

## **BOOK79R**

*Notes:*

"CA.2" on front

"Y-NB-1694" on front

"CA2" on spine

Blank pages: page opposite page 1, 136, 138-152, inside back cover sheet opposite page 152

-pages having 1 graph sheet taped to it: 51, 52, 66, 100

-page 102 has 2 graph sheets taped to it

-page 103 has 3 graph sheets taped to it and 1 small sheet of paper stapled to it

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*August 30, 1999*

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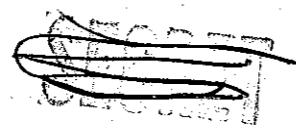
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Notelook no- 4-AB. 1694

Issued To- ~~Dr. A. D. Callahan~~ Calvin Hopper  
Dept. 3405  
Location 9735  
Date May 15, 1952

INVENTORIED FEB 27 1975  
INV 83

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C.A. 2    Expt. 1    Run 1  
 Sheet 1    Date May 15 1951    Time 1:30   
 Purpose To get multiplications to determine Mc for graphite-Plastic assembly theory check assembly

Mass  $\approx$  650 gm.  $\checkmark$   
 MULTIPLICATION

Scaler	c/10 min. BG/20 min.	Mult.	1/M
1	$40 \times 16 + 2$ $74 \times 16 + 9$		.930
2	$47 + 14$ $71 \times 16 + 2$		.748
3	$12 + 10$ $19 \times 16 + 7$		.771

See Loading sheets #1

All plastic inserted (18" long blocks), though some is in bottom of tubes. Tubes 12 & 14 - M, N, O, M', N', o' loaded. Other tubes within square bounded by P-10; K10; P-15; K15, in both halves, filled with graphite, but not U<sup>235</sup>. Shish types P, E.

Loading Change: U<sup>235</sup> inserted in

11 - K, L, M, N, O; 12 - N, O; 13 - K, L, M, N, O; 14 - N, O  
and symmetrically in movable half. (mirror image)

Ex. 1 Run 2

Mass = 1620 gm. ✓  
MULTIPLICATION

Scaler	c/ 10 min.	BG/ 20 min.	Mult.	1/M
1	55 × 16 + 2	74 × 16 + 9		.68
2	65 × 16 + 12	71 × 16 + 2		.57
3	13 × 16 + 7	19 × 16 + 7		.72

Ex. 1 Run 3

Date May 16 1951 Chief Callhan  
Recorder Mooneyham Crew Hunter  
Bly Jim...

Loading Change: Square now filled, bounded by J-9; O-9; J-14; O-14. ~~X~~-O-14 tubes filled, but not fueled. Movable half symmetrical (mirror image) Shish types D, E.

INSTRUMENT CHECK

Time 9:45 AM ~~PM~~ Source # 172

Channel 20  
A B C D E

Range \_\_\_\_\_ 5 × 10<sup>-10</sup> 2 × 10<sup>-10</sup> 1200v

Source Dist. \_\_\_\_\_ 3" 4" 6"

% F.S. Trip \_\_\_\_\_ ~300% ~300% 70%

Mass = 2,916 gm. ✓  
MULTIPLICATION

Scaler	c/ 10 min.	BG/ min.	Mult.	1/M
1	60 × 16 + 15			.61
2	68 × 16 + 15			.53
3	14 × 16 + 3			.69

Ex. 1 Run 4 Loading change: Now have rectangle 7 × 8, bounded I-90; P-9; ~~I-14~~ P-14; P-15, filled & fueled. Movable half symmetrical (mirror image) Shish types D, E.

Mass = ~~2,916~~ gm. 4320 v  
MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	1156	597		.51
2	1261	569		.45
3	282	156		.55

Ex. 1 Run 5

Loading change: Now have 9x9 loaded, bounded by I 8; Q 8; I 16; Q 16. Other side symmetrical (mirror image). Note: tubes I, I'-16 contain only two Q-size shishes. Shish types D, E.  $W_{25} = 6.750 \text{ kg}$

$6,750 \checkmark$   
Mass = ~~6686~~g  
MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	1420	597		.42
2	1622	569		.35
3	313	156		.50

Ex. 1 Run 6

Date May 17, 1957 Chie' Callahan  
Recorder Mooring Hunter C. Bly  
Zimmerman

INSTRUMENT CHECK

Time 10:35 AM Source PB 174

Range	Channel			
	A	B	C	E
	OK	OK	5x10"	5x10" 1200m
Source Dist.			5"	4'
% F.S. Trip			~300%	90% ~100%
			Counters 1,2,3	OK.

Ex. 1 Run 7

Loading change: See sheet #1: Plastic all in place as before; all shishes loaded except rows 6 & 7. Shish types D, E.

$W_{25} = \cancel{87754} 9018 \text{ g.}$   
MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	1737	597		.34
2	1963	569		.29
3	410	156		.38

Ex. 1 Run 7

Loading change: All tubes full, as per sheet #1. Shish types F & G in fixed half, D & E in movable.

$\downarrow 11,466 \text{ (Bly)}$   
Mass = ~~11,542~~g  $W_{25} = 11,686.5$   
MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	2374	597		.25
2	2690	569		.21
3	666	156		<del>.42</del> .24

Ev. 1 Run 8

Date May 18 1951 Chief Callahan  
 Recorder Mooneyham Crew Bly  
Hoake Hunter Zimmerman Williams

INSTRUMENT CHECK

Time 13:00 PM Source 172  
~~3:00 PM~~

	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>OK</u>
Source Dist.			<u>12"</u>	<u>10"</u>	<u>6"</u>
% F.S. Trip			<u>95%</u>	<u>7100%</u>	<u>100%</u>

Counters 1, 2, 3 - OK

Loading Change: Pulveras per sheet #1 full.  
 Type F & G in fixed half. Type H & I in  
 movable half.

Mass = 15,025.5g.  
MULTIPLICATION

Scaler	c/ 10 min.	BC/ 10 min.	Mult.	1/M
1	<u>3685</u>	<u>597</u>		<u>.16</u>
2	<u>4222</u>	<u>569</u>		<u>.14</u>
3	<u>837</u>	<u>156</u>		<u>.19</u>

~~INSTRUMENT CHECK~~

~~Time AM PM~~

~~Source~~

~~Channel A B C D E~~

~~Range~~

~~Source Dist.~~

~~% F.S. Trip~~

Ex. 1 Run 9

Date May 21 19551 Chief Callahan  
 Recorder Zimmerman & Thompson Crew Hunter  
Ply, Dames,

INSTRUMENT CHECK

Time 10:50 ~~AM~~ Source 177

	A	B	C	D	E
Channel	OK	OK	5X10"	5X10"	OK
Range			2ft	3 1/2 ft	6"
Source Dist.					
% F.S. Trip			>100%	>100%	100%

Counter 423 OK Voltage 1200

Loading Change: Approx. 3" Be reflector was added ~~to~~ to the movable half as shown on loading diagram. Purpose: to obtain criticality with this thickness

MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	<u>4488</u>	<u>597</u>		<u>.133</u>
2	<u>5479</u>	<u>569</u>		<u>.104</u>
3	<u>1539</u>	<u>156</u>		<u>.101</u>

Ex. 1 Run 10

Loading Change: Approx. 3" Be reflector added to fixed half, making 3" jacket reflector on both halves. See loading sheet for details

MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	<u>8586</u>	<u>597</u>		<u>.070</u>
2	<u>9600</u>	<u>569</u>		<u>.060</u>
3	<u>2830</u>	<u>156</u>		<u>.055</u>

Ex. 1 Run 11

Loading Change: Be reflector increased to approx 6" (jacket)

MULTIPLICATION

Scaler	c/ 10 min.	BG/ 10 min.	Mult.	1/M
1	<u>46500</u>	<u>597</u>		<u>.013</u>
2	<u>50700</u>	<u>569</u>		<u>.011</u>
3	<u>19100</u>	<u>156</u>		<u>.0082</u>

E.1 Run 12

Date May 22, 1951 Chief Callahan  
 Recorder Mooneyhan + Zimmerman Crew Hunter  
By Shorten Donnes

INSTRUMENT CHECK

Time 2:45 ~~AM~~ <sup>PM</sup> Source PB 172

	Channel				
	A	B	C	D	E
Range	<u>10 m. 50 sm</u>	<u>OK</u>	<u>5X10"</u>	<u>5X10"</u>	<u>OK (1200V)</u>
Source Dist.	<u>~4.5'</u>	<u>—</u>	<u>2'</u>	<u>2 1/2'</u>	<u>6"</u>
% F.S. Trip	<u>—</u>	<u>—</u>	<u>&gt;100%</u>	<u>&gt;100%</u>	<u>~100</u>

Counters 1, 2, 3 OK.  
 Loading: As shown on sheet #7. Mass = 17.8 kg.

CRITICAL POSITIONS

C.A. 2 Expt. 1 Run 1

Table Pos. .000" .0288 .0335

Control Rod	Channel
<u>A 1865 165</u>	<u>A</u>
<u>B 20,03 Out</u>	<u>B</u>
<u>D 20,07 Out</u>	<u>C</u>
	<u>D</u>
	<u>E</u>

Time Crit. 3:30 ~~AM~~ <sup>PM</sup> Duration 15 min.

Date May 23, 1951 Chief Callahan  
 Recorder Mooneyhan Crew Hunter  
By Zimmerman Wilkins

INSTRUMENT CHECK

Time 9:30 ~~AM~~ <sup>PM</sup> Source PB 172

	Channel				
	A	B	C	D	E
Range	<u>10/25</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200V</u>
Source Dist.	<u>8</u>	<u>OK</u>	<u>2'</u>	<u>1'</u>	<u>10"</u>
% F.S. Trip	<u>—</u>	<u>—</u>	<u>FST</u>	<u>FST</u>	<u>100</u>

Counters OK.

C.A. 2 Expt. 1 Run 13

Sheet 8 Date May 23, 1951 Time 9:50 ~~AM~~ <sup>PM</sup>

Purpose To measure critical conditions with core ~43.5" in diameter and a Be reflector (~3" to 6") Mass = 20.5 kg.

Loading: As shown on sheet #8 except plastic is missing as follows:

Two  $1\frac{1}{2} \times 1\frac{1}{2}$ " plastic rods missing from G, G'-15; H, H'-17; J, K, K', L, L'-19.

One  $1\frac{1}{2} \times 1\frac{1}{2}$ " plastic rod missing G, G'-9; F, F'-11; F, F'-13; M, N, O, P, Q-19

Two thirds ( $\frac{2}{3}$ )  $1\frac{1}{2} \times 1\frac{1}{2}$ " plastic missing R, Q'-17; M', N', P', Q'-19



CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 13

Table Pos. 1.035" L T R

Control Rod	Channel
A <u>Out</u>	A _____
<u>/</u>	B _____
C <u>Out 20.03"</u>	C _____
D <u>Out 20.07"</u>	D _____
	E _____

Tim Crit. 10:20 <sup>AM</sup>~~PM~~ Duration \_\_\_\_\_ min.

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 13

Table Pos. 1.082" L T R

Control Rod	Channel
A <u>14.65"</u>	A _____
<u>/</u>	B _____
C <u>Out 20.03"</u>	C _____
D <u>Out 20.07"</u>	D _____
	E _____

Tim Crit. 10:25 <sup>AM</sup>~~PM~~ Duration \_\_\_\_\_ min.

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 13

Table Pos. 1.185" L T R

Control Rod	Channel
1 <u>3.18"</u>	A _____
<u>/</u>	B <u>~.003 on log n</u>
3 <u>Out 20.03"</u>	C _____
4 <u>Out 20.07"</u>	D _____
	E _____

Tim Crit. 10:30 <sup>AM</sup>~~PM~~ Duration \_\_\_\_\_ min.

C.A. 2 Expr. 1 Run 14

Sheet \_\_\_\_\_ Date May 23, 1951 Time 1:55 <sup>AM</sup>~~PM~~

Purpose To remove more reflector (17 on each half) and change to 4" of graphite in center of reactor (fixed half altered but same length)

*Loading change: Type J & K shishes were inserted in place of type F & G shishes on the fixed table. All Be was removed from rows 4 & 22 of both halves and columns V and V'.*

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 14

Table Pos. 0.00 L T R

Control Rod Channel

A ~~10.4~~ 10.4 A

B .002 on log n

C Out

D Out

E

Tim Crit. 2:00 ~~AM~~ PM Duration \_\_\_\_\_ min.

C.A. 2 Expr. 1 Run 15

Sheet \_\_\_\_\_ Date May 23 1951 Time 2:50 ~~AM~~ PM

Purpose To approach bare reactor by removing Bc and adding core. Mass = 22.0 kg.

Loading: See Sheet #9

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 15

Table Pos. Together L T R

Control Rod Channel

A 7.1 A

B .001 on log n

C Out

D Out

E

Tim Crit. 4:30 ~~AM~~ PM Duration \_\_\_\_\_ min.

C.A. 2 Expr. 1 Run 16

Sheet \_\_\_\_\_ Date May 23 1951 Time \_\_\_\_\_ ~~AM~~ PM

Purpose To approach bare assembly by removing Bc Mass = 22.0 kg.

Loading Change:  
Removed Bc from columns U & U', rows 8-18.

Result: Sub-critical with tables together and all three control rods in. Almost made it go.  
log n = .001 with source in

Date 24 May 1951 City Callhan  
 Recorder Moodyham & Bly Crew Kuntar

INSTRUMENT CHECK

Time 2:30 <sup>AM</sup> ~~PM~~ Source PB-173,174

Range	Channel				
	A	B	C	D	E
	<u>OK</u>	<u>OK</u>	<u>10"</u>	<u>10"</u>	<u>1020R</u>
Source Dist.			<u>4'</u>	<u>1'</u>	<u>0"</u>
% F.S. Trip			<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>

Loading change: See sheet #10

C.A. 2 Expr. 1 Run 17  
 Sheet \_\_\_\_\_ Date May 24, 1951 Time 2:30 <sup>AM</sup> ~~PM~~  
 Purpose To approach bare assembly by removing B<sub>2</sub> and adding core.  
Mass = 23.6 kg.

Result: Sub critical log  $k = .00075$  with source in

MULTIPLICATION				
Scaler	c/10 min	BG/10 min	Mult.	1/M
1	<u>47,769</u>	<u>597</u>	<u>0.0125</u>	
2	<u>51,873</u>	<u>569</u>	<u>0.0110</u>	
3				

Date 5-25 1951 Chief Callahan  
 Recorder Mooneyham Crew Hunter  
Frank Zimmerman Downes Williams

C.A. 2 Expr. 1 Run 18  
 Sheet \_\_\_\_\_ Date May 25, 1951 Time 11:00 <sup>AM</sup>  
 Purpose To approach bare assembly by removing  
Bc and adding fuel  
Mass = 27.0 kg.

INSTRUMENT CHECK

Time 10:05 <sup>AM</sup> Source PB-173 E 174

	Channel				
	A	B	C	D	E
Range:	<u>OK</u>	<u>OK</u>	<u>5x10<sup>-11</sup></u>	<u>5x10<sup>-11</sup></u>	<u>1200V</u>
Source Dist:			<u>1'</u>	<u>1'</u>	<u>3"</u>
% I.S. Trip			<u>100</u>	<u>100</u>	<u>100</u>

Counters 12.7 - OK

Loading: See Sheet #11

Result: Sub-critical but very, very, very near critical  
 About 2" more of control rod probably would  
 have made it.

C.A. 2 Expr. 1 Run 19  
 Sheet \_\_\_\_\_ Date May 25, 1951 Time 2:45 <sup>PM</sup>  
 Purpose To approach bare assembly by  
removing Bc and adding cork.  
Mass = 29.3 kg.

Loading: Sheet #12

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 19

Table Pos. 00.00" | T

Control Rod	Channel
<u>A 0.00" In</u>	A
<u>2</u>	B
<u>C 11.70"</u>	C
<u>D 20.09" Out</u>	D
	E

Tim Crit. 3:15 ~~PM~~ Duration \_\_\_\_\_ min.

Date May 26, 1951 Chief Callihan

Recorder Mooneyham Crew Hunter

William Wainburg

INSTRUMENT CHECK

10:45 ~~PM~~ <sup>AM</sup> Source #1736175

	Channel				
	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>5-10"</u>	<u>5-10"</u>	<u>1200r.</u>
Source Dist.			<u>12"</u>	<u>12"</u>	<u>2"</u>
% F.S. Trip			<u>100%</u>	<u>100%</u>	

Counters OK

C.A. 2 Expr. 1 Run 20

Sheet \_\_\_\_\_ Date May 26, 1951 Time 11:00 ~~PM~~ <sup>AM</sup>

Purpose In approach bare assembly by putting proper size Plexiglas.

Mass still = 29.3 kg.

Loading: Replaced all Be ~~rod~~ with finished Plexiglass which Be had been used as moderator (not the reflector) in the fixed half. In movable half still have some under size Plexiglass. Fuel not changed from last run. See loading sheet # 13

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 20

Table Pos. 00.00 L T R

Control Rod Channel

3.50 A 10/500 35

B .002

C

D

E

Out 20.03

Out 20.09

Tim Crit. 1140A AM PM Duration      min.

C.A. 2 Expr. 1 Run 21

Sheet      Date May 26, 1951 Time 1:00 ~~AM~~ PM

Purpose To approach bare assembly by removing Bc

Loading Change: Bc removed from E-16 and E'16, F-17 and F'17, G-18 and G'18, S18 and S'18, T'17 and T'17, U16 and U'16.

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 21

Table Pos. 00.00 L T R

Control Rod Channel

In 00.00" A 10/200 - 45

B .001

In 99.97" C 5x10<sup>-9</sup> x 0.5

12.10" D

E

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

C.A. 2 Expr. 1 Run 22

Sheet      Date May 26, 1951 Time 1:30 ~~AM~~ PM

Purpose To approach bare assembly by removing Bc

Loading Change: R 19 and R'19, H 19 and H'19 tubes of Bc removed. Now have inner tubes of Bc on each half. See sheet #14.

CRITICAL POSITIONS

C.A. 2    Expr. 1    Run 22

Table Pos. 00.00    L    T    R

Control Rod	Channel
1 <u>In 0000</u>	A <u>14/200 - 35</u>
2 _____	B <u>1001</u>
3 <u>In 99.99</u>	C _____
4 <u>1.56</u>	D _____
	E _____

Tim Crit. 1:45    ~~AM~~ PM    Duration \_\_\_\_\_ min.

INSTRUMENT CHECK

Time 10:30 <sup>AM</sup>/<sub>PM</sub>    Source 1738/175

Range	Channel				
	A	B	C	D	E
	<u>de</u>	<u>de</u>	<u>5x10<sup>-4</sup></u>	<u>3x10<sup>-4</sup></u>	<u>1200</u>
Source Dist.			<u>6"</u>	<u>6"</u>	<u>2"</u>
% F.S. Trip			<u>100%</u>	<u>100%</u>	

Date May 28, 1951 195 Chief Hester

Recorder \_\_\_\_\_ Crew Dunn

Zimmerman Bly Callahan

C.A. 2    Expr. 1    Run 23

Sheet \_\_\_\_\_ Date \_\_\_\_\_ 195 Time \_\_\_\_\_ <sup>AM</sup>/<sub>PM</sub>

Purpose Approach 13 on Assembly

loading: See sheet #15

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 23

Table Pos. 00.00 L T R

Control Rod Channel

1 00.00 In A 10/500 14.

2 10.975 B .00070

3 20.097 Out C

4 \_\_\_\_\_ D \_\_\_\_\_

\_\_\_\_\_ E \_\_\_\_\_

Tim Crit. 11:10 ~~AM~~ ~~PM~~ Duration — min.

loading change: All Beryllium removed.  
Graphite & fuel shish tabs added in  
tubes E, E', U, U'-16; G, G', S, S'-18; I, I', Q, Q'-20

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 24

Table Pos. 0.000 L T R

Control Rod Channel

A 00.000 A (10/500) 25

B 11.235 B .00108

C 20.09 C

D \_\_\_\_\_ D \_\_\_\_\_

E \_\_\_\_\_ E \_\_\_\_\_

Tim Crit. 1:45 ~~AM~~ ~~PM~~ Duration 7 min.

loading change: Row 3 in both halves  
emptied.

