86

Foil Runs p. 148

Rossi α

Be Block	- 24 X 16 X 7	p. 95
"	"	102
"	24 X 16 X 7	125
"	24 X 16 X 7	126
"	"	127
"	24 X 21.08 X 7	128, 175
"	24 X 11 X 7	102
"	24 x 26 X 7	168
"	24 X 11 X 7	170
"	24	

Rossi α Fe

Fe Block	= 24 X16 X 7	p. 98
"	24 X 11 X 7	p. 99
"	24 X 16 X 7	103
"	24 X 11 X 7	137
"	24 X 16 X 7	139
"	24 X 21 X 7	140

Rod Evaluations

Be #1 + Be #5 p.41, 74*, 108*✓
Fe #1 + Fe #5 p. 34, 35, 36, 113
Follower #1, 2a, 2b p. 82 + 83
" #5 p. 109 ✓
Ni, W, #1 + #5 p. 84, 85
Ni, W, Fe #2a p. 77
Be #2a p. 84
3a + 3b p. 123
Be #1 + #5 @ 2 cm p. 108
#2a (W, Ni, Fe) @ 2 cm p. 74, 76
Fe #5 (21 cm Block) p. 130
Fe #3 (16 cm Fe) p. 98

Window — P. 93, 110
Al Sheet 47, 92
Fe " 47, 93
Cd " 92
Block Shield 91

30 cm Core p. 9, 191, 249
No Block p. 210
24 Cm Core (Back of 2, 3 + 4 off) p. 199, 194
Fe Block - 16 cm p. 209

outer Refl - p. 194
* Scatter 3 Series p. 124, 145

Scatterers

B. Lined #3 p. 107
" #4 48
Fe #3 106
" #4 105
Sect 3 124 *
2d 111
5b + 5c 108

Beam Plug 112, 143
Top Plug 73
Cd Lined #3 143
CH_2 #3 145 *
Be + CH_2 #3 147
Temp. Coefficient 163
U Exp = 10^{-5}

Nominal, Except Block -
Fe 24 x 21 x 2 216

9/

SORA MECHANICAL CHECK

9/21/65. Test of Core Insertion into Reflector. Contact of core with reflector will be indicated by deflection on the Simpson meter indicated electric continuity.

	Meter Indication
up	11"
down (Scram)	None
up	12"
down (Scram)	None

IIII IIII IIII - Normal up + down

5 - Scrams

Check out - ok

L X Measurements:

Be Block, 11 cm - p.282, 274
16 " - p.283, 272
21 " - p 268, 265 Fe p. 276 278 280
23.7 " - p 270

All Fe Cond.

11 cm - p. 131
16 " - p. 133
21 " - p. 134

SEP 22 1965

Checking SORA SEGMENT FOR TRAVEL TIME INTO & OUT OF MAIN REFLECTOR. SEE GRAPH. →

SEP 23 1965 Working with the horizontal "rotator." Post to Post travel ≈ 20 sec. Trying to get a reasonable position readout for same.

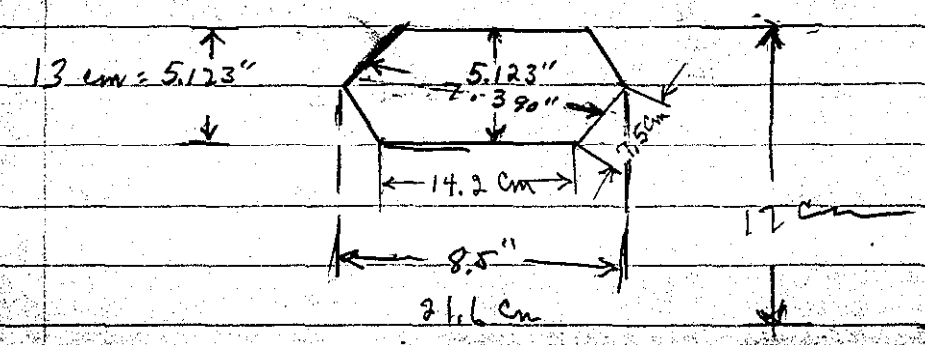
SEP 24 1965 ~~Parallelled at~~ Cont rigging for removable elements of SORA. Speed of "large crane" "up" at fastest = 12 ft. per minute.

APR 1 1965 Thermocouple fuel -

# 8780-52-0417	-	653.07 gms
-0418	-	647.51 "
-0419	-	652.56 "
Total	-	1953.14 "

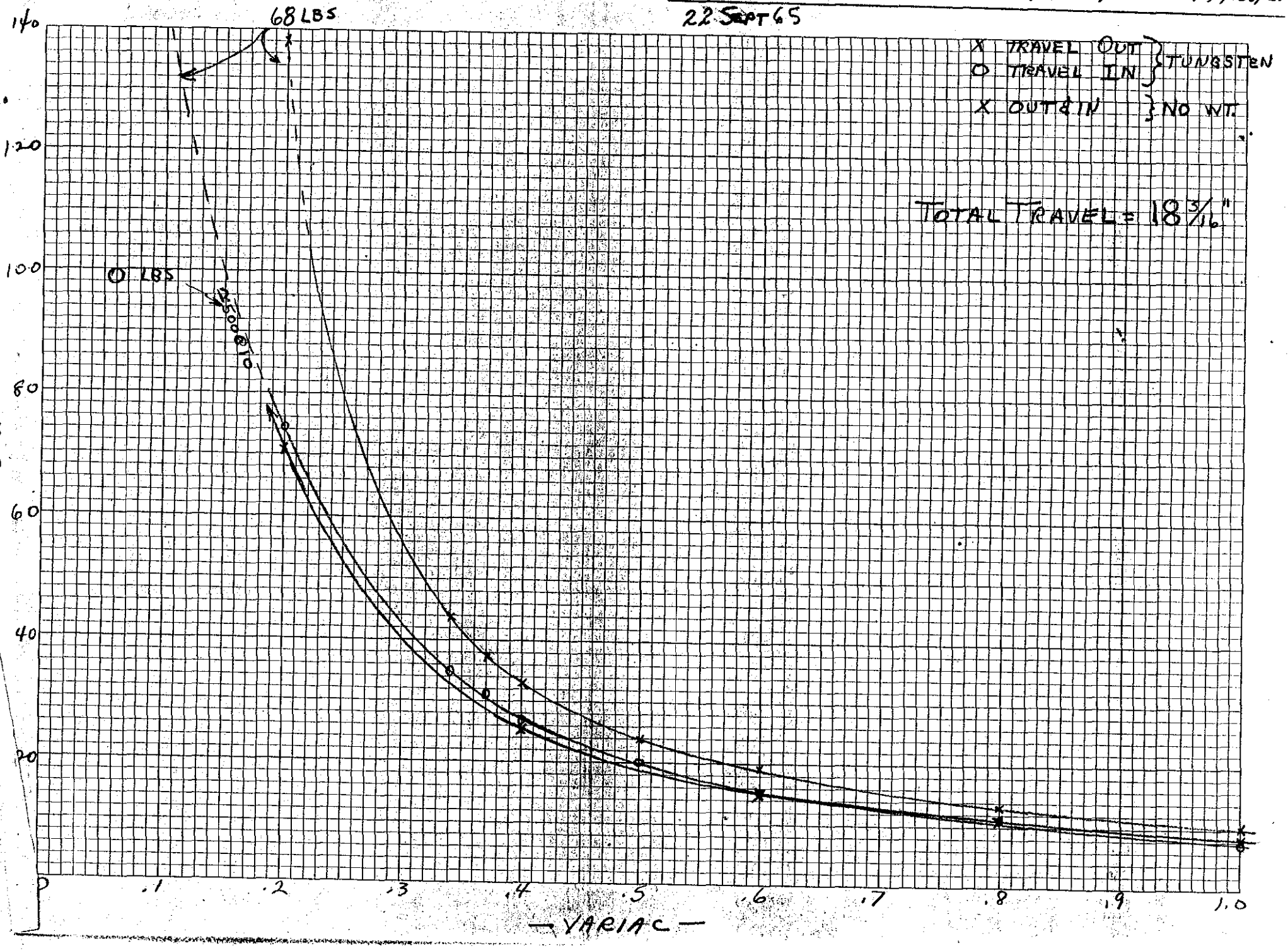
66.886 X 3 = 2006.58 gms — 53.44 gms

Measured



TRAVERSE TIME VS VARIAC SETTINGS.

22 SEPT 65



TRAVEL = 18 7/16

VARIAC	TUNGSTEN (SECONDS) OUT	TUNGSTEN (SECONDS) IN	NO WEIGHT OUT	NO WEIGHT IN
100	10.2	7.8	5.4	7.2
80	13.4	11.1	10.8	10.2
60	19.2	15.6	15.0	14.4
50	24.0	20.1	—	—
40	33.0	22.0	25.2	24.6
37	37.2	31.2	—	—
34	43.8	34.8	—	—
30	—	—	—	—
20	138.0	74.4	70.8	67.8
10	—	—	≃500	≃500

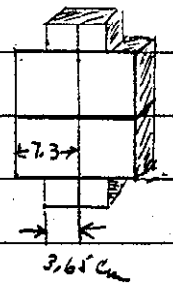
≃ 10 lb W = est. 2.375" x 19" x 2.1875" = 98.11 cm³
[illegible] = 1.559 cm³
[illegible] = 31220 gm
= 68 lb

24 cm High Core

$2\frac{7}{8}'' \times 2\frac{7}{8}'' \times 1''$

7.3 cm X 7.3 cm X 2.54 cm = 135.35 cm^3

#3.81

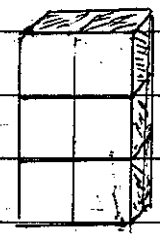


264 cm^2

672 cm^3

$2\frac{7}{8}'' \times 2\frac{7}{8}''$ = 53.3 cm^2

#4.31



319.8 cm^2

811 cm^3

21.9 cm X 14.6 cm X 2.54 cm

30 cm CORE

7" dia X 1" Thick

Be = #3.71

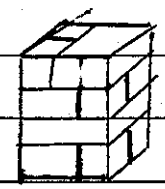
Poly = 2.92

C = 2.50

Fe = 2.27

C + Be = 2.86

#2.66

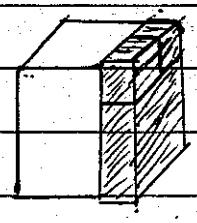


111 cm^2

811 cm^3

10.16 cm X 10.95 cm X 7.3 cm

#3.26



138 cm^2

1007 cm^3

10.16 cm X 13.49 cm X 7.3 cm

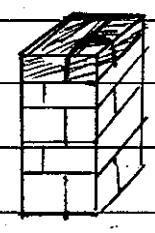
7" dia Be

1" Thick

A = 248.28 cm^2

V = 630.63 cm^3

#3.44



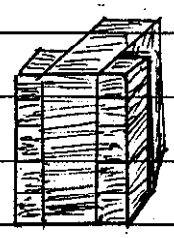
139 cm^2

1007 cm^3

12.7 cm X 10.95 cm X 7.3 cm

#3.55

#3.94



185 cm^2

1007 cm^3

$1\frac{1}{4}''$ Thick = #4.01

12.7 X (14.6 X 7.3) X (3.65 X 7.3 X 3.65)

$\frac{15}{16}''$ Thick = #3.37

Core shut down Scram

~~Normal down~~ 130 ms = #1

@ 1.3"

Weighted Average 93.18 % U^{235}

Fuel - 6 cm = 167.17 gm
12 " = 334.43 "

24 " = 668.86 gm
30 " = 836.03 "

NaK filled tube = 218 gm
Empty " = 194
24 gm NaK

Top Plugs - old (7 holes) New [2 Holes for ctrs]
16.3 cm High 17 cm High

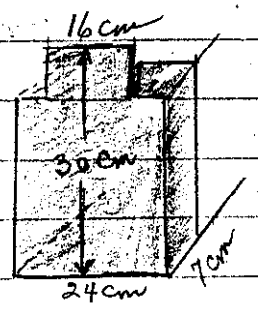
DATE SEP 23 1965 SAFETY CHECK

TIME 12 45 — MIHALCZO & TAYLOR

CHANNEL						
RANGE	10/1000	OPR	X	10/1000	850V	900V
SOURCE	5"	✓	6'	4"	3"	OK
% F.S.	90	✓	100	80	100	100
BLDG. ALARM	✓	✓	✓			
AUX GAS	✓	✓				

SOURCES USED Pu226 & Ra226 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓



Be Block

Mihalczo
Lynn
Taylor
Kistner, G

EX. SORA Expr. I Run 1

Date 9/28 1965 Time 1:00 ~~AM~~ PM

Purpose CRITICAL ASSEMBLY OF SORA

CORE 30 cm LONG NEAR WINDOW (at 3 rows)

other 24 cm 668.86 g U/ hole (24 cm)
836.03 g U/ hole (30 cm)

Bottom beam holes empty (N + NW sides)

1A. Three rows near window loaded to 30 cm length except the center hole in row near Be block 7x10" m/m on top of Reflector

24.27 Kg U

No RESPONSE ON INSTR.

CTR	2	(x 256)		3	(X 256)		
1min	2 25	= 537	511	1 247	= 503	521	
	1 229	= 485		2 26	= 538		

	#1	3	4	#2
up	23,32	+8	+5	23,332

B. added Row 4 24 cm/row except hole #65 which is 12 cm = 7.705 Kg

Total = 31.975 Kg

ctr #2 #3

1 + 244 = 497 2 + 65 = 577

1 + 211 = 467 1 + 255 = 511

C added Row 5. 7.37 Kg

Total = 39.34 Kg

ctr #2 #3

2 + 45 = 557 2 + 30 = 542

2 + 106 = 618 2 + 54 = 566

D added Top Steel plug. (Core Plug)
added Row 6 - 8.04 Kg

Total = 47.38 Kg

ctr # 2 #3

2 + 89 = 601 2 + 103 = 615

2 + 77 = 589 2 + 118 = 630

E added Row 7, except hole #30, 6.7 Kg

Total = 54 Kg

ctr # 2 #3

1 min $2^{+185} = 697$ $2^{+141} = 653$

$2^{+218} = 730$ $2^{+147} = 659$

F added Row 8, except holes #10 + 19, 7.37 Kg
added Row 9, holes #4, 5 + 6

Total = 61.3

#1

Super Crit = 19.31

∞ = 19.17

G Removed fuel from Row #9
Row 8, holes #11 + 18
- 3.35 Kg

Total = 58 Kg.

Scram - chan "A" Scale 100/100
Recorder stuck bottom
of chart.

Received Source PuBe #358

Run 1 H

9/24/65 core to 21.2
11:18A drop 2"
+ 124 → ×1.50

Run I

P. 13

2	2	-	R	9	0	1	4	.	-		
2	2	-	R	9	7	5	9	.	-		
2	2	-	R	9	0	7	0	.	-		
2	2	-	R	9	7	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	8	9	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	9	5	0	3	.	-		
2	2	-	R	8	7	5	0	.	-		
2	2	-	R	9	4	0	5	.	-		
2	2	-	R	8	7	5	1	.	-		
2	2	-	R	9	4	7	5	.	-		
2	2	-	R	8	9	9	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	8	9	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	9	5	0	3	.	-		
2	2	-	R	9	0	5	0	.	-		
2	2	-	R	9	4	0	3	.	-		
2	2	-	R	9	6	4	0	.	-		
2	2	-	R	9	0	7	5	.	-		
2	2	-	R	8	9	9	7	.	-		
2	2	-	R	9	0	7	5	.	-		
2	2	-	R	9	3	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	8	9	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	9	5	0	3	.	-		
2	2	-	R	9	0	5	0	.	-		
2	2	-	R	9	4	0	5	.	-		
2	2	-	R	9	7	0	0	.	-		
2	2	-	R	9	4	7	5	.	-		
2	2	-	R	8	9	8	7	.	-		
2	2	-	R	9	0	7	5	.	-		
2	2	-	R	9	3	0	7	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	9	5	0	3	.	-		
2	2	-	R	9	0	3	0	.	-		
2	2	-	R	9	5	0	5	.	-		
2	2	-	R	9	6	4	0	.	-		
2	2	-	R	9	4	1	5	.	-		
2	2	-	R	9	7	0	0	.	-		
2	2	-	R	9	4	7	5	.	-		
2	2	-	R	9	7	0	7	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	0	7	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	0	3	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	0	5	.	-		
2	2	-	R	9	6	4	0	.	-		
2	2	-	R	9	4	7	5	.	-		
2	2	-	R	9	3	4	7	.	-		
2	2	-	R	9	8	7	0	.	-		
2	2	-	R	9	7	0	7	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	0	7	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	0	5	.	-		
2	2	-	R	9	6	5	0	.	-		
2	2	-	R	9	5	7	5	.	-		
2	2	-	R	9	7	0	0	.	-		
2	2	-	R	9	4	7	5	.	-		
2	2	-	R	9	7	4	7	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	7	0	3	.	-		
2	2	-	R	9	6	3	0	.	-		
2	2	-	R	9	5	8	0	.			

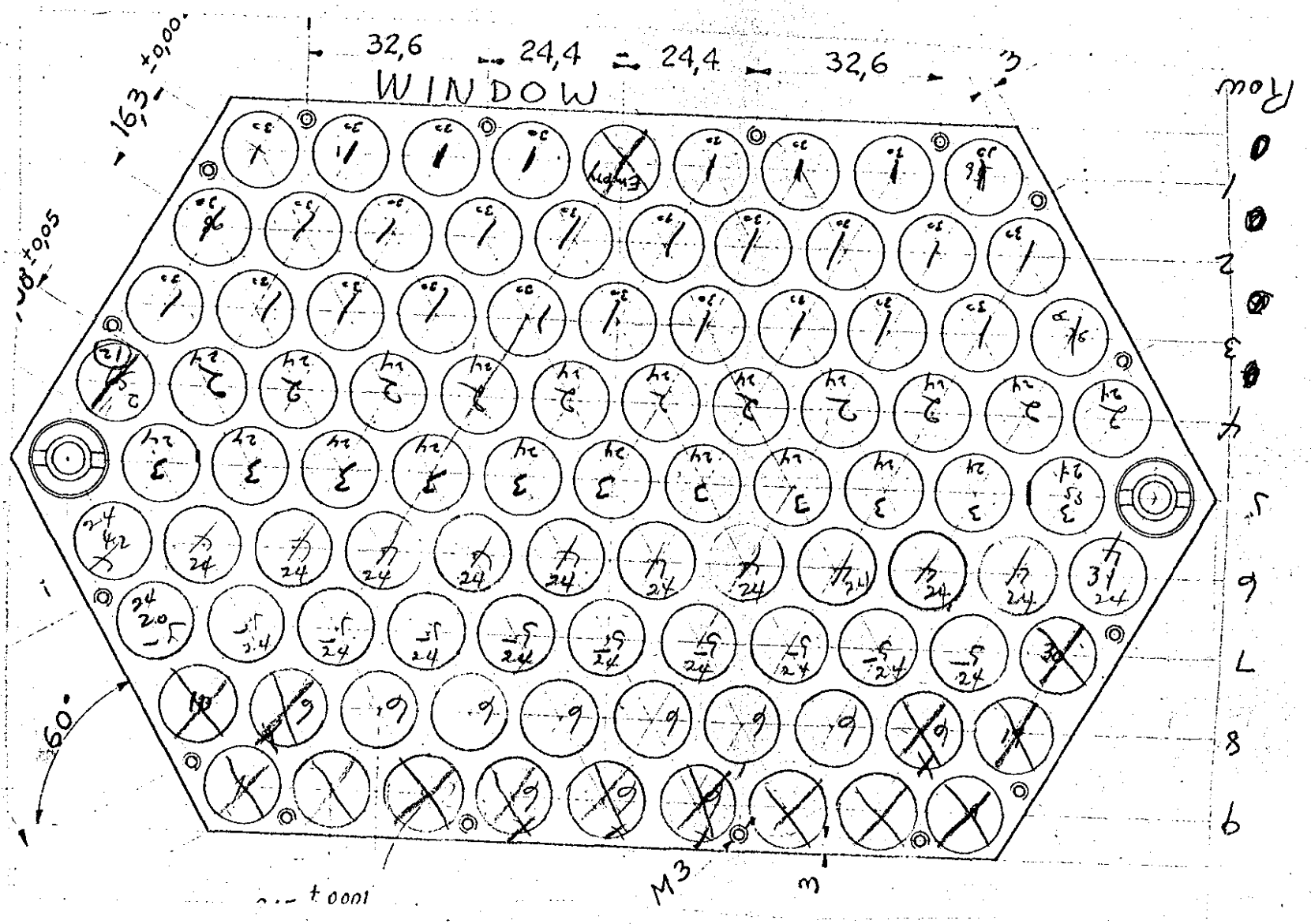
2	2	-	R	0	6	3	0	.	.	.	.
2	2	-	R	0	5	8	[illegible]	.	.	.	.
2	2	-	R	9	7	5	0	.	.	.	.
2	2	-	R	9	8	0	0	.	.	.	.
2	2	-	R	9	3	5	1	.	.	.	.
2	2	-	R	9	0	7	5	.	.	.	.
2	2	-	R	8	7	4	7	.	.	.	.
2	2	-	R	7	8	3	9	.	.	.	.
2	2	-	R	6	3	9	9	.	.	.	.
2	2	-	R	3	5	9	9	.	.	.	.
2	2	-	R	1	1	9	9	.	.	.	.
2	2	+	R	0	1	1	2	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	2	0	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	8	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	8	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	7	.	.	.	.
2	2	+	R	0	1	1	8	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	8	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	4	.	.	.	.
2	2	+	R	0	1	1	7	.	.	.	.
2	2	+	R	0	1	1	4	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	4	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	4	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	8	.	.	.	.
2	2	+	R	0	1	1	4	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.
2	2	+	R	0	1	1	5	.	.	.	.
2	2	+	R	0	1	1	6	.	.	.	.
2	2	+	R	0	1	1	9	.	.	.	.

Run 1 H

9/29/65 core to 21.2
11:18A drop 2"
+ 124 → x1.56

2	2	-	R	1	5	8	7	.	-
2	2	-	R	1	5	7	0	.	-
2	2	-	R	1	5	8	7	.	-
2	2	-	R	1	5	9	5	.	-
2	2	-	R	1	5	8	1	.	-
2	2	-	R	1	5	7	0	.	-
2	2	-	R	1	5	6	3	.	-
2	2	-	R	1	5	5	0	.	-
2	2	-	R	1	5	6	3	.	-
2	2	-	R	1	5	3	0	.	-
2	2	-	R	1	5	7	4	.	-
2	2	-	R	1	5	8	0	.	-
2	2	-	R	1	5	7	4	.	-
2	2	-	R	1	5	8	0	.	-
2	2	-	R	1	5	5	0	.	-
2	2	-	R	1	5	6	7	.	-
2	2	-	R	1	5	5	0	.	-
2	2	-	R	1	5	4	5	.	-
2	2	-	R	1	5	5	8	.	-
2	2	-	R	1	5	6	5	.	-
2	2	-	R	1	5	5	7	.	-
2	2	-	R	1	5	6	4	.	-
2	2	-	R	1	5	4	7	.	-
2	2	-	R	1	5	3	9	.	-
2	2	-	R	1	5	4	7	.	-
2	2	-	R	1	5	5	0	.	-
2	2	-	R	1	5	2	9	.	-
2	2	-	R	1	5	5	0	.	-
2	2	-	R	1	5	3	9	.	-
2	2	-	R	1	5	4	0	.	-
2	2	-	R	1	5	3	5	.	-
2	2	-	R	1	5	1	7	.	-
2	2	-	R	1	5	2	0	.	-
2	2	-	R	1	5	1	7	.	-
2	2	-	R	1	5	3	0	.	-
2	2	-	R	1	5	0	9	.	-
2	2	-	R	1	4	9	0	.	-
2	2	-	R	1	4	7	5	.	-
2	2	-	R	1	4	6	0	.	-
2	2	-	R	1	2	7	9	.	-
2	2	-	R	0	9	8	9	.	-
2	2	-	R	0	7	3	9	.	-
2	2	-	R	0	4	7	9	.	-
2	2	-	R	0	1	9	9	.	-
2	2	-	R	0	1	0	5	.	-
2	2	+	R	0	0	2	2	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	0	.	-
2	2	+	R	0	1	2	4	.	-
2	2	+	R	0	1	2	0	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	4	.	-
2	2	+	R	0	1	2	0	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	5	.	-
2	2	+	R	0	1	2	3		

2	2		+	R	0	1	2	0
2	2		+	R	0	1	2	5
2	2		+	R	0	1	2	5
2	2		+	R	0	1	2	6
2	2		+	R	0	1	2	4
2	2		+	R	0	1	2	4
2	2		+	R	0	1	2	4
2	2		+	R	0	1	2	5
2	2		+	R	0	1	2	1
2	2		−	R	6	1	0	0


32,6
24,4
24,4
32,6
WINDOW
163 ±0,00
±0,05
60°
M3
m
Row
1
2
3
4
5
6
7
8
9

13.792 mm .543" OD 12cm 170 Aug = 334.43 g.
" " 6cm 40 Aug = 167.17 g.

12cm = 334.43 g - 27.869 g/cm
6 cm = 167.17 - 27.861 g/cm
24 cm = 668.86
30 cm = 835.03

	Avh.
1-45	334.90444 gms
1-132	334.5591
1-170	334.4365 (12cm)

5344	167
166	166
1344	168
68540	→ 167.1707 (6cm)

Gustav

65,039.47
− 167.17
64,872.3 gms

170 (12cm) = 56854 gms
41 (6cm) = 6854 "

TOT = 63708
24 cm = I & II 1331.47

GRAND 65,039.47 gms

(12) 170 = 56854.205 → 334.4365
(6) 41 = 6854.0 → 167.1707
I & II 2 = 1331.47 → 665.7350

TOTAL 65039.675
− 167.17
64,872.5
4-1-66 + 1953.1
66,825.6
− 1336.
2-3-69 65,489.6

DATE SEP 2 9 1965 SAFETY CHECK

TIME 10:50 AM ~~PM~~ BY Mikolczo + Taylor

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	ok	X	10/1000	900V	850
SOURCE DIST.	5"	OK	3'	4"	3"	OK
% F. S. TRIP	90	✓	100	95		
ALDG. ALARM	✓	✓	✓			
AUX CTRS.	—	✓	✓			
SOURCES USED	M-2216 ~~Ra Be 5.58~~			MARKERS	✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

[redacted]

Table alignment check before Run. OK

C.A. SORA Expr. I Run 1H

{24 cm / 30 cm} Date 9-29-1965 11:05 AM

(79) Purpose Repeat of Run G.
Evaluation of Be Arm.

H Pos Period 12.5 ¢ #1 = 23.300 #2 = 23.310 #3 = -16 #4 = -15

Neg " #1 = 21.2 DROPPED CORE 2.1

$\underline{-1.50}$

I Pos Period #1 = 23.3 + 11.5 ¢
#2 = 23.307

Moved Be Arm away ~ $\underline{-9.60}$

SEP 30 1965 Removed all fuel from core (except one 12cm piece in row 3 number 11). It is stuck about 2" down into hole, top of it i.e.). Small hole was drilled under it and then it was pushed out. Hole #1-5 & hole #3-11 "reamed". Others cleaned and "swabbed." made adjustments to (Be block & motor) and to face by raising them such that Be will be centered on the core (which will next be 24 cm loading). Rhoette was removed to be repaired.

OCT 1 1965 Realigned the core for insertion tolerances.

DATE OCT 1 1965 SAFETY CHECK

TIME 1:20 AM PM BY Taylor + Lyman

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	open	X	10/1000	900V	820
SOURCE DIST.	12"	ok	5'	2"	10"	ok
% FULL TRIP	90	✓	100	90	100+	—
BLEED. ALARM	✓	✓	✓			
AUX. BTRS.		✓	✓			

SOURCES USED _____ MAGNETS _____

TABLES _____ LIGHTS _____ AREA CLEARED _____

C.A. SORA Expr. II Run 1A

24 cm Date 10-1-1965 Time 2:35 AM PM

Purpose Multiplication Measurements approach to Critical with Core length of 24 Cm.

Rotating Be Arm moved 3 cm up from Expr I.

7.6 cm Steel in all holes (bottom) u

1A 24 cm fuel in Row 1 thru 5. 35.45 Kg

up #1 = 23.325 #2 = 23.336 #3 = +7 #4 = +5

ctr	#2	#3
1 min cts	1 +69	0 +131
	1 +109	0 +151

B Added fuel to Row 6 8.02 Kg

ctr	#2	#3
	0 +136	0 +81
	0 +178	0 +65
	0 +184	0 +82

Total = 43.47 Kg u

C added fuel to Row 7, except holes #20 + #30

6.02 Kg. U

Total = 49.49 Kg U

Ctrs #D

0 +242

0 +218

#3

0 +131

0 +151

D Completed Row 7

added Row 8, except holes #10 + 19

6.68 Kg U

Total = 56.18 Kg U.

Super ⊙ #1 = 21.1

∞ ⊙ 20.98

1 hole (24 cm) = 668.86g.

Not Loaded

X Fuel Removed

9-1-65

+ #30
Kg. U
Kg U

DATE OCT 4 1965 SAFETY CHECK
TIME 8:10 AM PM BY LYNN & TAYLOR

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	OPR	X	10/1000	900V	850V
SOURCE DIST.	12"	OK	B	2"	8"	OK
% F. S. TRIP	90	OK	B	90	100+	100
BLDG. ALARM	✓	✓	D			
AUX CTRS.	✓	—	✓			

SOURCES USED Pu 226 & Ra 248 MAGNETS ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

Kg U
18 Kg U.

CA SORA Expr. II Run 1E
24 cm Date 10-4-1965 Time 9:35' AM PM
Purpose Cont'd critical condition approach

E Removed fuel from Row 8, holes #11 + 18
up = 23.33 1.38 Kg U
Total = 54.8 Kg U

∞ #1 = 22.59
#2 = 22.605

F Removed fuel from Row 7, holes #20 + 30
Filled all empty holes with steel. 1.38 Kg U
53.43 Kg U

∞ #1 = 21.95
#2 = 21.96

G Removed fuel from Row 6, holes #31 + 42
Filled with steel 1.38 Kg U
∞ #1 = 22.80 52.17 Kg U
#2 = 22.81 ¢

H Removed fuel from Row 4, hole #54 0.667 Kg
Filled with steel 51.5 Kg.
Pos Period - 23.33 (up) ; 33.6 sec pd
∞ #1 = 23.2 + 20.7 ¢

77 holes of fuel = 55.5 Kg
18 holes of steel

Rg U
Rg U

0.667 kg

pd

DATE OCT 8 1965 SAFETY CHECK
TIME AM PM BY
CHAN G G G
RE 10/1000 Opr x 10/1000 900 850
12" OK 3' 2" 5" OK
90 — 100 90 100+ —
✓ ✓ ✓
— ✓ ✓
SCRAMS USED M-226 + X MAN SCRAM ✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. ~~OCT~~ III ~~8 1965~~ Run 1
24 cm Date 10-8-1965 Time ~~AM~~ PM
Purpose Critical Condition with
Steel on BLOCK, 30 cm.
Pulse arm
668.86 g U/element
See p. 9

Fe-Block

Core

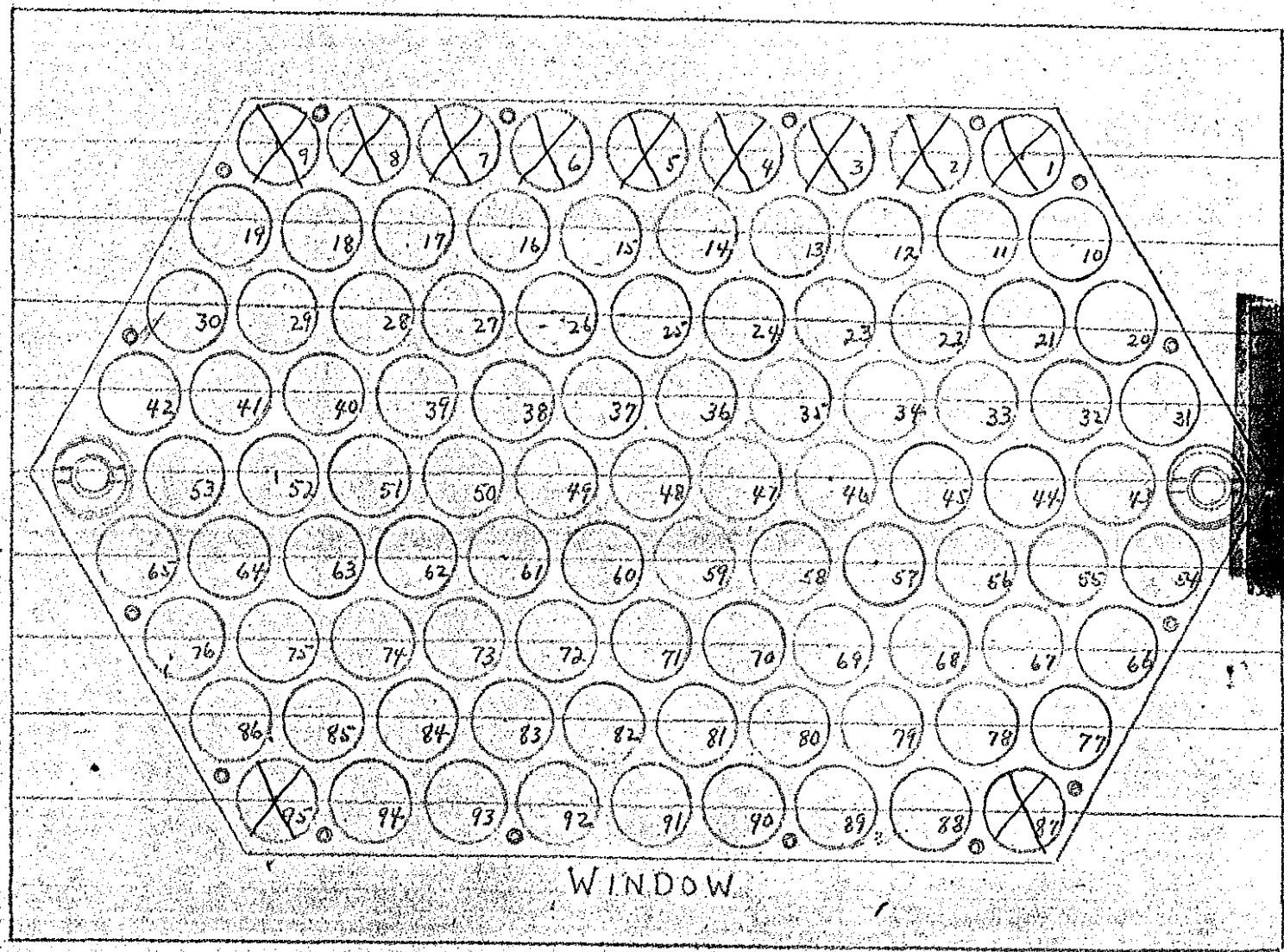
1 79 holes of fuel 52.83 Kg U
16 holes of steel, #87, 98, 30, 10, 11, 18, 19 + 1 thru 9

* ALL BEAM HOLES PLUGGED TO OUTSIDE BOUNDARY..

1 min cts #2 (X,Y,Z) 0 +218 0 +246 #3 X (Z,Y,Z) 0 +154 0 +16

up #1 = 23,32 #2 = 23336 #3 = +7 #4 = +3

X = Steel



2. Core, 82 fuel and 13 steel (#11, 18 + 30 changed)
54.85 Kg U

1 min cts	#2	#3
X(256)	2 +80	1 +186
	2 +199	2 +22

3. Core, 84 fuel and 11 steel (#10 + 19 changed)
(24 cm fuel) 56.18 Kg U

Poo Period = 28.77 sec
+ 22.71 ¢ Excess

84 fuel = 56.18 Kg.

DATE OCT 18 1965 SAFETY CHECK

TIME 12:20 PM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opu	x	10/1000	900	850
SLO	10"	OK	4'	2"	5"	OK
%	90	—	100	90	100	—
BLEED CLEAR	✓	✓	✓			
AUX. CTRS.	—	✓	✓			

SOURCES USED M-226 + 8 MOCKUPS ✓

TARGESS ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. So RA Expr. III Run 4

Date OCT 18 1965 Time 12:_ PM

Purpose Crit. Check, with 24 cm ✓
of Steel on Burst Arm. (Block)
Fe Block Raise Arm 2.28 cm (Centered)
Fuel Same as p. 20.

up #1 = 23.325 #3 = +6
#2 = 23.336 #4 = +3

Fuel = 24 cm
Burst Arm = 24 cm

Pos 132 sec Fe Block = 24 cm x 16 cm x 7 cm
+ 7.73 ¢

Normal bolt for Arm (Block) adjustment .590"
for this adjustment used bolt of .305"
.285"
(3 cm − .72 cm = 2.28 cm) or .72 cm

DATE OCT 27 1965 DATA SHEET
TIME 11:50 AM PM BY Mihalczo + Taylor

CHANNEL						
GAINS	10/1000	opr	X	10/1000	900	850
[illegible]	8"	ok	3'	2"	6"	ok
% [illegible]	90	—	100	90	100+	—
BLDG. [illegible]	✓	✓	✓			
AUX [illegible]	—	✓	✓			
SOURCES USED	M-226 + Y					✓
TABLES	✓		✓			✓

C.A. SORA Expr. III Run 5
Date OCT 27 1965 19 Time 12:05 AM PM
Purpose To Compare periods
Pitter, Log N + BF_3

5 Loading same as p. 21.
up. #1 = 23,247 #3 = +7
#2 = 23,336 #4 = +3

Measured Pos Period — Log N = 138.4 sec
BF_3 (2+3) = 138.8 sec, 7.42+ 7.43+
Move Pulse Arm,
measured negative Period —

DATE OCT 28 1965 SAFETY CHECK

TIME 11:10 AM BY TAYLOR + LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	x	10/1000	900V	850V
SOURCE DIST.	8"	ok	4'	3"	7"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	—	✓	✓			

SOURCES-USED M-226 + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. III Run 6

Date 10-28-1965 Time AM

Purpose Reactivity Measurement

6 Loading: 86 fuel, 9 steel (changed 87+95)

Pitte

Log N = -179.1 sec

$2 \times 10^{-8} = -8.82$ ¢ — 9.29 ¢

$10^{-8} = -8.88$

$5 \times 10^{-9} = -9.15$

$2 \times 10^{-9} = -9.39$

$10^{-9} = -8.68$

$5 \times 10^{-10} = -8.83$

$2 \times 10^{-10} = -9.3$

I	ρ	ρ ROD OUT
2×10^{-8}	+28.1	
10^{-8}	+28.3	
5×10^{-9}	+28.2	89.7
2×10^{-9}	+29.0	91
10^{-9}	+27.4	89.8
5×10^{-10}	+27.9	89.4
2×10^{-10}	+26.3	86.7
10^{-10}		−75.5

LN	28.9
BF_3	29.3
BF_3	28.97

7. Loading 85 fuel, 9 steel, 1 vacant (#87)

Poo Period — $L_n = 17.51^{\phi}$

I	ρ
10^{-10}	2.08
2×10^{-10}	2.36
5×10^{-10}	2.46
10^{-9}	2.44
2×10^{-9}	2.47

DATE NOV 3 1965 **SAFETY CHECK**

TIME 9:20 AM/PM BY Mihalczo + Lynn

CHAMBER	A	B	C	D	E	F
RANGE	1a/1000	off	X	1a/1000	900	850
	4"	OK	1"	2"	6"	OK
	85		100	100	100+	
PERIOD ALARM	✓	✓	✓			
AUX CTRS	—	✓	✓			

SOURCES USED M-226 + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. III Run 8

Date NOV 3 1965 Time 9:30 AM/PM

Purpose Reactivity measurement using Cette

Fe Block = 24 X 16 X 7

8 Loading same as Run 7 p.24
Pulse arm at most reactive position.
Pos Period = 22.8 sec
Log N = +25.95 + ✓

9. Loading same as Run 3, p.20
Log N = + 158.5 sec Cette = 6.49 +
+ 6.65 +

10. Repeat Run 9 Log N = +7.36 +, 158.5 sec
Removed Control Rod 3a, Log = -130.2, -15.08 +
Repeat Pos = +135.7 sec logN = -122.7, -16.8 +
+ 7.56 + ~13 5/16" - 3a = -22.44
~14½" - 3a = -24.36 +

11-5-65 SAFETY CHECK

AM PM BY

	A	B	C	D	E	F
Channel	10/1000	off	X	10/1000	900	850
Trip Dist	12"	OK	3'	4"	6'	OK
% Trip	80	✓	100	100	100	
		✓	✓	✓		

FUSES USED 226 ✓ MAGNETS ✓

TAGS ✓ LIGHTS ✓ AREA CLEARED ✓

SO RA Expr. IV Run 1A

Date 10-5-1965 Time AM PM

Purp Rod Calibration

Fe #1 East

Fe #5 West

Fe #1 = 33.64 down Selsyn reading

48.10 up " "

14.46"

36.7 cm travel

Fe #5 = Full travel = 46.2 cm (18.18")

1A Loading - Added Fuel to #4 & #5, 86 fuel 9 S.S.

Super Crit, moved Steel Block 2.5° East.

A Pos Period #1 out and #5 in:

LogN = + 97.71 sec, + 9.83 ¢

B Neg Period - 86.88 sec

#1 = 48.1 (out) #5 0 (2")

C Pos Period + 83.6 sec, 11.08 ¢

#1 = 47.00 #5 in

C.A. SORA Expr. IV Run B1

Date 11-5-1965 Time AM PM

Purpose Rod Fe #5 Evaluation
Pitte Value

Loading same as p.26

Fe #1 out Fe #5 in Pos Period + sec

Variac = .4 (27 sec) 78.05¢

Fe #5 out = -85.95¢

Fe #5 = 94¢

Variac = 1.0 (10 sec) Pos Period = 8.05¢

Fe #5 out = 93.9¢

				Setsyr #1	#5
D	Neg Period	-107.48 sec,	-22.25¢	47.00	?
E	Pos Period	+ 52.65 sec,	+15.45¢	46.00	in
F	Neg "	- 123.23 " ,	-16.66¢	46.00	?
G	Pos "	+ 124.85 " ,	+ 8.09¢	43.00	Same
H	Neg "	- 102.60 " ,	-24.83¢	43.00	?
I	Pos "	+ 79.80 " ,	+ 11.47¢	40.50	Same
J	Neg "	- 112.37 " ,	-20.08¢	40.50	?
K	Pos "	+ 79.53 " ,	+11.50¢	38.00	Same
L	Pos "	+ 282.29 " ,	+4.02¢	38.00	out
M	Neg "	- 136.25 " ,	-13.96¢	39.50	out
N	Pos "	+ 35.18 " ,	+20.11¢	33.64 (in)	out

Fe #1 = 115¢ Fe #5 = 104¢

DATE NOV 9 1965 SAFETY CHECK

TIME 9:30 AM PM BY Taylor + Lynn

	B	C	D	E	F
	10/1000	opr	x	10/100	900	860
	8"	ok	4'	2"	8"	ok
	90	–	100	90	100	+ –
	✓	✓	✓			
	—	✓	✓			

SOURCES USED M-226 + Y MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. IV Run C1

24 cm Date NOV 9 1965 Time 10:00 AM PM

Purpose Block Evaluation

Block, Steel 24 cm X 16 cm X 7 cm
~~Located as p. 21~~

C1 Loading – 84 fuel, 11 steel (1 thru 9, 87 + 95)

rep #1 = 23.35 #3 = +7

#2 = 23.357 #4 = +8

Pos Period log N = +8.03#

Cittle = +7.72#

Block out, Cittle = –#4.85

Value = –#4.93

C.A. SORA Expr. IV Run C_2
24 cm Date 11-9-1965 Time 3:05 PM
Purpose Counter and TMC
Check out.

C_2 Pos. Period — ~ 8 ¢

C_3 added 12 cm fuel hole #5.

Pos ~ 18 ¢ with Fe #5 @ 7 9/16"
Pette = 16.11 ¢ @ 2×10^{-8}
16.24 ¢ @ 10^{-8}
Lin = +16.66 ¢

95)

12 cm fuel in top of #5 = ~ 50 ¢

250

DATE NOV 10 1965 SAFETY CHECK

TIME 11:28 AM BY Taylor + Lynn

	A	B	C	D	E	F
CHAN						
NAN	10/1000	8pr	X	10/1000	900	850
SOUR	9"	ok	30"	2"	7"	ok
	90	–	100	90	100+	–
	✓	✓	✓			
AUX	✓	✓	✓			

SOURCES USED M-226 + Y MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA SCANNED ✓

C.A. SORA Expr. 1 V. Run C4

24 cm Date NOV 10 1965 Time 11:35 AM

Purpose Repeat Run C3 p. 29.

C4 Pos Period – log N = 17.74 ±

Cette = 17.5 ±

TMC .0006 → .06 (160 K)

1:45 PM C5 Repeat C4

Pos Period log N = 40.72 17.00 ±

Cette 17.88 ±

TMC Data .0005 → .03 (11 K)

Source left near Counters (M-226)

250 PW C_6 Repeat

Pos Period Log N = 34.2 sec 20.46 ¢

Little = 2×10^{-8} 19.87

TMC Data .0005 → .035 10^{-8} 20.01

5×10^{-9} 20.11

2×10^{-9} 20.18

10^{-9} 19.83

5×10^{-10} 19.31

2×10^{-10} 17.82

DATE NOV 11 1965 SAFETY CHECK

TIME 12:40 AM PM BY TAYLOR + LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10 1000	opn	X	10 1000	900	850
SOURCE DIST.	8"	ok	3'	2"	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓	—	—	—
AUX CTR.	✓	✓	✓	—	—	—

SOURCES USED Ra-226 + Y MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

S.A. SORA Expr. TV Run C-7

24 cm Date 11-11 1965 Time 1:00 AM PM

Purpose Repeat C6

BF3 Counter Settings

#	Disc	Rise Time	Fine Gain	Coarse
1	25	0.2 μs	1	4
2	25	"	1	4
3	25	"	1	8

Pos Period Log N = 52.9 sec, 15.4 +

Pette = 15.1 +

TMC Data .0003 → .03

C-8 Fe #5 from ~ 7½" to out, 55.9 @ 10^{-9}

55.9 @ 2×10^{-9}

C-9 Pos Period – Log N = 38.0 sec, 19.16 ϕ
Pitte = 19.9 ϕ @ 2×10^{-8}
20.04 ϕ @ 10^{-8}

TMC Data .00025 → .04

C-10 Moved Block out (west) – #4.6

#4.80

On sub-assembly
Run A, B, C + D
Pitte (2×10^{-9}) #-2.43, -2.38, -2.37 & -2.40
12 Nov 60 – E
#-2.48

-9
$\times 10^{-9}$

NOV 15 1965 SAFETY CHECK

AM PM TAYLOR & LYNN

	A			D	E	F
Lynn	10/1000	OPR	X	1/1000	900V	850V
Taylor	8"	OK	3'	2"	8"	OK
Kistner	90	—	100	90	100+	100
	✓	✓	✓	Rhodes OK		
	✓	✓	✓			

ALL OTHER SOURCES USED Ra-226 & Ra-248 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED

C.A. SORA Expr. 1V Run D-1

24 CM Date NOV 15 1965 Time AM PM

Purpose Base Run for block (Fe) Change evaluation

D-1 Fuel = 84 Steel Block = 24 cm X 16 cm X 7 cm

Steel = 11, (#1 → 9, 87 + 95) [Block centered]

Pos Period Log N = +130.3 sec, 7.81 ¢

Pitte =

BF_3 =

Block = #5.05

D-2 Moved Block west – Neg Pitte = -4.98 ¢

D-3a Pos Period = 127.9 sec, 7.93 ¢

D-3b Fe #5 Evaluation = 102.2 ¢ Pitte

Neg Period = -94.5 ¢

[1→4, 6→9, 87+95]

D-4 added 24 cm fuel Hole #5.
Fe #5 used to get power level. [Block centered]
{8 5 10} ∞ Fe #5 withdrawn = ?
Neg Period – Log N = 107.9 sec, 22.08 ¢
Pette = -17.6 ¢

24 cm fuel hole #5 = 76.9 ¢ Pette value

D-5 Removed 5 cm Steel from Block (2.5 cm each side)
Steel Block = 24 cm X 11 cm X 7 cm.
Sub Critical –

(20) D-6 added 24 cm fuel Hole #4. Block Centered
1→3, 6→9, 87+95 #1 in –
#5 in –
{6 9} Pos Period – Log N = +34.86 ¢
Pette = 34.1 ¢

D-6b Moved Block out – Pette = -$3.29

Fe Block = $3.63

4.18
3.63
$1.35

D-7 Fe #5 Evaluation –
Log N = +34.68 ¢
Pette = +33.62 ¢

D-7b on Pos above Rod Fe #5 in
moved same out Pette = -63.35
Fe #5 = 96.97 ¢
Block (24X11X7)

D-8 Fe #1 Rod Evaluation

Poo Period — Log N = 12.67 sec ; ~~13.1~~ 35.1 ¢

Petti = 34.05 ¢

D-8b On Poo period above Fe#1 in moved bank out = -65.38

Fe #1 = 99.43 ¢ ✓

D-9 Removed 6 cm fuel from Top of #4.

