BOOK69R

Notes:
"2% Bk#1 H/X = 195 and 294 (1958)" on front
"Book #1 2% 2%" on front
" 2% Bk 1" on front

"#1" on spine
"2% - Bk #1 H/X = 195 + 294 (1958)" on spine
"2%" on spine

Blank pages: page opposite page 1, 1, 2, 200, 300, inside back cover sheets

-small sheet of paper between pages 290/291
-page 292 has graph sheet taped to it

Scanned by:
Sheila Finch
RSICC /Oak Ridge National Lab.
August 24, 1999

E-9

22
Book #1

Standard Blank Book

No. 38

Journals Double $ and Cts. no Units

S. E. Ledgers " " "

D. E. Ledgers Full Page Form "

Records with Margin Line

In 150, 200 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

6-26-58 Total # 235

22,174.25

Total # 1,108,715

Bldg 9
Dept 26

	U	U235
A4	3284.1	65.69
A2	1641.0	32.81
A1	820.5	16.41
B4	819.1	16.38
B2	409.5	8.19
B1	204.1	4.08.
C4	206.2	4.124
C2	102.4	2.048
C1	51.4	1.028
A4S	2963.0	59.26
A-4 Reject	3286.8	65.73

Wagn
1
2
3
4

U g/g = .75903

shipping factor = .6983

Bldg 9206
Dept 2619

from 32 to 84 (2/24/58 .75904 g U / g UF4, avg. 50 kg) T is by est factor .6965 → .69832 new

Inventory 8% wt Paraffin Material 1065

Waybill	Items	Type cube	Net weight	Total T	
1	4x4=16	A-4	75470	52,565	47159
2	4x4=16	A-4	75438	52,543	
3	1x4=4 (1 Sample Reject)	A 4	18853	13,131	
4	4x8=32	A-2	75,447	52,549	
5	4x8=32	A-2	75,420	52,530	
6	3x8=24 1x16=16	A-2 A-1	75,403	52,519	
7	4x16=64	A-1	75,406	52,520	
8	3x16=48 1x~~3~~=12	A-1 A-1 + A-2	75,420	52,530	
9	2x8=16 2x16=32	A-2 B-4	75,334	52,470	
10	~~1~~ x8 x4 x16 = 23	B-2 B-1 B-4			
	3x4=12	A-4	75,433	52,539	
11	1x16=16 3x4=~~16~~ 12	B-4 A-4	75,415	52,526	
12	3x4=12	A-4			
	1 x5 x9 = 14	B-4 A-1	73,046	50,877	
13	4x4=16	A-4s	68,061	47,404	
14	4x4=16	A-4	75,445	52,547	
15	3x4=12 1 x3 x2 = 5	A-4 A-4, A-1	73,068	50,893	
16	4x4=16	A-4	75,457	52,554	
17	4x4=16	A-4	75,473	52,566	
18	4x4=16	A-4	75,483	52,574	
19	3x4=12	A-4	56,573	39,402	924,108
20	4x4=16	A-4	75,398	52,515	
21	4x4=16	A-4	75,455	52,555	
22	4x4=16	A-4	75,452	52,551	

over

Waybill	Item	Type Cube	Net Weight	Total T	
23	4 x 4 = 16	A - 4	75,574	52,637	
24	4 x 4 = 16	A - 4	75,448	52,550	
25	1 x 4 = 4	A - 4	18,855	13,132	
26	1 x 4 = 4 1 x 3 = 3 (7)	A - 4	32,985	22,974	
27	1 x 64 = 64 1 x 56 = 56 1 x 21 = 21 x 11 = 11 (32)	C - 4 C - 4 C - 2 C - 1	38,673	26,936	325,8
				1,249,958	

$\frac{H}{X} = 195$

Assembly			Page
28" Bare	6" Reflector Except West Side 290 92/8 Stationary Half.		21
In Foils p. 26 → 41			
29" Dia Cylinder	6" Reflector on Bottom		59
31" Dia. Cylinder	6" Reflector on Bottom		78
Height	16" Reflector on S.W. Side Sta. Table 25" Reflecta on S.W. Corner of Mov Table		
325,850 2% Foils p. 106			
29" Parallelepiped	Bare		121
36" Parallelepiped	Completely Reflected		131
36" Diameter Cylinder	Completely Reflected		137
44" Diameter cylinder	Completely Reflected		145
22" Parallelepiped	Bare		154
24" Parallelepiped	Completely Reflected		159
24" Diameter cylinder	Completely Reflected		166
~~23~~"			~~169~~
36" Diameter Cylinder	Bare		173
33" Diameter Cylinder	Bare		176
28" Parallelepiped	Latticed 1" pitch as Completely Reflected		185
24" Parallelepiped	Latticed		188

$\frac{H}{X} = 294$ p. 201

Assembly		Page
28" Parallelepiped	Bare	217
36" Parallelepiped	Comp. Reflected	229
44" Parallelepiped	Comp. Reflected	239
44" Diameter Cylinder	Comp. Reflected	241
50" Diameter cylinder	Bare	245
40" Diameter cylinder	Bare	246
32" Diameter Cylinder	Bare	249
28" Dia. Cylinder	Comp. Reflected	256
24" Dia. Cylinder	Bare	268
20" Parallelepiped	Comp. Refl.	274
18" Parallelepiped	Comp. Refl.	278
20" Dia. Cylinder	Comp. Refl.	281
22" Parallelepiped	Bare	286

	Assembly		Page
7	30" Diameter Cylinder	Bare	293
29			
39			
41			
45			
46			
49			
56			
68			
74			
78			
81			
6			

2/7/58

INSTRUMENT CHECK

Time 8:30 AM — Source PN-214 8 on E

Source PB-124 for start up

Channel	A	B	C	D	E
Range		10/1000 opr	10"	10/1000	900 V.
Source Dist.		0" ok	4"	½"	15"
% F.S. Trip		70 ok	100+	60	100+

Counters 1, 2 + 3 O.K.

C.A. 2% Run 1

Sheet — Date 2-7-58 Time 9:00 AM

Purpose 1st loading and multiplication

background 75,456 gms

52,555 gmU 1,051 gm U-235

1 Layer MTS Total 16 A-4

← 6" → Plexi

A4 A4 A4 A4 A4 A4 A4 A4

[Beginning 24" Square Base]

MULTIPLICATION

Scaler	c 5 min	B 5 min	Mark	1/M
Disc				
20 1	30 x 16 + 4 = 484 27 x 16 + 4 = 436	460		1.0
10 2	16 x 16 + 15 = 271 14 x 16 + 0 224	.248		1.0
12 3	9 x 16 + 8 = 152 8 x 16 + 3 = 131	142		1.0

12A45 - 35,556 gmU
711.12 gmU-235

LOADING CHANGE

Description: Added 44 A4 and 12 A45
Total 60 A4 – 12 A45
Reflected on bottom with plexiglas (~~5x~~ (5¾ x 18 x 23¾))

Mass before change	52,555 gmU	1,051	gmU-235
Mass of Change	180.083 gmU	3,601.5	gmU-235
Total Mass	232,638 gmU	4,652.5	gmU-235

Other Changes — Material — Mass

24" Base, 12" high

MULTIPLICATION

Scaler c/ 5 min. BG 5 min. Mult. 1/M

1 20	25 x 16 + 18 = 413 25 x 16 + 6 = 406	410		
2 10	12 x 16 + 8 = 200 12 x 16 + 9 = 201	200		
3 12	7 x 16 + 15 = 127 8 x 16 + 5 = 132	130		

Added 6" of paraffin reflector 18" high to N, S, E + W.
No mass change.

MULTIPLICATION

Scaler c/ 5 min. BG 5 min. Mult. 1/M

1	7 x 16 + 8 = 120 7 x 16 + 6 = 118	119		
2	3 x 16 + 10 = 58 3 x 16 + 4 = 52	55		
3	2 x 16 + 1 = 33 1 x 16 + 14 = 30	32		

12

LOADING CHANGE

Description Added 72 A4

4 A-4 high Total 132 A4 - 12 A4S

12" x 16" reflector removed on west side (Ctrs 1+2 Effected)

2/10

Mass before change 232,638 gmU 4,652.8 gmU-235

Mass of Change 236,176 gmU 4,723.2 gmU-235

Total Mass 468,815 gmU 9,376.0 gmU-235

Other Changes | Material | Mass

Base 24", 16" High

MULTIPLICATION

Scaler	c/ 5 min. BG 5 min.		Mult	1/M
1	11x16+5	181	185	
	11x16+13	189		
2	12x16+12	194	201	
	13x16+1	209		
3	2x16+10	42	62	
	5x16+2	82		

LOADING CHANGE

2/10/58

Description: Added one 4 in layer (20 x 24 x 24) [h w d]

Added 6" paraffin to the top – Beam hole to Ch 1+2 still open

Loading consist of: 25 A-4, 1 A-4s and 20 A-2

Mass before change 468,815 gmU 9,376 gmU-235

Mass of Change 118,249 gmU 2,365 gmU-235 36

Total Mass 587,064 gmU 11,741 gmU-235

Other Changes — Material — Mass

Base 24", High 20"

MULTIPLICATION

Scaler	c/5 min.	BG/ min.	Mult.	1/M
1	25 X 16 + 15 = 415 22 X 16 + 13 = 365			
2	38 X 16 + 2 = 610 38 X 16 + 9 = 617			
3	3 X 16 + 11 = 59 5 X 16 + 2 = 82			

14

2/10/58

INSTRUMENT CHECK

Time 8:55 AM ~~PM~~ Source PB-214 ~~ront~~

	Channel A	B	C	D	E
Range	10/1010	opr	10^{-11}	10/1.00	900V.
Source Dist.	0"	ok	2"	0"	15"
% F.S. Trip	70	OK	100+	60	100+

Counters 1, 2, & 3 ok

28" Base

~ 2/12/58

INSTRUMENT CHECK

Time 1145 AM PM Source RB-214 γ on E

	Channel A	B	C	D	E
Range	10/1000	Off	10"	10/1000	900V.
Source D	0"		4"	0"	17"
% F.S. Trip	70		100+	60	100+

counters 1, 2 and 3 ok

Present Loading: 28" x 28" x 16"

181 A-4 + 15 A-4s

11.889 + .689 = 12.778 Kg U^{235}

6" of Paraffin reflector on all sides except on west side of stationary table.

~6" of plexiglas reflector on bottom

No top reflector

Base 28", 16" High

MULTIPLICATION

Scaler c/ 5 min. min. Mult. 1/M

Disc 20	14 x 16 + 4 = 228	17 x 16 + 4 = 276
	12 x 16 + 8 = 200	17 x 16 + 2 = 274
	13 x 16 + 11 = 219	13 x 16 + 12 = 204
10 2	14 x 16 + 12 = 236	15 x 16 + 1 = 241
1 2 3	2 x 16 + 14 = 46	4 x 16 + 1 = 65
	2 x 16 + 6 = 38	2 x 16 + 12 = 44

Control Rods in

Control Rds withdrawn

2/13/58
Lynn
Mac
Scott

INSTRUMENT CHECK

Time 1:20 PM

Source PB-214 γ on C

	A				E
	10/1000	opr	10^{-11}	10/1000	900V
Source Dist.	0"	ok	2"	½"	15"
% F.S. Trip	60	OK	100+	55	100+

Counters 1, 2, & 3

LOADING CHANGE

Description Added 48 A4 + 1 A45 (for source)
Previous 181 15
Total 229 A4 16 A45

	gmU	gmU-235
Mass before change	638,976 (~~[illegible]~~)	12.778
Mass of Change	160628.6	3.212
Total Mass	799,605	15.990

Other Changes — Material — Mass
6" Reflector all around except on the west side of the stationary half.

Base 28", 20" high

MULTIPLICATION

Scaler c/ m.n. BG m.n. Mult. T/M

20 1	56 x 16 + 0 = 896	57 x 16 + 8 = 920
10 1 2	79 x 16 + 4 = 1268	81 x 16 + 5 = 1301
12 2 3	10 x 16 + 5 = 165	10 x 16 + 3 = 163
1		
3		

2/14/28

Scott
Lynn
McCarty

INSTRUMENT CHECK

Time 8:30 AM ~~PM~~ Source PB-2-14 / 8 on E

Channel	A	B	C	D	E
Range	10 / .020	.01x	10"	out	300V
Source Dist.	1/2"	OTC	2"	—	18"
% F.S. Trip	1.5	ok	100+	—	100+

Condition 1, 2 & 3 OK

8:40 AM

~~Fixtures~~ #2 Rack power left off. Tables rocked in and reversed. No explanation as to how the tables could be moved with no power to #2 relay rack

LOADING CHANGE

Description Added 12-A4, 1-B4, 2-B1, 73-A2
Total 241-A4, 16-A45, 1B4, 2-B1, 73-A2

Mass before change 799605 gmU 15,990 gmU-235
Mass of Change 160437 gmU ~~[illegible]~~ 3209 gmU-235
Total Mass 960042 gmU 19,199 gmU-235

Other Changes **Material** **Mass**
6" Reflector on all sides except west side of stationary half. Top is bare

Channel A erratic

Base 28", 24" high

18

2-17-88

Mac
Lyon
Scott

INSTRUMENT CHECK

Time 9:30 ~~PM~~ AM Source RB-21F

	Channel A	B	C	D*	E
Range	10/1000	off	18"	10/1000	900V
Source Dist.	0	OK	8"	0	15"
% F.S. Trip	85		100+	75	100+

Counter 1,2,3 OK

Condition same as pg 17

*Channel "D" is out of the "trip" circuit Channels A+E still active trips

MULTIPLICATION

Scaler	c/ 5 min. BG/ 5 (Pg 16) min.		Mult.	1/M
1 20	134 x16+15 = 2159 = 2169 136 x16+3 = 2179	920	2.36	.424
2 10	176 x16+1 = 2801 = 2811 177 x16+11 = 2823	1301	2.16	.463
3 12	24 x16+15 = 399 = 395 24 x16+6 = 390	163	2.42	.413

39
58
75

6" Reflector added to the top of the system and to a 6"x8" hole in the south west side. Now lead 6" all around except on the west side of the stationary leaf and a small crack in the top for the source.

MULTIPLICATION

	Scaler	c/ 5 m. 00 min.	Mult.	1/M
39696	1 20	608 X 64 + 63 = 38975 631 X 64 + 33 = 40417	43.1	.023
58250	2 10	900 X 64 + 59 = 57659 917 X 64 + 25 = 58841	44.7	.022
7576	3 12	118 X 64 + 52 = 7604 117 X 64 + 51 = 7539	46.5	.021

28" Base, 24" high

20

2/19/58
Lynn
Mac
Scott

INSTRUMENT CHECK

Time AM / PM Source

	Channel A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900 V.
Source Dist.	0 ~~7.5~~	0K	8"	0"	15"
% F.S. Trip	75	✓	100+	65	100+

Counters 1, 2 & 3 OK

- 2:00 PM Condition same as Pg 17 except the reflector has been "cleaned up" (ie, all holes and cracks filled)

MULTIPLICATION

Scaler c/ 5 min BG/ 5 min Mult. i/M

1	20	32x64+49 = 2097 / 32x64+11 = 2059	2078
2	5	80x64+20 = 5140 / 80x64+51 = 5171	
3	12	5x64+30 = 350 / 5x64+10 = 340	

1-16-2AS - 925 Volts

415 ct/m
1031 ct/m
69 ct/m

3:00 PM added 6" reflector to top except for source hole ~1" ø
Essentially the same as Pg 19 except cleaner

Rod C @ 0.080 on sec period = 5.18 ¢

Leveled Rd. C @ 8.65 Sensitivity ¢/in.

CRITICAL POSITIONS

2 7/0 Expr 1 Run 1

0.065 L T R

Control Rod		Channel	
A	0.032	A	53 100/200
C	8.65 (?)	B	0.0058
		C	.5 10^{-8}
		D	40 100/200
			780 Volts

Tim Crit. 3 18 ~~AM~~ PM Duration 15 min.

28" Base, 24" High

6" of Reflector except for West side of stationary table.

√

2/20/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 10:00 AM

Source PB-214 Y on E

				D	E
Range	10/1000	opr	10^-11	10/1000	900 Y
Source Dist.	0"		6"	0"	16"
% F.S. Trip	70		100+	65	100+

Counters 1, 2, & 3 OK

LOADING ~~CHANGE~~

Description Removed 12 A4 (39416 / 788.3) 24 A-2 (39384 / 287.7)
Added 1B1 (204.1 / 4.08)

Mass before change ~~[illegible]~~ 960042 gmU 19199 gmU-235 Pg 17
Mass of Change 78596 gmU 1572 gmU-235
Total Mass 881446 gmU 17627 gmU-235

Other Changes Material Mass
6" Reflector on all sides except west slot [352 in²] and Source hole

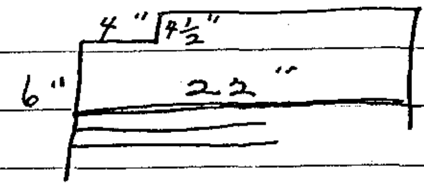
28" Base, 22" High

MULTIPLICATION

Scaler 3 min. min. Mult. 1/M

1 20	15 × 64 + 39 = 999 17 × 64 + 33 = 1121	= 1060	353 Ct/m
2 5	49 × 64 + 47 = 3183 52 × 64 + 48 = 3376	= 3290	1096 Ct/m
3 12	2 × 64 + 23 = 151 2 × 64 + 56 = 184	= 168	56 Ct/m

6" of Refl. added to 164 in² of west side of Stat. table placed on al extrusions
(352 in² Bare)



MULTIPLICATION

	Scaler	3 min.	Mult.	1/M
1	20	16 X 64 + 11 = ~~835~~ ; 16 X 64 + 25 = 849 = ~~842~~	2.86	
2	5 (1, 2)	146 X 64 + 56 = ~~9400~~ = 9299 ; 143 X 64 + 47 = 9199	3.899	
3	1 2/3	3 X 64 + 33 = ~~258~~ = 234 ; 3 X 64 + 18 = 210	78	

6" of reflector to entire reactor, except
~ 1 in² for source and
~ 4 in² for harnyak button

MULTIPLICATION

	Scaler 3 min.		Mult.	1/M
1	16 X 64 + 3 = 1027 ; 16 X 64 + 43 1067	1047		
2	271 X 64 + 3 = 17,347 ; 270 X 64 + 0 17,280	17,314		
3	4 X 64 + 28 = 284 ; 4 X 64 + 41 = 297	291		

77.7
77
[352 in²]
3.53 ct/m
1096 ct/m
56 ct/m

2/21/58
Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 10:00
PB-214
γ on E

	A	B	C	D	E
	10/1000	opr	10^{-11}	10/1000	900V.
Source Dist	0"	0"	3"	0"	16"
% F.S. Trip	70	✓	100+	65	100+

Counters 1, 2 & 3 ok

LOADING CHANGE

Description Removed: 1-A4S ~~(2963 / 59.26)~~
Added: 27A-1 (221535 / 4434) 1 B-2 (409.5 / 8.19)
1 B-1 (204.1 / 4.1) 1 A4 (3284.7 / 65.69)

Mass before change ~~[illegible]~~ 881446 gmU 17,627 gmU-235
Mass of Change 23,098.8 gmU 461.8 gmU-235
Total Mass 904535.0 gmU 18,088.8 gmU-235

Other Changes Material Mass
6" Reflector all around except:
1 in² round
4 in² Honeycomb Button

28" Base, 23" high on Stat. Table
22" " " Mov. "

The source was readjusted and now is 1 inches further from the Rx center than Pg 23

MULTIPLICATION

Pg 23

Scaler	c/ 3 min.	3 min.	Mult.	1/M
Disc 1 20	37 x 64 + 9 = 2377 38 x 64 + 5 = 2437	2408		.4148
2 6	596 x 64 + 46 = 38190 616 x 64 + 19 = 39443	38820		.446
3 12	10 x 64 + 24 = 664 9 x 64 + 49 = 625	644		.452

LOADING CHANGE

Description Added: 21 A 1 (172305 / 344.6)

Mass before change 904535 gmU 18,088.8 gmU-235

Mass of Change 17230.5 gmU 344.6 gmU-235

Total Mass 921,765 gmU 18,433.4 gmU-235

Other Changes

Material	Mass
6" Refl. except 10" 40"	Sauce Haugaak

10:55 AM

Rod C @ 0.085 on 271.5 sec period = 4.25 ¢

Levelec Rd C @ 7.705 Sensitivity ______ $/in.

28" Base, [illegible]
23" High

CRITICAL POSITIONS

A. 276 Expr 1 Run 2

Table Pos. 0.015 T ______ R ______

Control Rod	Channel
A 0.035	A 47 10/sec
C 7.705	B 0.0017
3	C 6.6 10^{-10}
4	D 84 10/200
	E 9 900 V

Fixed Rd 8
negative period
80.34 sec
¢

Tim Crit. 11:20 AM Duration 10 min.

2.4905

C.A. 2% Expr. 2 Run 1

Sheet _____ Date 2-21 1958 Time 2:34 ~~AM~~ PM

Purpose Bare Indium
Radial foil exposure
Horizontal

Location D.	θ	Foil #
hp		
	$-17\frac{1}{8}$	40
	-10	10 (14 1/6)
	-4	4
	0	27 ✓
	2	23
	4	22
	6	28
	8	25
	10	38
	12	31
	$14\frac{3}{32}$	38
	$15\frac{1}{2}$	6
	17	12
	$18\frac{1}{2}$	26

Added - 6 inches of reflector to the 4½ inches previously used for Honeycomb Button

CRITICAL POSITIONS

C.A. 2% Expr. 2 Run 1

... Pos. .015 L T R

Control Rod	Channel
A .040	A 34 $\frac{100}{200}$
B	B .0054 3×10^{-10}
~~C 9.950~~ 5	C 3.9
C 9.995	D 46 $\frac{100}{100}$
	E .6● 780

Tim Crit. 2:49 05/60 ~~AM~~ PM Duration 20 min.

Hutton

28

2/24/58

Scott
Mc Corty
Lynn

INSTRUMENT CHECK

Time 9:00 ~~PM~~ AM Source PB-21K Y on E

	Channel A	B	C	D	E
Range	10/1000 opr		10^-11	10/1000	900 V.
Source Dist.	0"	ok	2"	0"	15"
% F.S. Trip	65	ok	100+	65	100+

Counters 1, 2 & 3 ok

C.A. 2% Expr. 2 Run 2

Sheet _____ Date 2-24 1958 Time _____ AM PM

Purpose Cd. covered foil
Radial foil Exposure
Horizontal

Location		Foil #
N-	0- top	
	-17 1/8	6
	-10	25
	-4	28
Bare	0	27
	4	31
	6	23
	8	10
	~~12~~ 17	26
	14 3/8	38
	15 1/2	12
	17	22

cont. ~~Lo~~ Location Foil #
18½ 4

CRITICAL POSITIONS

C.A. 270 Expr. 2 Run 2

Table Pos. 01 L T R

Control Rod		Channel		
A	.040	A	62½	100 / 500
B		B	.0258	
C	7.88	C	~~8~~ 9.2	2.5×10^{-10}
		D	47	100 / 500
		E	2.4	710

Tim Crit. 10:24 59/60 AM ~~PM~~ Duration 20 min.

C.A. 270 Expr. 2 Run 3

Sheet ____ Date 2-24 1958 Time 1:35 ~~AM~~ PM

Purpose ~~Calibration Covered~~ Bare Indium

Radial Foil Exposure

~~Horizontal~~ Same as Run 1

Location D. O. Up.	Foil #
	—
-8	7
-6	14
-4	19
-2	32
0	N-1
+2	11
+4	35
+6	20
+8	36

CRITICAL POSITIONS

A 2.70 Expr. 2 Run 3

Tests Pos. .015 B .087 R

Channel

A .04	A 6.4	100/200
B	B .01	
C 10.045	C 7.8	3×10^{-10}
	D 89	100/100
	E 2.4	810

Tim Crit. 2:01 23/60 ~~AM~~ PM Duration 20 min.

32

2/25/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 10:40 AM ~~PM~~ Source PB-214 TONE

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	0	OK	3"	0	20"
% F.S. Trip	63'	OK	100	53'	100+

Counters 1, 2 & 3 ok

28" X 28" X 23"

C.A. 270 Expr. 2 Run 4

Sheet ~~Time~~ Date 2-25 1958 Time 1040 AM ~~PM~~

Purpose Bare ~~Cadmium~~ and Al. foils
Radial Foil Exposure
Vertical

Location Vertical	Foil #	Cluster of Foils
	—	Located 4-
+8	41	A 1- Bare Cd Foil
+4	8	A 2- Covered with tape
+2	5	B 3- Covered with Al
0	N_2	C 4- Covered with Tape + Al
-2	9	
-4	18	
-8	15	
$-11\frac{1}{2}$	17	
$-13\frac{1}{2}$	21	
$-15\frac{1}{2}$	39	

A	D
C	B

CRITICAL POSITIONS

~A	2%	Expr.	2	Run	4
…ule F…	.015		.0875	R	

[illegible] Rod		Channel		
A	.040	A	68	100/200
B		B	.01	
C	10.01	C	8.4	3x10-10
		D	95	100/100
		E	2.8	810

Tim Crit. 11^{10} AM ~~PM~~ Duration 20 min.

…ords
4-
…oil
…tape
4l
metal

34

2/26/58

Scott
McCarty
Lyman

INSTRUMENT CHECK

Time 8:30 AM ~~PM~~ Sr PB-21F Tone

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	0	OK	3"	~~5~~ 8"	16"
% F.S. Trip	65	OK	100+	55	100+

Counters 1, 2 & 3 OK

C.A. 270 Expr. 2 Run 5

Sheet _____ Date 2-26 1958 Time 8:45 AM ~~PM~~

Purpose Cd. Covered Radial foil exposure Vertical

Location Vertical	Foil #
+8	29
+4	3
+2	1
0	N_3
-2	2
-4	16
-8	24
$-11\frac{1}{2}$	33
$-13\frac{1}{2}$	46
$-15\frac{1}{2}$	13

CRITICAL POSITIONS

C.A. 270 Expr. 2 Run 5

Table For .012 B. 9865 R

	Control Rod		Channel	
A	.042	A	745	100/500
B	~~8.70~~	B	.026	
C	8.70	C	8.2 3X10^{-10}	
4		D	51.5	100/500
		E	4.5	750

Tim Crit. 9:08 20/60 ~~AM PM~~ Duration 20 min.

added: At source entrance

2 C-2 = ~ 4 gms (4.04)

1 C-1 = ~ 1 gms. (1.028)

~ 5 gms. 2.235 (5.118 2π)

(added in on page [illegible])

28X28" Base
804.7 g/1" layer

90 g. for rods

Rod C 0 15,000 117.3 sec period = 8.6
Loaded Rd. 17.395 sensitivity 3595 g/in.

C.A. 2% 92/8 Expr. 3 Run 1

Sheet ______ Date 2-26 1958 Time 1:45 ~~AM~~ PM

Purpose To remove top & Bottom reflector

28" Base, 27" High, Sides Reflected, Top Bare, Bottom partially

Removed (2) 6" by (4) 12" X36" of Plexiglas from Bottom

LOADING CHANGE

Description Removed 6" Parafin Reflector on top

Added — 23 A-4 (75,548.1 / 1,511) added - 2 - B - 4 (1,633 / 32.76)

" 30 A-2 (82,050 / 1,641) " — 2 - B - 2 (819.0 / 16.38)

" — 6 — C-2 (614.4 / 12.288)

Mass before change 921,765 gmU 18,433.4 gmU-235

Mass of Change 166,619 gmU 3,213.4 gmU-235

Total Mass 1088,384 gmU 21,646.8 gmU-235

Other Changes Material Mass

CRITICAL POSITIONS

C.A. ______ Expr. 3 Run 1

.02 min 990

Control Rod

A .085 A 59 100/100

2 ______ B .0031

C3 . 17.395 C 6.0 2.5 X10-10

4 ______ D 47 100/100

E 7 900

Time Crit. ______ min.

C.A. 27 9½/8 Expr. 3 Run 2

Sheet ____ Date 2-26 1958 Time 2:15 ~~AM~~ PM

Purpose Removing Reflector

28" Bore, 27" High, Sides Reflected
Top & Bottom Bare

Sub critical Log N .00033
Chan A 73 10/100
D 68 10/100
C 6.6 2.5 X 10-11

Removed remaining reflector from Bottom.
Sub Crit by ~ 15.5¢ by "Source pull" negative period

C.A. 27 9½/8 Expr. 3 Run 3

Sheet ____ Date 2-26 1958 Time 2:55 ~~AM~~ PM

Purpose adding Reflector

Placed 1/8" thick plexiglas size 34 1/8" by 40" across top.

Sub critical Log N .0009
Chan A 75 10/200
" D 67 10/200
" C 7.3 5 X 10-11

Sub-crit by 1.6¢

CA 270 9 2/8 Exp 3 Run 4

Sheet Date 2-26-1958 Time 3:36 PM

Purpose adding Reflector

Sides Reflected (6")

28" Base, 27" High, Bottom Bare

Top 1/4" Plexiglas

Placed another 1/8" thickness of plexiglas size 34 1/8" by 40" across top.
Total of 1/4" plexiglas on top

CRITICAL POSITIONS

CA 270 9 2/8 Expr. 3 Run 4

Table Pos. 015 B 9855

Control Rod	Channel
A .035	A 56 100/100
	B .0032
C 8.56	C 50 2.5X10-1/8
	D 85 100/50
	E .5 900

Tim Crit. 3:40 PM Duration 14 min.

Rod C @ 0.88 308.4 3.8 #

Leveled Rd. C @ 8.56 0.444 #/in

2/27/58

Scott
McCorty
Lynn

(6")

igloo

INSTRUMENT CHECK

Time 12:25 PM   Source PB-214 γ on 6

	Channel A	B	C	D	E
Range	10/1000	cpr	10^{-11}	10/1000	900 V.
Source Dist.	0"	0"	3"	0"	16"
% F.S. Trip	70	ok	100+	55	100+

C.A. 270 92/8   Expr. 2   Run 6
Sheet ______ Date 2-27 1958   Time 12:35 PM
Purpose Radial foil exposure
Cd. Covered
28" Parallelepiped, 27" High
Reflector Same as p. 38

Location Vertical	Foil #
+13½	9
+12½	10
+11½	7
+9½	12
+6½	8
+2½	6
0	1
-6	2
-8	4
-11½	3
-13½	5
0, -4, ½	N_1

LOADING CHANGE

Description Removed 1 - A 4 s (2963.0 / 59.26) 4 - B 1 (816.4 / 16.32)

To clean up source entrance hole 3 - B 4 (24573 / 491.4) 8 - C 2 (819.2 / 16.38)

3 - B 2 (12280.5 / 245.7) 2 - C 1 (51.4 / 1.028)

Added 5 - A 2 (8205 / 164.1) 2 - A 1 (820.5 / 16.41)

Mass before change	1,088,384 gmU	21,646.8 gmU-235
Mass of Change	680 gmU	13.8 gmU-235
Total Mass	1,089,074 gmU	21,660.6 gmU-235
Other Changes	256 Material 1,089,280	5.1 Mass 21,665.7 gm U 235

(see Page 35)

Removed Plexiglas from top of reactor -

Placed (6) 8" x 36" x 1/4" of plexiglas on bottom center of reactor. Completed covering bottom of Reactor with (2) 4" thick Plexiglas.

CRITICAL POSITIONS

270 9/8

Expr 1 2 Run 5 6

.017 BT .9855

Channel

A .033 87 100/500

C 11.235 .028

C 3.6 10-9

D 68 100/500

E 1.2 750

Tim Crit. 1:01 2/27/68 AM/PM Duration 20 min.

28" Base, 27" High

6" Reflector except top and Bottom as above

2/28/58

Scott
McCarty
Lipin

INSTRUMENT CHECK

Time 9:00 AM ~~PM~~ Source PB-214
Tone

	Channel A	B	C	D	E
Range	1/1000	opr	10"	10/1000	900 V.
Source Dist.	0"	ok	3"	0	16"
F.S. Trip	70	✓	100+	60	100+

Counters 1 2 & 3 OK

C.A. 2-76 92/8 Expr. 32 Run 67

Sheet ____ Date 2-28-1958 Time 9:10 AM ~~PM~~

Purpose Radial Foil exposure
~~Ed~~ Bare End.
28" Parallelepiped, 27" high

Location Vertical	Foil #	Reflector: Side 6"
+13½	9	Top Bare.
+12½	10	Bottom, ¼" on Port ½" on Port
+11½	7	
+9½	12	p.40
+6½	8	
+2½	6	
0	1	
-6	2	
-8	4	
-11½	3	
-13½	5	
0,-4,½	N,1	

LOADING CHANGE

Description

Mass before change ______ gmU ______ gmU-235
Mass of Change ______ gmU ______ gmU-235
~~Total Mass~~ ______ gmU ______ gmU-235
Other Changes ______ Material ______ Mass

CRITICAL POSITIONS

2% 9/28 Expr. 2 Run 7
.015 B-98.50 in

Rod	Position	Channel		
A	.030	A	72	100 / 200
B		B		
C	12.75	C	8.8	3 × 10^-10
D		D	58	100 / 200
		E	2.2	900

Time Crit. 9:29 24/60 AM ~~PM~~ Duration 20 min.

Scott
Lynn
McCarty

Rod C
0 to 10.78 = 7 ¢
8.695 to 12.75 = 7.65
14.65 ¢
3.15 ¢ Excess
8.7 to 10.8 = 11.5

Rod C @ 8.695 on 184.7 sec period = 7.65 ¢
Leveled Rod C @ 12.75 Sensitivity 1.88

28" Parallelepiped, 27" High + 9/49 **43**

3/3/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 8:50 AM

Source PB-214 γ one E

Channel	A	B	C	D	E
Rdg	0/1000	opz	10⁻¹¹	10/1000	900 V.
Source Dist.	0	0	3"	0	15"
% F.S. Trip	65	ok	100+	65	100+

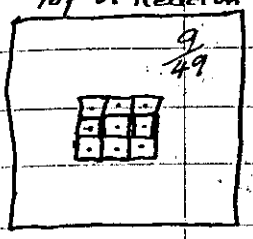
Counters 1, 2 + 3 ok

Reflector Same as p. 41

LOADING CHANGE

Description Removed 18"x36"x¼" of plexiglas from bottom center reactor, also removed ½" thick Plexiglas that completed the covering of bottom of reactor. added: 9 - A-1 7384.5 ~~7445~~ 147.69 to top center of Reactor.

Top of Reactor



Mass before change 1,089,280 gmU 21,665.7 gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass 1,096,665 gmU 21,813.4 gmU-235

Other Changes

Material	Mass

10:2
4:34
15:58

CRITICAL POSITIONS

CA 270 9/8 Expr. ~~2~~ 3 Run ~~4~~ 5

Table Pos. .015 B -.9848

Control Rod	Channel
A .0x0	A 88 100/50
B	B .0025
C 14.470	C 9.6 10-18
4	D 67 100/50
	E 3 900

Time Crit. 9:20 AM Duration 10 min

Rod C @ 9.770 on 93.4 sec period = 44.2 ¢

Levelec Rd. C @ 14.47 Sensitivity = 2.17 ¢/in

28" Base
27" High
+
9 A-1

Rod C
0 to 10.18 = 7¢
9.77 to 14.47 = 10.2
17.2¢
9.8 to 18 = 1.7+
15.5¢
Excess

C.A. 270 92/8 Expr. 3 Run 6

Sheet ______ Date 3-3 1958 Time 10:08 AM

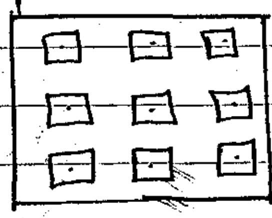
Purpose Fuel evaluation

28" Parallelepiped

27" High + 9/49"

Reflector Same as p. 41

Distributed the 9 - A-1 fuel blocks on top of reactor as shown.



9/49

Rod C @ .085 on 262.8 sec period = 4.35 ¢

Levelec Ru. 9.12 ______ sensitivity = 48

CRITICAL POSITIONS

C.A. 270 92/8 Expr. 3 Run 6

Table Pos. .015 L .9835 R ______

Control Rod	Channel	
A .045	A 80	10/500
B	B .0025	
C 9.13	C 98	10 / 10
	D 66	10/500
	E 3	900

Tim Crit. 9:25 AM Duration 12 min.

4.35 ¢

Excess

C.A. 2% $\frac{92}{8}$ Expr. 3 Run 7

Sheet ______ Date 3-3-1958 Time 11:03 AM/PM

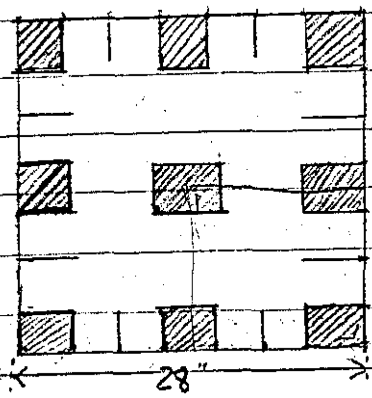
Purpose Fuel Evaluation

28" Parallelepiped

27" High + $\frac{9}{49}$

Reflector Same as p. 41

Distributed the 9- A-1 fuel blocks on top of reactor as shown.



$\frac{9}{49}$ .1837

Summary

~~Base -7.5~~
~~1/8" T +6/42~~
~~1/4 T +12~~
~~" B +12¢~~
+14.4 15.3
+4.31
-1¢

Sub critical

LOG N .00032

Channel A 70 $\frac{10}{100}$

D 65 $\frac{10}{100}$

C 6.5 2.5×10^{-11}

C.A. 270 $\frac{92}{8}$ Expr. 3 Run 8

Sheet ______ Date 3 - 3 1958 Time 1:38 ~~AM~~ PM

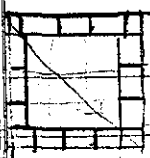
Purpose Fuel Evaluation

28" Parallelepiped

27" High + 1" ~~[illegible]~~ on 1 quadrant — 3/8" plexiglas

Reflector same as p. 41

¼" + ½" plex. on bottom



Top of Reactor

LOADING CHANGE

Description South east Quadrant of reactor Covered with 1" thick fuel

Added 12 — C-4 $\left(\frac{247.44}{49.49}\right)$

~~[illegible]~~ 4 — C-1 ~~$\frac{51.4}{1.03}$~~ $\left(\frac{205.6}{4.08}\right)$

Mass before change 1,096,665 gmU 21,813.4 gmU-235

Mass of Change 2680 ~~2474~~ ~~2526~~ ~~1,099,134~~ gmU ~~49.5~~ ~~50.5~~ 53.57 gmU-235

Total Mass ~~1,[illegible]~~ ~~1,099,191~~ gmU ~~21,863.92~~ gmU-235

Other Changes Material Mass

Total mass 1,099,345 21,866.97 gm U-235

Rod C @ .775 on 132 sec period = 7

Leveler Rd C @ 10.787 Sensitivity .65 ¢/in.