CRITICAL POSITIONS

C.A. 2 Expr. 1 Run 25

Table Pos. 00.00 L T R

Control Rod Channel

1 00.00 In A 10/201 45

2 5 B .001

3 5.44" C

4 20.09 Out D 2x10<sup>-12</sup> X 5.5

\_\_\_\_\_ E \_\_\_\_\_

Tim Crit. 2:53 ~~AM~~ ~~PM~~ Duration \_\_\_\_\_ min.

loading change: All undersize plastic,  
both halves, replaced with full size.



CRITICAL POSITIONS

CA. 2 Expr. 1 Run 26

Table Pos. 0.000 I T R

Control Rod	Channel
A <u>0.000</u>	A <u>25 (10/200)</u>
B <u>8.56</u>	B <u>.0007</u>
C <u>20.09</u>	C <u>3.9 (2 x 10<sup>-10</sup>)</u>
D	D
E	E

Tim Crit. 5:10 <sup>AM</sup> ~~PM~~ Duration 10 min.

Date 5-29 1951 Chief Hunter

Recorder Weinberg Crew Bly

Zimmerman

INSTRUMENT CHECK

Time 9:00 <sup>AM</sup> ~~PM~~ Source 173 175

Range	Channel				
	A	B	C	D	E
	<u>OK</u>	<u>OK</u>			
Source Dist.			<u>3'</u>	<u>4'</u>	<u>4'</u>
% F.S. Trip			<u>100+</u>	<u>100+</u>	<u>100+</u>

Counters OK

*2 1/2" dia In-Al foil and one 3/8" dia Cd foil inserted near center of reactor in L'12.*

Date ~~5-29-51~~ 195 Chief \_\_\_\_\_

Recorder \_\_\_\_\_ Crew \_\_\_\_\_

Purpose: *Reduce central void due to control rods*

CRITICAL POSITIONS

CA. 2 Expr. 1 Run 27

Table Pos. 0.00 I T R

Control Rod	Channel
A <u>0.000</u>	A <u>60 (1000/25)</u>
B <u>-0.025</u>	B <u>.01</u>
C <u>13.915</u>	C <u>4.3 (5 x 10<sup>-9</sup>)</u>
D	D <u>8.8 (1 x 10<sup>-9</sup>)</u>
E	E <u>19 (900 v.)</u>

Tim Crit. 9:58 <sup>AM</sup> ~~PM~~ Duration 20 min.

*Looking Change: Bulbs E, I, J, I'20, H, H'19 + I, I'20 completely imploded.*

CRITICAL POSITIONS

CA. 2 Expr. 2 Run 281

Table Pos. 000 I T R

Control Rod	Channel
A <u>0000</u>	A <u>24 (1000/500)</u>
B	B <u>10</u>
C <u>13.97</u>	C <u>7.1 (5 x 10<sup>-9</sup>)</u>
D <u>0.05</u>	D <u>6.0 (2 x 10<sup>-9</sup>)</u>
E	E <u>73 (750 v.)</u>

Tim Crit. 11:12 <sup>AM</sup> ~~PM~~ Duration 20 min.

*Determine operating times power level, and speed reactivity necessary for grid stabilization*

CA. 2 Expr. 2 Run 1

Sheet 15 Date 5-29-1951 Time 10:45 am

Purpose Determine operating times power level, and speed reactivity necessary for grid stabilization

C.A. 2 Expr. 2 Run 2  
 Sheet 15 Date 5-29 1951 Time 3:29 PM  
 Purpose \_\_\_\_\_

CRITICAL POSITIONS  
 C.A. 2 Expr. 2 Run 2  
 Table Pos. 00.00 1030 T. 032  
 Control Rod Channel  
 1 00.00 Im A \_\_\_\_\_  
 2 \_\_\_\_\_ B .055  
 3 014.2 C \_\_\_\_\_  
 4 00.04 Im D \_\_\_\_\_  
 E \_\_\_\_\_  
 Tim Crit. 413 ~~AM~~ PM Duration 20 min.

FOIL IRRADIATION  
 Pos. \_\_\_\_\_ Time Off \_\_\_\_\_ Exposed \_\_\_\_\_ Min. Control \_\_\_\_\_  
 Description Im 9070 AL 9070  
 Wt. \_\_\_\_\_  
 Thickness .010  
 Channel ~~A~~ B Pos. L'12  
 Range \_\_\_\_\_  
 Reading .056

Pos. Foil No.  
 G1-1 ch(1/4) 11  
 G1-4 " 1  
 G3-1 " 20  
 G3-4 " 21  
 P1-1 " 22  
 G3 L'14 An Power Step Au-7  
 EG03

Position Code:  
 1st B or P Means foil exposed in graphite or Plexiglas  
 2nd 1 means foil 1" from interface  
 (Note this is position of 1st fuel disk  
 3rd 1 thru 6 Position from Top to bottom of  
 shield:  
 Graphite:  
 1 1" 1.5"  
 2 1" 2.5"  
 3 1" 3.5"  
 4 1" 4.5"  
 5 1" 5.5"  
 6 1" 6.5"  
 or for Plex:  
 1 0.25"  
 2 0.50"  
 3 0.75"  
 4 1.00"  
 5 1.25"  
 6 1.50"

Date May 30, 1951 Chief Hunter  
 Recorder \_\_\_\_\_ Crew Williams  
Callahan

INSTRUMENT CHECK  
 Time 907 AM PM Source 173 175  
 Channel A B C D E  
 Range 10/25 10<sup>-10</sup> 10<sup>-10</sup> 1200<sup>v</sup>  
 Source Dlst. OK OK 8" 4" 3"  
 % F.S. Trip \_\_\_\_\_ F5+ F5+ 100

5/30/51

C.A. 2 Expr. 2 Run 3  
 Sheet 15 Date 5-30 1951 Time AM  
 Purpose Thermal Neutron  
Traverse

CRITICAL POSITIONS  
2 Expr. 2 Run 3  
 Pos. 0.00 T 0.00  
 Control Rod Channel  
 A 0.000 In A 48 x 10<sup>6</sup>/1000  
 B — B 0.05  
 C 15.32 C NS x 10<sup>-8</sup>  
 D + 0.04 In D 5 x 10<sup>-8</sup>  
 E —  
 Tim Crit. 9:42 AM Duration 20 min.

FOIL IRRADIATION  
 Pos. — Time Off — Exposed — Min. Control —  
 Composition In  
 Wt. —  
 Thickness 0.10  
 Channel B  
 Range —  
 Reading 0.05

Pos In Foil  
 L'12 { G1-2 2.  
 G1-5 4.  
 G3-2 7.  
 G3-5 6.  
 L'13 P1-2 14.  
 L'14 Au-8 (Pown)

C.A. 2 Expr. 2 Run 4  
 Sheet 15 Date 5-30 1951 Time 1045 AM  
 Purpose Continue Traverse

CRITICAL POSITIONS  
2 Expr. 2 Run 4  
 Pos. 00.00 T .028 .0315  
 Control Rod Channel  
 1 00.00 In A 1000/100 66  
 2 — B .06  
 3 15.2 C 6.7 x 2 x 10<sup>-8</sup>  
 A 00.04 In D —  
 E 33 at 750V  
 Tim Crit. 10:59:50 AM Duration — min. 20 min?

FOIL IRRADIATION  
 Pos. — Time Off — Exposed — Min. Control —  
 Composition In  
 Wt. —  
 Thickness 0.10  
 Channel — Pos. —  
 Range —  
 Reading —

Pos In Foil  
 L'12 { G3-3 19.  
 G3-6 9.  
 G1-3 15.  
 G1-6 24.  
 L'13 { P1-3 3.  
 P1-5 17.  
 L'14 G3 Au 9

C.A. 2 Expr. 2 Run 5  
 Sheet 15 Date 5-30 1<sup>st</sup> 2:45 AM  
 Purpose Continue traverse and take  
dist. in fuel.

CRITICAL POSITIONS  
 C.A. 2 Expr. 2 Run 5  
 Foil Pos. 00.00 10267 T R 0319  
 Control Rod Channel  
 1 00.00 A 50 100/1000  
 2 \_\_\_\_\_ B .053  
 3 14.12 C \_\_\_\_\_  
 4 00.04 D \_\_\_\_\_  
 E 47 J 810V  
 Tim Crit. 2:51 AM PM Duration \_\_\_\_\_ min.

20 min - turn

FOIL IRRADIATION  
 Pos. \_\_\_\_\_ Time Off \_\_\_\_\_ Exposed \_\_\_\_\_ Min. Control \_\_\_\_\_  
 Composition In + Al catcher  
 Wt. \_\_\_\_\_  
 Thickness .010 .002  
 Channel \_\_\_\_\_ Pos. \_\_\_\_\_  
 Range \_\_\_\_\_  
 Reading \_\_\_\_\_

IN #  
 { P1-4 13 } L-13  
 { P1-6 8 }  
 AU-2 (L-14) G3  
 A1 1 } .002" U#1  
 2 }  
 3 } .002" U#2  
 4 }  
 5 } U#3 } L-12  
 6 } U#4 } G1  
 7 }  
 8 }  
 9 } U#5  
 10 }

Date May 31 1951 Chief Hunter  
 Recorder Sumner Crew Dennis

INSTRUMENT CHECK  
 Time 10:15 AM PM Source E173  
 Channel  
 A B C D E  
 Range OK OK out 5X10" 1200V  
 Source Dist. \_\_\_\_\_ 8" 2"  
 % F.S. Trip \_\_\_\_\_ 7100% 100%  
Counters 1, 2, 3 - OK

C.A. 2 Expr. 2 Run 6  
 Sheet \_\_\_\_\_ Date 5/31 1951 Time 10:43 <sup>AM</sup>  
 Purpose To measure fission decay  
curves from capture foils

Test Shish L'12 @ A1 foils  
 13 and 14 at G1  
 15 .. 16 at G5  
 (numbers towards fuel)

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 6  
 Table Pos. 0000 L T R  
 Control Rod Channel  
 1 00000 A 94 \* 1000/25  
 2 \_\_\_\_\_ B 0.02  
 3 \_\_\_\_\_ C out  
 4 0.04 D 7.9 - 2x10<sup>-9</sup>  
 E 19 at 840V  
 Tim Crit. 10:43 <sup>AM</sup> Duration \_\_\_\_\_ min.

C.A. 2 Expr. 2 Run 7  
 Sheet 15 Date 5-31 1951 Time 2:00 <sup>PM</sup>  
 Purpose Continue Thermal Neut Distr.

Foil Loading

L'12 G1-1 In 23    L'14 Au-10    L'15 G1-1 In 27  
 G1-4 In 5  
 G3-1 In 12  
 G3-4 In 26  
 G1-24 In 36  
 G3-1 In 33  
 G3-24 In 31

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 7  
 Table Pos. -0005 L T R  
 Control Rod Channel  
 A 0000 A 85 (100/200)  
 B 0.021  
 C out  
 D .04" D 3.5 (5x10<sup>-9</sup>)  
 E 9 (770 V)  
 Tim Crit. 2:15 <sup>PM</sup> Duration 20 min.

C.A. 2    Expr. 2    Run 8  
 Sheet 15    Date May 31, 1951    Time 3:38 <sup>AM</sup>/<sub>PM</sub>  
 Purpose Cont Thermal Vent Meters and check capture efficiency of Al catcher

L'13 G1-2 In 58'    L'14 G3 Au 11  
 G3-2 In 52'    G1 Al 17 Next to Fuel  
 P1-1 In 69'    G1 Al 12 2<sup>nd</sup>  
 P1-7 In 74'

CRITICAL POSITIONS

C.A. 2    Expr. 2    Run 8  
 Table Pos. 00.005    1024 T 0315  
 Channel

A	+ 00.004	A	96 (100/500)
B	00.04	B	.0470
C	13.51	C	out
D	00.04	D	4.8 (10-8)
E		E	26 (750)

Tim Crit. 3:56 <sup>AM</sup>/<sub>PM</sub>    Duration 20 min.

Date 6-1 1951 Chief Callihan  
 Recorder Zimmerman Crew Hunter  
Hacker Bly Downes

INSTRUMENT CHECK

Time 8:30 <sup>AM</sup>/<sub>PM</sub>    Source { 173 / 175  
 Channel  
 Range    A    B    C    D    E  
           OK OK out 10 1200v  
 Source Dist.                8" 8"  
 % F.S. Trip                100+ 100+

Counters  
OK

C.A. 2    Expr. 2    Run 9  
 Sheet 15    Date 6-1 1951 Time 8:45 <sup>AM</sup>/<sub>PM</sub>  
 Purpose Continue Thermal Vent Meters (Cd covered Im)

Hoils:

L'12 G1-1 Cd Im 11 Cd    L'14 Au - 12  
 G1-4 " In 1 "  
 G3-1 " In 20 "  
 G3-4 " In 21 "  
 L'13 P1-1 Cd Im 22 Cd  
 P1-4 " In 13 "

CRITICAL POSITIONS

C.A. 2 Expr 2 Run 9

Table Pos. - .005"

Control Rod Channel

A .002" A 50 (1000/200)

2 .087

B 11.65" B out

D .038" D 5 (2x10<sup>-8</sup>)

E 49 (750 v.)

Tim Crit. 10<sup>02</sup> <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

C.A. 2 Expr. 2 Run 10

Sheet 15 Re. 6-1 Date 11<sup>25</sup> <sup>AM</sup>/<sub>PM</sub>

Purpose Continue thermal neutron traverse (Cd covered cln)

CRITICAL POSITIONS

C.A. 2 Expr 2 Run 10

Table Pos. Indicator out .024 .032

Control Rod Channel

A 0.000 A 50 (1000/200)

2 out B .09

B 11.57" C out

D .039" D 9.6 (10<sup>-8</sup>)

E 51 (750 v.)

Tim Crit. 11<sup>44</sup> <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils: (cln is cd covered)  
 \* 1/4" from bottom  

Tube	Pos.	Foil No.
L'12	G1-2	In 2 (cd)
	G1-5	" 4
	G3-2	" 7
	G3-5	" 6
	P1-2	" 14
	G3	" 17
L'13		
L'14		

Date 6-6-1951 Chief \_\_\_\_\_

Recorder Bly Crew Hanks (op)

Zimmerman

INSTRUMENT CHECK

Time 8:35 <sup>AM</sup>/<sub>PM</sub> Source {173,175}

Channel	A	B	C	D	E
Range	<u>10/25</u>	<u>OK</u>	<u>2x10"</u>	<u>5x10"</u>	<u>1200v</u>
Source Dist.	<u>OK</u>	<u>4'</u>	<u>1 1/2'</u>	<u>3"</u>	<u>1 1/2'</u>
% F.S. Trip	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>92%</u>	<u>100%</u>

Counter 12 OK Counter 3 but operating.

Purpose: Continue Cd-cln traverse  
 Note: this is first run to use recessed blocks of graphite and/or plastic

CRITICAL POSITIONS

C.A. 2 Expr 2 Run 11

Table Pos. 998.39 .025 T .532

Control Rod Channel

A .000 A out

2 .125

C 15.391 C 8.6 (5x10<sup>-8</sup>)

D .036 D 8.9 (2x10<sup>-8</sup>)

E 81 (750 v.)

Tim Crit. 10<sup>38</sup> <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils:

Tube	Pos.	Foil No.
L'12	G1-1	cd-Im 11
	G1-4	" 1
	G3-1	" 20
	G3-4	" 21
L'13	G1-1	" 27
	G3-3	" 31
L'14	G03	Au 13

C.A. 2 Expr. 2 Run 12  
 Sheet 15 Date 6-6 1951 Time 2<sup>00</sup> <sup>AM</sup> <sub>PM</sub>  
 Purpose Continue cd-cln traverse

CRITICAL POSITIONS  
 C.A. 2 Expr. 2 Run 12  
 Table Pos. 998.394 T .0248 B .432  
 Control Red Channel  
 A 0.000 A 54 (1000/200)  
 B            B .1  
 C 14.285 C 6.5 (5x10<sup>-8</sup>)  
 D .036 D 5.4 (2x10<sup>-8</sup>)  
 E 42 (750w)  
 Tim Crit. 2<sup>13</sup> <sup>AM</sup> <sub>PM</sub> Duration 20 min.

*Soils:*

Tube	Pos.	Foil No.
L'12	G1-2	cdcln 2
	G1-5	" 4
	G3-2	" 7
L'13	G3-5	" 6
	P1-1	" 22
	P1-4	" 13
	P3-2	" 29
L'14	P3-5	" 30
	G3	Au 14

Date 6-7 1951 Chief Haake  
 Recorder Downes Crew Zimmerman

INSTRUMENT CHECK  
 Time 8:40 <sup>AM</sup> <sub>PM</sub> Source 173-175  
 Channel  
 A B C D E  
 Range                       10" 10<sup>10</sup> 1200  
 Source Dist.            3' 1' 8<sup>4</sup>  
 % F.S. Trip ok ok 100+ 100+ 95

Purpose: Continue cd-cln traverse

CRITICAL POSITIONS  
 C.A. 2 Expr. 2 Run 13  
 Table Pos. 998.395 T .025 B .3315  
 Control Red Channel  
 A 0.000 A 19.5 (1000/500)  
 B            B .10  
 C 15.730 C 5.8 (5x10<sup>-8</sup>)  
 D .055 D 9.2 (10<sup>-8</sup>)  
 E 47 (750w)  
 Tim Crit. 9<sup>25</sup> <sup>AM</sup> <sub>PM</sub> Duration 20 min.

*Soils:*

Tube	Pos.	Foil No.
L'12	G3-3	cdcln 19
	G3-6	" 9
	G1-3	" 15
	G1-6	" 24
L'13	P1-3	" 3
	P1-5	" 17
	P3-3	" 41
	P3-5	" 42
L'14	G3	Au 16



Purpose: Cont. cd-cln traverse // Foils:

CRITICAL POSITIONS		
C.A. 2	2	14
Table Pos. 998.395	T. 0248	B. 1320
Control Rod		
A 0000	49 (1000/200)	
B	.10	
C 14.275"	5.8 (5x10 <sup>-8</sup> )	
D .036	9.2 (10 <sup>-8</sup> )	
	23 (750v)	
Tim Crit. 10 <sup>42</sup>	20 min.	

Tube	Pos.	Foil No
L'12	G2-1	65 Cdcln
	G2-4	66 "
	G4-1	67 "
	G4-4	68 "
L'13	P1-2	14 "
	P3-1	16 "
	P3-4	71 "
	G1-3	36 "
	G3-1	33 "
L'14	G3	17 Au

Purpose: Cont. cd-cln traverse // Foils:

CRITICAL POSITIONS		
C.A. 2	Expr. 2	Run 15
Table Pos. -.005	T. 0245	B. 0315
(rezeroed)		
Control Rod		
A 0000	A 29 (1000/500)	
B	B .12	
C 17.855	C 8.6 (5x10 <sup>-8</sup> )	
D .035	D off scale	
	E 60 (750v)	
Tim Crit. 2 <sup>14</sup>	PM Duration 20 min.	

Tube	Pos	Foil No
L'12*	G5-1	Cdcln 53
	G5-4	" 54
L'13	G1-2	" 58
	G3-2	" 52
	P1 <sup>1</sup> / <sub>2</sub> -3	" 55
	P2 <sup>1</sup> / <sub>2</sub> -3	" 56
L'14	G3	Au 7

\* To interface side of fuel

Date 6-8-51 195 Chief F.T. Bly  
 Recorder D. Weiberg Crew Downs  
 Houston Zimmerman

INSTRUMENT CHECK

Time 9:25 AM  
 Source 173-175

Channel

	A	B	C	D	E
Range			2x10 <sup>-11</sup>	3x10 <sup>-10</sup>	1200V
Source Dist.	OK	OK	18"	3"	1"
% F.S. Trip			100+	100+	100+

Purpose: Continue cd-cln traverse // Foils:

CRITICAL POSITIONS		
C.A. 2	Expr. 2	Run 16
Table Pos. 999.95	T	R
Control Rod		
A 0000	A 60 (1000/200)	
B	B .10	
C 16.205	C 7.15 (5x10 <sup>-8</sup> )	
D 00.036	D 6.0 (2x10 <sup>-8</sup> )	
	E 87-750	
Tim Crit. 9:53	AM PM Duration 20 min.	