Evaluation of Block - 24 cm X 11 cm X 7 cm = #1

vs time #2

Poo Period - Log N = 35.83 sec , 19.88 ¢ #3

Petti = 19.68 #4

∞ moved Block west = -3.48

6 cm Top Fuel hole #4 = 14.37 ¢

↑
37

DATE NOV 16 1965 **SAFETY CHECK**

TIME 815 AM ~~PM~~ BY TAYLOR - LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	OPR	X	10/1000	900V	850V
SOURCE DIST.	8"	OK	3'	2"	8"	OK
% F. S. TRIP	90	–	100	90	100+	100
BLDG. ALARM	✓	✓	✓	Pretty	OK	
AUX CTRS.	✓	✓	✓			

SOURCES USED M-226 & Ra-248 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. S.R.A. Expr. IV Run D-10

24 cm Date 16 Nov 1965 Time 9:00 AM ~~PM~~

Purpose Base Run Same as D-1

Scatterer Evaluations

#1 = 23,350

#2 = 23,357

#3 = +7

#4 = +8

D-10 Pos Period – Log N = 130.3 sec = 7.81¢

84 } Petta = 7.54¢

11 } on pos period above

withdrew Fe #1 = – 96.4¢

Fe #1 = 103.94 $104

Block = (24 x 16 x 7)

D-11 Exchanged Fe for Cd-lined polyethylene scatterer in Region 4 ~~for Fe~~. (11.2 cm diameter poly) (hole 14.1 cm)

Sub Critical

D-12 Exchanged Cd-lined poly for plain poly region 4. (14.1 cm dia poly)

Sub Critical

1235 PM
D-13 Returned 14.1 cm dia Fe to Region 4.
Exchanged Fe #1 for Be + Carrier (48 cm).
Be only = 46.5 cm.
Super Critical (~ 80#) guess
∞ Be #1 = 7 9/16" out (Top Carrier)
19.2 cm " "

46.5
18.4
28.1 cm

Be only = 18.4 cm - out

D-14 Removed Side pieces from steel Block
Block = 24 X 11 X 7 (See Run 5 p 30)
Be #1 and Be #5 in.
Steel removed = #1.35
Super Critical (~ 50#) guess
∞ Be #1 = 14.65 cm (Top of Carrier)
5 3/4"
Be only = 13.85 cm out

DATE NOV 17 1965 SAFETY CHECK

Taylor + Lynn

10/600 opr X 10/600

C.A. SORA Expr. IV Run D-15

24 cm Date NOV 17 1965 Time 8:45 AM ~~PM~~

Purpose Scatter Evaluation

D-15 Exchanged 2 ~~poly~~ Fe Scatterers (14.1 cm dia) for 2 polyethylene.

Sub critical

Core SoRA Expr. V Run A-1
24 cm Date 17 Nov 1962 Time 11:20 AM/PM
Purpose Design Reactor Configuration

#1 up 23.355
#2 23.359
#3 = +6
#4 = +9

A-1 Core – 84 fuel, 11 steel (1→9, 87+95) [SEE p.20]
Beam Holes (12) – Empty
Rods #1 + #5 – Be
Block (Pulse) – 24 cm x 11 cm x 7 cm (Be)
Window (inside to outside) = 5 mm Fe – 2 mm Void –
Region #2 + 3 = Fe 3 mm Fe – 3 mm Al –
SEE p. 110 2 mm void – Be Block
Scatterers #3 + #4 = B lined polyethylene

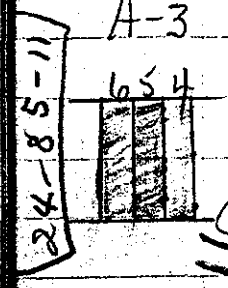
24-1

Sub Critical –

A-2 Added 12 cm of fuel to Center of hole #5.

Sub Critical.

A-3 Hole #5 filled (24 cm fuel)



Poo Period – Log N = 35.5 sec, 20.00 ¢
Pette = 19.4 ¢

24-85-11

A-4 Be #1 = + 19.4 ¢ / − $1.63 — $1.822

A-5 Be #1 = + 19.64 ¢ / − $1.635 — $1.831

Block centered geometrically

A-6 Block Be (24 X 11 X 7) = + 20.25 / − $6.075 — $6.28

Centered physically

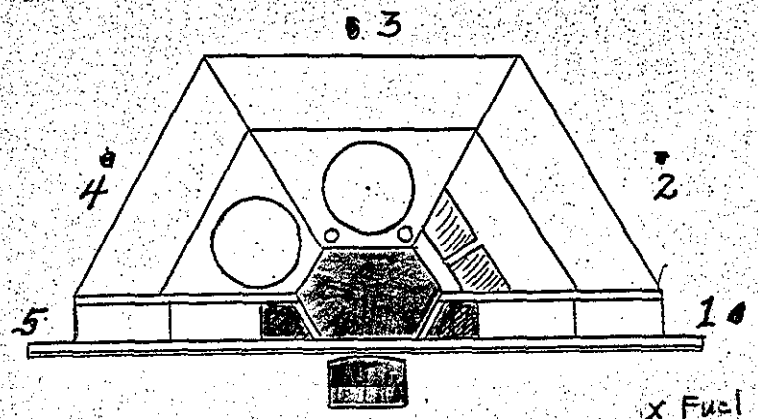
A-7 Block Be (24 X 11 X 7) = + 20.25 ¢ / − 6.005 — $6.21

Centered reactivity wise

A-8 Be #5 = + 19.72 ¢ / − 130.04 ¢ — $1.50

A-9 Be #5 = + 19.65 ¢ / − 130.80 ¢ — $1.50

.355
.359
+6
+9
p.20]



x Fuel
x STEEL
x Be

24-

SAFETY CHECK

DATE NOV 18 1965 TIME 10:00 AM BY Taylor + Lyman

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	X	10/1000	900	850
SOURCE DIST.	8"	ok	4'	2"	7"	ok
% F. S. TRIP	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED M-226 + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

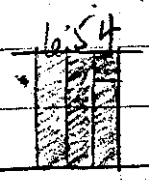
C.A. SoRA Expr. V Run A-10

24 cm (85) + (¼ Top) Date 18 Nov 1965 Time AM ~~PM~~

Purpose Fine Block Evaulation about center.

1→3, 6→9, 81, 95 and 1st ¾ #4

85¼
9¾



A-10 Added 6 cm fuel to top hole #4.
Centered Block Geometrically. Base Run
(0) Pos Period – Log N – +17.37 acc; 30.02 ¢
Pitte – +29.80 ¢

24-85¼-11

(1) Moved Block west – -2.2 cm
Neg Period – Log N
Pitte = – 8.33 ¢
6 cm fuel = 10.4 ¢
38.13 ¢

A-11 (2) Set Block west – –
Pos Period – Log N =
– Pitte = 20.39 ¢

(3) Moved Block west
Neg Period – Log N =
Pitte = -18.02 ¢

A-12 (4) Set Block East of Zero point, +5 mm. (.5cm)
Positive Period – Log N = +15.56 sec, 31.76 ¢
Pette = +31.82 ¢

(5) Moved Block East - +
Neg. Period Log N = – 255.1 sec, 5.92 ¢
Pette = – 5.33
BF_3 = – 257.9 sec 5.85 ¢

A-13 (6) Set Block East of Zero Point, + 1.2 cm
Positive Period – Log N = + 16.79 sec ; +30.56 ¢
Pette = 30.0 ¢

(7) Moved Block East = +3.7 cm
Neg Period –
Pette = –20.2 ¢
BF3 = 93.8 sec.

A-14 (8) Set Block East of Zero Point, + 9 mm –
Pos Period – Log N =
Pette = 30.98 ¢

(9) Moved Block East = + 1.8 cm
Pos Period – Log N = 25.0 sec ; 24.64 ¢
Pette = 23.6 ¢

After Shut down Chan "F" ~~Scanned~~ Tripped (Low-Level)

3:00 PM

A-15 (10) Set Block East = + 2 mm

Pos Period - Log N = 15.2 sec ; 32.1 ¢

Pitte = + 30.98 ¢

(11) Moved Block west = - 2 mm

Log N = 19.0 sec ; 28.6 ¢

Pitte = 27.67 ¢

A-16 (12) Set Block East of Zero = + 2.5 cm

Pos Period Log N = 84.0 sec 11.04 ¢

Pitte = + 10.83 ¢ @

(13) Moved Block west = - 1.6 cm

Pos Period - Log N = 212 sec 5.18 ¢

Pitte = ~~+10.85~~ + 5.03 ¢

DATE NOV 19 1965 SAFETY CHECK

TIME 9:00 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
LEVEL	10/1000	opr	x	10/1000	900	850
SQUARE WAVE	8"	ok	4'	2"	7"	ok
% F. S. TRIP	90	—	100	90	102+	—
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓		✓			

SOURCES USED M-226+ & MASKETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. So RA Expr. V Run A-17

24 cm (8 5) Date NOV 19 1965 Time 9:10 AM

Purpose Be #5 Evaluation

Block Be - 24X11X7

A-17 Removed the 6 cm fuel from Top Hole #4.

Pos Period - Log r = 37.3 sec ; 19.38 +

Pette = +19.03 ✓

BF_3 = 35.34 sec ; 20.04 +
40.07 sec ; 18.33 +

∞ with Rod Be #5

Measured after Shut down -

Top Be = 9.75 cm

Top Carrier = 10.55 cm ; 4 5/32"

A-18 Base Run (Repeat A-17)
Pos Period - Log N = 36.3 sec ; 19.72 ¢
Pette = 19.06 ¢
BF_3 = 41.8 sec ; 18.02 ¢
35.8 sec ; 19.89 ¢

A-19 Removed Al Sheet (3 mm) from Window side of reactor -
Sub Critical.

1:10 PM
A-20 Replaced Al plate in place - (1 m x 48 cm x 3 mm)
Pos Period - Log N = 38.0 sec 19.2 ¢
Pette = 18.73 ¢

4.

Removed Al plate.
Neg Period - Pette = -37.72

3 mm Al plate = 56.45 ¢

A-21 Placed 3 mm Steel plate in place
(1 M x 48 cm x 3 mm)
Pos Period - Log N = 24.97 sec 24.68 ¢
Pette = + 24.14 ¢

vs A-20

37.72
24.14
61.86 ¢

3 mm steel plate = 61.86 ¢

A-22 Al plate (3mm) returned to position.
~~Remove~~ poly core from B lined scatterer #4. (on overhead drive)

Poo Period – Log N = 37.1 sec 19.45 ¢
Cette = +19.02 ¢

With drew Poly Core (7.8 sec = time)
Poo Period – Log N =
Cette = +10.98 ¢

Poly Core #4 = 8.04 ¢

A-23 Entire Scatter #4 on overhead drive.
Poo Period – Log N =
Cette = +18.77 ¢

With drew Scatterer (B lined #4)
Neg Period – -48.35 ¢

B lined scatterer #4 = 67.12 ¢

22 Nov 63
8:00 Am "F" was Tripped

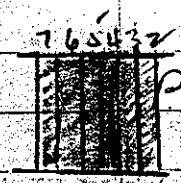
DATE NOV 22 1965
TIME 11:15 AM Taylor + Lynn

10/1000	opr	K	10/1000	900	850
9"	OK	4'	2"	6"	OK
90	—	110	90	100+	—
✓	✓	✓			
✓	—	✓			✓
M-226 + γ					✓
✓	✓				

C.A. SORA Expr. V Run B-1
24 cm (8") Date NOV 22 1965 Time AM PM
Purpose: 24 X 11 X 7 Be Block, fine evaluation about center.
Scatterers #3 + #4 = B Lined.
Beam Holes (12) = Empty

B-1 Be #1 + #5 - out, Fe #1 + #5 in —
Added 24 cm fuel to holes #5 + #6.

(26)



Row 9

Poo Period - Log N = 148.7 sec, 7.01 ¢
Petto = 7.0 ¢ $^{+.18}_{-.25}$
BF_3 (#3) = 152.1 sec; 6.88 ¢
29.25 ¢

Moved Block west = -2.25 cm
Neg Period = -22.25 ¢

1, 2, 3, 7, 8, 9
9 7 + 9 5

11 cm Be Block #1 + #5 = Fe

(26) B-2 added 2 - 6 cm fuels. (6 cm top #3 + 6 cm top #7) (4th 1/4 #3, 4th 1/4 #7)

Block at center - 0 point, Pos = 30.52 ¢

Fuel (24 cm) Block worth - moved out (West) = -5.84

87 + [1/4 #3 + 1/4 #7]

Pette = -5.54
30
5.84

87 1/2 1, 2, 8, 9, 8.7, 9.5, 1st 3/4 #3 + #7

7 1/2 B-3 ① Block at - 3 cm = Pette = -19.32 ¢

B-4 ② Set Block @ + .5 cm (E) =

Pos Period —

Pette = +29.01

③ Moved Block @ +2.4 cm (E)

Neg period - Pette = -0.9 ¢

B-5 ④ Set Block @ + 1.35 cm (E) =

Pos Period -

Pette = +20.58 ¢

⑤ Moved Block + 3 cm (E) =

Neg Period = -18.66 ¢

B-6 ⑥ Set Block +0.25 cm (E)

Pos Period =

Pette = 2

⑦ moved Block @ = 0.8 cm (W)

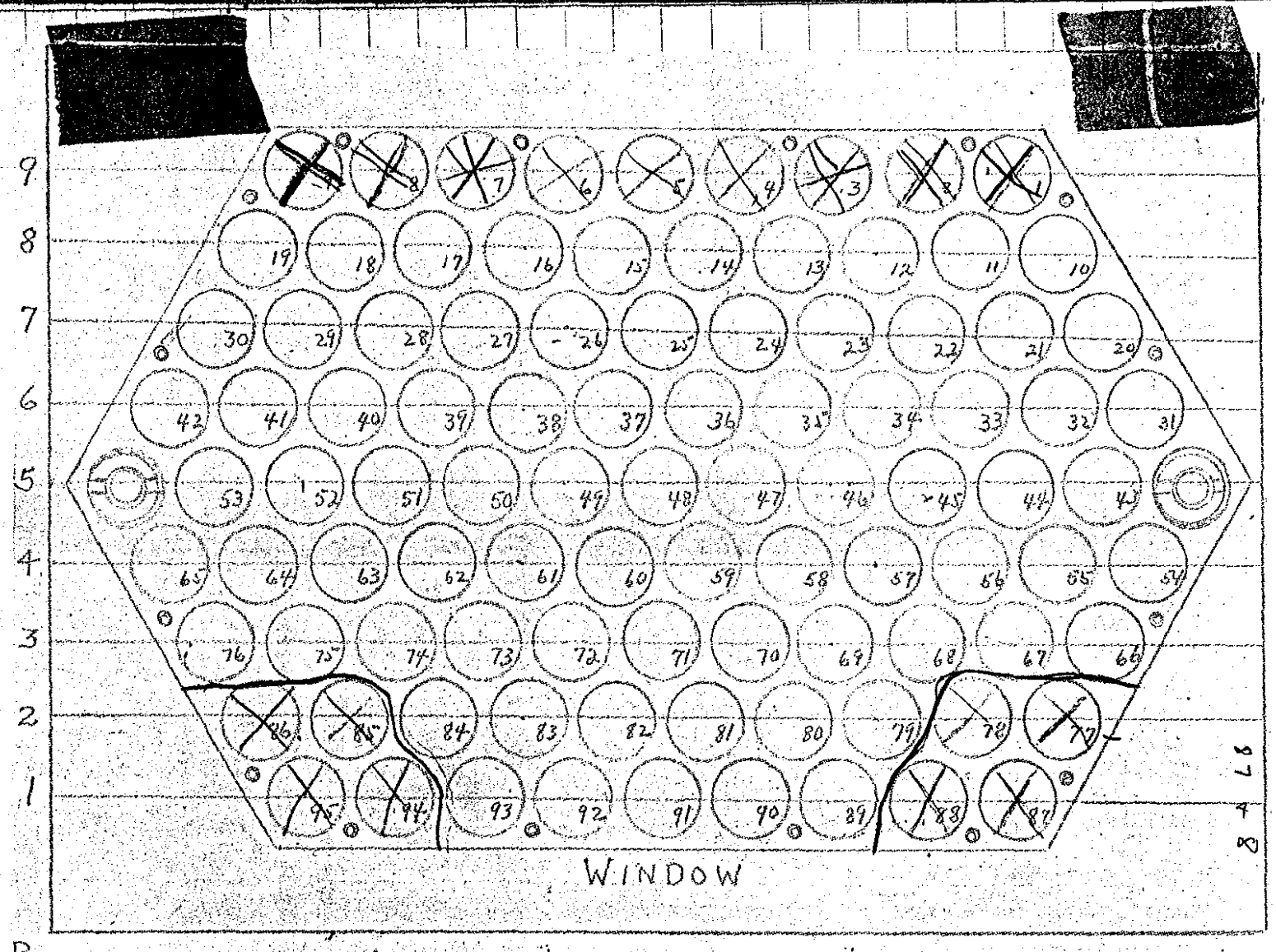
Pette = +26.44

¼ #7
top #7)

84

B-7 Set Block @ -.25 cm (W) :
Pos Period -
Pitte = 29.78 ¢

Mound Block @ -2.05 Cm (W)
Pos Period Pitte = 6.87 ¢



Row

4 8 7

4 7 8

4 8 0

4 6 1

3, 94+95)

C.A. SoRA Run C-1
24.cm (87) Date 22 Nov 65 Time 3:15 AM/PM
Purpose CoRE Change to check
Be Block (24x11x7) Change (Value)

C-1 Core = 87 Fuel ; 8 steel, (#1, 2, 8, 9, 87, 88, 94 + 95)
7.5 Poo Period – Pitte – +24.43

Moved Block west – Pitte = –#5.21
Block = #5.45

C-2 Core = 87 Fuel ; 8 steel (+ ¼ #1 + ¼ #9) (top)
– 2(⅛) (77, 78, 87, 88, 85, 86, 94 + 95)

Sub Crit. – (~ –10¢)

C-1 – Exchanging Fuel from #87 + #94 to
vs B-2, p.50. #3(¾) + #7(¾) = –6.1¢

(C-3) vs (C-1) Exchanging Fuel from #85, 86, 77, + 78 to
#1, 2, 8 + 9 = –8.0¢

DATE NOV 23 1965 SAFETY CHECK

TIME 9:00 BY Taylor + Lynn

	A	B	C	D	E	F
	10/1000	OK	X	10/1000	900	850
	8'	OK	4'	2"	6"	OK
	90	—	100	90	100+	—
	✓	✓	✓			
	✓	—	✓			

M-226 + 8 MAGNETS ✓

ALLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. V Run C-3

24cm (87) Date NOV 23 1965 Time 9:15 AM

Purpose Cont. of p. 52.

Be Block = 24 X 11 X 7

#1 + #5 = Fe

#3 + #4 = B Lined

Beam Holes = Empty

Window = 5 Fe - 2 void - 3 Fe - 3 AL - 2 void - Block

4+95)

C-3 Core - Fuel = 87, Steel = 8 (85, 86, 87, 88, 77, 78, 94+95)

Pos Period - Log N = 46.1 sec 16.90 ¢

(D) +0.0 cm Pitte = +16.43¢

BF3 = #2 = 45.19 sec, 17.13¢

#1 = 47.9 " , 16.47¢

Moved Arm west - Pitte = -#4.887

(Block) Arm = #5.04

6.1¢

(E) Moved Arm @ -1.3 cm Log N = 84.5 sec +10.98¢

Pitte = 10.68¢

to

-8.0¢

24.43
16.43
- 8.0 ¢

25

C-4 ① Set Block @ +.2 cm (E)

12:30 PM Pos Period — Pitte = +15.68 ¢

③ Moved Block to + (E)

NEG PERIOD — Pitte = - 9.57 ¢

C-5 ④ Set Block @ - .2 cm (W) = +16.83 ¢

Pos Period, Pitte =

⑤ Moved Block to -2.6 cm (W) = - 8.43 ¢

C-6 ⑥ SET Block @ -0.6 cm (W) = + 16.16

Pitte =

⑦ Moved Block to -1.95 cm (W)

Pitte = +3.50 ¢

C-7 ⑧ Set Block @ -0.95 cm (W)

Pitte = +14.66 ¢

Moved Block to +1.4 (E)

Pitti = 2.7 ¢

DATE NOV 24 1965 SAFETY CHECK

TIME 8 40 AM PM BY TAYLOR & LYNN

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	OPR	X	10/000	900	850
SOURCE DIST.	8"	✓	4'	2"	6"	✓
% F. S. TRIP	90	OK	100	90	100+	100
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu226 & Ra248 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expt. V Run D-1

24 cm (87) Date 24 Nov 1965 Time 9:00 AM PM

Purpose Block Evaluation (11 3/4" = 29.85 cm)

Be Block = 29.83 X 7.3 X 7.3 (2 7/8" = 7.3 cm)

#1 + #5 = Be

#3 + #4 = B Lined

Beam Holes = Empty

Window = 5-2-3-3-2

(33)

D-1 CORE — Fuel = 87, STEEL = 8 (77, 78, 85, 86, 87, 88, 94 + 95)

Poo Period — Log N = 135.7 sec, 7.56 ¢

Pitte = 7.3 ¢

BF_3 = #1 - 142.2 sec; 7.27 ¢
#3 - 137.5 sec, 7.48 ¢

Moved Block Away = -3.65 ¢

Block = 3.72 ¢

D-2 Added 12 cm fuel to top Steel plug north center hole.

Pitte = ~11 ¢ ?

D-2 added 12 cm fuel to Center hole of top Steel Core plug.

{VS D-1} Poo Period - Pitte + 17.72 ¢
2 (12 cm fuel) = 10.4 ¢
Moved arm out (west) = -3.57
BLOCK = 3.75 ¢

Moved ~~Set~~ Arm to ~~-1.8~~ -1.8 cm
Poo Poo Period - + 9.05 ¢

D-3 Set Arm + 0.6 cm (E)
Pitte = +16.80 ¢

Moved Arm to + 1.2 cm (E)
Pitte = 12.07 ¢

D-4 Set Arm - 0.6 cm (W)
Pitte = 15.96 ¢

Moved Arm to - 3.0 cm (W)
Pitte = - 6.47 ¢

D-5 Set Arm + 0.25 cm (E)
Pitte = +17.59

moved Arm to + 2.6 cm (E)
Pitte = - 5.12

D-6 ⓐ Set Arm @ -.2 cm ⓦ
∴ pette = +17.6¢

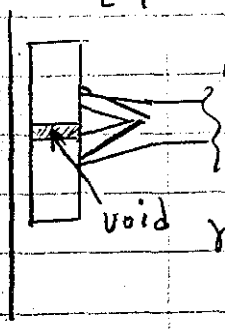
ⓐ Moved Arm to -2.3 cm ⓦ
pette = 1.79¢

¢

C.A. SoRA Expr. V Run E-1
24 cm (87 + ½# + ½#
Date 19 Time 1:20 AM ~~PM~~
Purpose Be Block Study.
(29.85 X 7.3 X 7.3) with void at
center (2.54 X 7.3 X 7.3)

~~Removed fuel from Steel Cover plug~~ (-10¢)

E-1 Removed center 1" from Be Block.
Added 12 cm fuel to holes # 78 + # 85



Pos Period - Critic = 31.50¢
Moved Block out = -#3.12
Block = #3.43

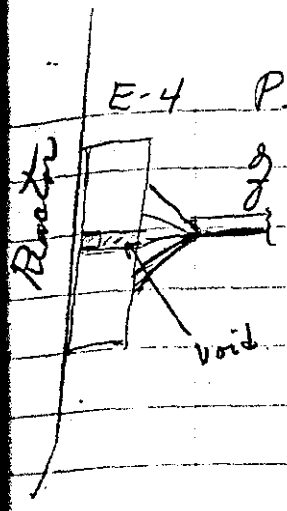
E-2 Removed 6 cm fuel, 4th quarter from bottom of hole #85

Pos Period = Critic = 20.48¢
6 cm Fuel = 11.02¢
Moved Block out = -#3.21
Block = #3.41

E-3 Removed 6 cm fuel from 3rd quarter from bottom of hole #85 (vs E-1)

Pos Period, Critic = 11.78¢
6 cm Fuel = 19.72¢
Moved Block out = -#3.65
BLOCK = #3.77

E-4 Placed 1" x 1" x 7/8" U metal at front Center of Void in Be Block



Pos Period - Pitte = 29.06 ¢

1x1x7/8 Fuel = 18.28 ¢

Moved Block ~~out~~ = - $3.61

Block = $3.90

E-5 Placed 2(1" x 1" x 7/8") U Metal at from of Be Block void. ✓

-31 ¢ → Removed Fuel from #85, (6 cm) + from #78, (12 cm)

Pos Period - Pitte = 21.72 ¢

2(pcs fuel) = 34.6 ¢

Moved Block out = - $3.70

Block = $3.92

3pc fuel = 42.92 ¢

E-5 vs D-2, p.56 = +14.4 ¢

DATE NOV 26 1965 SAFETY CHECK

TIME 9:20 AM BY Taylor + Lynn

SAMPLE						
RANGE	10/1000	op	X	10/1000	900V	850
SOURCE DIST.	8"	OK	3'	2"	6"	OK
% F. S. TRIP	90	OK	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	—	✓			

SOURCES USED M-226 + Y MARKERS ✓

TABLES ✓ LIGHTS ✓ AREA BLOCKED ✓

C.A. SORA Expr. V Run E-6

24 Cm (87) Date NOV 26 1965 Time AM PM

Purpose Base Run, Repeat E-5

E-6 Pos Period — Log N = 34.7 sec, 20.28 ¢

Gitte = 19.72 ¢

BF_3 = #1 = 40.2 sec, 18.48 ¢

#3 34.5 sec, 20.35 ¢

Moved Arm out = -3.68

Block = 3.88

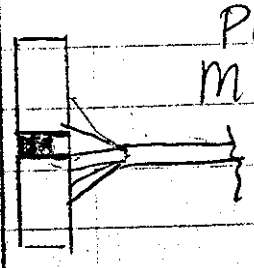
E-7 Placed 1" X 1 7/16" X 2 7/8" Be just behind

U at center of Block

Pos Period = 34.46 ¢

Moved Block out = -3.72

Block = 4.06



E-8 Removed ~~0~~ U from face of Block –
Added 2 fuels to top Core plug.
D-2, p.56

Sub Critical.

E-9 Removed 2 fuels added in E-8.
Added 12 cm fuel #85 (+30.74¢)
87 + [½ #85]

Pos Period – Pette = 14.58¢

moved Arm out – #3.37

Block = #3.52

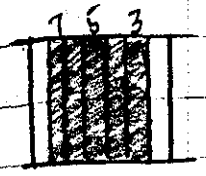
Reactivity Change = 50.6¢
Block CHange = 54¢

¢

8.48¢
0.35¢

88
d

4.06



Row 9

CA SoRA Expr. V Run F-1
24 Cm (82) Date 26 Nov 1965 Time 3:15 AM
Purpose Critical Condition with Be Block (24 cm X 16 cm X 7 cm).

Steel at Window

F-1 Core - 83 Fuel, 12 steel (1, 2, 8, 9, 77, 78, 85, 86, 87, 88, 94 + 95)

Super Crit. { Be #5 = 21.9 cm (Raised)
∞

F-2 Removed - 12 cm fuel from top of #3 + #7

~~Be Removed~~ - Super Crit.
Be #5 = ∞ = 18.8 cm
7.6

F-3 Removed remaining fuel from #3 + #7.
Removed fuel from #4 + #6.
79 Fuel
16 Steel Sub critical

DATE NOV 30 1965 SAFETY CHECK
TIME 9540 AM BY Taylor & Lyman

	A	B	C	D	E	F
	10/1000	oper	x	10/1000	900 V	850
	8"	ok	3'	2"	6"	ok (after tube change)

MAGNETS
ARE RELEASED

F-4 added 12 cm fuel to top #hole #4.
79 1/2 } Sub Critical.
15 1/2 }

F-5 Filled Hole #6, fuel.
{ 80 1/2 Fuel
{ 14 1/2 Steel Sub Critical.

F-6 Hole #4 full, + 12 cm in top #3.
{ 81 1/2 Fuel
{ 13 1/2 STEEL Poo Period — 40.6 + Log N
Little = 40.0 ✓

Moved Block west = #-7.59
Be Block = #8.00 ← 8 Fe Near Window
(24 X 16 X 7)

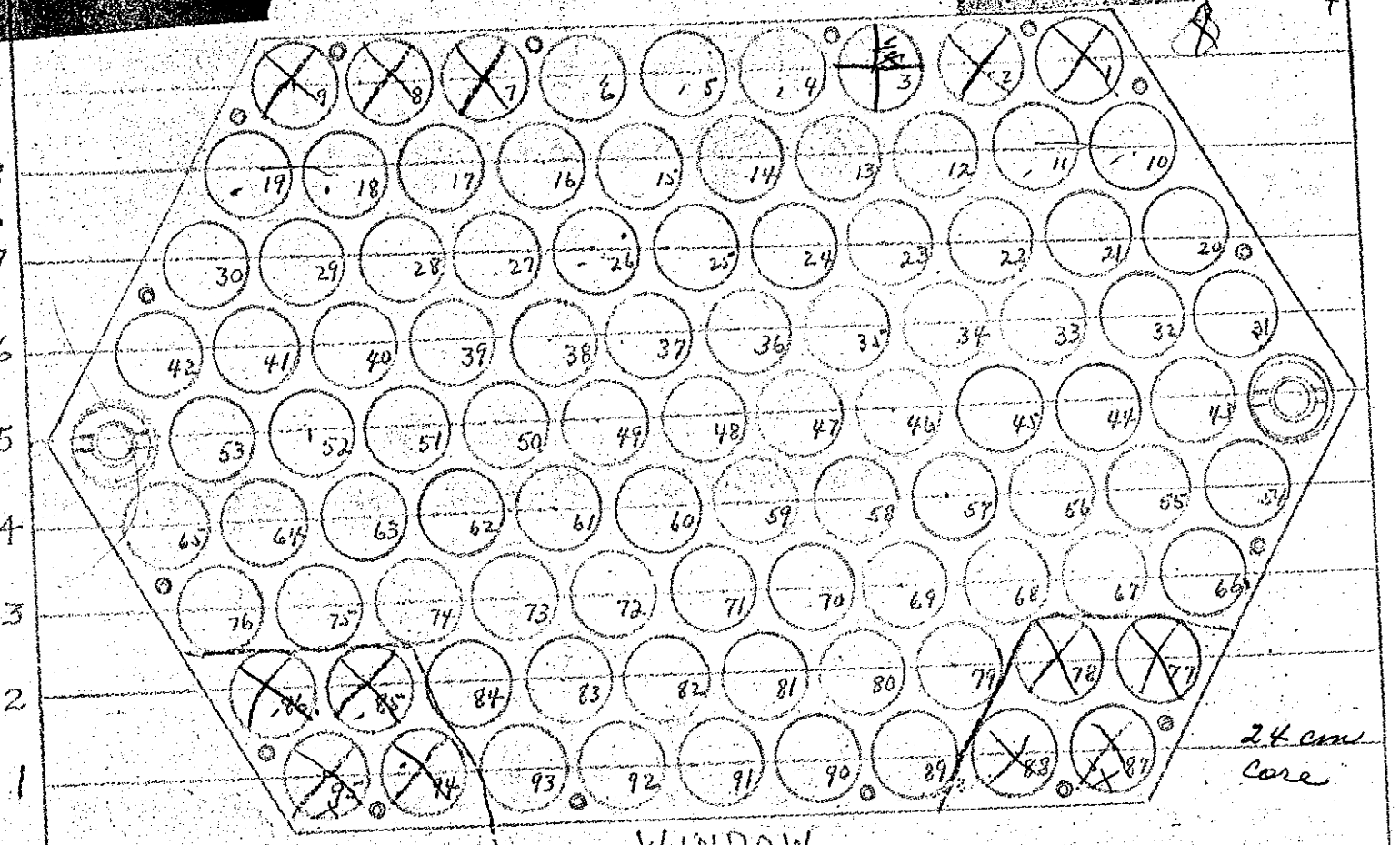
After Shut down Ch "F" - tripped

Rear Window

[redacted]

30 NOV 65

Fuel = 8 1/4
STEEL = 13 3/4



24 cm core

Row

5

Lock = 7.50

Lock K = 7.50

7, 78, 86, 87, 88, 2nd Bottom Tag #5

65

F-7 Removed 3rd quarter of fuel (6 cm) from
81¼ hole #3. [Top 6 cm only in hole #3]
13¾ Core – 81¼ Fuel, 13¾ steel, [1, 2, 7, 8, 9, 77, 78, 85, 86, 87, 88, 94 + 95, and Bottom ¾ of #3]

(0) Block @ 0

#1 + 5 = Be
#3 + 4 = B Lined
Window = 5-2-3-3-2 - Block

Poo Period – Log ν =
Pitte = 16.77 ¢
BF_3 =

Moved Block west = – ¢7.33

Block = ¢7.50

(1) Moved Block to – -1.4 cm
Poo Period = +2.26 ¢

F-8 (2) Set Block @ -0.5 cm.
Poo Period – +15.54 ¢

(3) Moved Block West – ¢7.35

Block = 7.50

(3) Moved Block to -1.8 cm
Neg period = -8.08 ¢

F-9 Be Rod drive difficulty. Fixed. Changed Rod Travel ~~[illegible]~~

(6) Reset Be Block @ Zero point.

vs Pos Period _ Pitte = 17.48 ¢

F-6 p.64 6cm Fuel = 12.5¢

moved Block wet = -7.55'

Be (24 X 16 X 1) Block = 7.72

F-10 (0) Set Block @ Zero point.

Pos Period _ log N = 41.8 = 18.02¢

Pitte = 17.39¢ ←

(1) moved Block East = +2.0 cm

Pitte = -6.41¢

(2) Set Block @ -0.2 cm (W)

Pitte = +17.23¢

(3) moved Block to -2.1 cm (W)

Pitte = -3.68

F-11 (4) Set Block @ +0.3 cm (E)

Pitte = 16.46¢

(5) moved Block to +~~1.0~~ 1.9 cm = +11.88¢ (E)

F-12 (6) Set Block @ +0.5 cm (E)
Pitte = +14.91 ¢

(7) moved Block to +1.5 cm (E)
Pitte = +1.58 ¢

F-13 (8) Set Block @ -0.5 cm (W)
Pitte = +16.79 ¢

(9) moved Block to -1.4 cm (W)
Pitte = +9.21 ¢

F-14 (10) Set Block @ = -0.6 cm (W)
Pitte = 16.29 ¢

(11) moved Block to -0.9 cm (W)
Pitte = +13.91 ¢

Date DEC 1 1965 SAFETY CHECK

8:20 Am Taylor + Lynn

10/1000 opr X 10/1000 900 750
7" OK 3' 2" 6" OK
90 — 100 90 100+ —
✓ ✓ ✓
✓ — ✓
M-226 + γ MAGNETS ✓
✓ LIGHTS ✓ AMPLIFIERS ✓

C.A. SoRA Expr. V Run F-15
24 cm (8 1/4) Date DEC 1 1965 Time AM PM
Purpose Block + Rod (Be #5)
Evaluation

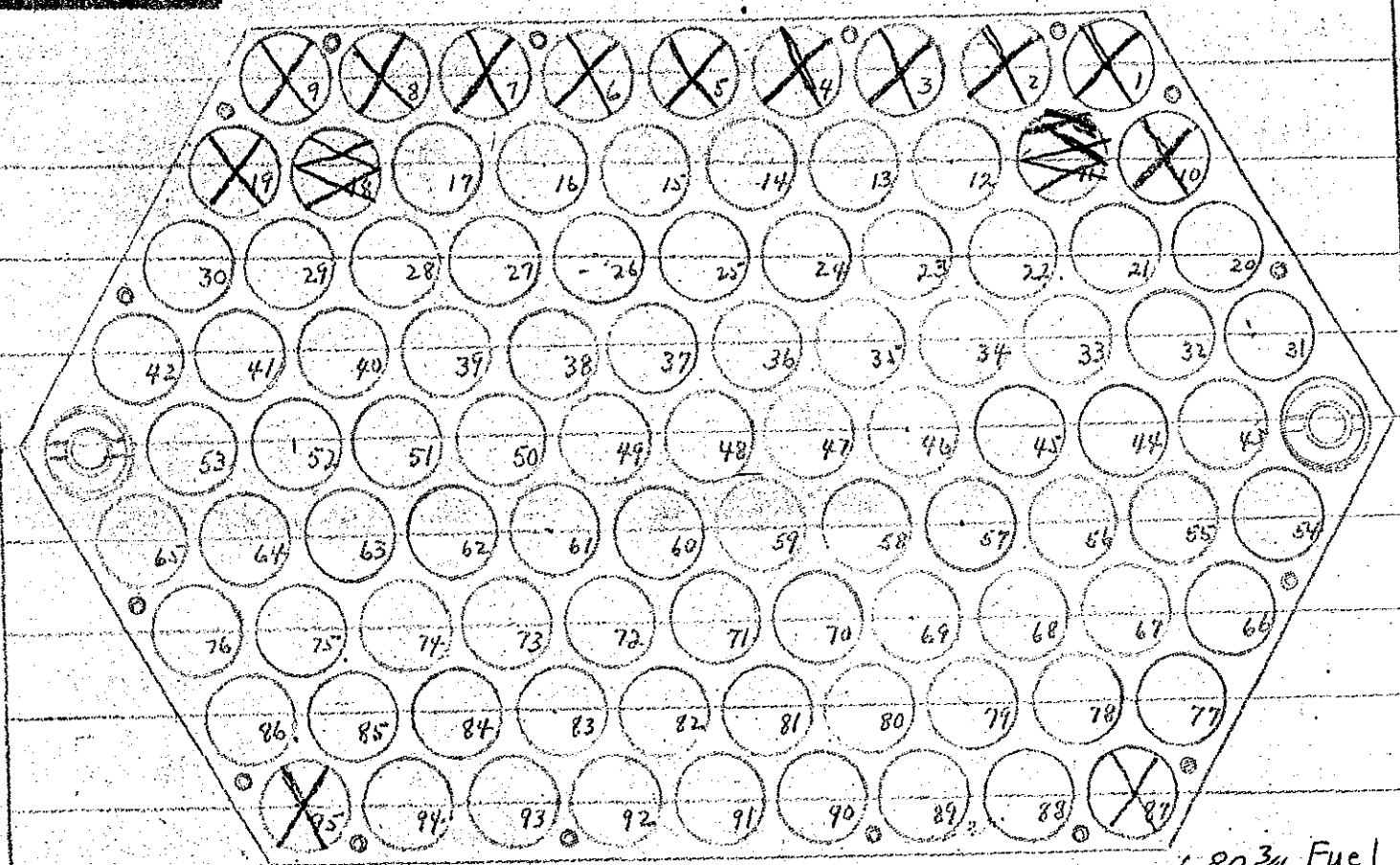
F-15 Pos Period Log N = 41.0 sec, 18.25 ¢
Pitte = 17.93 ¢
BF_3 = #1 = 39.9 sec, 18.57 ¢
#3 = 38.7 " , 18.94

Pulled Be #5 out
-1.34 ¢
Log N = 40.7 sec 18.34 ¢
Pitte = 17.92 ¢

moved Block out -7.45
Be Block = 7.63
(24 x 16 x 7)

[redacted]

X-STEEL



80 3/4 Fuel
14 1/4 STEEL

Block = 24 x 16 x 7
#1 + #5 = Be

Row

Pitch = 1.02 ∅

69

C.A. SORA Expr. VI Run A-1
24 (cm) Date 1 Dec 1965 Time 9:50 AM
Purpose Critical Condition with Fuel near Window, except #87 + #94

Be Block = 24 X 16 X 7

A-1 Core - 80 Fuel -
15 STEEL - [1 → 9, 10, 11, 18, 19, 87 + 95]

Sub Crit.

A-2 Added 6 cm fuel, 3rd quarter to hole #11

Sub crit

A-3 Added 12 cm fuel, top ½ of hole #18. (7)
Core = 80 ¾ Fuel, 14 ¼ STEEL [1 → 10, 19, 87 + 94, Bottom ½ of #18 and Bottom ½ + Top ¼ of #11]
(0) Pos Period - + 31.33

Moved Block out = - 8.76
Block = 9.07

(1) Moved Block - 1.55 cm
Pitte = 19.26 ¢

A-4 (2) Set Block @ + .3 cm
Pitte = 30.21 ¢

(3) Moved Block + 1.2 cm
Pitte = 19.02 ¢

A-5 ④ Set Block ⓐ +0.5 cm
Pitte = 28.53 ¢

⑤ moved Block +1.55 cm
Pitte = 10.69 ¢

A-6 ⑥ set Block ⓐ −0.25 cm
Pitte = 31.68 ¢

⑦ moved Block to 1.0 cm
Pitte = 27.64 ¢

A-7 ⑧ Set Block ⓐ −0.5 cm ⓦ
12:45 PM
Pitte = 30.99 ¢

⑨ Moved Block to −1.9 cm ⓦ
Pitte = 1.86 ¢

C.A. SoRA Expr VII Run A-1
24 cm (.85) Date 1 Dec 1965 Time 3:10 AM PM
Purpose Crit. Condition.
{ Nominal Design. }
{ See p. 40 }

A-1 up. #1 = 23.355 #2 = 23.361
#3 = +7 #4 = +7

Down #1 = 0.032
Old Safety Plug on overhead drive. (Italy)
Poo Period Pitte = + 5.57 #

Down - measured Core to plug. 23.14" South
23.80" North ∴ Not up to plug.

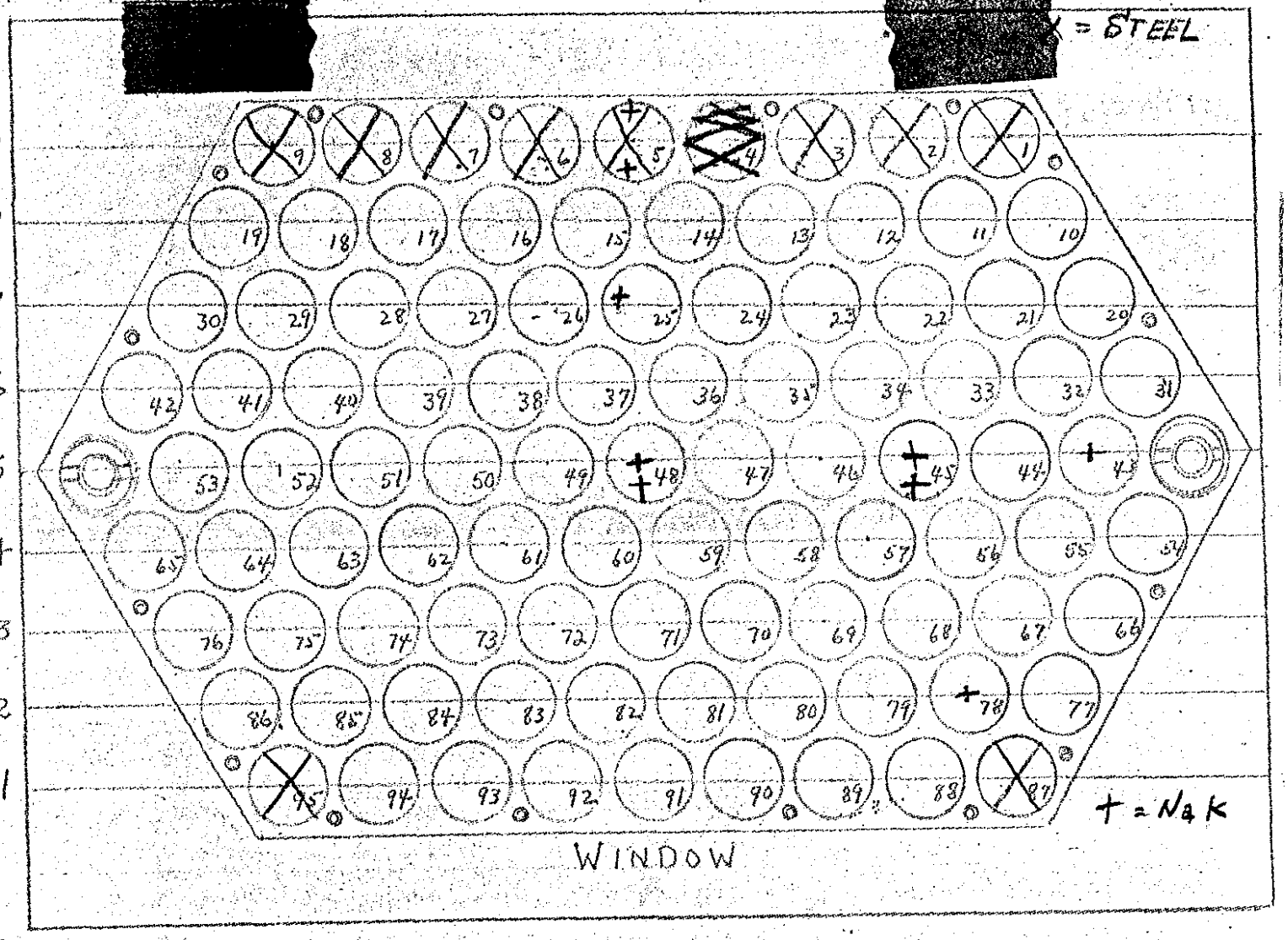
A-2 adjusted travel of Core (up 62.5 mils).
up #1 = 23.415 #2 =

Pitte = 2.70 #

A-3 NEW Top Plug in place.