CRITICAL POSITIONS

C.A. 270 $\frac{92}{8}$ Expr. 3 Run 8

Table 1.015 B. 8825 R

Rod	Channel	
A .038	A 43	~~100~~ 100
B	B .0026	
C 10.787	C 77	10 × 10
	D 65	10 / 500
	E 3	900

Tim Crit. AM PM Duration min.

7.0 ¢ Excess

CA 2% 92/8 Expr. 3 Run 9
Sheet Date 3 - 3 1958 Time 3:37 ~~AM~~ PM
Purp. Fuel Evaluation
28" Parallelepiped
27" High

LOADING CHANGE

Description Removed from South east Quadrant of reactor: 9 - A-1 (7384.5 / 147.7)
12 - C-4 (2474.4 / 49.5)
4 - C-1 (205.64 / 4.08)
Placed 1/8" thickness Plexiglas Size 34 1/8" by 40" across Top of Reactor

Mass before change 1,099,191 gmU 21,863.92 gmU-235
Mass of Change 10,064.5 ~~9910~~ gmU ~~198~~ 201.27 gmU-235
Total Mass 1,089,281 gmU 21665.72 gmU-235

Other Changes Material Mass

Estimate no plexiglas sub-crit by ~~[illegible]~~ 6.3 ¢

CRITICAL POSITIONS

2% 92/8 Expr 3 Run 9
Core Pos. .015' B- 0.8818 R.

Control Rod	Channel
A 0.03	A 71 10/200
C 7.975'	B 0.0008
	C 6.7 5 x 10^-11
	D 61 10/20
	E 0.1 90V

Period
C @ 0.088'
343 sec
3.5 ¢

Tim Crit. 4:25 ~~AM~~ PM Duration 5 min.

3/4/58

Scott
McCarty
Lynn

Operator on top

INSTRUMENT CHECK

Time 9:00 AM

Source 8B-214
6 on 6

	A	B	C	D	E
	10/1000	opr	10^{-11}	10/1000	900V.
Source D	0"	0"	2"	0"	15"
% F.S. Trip	65	OK	100+	55	100+

Counters 1, 2 & 3 ok.

C.A. 2% 92/8 Expr. 3 Run 10

Sheet ___ Date 3-4 1958 Time 9:12 AM

Purpose Fuel Evaluation

Added Plexiglas under reactor 18" X 36" X 1/4
Plus 1/2" thickness that completed covering of bottom of reactor.

Rod C 0.0075 - 8.4 div - 18.2 div/sec
C 9.895 - 6.0 ¢

CRITICAL POSITIONS

2% 92/8 Exp. 3 Run 10

6.015 .782

Channel

A 0.050 .43 100/100

B .0025

C 9.895 C 9.3 10^{-10}

D 65 100/50

E .4 900

Tim Crit. 9:44 AM Duration 18 min.

C.A. 2% 92/8 Expr. 3 Run 11

Sheet Date 3-4 1958 Time 10 23 AM

Purpose *Fuel Evaluation*

South east Quadrant of reactor covered with 1/8" Plexiglas - Sheet 22 inches X 20 in.

2.5¢

8.5
-6.0
2.5¢ for 1/8" plexg. on 1 quadrant

Rod C .075 on 11.125 sec period = 8.5 ¢

Leveled Rd. C 11.125 Sensitivity ¢/in.

1 1/4 turn

CRITICAL POSITIONS

2% 92/8 Expr 3 Run 11

.015 B .2762 R

		Channel
A .035	A 43	~~100~~ 100
B	B .0025	
C 11.125	C 9.2	10-10
		~~100~~
	D 65	50
	E .5	900

Tim Crit. 10 38 AM Duration 6 1/2 min.

Rod ___ on ___ sec period = ___ ¢

Leveled Rd. ___ Sensitivity ___ ¢/in.

Rod C .075 5.5 Div.

Secs. 119.5 8.5 ¢

C.A. 270 9 2/8 Expr. 3 Run 12

Sheet: Date 3-5 1958 Time 10 55 AM

Purpose Fuel Evaluation

J

Placed 1/8" thickness of plexiglas size 34 1/8" X 40" across top of reactor.

Rod C - 0 to 11.125 = 8.5 ¢
11.125 to 14.06 = 7.58 ¢
16.08 ¢ Excess

16.08
- 6.0
10.08 ¢ for 1/8 on entire top

CRITICAL POSITIONS

C.A. 270 9 2/8 Expr. 3 Run 12

Table Pos. 1015 B-3238 R

Control Rod	Channel
A .04	A 86 100/50
B	B .0025
C 14.06	C 9.4 10 -10 100/50
	D 65
	E .5 900

Tim Crit. 11:14 AM PM Duration 12 min.

Rod C @ 10.40 on 1086 sec period = 90 ¢
Levelec Rd. C @ 14.06 Sensitivity ¢/in.

Withdrew Rod C @ 11.125 on 1268 sec period = 7.58 ¢
Levelec Sensitivity ¢/in.

C.A. 2% 92/8 Expr. 3 Run 13

Sheet Date 3-5 1958 Time 11:45 AM PM

Purpose Fuel Evaluation

28"X28"X27"

South east Quadrant of Reactor Covered with a total of ½" Plexiglas.

8.5 ¢
+6.5
15.0 ¢ Exam

15.0 ¢
-6.0
9.0 ¢ for ½" on Quad.

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 3 Run 13

Tools Pos. .015 B - .0820

Control Rod	Channel
A .038	A 42 100/100
B-	S .02K
C 13.625	C 9.2 10 -10
	D 63 100/50
	E 5 900

Tim Crit. 12⁰¹ AM PM Duration 7 mins.

Rod C 11.125 on 165.1 acc period = 6.5 ¢

Levelac Rd. C @ 13.625 Sensitivity _____ ¢/in.

C.A. 2% 9/8 Expr. 3 Run 14

Sheet Date 3-5 1958 Time 1:15 ~~AM~~ PM

Purpose Fuel Evaluation

8.5
10.8
19.3 ¢ Excess
-6.0
13.3 ¢ per 1" fuel on 1 quad.

LOADING CHANGE

Description South east Quadrant of reactor covered with 1" thick fuel
added: 9-A-1
1-B-1
12-C-4

Mass before change	1,089280 gmU	21665.72	gmU-235
Mass of Change	10,063 gmU	201.28	gmU-235
Total Mass	1,099,343 gmU	21,867.00	gmU-235

Other Changes — Material — Mass

Rod C @ 13.625 on 125.5 sec period = 5.7 ¢
Leveled Rd C @ 15.495 Sensitivity 3.05 ¢/in.

CRITICAL POSITIONS

2% 9/8 Expr 3 Run 1K

.015 B .166 D

Channel

Rod A .038 A 8.5 100/100
B B .0052
C - 15.495 C 7.8 2.5 X 10^-10
D 66 100/100
E 1.2 900

Crit. 1:43 AM PM Duration 12 min.

Rod C @ 11.125 on 86.9 sec period = 4.8 ¢
Leveled Rd C @ 15.495 Sensitivity 2.45 ¢/in.

C.A. 270 92/8 Expr. 3 Run 15

Sheet _____ Date 3-5 1958 Time 2:57 AM PM

Purpose Fuel Evaluation

South east Quadrant of reactor covered with 1" Plexiglas

LOADING CHANGE

Description Removed 1" thickness of fuel from Quadrant of reactor (South east) 9 - A-1 (7384.5 / 147.7)
1 - B-1 (204.1 / 4.08)
12 - C-4 (2474.4 / 49.5)

Mass before change		gmU	gmU-235
Mass of Change	10,063	gmU	201.28 gmU-235
Total Mass	1,089,280	gmU	21,665.72 gmU-235

Other Changes — Material — Mass

8.5
11.9
20.4 Exam
-6.0
14.4 for 1" plug. on 1 Quad.

CRITICAL POSITIONS

C.A. 270 92/8 Expr. 3 Run 15

Table Pos. .015 B-1680 R

Control Rod	Channel
A .04	A 83 100/100
B	B .0054
C 15.82	C 7.6 2.5 x 10^-10
	D 64 100/100
	E 1.1 900

Time Crit. 3.04 AM PM Duration 8 min

Level Rd. C @ 12.42 Sensitivity _____ ¢/in.
Rod C @ 11.125 on 7.2 sec period = 11.9 ¢
Level Rd. 2 @ 15.820 Sensitivity 2.53 ¢/in.

C = 14.4
C = B.4.3

3/6/58
Scott
Lynn
McCarty

INSTRUMENT CHECK

Time 10:05 AM   Source PB-214 γ on E

Channel	B	C	D	E
	10/1000	oper	10^{-11}	10/1000	900 V.
Source Dist.	5"	0"	3"	0"	3"
% F.S. Trip	65	OK	100+	55	100+

Counters 1, 2 & 3 OK

C.A. 290 9 2/8   Expr. 3   Run 16

Sheet ___ Date 3-6 195__ Time 9:35 AM

Purpose Refl + Fuel Change

28" X 28" X 29"

LOADING CHANGE

Description Removed plexiglas under reactor (18" x 36" x 1/4 Plus 1/2" Plexiglas that completed covering of bottom of Reactor) ~~Removed~~ North South + West has 27 in. high reflector (Fuel height 29 in) Added 28A1 2297.40 45.948 60-B-4 = 4914.68 98.28 5-A-2 8205 164.10

Mass before change 1,089,280 gmU 21,665.72 gmU-235
Mass of Change 80,325 gmU 1606.38 gmU-235
Total Mass 1,169,605 gmU 23,272.10 gmU-235

Other Changes	Material	Mass

CRITICAL POSITIONS

2% 92/8	Expr. 3	Run 16	
.015	B 9820 R		
		Channel	
π .05	A 65	100/50	
B	B .0024		
C 15.575	C 6.5	10^-10	
	D 52	100/50	
	E .2	900	

Tim Crit. 10 45 ~~PM~~ AM Duration 6 min.

C.A. 2% 92/8 Expr. 3 Run 17

Sheet ______ Date 3-5 1958 Time 11:25 AM ~~PM~~

Purpose Fuel Evaluation

28" X 28" X 30"

Added 1" of fuel on top (included in fuel addition page 56)

30" Fuel Height

27" Reflector on North and South

Sub Critical

*

C.A. 2% $\frac{92}{8}$ Expr. 3 Run 18

Sheet ______ Date 3-6 1958 Time 1:54 PM

Purpose Fuel Evaluation

28" x 28" x 31"

LOADING CHANGE

Description Fuel Height @ 31", Reflector 31" High, 6" thick on N + S side

Added Run 17 - 49 A-1 ($\frac{40,285}{804.09}$)

" 18 20 A-1 ($\frac{16,410}{328.20}$)

116 C-4 ($\frac{23,919}{478.38}$)

Mass before change 1,169,605 gmU 23,272.1 gmU-235

Mass of Change 80,534 gmU 1,610.7 gmU-235

Total Mass 1,250,139 gmU 24,882.8 gmU-235

Other Changes Material Mass

Rod C @ 0.75 (7.75 struck) on 6.84 sec period = 1.8 ¢

Leveled Rd C @ 7.45 Sensitivity ______ ¢/in.

Measured Stack = $28\frac{3}{16}$" x $28\frac{3}{16}$" x $31\frac{3}{16}$"

CRITICAL POSITIONS

Expr. ______ Run ______

.015 B-883.0 R

Control Rod — Channel

A-.035 — A 72 $\frac{10}{200}$

B- — B .001

C-7.45 — C 7.6 1.0 -1.0

D 62 $\frac{10}{200}$

E .1 900

Tim Crit. 2:11 PM Duration 8 min.

3/7/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 8:30 AM

Source PB-214
γ on E

	A	B	C	D	E
	10/1000	off	10^{-11}	10/1000	900 V.
Source Dist.	0	0	3"	½"	18"
% F.S. Trip Counters	75	OK	100+	55	100+

C.A. 2% 92/8 Expr. 3 Run 19

Sheet ______ Date 3-7-1958 Time ______ AM

Purpose Fuel & Reflector Evaluation.

28 3/16" x 28 3/16" x 31 3/16"

Fuel 31" high
Reflector - 6" Parafin on top
5 ¾" of plexiglas on bottom
[(9 wide of 2⅞" x 36") + 1"]

Sub Critical: ~ 15¢

58

3/10/58

Scott

McCarty

Lynn

29" dia Cylinder

INSTRUMENT CHECK

Time 8:50 AM FM — PB-21 — J — Zone E

	A	B	C	D	E
Range	$\frac{10}{1000}$	off	10^{-11}	$\frac{10}{1000}$	900 V.
Source Dist.	0	0	3"	0	16
% F.S. Trip	65	OK	100+	65	100+

Counters 1, 2 & 3 OK

C.A. 2% 92/8 Expr. 4 Run 1

Sheet ____ Date 3-10-1958 Time 9:00 AM PM

Purpose 29" Cylinder

6" Reflector on bottom

29" x 31"

29" dia Base

31" High

MULTIPLICATION

Scaler	c 3 min.	b 3 min.	Mult.	T/M
120	24x16+10 = 394 23x16+11 = 379	387		
25	~~0x16+3 = 3~~ 0x16+1 = 1	2		
3,2	~~4x16+14 = 78~~ 5x16+0 = 80	79		

Loading: 1,016,865 gm U

20,215.5 gm U^{235} (Exp 3 Run 18 Less amount removed)

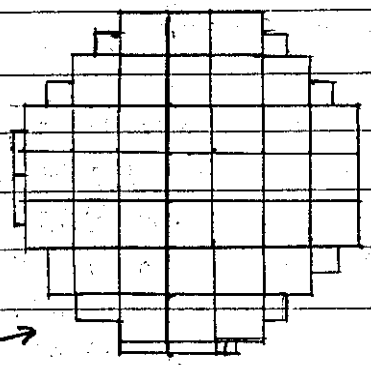
C.A. 2/0 92/8 Expr. 4 Run 2
Sheet Date 3-10 1958 Time 1:50 PM
Purpose 29" Cylinder
6" Reflector on bottom
29" X 34"

29" Base
34" High

MULTIPLICATION

Scaler	c	m n.	min.	Mult.	1/M
1	20	29 X 16 + 5 = 469 30 X 16 + 2 = 482	476		
2	5	0 X 16 + 12 = 12 0 X 16 + 11 = 11	11		
3	12	6 X 16 + 10 = 106 6 X 16 + 0 = 96	101		

Loading: 1,133,164 gm U (Exp 3 Run 18 less amt remaining.)
22,543.4 gm U^{235}



29" Base cylinder ← Plane of Table Separation
for Run 1 + 2

60

3/11/58
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McCarty
Lyman

INSTRUMENT CHECK

Time 10:20 AM ✓ Source PB-21 zone E

	Channel A	B	C	D	E
Range	10/1000	off	10"	10/1000	900 V.
Source Dist.	0		2"	0	16"
% F.S. Trip	70		100+	65	100+

Recorder 1,293 ok

C.A. 270 92/8 Expr. 4 Run 3

Shear Date 3-11 1958 Time 10:30 AM FM

Purpose Reflector addition

29" Base

34" High

LOADING CHANGE

Description Added 6" thick - 8" High reflector to sides on al extrusions
Added 18 C-4

Mass before change	1,133,164 gmU	22,543.4	gmU-235
Mass of Change	3,712 gmU	74.23	gmU-235
Total Mass	1,136,876 gmU	22,617.63	gmU-235

Other Changes	Material	Mass

MULTIPLICATION

Scaler c/... 3 ... min. Mult. 1 M

1	20	29X16+5=469
		30X16+2=482
2	5	0X16+12=12
		0X16+12=11
3	12	6X16+10=106
		6X16+0=96

C.A. 270 92/8 Expr. 4 Run 4

She... Date 3-11 1958 Time 12:40 PM

Purpo... Reflector addition

29" Base
34" High

LOADING CHANGE

Description Reflector 6" thick 16" High
Added 18 c-4

Mass before change 1,136,876 ~~1,136,872~~ gmU 22,617.62 gmU-235

Mass of Change 3713 ~~3708~~ gmU 74.23 gmU-235

Total Mass 1,140588 gmU 22,691.86 gmU-235

~~Other Changes~~ Material Mass

Rod C @ ~~*~~ .075 in 202 sec period = 5.5 ϕ

Leveled Rd. C @ 10.455 Sensitivity ____ ϕ/in.

CRITICAL POSITIONS

C.A. 270 9/8 Expr. 4 Run 4

Table Pos. U12 B. 2815 D.

	Channel
A .045	62 10/500
B	.0012
C 10.455	C 9.2 10-10
	D 56 100/50
	E .1 900

Tim Crit. 1:00 ~~AM~~ PM Duration 10 min.

Rod C 0 to 10.455 = 5.5 ¢
10.45 to 13.42 = 5.5 ¢ (1.8 ¢/in)
13.42 to 16.29 = 5.9
16.9 ¢

C.A. 270 $\frac{92}{8}$ Expr. 4 Run 5

Sheet ... 3-11 1958 Time 2:12 PM

Purpose Reflector addition

29" dia, 34" High

LOADING CHANGE

Description Reflector 6" thick 20" high

Removed reflector from bottom of reactor

added 9 C-4

Mass before change 1,140 588 gmU 22,691.86 gmU 235

Mass of Change ~~1857 580~~ 1856 gmU 37.12 gmU 235

Total Mass 1,142,444 gmU 22728.98 gmU 235

Other Changes Material Mass

Rod C on 13.42 ~~1.87~~ on 187 sec period 5.9

Leveler Rod C 16.295 Sensitivity 2 in/m.

CRITICAL POSITIONS

C.A. 270 $\frac{92}{8}$ Expr. 4 Run 5

Table Pos. .012 B 7.730

Rods		Channel	
A .045	A	60	100/50
B	B	.0012	
C 16.295	C	7.3	10-10
	D	48	100/50
	E	2	900

Time Crit. 2:27 PM Duration ____ min.

C.A. 270 92/8 Expr. → 4 Run 6

Sheet 3-11 1958 Time 4:05 AM PM

Purpose Reflector addition
Fuel Removal (6" from top)

LOADING CHANGE

Description Reflector 6" thick and 24" high

Removed: 68 A-2 8 B-4 1 C-4
11 A-4 6 B-2
48 A-1 1 B-1

Mass before change	1,142,444 gmU	22,728.98 gmU-235
Mass of Change	- 196,523 gmU	- 3,930.3 gmU-235
Total Mass	945,911 gmU	~~26,609.~~ gmU-235
Other Changes	Material	18,798 Mass

Mass (by block Count): Base 29" dia, 28" high
942,796 gm U 18,854.8 gm U^{235}

MULTIPLICATION

Scaler c/ 3 m DS min. Mult. 11/1M

Scaler	c/ m
1	18 X 16 + 4 = 308
1	20 X 16 + 6 = 326
2	1 X 16 + 1 = 17
2	1 X 16 + 1 = 17
3	~~5 X 16 + 2 = 82~~
3	~~5 X 16 + 12 = 92~~

3/12/58

INSTRUMENT CHECK

Time 9:20 AM ~~PM~~ Source PB-214 γ on E

	Channel A	B	C	D	E
Range	10/1000	opt	10"	10/1000	900V
Source Dist.	0		2"	0	16"
% F.S. Trip	70		100+	60	100+

Counters 1, 2, & 3 ok

C.A. 290 92/8 Expr 4 Run 7

Sheet ____ Date 3-12 1958 Time 9:50 AM ~~PM~~

Purpose Reflector addition

29" dia, 28" high

6" Reflector on all sides except top.

LOADING CHANGE

Description Reflector 6" thick 28" high
Fuel 28" high, 6" of Refl on bottom,
added 9 C-4

Mass before change	942796 gmU	18,854.8 gmU-235
Mass of Change	1,856 gmU	37.12 gmU-235
Total Mass	944,652 gmU	18,891.9 gmU-235

Other Changes — Material — Mass

Rod C @ 17 on 1/12.5 sec period = 8.5 ¢ ¢/in.

Leveler Rd. C @ 19.21 Sensitivity

CRITICAL POSITIONS

2% 92/8 Expr. 4 Run 7

.012 B5838

Channel

A.045

B.

C 19.21

Channel		
A	48	10/500
B	.6012	
C	5.5	10^{-10}
D	47	100/50
E	.4	900

Tim Crit. 10:03 AM Duration 7 min.

from page 63 Rod C = 17.0

$$\begin{array}{r} 17.0 \\ 8.5 \\ \hline 25.5 \text{ ¢} \end{array}$$

C.A. 270 92/8 Expr. 4 Run 8

Sheet ____ Date 3-13 1958 Time 11:13 AM ~~PM~~

Purpose Fuel addition

Reflector Removal (6" from bottom)

LOADING CHANGE

Description Added: 1" thickness of fuel on Top of Reactor

37-A-1 (30,358 / 607.2) 5-C-2 (512 / 10.24) 4-B-1 (816 / 16.32)

6-C-4 (1237 / 24.7) 9-C-1 (462 / 9.25)

Mass before change	944,652	gmU	18,891.9 gmU-235
Mass of Change	33,385	gmU	667.75 gmU-235
Total Mass	978,037	gmU	19,559.65 gmU-235

~~Other Changes~~ Material Mass

Sub Critical

Fuel 29" High

Reflector 28" [~~Except~~ top + Bottom Bore]

29" dia Cylinder.

C.A. 296 92/58 Expr. 4 Run 9

Sheet ____ Date 3-12 1958 Time 3:05 ~~AM~~ PM

Purpose Fuel addition

Approximately 1 Quadrant added to South east. (1" thick)

29 1/4

CRITICAL ~~CONDITIONS~~

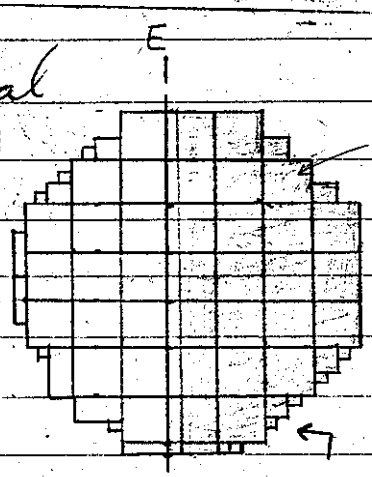
Loading CHANGE

	Description	added 1" Plexiglas reflector around top edges		
Reflector 29"				
Top + Bottom Bare	added:			
Fuel 29" +1" on SE Quad.	5 A-1 (4102.5 / 82.05)	3 C-2 (307.2 / 6.14)	1-A1 (820.5 / 16.41)	
	18 B-2 (4095 / 8.19)	17 C-4 (3,505.4 / 70.10)		
Mass before	978,037	19,559.65		gmU-235
Mass of Change	9,144	182.9		gmU-235
Total Mass	987,181	D 19,742.55		gmU-235
Other Changes	Material	E		

AM

Tim Crit. ____ PM Duration ____ min.

Sub-Critical



Shaded Section 30" high for final run (Run 11)

Stat. Table = 57.4%

M " = 42.6%

52.2%

(.412 in)

29" Cylinder for Runs 3-11

C-4 added as reflector was added.

- 3/13/58

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McCarty
Lynn

INSTRUMENT CHECK

Time 10:40 AM ~~PM~~ | PB-214 ron E

				D	E
Range	10/1000	apr	10"	10/1000	900 V.
Source Dist.	0	0	3"	0	16"
% F.S. Trip	70	OK	100+	60	100+

Counters 1, 2 & 3 ok

C.A. 2% 92/8 Expr. 4 Run 10

Sheet ______ Date 3-13 1958 Time 10:55 AM ~~PM~~

Purpose Fuel addition

[1" to Southwest quadrant]

29.5"

top edges

820.5
16.41

LOADING CHANGE

Reflector 29"
Top & Bottom Bore
Fuel 29" + 1" on South half.
(less ½" through center)

Description added: 9 A-1 (73.84 / 1477)
1 C-2 (1.02 / 2.04)
4 C-1 (2.05 / 4.08)

Mass before change 987,181 gmU 19,742.55 gmU-235

Mass of Change 7691 gmU 153.8 gmU-235

Total Mass 994,872 gmU 19,896.35 gmU-235

Other Changes Material Mass

Sub-Critical Log N 00022

~ 800 Sec Period (Negative)

~ 1.7 ¢ Sub

d run
m.11)

3-11
was
...ed.

C.A. 290 92/8 Expr. 4 Run 11

Sheet Date 3-13-1958 Time 1:00 ~~AM~~ PM

Purpose *Fuel addition*

[1" through E, w center]

29" Reflector

Top + Bottom Bare

LOADING CHANGE

Description *Fuel 29" + 1" on Stat. Table. (See page 68)*

Added:

7 - C-4 (443.4 / 28.86)

1 - C-1 (51.4 / 1.028)

Mass before change *994,872* gmU *19,896.35* gmU-235

Mass of Change *+ 1,494* gmU *+ 29.88* gmU-235

Total Mass *996,366* gmU *19,926.23* gmU-235

Other Changes Material Mass

Measured Stack 29 3/16 dia + 29 1/8" High + 1" on Stat. Table

CRITICAL POSITIONS

290 92/8 Expr 4 Run 11

.015 L T R

Channel

A - .05	A .82	10/100
B -	B .00047	
C - 5.66	C 7.7	2.5 x 10^{-11}
	D 66	10/100
	E .1	900

Tim Crit. 1:20 ~~AM~~ PM Duration 15 min.

Rod C @ .075 on /372 sec period = ~5 ¢

Lovalon Rd. C @ 5.66 Sensitivity ___ ¢/in.

3/14/58

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Lynn

INSTRUMENT CHECK

Time 8:58 AM   Source Pb-214 / Von E

	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900 V.
Source Dist.	0"	0	3"	0	16"
% F.S. Trip	70	OK	100+	60	100+

Counters 1, 2 & 3 ok

C.A. 2% 92/8 Expr. 4 Run 12

Sheet ____ Date 3/14/1958 Time 9:00 AM

Purpose To get system completely reflected.

29" dia, 24" high.

Completely reflected except 1 sq in for source

LOADING CHANGE

Description Removed 5" top layers of fuel + 1" off stat. table

Mass before change 996,366 gmU 19,926.23 gmU-235

Mass of Change 5" layer taken off + 1" of stat table

By Count Total Mass ~~941,106~~ gmU ~~18,818.4~~ gmU-235

Other Changes 807,516 Material 16,147.4 Mass

Multiplication: Counter 1 2 3

1st 12×16+5 = 197 5×16+11 = 91 3×16+2 = 50

13×16+9 = 217 6×16+14 = 110 3×16+12 = 60

(68)

at. Table

*

Period KEF Run / Rod Pos. changed
Rod A at 0.05 / C @ 19.02 on 12.5 sec period = 8.15¢
Levelec Rd. A @ 17.29 / C @ 19.02 Sensitivity ____ ¢/in.

29"

C.A. 290 92/8 Expr. 4 Run 13

Sheet ______ Date 3-14 1958 Time 1:40 ~~AM~~ PM

Purpose Completely Reflected
[Except 1 sq in for source]

29" dia., 26" High

Rod A in 15.49 on 139 sec period = 7.52¢
Levelec Rd. C @ 17.495 Sensitivity 3.76¢/in.

LOADING CHANGE

Description added 2" layer of fuel to top.

added 37 A-2 (60,717 / 1,214.3) 2 C-1 (102.8 / 2.05)
6 B-2 (2,457.0 / 49.14) 10 C-2 (1,024.0 / 20.48)
2 B-4 (1,638.2 / 32.76) 8 C-4 (1,649.6 / 32.98)

Mass before change	807,516	gmU	16,147.4	gmU-235
Mass of Change	67,587	gmU	1,351.7	gmU-235
Total Mass	875,103	gmU	17,499.1	gmU-235

~~Other Changes~~ ~~Material~~ ~~Mass~~

Rod A @ 0.05 / C @ 19.02 on 12.5 sec period = 8.15¢
Levelec Rd. C @ 20.63 / A @ 12.025 Sensitivity ____ ¢/in.

CRITICAL POSITIONS

290 92/8 Expr 4 Run 13

.015 I ____ T ____ P ____

A 12.025
B
C - 20.63 in

Channel
A .45 100/50
B .0014 10
C 5.0 10
D 71 1/200
E 7 900

Inserted Rod A at 20.275"
Levelled Rod C @ 12.488"

~43¢ Excess (from Runs 13,14 & 15)

Tim Crit. 1:52 ~~AM~~ ~~PM~~ Duration 38 min.

C.A. 270 92/8 Expr. 4 Run 14

Sheet ____ Date ____ 195__ Time 3:38 AM PM

Purpose Foil exposure

CRITICAL POSITIONS

270 92/8 Expr 4 Run 14

.015 I T R

	Channel	
A - 20.275	A 65	100/200
B	B .0096	
C 17.35	C 8.4	3×10^{-10}
	D 47	100/200
	E 1.5	750

Tim Crit. 3:51 45/60 PM Duration ____ min.

Indium foil #50 at 0, +½, 0

UF_4 2% Gas @ " " 0, -½, 0

Rod A 0 to 17.29 = 8.15 ¢

← C 15.49 to 17.495 = 7.52 ¢ or 3.76 ¢/in

Rod A 17.29 to 20.275 = ~~5.8~~ 5.8 ¢

∴ Rod A 0 to 20.275 = 13.96 ¢

Excess

0 + 14 + 15

3/17/58

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Lynn

INSTRUMENT CHECK

Time 9:20 AM PM — PB-214 Row E

	A	B	C	D	E
Range	100/1000	off	10"	10/1000	900 V.
Source Dist.	0		3"	0	17"
% F.S. Trip	65		100+	60	100+

Counters 1, 2, & 3 ok

C.A. 270 92/8 Expr. 4 Run 15

Sheet ______ Date 3-17 1958 Time 9:50 AM

Purpose Fuel ~~Addition~~ Removal

29" dia, Stat. table 26" high, Mov. table 25" high

Completely Reflected except 10" for source

25.57"
-.43
25.14"

LOADING CHANGE

Description Removed- 15 A-2 (24,675 / 492.30) 2- B2 (819.0 / 16.38) 2- B-4 (1638.2 / 32.76) (27,278 / 545.56)

Added-15 A-1 (12,307.5 / 246.5) 3- C1 (154.2 / 3.084) 2 B-1 (408.2 / 8.16) (12,870 / 257.4)

Mass before change 875,103 gmU 17,499.1 gmU-235

Mass of Change 14,408 gmU 288.2 gmU-235

Total Mass 860,695 gmU 17,210.9 gmU-235

~~Other Changes~~ Material Mass

Rod A @ 4.75 on 152 sec period = 7 ¢/in.

Leveler Rd. C @ 10.8K sensitivity ______ ¢/in.

Stat. Table = 5770

Mov. Table = 4370

CRITICAL POSITIONS

2% 92/8 Expr 4 Run 15

.615 I T R

Channel

A 20.275	A 59	100/50	
B	B .002		
C 10.842	C ~~8.8~~	~~10^-10~~	→ 6.8 10^-10
	D 94	10/200	
	E 1.0	900	

Crit. 10:20 AM ~~PM~~ ~~Duration~~ 25 min.

Rod C @ 12.85 on 105 sec period = 9.25¢

Levelec Rd. C @ 15.695 Sensitivity 3.25 ~~¢/in.~~

(Rod A out)

Rod C .075" to 10.8" = 7¢

C 10.84" to 12.85" = 6¢ (est 3¢/in)

C 12.85 to 15.7" = 9.25¢

22.25¢

at 26" – 43¢ Excess

25.5' – 22

21¢ for 43% layer

50% = 25¢ ½ layer

1% = .5¢

∴ 7% = 3.5¢

17.210

.290

16.92 Kg

(rotated in left margin:) Rod C @ .075 on 152 sec period = 7 ¢. Leveler Rd. C @ 10.842 Sensitivity ¢/in. Rod A in

high; ,278 / 5.56; ,870 / 57.4

C.A. 290 92/8 Expr. 39" 4 Run 16

Sheet _____ Date 3-17 1958 Time 1:45 PM

Purpose Fuel Removal

Bottle table 25" high

LOADING CHANGE

Description ~~Removed~~ Added: 22 - A-1 (18,051 / 361.02) (18,664.8 / 373.29)

2 - B-1 (408.2 / 8.16) 4 - C-1 (205.6 / 4.11) (38,046 / 760.93)

Rem. 22 - A-2 (36,102 / 722.0) 1 - C-4 (206.2 / 4.12)

4 - B-2 (1,636 / 32.96) 1 - C-2 (102.4 / 2.05)

Mass before change	860,695 gmU	17,210.9	gmU-235
Mass of Change	19,381 gmU	387.6	gmU-235
Total Mass	841,314 gmU	16,823.3	gmU-235

Other Changes Material Mass

MULTIPLICATION

Scaler 3 3 Mult. I/M

20 72 x 16 + 6 = 1158
74 x 16 + 13 = 1197

25 32 x 16 + 0 = 512
33 x 16 + 7 = 535

3 12 22 x 16 + 0 = 352
24 x 16 + 14 = 398

3/18/58

INSTRUMENT CHECK

Time 12:45 ~~AM~~ PM

Source PB-214
γ on E

Channel	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V.
Source Dist.	0	0	3"	1"	16"
% F.S. Trip	65	OK	100+	60	

~~Counters 1, 2 + 3 ok~~

64.8
73.29
~~[illegible]~~
~~[illegible]~~
046
0.93

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM

Source γ on all

Channel	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V.
Source Dist.	1"	0	12"	2"	16"
% F.S. Trip	65	OK	100+	60	100+

Counters 1 + 3 OK ?

Source PB-214 to D. Magnuson, γ to be used for Check

3/19/58

INSTRUMENT CHECK

Time 8:50 AM ~~PM~~

Source γ

Channel	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	2"	0	12"	2"	16"
% F.S. Trip	65	OK	100+	65	100+

Counters ?

78

3/19/58

31" Dia. Cylinder

C.A. 270 92/8 Expr. 31-1 Run 1

Sheet ____ Date 3-19 1958 Time ____ AM PM

Purpose First Loading of 31" dia. Cylinder.

LOADING CHANGE

Description Fuel - 31" dia, 25" High.
Reflector - 6" on bottom, 16" on South West side (stat. tab) + 25" high on SW corner 116-C-4 (21,857 / 437.14)
Added 227 A-4 (745,624 / 14,911.63) 447-A-2 (99,127 / 1,542.54) 43-B-4 35,221 / 704.34 8-C-2 (819 / 16.38)
13 A-45 (38,519 / 770.38) 64-A-1 (52,512 / 1,050.24) 4-B-1 816 / 16.32 14-C-1 719 / 14.38
Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass 973,214 gmU 19,463.36 gmU-235

Other Changes Material Mass

MULTIPLICATION

Scaler Mult. 1 M

1 20- 28 X 16 + L = 494
16 X 31 + 4 = 500

25- 16 X 0 + 3 = 3
16 X 0 + 12 = 12

3 12- 16 X 4 + 15 = 79
16 X 5 + 15 = 95

C.A. 2 $\frac{70\ 92}{8}$ Expr. 31-1 Run 2

Sheet ______ Date 3-19 1958 Time 1:50 PM

Purpose 2nd loading

Fuel 28" High

Reflector same as run 1

MULTIPLICATION

Scaler	3	Mult.	1/M
1 :20	16x65+13 = 1,053 16x60+4 = 964		
2 5	16x1+6 = 22 16x1+5 = 21		
3 12	16x21+0 = 336 16x17+14 = 272		

(21857 / 437.14)
-2 (819 / 1638)
C-1 719 / 14.39

LOADING CHANGE

Description Added: 254-A-4 (834,314 / 16,685.26) 81-A-2 (132,921 / 2,658.42)
13-A-4S (38,519 / 770.38) 28-A-1 (22,974 / 459.48)
50-B-4 (40,955 / 819.0) 100-C-4 (20,620 / 412.4)
1-C-2 102 / 2.06

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 1,090,405 gmU 21,806.98 gmU-235

Other Changes Material Mass

C.A. 270 9 2/8 Expr. 31-1 Run 3

Sheet ____ Date 3-19 1958 Time 4:00 AM PM

Purpose 3rd Loading Fuel 30" High

LOADING CHANGE

Description Fuel = 30" High

Reflector - 6" on bottom only

Added: 26-A-2 (42,666 / 853.32) 28-A-1 (22,974 / 459.48) 8-B-4 (6,552 / 131.04)

7-B-2 (2,867 / 57.33) 1-B-1 (204 / 4.08) 8-C-4 (1650 / 32.99)

12-C-2 (1228 / 24.57)

Mass before change	1,090,405	gmU	21,800.78	gmU-235
Mass of Change	78,141	gmU	1,562.8	gmU-235
Total Mass	78,141	gmU	1,562.8	gmU-235
Other Changes	1,168,546	Material	23,368.78	Mass

MULTIPLICATION

Scaler c ____ m 3 min. Mult. 1/M

1	20	16X76+13=1229 16X89+10=1430
2	5	16X0+13=13 16X1+4=20
3	12	16X13+5=213 168 12+3=195

3/20/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 10:30 AM ~~PM~~ Source Y

Channel	A	B	C	D	E
Range	10/1000 opr		10"	10/1000	900V
Source Dist.	1"	0	8"	1"	17
% F.S. Trip	70	OK	100+	65	100+

Counters 7

E.A. 2% 92 8 Expr. 31-1 Run 4

Sheet Date 3-20 1958 Time 11 12 AM ~~PM~~

Purpose 4th Loading - Fuel 32" High

1

LOADING CHANGE

Description

Mass before change	gmU		gm ^{235}
Mass of Change	gmU		gm ^{235}
Inventory Material Mass	1,246,767 gmU	24,954.36	gm ^{235}
less Remainder Other Changes	Material	Mass	

Log N - .0001 (mtr)

MULTIPLICATION

Scaler	3	Min.	Mult.	1/M
120	256 X 16 + 28 = 4124			
	256 X 18 + 170 = 4302			
25	16 X 3 + 8 = 56			
	16 X 2 + 5 = 41			
3,2	16 X 50 + 15 = 815			
	16 X 51 + 15 = 831			

C.A. 2°/0 92/8 Expr. 31 - 1 Run 5

Sheet Date 3-20 1958 Time 2:31 AM/PM

Purpose 5th loading.

Fuel - Moveable Table 32" High

Stationary Table 33" except for ~2" along outer edges

Reflector: 6" on bottom [(10(2 3/4)+1) wide, 36" long]

Loading: 1,263,091 gm U, 25,261.82 gm U 235

Total Inventory

MULTIPLICATION

Scaler		Min.	Mult.	1/M
120	256 X 41 + 50 = 10,546			
	256 X 45 + 224 = 11,744			
25	16 X 8 + 8 = 136			
	16 X 9 + 0 = 144			
3 1 2	16 X 118 + 14 = 1888			
	16 X 131 + 2 = 2096			

Log N = .00022

Neg. Period = 1360 Sec ?

< 1.0 ¢

Stack Measure: 31 1/4" dia, 32 1/8" Moveable, 33 1/2" Stationary

3/21/58

INSTRUMENT CHECK

Time 8:55 AM ~~PM~~ Source γ

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	1"	0	8"	1"	16"
% F.S. Trip	65	OK	100+	60	100+

counters

C.A 270 92/8 Expr. 31-1 Run 5

Sheet Date 3-21-1958 Time 9:08 AM ~~PM~~

Purpose Reflector Evaluation.