Tube	Pos	Foil No
L'13	G1-4	59 Cdcln
	G3-4	60 Cdcln
	P2-3	70 "
	P1-6	62 "
	P3-6	63 "
L'12		<del>64</del>
	G1-6	64 "
L'14	G3	8 Au
L'12	G3-1 <sup>1</sup> / <sub>2</sub>	72 Cdcln

Purpose: Calibrate Au foils for thickness

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 17

Table Pos. 0.000 T.0246 B .7319

Control Rod	Channel
A. <u>0.000</u>	A <u>52.5 (1000/100)</u>
B. <u>-----</u>	B <u>.05</u>
C. <u>7.579</u>	C <u>5.6 (2x10<sup>-8</sup>)</u>
D. <u>.0035</u>	D <u>4.5 (10<sup>-8</sup>)</u>
	E <u>37 (780<sub>u</sub>)</u>

Tim Crit. 1<sup>59</sup> <sup>AM</sup> PM Duration: 20 min.

Foils:

Tube	Pos	Foil No
N'10	G3	Au -12
L'10	G3	-11
N'14	G3	-6
L'14	G3	-3

Note: on run 17 <sup>only</sup> fuel discs were omitted from N'10, positions G1 + G5.

Purpose: Re-commence bare I in traverser.

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 18

Table Pos. 99.995 T.0260 B.6318

Control Rod	Channel
A <u>0.000</u>	A <u><sup>67</sup><del>66</del> (100/1000)</u>
B <u>-----</u>	B <u>.070</u>
C. <u>20.035</u>	C <u>8.3 (2x10<sup>-8</sup>)</u>
D. <u><del>17.75</del> 19.1</u>	D <u>3.4 (2x10<sup>-8</sup>)</u>
	E <u>35 (750<sub>u</sub>)</u>

Tim Crit. 3<sup>43</sup> <sup>AM</sup> PM Duration: 20 min.

Foils:

Tube	Pos	Foil No
L'12	G2-1	65 Im
	G2-4	66 "
	G4-1	67 "
	G4-4	68 "
L'13	P1-1	22 "
	P1-4	13 "
	P3-1	71 "
	P3-4	36 "
L'14	G3	9 Au

Date 6-9 1951 Chief Callahan

Recorder Bly Crew Hunter

INSTRUMENT CHECK

Time 8<sup>45</sup> <sup>AM</sup> ~~PM~~ Source 173

Counters I+II Channel A B C D E

Range 5x10<sup>10</sup> 1050

Source Dist. OK OK OK OK 3" 2"

% F.S. Trip 100+ 100+

Purpose: to determine why reactor was so much more active on run 18

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 19

Table Pos. -.005 L T R

Control Rod	Channel
A. <u>-.005</u>	A <u>39 (10/1000)</u>
<u>2</u>	B <u><del>.0055</del> .0045</u>
C <u>20.03</u>	C <u>4.8 (2x10<sup>-9</sup>)</u>
D <u><del>1.038</del> <sup>.43</sup> 0.38</u>	D <u>3.6 (10<sup>-9</sup>)</u>
	E <u><del>30</del> 33 (1050<sub>u</sub>)</u>

Tim Crit. 9:25 <sup>AM</sup> ~~PM~~ Duration: 9 min.

The power level is now increased x 20

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>19</u>
Table Pos. <u>- .005</u>	L <u>  </u>	T <u>  </u>
Control Rod	Channel	
A <u>.005</u>	A <u>46 (1000/200)</u>	
<u>  </u>	B <u>0.088</u>	
<del>BC</del> <u>20.03</u>	C <u>5.6 (5x10<sup>-8</sup>)</u>	
D <u>.43</u>	D <u>4.5 (2x10<sup>-8</sup>)</u>	
	E <u>66 (750 v.)</u>	
Tim Crit. <u>9:40</u>	<del>AM</del> <u>PM</u>	Duration <u>5</u> min.

Plastic rod in tube L'13 was only 13" long thru-out run 19.

Conclusion: reason for increased activity undetermined

Purpose: Continue Im traversal

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>20</u>
Table Pos. <u>- .008</u>	T <u>.0248</u>	B <u>.4318</u>
Control Rod	Channel	
A <u>0.000</u>	A <u>43 (10/1000)</u>	
<u>  </u>	B <u>.050</u>	
<del>BC</del> <u>20.03</u>	C <u>5.5 (2x10<sup>-8</sup>)</u>	
D <u>1.544</u>	D <u>4.3 (10<sup>-7</sup>)</u>	
	E <u>34 (750 v.)</u>	
Tim Crit. <u>11:22</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

Foils:

Tube	Pos.	Foil No
L'12*	G5-1	53 Im
	G5-4	54 "
L'13	P1-2	14 "
	P1-5	17 "
	P3-2	29 "
	P3-5	30 "
L'14	G3	10 Au

\* Foils on interface side of uranium

49  
Loading change: Tubes U, U'16; T, T'17; R, R'19 were emptied, in order to decrease central void.

Purpose: Continue cln traversal & calibrate Au foils.

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>21</u>
Table Pos. <u>- .005</u>	T <u>.024</u>	B <u>.231</u>
Control Rod	Channel	
A <u>0.000</u>	A <u>50 (1000/100)</u>	
<u>  </u>	B <u>.048</u>	
C <u>6.435</u>	C <u>5.2 (2x10<sup>-8</sup>)</u>	
D <u>.035</u>	D <u>8.4 (5x10<sup>-9</sup>)</u>	
	E <u>36 (780 v.)</u>	
Tim Crit. <u>2:45</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

Foils:

Tube	Pos	Foil No
L'10	G3	Au 4
L'12 <sup>14</sup>	G3	" 15
L'12	G1-6	In 64
L'13	P1-6	" 62
	P3-6	" 63
	P1 <sup>1</sup> / <sub>2</sub> -3	" 55
	P2 <sup>1</sup> / <sub>2</sub> -3	" 56
	G1-4	" 59
	G3-4	" 60

Date June 11, 1951 Chief Bly  
Recorder Murrayham Crew Downes  
Flacke

INSTRUMENT CHECK					
Time <u>9:05</u>	<del>AM</del> <u>PM</u>	Source <u>PD 173 + PB 175</u>			
		Channel	A	B	C
Range			OK	OK	5x10 <sup>10</sup> "
Source Dist.					5x10 <sup>10</sup> "
% F.S. Trip					1200 v.
					6" 3" 1.5"
					100+ 100+ 98
					Counters OK

Purpose: *Continued c/n traverse*

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>22</u>
Table Pos. <u>9996</u>	<u>T.024</u>	<u>B.0315</u>
Control Rod	Channel	
A <u>0.000</u>	<u>62 (1000/200)</u>	
	<u>.10</u>	
C. <u>6.32</u>	<u>7.2 (5x10<sup>-9</sup>)</u>	
D <u>0.035</u>	<u>6 (2x10<sup>-8</sup>)</u>	
	<u>E 60 (750N)</u>	
Tim Crit. <u>10<sup>36</sup></u>	AM <del>PM</del>	Duration <u>20</u> min.

*Coils:*

Sub	Poo	Coil No
L'10	G3	Au 11
L'14	G3	" 14
L'12	G1-1	Im 11
	G1-4	" 1
	G3-3 <sup>1/2</sup> (1 <sup>1/2</sup> )	" 72
L'13	P1-3	" 3
	P3-3	" 41
	G1-3	" 36
	G3-3	" 31

Date 6-12-51 195 Chief \_\_\_\_\_  
 Recorder Hicks Crew Murray (sp)  
Simons, Bly,

INSTRUMENT CHECK					
Time <u>1:45</u>	AM <del>PM</del>	Source <u>PB 173,175</u>			
		Channel			
		A B C D E			
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200</u>
Source Dist.	<u>—</u>	<u>—</u>	<u>18"</u>	<u>10"</u>	<u>5"</u>
% F.S. Trip	<u>—</u>	<u>—</u>	<u>10<sup>+</sup></u>	<u>10<sup>+</sup></u>	<u>100</u>

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>23</u>
Table Pos. <u>999,995</u>	<u>T.0239</u>	<u>B.9316</u>
Control Rod	Channel	
1 <u>999,995</u>	A <u>50 on 100/1000</u>	
2 <u>—</u>	B <u>.055</u>	
3 <u>5</u>	C <u>3.9 on 2x10<sup>-8</sup> → 5x10<sup>-8</sup></u>	
4 <u>.035</u>	D <u>4.0 on 10<sup>-8</sup></u>	
	E <u>28.5 on 770 v.</u>	
Tim Crit. <u>1:41</u>	AM <del>PM</del>	Duration <u>20</u> min.

*Coils:*

Sub	Poo	Coil no.
L'10	G3	Au 1
L'14	G3	" 21
L'12	G3-1	Im 20
	G3-4	" 21
L'13	P3-1	" 16
	P3-4	" 71
	P2-3	" 70

*Above Im coils were not counted.*

CONTROL ROD CALIBRATION			
C.A. <u>2</u>	Expr. <u>2</u>	Run <u>23</u>	Sheet <u>15</u>
			Safety Control Rod # <u>5</u>
N <sub>0</sub> = <u>6000</u>	N <sub>1</sub> = <u>.675</u>	Total: \$ <u>.49</u>	

*See attached record.*

$$\frac{.8 - .54}{.54} = .48 \text{ or } 48\%$$

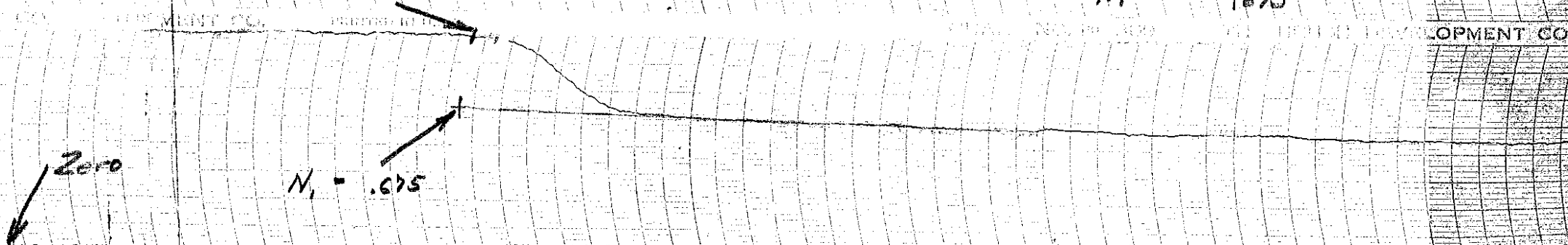
6/12/51  
CA 2 Ex. 2 Run 23  
Red #5

$$\frac{N_0 - N_1}{N_1} = \frac{1.0 - .675}{.675} = .48 \text{ or } 48\%$$

$N_0 = 1.000$

$N_1 = .675$

Zero



Purpose: Calibrate Au foil for thickness and also do another rod drop.

Note: Catcher foils for this and subsequent runs will be oriented numbered face toward fuel, ~~number~~ interface side of fuel disc in pos. G5, stick 383, tube L'10. Au foils oriented number face away from interface.

CRITICAL POSITIONS		
C.A.	2	Expr. 2 Run 24 .9315
Table Pos.	99.995	T .0240 B .8315
Control Rod		Channel
A	0.000	A 45 (100/1000)
		B .05
C	5.935	C 5.7 (2x10 <sup>-8</sup> )
D	0.035	D 9 (5x10 <sup>-9</sup> )
		E 62 (870n)
Tim Crit.	3 <sup>48</sup> PM	Duration 20 min.

Tube	Pos	Foil no.
L'10	G5	Al 16
L'14	G3	Au 22

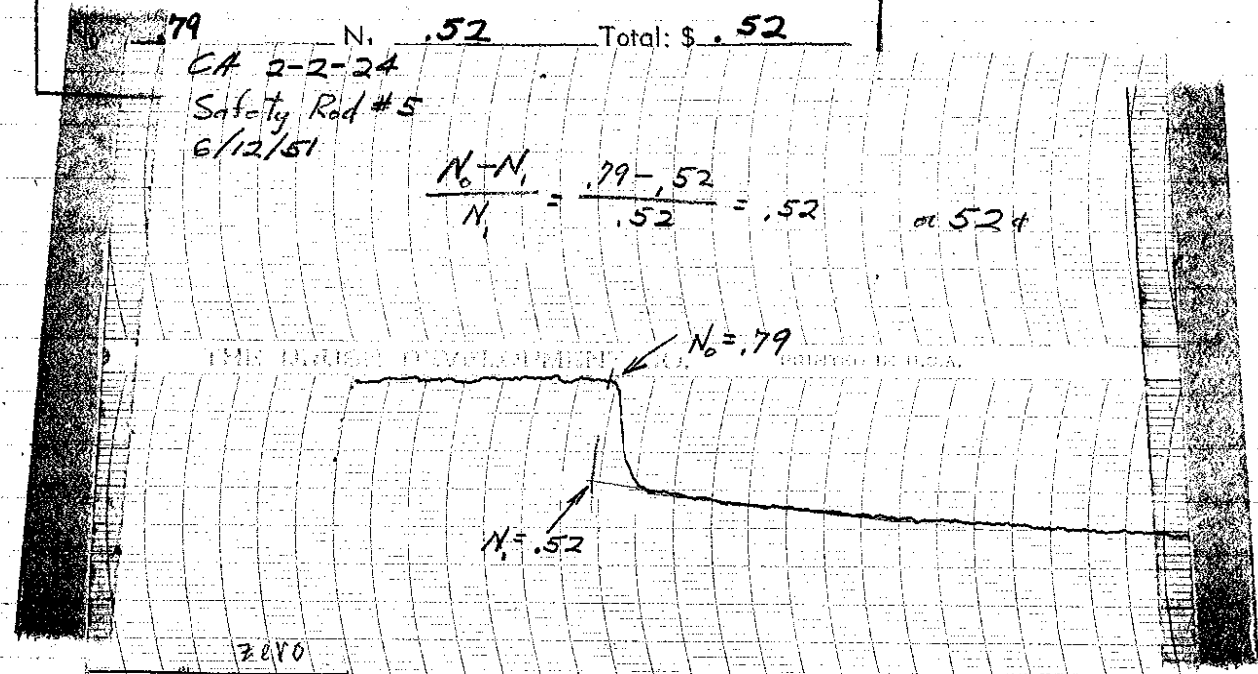
Date June 13 1951 Chief By  
 Recorder Mooneyham Crew Hoaka (Op.)

INSTRUMENT CHECK					
Time	9:30	AM	Source	PB 173, 175	
		PM			
			Channel		
			A	B	C
Range			OK	OK	10 <sup>-10</sup> 10 <sup>-10</sup> 12000
Source Dist.			-	-	12" 6" 3"
% F.S. Trip			-	-	10 <sup>+</sup> 10 <sup>+</sup> 100 <sup>+</sup>

CONTROL ROD CALIBRATION		
C.A.	2-2-24	Sheet 15 Safety Control Rod 5
N <sub>0</sub>	.79	Total: \$ .52
N <sub>1</sub>	.52	

CA 2-2-24  
 Safety Rod #5  
 6/12/51

$$\frac{N_0 - N_1}{N_1} = \frac{.79 - .52}{.52} = .52 \text{ or } 52\%$$



Purpose: Complete In traverse 9 cal. Au foil

CRITICAL POSITIONS		
C.A.	2	Expr. 2 Run 25
Table Pos.	999.995	T .024 T B .831
Control Rod		Channel
A	0.000	A 86 (100/200)
		B .021
C	6.706	C 8.4 (5x10 <sup>-9</sup> )
D	0.035	D 3.3 (5x10 <sup>-9</sup> )
		E 33 (900n)
Tim Crit.	10 <sup>35</sup> AM	Duration 20 min.
		PM

Tube	Pos	Foil No.
L'10	G5	Al 1
L'14	G3	Au 2
L'12	G3-1	In 20
	G3-4	" 21
L'13	P3-1	" 16
	P3-4	" 71
	P2-3	" 70

Date 6/14/51 1951 Chief Bly  
 Recorder Downes Crew Hakkc (op)  
Moonyham

INSTRUMENT CHECK

Time 8:30 AM Source 1734/175  
 PM

Range	Channel				
	A	B	C	D	E
	<u>ok</u>	<u>ok</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200</u>
Source Dist.			<u>10"</u>	<u>4"</u>	<u>3"</u>
P.S. Trip			<u>100</u>	<u>100</u>	<u>100</u>

Loading change: Type H slides in M', L', K'-12 replaced by type L. One type M slide in M'11 (nt) and K'11 (lt.) and two in L'11, all replacing type I slides.

Purpose: Commence In traverse on fine fuel detls.

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 251

Table Pos. 00.000 T.026 T. B.832

Control Rod	Channel				
	A	B	C	D	E
<u>A</u>	<u>999.995</u>	<u>28</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1000</u>
<u>2</u>		<u>.032</u>			
<u>B</u>	<u>13.34</u> <u>13.335</u>	<u>6.8</u>	<u>on 10<sup>-8</sup></u>		
<u>D</u>	<u>.043</u>	<u>2.8</u>	<u>on 10<sup>-8</sup></u>		
		<u>16</u>	<u>on 750</u>		

Tim Crit. 8:50 AM PM Duration 20 min.

Coils:

Tube	Pos.	Coil No.
L'10	G5	A13
L'11	G5-1	Im23
L'12	G5-4	Im12
L'13	P5-1	" 26
L'14	G3	Au5

Purpose: Continue In traverse.

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 2

Table Pos. 10.000 T.026 T. B.832

Control Rod	Channel				
	A	B	C	D	E
<u>1</u>	<u>999.995</u>	<u>17</u>	<u>on 100/1000</u>		
<u>2</u>		<u>.02</u>			
<u>3</u>	<u>13.08</u>	<u>2.0</u>	<u>on 2.10<sup>-8</sup></u>		
<u>4</u>	<u>.033</u>	<u>3.2</u>	<u>on 5.10<sup>-9</sup></u>		
		<u>22</u>	<u>on 860 v.</u>		

Tim Crit. 10:12 AM PM Duration 20 min.

Coils:

Tube	Pos.	Coil No.
L'14	G3	Au 19
L'10	G5	Au 4
L'12	G4 $\frac{1}{2}$ -2	Im 7 ✓
	G5-5	" 13
L'11	G5-2	" 14
L'13	P5-2	" 29
	P4 $\frac{1}{2}$ -5	" 52

Purpose: Continue In traverse.

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 3

Table Pos. 00.000 T.0270 T. B.8320

Control Rod	Channel				
	A	B	C	D	E
<u>A</u>	<u>0.000</u>	<u>30</u>	<u>(100/500)</u>		
		<u>.020</u>			
<u>C</u>	<u>12.555</u>	<u>7.1</u>	<u>(5x10<sup>-9</sup>)</u>		
<u>D</u>	<u>.039</u>	<u>72</u>	<u>(2x10<sup>-9</sup>)</u>		
		<u>66</u>	<u>(1020v.)</u>		

Tim Crit. 12:36 AM PM Duration 20 min.

Coils:

Tube	Pos.	Coil No.
L'10	G5	A15
L'11	G5-4	Im 34
L'12	G4 $\frac{1}{2}$ -3	" 35
	G5-6	" 57
L'13	P5-3	" 76
	P4 $\frac{1}{2}$ -76	" 77
L'14	G3	Au 20



Purpose: Cont. In. traverse

CRITICAL POSITIONS			
C.A.	2	Expr.	3
Run	4		
Table Pos.	0.000	T	D
Control Rod		Channel	
A	999.995	A	18 (100/1000)
2		C	.02
C	12.525	C	<del>4.4</del> <del>2.8</del> (10 <sup>-8</sup> )
D	.038	D	3.6 (5x10 <sup>-9</sup> )
		E	18 (810w)
Tim Crit.	1 <sup>25</sup>	AM	Duration 20 min.

Coils:

Tube	Pos.	Coil no.
L'10	G5	Al 6
L'11	G4 $\frac{1}{2}$ -1	Im 25
L'12	G4 $\frac{1}{2}$ -4	" 32
	G5-1	" 45
L'13	P4 $\frac{1}{2}$ -1	" 46
	P5-4	" 51
L'14	G3	Au 8

Date	6-15	195.1	Chief
Recorder	Bly	Crew	Jowris

INSTRUMENT CHECK					
Time	8:20	AM	Source	PB-173,175	
			Channel	A	B
Range	OK	OK	10 <sup>-10</sup>	10 <sup>-10</sup>	1200v.
Source Dist.	✓	✓	10"	2"	2"
% F.S. Trip	✓	✓	100	100	100

Purpose: Cont. In. traverse

CRITICAL POSITIONS			
C.A.	2	Expr.	3
Run	5		
Table Pos.	0.000	T .0280	B .8320
Control Rod		Channel	
A	999.995	A	31 (100/500)
		C	.020
C	12.46	C	3.8 (10 <sup>-8</sup> )
D	.038	D	3.0 (5x10 <sup>-9</sup> )
		E	28 (900w)
Tim Crit.	2 <sup>45</sup>	AM	Duration 20 min.