∞

[redacted] [redacted]



DATE DEC 2 1965
TIME 8:25 AM

Taylor + Lynn

10/1000	opt	✓	10/1000	900	750
8"	ok	3'	2"	6"	ok
90	—	110	90	100+	—
✓	✓	✓			
✓	—	✓			
M-226 + 8					✓
—	✓				✓

C.A. SORA Expr. VII Run A-4
(85 1/4) 24 cm Date DEC 2 1965 Time AM/PM
(9 3/4) Purpose Safety plug Evaluation
{Old plug per Gus}

A-4 added 6 cm fuel to top #4
6 & 4 Pos Period Log N - 50.7 sec; 18.64 #
Pitte = 15.37 #
BF_3 = #1 = 49.2 sec
#3 = 50.1 sec

Raised Safty Plug = − 2.20 #
Plug ht = 6 7/16"
out = 4 sec
6 7/16" + 9" = 8.7 sec.

Top PLUG = 2.35 #

Made Slight Block adjustment (forward)

A-5 Be #5 Evaluation – out = 17 9/16" = ~~44.60~~ 44.9 cm.
Pos Period – 20.25¢

withdrew Be #5 = $ -1.30 (out)
In → out = 8.4 sec
∞ with Be #5 = 4 9/32" = 10.85 cm

Be #5 = $ 1.50

A-6 Center Fuel Element (#48)
Pos Period = 19.95¢

withdrew center fuel = – $ 1.57
#48 Fuel = $ 1.77

A-7 Be #1 – ~~out~~ Travel = 17 7/16" = 44.30 cm
Pos Period = 20.40¢

withdrew Be #1 = – ~~$ 1.86~~ $ 1.61
In → out = 19.2 sec
∞ = 3 27/32" = 9.8 cm

Be #1 = $ ~~1.76~~ 1.81

A-8 Fe #2a – out = 17 7/16" = 44.30 cm
Pos Period – 20.34¢

2 cm from core withdrew Fe #2a = – 43.77¢
In → out 16.8 sec
∞ = 5 3/4" = 14.6 cm

Fe #2a 64.1¢

A-9 Fe #2b . out = 17½" = 44.45 cm

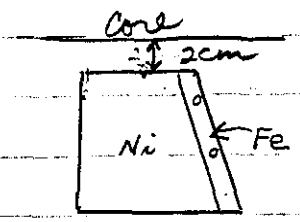
Pos Period = + ~~20.34~~ 20.10

withdrew Fe #2a = ~~43.74~~ -27.36

IN → out 16.2 sec Fe #2b = 47.4¢

∞ = 6 7/8" = 17.5 cm

A-10 Ni #2a out = 17 7/16" = 44.30 cm



Pos Period

To Fast

withdrew Ni #2a > 60 ¢

IN → out = 16.2 sec

∞ Ni #2a = 20.9 cm

8.25"

Removed 12 cm from top #5

Core = 84 3/4 Fuel

10 1/4 STEEL

DATE DEC 3 - 1965 SAFETY CHECK

TIME 8:08 AM BY Taylor + Lynn

CHECKED	A	B	C	D	E	F
RAD.	10/100	opr	x	10/100	900V	750
SCR. [illegible]	8"	OK	4'	2"	7"	OK
% F.S. [illegible]	90	—	100	90	100t	—
BLDG. ALARM	✓	✓	✓			
ADJ. BLDG.	✓	—	✓			
SO. ROES [illegible]	M-226 + Y		MAGNETS		✓	
TAGLES	✓	LIGHTS	✓	AREA CLEARED	✓	

C.A. SORA Expr. VII Run A-11

24 cm Date DEC 3 - 1965 Time AM PM

Purpose Rod Evaluations

84 3/4 Fuel, 10 1/4 STEEL

A-11 Poo Period (44.3 cm)

Pitte = 23.82 ¢

withdrew Ni #2a = − 74.6 ¢

IN to out = 9 sec Ni #2a = 98.4 ¢

∞ 5 5/32" = 12.75 cm

A-12 Tungsten #2a out = 17 7/16" = 44.3 cm

Poo Period — Log N = 42.3 sec 17.88 ¢

Pitte = 17.26 ¢

BF3 #1 = 39.7 sec, 18.63 ¢
#3 = 41.08 sec, 18.75 ¢

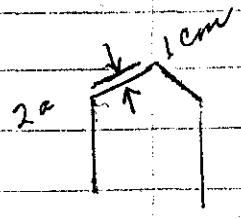
2 cm from core

withdrew W 2a = − 72.74 ¢

IN → out = 9.6 sec W 2a = 90.0 ¢

∞ 4 11/32 = 11.0 cm

C.A. SORA Expr. VII Run B-1
24cm (84 3/4) Date ___ 19 ___ Time 10:25 AM
Purpose Rod Evaluations
Position 2a moved to 1 cm of Core.
STEEL = 10 3/4 [#1, 2, 3, 6, 7, 8, 9, 87 + 95 and 12 cm bottom of #5 13 cm bottom of #4]



B-1 W #2a - ~~Travel out~~ - 17 7/16 - 44.30 cm
Pos Period - Petto = 25.31 ¢
withdrew W - Petto = -87.12
In → out = 11.4 sec
∞ = 4 13/16" = 12.35 cm
W 2a = 112.43 ¢

B-2 Ni #2a - out - 17 15/32" = 44.37 cm
Pos Period - 31.9 ¢
withdrew Ni #2a = - 89.52 ¢
In → out = 10.8 sec
∞ = 5 9/32" = 13.25 cm
Ni #2a = 121.42 ¢

B-3 Fe #2a - out 17 15/32" = 44.37 cm
Fuel - 8 5/4, STEEL - 9 3/4
Pos Period - - 18.73 ¢
Fe #2 out - - 61.56 ¢
p.73 ∞ 5 1/64" = 12.8 cm
Fe #2a = 80.29 ¢
In → out = 10.75 sec

B-4 Pos Period - 18.81 ¢
FUEL #5 (center Row 9) out = -69.82 ¢

Fuel #5 = 88.63

8.4 ¢
Cm
.88 ¢
18.63 ¢
18.25 ¢
0.0 ¢

	Position (Section)	Type	Travel	Period	{US Void} Worth
B-5	Core # 25	Fuel	—	+ 19.02 ¢	
	"	"	out	- 128.13 ¢	$1.47
B-6	Core # 43	"	—	+ 19.50 ¢	
	"	"	out	- 65.24	84.74 ¢
B-7	Core # 78	"	—	+ 19.07 ¢	
	"			- 79.35 ¢	98.42 ¢

DATE DEC - 6 1965 SAFETY CHECK

TIME 8:25 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	X	10/1000	900V	750
SCUTTLE DIST.	7"	OK	4'	2"	6"	OK
% F. S. TEST	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.			✓			

SOURCES USED M-226 + γ MAGNETS ✓

TABLES ✓ LIGHTS – AREA CLEARED ✓

C.A. SaRA Expr. VII Run B-8

24cm (85¼) (9¾) Date DEC - 6 1965 Time AM PM

Purpose Cont'd Evaluation

Non Design — See p. 40

B-8 Pos Period — Pitte = 19.38 ¢

Pulled Fuel #45 —

Neg Period — -1.19 ¢

#45 Fuel = 1.38 ¢

Lost magnet Current on Shut down

Bad Tube

B-9 Base Run for NaK tube. ½ tube in Core 12 cm ½ in top Plug 12 cm

Placed empty steel tube (Tare = 198 gms)

85¼ 8¾ 1 } in Row 9, hole #9

Pos Period Log N = 68.1 sec, 12.89 ¢

Pitte = 12.63 ¢

BF_3 = 1 = 57 sec

3 = 61.5 sec

VS Run B-8

Empty VS STEEL

∴ 1 Tube = -13.5 ¢ ½ Empty Tube = -6.75

{ Empty Tube = 194 gms
Na K Filled Tube = 218 gms }

B-10 Placed NaK filled tube in Row 9, hole #9.
Pos Period — Log N = 7.98 ¢
Pitte = +7.37 ¢
BF_3 =
1 Tube NaK = +1.49 ¢

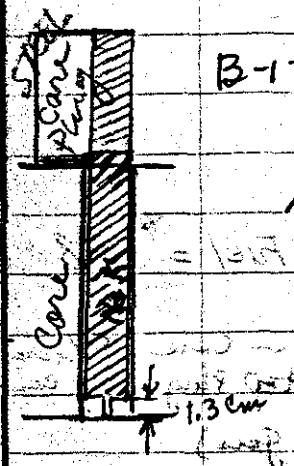
24 gms of NaK

B-11 Center fuel hole ~~of~~ fuel out (#48)
Filled holes #4 + #6 with fuel
Added 6 cm (3rd quarter to hole #3) #48
Empty SS Tube (194 gms) hole #25
Added 12 cm fuel to hole #7 top.
Pos Period Pitte = +26.54 ¢

{ 87 3/4
6 1/4
1 (void) }

{ 86
7
1 }

SS Tube = 19.96



B-12 NaK filled tube in hole #48
Pos Period — +27.80 ¢
Na = 22 W%
K = 78 W%
#48 NaK = +1.26

B-13 Hole #25 empty (core position)
Pos Period = 25.58 ¢

B-14 Hole #45 empty (core position)
Removed 12 cm Fuel from top #7
6 cm " " 3rd quarter #3
Pos Period — 9.83 ¢

{ 87
7
1 }

B-15 Empty Tube in place (#45)
1:20 PM
Pos. Period = +11.66¢

SS Tube = 1.83¢

B-16 NaK in #45
Pos Period = +12.99¢

#45 NaK = 1.33¢

B-17 Hole #5 empty (core section, 24 cm)
Removed 12 cm fuel from top #6
86 ½
7 ½
1
Pos Period = +18.53¢

B-18 Empty Tube in #5.
Pos Period +18.72

SS Tube = 3.19

B-19 NaK in #5
Pos Period +21.83¢

NaK = 3.11

B-20 Fuel Same as Run B-14, p. 80
24 cm Steel in #45,
Pos Period = +18.54¢

24 cm STEEL = 8.71¢

Empty SS tube = 194 gms, 40.3 cm long
1.3 cm fill tube
24 cm steel (2-12 cm) = 274 g.
1 Core plug pin = 192 g., 16.5 cm

$3\frac{1}{16}''$

DATE DEC - 7 1966 SAFETY CHECK

TIME 8:10 AM BY Taylor + Lynn

	B	C	D	E	F
10/1000	opr	X	10/1000	900	750
8"	OK	4'	2"	6"	OK
90	—	100	90	100+	—
✓	✓	✓			
✓	—	✓			

M-226 + γ BADGES ✓

BADGES ✓ HANDS ✓ AREA CLEARED ✓

CA SORA Expr. VII Run B-21

24 cm (85/10) Date DEC - 1 1966 Time 8:20 AM ~~PM~~

Purpose Con't Evaluation

Be Block = 24cm x 11cm X 7cm

B Follower in 2a ~~Travel~~ = 17 3/4" 8

B-21 ~~Same loading as B-3 p.77.~~

85 3/4 } Loading Sub critical
9 3/4 }

B-22 Core = 86 1/4 Fuel

+ 8 3/4 STEEL [1, 2, 3, 7, 8, 9, 87, 95 and 12 cm top #6 6 cm top #4]

Follower extends 0.4 cm above top for start.

2a Poo Period. Critic = + 31.65 ¢

withdrew B Follower #2a Neg ρ = -23.61

In → out = (17 3/4" - 0.157") 55.26 ¢

9 sec

∞ = 20.14 cm

8"

B-23 B Follower in 2 b - Travel ~~out~~ = $17\frac{17}{32}$" = 44.5 cm

{8 1/2 / 9} 6 cm from top #4

Pos Period - Pette = + 33.8 ¢

8 1/2 Follower out " = - 1.74

9 1/2 In to out = $17\frac{17}{32}$"

9 sec Follower 2b = 35.54 ¢

∞ $12\frac{15}{16}$" = 32.9 cm

(✱ 2:05 PM Emergency drill)

B-24 B Follower #1 Travel ~~out~~ = $17\frac{17}{32}$" = 44.5 cm.

{8 7/8 / 8} Fuel added to #4 (24 cm)

Pos Period - Pette = + 20.36 ¢

8 6 1/2 #1 out " = - 66.61

8 1/2 In to out = $17\frac{17}{32}$" - 9 sec.

∞ = $5\frac{3}{8}$" = 13.7 cm B Follower #1 = 86.97 ¢

B-25 B Follower #5 (inverted) has

{86 3/4 / 8 1/4} 1 cm lip causing void at bottom.

6 cm fuel from #6 top = (- 15¢ est) -12.5¢

Pos Period Pette = + 25.28 ¢

86 1/4 ∞ with Fe #2 b = $7\frac{5}{8}$" = 19.4 cm

8 3/4

B Follower #5 = 73 ¢

See p. 109.

DATE DEC - 8 1965 SAFETY LABEL

TIME 8:40 AM BY Lynn + Taylor

GRAPHITE						
RANGE	10/1000	opr	×	10/1000	900	750
SCALER	8°	ok	3'	2"	6"	ok
% F. S.	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	—	✓			✓
SOURCES USED	M-226 + x					✓
TABLES	✓	USED	✓	ARM	ALARM	

C.A. SORA Expr. VII Run B-26

24 cm Date DEC - 8 1965 Time 8:50 AM PM

Purpose Con't Evaluations

B-26 Core – 85 + 4th qt #4 + 4th qt #6

9½ – 1, 2, 3, 7, 8, 9, 87 + 85 + 3/4 qt #4, 3/4 qt #6

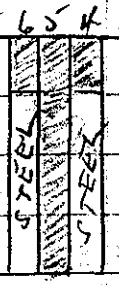
{85½, 9½}

W in #5 – Out = 17.5 in = 44.45 cm

Pos Period – Neg = +34.7 sec = +20.28¢

Pitt = +19.53¢

BF3 = +34.9 sec = +20.21¢, +35.6 sec = +19.96¢



In to Out travel time = 9.9 sec Neg Period = $1.14

∞ with Tungsten in #5 = 4.61" or 11.7 cm

Row 9

W #5 = $1.34

B-27 ~~6cm fuel from top #6~~

Ni in #5 - out 17.5" = 44.45 cm

$8\frac{1}{2}$ $9\frac{1}{2}$ Poo Period - +16.26 ¢

Ni #5 out Neg period = -¢1.14

IN → out 12.5" Ni #5 = ¢1.30

9.5 sec

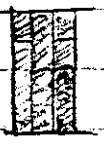
∞ = 4.25" = 10.8 cm

B-28 Ni in #1 - out $17\frac{15}{32}$" = 44.40 cm {6 cm fuel to 1st ½ #4}

Poo Period - Pitte + 39.47

{86 9} Ni #1 out - Neg period - ¢1.145

IN → out - $17\frac{15}{32}$"



9.0 sec Ni #1 = 1.54 ¢

∞ - $5\frac{7}{8}$" = 14.35 cm

B-29 W in #1 - out $17\frac{7}{16}$" = 44.30 cm

Poo Period - + 42.38 ¢

{86 9} W #1 out Neg period = - 1.12

IN → out - $17\frac{7}{16}$"

9.8 sec

∞ $5\frac{3}{4}$" = 14.6 cm W #1 = 1.54 ¢

B-30 Fe in #5, others Nominal

{85 10} Be #2a - out - $17\frac{7}{16}$" = 44.30 cm

Poo Period = + 30.74

Be #2a Out Neg period = ¢1.20

IN → out $17\frac{7}{16}$"

9.7 sec. Be #2a = 1.51

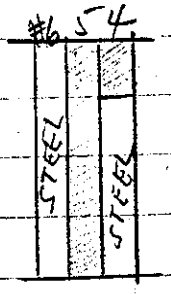
∞ = $4\frac{1}{2}$" = 11.35 cm

C.A. SORA Expr. VII Run C-1
24 (85/10) Date 8 Dec 1965 Time 3:30 PM
Purpose: Be Block Position Evaluation
24 cm x 11 cm x 7 cm
SEE p. 40

2 MW

(5)

C-1 Core = 85¼
9¾ [1, 2, 3, 6, 7, 8, 9, 87 + 95 and 1pt ¾ #4]

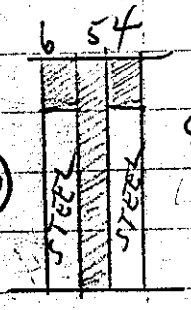


Row 9

Window – 5 Fe – 2 Void – 3 Fe – 3 Al – 2 void – Block
Block = 76 mils from Window (2 mm)
Pos Period = 23.14¢
Moved Block Away = $5.97
Block = $6.20

C-2 Added 4th qt fuel to #6 (6 cm)
1–3, 7–9, 87, 95, 1pt ¾ #4 + 1pt ¾ #6

(6)



(6)

Pos Period = 35.65¢
85½
9½ Block Away = –$5.92
6.28 Block = $6.27
Top ¼ #6 = 12.5¢

C-3 Moved Block BACK 1 cm

Sub Critical

1158
1839
1591
1242
1842
1273

599

3	4
3	3
3	2
3	1
3	0
2	9
2	8
2	7
2	6
2	5
2	4
2	3
2	2
2	1
2	0
1	9
1	8
1	7
1	6
1	5
1	4
1	3
1	2
1	1
1	0
0	9
0	8
0	7
0	6
0	5
0	4
0	3
0	2
0	1

0	0	0	5	0	9
0	0	0	1	4	0
0	0	0	1	4	3
0	0	0	1	7	2
0	0	0	1	7	7
0	0	0	1	9	8
0	0	0	2	3	0
0	0	0	2	4	1
0	0	0	2	6	1
0	0	0	2	9	8
0	0	0	3	3	6
0	0	0	4	3	1
0	0	0	4	4	1
0	0	0	4	8	3
0	0	0	6	0	6
0	0	0	6	2	4
0	0	0	6	6	5
0	0	0	6	9	5
0	0	1	0	1	1
0	0	1	1	2	2
0	0	1	3	6	2
0	0	1	5	4	2
0	0	1	7	8	4
0	0	2	2	0	3
0	0	2	5	4	8
0	0	2	8	9	3
0	0	3	4	6	9
0	0	4	0	6	5
0	0	4	7	3	3
0	0	5	6	1	6
0	0	6	3	4	2
0	0	7	4	5	7
0	0	9	1	2	4
0	1	1	6	3	0

3.14
.64
2.52

3.
2.56
.44

5.47x4

45
4

4.5
3.0
1.4
.14

.16
32
32
48
512

.32
.64

309
222
x14

80
256

SAFETY CHECK

DATE	DEC - 9 1965					
TIME	9:15	AM BY	Taylor + Lynn			
CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	X	10/1000	900	750
SURFACE DISP.	8"	off	3'	2"	6"	off
% F. S. TMP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
ABX CTRS.	✓	—	✓			
SOLNOIDS USED	M-222 + 8		MAGNETS	✓		
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

CA. SORA Expr. VII Run C-4

24 cm (85/10) Date DEC - 9 1965 Time 9:25 AM ~~PM~~

Purpose Contd Block Evaluations

85½
9½ (6)

C-4 Block = 114 mils (3 mm)

{85 + ¼ + ¼ / 9½} Pos Period = 23.66 ¢ 3 mm

C-5 Block = 154 mils (4 mm)

4 mm (6) Pos Period Pitt 11.24 ¢

Lgn = 78.9 sec 11.56 ¢

C-6 Block = 14 Mils (.36 mm)

Removed 1st ½ of #5 (12 cm) = -44.3 ¢

{85 / 10}

Pos Period Pitt = 26.66 ¢

70.9

0.36 mm

35.65
23.66
-11.99

23.66
11.56
-12.10

#1 = 78.3 sec
BF3 #3 = 78.8 "

C-7 Block = 1 cm

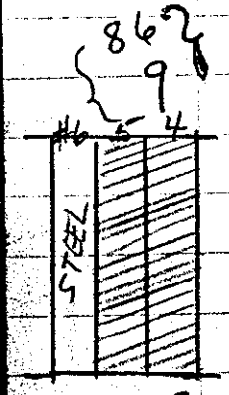
{86, 9} Added 1st ½ #5
Added 1st ½ #4

Sub critical

C-8 Block = 7 mm

(20)

86 — Fuel
9 — STEEL [1, 2, 3, 6, 7, 8, 9, 87 & 95] (1–3, 6 → 9)



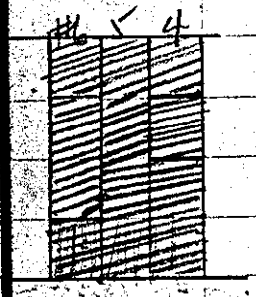
Pos Period - Pitte = 18.62 ¢

Moved Block Away = − 5.24 ¢
Block = $5.43

7 mm

C-9 Fuel Evaluation.

SEE LEFT



86 ¼
8 ¾

Pos Period = Pitte = 19.30 ¢

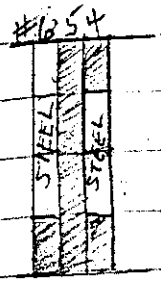
Moved Block Away = − $5.24
Block = $5.43

0.68 ¢ diff

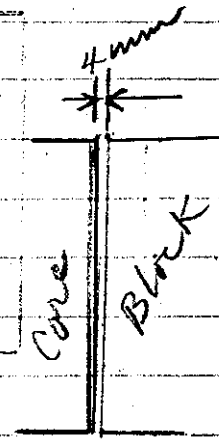
1 → 3, 7 → 9, 87, 95, 3rd ¼ #4
2nd & 3rd ¼ #6

$85\frac{3}{4}$ $9\frac{1}{7}$ 1→3, 7→9, 87 15, 2nd + 3rd ¼ #4, and Top ¾ #6

(54)



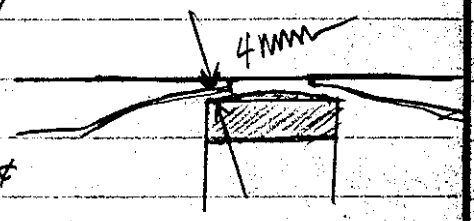
C.A. SoRA Expr. VII Run D-1
24 cm (8.5/10) Date 9 DEC 1965 Time ____ PM
Fine Block Traverse
Across window.
{ Be Block = 4 mm
24 cm X 11 cm X 7 cm }



D-1 (0) SET BLOCK @ Geo. Zero - 0
Pos Period = 23.83 ¢
Moved Block out = - 5.56
Block = 5.80

24-85-11

43 (1) Moved Block to - 1.6 cm
Pos Period = + 15.19 ¢



D-2 (2) Set Block @ + 0.35 cm
Pos Period = + 21.71 ¢

(3) Moved Block to + 1.8 cm
43 Neg Period = - 1.65 ¢

D-3 (4) Set Block @ +0.2 cm
Pos Period = + 22.16 ¢
(5) Moved Block to + 1.2 cm
Pos Period = + 11.65 ¢

D-4 (6) Set Block @ 0.1 cm
Pos Period = + 23.83 ¢
(7) Moved Block to - 3.1 cm
Neg Period = - 15.93 ¢

D-5 ⊗ Set Block = -3.5 mm (0.35 cm)
Pos Period — +24.05

Moved Block ~~to~~ - -1.2 cm
Pos Period — 19.90 ¢

1 → 3, 7 → 9, 8 7, 9 5, 2nd + 3rd ¼ + #4
and 2nd ¼ #6

56

DEC

8:40 Taylor + Lynn

$\frac{10}{1000}$ opr × $\frac{10}{1000}$ 900 750

8" OK 3' 2" 6" OK

90 — 100 90 100+ —

M-226 + 8

SORA VII E-1

24cm (85/0) DEC 8:45 —

Window material Changes

Wind → out

5Fe - 2void - 3Fe - 3 AL - 4 void Block

85 3/4 / 9 1/4

1→3, 7→9, 27, 9 5, 2nd + 3rd 1/4 # 4, 2nd top 3/4 # 6

E-1 Conditions same as p. 89, D-11

Base Run — Pos Period = 23.52¢

moved Block west to = -2.4 cm

Pos Period = +2.22¢

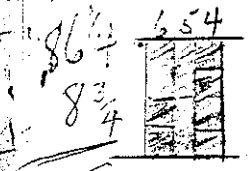
E-2 Removed Top Block Shield, 3 cm × 70 cm × 20 cm

Sub Critical

E-3 Added last ½ (12 cm) to #6 (+38¢)

Pos Period - Pitte = 12.58¢

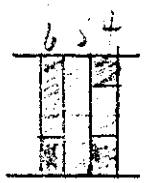
Moved Block out = -5.61"



Block Shield = 49.0¢ Block = $5.74

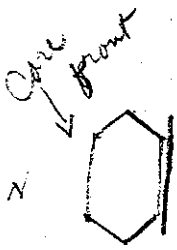
54

E-4 Conditions same as D-1, p 88 except 3 mm Al plate move back 25 mils to make room for Cd plate insertion



Pos Period Pitte +23.16 ¢

3 mm x 48 cm x 1 m Al Sheet out = − 33.55



Block back ✓ 3mm Al = 56.7¢

E-5 Added 0.5 mm x 52 cm x 1 m Cd Sheet to void — just in front of 3 mm Al sheet

54

Pos Period − Pitte = 32.77 ¢

moved Block away = − ¢5.58

Block = ¢5.83

0.5 mm Cd Sheet = 9.61 ¢

E-6 Set Block @ 5 mm (moved back 1 mm)

54 Left void for insertion of 3 mm x 48 cm x 1 m Steel Sheet.

Window - 5 Fe - 2 Void - 3 Fe - 3 Al - 3 Void - 2 Void - Block

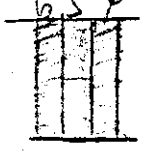
Pos Period − Pitte = 11.24 ¢

moved Block Away = − 5.57

Block = ¢5.70

1 → 4, 6 – 9, 27 + 95

E-7 Inserted 3 mm × 48 cm × 1 m Fe plate behind Al plate.



Window = 5 Fe – 2 void – 3 Fe – 3 Al – 3 S – 2 Void – Block

Removed fuel from #4 + #6 (– 37.5¢)

At slow speed switch = + 12.52¢

Pos Period = 36.13¢

{8 8 / 10} moved Block out = – #5.48

Block = #5.84

7¢ 3 mm Fe sheet = ~~61.11~~ 62.39 ¢

measured – at Block centered Avg = 1.3 mm Void

Block at West Edge of Reactor = ~~3 mm~~

E-8 BACK To Nominal, except built in window.

Window – 5 Fe – 3 Void – 2 Fe – 3 Al – 2 Void

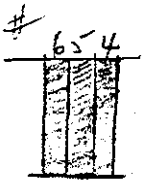
Pos Period + 21.46 ¢

5 = 2 – 3

See p. 110

E-9 Back To Nominal –

Window – 5 Fe – 2 Void – 3 Fe – 3 Al – 2 Void



Pos Period – Pitte = + 32.05 ¢

1 mm Fe = 10.59 ¢

12.9 cm × 30 cm in core section only

5 – 2 – 3 = 21.46

5 – 1 – 4 = 32.05

10.59¢

AUGUST						1965
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
*	*	*	*	*	*	*

221

MONDAY

9

AUGUST

144

Miho
TAY
LYN
His

F
6

F
6

85¼
9¾

R

TUESDAY

JULY 1965						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
*	*	*	*	*	*	*

10

AUG. 1965

SEPTEMBER 1965						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		
*	*	*	*	*	*	*

APPOINTMENTS

7 A. M.

8 A. M.

9 A. M.

10 A. M.

11 A. M.

12 Noon

1 P. M.

2 P. M.

3 P. M.

4 P. M.

5 P. M.

6 P. M.

Mihalczo, J.
TAYLOR, J.
LYNN, J.
KISTNER, G.

DATE DEC 14 1965 SAFETY CHECK

TIME 9:30 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RATE	10/1000	open	x	10/1000	900 ✓	750
SCALER	8"	OK	3'	2"	5"	OK
% E. S.	90	—	100	90	100+	—
BIAS, ALARM	x	✓	✓			
AUX. CTRS.	—	—	✓			

SOURCES USED M-226 + Y MAGNETS ✓

FAILS _____ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. VII Run F-1

24 cm (~~85~~) Date DEC 14 1965 Time 10:30 AM PM

Purpose Rossi α (Nominal)

1 scintillator Be Block = 24X11X7

1 small fission ctr

F-1 old Core plug. Holes bored to accomodate Counters.

6 5 4

Super Critical. ~ 50¢

F-2 Removed top (12 cm) of #5.

6 5 4

Poo Period ~ 15¢

85 5/4

9 3/4

∞ Log N = .0001

D = 50 100/100

A = 43 100/80

up #1 = 23423

#2 = 23.418

#3 = +2

#4 = −6

Row 9

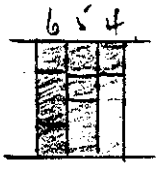
Fe Rod 3 b = 8 7/8"

Time = 147 min.

F-3 2 Scintillators. (In Core Plug)

8 5½
9½

add 6 cm to top #5 Poo Per = ~ 15 ¢



Row #9

∞ Log N = .00005 est

Fe 3 f = 9 15/16" A = 50 10/100

Time = 130 min. D = 68 10/200

+18 ¢

DEC 15 1985

12:45 PM Taylor + Lyons

A	B	C			
10/1000	opr	x	10/1000	900	758
8"	OK	31	24"	54	OK
90	—	100	90	100+	—
No	✓	✓			
✓	—	✓			

M-226 + γ ✓ ✓ ✓

Sample SORA Expr. VII Run F-4

24 cm (~~X~~) Date DEC 15 1985 Time

Remarks Rossi α Con'td

PM

F-4 F-3, repeated.

85½ Data collection started @ 7:11 PM

9½

Log ν = .00006 est

A = 50 10/200 BF_3 = 19.5 (x256)

D = 68 10/200

∞ Fe 38 = 9 15/16"

Time = 153 min.

SAFETY CHECK

TIME 10:15 AM BY Taylor + Lynn

RANGE	10/1000	opr	x	10/1000	900	750
SCALE	8"	ok	30"	2"	6"	ok
% F. S.	90	—	100	900	100+	—
RADS. ALARM	✓	✓	✓			
MIX CTRS.	✓	—	✓			

MODES USED M-226 + γ MANUAL ✓

FILTER ✓ LIGHTS ✓ AREA TEMP ✓

SORA Exp. VIII Run 1-A

24 cm (84 / 11) DEC 16 1965 Time 10:30

Purpose Rossi α

All Fe Condition, except BEAM HOLES FILLED, RODS = Fe

Fe Block = 24 X 16 X 7

Al → 3mm plate + Block Shield

1-A Core = 84 1/4 U

10 3/4 Fe [1→4, 6→9, 87 + 95 + 1st 3/4 #5]

∞ Fe 3b out (Control)

1-B Removed the 1/4 fuel from #5.

{84 / 11} 24-84-16

Fe 3b in - Pos Period - 110.2 sec, 8.94 ¢

" out - Neg Period - 122 " , 16.9 ¢

(Prompt 10^{-9} = 13.7¢)

Log N = .00005

Fe 3b = 25.84 ¢

A = 56 16/200

4th 1/4 #5 = ~~[illegible]~~ 16.9 ¢

D = 72 10/200

∞ 3b = 8 3/16"

Data Started @ 11:31 AM

~~Down~~ Stopped 1:53 PM - 142 min

Down 4:03 PM - ~~[illegible]~~ 124 min

DEC 17 1965

TIME 8:15 — Taylor + Lynn

10/1000	opr	x	10/1000	900	750
9"	OK	4'	2"	5"	OK
90	—	100	90	100+	—
NO	✓	✓			
✓	—	✓			
M-226 + X					✓
✓		✓			✓

C.A. SORA Expr. ∇ III Run 1-C

24 cm (82½)(11) Date DEC 17 1965 Time 8:25

Purpose Rossi α

All Fe, except BLOCK

Be Block = 24cm X 11cm X 7cm

1-C Core - 82½

12½ [1 → 10, 87, 95 + 1st ½ #19]

24-82½-11

∞ Fe 3b = 12 1/16"

Data Start = ~~9:05~~ A

Down = 11:57 A

Time = 172½ min

Log N = .00005

"A" = 28 10/200

"D" = 28 10/100

BF_3 = 6 (X 256)

1-D Be Block - 24 x 11 x 7

{80, 15} #1 + #5 = Be

Remaining = Fe

Fe 3 b = out

Super Crit. ~ 10¢

1-E Removed 3rd 1/4 #12

{79 3/4, 15 1/4} Core = 79 3/4 Fuel

15 1/4 Steel [1 → 17, 18, 19, 87, 95 + 3rd 1/4 #12]

Data Collection started @ 12:55 PM

∞ Fe 3 b = 8 1/2"

Time = 195 min

Log N = < .0000 ¢

A = 30 10/100

B = 25 10/100

BF_3 = 1.3 (x256)

DEC 1 9 1965

8:20 — Taylor + Lynn

10/1000 opr X 10/1000 900 750
9" ok 4' 2" 6" ok
90 — 100 90 100 +
NO ✓ ✓
✓ — ✓
M-226 + X ✓
✓ ✓ ✓

12

SORA Sup. VIII Run 1-F
24 cm (79 3/4) 11 Date: DEC 19 Time 8:35 —
Purpose: Cont'd Rossi α

1-F Cont'd Same as Run 1-E.
Data Collection started @ 8:55 AK

Log N = < .00004
"A" = 55 10/1000
D = 28 10/100
BF_3 = 2.8 (X256)

∞ Fe 3b = 8½"
Time = 62 min

Raised power Log N = .016
Pos Period = 7.95 ¢

Up Position #1 = 23.423
#2 = 23.418

Position #1 = 23.320 ∞
#2 = 23.311

DEC 2 1965 SAFETY UNION

9:00 — Taylor + Lynn

10/1000	open	X	10/1000	900	750
9"	OK	5'	2"	6"	OK
90	—	100	90	100+	—
✓	✓	✓			
✓	—	✓			
	M-226 + γ				✓
✓		✓			✓

SORA Exp. VIII Run 1-G

24 cm (85) 11 DEC 2 1965 Time 9:15

Purpose Nominal Designs

Rossi α measurements

Scint. in Top Plug.

See p. 40

1-G Core - 85 1/4 Fuel

9 3/4 [1, 2, 3, 6, 7, 8, 9, 87, 95 + 1st 3/4 #4] Fe.

∞ Fe 3 b out

Removed 4th 1/4 #4

Core - Fuel = 85

Fe = 10

Data Collection start @ 9:45A

∞ Fe 3 b = 9 1/8"

Log N = < .00004

A = 34 10/100

D = 25 10/100

BF_3 = 2.4 (X256)

Time = 296 min

94-85-11

DEC

9:20 — Taylor + Lynn

10/1000	opn	x	10/1000	900	750V
9"	OK	3'	2"	6"	OK
90	✓	100	90	100+	—
2K ✓	✓	✓			
✓	—	✓			
226 + 8					✓
✓	✓				✓

S. R A VIII 1-H

24cm (84) 16 DEC 9:40 —

Repeat Rossi α γ p. 98.

All Fe Condition See p. 98

Block = 24 x 16 x 7

1-H Core -84

11 [1 → 9,87 + 9,5]

∞ Fe 3f = 13.7 #

Data Collections Started @ 10:03 A

Time = 207 min

Log N = <.00004

"A" = 34 10/100

D = 28 10/100

BF_3 = 3,0 (x256)

7:45A

Down @ 4:00 PM

104

3 Jan 66

Run 7 p. 106

Tables + Normal shutdown. 40"/min

```
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 9 .
2 2  - R 9 9 9 1 .
2 2  - R 8 9 8 9 .
2 2  - R 7 5 9 9 .
2 2  - R 6 8 5 1 .
2 2  - R 5 7 9 9 .
2 2  - R 5 0 1 9 .
2 2  - R 4 3 9 9 .
2 2  - R 3 6 9 9 .
2 2  - R 3 0 7 9 .
2 2  - R 2 4 9 9 .
2 2  - R 1 9 9 9 .
2 2  - R 1 5 9 9 .
2 2  - R 1 1 9 9 .
2 2 5 → R 0 8 8 9 .
2 2 4 - R 0 5 9 9 .
2 2  - R 0 3 9 9 .
2 2 3 - R 0 1 9 9 .
2 2 2 → R 0 0 8 9 .
2 2 → + R 0 0 0 0 .
2 2 1 + R 0 0 6 0 .
2 2  + R 0 0 7 9 .
2 2 0 → + R 0 0 8 6 .
2 2  + R 0 0 8 4 .
2 2  + R 0 0 8 1 .
2 2  + R 0 0 8 3 .
```

18.65

```
2 2      R 0 1 9 0 .
2 2      R 0 1 8 6 .
2 2      R 0 1 8 5 .
2 2      R 0 1 8 4 .
2 2      R 0 1 8 1 .
2 2 ~~48~~  + R 0 1 8 9 .
2 2      + R 0 1 9 0 .
2 2 10   + R 0 1 8 7 .

2 2      + R 0 0 9 5 .
2 2 9.23 + R 0 0 9 0 .
2 2   x2 + R 0 0 9 3 .
2 2      + R 0 0 9 4 .
2 2 ~~20~~ + R 0 0 9 0 .
2 2      + R 0 0 8 9 .
2 2      + R 0 0 9 0 .
2 2 18.46 + R 0 0 9 7 .
2 2      + R 0 0 9 3 .

2 2      + R 0 0 3 8 .
2 2      + R 0 0 3 6 .
2 2      + R 0 0 3 7 .
2 2      + R 0 0 3 8 .
2 2      + R 0 0 3 6 .
2 2      + R 0 0 3 5 .
2 2 50   + R 0 0 3 4 .
```

3.63
x5
18.15

~~3.63~~

~~3.63~~

2½ sec = 1.00

.667"/sec

1966

DATE JAN 3 1966 SAFETY CHECK

TIME 1045 AM PM BY Taylor + Lynd

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	X	10/1000	900V	750
SOURCE DIST.	9"	ok	4'	2"	6"	ok
% F. S. TRIP	90	–	100	90	100+	✓
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	–	✓			

SOURCES USED M-226 + Y MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. TX Run 1

24 Cm (82) 11 Date 3 Jan 66 Time AM PM

Purpose: Crit. Cond. for Fe Scatterer evaluation

1. Nominal design - except scatter #4 = Fe.

82 } See p. 40 - sub crit.
13 } Core = 82 Fuel ; 13 STEEL (1 → 10, 19, 87, + 95)

2. added fuel to #10.

∞

83 }
12 } 3. added 3rd ¼ fuel to #19.

Pos Period - +18.98 ¢ Log ν = 38 sec +19.16 ¢

83¼ } Fe #4 Withdrawn Pitte = -141.91 ¢
11 3/64 } Travel = 17"

∞ = 3 49/64 ; 9.6 Cm Fe #4 = 160.89 ¢

Time = 10.8 sec.

24-83¼-11

4. Nominal Design, except scatterer #3 = Fe.

83 1/4
11 3/4 } Super Crit

5. Remove 3rd 1/4 from #19.
" 2nd 1/2 from #10

82 1/2
12 1/2 } Poo Period = +41.91 ¢

#3 out = − 22.452

24-82 1/2-11

Transd = 17" Fe #3 = 266.43 ¢

Time = 10.8 sec. ∅ = 11.2 cm
4 7/16"

6. Nominal Design - see p. 40

85
10 } Poo Period - Pette = 16.59 ¢

Withdrew poly core of scatterer #3 Poo Period = +10.52 ¢

poly on overhead drive then poo period = +8.7 ¢

Poly Core #3 Scatterer = 7.89 ¢

7. Repeat Run 6.

Poo Period - Pette = +16.81 ¢

Withdrew Poly Core #3, Poo

then poo period +8.3 ¢

Poly Core #3 Scatter = 8.53

8. Repeat - Poo Period =

withdrew poly core quickly on string

Poo Period

Pette = ?

DATE JAN 1966 SAFETY CHECK

TIME 8:10 TAYLOR & LYNN

10/1000 OPR	x	10/1000	900	750	
90 OK	100	90	100+	100	
* ✓ ✓	✓				
				✓	

Pw 226 & RA 248

PANEL ✓ UNITS ✓ AREA CLEANED

* This alarm will not check by normal method. By agreement, the trip point is lowered (then check is made) and trip point is returned to correct position.

SORA TX 9

24 cm (8s) (11) 4 Jan 66 9:30 —

Cont'd Scatterer Evaluation

9. Pos Period for Pitte, BF3 + Log N check

Pitte =		+11.22 ¢	
Log N =	82.9 sec	11.15 ¢	
BF3 (1) =	80.1	11.44 ¢	CHECK
(2) =	83.3	11.11 ¢	
(3) =	82.4	11.20 ¢	

Pos Period — 16.96 ¢

withdrew B Lind Scatter #3 = −83.3 ¢

Travel = 17 3/8"

Time = 8.5 sec

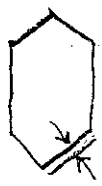
#3 = 13.1 cm, 5 1/8"

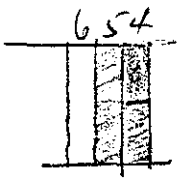
#3 Scatterer = 100.26 ¢

10. Repeat Run 6.
Pos Period Poly Core #3 out = 8.4 ¢
" " #3 in = 16.77 ¢
#3 Poly Core = 8.37 ¢

11. Fe #5c:
Pos Period #5c out – 16.34 ¢
" 5c in – 16.90 ¢
Fe #5c = 0.56 ¢

12. Fe #5b.
adjusted core to try to eliminate contaminity at entrance
Pos Period – #5b in = 11.68 ¢
Neg Period #5b out = – 2.86 ¢
Travel = 17 7/16" Fe 5b = 14.54 ¢
Time = 9.6 sec
∞ = ~~13.1 cm, 5 1/8"~~ 27.7 cm, 10 15/16"

13. Be #5 – 1 cm from core

Pos Period – Be #5 in = + 10.88 ¢
Neg Period Be #5 out = – 135.26 ¢
1 cm Travel = 17.5" Be #5 = 146.14 ¢
Time = 8.5 sec
∞ = 3 3/4", 8.4 cm

14 added 12 cm fuel, 1st half #4. (38 ¢)


added 1 cm Fe between Be #5 + Core.
Pos Period = + 26.91 ¢
#5 Be out = – 73.98 ¢
85 1/2 Travel = 17.5" Be #5 @ 2 cm = 100.89 ¢
Time = 8.6 sec
9 1/2 ∞ Be #5 = 14.1 cm, 5 9/16"

[redacted] 1956

8:45 — Taylor + Lynn

10/1000	opr	X	10/1000	900	750
8'	ok	5'	2"	6"	ok
90	—	100	90	100+	—
✓	✓	✓			
✓	✓	✓			
M-226 + 8					✓
✓		✓			✓

Up #1 23.422
#2 = 23.449
#3 = -1
#4 = -3

SOBA 1X 15

24 cm (85)" [redacted]

Reactivity Measurement

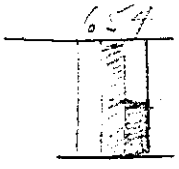
Check
Pitte = 18.81 ¢
Log r = 36.7 sec
+ 19.58 ¢
BF3 (1) = 40.7 sec
(2) = 36.1 "
(3) = 36.9 "
Fol #5 = 73.1 ¢

15 Nominal Design.

86 1/4 Boron Follower #5 in position.
8 3/4 Pos Period = +31.61 ¢
Follower out = -41.49 ¢
Travel = 17.5"
Time = 8.6 sec
∞ Fol #5 = 18.1 cm, 7 1/8"

16. Nominal except Be #1 2cm from Core.
85 1/2 Pos Period = +27.21 ¢
9 1/2 Be #1 out = -100.69
Travel = 17.5"
Time = 8.4 sec
∞ Be #1 = 12.5 cm, 4 15/16"

Be #1 @ 2cm = 127.90 ¢



9 ¢

Row 9

17. Nominal Design (24-85-11)

{85, 10} Window - 5Fe - 2 void - 3 Fe - 3 Al - 2 void - Black

Poo Period = + 16.14 ¢ Pitte

Logr = 16.65 ¢

* Window Nominal found to be

5 Fe - 1 void - 4 Fe - 3 Al - 2 void - Black

↑ used for all shots labeled Nominal.

93

See P

18. Window Now - 5 Fe - 2 void - 3 Fe - 3 Al - 2 void - Black

16.14
- 5.59
10.55 ¢

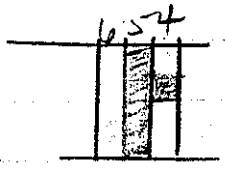
Poo Period = 5.59 ¢

withdrew 3 mm al Sheet = - 50.74 ¢

1 M X 48 cm X 3 MM

3 mm Sheet = 56.3 ¢

19. Added 3rd 1/4 fuel to #4.



Poo Period = 28.38 ¢

3rd 1/4 #4 = 22.64 ¢

20. Window - 5 Fe - 3 void - 2 Fe - 3 Al - 2 void

85 1/4
9 3/4

Poo Period - 13.04 ¢

3 mm Sheet out = - 43.13 ¢

1 → 3, 6 → 9, 87, 90
1st 1/4 + 3rd 1/4 #4

3 mm Plate = 56.17 ¢

28.38
13.04
- 15.34 ¢

1 mm Fe at window = ~~[illegible]~~ ¢
15.34 ¢

21 [Window – 5Fe – 2 void – 3 Fe – 3 Al – 2 void

~~20~~ Run 19 as base = 28.38 ¢

Removed 2 d. – back section of section 2.

Pos Period = 8.91 ¢ Pitte

9.45 ¢ Log N

Moved Block west = – $5.92

Block = $6.01

Fe 2d = 19.47 ¢

JAN 5 1956

9:40 — Taylor + Lynn

12/800	open	X	12/800	800	750
8"	ok	4'	2"	6"	ok
90	—	100	90	100+	—
✓	✓	✓			—
✓	✓	✓			
M-226 + 8					✓
✓	✓				✓

Exp. SORA Exp. TX Run 22

24 Cm (85) 11 Date JAN 5 1956 Time 10:50

Purpose Beam Plug Evaluations

Window — 5 Fe — 2 void — 3 Fe — 3 Al — 2 void.

Removed 3 ¾ ¼ fuel from #4 = 22.64 ¢

22 Beam Plug in —

85 } 10 } 1→4,6 → 9,8 & 9,5 Poo Period — Pitte = 9.70 ¢

Log N = 94.1 sec, 10.12 ¢

BF_3 = (1) 89.8 sec = 10.49

(2) 92.5 " = 10.25

(3) 93.5 " = 10.17

? Vs Run 20 p.110

22.64 ¢
+9.70
32.34 ¢
−13.04
19.3 ¢
−15.3
4.0 ¢

Beam Plugs.

SEE p.143

Vs Run 18 p.110

9.70
5.09
4.11 ¢

22. Fe #5 Evaluation [#1 = Be]

{86, 9} Pos Period = +10.55 ¢

Fe #5 out = −72.92 ¢

1→4, 7→9, 87→95

Travel = 17.5"

Time = 8.7 sec

∞ Fe #5 = ~~19.05 cm~~, 4 11/32"
11.03 cm

Fe #5 = 83.47 ¢

23. Fe #1 Evaluation [#5 : Be]
added 3rd 1/4 #6 Fuel

Pos Period = +13.24 ¢

{86 1/4, 8 3/4} Fe #1 out = −85.32 ¢

Travel = 17.5"

Time = 9.0 sec

1→4, 7→9, 87, 95
3rd 1/4 #6

∞ Fe #1 = 10.65 cm, 4 3/16"

Fe #1 = 98.56 ¢

24 Block Worth with Be #1 = 16.8 cm } 1/4
Be [24 cm × 11 cm × 7 cm] Be #5 = 23.8 cm } 1/2

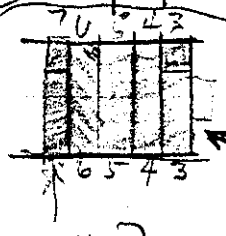
(37) 87 3/4 } 7 1/4

Pos Period = +22.21 ¢

1, 2, 7, 8, 9, 87, 95 + 4th 1/4 #3

Block out = ¢-5.47

Block = ¢5.69



← Run 25.