(1 guardpoint)

added 1" thick plexiglas to NE ~~half~~ of moveable table.

long
long
23 S

CRITICAL POSITIONS

270 92/8 Expr. 31-1 Run 6

02 T R

	Channel	
Rod		
A - .045 out	A 42	10/200
B - 44	B .0005	
C - 7.86	C 4.0	5X10 11
Very slight Positive period.	D 32	10/200
	E 0	900

Crit. 9:28 AM ~~PM~~ Duration 14 min.

3-21-58

C.A. 270 9/8 Expr. 31-1 Run 7

Sheet ____ Date 3-21-1958 Time 10:18 AM

Purpose Reflector Evaluation

+ 8.5¢

Completed Covering of Moveable table with 1" thick plexiglas

CRITICAL POSITIONS

C.A. 270 9/8 Expr. 31-1 Run 7

Table Pos. .02 L ____ T ____ R ____

	Control Rod		Channel	
0.050	A 15.00 ~1.9¢	A	69	100/50
	B ____	B	.002	=10
13.88	C 13.00	C	4.0	2.5X10
	____	D	52	100/50
	____	E	.2	900

Tim Crit. 9:38 AM PM Duration ____ min.

A = 0.05 out

Rod C @ 11.50 on 228 sec period = 4.9 .88"

Leveled Rd. C @ 13.88 Sensitivity 2.13 ¢/in

A = 15.00

Rod C @ 7.44 on 163 sec period = 6.55

Leveled Rd. C @ 13.00 Sensitivity 1.17 ¢/in

13.88
-8.99
4.9"
X1.1
5.4¢

Level Rod A = 20.265 = ~5.4¢

Rod C = 8.99 = 3.0¢

8.4¢

4 mil. Foil 3-

C.A 2 70 9 2/8 Expr. 31-1 Run 8

Sheet Date 3-21 1958 Time 12:53 PM

Purpose

Removed 1" thick Plexiglas from Top of movable table.

MULTIPLICATION

Scaler 3 min. Mult. 1/M

120	256 X 44 + 268 = 11,532 256 X 47 + 29 = 12,061	
25	16 X 8 + 1 = 129 16 X 9 + 3 = 148	
3/2	16 X 125 + 4 = 2004 16 X 127 + 7 = 2039	

$\log_e N = .00023$ (See Run 5)
(Same Conditions)

C.A. 2% 92/8 Expr. 31-1 Run ~~8~~ 9

Sheet ______ Date 3-21 1958 Time 2:20 ~~AM~~ PM

Purpose Placed 1" thickness Plexiglas on top of 1" stationary + movable table.

6" Reflector on bottom
-1" " on top

CRITICAL POSITIONS

C.A. 2% 92/8 Expr 31-1 Run 9

.02

Rod		Channel	
A 20.265	A	64	100/50
B	B	.002	
C 17.56	C	9.6	10^{-10}
4	D	48	100/50
	E	.2	900

Time Crit. 2:25 PM Duration 6

Rod C @ 15.455 on 168 sec period = 6.42
Leveled Rd. C @ 17.56 Sensitivity 3.04¢/in.

Rod C = 15.455
C = 13.88

1.57 in at 2.5 ¢/in = 4.4 ¢
or 6.4
10.8 ¢
5.4 ¢ Rod A
+ 16.2 ¢ Stat Table

17.0 ¢
1" on Stat Table

C = 8.19 to 13.00 = 5.5 ¢
13.00 to 15.45 = 6.1 ¢
15.45 to 17.56 = 6.4 ¢
+ 18.0 ¢

3/24/58

~~INSTRUMENT CHECK~~

Time 8:30 AM ~~PM~~ Source 8

Channel

	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900 V.
Source Dist	1"	0	14"	1"	17"
% F.S. Trip	75	OK	100+	75	100

Counters

C.A. 270 92/8 Expr. 31-1 Run 10

Sheet ______ Date 3/24 1958 Time 8:55 AM PM

Purpose Zero run

Same as Run 9

Rod C @ 15.45 or 1.54 sec period = 6.9 ¢

Leveled Rd C 0 17.725 Sensitivity 3.03 ¢/in

~~CRITICAL POSITIONS~~

C.A. 270 92/8 Expr. 31-1 Run 10

Table Pos. .02

Rod		Channel		
A	20.265	A	69	100/50
C	17.725	B	.002	
		C	4.0	2.5×10^{-10}
		D	51	100/50
		E	.2	900

Rod A = 5.4 ¢

Rod C 0.0 to 8.99 = 3.0 ¢
8.99 to 13.00 = 5.5 ¢
13.00 to 15.45 = 6.1 ¢
15.45 to 17.72 = 6.9 ¢

26.9 ¢

Excess

Tim Crit. 9:09 AM ~~PM~~ Duration 12 min.

C.A. 2% $\frac{92}{8}$ Expr. 31-1 Run 11

Sheet ______ Date 3-24 1958 Time 9:33 AM

Purpose Bottom Reflector Evaluation

1" top Reflector

E — 1 2 3 4 5 6 7 8 9 10 11 — W — 2⅞" X 2⅞" X 36" Plexiglas

Removed 1 & 6

Excess

Rod C @ .075 on 260 sec period 4.38 $

Levelec Rd. C @ 12.215 ______ ¢/in.

26.90
− 4.38
21.52
for 1 & 6

CRITICAL POSITIONS

C.A. 2% $\frac{92}{8}$ Expr. 31-1 Run 11

[illegible] .02

[illegible] Rod Channel

Rod		Channel	
A- .05		A 72	100 / 56
B-		B .0022	
C-12.215		C 4.1	2.5×10^{-10} / 100
		D 53	50
		E .2	900

Tim Crit. 9:46 AM Duration 11 min.

C.A. 270^{92}_{8} Expr 31-1 Run 12

Sheet ____ Date 3-24 1958 Time 10:40 AM ~~PM~~

Purpose Reflector Evaluation

add 1" thick plexiglas to top of ~~Movable~~ Stationary table. (total 2") (1" on mov. Table)

Rod C from 12.21 to 14.50 = 5.06¢ (2.24¢/in page 84)

+ 6.00

+ 11.06¢ 2nd 1" on Stat table

CRITICAL POSITIONS

C.A. 270^{92}_{8} Expr. 31-1 Run 12

Table Pos. 02 T F

Control Rod	Channel	
~~A~~ .045	A 34	100/100
B	B .0021	
C 16.93	C out	
D	D 52	100/50
Excess 15.44¢	E out	

Firm Crit. 10:52 AM ~~PM~~ Duration 9 min.

Rod C 14.50 on 182 sec period = 6.0 ¢

Lowest Rod C 16.93 Sensitivity 2.47 ¢/in. 2.43"

11.38
5.06
6.00
15.44

C.A. 290 92/8 Expr. 31-1 Run 13

Sheet _____ Date 3-24 1958 Time 1:30 ~~AM~~ PM

Purpose Reflector Evaluation.

Added: 1" thick Plexiglas to top of Movable table

2" top Reflector

Pile C @ 18.50 on 213 sec period = 5.2

Levelac Pile C @ 20.360 Sensitivity 2.79 ¢/in.

A = 5.4¢

C = 16.93/18.50 = 3.9¢

5.2¢

+14.5¢

A = 5.4¢

C 0 to 16.93 = 15.44¢

C 16.93 to 18.0 = 3.9

18.0 to 20.36 = 5.2

29.74 Cycles

13.44

14.20

CRITICAL CONDITIONS

290 92/8 31-1 Run 13

Tables pos. .02 T P

Control Rod Channel

A 20.265 36 100/100

B .0021

C 20.36 4.0 2.5 X 10^-10 / 100

D .55 50

E .2 90

Tim Crit. 1:42 ~~AM~~ PM Duration 13 min.

C.A. $270\frac{92}{8}$ Expr. 31-1 Run 14

Sheet _____ Date 3-24 1958 Time 2:05 AM PM

Purpose Reflector Evaluation

Removed #2 + #7 (note: Page 88)

CRITICAL POSITIONS

$270\frac{92}{8}$ Expr 31-1 Run 14

.02 L T R

Control Rod		Channel	
A 20.265	A	41	$\frac{10}{100}$
B	B	.0002	
C 17.30 ✓	C	4.0	2.5×10^{-11}
	D	41	$\frac{10}{100}$

Tim Crit. 2:12 AM PM Duration 45 min.

A from 14.15 to 16.93 = 6.86 ¢
C " 16.93 to 18.50 = 3.9 ¢ = -15.9 ¢ for 2+7
C " 19.50 to CRITICAL POSITION ¢

$270\frac{92}{8}$ Expr 31-1 Run 14

Table Pos. .02

Control Rod		Channel		
A 20.265	A	32	$\frac{100}{100}$	73 $\frac{100}{100}$
B ✓	B	.002		.005
C 14.15	C	3.6	2.5×10^{-10}	$8.9\ 2.5 \times 10^{-10}$
	D	25	$\frac{10}{100}$	57 $\frac{100}{100}$

Rod C = 13.905 ✓

B: .005

Rod C @ 12.60 on 332 sec period 3.55 ¢

Rod C @ 14.15 Sensitivity 1.65 ¢/in.

Lowpipe Rd.

92

3/25/58

Scott
McCarty
Lynn

INSTRUMENT CHECK

Time 9:15 AM PM Source γ

Channel

	A	B	C	D	E
Range	10/1000	Opr	10	10/1000	900 V.
Source Dist.	1"		13"	1.5"	18"
% F.S. Trip	65		100	70	102

Counters

C.A. 270 92/8 Expr. 31-1 Run 15

Sheet ____ Date 3-25 1958 Time 9:45 AM PM

Purpose Reflector Evaluation.
Source distance evaluation.
2" plexiglas on top of reactor.

Source	Log N	A	B	C	D	E	Rods A	C
out	.0002	42 10/100	4.1	2.5X10⁻¹¹	60 10/50	0	20.265	16.95
½" out of Pig	"	"	"	"	"	"	"	17.30
"	.00053	90 50/100	9.8	2.5X10⁻¹¹	69 1.5/100	.1	"	15.28
Source out	"	"	"	"	"	"	"	15.19
"	.00095	75 10/100	9.2	5X10⁻¹¹	26 100/50	"	"	14.53
½" out of Pig	"	"	"	"	"	"	"	14.62
"	.002	66 100/50	3.6	2.5X10⁻¹⁰	49 100/50	.2	"	14.13
Out		No Change						

F (A, M)

C.A. 270 9.2/8 Expr. 31-1 Run 16

Sheet ____ Date 3-25 1958 Time 12 40 PM

Purpose Reflector Evaluation

1" thickness Plexiglas removed from top of Reactor

Replaced #2 & #7 Plexiglas under table (Note Page 88)

18 / 6

Source	Log N	A	C	D	E	Rods A-	C-
out	.00022	45 10/100	4.4 2.5×10^{-11}	35 10/100	0	.045	3.03 / 4.95
1/2" out of Pig	"	"	"	"	"	"	3.21 / 5.13
"	.0005	82 10/100	9.3 2.5×10^{-11}	64 10/100	.1	"	1.44 / 3.36
out	"	"	"	"	"	"	1.33 / 3.25
"	.00095	75 10/200	9.3 5×10^{-11}	60 10/200	.1	"	.53 / 2.45
1/2" out of Pig	.002	60 10/500	9.4 10^{-10}	50 100/50	.2	"	0 / 1.92
Out	No change						

,000

16.95	2.82
17.30	3.17
15.28	1.15
15.19	1.06
14.53	.40
14.62	.49
14.13	0

C.A. 270 $\frac{92}{8}$ Expr. 31-1 Run 17

Sheet ______ Date 3-25 1958 Time 2:20 PM

Purpose

Added 1" thick Plexiglas over top of reactor

Movable table 3"

Stat. table 2"

Removed #2 & #7 Plexiglas under Table (note drawing Page 88) Rods

Source	Log-N	A	C	D	E	A	C

CRITICAL POSITIONS

C.A. 270 $\frac{92}{8}$ Expr. 31-1 Run 17

Table Pos. .02 L ___ T ___ R ___

Control Rod	Channel
A 20.275	A 37 $\frac{100}{200}$
B	B .005
C 17.27	C 9.0 2.5x10^{-10}
	D 56 $\frac{100}{100}$
	E 3 900

Tim Crit. 2:36 PM Duration 14 min.

17.27 Page 91
13.90
3.37"
2.24/in
6.74
674
(+7.4 ¢)

3rd inch on moveable table

Rod C @ 14.50 cm 176 sec period = 6.2

Leveled Rd. C @ 17.27 Sensitivity 1.23 ¢/in.

19.684 Excess

C.A. 270 92/8 Expr. 31-1 Run 18

Sheet ____ Date 3-25-58 Time 2:57 ~~AM~~ PM

Purpose

Removed #3 + #8 under table
(note drawing page 88)

ds
C

CRITICAL POSITIONS

C.A. 270 92/8 Expr 31-1 Run 18

Test .02 I T R

		Channel
A .040 (5.4¢)	A 73	100/100
B	B .0045	
C 13.71	C 9.0	2.5x10⁻¹⁰
	D 56	100/100
	E .3	900

Tim Crit. 3:07 ~~AM~~ PM Duration 13 min.

Rod C @ .075 on 204 sec period = 5.4 ¢

Levetec Rd. C @ 13.71 Sensitivity

5.4
7.8
-13.2 ¢
for 3 + 8

17.27
13.71 "
3.56
2.24 ¢/in
712
712
783

5.4 ¢ Exams

3/26/58

INSTRUMENT CHECK

Time 8:40 AM Source J

	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900 V
Source Dist.	1"	0	13"	1"	17"
% F.S. Trip	75	OK	100+	70	100

Counter.

C.A. 290 92/8 Expr. 31-1 Run 19

Sheet ______ Date 3-26 1958 Time 8:48 AM

Purpose

Added 1" thick Plexiglas to ~~movable~~ Top of ~~table~~ reactor

Stat table 3" Plex. Movable table 4" Plexiglas on top

Rod C @ 10.60 on 174 sec period = 6.3 ¢

Leveled Rod C @ 15.00 Sensitivity 1.43 ¢/In.

CRITICAL POSITIONS

C.A. 290 92/8 Expr 31-1 Run 19

Table Pos. .018 L ____ T ____ F ____

Rod		Channel		
A	20.265	A	76	100/100
B		B	.005	
C	15.00	C	93	2.5×10⁻¹⁰
		D	57	100/100
		E	3	900

Tim Crit. 9:03 AM Duration 19 min.

1500
13.71
1.29
×1.5
1.93
5.4
+7.3
12.74
Excess

C.A. 29, 9 3/8 Expr. 31-1 Run 20

Sheet ____ Date 3-26 1958 Time 9:27 AM

Purpose ____

Removed Plexiglas under reacto #4 & #9 (note Page 88)

The above plexiglas directly under Control Rods.

CRITICAL POSITIONS

29, 9 3/8 Expr 31-1 Run 20

Rod Pos. 018 L T R

Control Rod	Channel
A .045 (4 ¢)	A 91 10/500
B	B .003
C 11.06	C 7.2 2.5×10^{-10}
	D 74 100/50
	E .2 900

Crit. 9.42 AM PM Duration 18 min.

29.
11.5
1.94
5.4
7.34

Rod C @ 07 on 540 sec period = 2.25 ¢

Levelec Rd. C @ 11.06 Sensitivity ____ ¢/in.

2.25
4.
-6.2 ¢

C.A. 270 92/8 Expr. 31-1 Run 21

Sheet _____ Date 3-26 1958 Time 10:35 AM PM

Purpose

Added: 1" thick plexiglas to top of reacta: Stat. table 4" - Movable table 5" Plex.

CRITICAL POSITIONS

C A 270 92/8 Expr 31-1 Run 21

Table Pos : 02 L T

Control Rod		Channel	
A .045	A	75	100/100
B	B	.0048	
C 13.26	C	91	2.5×10^{-10}
	D	57	100/100
	E	.3	900

Time Crit. 10:48 AM PM Duration 18 min

Rod C @ .07 on 260 sec period = 4.38

Leveled Rd. C @ 13.26 Sensitivity _____ #/hr.

Inserted Rod A : 20.29

Levelled Rod C = 6.39

C.A. $270\frac{92}{8}$ Expr. 31 - 1 Run 22

Sheet _____ Date 3-26 1958 Time 1:10 PM

Purp.

Total of 6" of Plexiglass on top of Reactor
Two inches added to stat table.
One inch added to movable table

CRITICAL POSITIONS

$270\frac{92}{8}$ Expr 31-1 Run 22

018 L T R

Channel

	A 85	$\frac{100}{180}$
A 045	B .0055	
B	C 8.5	3×10^{-10} / 100
C 14.17	D 65	$\frac{}{100}$
	E 4	900

Time Crit. 1:17 PM Duration 16 min.

Rod C @ .07 on 243 sec period = 4.6 ¢

Levelec Rd. C @ 14.17 Sensitivity _____ ¢/in.

$$-4.6$$
$$2.2$$
$$+2.4$$

C.A. $27_0\frac{92}{8}$ Expr. 31-1 Run 23

Sheet _____ Date 3-26 1958 Time 1:46 PM

Purpose _____

Removed Plex. underneath - #5 - #10 - #11 (see p. 88)

Reflector - Bottom Bare

- 6" plexiglas on top [less ~ 3"x3/8" to w along the 3" level for support rods]

Sub-critical

CRITICAL POSITIONS

$27_0\frac{92}{8}$ Expr 31-1 Run 23

.018

Control Rod	Channel	
A .045	35	100/50
B	.012	
C .070	7.2	10 to 10
	D 58	10/200
	E .1	900

Time Crit. 1:55 PM Duration 11 min.

Very slight negative period — ~ 1¢

Est. value of ~ 5¢ for #5, 10 & 11

1 & 6 = 23.8 ¢
2 & 7 = 15.9 ¢
3 & 8 = 13.2 ¢
4 & 9 = 6.2 ¢
5, 10 & 11 = 5.0

Total 64 ¢

3/27/58

INSTRUMENT CHECK

Time 11:00 — Source γ

Channel	A	B	C	D	E
Range	10/1000	Opr	10"	10/1000	900V
Source Dist	1"	0"	13"	15"	16"
% F.S. Trip	75	OK	100+	70	100+

Counters

C.A. 27.0 92/8 Expr. 31-2 Run 1

Sheet Date 3-27 1958 Time 11:20 AM

Purpose Lateral reflector addition

Fuel – 31" dia, 32" movable Table
33" Fixed

Reflector – 8" on lower lateral surface
– Top + Bottom Bore

MULTIPLICATION

Scaler	3 min	Mult.	1/M
1 20	16x128+5 = 2073 16x119+11 = 1904		
2 5	16x1+11 = 27 16x1+2 = 18		
3 12	16x24+1 = 397 16x25+9 = 409		

C.A. 290 $\frac{92}{8}$ Expr. 31 — 2 Run 2
Sheet ______ Date 3-27 1958 Time 1:38 PM
Purpose: Lateral Reflector addition.

Fuel — Same

Reflector — 16" on lower lateral area
— Top & Bottom Bore

Super Critical — Tables = 0.30"

C.A. 290 $\frac{92}{8}$ E. 31 — 2 Run — 3
Sheet ______ 3-27 1958 2:29 PM
Purpose Lateral Reflector addition

Fuel 28" high
(D M U - T Mass 1,690,405) (U 235 Mass 21,806.98) (See page 79)

MULTIPLICATION

Scaler 3 min. Mult. 1 M

1-20 16x51+14=830
16x52+12=844
2-5 64x0+32=32
16x2+7=39
3-12 16x11+13=189
16x10+3=163

C.A. 270 92/8 Expr. 31-2 Run 4

Sheet _____ Date 3-27 1958 Time 4:10 PM

Purpose Lateral Reflector addition

Fuel same - 28"
Reflector 24"

Super critical - Table = .17

3/28/58

INSTRUMENT CHECK

Time 9:40 AM

Source

Channel

	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900V.
Source Dist.	15"	0	13"	15"	17"
% F.S. Trip	80	ok	100+	70	100+

Counters

C.A. 290 92/8 Exp. 31 - 2 Run 4

Sheet ______ Date 3-28 1958 Time 9:45 AM

Purpose Lateral Reflector addition

Fuel 26"

Reflector - 24" ~~sides~~ Top & Bottom Bore

LOADING CHANGE

Description

~~Mass before change ______ gmU ______ gmU-235~~

Mass of Change ______ gmU ______ gmU-235

Total Mass 1012,316 gmU 20,243.60 gmU-235

Scaler 3 min Mult. 1 M

1	Bias 2d -	16 X 47 + 0 = 752
		16 X 48 + 8 = 776
2	5 -	16 X 2 + 0 = 32
		16 X 2 + 2 = 34
3	12 -	16 X 9 + 2 = 146
		16 X 7 + 14 = 126

Measured & Stack

C.A. 27 92/8 Expr. 31-2 Run 5

Sheet ____ Date 3-28 1958 Time 11:20 AM PM

Purpose Lateral Reflector addition

Fueled 27" High, 31" dia cylinder

Reflector: 6" on sides, Top & Bottom Bare

LOADING CHANGE

Description

Measured Stack: 31¼" dia

Mass before change ____ gmU ____ gmU

Mass of Change ____ gmU ____ gmU

Total Mass 1,050645 gmU 21,024.9 gmU

A = 10.3 ¢

CRITICAL POSITIONS

27 92/8 Expr. 31-2 Run 5

.017 T R

Control Rod

Channel

A	.045	A	82 100/100
B		B	.005
C	19.145	C	7.2 2.5X10⁻¹⁰
	27.48 EXCESS	D	64 100/100
		E	1.0 9.00

Tim Crit. 11:28 AM PM Duration 37 min.

Rod C @ 16.00 on 98 sec period = 9.8 ¢/in.

Levelec Rd. C @ 19.145 Sensitivity 2.84 ¢/in.

A = 10.3 ¢

Rod C @ 12.50 on 115 sec period = 8.7 ¢/in.

Leveled Rd. C @ 16.00 Sensitivity 2.49 ¢/in.

A = 19.00

A = 19.00

Leveled Rod A = 20.27

C = 15.355

7.7 / 1.6 / 10.34

16.00 / 15.33 / .67 / X2.1 / 1.6

106

3/31/58

INSTRUMENT CHECK

Time 8:30 AM Source Y

	A	B	C	D	E
Range	10/1000	OPV	10^{-11}	10/1000	900 V.
Source Dist.	1"	0"	13"	1.5"	16"
% F.S. Trip	75	DK	100+	70	100+

Counters

C.A. 270 92/8 Expr. 31 - 2 Run 6

Sheet Date 3-30 1958 Time 8:45 AM PM

Purpose Vertical Foils Traverse

UFt - 2% Foils

6" Ruff on sides; Top & Bottom Bare;

31" dia; 27" High

Location Vertical	Foil #
+13¼	15
+10	13
+6	11
+2	9
0	1
-2	2
-6	4
-10	6

CRITICAL POSITIONS

C A 2% 92/8 Expr 31-2 Run 6

Table Pos .015 L T R

Control Rod	Channel
1 A - 20.27	A 80 100/100
B -	B .005
C - 14.88	C 7.0 2.5×10^{-10} 100/100
	D 62 100/100
	E .8 900

Tim Crit. 9:02 54/60 AM PM Duration 2.0 min.

~~3/31/58~~
4/1/58

INSTRUMENT CHECK

Time 8:30 AM   Source γ

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900 V.
Source Dist	1"	0	13"	1.5"	16"
~~% F.S. Trip~~ Counters	75	OK	100+	65	100+

C.A. 290 92/8   Expt 31-2   Run 7

Sheet   Date 4-1 1958   Time 8:50 AM

Purpose Vertical foil Traverse
U 7x4 - 290 Foils

Location

Vertical	Foil #	
0	A-8	Bare
-4	DPL. 1	Bare
+4	A-3	Cd. Covered.
+8	A-5	Cd. Covered.
+13 1/4	A-7	Cd. Covered.

CRITICAL POSITIONS

CA 270 9/8 Expr 31-2 Run 7

1018 L T P

Control Rod Channel

A 20.27 A 74 100/200

B .01

C 12.67 C 8.6 3X10^-10

D 58 100/200

E 1.4 870

Tim Crit. 9:26 25/60 AM PM Duration 20 min.

Rod C @ 7.00 on 139 sec period = 7.5 ¢

Levelec Rd. C @ 12.67 Sensitivity 1.32 ¢/in.

C.A. 270 92/8 Expr. 31-2 Run 8

Sheet ____ Date 4-1 1958 Time 1:55 AM PM

Purpose Top Fuel Evaluation

Zero Run (Same as Run 5)

Fuel 27" High

CRITICAL POSITIONS

270 92/8 Expr. 31-2 Run 8

Table Pos. .015 T R

	Control Rod	Channel
A	20.27	70 100/100
B		.005
C	15.165	6.1 2.5x10^-10
D		54 100/100
E		.7 900

Tim Crit. 2:08 AM PM Duration 9 min.

.07 to 7.00 1.4¢
7.00 to 12.67 7.5¢
12.67 to 15.16 6.1¢
A = 10.3¢
25.3¢ Excess

15.16
12.67
2.49
x 2.46
6.12¢

Rod C @ 12.51 on 163 sec period = 6.55

Leveled Rd. C @ 15.165 Sensitivity 246

Rod C 12.67 Page 109
11.58
1.09" @ 2¢/in = 2.2¢

7.5¢
5.3¢

6.7¢
-5.3
1.4¢

C 7.00 to 11.58

C .07 to 7.00

C.A. $290\frac{92}{8}$ Expr. 31 - 2 Run 9

Sheet ____ Date 4 - 1 1958 Time 2:49 PM

Purpose

Removed South east Quadrant 1" of Fuel

note drawing below

~197 gm U^{235}

~9855 gm U

26 3/4" High

loading: 1,040,590 g U 20,828 g U^{235}

CRITICAL POSITIONS

C.A. $290\frac{92}{8}$ Expr. 31 - 2 Run 9

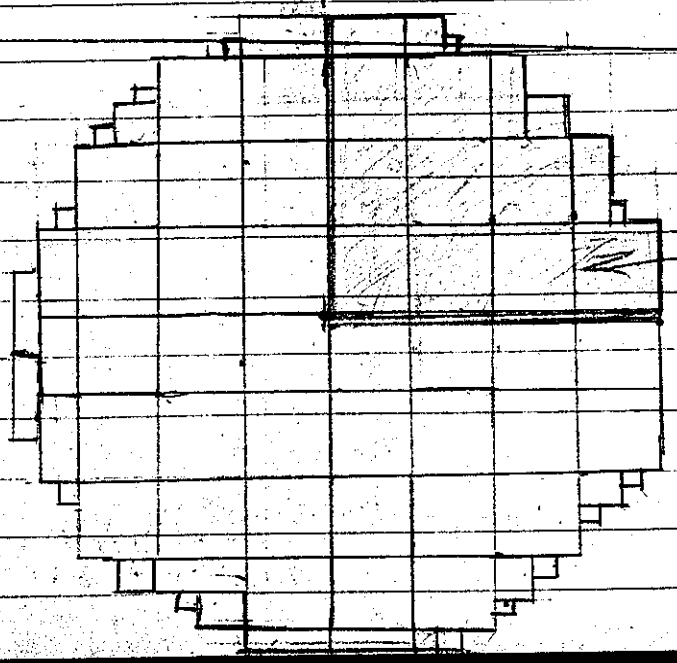
Table Pos. .015 L T R

	Control Rod		Channel	
A	.05"	A	79	100/100
B		B	.0051	
C	11.58	C	8.8	2.5×10^{-10} 100/100
4		D	61	100/100
		E		

Tim Crit. 3:00 PM Duration 10 min.

Level Rod C = 0.07

A = 16.56



31" dia. Cyl.

Removed

25.3 ¢

6.7

18.6 ¢

Rod C @ 0.7 on 1/8 sec period = 6.7 ¢

Leveled Rd. C @ 11.58 Sensitivity 1/in

Rod A Bn

6.7

2.49

2.46.

6.12 ¢

C.A. 290 92/8 Expr. 31-2 Run 10

Sheet _____ Date 4-1 1958 Time 3:55 AM PM

Purpose

Filled Southeast 2nd quadrant with 1" Plexiglas

CRITICAL POSITIONS

C.A. 290 92/8 Expr. 31-2 Run 10

Table Pos. -015 L T S

Control Rod		Channel	
A 20.265	A	79	100/100
B	B	005	
C 15.705	C	8.0	2.5 x 10^-10
	D	58	100/100
	E	.8	900

Tim Crit. 4:04 AM PM Duration 10 min

Rod C @ 12.50 128 period = 8.0 ¢

Leveled Rd C @ 15.705 Reactivity 2.5 ¢/in

A = 10.3 ¢

Rod C 0 to 11.58 = 6.7 ¢

11.58 to 12.50 = 2.3 ¢

12.50 to 15.70 = 8.0

27.3 ¢ Excess

4/2/58

INSTRUMENT CHECK

Time 12:40 ~~AM~~ PM Source γ

	Channel A	B	C	D	E
Range	~~10~~ 1000	off	10 ~~11~~	~~10~~ 1000	900 V
Source Dist.	1"	0"	14"	15"	16"
% F.S. Trip	80	OK	100+	65	100+

Counters

31" dia

C.A. 290 ~~92~~ 8 Expr. 31-3 Run ~~#~~ 1

Sheet ____ Date 4-2 1958 Time 12:55 AM PM

Purpose

Completely reflected 6" Pressed in² for source

Fuel ~~22"~~ Heigh 31" dia.

LOADING CHANGE

Description ____

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass 856,416 gmU 17,160 gmU-235

MULTIPLICATION

Scaler C ____ min. 3 min. Mult. 1/M

1	20	16 X 34 + 2 = 546 16 X 35 + 12 = 572
2	5	16 X 10 + 5 = 165 16 X 11 + 7 = 183
3	1/2	16 X 7 + 4 = 116 16 X 9 + 5 = 149

C.A. 270 9/8 Expr 31-3 Run 2

Sheet ____ Date 4-2 58 Time 2:08 PM

Purpose 31" dia

Completed reflected 6" dia 1 in² fan source.
Fuel 23" Reflector 2S

LOADING CHANGE

Description ____

Mass before change ____ gmU ____ gm U-235

Mass of Change ____ gmU ____ gm

Total Mass 895,344 gmU 17,940 gms

Rod A = 9.8 .045 to 16.44
7.9
17.74

CRITICAL POSITIONS

270 9/8 Expr 31-3 Run 2

.012 T R

Channel		
A .045	.79	100/100
B.	.005	
C 20.385	8.2	2.5x10⁻¹⁰
D	54	100/100
E	2.1	840

Rod C from 16.70 to 18.40 @ 46¢/in = 7.9¢

Rod C @ 16.80 on 124 sec period = 8.2¢

Leveler Rd. C @ 16.70 Sensitivity 4.31¢/in.

Rod A in.

Tim Cat. 2:25 AM PM Duration ____ min.

Level Rod C = 18.40.
Rod A = 16.44

Rod C @ 18.40 on 98 sec period = 9.8¢

Leveled Rd C @ 20.385 Sensitivity 4.94 ¢/in.

Rod 1 out

4/3/58

McCarty
Lynn

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM

	A	B	C	D	E
	10/1000	opr	10"	10/1000	900V.
Source Dist.	15"	0"	13"	15"	17"
% F.S. Trip	80	ok	100+	70	100+

Counters

C.A. 270 92/8 Expr. 31-3 Run 3

Sheet Da. 4-3-58 95 Time 1:23 PM

Purp.

31" Dia.
Fuel Height ~~Stationary~~ Stationary table 23" - Movable 22"

LOADING CHANGE

Description: Completely Reflected

Mass before change	895,344	gmU	17,940	gmU-235
Mass of Change	18,119	gmU	362	gmU-235
Total Mass	877,225	gmU	17,578	gmU-235

Rod C 0 to 9.60 = 6.2 (from Runs 4+5)
9.60 to 13.42 = 10.8 page 116
13.42 to 14.80 = 4.9
14.80 to 16.70 = 8.2
16.70 to 18.40 = 7.9
18.40 to 20.38 = 9.8 / 47.8

Rod C = 18.40
Rod A = 16.44

CRITICAL POSITIONS

Exp 270 72/8 Expr 31-3 Run 3

Tabs To .012

Control Rod	Channel
A .045	A 72 100/100
B	B .0048
C 13.42	C 6.2 2.5×10^{-10}
	D 50 100/100
	E 2.0 840

Tim Crit. 1:38 AM PM Duration 23 min.

Level Rod C @ 9.60
Rod A @ 16.96

Rod C @ 9.60 on 87 sec period = 10.8 ¢

Leveled Rd. C @ 13.42 Sensitivity 2.83 ¢/in

9.60 to 13.42 10.8 ¢

Rod C 7.30 to 9.60 = 4.6 ¢ page 118

.07 to 7.30 = 2.8 ¢

18.2 ¢ Excess

4/7/58

INSTRUMENT CHECK

Source γ

Time 2:00 PM

	Channel A	B	C	D	E
Range	10/1000		10"	10/1000	800 V.
Source Dist	~~1"~~	0"	13"	15"	16"
% F.S. Trip	80		100+	70	100+

counters

C.A. 2% 92/8 Expr. 31-3 Run 4

Sheet 1 Date 4-7 1958 Time 2:15 AM PM

Purpose Removed Southeastern Quadrant of fuel, 1" thick
note drawing Page 111
Fuel 22" except for Southwest Quadrant which is 23"

LOADING CHANGE

Description

Mass before change 877,225 gmU 17,578 gmU 135

Mass of Change 9,855 gmU 197 gmU 135

Total Mass 867,370 gmU 17,381 gmU 135

CRITICAL POSITIONS

2 %o 92/8 Exp. 31 - 3 Run 4

.012

Rod	Channel	
A - .05	62	10/500
B -	.002	
C - 7.30	6.8	10^{-10}
	D 44	10/500
	E 1.2	900

Tim Crit. 2:43 ~~AM~~ PM Duration 13 min.

~~Rod~~ C @ .07 on 417 period = 2.8 ¢

Levelec Rd. C @ 7.30 Sensitivity ______ ¢/in.

9.60
7.30
2.3"
2 ¢/in
4.6 ¢

4/8/58

McCarty
Lynn

INSTRUMENT CHECK

Time 1:30 AM 8

			C	D	E
	10/1000	ops	10"	10/1000	900 V
Source D	1"	0"	13"	1.5"	16"
% F.S. Trip	75	OK	100+	70	100+

Counters

C.A. 270 92/8 29-5 Run 1

Sheet 4-8-58 1:50 PM

Purpose

29" Parallelepiped
Fuel Height - Stat. Table 22" Movable 20"

MULTIPLICATION

Scaler 3 min. Mult. 1/M

~~16×21+13 = 349~~
120 16×19+3 = 307

25 16×6+5 = 101.
~~16×5+10 = 90~~

312 16×9+11 = 155
16×9+11 = 155

LOADING CHANGE

Description

1 A-4 = 231 (75,766 / 15174.4) A-2 = ~~B~~ 28 (45,948 / 918.96) C-4-16 (3,299 / 65.98)
A-45 = 14 (41,482 / 829.6) A-1 = 69 (56,615 / 1132.29)

Mass before change ____ gmU ____ gmU-235

Total Mass ~~of Change~~ 906,110 gmU 18,121.23 gmU-235

C.A. 290 9⅞ Expr. 29-5 Run 2

Sheet Date 4-8 1938 Time 3:15 PM

Purpose

29" Parallelepiped

Fuel Height - Stat. Table 22" - Movable 21"

MULTIPLICATION

Geiger	c/ 3 min.	Mult.	1/M
1 20	16×93+6=1494 16×103+7=1655		
2 5	16×32+15=527 16×33+7=535		
3 12	16×3+9=57 16×3+11=59		

LOADING CHANGE

Description

Added: A-1—21 (17,230 / 344.61) C-4—10 51 / 1.02

C-1—1 (2,062 / 41.24)

Mass before change 906,110 gmU 18121.23 gm U-235

Mass of Change 19,343 gmU 386.87 gm U-235

Total Mass 925,453 gmU 18,508.10 U-235

4/9/58

McCarty

Lynn

INSTRUMENT CHECK

Time 8:45 AM PM Source γ

	Channel A	B	C	D	E
Range	10/1000 Opr		10^11	10/1000	900 V
Source Dist.	2"	0"	13"	2"	17"
% F.S. Trip	80	OK	100+	70	100+

Counters

C.A. 270 92/8 Expr. 29-5 Run 3

Sheet ____ Date 4-9 1958 Time 9:30 AM PM

Purpose

29" Parallelepiped
22" Heigh
Fixed Height - Stat. Table 22 - Mov. 22

CRITICAL POSITIONS

270 92/8 Expr 29-5 Run 3

Table Pos -01 T P

Control Rod Channel

A - .05	A	80	100/100
B -	B	.005	
C - 15.03	C	7.6	2.5 x 10^-10
	D	55	100/100
	E	1.6	840

Tim Crit. 9:50 AM PM Duration 56 min.

Rod C @ 12.495 on 10⅝ sec period = 9.3 ϕ

Leveled Rd C @ 15.03 Sensitivity 3.66 ϕ/in.

LOADING CHANGE

Description Removed A-1 added for Run 2.

Added: A-2 = 21 (34,461 / 689.22) C-4 = 10 (2062 / 41.24)

C-1 = 1 (56 / 1.02)

Mass before change: 925,453 gmU 18,508.10 gmU-235

Mass of Change 19,344 gmU 386.87 gmU-235

Total Mass 944,797 18,894.97 gmU-235

Rod C @ .07 on 124 sec period = 8.2 ¢

Leveled Rd. C @ 9.985 Sensitivity ____ ¢/in

Rod-A = 18.10

Level Rod-A = 20.265

Rod-C = 6.44

Rod C @ 9.985 on 165 sec period = 6.5 ¢

Leveled Rd. C @ 12.29 Sensitivity 2.81 ¢/in

Rod A = 15.38

Rod C .07 to 9.985 = 8.2 ¢

9.985 to 12.29 = 6.5 ¢

12.29 to 12.495 = 0.6 ¢ @ 3¢/in

12.495 to 15.03 = 9.3 ¢

24.6 ¢ Excess

Measured Stack:

29 3/32" wide

22 3/32" high

C.A. 270 92/8 Expr. 29-5 Run 4

Sheet ___ Date 4-9 1958 Time 12:50 ~~AM~~ PM

Purpose

29" Parallelepiped

Fuel Height 22" except S.E. Quadrant (21")

24.6
19.2
15.4

Quadrant

CRITICAL POSITIONS

270 92/8 Expr 29-5 Run 4

Table Pos. .012 T R

		Channel	
A- .045	A	90	100/100
B-	B	.005	
C- 10.63	C	8.3	2.5 x 10⁻¹⁰ 100
	D	61	100
	E	2.0	840

Crit. 1:05 ~~AM~~ PM Duration ___ min.