Coils:

Tube	Pos.	Coil no.
L'10	G5	Al 7
L'11	G4 $\frac{1}{2}$ -2	Im 28
L'12	G4 $\frac{1}{2}$ -5	" 39
	G5-2	" 43
L'13	P4 $\frac{1}{2}$ -2	" 50
	P5-5	" 61
L'14	G3	Au 10

Purpose: Cont. In. traverse

CRITICAL POSITIONS			
C.A.	2	Expr.	3
Run	6		
Table Pos.	0.005	T .029	B .732
Control Rod		Channel	
A	999.995	A	82 (100/200)
2		B	.020
C	13.331	C	8.2 (5x10 <sup>-9</sup> )
D	.038	D	3.2 (5x10 <sup>-9</sup> )
		E	30 (900w)
Tim Crit.	8 <sup>49</sup>	AM	Duration 20 min.

Coils:

Tube	Pos.	Coil no.
L'10	G5	Al 8
L'11	G4 $\frac{1}{2}$ -4	Im 38
L'12	G4 $\frac{1}{2}$ -6	" 40
	G5-3	" 44
L'13	P4 $\frac{1}{2}$ -3	" 48
	P5-6	" 49
L'14	G3	Au 18



58  
 Purpose: Cont. In traverse

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>7</u>
Table Pos. <u>000.001</u>	<u>T .029</u>	<u>B .732</u>
Control Rod	Channel	
A <u>999.995</u>	A <u>76 (100/200)</u>	
<u>2</u>	B <u>.021</u>	
C <u>12.99</u>	C <u>7.5 (5x10<sup>-9</sup>)</u>	
D <u>.035</u>	D <u>7.6 (2x10<sup>-9</sup>)</u>	
	E <u>29 (900 v)</u>	
Tim Crit. <u>10<sup>36</sup></u>	AM PM	Duration <u>20</u> min.

Foils:

Tube	Pos.	Foil No.
L'10	G5	A19
L'11	G4 <sup>3</sup> / <sub>4</sub> -1	Im 10
	<del>G4<sup>3</sup>/<sub>4</sub>-1</del>	
	G5 <sup>1</sup> / <sub>2</sub> -1	" 18
L'12	G4 <sup>3</sup> / <sub>4</sub> -2	" 37
	G5 <sup>1</sup> / <sub>2</sub> -2	" 60
L'13	P5 <sup>1</sup> / <sub>2</sub> -3	" 75
	P5-2	Im 29
L'14	G3	Au

59

Purpose: Commence Cd-In traverse

CRITICAL POSITIONS		
C.A. _____	Expr. _____	Run _____
Table Pos. _____	<u>T</u>	<u>R</u>
Control Rod	Channel	
1 _____	A _____	
2 _____	B _____	
3 _____	C _____	
4 _____	D _____	
	E _____	
Tim Crit. _____	AM PM	Duration _____ min.

Tube	Pos.	Foil No.
L'10	G5	A11
L'12	G4 <sup>1</sup> / <sub>2</sub> -2	CDIm 7
	G5-5	" " 13
L'11	G5-2	" " 14
L'13	P5-2	" " 29
	P4 <sup>1</sup> / <sub>2</sub> -5	" " 52
L'14	G3	Au

Not run: some of foils still hot.

219

6/15/51

Purpose: include Im traverse

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>8</u>
Table Pos. <u>0.002</u>	<u>Top 0.028</u>	<u>B 0.732</u>
Control Rod	Channel	
A <u>999.995</u>	A <u>78 (100/200)</u>	
<u>2</u>	B <u>0.02</u>	
C <u>13.03</u>	C <u>7.4 (5x10<sup>-9</sup>)</u>	
D <u>0.035</u>	D <u>7.6 (2x10<sup>-9</sup>)</u>	
	E <u>26 (900 v)</u>	
Tim Crit. <u>11:54</u>	AM PM	Duration <u>20</u> min.

Foils:

Tube	Pos.	Foil no.
L'10	G5	A110
L'11	G5 <sup>1</sup> / <sub>4</sub> -1	Im 2
L'12	G4 <sup>1</sup> / <sub>2</sub> -1	" 17
	G5 <sup>1</sup> / <sub>4</sub> -2	" 22
L'13	<del>P4<sup>1</sup>/<sub>2</sub>-2</del>	" 50
	<del>P5<sup>1</sup>/<sub>2</sub>-3</del>	" 59
L'14	G3	Au

Note: Foil A110 was found to be off center

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>9</u>
Table Pos. <u>.002</u>	<u>Top 0.028</u>	<u>B .6</u>
Control Rod	Channel	
1 _____	A <u>88</u>	<u>1000/25</u>
2 _____	B <u>0.02</u>	
3 _____	C <u>7.1</u>	<u>5x10<sup>-7</sup></u>
4 _____	D <u>2.3</u>	<u>2x10<sup>-9</sup></u>
	E <u>40</u>	<u>960V</u>
Tim Crit. <u>2:19</u>	AM PM	Duration <u>20</u> min.

Tube	Pos.	Foil No.
L'10	G5	A11
L'11	G5-4	CDIm 34
L'12	G4 <sup>1</sup> / <sub>2</sub> -3	" " 35
	G5-6	" " 57
L'13	P5-3	" " 76
	P4 <sup>1</sup> / <sub>2</sub> -6	" " 77

false instr. scram after 7 min. op. (channel 10)

Purpose: Cont. Cd-Im traverse

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>10</u>
Table Pos. <u>.002</u>	T. <u>0319</u> B. <u>6321</u>
Control Rod	Channel
1 <u>999.995</u>	A <u>82</u> on <u>100/200</u>
2 <u>          </u>	B <u>.021</u>
3 <u>12.095</u>	C <u>8.1</u> on <u>5·10<sup>-9</sup></u>
4 <u>.037</u>	D <u>8.1</u> on <u>2·10<sup>-9</sup></u>
	E <u>42</u> on <u>945 v.</u>
Tim Crit. <u>3:29</u>	<sup>AM</sup> PM Duration <u>20</u> min.

#4

Foil:		
Tube	Pos.	Foil No.
L'10	G5	Al 12
L'11	G4 <sup>1</sup> / <sub>2</sub> -1	CdIm 25
L'12	G4 <sup>1</sup> / <sub>2</sub> -4	" " 32
	G5-1	" " 45
L'13	P4 <sup>1</sup> / <sub>2</sub> -1	" " 46
	P5-4	" " 51

Date <u>June 16, 1951</u>	Chief <u>          </u>
Recorder <u>Mooneyham</u>	Crew <u>Hacker</u>
<u>03ly</u>	

INSTRUMENT CHECK					
Time <u>10:00</u>	<sup>AM</sup> <del>PM</del>	Source <u>PB 173+175</u>			
		Channel	A	B	C
Range	<u>OK</u>		<u>OK</u>	<u>10<sup>10</sup></u>	<u>10<sup>10</sup></u>
Source Dist.			<u>14"</u>	<u>4"</u>	<u>3"</u>
% F.S. Trip			<u>100+</u>	<u>100+</u>	<u>~100</u>
			<u>Counters OK</u>		

~~Purpose: Cont. Cd-Im traverse~~

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>11</u>
Table Pos. <u>.004</u>	T. <u>0228</u> B. <u>532</u>
Control Rod	Channel
A <u>999.995</u>	A <u>275</u> on <u>100/1000</u>
<del>          </del>	B <u>.033</u>
C <u>10.948</u>	C <u>3.45</u> on <u>2·10<sup>-9</sup></u>
D <u>.036</u>	D <u>2.6</u> on <u>10<sup>-8</sup></u>
	E <u>23</u> on <u>810 v.</u>
Tim Crit. <u>10:23</u>	<sup>AM</sup> <del>PM</del> Duration <u>21.6</u> min.

Foil:		
Tube	Pos.	Foil No.
L'10	G5	Al 13
L'11	G5-4	CdIm 34
L'12	G4 <sup>1</sup> / <sub>2</sub> -3	" " 35
	G5-6	" " 57
L'13	P5-3	" " 76
	P4 <sup>1</sup> / <sub>2</sub> -6	" " 77

Purpose: Cont. Cd-Im traverse

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>12</u>
Table Pos. <u>.001</u>	T. <u>.0282</u> B. <u>4320</u>
Control Rod	Channel
A <u>999.994</u>	A <u>48</u> on <u>100/500</u>
<del>          </del>	B <u>.030</u>
C <u>10.652</u>	C <u>6.0</u> on <u>10<sup>-8</sup></u>
D <u>.068</u>	D <u>4.7</u> on <u>5·10<sup>-9</sup></u>
	E <u>46</u> on <u>930 v.</u>
Tim Crit. <u>11:42</u>	<sup>AM</sup> PM Duration <u>20.0</u> min.

Foil:		
Tube	Pos.	Foil No.
L'10	G5	Al 14
L'11	G5-2	Cd-Im 14
L'12	G4 <sup>1</sup> / <sub>2</sub> -2	" " 7
	G5-5	" " 13
L'13	P5-2	" " 29
	P4 <sup>1</sup> / <sub>2</sub> -5	" " 52

*Too long an exposure on std. catcher foil*

Purpose: Cont. Cd-In traverse

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>13</u>
Table Pos. <u>.003</u>	T. <u>.028</u> B. <u>.432</u>
Control Rod	Channel
A <u>999.995</u>	A <u>45 (100/500)</u>
	B <u>.029</u>
C <u>10.095</u>	C <u>5.6 (10<sup>-8</sup>)</u>
D <u>.036</u>	D <u>4.4 (5x10<sup>-9</sup>)</u>
	E <u>29 (900 n.)</u>
Tim Crit. <u>2:09</u> <del>AM</del> PM	Duration <u>20</u> min.

Soils:

Tube	Pos	Soil no
L'10	G5	AL 15
L'11	G4 <sup>1/2</sup> -2	Cd Im 28
L'12	G4 <sup>1/2</sup> -5	" " 39
	G5-2	" " 43
L'13	P4 <sup>1/2</sup> -2	" " 50
	P5-5	" " 61

Date 18 June 1951 Chief \_\_\_\_\_  
 Recorder \_\_\_\_\_ Crew \_\_\_\_\_

INSTRUMENT CHECK				
Time <u>8:50</u> AM	Source <u>PB 173-175</u>			
	Channel			
	A	B	C	D E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup> 1200 n.</u>
Source Dist.			<u>11"</u>	<u>8" 4"</u>
% F.S. Trip			<u>100%</u>	<u>100% 100</u>
	<u>Combined OK</u>			

Purpose: Cont. Cd-In traverse

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>14</u>
Table Pos. <u>0.000</u>	T. <u>.0289</u> ; B. <u>.4321</u>
Control Rod	Channel
1 <u>0.000</u>	A <u>46 m 100/500</u>
	B <u>.030</u>
2 <u>9.932</u>	C <u>5.8 m 10<sup>-8</sup></u>
4 <u>.036</u>	D <u>4.4 m 5.10<sup>-9</sup></u>
	E <u>43 m 930 n.</u>
Tim Crit. <u>3:31</u> <del>AM</del> PM	Duration <u>20</u> min.

Soils

Tube	Pos	Soil no
L'11	G4 <sup>1/2</sup> -4	Im 38
L'12	G4 <sup>1/2</sup> -6	" 40
	G5-3	" 44
L'13	P4 <sup>1/2</sup> -3	" 48
	P5-6	" 49
L'10	G-5	AL 16

Purpose: Cont. Cd-In traverse

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>3</u> Run <u>15</u>
Table Pos. <u>.002</u>	T. <u>.0285</u> B. <u>.4320</u>
Control Rod	Channel
A <u>999.993</u>	A <u>49 (100/500)</u>
	B <u>38 (900 n.) .030 (meters)</u>
C <u>11.041</u>	C <u>61 (10<sup>-8</sup>)</u>
D <u>.037</u>	D <u>4.8 (5.10<sup>-9</sup>)</u>
	E <u>38 (900 n.)</u>
Tim Crit. <u>9:52</u> <del>AM</del> PM	Duration <u>20</u> min.

Soils:

Tube	Pos	Soil no
L'10	G4 <sup>3/4</sup> -2	37
L'11	G5 <sup>1/2</sup> - <del>1</del>	<del>60</del> 18 Cd Im
	G4 <sup>3/4</sup> -1	10 " "
L'12	G5 <sup>1/2</sup> -2	26 60 " "
	G4 <sup>3/4</sup> -2	37 " "
L'13	<del>G4<sup>3/4</sup>-1</del>	
	<del>P5-1</del>	26 " "
L'10	G5	17 AL

Purpose: Cont. Cd-In traverse

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>16</u>
Table Pos. <u>.001</u> T.0287; B.4321		
Control Rod		Channel
1 <u>999.997</u>	A <u>49 on 100/500</u>	
2 <u>          </u>	B <u>.030</u>	
3 <u>11.33</u>	C <u>6.1 on 10<sup>-8</sup></u>	
4 <u>.038</u>	D <u>4.7 on 5·10<sup>-9</sup></u>	
	E <u>39 on 900 v.</u>	
Tim Crit. <u>11:35</u> <del>AM</del> <sup>AM</sup> Duration <u>20</u> min.		

Foils:

Inch	Pos.	Foil No.
L'11	G5-1	23 Cd
L'12	G4½-1	17 "
	G5-4	12 "
L'13	P5½-3	75 "
L'10	G-5	Ab 18

Purpose: Continue Cd-In Cd traverse

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>17</u>
Table Pos. <u>.000</u> T.028 B=.432		
Control Rod		Channel
A <u>999.995</u>	A <u>44.5 on 100/500</u>	
2 <u>          </u>	B <u>.030 (meter)</u>	
C <u>11.281</u>	C <u>5.6 on 10<sup>-8</sup></u>	
D <u>.037</u>	D <u>4.4 on 5·10<sup>-9</sup></u>	
	E <u>34 on 900 v.</u>	
Tim Crit. <u>2<sup>06</sup></u> <del>AM</del> <sup>AM</sup> Duration <u>20</u> min.		

Foils

Inch	Pos.	Foil No.
L'10	G5	AP19
L'11	G5-4	Cd In 34
L'12	G4½-3	" " 35
L'12	G5-6	" " 57
L'13	P4½-4	" " 59

Purpose: <sup>complete</sup> Cd-In Cd traverse

CRITICAL POSITIONS		
C.A. <u>2</u>	Expr. <u>3</u>	Run <u>18</u>
Table Pos. <u>0000</u> T.0278 B.3320		
Control Rod		Channel
A <u>999.995</u>	A <u>44 (100/500)</u>	
	B <u>.030</u>	
C <u>10.785</u>	C <u>5.4 (10<sup>-8</sup>)</u>	
D <u>.035</u>	D <u>4.4 (5·10<sup>-9</sup>)</u>	
	E <u>35 (900 v.)</u>	
Tim Crit. <u>3:10</u> <del>AM</del> <sup>PM</sup> Duration <u>20</u> min.		

Foils

Inch	Pos.	Foil No.
L'10	G5	AP20
L'11	G5½-1	Cd In 2
L'12	G5½-2	" " 22
L'13	P5-3	" " 76
	P4½-6	" " 77
L'12	G4½-3	" " 35

Date 6-19 1951 Chief \_\_\_\_\_  
 Recorder Bly Crew Hoake  
Dames Manningham

INSTRUMENT CHECK

Time 8:45 AM ~~PM~~ Source PB 173,175

	A	B	C	D	E
Range	OK	OK	10 <sup>-10</sup>	10 <sup>-10</sup>	1200v
Source Dist.	-	-	8"	5"	3"
% F.S. Trip	-	-	100 <sup>+</sup>	100 <sup>+</sup>	100 <sup>+</sup>

Purpose: Determine reactivity drop due to rod 4 (fine fuel distbr)

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 19

Table Pos. .000 T.0239; B.1319

Control Rod	Channel
<u>999.996</u>	A <u>74</u> on <u>10<sup>-5</sup>/500</u>
<u>2</u>	B <u>.049</u>
<u>3</u> <u>12.755</u>	C <u>89</u> on <u>10<sup>-8</sup></u>
<u>4</u> <u>.037</u>	D <u>7.2</u> on <u>5·10<sup>-9</sup></u>
	E <u>46</u> on <u>870 v.</u>

Tim Crit. 1:21 PM ~~AM~~ ~~PM~~ Duration 30 min.

Note: Rod 3 also dropped by accident

CONTROL ROD CALIBRATION

C.A. 2 Sheet 15 Control Rod SR 3+4

No. 80 N<sub>1</sub> 36 Total: \$ 1.22

Purpose: Repeat run 2-3-8

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 20

Table Pos. 999.999 T.0238 B.1317

Control Rod	Channel
A <u>999.996</u>	A <u>74</u> (100/200)
<u>C</u> <u>12.356</u>	B <u>.021</u>
<u>D</u> <u>.037</u>	C <u>7.0</u> (5X10 <sup>-9</sup> )
	D <u>7.2</u> (2X10 <sup>-9</sup> )
	E <u>16</u> (900v.)

Tim Crit. 3:21 AM ~~PM~~ Duration 20 min.

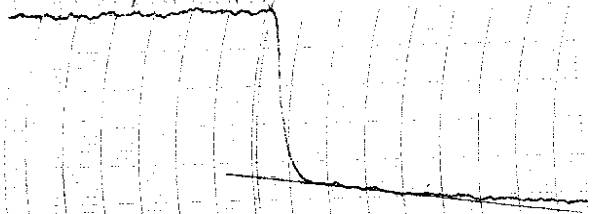
Coils:

Tube	Pos	Foil No
L'10	G5	At 21
L'11	G5 <sup>1</sup> / <sub>4</sub> -1	Im 20
L'12	G4 <sup>1</sup> / <sub>2</sub> -1	" 17
	G5 <sup>1</sup> / <sub>4</sub> -2	" 22
L'13	P4 <sup>1</sup> / <sub>2</sub> -4	" 59
<del>L'14</del>		

Note: Foil # 20 was used in L'11 because #2 could not be found. The two have the same weight (.0284g.)

CA 2 Eq. 3 Run 19

$$\frac{N_0 - N_1}{N_1} = \frac{.80 - .36}{.36} = 1.22 = \$1.22$$



ZERO

Date 6-20 1951 Chief \_\_\_\_\_  
 Recorder M. M. M. M. Crew Haake  
BB

INSTRUMENT CHECK

Time 9:10 AM  
 Source PB173,175

Range	Channel				
	A	B	C	D	E
	OK	OK	10 <sup>-10</sup>	10 <sup>-10</sup>	1200v
Source Dist.	-	-	10"	4"	2"
% F.S. Trip	-	-	100 <sup>+</sup>	100 <sup>+</sup>	100 <sup>+</sup>

Purpose: Cont. irradiate bare In in plain glass (repeats)

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 21  
 Table Pos. .000 T.024 B.132

Control Rod	Channel	
	A	B
A <u>999.995</u>	A <u>31</u> on <u>100/500</u>	
B <u>.038</u>	B <u>.020</u> (meter)	
C <u>13.110</u>	C <u>7.3</u> on <u>5x10<sup>-9</sup></u>	
D <u>.036</u>	D <u>7.6</u> on <u>2x10<sup>-9</sup></u>	
	E <u>26</u> on <u>900v.</u>	

Tim Crit. 10:59 AM  
 PM Duration 20 min.

Inube	Position	Foil No.
L'13	<del>P4-1</del>	<del>In 46</del>
	<del>P4-4</del>	<del>In 59</del>
	<del>P5-1</del>	<del>In 26</del>
	<del>P5-4</del>	<del>In 51</del>
L'10	G5	A1 22

Note: Fresh 4" graphite block placed next to catcher foil (A1).

Purpose: Cont. irradiate bare In in plain glass (repeats)

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 22  
 Table Pos. 000,000 T.024 B.132

Control Rod	Channel	
	A	B
A <u>999.997</u>	A <u>27.5</u> <u>100/500</u>	
B <u>.038</u>	B <u>.020</u>	
C <u>12.803</u>	C <u>7.0</u> on <u>5x10<sup>-9</sup></u>	
D <u>.038</u>	D <u>7.2</u> on <u>2x10<sup>-9</sup></u>	
	E <u>23</u> @ <u>900v</u>	

Tim Crit. 1:57.5 AM  
 PM Duration 20 min.