Be #1 = 23.5 cm
Be #5 = 23.8 cm

88 1/2 } 6 1/2

Pos Period = +16.24 ¢

Block out = ¢5.35

Block = ¢5.51

1, 2, 8, 9, 87, 95
4th 1/4 #3 + #7

JAN 1966

9:15 SAFETY CHECK

Taylor + Lynn

10/1000	opr	X	10/1000	900	750
8"	OK	5'	2"	6"	OK
90	–	100	90	100+	–
✓	✓	✓			
✓	✓	✓			
PuBe 26 + 8				✓	
	✓				✓

SORA Expr. X Run 1a

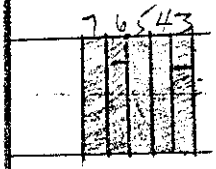
24 cm (85) 11 Date JAN 1966 Time

Purpose Core Reactivity Measurements

Be Block = 24 X 11 X 7

Window = 5-2-3-3-2

1a Fe in center #48 (See p.2) + p.80



Pos Period + 33.89 ¢

Fe #48 out + 27.46 Fe #48 = 6.43 ¢

8 6 3/4 7 1/4 } 1b. Mo in #48 +38.33 ¢

out +27.57 ¢ Mo #48 = 10.76 ¢

8 6 1/2 7 1/2 } 1c Mo in #25 + 49.19

out + 30.64 Mo #25 = 18.55 ¢

1d Fe in #25 + 42.55

out + 30.58 Fe #25 = 11.97 ¢

1e Filled NaK #25 + 36.04 ¢
out + 30.71

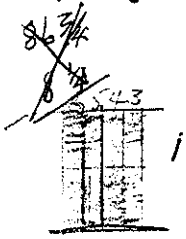
Na + Tube = 5.33 ¢

1f Empty NaK Tube #25 + 34.35
out 30.67

#45 Tube = 3.68 ¢
NaK #45 = 1.65 ¢

1g Empty NaK Tube #78 + 42.18
out + 37.95

Tube #78 = 4.23 ¢



1h Filled NaK #78 + ~~55.15~~ 44.95
out + 37.92

NaK + Tube #78 = 7.03 ¢
NaK = 2.80 ¢

85 3/4, 8 1/4, 1 — 1i Fe #78 + 55.15 ¢
out + 37.58 ¢

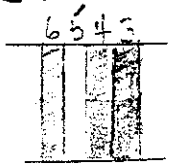
Fe #78 = 17.57 ¢

1j. Mo #78 + 64.01
out + 37.39

Mo #78 = 26.62 ¢

85, 9, 1 — 1k Mo #5 + 15.00
out − 14.14

Mo #5 = 29.14 ¢



1l Fe #5 + 4.26
out use −14.14

Fe #5 = 18.40 ¢

Log N = 263.8 Ave = 4.28
BeF_3 ① = 260.5 " = 4.33
② = 268.3 " = 4.21
③ = 267.1 " = 4.23

/4.26 ¢

1m. Safety plug ~~Plug~~ Pin #5 + 17.73
out + 16.42

Pin #5 = 1.31 ¢

85½
8½
1 } In NaK+Tube. #5 + 24.37
(filled) out (use) + 16.42

#5 NaK+Tube = 7.95 ¢

10 Tube #5 (Empty) + 20.99
out + 16.57

Tube = 4.42 ¢

#5 NaK = 3.53 ¢

JAN 10 1966

8:30 AM

Taylor + Lynn

A	B	C	D	E	
10/1000	open	X	10/1000	900	750
8"	OK	4"	2"	6"	OK
90	—	100	90	100+	
✓	✓	✓			
✓	✓	✓			
M-226 +	✓				✓
✓	✓				✓

SoRA X 1p

24 cm (85) 11 JAN 10 1966 8:45

Core Reactivity Con'td

1p. Empty NaK Tube #43 = Pos Period = + 29.23
out = Pos Period = + 26.21

Tube #43 = 3.02 ¢

1q. NaK filled Tube #43 = Pos Period = +31.91
out Pos Period = +26.50

NaK + Tube = 5.41

26.21
26.50
26.27
Avg = 26.32 ¢

NaK #43 = 2.39 ¢

1r Fe #43 = Pos Period = 39.66 ¢
out = Pos Period = 26.27

Fe #43 = 13.39 ¢

1s Mo #43 = Pos Period = +46.32 ¢ Mo #43 = 20.00 ¢

1t Top Plug Pin #43 = 27.58 ¢
out = 26.45 ¢ Pin #43 = 1.13 ¢

1u Fuel #71 = Pos Period Pitta = 4.96¢ ¢

85 }
10 }

Log N = 207.4 sec 5.28
BF_3 ① = 205.8 " 5.32
② = 221.4 " 4.99
③ = 218.9 " 5.03

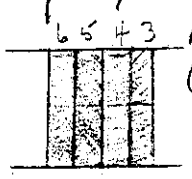
#71 out = − 155.16¢

Fuel #71 = 160.12¢

1v Fe #71 = Pos Period + 30.38¢
out " + 19.56 Fe #71 = 10.82¢

87½ }
6½ }

1w
NaK Tube #71 Pos Period = 23.44
(empty) " out = 19.73 Empty Tube #71 = 3.71¢



1x NaK + Tube #71 Pos Period + 24.96
(Filled) out " 19.62

NaK + Tube = 5.34
#71 NaK = 1.63¢

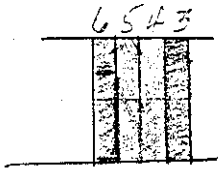
1y Top Plug Pin #71 = + 21.51
out = 19.62 (1w, + x)

Pin #71 = 1.89¢

1z Mo #71 = + 36.04
19.62 Mo #71 = 16.42¢

2a Top Plug Pin #91 + 24.10
Out 22.71

Pin #91 = 1.39¢



Row 9

2b Empty NaK Tube #91 = + 27.64
out = + 22.66 Empty Tube #91 = 4.98#

2c NaK Tube #91 = 30.62
Filled out = 22.66 NaK + Tube #91 = 7.96#
#91 NaK = 2.98#

85 3/4
8 1/4
1

2d Fe #91 = + 43.15
$\frac{a+b+c}{3}$ = 22.68 Fe #91 = 20.47#

2e Mo #91 = + 52.30
$\frac{a+b+c}{3}$ = 22.68 Mo #91 = 29.62#

2f Fuel #91 = + 16.74
out = − 94.02 Fuel #91 = 110.76#

85 1/4
9 3/4

4th 1/4 #4 Fuel = 11.78#
vs Run 1 u p. 118
4th 1/4 #4 Fuel = 12.58#
Run g vs Run h p. 120

DATE JAN 1 1 1966 SAFE CHECK
TIME 9:45 AM BY Taylor + Lynn

	A	B	C	D	E	F
	10/1000	opr	X	10/1000	900	250
	7"	ok	4'	2"	6"	ok
	90	—	100	80	100+	—
AUX. EQUIP.						
SOURCES USED						
TABLES						

C.A. SORA Exp. I Run 2 g
24 cm (85) 1 bar JAN 1 1 1966 Time 9:50 AM
Purpose Cont'd Reactivity Meas.

2g Fuel #53 Pos Period = Pitt = 4.05 ¢
85 10 Log N ±425 ave 4.41 ¢
BF_3 ① = 242.3 " , 4.61 ¢
② = 241.0 " 4.63 ¢
③ = 239.7 " 4.65 ¢

Fuel #53 out = − 69.76 ¢

Fuel #53 = 73.81 ¢

2h Fuel #51 = Pos Period = +16.63
85 1/4 9 3/4 out = − 111.36

Fuel #51 = 1.28

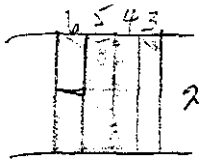
2i Fuel #18 = Pos Period = +16.93
out = − 59.64

Fuel #18 = 76.57 ¢ 3:15 PM

885 1/4
8 1/4
1

2j. Top Plug Pin #18 = + 31.57 ¢
out + 30.47 Pin #18 = 1.10 ¢

2k Empty NaK Tube #18 = + 34.30 ¢
out = + 30.56 Empty #18 NaK Tube = 3.74 ¢



Row 9

NaK Filled Tube #18 = + 36.64
out = + 30.41 Filled NaK Tube = 6.23 ¢
#18 NaK = 2.49 ¢

2m Fe #18 = + 46.81
$\frac{j+k+l}{3}$ = 30.48 Fe #18 = 16.33 ¢

2n Mo #18 = + 54.45
30.48 Mo #18 = 23.97

2o Top Plug Pin # 53 = + 22.51 ¢
out = + 21.91 Pin #53 = 0.60 ¢

2p Empty NaK Tube #53 = + 24.50
out = + 21.63 Empty Tube #53 = 2.87 ¢

2q NaK Filled #53 = + 27.10
out = + 21.80 NaK Filled #53 = 5.30
NaK #53 = 2.43 ¢

2r Fe #53 = + 35.49 $\frac{o+p+q}{3}$ = + 21.78 Fe #53 = 13.71
7 ¢ PM 3:15 2s Mo #53 = 41.97 " Mo #53 = 20.19

Position	P. Fuel	NaK (.505" dia)	Fe	Mo	Hole Void Plug Pin	Fuel in Hole Plug Pin	Fe P. Ti 30 cm
# 48	74 #1.77	1.26 ¢	6.43 ¢	10.76 ¢	—	2.09	177 5.33 6.97
71	118 1.60	1.63	10.82	16.42	1.89	2.09	178 10.89 10.80
25	78 1.47	1.65	11.97	18.55	—	2.08	11.17 9.56
45	79 1.38	1.33	8.71 1.72 10.43	—	—	2.16 ¢	9.77 9.38
51	120 1.28	—	122 10.57	122 15.52	122 1.72	1.77	178 9.59 9.61 ¢
91	119 1.11	2.98	20.47	29.62	1.39	1.81 ~~1.60~~	178 14.31 15.11 ¢
78	78 .984	2.80	17.57	26.62	—	1.11	17.04 14.51
5	.886	3.53 3.11	11.80	29.14	1.31	1.38	17.07 15.73
43	78 .847	2.39	13.39	20.0	1.13	0.73	—
18	.766	2.49	16.33	23.97	1.10	1.03	12.81
53	120 .738	2.43	13.71	20.19	0.60	0.53	10.39 179

NaK = True Values; other Values = Sample + Plug Pin

2t Top Plug Pin #51 = + 17.04
out = + 15.32 Pin #51 = 1.72¢

2u Fe #51 = + 25.89¢
2t = 15.32 Fe #51 = 10.57¢

2v Mo #51 = 30.84¢
2t = 15.32 Mo #51 = 15.52¢

85½
89¾

DATE JAN 12 1966 SAFETY CHECK

TIME 10:20 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	12/1000	off	X	10/1000	900	750
[illegible]	8"	ok	4'	2"	6"	ok
[illegible]	90	—	100	90	100+	—
[illegible]	✓	✓	✓			
[illegible]	✓	✓	✓			
SOURCES USED M-226 + γ				PA[illegible]	✓	
TABLES ✓	LIGHTS	✓	AREA [illegible]ANED ✓			

C.R. SORA Expr. X Run 3a

24 cm (85) Date JAN 12 1966 Time AM PM

Purpose Rod 3a + 3b Evaluation

Log N = 46 sec
BF_3 ① = 45.6"
② = 46.2"
③ = 47.2"

Counter + Pitts on Cart top

3a Rod 3b in = + 16.18 ¢ ✓
" out = − 6.17 ¢ Fe 3b = 22.35 ¢

85 1/16
89 3/4

3b Ctrs + Pitts in Normal position
Rod 3b in = + 16.52 ¢
out = 6.09 ¢ Fe 3b = 22.61 ¢
Travel = 17.5"
Time = 8.3 sec

3c Fe 3a in = 16.39 ¢
out = 5.91 ¢ Fe 3a = 22.30 ¢
Travel = 17.5"
Time = 8.3 sec ∞ Fe 3a = 24 cm, 9 7/16"

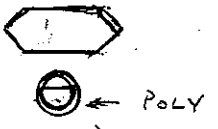
16.18
16.52
16.39
3) 49.09
Avg = 16.36 ¢

C.A. SORA Expr. X Run 4a
24cm (85) Date 1-12-1962 Time 12:45 ~~AM~~ PM
Purpose Scatterer Studies

Base Run 3b + 3c = 16.45 ¢

Semicyl = 11 cm dia X 48 cm long.

4a Scatter 3b - Boron Lined.
½ poly Core out
Poo Period - +4.98 ¢ Pitts (10^{-9})
5.07 Log N



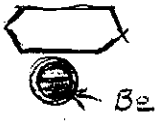
5¼
9¾

-11.47 ¢

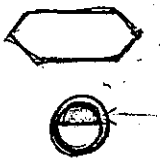
4b Scatter 3b - B Lined
½ poly Core out
Poo Period = 24.30 ¢

× 7.85 ¢

4c Scatter 3b - B Lined
Core = ½ Be + ½ Poly
Poo Period = + 30.48 ¢



4d Scatter 3b - B Lined
Core = ½ Be + ½ Void
Be # 5 = out ¢1.50
Poo Period = 0.37 @ slow speed. or ¢2.30 ± .10
Slow Speed to up = 40 ¢ ± 10 ¢



— 16
32.14

4e Scatter 3b - B Lined
Core = Semicylinder Void
" Poly with Semicylindrical void
Poo Period = ¢27.66 ¢ ✓

4f Scatter 3. = Polyethelene 14.1 cm dia

Poo Period = 29.27 ¢ ✓ or Poly (14.1cm) * +12.82 ¢

B. Limit = 100.¢ 2
12.8

SEEP. 107 → POLY #3 SCATTERER = $1.13

93¢

-47¢

-82¢

C.A. SORA Expr. XI Run A-1
24cm (81) 16 Date 12 Jan 19 66 Time 3:45 ~~AM~~ PM
Purpose Preparing for Rossi α

Be BLOCK = 24 cm X 16 cm X 7cm
WinAow = Nominal 5-2-3-3-2

Top Plug for scintillators

81½ } 2
13½ } 2

Poo Period = +60 ¢

80¾ }
14¼ }

Poo Period = + 25.3 ¢

[1 → 11, 19, 87, 95, 4th ¼ #18]

DATE JAN 1966 SAFETY CHECK

TIME 8130 BY [redacted]

	B	C	D	E	F
	10/1000	ok	X	10/1000	900	750
	8"	ok	5'	2"	6"	ok
	90	–	100	90	100+	
	✓	✓	✓			
	✓	✓	✓			
	M-226 + X				✓	
TABLES	✓	✓			✓	

S.A. SORA Expr. XI Run A-2

Film (81) Date [redacted] 1966 Time AM ~~PM~~

Purpose Rossi α

ctrs in Top Plug

16 cm Block

A-2 Core = 80 3/4 Fuel

80 3/4 14 1/4 Fe – 1 → 11, 19, 87, 95 + 3rd 1/4 #18

14 1/4 Data Collection started @ 10:14 AM

A = 63 10/50

D = 56 1/1000

BF_3 = 270 CPM.

Time = ~~6 hrs~~ 5 hr 56 min

∞ Fe 3# = 6 5/8" = 8.5#

DATE JAN 14 1966 SAFETY CHECK

TIME 8:25 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	open	X	10/1000	900	750
[illegible] DIST.	8"	ok	4'	2"	6"	ok
[illegible] TRIP	90	–	100	90	100+	–
[illegible] ALARM	✓	✓	✓			
[illegible]	✓	✓	✓			

SOURCES USED m-226 + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XI Run A-3

24 cm (81) Date JAN 14 1966 19 Time 8:30 ~~PM~~ AM

Purpose Rossi α

Be Block = 24X16X7

A-3 ½" Detector in Top Plug.

84 ¼" Detector in Section 3 center beam Hole (vert)

Data collection started @ 8:55 AM

Time = 116 min 47 sec

∞ 3b =

A =

D = 52

BF_3 =

C = 48

C.A. SORA Expr. XL Run A-4
Date 1-14 19 66 Time AM ~~PM~~
Purpose Crit Condition
Be Block = 24 cm X 21.08 Cm X 7 cm
Detectors in Top Plug.

A-4 Removed 2 1/2 Fuel Pins. #30, #20 + 1st 1/2 #18
Pos Period > 60 ¢
∞ Be #1 = 16.1 cm

A-5 Removed 1st 3/4 #42 Fuel
Pos Period = 35 ¢
∞ Be #1 = 12.2 cm

A-6 Removed 4th 1/4 of #42 + 4th 1/4 #31
Core = 76 3/4 Fuel
18 1/4 Fe [1 → 11, 18, 19, 30, 42, 20, 87, 95 + 3rd 1/4 #31]

24-76 3/4-21

Rossi

Data Collection started @ 12:33 PM

Time =

A = 65 1/1000
C = 48 —
D = 48 10/50
BF_3 = 280 CPM

B-5 p.13

Fe 3 f ∞ = — +10 ¢
Re start @ 3:13 PM

Pos Period = 14.29 ¢
Moved Block out = -#11.04 Block = #11.18

Be added back with 16 Cm Block

(38)

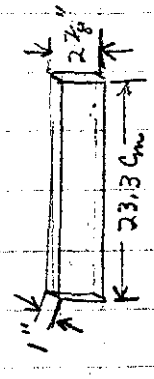
DATE JAN 17 1966 SAFETY CHECK

TIME 8:25 BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	0/1000	open	X	10/1000	900	750
SCALE	8"					

MAGNETS

TABLES LIGHTS AREA CLEARED



C.A. SoRA Expr. XI Run B-1

Date JAN 17 1966 Time AM PM

Purpose Fine Block Traverse about Center

Be Block = 24cm X 21.08 cm X 7 cm

other Coord = Nominal

(34)

Core — 76 3/4 U

18 1/4 Fe [1 → 11, 18, 19, 30, 42, 20, 87 + 98) and 4th 1/4 #31

Log = 98.1 cm

BT3 = 94.5

B-1

(0) Pos Period = + 9.18 ¢

Moved Block out = − 11.14 ¢

Block = 11.23 ¢

(1) Set Block @ − 1.1 cm

Pos Period = + 1.48 ¢

B-2

(2) Block @ + 0.4 cm = Pos Period = 8.62 ¢

(3) @ + 0.9 " = " = 1.08 ¢

B-3 (4) Block @ + 0.2 " = " = 9.63 ¢

(5) " @ + 1.5 " = Avg Period = 10.33

B-4 (6) Block @ −0.2 cm = Pos Period = +10.79 ¢
(7) " @ −1.7 " = Neg Period = −12.4 ¢

B-5 (8) Block @ 0 cm = Pos Period = +10.71 ¢ (V)
(9) @ −0.8 cm = " = +7.18 ¢

B-6 (10) Block @ +0.3 cm = Pos Period = 10.37 ¢
(11) " @ +0.6 " = Pos Period = 6.08 ¢

Withdrew Be Rod #5 = −1.59 ¢
Block as in (11)

Be #5 = 1.65 ¢

21 cm Block

C.A. SORA Expr. XII Run 1a
24cm (86) 11 Date 17 Jan 1966 Time 2:35 ~~AM~~ PM
Purpose Critical Cond. for Block Evaluation
All Fe see p 35

Fe Block - 24 cm x 11 cm x 7 cm

Rods = Fe
Scatterers = Fe
Beam Plugs in

1a Core = 86 Fuel
9 Fe [1, 2, 3, 6, 7, 8, 9, 87 + 95] = 57.52 Kg

Block = 0
⓪ Pos Period = 19.39 ¢
Moved Block out = − ¢3.575 Block = ¢3.76
① Block @ −1.6 cm Pos Period = 10.48 ¢ − .19

20

1b ② Block = −0.2 cm
Pos Period = +20.09 ¢
③ Block @ −2.4 cm Neg Period = −1.85 ¢

1c ④ Block @ = +0.2 cm Pos Period = +18.68 ¢
⑤ @ = +2.0 cm Neg Period = −4.36 ¢

DATE JAN 1966 SAFETY CHECK
TIME 9:00 BY Taylor + Lynn

	A	B		C	D	E
CHANNEL						
RANGE	10/1000	off	X	10/1000	900	750
SCOPE DIS.	8"	ok	4"	2"	6"	ok
% F. S. DEF.	90	—	100	90	100+	
BLOC. [illegible]	✓	✓	✓			
AUX CH.	✓	✓	✓			
SOURCES USED	M-226 + γ					✓
TABLES	✓		✓			✓

1d p. 131 cont'd –

⑥ Block ⓪ + 0.45 cm = Poo Period = 17.01 ¢
⑦ " ⓪ + 1.5 " = " 5.20 ¢

1e ⑧ Block ⓪ − 0.5 cm = Poo Period = 19.96 ¢
⑨ " ⓪ − 0.9 " = " = 18.06 ¢

For P. 133

2f ⑧ Block ⓪ − 1.0 cm = +21.18 ¢
⑨ " ⓪ − 2.8 " = −8.73 ¢

SORA Expt. XII Run 2a

24 cm (84) 16 Date 18 Jan 1966 Time AM PM

Purpose Critical Condition

All Fe

Fe Block = 24 cm x 16 cm x 7 cm

9 3/4

2a Core = 85 1/4 Fuel

9 3/4 Fe [1, 2, 3, 6, 7, 8, 9, 8-7, 9-5, 1st 1/2 + 4th 1/4 #4]

Super Crit. ∞ Fe #5 = 8 11/16", 22 cm

2b Core = 84 1/4 Fuel 1→4, 6, 7, 8, 9 10 3/4 (21)

= 10 3/4 Fe [1 → 9, except 3rd 1/4 #5, 8 + 9-5]

Log N = 80.3 sec = 11.42¢ Title = 10.94¢

BF_3 ① = 78.1 sec = 11.65¢

② = 77.5 " = 11.7¢

③ = 82.5 " = 11.18¢

on Pos Period = 21.94¢

Mound Block out = -$5.12

Fe Block = $5.34

⓪ Block at 0 = 21.94¢

(1) " @ -1.25 cm = 17.47¢

2c ② Block @ +0.4 cm = +22.52¢

③ " @ -2.5 " = -0.75¢

2d ④ Block @ +0.4 cm = +20.74¢

⑤ " @ +2.0 " = 0.02¢

2e ⑥ Block @ -0.7 cm = +22.44¢

⑦ " @ -1.8 " = +11.83

DATE JAN 1 9 1966 SAFETY CHECK

TIME 8:20 AM BY Taylor + Lynn

A

10/1000 open x 10/1000 900 750

7" OK 4' 2" 6" OK

90 — 100 90 100+ —

✓ ✓ ✓

✓ ✓ —

M-226 + 8 ✓

TABLES ✓ ✓

C.A. SORA Expr. XII Run 3a

24cm (82) Date JAN 1 9 1966 Time 8:40 AM

Purpose Crit. Condition

All Fe

Fe Block = 24 cm x 21 cm x 7 cm

3a Placed 2½ cm Fe on either side of 16 cm Block.

{ 82¼ Core = 82¼ Fuel
12¾ 12¾ Fe Pos Period = 5.3¢

3b Core = 82½ Log N = 15.56¢
12½ Pitte = 15.34¢

82½
12½

[1→10, 87, 95 + 2nd ½ #19] BF3 ① 53.7 μa = 15.44¢
② 51.5 " = 15.68¢
③ 52.1 " = 15.52¢

2r

Block @ 0

(0) Pos Period = 15.34¢

Moved Block out = 6.37 Block = 6.52

(1) Block @ 1.45 cm = 9.67¢

Chart Speed on fast = 16.25"/min
10.0" → 19.26" in .57 min

3c ② Block ⓐ +0.5 cm = Pos Period = +12.56 ¢
③ " ⓐ +2.2" = Neg " = −9.06 ¢

3d ④ Block ⓐ +0.3 cm = Pos Period = +13.95 ¢
⑤ " ⓐ +1.5 cm = Pos " = +2.88 ¢

3e ⑥ Block ⓐ −0.25 cm = Pos Period = +15.38 ¢
⑦ " ⓐ −1.9 " = Neg Period = −11.75 ¢ ←
−2.9

3f ⑧ Block ⓐ −0.5 cm = Pos Period = 15.62 ¢
⑨ " ⓐ −2.3 " = Neg " = 0.06 ¢

3g ⑩ Block ⓐ −0.8 cm = Pos Period = +14.58 ¢
" ⓐ −1.3 " " = +11.59 ¢

E.A. SoRA Expr. XII Run 4a
24cm(82) 21 Date 1-19-1966 Time 11:20 AM PM
Purpose Rossi α
PDP4
Detectors in Top Plug

4a Core = 82 3/4 U
12 1/4 Fe [1 → 10, 87, 95 + 4th 1/4 # 19]
Control = 3b

∞ = 3f = 9 3/8"

A = 60 10/50'
C = 49
D = 50 1/1000
BF_3 = 275 CPM

DATE JAN 20 1966 SAFETY CHECK

TIME 9:30 AM BY Lynn + Taylor

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	open	x	10/1000	900	750
SOURCE DIST.	7"	OK	4'	2"	5"	OK
% F. S. TRIP	90	-	100	90	100+	-
SLOG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED ✓ MACHINES ✓

TABLES ✓ LIGHTS ✓ AREA CLEANED ✓

C.A. SORA Expr. XII Run 5a

24 cm (86) 11 Date JAN 20 1966 Time AM

Purpose Rossi α

Fe Block = 24 cm x 11 cm x 7 cm

10:04:15

5a Core = 86 1/4

8 3/4 [1,2,3, 7,8,9, 87, 95 + 1 3/4 #6]

Control = 3 b

∞ = 3 b = 10 3/4"

A = 60 10

C = 50

D = 50 1/1000

BF_3 = 200 cpm

START 10:04:15 AM

Down 10:31 AM

DATE [redacted] 24 1956 SAFETY CHECK

TIME 8:45 AM BY M. Halczyo + Lynn

	A	B	C	D	E	F
CHAMBER	10/1000	open	x	10/1000	900V	700
RANGE	7"	OK	3'	2"	6"	OK
SCUL. & BKG.	90	—	100	90	100+	—
A.F.C. TEST	✓	✓	✓			
GLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			
SOURCES USED	M-226 + X			MAGNETS	✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

C.A. SORA Expr. XII Run 5b

24cm (86) II Date [redacted] 24 1956 Time AM PM

Purpose

Repeat 5a p. 137

5b Data Collection Started

Down @ = 11:22 AM

∞ 3b = 11 3/8" =

A = 60 10/1000

C = 50

D = 50 1/1000

BF_3 = 271 CPM

C.A. SoRA XII Run 5c
24cm (8 8) 16 Time 11:30 AM
Purpose Rossi ∞

FE Block = 24 x 16 x 7

5c. Loading same as 2b p.133. (+10.9 ¢)

8 4 4

∞ 3b = 7" =

A = 60 + 10/1000
C = 50
D = 50 + 1/1000

DATE JAN 25 1966 SAFETY CHECK

TIME 8:25 AM BY Taylor + Lynd

CHANNEL	A	B	C	D	E	F
RANGE	10/100	off	X	10/1000	90.0	750
SOURCE DIST.	8"	ok	8"	2"	6"	ok
% F. S. THR	80	–	100	80	100+	–
BLDG. ALARM	✓	✓	✓			
AUX. CHNS.	✓	✓	✓			

SOURCES USED Ra-226 + γ MASKED ✓

TABLES ✓ LIGHTS ✓ AREA RELAXED ✓

C.A. SORA Expr. XII Run 5d

24 cm (82½ 21 Date ~~JAN~~ 25 1966 Time 9:25 AM ~~PM~~

Purpose Rossi α

Fe Block = 24 x 21 x 7

5d Core = 82½ U
12½ Fe [1 → 10, 82, 95, + 2nd ½ #19]

Data Collection Started @ ~~9:37 AM~~ 10:03 AM

A = 60 10/50 ✓
C = 50
D = 55 1/1000
BF_3 = 200 CPM

11:35

24 - 8 2½ - 21

3 ft = 5 11/16" ∞ =

C.R. SORA Expr. XII Run 5e
24cm (88") Date 1-25-1966 Time 12:20 PM
Purpose Rossi α
Fe Block = 24 × 11 × 7
Scatterers #3 + #4 = B lined

5e Core = 88 3/4 u
6 1/4 Fe
Sub Cri –

5f Core = 89 1/4 u
5 1/2 Fe
Sub crit –

5g Core = 90 1/2 u
4 1/2 Fe [1, 9, 87, 95 and 1st 1/2 #2]

24-90½-11

Data collection started @ 12:55 PM
Down @ 2:28 PM

3R = 1 15/16" ∞

A = 55 10/50
C = 50
D = 50 1/1000
BF_3 =

13 90
12 60

JAN 26 1956 — SAFETY CHECK

TIME 10:30 — Taylor + Lynn

CHANNEL						
RANGE	10/1000	oper	X	10/1000	900	750
SOURCE Dist.	6"	ok	5'	2"	6"	ok
% F. S. Corr	90	–	100	90	100+	–
BLDG. ALARM	✓	←	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED	PuBe 226 + γ MARGLITE					✓
TABLES	✓		✓			✓

C.N. SORA Expr. XIII Run E-1

Date JAN 26 1956 Time 10:50 AM

Purpose Nominal Conf. ✓

24-8

E-1 Core = 85¼ U Beam Plugs (12) in.

= 9¾ Fe [1, 2, 3, 6, 7, 8, 9, 87, 95 and 4th ¼ #4]

Pitte = 15.4 ¢

24-85¼-11

Pos Period – Log ν = 48.2 sec = 16.18 ¢

BF_3 ① = 50.3 ② 50.8

D Pos Period –

Pitte = 22.35 ¢

2) Removed Plug Pin #48 Pitte = 20.26 ¢

3) " " " + #53 = 19.78 ¢

Pin #48 = 209 ¢

" #53 = 0.53 ¢

E-2 Removed Beam Plugs. (12)

Beam Plug = 3.26¢

1) Pos Period - +19.09¢

2) Removed Plug Pin #71 = +17.00¢

3) " " " #71 + #78 = +15.89¢

Pin #71 = 2.09¢

#78 = 1.11¢

E-2 Scatterer #3 Cd lined.

Super crit.

Pos Period, Poly core out #3 = +9.08¢

19.39

E-3 Removed 2nd ½ #5 Fuel = -28.47¢

Top ½ #5

24-843/4-11

1) Pos Period = +18.00¢

2) Poly Core out #3 = -19.39¢

Travel = 17 7/16"

Time = 9 sec

Scatterer #3 Poly Core = 37.39¢

3) Plug Pin #91 out = -23.99

Pin #91 = 4.60¢

4) Plug Pin #51 out = -25.76

Pin #51 = 1.77¢

vs E-2

+19.09

+28.47

48.56

-18.00

+30.56¢

30.
93

#3 Scatterer Cd Lined vs B. Lined

C.A. SORA Expr. XIII Run E-4
24 cm (84) II Date JAN 2 1956 Time AM PM
Purpose Con't Reactivity

E4. Poo Period = +17.94¢

24-84 3/4-11

1) withdrew Entire Scatt. cd Lined #3 = 1.076¢

Levelled ∞

2) ~~withdrew~~ Plug Pin #18 out = −1.03¢

3) ∞ " " #18 + #91 out = −2.84¢

cd Lined Scatt #3 = 125.5¢

∞ Scatt #3 = 11.7 cm 4 3/8" ∴ Plug Pin #18 = 1.03¢

Travel = 17 1/2" ∴ #91 = 1.81¢

Time = 9 sec

E-5 Scatterer #3 Polyethelene (14.1 cm dia) ✓

{85 / 10}

Pos Period — Log N = 39.4 sec 18.72 ¢

Pitte = 17.74 ¢

24-85-11

BF_3 ① = 39.08 sec

③ = 38.7 "

1) Withdrew Poly Scatt #3 = −85.08 ¢

2) Plug Pin #5 out = −1.38 ¢

~~3)~~ " # "

177
76
93.7
94 ¢

∞ Poly Scatterer #3 = 5⅛", 12.9 cm

Travel = 17½"

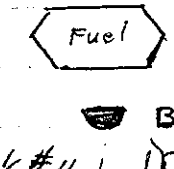
Time = 9 sec

Poly Scatter #3 = 102.8 ¢

Plug Pin #5 = 1.38 ¢

2:00 PM E-6 Scatterer #3 B. Lined with semi cyclinder of Be as Core away from Core (fuel)

{85 / 10}



vs E-2, P. 143 (+19.09 ¢ less 4th ¼ #4 fuel) [~ 10 ¢]

24-85-11

∞ Be #5 = 24.5 cm =

E-7 Removed fuel #5 + 1 3/4 #19
83 1/4 884" + 60 ¢ = 148 ? SEE p.122 p.143
11 3/4

Slight Poo.

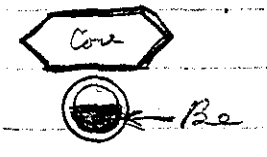
E-8 added 3rd 1/4 #19 Fuel
1 — .004" 235 U foil at Center of Be Block
7.7
min exposure @ Log N = .01
83 1/2 ∞ = +0.79¢ Pitta = 1.3 X 10^-8 D = 85 1000/200
11 1/2 1) Pulled Plug Pin #78 A = 65 1000/200
24-83 1/2-11 − 0.02¢
2) Plug Pin #78 + #25 out = − 2.10¢

Pin #78 = 0.81¢
Pin #25 = 2.08¢

E-9 4th 1/4 #19 Removed
Poo Period = 17.06¢ vs E8 thru 4th 1/4 #19 =
83 1/4 withdrew semi cyl. Be
11 3/4 from Core of Scatterer #3 = − 91.76¢

Be as E-6 = 108.82¢

24-83 1/4-11



122
143

JAN 26 1956 — SHIFT CHECK

TIME 10:00 — Taylor + Lyon

10/1000	opr	X	10/1000	900	750
8"	OK	4'	2"	6"	OK
90	—	100	90	100+	—
✓	✓	✓			
✓	—	✓			

PuBe 226 + X ✓

AMES ✓ ✓ ✓

SORA Expr. XIII Run E-10

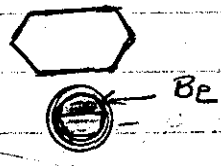
24 Cm (82) II Date JAN 26 1956 Time AM

Purpose Cont Reactivity Meas.

29
142
171

E10 Scatterer #3 B. Lined with Semi cyl of Be and Semi Poly cyl.

82½
17½



Pos Period — +28.93¢ +

withdrew Scatt. Core = − 142.26¢

= 4.5" Scatterer Core = 171.2¢

24-82¼-11

¢

1) Pin #45 out = 2.17¢

2) Pin #45 + #43 out = 2.89¢

Pin #45 = 2.16¢

Pin #43 = 0.73¢

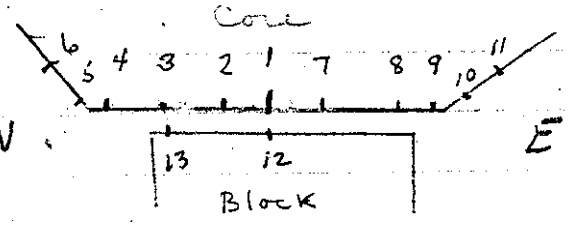
Scatt Core = 4.5", 11.5 cm

Travel = 17.5"

Time = 9.0 sec

C.A. SORA Expr. XIII Run F-1
24 Cm (85) II Date 1-28-1965 Time 12:30 ~~PM~~
Purpose 235 U foil Exposure
.004" X 5/16" dia (.295")
Be Block = 24 cm X 11 cm X 7 cm

F-1 Foils as shown
Taped to outside of Core
at center line.



85 1/4
9 3/4
Log N = .01
A = 53 1000/200
D = 80 1000/200

Position 1, 2, 3, 4, 5, 6, 7, 8,
#54, 55, 58, 59, 60, 61, 63, 64
9, 10, 11, 12, 13.
65, 66, 67, 68, 70.

up #1 = 23.33
2 = 23.459
3 = -1.0
4 = -2.0

24-85 1/4-11

Time = 30 min. Cut @ 12:41 ~~PM~~ pm
Down @ 1:11 pm

#12 = Center Be Block
13 = Edge of Be Block

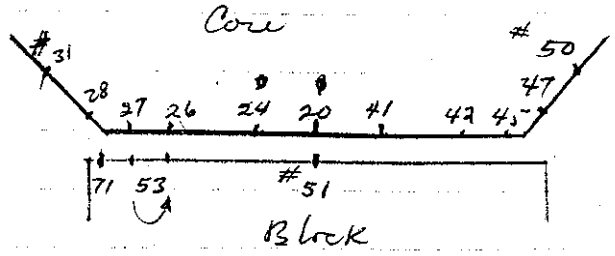
Pos.	4,	3,	2,	1,	7,	8,	9
Dist cm from W edge of Core	½ cm,	2,	5,	7,	9,	12,	13½
	5,	6		10,	11		
	1 cm,	3		1 cm,	3 cm from E corner		

24

1-11, 18, 87, 95

C.A. SORA Expr. XIII Run F-2
24cm (80) Date 1-28 19-60 Time 2:30 PM
Purpose 235 u foil Exposure
.004" x 5/16"
Be Block = 24cm X 16cm X 7cm

F-2 Foils as shown



{80 3/4, 14 1/4} Crit : 2:39 PM

Log N = .031
A = 40 1000/1000
D = 60 1000/1000

Time = 25 min

Down 3:04 PM

→ 11, 18, 87, 95 and 3 at 1/4 #19

#51 = Center of Block
#53 = Same pos as 13 Run p.148
#71 = Edge of Block

24-80 3/4-16

½

DATE JAN 31 1966 SHIFT PATROL

TIME 8:40 Taylor + Lynn

	10/1000	opr	X	10/1000	980	750
	6"	OK	4'	2"	5"	OK
%	90	—	100	90	100+	—

BLDG. ALARM

ANY OTHER

BURNED DOWN

TABLES LIGHTS

C.A. SORA Expr. XIII Run F-3

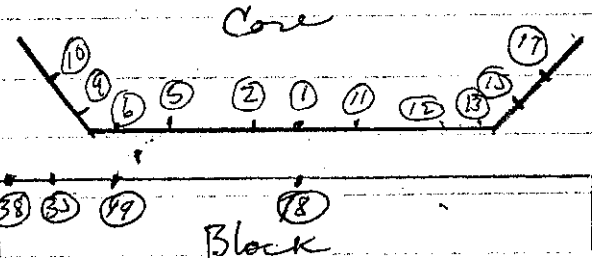
24cm (76) Date JAN 31 1966 Time

Purpose 235 U Foil Exp. .004" X 5/16"

Be Block = 24 cm X 21.08 cm X 7 cm

24-76½-21

F3 Foils as shown –



76½ } Crit = 9:52 AM
18½ } Down – 10:17
Time ~ 25 min

1 → 11, 18, 20, 31, 30, 42, 87, 95, and 2nd ½ #19

38 = Edge of Block, other foils on block repeat previous positions

Log N = .025
A = 41 1000/1000
D = 60 1000/1000

DATE FEB 1 1966 SAFETY CHECK

TIME 11:10 BY Taylor + Lynn

CONTROL						F
[illegible]	10/1000	opn	x	10/1000	900	750
[illegible]	7"	ok	4"	2"	6"	ok
[illegible]	90	—	100	90	100+	—
[illegible] PLATE	✓	✓	✓			
[illegible]	✓		✓			

BE WORK UNDER PuBe 226 + X RAILS ✓

TABLES ✓ LIGHTS ✓ AREA CLEANED ✓

C.A. SORA Expr. XIII Run F-4

24 cm (76½) Date FEB 1 1966 Time 11:20 AM

Purpose 235 U Foil Exposure .004 x ~~76~~ .295"

Be Block = 24 x 21.08 X 7

24-76½-11

F-4 Critical @ 11:38 AM

76½
18½ } Time = 10 min

Log N = .035

A = #1 1000/1800

D = 60 1000/1000

Radial foil location

Foil #62 @ Center fuel #48

#57 " " " #71

#56 " " " #91

#49 Position #1 of Run F-1, p. 148

C.A. SORA Expr. XIII Run F-5
24 cm (80) 16 Date 2-1-1965 Time 1:15 ~~AM~~ PM
Purpose 235 U foils .004" x 5/16"
Radial
Be Block = 24 X 16 X 7

F-5 Critical = 1:25 PM Foil # 48 Center of fuel #48
Time = 10 min " #46 " #71
" #44 " #91
" #43 outside as position #1
p.148

80 3/4
14 1/4
SEE p.149

Log N = .035
A = 41 1000/1000
D = 60 1000/1000

24-80 3/4-16

F-6 Be Block = 24 X 11 X 7

85 1/4 Critical = 2:37 PM Foil # 36 Center of fuel # 48
93/4 Time = 10 min " #34 " #71
" #30 " #91
" #29 outside as position #1
p.148

24

Log N = .031
A = 41 1000/1000
D = 60 1000/1000

24-85 1/4-11

22760

22590

.170

2276
2238
.38

2276
21.30
1.36

2276
20.10
2.66

2276
18.20
4.56

2276
19.49
3.27

2276
17.19
5.57

50000

1.0254

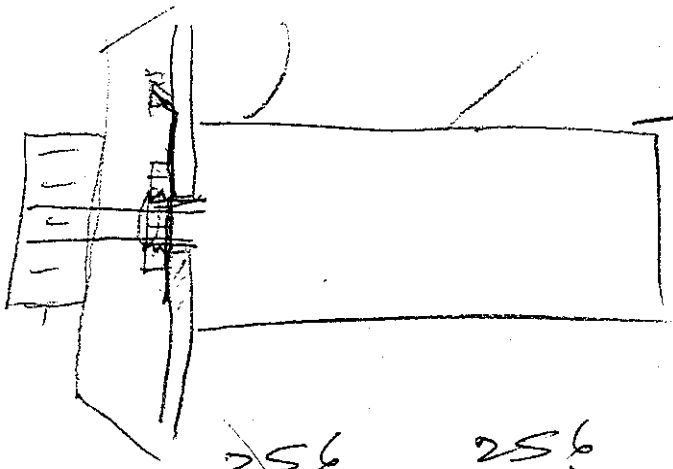
2.48

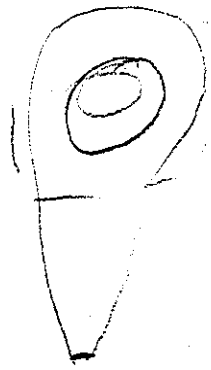
1 2 3

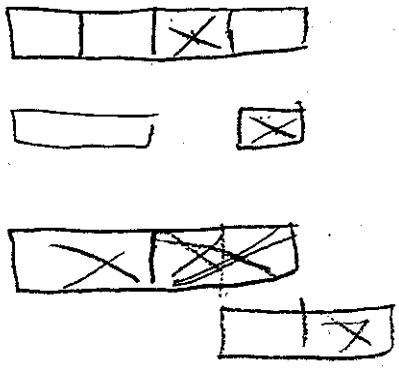
256 + 12 = 268

128 + 39 = 167

256
128
96
17
497







256 + 1 = 257

256 + 13 = 269

256 + 12 = 268

13 of 67

245

243

244

84 1/2

84 1/2

84 3/4

84

Zero

+ 35.42
31.33
17.61
17.76

= 1
= 1
= 2

= 2
1/2
1
2

4.14
7.

3C

DATE FEB 16 1966 SAFETY CHECK

TIME 1115 AM PM BY Taylor + Lynn

CHANNEL		B	C	D	E	F
RANGE	10/1000	opn	X	10/1000	900	750
SOURCE DIST.	10"	ok	3'	2"	8'	ok
% F. S. TRIP	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
RUN CTRS.	✓	✓	✓			

SOURCES USED Pu Be 226 + γ MAGNETS ok

TABLES ok LIGHTS ok AREA CLEARED ok

C.A. SORA Expr. XIV Run A-1

24 cm (80) Date FEB 16 1966 Time AM PM

Purpose Preparation for Jet Run with Block 1 cm off Center Normal - Scatterers + Refl. Be Block = 24 x 16 x 7

A-1 Core = 80 3/4 Fuel
14 3/4 Fe [1 → 11, 18, 87, 95, + 3 1/4 #19]

Poo Period = hog =
Pitte = 5.02 +
BF3 = ① 174.5 sec = 6.12 +
② 175.8 sec = 6.09 +

24 - 80 3/4 - 16

∞ with Fe 3 b = 27.2 cm 3.8 +

Moved Block east and west to establish most reactive position, found that we were there to start with.
after shut down Block 2 mm to west of starting position.

A-2

C.A. SORA Expr. XLV Run A-2
24 cm (80) Date 2-16-1966 Time ~~AM~~ PM
Purpose Foil Exposure with
Block 1 cm off Center to West from original zero.
Be Block = 24 X 16 X 7

24-80¾-16

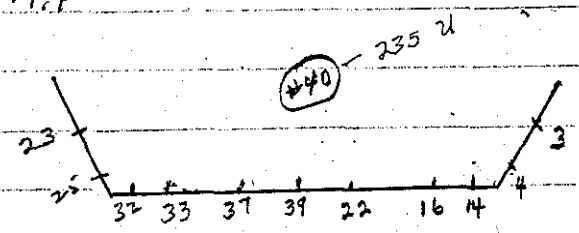
Foil Pos on p. 148. .004" X 5/16" dia 235 u

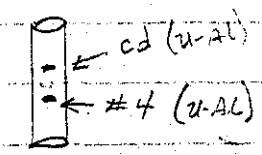
Pos.	1	2	3	4	5	6	7	8	9	10	11
Foil #	39	37	33	32	25	23	22	16	14	4	3

#40 at Center of Core (Hole #48)
U-Al alloy #4 center of Polyethylene Scatterer #3
on Core axis. 28.5 cm from top.
Cd Covered U-Al alloy 22.5 cm from top Scatterer #3.
[U-Al alloy .005" X 5/16" dia]

Log N = .08 Crit @ 3:13 PM
"A" = 51 1000/1000 Time = 18 min
"D" = 80 1000/1000

σ 3b = 16.3 cm. 14.4 ¢





Scatter #3

DATE FEB 17 1966 DAILY CHECK

TIME 11:15 AM BY Taylor + Lynn

	A	B	C	D	E	F
	10/1000	oper	X	10/1000	900	750
	7"	ok	6'	2"	6"	ok
	90	—	100	90	100+	—
	✓	✓	✓			
	✓	✓	✓			
	PuBe 226 + 8				✓	
TABLE	✓		✓			✓

C.A. SORA Expr. XIV Run A-3

24 cm (76) Date FEB 17 1966 Time _____ AM PM

Purpose Prepare for full run with block off center.

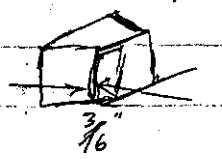
Be Block = 24 cm x 21.08 cm x 7 cm

A-3 Core = 76½ Fuel

18½ Fe [1→11, 18, 20, 31, 30, 42, 87, 95 + 2nd ½ #19

1" thick Be Blocks (9213 stock) taped to either side of the 16 cm block, taped 3/16" back from edge of block.

See p. 139.