21.75"
- .17
21.58"
High

9.2/13.4 = 68%

24.1
.68
14.78

18,684
- 143
18,531
Mass

24.46%

Removed 1" of fuel from SE Quadrant (24.46% of 1 layer)

LOADING CHANGE

Description Removed 16-A-2 (26,256 / 525.12)

Added: 16-A1 (13,128 / 262.56) C-4 = 11 (2268 / 45.36)

C-2 = 1 (202 / 4.04)

Mass before change 944,797 gmU 18,894.97 gmU-235

Mass of Change 10,~~633~~ 553 gmU ~~213.12~~ 211.08 gmU-235

Total Mass ~~934,147~~ 934,244 gmU ~~18,681.85~~ 18,683.89 gmU-235

1" Layer = 43,141 g U [struck through] 862.84 g U235

Rod C 07 on 105 sec period = 7.25¢

Lowest Rd. C ~~6~~ 10.63 Sensitivity ___ ¢/in.

C.A. 2% 92/8 Exp. 29-6 Run 1

Sheet Date 4-9 1958 Time 3:15 PM

Purpose 29" Parallelepiped

26" Heigh

Top + Bottom bare - Sides Reflected

CRITICAL POSITIONS

2% 92/8 Exp. 29-5 Run 5

Table Pos. .01 T

Control Rod		Channel	
A .045	A	72	100 / 50
		.002	
B -			
C 7.075	C	7.5	10^{-10}
	D	54	100 / 50
	E	.2	900

Tim Crit. 3:43 PM Duration 12 Min.

Rod C .07 on 540 sec period = 2.25¢

Lovelac Rd C 7.075 Sensitivity ¢/in.

LOADING CHANGE

Description Returned to 22" Height, add 4" Layer

Mass before change 944,794 gmU 18,894.97 gmU-235
from Run 3

Mass of Change 172,593 gmU 3,451.92 gmU-235
from Run 3

Total Mass 1,117,387 gmU 22,346.89 gmU-235

Stack Measure: 29 7/32"

26 3/32"

4/10/58

McCarty
Lynn

INSTRUMENT CHECK

Time 9:45 AM

Source γ

	Channel A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900V
Source Dist.	1"	0"	13"	1.5"	17"
% F.S. Trip	75	OK	100+	70	100+

Counters

C.A. 290 92/8 Expr. 29-5 Run 6

Sheet ______ Date 4-10 1958 Time 10:05 AM

Purpose 29" Parallelepiped
26" Height of fuel

6" reflector on north-top + bottom

MULTIPLICATION

3 min | 1/M

1 ~~20~~ 64 X 92 + 2 = 5790
64 X 95 + 30 = 6110

2 out

3/2 16 X 81 + 10 = 1306
16 X 83 + 6 = 1334

Log N = .00019
Ch C = 7.0 @ 1.5×10^{-11}

C.A. 27 92/8 Expr 29-5 Run 7

Sheet _____ Date 4-10-958 Time 12:55 AM PM

Purpose 29" Parallelepiped

28" Height of fuel

6" Reflector on Top + Bottom

LOADING CHANGE

Description Added:

5-A-2 — (8205.0, 164.10) 55-B-4 (45,050, 900.9)

32-A-1 — (26,256.0, 525.12) 28-C-4 (5,773.6, 115.47)

2-B-2 — (819.0, 16.38) 1-C-2 (102.4, 2.04)

Mass before change 1,117,387 gmU 22,346.89 gmU-235

Mass of Change 86,205.4 gmU 1,724.01 gmU-235

Total Mass 1,203,592.4 gmU 24,070.90 gmU-235

MULTIPLICATION

Scater c m 3 min. Mult. T/M

120 16X277+3=4435
16X278+5=4456

25 out

312 16X46+0=736
16X47+4=756

Log N .0012.

Rod C = 6.0 10^{-11}

C.A. 2% 92/8 Exp. 29-5 Run 8

Sheet ____ Date 4-10 1958 Time 1:55 ~~AM~~ PM

Purpose 29" Parallelepiped
29" Length of fuel
6" Reflector on Top & Bottom, Sides Bare

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 29-5 Run 8

.015

Control Rod		Channel	
A	.05	A	49 — 100/100
B		B	.0025
C	9.96	C	7.6 — 2.5×10⁻¹⁰ 100
		D	69 — 50
		E	.1 — 900

Time Crit. 2:02 ~~AM~~ PM Duration 27 min.

Rod C @ 107 on 40% sec period = 2.95 ¢

Leveled Rd. C @ 9.96 Sensitivity ____ ¢/in.

LOADING CHANGE

Description Added:

34-A-1 (27,897 / 557.94)	42-C-4 (8660 / 173.20)
6-B-4 (4915 / 98.24)	1-C-1 (51 / 1.02)
4-B-2 (1638 / 32.76)	

Mass before change 1,203,592.4 gmU 24,070.90 gmU-235

Mass of Change 43,161 gmU 863.16 gmU-235

Total Mass 1,246,753.4 gmU 24,934.06 gmU-235

4/11/58

McCarty
Lynn

INSTRUMENT CHECK

Time 11:00 AM PM Source X

Channel	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V.
Source Dist.	15"	0"	13"	15"	16"
% F.S. Trip	80	OK	100+	70	100+

Counting 443 OK

C.A. 270 92/8 Exp. 36-1 1

Sheet Date 4-11-58 Time 11 15 AM PM

Purpose 36" Parallelepiped

Fuel 18" high - 6" Reflector on bottom only

18" plexiglas on each table
(36" x 41" x 5 3/16")

Scaler 3 Mon. 1-M

1 20 - 16 x 18 + 15 = 303
16 x 20 + 12 = 332

2 out

3 12 16 x 4 + 4 = 68
16 x 3 + 6 = 54

LOADING CHANGES

Description			
A-4-257	844.168 / 4,882.3	A-2-108	177,223 / 3,544.56
A-45-74	4,482 / 829.64	A-1-99	81,229 / 1624.59
Mass before change:	gm U		gm U-235
Mass of Change	gm U		gm U-235
Total Mass	1,144,102 gm U	22,881.09	gm U-235

See p. 130

C.A. 2% 93% Expr. 36-1 Run 2

Sheet ____ Date 4-11 1958 Time 1:00 AM PM

Purpose 36" Parallelepiped

Fuel 18" High - 6" reflector on bottom + Rear (N+S)

Bottom Refl 36" X 40" X 5 3/4"

MULTIPLICATION

Scaler	c	3 min.	Mult.	1/M
1	20	16X19+6=310 16X18+7=294		
2	out			
3	12	16X2+1=33 16X2+7=39		

C.A. 270 92/8 Expr. 36-1 Run 3

Sheet _____ Date 4-11 1958 Time 2:08 AM PM

Purpose 36" Parallelepiped

Fuel 18" High - 6" reflector on bottom, Top + rear (N+S)
Bottom Refl (36" x 41" x 5 3/4")

MULTIPLICATION

Scaler _____ 3 min. Mult. 1/M

1 20 16 x 107 + 14 = 1726
16 x 104 + 5 = 1669

2

3 12 16 x 9 + 11 = 155
16 x 10 + 7 = 167

LOADING CHANGE

Description A-4 = 253 (831,029 / 16,619.5) A-4s = 14 (41,482 / 829.6)
A-2 = 108 (177,228 / 3544.5) A-1 = 147 (120,614 / 2412.3)
B-4 = 33 (27,030 / 540.5)

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

By Count Total Mass 1,197,383 gmU 23,947 gmU-235
- 115 for Rods
23,832

C.A. 2% 9 2/8 Expr. 36-1 Run 4

Sheet _____ Date 4-11 1958 Time 3:08 AM PM

Purpose 36" Parallelepiped

Fuel 18" — Completely reflected

Bottom Refl (36" X 41" X 5 3/4")

CRITICAL POSITIONS

C.A. 2% 9 2/8 Exp. 36-1 Run 4

Tablets .015 T R

	Channel	
A .043	A 57	100/100
B	B .005	
C 18.19	C 7.2	2.5×10^{-10}
	D 39	100/100
	E 1.2	900

Tim Crit. 3:10 AM PM Duration 10 min.

Rod C @ 16.50 on 109 sec period = 9.0 ¢

Leveled Rd. C @ 18.19 Sensitivity 5.32 ¢/in.

Rod C .075 to 15.51 = 37.9 ¢ (p. 132)

15.51 to 16.50 = 5.3 ¢

16.50 to 18.19 = 9.0 ¢

52.2 ¢ Excess

4/14/58

INSTRUMENT CHECK

Time 10:30 AM ~~PM~~ Source 8

Range	10/1000	opr	10⁻¹¹	10/1000	900 V.
Source Dist.	1"	0"	14"	2"	16"
% F.S. Trip ~~Counters~~	80	OK	100+	65	100+

C = .075 to 9.82 = 15.5¢
9.92 to 13.00 = 11.1
13.10 to 15.51 = 11.3
37.9¢ at 3.0¢/i

C.A. 270 92/8 Expr. 36-1 5

Sheet [illegible] Date 4-14-958 Time 10:45 AM ~~PM~~

Purpose 36" Parallelepiped
Completely Reflected
Fuel 18" except SE Quadrant (17")
Bottom Refl.: Movable Table (18" X 48" X 5¾")
Stat. Table (28" X 48" X 5¾") except back 10" is 5" thick.

CRITICAL POSITIONS

270 92/8 Expr 36-1 Run 5

01 T R

Control Rod		Channel		
A - .045	A	60	100/200
B	B	.605	
C 15.515	C	9.0	2.5×10^{-10}
4	D	39	100/200
	E	2.4	840

Tim Crit. 11:03 AM Duration 8 min.

Rod C @ 13.00 or 81.5 sec period = 11.3 ¢
Loaded Rod C @ 15.515 Sensitivity 4.50 ¢/in.

23.614
−.115
23.499

U = 1,180,752 g U^{235} = 23,614 g.

4-1

Run 5

LOADING CHANGE

4-14-58

Description Removed A-2, B-4 & B-2 (16) (8) (1)
added A-1, C-4 + B-1 (16) (16) (1)

~~1,197,383~~ ~~23,947~~

Mass before change ~~1,144,103~~ gmU ~~22,881.09~~ gmU-235

Mass of Change ~~16,631~~ gmU ~~332.62~~ gmU-235

Total Mass ~~1,127,571~~ gmU ~~22,548.47~~ gmU-235

C.A. 2% 92/8 Expr. 36-1 Run 6

Sheet ______ Date 4-14-1958 Time 11:25 AM

Purpose 36" Parallelepiped

Fuel 18" on North Half
17" on South Half

Completely Refl (see Run 5)

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 36-1 Run 6

Table Pos. .01 L ___ T ___ R ___

Control Rod	Channel	
A .040	A 60	100/200
B	B .0048	
C 9.82	C 8.7	2.5×10^{-10}
	D 77	100/100
	E 2.2	840

Time Crit. 11:54 AM Duration ______ min.

Rod C @ 5.50 on 87 sec period = 10.7 ¢

Leveled Rod C @ 9.82 Sensitivity 2.48 ¢/in.

Rdc @ .075 on 10.75 sec Per. 9.1 ¢

Leveled Rod C @ 7.265 Sensitivity ______ ¢/in.

Rod A = 11.00

15.6 ¢ Excess

7.26 = 9.1 ¢
9.82 = 10.7 ¢
19.8 ¢
4.2 ¢
15.6 ¢

@ 2.48 ¢

.075 to 5.50
5.50 to 7.26

7.26
5.50
1.76
x 2.4
4.2 ¢

23.499

Run 6

LOADING CHANGE

Description: Remove 16 A-2, 8 B-4 + 1 B-2

Added 16 A-1, 16 C-4 + 1 B-1

	1,180,752	23,614.4
Mass before change	~~1,127,571~~ gmU	~~22,548.47~~ gmU-235
Mass of Change	16,631 gmU	332.62 gmU-235
Total Mass	~~1,110,940~~	~~22,215.85~~ gmU-235
	1,164,121	23,281.8
		115
		23.166

Rod C .075 to 7.265 = 9.1 ¢

7.265 to 9.82 = 6.4 ¢

15.5 ¢

37.9 ¢

15.5 ¢

22.4 ¢

15.5 / 22.4 = .7

.25 / .7 / .175"

.33 / .7 / .231 Kg

17.500 − .175 = 17.325" High

23.166 + .231 = 22.935 Kg for 0¢ Excess

4/15/58

McCarty
Lynn

INSTRUMENT CHECK

Time 11:20 AM

	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	1"	0"	14"	1.5"	16"
% F.S. Trip Counters	80	OK	100+	65	100+

4/17/58

INSTRUMENT CHECK

Time 8:25 AM ~~PM~~

	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	1"	0"	18"	2"	14"
% F.S. Trip Counters	80	OK	100+	75	100+

C.A. 2% 92/8 Expr. 36-2 Run 1

Sheet _____ Date 4-17 1958 Time 8:38 AM ~~PM~~

Purpose 36 in. dia Cylinder Completely Reflected.
Fuel 20" Height

Super Critical Tables .15"

LOADING CHANGE

Description A-4 = 251 (824,460 / 16,488.19) A-4s = 15 (44,445 / 888.90)
A-2 = 74 (121,434 / 2,428.68) B-4 = 55 (45,050 / 900.90)
C-4 = 20 (4,124 / 82.48)

Mass before change _____ gmU _____ gmU-235
Mass of Change _____ gmU _____ gmU-235
Total Mass 1,039,513 gmU 20,789.15 gmU-235

C.A. 2 70 98 Expr. 36-2 Run 2
Sheet _____ Date 4-17 1958 Time 10:49 AM PM
Purpose 36 in. dia. - Cylinder Completely reflected.
Fuel 18" high.

LOADING CHANGE

Description Removed 4" Layer A-4=57, A-2=8, B-4=12
added 2" Layer

Mass before change 1,039,513 gmU 20,789.15 gmU-235
Mass of Change 105,186 gmU 2103.50 gmU-235
Total Mass 934,327 gmU 18,685.65 gmU-235

Sub-Critical

C.A. 2% $\frac{92}{8}$ Expr 36-2 Run 3

Sheet Date 4-17-1958 Time 2:15 PM

Purpose 36" dia. cylinder completely reflected
Fuel 19" High

Rod C from 8.485 to 9.50 = ~3.5¢

CRITICAL POSITIONS

2% $\frac{92}{8}$ Expr 36-2 Run 3

.01

Control Rod — Channel

Control Rod		Channel		
A	.0¢	A	55	$\frac{100}{200}$
B		B	.005	
C	12.155	C	9.1	2.5×10^{-10}
D		D	75	$\frac{100}{100}$
		E	1.3	780

Time Crit. 2:30 PM Duration min.

9.8¢
9.4¢
3.5¢
22.7¢ Excess

Rod C @ 9.50 on 103 sec period = 9.4¢
Lowest Rd. C @ 12.155 Sensitivity 3.5¢/in.

Rod C @ .07 on 98 sec period = 9.8¢
Lowest Rd. C @ 8.485 Sensitivity ¢/in.

LOADING CHANGE

Description Added 1" Layer

A-1 = 58 ($\frac{47589}{951.78}$) C-4 = 18 ($\frac{3711.6}{74.23}$)

C-1 = 24 ($\frac{1233}{24.66}$)

Mass before change 934,327 gmU 18,685.65 gmU-235

Mass of Change 52,533 gmU 1,050.67 gmU-235

Total Mass 986,860 gmU 19,736.32 gmU-235

.85
.90
.50
0.90

=12

138

4/18/58

McCarty
Lynn

INSTRUMENT CHECK

Time 10:30 AM ~~PM~~ Signature

	A	B	C	D	E
	10/1000	Opr	10"	10/1000	900 V.
Source		1.5"	0	16"	1.5"	15"
% F.S. Trip Counters		80	OK	100+	65	100T

C.A. 270 92/8 Expr 36-2 Run 4

Sheet ~~Run~~ Date 4-18-58 Time 10:35 AM ~~PM~~

Purpose 36" dia Cylinder
Fuel 22" Heigh

Reflector: 6" on Sides
Top & Bottom Bare

LOADING CHANGE

Description Removed 1" Layer
Added 4" Layer

Mass before change	✓ gmU	✓	gmU-235
Mass of Change	104,999 gmU	2099.95	gmU-235
from Run 1 Total Mass	4,144,512 gmU	23,889.10	gmU-235

Sub-Critical

C.A. 270 9/8 Expr. 36-2 Run 5

Sheet _____ Date 4-18 1958 Time 11:15 AM ~~PM~~

Purpose 36" dia cylinder
Fuel 24" High
Top & Bottom Bare (Except 10" at lock, 6" on Sides of which 2" under fuel)

LOADING CHANGE

Description Added 2" Layer

Total Inventory less: A-45 = 1, C-4 = 13
C-2 = 4
C-1 = 16

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass 1,256,217 gmU 25,124.32 gmU-235

Super Crit Tables = .20"

C.A. 290 $\frac{92}{8}$ Expr. 36-2 Run 6

Sheet ______ Date 4-18 1958 Time 12:45 ~~AM~~ PM

Purpose 36" dia cylinder
23" High

Top & Bottom Bore (2" under full at back
6" on sides

CRITICAL POSITIONS

C.A. 290 $\frac{92}{8}$ Expr. 36-2 Run 6

Table P ______ T ______

Control Rod ______ Channel

A

B

C ______ C

4 ______ D

E

Tim Crit. ______ AM PM Duration ______ min.

MULTIPLICATION

Scaler ______ 3 min. Mult. 1/M

1 30 / 20 / out 2 — 64 x 90 + 14 = 5774
64 x 110 + 4 = 7044

3 /2 — 16 x 45 + 15 = 735
16 x 54 + 1 = 865

Log N = .00016

Run #6 Removed 1" Layer.

LOADING CHANGE

Description ~~added: Al-16 (13,128 / 262.56)~~

~~C-H - 9 (185 / 37.11)~~

~~The above covers 28.47% of Top.~~

Mass before change 1,256,217 gmU 25,124.32 gmU-235

Mass of Change 52,972 gmU 1,059.43 gmU-235

~~Total~~ Mass 1,203,245 gmU 24,064.89 gmU-235

C.A. 2% 92/8 Expr. 36-2 Run 7

Sheet — Date 4-18 1958 Time 1:45 PM

Purpose 36" dia Cylinder

23.28" Heigh

Top & Bottom Bare (3" mchr fuel at bot)

Sides with 6" Refl.

Rod C from 9.89 to 10.50 = 4.1¢ @ 2.7¢/in

9.0
8.0
4.1
21.1 ¢

CRITICAL POSITIONS

2% 92/8 Expr 36-2 Run 7

.01 T R

Channel

A - .04	A 58	100 / 200
B -	B .005	
C - 13.645	C 6.2	3x10^-10
	D 90	100 / 100
	E 1.2	900

Time Crit. 2:03 PM Duration — min.

Rod C @ 10.50 on 108 sec period = 9.0 ¢

Leveled Rd. C @ ~~8~~ 13.645 Sensitivity 2.86 ¢/in.

Rod A = in

Rod C @ .07 on 128 sec period = 8 ¢/in.

Leveled Rd. C @ 8.78 Sensitivity

Rod A = 18"

LOADING CHANGE

Run #7

Description Added: A-1=16 (13,128 / 262.56)

C-4=9 (185. / 37.11)

The above Covers 28.47% of Top

Mass before change 1,203,245 gmU 24,064.89 gmU-235

Mass of Change 13,313 gmU 299.67 gmU-235

Total Mass 1,216,558 gmU 24,364.56 gmU-235

4/22/58

Ellis
Lynn

INSTRUMENT CHECK

Time 8:50 AM Source γ

	A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	1 IN		12 in	1 in	14 in
% F.S. Trip	80		100+	70	100+

C.A. _____ Expr. _____ Run _____

Sheet _____ Date 4/22/1958 Time 9:14 ~~AM~~ ~~PM~~

Purpose 36" Dia. Cylinder
23" High (Except SE Quadrant which is 24" High)
6" Refl on sides
Top & Bottom Bare (Plexiglas on bottom pushed back)

LOADING CHANGE

Description Removed: A-1-2 (1641 / 32.82) C-4-2 (412 / 8.24)
Added: C-2-2 (204 / 4.08)

Mass before change	1,216,558 gmU	24,364,356	gmU-235
Mass of Change	1,849 gmU	36.98	gmU-235
Total Mass	1,214,709 gmU	24,327,358	gmU-235

CRITICAL POSITIONS

C A 28 9 3/8 Expr. 36-2 Run 8

.01 L T R

	Channel
A .045	A 51 at 100/200
C 11.80	B .005
3	C 6.0 3×10⁻¹⁰
4	D 80 100/100
	E .7 900V.

Thru Coil AAA Duration min.

Rod C @ 9.00 on 154 sec period = 6.9 ¢

Levelec Rd. C @ 11.80 ... ¢/in.

C from .07 to 8.98 = 8.0¢ (p 141)

6.9

14.9¢ Exass.

9/23/58

Ellis
Lynn

INSTRUMENT CHECK

Time 2:20 ~~AM~~ PM Source γ

	A	B	C	D	E
Range	10/1000	opr	10^{-4}	10/1000	900
Source Dist.	0"	0"	14"	2'	12"
~~% F.S. Trip~~ Counters	85	O/C	100	60	100

C.A. 2% 93/8 Expr. 44-1 Run 1

Sheet ______ Date 4-23 1958 Time 3:00 ~~AM~~ PM

Purpose 44" dia cylinder
16" High
Totally Reflected.

LOADING ~~CHANGE~~

Description Total Inventory Less: A-1 = 8 (6564 / 131.28)
B-2 = 8 (3276 / 65.52) B-1 = 4 (816 / 16.32)
C-4 = 114 (23,501 / 470.13) C-2 = 9 (921 / 18.43)
C-1 = 21 (1079 / 21.58)

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 1,226,834 gmU - 24,538.56 gmU-235

~~MULTIPLICATION~~

Scaler c/ 3 min. BG/ ______ min. Mult. 1/M

Tables separated
Source out
(3 min)

Disc.		
1 20	37x16+5	597
2		
3 12	5x16+2	82

ctr 1 11x16+1 = 177
3 1x16+5 = 21

146

4/24/58

INSTRUMENT CHECK

Time 10:45 AM

	A	B	C	D	E
Range	10/1000	off	10"	10/1000	900 V.
Source Dist.	1"	0"	12"	1.5"	14"
% F.S. Trip Counters	80	off	100+	60	100+

C.A. 27 93/8 Expr. 44-1 Run 2

Sheet _____ Date 4-24 1958 Time _____ AM PM

Purpose 44" dia Cylinder
~16½" High
Completely Reflected.

M.T. = 16" High
S.T. = 16" ± 1" except 6" at back + 1" on W

LOADING CHANGE

Description Total Inventory

Mass before change	gmU	gmU-235
Mass of Change	gmU	gmU-235
Total Mass	1,263,091 gmU	25,261.82 gmU-235

CRITICAL POSITIONS

CA 270 9/8 Expr. 44-1 Run 2

Table Pos. .01 L T R

Control Rod		Channel	
A	.05	A 45	100/200
C	15.07	B .0052	
		C 7.2	2.5×10^{-10}
4		D .64	100/100
		E 1.6	840 v.

Tim Crit. ____ AM PM Duration ____ min.

- 6" +

Rod C @ 13.25 on 113 sec period = 8.8 ¢ Rod A = out

Levelec Rd. C @ 15.07 Sensitivity 4.83 ¢/in.

Rod C @ 2.30 on 98 sec period = 9.8 ¢ Rod A = in

Levelec Rd. C @ 6.89 Sensitivity 2.13 ¢/in.

13.25 — 8.8

6.89 — 9.8

6.36 at 3.5 ¢/in = 22.2 ¢

50.8

0 ← 2.30 — 10. ¢

60.8 ¢

*

C.A. 2% 93/8 Expr. 44-1 Run 3

Sheet ___ Date 4/24 1959 Time 1:25 ~~AM~~ PM

Purpose 44" dia cylinder (1504 in² Base)
16¼" High (M.T. 16" / S.T. 16" + 1" on SE Quadrant)
Completely Reflected

LOADING CHANGE

Description Removed: ~~B~~-4 = 72 (14,842 / 296.92)
C-2 = 9 (922 / 18.43)
C-1 = 21 (1079 / 21.59)

Mass before change 1,263,091 gmU 25,261.82 gmU-235
~~Mass of Change~~ 16,843 gmU 336.94 gmU-235
Total Mass 1,246,248 gmU 24,924.88 gmU-235

Rod C from 4.285 to 5.96 at 2.7¢/in = 4.54¢
7.3
11.8¢
Excess

Rod C @ 2.30 on 156 sec period = 6.8¢
Leveled Rd. C @ 5.96 Sensitivity 2.55 ¢/in.
Rod A: out

Rod C @ 992.05 on 146 sec period = 7.25¢
Leveled Rd. C @ 4.285 Sensitivity ___ ¢/in.
Rod A = 8.00"

CRITICAL POSITIONS

Expr ___ Run ___

.01

Control Rod ___ Channel

A .045 ~~71~~ 100/100

C 5.96 B .0052

C 7.0 2.5×10⁻¹⁰

D 49 100/100

E 1.2 840 r

Time Crit. 1:40 ~~AM~~ PM Duration ___ min.

~~Rod C limit switch~~ (out Pos.) moved back ~ 8".

4/25/58

Ellis
Lynn

TRUMENT CHECK

Time 2:00 PM

	A	D	D	E
Range	~~10~~ 1,000	10 1000 opr	10^{-11} 10 1000	900 v.
Source-Dist.		1"	0" 12"	3" 15"
% F.S. Trip		80	ot 100 60	100 t

Centers

C.A. 2% ~~98~~ 8 Expr. 18-1 Run 1

Sheet _____ Date 4/25/1958 Time 2:15 AM PM

Purpose 18" Parallelepiped
48" High
Completely Reflected

LOADING ~~CHANGE~~

Description A-4 = 184 (604,384 / 12,096.96) A-4s = 8 (23,704 / 447.08)
A-2 = 95 (155,895 / 3117.90) B-4 = 13 (10,648 / 212.94)
C-4 = 2 (412 / 8.25)

	gmU	gmU-235
Mass before change		
Mass-of-Change		
Total Mass	795,043 gmU	15,900.13 gmU-235

MULTIPLICATION

Scaler	c/ 3 min. BG/ ____ min.	Mult.	1/M
1	16X2 + 7 = 39		
2			
3	16X2 + 0 = 32		

Rad A = 8.00"

C.A. 296 9/8 Expr. 18-1 Run 2

Sheet ____ Date 4/25/1958 Time 3:15 ~~AM~~ PM

Purpose 18" Parallelepiped
56" High
Completely Reflected

LOADING CHANGE

Description Added A-4 = 16 (52,555 / 1051.04)
A-1 = 18 (14,770 / 295.38)
B-4 = 16 (13,105 / 262.08)

Mass before change	795,043 gmU	15,900.13	gmU-235
Mass of Change	80,430 gmU	1,608.50	gmU-235
Total Mass	875,473 gmU	17,508.63	gmU-235

MULTIPLICATION

Scaler	c/ 3 min.	DG/ min.	Mult.	1/M
1	2X16+6	36		
2	~~2X16+7~~			
3	.0X16+7	7		

4/28/58

McCarley
Lynn

INSTRUMENT CHECK

Time 10:50 AM ~~PM~~ Source 8

	Channel A	B	C	D	E
Range	10/1000	op	10"	10/1000	900V.
Source Dist.	1"		12"	15"	17"
% F.S. Trip	75		100+	65	100+

Counters

C.A. 290 92/8 Expr. ~~78~~-22-1 Run 1

Sheet Date 4-28 1958 Time 10:04 AM PM

Purpose 22" Parallelepiped
Fuel 32" High
Completely Reflected

LOADING CHANGE

Description		U	U235
A-4 = 190		624,093	12,481.1
A-45 = 10		29,630	592.6
A-2 = 79		129,639	2,592.78
B-4 = 9		7,372	147.42
C-4 = 2		412	8.25
Mass before change		gmU	gmU-235
Mass of change		gmU	gmU-235
Total Mass	791,146	gmU	15,822.15 gmU-235

MULTIPLICATION

Scaler m 3 mm Mult. 1/M

1 20 - 16X5+4=84
16X4+11=75

2
16X1+2=18

3/2 16X0+14=~~30~~ 14

C.A. 290 92/8 Expr. 22-1 Run 2

Sheet ____ Date 4-28 1958 Time 1:20 AM PM

Purpose 22" Parallelepiped
Fuel 36" High.
Comp Buff.

LOADING CHANGE

Description		U	U 235
	A-4-25	82,117	1,642.25
	A-2-10	16,410	328.2
	B-4-1	819.1	16.38
		99,346	
Mass before change		791,146 gmU	15,822.15 gmU-235
Mass of Change		99,346 gmU	1,986.83 gmU-235
Total Mass		890,492 gmU	17,808.98 gmU-235

MULTIPLICATION

Scaler c/ ____ m.n. 03 3 min. Mult. 1/M

1 20 16X6+8=104

2

3/2 16X1+4=20

C.A. 2% 92/8 Expr. 22-1 Run 3

Sheet ______ Date 4-28 1958 Time 2:20 ~~AM~~ PM

Purpose 22" Parallelepiped Fuel 44" High

Comp. Refl.

LOADING CHANGE

Description		U	U 235
	A-4 = 31	101,826	2036.39
	A-2 = 17	27,897	557.94
	A-1 = 82	67,281	1345.62
	B-4 = 2	1,638	32.64

Mass before change ~~890,492~~ 890,492 gmU 17,808.98 gmU-235

Mass of Change 198,642 gmU 3972.59 gmU-235

Total Mass 1,089,134 gmU 21,781.57 gmU-235

MULTIPLICATION

Scaler c ______ 3 min. Mult. 1 M

120 64 X 38 ~~+~~ 36 = 2468
64 X 48 + 42 = 3114

2

3/2 16 X 30 + 14 = 494
16 X 39 + 12 = 636

C.A. 2% 92/8 Expr. 22-1 Run 4

Sheet Date 4-28 1958 Time 3:15 PM

Purpose 22" Parallelepiped Fuel 46"

Comp. Reff

LOADING CHANGE

			U	U-235
7.9	Description	A-1 = 50	41,025.0	820.50
5.6		B-4 = 10	8,191.0	163.80
7.65		B-2 = 1	409.5	8.19
21.15¢	Mass before change	1,089,134 gmU	21,781.57	gmU-235
Excess	Mass of Change	49,625.5 gmU	992.49	gmU-235
	Total Mass	1,138,759.5 gmU	22,774.06	gmU-235

Rod A @ 6.00 on 129 sec period = 7.9 ¢/in.
Leveled Rd A @ 12.48 Sensitivity ¢/in.
Rod C = 17.00

CRITICAL POSITIONS

C.A. 2% 92/8 Expr. 22-1 Run 4

Table 01 T R

Rod		Channel	
A	16.35	A 60	100/200
B		B .005	
C	.093	C 73	2.5×10^{-10}
		D 74	100/100
		E 1.0	750

Tim Crit. 3:34 PM Duration min.

Rod A @ 14.25 on 135 sec period = 7.65 ¢
Leveled Rd A @ 16.35 Sensitivity 3.64 ¢/in
Rod C = out

Rod A from 12.48 to 14.25" = 5.6¢
3.17 ¢/in Run 5

4/29/58
McCarty
Lynn

INSTRUMENT CHECK

Time 9:10 AM PM Source γ

	Channel B	C	D	E
Range	10 / 1000 OFF	10"	10 / 1000	900 V
Source Dist.	18"	14"	1"	17"
F.S. Trip Counts	80	100+	75	100+

43-3/4"

C.A. 270 9a/8 Expr. 22-1 Run 5

Sheet Date 4-29 1958 Time 9:17 AM PM

Purpose 22" Parallelepiped
Fuel 46" (Except 1 Quadron of 45")

LOADING CHANGE

Description	U	U-235	Added:	U	U-235
Removed:					
A-1-=9	7385 - 147.69		C-4=17	3505 - 70.11	
B-4=3	2457 - 49.14		C-2=1	102	2.05
			C-1=1	51	1.03

Mass before change 1,138,759.5 gmU 22,794.06 gmU-235

Mass of Change 6,184 gmU 123.64 gmU-235

Total Mass 1,132,575 gmU 22,650.42 gmU-235

3.17 4/in Run 5

CRITICAL POSITIONS

[illegible] 2/10/92 [illegible] Expr 22-1 Run 5

[illegible] Pos [illegible] .01 T [illegible]

Rod		Chamber		
A	15.55	A	59	100/200
B		B	.005	
C	.09	C	7.3	2.5 x 10^-10
		D	74	100/100
		E	1.0	750

Tim Crit. 9:32 AM Duration 8 min.

45 3/4"

Rod A @ 12.48 on 99 sec period = 9.85 ¢

Leveled Rd. A @ 15.55 Sensitivity 2.17 ¢/in

7.94 (Run 4)
9.75
17.65 ¢ Excess

21.15
17.65
3.50 ¢ for 1 quadrant

C.A. 290 92/8 Expr. 22 - 1 Run 6

Sheet _____ Date 4-29 1958 Time 10:25 AM PM

Purpose 22" Parallelepiped Fuel 45" High.

LOADING CHANGE

Description	U	U^{235}		U	U^{235}
Removed: A-1=16	13,128	-262.56	Added: C-4=3	618.6	-12.372
B-4=7	5,733.7	-114.66	C-2=1	102.4	2.048
B-2=1	409.5	8.19			

Mass before change: 1,132,575 gmU 22,650.42 gmU-235

Mass of Charge 18,552 gmU 370.89 gmU-235

Total Mass 1,114,023 gmU 22,279.53 gmU-235

22.774 @ 46"
22.280 @ 45"
494 g/1" layer

22.280
- 494
21.786 @ 44"

CRITICAL POSITIONS

290 92/8 Expr 22-1 Run 6

O L T R

	Channel	
Δ	12.83	A 67 100/200
B		.0052
C	.095	C 8.4 2.5x10⁻¹⁰ 100/100
		D 83 100/100
		E 1.2 750

Time Crit. 10:42 AM PM Duration 15 min.

Rod A-B .045 on 109 sec period = 9.0 ¢ Excess

Leveled Rd. A @ 12.83 Sensitivity _____ ¢/in.

CA 29092 Expr. 22-1 Run 7

Sheet _____ Date 4-29-1958 Time 2:07 ~~AM~~ PM

Purpose 22" Parallelepiped
Fuel 44½" High [½ in 45" ½ in 44"]
Completely Reflected

44.5"

LOADING CHANGE

Description		u	u235
Removed:	A-1=15	12,309	246.15
	C-4=1	206.2	4.12
Added:	C-2=1	102.4	2.048
Mass before change		1,114,023 gmU	22,279.53 gmU-235
Mass of Change		12,410.8 gmU	248.23 gmU-235
Total Mass		1,101,613 gmU	22,031.30 gmU-235

CRITICAL POSITIONS

CA 29092 Expr 22-1 Run 7

01

	Card		Channel
A	9.755	A 39	100/100
B		B .0013	
C	.095	C 5.5	10^{-10}
		D 46	100/50
		E .2	750

Tim Crit. 2:29 PM Duration 7 min.

4/30/58

McCarty

Lynn

INSTRUMENT CHECK

Time 9:45 AM — Source Y

	Channel A	B	C	D	E
Range	10/1000 opr	10"	10	900V	
Source Dist.	1.5"	0"	18"	1.5"	16"
F.S. Trip Counters	80	OK	100+	65	100+

C.A. 270 92/8 Expr. 24-1 Run 1

Sheet Date 4-30 1958 Time 9:55 AM PM

Purpose 24" Parallelepiped
32" High
Completely Reflected

LOADING CHANGE

Description			U 235
	A-4 = 248	814,432	16,291.12
	A-4S = 12	35,556	711.12
	A-2 = 56	91,896	1,837.92

Mass before change ____ gmU: ____ gmU-235

Mass of Change ____ gmU: ____ gmU-235

Total Mass 941,884 gmU 18,840.16 gmU-235

CRITICAL POSITIONS

C.A. 29 9/2/8 Expr. 24-1 Run 1

Table .01 T

Channel

A 16.325		74	100/200
B		.006	
C 19.605	C	8.4	3x10^-10
	D	50	100/200
	E	2.6	750

Tim Crit. 10^22 AM Duration 16 min.

~~Rod A @ .04 in. 127 sec period = 8.05 ¢~~

Leveled Rd. A @ 16.325 Sensitivity ¢/in.

Rod C = 19.605

Level Rod C = 20.695 IN

Rod A = 15.04

04 to 16.325 = 8.05 ¢

16.325 to 19.10 = 5.7 ¢

13.75

13.75
8.05
21.80 ¢ Excess

C.A. 2% $\frac{92}{8}$ Expr. 24-1 Run 2

Sheet ______ Date 4-30 1958 Time 11:10 AM

Purpose 24" Parallelepiped
Fuel 31 ½" High [½ is 31" / ½ is 32"]
completely reflected

3½

LOADING CHANGE

Description Removed:

A-4=9 29,562.3 - 591.21

Added

A-1=18 14,769 - 295.38

Mass before change 941,884 gmU 18,840.16 gmU-235

Mass of Change 14,793 gmU 295.83 gmU-235

Total Mass 927,091 gmU 18,544.33 gmU-235

[illegible]

18,544
.117
18,427 U^{235}
-0 Excess

CRITICAL POSITIONS

2% $\frac{92}{8}$ Expr 24-1 Run 2

.01 ...T......R......

6.4 ¢ excess

Control Rod		Channel	
A	15.165	63	100 / 200
B		.005	
C	.095	7.0	3×10^{-10}
		D 84	100 / 100
		E 2.0	750

31.5
.2
31.3" 0 Height

Crit. 11:32 AM Duration 16 min.

Level with Rod
A .04

Rod C-out

Rod A .04 on 16.2 sec period = 6.4 ¢

Rod C: 15.455

Leveled Rd. A @ 15.165 Sensitivity ______ ¢/in.

C.A. 270 92/8 Expr. 24-1 Run 3

Sheet _____ Date 4-30 1958 Time 1:20 AM PM

Purpose 24" Parallelepiped
fuel 32" except 1 quadrant which
was 31 (31 3/4")
Completely reflected
Measured Stack 24 1/8" + 32 1/8"

LOADING CHANGE

Description _____

	U	U-235
Added:		
A-1=9	7,384	147.69

Mass before change	927,091 gmU	18,544.33 gmU-235
Mass of Change	7,384 gmU	147.69 gmU-235
Total Mass	934,475 gmU	18,692.02 gmU-235

31.5 / 31.39

64/7.9 = 80%

147 .80 / 117 g

.25" .80 / 2"

CRITICAL POSITIONS

C.A 270 92/8 Expr 24-1 Run 3

.01

Channel

A 19.610	61	100/200
C .095	.0052	
	6.9 3x10⁻¹⁰	
	D 82	100/100
	E 2.0	750

Tim Crit. 1:38 AM PM Duration 6 min.