Inube	Position	Foil No.
L'13	P5-3	In 76
	<del>P5-6</del>	<del>In 44</del>
	<del>P4-3</del>	<del>In 48</del>
	<del>P4-6</del>	<del>In 17</del>
L'10	G5	A1 23
L'11	G5-1	In 23
L'12	G5-1	In 45
	G5-4	In 12

Purpose: Cont. irradiations of bare In (repeats)

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 23  
 Table Pos. 999.998 T.0238; B.1318

Control Rod	Channel	
	A	B
1 <u>999.995</u>	A <u>84</u> on <u>100/200</u>	
2 <u>.038</u>	B <u>.021</u>	
3 <u>12.625</u>	C <u>8.0</u> on <u>5x10<sup>-9</sup></u>	
4 <u>.038</u>	D <u>8.0</u> on <u>2x10<sup>-9</sup></u>	
	E <u>25</u> on <u>900v.</u>	

Tim Crit. 2:53.6 AM  
 PM Duration 20 min.

Inube	Position	Foil No.
L'13	<del>P5-4</del>	<del>In 51</del>
L'11	G5-4	In 34
L'12	G5-2	In 43
	G5-5	In 13
L'10	G5	A1 24



Date June 21, 1951 Chief \_\_\_\_\_  
 Recorder Mooneyhan Crew Waska

INSTRUMENT CHECK

Time 8:45 <sup>AM</sup>/<sub>PM</sub> Source PB173 + 175

Range	Channel				
	A	B	C	D	E
	OK	OK	5.10"	5.10"	1200"
Source Dist.	-	-	16"	18"	2"
% F.S. Trip	-	-	100+	100+	100+

*Purpose: Cont. irradiate bare In (repeats)*

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 24

Table Pos. \_\_\_\_\_

Control Rod \_\_\_\_\_ Channel \_\_\_\_\_

1 \_\_\_\_\_ A \_\_\_\_\_

2 \_\_\_\_\_ B \_\_\_\_\_

3 \_\_\_\_\_ C \_\_\_\_\_

4 \_\_\_\_\_ D \_\_\_\_\_

\_\_\_\_\_ E \_\_\_\_\_

Tim Crit. \_\_\_\_\_ <sup>AM</sup>/<sub>PM</sub> Duration \_\_\_\_\_ min.

Foils Run 24		
Inch	Pos.	Foil No.
L'12	65-3	In 44
L'12	65-6	In 57
L'13	65-5	In 61
L'10	65	A1 25

*Purpose: Cont. irradiate bare In.*

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 25

Table Pos. 999.996 T.0235 B.1314

Control Rod \_\_\_\_\_ Channel \_\_\_\_\_

A 999.995  $\Delta$  79 <sup>100</sup>/<sub>200</sub>

B .020

C 13.585 C 7.6 on 5x10<sup>-9</sup>

D .036 D 7.7 on 2x10<sup>-9</sup>

E 24.5 @ 900V

Tim Crit. 9:28 <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils: Run 25		
Inch	Position	Foil No.
L'13	64 1/2 - 4	In 35
L'12	64 1/2 - 3	In 59
L'11	65 - 3	In 64
L'10	65	A1 26

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 25

Table Pos. 999.997 T.024; B.131

Control Rod \_\_\_\_\_ Channel \_\_\_\_\_

1 999.997  $\Delta$  67 on <sup>100</sup>/<sub>200</sub>

2 \_\_\_\_\_ B .019

3 13.45 C 3.2 on 10<sup>-8</sup>

4 .048 D 6.65 on 2.10<sup>-9</sup>

E 43 @ 990V

Tim Crit. 10:42 <sup>AM</sup>/<sub>PM</sub> Duration \_\_\_\_\_ min.



C.A. 2 Expt. 4 Run 1  
 Sheet \_\_\_\_\_ Date June 22, 1951 Time \_\_\_\_\_ AM  
 PM  
 Purpose To obtain vertical, horizontal, and longitudinal traverses of power distribution by use of catcher foils

Loading change: For each of the following 15 positions a solid, small fuel disc was inserted to replace the one already there. The aluminum catcher foils were placed adjacent to the fuel on the side opposite the reactor interface. Foil numbers faced the fuel. All aluminum was irradiated in the movable half.

	Tube	Shish	Position	Foil No.
1	U'11 l	624	G1	112 Al
2	U'11 r	623	G1	111 Al
3	M'11 l	324	G17	106 Al
4	M'5 l	651	G1	113 Al
5	T'11 r	209	G1	110 Al
6	S'11 r	213	G1	109 Al
3	M'11 l	224	G13	105 Al
6	M'7 l	172	G1	114 Al
3	M'11 l	224	G9	103 Al
10	Q'11 r	217	G1	108 Al
1	O'11 r	221	G1	107 Al
12	M'9 l	196	G1	115 Al
13	M'13 l	251	G1	116 Al
3	M'11 l	224	G5	102 Al
3	M'11 l	224	G1	101 Al

Also irradiated at same time

Tube	Position	Foil No.
L'13	P4 $\frac{1}{2}$ -3	In <del>58</del> 39
L'10	G5	Al <del>26</del> 27

INSTRUMENT CHECK

Time 8:30 AM  
 PM  
 Source PB 173 + 175  
 Channel  
 A B C D E  
 Range OK OK 5x10" 5x10" 1200"  
 Source Dist. - - 10" 8" 2"  
 % F.S. Trip - - 100+ 100+ 100+  
 Counters OK

Date 6-22 1951 Chief \_\_\_\_\_  
 Recorder Hacke Crew Downs  
Murray

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 1

Table Pos. 999.996 T.024 B.0310

Control Rod	Channel
1 <u>999.995</u>	A <u>74 on 100/200</u>
2 <u>_____</u>	B <u>.020</u>
3 <u>13.48</u>	C <u>7.3 on 5·10<sup>-9</sup></u>
4 <u>.035</u>	D <u>7.6 on 2·10<sup>-9</sup></u>
	E <u>31 on 900 v.</u>

Tim Crit. 9:04 <sup>AM</sup>~~PM~~ Duration 20 min.

C.A. 2 Expr. 3 Run 26

Sheet \_\_\_\_\_ Date 6/22/1951 Time 10:45 <sup>AM</sup>~~PM~~

Purpose To repeat bare indium irradiation in plunger with fine fuel (.002)

CRITICAL POSITIONS

C.A. 2 Expr. 3 Run 26

Table Pos. 999.996 T.0237 B.0312

Control Rod	Channel
A <u>999.995</u>	A <u>73 100/200</u>
B <u>_____</u>	B <u>.020</u>
C <u>13.405</u>	C <u>7.0 on 5x10<sup>-9</sup></u>
D <u>.037</u>	D <u>7.2 on 2x10<sup>-9</sup></u>
	E <u>44 on 990</u>

Tim Crit. 11:15 <sup>AM</sup>~~PM~~ Duration \_\_\_\_\_ min.

*Fail*

L'13 P5-4 In 40  
L'10 G5 A128

C.A. 2 Expr. 4 Run 2  
 Sheet \_\_\_\_\_ Date June 2, 1951 Time 1:15 <sup>AM</sup> PM  
 Purpose Do antineutrino power distribution measurements using catcher foils with fuel bare and Cd covered. All .002" fuel discs removed and std. fuel restored

INSTRUMENT CHECK

Time 1:10 <sup>AM</sup> PM Source PB1736 175  
 Channel  
 A B C D E  
 Range N.O. OK 10<sup>-10</sup> 10<sup>-10</sup> 1200v  
 Source Dist. \_\_\_\_\_ 10" 8" 2"  
 % F.S. Trip \_\_\_\_\_ 100% 100% 100%  
 Counters 1 & 2 OK

Loading change: All .002" fuel removed from M'12 and M'11 (rt), L'11 (left), L'11 (rt), and K'11 (lt.). These shields were then reloaded with normal thickness fuel. Therefore, the loading is now as it was in Ex. 2 with only .010" uranium at 4 in. intervals.

Foils]

Inba	Shield	Position	Foil No.
M'11	224	G1	117 A1
		G5	118 A1
		G17	Cd-122A1-Cd
L'11	226	G1	119 A1
U'11 (r)	623	G1	Cd-120A1 - Cd
M'5 (l)	651	G1	Cd-121A1 - Cd
<del>M'10</del> L'10		<del>G5</del>	29 A1

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 2  
 Table Pos. 999.994 T=0.237 B#315  
 Control Rod Channel  
 A 999.994" A N.O.  
 / B .10  
 C 4.105" C 6.6 on 5x10<sup>-8</sup>  
 D .975 D 5.5 on 2x10<sup>-8</sup>  
 E 44 on 750v.  
 Tim Crit. 1:58 <sup>AM</sup> PM Duration 20 min.

Purpose: Cont. power dist. measurements with Cd covered fuel

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 3  
 Table Pos. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_  
 Control Rod Channel  
 1 \_\_\_\_\_ A \_\_\_\_\_  
 2 \_\_\_\_\_ B \_\_\_\_\_  
 3 \_\_\_\_\_ C \_\_\_\_\_  
 4 \_\_\_\_\_ D \_\_\_\_\_  
 E \_\_\_\_\_  
 Tim Crit. \_\_\_\_\_ <sup>AM</sup> PM Duration \_\_\_\_\_ min.

Foils	Pos.	No Good Foil No.
<del>M'11</del>	<del>G1</del>	<del>Cd-122A1-Cd</del>
<del>M'11</del>	<del>G13</del>	<del>Cd-124A1-Cd</del>
<del>L'10</del>	<del>G5</del>	<del>30 A1</del>

Date June 25 1951 Chief \_\_\_\_\_  
 Recorder Mooneyham Crew Hoaks  
Dawson

C.A. 2 Expr. 2 Run 26  
 Sheet \_\_\_\_\_ Date June 25, 1951 Time 10:00 ~~PM~~ <sup>AM</sup>  
 Purpose: To repeat bare In irradiations for some points in the 010 fuel loading.

INSTRUMENT CHECK

Time 9:15 <sup>AM</sup> ~~PM~~ Source PB 173,175

	Channel				
	A	B	C	D	E
Range	<u>Not Oper-ating</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200v.</u>
Source Dist.	<u>1</u>	<u>-</u>	<u>11"</u>	<u>8"</u>	<u>4"</u>
% F.S. Trip	<u>1</u>	<u>-</u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>

Soils Ex. 2 Run 26

Sub	Position	Soil No.
<u>L'10</u>	<u>G5</u>	<u>A1 31</u>
<u>L'14</u>	<u>G3</u>	<u>A4 7</u>
<u>L'13</u>	<u>G1-1</u> ✓	<u>In 27</u>
	<u>G3-1</u> ✓	<u>In 33</u>
<u>L'13</u>	<u>P1-2</u> ✓	<u>In 4</u>
	<u>P3-2</u> ✓	<u>In 29</u>

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 26  
 Table Pos. 999.997 T. 0240; B .0320

Control Rod	Channel
<u>1 999.993</u>	<u>A out</u>
<u>2</u>	<u>B .02</u>
<u>3 6.08</u>	<u>C 8.3 m 5 · 10<sup>-9</sup></u>
<u>4 .035</u>	<u>D 8.3 m 2 · 10<sup>-9</sup></u>
	<u>E 26 m 900 v.</u>

Tim Crit. 10:20 <sup>AM</sup> ~~PM~~ Duration 20 min.

Soils Run 27

<u>L'10</u>	<u>G5</u>	<u>A1 32</u>	<u>A1 32</u>
<u>L'14</u>	<u>G3</u>	<u>A4 11</u>	<u>A4 13</u>
<u>L'13</u>	<u>P1-2</u>	<u>In 5</u>	<u>In 13</u>
	<u>P3-2</u>	<u>(In 4)</u>	<u>In 4</u>
<u>L'13</u>	<u>G1-3</u>	<u>Seram In 08</u>	<u>In 6</u>
	<u>G3-3</u>	<u>In 52</u>	<u>In 12</u>

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 27  
 Table Pos. \_\_\_\_\_ R \_\_\_\_\_

Control Rod	Channel
1	A
2	B
3	C
4	D
	E

AM ~~PM~~ Duration \_\_\_\_\_ min.

Note: Air-conditioning failed in counting room therefore, unable to use G-M counters

C.A. 2 Expr. 4 Run 3  
 Sheet \_\_\_\_\_ Date June 25, 1951 Time \_\_\_\_\_ AM  
 PM  
 Purpose To cont. irradiation of catcher foils with fuel Cd covered as part of power distribution measurements.

Loading change: To obtain more excess reactivity, material that had been previously removed (p. 29) was replaced, i.e.

- |       |   |           |               |
|-------|---|-----------|---------------|
| p. 29 | { | E + E' 16 | contains fuel |
|       |   | F + F' 17 | no fuel       |
|       |   | H + H' 19 | no fuel       |
|       |   | I + I' 20 | contains fuel |
| p. 29 | { | U + U' 16 | contains fuel |
|       |   | T + T' 17 | no fuel       |
|       |   | R + R' 19 | no fuel       |

Tube	Position	Foil No.
M'11 l Sh. 224	G1	Cd - Al 127 - Cd
	<del>G13</del> G13	Cd - Al 128 - Cd
U'11 l Sh. 624	G1	Cd - Al 126 - Cd
M'7 l Sh. 172	G1	Cd - Al 125 - Cd
L'10	G5	Al 33

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 3  
 Table Pos. 999.995" T: .0240 B: .0317  
 Control Rod Channel  
 A 999.990" A N.O.  
 X B .1 meter  
 C 20.035 out C 7.9 on  $5 \times 10^8$   
 D .710 D 6.6  $2 \times 10^8$   
 E 52 on 750v.  
 Tim Crit. 3:28 <sup>AM</sup> PM Duration 20 min.

C.A. 2 Expr. 4 Run 4  
 Sheet \_\_\_\_\_ Date June 26, 1951 Time 8:15 AM  
 PM  
 Purpose To cont. power distribution with Cd-covered fuel

INSTRUMENT CHECK

Time 9:00 <sup>AM</sup> ~~PM~~ Source PB123 + 125  
 Channel  
 Range OK  $10^{-10}$  1700V  
 Source Dist. 11" 2"  
 % F.S. Trip 100<sup>+</sup> 100<sup>+</sup>  
 Counters 1 + 2

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 4

Table Pos. -00.005 1.024 T R032

Control Rod Channel

1	-0.005	A	
2		B	.1 meter
3		C	
4	+0.032	D	
		E	47 740v.

Tim Crit. 1:46A <sup>AM</sup> <sub>PM</sub> Duration 20 min.

*Fuels*

Tube	Shield	Pos.	Fuel	
M'9	196	G-1	A1-130	Cd
M'13	251	G-1	A1-131	Cd
S'11	213	G-1	A1-129	Cd
L'10		G5	A134	

*Cat. Power Distribution, Cd covered fuel*

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 5

Table Pos. 999.997 T 0.024 T B.03.2

Control Rod Channel

A	999.993	A	
B		B	.1 Meter
C	20.035	C	7.0 $5 \times 10^{-8}$
D	2.34	D	6.0 $2 \times 10^{-8}$
		E	93 740v.

Tim Crit. 2:23 <sup>AM</sup> <sub>PM</sub> Duration 20 min.

Tube	Shield	Pos.	Fuel	
M'11	224	G9	Gd-13	A-Cd
O'11	221	G1	Gd-13	A-Cd
L'10		G5	35A	

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 6

Table Pos. 999.997 T .0238 B .0318

Control Rod Channel

A	999.995	A	56 1000/200
X		B	.1 meter
C	20.035	C	64 $5 \times 10^{-8}$
D	4.810"	D	52 $2 \times 10^{-8}$
		E	35 750v.

Tim Crit. 4:02 <sup>AM</sup> <sub>PM</sub> Duration 20 min.

Til n 61 Cd-134 A-Cd  
 L'10 G1 Cd-135 A-Cd  
 L'10 G5 36A1  
 Standard not counted!  
 Job!

C.A. 2 Expr. 4 Run 7

Sheet          Date June 27, 1951 Time 10:00 <sup>AM</sup> <sub>PM</sub>

Purpose To cont. power distribution measurements with Cd covered fuel

INSTRUMENT CHECK

Time 10:00 <sup>AM</sup> <sub>PM</sub> Source PB 173 & 175

Channel

A	B	C	D	E
Range	OK	OK $10^{-10}$	$60^{-10}$	1200v.
Source Dist.		4"	OK	3"
% F.S. Trip	Counters OK			100

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 7

Table Pos. 999.997 T. 0.024 B. 932

Control Rod	Channel
<u>999.993</u>	A <u>76</u> scale <u>100/500</u>
<u>20.035</u>	B <u>.42 meter</u>
<u>3.03"</u>	C <u>9.0 x 10<sup>-8</sup></u>
	D <u>7.4 5x10<sup>-9</sup></u>
	E <u>39-850v</u>

Tim Crit. 10:50 <sup>AM</sup> ~~PM~~ Duration 20 min.

Purpose: Repeat run #6

CRITICAL POSITIONS

C.A. 2 Expr. 4 Run 8

Table Pos. 999.995 T. .0240 B. .9320

Control Rod	Channel
<u>999.991</u>	A <u>66</u> on <u>1000/200</u>
	B <u>0.11</u> (meter)
<u>20.035 out</u>	C <u>7.1</u> on <u>5x10<sup>-8</sup></u>
<u>5.104</u>	D <u>6.2</u> on <u>2x10<sup>-8</sup></u>
	E <u>out</u> (erratic)

Tim Crit. 2:48 <sup>AM</sup> ~~PM~~ Duration 20 min.

Tube Position Foil No  
 G'11 r G1 Cd-136A1-G  
 M'11 l G5 Cd-104A1-G  
 L'10 G5 37A1

T'11 r G1 Cd-137A1-G  
 L'11 l G1 Cd-138A1-G  
 L'10 G5 ~~38~~ 11

C.A. 2 Expr. 2 Run 27

Sheet \_\_\_\_\_ Date June 28, 1951 Time 9:30

Purpose To Repeat bare In irradiations for some points in the .010" fuel loading.

INSTRUMENT CHECK

Time 9:45 <sup>AM</sup> ~~PM~~ Source PB 173,175

	Channel				
	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200v</u>
Source Dist.			<u>10"</u>	<u>8"</u>	<u>3"</u>
% F.S. Trip			<u>100%</u>	<u>100%</u>	<u>100%</u>

Loading Change: Since no more cadmium covered fuel irradiation the excess reactivity was diminished by removing the contents of

E + E'16	U + U'16
F + F'17	T + T'17
H + H'19	R + R'19
I + I'20	(see page 80)

Tube	Position	Foil No.
L'10	G-5	39 A1
L'14	G-3	13 Au
L'13	P1-4	13 In
	P3-4	4 In
L'13	G1-3	6 In
	G3-3	12 In

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 27

Table Pos. 999.997 10240 T B: .9318

Control Rod	Channel
A <u>999.998 in.</u>	A <u>89 on 100/500</u>
<u>2</u>	B <u>.05 (meter)</u>
C <u>8.825"</u>	C <u>5.2 on 2x10<sup>-8</sup></u>
D <u>.035 in.</u>	D <u>8.6 on 5x10<sup>-9</sup></u>
	E <u>40 on 810 v</u>

Tim Crit. 10:24 <sup>AM</sup> ~~PM~~ Duration 20 min.

Purpose: Cont. repeats of E. 2 with bare In.

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 28

Table Pos. 999.994 T.0240 B.9315

Control Rod	Channel
A <u>999.993</u>	A <u>88 on 100/500</u>
<u>2</u>	B <u>.053</u>
C <u>8.805</u>	C <u>4.9 on 2x10<sup>-8</sup></u>
D <u>.030</u>	D <u>8.6 on 5x10<sup>-8</sup></u>
	E <u>39 on 810 v</u>

Tim Crit. 12:51 <sup>AM</sup> ~~PM~~ Duration 20 min.

Foils

- L'10 G5 40 In
- L'14 G3 14 In
- L'13 P1-3 5 In
- P3-3 7 In
- L'13 G1-2 58 In
- G3-2 52 In

Purpose: Continue repeats runs of Exp. 2 with bare In.

CRITICAL POSITIONS

C.A. 2 Expr. 2 Run 29

Table Pos. 999.997 T.0236; B.9316

Control Rod	Channel
A <u>999.987</u>	A <u>70 on 100/200</u>
B <u>_____</u>	B <u>.02</u>
C <u>8.274</u>	C <u>6.5 on 5x10<sup>-9</sup></u>
D <u>.032</u>	D <u>6.7 2x10<sup>-9</sup></u>
	E <u>32 on 920 v</u>

Tim Crit. 2:36 <sup>AM</sup> ~~PM~~ Duration \_\_\_\_\_ min.