Sub Crit

A-4 Added 3rd ¼ #19 fuel {76 3/4, 18 ¼}

24-76 3/4-21

Poo Period = 16.42 ¢

over ∞ 3b = 28.9 cm

2.8¢

A-4 Moved block east and west, hunting for most reactive position, found that original zero setting was good.
After shutdown, block found to be 1 mm west of original zero.

C.A. SORA Expr. XII Run A-5
24cm (76) Date _____ 19 ___ Time _____ AM PM
Purpose Foil Exposure with block 1 cm off center (West) from original zero.
Be Block = 24 X 21.08 X 7

76 3/4
18 1/4

Foil Position as p. 148, .004" X 5/16" dia .235 U

Position	6	5	4	3	2	1	7	8	9	10	11
Foil #	12	11	10	9	6	51	53	71	1	2	5

center of core # 50 (Hole #48)
Scatterer #3 (Poly) - 28.5 cm from Top #2 Bare
" " - 22.5 " " " #9 Cd.
#2 + #9 = U-Al alloy .005" X 5/16" dia

24-76 3/4-21

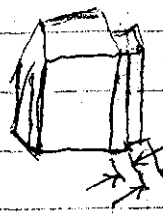
Log N = .105 Crit @ 1:42 PM
A = 51 1000/1000 Time = 22 min
"D" = 80 1000/1000

∞ 3f = 18.5 cm,
12.0 ¢

FEB 22 1966

A	B	C	D	E	F
10/1000	open	X	10/1000	900	950
8"	OK	30"	2"	6"	OK
90	—	100	90	100+	—
✓	✓	✓			
✓		✓			
				✓	
	✓				✓

C.A. SORA Expr. XIV Run A-6
24cm (73) Date FEB 22 1966 Time AM PM
Purpose Critical Condition with Be Block 26.16 cm wide.



~~added 1" thick Be Blocks to right side of~~ 21.08 cm

A-6 Core = 73 3/4 U
21 1/4 [1→12, 17, 18, 20, 30, 31, 42, 87, 95, 2nd 1/2 #13 + #16, + 4th 1/4 #19]

Be added = 1" X 2 7/8" X 22 cm
Sub Critical.

A-7 Core = 74 3/4 U added 2nd 1/2 #13 + #16
20 1/4 Fe [1-12, 17, 18, 20, 30, 31, 42, 87, 95 + 4th 1/4 #19]
Sub Critical.

24-74 3/4-26

A-8 Core = 75 3/4 U added 1st 1/2 #12 + #17
19 1/4 Fe [1→11, 18, 20, 30, 31, 42, 87, 95 + Top 1/2 #12 + #17, 4th 1/4 #19]
Super Cut = +43¢

24-75 3/4-26

~~added~~ Removed 2nd ¼ #17 (19)

A-9 Core = 75½ U = 50.5 Kg.
19½ Fe [1→17, 20, 18, 30, 31, 42, 87, 98,
Top ½ #12, Top ¾ #17, 4th ¼ #19]

24-75½-26

Pos Period _ Cattle = #21.46 ¢
Moved Be Block out = -11.68
Block = #11.90

26cm Be

C.A. SoRA Expr. XIV Run A-10
24cm Date 22-Feb-66 Time 1:45 ~~AM~~ PM
Purpose Foil Exposure
Removed 1st ¼ #17.
Block centered (Geo.)
Be Block = 24cm X 26.16cm X 7cm

Removed 1st ¼ #17

235 U foils as p. 148

Position	6	5	4	3	2	1	7	8	9	10	11
Foil #	66	63	64	54	61	58	59	55	68	47	70

at Core Center (#48) = #60

24-

75¼ } Satterwo #3 (Poly) 28.5 cm from top U-Al #5 Bare
19¾ } " 22.5 " " " #8 Cd Cov'd

Log N = .05
"A" = 51 100U/1000
"D" = 80 1000/1000

Time crit = 2:07 PM
Time = 25 min.

24-75¼-26

Fe 3b = 18.3 cm
12.2 ¢

FEB 23 1966

10:00 AM Taylor + Lyon

20/1000	OPEN	X	10/1000	900	750
8"	~~OK~~	30"	2"	6"	OK
90	—	103	90	100+	✓
✓	✓	✓			
✓	—	✓			
Pu Be 226 + 8				✓	
✓	✓			✓	

CA SORA Expr. XIV Run A-11

24 cm (75½) Date FEB 23 1966 Time _____ AM PM

Purpose Fine block traverse about Center.

Be Block = 24 cm X 26.16 cm X 7 cm

A-11 Core = 75½ U = 50,498 Kg. (19)

19½ Fe [1 → 11, 18, 20, 30, 31, 42, 87, 95, 2nd ½ #12, 4th ¼ #17, + 4th ¼ #19]

24-75½-26

Poo Period — log N = 18.71¢

Chk Petto = 18.25¢

BF_3 ③ = 39.7 sec, 19.25¢

⓪ Block ⓐ 0 = +18.78¢

① Moved Block (w) -2.1 cm = -6.72¢

A-12 ② Set Block ⓪ −0.4 cm = +19.15 ¢
③ Moved " to −1.3 " = +10.55

A-13 ④ Set Block ⓪ +0.35 cm = +18.45 ¢
⑤ Moved Block to +1.65 " = +0.47

A-14 ⑥ Set Block ⓪ +0.65 cm = 15.69 ¢
⑦ Moved " to +2.25 " = −11.62

A-15 ⑧ Set Block ⓪ −0.8 cm = +16.72 ¢
⑨ Moved " to — " = −32.06

A-16 Set Block ⓪ 0 = +19.13 ¢
moved Block to ? = #19.24 ¢
Block Moved Out = −11.72
Block = #11.91

MAR 1966

DATE MAR 1966 SAFETY CHECK

C.A. _____ Expr. _____ Run _____

Date MAR 1966 Time _____ AM PM

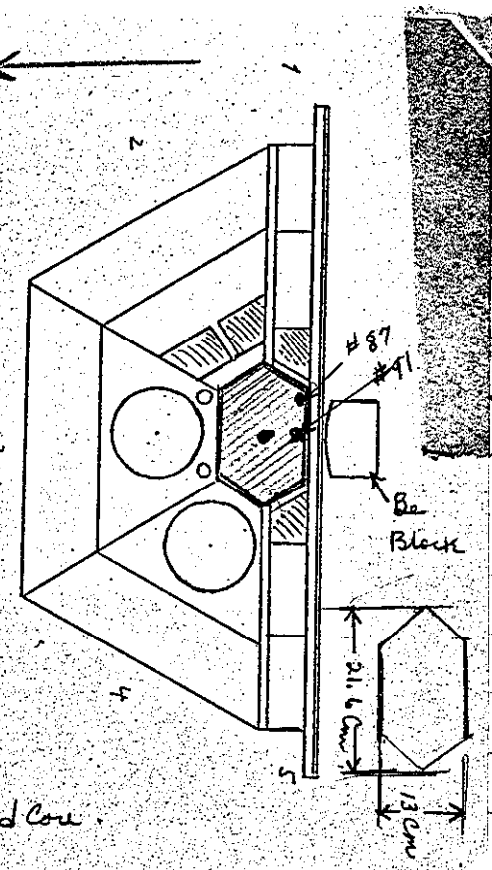
Purpose Pette Calibration

See Book 5, p. 101

U - Metal

Thermocouple Locations

1) Center fuel pin, bottom
2) " Center
3) " Top
4) fuel pin #91, bottom
5) " Top
6) " #87, bottom
7) " Top
8) Be rod #1, bottom
9) " , Top
10) Window, bottom
11) " , Top
12) Scatter #3, bottom of poly toward Core.
13) Scatter #4, " "
14) North side, outside, midplane
15) Top plug, bottom (-.3cm)
16) Base plate, Center South



Run 2 p. 163

	#1		#1
∞	= 23.12	-1.50	- 21.50
-22¢	= 22.93	-2.35	- 20.60
-90¢	= 22.23		

Run 3

up = 26¢

#1 = 22.96 = -9¢

22.56 = -50¢

Recorder 27°C

6 apr 66
Run 4, p. 164

2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	2	2	.
2	2		+	R	0	0	2	6	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	2	4	.
2	2		+	R	0	0	2	6	.
2	2		+	R	0	0	2	5	.
2	2	+2.67 ¢	+	R	0	0	3	0	.
2	2		+	R	0	0	2	8	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	2	4	.
2	2		+	R	0	0	2	5	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	8	.
2	2		+	R	0	0	2	6	.
2	2		+	R	0	0	2	3	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	3	2	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	3	.
2	2		+	R	0	0	2	8	.
2	2		+	R	0	0	2	1	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	2	2	.
2	2		+	R	0	0	2	8	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	5	.
2	2		+	R	0	0	2	4	.
2	2		+	R	0	0	2	4	.
2	2		+	R	0	0	2	0	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	3	1	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	2	8	.
2	2	+2.13 ¢	+	R	0	0	2	5	.
2	2		+	R	0	0	2	0	.
2	2		+	R	0	0	2	5	.
2	2		+	R	0	0	2	0	.
2	2		+	R	0	0	1	8	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	2	9	.
2	2	+2.88 ¢	+	R	0	0	2	5	.
2	2		+	R	0	0	3	2	.
2	2		+	R	0	0	2	2	.
2	2		+	R	0	0	2	9	.
2	2		+	R	0	0	3	2	.
2	2		+	R	0	0	3	0	.
2	2		+	R	0	0	2	7	.
2	2		+	R	0	0	2	5	.
2	2		+	R	0	0	2	5	.
2	2		+	R	0	0	2	2	.
2	2		+	R	0	0	2	9	.

2	2		+	R	0	0	3	2	
2	2		+	R	0	0	3	0	
2	2		+	R	0	0	2	7	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	2	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	2	
2	2		+	R	0	0	2	8	
2	2		+		0	0	3	0	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	8	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	4	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	1	9	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	2	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	2	0	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	8	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	7	
2	2		+	R	0	0	2	4	
2	2		+	R	0	0	2	8	
2	2		+	R	0	0	1	9	
2	2		+	R	0	0	1	7	
2	2		+	R	0	0	2	8	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	9	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	0	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	4	
2	2		+	R	0	0	2	4	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	1	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	0	
2	2		+	R	0	0	2	6	
2	2	X 2.42 x	+	R	0	0	2	7	
2	2		+	R	0	0	2	4	
2	2		+	R	0	0	3	0	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	1	9	
2	2		+	R	0	0	2	2	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	8	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	2	5	
2	2		+	R	0	0	2	6	
2	2		+	R	0	0	2	3	
2	2		+	R	0	0	1	9	
2	2		+	R	0	0	2	4	

2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	8	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	9	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	8	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	2	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	9	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	3	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	3	2	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	

+216 ✗

2	2	+	R	0	0	2	5	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	3	2	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	7	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	7	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	3	2	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	2	8	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	7	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	1	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	7	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	3	
2	2	+	R	0	0	1	7	
2	2	+	R	0	0	1	4	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	

+1.864

2	2	+	R	0	0	1	8	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	1	7	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	8	
2	2	+	R	0	0	1	0	
2	2	+	R	0	0	1	7	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	4	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	7	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	2	4	
2	2	+	R	0	0	2	1	
2	2	+	R	0	0	2	3	
2	2	+	R	0	0	1	6	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	4	
2	2	+	R	0	0	2	2	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	2	6	
2	2	+	R	0	0	2	0	
2	2	+	R	0	0	1	4	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	1	9	
2	2	+	R	0	0	2	0	

6 apr 66
Run 3, p. 163
+ 25.74 ¢

2	2		+	R	0	2	6	0	.
2	2		+	R	0	2	6	6	.
2	2		+	R	0	2	5	5	.
2	2		+	R	0	2	5	5	.
2	2		+	R	0	2	5	2	.
2	2		+	R	0	2	5	7	.
2	2		+	R	0	2	6	5	.
2	2	25.74	+	R	0	2	5	8	.
2	2		+	R	0	2	5	7	.
2	2		+	R	0	2	4	9	.
2	2		+	R	0	2	5	9	.
2	2		+	R	0	2	5	1	.
2	2		+	R	0	2	5	8	.
2	2		+	R	0	2	4	7	.
2	2		+	R	0	2	6	3	.
2	2		+	R	0	2	5	8	.
2	2		+	R	0	2	5	9	.
2	2		+	R	0	2	4	2	.
2	2		+	R	0	2	6	0	.
2	2		+	R	0	2	4	9	.
2	2		+	R	0	2	4	5	.
2	2		+	R	0	2	4	0	.
2	2		+	R	0	2	4	9	.
2	2		+	R	0	2	6	0	.
2	2		+	R	0	2	5	0	.
2	2		+	R	0	2	1	9	.
2	2		+	R	0	2	6	0	.
2	2		+	R	0	2	5	0	.
2	2		+	R	0	2	4	9	.
2	2		+	R	0	2	6	2	.
2	2		+	R	0	2	7	0	.
2	2		+	R	0	2	4	7	.
2	2		+	R	0	2	6	3	.
2	2		+	R	0	2	3	4	.
2	2		+	R	0	2	4	0	.
2	2		+	R	0	2	6	7	.
2	2		+	R	0	2	7	0	.
2	2		+	R	0	2	5	0	.
2	2		+	R	0	3	0	0	.
2	2		+	R	0	2	0	0	.
2	2		+	R	0	1	9	9	.
2	2		+	R	0	2	4	0	.
2	2		+	R	0	2	6	5	.

Run 2 p. 163

2	2		+	R	0	1	5	0	.
2	2		+	R	0	1	4	6	.
2	2		+	R	0	1	5	0	.
2	2		+	R	0	1	5	3	.
2	2		+	R	0	1	4	7	.
2	2	X 14.78 ¢	+	R	0	1	5	1	.
2	2		+	R	0	1	4	8	.
2	2		+	R	0	1	4	9	.
2	2		+	R	0	1	3	9	.
2	2		+	R	0	1	5	0	.
2	2		+	R	0	1	4	6	.
2	2		+	R	0	1	4	4	.

2	2	+	R	0	1	3	9	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	4	6	.	-
2	2	+	R	0	1	4	4	.	-
2	2	+	R	0	1	4	9	.	-
2	2	+	R	0	1	3	9	.	-
2	2	+	R	0	1	4	9	.	-
2	2	+	R	0	1	5	5	.	-
2	2	+	R	0	1	4	5	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	5	3	.	-
2	2	+	R	0	1	4	8	.	-
2	2	+	R	0	1	5	6	.	-
2	2	+	R	0	1	4	9	.	-
2	2	+	R	0	1	4	9	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	4	6	.	-
2	2	+	R	0	1	4	2	.	-
2	2	+	R	0	1	5	4	.	-
2	2	+	R	0	1	5	6	.	-
2	2	+	R	0	1	4	9	.	-
2	2	+	R	0	1	5	5	.	-
2	2	+	R	0	1	3	0	.	-
2	2	+	R	0	1	6	3	.	-
2	2	+	R	0	1	5	7	.	-
2	2	+	R	0	1	4	3	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	4	0	.	-
2	2	+	R	0	1	6	3	.	-
2	2	+	R	0	1	3	9	.	-
2	2	+	R	0	1	5	8	.	-
2	2	+	R	0	1	6	3	.	-
2	2	+	R	0	1	6	0	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	3	4	.	-
2	2	+	R	0	1	4	0	.	-
2	2	+	R	0	1	4	3	.	-
2	2	+	R	0	1	7	4	.	-
2	2	+	R	0	1	5	0	.	-
2	2	+	R	0	1	4	7	.	-
2	2	+	R	0	1	7	0	.	-
2	2	+	R	0	1	4	0	.	-
2	2	+	R	0	1	0	9	.	-
2	2	+	R	0	1	3	4	.	-
2	2	+	R	0	1	3	9	.	-
2	2	+	R	0	1	0	1	.	-
2	2	+	R	0	1	0	5	.	-
2	2	+	R	0	1	3	0	.	-
2	2	+	R	0	1	4	1	.	-
2	2	+	R	0	1	0	3	.	-
2	2	+	R	0	0	9	0	.	-
2	2	+	R	0	1	4	1	.	-
2	2	+	R	0	1	0	3	.	-
2	2	+	R	0	1	3	8	.	-

5/10-9

DATE APR 6 1966 SAFETY CHECK

TIME 10:15 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	1-14	60/1000	900	750
SOURCE DIST.	10"	ok	4'	1"	5"	ok
% F. S. TRIP	90	–	100	90	100+	–
PERIOD ALARM	✓	✓	✓			
AUTO SCRS.	✓	✓	–			

SC RODS USED Pu Be + δ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XV Run 1

24Cm (86)-11 Date APR 6 1966 Time 10:30 AM

Purpose Temperature Coeff.

Loading = 86 Fuel
9 Steel
[1, 2, 3, 4, 6, 7, 8, 9, + 95]

1. See p. 40.

Window – 0 – 5 to make thermocouple space.

#1 + #5 = Be

Scatterer #3 + #4 = B lined polyethelene

Be Block = 24 X 11 X 7

Fe #3b = out position (on drive)

cp #1 = 23.24
#3 = + 9
#4 = – 6

Sub critical ✓

2. added 12 cm fuel to Top #4.

86½
8½

Pos Period – Log N = +15.85 ¢
Litte = +14.78 ¢

3. added 6 cm fuel to Top #6

86¾
8¼

Pos Period – Log N = 20.9 sec, 27.2 ¢
58.02 Kg. Litte = 25.74 ¢

C.A. SORA Expr. XV Run 4

24 cm (86 3/4) Date 6 apr 1966 Time 3:30 ~~AM~~ PM

Purpose Reactivity after heating

Conditions Same as p. 163

4. Thermocouple

1) 124.5 °C	5) 123.5 °C	9) 31.0 °C	13) 30.7 °C
2) 130.5	6) 119.5	10) 36.6	14) 26.4
3) 126.5	7) 119.5	11) 36.6	15) 29.5
4) 121.5	8) 40.0	12) 30.4	16) 27.8

24-86 3/4 -11

Pos Period - + 2.67 ¢ Pitte (10^{-8})

25.74
2.67
23.07 ¢ Change

Core 1 → 7 Avg 123.6 °C ←

Refl 8 → 16 32.1 °C ←

$\frac{23.07}{97.6}$ $\frac{123.6}{97.6}$

$\frac{\Delta\rho}{\Delta T}\left(\frac{\text{cents}}{°C}\right) = .236$

7 apr 66

Run 6, P. 165

+121 ¢

2									
2									
2									
2	2		+	R	0	0	1	0	.
2	2		+	R	0	0	1	3	.
2	2		+	R	0	0	1	7	.
2	2		+	R	0	0	1	0	.
2	2		+	R	0	0	1	6	.
2	2		+	R	0	0	1	7	.
2	2		+	R	0	0	0	9	.
2	2		+	R	0	0	1	8	.
2	2		+	R	0	0	0	6	.
2	2		+	R	0	0	1	5	.
2	2		+	R	0	0	1	2	.
2	2		+	R	0	0	0	0	.
2	2		+	R	0	0	0	7	.
2	2		+	R	0	0	1	2	.
2	2		+	R	0	0	0	0	.
2	2		+	R	0	0	1	6	.

2	2		+	R	0	0	1	8	
2	2		+	R	0	0	0	7	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	2	0	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	7	
2	2		+	R	0	0	1	1	
2	2		+	R	0	0	1	0	
2	2	X	+	R	0	0	0	9	
2	2		+	R	0	0	2	0	
2	2		+	R	0	0	1	5	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	0	3	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	4	
2	2	X	+	R	0	0	1	0	
2	2		+	R	0	0	1	7	
2	2		+	R	0	0	1	5	
2	2		+	R	0	0	0	8	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	4	
2	2		+	R	0	0	0	6	
2	2		+	R	0	0	0	3	
2	2		+	R	0	0	1	3	
2	2		+	R	0	0	1	2	
2	2		+	R	0	0	1	1	
2	2		+	R	0	0	1	2	
2	2		+	R	0	0	0	5	
2	2		+	R	0	0	1	8	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	0	7	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	0	7	
2	2		+	R	0	0	0	7	
2	2		+	R	0	0	0	1	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	7	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	1	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	0	7	
2	2		+	R	0	0	1	2	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	6	
2	2		+	R	0	0	1	3	
2	2		+	R	0	0	1	2	
2	2		+	R	0	0	1	4	
2	2		+	R	0	0	1	3	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	0	2	
2	2		+	R	0	0	1	2	
2	2		+	R	0	0	0	5	
2	2		+	R	0	0	1	3	
2	2		+	R	0	0	0	9	
2	2		+	R	0	0	1	4	
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	3	
2	2		+	R	0	0			
2	2		+	R	0	0	1	0	
2	2		+	R	0	0	1	6	
2	2		+	R	0	0	1	7	

1	1	+	R	0	0	1	3	.	-
2	2	+	R	0	0	1	7	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	1	6	.	-
2	2	+	R	0	0	1	7	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	1	8	.	-
2	2	+	R	0	0	0	6	.	-
2	2	+	R	0	0	1	5	.	-
2	2	+	R	0	0	1	2	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	0	7	.	-
2	2	+	R	0	0	1	2	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	1	6	.	-
2	2	+	R	0	0	0	7	.	-
2	2	+	R	0	0	0	5	.	-
2	2	+	R	0	0	0	4	.	-
2	2	+	R	0	0	1	6	.	-
2	2	+	R	0	0	0	3	.	-
2	2	+	R	0	0	1	9	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	0	1	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	0	8	.	-
2	2	+	R	0	0	0	6	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	1	4	.	-
2	2	+	R	0	0	1	5	.	-
2	2	+	R	0	0	2	0	.	-
2	2	+	R	0	0	1	3	.	-
2	2	+	R	0	0	0	5	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	0	2	.	-
2	2	+	R	0	0	1	2	.	-
2	2	+	R	0	0	1	5	.	-
2	2	+	R	0	0	1	1	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	1	2	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	0	7	.	-

10-8

2	2	+	R	0	0	0	4	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	0	6	.	-
2	2	+	R	0	0	0	3	.	-
2	2	+	R	0	0	0	8	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	0	3	.	-
2	2	+	R	0	0	0	8	.	-
2	2	+	R	0	0	0	5	.	-
2	2	+	R	0	0	1	6	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	0	4	.	-
2	2	+	R	0	0	0	4	.	-
2	2	-	R	0	0	0	1	.	-
2	2	+	R	0	0	0	7	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	1	0	.	-
2	2	+	R	0	0	0	3	.	-
2	2	+	R	0	0	0	9	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	0	7	.	-
2	2	+	R	0	0	0	7	.	-
2	2	+	R	0	0	0	0	.	-
2	2	+	R	0	0	0	0	.	-

2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	7	.
2	2	+	R	0	0	0	7	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	0	.
2	2	-	R	0	0	0	0	.
2	2	+	R	0	0	0	5	.
2	2	+	R	0	0	1	0	.
2	2	+	R	0	0	0	6	.
2	2	+	R	0	0	1	2	.
2	2	+	R	0	0	0	5	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	2	0	.
2	2	+	R	0	0	0	0	.
2	2	-	R	0	0	0	0	.
2	2	+	R	0	0	0	8	.
2	2	+	R	0	0	0	6	.
2	2	+	R	0	0	1	7	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	6	.
2	2	+	R	0	0	0	7	.
2	2	+	R	0	0	0	9	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	6	.
2	2	+	R	0	0	0	9	.
2	2	+	R	0	0	0	9	.
2	2	+	R	0	0	0	4	.
2	2	+	R	0	0	1	1	.
2	2	+	R	0	0	0	3	.
2	2	-	R	0	0	0	0	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	3	.
2	2	+	R	0	0	0	5	.
2	2	+	R	0	0	0	0	.
2	2	+	R	0	0	0	2	.
2	2	+	R	0	0	1	2	.
2	2	+	R	0	0	0	9	.
2	2	+	R	0	0	0	5	.
2	2	+	R	0	0	0	7	.
2	2	-	R	0	0	0	0	.
2	2	+	R	0	0	0	4	.

2	2	+	R	0	2	3	2	.
2	2	+	R	0	2	3	4	.
2	2	+	R	0	2	2	7	.
2	2	+	R	0	2	3	9	.
2	2	+	R	0	2	3	1	.
2	2	+	R	0	2	2	8	.
2	2	+	R	0	2	2	9	.
2	2	+	R	0	2	3	6	.
2	2	+	R	0	2	3	4	.
2	2	+	R	0	2	2	6	.
2	2	+	R	0	2	4	1	.
2	2	+	R	0	2	3	2	.
2	2	+	R	0	2	3	9	.
2	2	+	R	0	2	4	0	.
2	2	+	R	0	2	2	7	.
2	2	+	R	0	2	3	1	.
2	2	+	R	0	2	3	0	.
2	2	+	R	0	2	4	0	.
2	2	+	R	0	2	4	0	.
2	2	+	R	0	2	2	4	.

```
2 2     + R 0 2 3 2 .
2 2     + R 0 2 3 4 .
2 2     + R 0 2 2 7 .
2 2     + R 0 2 3 9 .
2 2     + R 0 2 3 1 .
2 2     + R 0 2 2 8 .
2 2     + R 0 2 2 9 .
2 2     + R 0 2 3 6 .
2 2     + R 0 2 3 4 .

2 2     + R 0 2 2 6 .
2 2     + R 0 2 4 1 .
2 2     + R 0 2 3 2 .
2 2     + R 0 2 3 9 .

2 2     + R 0 2 4 0 .
2 2     + R 0 2 2 7 .
2 2     + R 0 2 3 1 .

2 2     + R 0 2 3 0 .
2 2     + R 0 2 4 0 .
2 2     + R 0 2 4 0 .
2 2     + R 0 2 2 4 .
2 2     + R 0 2 3 0 .
2 2     + R 0 2 2 7 .
2 2     + R 0 2 3 5 .
2 2     + R 0 2 3 0 .
2 2     + R 0 2 2 9 .
2 2     + R 0 2 3 3 .
2 2     + R 0 2 3 5 .
2 2     + R 0 2 3 0 .
2 2     + R 0 2 3 0 .
2 2     + R 0 2 3 5 .
```

APR 7 1966

DATE APR 7 1966	SAFETY CHECK				
TIME 8:15	— Y. Taylor + Lyman				
CHANNEL				E	F
RANGE	10/1000	opr	L-14	10/1000	900V 750
SCR. ADJUST.	8"	OK	3'	2"	
[illegible] TEMP	90	—	103	90	
[illegible]					
[illegible]					
SCR. HOLES USED			MAGNETS		
TABLES	LIGHTS		AREA CLEARED		

30.7°C
16.4
29.5
27.8

C.A. SORA Expr. XV Run 5

Date APR 19 [illegible] Time 8:25 AM ~~PM~~

Purpose Repeat Run 8 p.163

24-86 3/4-11

5. up #1 = 23.24 Poo Period

∞	23.045	Pette = 24.85¢
−23¢	22.84	
−52¢	22.56	− 1.21
−1.70¢	21.93	23.64¢ change

Recorder 26°C

6. Reactivity after heating -
1:10 PM Thermocouple

1) 130.4°C	5) 130.7°C	9) 31.5°C	13) 30.5°C
2) 137.0	6) 124.5	10) 36.5	14) 26.0
3) 133.5	7) 125.5	11) 36.5	15) 29.5
4) 128.9	8) 36.8	12) 30.5	16) 27.5

Poo Period + 1.21¢ Pette

98.37

Core 1 → 7 = 130.07°C Avg

Refl 8 → 16 = 31.7°C

$\frac{23.64}{98.37} = .2403$

$\Delta\rho/\Delta T$

#1 .234

#2 .227

AV $\frac{.463}{2} = .23 \pm 5\%$

DATE APR 11 1966 SAFETY CHECK

TIME 3:40 Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	1-14	10/1000	900	750
[illegible]	8"	ok	6'	1"	5"	ok
[illegible]	90	–	100	90	100+	—
[illegible]	✓	✓	✓		—	—
[illegible]		✓				✓
[illegible] USED Pulse + 8						
TABLES ✓	LIGHTS ✓				AREA SECURED ✓	

C.A. SORA Expr. XVI Run A-1

24 cm (75¾) Date APR 1 1 1966 Time 3:50 AM PM

Purpose Reactivity Check.

Be Block = 24 cm X 26.06 cm X 7 cm

75¾ Loading = 75¾ U up #1 = 23.280

19¼ 19¼ Steel #2 = 23.385

24-75¾-26

1 + 11, 20, 31, 18, 30, 42, 87, 95

and top ½ #17 + #19 + top ¼ #12]

Sub Critical.

#1 + #5 = Be

#3 + #4 = B lined

Window = 5-1-4-3-2

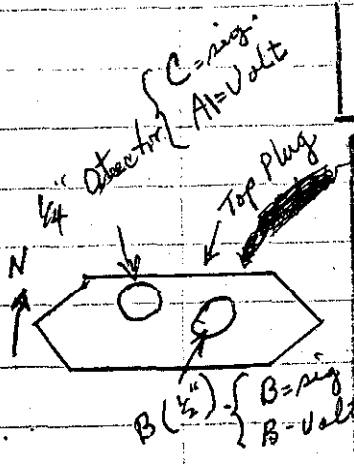
Beam Hole = Empty

APR 12 1966

DATE APR 12 1966 SAFETY CHECK

8:20 AM BY Taylor + Lynn

	10/1000	Opr	L-1½	10/1000	900	750
DIST.	5"	ok	4'	1"	8"	ok
F. S. TRIP	90	—	100	90	100+	—
ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	—			
SOURCES USED PuBe + γ						✓
TABLES ✓ LIGHTS ✓					CLEARED ✓	



C.A. So-RA Expr. XVI Run A-2

24 cm Date APR 12 1966 19 Time 8:35 AM

Purpose Rossi α

Detectors in Top plug.

Be Block – 24 cm x 26.06 cm x 7 cm

A-2 Added 3rd ¼ # 17.

Sub critical.

Found Be Block to be too narrow (21 cm)

Stack pcs taped to 11 cm. (5 cm too narrow)

A-3 Same as Run A-1. Except Now Be Block = 24 x 26.06 x 7

Slight Poo with 3 b out.

A-4 Loading – 75¾ Fuel, 19¼ Steel, { 1 → 11, 20, 31, 18, 30, 42, 87, 95 + top ½ #17, #19 / 3rd ¼ #12

75¾
19¼ ∞ 3 b out

24 – 75¾ – 26

75½ pins = 50.49 Kg.

A-5 Removed 4th ¼ #12. A = 45 10/50

75½ ∞ 3 8 = 7⅜" D =

19½ Data Collection started @ 10:10 A C = 60 L-15

24-75½-26 Stopped 1:15 P BF_3 = 1 Reg/min

Time = 185 min

Lost Data - TMC

A-6 Repeat - Data Collection started @ 1:58 pm

Stopped @

Time =

Instruments same

STOP 4:55

DATE APR 13 1966 SAFETY CHECK

TIME 10:00 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	apr	2-5	10/1000	800	250
SOURCE DIST.	8"	ok	3'	14"	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	—			

SOURCES USED Pu Be + γ

TABLES ✓ LIGHTS ✓ ANNUNCIATED ✓

C.A. SORA Expr. XVI Run A-7

24 cm (85½) Date APR 13 1966 Time 10:10 AM

Purpose Rosie α [see p.167]

Nominal ~~Loading~~ Configuration

Be Block = 24cm x 11cm x 7cm

Detectors same as p.168

Loading - 85½ Fuel

9½ steel [1, 2, 3, 6, 7, 8, 9, 87 + 95 + top ½ #4]

∞ 3 b = 11" = 27.6 cm, +19.0 #

24-85½-11

Data Collection started @ 10:30 A

Stopped @ 3:35 P

5.0 x 10⁶

A =

D =

C =

BF₃ = 11 reg (x16)

N

APR 14 1966

DATE APR 14 1966 SAFETY CHECK

TIME 8:05 AM BY Taylor + Lyon

CHANNEL	A	C	D	D	E	F
RANGE	10/1000	off	L-15	10/1000	900	750
SOURCE DIST.	8"	ok	3'	1"	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
ASK OPS.	✓	✓	—			

SOURCES USED Pu Be + γ MARKERS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XVI Run A-8

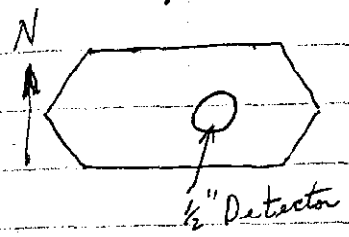
24 cm (84 3/4) Date APR 14 1966 Time 8:15 AM PM

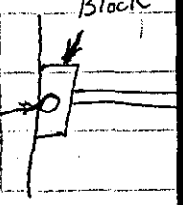
Purpose Rossi α (See p. 167) for condition

1/4" Detector centered at Window against Be Block

Be Block = 24 x 11 x 7

Top plug





A-8 - Loading - 84 3/4 Fuel

- 10 1/4 Fe [1, 2, 3, 4, 6, 7, 8, 9, 87, 95 + 4th 3/4 #5]

24-84 3/4-11

Data Collection started @ 8:48 AM

stopped @ 2:35 PM

A = 49 10/50

D =

C = 60 L-15

7.5×10^6

∞ 5b = 5 9/16" = 14.1 cm

+ 5.5#

BF_3 = 15 neg/min (x16)

APR 15 1966

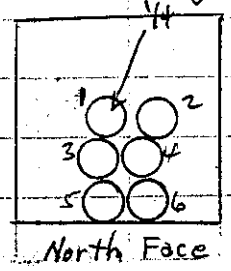
DATE APR 15 1966 SAFETY CHECK

TIME 8:10 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
GAINS	10/1000	opn	L-15	10/1000	900	750
SOURCE DIST.	8"	ok	3'	1"	4"	ok
% F. S. TRIP	90	–	100	90	100+	
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	–			

SOURCES USED PuBe + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓



C.A. SORA Expr. XVI Run A-9

24 cm (85) Date APR 15 1966 Time 8:15 AM PM

Purpose Rossi α

1/4" Detector in Beam Hole #1

Nominal Configuration

Be Block = 24 X 11 X 7

A-9 Loading – 85 1/4

9 3/4 [1, 2, 3, 6, 7, 8, 9, 87, 95 + 1st 3/4 #4]

24-85 1/4-11

Data Collection started @ ~~8:10~~ 10:12 AM

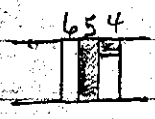
Stopped @ 3 15 PM

A = 50 12/100

D = 50 11/100

C = 60 (L-15)

BF_3 = 14/reg/min (X16)



∞ 3-b = 6 5/8"

6.4×10^7 =

APR 18 1966

DATE APR 18 1966

TIME 8:20 AM — Taylor & Lynn

CHANNEL						
RANGE	10/1000	Open	L-15	10/1000	900	750
SOURCE DIST.	8"	ok	3'	1	6"	ok
% F. S.	90	—	100	90	100+	—
BLDG. MONIT.	✓	✓	✓		—	—
AUX. CHAS.	✓	✓	—		—	✓
SOURCES USED	Pu Be & γ					
TABLES ✓		✓			CHARTS ✓	

C.A. SORA Expr. XVI Run A-10

24 Cm (85¼) Date APR 18 1966 Time 8:30 AM PM

Purpose Rossi α

¼" Detector on top of top plug.

Nominal Configuration

Be Block = 24 x 11 x 7

A-10 Same Loading -

Data Collection started @ 8:37 AM

Stopped @ 3:38 PM

A = 50 co/100

D = —

C = 60 L-(15)

BF_3 = 15 μg/min (x16

24-85¼-11

6.5×10^7

∞ Be ~~X~~ b = 6 5/8"

DATE APR 19 1966 SAFETY CHECK

TIME 12:25 ~~AM~~ PM BY Taylor + Lyon

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	L-15	10/1000	900	750
SOURCE DIST.	8"	ok	3'	14"	5'	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓	—	—	—
AUX CTRS.	✓	✓	—	—	—	—

SOURCES USED PuBe + γ MAGNETS ✓

~~TABLES~~ ✓ LIGHTS ✓ AREA CLEARED ✓

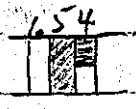
C.A. SoRA Exp. XV Run 5

24 Cm (85½) Date APR 19 1966 Time 12:35 ~~AM~~ PM

Purpose Top Plug Temp. Measurement

Nominal Configuration
BeBlock - 24 x 11 x 7

5. Loading - 85½ Fuel
9½ Fe [1, 2, 3, 6, 7, 8, 9, 87, 95 and 1st ½ #4]

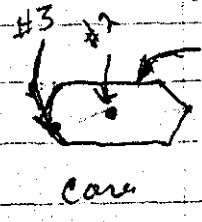


Temp = 25.5 °C.

Poo Period - Critic = 36.25 ¢

3:55 PM 6. Top Core Plug heated.

Thermocouple: 1) outside Reflector 25.5 °C
2) Center of Top Plug. 140° C
3) Edge of Top Plug. 124° C



Poo Period - Critic = 32.96 ¢

Change = - 3.29 ¢

19 april 66
Run 6, p.174

3.29 ¢
change

2	2		-	R	1	9	1	9	-
2	2		-	R	1	5	3	9	-
2	2		-	R	1	1	5	9	-
2	2		-	R	0	7	9	9	-
2	2		-	R	0	4	5	9	-
2	2		+	R	0	0	0	0	-
2	2		+	R	0	1	0	8	-
2	2		+	R	0	1	1	2	-
2	2		+	R	0	1	1	3	-
2	2		+	R	0	1	1	2	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	0	7	-
2	2		+	R	0	1	0	5	-
2	2		+	R	0	1	1	1	-
2	2		+	R	0	1	0	6	-
2	2		+	R	0	1	1	3	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	0	6	-
2	2		+	R	0	1	1	3	-
2	2		+	R	0	1	0	9	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	1	1	-
2	2		+	R	0	1	0	9	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	0	9	-
2	2		+	R	0	1	0	5	-
2	2		+	R	0	1	0	8	-
2	2		+	R	0	1	1	1	-
2	2		+	R	0	1	0	3	-
2	2		+	R	0	1	0	5	-
2	2		+	R	0	1	1	1	-
2	2		+	R	0	1	0	7	-
2	2		+	R	0	1	0	7	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	1	1	2	-
2	2		+	R	0	1	1	0	-
2	2		+	R	0	2	2	0	-
2	2		+	R	0	3	0	9	-
2	2		+	R	0	3	3	5	-
2	2		+	R	0	3	2	8	-
2	2		+	R	0	3	2	7	-
2	2		+	R	0	3	2	7	-
2	2	96	+	R	0	3	2	8	-
2	2		+	R	0	3	3	0	-
2	2	32	+	R	0	3	3	2	-
2	2		+	R	0	3	3	2	-
2	2		+	R	0	3	3	0	-
2	2		+	R	0	3	2	7	-
2	2		+	R	0	3	2	5	-
2	2		+	R	0	3	3	0	-
2	2		+	R	0	3	3	2	-
2	2		+	R	0	3	2	9	-
2	2		+	R	0	3	3	4	-

2	2	+	R	0	1	0	8	.	-
2	2	+	R	0	1	1	1	.	-
2	2	+	R	0	1	0	3	.	-
2	2	+	R	0	1	0	5	.	-
2	2	+	R	0	1	1	1	.	-
2	2	+	R	0	1	0	7	.	-
2	2	+	R	0	1	0	7	.	-
2	2	+	R	0	1	1	0	.	-
2	2	+	R	0	1	1	0	.	-
2	2	+	R	0	1	1	2	.	-
2	2	+	R	0	1	1	0	.	-
2	2	+	R	0	2	2	0	.	-
2	2	+	R	0	3	0	9	.	-
2	2	+	R	0	3	3	5	.	-
2	2	+	R	0	3	2	8	.	-
2	2	+	R	0	3	2	7	.	-
2	2	+	R	0	3	2	7	.	-
2	2	+	R	0	3	2	8	.	-
2	2	+	R	0	3	3	0	.	-
2	2	+	R	0	3	3	2	.	-
2	2	+	R	0	3	3	2	.	-
2	2	+	R	0	3	3	0	.	-
2	2	+	R	0	3	2	7	.	-
2	2	+	R	0	3	2	5	.	-
2	2	+	R	0	3	3	0	.	-
2	2	+	R	0	3	3	2	.	-
2	2	+	R	0	3	2	9	.	-
2	2	+	R	0	3	3	4	.	-
2	2	+	R	0	3	2	9	.	-
2	2	+	R	0	3	2	7	.	-
2	2	+	R	0	3	2	9	.	-
2	2	+	R	0	3	3	6	.	-
2	2	+	R	0	3	3	0	.	-
2	2	+	R	0	3	2	5	.	-
2	2	+	R	0	3	2	8	.	-
2	2	+	R	0	3	3	0	.	-
2	2	+	R	0	3	2	9	.	-
2	2	+	R	0	3	3	5	.	-
2	2	+	R	0	3	2	8	.	-
2	2	+	R	0	3	2	9	.	-
2	2	+	R	0	3	2	8	.	-
2	2	+	R	0	3	2	0	.	

32.96

19 april 66
Run 5, p. 174

+36.25 ¢

2	2		+	R	0	3	6	1	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	6	0	.
2	2		+	R	0	3	6	1	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	6	0	.
2	2	+36.25¢	+	R	0	3	5	9	.
2	2		+	R	0	3	6	2	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	6	0	.
2	2		+	R	0	3	6	3	.
2	2		+	R	0	3	6	4	.
2	2		+	R	0	3	6	0	.
2	2		+	R	0	3	6	6	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	0	.
2	2		+	R	0	3	6	6	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	2	.
2	2		+	R	0	3	5	9	.
2	2		+	R	0	3	5	7	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	6	4	.
2	2		+	R	0	3	7	0	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	5	8	.
2	2		+	R	0	3	6	6	.
2	2		+	R	0	3	6	9	.
2	2		+	R	0	3	7	0	.
2	2		+	R	0	3	5	6	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	5	.
2	2		+	R	0	3	7	0	.
2	2		+	R	0	3	6	7	.
2	2		+	R	0	3	6	3	.

DATE APR 20 1966 SAFETY CHECK
TIME 9:00 BY Taylor + Lynn

CHANNEL					
RANGE	10/500	opr	L-15	10/1000	900	750
	8"	ok	3'	2"	5"	ok
	90	—	100	90	100+	—
	✓	✓	✓			
	✓	✓	—			

SO [illegible] Pulse + δ MARKERS ✓
TABLES ✓ ✓ [illegible] ✓

C.A. SORA Expr. XVI Run A-11
24 cm (77) Date APR 20 1966 Time 9:50 AM PM
Purpose Rossi α
Detectors in Top Plug - See p.168
Nominal Configuration
Be Block = 24 X 21.08 X 7

A-11 77 - Fuel
18 - Fe, Sub Critical.

A-12 77¼ - Fuel
17¾ - Fe [1→11, 17, 20, 30, 87, 95, - 2nd ½ #19, 1st ½ #31, + ~~3rd~~ ¾ #42]
Sub Critical

#1 = 23.318
#2 = 23.318

A-13 Added 3rd ¼ #42.
77½ Data Collection started @ 10:42 AM A = 46 10/100
17½ Stop 3 38 PM C = 61 (L-15)
Fe 3-b = 10 7/16"

1a

Check Log 71.3, 12,46 ‡

BF₂ 1) 77.5 sec 11.72 ‡

2) 74.9 12,02 ‡

3) 73.6 12,18 ‡

Litt = 11.78 ‡

APR 21 1966

SAFETY CHECK

DATE APR 21 1966 BY Taylor + Lynn

TIME 12:20 ~~AM~~ PM

	A	B	C	D	E	F
CHANNEL	10/100	opr	L-15	10/100	900	750
RANGE	8'	OK	3'	2"	5	OK
SOURCE DIST.	90		100	90	100	—
% F. S. TRIP	✓	✓	✓			
CHG. ALARM	✓	✓				

MAGNETS

AREA CLEARED

TABLES

Titanium

C.A. SoRA Expr. XVII Run 1a

24-87-11 Date APR 21 1966 Time 12:45 ~~AM~~ PM

Purpose Reactivity Measurements
Ti + Fe
Nominal Config.
Be Block = 24 x 11 x 7

24 Cm Fuel Wt
87 No. of Fuel Pins
11 Be Block Width

1a Loading – 87 Fuel, 7 Fe, + 1 ~~Test~~ Test.