7.9 / 6.4 / 14.34 Exam

Rod A @ 15.165 on 129 sec period 7.9 ¢

Leveled Rd. A @ 19.610 Sensitivity 1.73 ¢/in.

C.A. 270 92/8 Expr. 24-2 Run 1

Sheet ____ Date 4-30 1958 Time 3:15 PM

Purpose 24" Parallelepiped
Fuel 36" High
Top + Bottom Bare
6" Refl on Sides

LOADING CHANGE

Description	Added:	U	U 235
	A-4 = 1%	45,985.8	919.66
	A-2 = 44	72,204	1,444.08
	A-1 = 9	7,384	147.69
Mass before change		934,475 gmU	18,692.02 gmU-235
Mass of Change		125,574 gmU	2,511.43 gmU-235
Total Mass		1,060,049 gmU	21,203.45 gmU-235

CRITICAL POSITIONS

270 92/8 Expr 24-2 Run 1

.015 T P

	Channel	
A 18.75	A 58	100/200
C 17.50	B .0655	
	C 6.6	3×10^{-10}
	D 8%	100/100
	E 6	750 V.

Level Rod C = 20.695
Rod A = 17.28

Firm Crit. 3:37 AM PM Duration 17 min.

Rod A @ .04 on 135 sec period = 7.6 ¢

Levelec Rd. A @ 18.75 Sensitivity ____ ¢/in.

Rod @ 17.50

164

5/1/58

McCarty
Lynn

INSTRUMENT CHECK

Time 10:15 AM Source Y

	Channel A	B	C	D	E
	10/1000	opr	10"	10/1000	900V
Source Dist.	1"	0"	15"	2"	12"
F.S. Trip Counters	80	OK	100+	65	100+

C.A. 290 9/8 Exp. 24-2 Run 2

Sheet Date 5-1 1958 Time 10:38 AM

Purpose 24" Parallelepiped
Fuel 41" high.
Sides bare - Top + Bottom reflected

LOADING CHANGE

Description	U	U 235
Added:		
A-1 = 100	82,050.0	1,641.00
A-2 = 11	18,051	361.02
B-4 = 58	47,507	950.04
Mass before change	gmU	gmU-235
Mass of Change	gmU	gmU-235
Total Mass	gmU	gmU-235

MULTIPLICATION

Scaler	Counts	DG 3 min	Mult.	1/M
120	16×29+0=464 16×28+4=452	458		
2				
312	16×4+11=75 16×5+7=98	86		

C.A. 296 92/8 Expr. 2-4-2 Run 3

Sheet _____ Date 5-1 1958 Time 12:40 ~~AM~~ PM

Purpose 24" Parallelepiped
Fuel 43" High (except Back corner 42")
Side bare - Top + Bottom reflected

LOADING CHANGE

Description Total Inventory

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass 1,263,091 gmU 25,261.82 gmU-235

MULTIPLICATION

Scale: 3 min. Mult. T/M

120 16X41+12=668 664
16X41+7=661

2

3/2 16X6+7=103 95
16X7+6=86

166

5/2/58

McCarty
Lynn

INSTRUMENT CHECK

Time 9:25 — Date 8

	A	B	C	D	E
	10/1000	opr	10^{-11}	10/1000	900 V
Source Dist.	1"	0"	14"	15"	16"
% F.S. Trip	80	OK	100+	75	100+

Counters

EA. 2% 9 1/8 Expr. 24-4 Run 1

Sheet ____ Date 5-2-1958 Time ____ AM PM

Purpose 24" diameter Cylinder
40" High
Completely Reflected

LOADING CHANGE

Description		gm U	gm U^{235}
Added	A-4 = 188	617,524	12,349.72
	A-4s = 8	23,704	474.08
	A-2 = 100	164,100	3,282.00
	B-4 = 44	36,040	720.72
	A-1 = 80	65,640	1,312.80
	C-4 = 8	1,649	32.99
Mass before change =	2	gm U	gm U-235
Mass of Change		gm U	gm U-235
Total Mass	908,861	gm U	18,176.36 gm U-235

Sub Crit.
No multiplication taken

C.A. 270-92/8 Expr. 24-4 Run 2

Sheet _____ Date 5-2 1958 Time 10:50 AM PM

Purpose 24" diameter Cylinder
44" High
Completely Reflected

LOADING CHANGE

Description			U^{235}
Added	A-4=34	111,679	2233.46
Removed	A-1=14	11,487	229.74
	B-4=6	4,914	98.28

Mass before change 908,861 gmU 18176.36 gmU-235
Mass of Change 95,278 gmU 1905.44 gmU-235
Total Mass 1004,139 gmU 20,081.80 gmU-235

MULTIPLICATION

Scaler c n 3 min. Mult. I/M

1 20	16X10+9=169 16X10+1=161			
2				
3 12	16X2+0=32 16X2+8=40			

C.A. 2 70 92/8 Expr 24-4 Run 3

Sheet Date 5-2-58 Time 2:50 PM

Purpose 24" diameter Cylinder
Fuel 48" High
complitily reflected

LOADING CHANGE

Description Added	U	U 235
A-4 = 23	75,548	1,510.87
A-1 = 22	18,051	361.02
B-4 = 1	819	16.38
C-4 = 3	618	12.36

Mass before change 1,004,139 gmU 20,081.80 gmU-235

~~Mass of Change~~ 95,036 gmU 1,900.63 gmU-235

Total Mass 1,099,175 gmU 21,982.43 gmU-235

~~CRITICAL POSITIONS~~

C.A. Expr Run

Table S .015

Rod		Channel	
A-.05		A 68	100/100
4.8 ← C-19.46		B .0022	
		C 5.4	2.5×10^{-10}
		D 46	100/100
		E ~~57~~ 1.4 @ 780	

Tim Crit. 3:10 PM ~~Duration~~ min.

5/6/58

McCarty
Lynn
Pryor (K-25)

INSTRUMENT CHECK

Time 1:45 Source 8

	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900 V.
Source Dist.	1"	0"	14"	1.5"	15"
% F.S. Trip	75	OK	100+	70	100+

Counters

C.A. 296 92/8 Expr. 23-1 Run 1

Sheet ______ Date 5-6 1958 Time 2:10 PM

Purpose 23" Diameter Cylinder
Fuel 56 3/16" High
Completely reflected

LOADING

Description Total Inventory less:

	U	U^{235}		U	U^{235}
A-45 = 8	23,704	474.08	A-4 = 10	32,847	656.9
A-4 Rj = 1	3,287	65.73	C-4 = 40	8,248	164.96
B-2 = 2	819	16.38	C-2 = 9	921	18.43
B-1 = 4	816	16.32	C-1 = 21	1080	21.59

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 1,191,269 gmU 23,827.43 gmU-235

MULTIPLICATION

Scaler c 3 min Mult. 1/M

1 20 16 × 22 + 5 = 357
16 × 23 + 3 = 371

2

3 12 16 × 4 + 10 = 72
16 × 5 + 10 = 80

170

5/7/58

Lynn
McCarty
Pryor (R-25)

INSTRUMENT CHECK

Time 2:50 ~~AM~~ PM

	A	B	D	C
	10/1000 opr	10"	10/1000	900 V.
Source Dist.	15"	17"	2"	18"
% F.S. Trip	80	100+	65	100+

Counters

C.A. 270 92/8 Expr. 36-3 Run 1

Sheet ____ Date 5-7-58 Time 3:00 ~~AM~~ PM

Purpose 36" Diameter Cylinder
Fuel 2.4" High
Bare

LOADING CHANGE

Description	Total inventory lease	U-235
C-4 = 2	412.4	8.248
C-2 = 10	1024.0	20.480
C-1 = 3	668.2	13.364
Mass before change	~~1,993,769~~ 1,263,091 gmU	~~25,211.82~~ ~~2,627.43~~ gmU-235
Mass of Change	2,094 gmU	42.69 gmU-235
~~Total Mass~~	~~1,995,195~~ gmU	~~25,254.51~~ gmU-235
Total Mass	1,260,997	25,219.73

MULTIPLICATION

Scaler C 3 Mult. 1 M

1 20 16x46+4 = 740
16x47+2 = 754

2
16x6+10 = 106

3 12 16x6+10 = 106

C.A. $290\frac{92}{8} + \frac{88}{11.5}$ Expr. 36-3 Run 2

Sheet Date 5-7 1958 Time 3:36 AM PM

Purpose 36" Diameter Cylinder
Fuel 24" + 27 block $\frac{H}{X} = 300$ on top
Through center East + West
Completely Bare

LOADING CHANGE

Description Added: $(\frac{H}{X} = 199)$

	U	U-235
A2-4 = 27	74,682	1,493.64
	1,260,997	25,219.73
Mass before change	~~1,189,195~~ gmU	~~23,785.37~~ gmU-235
Mass of Change	74,682 gmU	1,493.64 gmU-235
~~Total Mass~~	~~1,263,877~~ gmU	~~25,278.58~~ gmU-235
	~~1,186,315~~	
Total Mass	1,335,679	26,713.37

MULTIPLICATION

Scaler	c	3 min.	Mult.	1/M
1	20 16X55+28 = 908 16X55+45 = 925			
2				
3	12 16X32+12 = 524 16X33+10 = 538			

172

5/8/58

McCarty
Lyon
Pryor (Kbs)

INSTRUMENT CHECK

9:35 AM

	A	B	C	D	E
RANGE	10/1000	off	10"	10/1000	900V.
Source Dist.	1"		13"	15"	16"
% F.S. Trip.	80		100+	60	100+

Counters

C.A. 270 92/8 +88.5/11.5 END 36-3 Run 3

Sheet Date 5 8 1958 10:15 AM PM

Purpose .36" Dia. Cylinder
Fuel 24" +307 Blocks on ty
24=300 thingle center
Bare

LOADING CHANGE

Description			
Added (46/X=300)	U	U 235
A24 = 10	27,660	553.20

Mass before change	1,335,679 gmU	26,713.37	gmU-235
Mass of Charge	27,660 gmU	553.20	gmU-235
Total Mass	1,363,339 gmU	27,266.57	gmU-235

Super Critical

C.A. 270 92/8 + 88.5/11.5 Expr. 36-3 Run 4

Sheet ... Date 5-8 1958 Time 10:45 AM

Purpose: 36" Diameter cylinder
Fuel 24" High + 32 Blocks on top
H/X = 300 through center
Bare

LOADING CHANGE

Description	u	u 235
Removed:		
A-4-5	13,830	276.6

Mass before change 1,363,339 gmU 27,266.57 gmU-235

Mass of Change 13,830 gmU 276.60 gmU-235

Total Mass 1,349,509 gmU 26,989.90 gmU-235

CRITICAL POSITIONS

C.A. 270 92/8 + 88.5/11.5 Expr. 36-3 Run 4 — 5.7¢

Table Pos. .015 T R — 7.05¢

Control Rod — Channel — 5.

Control Rod		Channel		
A	.05	A	45	100/300
C	16.755	B	.005	
		C	6.8	3X10^-10
		D	65	100/100
		E	.2	900

25 ¢

Time Crit. 11:08 AM Duration 11:32 min.

Rod C @ 15.00 on 195 sec period = 5.7 ¢

Leveled Rd. C @ 16.755 Sensitivity 3.25 ¢/in.

Rod C @ 9.75 on 150 sec period = 7.05 ¢

Leveled Rd. C @ 12.99 Sensitivity 2.17 ¢/in.

Rod A IN.

174

5/9/58

McCarty
Lynn
Pryor

INSTRUMENT CHECK

Time 10:00 ~~PM~~ Source X

Counters

	A	B	C	D	E
Range	10 / 900	opr	10"	10 / 1,000	900 V
Source Dist	1"	0"	14"	15"	17"
% F.S. Trip	80	ok	100+	65	100+

C.A. $2^{90\frac{92}{8}} + 88.5$ 11.5 Expr. ~~36~~ B3-1 Run ~~1~~ 1

Sheet Date 5-9 58 Time 10:15 ~~PM~~ AM

Purpose 33" Diameter Cylinder
Fuel ~~29~~ 29" High
Bare
H/X = 300 blocks distributed as shown p. 179

H/X = 200 Inventory Loss:

LOADING CHANGE

Description		U	U 235	U 4235
	A-45 = 2	5,926	118.52	C-4=8₂ 16,908 - 338.16
	A-2 = 17	27,897	~~5 23.12~~ 557.94	C-2=5 512.0 - 10.24
	A-1 = 34	27,897	557.94	
	B-4 = 14	11,467	229.32	
	B-2 = 8	3,276	65.52	
Plus H/X = 300 Mass before chg	A2-4 = 28	77,448 gmU	1,548.96	
Mass of Change		93,883 gmU	1877.61 ~~1,844.82~~	gmU-235
Total Mass		1,246,656 gmU	24,933.17	gmU-235

MULTIPLICATION

Scaler 3

1 20 64 X 94 + 36 = 6049
64 X 93 + 61 = 6013

2 64 X 29 + 44 = 1900
64 X 29 + 21 = 1877

3 (V) 64 X 14 + 21 = 917
~~64 X 15 + 2~~ = 960

C.A. 270 $\frac{22}{8}$ + $\frac{8.5}{11.5}$ Expr. ~~33-1~~ Run 20

Sheet _____ Date 5-9 1958 Time 10:53 AM PM

Purpose 33" Dia. Cylinder

Fuel ~~22~~ 24" High (1 Quadrant ~~22~~ 30" High)

Bare

see p. 179

LOADING CHANGE

Description Added: $\left(\frac{H}{X} = 200\right)$

10-A-1	8,205	164.10
5-C-2	512.0	10.24
9-C-4	1,855.8	37.116
1-C-1	51.4	1.028

~~Mass before change~~ 1,246,656 gmU 24,933,17 gmU-235

Mass of Change 10,623 gmU 212.47 gmU-235

Total Mass 1,257,279 gmU 25,145.54 gmU-235

MULTIPLICATION

Scaler		Min.	Mult.	1/M
1	20 64X235+30 = 15,070	3		
2	30 64X66+46 = 4270			
3	12 64X35+2 = 2242			

235
38.16
0.24

C.A. 2% 92/8 + 88.5/11.5 Expr. 33-1 ~~36-3~~ Run 3 ~~4~~

Sheet ______ Date 5-9-1958 Time 12:54 PM

Purpose 33" Diameter cylinder 29¾" High (3 quadrant 30" High) Bore

See p. 179

LOADING CHANGE

Description Added (#/x = 200)

A-1	22-18,051		361.02
C-4	15	3,093	61.86 / ~~618.60~~
B-1	3	612	12.24

Mass before change 1,257,279 gmU 25,145.64 / ~~435.12~~ gmU-235

Mass of Change 21,756 gmU ~~991.86~~ gmU-235

Total Mass 1,279,035 gmU 25,580.76 gmU-235

CRITICAL POSITIONS

C.A. 2% 92/8 + 88.5/11.5 Expr. 33-1 ~~36-3~~ Run 3

.015

Channel

A = 11.85 A 44 ~~100~~ / 200

C - 20.695 B .0048

C 6.6 3×10^-10 / 100

D 62 100

E .3 900

Tim Crit. 1:13 PM Duration 15 min

Rod A 0 to 11.85 = 2¢

Rod A = 10.45" C = 18.00 in 141 sec period = 7.45¢ Sensitivity ____ ¢/in.

Leveled A = 11.85 C = 20.695

20.7 / 18.6 / 2.7" / 5.5 / 5.4 2 Hi

7.5¢
5.5¢
6.7¢
19.7¢

C.A. 270 92/8 88.5/11.5 Expr. 33-1 Run 4

Sheet ____ Date 5-9 1958 Time 1:42 PM

Purpose 33" Diameter Cylinder
28½" High (2 Quadrants 29" High)
(2 " 28" High)

See p. 179

~~LOADING CHANGE~~

Description Total Inventory of H/X = 200 less: (U, U^{235})

	U	U^{235}		U	U^{235}
A-45 = 2	5,926	118.52	B-2 = 6	2,457	49.14
A-2 = 17	27,897	557.94	B-1 = 2	408	8.16
~~A-1 = 12~~	~~9,846~~	~~196.92~~	~~C-4 = 83~~	~~17,114~~	~~342.29~~
~~B-4 = 14~~	~~11,467~~	~~222.32~~	C-1 = 19	976	19.53

~~Mass Before Change~~ Plates 28.424 77,448 gmU 1,548.96 gmU-235

~~Mass of Change~~ ____ gmU ____ gmU-235

Total ~~Mass~~ 1,264,448 gmU 25,288.96 gmU-235

CRITICAL POSITIONS

270 92/8 + 88.5/11.5 Exp. 33-1 Run 4

.015

Rod	Rod		Channel	
A	.040		47	160/200
C	15.17		.605	
		C	7.0	3×10^{-10}
		D	68	100/100
		E	.2	900

C from 18.00
15.17
2.83
×2
5.66

Tim Crit. 1:55 PM Duration 13 min.

Rod C @ .09 on 159 sec period = 6.7 ¢/in.

Leveler Rd. C @ 15.13 Sensitivity ____

5¢
5¢
7¢
7¢

178

5/12/58

McCourty
Lyman
Boyer

INSTRUMENT CHECK

Time 9:60 AM PM Source 8

	Channel A	B	C	D	E
Range	10/1000	off	10"	10/1000	900 V.
Source Dist.	1"	0"	13"	15"	17"
% F.S. Trip	80	OK	100+	70	100+

Counters —

C.A. $27\frac{92}{8}+\frac{88.5}{11.5}$ Expr. 33-1 Run 5

Sheet ____ Date 5-12-58 Time 9:20 AM PM

Purpose 33" Diameter Cylinder
29½" High [½ = 30" High
½ = 29" High

LOADING CHANGE

Description ~~Removed~~ $\frac{H}{X}=300$

A2-4 = 4	11,064	2.235	
$\frac{H}{X}=200$ Added A2-4 = 8	13,128	262.56	

Mass before change 1,264,448 gmU 25,288.96 gmU-235

Mass of Change ~~0~~ 11,064 gmU + 41.28 gmU-235

Total Mass 1,266,512 gmU 25,330.24 gmU-235

Rod C @ .09 on 319 sec ~~period~~ = 3.7 ✓

Levelec Rd. C @ 12.85 Sensitivity ____ %/in.

CRITICAL POSITIONS

$2\text{-}70\frac{92}{8}+\frac{88.5}{11.5}$ Expr 33-1 Run 5

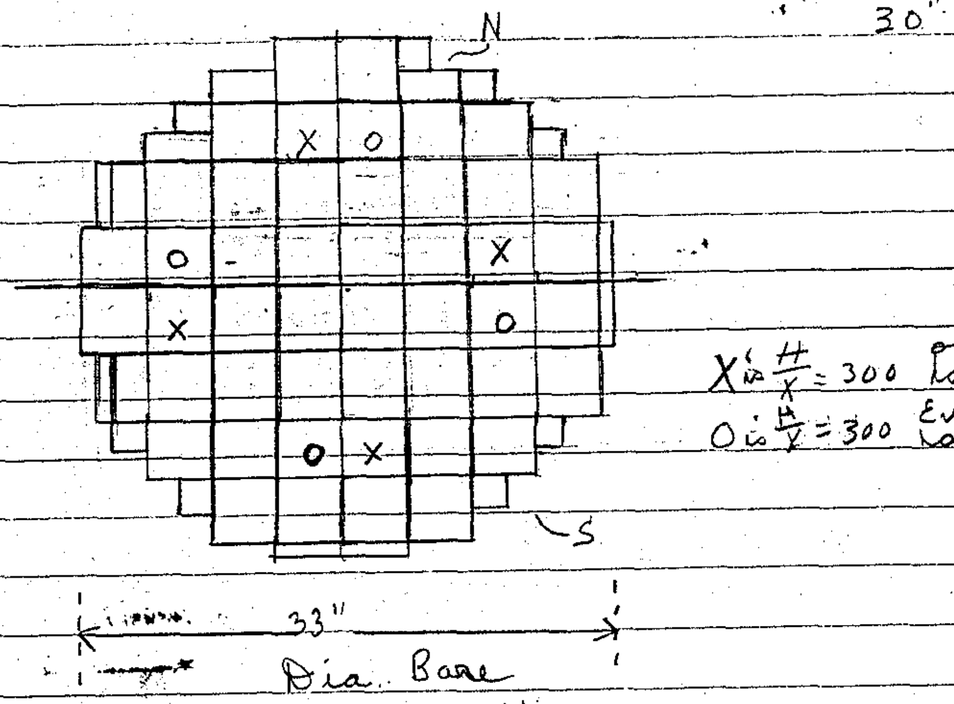
.015

Table Pos. T R

Controllers Channel

A - .045	63	100/100
C - 12.$\frac{85}{795}$	.0032	
	C 7.2	2.5×10^{10}
	D 45	100/100
	E .2	900

Tim Crit. 9:35 AM Duration 11 min.



X is $\frac{H}{X}=300$ odd layers
O is $\frac{H}{X}=300$ Even layers

$\frac{H}{X}=199$, $\frac{H}{X}=300$

C.A. 2% $\frac{92}{8}$ + $\frac{88.5}{11.5}$ Expr. 33-1 Run 6

Sheet ____ Date 5-12 1958 Time 1:20 PM

Purpose 33" Diameter Cylinder
29¾" High [3 quad. 30" High
1 quad 29" "]

LOADING CHANGE

$\frac{H}{X}$ = 200 Description Added:	9 A-2	14,769	295.38
	12 A-1	9,846	196.92
	12 B-4	9,829	196.56
	1 B-1	204	4.08
	11 C-4	2,268	45.36
$\frac{H}{X}$ = 300 Removed:	8-A2-4=8	22,128	442.56
Mass before change	1,266,512 gmU		25,330.24 gmU-235
Mass of Change	14,788 gmU		295.94 gmU-235
Total Mass	1,281,300 gmU		25,625.98 gmU-235

MULTIPLICATION

Scaler		Mult.	TM
1	20 16X766+7 = ~~12,263~~ 12,263		
	20 16X216+11 = 3,467		
2	16X216+5 = 3,461		
	12 16X105+13 = 1693		
3	16X116+9 = 1865		

$$\frac{H}{X} = \frac{25,073}{25,958}(194) + 895(300) = \frac{25,073}{25,958} + 895$$

$$= \frac{4,989,527}{516,642} + 265,500 = \frac{5,255,027}{25,958} = 202$$

C.A. 2% $\frac{92}{8}$ + $\frac{88.5}{11.5}$ Expr. 33-1 Run 7

Sheet ______ Date 5-12 1958 Time 2:00 PM

Purpose 33" Diameter cylinder
30" High
Bore

LOADING CHANGE

Description Total Inventory $\frac{H}{X}$ = 200 less:

	U	U^{235}
C-4 = 41	8446	169.08
C-1 = 19	976	19.53
A-45 = 2	5926	~~118.52~~ (118.52)
Plus 16 A2-4 @ $\frac{H}{X}$ = 300	44,256	885.12

Mass ~~of H/X = 199~~ 1,247,643 gmU 24,964.69 gmU-235
H/X = 300 44,256 885.12 ✓
Mass of Change 1,291,899 gmU 25,849.81 gmU-235
Total Mass ~~1,247,926~~ gmU ~~25,958.33~~ gmU-235

Measured stack: 30⅛" High + 33 3/16 Dia.

CRITICAL POSITIONS

2% $\frac{92}{8}$ $\frac{88.5}{11.5}$ Expr. 33-1 Run 7

.015

Rod		Channel
A-.04	46	100/200
C-14.05	.0046	
	C 6.8	3×10⁻¹⁰ / 100
	D 62	100
	E .3	900

Tim Crit. 2:18 PM Duration 9 min.

Rod C @ .09 on 2.17 sec period = 5.1 ¢ ✓
Leveled Rd. C @ 14.05 Sensitivity ______ ¢/in.

$\frac{4,868,170 + 260,190}{25,850}$ = 198.4

24,965 (195) + 885 (294) / 24,965 + 885 = "

#X

202

182

5/14/58

McCarty
Lynn
Bragar

INSTRUMENT CHECK

Time 10:00 AM ~~PM~~ Source Y

Ch

	A	B	D	E
Range	10/1000	off	10"/1000	900+
Source Dist.	1"	0"	14"	1.5"	16"
% F.S. Trip counters	80	OK	100+	70	100+

C.A. 270 9-8 Expr 28-2 Run 1

Sheet Date 5-14-58 Time 10:08 AM ~~PM~~

Purpose 28" Parallelepiped
19" High [16" Fuel - 3" Plexiglas]
Sides + Bottom reflected - Top Bare

Fuel stacked with 1" thick Plexiglas between 4" layers of fuel. Plexiglas in horizontal plane only.

LOADING CHANGE

Description		U	U 235
A-4 = 168	551,828.16		11,035.92
A-2 = 49	80,409		1,608.18
B-4 = 7	5,733.7		144.66
C-4 = 14	2,886.8		57.93

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

~~Total Mass~~ 640,837 gmU 12,816.49 gmU-235

MULTIPLICATION

Scaler c ... 3 min. Mult. 1 M

120 16x7+5=117

220 16x2+4=36

31V 16x1+3=19

C.A. 270 92/8 Expr. 28-2 Run 2

Sheet ____ Date 5-14 1958 Time 10:55 AM PM

Purpose 28" Parallelipiped
24" High - 20" Fuel - 4" Plexiglas
Side + bottom reflected - Top Bare

LOADING CHANGE

Description		u	u 235
Added			
A-4 = 49		160,950	3,218.81

Mass before change 640,837 gmU 12,816.49 gmU-235
Mass of Change 160,950 gmU 3,218.81 gmU-235
Total Mass 801,787 gmU 16,035.30 gmU-235

Super Critical Tables = .69

C.A. 270 92/8 Expr. 28-2 Run 3

Sheet ____ Date 5-14 1958 Time 1:04 PM

Purpose 28" Parallelipiped
22" High [18" fuel - 4" Plexiglas]
Completely Reflected

LOADING CHANGE

Description		u	u 235
Removed: 49 - A-4		160,950	3,218.81
Added			
A-2 = 24		39,384	787.68
A-1 = 50		~~41,025~~ 41,019	820.50

Mass before change 801,787 gmU 16,035.30 gmU-235
Mass of Change ~~80,531~~ 80,521 gmU 1610.63 gmU-235
Total Mass ~~721,256~~ 721,266 gmU 14,424.67 gmU-235

Super Critical

C.A. 29.92/8 Exp: 28-2 8 4

Sheet ___ Da: 5-18 958 Time 1:48 PM

Purpose 28" Parallelipiped.
19" High - [16"g Fuel, 3" Plexiglas]
Completely Reflected

LOADING CHANGE

Description Same as for Run 1

Mass before change ___ gmU ___ gmU-235

Mass of Change ___ gmU ___ gmU-235

Total Mass ~~640,837~~ gmU 12,816.49 gmU-235

MULTIPLICATION

Scaler c 3 ___ min. Mult. 1/M

1 16 x 49 + 1 = 885

2 16 x 19 + 4 = 308

3 16 x 9 + 2 = 146

Rod C 11.75 to 13.38 = 8.6 ¢
10.64 to 11.75 = 4.5 ¢
8.58 to 10.64 = 7.25 ¢
.09 to 8.58 = 7.75 ¢
28.1 ¢ Excess

C.A. 2-90 92/8 Expr. 28-2 Run 5

Sheet ____ Date 5-14 1958 Time 3:08 PM

Purpose 28" Paralleliped
Fuel 16" + South East Quadrant
Which is 17" 3-1" layers of Plexiglas exactly these quad of 4.
Completely reflected

LOADING CHANGE

Description	U	U 235
Added:		
A-1 = 9	7,384	147.69
C-4 = 12	2,474	49.48
E-2 = 2	204	4.09
	10,063.7	201.26
Mass before change	640,837 gmU	12,816.49 gmU-235
Mass of Change	10,064 gmU	201.26 gmU-235
Total Mass	650,901 gmU	13,017.75 gmU-235

CRITICAL POSITIONS

270 92/8 Expr 28-2 Run 5

.015 T B

	Channel	
A .035	42	100/200
C 13.385	.0046	
	e 5.2	3X10 -10
	D 59	100/100
	E .8	750V

Tim Crit. ____ Add Pull Duration ____ min.

Rod C @ 11.75 on 117 sec period = 8.6 ¢
Levelec Rd. C @ 13.385 Sensitivity 5.27 ¢/in.

Rod C @ 8.58 on 132 sec period = 7.75 ¢
Levelec Rd. RA @ 19.550 Sensitivity ____ ¢/in.

Rod C @ 8.58 on 145 sec period = 7.25 ¢
Levelec Rd. Rod A @ 17.000 Sensitivity 2.57 ¢/in.

186

5/15/58

McCarty
Lynn

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM Source 8

Chamber

	A	B	C	D	E
Range	10 / 1000	off	10"	10 / 1000	800
Source Dist.	1"	0"	14"	15"	16"
% F.S. Trip	80	ok	100+	70	100+
Counters					

C.A. 290 92/8 Expr. ~~28~~ 3 24-5 Run

Sheet ____ Date 5-15 58 Time 1:12 ~~AM~~ PM

Purpose 24" Parallelipiped
24" High Fuel 20" 4" Plexiglas
Completely reflected

stacked with 1" thick plexiglas in horizontal plane between 4" layers of fuel.

$\frac{\#}{X} = 199+$

MULTIPLICATION

Scaler c m 3 Mult. 1 M

1 20 16 X 26 + 13 = 429

2 20 16 X 10 + 3 = 163

3 12 16 X 9 + 8 = 152

Plexiglas
24" X 24" X 1" = 576 in³/layer

Fuel
24" X 24" X 4" = 2304 in³/layer

LOADING CHANGE

Description		gmU	gmU-235
A-4 =	156	512,413	10,247.64
A-2 =	42	68,922	1,378.44
B-4 =	6	4,914	98.28
C-4 =	12	2,474	49.48
Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass		588,723 gmU	11,773.84 gmU-235

C.A. 270 92/8 Expr. 24-5 Run 2

Sheet _____ Date 5-15 1958 Time 2:00 ~~AM~~ PM

Purpose 24" Paralleliped
24" high - Fuel 20" (South East quadrant of 1" 1" Plexiglas under fuel)
4" of plexiglas

LOADING CHANGE

Description		U	U 235
Added:			
A-1 = 9		7,384	147.69
Mass before change		588,723 gmU	11,773.84 gmU-235
Mass of Change		7,384 gmU	147.69 gmU-235
Total Mass		596,107 gmU	11,921.53 gmU-235

MULTIPLICATION

Scaler		3 min. Mult. 1/M
1	20	64 x 34 + 60 = 2236
2	20	16 x 55 + 10 = 890
3	12	16 x 26 + 12 = 428

C.A. 2% 92/8 Expr. 24-5 Run 3

Sheet Date 5-15-1958 Time 2:27 PM

Purpose Fuel ~~24"~~ 21" High Stationary Table-Plexiglas 5"
" 20" High on Movable "-Plexi 4"

20 1/2
− 1/4
Fuel 20.25"

. 24" Parallelipiped

24" High on Movable } 25"
26" " " Stationary } 1/4 24.75" Phy. dimensions

LOADING CHANGE

Description Added:

		U	U-235
Rod C .09 to 14.3 = 8.5¢			
14.3 to 16.0 = 5.0¢	A-1 = 8	7,384	147.69
16.0 to 18.84 = 8.9			
22.4¢			

Mass before change 596,107 gmU 11,921.53 gmU-235

1 quad = 20¢/page 194 & 195 — Mass of Change 7,384 gmU 147.69 gmU-235

Total Mass 603,491 gmU 12,069.22 gmU-235

Rod C @ 3.9 on 14.1 sec period = 8.5 ¢

Leveled Rd. C @ 14.30 Sensitivity 1.98 ¢/in.

Rod X @ 16.00

Rod Value = 0 at ~8"

1.38/[illegible]

6.3/[illegible]

CRITICAL POSITIONS

CA 2% 92/8 Exp 24-5 Run 3

Table .02

Control Rod

A .035

C 18.845

A	61	100 / 200
B	.0052	
C	7.4	3 × 10⁻¹⁰
D	42	100 / 200
E	1.5	750 V

Tim Crit. 2:46 PM Duration 27 min

Rod C @ 16.00 on 109 sec period = 8.95 [illegible]

Leveled Rd. C @ 18.845 Sensitivity 3.15 ¢/in.

5/16/58

McCarty
Lynn

INSTRUMENT CHECK

Time 1:00 ~~AM~~ PM

	A	B	C	D	E
Range	10/1000 apr		10"	10/1000	900 V
Source Dist.	1.5"		14"	2"	15"
% F.S. Trip	80		100+	65	100+

Counters

C.A. 290 92/8 24-6 Run 1

Sheet: Da 5-16 958 Time 1:05 ~~AM~~ PM

Purpose Zero runs for Reflector thickness

Completely Reflected - 6" thick

CRITICAL POSITIONS

CA 290 92/8 Exp 24-6 Run 1

.02 T

Control Rod

A - 12.50

C - 17.31

Channel

A 57 100/200

.005

7.2 3X10^-10

D 78 100/100

E 1.4 750 V

Inv Crit. 2:24 ~~AM~~ PM Duration 10 min.

Leveled Rod A: 0.05 out C: 18.88"

Rod C @ 14.30 on 1/2 sec period = 8.35¢

Leveled Rd C @ 17.3 Sensitivity 2.77¢/in.

Rod A = 12.50

190

5-16-58

Time	Run #	Top Ref	Log N	Rod c	Excess ¢
1:20 P.M.	1	6" Paraffin	.005	18.88 22.8¢	22.5
1:42 P.M.	2	4½" "	.0047	18.705 22.4¢	21.95
2:13 P.M.	3	3" "	.0048	17.82 18.1¢	17.15
2:40 P.M.	4	1½" " Sub-critical			
3:20 P.M.	5	1½" Paraffin ½" Plexiglas	.001	11.67 3.5¢	3.45
4:06 P.M.	6	7½" Paraffin	.0038	18.885 22.8¢	22.5

From new calibration curve →

5-19-58	Run #	Top Ref	Log N	Rod c	Rod A	Excess
	7	6" Plexiglas	.005	20.70	~~20.70~~ 14.82 37.6¢	39¢
	8	5" "	.0043	20.70	14.59 37.0¢	38¢
	9	2" "	.002	0.09	12.975 8¢	6.05

Correct Values

5/19/58

McCarty
Lynn

INSTRUMENT CHECK

10:40 AM

	A	B	C	D	E
Range	10/1000	off	10''	10/1000	900 V.
Source	1.5''		14''	2''	17''
% F.S.	75		100+	70	100+

counters

C.A. 270 92/8 Expr. 24-6 Run 7

Sheet Da 5-19 1958 Time 10:45 AM

Purp. Plexiglas - Parafin Reflector Comparison

Completely reflected - 6'' Paraffin outside
6'' Plexiglas Top + Bottom

CRITICAL POSITIONS

C.A. 270 92/8 Expr 24-6 Run 7

Table Pos. .012 T R

Control Rod	Channel	
A 1 14.82	A 63	100/200
2	B .005	
C 3 20.70	C 8.0	3 x 10^-10
4	D 44.5	100/200
	E 1.4	750 V.

Tim Crit. 11:03 AM Duration ~~16~~ 19 min

Rod A @ .05 on 94 sec period = 10.1 ¢

Leveled Rd. A @ 14.82 Sensitivity ~~[illegible]~~ ¢/in.

Level Rod A = 17.03
Rod C = 18.885

5/21/58

McCarty
Lynn

INSTRUMENT CHECK

Time 8:40 A

	10/1000	opr	10"	10/1000	900V
Source Dist.	1.5"	0"	15"	2"	16"
% F.S. Trip	80	OK	100+	70	100+

Counters

C.A. 2% 92/8 Expr. 24-7 Run 1

Sheet Date 5-21-1958 Time 8:50 AM

Purpose Base 24" x 24.5"

Fuel 20" high Plus 4 layers of Plexiglas 1/2" thick - 24 5/8" Wide

LOADING CHANGE

Description

A-4 = 144	472,996	9,459.36
A-2 = 36	59,076	1,181.52
A-1 = 6	4,923	98.46
C-4 = 6	1,236	24.74

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 538,231 gmU 10,764.08 gmU-235

Super Critical

Tables ~~B~~ 3

C.A. 29-92-8 Expr. 24-7 Run 2

Sheet ..... Date 5-21-1958 Time 9:55 AM PM

Purpose Base 24" X 24.5"

Fuel 18" High + 4 layers of Plexiglas ½" thick.

LOADING CHANGE

Description		N	N235
Removed			
A-4	=30	98,541	1,97.078
Added			
A-2	=24	39,384	78.768
B-4	6	4,914	98.28
Mass before change		538,231 gmU	10,764.08 gmU-235
Mass of Change		54,252 gmU	1,084.74 gmU-235
Total Mass		483,979 gmU	9,679.34 gmU-235

MULTIPLICATION

Scaler 3 min. Mult. T/M

1 20 64X6+37=421

2 20 16X9+11=153

3 20 16X3+11=59

C.A. 290 92/8 Exp. 24-7 3

Sheet Date 5-21 1958 Time 1046 AM

Purpose Base 24"X 24.5"
Fuel 19" high on Mov. Table - 18" high on Stationary Table
Plus 4 layers of Plexiglas 1/2" thick.

20 1/32

Description Added: U U 235
A-1-15 12,307 246.15
C-4-6 1,237 24.74

Measured Stock:
24 5/8" wide
21 3/32" High Mov. T.
20 3/32" " Stat. T.

Mass before change 483,979 gmU 9,679.34 gmU-235
Mass of Change 13,544 gmU 270.89 gmU-235
Total Mass 497,523 gmU 9,950.23 gmU-235

20.2" High
9.868 Kg } 0 Exes

CRITICAL POSITIONS

CA 290 92/8 Exp 24-7 Run 3
015

Control Rod		Channel
A .035	A 52	100
C 14.53	B .005	200
	C 6.3 3X10	-10
12.1 +	D 72	100
Excess	E .8	100
		75 1V

Tim Crit. 10:55 AM PM Duration 7 min.

Rod C @ .09 on 75 sec period = 12.1 ¢

Levelec Rd. C @ 14.53 Sensitivity ____ ¢/in.