Foils:

- L'10 G5 41 In
- L'14 G3 21 In
- L'13 P1-5 17 In
- P3-5 30 In
- L'13 G1-4 21 In
- G3-4 15 In

C.A. 2 Expr. 5 Run 1

Sheet \_\_\_\_\_ Date 6-29 1951 Time \_\_\_\_\_ <sup>AM</sup> ~~PM~~

Purpose Begin In Traverses with thin plexiglass (3/4")

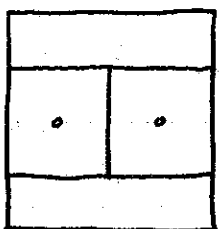
INSTRUMENT CHECK

Time 11:00 <sup>AM</sup> ~~PM~~ Source 173, 175

Range	Channel				
	A	B	C	D	E
			<u>10<sup>10</sup></u>	<u>10<sup>10</sup></u>	<u>100<sup>10</sup></u>
Source Dist.	<u>1/2</u>	<u>1/2</u>	<u>5"</u>	<u>6"</u>	<u>2"</u>
% F.S. Trip			<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>



Loading Change: Changed loading of K'13, L'13, & M'13 to thin plastic configuration as shown below:



The lower layer of graphite consists of three <sup>sub</sup>layers, each containing 6 pieces of 3x3x1/4" graphite side by side. This leaves 1" of void in this layer at the outer end.

~~Deposited into source~~

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>5</u> Run <u>1</u>
Table Pos. <u>999.993</u> <u>T.0235; B.9318</u>	
Control Rod	Channel
A <u>999.992</u>	A <u>77 on 100/200</u>
B <u>          </u>	B <u>.020</u>
C <u>20.035 (out)</u>	C <u>1.9 on 2·10<sup>-8</sup></u>
D <u>5.389</u>	D <u>7.4 on 2·10<sup>-9</sup></u>
	E <u>35 on 900 v.</u>
Tim Crit. <u>1:10</u>	<del>AM</del> PM Duration <u>20</u> min.

Poils:

L'10 G5 Al 42  
 L'12 G5-3 Im 35  
       G7-3 Im 44  
 L'13 P5-1 Im 46  
       P7-1 Im 26  
       G5-1 Im 25  
       G7-1 Im 23

loading change: Removed contents of 89 Q, Q' 20; G, G' 18, 5, 5', 18 in order to attain criticality with rod D completely in.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>5</u> Run <u>2</u>
Table Pos. <u>999.999</u> <u>T.0242T</u> <u>B.9317</u>	
Control Rod	Channel
A <u>999.989</u>	A <u>88</u> <u>100/200</u>
B <u>          </u>	B <u>.021</u>
C <u>18.36</u>	C <u>          </u>
D <u>.035</u>	D <u>8.3</u> <u>2x10<sup>-9</sup></u>
	E <u>34</u> <u>890v</u>
Tim Crit. <u>2:52</u>	<del>AM</del> PM Duration <u>20</u> min.

Poils:  
 L'10 G5 Al 43  
 L'12 G5-4 Im 32  
       G7-4 " 12  
 L'13 P5-2 " 50  
       P7-2 " 29  
       G5-2 " 28  
       G7-2 " 14

Source left in by mistake during ventura run.

Date <u>6-30</u>	195 <u>1</u> Chief <u>Haake</u>
Recorder <u>William</u>	Crew <u>Haake &amp; William</u>

INSTRUMENT CHECK					
Time <u>9:10</u>	<del>AM</del> PM	Source <u>PB173,175</u>			
		Channel	A	B	C
Range	<u>OK</u>	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>1200 v.</u>
Source Dist.	<u> </u>	<u> </u>	<u> </u>	<u>8"</u>	<u>2"</u>
% F.S. Trip	<u> </u>	<u> </u>	<u> </u>	<u>100+</u>	<u>100+</u>

CRITICAL POSITIONS

C.A. 2    Expr. 5    Run 3

Table Pos. 999.998    T. 0246    B. 9318

Control Rod	Channel
A <u>999.986</u>	A <u>83 or <math>\frac{100}{200}</math></u>
B <u>      </u>	B <u>.02</u>
C <u>20.035 (out)</u>	C <u>      </u>
D <u>0.229</u>	D <u><math>8.0 \times 2 \times 10^{-9}</math></u>
	E <u>44 @ 930V</u>

Tim Crit. 9:37    ~~PM~~ <sup>AM</sup>    Duration 20 min.

F<sub>0</sub>:13:

L'10	G5	A144
L'12	G5-4	I <sub>2</sub> 32
	G7-4	" 12
L'13	P5-2	" 50
	P7-2	" 29
	G5-2	" 28
	G7-2	" 14

Loading change:

Removed I, I' 4, Q, Q' 4  
 U, U' 8    E, E' 8

This done so control rods will be  
 in farther.

CRITICAL POSITIONS

C.A. 2    Expr. 5    Run 4

Table Pos. 999.998    T. 0243    B. 9317

Control Rod	Channel
A <u>999.991</u>	A <u>79 or <math>\frac{100}{200}</math></u>
B <u>      </u>	B <u>.021</u>
C <u>6.631</u>	C <u><math>4.7 \times 10^{-8}</math></u>
D <u>0.32 0.032</u>	D <u><math>7.7 \times 2 \times 10^{-9}</math></u>
	E <u>45 @ 930V</u>

Tim Crit. 1:07    ~~PM~~ <sup>AM</sup>    Duration 20 min.

L'10	G5	A145
L'12	G5-5	I <sub>2</sub> 39
	G7-5	13
L'13	P5-3	48
	P7-3	76
	G5-3	52
	G7-3	61

CRITICAL POSITIONS

C.A. 2    Expr. 5    Run 5

Table Pos. 999.998    T. 0245    B. 9318

Control Rod	Channel
A <u>999.990</u>	A <u><math>76 \times \frac{100}{200}</math></u>
B <u>      </u>	B <u>.02</u>
C <u>4.769</u>	C <u><math>4.2 \times 10^{-8}</math></u>
D <u>0.030</u>	D <u><math>7.3 \times 2 \times 10^{-9}</math></u>
	E <u>44 @ 930V</u>

Tim Crit. 2:28    ~~PM~~ <sup>AM</sup>    Duration 20 min.

L'10	G5	A146
L'12	G5-6	I <sub>2</sub> 40
	G7-6	57
L'13	P5-4	59
	P7-4	51
	G5-4	38
	G7-4	34

Date 7-2- 1951 Chief \_\_\_\_\_  
 Recorder Hoake Crew Downes

INSTRUMENT CHECK

Time 9:30 <sup>AM</sup> ~~PM~~ Source PB 173,175

Range	Channel				
	A	B	C	D	E
	OK	OK	N.G.	10 <sup>-10</sup>	1200v
Source Dist.				6" 2"	
% F.S. Trip				100 <sup>+</sup>	100 <sup>+</sup>

Note: Counter 2 not operating

Purpose: Begin Cd-9m Traverse with thin plexiglass.

CRITICAL POSITIONS

C.A. 2 Expr. 5 Run 6

Table Pos. 999.999 T. 0.0248; B. 9320

Control Rod	Channel
<u>999.989</u>	A <u>79</u> on <u>100/200</u>
<u>                    </u>	B <u>.02</u>
<u>4.69</u>	C <u>4.5</u> on <u>10<sup>-8</sup></u>
<u>.028</u>	D <u>7.5</u> on <u>2·10<sup>-9</sup></u>
	E <u>35</u> on <u>900 v.</u>

Tim Crit. 10:02 <sup>AM</sup> ~~PM~~ Duration 20 ~~10:02~~ min.

Coils:

L'10 G5 Al 47  
 L'12 G5-3 Cd 9m 35  
 G7-3 " " 44  
 L'13 P5-1 " " 46  
 P7-1 " " 26  
 G5-1 " " 25  
 G7-1 " " 23

Purpose: Continue Cd-9m Traverse with thin plexiglass

CRITICAL POSITIONS

C.A. 2 Expr. 5 Run 7

Table Pos. 999.999 T. 0.0248; B. 8320

Control Rod	Channel
<u>999.988</u>	A <u>75</u> on <u>100/200</u>
<u>                    </u>	B <u>.02</u>
<u>4.72</u>	C <u>4.3</u> on <u>10<sup>-8</sup></u>
<u>.031</u>	D <u>7.2</u> on <u>2·10<sup>-9</sup></u>
	E <u>34</u> on <u>900 v.</u>

Tim Crit. 11:15 <sup>AM</sup> ~~PM~~ Duration 20 min.

Coils:

L'10 G5 Al 48  
 L'12 G5-4 Cd 9m 32  
 G7-4 " " 12  
 L'13 P5-2 " " 50  
 P7-2 " " 29  
 G5-2 " " 28  
 G7-2 " " 14

Purpose: Continue Cd-9m traverse with thin plexiglass.

CRITICAL POSITIONS

C.A. 2 Expr. 5 Run 8

Table Pos. 0.000 T. 0.0245; B. 8317

Control Rod	Channel
<u>999.985</u>	A <u>45</u> on <u>100/500</u>
<u>                    </u>	B <u>.03</u>
<u>4.158</u>	C <u>6.2</u> on <u>10<sup>-8</sup></u>
<u>.03</u>	D <u>4.3</u> on <u>5·10<sup>-9</sup></u>
	E <u>50</u> on <u>900 v.</u>

Tim Crit. 2:09 <sup>PM</sup> ~~AM~~ Duration 20 min.

Coils:

L'10 G5 Al 49  
 L'12 G5-5 Cd 9m 39  
 G7-5 " " 13  
 L'13 P5-3 " " 48  
 P7-3 " " 76  
 G5-3 " " 52  
 G7-3 " " 61

Purpose: Complete Cd-9m Travers with thin Plexiglass.

CRITICAL POSITIONS

C.A. 2 Expr. 5 Run 9

Table Pos. 999.999 T.0248; B.8319

Control Rod	Channel
1 <u>999.988</u>	A <u>58 on 1000/50</u>
2 <u>          </u>	B <u>.03</u>
3 <u>4.256</u>	C <u>5.7 on 10<sup>-8</sup></u>
4 <u>.032</u>	D <u>9.9 on 2.10<sup>-9</sup></u>
	E <u>37 on 900 v.</u>

Tim Crit. 3:06 <sup>AM</sup>PM Duration 20 min.

Foils:

L'10 G5 Al 50  
 L'12 G5-6 Cd 9m 40  
 G7-6 " " 57  
 L'13 P5-4 " " 51  
 P7-4 " " 52  
 G5-4 " " 38  
 G7-4 " " 34

Date July 3 1951 Chief \_\_\_\_\_  
 Recorder \_\_\_\_\_ Crew \_\_\_\_\_

INSTRUMENT CHECK

Time 1:40 <sup>AM</sup>PM Source 173 7175

Range	Channel				
	A	B	C	D	E
	<u>ok</u>	<u>ok</u>	<u>2x10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200<sup>v</sup></u>
Source Dist.			<u>3"</u>	<u>1"</u>	<u>2"</u>
% F.S. Trip			<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100</u>

Channel "C" not in trip circuit

C.A. 2 Expr. 1 Run 28

Sheet 17 Date 7-3-51 195 Time            <sup>AM</sup>PM

Purpose Check Crit Position  
NOTE Loading changed to same  
as Expt 1 Run 27

Retard: II'4 EE'8 TT'17  
 QQ'4 UU'8 ~~RR'18~~  
 GG'18 UU'16 55'18  
 RR'19 QQ'20

CRITICAL POSITIONS

2 Expr. 1 Run 28

Table Pos. 00.00 T.025T B0832

Control Rod	Channel
A <u>999 - 2m</u>	A _____
B <u>          </u>	B <u>0.10</u>
C <u>4.78 4.82</u>	C _____
D <u>13.915</u>	D _____
	E _____

Tim Crit. ~ 2:30P <sup>AM</sup>PM Duration \_\_\_\_\_ min.

Radiation level spot readings taken around building by H.P.

Date 7/5/51 195 Chief Hoake  
 Recorder Dawnes Crew Zimmerman  
Herman

C.A. 2 Expr. 6 Run 1  
 Sheet \_\_\_\_\_ Date 7/5/51 195 Time 9:20 <sup>AM</sup>/<sub>PM</sub>  
 Purpose To irradiate A<sup>n</sup> foil for Dead Time check

INSTRUMENT CHECK

Time 9:00 <sup>AM</sup>/<sub>PM</sub> Source 173 & 175

	Channel				
	A	B	C	D	E
Range			<u>10<sup>40</sup></u>	<u>10<sup>40</sup></u>	<u>1200<sup>v</sup></u>
Source Dist.	<u>ok</u>	<u>ok</u>	<u>6"</u>	<u>6"</u>	<u>4"</u>
% F.S. Trip			<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>

CRITICAL POSITIONS

C.A. 2 Expr. 6 Run 1  
 Table Pos. 00,000 T.0.25 T B.8318

Control Rod	Channel
<u>A 999,999</u>	<u>1.31</u> <u>1000/500</u>
<u>B</u>	<u>1.</u>
<u>C 20,035</u>	<u>8.8</u> <u>5x10<sup>-8</sup></u>
<u>D 2.21</u>	<u>9.3</u> <u>end Range</u>
	<u>E 3.6</u> <u>750<sup>v</sup> Bergerard</u>

Tim Crit. 9:30 <sup>AM</sup>/<sub>PM</sub> Duration 10 min.

C.A. 2 Expr. 7 Run 1-3  
 Sheet \_\_\_\_\_ Date 7-5 195 Time 10:15 <sup>AM</sup>/<sub>PM</sub>  
 Purpose To check effect of table separation on critical positions & to investigate reproducibility.

CRITICAL POSITIONS

C.A. 2 Expr. 7 Run 1  
 Table Pos. 999,999 T.0248; B.8318

Control Rod	Channel
<u>1 999,988</u>	<u>A 85 m</u> <u>100/200</u>
<u>2</u>	<u>B .02</u>
<u>3 20.035 (out)</u>	<u>C 7.6 m</u> <u>5·10<sup>-9</sup></u>
<u>4 2.67 ± .03</u>	<u>D 8.2 m</u> <u>2·10<sup>-9</sup></u>
	<u>E 51 m</u> <u>990v.</u>

Tim Crit. 10:25 <sup>AM</sup>/<sub>PM</sub> Duration \_\_\_\_\_ min.

D: 2.71  
2.64<sup>+</sup>

Table now separated by small increments and Rod D adjusted to keep level at same power.

Table I B Rod D

<u>.015<sup>0</sup></u>	<u>.0259</u>	<u>.8333</u>	<u>.0013</u>	<u>2.538<sup>-</sup></u> <u>2.509<sup>+</sup></u>
<u>.056</u>	<u>.0568</u>	<u>.8561</u>	<u>.0087</u>	<u>2.03</u>
<u>.081</u>	<u>.0761</u>	<u>.8672</u>		<u>1.58</u>
<u>.100</u>	<u>.0904</u>	<u>.8769</u>		<u>1.18</u>
<u>.140</u>	<u>.1081</u>	<u>.9112</u>		<u>.035</u>
<u>0</u>	<u>10248</u>	<u>.8318</u>		<u>2.67</u>

98 Separated table and ran out control rods. Then ran up to same level as before.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>7</u> Run <u>2</u>
Table Pos. <u>999.999</u>	T. <u>0249</u> ; B. <u>8319</u>
Control Rod	Channel
1 <u>999.991</u>	A <u>85 on 100/200</u>
2 <u>                    </u>	B <u>.021</u>
3 <u>20.035</u>	C <u>87.4 on 5-10-9</u>
4 <u>2.55</u>	D <u>8.2 on 2-10-9</u>
	E <u>55 on 990v.</u>
Tim Crit. <u>11:15</u> <sup>AM</sup> <del>PM</del>	Duration <u>10</u> min.

Separated tables and ran out control rods. Kept safety rods cocked. Allowed to cool until 1:00 p.m.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>7</u> Run <u>3</u>
Table Pos. <u>999.999</u>	T. <u>0261</u> ; B. <u>8320</u>
Control Rod	Channel
1 <u>999.989</u>	A <u>85 on 100/200</u>
2 <u>                    </u>	B <u>.023</u>
3 <u>20.035</u>	C <u>7.4 on 5-10-9</u>
4 <u>2.215</u>	D <u>8.2 on 2-10-9</u>
	E <u>37 on 900v.</u>
Tim Crit. <u>1:12</u> <sup>AM</sup> <del>PM</del> ( <u>half power</u> )	Duration <u>15</u> min.

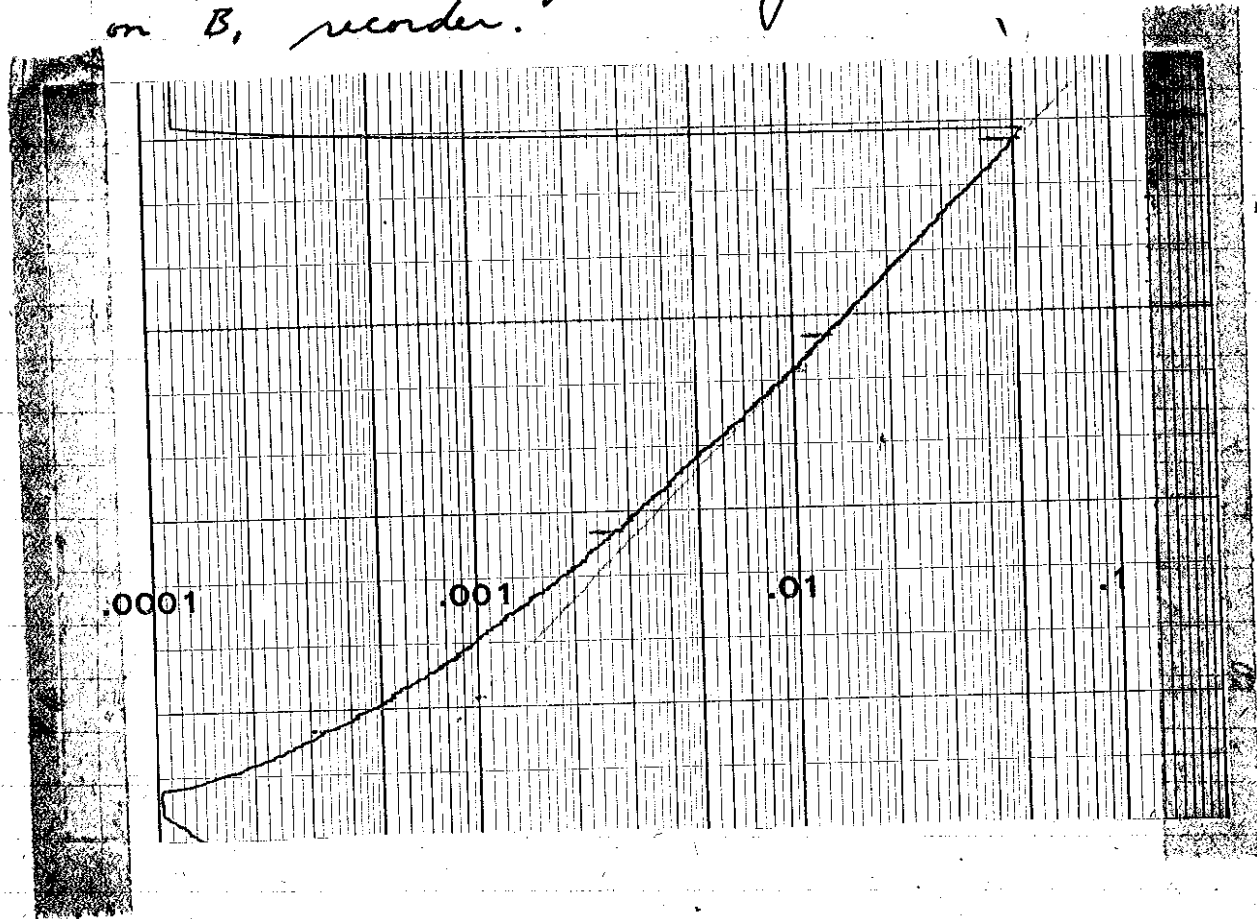
Fired S.R. 5, Ran C.R. "D" out to 16 in. Recocked S.R. 5, then ran C.R. "D" in till critical at previous level.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>7</u> Run <u>3a</u>
Table Pos. <u>999.999</u>	T. <u>0261</u> ; B. <u>8320</u>
Control Rod	Channel
1 <u>999.989</u>	A <u>85 on 100/200</u>
2 <u>                    </u>	B <u>.023</u>
3 <u>20.035</u>	C <u>7.4 on 5-10-9</u>
4 <u>2.18 2.17</u>	D <u>8.2 on 2-10-9</u>
	E <u>37 on 900v.</u>
Tim Crit. <u>1:35</u> <sup>AM</sup> <del>PM</del>	Duration <u>10</u> min.