87
7
1

Pos Period 15.87¢ Rod Fe 3b out

1b – Loading – 86 3/4 Fuel, 1 ~~Test~~ Test #48

7¼ Fe [1, 2, 7, 8, 9, 87, 95 + 1st 3/4 #3]

#48 – 30 cm x .501" Fe

~~Fe 3b in~~

Fe 3b out = + 3.92¢

up #1 = 23.315'
#2 = 23.329
#3 = +4
#4 = –12

1c #48 – 30 cm x .508" Ti = Pos Period = 5.31¢

(Void) Ti out = Neg Period = –1.66¢

+ 5.31
+ 3.92 vs Fe #48

Ti = + 1.39¢

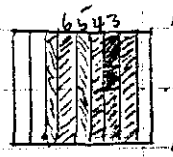
Fe = 5.58¢ Ti = 6.97¢

Fuel #6 - Removed 1, 2 + 4th (1/4)

1d. Test # 51 - Fe in Pos Period + 8.43¢
e Ti in " + 8.46
f Ti out (void) Neg. Period - 1.15

Ti = Fe Ti = + 9.61¢
Fe = 9.58¢

1g. Test # 91 - Removed 3rd 1/4 #6



1f Fe in Pos Period + 13.16¢
1h Ti in " + 8.96¢
1i Ti out (void) Neg Period - 6.15

Ti = 15.11¢

Ti vs Fe = - 4.20¢ Fe = 19.31

1j. Test # 71 - Added 1st 3/4 #6

J Fe in Pos Period + 13.06¢
K Ti in " + 13.17¢
L Ti out (void) " + 2.37¢

Ti = 10.80¢

Ti = Fe Fe = 10.69

APR 22 1966

DATE APR 22 1966 **SAFETY CHECK**

TIME 8:10 AM ~~PM~~ BY Taylor + Lyman

	A	B	C	D	E	F
CHANNEL						
RANGE	10/1000	~~cpm~~	4-15	10/1000	900	750
SOURCE DIST.	8"	ok	4'	2"	5"	ok
% F. S. TRIP	90		100	90	100+	✓
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

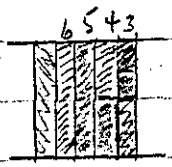
SOURCES USED Ra Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XVII Run 1M

[24.- -11] Date APR 22 19 1966 Time 8:20 AM PM

Purpose Con't Reactivity Measurements



Removed 1st 3/4 #6 + 2nd 1/2 #4 Check

1m Test #53 Pos Period Log N = 38.0 pc, 19.1 ¢

m) Fe in + 4.53 ¢ BF3 1) = 44.3 " 17.4 ¢

n) Ti in + 2.82 2) = 41.7 " 18.05

o) Ti out (void) − 7.57 3) = 44.3 " 17.4

Ti = 10.39 ¢ Fe = 12.10

Ti vs Fe = −1.71 ¢

1p Test #18 — No Fuel Change

1p Fe in + 3.62 Ti = +12.81

q Ti in + 2.15 Fe = 14.28

r Ti out (void) − 10.66 Ti vs Fe = −0.47 ¢

Fuel change - added 4th 1/4 #3

1s Test #5 Fe in + 3.27 #
t) Ti in + 1.93
u) Ti out (void) − 13.80
Ti = 15.73 #
Ti vs Fe = − 1.34 # Fe = 17.07 #

1v Test #78 added 4th 1/4 #4
v Fe in + 9.40
w Ti in + 6.87 Ti vs Fe = − 2.53
x Ti out (Void) − 7.64
Ti = 14.51
Fe = 17.04

1:00 pm 1y Test #45 − added 2nd 1/2 #6 Ti vs Fe = + 0.61
y Fe in − 4.30 #
2a Ti in − 3.69 Ti = 9.38 #
b Ti out (void) − 13.07 Fe = 8.77 #

2c Test #25 − added 3rd 1/4 #4, 4th 1/4 out
2c Fe in − 2.13 #
d Ti in − 3.74 #
e Ti out (Void) − 13.30
Ti = 9.56 #
Fe = 11.17 #

APR 25 1966

DATE APR 25 1966 SAFETY CHECK

TIME 1:00 ~~AM~~ PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10 1000	opn	1-15	10 1000	900	7050
SOURCE DIST.	9"	ok	30"	2"	5"	ok
% F. S. TRIP	90	—	100	90	100+	
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XVII Run A-1

24-89-10/31/11 Date APR 25 1966 Time 1:15 ~~AM~~ PM

Purpose Block Studies

Be Block = 10.16 X 10.95 X 7.3 cm
(4" X 4 5/16" X 2 7/8")

A-1 Loading – 89
6 [1, 2, 8, 9, 87 + 95]

Sub crit

A-2 Added – 2nd ½ # 2 Fuel

89½
5½

Pos Period – ~~10~~ + 20.45¢

Pulled Block Away – ¢ 2.45 ¢

Block at Center of Window Block = 2.66

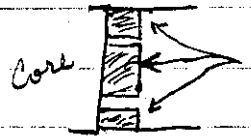
A-3 Added – 2nd ½ #8 Fuel. (30¢)

Block on bottom At blade. 20.3"

Sub critical Peak Reacting

90
5

A-3 Loading - 87½ Fuel
7½ Fe [1, 2, 3, 8, 9, 87, 95, 1st ½ #7]

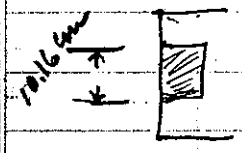


vs Run A-2 added 2½" at top (2½ X 2⅞")
2" at Bottom (2" X 2⅞")

Poo Period - +16.3¢
Pulled Block - $2.834
Block = $3.00

A-4 Loading - 90½
4½ [1, 8, 87 + 95]
4th ¼ #2 + #7

added 1" X 4 5/16" X 2⅞" to [A-2 Block]
Be Block at center [10.16 cm X 13.5 cm X 7 cm]



Poo Period +22.77¢
Pulled Block - $3.033
Block = $3.26

APR 2 9 1966

DATE APR 2 9 1966 SAFETY CHECK

TIME 10:45 AM PM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opn	L-15	10/1000	900	750
SOURCE DIST.	9"	ok	3'	2"	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
ADX CTRS.	✓	✓	✓			

RADIOISOTOPES USED PuBe + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SoRA Expr. XVII Run A-5

24-90½-12.7cm/11 Date APR 2 9 1966 Time 10:33 AM PM

Purpose Be Block Studies

A-5 Same amount Be as for A-4

Block = 12.7 cm X 10.95 cm X 7.3 cm

Core  12.7cm at center of window

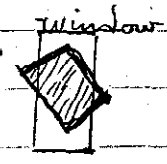
Poo Period + 35.53#

Pulled Block − # 3.085

BLOCK = # 3.44

A-6 Same Block as A-5

oriented diagonally with window



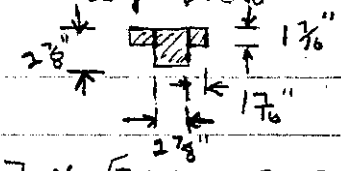
Poo Period + 18.34#

Pulled Block − # 3.021

BLOCK = # 3.20

Removed 3rd ¼ # 2 + #7

Top View



A-7 Same material as - A-5

89 } Centered in window
5 }

Block = 12.7 cm x [14.6 x 7.3] X [3.65 x 7.3 x 3.65]

Poo Period + 41.72 ¢

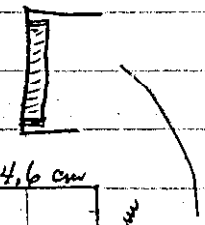
Pulled Block − $3.52 Block = $3.94

A-8 Removed 1st ½ #3 + #7 and ¼ #6

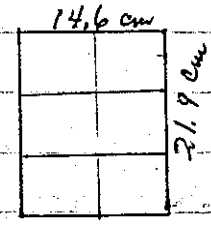
Same material as A-2.

87 ¾ Be Block = 21.9 cm X 14.6 cm X 2.54 cm
7 ¼ (8 ⅝" X 5 ¾" X 1")

Sub crit



A-9 Added 4th ¼ # 6 + #2



88 ¼
6 ¾ [1, 7, 8, 9, 87, 95

Poo Period + 17.54 ¢

Pulled Block − $4.139 BLOCK = $4.31

APR 27 1966

DATE APR 27 1966 SAFETY CHECK
TIME 12:45 AM/PM BY Taylor + Lyons

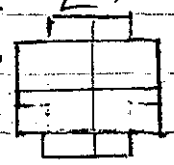
CHANNEL	A	B	C	D	E	F
RANGE	10/100 opr					
SOURCE DIST.						
% F. S. TRIP						
BLDG. ALARM						
AUX CTRS.						

SO RODS USED _____ MAGNETS _____
TABLES _____ LIGHTS _____ AREA CLEARED _____

C.A. SORA Expr. XVII Run A-10
24-. _____ Date APR 27 1966 Time _____ AM PM
Purpose Block Studies.

A-10 Loading – 88 ½
6 ½ [1, 7, 8, 9, 87, 95 + 1st ½ #2]

Be Block –



Same as A-9 except 1 7/16" Square removed from Corners

Pos Period + 24.63 #
Pulled Block = – #3.56
Block = #3.81

A-11 Replaced normal block shield (49#) with 1" thick Be supported by ¼" al.
Same Block as A-10.
Pos Period + 46.58 #
Pulled Block – #3.334
Block = #3.80

APR 2 1966

APR

DATE APR 28 1966	SAFETY CHECK					
TIME 1:25 ~~AM~~ PM	BY Taylor Lynn					
CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	L-15	10/1000	900	750
SOURCE DIST.	10"	ok	3'	2"	5"	ok
% F. S. TRIP	90	–	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED PaBe + γ			MAGNETS		✓	
TABLES ✓	LIGHTS ✓		AREA CLEARED —			

C.A. SORA Expr. XVII Run A-12

Date APR 28 1966 Time 1:45 ~~AM~~ PM

Purpose Rossi α

Detectors in top plug ½" S, ¼" N

Be Block as per A-10

Loading – 88 3/4

6 1/4 [1, 8, 9, 87, 95, 1 at ½ # 2 and 1 at 3/4 #7]

∞ Fe 3 b = 10"

(a) Log N = —

A = 42 10/100

D = 32 100/25

C = 61 L-15

BF_3 = 2.5 Reg

(x256) 3.7 "

1.8 "

Bgd = 64 Pk/Bgd = 32.8

Peak = 2100

(b) Log N = .0003

A = 42 100/100

D = 32 100/200

C = 61 L-22

BF_3 = 55.3 Reg

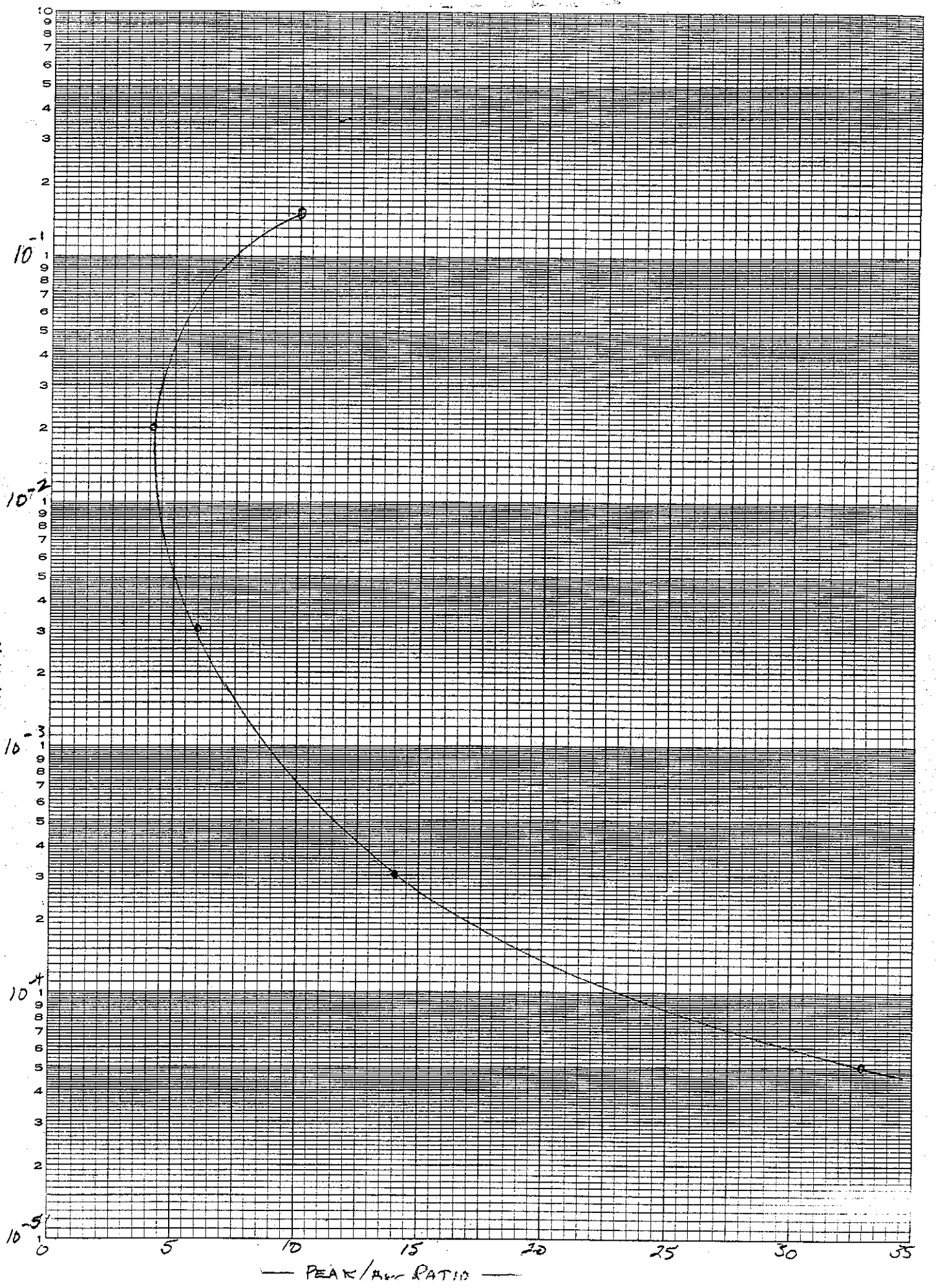
75.6 "

39.1 "

Bgd = 142 Pk/Bgd = 14.1

Peak = 2000

Rossi Alpha Peak to Background (Vs SCRA Power level.



APR 29 1966

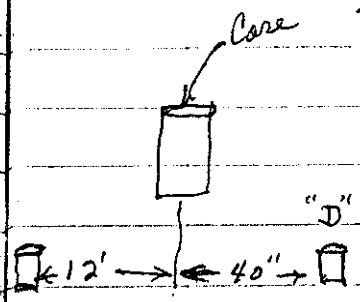
DATE APR 29 1966 SAFETY CHECK

TIME 8:45 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
GAUGE	10/1000	opr	415	10/1000	900	750
SCALER DIST.	9"	ok	3'	2"	5"	ok
[illegible] TRIP	90	—	100	90	100+	—
[illegible] ALARM	✓	✓	—			
[illegible] CHKS.	✓	✓	✓			

SOURCES USED Pu Be + γ ✓

TABLES ✓ LIGHTS ✓ AREA [illegible] ✓



C.A. SORA Expr. XVII Run A-12

Date APR 29 1966 Time AM ~~PM~~

Purpose Rossi L

Same as p. 186

(c) Log N = .003

A = 32 $\frac{1000}{100}$

B = 81 $\frac{1000}{100}$

C = 60 H-10

Bgd = 337

Peak = 2048

BF_3 – 1) 279.6

2) 630

3) 340.5

Cette 1.9 $\times 10^{-9}$

$\frac{Pk}{Bgd}$ = 6.1

(d) Log N = .02

A = 22.2 $\frac{1000}{100}$

B = 37.5 $\frac{1000}{1000}$

C = 74 H18

Bgk = 476

Peak = 2048

BF_3 1) = —

2) = 165.6 2.62

3) = 234.8 4.03

Cette = 1.9 $\times 10^{-8}$

$\frac{Pk}{Bgd}$ = 4.1

10:50 AM & Add cd around "D" Chamber.
Add cd around and 3" paraffin in front of "A"

Log N = 1.15 Alarms A = 750
"A" = 77 $\frac{1000}{500}$ B = 280
D = 25 $\frac{1000}{500}$ C = 325
C = 46 H-28
E = 1 690 V BF_3 2) = 335
F = 7.6 750 V

Bgk = 20 $\frac{Pk}{Bgd}$ = 10
Peak = 191

C.A. SORA Expr. XVII Run A-13
24 - 89¼ - 7" dia Date APR 29 1966 Time 1:15 ~~AM~~ PM
Purpose More Block Studies
Center of Window
Be Block = 7" dia disc, 1" Thick
18.54 cm dia, ~~269.96 cm²~~

A13 Loading - 89¼ 686 cm³
5¾ [1, 9, 87, 95, 1st ½ #2, #8, 6, 3rd ¼ #7

(a)

Pos Period - + 37.07 ¢
Pulled Block - - #3.185 Block = #3.55

(b) Be Block - 7" dia x 1¼" Thick
269.96 cm²
758 cm³

Loading - 88½
6½ [1, 8, 9, 87, 95, 1st ½ #6, 1st ¾ #2 + 3rd ¼ #7

Pos Period - + 29.88
Pulled Block - - #3.715 Block = #4.01

(c) Be Block - 7" dia x 15/16" Thick
269.96 cm²
643.[illegible] cm³

Loading - 89½
5½ [1, 9, 87, 95, 1st ½ #6, 1st ¾ #2, 3rd ¼ #7]

Pos Period + 27.90 ¢
Pulled Block - #3.10 Block = #3.37

MAV

30 cm fuel = 836.07 gms.

87

8

1

29 (30 cm fuels) = 24.246 Kg.

8

MAY 2 1966

30 cm Core

DATE MAY 2 1968 SAFETY CHECK

TIME 10:45 AM Taylor + Lynn

	A	B	C	D	E	F
CHANNEL						
RANGE	10/1000	off	L-15	10/1000	900	250
SCALE DIST.	3"	ok	3'	0	5"	ok
SCR. STRIP	90	—	100	90	100+	—
ALARM	✓	✓	✓			
GAS.	✓	✓	✓			

cd "A + D"

RODS USED Pu Be + x MAGNETS ✓

CABLES ✓ LIGHTS ✓ AREA CLEARED ✓

30 cm fuel = 836.03 gms.
24 cm " = 668.86 "

C.A. SoRA Expt. XIII Run 1a

30-85-7" dia Date MAY 2 1966 Time AM PM

Crit Condition with
1st three rows of fuel
30 Cm high, exp of #90 (24 cm)
Be Block = 7" dia x 1" Thick

1a Loading - 85 fuel, 1 void (#20)
9 Fe. [1 → 9]

Sub Crit

87 8 } 1b Added #5 + #20 Sub Crit.

c Added #4 + #6 Be #5 = 6 15/16" = 17.6 cm

89 = 64.4 Kg } Pos. Period + 26.90 #
6 } Pulled Be Block − 3.156 #

Block = 3.43 #

Next page

1:00 PM d. Removed 3rd 1/4 #6 — Super Be #5 = 6"

e Removed 1st 1/2 #6 — ∞ Be #5 = 6 1/4"

88 1/4 } 6 3/4 }

7" dia X 1" thick Blocks

1e Removed 1st ½# #.
u = 87 ¾ — 63.54 Kg.
Fe = 7 ¼ — 1, 2, 3, 7, 8, 9, 1st ½ #4, + 1st ¾ #6]

Pos Period = +19.32 ¢
Pulled Be Block — #3.513 Be Block = #3.71

f Block = 7" dia x 1" thick Polyethelene
88 ½
6 ½ Slight Pos.

g 88 ¾ u = 64.21 Kg.
6 ¼ Fe [1, 2, 7, 8, 9, 1st ¾ #3, + 1st ½ #6]

Pos Period +18.54
Pulled Block — 2.734 Poly Block = #2.92

h 89 ¼ u = 64.54 Kg.
5 ¾ Fe = [1, 2, 7, 8, 9, 1st ½ #3 + 4th ¼ #3]
Block = 7" dia x 1" thick graphite

Pos Period = + 16.98 ¢ Graphite
Pulled c Block — #2.33 Block = #2.50

i. Fe Block = 7" dia x 1" thick

$89\frac{3}{4}$ = 64.88 Kg.

$5\frac{1}{4}$ = [1, 2, 7, 8, 9, 3rd $\frac{1}{4}$ #3]

Pos Period + 27.59 ¢

Pulled Fe Block − $1.99 Fe Block = $2.27

j. Block = ½" C + ½" Be, 7" dia
carbon facing window

$88\frac{3}{4}$ # = 64.21 Kg.

$6\frac{1}{4}$ Fe [1, 2, 4, 7, 8, 9 + 3rd $\frac{1}{4}$ #3]

Pos Period + 10.01 ¢

Pulled Block − $2.755 ½+½ Block = $2.86

MAY 4 1966

DATE MAY 4 1966 SAFETY CHECK

TIME 9:55 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RAUSE	10/1000	off	1.15	1/100	900	750
SOURCE DIST.	1"	ok	3'	4'	5'	8k
% F. S. TRIP	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be & γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

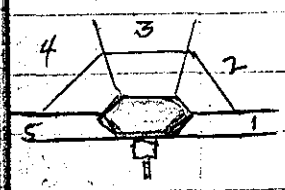
C.A. SORA Expr. XVIII Run 2A

24/30 – 89 – 7" dia Date MAY 4 1966 Time 10:05 AM ~~PM~~

Purpose Reflector evaluations

Removed Outer pcs of Fe, Section #2, 3 + 4.

Be Block = 7" dia X 1" Thick



2A Loading – 89 1/4
5 3/4

Super Crit #1 = 22.3

2B Loading – 88 3/4
6 1/4 [1, 2, 3, 7, 8, 9 + 3rd 1/4 #4]

Super Crit > 40 ¢

2C Loading – 88 1/4
6 3/4 [1, 2, 3, 7, 8, 9 + 1st 1/2 + 4th 1/4 #4]

Pos Period + 26.2 ¢

Pulled front section of Section #3 – $5.59

Front Section #3 = $5.85

24/30 – 88 1/4 – 7" dia

2D. Same
Pos Period + 23.3 ¢
Pulled Be Block (7"x1") — ¢3.31 Block = ¢3.54

12:55 PM E. Moved Front Section #3 back 1/4" ←
Used reflector to get power
1/4" Neg Period −39.85 ¢ 23.3 / 39.85
1/4" Move = 63.15 ¢

{88 3/4 / 6 1/4} F. Add 2nd 1/2 # 7 Fuel. Move Front Sect. #3 another 1/4"
Same reflector used.
1/2" Pos Period + 17.56 ¢
Neg Period − 61.62 ¢

G. Placed front section @ 1/4". as Run E.
Neg Period − 12.11 ¢
1st 1/2 #7 Fuel = 27.74 ¢
Then 1/2" Move = 112.66 ¢
Move

{89 1/4 / 5 3/4} H. Add 1st 1/2 #7 Fuel [27.74 ¢]
Placed front sect. #3 at 3/4".
3/4" Neg. Period −86.10 ¢
Then 3/4" Move = 164.8 ¢

I. Be Block 7" dia x 2" Thick
Loading − 87 Fuel, 8 Fe [1, 2, 3, 4, 5, 6, 7, 8 + 9]
Super > 50 ¢

Be Block = 2"

2J. Loading – 86 ½

2/30 – 86½ – 7" dia x 2" thick 8 ½ [1, 2, 3, 4, 6, 7, 8, 9 + 1 at ½ #5]

Poo Period +43.29 ¢

Pulled Block –$4.59 Block = $5.02

K. Loading – 87 ¼

7 ¾ [1, 2, 3, 6, 7, 8, 9 + 1 at ¾ #4]

Be Block = 1½"

Poo Period = +34.58 ¢

Pulled Block –$4.137 Block = $4.48

MAY 5 1956

MAY 5 1956 SAFETY CHECK

TIME 8:50 AM BY Taylor + Lyman

CHANNEL		H				F
GAUGE	10/1000	open	2-15	1/1000	900	750
[illegible]	1"	ok	3'	4"	5"	ok
[illegible]	90		100	90	100+	–
[illegible]	✓	✓	✓			
[illegible]	✓	✓	✓			✓

[illegible] Pu Be + γ [illegible]

CABLES ✓ LIGHTS ✓ [illegible] ✓

CA SoRA Expr. XVIII Run 3A

24/30 – 88¼ – 7" dia Date MAY 5, 1956 Time 9:05 AM ~~PM~~

Purpose Reflector Evaluation

Be Block – 7" dia X 1" thick

Back of Section 2, 3, + 4 off.

3A Loading – 88¼

6¾ [1, 2, 3, 7, 8, 9 + 1st ½ + 9th ¼ #4]

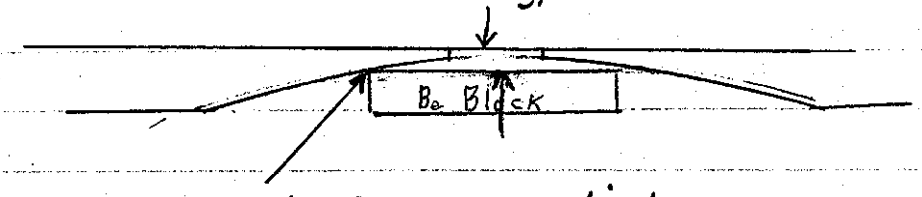
Scram Pushed – to keep power level down Volt on "E" still up.

10:10 B. Pos Period – + 30.11 ¢

Pulled front of Section 2 – –3.097

5.5 mm front # 2 = #3.40

See p. 194



Measurements for radial block movements made at this point

0 = 30.11 ¢

3c. Moved Block back 50 mils (1.27 mm)
Pos Period = 23.71 ¢

Change
7.48 ¢
7.48

D Block back 100 mils (2.54 mm)
Pos Period = 13.76 ¢

9.95 ¢
17.43

E. Block @ 0 Pos Period + 31.19 ¢

F. Add 2nd ½ #3 Fuel - vs Run D.
88 3/4
6 1/4
Pos Period = 48.57 ¢
½ #3 = 34.82 ¢

21.58
38.99

G. Block back 205 mils (5.2 mm)
Pos Period = 26.99 ¢

H Added 1st ½ #3 Fuel (34.82 ¢)
Block back 425 mils (10.7 mm)
Pos Period = 24.89 ¢

36.92 ¢
75.91

I Block back 585 mils (14.73 mm)
Pos Period = 5.44 ¢

19.45
95.36

24 cm Core

MAY 6 1966

SAFETY CHECK						
DATE MAY 6 1966						
TIME 8:30 AM	BY Taylor + Lyon					
CHANNEL	A	B	C	D	E	F
RANGE	10/100	off	2-15	1/100	900	750
SOURCE DIST.	1"	ok	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100	—
HIGH ALARM	✓	✓	✓			
AUX CTRS.	✗	✓	✓			
SOURCES USED Pu Be + γ			MAGNETS		✓	
TABLES ✓		LIGHTS ✓		AREA CLEARED ✓		

CA SORA Expr. ~~XIX~~ Run A-1

24-86½-16 Date MAY 6 1966 Time 9 AM PM

Purpose Crit. Cond.

All Fe

Back of Sections 2, 3 + 4 off. ✓

Fe Block = 24 x 16 x 7

A-1 Loading 84¼ Sub crit

10 ¾

2 " 85¼ Sub crit

9 ¾

3 " 86¼ Sub crit

8 ¾

4 Loading 86½ + [6 cm extra in #95] (30 cm)

8½ [1, 2, 3, 4, 6, 7, 8, 9 + 1 ½ #5]

Poo Period + 26.03 ¢

Moved Block away − 5.00

Block Fe, 16 cm = 5.26

C.A. SoRA Expr. XIX Run: B-1
24-86½-16 Date 6 may 1966 Time 10:05 AM ~~PM~~
Purpose Run α
Detector in top plug.
Fe Block = 24 x 16 x 7

B-1 Changed top plugs.
Added 4th ¼ #4 – Positive with 3b out.

2 Loading – 86½ (30 cm in #9.5)
8½ [1→4, 6→9 + 1st ½ #5]

∞ 3 b = 10½"

Cd Removed from "A+D"
A = 57 10/1000
D = 50 10/1000
C = 66 L-15

Start 10:45 AM
Stop. 3:45

MAY 9 1966

DATE MAY 9 1966 SAFETY CHECK

TIME 9:18 BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	L.15	10/1000	900	750
SOURCE DIST.	8"	OK	3'	3"	5"	OK
% F. S. TRIP	90		100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pa Be + γ ALL CTS ✓

TABLES ✓ UNITS ✓ ALL PURPOSED ✓

C.A. SORA Expr. XIX Run C-1

24-86½-16 Date MAY 9 1966 Time 9:25 AM ~~PM~~

Purpose Reactivity Check
Removed the bar from
bottom #95 =
Fe Block = 24-16-7

C-1 Loading – 86½
8½ [1, 2, 3, 4, 6, 7, 8, 9 + 1st ½ #5] (35)

Pos Period = + 20.70

Moved Block away = – $4.967

Block = $5.17

C.A. SORA Expr. XIX Run D-1
24-
Date 9 May 1966 Time 1:08 AM/PM
Purpose Fine traverse about center with 7" dia x 1" thick Be Block
Nominal Configuration except back sect 2,3 + 4 off

D-1 Loading - 88 1/2
6 1/2 Sub Crit.

2 Loading - 90 1/2 Be #1 = 6 3/8" +30 ¢
4 1/2 Super > 50 ¢

3 " - 70 Be #1 = 5 1/8" +30 ¢
5 Super

4 " - 89 3/4
5 3/4 [1, 2, 8, 1 at 1/2 # 7 + 1 at 1/2 + 4 at 1/4 #3]

[24-8934 - 7" dia]

4a Block ◎ 0 mm +39.98 ¢
b " ◎ -4.3 " -5.18 ¢

5a " ◎ -.25 mm = +40.08 ¢
b ◎ -3.5 " = +10.03

[24]

6a " ◎ +0.3 " = +39.23 ¢
b " ◎ 3.5 " = +0.90 ¢

7a	Block	⊗	+0.6 mm	= +37.75 ¢
	+	⊗	+1.65 "	= +28.81 ¢
8a	"	⊗	−0.75 mm	+39.17 ¢
9a	"	⊗	−1.05 mm	+37.97 ¢
	"	⊗	−2.60 "	+23.93 ¢
10a	"	⊗	0	+39.81 ¢

Block moved away −#3.256

Block = #3.65

7"x1" Be

DATE MAY 10 1966 SAFETY CHECK

TIME 10:15 BY Taylor + Lynn

CHANNEL		G	C	D	E	F
RANGE	10/1000	opr	475	10/1000	900	750
SOURCE DIST.	3"	OK	3'	1"	5"	OK
% F. S. TRIP	90		100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	—	✓	✓			

SOURCES USED PuBe + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

5

C.A. SORA Expr. XIX Run F-1

24-90-7" dia Date 10 May 1966 Time 10:25 AM ~~PM~~

Purpose Base Run for Vertical Block traverse.

Be Block = 7" dia x 1" thick

F-1 Block in Contact with window + Centered.
Removed top block shield (Al - 3 cm x 20 cm x 70 cm)
Pos. Period + 29.45 ¢

{90, 5}

F-2 Removed 4th 1/4 #3
Mounted Be Block on rod drive. Centered
Rod travel = 45 cm
Time = 26.4 sec
Pos Period = 15.80 ¢

{89 3/4, 5 1/4}

24-89 3/4-7" dia

Made vertical traverse + repeated
see tapes from Pitle

Block Centered – Bottom = 4 cm from bottom shield plate

Block Down Position – Bottom = 0.3 cm from bottom shield plate

∞ Block Bottom = 7.3 cm from bottom shield plate.

MAY 11 1966

DATE MAY 11 1966 SAFETY CHECK

TIME 8:25 BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
TYPE	10/1000	opr	L-15'	10/1000	900	750
CHANGE DIST.	3"	OK	6'	1"	6"	OK
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	—	✓	✓			

SOURCES USED Pu Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. ~~XIX~~ Run E-1

24-89½-7" dia Date MAY 11 1966 Time 8:35 ~~PM~~ AM

Purpose Rossi α

Nominal Conf.

Be Block = 7" dia x 1" thick

E-1 Loading – 89½ fuel

5½ Fe [1, 2, 8, 9, + (1st ½ + 4th ¼ #7 + #3)]

Data started 8:50 AM A = 75 10/50

stopped occassionally for adjustment D = –

Down 3:43 PM C = 70 L-10

MAY 12 1966

DATE MAY 12 1966 SHIFT CHECK

TIME 12:50 PM BY Taylor + Lyons

CHANNEL	B			E	F
RANGE	10/1000	opr	5W	10/1000	900	750
SHIFT	3'	OK	3'	0	5"	OK
[illegible]	90	—	100	90	100†	—
[illegible]	✓	✓	✓			
[illegible]	—	✓	✓			
SUPPLIES	Pu Be + γ					✓
TABLES ✓	LOGS ✓					✓

C.A. SORA Expr. XX Run A1

24 — -23.7 Date MAY 12 1966 Time 12:55 AM/PM

Purpose Fine traverse about center with Be Block - 24X23.7X7 Nom. Configuration

(Before p. 189)

A1 Back Sections 2, 3 + 4 on.

Be Block = 16 cm + 1" thickness on east side + 2" thickness on West side. or 23.7 cm wide.

Loading = 76 fuel

19 Fe P_∞ = ~ + 5 ¢

2 Loading = 76 1/4 U (14)

18 3/4 Fe [1 → 11, 18, 20, 30, 42, 87, 95, 31]
2nd 1/2 # 19
4th 1/4 # 17

24-76 1/4-23.7

P_∞ Period — 29.32 ¢

Mond Block out $5,383 (x20) = 10,766

Block = $11.05

Be Block - 24 X 23.7 X 7

A-3

3a	Block = 0 cm		+ 29.61
b	" = +0.25 cm		+ 28.12
c	" = -1.5 cm		+ 20.34
d	" = +0.8 cm		+ 22.06
e	" = -0.65 cm		+ 29.10
f	" = +1.8 cm		0.0
~~g~~	~~" = 0.65 cm~~		~~29.10~~
g	" = -0.15 cm		+ 29.98
i	" = -2.60 "		-7.26
2:10 PM j	" = -0.4 "		+ 30.03
k	" = -2.05 "		+ 6.80 ?

part 1
=

MAY 16 1966 Taylor + Lyme

CHANNEL	A	B				
RANGE	10/1000	open	L-15	10/1000	900	750
SH	3"	OK	31	0	5"	OK
P	90	—	100	90	100+	—
	✓	✓	✓			
	—	✓	✓			
	Pu Be + γ					✓
TA	✓		✓			✓

CA SORA Expr. XXI Run A-1
24- -16 Date MAY 16 1966 Time 9:20 AM ~~PM~~
Purpose Critical Condition
All FE Condition

Fe Block = 24X16X7

A1 Back Sections of Sections 2, 3 + 4 off -
Al Shields for Block off.
3 mm X 48 cm X 1 m - Plate = Fe
Loading - 86 u + 9 Fe Sub Crit.

A-2 Loading - 86 ½ u
8 ½ Fe [1, 2, 3, 7, 8, 9, 87, 95 + ½ #7]
Pos Period = + 8.52 ¢
Moved Block Away = - #4.686 Block = #4.77

A-3 Loading = 87 u
8 Fe [1, 2, 3, 7, 8, 9, 87 + 95]
part ½ #7
= 40.5 ¢ Pos Period = 49.0 ¢
Moved Block Away = - 4.224 Block = #4.71

C.A. SORA Expr. XXII Run B-1
94- Date 19 Time 1:15 AM PM
Purpose Crit. Condition with
No Block + No Block Shield
Nominal Config except Back out 2, 3 + 4 Pb.

B-1 91-U + 4 Fe [1, 9, 87 + 95].
Fe Block - 6 cm off center.

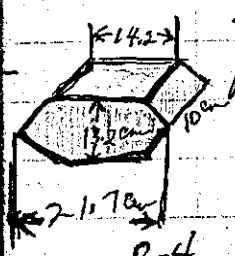
Be #5 = 9 1/4" - Poo +17.6 ¢
Moved Block away = -¢3.417 Block = ¢3.59
Be #5 @ 9 1/4" = ¢1.10
Thru Rod in + Block away = -¢2.50

B-2 95 U. No Block.
Plexiglas glass shim to get up.

Neg = +63.48 ¢ ~~(Pitte low)~~

24-95-0

B-3 Al Top Core Plug placed 6 1/2" (16.4 cm)
from Window to simulate necessary
Material for block support.
Neg = -44.2 ¢ +19.28 ¢



B-4 Al placed @ 20.4 cm from Window
Neg Per. = -51.6 ¢ +11.88 ¢

B-5 Al placed @ 14.4 cm from Window.
Neg = -37.34 ¢ +26.14

B-6 Repeat B-2 Al @ 16.4 cm from Window.
Neg Pen = - 42.9 ¢
+ 20.58 ¢

212

MAY 18 1966

DATE MAY 18 1966 SAFETY CHECK

TIME 10:30 AM ~~PM~~ BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10 / 1000	opr	L-15	10 / 1000	900	250
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100+	
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	—	✓	✓			

SOURCES USED Pu Be + γ MAG. CTS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORAD Expr. ~~XXIII~~ Run A

24X80¾-16 Date MAY 18 1966 Time 10:40 AM ~~PM~~

Purpose 235 U Sil Exposure,

Nominal Configuration

Be Block = 24 X 16 X 7

235 U 5/16" dia X .004" #24 center Scatter #3

#15 Centerg Fuel #48

Time = 10 min

Cut @ 1053 Am A = 42.5 1000/1000

3 ↓ = 8½" (21.54 cm) 12.70 ↓ B = 36 1000/1000

80 ¾ log N = .05

14¼ Fe [1 → 10, 18, 87, 95 C = 54 H-23

2nd #19 + 1st ¾ #11]

MAY 19 1966

DATE MAY 19 1966 SAFETY CHECK

TIME 8:20 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	Oper	L-15'	10/1000	900	750
SOURCE DIST.	3"	OK	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100+	—
SLUG. ALARM	✓	✓	✓			
AUX CHS.	—	✓	✓			

SOURCES USED Pu Be + γ MARKETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXIII Run A2

24-80 3/4-16 Date MAY 19 1966 Time 8:30 AM PM

Purpose U-Al Alloy foil exposure

Same Cond as p. 212

U-Al, 5/16" dia X .005", #13 Center of Scatter #3
#15 Center of Fuel #48

Time = 20 min

Crit = 8:46 AM A = #2 1000/1000

3t = 8 1/8" (20.64cm) D = 36 1000/1000

11.52#

Log N = .05

BF_3 (3) = 12.6# C = 7.0 H-22

∞ moved Block away = #-8.58

Be = 24 X 16 X 7

C.A. SORA Expr. XXIV Run 1a
24.- Date 19 May 1966 Time 1:25 AM/PM
Purpose Be Block EVALUATIONS.

1a Be Block – 24 X 26.16 X 7 [2" Stock Be on either side of 16 cm Block]
Loading – 75 1/4
19 3/4 [1 → 12, 18, 20, 30, 31, 42, 87, 95
2nd 1/2 #19 + 4th 1/4 #17.]
2 ¢
Poo = 10.0 ¢
moved block away = – $11.96 · Block = $12.06
LOW → Critic > 2×10^{10}

b. Repeat. (added 4th 1/4 #17 Fuel). [1 → 12, 18, 20, 30, 31, 42, 87, 95 + 2nd 1/2 #19]
{75 1/2, 19 1/2}
Poo = 21.75 ¢
Block out = – 5.875 (20) = 11.75 ~~11.675~~
(1.8) Block = $11.97

c Be Block – 24 X 23.7 X 7 (1" from side of the above, then centered)
{76 1/2, 18 1/2} Added #12
Super Crit. ~ 50 ¢

d Repeat [Removed Top 1/2 #12 Fuel] (1.5)
{76, 19}
Period = + 9.17
Block out = – 4.583 (x20) = $11.076
[1 → 11, 18, 20, 30, 31, 42, 87, 95,
2nd 1/2 #19, + 2nd 1/2 #12]
Block = $11.17

1e Be Block - 24 X 21.08 X 7 [1" stock Be on either side of 16 cm Block]

76 3/4
18 1/4 slight Poo. [1 → 11, 18, 20, 30, 31, 42, 87, 95
4th 1/4 #19 (12)]

+ Added 4th 1/4 #19.

77 } Period = + 10.39 $
18 } Block out = - 5.254 (20) $10.507

Block = - $10.61

16
43
19

MAY 23 1966

DATE MAY 23 1966 SAFETY CHECK

TIME 9:45 AM PM Taylor + Lyon

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	2-15	10/1000	900	750
SOURCE DIST.	3"	OK	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.		✓	✓			
SOURCES USED	PuBe + γ		MAG. 15		✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

CA SORA Expr. XXV Run 1

24 -21 Date MAY 23 1966 Time 9:55 AM PM

Purpose Crit Condition

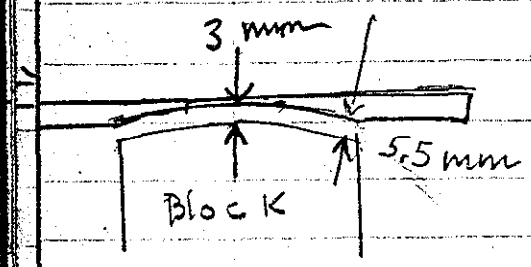
Nominal Config. Fe Block

Fe Block = 24 X 21 X 7

1 Loading - 83 1/2 U
11 1/2 Fe - Sub Crit

2 Loading - 84 1/2 U
10 1/2 Fe - ∞ close (58)

3 Loading - 84 3/4 U
10 1/4 Fe [1 → 4, 6 → 9, 87, 95 + 1st 1/4 #5]



Pos Period 0 cm + 20.07 ¢

Block away = - 6.052 ¢

Block = 6.25 ¢

Block ⓪ -1.1 cm = + 16.73 ¢

29.20 ¢

4 Block ④ - 0.3 mm = 4.15

- 2.25 cm = 4.15 ¢

5 Block @ +0.2 cm = +19.51 ¢
" +2.25 " = −3.33

6 Block @ +0.55 cm = 18.02 ¢
@ +1.4 " = 10.60 ¢

7. Block @ −0.6 cm = 19.81
@ −3.2 " = −14.61

8 Block @ −0.7 cm = +19.03 ¢

Pos. Period 0 cm = +19.83 ¢
Block away −$6.036

Block +$6.23

MAY 24 1966

DATE MAY 24 1966	SAFETY CHECK				
TIME 1:00 ~~AM~~ PM	BY Taylor + Lynn				
CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	L-15'	10/1000	900	750
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.		✓	✓			
SOURCES USED	Pu Be + γ		MAGNETS	✓		
TABLES ✓	LIGHTS ✓		AREA CLEARED	✓		

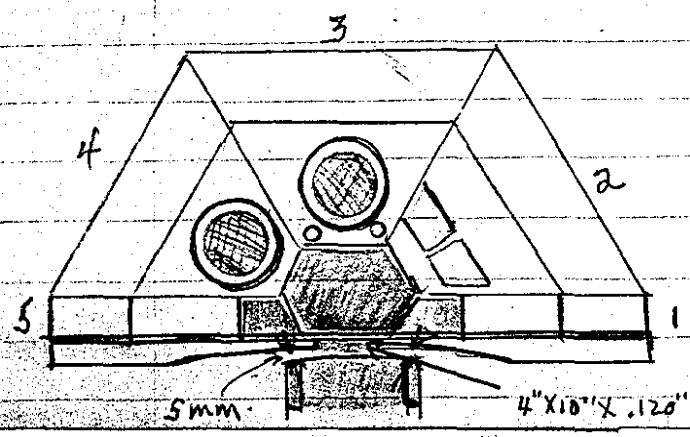
BF3 1) 63.75 μc = 13.52 ¢
2) 65.18 " = 13.32 ¢

Window
15.05 mm Fe

EA SORA	Expr. XXVI	Run A-1	
2K- -21	Date MAY 24 1966	Time ~~AM~~ PM	
Purpose Critical Condition			
Block + Window Changes			
→ Block moved back to make space for Window changes.			
Be Block - 24 x 21.08 x 7			

A1 Loading - 75 1/2 U
19 1/2 Fe Sub Crit. (#87 + 95 = Fuel)

A-2 " - 77 1/2 U
17 1/2 Fe Sub crit



X - Fuel
X - Poly
X - Be

4 mm space ~~Void~~ at center of Block
5mm Space at center of taped on Be.

Window - 5 - 1 - 4 - 3 - 3 - 3 - 4
Void, Al, Void
Fe: 3mm x 4.8cm x 1m; 4"x10"x.120"

Beam Holes - Empty
B lined Scattering #3 + #4

Block Geometrically Centered

(45)

A-3 Loading = 78 u

17 Fe [1 → 11, 18, 20, 30, 31, 42, 1st ½ #17 + 2nd ½ #19]

Pitte on Cart. from floor, from center of core.

0 cm Period = + 13.35¢ x10

~~Block out~~ + 6.60¢ (x 20) = 13.20¢

Block out = - 4.509 (x20) = $9.01

- 1.1 cm = + 1.03¢

Block = $9.15

1) 63.75 sec = 13.52¢
2) 65.18 " = 13.32¢
3) 64.4 " = 13.42¢

BF3 A-4 Raised Pitte to 86" from floor from center of core.

0 cm Period = + 13.30¢ (x10)

6.63 (x20) = 13.26¢

Block out = - 4.568 (x20) = - $9.136

Block = $9.27

Block @ - 1.9 cm = - 15.00¢

A-5 Block @ + 0.2 cm = + 13.65¢

+ 1.2 cm = + 6.25¢

A-6 Block @ + 0.5 cm = + 12.39¢

- 1.8 " = - 13.17

A-7 Block @ - 0.15 cm = 12.57¢

@ + 2.0 " 9.93

A-8 Block @ - 0.55 cm = + 10.39¢

- 0.95 " = + 4.37

MAY 25 1966

DATE MAY 25 1966 SAFETY CHECK

TIME 10:55 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10 / 1000	~~0.4~~	~~B~~	10 / 1000	900	750
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100+	✓
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXVI Run B-1

24 — 2108 Date MAY 25, 1966 Time AM PM

Purpose Cont Window Band Block Changes. Window = 19.82 mm Fe

Window = 5 - 1 - 4 - 3 - 7.82 - 3 AL - 4 Gap - Block (Void)

Be Block = 24 X 21.08 X 7

Window 19.82 mm Fe

B-1 Loading - 80
15 - Super > 60 ¢

B-2 Loading - 78 3/4
15 3/4 [Super > 40 ¢

B-3 Loading - 78 1/2
16 1/2 [1 → 11, 18, 20, 30, 31, 42 + 2nd 1/2 #19]

Po Period = 41.27 ¢

Block Away = ¢ 7.818 Block = ¢ 8.23 ✓

87895 = U

B-4 Loading – 78 1/4 U
16 3/4 Fe [1→11, 18, 20, 30, 31, 42, 2nd 1/2 #19, 3rd 1/4 #12]

24 - 78 1/4 - 21.08

(0 cm) Period – + 18.69 ¢
Block away = - ¢7.956 Block = ¢8.14
Block @ – 0.55 cm = + 14.59 ¢

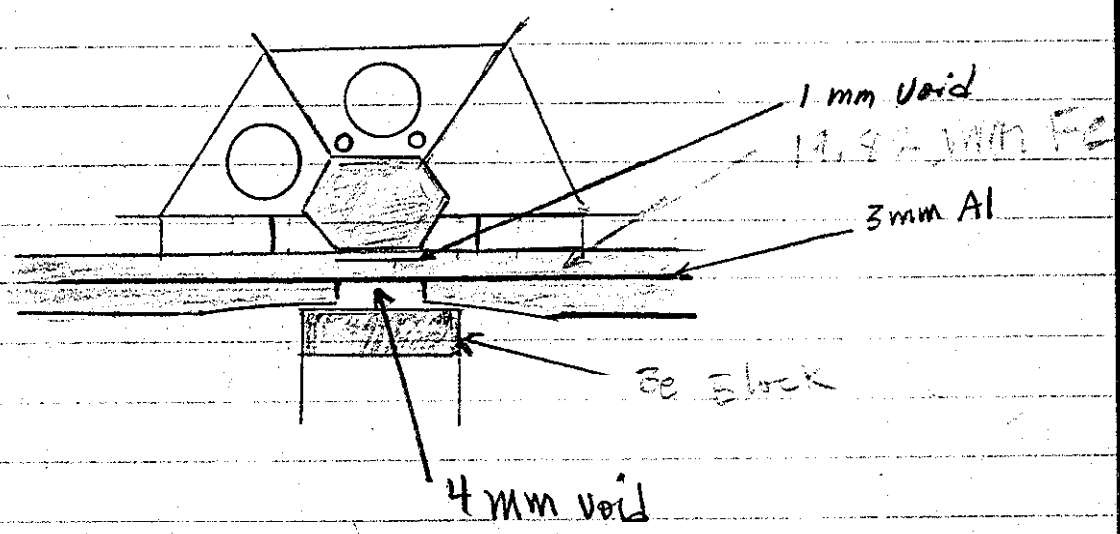
46

B-5 Block @ + 0.2 cm = + 18.66 ¢
1:37 PM + 2.5 " = – 14.33

B-6 @ + 0.5 cm = + 17.97 ¢
" + 1.8 " = + 2.79 ¢

B-7 @ – 0.25 cm = + 18.07 ¢
– 1.10 cm = + 9.71

B-8 @ – 0.4 cm = + 17.25 ¢
– 2.1 " = – 11.18 ¢



87 + 95 = Fuel

C.A. SORA Expr. XXVI Run C-1
2.4 - -21.08 Date 25 may 9 Time 3:30 AM/PM
Purpose Crit Condition.
Window + Block Changes
Window = {5-1-4-3-7.82-10.9} 3 AL-4 Gap-Block
Be Block = 24 X 21.08 X 7

30.72 mm Fe

C-1 Loading - 77½ U -
17½ Fe - Sub crit

C-2 " - 79 U
16 Fe - [1→10, 18, 20, 30, 31, 42, 2nd ½ #19 + #11]

⊙ Block centered 0cm Period +24.91 ¢
Block out = -#5.727

Block = #5.97

24-79-21.08

① Block @ -0.5 cm = +22.90 ¢

Window = 5 Fe - 1 void - 4 Fe - 3 Fe - 18.72 Fe - 3 Al - 4 Gap - Block

10 mm. 3 mm x 48 cm x 1 m — available sheets {.103" .060" 3 mm x 48 cm x 1 m

47

MAY 26 1966

DATE MAY 26 1966 SAFETY CHECK

TIME Taylor + Lyon

OPAMBEE	A	B	C	D	E	F
RANGE	10/1000	off	1-15	10/1000	900	750
STD. DIST.	3"	ok	—	0	5	ok
H. V. S. TRIP	90	—	—	90	100+	—
ALARM	✓	✓	✓			
	✓	✓	✓			

SAFETY WORK Pu Be + γ LIGHTS ✓

ALLOS ✓ MONITS ✓ AREA CLEARED ✓

Co SORA Expr. ~~XXVI~~ MAY 26 1966 Run C-3

24-79-21.08 Date 19 Time 10:00 AM ~~PM~~

Purpose Cont'd α measurements

C-3 3) Block ⊗ +0.3 cm = +24.13 ¢
4) ⊗ +3.1 " = -12.29 ¢

C-4 5) ⊗ +0.15 cm = +24.88 ¢
6) ⊗ +2.15 " = +7.52

C-5 7) ⊗ -0.25 cm = +24.17 ¢
8) ⊗ -1.05 " = +18.11 ¢

C-6 9) ⊗ -1.55 cm = +12.29 ¢
10) ⊗ -2.70 " = -10.48

87 + 95 = Fuel

C.A. SORA Expr. XXVI Run D-1
24 = 26.16 Date 26 May 1966 Time 1:25 AM PM
Purpose Crit. Cond. for α measurements
SAME WINDOW as p. 222 (30.72 mm Fe)
Be Block = 24 x 26.16 X 7
4 mm Block GAP

D-1 Loading – 78 U
17 Fe [1 → 11, 18, 20, 30, 31, 42, 2nd ½ #19 + #12]
(50)

24X.78X26.16

1) Block 0 cm + 25.52 ¢
Block away – $6.456 Block = $6.71
1) –1.0 cm + 20.88 ¢

D-2 2) +0.25 cm + 24.92 ¢ ? ✓
3) + 3.05 " – 2.45 ¢

D-3 4) +0.55 cm = + 24.84 ¢
5) + 1.0 " = + 22.99

D-4 6) –0.25 cm = + 25.02 ¢
7) + 2.3 " = + 10.50 ¢

D-5 8) + 0.55 " = + 23.38
9) – 3.55 " = – 20.83

D-6 10) – 0.2 " = + 25.38
11) – 2.55 = + 1.88

C.A. SORA Expr. XXVI Run E-1
24 - 80½ - 16 Date 26 May 66 Time 3:58 ~~AM~~ PM
Purpose Crit Cond for α measurement
SAME Window as p. 222 (30.72 MM Fe)
Be Block = 24 X 16 X 7

E-1 Loading - 80½ U
14½ Fe [1 → 10, 20, 30, 31, 42 + 2nd ½ #19]
Period = + 3.3 ¢

Fe Thickness → actual displacement difference

30.72 MM →	25.75 cm
19.82 " →	26.95 "
14.6 " →	27.50 "
8.0 " →	28.05 "

MAY 27 1966

DATE MAY 27 1966 SAFETY CHECK

TIME 9:45 ~~PM~~ BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
GAIN	10/1000	open	L-15	10/1000	900	750
SOURCE DIST.	3"	~~OK~~	~~L-15~~ 3'	0	5"	OK
SCA S. TSIP	90	—	100	90	100+	
LOGIC ALARM	✓	✓	✓			
AUX CHAN.	✓	✓	✓			

SOURCES USED Pa Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

g 7 & 95 = Fuel

window 30.72 mm Fe

Cont α measurements for 16 cm Block

E-2 Loading – 80 3/4 –
14 1/4 –[1→10, 20, 30, 42, 2nd 1/2 #19 + 1st 1/2 + 4th 1/4 #31]

24-80 3/4 - 16

0) Block 0 cm + 19.38 ¢ (44)
Block Away – # 4.623 Block = #4.82
1) Block @ -0.9 cm + 13.93 ¢

E-3 2) @ + 0.3 cm + 19.64 ¢
3) @ + 2.55 " – 6.28
E-4 4) @ + 0.55 " + 18.89
5) @ + 1.6 " + 8.84 ✓

E-5 6) @ – 0.15 cm + 19.54 ¢
7) @ – 2.85 " – 20.05 ¢

E-6 8) @ ~~-2.1~~ – 0.4 cm + 18.68
9) @ – 2.1 " – 3.35 18.45
E-7 10) @ + 0.8 " + 17.56
11) @ – 0.4 " + 18.21

24-

87+95 = fuel

C.A. SORA Expr. XXVI Run F-1
24 = = 11 Date MAY 27 1966 Time 12:50 PM
Purpose Crit Cond for α measurements
30.72 mm Fe Window

Be Block = 24 X 11 X 7

F-1 Loading – 82 3/4 U
12 1/4 Fe – Sub Crit.