C.A. $29\%\frac{92}{8}$ Expr. 24-7 Run 4

Sheet ______ Date 5-25 1958 Time 1:40 PM

Purpose: Fuel 19" high on Movable table + 4 layers of Plexiglas ½"
Fuel 18" high on Stationary table + South east Quadrant which is 19" + 4 ½" layers of Plexiglas
Completely Reflected

LOADING CHANGE

21"

Description	Added	U 235
A-1 = 6	4,923.0	98.46
C-4-9	1,855.4	37.11

Mass before change 497,523 gmU 9,950.23 gmU-235

Mass of Change 6,778.4 gmU 135.57 gmU-235

Total Mass 504,301 gmU 10,085.80 gmU-235

CRITICAL POSITIONS

$29\%\frac{92}{8}$ Exp. 24-7 Run 4

.01 T___ P___

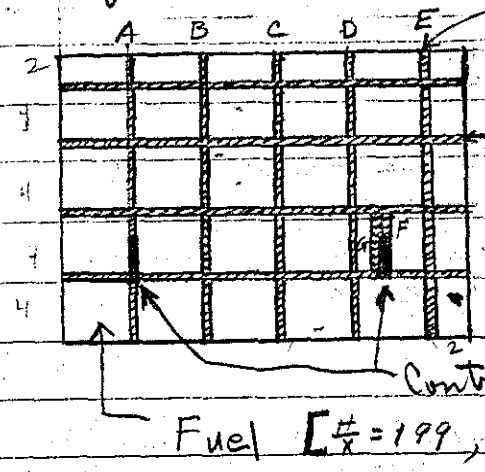
Control Rod	Channel		
A - 14.535	A 60	100/100	12.1 ¢
	.0028		12.0
C - 16.84	6.8	2.5×10^{-10}	8.7
	D 40	100/100	32.8 ¢
	E 5	750 V.	Excess

Tim Crit 1:53 PM Duration 19 min.

Rod C @ 14.53 ... 14.5 rod period = 8.7
Leveled Rod C 16.84 ... sensitivity 3.76¢/In.

Leveled Rod A = 16.95
Rod C = 14.53

Stationary Table



For movable table add 1" Fuel with associated plexiglas.

Stat. Table is 1" higher than drawing

B, C + D - 3 [24 X 18.5 X 1/2] = 666 in^3

A + G - 1 [24 X 19.5 X 1/2] = 234

F - 1 [24 X 1 3/32 X 1/2] = 14

E - 1 [24 X 18.5 X 7/16] = 194

1108 in^3 Vertical

24 X 24.5 X 1/2 = 294 in^3 for 1 layer Horizontal

X 4

1176 in^3

+ 1108

2284 in^3

5/22/58

McCarty
Lynn

INSTRUMENT CHECK

Time 9:30 AM PM

	A	B	C	D	E
Range	$\frac{10}{1000}$	off	10"	$\frac{10}{1000}$	900 V
Source Dist.	1"	0"	14"	2"	16"
% F.S. Trip	80	OK	100	65	100

Counters

C.A. 290 $\frac{92}{8}$ Expr 24-7 Run 5

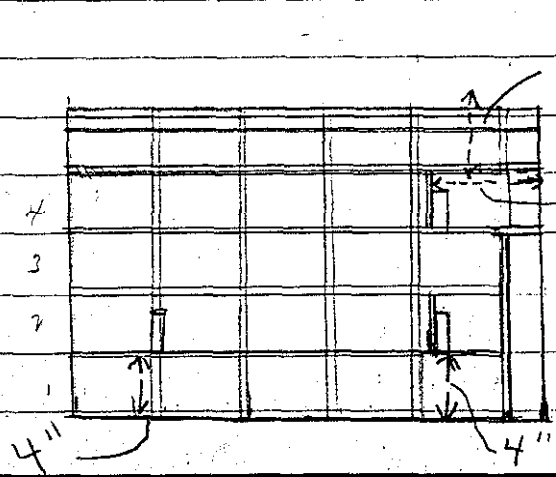
Sheet Date 5-22-58 Time 9:40 AM PM

Purpose Rod Sleeve Evaluations

~~Fuel 19" High on Movable table + 4 layers of Plexiglas ½"~~
~~Fuel 18" High on Stationary table + 1" on S.E.~~
~~Irradiation which is 19" Plus 4 - ½" Layers of Plex.~~

LOADING CHANGE

Description		U	U-235
Removed:			
	A-4=3	9,852	197.07
Added			
	A-45=3	8,889	177.78
Mass before change	503,301 gmU	10,085.86	gmU-235
Mass of Change	963 gmU	~~19.29~~ 19.29	gmU-235
~~Total Mass~~	503,338 gmU	~~10,044.22~~ 10,141.22	gmU-235



CRITICAL POSITIONS

2 % 92/8 Expr 24-7 Run 5

.01

Control Rod

Control Rod	Channel		
A-15.53	A	70	100/100
	B	.0031	
C-14.89	C	8.2	2.5×10^{-10}
	D	48	100/100
	E	.7	750V

Tim Crit. 10:57 AM Duration 8 min.

Rod C = 16.84 Run 4

14.89

1.95

X 3.76 ¢/in (p.195)

7.33 ¢

2% H = 300

Inventory 11.5 %/wt Paraffin T by ist factor 199
-6717 (Theorecital)
-67147 (Analysis)

Waybill	Item	Type	Net Weight	Total T

.8643 g/in³ 201

5-23-58

Lynn McCarty

INSTRUMENT CHECK

Time 1:45 PM

	A	B	C	D	E
Range	10/1000	opp.	10	10/1000	900 V.
Source Dist.	1"		15"	6.5"	16"
% F.S. Trip	85		100	70	100

C.A. 2% 88.5 11.5 Expr. 24-1 Run 1

Sheet Date 5-23 1958 Time 1:55 PM

Purpose 24" Parallelepiped
Fuel 12" High
6" Reflector Sides & Bottom
Top Bare

LOADING CHANGE

Description		
96-2A4	265,536	5,310.72
12-2A4S	30,000	600.00

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass 295,536 gmU 5910.72 gmU-235

MULTIPLICATION

Scaler - C 3 min. Mult. T/M

1 20-16X10+8=168
16X13+13=221

2 20-16X5+4=84
16X6+6=96

3 12-16X2+15=47
16X3+8=56

C.A. 270 $\frac{88.5}{11.5}$ Exp. 24 - 1 Run 2

Sheet ______ Date 5-23 1958 Time 2:55 ~~AM~~ PM

Purpose 24" Parallelepiped
Fuel 16" High
Completely reflected

16"

LOADING CHANGE

Description Added:

	U	U-235
$A_2$4 = 36	99,576	1,991.52

Mass before change 295,536 gmU 5,910.72 gmU-235
Mass of Change 99,576 gmU 1,991.52 gmU-235
Total Mass 395,112 gmU 7,902.24 gmU-235

MULTIPLICATION

3

Scaler		Mult.	I.M.
1 20	16 X 4 + 4 = 68		
2 20	16 X 1 + 1 = 17		
3 20	16 X 0 + 8 = 24		

Rod C from 1900 to 20.7 = 87 or 4.7 ¢/in

C.A. 2% $\frac{88.5}{11.5}$ Expr. 24-1 Run 3

Sheet ______ Date 5-23 1958 Time 3:36 ~~AM~~ PM

Purpose 24" Parallelipiped Fuel 20" High

Completely reflected

20"

LOADING CHANGE

Description Added:

A_{24} = 36 99,576 1,991.52

Rod A = 0 to 13.73 = ~~10.0 ¢~~

13.73 to 15.99 = ~~8.0 ¢~~

C = 33

514 Excess

Mass before change 395,112 gmU 7,902.24 gmU-235

Mass of Change 99,576 gmU 1,991.52 gmU-235

Total Mass 494,688 gmU 9,893.76 gmU-235

CRITICAL POSITIONS

C.A. 2% $\frac{88.5}{11.5}$ Expr. 24-1 Run 3

.015

Control Rod

Channel

A - 13.73 A 53 $\frac{100}{200}$

C - 20.695 In B .0046

C 8.5 3×10^{-10}

DD 75 $\frac{100}{100}$

EE 1.5 750V

Time Crit. 3:52 ~~AM~~ PM Duration ______ min.

Rod A @ .045 on 96 sec period = 10.0 ¢

Leveled Rd. A @ 13.73 Sensitivity ______ ¢/In.

Rod C = [illegible]

Rod C from 19.00 to 20.7 = 8¢ or 4.7¢/in

from 16 to 19 = 3 x 5 = ~15¢

Rod C to 19" = ~33¢

Rod A @ 13.73 on 128 sec period = 8.0 ¢

Leveled Rd. A @ 15.99 Sensitivity 3.53 ¢/In.

Rod C = 19.00 = 4.70¢/in

5-26-58

McCarty
Lynn

INSTRUMENT CHECK

Time 9:40 AM ~~PM~~ 8

	Channel				
	A	B	C	D	E
	10/1000	opr	10"	10/1000	900 V
Source Dist	1.5"	0"	17"	1"	15"
% F.S. Trip	80	ok	100+	70	100+

Counters

C.A. 270 ~~115~~ 88.5 Expr. 24-1 4

Sheet ______ Date 5-26-1958 Time 9:53 AM

Purpose 24" Parallelpiped (Rod Sleeve Evaluation)
Fuel 20" High
Completely reflected

LOADING CHANGE

Description Removed:
A2-4-3 8,298 165.96
Added
A2-45-3 7,500 150.00

Mass before change	494,688	gmU	9,893.76	gmU-235
Mass of Change	798	gmU	15.96	gmU-235
Total Mass	493,896	gmU	9,877.80	gmU-235

Leveled Rod A. = 20.27 IN
Rod C = 11.76

Rod A @ 10.00 106 sec 9.2 ¢
Leveled Rd. A @ 14.265 Sensitivity 2.15 ¢/in

CRITICAL POSITIONS

CA 290 88.5/11.5 Expr. 24-1 Run 4

015 T R

Channel

A 14.265 A 47 100/200

C 19.00 004

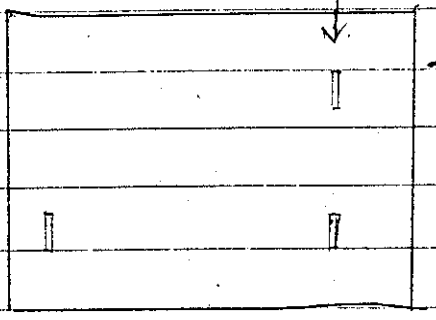
C 6.0 3x10⁻¹⁰

D 6.5 100/100

E 1.4 750 V.

Tim Crit. 10 10 AM PM Duration 15 min.

Placed Rod sleeve in North east quadrant symetrical with other rods.



Run 3 - Level Rod A = 15.99 C = 19.00

4 - " = 14.26 C = 19.00

1.73"

X 3.53 ¢/in p.203

6.1 ¢

C.A. 270 $\frac{88.5}{11.5}$ Expr. 24-1 Run 5

Sheet ________ Date 5-26 1958 Time 10:57 AM

Purpose 24" Parallelipiped
Fuel 20" high on Stationary Table
19" " "Movable "
completely reflected

19.5"

LOADING CHANGE

Description	U	U 235
Removed:		
$A_2 4 = 18$	49,788	995.76
Added: $A_2 2 = 18$	24,876	497.52
$A_2 1 = 18$	12,438	248.76
Mass before change	493,890 gmU	9,877.80 gmU-235
Mass of Change	12,474 gmU	249.48 gmU-235
Total Mass	481,416 gmU	9,628.32 gmU-235
	798	+ 15.96 (A_2-4s)
→	482,214	9,644.28

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Expr. 24-1 Run 5

Table Pos. .815

Control Rod		Channel	
A 11.395	4.34	A 54	10 / 500
C 0.09	Out	.0013	10
		C 85	10
		D 41	100 / 50
		E 2	750 r.

Tim Crit. 11:18 AM Duration 14 min.

51.4 Run 3
- 4.4
47.4 for ½"
or
24.4/quad.

C.A. 270 $\frac{88.5}{11.5}$ Expr. 24-2 Run # 1

Sheet ____ Date 5-26 1958 Time 2:31 AM PM

Purpose 24" Parallelepiped
Fuel 24" high
Top + Bottom bare

LOADING CHANGE

Description Added A_2-4=36 to ~~Run~~ EXP 24-1 Run 3

Mass before change 494,688 gmU 9893.76 gmU-235
Mass of Change from Run 3 99,576 gmU 1991.52 gmU-235
Total Mass from Run 3 594,264 gmU 11,885.28 gmU-235

Super critical - Tables = 0.20 ✓

C.A. 270 88.5 / 11.5 Expt. 24-2 Run 2

Sheet ____ Date 5-26 [illegible] Time 3:34 PM

Purpose 24" Parallelepiped
Movable 23" - Stationary 24" (23½)
Top + Bottom bare

LOADING CHANGE

Description ~~Added~~ Removed $A_2-4=18$
Added $A_2-2=18$ Same changes as
$A_2-1=18$ for REAP 24-1 Run 3

Mass before change	594,264 gmU	11,885.28	gmU-235
Mass of Change	− 12,474 gmU	− 249.48	gmU-235
Total Mass	~~606,738~~ gmU	~~12,134.76~~	gmU-235
	581,790	11,635.52	

88.5 CRITICAL POSITIONS

C.A. 270 11.5 Expt. 24-2 Run 2

Table Pos. .015

	Control Rod	Channel
1	A 15.27	A 54 100/200
2	C 18.50	B .0046
3		C 7.63 X 10 −10
4		D 41 100/200
		E 3 750 V.

Tim Crit. 3:48 PM Duration 8 min.

A = 10.4 ± [0 to 15.95]
C = 9.5 ± [15.95 to 18.5]
= 16.0
25.9 ± excess

Rod A @ .045 on 91 sec period = 1.4

Levelec Rd. A @ 15.27 Sensitivity ____

5/27/58

McCarty

Lynn

Johnson (K-65)

INSTRUMENT CHECK

Time 8:35 AM PM Source Y

	A	C	D	E
Range	10/1000 or 10"		10/1000	900V.
Source Dist	1"	0"	16"	1.5"	16"
% F.S. Trip	80	OK	100†	70	100†

Counters

C.A. 290 88.5/11.5 Expr. 24-2 Run 3

Sheet ____ Dia. 5-27-1958 Time 9:04 AM PM

Purpose 24" Parallelepiped
Movable table 23" (23 1/4")
Stationary " - S.E. Quadrant 23"
S.W. " 24"
Sides Reflected; Top + Bottom Bare

LOADING CHANGE

Description			
Removed			U235
	$A_{24}=9$	24,894	497.88
Added			
	$A_{22}=9$	12,438	248.76
	$A_{21}=9$	6,219	124.38
		11,635.52	
Mass before change		~~594,264~~ 591,790 gmU	~~11,885.28~~ gmU-235
Mass of Change		6,237 gmU	124.74 gmU-235
Total Mass		~~588,027~~ gmU	~~11,760.54~~ gmU-235
		575,553	11,510.78

Rod C @ .09 on 102 sec period = 9.5 ¢ Exces

Levelec Rd. C @ 15.195 Sensitivity ____ ¢/In.

11,510
60
11,450

18,500
15,195
3,305 = 11

25.9
9.5
16.4 ¢/quad.

CRITICAL POSITIONS

C.A. 270 88.5/11.5 Expr 24-2 Run 3

Table Pos. .015 T

	Control Rod		Channel
1	A .055	A	61 100/200
2	C 15.195	B	.005
3		C	8.5 3X10^-10 100/200
4		D	47
		E	2.2 900

Tim Crit. 9:21 AM PM Duration 8 min.

C.A. 27 $\frac{88.5}{11.5}$ Exp. 24-2 Run 4

Shell Date 5-27 1958 Time 11:05 AM

Purpose 24" Parallelepiped
Fuel 3.0" High
Completely bare

LOADING CHANGE

Description		u	u_{235}
From Run #1 A_1 4=36		99,576	1991.52
Added A_2 2=36		49,752	995.04
Mass for Run 1		594,264 gmU	11,885.28 gmU-235
Mass of Change from Run #1		149.328 gmU	2,986.56 gmU-235
Total Mass		743,592 gmU	14,871.84 gmU-235

MULTIPLICATION

Scaler	3 min.	Mult.	I-M
1	out		
2	16×6+14=110		
3	16×2.0+9=41		

C.A. 270 88.5 / 11.5 Expr 24-2 Run 5

Sheet Date 5-27 1958 Time 12:52 ~~AM~~ PM

Purpose 24" Parallelipiped
Fuel 32" High
Bare

LOADING CHANGE

Description			
Removed:			331.68 ~~768~~
	$A_2 2 = 12$	16,584	
Added:			
	$A_2 4 = 24$	66,384	1,327.68
Mass before change	743,592 gmU	14,871.84	gmU-235
Mass of Change	49,800 gmU	~~996.00~~ 995.68	gmU-235
Total Mass	~~793,392~~ gmU	~~15,431.52~~ 15,867.84	gmU-235

with tables ~ .15" separated, stopped, the table drive switch was activated and tables moved at fast speed. This gave ~ 25 sec period. Tables were separated.

E. R. Fisher (Inst. Dept.) replaced a weak tube (6SN7) in drive circuit.

5/28/58

McCarty
Lyman
Johnson (K-25)

INSTRUMENT CHECK

Time 8:25 AM

	A	B	C	D	E
Range	10/1000	opr	10"	10/100	900V
Source Dist.	1"		16"	1.5"	16"
% F.S. Trip	80		100+	75	100+

C.A. 29 88.5/11.5 Expt 24-2 Run 6
Sheet Date 5-28 1958 Time 8:40 AM PM
Purpose Same as run #5

32"

Super Critical
Tables Together - Control Rods in.

(94 sec 89
10.24)

C.A. 29 88.5/11.5 Expt 24-2 Run 7
Sheet Date 5-28 1958 Time 9.00 AM PM
Purpose 24" Parallelepiped
Fuel Height - 31" on stationary
32" on movable

(31½")

Bare

LOADING CHANGE

Description		W	U 235
Removed			
$A_2 4 = 6$		16,596	331.92
$A_2 2 = 6$		8,292	165.84
Added: $A_2 1 = 18$		12,438	248.76

Mass before change 793,392 gmU 15,867.84 ~~15,432.52~~ gmU-235

Mass of Change 12,450 gmU 249.00 gmU-235

~~Total Mass 780,942 gmU 15,182.52 gmU-235~~

15,618.84

CRITICAL POSITIONS

C.A. 276 ~~88.5~~ 11.5 Expr. 24 - 2 Run 7

Table Pos. .015 T P

	Control Rod	Channel
	A-18.40	A 50 100/200
2	C-12.50	B .0045
3		C 8.2 3×10^{-10}
4		D .71 100/100
		E .5 900 K

Tim Crit. 9:19 ~~PM~~ AM Duration 15 min.

Rod ~~A~~ @ .05 on 131 sec period = 7.8

Leveled Rd. A @ 18.40 Sensitivity ~~[illegible]~~

7.8
1.2
9.04
Expos

Level Rod C .09 out

Rod A 19.06

C.A. 2.90 88.5 11.5 Expr. 2-4-2 Run 8

Sheet Date 2-28 1958 Time 10:10 AM

Purpose 24" Parallelepiped
Fuel height - 31" on Stationary (31¼")
Movable 32" on N.E. half
" 31 on N.W half.

Bore

LOADING CHANGE

Description Removed: N h 235

$A_2 4 = 9$ 24,894 497.88

Added: $A_2 2 = 9$ 12,438 248.76

$A_2 1 = 9$ 6,219 124.38

Mass before change 780,942 gmU ~~5,182.52~~ gmU-235

Mass of Change 6,237 gmU 124.74 gmU-235

Total Mass 774,705 gmU ~~5,057.78~~ gmU-235

15,494.10

CRITICAL POSITIONS

Run

Table Pos. .015 T R

	Channel	
A- 12.05	A 48	10/500
C- .09	B .0011	
	C 6.2	10^{-10}
	D 38	10/500
	E .1	900

Trim Crit. 10:25 AM PM Duration 15 min.

Rod A 0 .05 on 1020 sec period 1.2 ✓ Excess

Leveler Rd A 12.05 Sensitivity ____ in.

C.A. 2% $\frac{88.5}{11.5}$ Expr. 28-~~2~~ Run ~~2~~ 1

Sheet Date 2-28 1958 Time 1:24 ~~AM~~ PM

Purpose 28" Parallelipiped
Fuel 22"
Bare

LOADING CHANGE

Description	u	u235
$A_2 4 = 231$	638,946	12,778.92
$A_2 2 = 49$	67,718	1,354.36
$A_2 45 = 14$	35,000 ~~35,000~~	700.00

Mass before change ____ gmU ____ gmU-235

Mass of Change ____ gmU ____ gmU-235

Total Mass 741,664 gmU 14,833.28 gmU-235

MULTIPLICATION

Scaler 3 M

1 16 x 11 + 9 = 185
16 x 12 + 15 = 207

2 16 x 4 + 15 = 79
16 x 5 + 5 = 85

3 ~~16 x 18 + 12 = 300~~
16 x 19 + 11 = 315

C.A. 2% $\frac{88.5}{11.5}$ Expr. 28-1 Run 2

Sheet ____ Date 2-28 1958 Time 2:04 ~~AM~~ PM

Purpose 28" Parallelepiped

Fuel 22" + $\frac{35}{49}$ 22.57"

Bare

LOADING CHANGE

Description		W	N-235
Added:			
A_2 1 = 25		17,275	345.50

Mass before change	741,664 gmU	14,833.28	gmU-235
Mass of Change	17,275 gmU	345.50	gmU-235
Total Mass	758,939 gmU	15,178.78	gmU-235

C.A. 2% $\frac{88.5}{11.5}$ Expr. 28-1 Run 3

Sheet ____ Date 2-28 1958 Time 2:23 ~~AM~~ PM

Purpose 28" Parallelepiped

Fuel 23" High

Bare

LOADING CHANGE

Description Added: U 4235
A 21-24
16,584 331.68

Mass before change 758,939 gmU 15,178.78 gmU-235
Mass of Change 16,584 gmU 331.68 gmU-235
Total Mass 775,523 gmU 15,510.46 gmU-235

CRITICAL POSITIONS

C.A. 270 88.5 Expr. 2841 Run 3
Table Pos. .015

Control Rod	Channel
1 A- .05	A 40 100/200
2 C- 16.54 ✓	B .004
3	C 6.73X10^{-10}
4	D 57 100/100
5	E .2 900

Time Crit. 2:40 AM PM Duration 23 min.

Rod C 0 to 9.61 = 4.35¢ Run 4
9.61 to 10.75 = 2.8¢ @ 2.5¢/in
10.75 to 13.88 = 10.45¢
13.88 to 15.00 = 4.5¢ @4¢/in
15.00 to 16.54 = 7.45¢
29.55¢ Excess

Rod C @ 15:06 on 141 sec period = 7.45
Levelec Rd. C @ 16.54 Sensitivity 4.83 ¢/in.
Rod A out

Rod C @ 10.75 on 90 sec period = 10.45
Levelec Rd. @ 13.88 Sensitivity 3.34 ¢/in.
Rod A in

C.A. 29 88.5/11.5 Expr 28-1 Run 4

Sheet Date 6-28-1958 Time 3:30 AM PM

Purpose 28" Parallelipiped
Fuel 23" high except S.W
Quadrant which is 22" high 22.75"
Base

LOADING CHANGE

Description			
Removed	A21-12	8,292	165.84

Mass before change	775,523 gmU	15,510.46	gmU-235
Mass of Change	8,292 gmU	165.84	gmU-235
Total Mass	769,231 gmU	15,344.62	gmU-235

CRITICAL POSITIONS

C.A. 29 88.5/11.5 Expr 28-1 Run 4

Table Pos. .015 T B

	Control Rod	Channel	
1	A .0X	A 62	100/100
3	C 9.61	B .003	
		C 7.6 2.5X10	-10
2		D 43	100/100
		E 2	900V

Time Crit. 3:43 AM PM Duration 11 min.

25¢/quadrant

Rod C @ .69 on 263 sec period = 4.33 ¢ Excess

Leveled Rd. C @ 9.61 Sensitivity ¢/in.

220

5/29/58

INSTRUMENT CHECK

Time 10:45 AM PM Source Y

	Channel A	B	C	D	E
Range	10/1000	off	15"	10/1000	900 V.
Source Dist.	15"	0"	14"	2"	17"
% F.S. Trip Counters	86	OK	100+	70	150+

C.A. 270 88.5/11.5 Exp. 28-2 1

Sheet Date 5-29-58 Time 10:55 AM PM

Purpose 28" Parallelepiped
12" High
completely reflected

LOADING CHANGE

Description			
A24 = 133	367,878	7357.56	
A245 = 14	35,000	700.00	
Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass	402,878	gmU 8,057.56	gmU-235

C.A. 270 88.5 11.5 Expr. 28-2 Run 2

Sheet ____ Date ~~2-8-2~~ 5-28 1958 Time 1:50 ~~AM~~ PM

Purpose 28" Paralleliped 15" High Completely reflected

15"

LOADING CHANGE

Description Added:

$A_2 2 = 49$	67,718	1,354.36
$A_2 1 = 49$	33,859	677.18

Mass before change	402,878 gmU	8,057.56	gmU-235
Mass of Change	101,577 gmU	2,031.54	gmU-235
Total Mass	504,455 gmU	10,089.10	gmU-235

C.A. 270 845 11.5 Expr. 28-2 Run 3

Sheet ____ Date 2- 1958 Time 3:47 ~~AM~~ PM

Purpose 28" Paralleliped Fuel 17" High Compl. Refl.

17"

LOADING CHANGE

Description Removed

$A_2 2$	67,718	1,354.36
Added $A_2 4$	135,534	2,710.68
	504,455	10,089.10

Mass before change	~~402,878~~ gmU	~~8,057.56~~	gmU-235
Mass of Change	67,816 gmU	1356.32	gmU-235
Total Mass	~~470,694~~ gmU	~~9413.88~~	gmU-235
	572,271	11,445.42	

CRITICAL POSITIONS

C.A. 27° $\frac{88.5}{11.5}$ Expr. 28-2 Run 3

Table .015

Channel		
1 A - 20.265	A 35	100/200
2	B .0035	
3 C 19.21	C 4.7 3X10	-10
4	D 48	100/100
	E .2	750

Tim Crit. 3:50 AM PM Duration 7 Min.

Rec C @ 1800 on 102 sec period = 95

Leveled Rd. C @ 19.21 Sensitivity 7.85

C.A. 27° $\frac{88.5}{11.5}$ Expr. 28-2 Run 4

Sheet ____ Date 5-29-1958 Time 3:45 AM PM

Purpose 2-8" Paralleliped

Final 16" + $\frac{25}{49}$ ✓ 16.51"

Comp Refl.

LOADING CHANGE

Description Removed:

A 2 1 ~~Am~~ 24

16,584 - 33168

572,221 11445.42

~~Mass before change 470,694 gmU 9413.88~~ gmU-235

Mass of Change 16 584 gmU 331.68 gmU-235

Total Mass ~~454,110~~ gmU ~~9,082.20~~ gmU-235

555,687 11,113.74

CRITICAL POSITIONS 4

CA 276 88.5/11.5 Expr 28-2 Run 4

Table 0 2 T R

Channel

A 20.265 76 100/100

C 16.545 .0037

~~16.545~~ 7.0 2.5X10^-10 100

D 50 100

E .2 750

Time Crit. 4:03 ~~AM~~ PM Duration ~~2.5~~ 12 min.

C Rod C @ 7.25 87 sec period = 10.8 ¢

Leveler Rd. C @ 10.545 Sensitivity 3.21 ¢/in.

224

6-2-58

Lynn McCarty

INSTRUMENT CHECK

Time 10:05 AM PM Source

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900Y
Source Dist.	1.5"	0"	15"	2"	16"
% F.S. Trip	85	ok	100+	70	100+

C.A. 2% 885/11.5 Expr. 28-2 Run 5

Sheet ____ Date 6-2 58 Time 1020 AM PM

Purpose 28" Parallelepiped

Fuel 16" except for N.E. Quadrant which is 17" (16 1/4")

Comp. Refl. (6")

LOADING CHANGE

Description		U	U_{235}
Removed:			
	$A_2 - 1 = 6$	4,146	82.92
Added	$C_2 4 = 12$	2,083	41.64
	$C_2 2 = 2$	173	3.47
Mass before change	555,687 gmU	14,113.74	gmU-235
Mass of Change	1,870 gmU	37.80	gmU-235
Total Mass	553,817 gmU	14,075.94	gmU-235

CRITICAL POSITIONS

C.A. 29 ~~11.5~~ 88.5 Expr. 28-2 Run 5

Table Pos. .015 T D

Control Rod		Channel	
1 A 0.5	A	40	100/200
2 C 8.775	B	.0036	
3	C	73	2.5×10^{-10} / 100
4	D	53	100
	E	.4	750 V

Tim Crit. 10:40 AM ~~PM~~ Duration 19 min.

LOADING CHANGE

Description Removed.

	$A_2 1 = 11$	11,056	221.12
Added:	$C_2 4 = 12$	2,083	41.64
	$C_2 2 = 2$	173	3.47

Mass before change 555,187 gmU 11,113.74 gmU-235

Mass of Change 8,800 gmU 176.01 gmU-235

Total Mass 546,887 gmU 10,937.73 gmU-235

Rod C @ .09 on 120 sec period = 8.5 ¢ Excess

Leveled Rd. C @ 8.775 Sensitivity ____ ¢/in.

10.937
× 9
10.9

C.A. 29 $\frac{88.5}{11.5}$ Expr. 28-2 Run 6

Sheet _____ Date 6-2 1958 Time 11:21 AM PM

Purpose 28" Parallelepiped (16½")

East half in 17

West half 16

Compl. Refl.

Rod C — 0.05 to 8.775 = 8.5 ¢

8.775 to 10.55 = 6.3 ¢

10.55 to 13.00 = 12.3 ¢ @ 5¢/in

13.00 to 14.56 = 10.8

LOADING CHANGE

Description Added:

37.9912-A₂1 = 8,292 165.84

2-C₂² = 172 3.46

Exam

Mass before change	546,887 gmU	10,937.73 gmU-235
Mass of Change	8,464 gmU	169.30 gmU-235
Total Mass	555,351 gmU	11,107.03 gmU-235

Rod C @ 13.0 on 87 sec period = 10.8 ¢

Leveler Rd C @ 14.56 Sensitivity 6.21 ¢/in.

CRITICAL POSITIONS

C.A. 29 $\frac{88.5}{11.5}$ Expr 28-2 Run 6

Test .015

38 9/gm

	Channel		
1	A .045	A 54	100/100
2	C 14.56	.0022	
3		7.2	10-10
4		D 70	100/50
		3	750

Tim Crit. 10 32 AM PM Deviation 8 min.

36"

CA 270 $\frac{88.5}{11.5}$ Expr 36 - 1 Run 1

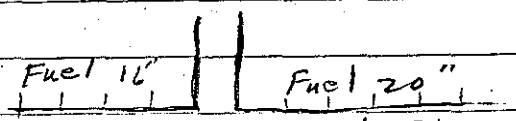
Sheet Date 6 - 2 1958 Time 3:33 AM PM

Purpose 36" Parallelepiped
Fuel 12" High
Completely reflected

LOADING CHANGE

Description			
	$A_2 45 = 16$	40,000	800.00
	$A_2 4 = 226$	625,116	12,502.32
	$A_2 2 = 1$	1,382	27.64
	$A_2 1 = 1$	691	13.82
Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass	667,189	gmU	13,343.78 gmU-235

Sub Critical



228

6/3/58

INSTRUMENT CHECK

Time 8:30 AM PM Source X

	A	B	C	D	E
Range	10/1000	opr	10"/1000		900V
Source Dist.	1.5"	0"	15"	1.5"	15"
% F.S. Trip	80	o/c	100+	70	100+
Counters					

C.A. 2% 88.5/11.5 Exp 36 - 1 2

Sheet ____ Date 6 - 3 - 58 Time 9:07 AM PM

Purpose 36" Paralleliped
Fuel - 14" on movable Table
12" on Stationary Table
Comp. Refl.

LOADING CHANGE

Description Added A_2 - 2 = 36
49,752 g.U 995.04 g U^{235}

Mass before change 667,189 gmU 13,343.78 gmU-235
Mass of Change 49,752 gmU 995.04 gmU-235
Total Mass 716,941 gmU 14,338.82 gmU-235

Sub Critical

C.A. 2% $\frac{88.5}{11.5}$ Expr 36-1 Run 3

Sheet ____ Date 6-3 1958 Time 10:08 AM

Purpose: 36" Parallelipiped
Fuel 14" high
Completely Reflected

14"

LOADING CHANGE

Description Added:	U	U-235
$A_2$2 = 42	58,044	1,160.88
$A_2$1 = 6	4,146	82.92

Mass before change 716,941 gmU 14,338.82 gmU-235

Mass of Change 62,190 gmU 1,243.80 gmU-235

Total Mass 779,131 gmU ~~15,632.62~~ gmU-235

15,582.62

CRITICAL POSITIONS

C.A. 2% $\frac{88.5}{11.5}$ Expr 36-1 Run 3

Table Pos. 015 L ____ T ____ R ____

Channel

A 20.27	A	72	100/100
C 15.015	B	.0033	
	C	7.0	2.5×10^{-10}
	D	47	100/100
	E	2	750 V

Time Crit. 10:26 AM Duration 7 min.

Rod C @ 13.50 on 91 sec period = 10.4 ¢

Leveler Rd. C @ 15.01 Sensitivity 1.89 ¢/in.

C.A. 270 $\frac{88.5}{11.5}$ Expr. 36 – 1 Run 4

Sheet ______ Date 6-3 1958 Time 11:12 AM

Purpose 36" Parallelipyed
Fuel 14" high except
S.E. Quadrant which 13" (13¾)
Completely reflected

LOADING CHANGE

Description Removed:

A₂2 = 25	~~34,550~~ ~~27,850~~	691.00
Added: A₂1 = 20	13,820	~~350~~ ~~80~~ 276.40
C₂4 = 18	3,114	62.46
C₂2 = 2	173	3.47
B₂4 = 5	3,445	69.00

Mass before change 779,131 gmU ~~15,582.62~~ gmU-235

Mass of Change 13,988 gmU 279.68 gmU-235

Total Mass 765,143 gmU ~~15,352.94~~ 15,302.94 gmU-235

552

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Expr. 36 – 1 Run 4

Table Pt. .02

Channel

1 A .05	A 81	$\frac{180}{100}$
C 15.885	B .0034	
3	C 7.6	2.5×10^{-10}
4	D 51	$\frac{100}{100}$
	E .3	750 V.

54.24 Excess

Time Crit. 11:20 AM Duration 58 min.

① Rod C @ 14.00 on 83 sec period = 11.1 ¢
Leveled Rd. C @ 15.885 Sensitivity 5.885 ¢/in.

② Rod A @ .07 on 187 sec period = 5.9 ¢
Leveled Rd. C @ 5.175 Sensitivity 1.16 ¢/in.
Rod A IN.

③ Rod C @ 5.175 on 98 sec period = 9.8 ¢
Leveled Rd. C @ 8.51 Sensitivity 2.93 ¢/in. (3.3X)
Rod A @ 18.17

④ Rod C @ 8.51 on 115 sec period = 8.7 ¢
Leveled Rd. C @ 16.56 Sensitivity 4.24 ¢/in.
Rod A @ 16.30

⑤ Rod C @ 11.56 on 94 sec period = 11.1 ¢
Leveled Rd. C @ 13.37 Sensitivity 5.58 ¢/in.
Rod A @ 12.50

C.A. 270 88.5 / 11.5 Expr. 36 - 1 5

Sheet Date 6-3 1958 Time 1:45 ~~AM~~ PM

Purpose 36" Parallelipiped
Fuel 13" on 1/2
14 on t/2 (13 1/2")

LOADING CHANGE

Description Removed

	$A_2 2 = 17$	23,494	469.88	
	$C_2 2 = 2$	173.6	3.47	
Added	$B_2 4 = 4$	2,759.6	55.20	
	$A_2 1 = 10$	6,910	138.20	
Mass before change	765,143 gmU	15,~~350~~ 302.94		gmU-235
Mass of Change	13,998 gmU	279.95		gmU-235
Total Mass	751,145 gmU	15,022.99		gmU-235

15,022.99

CRITICAL POSITIONS

C.A. 270 88.5 / 11.5 Expr. 36 - 1 Run 5

.02

280.
70.

Channel

A = .05 — 94 — 100/100

C = 7.875 — .0033

C — 6.8 — 2.5×10^{-10} — 100

D — 46 — 100

E = 2 — 750 V.

Crit. 2:02 AM PM Duration 7 min.

Rod C @ 3.000 on 99 sec period = 9.7 ¢

Leveled Rd. C @ 7.875 Sensitivity 2.0 ¢/in.

Rd C
0 to 5.175 = 5.9
5.175 to 7.875 = 5.2
11.1 ¢

Extras

6/4/58

McCarty
Lynn
Johnson (K-25)

INSTRUMENT CHECK

Time 9:30 AM / PM   Source γ

Channel	A	B	C	D	E
Range	10/1000	Opr	15"	10/1000	900V
Source Dist.	1"	0"	15"	15"	15"
% F.S. Trip	80	OK	100+	70	100+

Counters

CA 2% 88.5/11.5 Expt 36 - 2 Run 1

Sheet   Date 6 - 4 1958 Time 9:45 AM / PM

Purpose 36" Parallelepiped

Fuel - 14" on 1/2
16" on 1/2

Bare

(15")

LOADING CHANGE

Description Added:

	U	U 235
$A_2 4 = 36$	99,576.0	1,991.52
$A_2 2 = 45$	62,190.0	1,243.80
$B_2 4 = 9$	6,209.1	124.20

From Run #1 (Exp. 36-1) Page 229

Mass before change 667,189 gmU 13,343.78 gmU-235

Mass of Change 167,975 gmU 3,359.52 gmU-235

Total Mass 835,164 gmU 16,703.30 gmU-235

Sub - critical

C.A. ~~29 36~~ 88.5 11.3 Expr. 36-2 Run 2

Sheet ____ Date 6-4-58 Time ____ AM ~~PM~~

Purpose 36" Parallelepiped
17" High
Bare

(17")

11209

LOADING CHANGE

Description			U	U^{235}
Added	$A_2 - 4 = 2$		5,532	110.64
	$A_2 - 2 = 34$		46,988	939.76
	$A_2 - 1 = 81$		55,971	1119.42
	$B_2 - 4 = 5$		3,450	69.00
Mass before change	835,164	gmU	~~13,545.~~ 16,703.30	gmU-235
Mass of Charge	111,941	gmU	2238.82	gmU-235
Total Mass	947,105	gmU	18,942.12	gmU-235

Sub-Critical

C.A. 296 88.5 11.5 Expr. 36-2 Run 3

Sheet ____ Date 6-4-58 Time ____ AM PM

Purpose 36" Parallelepiped
18" High
Bare

(18")

LOADING CHANGE

Description			U	U^{235}
Added:	$C_2 4 = 24$		4,166	~~83.28~~
	$A 2 1 = 17$		11,747	234.94
	$A_2 2 = 1$		1,382	27.64
	$B_2 4 = 56$		34,495	690.00
	$B_2 2 = 12$		4,149	83.04
Mass before change	947,105	gmU	18,942.12	gmU-235
Mass of Change	55,976	gmU	1,118.90	gmU-235
Total Mass	1,003,081	gmU	20,061.02	gmU-235

MULTIPLICATION

Scaler c ... cm ... 3 min, Mult. 1 M

185	16 x 13 + 13 = 221	
259	16 x 62 + 6 = 998	
347	~~[illegible]~~ 16 x 167 + 11 = 2683	

C.A. ~~290~~ 88.5 ~~11.5~~ Expr. 36 - 2 Run 4

Sheet ______ Date 6 - 8 1958 Time 1:55 ~~AM~~ PM

Purpose 36" Parallelepiped
18" ~~Plus~~ except S. E.
Quadrant which is 19"
Bare

18 1/4"

LOADING CHANGE

Description Added:	U	U 235
B_2 1 = 11	1981.9	38.06
A_2 1 = 1	691.0	13.82
C_2 4 = 66	11,457.6	229.02

~~Mass before change 1,003,081 gmU 20,061.02 gmU-235~~

Mass of Change 14,050.5 gmU 280.90 gmU-235

Total Mass 1,017,131.5 gmU 20,341.92 gmU-235

CRITICAL POSITIONS

2% 88.5/11.5 Expt 36-2 Run 4

.015 T

A .03 43 200/200

C 13.59 .004

7.0 3x10^-10

D 61 100/100

E .2 900

Tim Crit. 2:05 AM/PM Duration 43 min.