Ran CR's out and table out to about 2", then returned to level.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>7</u> Run <u>3b</u>
Table Pos. <u>.000</u>	T. <u>0255</u> ; B. <u>8320</u>
Control Rod	Channel
1 <u>999.989</u>	A <u>84 on 100/200</u>
2 <u>                    </u>	B <u>.023</u>
3 <u>20.035</u>	C <u>7.4 on 5-10-9</u>
4 <u>2.105</u>	D <u>8.2 on 2-10-9</u>
	E <u>35 on 900v.</u>
Tim Crit. <u>1:50</u> <sup>AM</sup> <del>PM</del>	Duration <u>12</u> min.

Ran C.R. "D" out; allowed level to fall to .0001 on channel B, then ran C.R. "D" in to .1" super-critical (1.105") and allowed level to rise exponentially to obtain trace on B<sub>1</sub> recorder.



Date 7-6 1951 Chief Downes  
 Recorder Haske Crew Downes  
and Haske

INSTRUMENT CHECK

Time 9:30 <sup>AM</sup> ~~PM~~ Source PB 173,175

	Channel				
	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200v.</u>
Source Dist.	<u> </u>	<u> </u>	<u>11"</u>	<u>2"</u>	<u>3"</u>
% F.S. Trip			<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>	<u>100<sup>+</sup></u>

*Counters 1 & 2 are OK.*

*Note: C out of Trip chkt. and connected to Brush recorder.*

CRITICAL POSITIONS

C.A. 2 Expr. 8 Run 1

Table Pos. .000 T. 0260; B. 8320

	Control Rod	Channel
1	<u>999.995</u>	A <u>89</u> <u>100/200</u>
2	<u>—</u>	B <u>.024</u>
3	<u>20.035 out</u>	C <u>8.0</u> <u>5 · 10<sup>-9</sup></u>
4	<u>2.54</u>	D <u>8.4</u> <u>2 · 10<sup>-9</sup></u>
		E <u>68 on 990v.</u>

Tim Crit. 10:05 <sup>AM</sup> ~~PM~~ Duration \_\_\_\_\_ min.

*Purpose: To calibrate rods by rod drop method.*



(and A to ~4")

Fired SR 3, ran out CR "D", rechecked SR. 3 and ran A and D back in to critical at previous level. Positions + levels all same as previous run except rod D now at 2.34"

$$\frac{N_0 - N_1}{N_1} = \frac{.78 - .48}{.48} = .625 = 62.5\%$$

S.R. 3

Maintained level for ~13 min. Then fired S. rod 4

$$\frac{N_0 - N_1}{N_1} = \frac{.78 - .475}{.475} = .64 = 64\%$$

S.R. 4

Returned to same level as before. Rod A now 997.989  
Maintained level for ~13 min. Fired S. rod 5

$$\frac{N_0 - N_1}{N_1} = \frac{.79 - .505}{.505} = .56 = 56\%$$

Rod 5

S.R. 5

Returned to same level as before. Rod D now 2.20"  
Maintained level for ~13 min. Fired S. rod 8

1.2.2

$$\frac{N_0 - N_1}{N_1} = \frac{.77 - .502}{.502} = .53 = 53\%$$

S.R. 8



$$\frac{N_0 - N_1}{N_1} = \frac{1785 - 150}{150} = .57 = 57\%$$

S.R. 1

Safety Rod.

# 1	-	57¢	Long
# 3	-	62.5¢	Long
# 4	-	64¢	Long
#. 3 + 4	-	\$1.22	
# 5	-	56¢	Short
"	-	52¢	
"	-	48¢	
# 8	-	53¢	

Calc Values

A  $1.2075 \times .56 = .6762$

B

C  $\frac{.57}{1.2075} = .472$

D  $\frac{62.5}{1.2075} = .5176$

7-6-51

Returned to same level as before, now using rod C instead of rod D. Rod A: .015, Rod D: 20.10, Rod C: 0.290  
 Maintained level for ~ 13 min. Fired Rod 1.

CRITICAL POSITIONS			
C.A.	2	Expr.	8 Run 2
Table Pos.	-99.989	L 025T	R 8.320
	Control Rod		Channel
1	A 99.989	A 89	100/200
2	—	B .025	—
3	20.035	C 7.6	5x10 <sup>-9</sup>
4	<del>1.235</del> 1.230	D 8.4	2x10 <sup>-9</sup>
		E 990V	64
Tim Crit.	1:55	AMM PM	Duration _____ min.

Purpose -  
 Control Rod  
 Calibration

- 1) Remove A 1" to ~~D~~ .986
  - a) move D to 0.150 (critical pos.)
  - b) D back to 1.230 — C in  $\rightarrow$  16.565 (crit.)
- 2) A to 1.995
  - a) . . . . .

→  
 See next page:

Critical Positions for Control Rods. —

A	B	C	D
-99.989	—	20.035	1.230
.986	—	20.035	0.150
.986	—	16.565	1.230
1.995	—	16.565	1.240
1.995	—	15.355	1.235
2.990	—	15.365	?

~~Failed~~ Attempted to return all rods to original positions —  
 found -99.975 — 20.035 ~ .87

Making a difference in D of .36 mi.

No satisfactory explanation —

Inst. Scram on D ~ 3:45 PM.  
 no apparent reason.

Date 7-9 1951 Chief \_\_\_\_\_  
 Recorder Maake Crew Zimmerman

INSTRUMENT CHECK

Time 9:40 <sup>AM</sup>/<sub>PM</sub> Source PB 173,175

Range	Channel				
	A	B	C	D	E
	OK	OK	$10^{-10}$	$10^{-10}$	1200V
Source Dist.			2'	8"	3"
% F.S. Trip			100%	100%	100%

Counters O.K.

Purpose: To attempt to reproduce critical posns. of  $7/6$  and to notice time variation during operation.

CRITICAL POSITIONS

CA 2 Expr. 9 Run 1

Table Pos. .000 T.0261 B.8320

Control Rod	Channel
<u>999.985</u>	A <u>87</u> on $100/200$
<u>20.035</u> out	B <u>.024</u>
<u>0.561</u>	C <u>7.8</u> on $5 \cdot 10^{-9}$
	D <u>8.4</u> on $2 \cdot 10^{-9}$
	E <u>37</u> on 900V.

Tim Crit. 10:09 <sup>AM</sup>/<sub>PM</sub> Duration 81 min.

Made adjustments of rod D to maintain level.

Time	D Pos'n
<u>10:25</u>	<u>.53</u>
<u>10:33</u>	<u>.50</u>
<u>10:36</u>	<u>.52</u>
<u>10:47</u>	<u>.48</u>
<u>11:00</u>	<u>.46</u>
<u>11:12</u>	<u>.44</u>
<u>11:14</u>	<u>.43</u>
<u>11:20</u>	<u>.41</u>
<u>11:25</u>	<u>.39</u>
<u>11:30</u>	<u>.38</u>

CRITICAL POSITIONS

CA 2 Expr. 9 Run 2

Table Pos. .000,00 T.0256 B-.9320

Control Rod	Channel
A <u>999.985</u>	A <u>61</u> on $100/200$
B <u>—</u>	B <u>0.1</u>
C <u>16.49</u>	C <u>6.5</u> on $15 \cdot 10^{-9}$
D <u>1.212</u>	D <u>7.2</u> on $12 \cdot 10^{-9}$
	E <u>58</u> on 900V

Tim Crit. 12:58 <sup>AM</sup>/<sub>PM</sub> Duration 2hr 38 min.

System ~~could not~~ could not be made critical with rod D all the way in.

(C at 16.49)

Made adjustments on Rod D to maintain level

Time	D Position Reading	(Unsteady reading)
1:03 P	1.212	
1:10 P	1.280	
1:19 P	1.233	
1:30 P	1.210	
1:33 P	1.190	
1:42	1.170	
1:48	1.150	
1:59	1.105	
2:12	1.082	
2:20	1.060	
2:29	1.024	
2:38	1.000	

Control D was run in to 0.025 (IN Position.)  
 C changed to 18.82" to hold power level  
 at 0.100 time - 3:00 PM.  
 Variation in C: (A and D in)  
 3:00 - 18.820

Changed power level to 0.010  
 slightly subcritical at above settings i.e. C-18.820  
 A & D in - (3:17 P.M.)  
 3:22 PM. cut at C  
 18.65  
 3:40 18.59 ~ (not certain)  
 3:42 Inst. Scram on D - (changed chart  
 speed on D)

7/10/51 Loading change: Emptied contents of tubes 109  
 U, U' - 16; T, T' - 17; R, R' - 19; Q, Q' - 20, to compensate  
 for increased reactivity due to thinner plastic.

Date 7-10 1951 Chief \_\_\_\_\_  
 Recorder William Crew Hoake

Tubes K', L', M' 11; and K', L', M' 13 now contain  
 1" layer of plexiglass, 2 small shishes, and 1/2" graphite.

INSTRUMENT CHECK						
Time	Source	Channel				
Time <u>2:15</u> AM	Source _____	A	B	C	D	E
Range <u>1</u> <u>2</u>		OK	OK	10 <sup>-10</sup>	10 <sup>-10</sup>	10 <sup>0</sup> DV
Source Dist. <u>OK</u> <u>OK</u>				8"	5"	2"
% F.S. Trip				FS <sup>+</sup>	FS <sup>+</sup>	95

C back in  
 Trip ckt.  
 D out of  
 Trip  
 circuit,  
 because of  
 accidental  
 scrams.

Purpose: Begin ~~in~~ I in traverse with intermediate plexifan (1")

CRITICAL POSITIONS			Foil positions		
C.A. <u>2</u>	Expr. <u>10</u>	Run <u>1</u>	L'10	G-5	H1 "51
Table Pos. <u>00.00</u>	T. <u>0279</u>	B. <u>7320</u>	L'12	G-5-2	3m 8
				G-7-2	42
Control Rod	Channel		L'13	P5-1	30
A <u>997.487</u>	A <u>86 e 1/2 10</u>			P7-1	67
B _____	B <u>1020</u>			G5-1	33
C <u>20.035 (cont)</u>	C <u>7.4 15 10<sup>-9</sup></u>			G7-1	53
D <u>11.772</u>	D <u>8.1 12 10<sup>-9</sup></u>				
	E <u>30 @ 900 Volts</u>				
Tim Crit. <u>11:03</u>	AM	Duration <u>20</u> min.			

CRITICAL POSITIONS

C.A. 2    Expr. 10    Run 2

Table Pos. .000    T0280 T B7.319

Control Rod	Channel
A <u>999.991</u>	A <u>83</u> $100/200$
	B <u>1020</u>
C <u>20.035</u>	C <u>7.3</u> $5 \times 10^{-9}$
D <u>11.185</u>	D <u>8.0</u> $2 \times 10^{-9}$
	E <u>29</u> @ <u>900v</u>

Tim Crit. 2:10 <sup>AM</sup>/<sub>PM</sub>    Duration 20 min.

*Boils:*  
 L'10 G5 Al5  
 L'12 G5-3 9m 6  
 G7-3 "60  
 L'13 P5-2 "60  
 P7-2 "68  
 G5-2 "7  
 G7-2 "27

Date July 11 1951 Chief \_\_\_\_\_  
 Recorder Haake Crew Downes

INSTRUMENT CHECK

Time 8:30 <sup>AM</sup>/<sub>PM</sub>    Source PB 173,175

Range	Channel				
	A	B	C	D	E
	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200v</u>
Source Dist.	<u>+</u>	<u>+</u>	<u>11"</u>	<u>3"</u>	<u>4"</u>
% F.S. Trip			<u>100+</u>	<u>100+</u>	<u>100</u>

Counters 1+2 are OK.

*Boils:*  
 L'10 G5 Al53  
 L'12 G5-4 9m17  
 L'12 G7-4 "5  
 L'13 P5-3 "4  
 P7-3 "37  
 G5-3 "56  
 G7-3 "63

*Purpose: Continue in traverse with int. (1") plexiglass.*

CRITICAL POSITIONS

C.A. 2    Expr. 10    Run 3

Table Pos. .002    T0282; B.6320

Control Rod	Channel
1 <u>999.992</u>	A <u>84</u> on $100/200$
2 _____	B <u>.02</u>
3 <u>20.035</u>	C <u>7.4</u> on $5 \cdot 10^{-9}$
4 <u>11.975</u>	D <u>8.2</u> on $2 \cdot 10^{-9}$
	E <u>30</u> on <u>900v</u>

Tim Crit. 8:53 <sup>AM</sup>/<sub>PM</sub>    Duration 20 min.

Purpose: Continue 9m Traverse with 1" plexiglass.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>10</u> Run <u>4</u>
Table Pos. <u>.003</u>	T. <u>.0280</u> ; B. <u>.6320</u>
Control Rod	Channel
1 <u>999.995</u>	A <u>85</u> on <u>100/200</u>
2 <u>          </u>	B <u>.02</u>
3 <u>20.035 (out)</u>	C <u>7.4</u> <u>5.10<sup>-9</sup></u>
4 <u>11.80</u>	D <u>8.0</u> <u>2.10<sup>-9</sup></u>
	E <u>29</u> m <u>900v</u>
Tim Crit. <u>9:44</u>	<del>PM</del> <sup>AM</sup> Duration <u>20</u> min.

Foils:  
 L'10 G5 al 54  
 L'12 G5-5 9m 69  
       G7-5 " 21  
 L'13 P5-4 " 65  
       P7-4 " 51  
       G5-4 " 61  
       G7-4 " 55

Purpose: Complete 9m Traverse with 1" plex.

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>10</u> Run <u>5</u>
Table Pos. <u>.000</u>	T. <u>.0271</u> ; B. <u>.5321</u>
Control Rod	Channel
A <u>999.999</u>	A <u>84</u> on <u>100/200</u>
2 <u>          </u>	B <u>.02</u>
3 <u>20.035 (out)</u>	C <u>7.3</u> on <u>5.10<sup>-9</sup></u>
4 <u>11.71</u>	D <u>8.0</u> on <u>2.10<sup>-9</sup></u>
	E <u>29</u> on <u>900v</u>
Tim Crit. <u>11:15</u>	<del>PM</del> <sup>AM</sup> Duration <u>20</u> min.

Foils:  
 L'10 G5 al 55  
 L'12 G5-6 9m 77 ✓  
       G7-6 " 45 ✓  
 L'13 P5-5 " 58 ✓  
       P7-5 " 43 ✓

Purpose: Begin Cd. 9m traverse with 1" Plexiglass

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>10</u> Run <u>6</u>
Table Pos. <u>00.000</u>	T. <u>0.250</u> ; B. <u>5.319</u>
Control Rod	Channel
A <u>999.999</u>	A <u>85</u> on <u>100/200</u>
2 <u>          </u>	B <u>.02</u>
C <u>20.035</u>	C <u>7.4</u> <u>5.10<sup>-9</sup></u>
D <u>8.515</u>	D <u>8.0</u> <u>2.10<sup>-9</sup></u>
	E <u>26</u> <u>900v</u>
Tim Crit. <u>1:35</u>	<del>PM</del> <sup>AM</sup> Duration <u>20</u> min.

Foils:  
 L'10 G5 al 56  
 L'12 G5-2 Cd 9m 8 ✓  
       G7-2 " " 42  
 L'13 P5-1 " " 30 ✓  
       P7-1 " " 67 ✓  
       G5-1 " " 33 ✓  
       G7-1 " " 53 ✓

Purpose: Continue Cd. 9m Traverse with 1" Plexiglass

CRITICAL POSITIONS	
C.A. <u>2</u>	Expr. <u>10</u> Run <u>7</u>
Table Pos. <u>999.999</u>	T. <u>0.250</u> ; B. <u>5.320</u>
Control Rod	Channel
A <u>999.995</u>	A <u>86</u> on <u>100/200</u>
2 <u>          </u>	B <u>.02</u>
C <u>20.035</u>	C <u>7.3</u> on <u>5.10<sup>-9</sup></u>
D <u>8.505</u>	D <u>8.0</u> on <u>2.10<sup>-9</sup></u>
	E <u>28</u> on <u>900v</u>
Tim Crit. <u>2:48</u>	<del>PM</del> <sup>AM</sup> Duration <u>20</u> min.

Foils:  
 L'10 G5 al 57  
 L'12 G5-3 Cd 9m 6  
       G7-3 " " 60  
 L'13 P5-2 " " 66  
       P7-2 " " 68  
       G5-2 " " 7  
       G7-2 " " 27

Date 7-12 1951 Chief \_\_\_\_\_  
 Recorder Hake Crew Downes

INSTRUMENT CHECK

Time 8:40 <sup>AM</sup>/<sub>PM</sub> Source PB173,175

Range	Channel				
	A	B	C	D	E
	OK	OK	10 <sup>-10</sup>	10 <sup>-10</sup>	1000v.
Source Dist.			8"	8"	3"
% F.S. Trip			100+	100+	100

Counters O.K.

Purpose: Continue Cd-9m traverse with 1" plexiglass.

CRITICAL POSITIONS

CA 2 Expr. 10 Run 8

Table Pos. .000 T.0260; B.5320

Control Rod	Channel
1 <u>999.995</u>	A <u>83</u> on <u>100/200</u>
<u>—</u>	B <u>.018</u>
<u>20.035</u>	C <u>7.3</u> on <u>5·10<sup>-9</sup></u>
<u>9.10</u>	D <u>8.0</u> on <u>2·10<sup>-9</sup></u>
	E <u>29</u> on <u>900v.</u>

Tim Crit. 8:54 <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils:

L'10 G5 Al58  
 L'12 G5-4 Cd-9m 17  
 G7-4 " " 5  
 L'13 P5-3 " " 4  
 P7-3 " " 37  
 G5-3 " " 56  
 G7-3 " " 63

Note: Plexiglass was not in proper position. No foils 4+37 were not counted.

Purpose: Continue Cd-9m traverse with 1" plexiglass.

CRITICAL POSITIONS

CA 2 Expr. 10 Run 9

Table Pos. .000 T.0260; B.5320

Control Rod	Channel
1 <u>.025</u>	A <u>85</u> on <u>100/200</u>
2 <u>—</u>	B <u>.019</u>
3 <u>20.035 (out)</u>	C <u>7.4</u> on <u>5·10<sup>-9</sup></u>
4 <u>9.15</u>	D <u>8.0</u> on <u>2·10<sup>-9</sup></u>
	E <u>31</u> on <u>900v.</u>

Tim Crit. 9:54 <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils:

L'10 G5 Al59  
 L'12 G5-5 Cd-9m 69  
 G7-5 " " 21  
 L'13 P5-4 " " 65  
 P7-4 " " 51  
 G5-4 " " 61  
 G7-4 " " 55

Purpose: Continue Cd-9m traverse with 1" plexiglass.

CRITICAL POSITIONS

CA 2 Expr. 10 Run 10

Table Pos. .000 L.0260; .5320

Control Rod	Channel
1 <u>999.996</u>	A <u>85</u> on <u>100/200</u>
<u>—</u>	B <u>.020</u>
<u>20.035 (out)</u>	C <u>9.3</u> on <u>5·10<sup>-9</sup></u>
4 <u>9.68</u>	D <u>8.0</u> on <u>2·10<sup>-9</sup></u>
	E <u>31</u> on <u>900v.</u>

Tim Crit. 10:57 <sup>AM</sup>/<sub>PM</sub> Duration 20 min.

Foils:

L'10 G5 Al60  
 L'12 G5-6 Cd-9m 77  
 G7-6 " " 45  
 L'13 P5-5 " " 58  
 P7-5 " " 43



7/13/51

Continue Cd-116 source in 1" plexiglass -

CRITICAL POSITIONS

CA. 2 Expr. 10 Run 11

Table Pos. 949.96 L. 0246T - R. 5318

Control Rod	Channel
A <u>999.995</u>	A <u>96</u> <u>100/200</u>
<u>20.035</u>	B <u>0.020</u>
<u>10.200</u>	C <u>8.3</u> <u>5x10<sup>-9</sup></u>
	D <u>9.2</u> <u>2x10<sup>-9</sup></u>
	E <u>33</u> <u>X 900V</u>

Tim Crit. 12:17 <sup>AM</sup> PM Duration 20 min.