F-2 " – 83 1/2 U
11 1/2 Fe [1→10, 2nd 1/2 # 19, 20 + 30]
∞

F-3 " – 83 3/4 U
11 1/4 Fe [1→10, 2nd 1/2 # 19 + 30 + 4th 1/4 # 20]

24-83 3/4-11

0) Block @ 0 cm + 17.17 ¢ (41)
Block Away – $3.096 Block = $3.27
1) " @ -0.9 cm + 13.11 ¢
F-4 2) " @ +0.2 " + 16.99
3) " @ +2.65 " – 7.17
F-5 4) " @ +0.7 " + 15.44
5) " @ +1.5 " + 9.28
F-6 6) " @ -0.5 " + 15.74
7) " @ -3.1 " -20.19
F-7 8) " @ +0.5 " + 16.57
9) " @ -2.3 " – 3.74
F-8 10) " @ -0.25 " + 16.69
11) " @ -1.6 " + 5.26

C.A. SORA Expr. XXVI Run G-1
24- -11 Date 19 Time 4:00 ~~AM~~ PM
Purpose Crit Cond.
Window = 19.82 mm Fe

Be Block = 24cm X 11cm X 7cm

G-1 Loading — 81 ½
13 ½ [Sub Crit
G-2 " — 83 ½
11 ½ [1 → 10, 20, 2nd ½ #14]

Sub crit.

Window = 5Fe-1void-4Fe-3Fe-7.82Fe-3Al-4Gap-Block

MAY 3 1 1966

DATE MAY 3 1 1966 SAFETY CHECK

TIME 8:20 AM ~~PM~~ BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	1-16	10/100	900	750
SOURCE DIST.	3"	off	30"	•	5	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be + γ Line ✓

TABLES ✓ LIGHTS ✓ AM[illegible] ✓

C.A. SoRA Expr. XXVI Run G-3

24-[illegible] - 11 Date MAY 3 1 1966 Time 8:40 AM ~~PM~~

Purpose Crit Condition for α Measurements.

Window = 19.82 mm Fe

Be Block = 24 X 11 X 7

G-3 84 U

12 Fe Sub crit.

G-4 84½ U

10½ Fe [1 → 10, [redacted] + 2nd ½ #19] — ∞

G-5 84¾

10¾ [1 → 10 + 4th ¼ #19] (40) {Log N = 54.3 μ 15.1 ¢

(40) 24-84¾-11

1) Block 0 cm Period + 15.27 ¢

Block away — 4.209 Block = 4.36

2) Block @ -0.85 cm + 11.05 ¢

G-6 2) " @ +0.35" +14.84

3) " @ +2.5 " −14.66

G-7	4)	Block @	+ 0.55 cm	+ 13.57 ¢
	5)	@	+ 1.70 cm	− 0.29 ✓
G-8	6)	@	−0.15 cm	+14.96 ¢
	7)	@	−2.60 "	−19.47
G-9	8)	@	−0.4 cm	= +14.19 ¢
	9)	@	− 1.5 "	+ 2.64
G-10	10)	@	+ 0.85 cm	+11.15 ¢
	11)	@	− 0.65 cm	+13.30

24

C.A. SORA Exp. XXVI Run H-1

24-80¾-16 Date 31 May 1966 Time 3:00 PM

Purpose: Crit. Condition for α measurements. 19.82 mm Fe Window

5-1-4-3-7.82-3-4-Block

Be Block = 24cm x 16cm x 7cm

H-1 Loading 80¾ U

14¼ Fe [1 → 10, 20, 30, 31, 42, + 4 ½ #19]

43

24-80¾-16

a) 0 cm + 15.93 #

Block away − #6.27 Block = #6.43

1) Block @ − cm + 12.59 #

H-2 2) Block @ + 0.30 cm +15.88

3) + 2.0 " − 9.73

H-3 4) @ +0.6 cm +13.77

5) @ +1.5 " +2.56

H-4 6) @ − 0.2 cm +16.03

7) @ − 2.35 " −19.23

H-5 8) @ − 0.5 cm + 15.49

9) @ −1.70 " − 2.08

JUN 1966

DATE JUN 1 1966 SAFETY CHECK

TIME 8:50 BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	L-15	10/1000	900	750
SCALER DISC.	3"	ok	3'	0	6"	ok
% F. S. TIME	90	—	100	90	100+	—
BLOCK POWER	✓	✓	✓			
AUX CTRS	✓	✓	✓			

SOURCES Used Ra Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXVI Run I-1

24-77¼-26.16 Date JUN 1 1966 Time 9:15 AM ~~PM~~

Purpose Crit. Condition for α Measurements

Window - 19.82 mm Fe

Be Block = 24 x 26.16 X 7

I-1 Loading - 77 u

18 Fe - + 7 ¢

(49)

I-2 Loading - 77¼ u

17 ¾ Fe [1→11, 18, 20, 30, 31, 42, + 1 ½ #19 2nd ½ #12]

24-77¼-26.16

1) Block @ 0 cm + 19.78 ¢

Block away — $8.852 Block = $9.05

1) " @ -0.25 cm + 18.20 ¢

I-3 2) " @ 0.50 cm + 18.11 ¢

3) @ +2.65 — 10.71

I-4	4)	Block	+ 0.35 cm	+ 18.61 ¢
	5)		+ 1.95 "	+ 2.48
I-5	6)		− 0.55 cm	+ 17.27 ¢
	7)		− 2.95 "	− 20.40
I-6	8)		− 0.80 cm	+ 18.96 ¢ ~~+ 17.27~~
	9)		− 2.0 "	− 0.17
I-7	10)		+ 0.95 cm	+ 18.87 ¢
	11)		− 0.12 "	+ 18.89

17'14

C.A. SORA Expr. ~~XXVI~~ Run J-1
24 – 26.16 Date [redacted] 1 1953 Time 1:00 ~~AM~~ PM
Purpose Critical Condition for α Measurements

Be Block = 24 X 26.16 X 7
Window = 14.6 mm Fe
5 Fe – 1 void – 4 Fe – 3 Fe – 2.6 Fe – 3 Al – 4 Gap – Block

J-1 Loading – 76 1/4 ¢
18 3/4 Fe – Sub Crit.

J-2 Loading – 77 ¢
.18 Fe + 39.02 ¢
Block away = – $5.02 (X20) Block = – $10.43

24-

4th 1/4 #13 = 12.58 ¢

J-3 Loading – 76 3/4
18 1/4 [1→12, 18, 20, 30, 31, 42, 2nd 1/2 #19 + 17 + 4th 1/4 #13]

24-76 3/4-26.16

0) Block @ 0 cm + 26.44 12.954 (20) –
Block away – $5.031 (X20) = Block = $10.32
1) " @ – 0.45 + 24.96

(48)

J-4 2) " @ + 0.30 cm + 26.58 ¢
3) " @ + 2.80 " – 8.97
J-5 4) " @ + 0.55 " + 25.50
5) " @ + 2.10 " + 6.97
J-6 6) " @ + 0.85 " + 23.23
7) " @ – 0.8 " + 21.34
J-7 8) " @ – 0.15 " + 26.18
9) " @ – 2.90 " – 19.72
J-8 10) " @ – 1.10 " + 18.59
11) " @ – 2.10 " + 0.62

See p. 276

C.A. SORA Expr. XXVI Run K-1
24-80 3/4-16 Date ____ 19 ____ Time ____ AM PM
Purpose Crit. Cond. for α measurements
Window = 14.6 mm Fe
Be Block = 24 × 16 × 7

K-1 Loading - 80 3/4 u (42)
14. 1/4 Fe [1 → 10, 20, 30, 31, 2nd 1/2 #19 + 1st 3/4 #42]

24-80 3/4-16

0) Block @ 0 cm + 21.51 ¢
Block away − # 7.128 Block = 7.34
1) " @ 0.05 cm + 21.87 ¢

K-2 2) " @ + 0.30 cm + 21.70 ¢
3) " @ + 2.25 " − 12.99

K-3 4) " @ + 0.55 cm + 19.70 ¢
5) " @ + 1.70 " + 2.12

DATE JUN 2 1966 SAFETY CHECK JUN 2 1966

TIME 8:00 AM Taylor + Lyman

	10/1000	opr	5-15'	10/1000	900	750
	3"	ok	3'	0	5"	ok
	90	—	100	90	100+	—
	✓	✓	✓			
	—	✓	✓			

SOURCES USED PuBe + γ MASKS ✓

TABLES — LIGHTS — AREA CLEARED —

See p. 237

Cont'd ∝ measurements from p. 235

K-4	Block	◎	+0.95 cm	+16.54 ¢
		◎	−1.10 "	+9.18
K-5	"	◎	−0.25 cm	+20.48
	"	◎	−2.15 "	−19.50
K-6	"	◎	−0.50 cm	+18.98
	"	◎	−1.80 "	−6.12 ✓

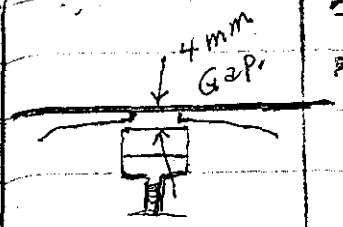
C.A. SORA Expr. XXVI Run L-1
24- -11 Date 2 June 66 Time 9:10 AM PM
Purpose Crit Condition for α measurements
Window = 14.6 mm Fe
5 Fe - void - 4 Fe - 3 Fe - 2.6 Fe - 3 Al - 4 Gap - Block
Be Block = 24cm x 11cm x 7cm

See p. 214

L-1 Loading - 85 1/4
9 3/4 = + 12.43 ¢
Block away - $ 4.875 Block = $ 5.00

L-2 Loading - 85 1/2
9 1/2 [1 → 9, + 1 at 1/2 #10] 4 #1/4 #10 = 9 ¢
39
24-85½-11
0) Block @ 0 cm + 21.40 ¢
Block away - $ 4.780 Block = $ 4.99
1) " @ - 0.30 cm + 20.38 ¢
L-3 2) " @ + 0.50 + 20.24
39
3) " @ + 2.40 - 9.09
L-4 4) " @ + 0.25 + 21.21
5) " @ + 1.75 + 6.02
L-5 6) " @ + 0.85 + 18.11
7) " @ - 1.0 + 12.81
L-6 8) " @ - 0.55 + 18.26
9) " @ - 2.50 - 20.50
L-7 10) " @ - 1.25 + 8.77
11) " @ - 1.95 - 6.05

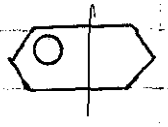
SEE p. 274



C.A. SORA Expr. XXVI Run M-1
24-81-16 Date 19 Time 3:00 PM
Purpose Crit. Cond. for top plug hole (for scintillators) evaluation]
Window = 8 mm Fe [5-2-3-3-4]
Be Block = 24 cm X 16 cm X 7 cm

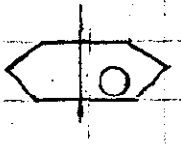
M-1 Loading - 81
14 [1 → 10, 20, 30, 42, 2nd ½ #19 + 1st ½ #31]
Pos Period = 35.0 ¢
Block away = -$8.43 Block = $8.78

M-2 Exchanged normal top plug for plug bored for scintillator with North West Center hole open.



Pos Period = 5.94 ¢
Block away = -$8.687 Block = $8.74
Scint Plug Hole = 29.06 ¢

M-3 Rotated plug - South East Hole open



Pos Period = 0.21 ¢
Block away - $8.737 Block = $8.74
Scint Plug Hole = 34.79 ¢

DATE JUN 3 1966 SAFETY CHECK

TIME 9:55 BY Taylor + Lynn

CHANNEL	H		G	D	E	F
VOLTAGE	10/1000	opr	L-15	10/1000	800	750
VOLTAGE DIST.	3"	OK	24"	0	5"	ok
90 % S. TRIP	90	–	100	90	100+	–
GAS. ALARM	✓	✓	✓			
AUX CHG.	✓	✓	✓			

SOURCES USED Pu Be + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

see p. 274

C.A. SORA Expr. ~~XXVI~~ Run N-1

24-80 3/4-16 Date JUN 3 1966 Time 10:05 AM ~~PM~~

Purpose α measurements

Window = 8 mm Fe

Be Block = 24 cm x 16 cm x 7 cm

87+95 FUEL

N-1 Loading – 80 3/4

14 1/4 [1 → 10, 20, 30, 42, 2nd 1/2 #19 + 1st 3/4 #31]

0) Block @ 0 cm + 19.42 +

Block away – $8.587 Block = $8.78

1) " @ –0.35 cm + 17.65 +

N-2 2) " @ +0.25 + 19.17 59

3) " @ +1.95 – 12.49

N-3 4) " @ +0.55 + 18.06

5) " @ +1.50 + 2.17 1/4 #13 + #17

N-4 6) " @ +0.95 + 12.57

7) " @ –1.95 – 20.64

N-5 8) " @ –0.50 + 16.43

9) " @ –1.50 – 6.61

80 1/4
14 3/4

N-6 10) Block ⊙ -0.80 cm + 10.73
11) " ⊙ -1.2 " + 3.65

C.A. SORA Exp. XXVI Run 0-1
24 - -26.16 Date 3 June 66 Time 2:40 ~~AM~~ PM
Purpose α measurements
Window = 8 mm Fe
5-2 mil-3-3Al-4Gap-Block
Be Block = 24cm X 26.16 cm X 7cm
(2" Stock tapped on 16 cm)

87 + 95 Fuel

SEE p. 274

0-1 Loading - 75½
19½ [sub crit.

57

0-2 Loading - 76¼
18¾ [1 → 12, 17, 18, 20, 30, 31, 42, 2nd ½ #19, 3rd ¼ #13]

⊙ Block ⊙ 0 cm + 11.12 (x20)
Block away - #6.026 (x20) Block = #12.27

#31]

⊙ Block ⊙ 0 cm + 22.32 ‡
1) " ⊙ -0.40 " + 20.29
0-3 2) " ⊙ +0.25 " + 22.46
3) " ⊙ +2.45 " - 11.07
0-4 4) " ⊙ +0.65 " + 20.61
5) " ⊙ +1.90 " 4.03
0-5 6) " ⊙ +1.0 " + 18.15
7) " ⊙ -2.40 " - 16.90
0-6 8) " ⊙ -0.55 " + 18.71
9) " ⊙ -1.45 " + 3.22

24 - 76¼ - 26.16

602/2 = 12.04

JUN 1966

24

JUN 16 1966 SAFETY CHECK

9100 BY Taylor + Lynn

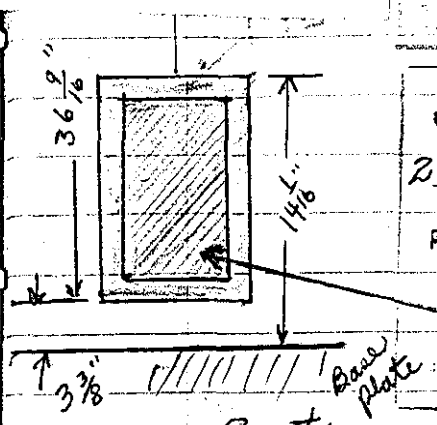
	B	D	E	F
10/1000	spr	L-18	10/1000	900	750
3''	OK	3'	0	5''	OK
90	—	100	90	100	—
✓	✓	✓			
✓	✓	✓			
Pulle + 8				BASKETS	✓
✓		✓		AREA CLEARED	✓

Be + Fe

$10\frac{5}{8}'' = 26.99$ cm

$7\frac{1}{16}'' = 17.94''$

$1\frac{1}{4}'' = 3.18''$



C.A. SORA Expr. XXVII Run 1a

24 - -MB Date JUN 16 1966 Time AM ~~PM~~

Purpose Critical Condition with Mock Burst Block = MB

$8\frac{5}{8}'' \times 5\frac{1}{16}'' \times 1\frac{1}{4}''$ Be with 1" Fe around perimeter

Sections 2, 3 + 4 with back off. Window clear to

1a Loading = 89 U

1 cm Fe (less 2 mm void) [curved Fe Block Shield 3 mm Al

6 Fe [1, 2, 3, 7, 8 + 9]

Window: 5-2-3

Super #1 = 23.22 + 32 ¢

Fe #3 b out

Sect P 27 ¢

f Loading = 88 U

7 Fe [1, 2, 3, 6, 7, 8 + 9]

c Loading = 88¼ U

6¾ Fe [1, 2, 3, 7, 8, 9 + 1st ½ + 4th ¼

Pos Period = 14.57 ¢

Fe 3 b out = -8.58 ¢ 3 b = 23.1

Pos Period = 14.39 ¢

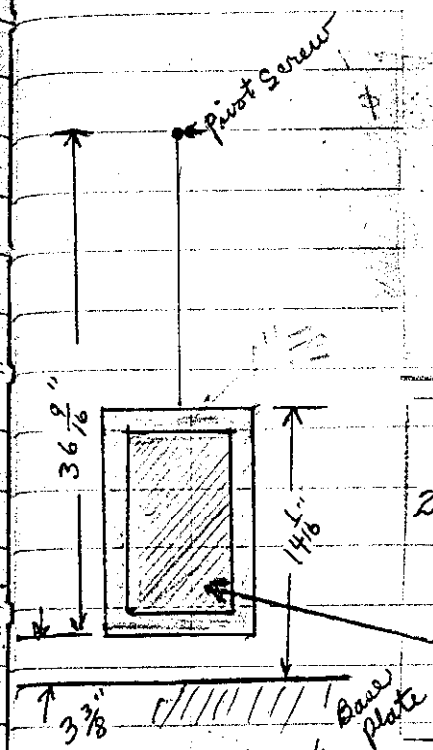
Block away = -6.366 Block = $6.5

JUN 1966

JUN 13 1966 SAFETY CHECK

			E	F
$8\frac{5}{8}$" = Be	21.90 cm	+ hyps	900	750
$5\frac{1}{16}$" =	12.86 "		5"	ok
$1\frac{1}{4}$" =	3.18 "		100	

CLEARED



C.A. SORA Expr. XXVII Run 1a

24 - -MB Date JUN 13 1966 Time AM ~~PM~~

Purpose Critical Condition with Mock Burst Block = MB

$8\frac{5}{8}$" X $5\frac{1}{16}$" X $1\frac{1}{4}$" Be with 1" Fe around perimeter

Sections 2, 3 + 4 with back off. Window clear to the

1a Loading = 89 U — 1 cm Fe (Less 2mm void) [Curved Fe off-Block Shield off 3 mm Al off]

6 Fe [1, 2, 3, 7, 8 + 9]

Window: 5-2-3

Super #1 = 23.22 + 32 ¢

Fe #3 b out

SEE P. 274

f Loading = 88 U

7 Fe [1, 2, 3, 6, 7, 8 + 9]

c Loading = $88\frac{1}{4}$ U

$6\frac{3}{4}$ Fe [1, 2, 3, 7, 8, 9 + 1 pt ½ + 4 th ¼ #6]

Pos Period = 14.57 ¢

Fe 3 b out = - 8.58 ¢ 3 f = 23.15 ¢

Pos Period = 14.39 ¢

Block away = - 6.366 Block = #6.51

d Loading = 88½ U
6½ Fe [1, 2, 3, 7, 8, 9 + 1st ½ #6]

Block	⊙	0 cm	+40.24¢
	⊙	−4.0 "	−23.40
e	⊙	−0.75 "	+37.32
	⊙	−3.4 "	−5.48
f	⊙	−0.3 "	+39.72
	⊙	−2.55 "	+12.26
g	⊙	−1.25 "	+33.8
	⊙	−13.25 "	−#4.17
h	⊙	+0.85 "	+37.72
	⊙	+4.15 "	−18.73
i	⊙	+0.3 "	+39.68
	⊙	+3.55 "	−1.77
j	⊙	+1.15 "	+35.66
	⊙	+2.55 "	+21.19

k Poo period to get up
Block away −#6.255

use 0 point 40.24¢ Block = −#6.66

∝ χ = 3.45 per G. Kistner
7-11-66

JUN 1966

DATE JUN 14 1966 SAFETY CHECK
TIME 8:50 Lynn & Taylor

	10/1000	off	L-15	10/1000	900	750
	3"	OK	3'	0	5"	OK
	90	–	100	90	100+	–
	✓	✓	✓			
	✓	✓	✓			
						✓
TAMPER	✓		✓			✓

Pu Be + γ

CA SOBA Expr. ~~XXIII~~ Run 2 A
24 – MB Date JUN 14 1966 Time 9:10 AM ~~PM~~
Purpose Radial displacement
– γ MB

SEE p. 274

2A Loading – 88½ U
6½ Fe [1, 2, 3, 7, 8, 9 + 1st ½ #6]

MB spaced 128" from Window

3.25 mm

Neg Period = – 8.83 +

1/8" Block away = – #6.401

#1 = 23.310
#2 = 23.307
#3 = +4
#4 = –18

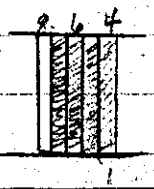
Block = #6.31 ← See p. 246

2B MB ◎ O spacing

Period = + 25.13

Block away = – #6.323

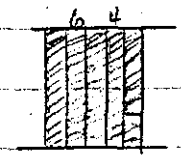
Block = #6.57



88½ pin = 59.194 Kg

SEE p. 274

2C Loading = 89 1/4 U
5 3/4 Fe [1, 2, 7, 8, 9 + top 3/4 #3]

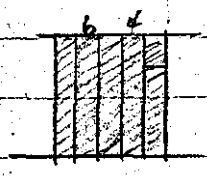


MB @ 0.128" 3.25 mm Fuel Change = 43.8¢
Period + 34.97
1/8" Block away − $5.876 Block = $6.23

2D MB @ ~~0.245~~ 0.255 6.48 mm
Period − 3.58¢
1/4" Block away − $5.835 Block = $5.80

Inst Check Crite = 11.41¢
log N = 76.0 sec, 11.9¢
BF3 1) 76.8 sec
2) 89.2 "
3) 82.1 "

2E Loading = 89 3/4 U
5 1/4 Fe [1, 2, 7, 8, 9 & 4th 1/4 #3]

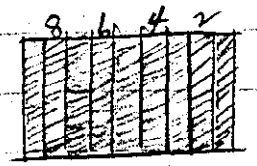


MB @ 0.255 6.48 mm Fuel change = 43.17¢
Period = + 39.59¢
1/4" Block away = − $5.39 Block = $5.79

2F MB @ 0.380" 9.65 mm
Period > ∞
3/8" Block away = − $5.42 Block = $5.42

2G Loading = 90½ u

4½ Fe [1, 2, 8, 9 + 1st ½ #7]



3.8¢

MB @ 0.380" 9.65 mm Fuel change = 42.58¢

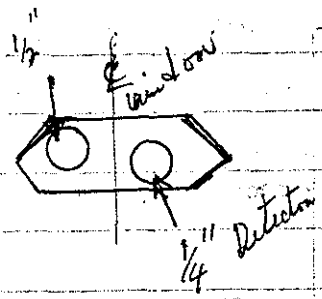
Period + 42.58¢

3/8" Block away − # 4.966 Block = #5.39

2H MB @ 0.510" 12.95 cm

Period + 6.54¢

½" Block away − # 4.911 Block = #4.98



Top Plug Change for Scintillators
To Obtain Critical for
Rossi α

Purpose
Date 6-14-66 Time
CA SORA Exp. Run 2i

See p. 274

MB @ ⅛" from Window

2i Loading 89¼

5¾ [1, 2, 7, 8, 9 + 1st ¾ #3]

3.17¢

Poo Period 21¢

.79

Runs 2A → 2H Fuel change = #1.48

Block " = #1.59

42

43.8
43.2
42.6
129.6¢
+18.6
148.2¢

2B = 25.1¢
2H = 6.5
18.6¢

JUN 15 1966

DATE	JUN 15 1966	SAFETY CHECK		
TIME	8:20	Lengths & Angles		
CHAMBER				
PLACE				
SOURCE DIST.	3"	84	31	0 5" 24
SOURCE	90	—	100	90 100 —
BLOCK ALARM				
ACK. BLOCK				
SOURCES				
TABLES				

C.A. SORA Expr. XXVII Run 3a

24-89-MB Date JUN 15 1966 Time AM PM

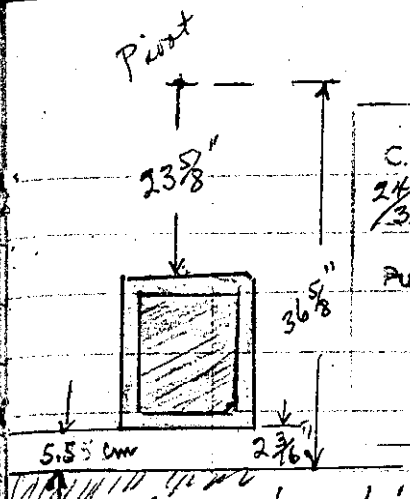
Purpose Rosse α

MB Spaced 1/8" from Window

3a Loading = 89 u
6 Fe [1, 2, 3, 7, 8 + 9]

Not Run — See p. 253

30 cm Core



C.A. SORA Expr. XXVIII Run A-1
24/30 - 87 - MB Date JUN 1966 Time 2:20 ~~AM~~ PM
Purpose Crit Condition for 24/30 cm Core with Mock Burst Block 8 5/8" x 5 1/16" x 1 1/4" Be with 1" Fe Frame - Stripped as p. 243.

A-1 Loading - 87 U
8 Fe [1→4, 6→9] @ 0 cm

SEE p. 274 Period + 30.11 +
Block away - #6.513 Block = #6.81

(30+57) - 87 pin = 63.207 Kg -

A-2 α measurements

	Block	@ 0	cm	+ 29.26 +
	"	-3.75	"	- 25.80
3	"	-0.40	"	+ 29.52
	"	-2.95	"	- 4.07
4	"	-1.0	"	+ 27.71
	"	-2.25	"	+ 9.58
5	"	-0.75	"	+ 29.12
	"	-13.75 cm		#4.57

JUN 16 1966

DATE JUN 16 1966 SAFETY CHECK

TIME 8:20 AM BY Taylor + Lyman

CHANNEL		C	D	E	F
RANGE	10/1000	30 per	L-15	10/1000	900	750
SOURCE DIST.	3'	ok	3'	0	5"	ok
% F. S. TRIP	90	–	100	90	100+	–
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be + X MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEANED ✓

See p. 274

A-6 Cont'd α measurements

	Block	⊙	0.3 cm	+32.67
	"	⊙	4.0 "	−28.39
A-7	"	⊙	0.7 "	+31.47
	"	⊙	2.9 "	∞
A-8	"	⊙	0 "	+32.32
	"	⊙	1.9 "	+16.73
A-9	"	⊙	−0.3 "	+32.56
	"	⊙	+1.4 "	+23.32
A-10	"	⊙	−0.8 "	+31.79
	"	⊙	+0.8 "	+28.59

C.A. SoRA Exp. XXVIII Run B-1
39/24 - ~~87~~ - MB Date 6-16-1966 Time 10:25 AM PM
Purpose Preparing for Rossi α
MB - 1/8" from Window

See p. 274

B-1 Loading 87 u
8 Fe [1, 2, 3, 4, 6, 7, 8 & 9]
Period - 6.59 ¢
Block away - ¢6.603 Block = ¢6.54
Pitt @ low current

B-2 Loading - 87 1/2 u
7 1/2 Fe [1, 2, 3, 6, 7, 8, 9 + 1st 1/2 #4]
Period + 23.51 ¢
Block out - ¢6.193 Block = ¢6.43
USE

B-3 Exchange top plugs.
2 Scintillators in place - [as p. 247]

Period + 12.85 ¢
Fe 3 b =
Loss = 10.66 ¢
Plug + Counters

1:40 PM Rossi α ∞ 3 b = 9 5/16"
Data Started @ 2:05 PM C = 66 L-15
stop 4:12 PM A = 45 10/100

JUN 17 1966

DATE JUN 17 1966	SAFETY CHECK				
TIME 8:25 AM		TAYLOR + Lynn			
CHANNEL		B	D	E	F
RANGE	10/1000	OK ~~[illegible]~~	4.5	10/1000	800 ~~[illegible]~~	750
SOURCE DIST.	3"	✓	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CHRS.	✓	✓	✓			
SOURCES USED	PuBe + γ					✓
TABLES	✓		✓			✓

C.A. SORA Expr ~~XXVIII~~ Run ~~B~~-4

24-87½-MB Date JUN 17, 1966 Time — AM PM

Purpose Cont'd Rossi α

Same as p. 251

B-4 Data Collection Started @ 8:53 AM

Down @ 11:25 AM

24-87½-MB

3b (Fe) =

24 Cm Core

C.A. SORA Exp. ~~XXVIII~~ Run 3b
24- 89-MB Date 19 Time 1:50 AM PM
Purpose Rossi α

3b Loading - 89 u
6 Fe [1, 2, 3, 7, 8 + 9]
Fe 3b = 7 7/8"
Data collection started @ 1:05 PM
Stop 4:10 PM

See p. 274

DATE JUN 20 1966	SAFETY CHECK					JUN 20 1966
9:20 AM	BY Taylor + Lynn					
	10			10		
	1000	opr	L-1s	1000	900	750
	3"	ok	3'	0	5"	ok
	90	—	100	90	100+	—
	✓	✓	✓			
	✓	✓	✓			
	Pu Be + γ					✓
TABLES ✓	LIGHTS	✓				✓

3c Rossi α Cont'd.
Data collection started @ 9:35 AM
down @ 10:38 AM

JUN 21 1966

DATE JUN 21 1966 SAFETY CHECK

TIME 11:15 AM BY Taylor & Lyons

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	L-W	10/1000	900	750
SOURCE DIST.	3½"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100+	
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES USED Pu Be + γ MANUALS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXIX Run N-1

24-86-21 Fe Date JUN 21 1966 Time 11:20 AM

Purpose Critical Condition

Nominal Config. (see p. 40)

Fe Block = 24 X 21 X 7

N-1 Loading - 85 U

10 Fe [1 → 10] Sub Crit,

N-2 " - 85 3/4 U

9 1/4 Fe [1 → 9 + 2nd 1/4 #10]

Pos Period

N-3 Loading 85 3/4 U

9 1/4 Fe [1 → 9 + 4th 1/4 #10]

Block @ 0 cm + 14.42 ¢ Title

Log N = 55.9 sec, 14.82 ¢

BF_3 ① = 59.9 " 14.14 ¢

53.4 " 15.30 ¢

56.0 " 14.81 ¢

SEE p. 274

See p. 297

95 1/2
9 1/2

N-4 Loading – 86 u
9 Fe [1 → 9]

Block @ 0 cm = + 23.37¢

23

24-86-21 Fe

Block out – $6.401

Block = $6.63

Block @ -0.5 cm = +21.61¢

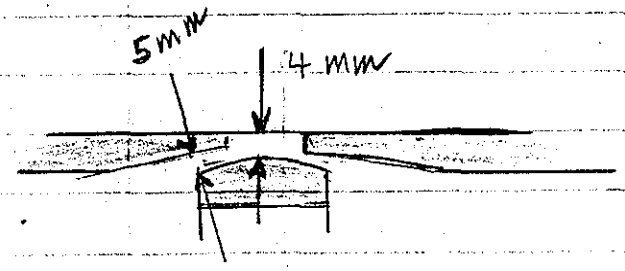
N-5 @ +0.4 " = -12.42

N-6 @ +0.85 cm = +20.67¢
@ 2.15 " + 4.53

N-7 @ -0.20 cm +23.03¢
@ -3.05 " -18.75

N-8 @ -0.95 cm = +18.66
@ -2.55 " -6.05

N-9 @ -1.25 cm = + 16.06¢
@ -1.95 " + 5.49



Window – 5 Fe – 2 void – 3 Fe – 3 Al – 4 Gap – Block

C.A. SORA Expr. XXIX Run 0-1

24-78-2608 Date 21 June 1966 Time 4:00 ~~AM~~ PM

Purpose Crit. Cond -

21.08 Be

0-1 Loading = 7.8 u

17 [1 → 11, 18, 19, 20, 30, 31, + 42]

See p. 274

Super #1 = 23.24

JUL 1966

DATE JUL 1966 SAFETY CHECK

TIME 9:40 AM BY Taylor & Lyon

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	L-3	10/1000	900	750
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED PuBe + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEANED ✓

C.A. SORA Expr. XXX Run H-1

24 Date JUL 1966 Time 9:55 AM

Purpose L χ measurement

Nominal cond, except

for #87 + #95 = [Fuel]

Be Block - 24cm x 21.08cm x 7cm

Fe Al GAP

5-2-3-3-4

Void

H-1 Loading - 77½ U

17½ [1 → 11, 18, 19, 20, 30, 31, 42 + 2nd ¼ #12]

Pos Period = 15.99 ¢

H-2 Loading - 77¾ U

17¼ Fe [1 → 11, 18, 19, 20, 30, 31, 42 + 4th ¼ #12]

Pos Period = 18.61 (x20) 37.22

14 Block away = 5.75 (20) = #11.50

Block = #11.87

See p. 2

3rd ¼ #12 = 21.23 ¢

258 SEE p. 274 4th 1/4 #12 = 11.55¢

27.54
15.99
11.55

H-3 Block @ 0 cm +27.54¢

24-77 3/4-21.08

Block assay = 5.773 (x20) = 11.546 Block = #11.82

@ -0.4 cm = +25.18¢

29

H-4 @ +0.6 cm = +26.10¢

+2.45" = -17.27¢

H-5 @ +0.25 cm = +28.00¢

@ +2.05" = -4.50¢

H-6 @ +1.10 cm = +20.02¢

+1.65" = +8.77¢

12:40 PM H-7 @ -0.70 cm = +20.85¢

-2.15" = -20.08¢

H-8 @ -1.15 cm = +12.19¢

-1.60" = -1.44¢

2.54
.99
.55

#11.82

-9

See p. 27

C.A. SORA Expr. XXX Run I-1
24- -21.08 Date JUL 6 1966 Time 1:55 ~~AM~~ PM
Purpose α measurements.
[Same except for fuel + Fe changes]
Nominal Config. [#87 + #95 = Fe]
Be Block = 24 cm X 21.08 cm X 7 cm

I-1 Loading = 77 U
18 Fe - Sub Crit.

I-2 77½ U
17½ Fe - ~~Sub Crit~~ + ~ 4.0 ¢

I-3 77¾ U
17¼ Fe [1 → 10, 19, 20, 30, 31, 43, 87, 95 and 4th ¼ # 11]

24-21.08-77¾ ¼

(13)

Block @ 0 cm + 11.96 (x20) 23.92 ¢, 24.30 ¢ (x10)
Block average = 5.351 (x20) = 10.702 Block = #10.94

@ -0.55 cm = +20.07 ¢
I-4 @ +0.20 " = +24.74
@ +2.45 " = -16.91
I-5 @ +0.60 " = +23.31
@ +1.85 " = -0.38
I-6 @ +1.0 " = +18.52
@ +1.45 " = +10.53
I-7 @ -0.20 " = +23.94
@ -2.15 " = -18.53
I-8 @ -0.80 " = +16.49
@ -1.55 " = -0.73

JUL 7 1966

DATE JUL 7 1966 SAFETY CHECK

TIME 9:18 AM ~~PM~~ BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10 log	ogr	L	10 1000	900	750
SOURCE POS.	3	ok	10'	0	5"	ok
% F. S. TRIP	90	—	100	90	100+	—
ARM	✓	✓	✓			
AUTO. CTRS.	✓	✓	✓			

SOURCES USED PuBe + γ MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. ~~XXX~~ Run J-1

24 -19.81 Date JUL 7 19 1966 Time AM ~~PM~~

Purpose α measurements

16 cm block - with 1" Be taped on 1 side and ½" Be taped on the other up.

Be Block = 24 cm X 19.81 cm X 7 cm

SEE p. 274

23,31

J-1 Loading - 79½ U

15½ Fe Super 23,23 > 60 ¢

J-2 " 78¾ U

16¼ Fe [1 → 10, 19, 20, 30, 87, 95, 2nd ½ #42, + 1st ½ + 4th ¼ #31]

24 - 19.81 - 78¾

Block 0 cm + 16.74 (x20) = 33,48 ¢

" away - 5.064 (x20) = 10.128

Block = 10.46 ¢

0 Block @ 0 cm = +33.68 ¢ (x10)

1 @ -0.3 " = +31.52

J-3 2 @ +0.5 " = +33.33

3 @ -2.45 " = -8.67

+

11

J-4 Block @ +0.25 cm + 34.02 ¢
@ +2.0 " + 6.77

J-5 @ +0.8 cm + 31.61 ¢
@ +1.5 " + 19.93

J-6 @ -0.6 cm + 27.75 ¢
@ -2.0 " -11.04

J-7 @ -0.9 cm + 22.44 ¢
@ -1.4 " +10.04

C.A. SORA Expr. XXX Run K-1
24- Date 7 July 66 Time 1:25 ~~AM~~ PM
Purpose Block Value
#87 + 95 = Fuel
Be Block = 24 X 19.81 X 7

SEE p. 27

#42

K-1 Loading - 78 3/4 U
16 1/4 Fe [1 → 10, 19, 20, 30, 31, 42, 2nd 1/2 #18
and 1st 1/2 + 4th 1/4 #11]

46¢ Pos Period + 34.96 ¢ (X10) Fe 3 b out
Block away - 5.323 (X20) = 10.646 Block #11.00

78 11 K-2 Loading 78 1/2 U
16 1/2 Fe [1 → 11, 19, 20, 30, 31, 42, 1st 2nd 1/2 #18]

14 Pos Period 17.95 (X20) = 35.90 ¢
Block away 5.343 (X20) = 10.686 Block #11.05

JUL 8 1966

DATE JUL 8 1966 SAFETY CHECK
TIME 8:50 AM BY Taylor + Lyman

CHANNEL						
	10/1000	opr	L-15'	10/1000	900	750
	3"	ok	3'	0	5"	ok
	90	—	100	80	100+	—
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			
SOURCES USED Pu Be + γ						✓
TABLES ✓ LIGHTS ✓ AREA CLEARED ✓						

C.A. SORA Expr. XXXI Run N-1
24 - ?-21.08 Date JUL 8 19 1966 Time 8:55 AM
Purpose Crit Condition with Fe distributed thru the Core.
~~Be Block = 24 X 21.08 X 7~~

see data p. 67

Sep p. 74

N-1 Loading = 80 U
15 Fe [11, 18, 23, 25, 27, 41, 45, 48, 51, 53, 69, 71, 73, 78 + 85]
Sub critical

N-2 " 82 U
13 Fe [11, 18, 23, 25, 27, 45, 48, 51, 69, 71, 73, 78 + 85]
Sub crit.

N-3 " 84 U
11 Fe [11, 18, 25, 27, 45, 48, 51, 69, 71, 78 + 85]
Sub crit.

N-4 " 86 U
9 Fe [11, 25, 27, 45, 48, 51, 69, 71 + 85]
Sub Crit

SEE p. 277

31

N-5 Loading 87½ u
7½ Fe [25, 27, 45, 48, 51, 69, 71 + 1 at ½ #85]

Down 99.97 → up #1 23.30 #3 = +4 #4 = -19
#2 23.287

N-6 Loading - 88 u
7 Fe [25, 27, 45, 48, 51, 69, & 71]

Pos Period = 10.97 ¢
Block away = 5.122 (x20) = 10.244
Block = # 10.35

Log N = 11.3 ¢, 81.38 sec
BF_3 1) = 10.88 ¢ 85.6 "
2) = 10.84 ¢ 86.0 "
3) = 10.79 ¢ 86.5

JUL 11 1966

DATE JUL 11 1966 SAFETY CHECK

TIME 10:00 AM BY Taylor + Lyon

CHAMBER	10/(100)	gpm	2-15	10/1000	900	750
LEVELS	3"	OK	3'	0	5"	OK
SCRAM	90	—	100	90	100+	✓
% F. C. TAG	✓	✓	✓	—	—	—
BLDG. ALARM	✓	✓	✓	—	—	—
AUX. CTRS.						✓
SOURCES USED	Pu Be + X					✓
TABLES ✓	LIGHTS ✓					

C.A. SORA Expr. XXXI Run N-7

24 = 21.08 Date JUL 11 1966 Time 10:10 AM ~~PM~~

Purpose Prep. for fail approach

Uniform Fe

See p. 274

N-7 8 7½ U

7½ Fe [25, 27, 45, 51, 69, 71 + 1pt ½ + 4th 1/4 #23 + #73]

N-8 Loading - 8 7¾ U

1:40 PM 7¼ Fe [25, 27, 45, 51, 69, 71, 1pt ½ #73 + 1pt ½ + 4th 1/4 #23]

U-Alu foils - #16 @ center of Core, Bare

8 7¼

24-21.08-8 7¾

Scatter #3 - #11 cd Cov'd
- #1 Bare

Crit @ 1:54 PM

Log N = .05 Time = 20 min

"A" = 50 1000/1000

"D" = 30 1000/1000 "C" = 78 H-22

DATE JUL 12 1966 SAFETY CHECK
TIME 10:10 BY Taylor + Lymo

CHANNEL	A	B				F
RANGE	10/1000	opr	1-10	10/1000	900	750
SCOPE DISP.	3"	ok	3"	0	5"	ok
S. F. S. TMP	90	—	100	90	100+	
BLDG. ALARM	✓	✓	—			
AUX CHS.	✓	✓	✓			

SOURCES USED Pu Be + r MAGNETS ✓
TABLES ✓ LIGHTS 2 AREA CLEANED ✓

C.A. SORA Expr. XXX Run 0-1
Date JUL 12 1966 19 Time 10:20 AM
Purpose Crit Cond. Nominal Config.
except #1 = W #3 = Ni
Be Block = 24 X 21.08 X 7

0-1 Loading - 78 1/4 U
16 3/4 Fe [1 → 10, 19, 20, 30, 31, 87, 95 + 1st 1/2 4th 1/4 #42 + #73]
Sub crit.