Rod C @ .09 on 161 sec period = 6.6 ¢

Leveled Rd. C @ 6.86 Sensitivity ____ ¢/in.

Rod C @ 6.86 on 141 sec period = 7.45 ¢

Leveled Rd. C @ 9.185 Sensitivity ____ ¢/in.

Rod C @ 12.00 on 113 sec period = 8.8 ¢

Leveled Rd C @ 13.59 Sensitivity 5.5 ¢/in.

Rod C @ 9.185 on 119 sec period = 8.5 ¢

Leveled Rd. C @ 11.29 Sensitivity 4.0 ¢/in.

6.86 ¢
7.45 ¢
8.50 ¢
3.50 ¢
8.80
35.11 ¢

12.00
11.29
.71
9
3.5

236

6/5/58

McCarty
Lynn
Johnson (K-25)

INSTRUMENT CHECK

Time 9:55 AM P

Source γ

Ch

	A	B	D	E
Disc	10/1000	opr	10"	10/1000 900V
Source Dist.	1"	14"	1.5"	16"
% F.S. Trip	80	101+	75	100+

Counters

C.A. 270 88.5/11.5 Expr. 40=1 Rul 1

Sheet Date June 5 1958 Time 10 13 AM PM

Purpose X⊗" Paralleliped
½ in 14" High
½ in 16" "
Bore

LOADING CHANGE

Description			
Added	$A_2 4 = 264$	730,224	14,604.48
	$A_2 4S = 16$	40,000	800.00
	$A_2 2 = 104$	143,728	2,874.56
	$A_2 1 = 100$	69,100	1,382.00
	$B_2 2 = 12$	4,149	83.04
	$B_2 4 = 64$	44,153	883.20

Mass before change ~~1,003,081~~ gmU ~~20,341.92~~ gmU-235

Mass of Change gmU gmU-235

Total Mass 1,031,354 gmU 20,627.28 gmU-235

Sub Critical

C.A. 290 $\frac{88.5}{11.5}$ Expr. 40-1 Run

Sheet Date 6-5 1958 Time 10:58 AM ~~PM~~

Purpose 40" Parallelipiped 16" High except for Back layer on each table which is 15"

Bore

LOADING CHANGE

Description Total Inventory: ~~Bore~~

Mass before change gmU ~~gmU-235~~

Mass of Change gmU ~~gmU-235~~

Total Mass 1,086,532 gmU 21,730.59 ~~gmU-235~~

MULTIPLICATION

Scaler 3 min Mult 1 M

201 16X37+5=597

202 16X11+11=187

123 16X4X10=74

CA 270 $\frac{88.5}{11.5}$ Expr. 44 - 1 Run 1

Sheet _____ Date 6 - 5 1958 Time 3:05 PM

Purpose 44" Parallelipiped
13" High
Comp. Refl.

LOADING CHANGE

Description Total Inventory less U235
$B_2 - 4 = 2$
$C_2 - 4 = 12$
$C_2 \bullet 2 = 11$
$C_2 - 1 = 21$

Mass before change	1,086,532 gmU	21,730.59	gmU-235
Mass of Change	5,327 gmU	106.51	gmU-235
Total Mass	1,081,205 gmU	21,624.08	gmU-235

Super Critical Tables = .10

C.A. 2% 88.3/11.5 Expr. 44-1 Run 2

Sheet ______ Date 6-5 1958 Time 3:40 ~~AM~~ PM

Purpose 44" Parallelepiped

½ is 13" High

½ is 12" High

Comp. Rift.

(12½")

LOADING CHANGE

Description		U	U^{235}
Removed:	A_2-1 = 36	24,870	497.52
	C_2-4 = 86	14,930	298.42
	B_2-1 = 12	2,075	41.52
			837.46

Mass before change 1,081,205 gmU 21,624.08 gmU-235

Mass of Change 41,875 gmU 837.46 gmU-235

Total Mass 1,039,330 gmU 20,786.62 gmU-235

1,039,330

CRITICAL POSITIONS

C.A. 1 Expr. 44-1 Run 2

Table Pos. .015 I T R

Control Rod		Channel		
A	16.18	A	53	100/200
C	994.615 (out)	B	.004	
		C	5.8	2.5×10^{-10}
		D	70	100/50
		E	2	750 V.

Tim Crit. ______ AM/PM Duration ______ min.

10.5¢
10.0
9.6
8.6
38.7 ¢

Rod A ... 14.00 on 117 sec period = 8.6 ¢
Leveled Rd. A @ 16.18 Sensitivity 3.94 ¢/in.
Rod C-out
Rod A fr 11.24 to 14.00 = 9.6¢ @ 3.5¢/in.

Rod A 0.04 ... 89 sec period = 10.5 ¢
Leveled Rd. A 7.93 Sensitivity ¢/in.
Rod C = 16.67

Rod A 7.93 ... sec period = 10.0 ¢
Leveled Rd. A @ 11.24 Sensitivity 3.02 ¢/in.
Rod C = 8.90

out limit Switch on Rod C
Moved ~ 6".

6/6/58

INSTRUMENT CHECK

Time 10:00 AM

Source γ

Channel

	A	B	C	D	E
	10/1000	opr	10"	10/1000	900V
Range	1"	0"	15"	1"	15"
Source Dist	80	OK	100+	70	100+
% F.S. Trip					

Counters

C.A. 270 88.5/11.5 Expr. 44-1 Run 3

Sheet — Date 6-6 1958 Time 10:23 AM

Purpose 44" Parallelepiped
Fuel 12" except N.W. Quadrant
which is 13" (12 1/4")
Completely reflected

LOADING CHANGE

Description Removed

$A_2 1 = 30$ 20,730 -414.60

$C_2 4 = 1$ 173 3.47

Mass before change	1,039,330 gmU	20,786.62 gmU-235
Mass of Change	20,903 gmU	418.07 gmU-235
Total Mass	1,018,427 gmU	20,368.55 gmU-235

Sub-critical

A .05 on 120 sec period = 7.5

C.A. 2% $\frac{88.5}{11.5}$ Expr. 44 - 2 Run 1

Sheet ______ Date 6 - 6 1958 Time 1:40 ~~AM~~ PM

Purpose 44" Diameter Cylinder (1,504 in² Base)

13" High

Comp. Refl.

9.5¢
6.6¢
11.0¢
8.1¢
5.5¢
40.7¢ ← Excess

LOADING CHANGE

Description	U	U235
A_2-4 = 240	663,840	13,276.80
A_2-4_S = 16	40,000	800.00
A_2-2 = 44	60,808	1,216.16
	~~9,658~~	~~193.20~~
A_2-1 = 89	61,499	1,229.80
B_2-4 = 14	9,658	193.20
B_2-1 = 4	692	13.89
Mass before ~~B~~$_2$-4 = 20	3,472	69.40 gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 839,969 gmU 16,799.2 gmU-235

Rod A @ 17.92 on 202 sec period = 5.5 ¢
Levelec Rd. A @ 19.135 Sensitivity ______ ¢/in.
C = 944.61 (out)

Rod A @ .05 on 120 sec period = 9.5 ¢
Levelec Rd. A @ 10.485 Sensitivity ______ ¢/in.
Rod C = 10.50

Rod A @ 10.485 on 161 sec period = 6.6 ¢
Levelec Rd. A @ 12.90 Sensitivity 2.68 ¢/in.

~~CRITICAL POSITIONS~~

C.A. 2% $\frac{88.5}{11.5}$ Expr. 44-2 Run 1

.015

Control Rod

A - 10.485

C - 10.50

Channel		
A	25	100/200
B	.0038	
C	6.2	2.5×10^{-10} / 1.0
D	68	50
E	.8	900 V.

Crit. 1:55 ~~AM~~ PM Duration ______ min.

Rod A @ 12.90 on 85 sec period = 11.0 ¢
Levelec Rd. A @ 15.97 Sensitivity 3.58 ¢/in.

Rod A @ 15.97 on ______ sec period = 8.15 ¢
Levelec Rd. A @ 17.92 Sensitivity 4.18 ¢/in.

242

6/9/58

INSTRUMENT CHECK

Time 9:30 AM ~~PM~~ 8

	A	B	D	E
Range	10/1000	opr 10"	10/1000	900 V.
Source Dist	1"	14"	15"	12"
% F.S. Trip	85	100+	75	100+
Counters				

C.A. 270 88.5/11.5 Expr. 44 - 2 2

Sheet _____ Date 6 - 9 1958 Time 9:50 AM PM

Purpose 44" Diameter Cylinder (1,504 in² Base) (12 3/4")
Fuel is 13" high except S.E Quadrant which is 12".

LOADING CHANGE

Description Removed

	$A_2 1 = 28$	19,348	386.96
	Added $C_2 4 = 1.8$	3.124	62.48

Mass before change 839,969 gmU 16,799.2 gmU-235

Mass of Change 16,224 gmU 324.50 gmU-235

Total Mass 823,745 gmU 16,475.80 gmU-235

MULTIPLICATION

Scaler 3 Mult. T M

120 16 X 3 + 79 = 127
16 X 3 + 215 = 263

240 16 X 20 + 2 = 322
16 X 22 + 9 = 361

312 16 X 10 + 8 = 168
16 X 12 + 14 = 206

C.A. 2% 88.5/11.5 Expr. 44-2 Run 3

Sheet ______ Date 6-9 1958 Time 10:40 AM/PM

Purpose 44" Diameter cylinder 13" High except for One Octant of 12".

(12 7/8")

LOADING CHANGE

Description Removed:

C-4 = 6 1041.6 - 20.82

Added A-1 = 12 8,292 - 165.84

B-1 = 3 518 10.38

C-2 = 8 694 13.88

Mass before change 823,745 gmU 16,475.80 gmU-235

Mass of Change 8463.6 gmU 169.28 gmU-235

Total Mass ~~815,282~~ gmU ~~16306.52~~ gmU-235

832,208 16,645.08

40.7

10.8

30.¢

CRITICAL POSITIONS

C.A. 2% 88.5/11.5 Expr 44.2 Run 3

.015

Channel

A 11.01 53 100/100

.004

C 994.615 (out) C 7.0 2.5×10^{-10}

4 D 71 100/50

.1 730 V-

Tim Crit. ______ AM/PM Duration ______ min.

Source in (stuck)

Period @ .085 on 87 sec period = 10.8 ¢/in.

Loaded Rd. A @ 11.01 Sensitivity ______ ¢/in.

69¢ (Base)

244

6-10-58

INSTRUMENT CHECK

Time 8:40 AM / PM

		B		D	E
Range	10/1000	0"	10"	10/1000	900 V
Source Dist.	8"	OK	15"	15"	13"
% F.S. Trip	88	OK	100+	70	100+
Counters					

C.A. 296 88.5/11.5 Expr. 52-1 Run 1

Sheet ♦ Date 6-10 1958 Time 9:12 AM

Purpose 52" Diameter Cylinder (2,128 in² Base)
Fuel 12" High except for outer
2" on movable table, which is 11"
Camp Ruff.

LOADING CHANGE

Description Total Inventory as of 6/10/58

Mass before change _____ gmU _____ gmU-235

Mass of Change _____ gmU _____ gmU-235

Total Mass 1,086,532 gmU 21,730.59 gmU-235

MULTIPLICATION

Scaler 3 min. Mult. T.M

1 20 16 X 55 + 11 = 891
16 X 58 + 3 = 931

2 20 16 X 21 + 3 = 339
16 X 22 + 9 = 361

3 12 16 X 24 + 4 = 388
16 X 27 + 10 = 442

C.A. 270 88.5/11.5 — 50–1 Run 1

Sheet 1-10-58 Time 2:00 PM

Purp. 50" Diameter Cylinder (1964 in² Base)
Fuel 12" high except for S.E.
Quadrant which is 13" High
Comp. Refl.

12.5"

LOADING CHANGE

Description: Total Inventory Less

	U	U 235		U	U 235
$A_2 1 = 20$	13,820	276.40	$C_2 1 = 20$	868	17.36
$A_2 2 = 19$	26,258	525.16	$C_2 2 = 8$	694	13.88
$B_2 1 = 8$	1,383	27.68	$C_2 4 = 47$	8,159	163.09
$B_2 2 = 4$	1,383	27.68			
$B_2 4 = 1$	689	13.80			

Mass before change 1,086,532 gmU 21,730.59 gmU-235

Less Inventory — Mass of Change 53,254 gmU 1,065.05 gmU-235

Total Mass 1,033,278 gmU 20,665.58 gmU-235

CRITICAL POSITIONS

C.A. 270 88.5/11.5 Expr 50–1 Run 1

Table Pos. .015 L____ T____ R____

	Channel	
A 12.295	A 44	100/100
C ~~99.4~~ 994.61	.004	
	5.4	2.5×10^{-10}
		100
	64	50
	2	750

15.5¢ Excess

Tim Crit. 2:13 PM Duration 25 min.

Rod A @ .05 on 20.4 sec period = 5.4 ¢

Leveled Rd. A @ 6.845 Sensitivity ____ ¢/in.

Rod C = 4.00

Rod A @ 7.09 96 sec period = 10.0 ¢

Leveled Rd. A @ 12.295 Sensitivity 1.92 ¢/in.

246

6/11/58

INSTRUMENT CHECK

Time 12:50 ~~AM~~ PM Source Y

	A	B	C	D	E
Range	$\frac{10}{1000}$	opr	10"	$\frac{10}{1000}$	900V
Source Dist.	1"	0"	15"	15"	13"
% F.S. Trip	90	~~97~~	100	70	100

Counters

C.A. 290 $\frac{88.5}{11.5}$ Expr. 40 – 1 Run 1

Sheet ____ Date 6-11 1958 Time 1:05 ~~AM~~ PM

Purpose 40" Diameter Cylinder

Fuel 18" high (1264 in²)

Measured Stack 18 3/16" by 40 3/16"

Bare

18"

LOADING CHANGE

Description ____

Total Inven. Mass before change	1,086,532 gmU	21,730.59 gmU-5
Mass of Change	~~99,129~~ 89,403.32 gmU	2,137.93 gmU-5
Total Mass	~~99,129~~ 106,891 979,641 gmU	19,593.66 gmU-5

CRITICAL POSITIONS

270 $\frac{88.5}{11.5}$ Exp 40-1 Run 1

.015

	Channel	
A .05	A 50	100/200
C 16.515	.0044	-10
	C 7.2 3X10	,100
	D 69	/100
	E .2	900

Tim Crit 1:26 AM Duration 43 min

Rod C @ 14.50 120 period = 8.4 ¢ — 8.4

Leveled Rd. C @ 16.515 Sensitivity 4.97 ¢/in. — 7.6

Rod C @ 994.61 on 137 sec period = 7.6 ¢

A=14.4" Leveled Rd. C @ 10.30 Sensitivity ____ ¢/in. — 5.7

Rod C @ 10.30 on 195 sec period = 5.7 ¢ — 8.0

Leveled Rd. C @ 12.31 Sensitivity 2.83 ¢/in. — 29.7 ¢

Excess

Rod C @ 12.31 on 128 sec period = 8.0 ¢

Leveled Rd. C @ 14.54 Sensitivity 3.58 ¢/in.

C.A. 2% $\frac{88.5}{11.5}$ Expr. 40-1 Run 2

Sheet ______ Date 6-11 1958 Time 3:10 PM

Purpose 40" Diameter cylinder
Fuel 18" high except for one Octant
which is 17" (stationary table) (17.88")
Bare

LOADING CHANGE

Description Removed:

10 A,1 = 6,910 138.20

B,4 = 2,069 41.40

Added B,1 = 11 1901 38.06

$C_2$2 = 7 607 12.15

Mass before change 979,641 gmU 19,593.66 gmU-235

Mass of Change 6,471 gmU 129.39 gmU-235

Total Mass 973,170 gmU 19,464.27 gmU-235

CRITICAL POSITIONS

C.A. 2% $\frac{88.5}{11.5}$ Expr. 40-1 Run 2

Table Pos. .02

Control Rod	Channel	
A - .05	A 31	100 / 200
2 C - 7.79	B .003	
3	C 6.8 2.5x10	10 / 100
4	D 47	100
	E .1	900 V.

Time Crit. 3:30 AM PM Duration 6 min.

Rod C @ 994.61 on 401 sec period = ~~4.75~~ ¢ 2.94

Leveled Rd. C @ 7.79 Sensitivity ______ ¢/in. Excess

6/12/58

INSTRUMENT CHECK

Time 10:10 AM   Source 8

Channel	A	B	C	D	E
Ra	10/1000	8pl	10	10/1000	900V.
Source Dis	1.5"			2"	13"
% F.S. Trip Counters	80			70	100+

38"

C.A. 2% 88.5/11.5 Exp 32 – 1 Run 1

Sheet ____ Date 6-12 1958 Time 10:25 AM

Purpose 32" Diameter cylinder (800 in² Bare)

Fuel 22" high

Bare

LOADING CHANGE

Description A_24	= 208	575,328	11,506.56
A_22	= 69	95,358	1,907.16
A_21	= 62	42,842	856.84
B_24	= 12	8,278	165.60
C_24	= 24	4,166	83.28
C_22	= 4	347	6.94
A_245	= 12	30,000	600.00

~~Mass before change ____ gmU ____ gmU-235~~

Mass of Change ____ gmU ____ gmU-235

Total Mass 756,319 gmU 15,126.38 gmU-235

691.44 g/1" layer

CRITICAL POSITIONS

C.A. 29 $\frac{88.5}{11.5}$ Expr. 32 – 1 Run 1

Table Pos. .02

Channel			
1 A	13.725	A 55	100/200
2 C	20.695	.005	
3		C 8.3 3x10^{-10}	
4		D 79	100/100
		E 2	900

Tim Crit. 10.45 AM PM Duration 6 min.

Rod A @ .045 on 143 sec period = 7.35

Levelec Rd. A @ 13.725 Sensitivity ____ $/in.

C.A 29 $\frac{88.5}{11.5}$ Expr. 32 – 1 Run 2

Sheet ____ Date 6-12-1958 Time 11:15 AM

Purpose 32" Diameter Cylinder
22" Except for SW Quadrant
Which is 21"
Bore

(21.75")

LOADING CHANGE

				U^{235}
Description	Removed:	A_2-1 = 11	~~7,601~~ 7,601	152.02
		B_2-4 = 2	1,379	27.60
	Added	C_2-4 = 2	347	6.94
Mass before change			756319 gmU	15,126.38 gmU 235
Mass of Change			~~11,623~~ 9633 gmU	172.68 gmU 235
Total Mass			747,686 gmU	14,953.70 gmU 235

CRITICAL POSITIONS

$2\eta_{11.5}^{88.5}$ Expr 32-1 Run 2

.02

		Channel
A	.025	53 100/200
C	13.975	.0047
		7.5 3×10^{-10} 100
D	70	100
E	.2	900

Tim Crit. 11:26 A/M P/M Duration 6 min.

Rod C @ 0.0 on 142 sec period = 7.43

Leveled Rd. C @ 13.975 sensitivity ¢/in.

C.A. $2\eta_{11.5}^{88.5}$ Expr. 32-1 Run 3

Sheet ____ Date 6-12 1958 Time 1:00 AM/PM

Purpose 32" Diameter cylinder 22" High except for one detent Bore (21.875")

LOADING CHANGE

Description Added

$A_2 1 = 4$	2.764	55.28
$B_2 1 = 3$	518	10.38
$C_2 14 = 3$	520	10.41
$C_2 2 = 6$	520	10.41

Mass before change	747,686 gmU	14,953.70 gmU-235
Mass of Change	4,322 gmU	86.48 gmU-235
Total Mass	752,008 gmU	15,040.10 gmU-235

CRITICAL POSITIONS

290 $\frac{88.5}{11.5}$ Expr 32-1 Run 3

.02

Channel

A 13.725 80 $\frac{100}{100}$

C 16.40 .004

C 72 3×10^{-10}

D 57 $\frac{100}{100}$

E .2 908

Time Crit. 1:15 ~~AM~~ PM Duration 6 min.

Rod C @ 13.975 on 148 sec period = 7.15

Leveled Rd. C @ 16.40 Sensitivity ¢/in.

7.35
7.4
7.15
21.904
Exars

21.9
7.4
14.5¢/octant

C.A. 290 88.5/11.5 Expr. 32-2 Run #1

Sheet ______ Date 6-12-1958 Time 3:45 PM

Purpose 32" Diameter Cylinder (800 in² Base)
Fuel 16" High

completely reflected

LOADING CHANGE

Description		
A-34 = 164	453,624	9072.48
A-45 = 12	30,000	600.00
A-22 = 28	38,696	773.92
A-1 = 32	22,112	442.24
B-24 = 4	2,759	55.20
C-24 = 8	1,388	27.76
C-22 = 4	347	6.94

Mass before change ______ gmU ______ gmU-235

Mass of Change 548,926 gmU 10,978.54 gmU-235

Total Mass 548,926 gmU 10,978.54 gmU-235

CRITICAL POSITIONS

C.A. 290 88.5/11.5 Expr. 32-2 Run #1

Scale ... .02 T ___ R ___

Rod | Channel

1. A-4.84 A 38 100/200
2. C-20.685 B 803
C 5.0 3×10⁻¹⁰ 100
4. D 47 100
E .2 750

Tim Crit 4:00 PM Duration 11 min.

Rod A @ 0.04 in 87 sec period = 10.8 ¢/in.
Leveled Rd. A @ 11.67 Sensitivity
C = 18.98

Level Rod A @ 11.67
Rod C @ 18.98

254

6-13-58

INSTRUMENT CHECK

Time 9:30 AM   Source γ

	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1500	900 V
Source Dist.	15"	0"	15"	15"	14"
% F.S. Trip	85	OK	100+	70	100+

counters

C.A. 2% 88.5/11.5 Expr. 32-2 Run 2

Sheet ______ Date 6-13-1958 Time 9:45 AM

Purpose 32" Diameter Cylinder (15.75")
Fuel 16" high except S.W. Quadrant
which was 15" comp Refl.

10.8 Rod A
9.8
20.6

LOADING CHANGE

Description			U-235
Removed: $A_2 4 = 11$		30,426	608.52
Added $A 22 = 9$		12,438	248.76
$A_2 1 = 9$		6,219	124.38
$B_2 4 = 2$		1,379	27.66
$C_2 4 = 10$		1,736	34.70

Mass before change 548,926 gmU 10,978.54 gmU-235

Mass of Change 8,654 gmU 173.08 gmU-235

Total Mass 540,272 gmU 10805.46 gmU-235

CRITICAL POSITIONS

2% 88.5/11.5 Expr. 32-2 Run 2

.015

Rod		Channel	
A- 11.67	A	52	100/200
C- 11.80	B	.0047	
	C	6.0	3×10^{-10}
	D	70	100/100
	E	4	750 V.

Tim Crit. 10:06 AM Duration 7 min.

Rod C @ .15 on 98 sec period = 9.8

Leveled C @ 11.80 Sensitivity ______ ¢/in.

C.A. 2% 88.5/11.5 32-2 Run 3

Sh... Da 6-13-1958 Time 10:26 AM

Purp 32" Diameter cylinder
Fuel 16" high except for one octant which is 15" (15.875")
Comp Rifl

LOADING CHANGE

Description Added:
See Page 251
(32-1) Run 3

F... change	540,272	gmU	10,805.46	gmU-235
Mass Change	4,322	gmU	86.48	gmU-235
Total Mass	~~535,950~~ 544,594	gmU	~~10,718.98~~ 10,891.94	gmU-235

CRITICAL POSITIONS

C.A. 2% 88.5/11.5 Exp 32-2 Run 3

.015

Rod			
A	11.67	47	100/200
C	16.05	.004	
		7.0	3×10^{-10}
		64	100/100
		6	750

Tim Crit. 10:48 AM Duration ______ min.

10.8 ¢
9.8 ¢
6.2 ¢
12.2 ¢
39.0 ¢

Rod C @ 13.50 on 74 sec period = 12.2 ¢

Leveled Rd. C @ 16.05 Sensitivity 4.78 ¢/in.
A = 11.67

9.8
−3.6
6.2 ¢

Rod C @ 11.80 on 98 sec period = 9.8 ¢

Leveled Rd. C @ 14.35 Sensitivity 3.84 ¢/in.

Rod A = 13.85

14.35
13.50
.85
~~4.2~~ ¢/in
3.57 ¢

256

6/16/58

McCarty
Lynn

28" Cylinder

INSTRUMENT CHECK

Time 8:30 AM PM Source X

Channel	B	C	D	E
Ranges	10/1000	opr	10"	10/1000	900 V.
Source-Dist.	1"	0"	16"	1.5"	13"
% F.S. Trip	80	OK	180+	70	180+

COUNTERS

C.A. 27° 88.5 / 1.5 Expr. 28-3 Run 1

Sheet ____ Date 6-16-1958 Time ____ AM PM

Purpose 28" Diameter Cylinder
Fuel 18" high
completely reflected

616 in Base

LOADING CHANGE w235

Description			
	$A_24 = 110-304,260$		6,085.20
	$A_45 = 10$	25,000	500.00
	$A_22 = 60$	82,920	1,658.40
	$A_21 = 54$	37,314	746.28
	$B_24 = 26$	17,937	358.80
	$B_22 = 4$	1,383	27.68
	$C_24 = 38$	6,596	131.86
Mass for change	$C_22 = 2$	gmU 173	3.47
Mass of Change		gmU	
Total Mass	475,583	gmU	9,511.69

CRITICAL POSITIONS

C.A. 27° 88.5 / 1.5 Expr. 28-3 Run 1

.015

Control Rod Channel

A-.02 A 54 100/200

C-12.635 B .0045

C 7.0 3X10⁻¹⁰

D 69 100/100

E .5 750 V.

Tim Crit. 9:13 AM PM Duration 5 min.

Rod C @ 1.5 (out) on 83 sec period = 1.2 ¢/in.

Leveled Rd. C @ 12.633 Sensitivity ____ ¢/in.

C.A. 2% $\frac{88.5}{11.5}$ Expr. 28-3 Run 2

Sheet Date 6-16 1958 Time 10:20 AM

Purpose 28" Diameter cylinder
Fuel 18" high plus 1" Rlaut

LOADING CHANGE

Description Added:

	U	U 235
A₂1 = 2	1,382	27.64
B₂1 = 2	345	6.92
C₂4 = 8	1,388	27.76
C₂2 = 3	260	5.21
C₂1 = 1	43	.87

Mass before change 475,583 gmU 9,511.69 gmU-235

Mass of Change 3,418 gmU 68.40 gmU-235

Total Mass 479,001 gmU 9,580.09 gmU-235 9,580.09

CRITICAL POSITIONS

C.A. 2% $\frac{88.5}{11.5}$ Expr. 28-3 Run 2

.015

Channel

A - .04	A 80	100/100
C - 15.405	B .0034	
	C 5.5	3×10⁻¹⁰
	D 53	100/100
	E 4	750 V.

Tim Crit. 10:30 AM Duration 7 min.

Rod C 12.365 (632) 67 sec period 13.1 ¢

Leveled Rd. C @ 13.405 Sensitivity 4.30 ¢/in.

11.2
13.1
24.3 ¢

C.A. 298 8.5 / 1.5 Exp. 28-4 Run 1

Sheet _____ Date 6-16 1958 Time 2:15 PM

Purpose ~~14"~~ ~~Height~~ 28" Diameter Cylinder
24" High

Bare

LOADING CHANGE

Description			
	$A_{24} = 170$	470,220	9,404.40
	$A_{245} = 10$	25,000	500.00
	$A_{22} = 46$	63,572	1,271.44
	$A_{21} = 82$	56,662	1,133.24
	$B_{24} = 26$	17,937	358.86
	$C_{24} = 10$	1,736	34.7
Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass		635,127 gmU	12,702 58 gmU-235

616 in³ Rods times .8643 g/in³ = 532.4 g/1" layer

~~CRITICAL POSITIONS~~

Sub-Critical Run 532.4

X 24"

12,777.6 g

- ~ 75 g for Rods

12,702

A	
B	
C	
D	
E	

Tim Crit. _____ AM PM Duration _____ min.

C.A. 270 88.5 / 11.5 Expr 28-4 Run #2

Sheet ____ Date 6-16 1958 Time 2:50 PM

Purpose 28" Dia. Cylinder

Fuel 26" high

Bare

635,129

53,332

688,461 gU

LOADING CHANGE

Description	Added:		
A-2 = 23	31,786	635.72	
A-1 = 16	11,056	221.12	
B-4 = 5	3,449	68.00	
B-1 = 10	1,729	38.60	
C-4 = 12	2,083	41.64	
C-2 = 4	347	6.94	
Mass before change	635,127 gmU	12,702.58 gmU-235	
Mass of Change	50,450 gmU	1,008.9 gmU-235	
Total Mass	685,577 gmU	13,711.48 gmU-235	

616 in² Base

Used

A-2 = 23 X 16 = 368 in²

A-1 = 8 X 16 = 128 in² (2/layer)

B-4 = 5 X 8 = 40 in²

B-1 = 5 X 4 = 20 in² (2/layer)

C-4 = 6 X 4 = 24 in² (2/layer)

C-2 = 2 X 2 = 4 in² (2 layer)

584 in²

616

- 584

32 in² not accounted for

Required for 2" layer

CRITICAL POSITIONS A-2 = 30

Expr ____ Run B-4 = 8

B-2 = 4

C-4 = 28

Channel

Sub-critical

U235	
829.2 g	
110.4	
27.68	
97.16	
1064.44	

gms

1064

- 1008

52 gms short

A

B

C

D

E

AM PM Duration 64 X .8643 = 55 gms. min.

Crit

64 in³

532.4

X 26

13,842 g

= 75 times Ratio

13,767 g

12,702.58 g U²³⁵

+ 1064.44

13,767.02 g U²³⁵

C.A. 270 88.5 / 11.5 Expr. 28-4 Run 3

Sheet _____ Date 6-16-1958 Time 3:15 PM

Purpose 28" Dia. Cylinder
Fuel 26 on ½
2⅞" on ½

LOADING CHANGE

Description			
A-2 = 23	3478	685.72
A-1 = 16	11,056	221.12
B-4 = 5	3,449	69.00
B-1 = 10	1,728	34.60
C-4 = 12	2,083	41.64
C-2 = 4	347	6.94
Mass before charge	gmU	gmU-235
Mass of Change	gmU	gmU-235
Total Mass	gmU	gmU-235

LOADING CHANGE

Description			
Added:			
A-1 = 16		11,056	221.12
C-4 = 10		1,736	34.70
B-1 = 2		345	6.92
C-2 = 2		173	3.47
Mass before charge	685,577 gmU	13,711.48	gmU-235
Mass of Change	13,310 gmU	266.21 ✓	gmU-235
Total Mass	698,887 gmU	13,977.69	gmU-235

Sub-Critical

688,461 + 13,310 = 701,771 gU

13,767.02 + 266.21 = 14,033.23 gU^{235}

C.A. 290 $\frac{88.5}{11.5}$ Expr. 28-4 Run 4

Sheet ____ Date 6-16 1958 Time 3:54 PM

Purpose 28 Dia. Cylinder

Fuel 27" except for 1 quadrant which is 26" 26.75"

Bare

LOADING CHANGE

Description		Added:	
A-1=8	5,528	110.56	
C-4=5	868	17.35	
B-1=1	173	3.46	
C-2=1	~~43~~ 87	~~0.86~~ 1.73	
Mass before change	~~698,887~~ gmU	13,977.69	gmU-235
Mass of Change	6,623 gmU	133.10	gmU-235
Total Mass	705,510 gmU	14,110.79 ← 14,110.79	gmU-235

701,771
6623
708,394 gU

14,033.23
133.10
14,166.33 gU^{235}

CRITICAL POSITIONS

290 $\frac{88.5}{11.5}$ Expr. 28-4 Run 4

.015

	Channel	
A-.035	56	100/100
C-13.135	B .0022	
	C 4.5 3×10^{-10}	
	D 76	100/50
	E 2	900

Time Crit. 4:06 AM PM Duration 4.6 min.

PM Duration

Rod C @ .15 on 358 sec period = 3.3 ¢

Leveled Rd. C @ 13.135 Sensitivity ____ ¢/in.

6/17/58

14,166.33 g U^{235}
64.02
14,230.35 g U^{235}

INSTRUMENT CHECK

Source r

Time 9:00 AM

	Channel A	B	C	D	E
Range	10/1000	oyr	10⁻¹¹	10/1000	900 V.
Source Dist.	1"	0"	16"	1.5"	15"
% F.S. Trip Counters	80	OK	100+	70	100+

26.875"

C.A. 290 98.5/11.5 Expr. 28-4 Run 5

Sheet ___ Date 6-17-58 Time 9:07 AM

Purpose 28" Diameter Cylinder

Fuel 27" except for 1 Octant which is 26"

708,394
3201
711,595 gU

~~LOADING~~ Base CHANGE

Description Added:

~~3~~ $A_2$1=3	2,073	41.46
$C_2$4=3	520	10.41
$C_2$1=14	607	12.15

Before change ~~705,510~~ gmU ~~14,110.79~~ gmU-235

Loaded Charge 3,201 gmU 64.02 gmU-235

Total Mass ~~708,710~~ gmU ~~14,174.81~~ gmU-235
14,230.35

Rod C @ 13.13 on 127 sec period = 8.1 ¢

Leveling Rd. C @ 16.515 Sensitivity 2.39 ¢/in.

CRITICAL POSITIONS

C.A. 290 88.5/11.5 Expr. 28-4 Run 5

Table Sep. ... 015

A - .04	A 43	100/200
C - 16.515	B .0037	
3.	C 7.5	3×10⁻¹⁰
4.	D 59	100/100
Temp. 9:24 AM - 7 min.	E 2	900 V.

3.3
8.1
11.4¢

Excess

C.A. 296 $\frac{88.5}{11.5}$ Expr. 24-3 Run 1
Sheet ______ Date 6-17 1958 Time 1:45 PM
Purpose 24" Diameter cylinder
Fuel 40" High
Bare

448 in²
Bare

LOADING CHANGE

Description		
A_{24} = 232	641,712	12,834.24
A_{245} = 8	20,000	400.00
A_{22} = 76	105,032	2,100.64
B_{24} = 4	2,759 ~~1,388~~	55.20
C_{24} = 8	1,388	27.76
C_{22} = 4	347	6.94

Mass before change ______ gmU ______ gmU-235
Mass of Change ______ gmU ______ gmU-235
Total Mass 771,238 gmU 15,424.78 gmU-235

C.A. 296 $\frac{88.5}{}$ Expr. 24-3 Run 2
Sheet ______ Date 6-17 1958 Time 2:13 PM
Purpose 24" Diameter Cylinder
Fuel 44" High
Bare

LOADING CHANGE

Description Added:

	u	u 235
A_{24} = 24	66,384	1,327.68
A_{22} = 8	11,056	221.12

Mass before change 771,238 gmU 15,424.78 gmU-235
Mass of Change 77,440 gmU 1,548.80 gmU-235
Total Mass 848,678 gmU 16,973.58 gmU-235

Run #2

MULTIPLICATION

Scaler 3 Mult. I.M.

1 16 X 16 + 0 = 256
16 X 18 + 2 = 290
2 16 X 14 + 4 = 228
3 16 X 12 + 9 = 201
16 X 12 + 1 = 193

C.A. 290 88.5/11.5 Expr. 24 - 3 Ru. 3

Sheet Date 6-17 1958 Time 3:18 PM

Purpose 24" Diameter cylinder
Fuel 48" high (448 in² Bore)

Bare

LOADING CHANGE

Description Added:

A₂4 = 5	13,830	276.60
A₂2 = 24	33,168	663.36
A₂1 = 20	13,820	276.40
B₂4 = 24	16,557	331.20

Mass before change 848,678 gmU 16,973.58 gmU-235

Mass of Change 77,375 gmU 1,547.56 gmU-235

Total Mass 926,053 gmU 18,521.14 gmU-235

MULTIPLICATION

Scaler c/ min. 3 min. Mult. I.M.

1 10 16 X 57 + 4 = 916
16 X 52 + 1 = 833
2 20 16 X 21 + 5 = 341
16 X 17 + 0 = 272
3 31 16 X 19 + 4 = 308
16 X 16 + 11 = 267

6/18/58

McCarty
Lynn
Connolly [Auburn]

INSTRUMENT CHECK

9:10 ~~PM~~ AM

Source γ

	A	B	C	D	E
	10/1000	0	10"	10/1000	900 V.
Source Dist.	1"	0"	15"	1"	14"
% F.S. Trip	85	OK	100+	75	100+

C.A. 296 88.5/11.5 Expr. 24-3 Run 4

Sheet ______ Date 6-18 1958 Time 9:20 AM

Purpose 24" Diameter cylinder
Fuel 54" High [448 in² Base]
Bare

LOADING CHANGE

Total Inventory Less

Description		
A_2 45 = 8	20,000	400.00
~~A_2 1 = 40~~	6,900	~~138.20~~
B_1 = 4	691	13.84
B_2 2 = 1	345	6.92
C_2 2 = 4	347	6.94
C_2 1 = 21	911	18.22
C_2 4 = 103	17,880	~~375.41~~ 357.41
Total Inv. Mass	1,086,532 g	21,730.59
Mass Less	47,074	941.53
	1,039,458	20,789.06

MULTIPLICATION

Scaler 3 min. Mult. 1/M

1²⁰ out 16 x 2740

2²⁰ ~~16 x 116 + 11 = 1856~~
16 x 117 + 4 = 1876

3₁₂ 16 x 142 + 4 = 2276
16 x 130 + 2 = 2082

C.A. 290 $\frac{88.5}{11.5}$ Expr. 24-3 Run ~~4~~ 5

Sheet _____ Date 6-18 1958 Time 1:48 PM

Purpose 24" Diameter Cylinder (456 in² Base)
Fuel 54" high

Bare

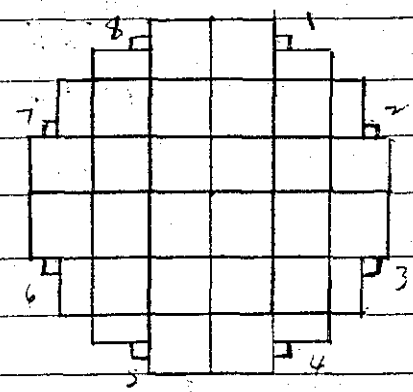
Increased Base of Cylinder by 8 in².