0-2 Loading - 78 3/4
16 1/4 [1 → 10, 19, 20, 30, 31, 87, 95, + 4th 1/4 #42 4th 1/4 #423]
Pos Period 15 +

0-3 Loading 79 U
16 Fe [1 → 10, 19, 20, 30, 31, 87 + 95]
Pos Period - 8.67 (X20) = 17.34 +
Block away 5.2 58 (X20) = 10.5 6
Block = 10.69 ✓

PM SEE P. 274

78 1/2
16 1/2 } 1 → 10, 19, 20, 30, 31, 87, 95 and 3rd 1/4 #13 + #17

36

 See p. 27

4 lb 1/4 #31 = 7.84 ¢

0-4 Loading = 99 1/4 u

15 3/4 Fe [1→10, 19, 20, 30, 87, 95 + ~~#~~ 3/4 #31]

24-78 3/4-21.08

Pos Period 12.59 (x20) 25.18 ¢

Block away -5, ~~26.3~~ 207 (x20) ~~10.504~~ 10.414 Block: ~~10.78~~ #10.67

See Tapes

0-4	Block	@	0 cm	+ 25.49 ¢
			-0.75 "	+ 21.65
0-5	"	@	+0.30 cm	+ 24.28 ¢
		@	+2.20 "	- 19.94
12:25 PM 0-6	"	@	+0.50 cm	+ 22.67 ¢
		@	+1.75 "	- 4.06
0-7	"	@	+0.85 cm	+ 17.79 ¢
	"	@	+1.25 "	+ 10.38
0-8	"	@	-0.20 cm	+ 25.44 ¢
	"	@	-2.30 "	- 17.60
0-9	"	@	-0.45 cm	+ 24.70 ¢
	"	@	-1.85 "	- 1.94
0-10	"	@	-1.05 "	+ 17.95 ¢
		@	-1.40	+ 11.20

JUL 15 1966

DATE JUL 15 1966 SAFETY CHECK

TIME 1' PM Lynn + Taylor

CHANNEL	A	B	C	D	E	F
RANGE	1000	opt	L-16	1000	900	750
SOURCE DIST.	3"	OK	3'	0	5"	ok
SCR. TRIP	90	—	100	90	100+	—
SCR. ALARM	✓	✓	✓			
ALT. DIG.	✓	✓	✓			

SOURCES USED Pu Be + 8. MARKETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SoRA Expr. XXXI Run P-1

24 - 21.08 Date JUL 15 1966 Time AM PM

Purpose Crit Cond for α measurements with Fe uniformly distributed in core ~~for Block - 24.x 21.08~~ x 7.

Nominal Configuration. [5-2-3-3-4]
Fe Void Fe Al Gap

P-1 Loading - 88 4.
7 Fe [25, 27, 45, 51, 69, 71 2nd ½ # 23 and 1st ½ # 73]

See p. 274

Pos Period 20.87 (x20) = 41.74 ¢

(32) Block away -5.052 (x20) = 10.104

Block = # 10.52 ✓

P-2 Loading - 87 3/4
7 1/4 [25, 27, 45, 51, 69, 71 2nd ½ # 23, and 1st ½ + 4th 1/4 # 73]

(30) 87 1/4 / 7 3/4 Scram - Electrical Storm.

268

JUL 18 1966

DATE JUL 18 1966 **SAFETY CHECK**

TIME 8:20 AM BY Taylor & Lynn

CHANNEL	A	B	C	D	E	F
VOLTAGE	10 ~~1200~~	~~opr~~	1-16	10 ~~1000~~	~~90~~	~~750~~
SCALER DIST.	3"	ok	3'	0	5"	ok
S. C. S. TRIP	90	—	100	90	100+	—
[illegible] ALARM	✓	✓	✓			
AUX CIRC.	✓	✓	✓			

SOURCES USED Pu Be + X MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SoRA Expr. ~~XXXI~~ / Run P-3

24 – 21.08 Date JUL 18 1966 Time 8:40 AM

Purpose α χ measurements

Uniform Core

24-87 3/4 – 21.08

24-87 1/4 – 21.08

See p. 274

P-3 Pos Period = 8.73 (x 20) 17.46+

Block away 4.993 (x 20) = 9.986 Block = 10.16

Block @ 0 cm = +17.80+

" @ -0.4 " = +15.72

P-4 " @ +0.2 " = +17.63

" @ +2.2 " = -16.60

P-5 " @ +0.5 " = +16.19

" @ +1.75 " = -4.45

P-6 " @ +0.80 " = +13.70

" @ +1.10 " = +8.75

P-7 " @ -0.70 " = +12.49

" @ -2.0 " = -17.70

P-8 " @ -1.0 " = +8.97

" @ -1.60 " = -4.65

C.A. SoRA Expr. XXXI Run Q1
24 - 23.7 Date 7-18.1966 Time 3:38 ~~AM~~ PM
Purpose Crit Cond. for α X.
Nom. Config.
Window 5-2-3-3-4
Be Block = 24 X 23.7 X 7

207
p. 214

Q-1 Loading = 76 U
19 Fe [1 → 11, 18, 19, 20, 30, 31, 42, 87 + 95].
Sub crit -

Q-2 " 76½ U
18½ Fe [1 → 11, 18, 19, 20, 30, 31, 87, 95 + 1 ½ #42]
∞

See p. 274

10.16

JUL 19 1966

DATE JUL 19 1966 SAFETY CHECK

TIME 8:20 AM ~~PM~~ BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	Opr	L-16	10/1000	900	750
SOURCE DIST.	3"	OK	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			

SOURCES USED Pu Be + 8 MAGNETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEANED ✓

S.A. SORA Expr. XXXI Run Q-3

24-23.7 Date JUL 19 1966 Time 9:00 AM ~~PM~~

Purpose L & γ Measurements

Be Block = 24 X 23.7 X 7

Q-3 Loading - 76 3/4 u

18 1/4 Fe [1→11, 18, 19, 20, 30, 87, 95, 1pt 1/2 #42 + 1pt 1/2 + 4pt 1/4 #31]

+8.59 (x20) = 17.18 ¢

SEE p. 274

Block away = 5.713 (x20) = 11.426

Block = $11.60

17

Q-4 Loading = 77 u

18 Fe [1→11, 18, 19, 20, 30, 87, 95 + 1pt 1/2 #42 + #31]

+ 12.38 (x20) = 24.76 ¢

Block out = 5.63 (x20) = 11.260

Block = $11.51

4pt 1/4 #31 = 7.58 ¢

16

24 - 76 1/2 - 23.7

Q-4 a) Block ⊙ 0 cm = +25.23 ¢
b) " ⊙ −0.5 " = +24.35

Q-5 2) " ⊙ +0.2 cm = +24.38 ¢
3) " ⊙ +2.3 " = −19.63

Q-6 4) " ⊙ +0.5 cm = +21.75 ¢
5) " ⊙ +1.8 " = −2.84

Q-7 6) " ⊙ +0.85 cm = +17.25 ¢
7) " ⊙ +1.45 " = +6.34

Q-8 8) " ⊙ −0.25 cm = +25.67 ¢
9) ⊙ −2.70 " = −20.06

#31] Q-9 10) " ⊙ −1.05 cm = +20.65 ¢
11) " ⊙ −2.35 " = −8.09

Q-10 12) " ⊙ −0.80 cm = +23.28
13) " ⊙ −1.85 " = +6.42

31]

272

JUL 20 1966

DATE JUL 20 1966 SAFETY CHECK

TIME 10:30 AM BY Taylor + Lyon

CHANNEL	A	B	C	D	E	F
RANGE	1000	off	2-16	100	900	950
SCALE DIST.	3"	OK	3'	0	5"	OK
S. F. S. TRIP	90	—	100	90	100+	—
NEUT. ALARM	✓	✓	✓	—	—	—
[illegible]	✓	✓	✓	—	—	✓

SOURCES USED PuBe + γ MARKERS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SoBA Expr. XXXL Run R-1

24-16 Date JUL 20 1966 Time 10:50 AM

Purpose: Crit Cond. for & measure nominal Config.

BeBlock = 24x16x7

R-1 Loading - 80 U
15 Fe [1 → 10, 19, 20, 30, 87 + 95]
Sub crit.

R-2 Loading 80½ U
14½ Fe [1 → 10, 19, 20, 87, 95 + 1 pt ½ # 30]
Sub crit

R-3 Loading - 81¼ U
13¾ Fe [1 → 10, 19, 87, 95, 1 pt ½ # 30 + 1 pt ¼ # 30]
Period = + < 5 #

* R-4 Loading - 81½ U
13½ Fe [1 → 10, 19, 87, 95 + 1 pt ½ # 30]
Po Period = 20.31 #
Block out = -8.513
Block = # 8.72

24-81-14

4

R-4 Block @ 0 cm = + 20.31 ¢
@ -0.35 " = + 17.96

R-5 " @ + 0.25 cm = + 20.56 ¢
" @ + 2.20 " = - 16.74

R-6 " @ + 0.55 cm = + 19.12 ¢
" @ + 1.75 " = - 3.38 ¢

R-7 " @ + 0.90 cm = + 14.75 ¢
" @ + 1.35 " + 8.56

R-8 " @ - 0.55 cm = + 16.50 ¢
" @ - 1.90 " = - 18.44 ¢

R-9 " @ - 1.05 cm = + 8.47 ¢
" @ - 1.55 " = - 5.96

#30]

[1/4 #20]

30]

4

72

JUL 21 1966

DATE JUL 21 1966 SAFETY CHECK

TIME 10:00 AM BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	L-16	10/1000	900	750
SOURCE DIST.	3"	OK	3'	0	5"	OK
% F. S. TRIP	90	—	100	90	100+	—
BLDG. ALARM						
AUX CTRS.						
SOURCES USED						

TABLES _____ LIGHTS _____ AREA CLEARED _____

C.A. SORA Expr. ~~XXXI~~ Run S-1

24-11 Date JUL 21 1966 Time 10:00 AM ~~PM~~

Purpose Crit Coeff for 2 measurements

Nominal Config

Be Block = 24 X 11 X 7

S-1 Loading - 85½ 4

9½ Fe [1, 2, 3, 6, 7, 8, 9, 87, 95, 1st ½ #4]

Sub Critical

S-2 " - 86½ 4

8½ Fe [1, 2, 3, 7, 8, 9, 87, 95, 1st ½ #4]

Period = ~ + 43 ¢

S-3 " - 86¼ 4

8¾ Fe [1, 2, 3, 7, 8, 9, 87, 95, 1st ½ #4, + 4th ¼ #6]

Poo Period = 31.01 ¢

Block away = - #5.765 Block = #6.07

* Fuel Count - discovered 6 cm Fe in 3rd ¼ #13 + #17

see p. 241 + p. 234

{ Then fuel loadings entered since page 241 are 12 cm too high. Between page 234 + 241 are 6 cm too high. }

S-4 Loading = 85 ½

9 ½ [1, 2, 3, 6, 7, 8, 9, 87, 95 + 1 at ½ #4] (3)

Poo Period = 32.93 ¢

Block cut = - #5.753 Block = #6.08

S-4	Block	@	0	cm	= +32.93 ¢	
	"	@	-0.65	"	= +29.18	
S-5	"	@	+0.25	"	= +32.40	✓
	"	@	+2.30	"	= -7.73	✓
S-6	"	@	+0.60	"	= +29.95	✓
	"	@	+1.90	"	= +5.08	✓
S-7	"	@	+0.90	"	= +26.22	✓
	"	@	+1.40	"	= +16.96	✓
S-8	"	@	-0.20	"	= +32.42	✓
	"	@	-2.40	"	= -10.53	
S-9	"	@	-0.45	"	= +30.79	✓
	"	@	-1.85	"	= +3.78	
S-10	"	@	-0.95	"	= +25.50	
#6]	"	@	-1.55	"	= +12.26	

#7

JUL 25 1966

DATE JUL 25 1966 SAFETY CHECK

TIME 1:30 ~~AM~~ PM BY Taylor + Lynn

CHANNEL						
RANGE	10/1000	opr	L-16	10/100	900	750 ✓
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100	—
BLDG. ALARM	✓	✓	✓			—
AUX. CTRS.	✓	✓	✓			✓
SOURCES USED	Pu Be + γ					
TABLES ✓ LIGHTS ✓					AREA INFORMED	✓

C.A. SORA Expr. XXXII Run 3a

24 - 21 Fe Date JUL 25 1966 Time 1:40 ~~AM~~ PM

Purpose Crit. Cond. for α Measurements

Nominal Config. (Refl.)

Window = 5-1-4-3-2,6-3-4

Fe Block = 24 x 21 x 7

Window 14,6 Fe

3a Loading = 85½ U

9½ Fe [1 → 9 + 2nd ½ #10]

Period = ~ +45 ¢

b Loading = 85¼ U

9¾ Fe [1 → 9 + 2nd, 3rd + 4th ¼ #10]

24-85¼-21 Fe

Period = + 28.11 ¢

Block out = -#5.104 Block = #5.38

Block @ 0 cm = + 28.11 ¢

" @ -0.55 " = + 27.00

C " @ +0.3 " = + 27.76

" @ +3.30 " = - 9.27

51

3d	Block	@	+0.75	=	+26.48 ¢
	"	@	+2.75	=	+1.57
e	"	@	+1.05	=	+24.23 ¢
		@	+	=	+17.02
f	"	@	-0.25	=	+27.87 ¢
	"	@	-3.30	=	-10.73
g	"	@	-0.80	=	+25.92 ¢
		@	-2.50	=	+5.00
h	"	@	-0.95	=	+24.67 ¢
	"	@	-1.90	=	+14.50

JUL 26 1966

DATE JUL 26 1966 SAFETY CHECK

TIME 10:15 AM BY Taylor + Lyman

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	opr	1-16	10/1000	900	750V
STOPPER DIST.	3"	ok	3'	0	4"	ok
% F. S. TRIP	90	—	100	90	100	—
BLDG. ALARM						
AUX CTRS.						

SOURCES USED _____ MAGNETS _____

TABLES _____ LIGHTS _____ AREA CLEARED _____

C.A. SoRA Expr. XXXII Run 4n

24-21 Date JUL 26 1966 Time _____ AM ~~PM~~

Purpose Crit Cond for α Measurements

Nominal Refl. Cond.

Window = 5-1-4-3-7.82-3-4

Fe Block = 24 cm x 21 cm x 7 cm

Window 19.82 MM Fe

47 x 9½" 2

4n Loading = 84½ u

10½ Fe [1→10 + 2nd ½ #11]

52

Period = +33.44

Block out = −#4.586 Block = #4.92

24-84½-21 Fe

Block @ 0 cm +33.44 ✓

" @ −0.9 " +30.29 ✓

4o " @ +0.25 +33.53

" @ +3.80 −7.05

4q	Block	⊗	+ 0.75 cm	+ 32.48 ±	
	"	⊗	+ 3.35 "	+ 2.13	
r	"	⊗	+ 1.20 "	+ 30.11	
	"	⊗	+ 2.30 "	+ 18.2	✓
s	"	⊗	− 0.2 "	+ 33.40	
	"	⊗	− 3.70	− 10.57	✓
t	"	⊗	− 0.55 "	+ 32.34	
	"	⊗	− 3.00 "	+ 2.95	✓
u	"	⊗	− 1.30 "	+ 27.16	
	"	⊗	− 2.30 "	+ 14.75	

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C.A. SORA Expr. XXXII Run 5-A
24-21 Fe Date 7-26-1966 Time 1:30 AM PM
Purpose Crit. Cond. for α measurements
Nominal Refl. Window = 30.72 mm Fe

Fe Block = 24 cm X 21 cm X 7 cm

Window 30.72 mm Fe

5-A LOADING = 83 1/4 u
11 3/4 Fe [1 → 10, 19, + 1 at 3/4 #11]
Slight Poo.

B 83 1/2 u
11 1/2 Fe [1 → 10, 19 + 1 at 1/2 #11]
Poo Period = + 25.44 ¢
Block out = − $ 3.465 Block = $ 3.72

24-83 1/2-21 Fe

53

	Block	⊗	0 cm	+25.44 ¢
	"	⊗	−1.0 "	+23.02
C	"	⊗	+0.35 "	+25.30
	"	⊗	+4.35 "	−14.93
D	"	⊗	+0.85 "	+23.97
	"	⊗	+3.55 "	−1.52
E	"	⊗	+1.30 "	+21.92
	"	⊗	+2.60 "	+11.63
F	"	⊗	−0.20 "	+26.03
	"	⊗	+4.2 "	−11.11
G	"	⊗	−0.5 "	+25.01
	"	⊗	−3.90 "	−9.96
H	"	⊗	−1.50 "	+20.05
	"	⊗	~~−0.75~~ −3.10	+1.88
I	"	⊗	−0.75	+23.98
	"	⊗	−2.10	+14.45

DATE AUG 5 1966	SAFETY CHECK				
TIME 1:55 AM/PM	BY Taylor & Lyons				
CHANNEL	A	B	C	D	E	F
RANGE	1000	Opr.	L-16	1000	900	750
SOURCE DIST.	3"	OK	30"	0	4"	OK
S. TRIP	90	—	100	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓	✓	✓			
SOURCES USED M-226 + γ				MAGNETS ✓		
TABLES ✓	LIGHTS ✓			AREA CLEARED ✓		

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3.72

C.A. SORA Expr. XXXII Run 6-a

2.4-11 Date AUG 5 1966 Time 2:05 AM/PM

Purpose: Crit. Cond. for α Measurement

Nominal Conditions as p. 40

Window = 5-2-3-3-4

Be Block - 24 cm x 11 cm x 7 cm

up Pos. #1 = 23,473 #3 =

#2 = 23,375 #4 =

6a Loading - 85¼

9¾ [1, 2, 3, 6, 7, 8, 9, 87, 95 + 4th ¼ #4]

Pos Period < 15¢

b Loading - 85¼

9¾ [1, 2, 3, 6, 7, 8, 9, 87, 95 + 3rd ¼ #4]

Pos Period = ~ 25¢

Block away = Block =

Block @ cm =

→ The 48 cm x 1 m x 3 mm Fe Sheet in.

c Removed Fe Sheet

Pos Period = ~ 3¢

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AUG 8 1966

85½u

DATE AUG 8 1966 **SAFETY CHECK**

TIME 8:55 AM BY Taylor & Lyne

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	off	L-16	10/1000	900	750
SOURCE DIST.	3"	ok	3'	0	5"	ok
% F. S. TRIP	90	—	100	90	100	—
BLDG. ALARM	✓	✓	✓	—	—	—
AUX. CTRS.	✓	✓	✓			—

SOURCES USED Pu B. + γ MASKS —

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

6d α & γ measurement, cont'd (4)

Loading - 85½ u

9½ Fe [1, 2, 3, 6, 7, 8, 9, 87, 95 + 1st, 4th, 4th]

24-85½-11

a) Block @ 0 cm = +30.13#

Block out = 5.556 Block = 5.86 (24)

1) " @ -0.35 cm = +28.68#

6e 2) " @ +0.25 " = +30.45

3) " @ +2.55 " = -9.51

6f 4) " @ +0.60 " = +28.97

5) " @ +2.05 " = +2.69

6g 6) " @ +0.95 " = +25.17

7) " @ +1.55 " = +15.40

6h 8) " @ -0.15 " = +29.30

9) " @ -2.15 " = -9.96

6i 10) " @ -0.65 " = +25.40

11) " @ -1.8 " = ~~+21.90~~ -0.25

6j 12) " @ -0.85 " = +24.90

13) " @ -1.40 " = +10.17

$85\frac{1}{2}u$

C.A. SORA Expr XXXII Run 7a
24-16 Date AUG 8, 1966 Time 12:45 ~~AM~~ PM
Purpose α γ measurement
Window (8 mm Fe) = 5-2-3-3-4
Be Block = 24 x 16 x 7

7a Loading = 81 ½ u
13 ½ Fe [1 → 10, 19, 87 + 95 + 2nd ½ #30]

Pos Period #1 = 23.31 + 35 ¢ (9)

b Loading = 81 u
14 Fe [1 → 10, 19, 87, 95, 2nd ½ #30 + 2nd ½ #31]

24-81-16

	Block @	0 cm	=	+ 30.78 ¢	
	Block out		=	− #8.308	Block = #8.62
	" @	−0.35 cm	=	+ 28.71 ¢	
7e	" @	+0.55 "	=	+ 29.29	
	" @	+2.10 "	=	− 7.13	
d	" @	+0.25 "	=	+ 30.82	
	" @	~~+0.85~~ +1.70 "	=	+ 6.98	
e	" @	+0.85 "	=	+ 24.81	
	" @	+1.30 "	=	+ 18.58	✓
f	" @	− 0.75 "	=	+ 24.89	
	" @	− 1.90 "	=	− 6.95	
g	" @	−0.90 "	=	+ 21.18	
	" @	−1.50 "	=	+ 4.32	✓
h	" @	−0.20 "	=	+ 30.55	
	" @	− 1.40 "	=	+ 11.65	✓

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AUG 9 1966

DATE AUG 9 1966 **SAFETY CHECK**

TIME 12:45 BY Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	1000	Opr	2-6	10/1000	900	750
SOURCE DIST.	3"	OK	8	0	4"	OK
% F. S. TRIP	90	—	~~4~~	90	100+	—
BLDG. ALARM	✓	✓	✓			
AUX. CTRS.	✓	✓	✓			

SOURCES USED Pu Be + α GASKETS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXXII Run 8a

24-11 Date AUG 9 1966 Time 1:00 ~~AM~~ PM

Purpose α measurement

Window (8 mm Fe) - 5-2-3-3-4

Be Block = 24 x 11 x 7

(3)

8a Loading = 85½ u

9 ½ Fe [1, 2, 3, 6, 7, 8, 9, 87, 95 + 1st ½ #4]

Counter check BF3 ① 35.76 sec ; 19.90 ¢

② 34.59 " 20.30 ¢

③ 34.59 " 20.30 ¢

Log N = 31.9 " 21.35 ¢

Block = 0 cm +20.74 ¢

Block out = - $5.576 Block = $5.78

Block @ -0.45 cm = 17.61 ¢ $5.79

b " @ +0.6 cm = 19.45 ¢

" @ +2.5 " = -18.80 ¢

8c Block @ +0.2 cm = +21.02 ¢
" @ +2.15 " = −9.14

d " @ +0.95 cm = +15.66 ¢
" @ +1.60 " = +4.40

e " @ −0.20 cm = +19.89 ¢
" @ −2.15 = −19.79

f " @ −0.75 cm = +13.27
" @ −1.80 " = −7.55

g " @ −0.35 cm = +18.88
" @ −1.20 " = +6.58

)

½ #4]

#
= 5.78
$5.79

DATE AUG 10 1966 SAFETY CHECK

TIME 12:50 Taylor + Lynn

CHANNEL	A	B	C	D	E	F
RANGE	10/1000	Off		10/1000	900	750
SCALE DIST.	3"	OK		0	4"	OK
SCA. S. TRIP	90	—		90	100+	—
BLDG. ALARM	✓	✓	✓	—	—	—
AUX CTRS.	✓	✓	✓	—	—	—

SOURCES USED PuBe + 8 BANKS ✓

TABLES ✓ LIGHTS ✓ AREA CLEARED ✓

C.A. SORA Expr. XXXII Run 9a

24-16 Date AUG 10 1966 Time 1:00 AM

Purpose Crit Cond. Nom. Config.

8 Steels Near Window

Window (8 mm Fe) - 5-2-3-3-4

Be Block = 24 x 16 x 7

9a Loading - 83 U

12 Fe Super #1 = 22.585 +26¢

∞ = 22.314

b " 82 1/4 U Super #1 = 23.17 +30¢

12 3/4 Fe ∞ 22.87

c Loading 81 3/4 U

13 1/4 Fe [1,2,8,9, 77, 78, 85, 86, 87, 88, 94, 95

2nd 1/2 #3 + 1st 3/4 #7]

Block @ 0 cm +35.17¢

Block out = -$6.989 Block = $7.34

Block @ -0.4 cm = 32.85¢

27

9d Block @ +0.25 cm = +35.51 ¢
" @ +2.60 = −9.52

e " @ +0.50 cm = +34.91 ¢
" @ +2.05 " = +8.42

f " @ +0.85 cm = +32.24
" @ +1.45 " = +23.05

g " @ −0.55 cm = +31.49
" @ −2.20 " = −9.43

h " @ −0.9 cm = +26.18
" @ −1.70 " = +6.36

i " @ −0.15 cm = +34.71
" @ −1.40 " = +16.26

+26 ¢

+30 ¢

9495

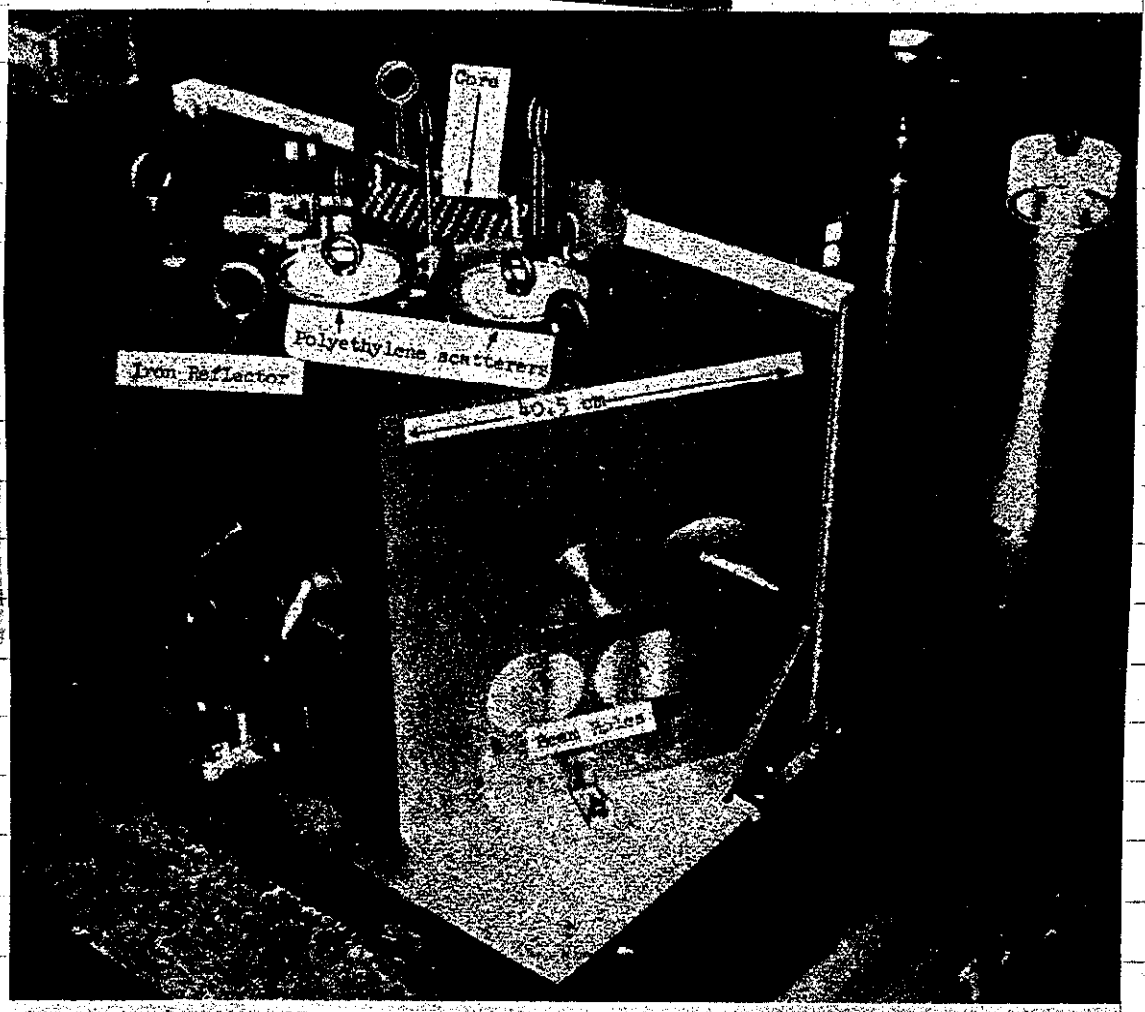
.34

27 Jan 67 Cont. to "set up" SORA for pulse arm experiment.

Ram alignment: down selsyn = 000.30
1st offset @ 7.64 on selsyn #1
2nd offset @ 10.00
3rd " @ 11.00

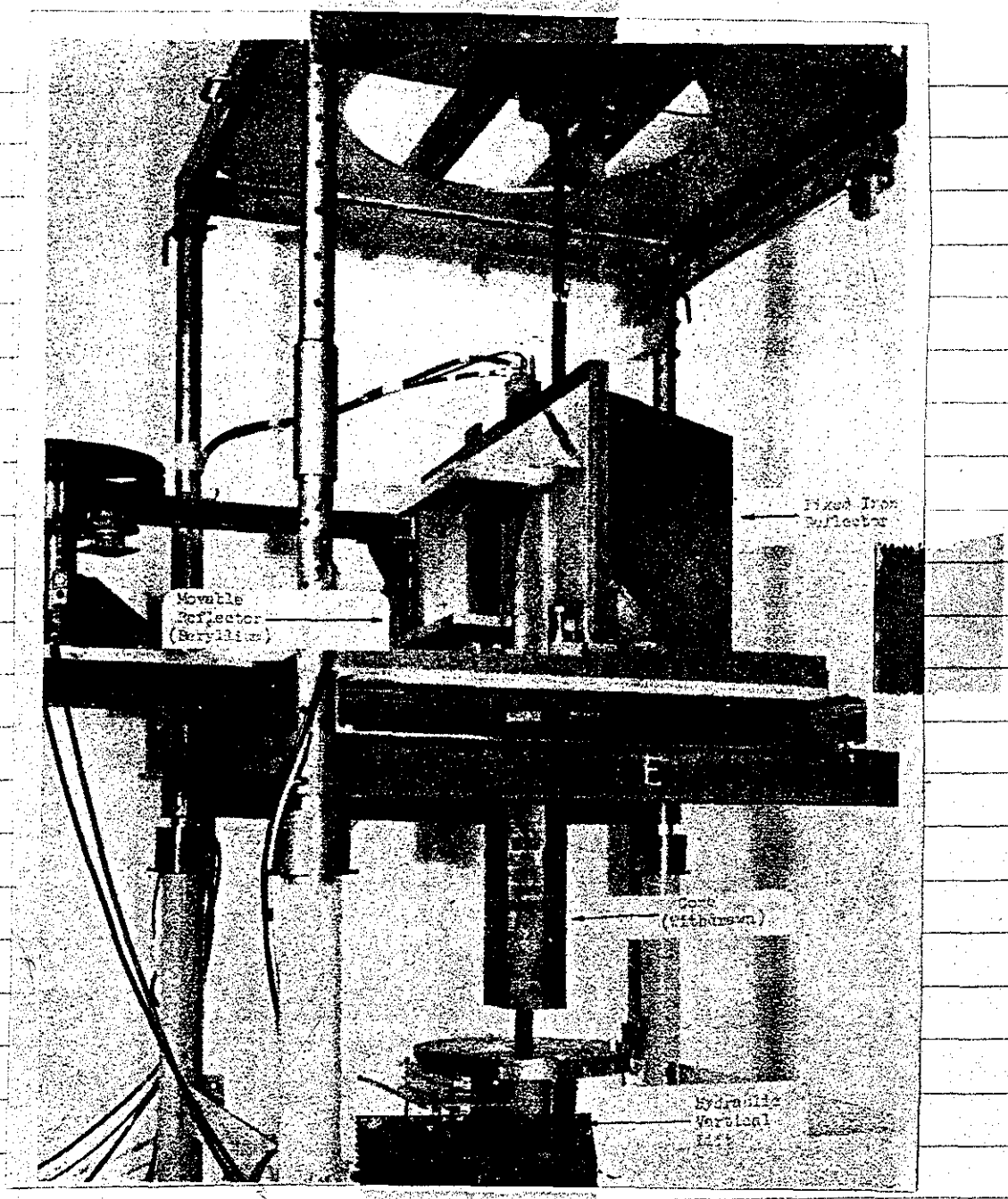
Up position #1 = 23.645; #2 = 23.339; #3 = +3; #4 = -4.
Alignment was good with no core contact.
Minimum clearance of wooden test arm:
0.290" on the North & 0.190" on the South.
redo 0.213" & 0.232"

[redacted]



[redacted] Assembly.

"STATIC" MEDS.


Fixed Iron
Reflector
Movable
Reflector
(Beryllium)
E
Core
(withdrawn)
Hydraulic
Vertical
Lift

STATIC

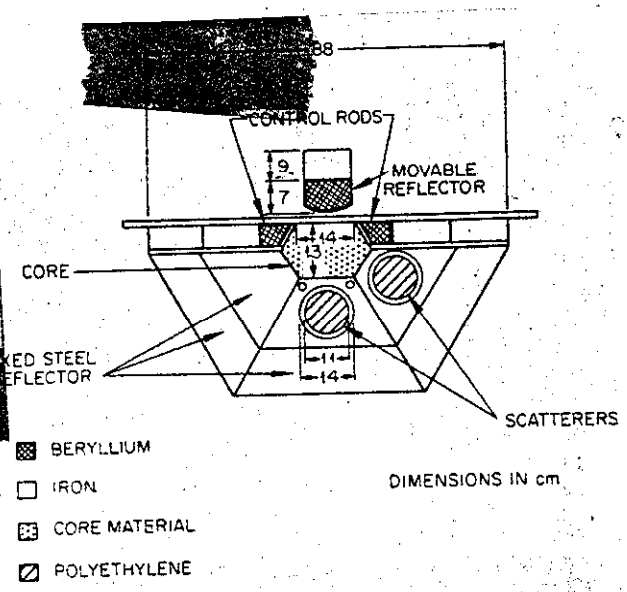


FIG. 2. Cross Section of the Mockup of the SORA Critical Assembly.

[redacted]

STATIC

14 prints out
~ 7 sec
Arm is clear

2 Scint + Plug change = -10.66 # p.251

Normal SORA Loading = 130 Msec for 1st #/ on Scram

24 cm High Be Block, 4mm from window

Width (cm)	Fuel (Pins)	Value #	Window Fe (mm)	Excess ¢
11	85	6.20 (2)	8.0	23.1
	* 85	5.80	8.0	23.8
	85 1/2	5.00	14.6	21.4
	84 3/4	4.36	19.82	15.3
	83 3/4	3.27	30.72	17.2
16	80 3/4	* 8.58 (2)	8.0	0
	80 3/4	* 8.78		19.4
	80 3/4	7.34	14.6	21.5
	80 3/4	6.43	19.82	15.9
	80 3/4	4.82	30.72	19.4
21.08	77 77 3/4	10.60 (2)	8.0	10.4 ¢
	78	10.94 9.20	8.0 15.05	23.9 p.259 13.2
	78 1/4	8.14	19.82	18.7
	79	5.97	30.72	24.9
26.16	75 1/2	11.90 (2)	8.0	21.8
	76 1/4	12.27	8.0	22.3
	76 3/4	10.32	14.6	26.4
	77 1/4	9.05	19.82	19.8
	78	6.71	30.72	25.5

(2) - 2 mm window Gap + (* #87 + #95 Fe)
Measured from curved Fe pcs.

$$5\overline{)875}\ 175$$

$$5\overline{)7875}\ 1575$$

$$-40$$

$$1535$$

$7\frac{3}{8}''$ 1st

$9\frac{13}{16}$ 2nd

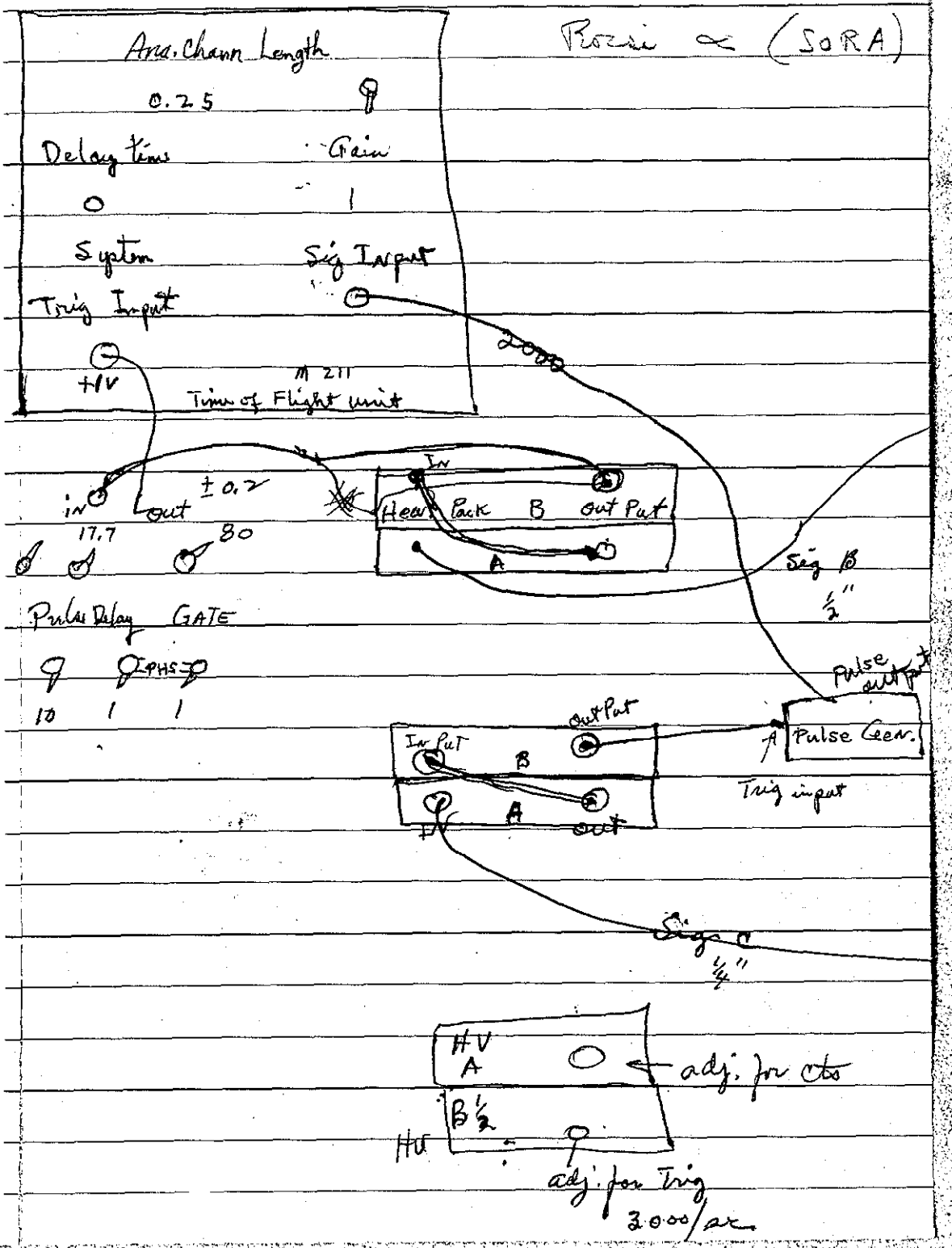
$10\frac{13}{16}$ 3rd

Measured - 2-1-67

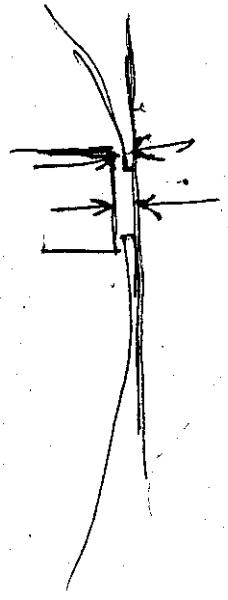
Operating data

	1965	1966
Starts	205	600
Criticals	160	–
Hours	80	–
Scrams	–	

Rozzi ∝ (SORA)


Area. Chann Length
0.25
Delay time
Gain
0
1
System
Sig Input
Trig Input
+1V
M 211
Time of Flight unit
in
out
± 0.2
17.7
80
Heat Pack
B
out Put
A
Sig B
1/2"
Pulse Delay
GATE
PHS
10
1
1
Pulse output
Pulse Gen.
Trig input
In Put
out Put
B
A
out
Sig C
1/4"
HV
A
adj. for cto
B 1/2
HV
adj. for Trig
3000/sec

11.076
.092
11.168
11.17



3 row of 30 cm
57 pins 24 "

} 874
8 Fe

→ 63.2 Kg. p. 249

Mock Block ←

Orig. p. 11

30 cm Block ✓

3 row of 30 cm

58 Kg.

↑

40 pins
30 cm = 33.4 Kg.
44 pins
24 cm = 27
60 Kg.

→ 33.4 Kg.

63.708
2 1.33
65.0
3 1.88
67 Kg.

20

167 } 3500
334

$$\begin{array}{r} 167\,40 \\ \hline 6.6\overline{)9} \end{array}$$

$$\begin{array}{r} 40 \\ \hline 300 \end{array}$$

$$\rightarrow \frac{24}{30} = 87 = 6.8$$

$$\rightarrow 24 = 89 =$$

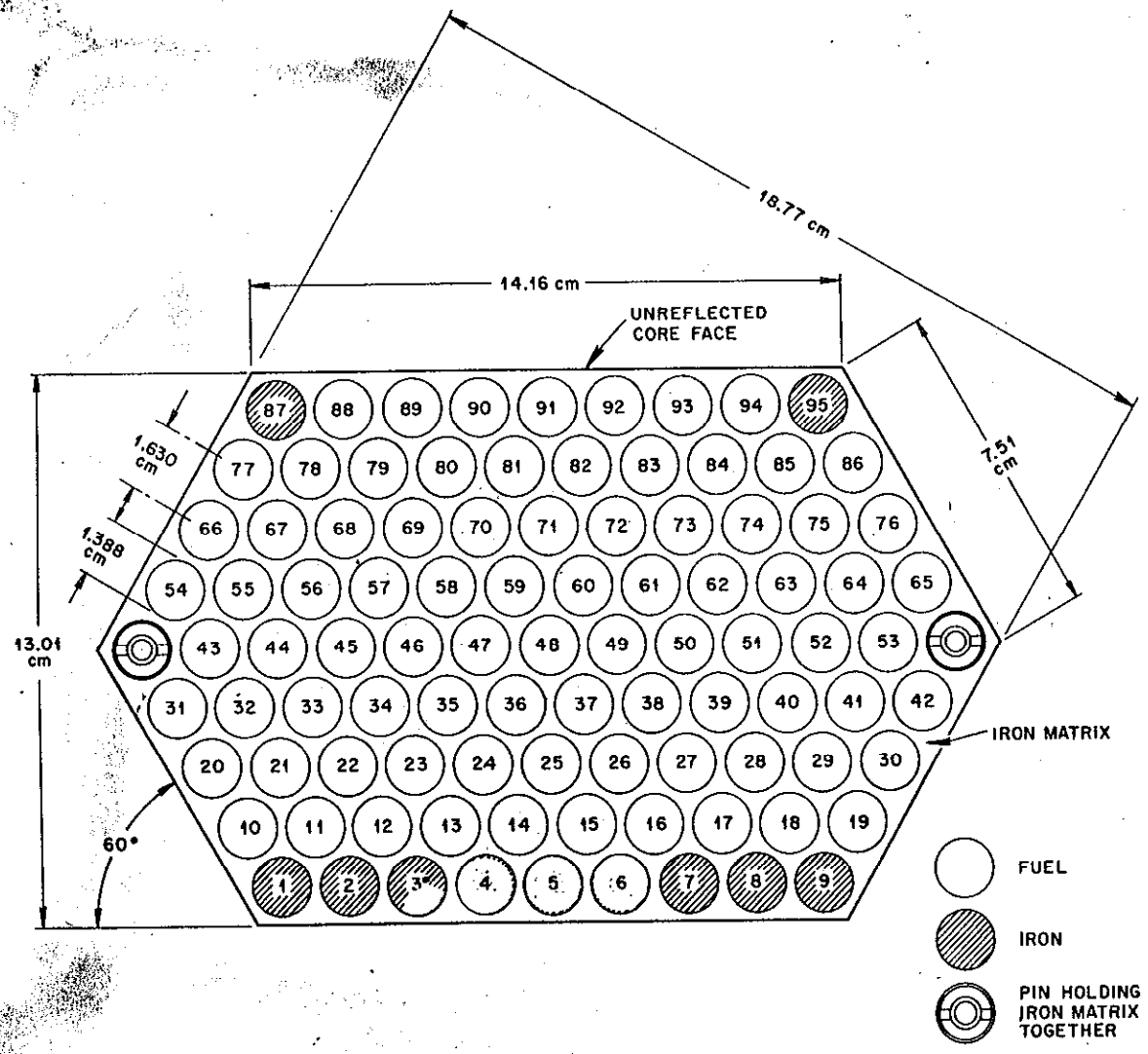
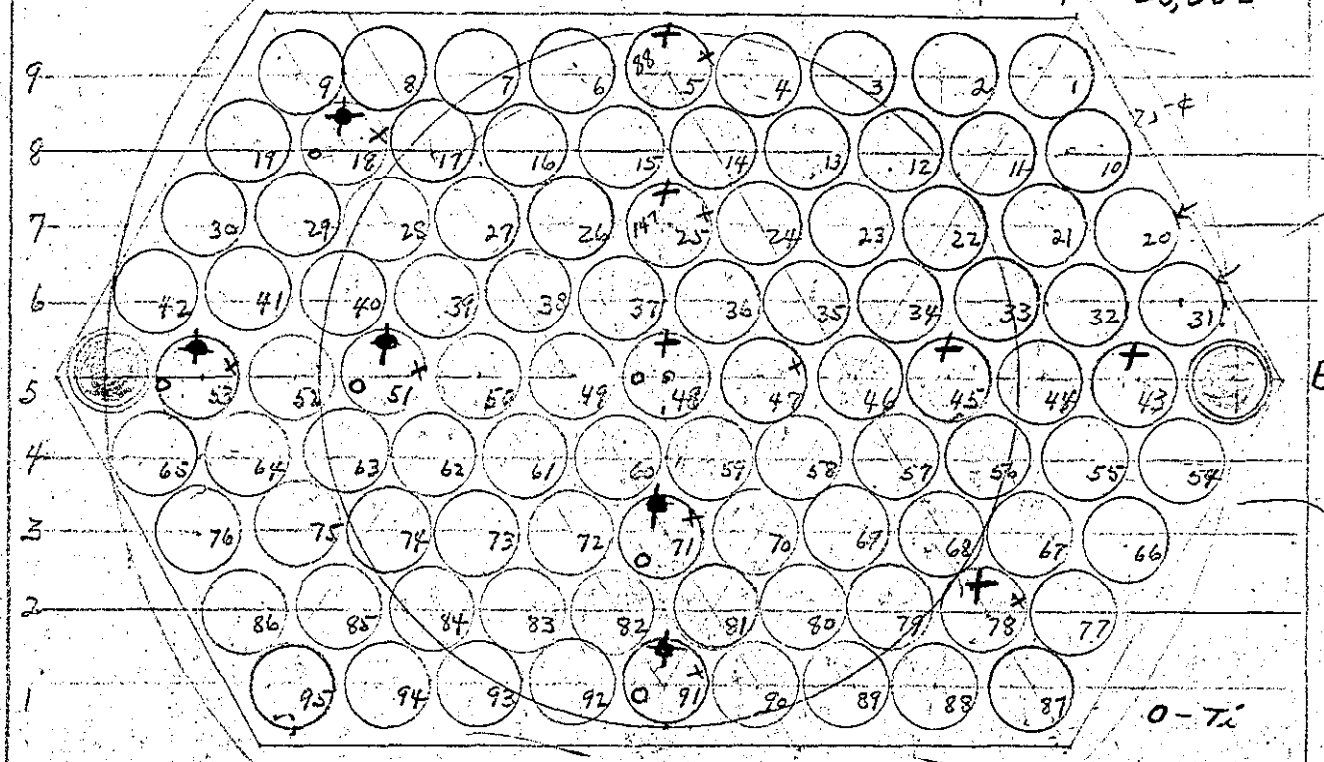


Fig. 1. Horizontal Section Through a Core Assembly Identifying the Fuel Rod Locations and Showing a Typical Loading.

6 cm = 167.215 gms
12 " = 334.43 "
30 " = 836.08 "

1-24 cm Fuel = 668.86 gm
85 Fuels = 56,857 gm.

N 30 (30 cm pins) = 25,082 "



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