LOADING CHANGE

Description Total INV.

$A_{2}45 = 8$	20,000	400.00	
$A_{2}11 = 8$	5,528	110.56	
$B_{2}4 = 1$	689	13.80	
Mass before change	1,086,532 gmU	21,730.59	gmU-235
Mass of Change less	26,217 gmU	524.36	gmU-235
Total Mass	1,060,315 gmU	21,196.23	gmU-235

Super Critical
Table at .17



Added for Run 5

24" Diameter
448 in² Base
For Runs 1 thru 4.
Pencil drawing

CA 270 $\frac{88.5}{11.5}$ Expr 24-3 Run 5 0

Sheet ____ Date ____ 95 Time 2:23 AM PM

Purpose 24" Diameter Cylinder (4 54 in² Base)

Fuel 54" High

Bare

Decreased base of cylinder by 2"

LOADING CHANGE

Description				
Removed	$C_2 4 = 23$	3,99%		u235
	$C_2 1 = 12$	520		79.81
	$C_2 2 = 2$	173		10.41
				3.47

Mass before change ~~1,060,885~~ 1,060,375 gmU 21,196.23 gmU-235

Mass of Change ~~4,685~~ 4685 gmU 93.69 gmU-235

Total Mass 1,055,630 gmU 21,102.54 gmU-235

Super Critical

Tables - 07

Removed 1 + 5 from Run 6 p. 266

6-19-58

C.A. 290 $\frac{88.5}{11.5}$ Expr. 24-4 Run 2

Sheet ________ Date 6-19 1958 Time 1:14 ~~AM~~ PM

Purpose 24" Diameter Cylinder

Fuel ~~23~~" High 23" on ½ + 24" on other ½ — 23.5"

Completely reflected

LOADING CHANGE

Description Removed: A_{24}=12 33,192 - 663.84

Added: A_{22} = 8 11,056 221.12

A_{21} = 12 8,292 165.84

B_{24} = 4 2,759 55.20

C_{24} = 6 1,041 20.82

C_{22} = 2 173 3.47

C_{21} = 2 86 1.73

Mass before change 461,478 gmU 9,229.58 gmU-235

Mass of Change ~~23,~~ 9,787 gmU 195.66 gmU-235

Total Mass 451,691 gmU 9,033.92 gmU-235

Rd. A @ .04 on 91 sec period = 10.4 ¢

Unvalue Rd. A @ 16.135 Sensitivity ______ ¢/in.

CRITICAL POSITIONS

C.A. 290 $\frac{88.5}{11.5}$ Expr 24-4 Run 2

.015 T R

Control Rod Channel

A - 16.135 .68 100/200

C - 16.00 .0044

C 8.1 3×10^{-10}

D 46 100/200

E 1.6 750

Tim Crit. 1:30 PM Duration 6 min.

10.0 ¢

10.4 ¢ Excess

20.4 ¢

6-19-58

C.A. 270 $\frac{88.5}{11.5}$ Expt. 24-4 Run 3

Sheet Date 6-19 1958 Time 2:22 PM

Purpose 24" Diameter cylinder
Fuel 23" except 1 Irradiant which is 24"
completely reflected.

23 1/4"

LOADING CHANGE

Description Removed $A_2 4 = 6$ 16,596 - 331.92

Added: $A_2 2 = 4$ 5,528 110.56

$A_2 3 = 6$ 4,146 82.92

$B_2 4 = 2$ 1,379 27.60

$C_2 4 = 3$ 520 10.41

$C_2 2 = 1$ 86 1.73

$C 1 = 1$ 43 0.86

Mass before 451,691 9,033.92 gmU-235

Mass of Change 4,867 97.84 gmU-235

Total Mass 446,824 8,936.08 gmU-235

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Exp. 24-4 Run 3

.015

Channel

A - 13.87 47 $\frac{100}{200}$

C. 15 out .003

C 7.0 3 x 10^{-10}

D 61 $\frac{100}{100}$

E 1.0 750 V

Time Crit. 2:46 PM Duration 8 min

5.5 Exars

Rod A .045 202 sec period = 5.5

Leveled Rod A 13.87 ... /in.

272

6/20/58

McCarty
LyNN
Connolly (Auburn)

INSTRUMENT CHECK

Time 10:10 Source Y

	Channel A	B	C	D	E
Range	10/1000	opr	10"	10/1000	900V
Source Dist.	1"	0	15"	1.5"	16"
% F.S. Trip Counters	90	OK	100+	70	100+

C.A. 2% 88.5/11.5 Expr. 20 - 1 Run 1

Sheet ______ Date 6-20 1958 Time 10:25 AM

Purpose 20" Parallelepiped
28" High

Completely Reflected

9680.16g

LOADING CHANGE

Description A_24 = 165 456,390 9,127.8
A_245 = 25,000 500.00

Mass before change ______ gmU ______ gmU-235
Mass of Change ______ gmU ______ gmU-235
Total Mass 481,390 gmU 9627.8 gmU-235

Sub-Critical

C.A. 290 $\frac{88.5}{11.5}$ 20-1 Run 2

She[illegible] 6-20 [illegible]58 Time 10:45 AM

Purp[illegible] 20" Parallelipiped
29" High

Completely reflected

LOADING CHANGE

Description Added
A_2 1 = 25 17,275 34550

Mass before change 481,390 gmU 9,627.8 gmU-235
Mass of Charge 17,275 gmU 345.50 gmU-235
Total Mass 498,665 gmU 9,973.30 gmU-235

Sub critical

10.717
$_2$

C.A. 270 88.5/11.5 Expr. 20-1 Run 3

Sheet ____ Date 6-20 1958 Time 11:25 AM PM

Purpose 20" Parallelpiped

Final 31" high

31"

Completely Reflected

LOADING CHANGE

Description		n	n 235
Added A_2 2	= 25	34,550	691.00

Mass before change 498,665 gmU 9,973.30 gmU-235

Mass of Change 34,550 gmU 691.00 gmU-235

Total Mass 533,215 gmU ~~10,464.30~~ 10,664.30 gmU-235

CRITICAL POSITIONS

270 88.5/11.5 Expr 20-1 Run 3

Date ____ Time ____

Control Rod	Channel
A 16.105	A 43 100/200
C 19.00	B .004
	C 60 3.X10 -10 100
	D 58 100
	E .5 750 V.

Tim Crit. 11:34 AM PM Duration 8 min.

Rod A @ .04 on 109 sec period = 9.0 ¢/

Levelec Rd. A @ 16.105 Sensitivity ____ ¢/in.

C.A. 290 $\frac{88.5}{11.5}$ 20-1 Run 4

She... Date 6-20-58 Time 2:45 PM

Purp 20" Parallelipiped
Fuel 30" on ½ of table
31" on other half | 30½"

Completely reflected

LOADING CHANGE

Description Removed:

1.5 $A_2$1 10,365 207.30

Added

10 $C_2$4 1,7360 34.7

Mass before change 533,215 gmU 10,664.30 gmU-235

Mass of Change 8,629 gmU 172.60 gmU-235

Total Mass 524,586 gmU 10491.70 gmU-235

CRITICAL POSITIONS

C.A. 290 $\frac{88.5}{11.5}$ Exp 6-20 Run 4

.01

Channel

A- 18.815	A 47	100/200	
C- 14.75	B 0036		
	C 7.6	2.5×10^{-10} / 100	
	D 63	100	
	E 7	750 V.	

Tim Crit. 3:32 PM Duration 6 min.

Rod A @ 16.105 on 92 sec period = 10.3¢

Leveled Rd A @ 18.815 Sensitivity 3.80¢/in.

276

6/23/58

8643

INSTRUMENT CHECK

γ

Time 8:40 AM

10/1000 gr 10" 10/1000 900V.

Source Dist. 1.5" 0" 16" 15" 15"

% F.S. Trip 85 OK 100+ 75 100+

C.A. ~~290~~ 88.5/11.5 Expr. 20-1 Run 5

Sheet ____ Date 6-23 1958 Time 9:05 AM

Purpose 20" Parallelepiped 30" Except 1 quadrant of 31". 30 1/4"

Removed One Quadrant Completely Reflected

22.7
12.2
34.9 Excess

LOADING CHANGE

			μ 235
Description	Removed: A 21 = 6	4,146	82.92
	~~A 22 = 6~~	~~8,292~~	~~165.84~~
	C 24 = 2	347	6.94
	Added: B 21	172.9	3.46

Mass before change 524586 gmU 10,491.70 gmU-235

Mass of Change ~~8,467~~ 4321 gmU ~~169.32~~ 86.40 gmU-235

Total Mass ~~516,119~~ ~~515,447~~ gmU ~~10,322.38~~ ~~10,218.80~~ gmU-235

Total mass 520,265 10,405.30

Rod A @ .05" on 74 sec period = 12.2 ¢

Leveled Rd. A @ 17.31 Sensitivity ____ ¢/in.

CRITICAL POSITIONS

C.A. 290 88.5/11.5 Expr 20-1 Run 5

.01 T ____ P

Channel

A - 17.31 A 48 100/250

C - 14.95 B .0042

C 6.1 3x10^-10 / 100

D ~~2.46~~ 37 200/750

Duration 6 min.

C.. 2% $\frac{88.5}{11.5}$ 20-1 Run 6

She 6-23 1958 9:43 AM

Purp. 20" Parallelipiped

30" High 30"

Removed one Quadrant completely reflected

LOADING CHANGE

Description Removed:	U	U-235
$C_2 4 = 8$	1,388	27.76
$A_2 1 = 4$	2,764	55.28
$B1 = 1$	172	3.46
Mass before change	520,265 gmU	10,405.30 gmU-235
Mass of Change	4,824 gmU	86.50 gmU-235
Total Mass	515,441 gmU	10,318.80 gmU-235

1/4"

Rod C @ 15" 37 sec period = 14.7 ¢

Levelled Rod C @ 13.333" Sensitivity ¢/in.

CRITICAL POSITIONS

C.. 2% $\frac{88.5}{11.5}$ Exp. 20-1 Run 6

.01 T P

Channel

A- 17.31		.43	100 / 200
C- 13.355		0.037	-10
14.7¢		6.5	2.5 x 10
A = 12.2	D	57	100 / 100
26.9	E	.5	750

Time Crit. AM PM Duration min.

Levelled Rod C = 14.75 -

A = 14.88 -

~~23.2~~ 22.7 ¢

4.2

Excess 26.9 ¢

C.A. 290 $\frac{88.5}{11.5}$ Expr. ~~20~~ 18 - 1 Run 1

Sheet _____ Date 6-23 1958 Time 1:15 PM

Purpose 18" Parallelipiped

48" High

Completely reflected

LOADING CHANGE

Description			U 235
	$A_24 = 184$	508,944	10,178.88
	$A_22 = 83$	114,706	2,294.12
	$A_21 = 24$	16,584	331.68
	$B_24 = 13$	8,957	179.40
	$C_24 = 2$	347	6.94
	$A_25 = 8$	20,000	400
Mass before change		gmU	gmU-235
Mass of Change		gmU	gmU-235
Total Mass	669.538	gmU 13,391.02	gmU-235

Sub-critical

C.A. 290 $\frac{88.5}{11.5}$ Expr. _____ Run _____

Sheet _____ Date 6-23 1958 Time 1:43 PM

Purpose 18" Parallelipiped

54" High

Completely reflected

LOADING CHANGE

Description			
	Added:	44,256	885.12
	$A_24 = 16$	27,640	552.80
	$A_22 = 20$	5,528	110.56
	$A_21 = 8$	6,209	124.20
	$B_24 = 9$	345	6.92
	$B_22 = 1$		
Mass before change	669,538 gmU	13,391.02	gmU-235
Mass of Change	83,978 gmU	1,679.40	gmU-235
Total Mass	753,516 gmU	15070.42	gmU-235

280

14790

Rod A @ .65 on 1.89 sec period = 5.8 ϕ/in.
Leveled Rd 4.0 / 4.83 Sensitivity ϕ/in.

CRITICAL POSITIONS

C.A. 270 88.5/11.5 18-1 Run 2

.01 T R

Channel

A - 14.83 50 100/200

C - .15 .004

- 5.2 3X10 -10 100

D 66 100

E. 6 750

Tim Crit. 2:06 AM/PM Duration 6 min.

54" High

5.8 ϕ

Excess

C.A. 270 88.5/11.5 18-1 Run 3

Sheet Col 95 Time 2:40 AM/PM

Purpo 18" Parallelepiped

55" High

Completely reflected

LOADING CHANGE

Description Added:

	A_2 1 = 16	11,056 - 22.12	
	C_2 4 = 16	2,777	55.52
	B_2 1 = 1	172	3.46
Mass b f	753,516 gmU	15,070.42	gmU-235
Mass of Cl	14,006 gmU	280.10	gmU-235
Total M	767,522 gmU	15,350.52	gmU-235

Rod A @ 14.83 on 178 sec period = 6.15

Leveled Rd. A @ 16.83 Sensitivity

6.15
5.8
11.95 + Excess

6/24/58

INSTRUMENT CHECK

T[illegible] 1:10 ~~AM~~ PM

Source Y

Channel

	A	B	C	D	E
	10/1000	OPR	10^{-11}	10/1000	900V.
Source Dist	1"		16"	15"	15"
% F.S. Trip	90		100	70	100+

C.A. 2% 88.5/11.5 Expr. 20-2 Run 1

Sheet ______ Date 6-24 1958 Time ______ ~~AM~~ PM

Purpose 20" CYLINDER

52" HIGH

COMPLETELY REFLECTED

SIDES REFL. WITH ~ ½ PLEX + ½ PARAFFIN

ENDS LOADING CHANGE PARAFFIN

Description	A24 = 200	553,200	11,064.00
	A245 = 8	20,000	400.00
	A22 = 52	71,864	1,437.28
	B24 = 45	31,045	621.00
	B22 = 10	3,458	69.20
	B21 = 9	1,556	31.14
	C24 = 120	20,832	416.40
	C22 = 11	948	19.03
	C21 = 20	868	17.36

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass 703,771 gmU 14,075.41 gmU-235

Rod A @ 17.50 on 79 sec period = 11.5 ¢

Leveler Rd. A @ 20.17 Sensitivity 4.30 ¢/in.

CRITICAL POSITIONS

C.A. 2% 88.5/11.5 Expr. 20-2 Run 1

.01 T ___ P ___

A 20.17

C .16

Channel

48 100/200

.0036

C 4.4 3×10^{-10} 100

D 68 100

E 8 750V

14.64 / 4.3 / 16.3 / 3

13.1 / 4.6 / 29.2

Tim. Crit. 1:35 ~~AM~~ PM Duration 6 min

C.A. 270 $\frac{88.5}{11.5}$ Expr. 20-2 Run 2

Sheet ____ Date 6-24 1958 Time 3:37 ~~AM~~ PM

Purpose 20" Cylinder
50" High
completely reflected
Sides Refl. with ~ ½ Plex. + ½ Paraffin
Ends Refl. " Paraffin

50"

LOADING CHANGE

Description Removed:

16: A_4	44,256	885.12
$C_2 4 = 5$	868	17.35
Added: $A_2 2 = 12$	16,584	331.68
$B_2 4 = 2$	1,379	27.60

Mass before change 703,771 gmU 14,075.41 gmU-235

Mass of Change 27,161 gmU 543.19 gmU-235

Total Mass 676,610 gmU 13,532.22 gmU-235

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Expr. 20-2 Run 2

.01

Channel

1 A	16.22	A	44	100 / 200
2 C	.155		.0032	
3		C	6.7	2.5 × 10⁻¹⁰
4		D	59	100 / 100
		E	6	750

Tim Crit. 3:53 PM Duration ____ min.

Rod A @ 13.00 in 102 sec period = 9.5 ¢
Leveled Rd. A @ 16.22 Sensitivity 2.95 ¢/in.
Rod A @ .0 in 102 sec period = 9.5 ¢
Leveled Rd. A @ 15.03 Sensitivity ____
Rod C = 13.00
C = out

8.3
2.9
17.2
3.6 ¢/in

17.30
16.22
1.28"
3.6
4.6 ¢

16.22
15.03
1.19"
× 3 ¢/in
3.57 ¢

9.5
3.6
13.1 ¢ Excess

29.2
13.1
16.1 ¢

or 8¢/1" layer

16

6/25/58

INSTRUMENT CHECK

Time 8:40 AM

	A	B	C	D	E
	10/1000	opr	10"	10/1000	900V
Source	1"	0"	16"	1"	15"
% F.S. Trip	90	OK	100+	65	100+

C.A. 2% 88.5/11.5 Expr 20-2 Run 3

Sheet 6-25-1958 8:55 AM — 49½

Purpose 20" Cylinder
49" on ½ of table - 50" on other ½
Ends Refl. with ~~Paraffin~~.
Sides refl. with 2-½" Plex + ½ Paraffin

LOADING CHANGE

Description Removed:

$A_2 2$ = 8	11,056	221.12
$B_2 4$ = 2	1,379	27.60
$C_2 2$ = 5	434	8.68
$B_2 2$ = 2	691	13.84
Add: $A_2 1$ = 8	5,528	110.56
$C_2 1$ = 5	217	4.34
$B_2 1$ = 6	1,037	20.76

Mass before 676,610 gmU 13,532.22 gmU-235
Mass of 6,778 gmU 135.58 gmU-235
669,832 13,396.64
Total gmU gmU-235

Rod A @ 14.5 on 107 sec period = 9.1 ¢
Levelec Rd. A @ 15.01 Sensitivity ¢/in.

x 3¢/in
30.57¢

16 ...

CRITICAL POSITIONS

C.A. 2% 88.5/11.5 Expr 20-2 Run 3

.01

A 15.01
C .155

Channel

A	64	100/200
B	.0042	
C	6.4	3x10^-10/100
D	44	200
E	60	750

7 min.

13.1 ¢ — 4.0 ¢/½" layer

C.A. 2901 88.3 Expr. 20-3 Run 1

Sheet ____ Date 6-25 1958 Time 3:50 PM

Purpose 20" Parallelepiped
64" High
Completely Bare

LOADING CHANGE

Description			U235
Total Inventory less			
	$C_2^4 = 19$	3,298.40	65.93
	$C_2 1 = 21$	911.40	18.22
	$C_2 2 = 11$	954.80	19.09
Total Inv.			
Mass before change		1,108,715 gmU	22,174.25 gmU-235
Less Mass of Change		5,164 gmU	103.24 gmU-235
Total Mass		1,103,551 gmU	22,071.01 gmU-235

MULTIPLICATION

Scaler 3 Unit Mult. 1 M

1 out

220 16x7+1=113
16x5+2=82

3 12 16x4+6=68
16x4+12=76

285

6/26/58

McCarty
Connolly (Auburn)
Lynn

INSTRUMENT CHECK

Time 10:00 AM Source γ

	A	B	C	D	E
Range	10/1000	EPR	10^{-11}	10/1000	900V
Source Dist.	1"	0"	1.5"	1"	17"
% F.S. Trip	85	OK	100+	65	100+

Counters

C.A 290 22-1 Run 1

She 6-26 Time 10:15 AM PM

Purr 22" Parallelepiped
52" High

Bare

LOADING CHANGE

Description			
$A_2 45$ = 4	10,000	200.00	
$C_2 4$ = 63	10,936	218.61	
$C_2 2$ = 9	781	15.62	
$B_2 2$ = 1	345	6.92	
$B_2 1$ = 6	1,037	20.76	
$C_2 1$ = 21	911	18.22	
Total Mass	1,108,715 gmU	22,174.25	gmU
Mass of Core	24,010 gmU	480.13	gmU
Total Mass	1,084,705 gmU	21,694.12	gmU

CRITICAL POSITIONS

C = 290 $\frac{58.5}{11.5}$ Run 1

.01

A = 16.835

C = 20.695

A 56 Channel $\frac{100}{200}$

.0041

6.4×10^{-10}

D $\frac{74}{100}$

.3 $\frac{100}{900}$

Rod A @ 14.50 on 1/41 sec period = 7.45 ¢
A @ 16.835 Sensitivity 3.2 ¢/in.

Level pc Rd.

C.A. 270 $\frac{88.5}{11.5}$ Expr. 22-1 Run 2

Sheet ______ Date 6-26 1958 Time 10:55 AM

Purpose 22" Parallelipiped

50" High

Completely Bare

50"

LOADING CHANGE

Description Removed: $A_2 4 = 25$ 69,150 - 1,383

Add: $A_2 2 = 15$ 20,730 - 414.60

$B_2 4 = 9$ 6,217 - 124.29

$B_2 2 = 1$ 343 - 6.92

Mass before change 1,084,705 gmU 21,694.12 gmU-235

Mass of Change 41,818 gmU 838.71 gmU-235

Total Mass 1,042,887 gmU 20,855.31 gmU-235

Rod 4 @ .05 on 1/22 sec period = 8.2 ¢

Levelec Rd. 4 @ 15.99 Sensitivity ______ ¢/in.

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Expr. 22-1 Run 2

Table P... .01 T...

		Channel	
4 - 15.99	A	51	100 / 200
C - 16.14	B	.0044	
	C	7.8 3X10	10
	D	76	100 / 100
	E	.3	900

Time Crit. 11:09 AM Duration 6 min.

C.A. 270 $\frac{88.5}{11.5}$ Exp. 22-1 Run 3

Sh. 6-26 1958 1:30 PM

Purp. 22" Parallelpiped
½ in 49" – ½ in 3/8"

49½"

Bare

LOADING CHANGE

Description Removed:

$A_2 2 = 5$	6,910	138.20
$A_2 1 = 6$	4,146	82.92
$B_2 4 = 4$	2,763	55.20
Added		
$B_2 1 = 6$	1,037.4	20.76
$C_2 4 = 13$	2,256.8	45.11
$C_2 1 = 1$	86.8	1.73

Mass before 1,084,705 gmU 20,855.31 gmU-235

Mass of Change 1,042,887 ~~10,440~~ gmU 208.72 gmU-235

Total Mass 1,032,447 gmU 20,646.59 gmU-235

Rod A: 0 to 15.99 = 8.2¢
A 15.99 to 16.835 = 2.7¢
16.835 to 18.195 = 5.5¢
16.4¢

CRITICAL POSITIONS

C.A. 270 $\frac{88.5}{11.5}$ Exp. 22-1 Run 3

Temp. .01

1. A – 18.195 — 44 — 100/200

Excess 2. C – .155 out — .0036

6.2 3 × 10⁻¹⁰

59 — 100/600

.2 — 900

1:45 Duration 7 min.

Rod A 16.835 – 202 sec period = 5.5¢

Leveled Rd. A @ 18.195 Sensitivity 4.07 ¢/in.

C.A. 290 $\frac{88.5}{11.5}$ 22-1 Run 4

Sheet 6-26-58 Time 2:12 PM

Purpose 22" Parallelepiped
48" High

Bare

48"

LOADING CHANGE

Description Removed	U	U235
A22 = 10	13,820	276.40
A21 = 10	6,910	138.20
B24 = 7	4,835	96.67
B22 = 1	345	6.92
B21 = 6	1,037	20.76
C24 = 25	4,340	86.75
C22 = 1	86	1.73

Mass before change 1,032,447 gmU 20,646.59 gmU-235

Mass of Change 31,364 gmU 627.43 gmU-235

Total Mass 1,001,083 gmU 20,019.16 gmU-235

CRITICAL POSITIONS

C.A. 290 $\frac{88.5}{11.5}$ Expt 22-1 Run 4

Table Pos. .01

∠ 1st Excess

Control Rod	Channel
1 A- 12.70	A 23 $\frac{100}{106}$
2 C- 155	B .0008
3	C 6.8 10^{-10}
4	D 30 $\frac{100}{56}$
	E ~~6.8~~ .1 900

Tim Crit. 2:23 ~~AM~~ PM Duration min.

C. 290 88.5/1.5 Exp 22-1 Run 5

She Da 6-26-58 Time 2:50 ~~AM~~ PM

Purp 22" Parallelepiped

48" High on ½ 48½"

49" ~~7 8 X X~~ on other ½

LOADING CHANGE

Description		U	U235
Added:			
$A_2 1 = 10$		6,910	138.20
$B_2 1 = 5$		864	17.30
$C_2 4 = 15$		2,604	52.05
$C_2 2 = 1$		86	1.73
Mass before	1,001,083 gmU		20,019.16 gmU-235
Mass of Change	10,464 gmU		209.28 gmU-235
Total Mass	1,011,547 gmU		20,228.34 gmU-235

CRITICAL POSITIONS

C. 290 88.5/1.5 22-1 Run 5

.01

Channel

1 A 15.065 45. 100/200

2 C- .155 .0036 -10

6.23X10 100

D 60 100

E .2 998

Tim Crit. 3:00 AM/PM Duration 6 min

Exists

Rod A @ .04 195 sec period = 5.7 ~~#~~

Leveled Rd. A @ 15.065 Sensitivity [redacted]

290

7/3/58

McCarty
Connolly
Lynn

INSTRUMENT CHECK

Time 9:00 AM   Source r

Channel

				D	E
Range	10/1000	off	10"	10/100	900 V
Source Dist.	1"	0"	15"	15"	15"
% F.S. Trip (Counts)	85	8K	100+	80	100+

C.A. 2570 ~~10.25~~ 9.75 Expr. 31m-1 Run 1

Sheet ______ Date 7-3-1958 Time 9:15 AM

Purpose 31" Diameter Cylinder [762 in² Base] Fuel 28" High

mixed Blocks

Bare

LOADING CHANGE

Description This assembly was built by alternating the 92/8 and 88.5/11.5 blocks which gives an avg. of 0.9454 g/in³. of U^{235}

$762\ in^2 \times .9454 \times 28 = 20.171\ Kg\ U^{235}$

Mass before change ______ gmU − 58 g for Rods gmU-235

Mass of Change ______ gmU 20.113 Kg U^{235} gmU-235

Total Mass ______ gmU ______ gmU-235

Super Critical at .40 on table

A45 (9270)

		Avg
A-4 3.92	4716 gm	36
A 2 2.65	2356 gm	108
A 1 1.95	1178 gm	147
B 4 1.63	1176 gm	64
B 2 .94	588 gm	8
B 1 .55	293 gm	4

Al foil

A45 4254 ±49 +57 16

C.A. 2% $\frac{9025}{9.75}$ 31-1 Run 2

Shee 7-3-38 Time 10:15 AM

Purp 31" dia Cylinder
27" High
Bare

LOADING CHANGE

Description Removed 1" Layer

[Base] 762 in² x .9457 x 27 = 19.450

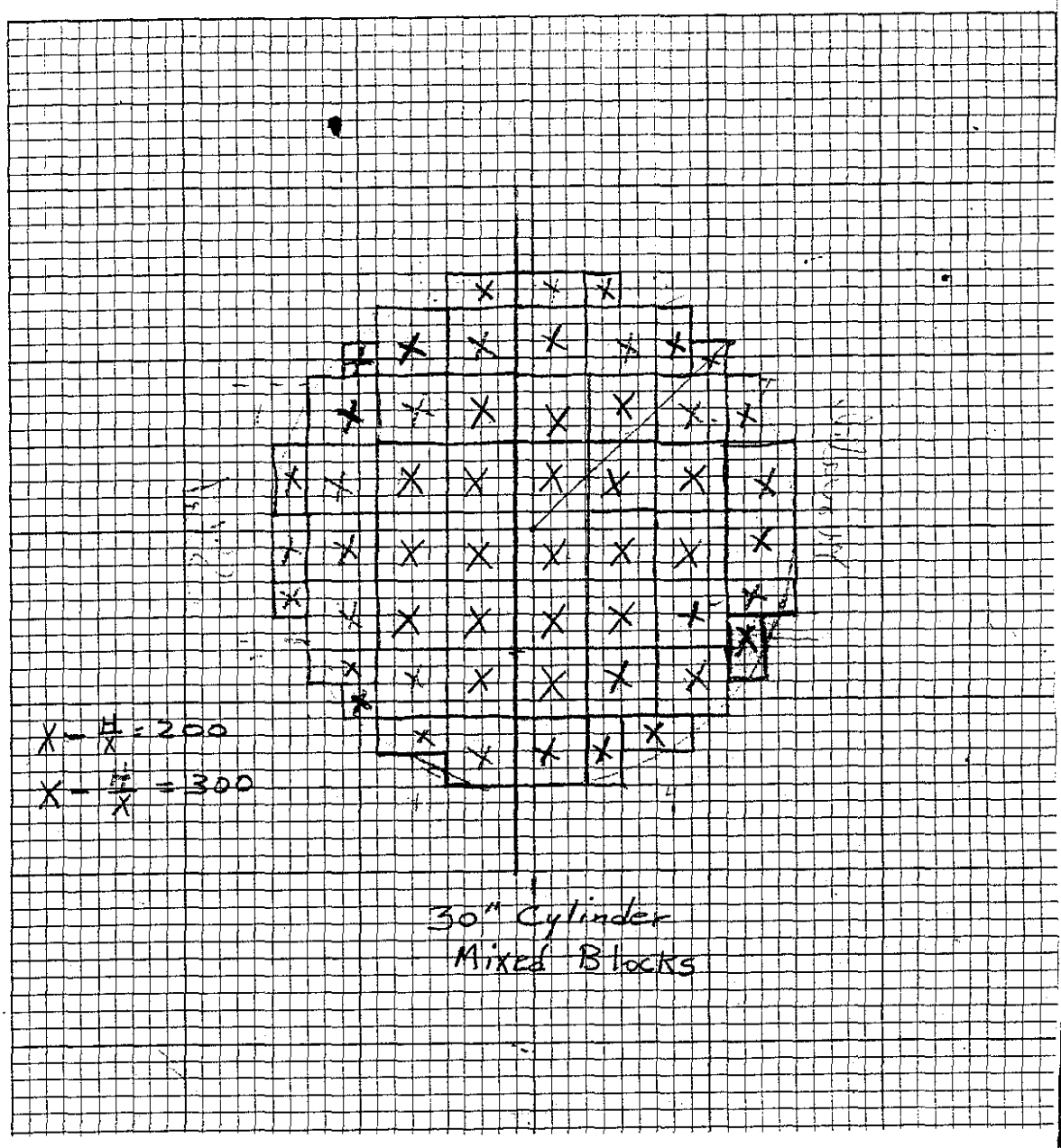
Mass before change gmU -58 gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 19,392 gmU-235

...ating
...n Dwg.

Super Critical at .10 on tables



C.A. 270 $\frac{90.25}{9.75}$ Expr. 30M-1 Run 1

Sheet ______ Date 7-3 1958 Time 12:45 PM

Purpose 30" Diameter Cylinder
Fuel 27" High

Bare

Assembly of mixed blocks stack alternately.

LOADING CHANGE

Description

708 in² X .9454 X 27 = 18,074.96
-55
18,019

Mass before change ______ gmU ______ 18,019 Kg -235
Mass of Change ______ gmU ______ gmU-235
Total Mass ______ gmU ______ gmU-235

Sub-critical

C.A. 270 $\frac{90.25}{9.75}$ Expr. 30M-1 Run 2

Sheet ______ Date 7-3 1958 Time 1:10 PM

Purpose 30" Diameter Cylinder
Fuel 28" High

Bare

LOADING CHANGE

Description

708 in² X .9454 X 28 = 18,741.60
-55

Mass before change ______ gmU ______ gmU-235
Mass of Change ______ gmU ______ gmU-235
Total Mass ______ gmU 18,686 gmU-235

Sub-critical

C.A. 290 $\frac{90.25}{9.75}$ Run 3

Sheet 30M-1 1:45 PM

Date 7-3-58

Purpose 30" Diameter Cylinder

Fuel 29" High

29"

BOARING CHANGE

Description

708 in² X .9454 X 29 = 19,410.94

- 35

Mass before gmU-235

Mass of Change 19356 gmU-235

Total Mass gmU-235

Super Critical - Tables together - No Reflector

C.A. 290 $\frac{90.25}{9.75}$ Expr. 30M - 1 Run 4

Sheet No. 7-3-58 Time 2:05 PM

Purpose 30" Diameter Cylinder

Fuel - 28" on ½

29" on ½

28½"

LOADING CHANGE

Description Removed 1" layer off ½ g stock.

708 in² X .9454 X 28.5 = 19075

Mass before change gmU - 55 gmU-235

Mass of Change gmU gmU-235

Total Mass gmU 19020 gmU-235

Critical Stamp Next Page

Rod C @ .15 on 87 sec period = 10.8 ¢

Leveled Rod C @ 15.97 Sensitivity ______ ¢/in.

CRITICAL POSITIONS

CA 270 98.25/9.75 Expr 30 m-1 Run 4

Table Pos .01

Channel

A - 14.00 A 68 100/100

C - 15.97 .0033

C 4.8 3x10^-10 100

D 49 100

E .2 900

Tim Crit. 2:17 ~~AM~~ PM Duration ______ min.

Level Rod A @ .035
Rod C = 16.51

LOADING CHANGE

Description ______

Mass before change ______ gmU ______ gmU-235

Mass of Change ______ gmU ______ gmU-235

Total Mass ______ gmU ______ gmU-235

10.8
11.1
1.94 Excess

16.51
15.97
.54"
x 2.04/in
~1.14

C.A. 2% $\frac{90.25}{9.75}$ Expr. 30M-1 Run 5
Sheet Date 7-3-58 Time 2:45 PM
Purpose 30" dia Cylinder
28 5/8" High
Bare

LOADING CHANGE

Description added 91 in³ or ~1 octant

708 in² X .9454 X 28.625 = 19.158
Mass before change ____ gmU ____ ~.55 gmU-235
Mass of Change ____ gmU ____ gmU-235
Total Mass ____ gmU 19.103 gmU-235
708 in² X .9454 X 28.35" = 18974
− 55
18.919 Kg for 28.35" High

28.50
− .125
28.375"
5C
28.35"

CRITICAL POSITIONS

C.A. 2% $\frac{90.25}{9.75}$ Expr. 30M-1 Run 5
Table Pos. ____

Control Rods	Channel
1 A = 14.00	A 36 100/200
2 C = 19.03	B .0037
3	C 5.23 X10⁻¹⁰
4	D 54 100/100
	E 3 900

Tim Crit. ____ AM PM Duration ____ min.

Rod C @ 15.97 on 12.8 sec period = 8.0¢/in.
Leveled Rd. C @ 19.03 Sensitivity ____ ¢/in.
Rod A = 14.00

11.9
8.0
19.9¢ Excess

19.03
15.97
3.06 | 8.00 2.6¢/inch

296

7-7-58

McCarty
Connolly
Lynn

INSTRUMENT CHECK

Time 1:00 PM Source Y

Channel

	A	B	C	D	E
Range	10/1000	opr	10^{-11}	10/1000	900V
Source Dist.	1.5'		15"	1.5'	17"
% F.S. Trip	85	-	100+	70	100+

Counters

C.A. 2% 90.25/9.75 Expr. 30M-2 Run 1

Sheet ____ Date 7-7-1958 Time ____ PM

Purpose 30" dia cylinder
18" High
Comp. Reflected

LOADING CHANGE

Description

708 in² X .9454 X 18" = 12,048.17

Mass before change ____ gmU ~~11,980.69~~ gmU-235
Mass of Change ~~12,048.17~~ ~~72.68~~ ~~5.20~~ gmU-235
Total Mass ~~11,975.49~~ ~~11,985.89~~ gmU-235

12,048.17
- 79.0
11,969.17 Kg U235

sub critical

C 2% $\frac{90.25}{9.75}$ 30M-2 Run 2

Sh 7-7 58 Time: 1:53 PM

Purp 30" Dia. cylinder

19" High

Completely reflected

19"

LOADING CHANGE

Description

708 in^2 × .9454 × 19" = ~~12,717.46~~

~~78.68~~

Mass b-f ~~12,644~~ gm U-235

Mass of Change −79 gm U-235

Total Mass 12,638.46 gm U-235

CRITICAL POSITIONS

CA 2% $\frac{90.25}{9.75}$ 30M. 2 Run 2

.015

A - 14.10 82 $\frac{100}{100}$

C - .155 .0035

6.5 3 × 10^{-10}

60 $\frac{100}{100}$

E 1.2 750

Tim Crit. 2:09 PM Duration 6 min.

Rod A @ .03 on 119 sec period = 8.5 ¢ Excess

Leveled Rd. A @ 14.10 Sensitivity ____ ¢/in.

C.A. 290 $\frac{90.22}{9.75}$ Expr. 30M-2 Run 3

Sheet _____ Date 7-7 1958 Time 2:35 PM

Purpose 30" Dia. Cylinder

Fuel 19" High + one octant 19 1/8"

Completely Reflected

LOADING CHANGE

Description _____

708 in X .9457 X 19.125 = 12.801

Mass before change _____ gmU _____ = ~~79.235~~

Mass of Change _____ gmU _____ gmU-235

Total Mass _____ gmU 12.722 gmU-235

8.5 #
1.5 #
10.8
20.8 # Extra

CRITICAL POSITIONS

C.A. 290 $\frac{90.25}{9.75}$ Expr. 30M-2 Run 3

Table File .015

		Channel
A 17.885	73	100
C .155	.0034	
	C 4.6	3.1×10^{-10}
	D 52	100
	E 1.4	750

Tim Crit 2:50 ~~AM~~ PM Duration ~~min~~

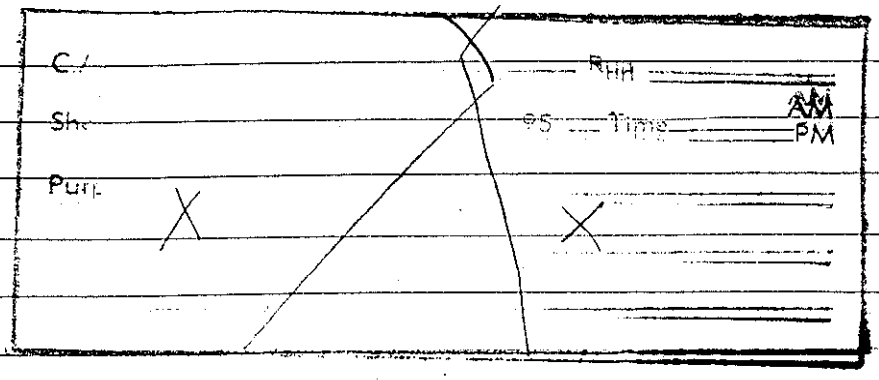
Rod C @ 14.60 on 87 sec period = 10.8

Leveled Rd. C @ 17.885 Sensitivity _____ ¢/in.

1 octant = 12.3 #

8.5/12.3 = .08" r

56 g U-235



12.722 g 19⅛"

12.638 g 19.0"

84 g for 1 cent

$\frac{8.5}{12.3} = 69\%$

84

.69

57.9 gm

12.638 Kg for 30" dia, 19" High

− 58

12.580 Kg - 0 ¢ Excess at 18.92"

Exp. Cont. in Book # 2