Foils:

L-10 G-5 al 61  
L-13 P-5-3 & 10  
L-13 P-7-3 & 15

Date 7/13/51 1951 Chief \_\_\_\_\_

Recorder Zimmerman Horke Crew Downes

INSTRUMENT CHECK

Time 9:30 <sup>AM</sup> ~~PM~~ Source 173 175

Range	Channel			
A	B	C	D	E
<u>10/25</u>	<u>10<sup>10</sup></u>			
<u>ok</u>	<u>ok</u>	<u>8"</u>	<u>6"</u>	
		<u>100+</u>	<u>100+</u>	

% FS. Trip

CRITICAL POSITIONS

CA. 2 Expr. 10 Run 12

Table Pos. 00.000 T. 0242T B. 5316

Control Rod	Channel
A <u>99.999</u>	A <u>87</u> <u>100/200</u>
	B <u>.010</u>
C <u>20.035</u>	C <u>7.5</u> <u>5x10<sup>-9</sup></u>
D <u>11.916</u>	D _____
	E <u>53</u> <u>on 1020</u>

Tim Crit. 9:01 <sup>AM</sup> ~~PM~~ Duration \_\_\_\_\_ min.

7/13/51

C.A. 2 Expr. 11 Run 1  
 Sheet \_\_\_\_\_ Date 7 July 1951 Time 10:20 AM  
 Purpose To determine effectiveness of ~~74~~ 1" versus 1 1/2" plexiglass

1" Plexi. CRITICAL POSITIONS  
 C.A. 2 Expr. 11 Run 1  
 Table Pos. 99.999 T. 0240 B. 5312  
 Control Rod Channel  
 A 99.994 A 87 1/300  
 B .002  
 C 20.035 (out) C 9.1 5 x 10<sup>-10</sup>  
 D 11.980 D \_\_\_\_\_  
 E 21 @ 1200V  
 Tim Crit. 10:20 AM Duration \_\_\_\_\_ min.

Fission Ch.  
 Time 2 min  
388 x 16  
+ 11  
376 x 16  
+ 8

① Moved Channel A, C & E (Chambers)

INSTRUMENT CHECK  
 Time 12:10 AM/PM Source 173 175  
 Channel  
 A B C D E  
 Range \_\_\_\_\_ OK 10<sup>-10</sup> \_\_\_\_\_ 1200V  
 Source Dist. \_\_\_\_\_ 8" \_\_\_\_\_ 3"  
 % F.S. Trip \_\_\_\_\_ 100<sup>+</sup> \_\_\_\_\_ 100  
 Counters OK

1 1/2" Plexi CRITICAL POSITIONS  
 C.A. 2 Expr. 11 Run 2 A  
 Table Pos. \_\_\_\_\_ T T B \_\_\_\_\_  
 Control Rod Channel  
 A in A \_\_\_\_\_  
 B .002 B .002  
 C ~ 6.45 C \_\_\_\_\_  
 D in D \_\_\_\_\_  
 E \_\_\_\_\_  
 Tim Crit. 12:38 AM/PM Duration 4 min.

Scram from channel C

1 1/2" Plexi. CRITICAL POSITIONS  
 C.A. 2 Expr. 11 Run 2 b  
 Table Pos. 99.995 T 2240 B 5318  
 Control Rod Channel  
 A 99.986 A 85 1/30  
 B .002  
 C 6.320 C \_\_\_\_\_  
 D 0.035 D 6.9 10<sup>-10</sup>  
 E 4 1200V  
 Tim Crit. 1:06 AM/PM Duration 10 min.  
 (1:15 PM)

Tubes K, L, M - 11 and K, L, M - 13 now contain 1 1/2" plexiglass, 2 and  
 shields (See 7/10/51)

Period Calibration  
6.71 min 3.13 - C-Rod ~ 100 Sec (see above)  
 1 decade on B, B<sub>2</sub>

CRITICAL POSITIONS

C.A. 2 Expr. 11 Run 2c

Table Pos. 99.995 T. 2240 B. 5318

Control Rod Channel

A 99.986 A \_\_\_\_\_

B \_\_\_\_\_ B .45

C 6.160 C \_\_\_\_\_

D 0.035 D \_\_\_\_\_

E 95 - 750V E \_\_\_\_\_

Reading Time 130 AM PM Duration \_\_\_\_\_ min.

Run 2d - Scram  
from Channel E

Tables did not  
separate

CRITICAL POSITIONS

C.A. 2 Expr. 11 Run 2d

Table Pos. 99.995 T. 2240 B. 5318

Control Rod Channel

A 99.986 A \_\_\_\_\_

B \_\_\_\_\_ B .85

C 6.200 C \_\_\_\_\_

D 0.035 D \_\_\_\_\_

E \_\_\_\_\_ E \_\_\_\_\_

Reading Time 150 AM PM Duration \_\_\_\_\_ min.

File Sc. 5X10<sup>4</sup> - 49

C.A. 2 Expr. 11 Run 3

Sheet \_\_\_\_\_ Date 13 July 1951 Time 2:32 ~~AM~~ PM

Purpose To measure time variation during operation. (Duplicate)

CA-2 EXP. 9 Run 2

Scram on Chan E  
at 0.1 on B<sub>1</sub>

CRITICAL POSITIONS

C.A. 2 Expr. 11 Run 3

Table Pos. \_\_\_\_\_ T. B R. \_\_\_\_\_

Control Rod Channel

A \_\_\_\_\_ A \_\_\_\_\_

B \_\_\_\_\_ B \_\_\_\_\_

C \_\_\_\_\_ C \_\_\_\_\_

D \_\_\_\_\_ D \_\_\_\_\_

E \_\_\_\_\_ E \_\_\_\_\_

Tim Crit. 246 AM PM Duration \_\_\_\_\_ min.

for Rods A & D  
(See Above)  
Period Calibrat.

G-2.21

Date July 16 1951 Chief \_\_\_\_\_  
 Recorder Downes Crew Hecke  
Zimmerman

INSTRUMENT CHECK

Time 8:25 AM Source 1738175

	Channel				
	A	B	C	D	E
Range	<u>10<sup>25</sup></u>	<u>—</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200<sup>+</sup></u>
Source Dist.	<u>ok</u>	<u>ok</u>	<u>12"</u>	<u>10"</u>	<u>2"</u>
% F.S. Trip			<u>10<sup>+</sup></u>	<u>10<sup>+</sup></u>	<u>100<sup>+</sup></u>

Run 1  
 Expt. 3  
 Date 7-16 1951  
 Sheet \_\_\_\_\_  
 Purpose \_\_\_\_\_

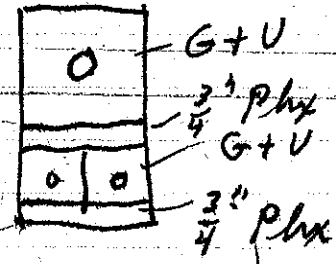
Loading Change: All plastic removed from upper half of reactor, from rows 5, 7, 9, + 11

MULTIPLICATION

Scaler	c/ 5 min.	BG/ 5 min.	Mult.	1/M
1	<u>1556</u>	<u>636</u>	<u>2.45</u>	<u>409</u>
2	<u>1648</u>	<u>198</u>	<u>8.32</u>	<u>1201</u>
3		<u>34</u>		

C.A. 3 Expt. \_\_\_\_\_ Run 2  
 Sheet \_\_\_\_\_ Date July 16 1951 Time \_\_\_\_\_ AM/PM

Loading Change: Plex glass replaced in row 11 in both fixed + movable halves. This plex is  $\frac{3}{4}$ " thick

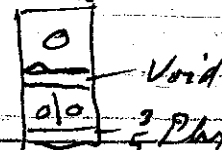


MULTIPLICATION

Scaler	c/ 5 min.	BG/ _____ min.	Mult.	1/M
1	<u>5120</u>			
2	<u>5730</u>			
3	<u>902</u>			

C.A. 3 Expt. 1 Run 3  
 Sheet \_\_\_\_\_ Date 7-16 1951 Time \_\_\_\_\_ AM/PM

Loading Change:  $\frac{3}{4}$ " Plex added to bottom of row 9 both halves.



MULTIPLICATION

Scaler	c/ 5 min.	BG/ _____ min.	Mult.	1/M
1	<u>23948</u>			
2	<u>26230</u>			
3	<u>4327</u>			

C.A. 3 Expt. 1 Run 4  
 Sheet \_\_\_\_\_ Date 7-16 1951 Time \_\_\_\_\_ AM/PM

Loading change: added  $\frac{3}{4}$ " Plex glass to 6 cells top, row 9, both halves center, both halves

MULTIPLICATION			
Scaler	c/	min. DC/	min. Mult. 1/M
1			
2			
3			

CRITICAL POSITIONS			
C.A.	3	Expr.	1
Run		Run	4
Scale Pos.	-99.997	.2239	.4718
Control Rod	-99.984	Channel	40 $100/25$
		B	.0005
	<del>0.26</del> 12.255	C	.6 - $10^{-9}$
	.026	D	3.6 $8 \times 10^{-11}$
		E	0 - 1200 ✓
Tim Crit.	11:50 AM	Duration	5 min.

C.A.	3	Expr.	1	Run	5
Sheet		Date	7-16 1951	Time	AM PM

*Loading change.*  
 Fried Half: Pbx (Doubt  $\frac{3}{4}$  layers) completed through row 7, 9, 11

Movable Half: Pbx completed through row 9, and 11 and row 7 P thru J.

Graph + U removed from: Rows 4 and 5 and from Columns EE', U, U'  
 (see CA 3 sheet 1)

CRITICAL POSITIONS			
C.A.	3	Expr.	1
Run		Run	5
Scale Pos.	99.994	T.22324	B.4315
Control Rod	In 99.987	Channel	$100/50$ 16.0
		B	.0004
	Out 20.035	C	
	6.242	D	
		E	1200V 2.0
Tim Crit.		Duration	

C.A. 3 Expr. 1 Run 6  
 Sheet \_\_\_\_\_ Date \_\_\_\_\_ 195\_\_ Time \_\_\_\_\_ AM  
 PM

loading change: Plus  $\frac{3}{4}$ " Double layer completed  
 in row 7 movable half.  
 Graph + V and P.M. ( $1\frac{1}{2}$ ") removed from  
 rows 19 and 20

CRITICAL POSITIONS  
 C.A. 3 Expr. 1 Run 6  
 Table Pos. 99.996 T.2245 B.4318

Control Rod	Channel
<u>In 99.995</u>	A <u>100/25</u> 20.
<u>2</u>	B <u>- Neg</u>
<u>In 99.974</u>	C <u>1 x 10<sup>-10</sup></u>
<u>In .025</u>	D <u>5 x 10<sup>-11</sup></u>
	E <u>0</u>

or may not  
 May, but sub crit?  
 Tim Crit. \_\_\_\_\_ AM  
 PM Duration \_\_\_\_\_ min.

C.A. 3 Expr. 1 Run 7  
 Sheet \_\_\_\_\_ Date \_\_\_\_\_ 195\_\_ Time \_\_\_\_\_ AM  
 PM

Purpose Sub-critical  
See loading sheet -

loading change: Inserted 2 -  $\frac{3}{4}$ " thick Plexiglas  
 in Row 15 replacing  $1\frac{1}{2}$ "

CRITICAL POSITIONS  
 C.A. 3 Expr. 1 Run 8  
 Table Pos. 0000 T.0.2235 B.0.4314

Control Rod	Channel
A <u>999.99</u>	A <u>41</u> <u>100/25</u>
B <u>-</u>	B <u>0.005</u>
C <u>20.03 out</u>	C <u>4.5 x 2 x 10<sup>-10</sup></u>
D <u>1.848</u>	D <u>5.8 x 10<sup>-10</sup></u>
	E <u>0</u>

Tim Crit. 3:35 AM  
 PM Duration 5 min.

loading change:  $\frac{3}{4}$ " Plexiglas in Row 17.  
 Empty: H-7, R-7, G-9, S-9, G-8, S-8, G-16, S-16, I-6, Q-6,  
 I-18, Q-18, R-17, H-17, S-15, G-15.

C.A. 3 Expr. 1 Run 9  
 Sheet \_\_\_\_\_ Date 7/16 1951 Time 4:15 AM  
 PM

Purpose Sub critical by fair amount -

Date July 17 1951 Chief \_\_\_\_\_  
 Recorder Zimmerman Mooney, Scott. William

INSTRUMENT CHECK

Time 1:30 <sup>AM</sup> ~~PM~~ Source 173-175

	Channel				
	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200V</u>
Source Dist.			<u>8"</u>	<u>12"</u>	<u>5"</u>
% F.S. Trip			<u>100</u>	<u>100</u>	<u>100</u>

Sub CRITICAL POSITIONS

C.A. 3 Expr. 1 Run 10

Table Pos. \_\_\_\_\_

Control Rod	Channel
1	A
2	B
3	C
4	D
	E

Tim Crit. \_\_\_\_\_ <sup>AM</sup> ~~PM~~ Duration \_\_\_\_\_ min.

Loading change  
 add Plexiglass and  
 small shields for  
 tubes G9, G15, S9, S15  
 and G'9, G'15, S'9, S'15.

Sub

C.A. 3 Expr. 1 Run 11  
 Sheet \_\_\_\_\_ Date 7-17 1951 Time 2:25 <sup>AM</sup> ~~PM~~  
 Purpose New loading: Add full slugs  
to: I6, I18, G8, G16, Q6, Q18, S8, S16  
Same number to movable half (same position).

CRITICAL POSITIONS

C.A. 3 Expr. 1 Run 11

Table Pos. 000.00 1.2234T 4316

Control Rod	Channel
1 <u>999.99 On</u>	A <u>13</u> <u>10/200</u>
2 _____	B <u>.00033</u>
3 <u>8.05</u>	C <u>2.0</u> <u>2x10<sup>-10</sup></u>
4 <u>103 On</u>	D <u>2.6</u> <u>10<sup>-10</sup></u>
	E <u>0</u> <u>at 1200</u>

Tim Crit. 2.37 <sup>AM</sup> ~~PM~~ Duration 5 min.

Loading change

↓  
over

C.A. 3 Expr. 1 Run 12  
 Sheet \_\_\_\_\_ Date 7-17 1951 Time 3:20 <sup>AM</sup> <sub>PM</sub>  
 Purpose Loading change (fixed and movable halves the same)  
Add G+Plexiglass to H7, H17, R7, R17  
Remove 3" slugs and put in 2-1/2 slugs in each of following:  
G8, G16, I6, I18, Q6, Q18, S8, S16

CRITICAL POSITIONS

C.A. 3 Expr. 1 Run 12  
 Table Pos. 00000 12232 — 4316

Control Rod	Channel
1 <u>9997</u>	A <u>22</u> <u>10/200</u>
2 <u>—</u>	D <u>.00048</u> <u>—</u>
3 <u>20.40 out</u>	C <u>2.8</u> <u>5x10<sup>-10</sup></u>
4 <u>4.50</u>	D <u>4.5</u> <u>x10<sup>-11</sup></u>
	E <u>0</u> <u>— 1200</u>

Tim Crit. 3:27 <sup>AM</sup> <sub>PM</sub> Duration \_\_\_\_\_ min.

C.A. 3 Expr. 1 Run 13  
 Sheet \_\_\_\_\_ Date 7-17 1951 Time \_\_\_\_\_ <sup>AM</sup> <sub>PM</sub>  
 Purpose Loading Change:  
Remove half of G and P. from each of following cells -  
(both halves of assembly)  
H7, H17, R7, R17

CRITICAL POSITIONS

C.A. 3 Expr. 1 Run 13  
 Table Pos. 00000 12231 — R4316

Control Rod	Channel
A 1 <u>999.99</u> <u>on</u>	A <u>38</u> <u>10/200</u>
B 2 <u>—</u>	B <u>.0009</u>
C 3 <u>14.16</u>	C <u>6.2</u> <u>2x10<sup>-10</sup></u>
D 4 <u>.03</u> <u>on</u>	D <u>6.1</u> <u>2x10<sup>-10</sup></u>
	E <u>0 - 1200</u>

Tim Crit. 4:04 <sup>AM</sup> <sub>PM</sub> Duration 5 min.

Date 7-18 1951 Chief \_\_\_\_\_  
 Recorder \_\_\_\_\_ Crew \_\_\_\_\_

INSTRUMENT CHECK

Time 9:15 <sup>AM</sup> <sub>PM</sub> Source PB 173, 175

	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u>10<sup>-10</sup></u>	<u>10<sup>-10</sup></u>	<u>1200v.</u>
Source Dist.	<u> </u>	<u> </u>	<u>12"</u>	<u>10"</u>	<u>3"</u>
% F.S. Trip			<u>100+</u>	<u>100</u>	<u>100+</u>



Purpose: Begin In traverse with split plexiglass.

CRITICAL POSITIONS		
C.A. <u>3</u>	Expr. <u>2</u>	Run <u>1</u>
Table Pos. <u>.000</u>	<u>T.2241 B.4318</u>	
Control Rod	Channel	
1 <u>999.999</u>	A <u>88 on 100/200</u>	
2 <u>                    </u>	B <u>.021</u>	
3 <u>02.14.375</u>	C <u>8.1 on 5x10<sup>-9</sup></u>	
4 <u>.028</u>	D <u>7.8 on 2x10<sup>-9</sup></u>	
	E <u>31 on 1050V</u>	
Tim Crit. <u>10:07</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

Foils:

L'10	G5	al 63
L'11	G1-1	9m 68
	G3-1	" 30
	P1-1	" 39
	P3-1	" 73
L'12	G1-3	" 1
	G3-3	" 37

Foils - Loading

L'10	G5	al 65
L'11	G1-3	In 4
	G3-3	" 20
	P1-3	" 49
	P3-3	" 60
L'12	G1-5	" 67
	G3-5	" 76

Continue In traverse with split plexiglass

CRITICAL POSITIONS		
C.A. <u>3</u>	Expr. <u>2</u>	Run <u>3</u>
Table Pos. <u>.000.002</u>	<u>T.2263 B.4318</u>	
Control Rod	Channel	
A <u>999.990</u>	A <u>81 on 100/200</u>	
	B <u>.020</u>	
C <u>14.114</u>	C <u>7.3 on 5x10<sup>-9</sup></u>	
D <u>0.029</u>	D <u>7.1 on 2x10<sup>-9</sup></u>	
	E <u>29 on 1050V</u>	
Tim Crit. <u>1:02</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

Continue In traverse with split plexiglass -

CRITICAL POSITIONS		
C.A. <u>3</u>	Expr. <u>2</u>	Run <u>2</u>
Table Pos. <u>000.00</u>	<u>T.2249 T. - P.4316</u>	
Control Rod	Channel	
1 <u>999.995</u>	A <u>81 100/200</u>	
2 <u>                    </u>	B <u>.020</u>	
3 <u>14.226</u>	C <u>7.2 5x10<sup>-9</sup></u>	
4 <u>0.029</u>	D <u>7.0 2x10<sup>-9</sup></u>	
	E <u>29 - 1050V</u>	
Tim Crit. <u>11:04</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

Foils - loading

L'10	G5	al 64
L'11	G1-2	9m 59
	G3-2	" 9
	P1-2	" 46
	P3-2	" 34
L'12	G1-4	" 28
	G3-4	" 62

Foils - Loading

L'10	G5	al 66
L'11	G1-4	In 29
	G3-4	72
	P1-4	6
	P3-4	35
L'12	G1-6	66
	G3-6	42

Continue In traverse with split plexiglass

CRITICAL POSITIONS		
C.A. <u>3</u>	Expr. <u>2</u>	Run <u>4</u>
Table Pos. <u>00.002</u>	<u>T.2275 B.4320</u>	
Control Rod	Channel	
A <u>999.990</u>	A <u>77 on 100/200</u>	
	B <u>.020</u>	
C <u>14.032</u>	C <u>7.0 on 5x10<sup>-9</sup></u>	
D <u>0.027</u>	D <u>6.8 on 2x10<sup>-9</sup></u>	
	E <u>31 on 1050V</u>	
Tim Crit. <u>2:00</u>	<del>AM</del> <u>PM</u>	Duration <u>20</u> min.

(cd)  
Continue in traces with split plexiglass

CRITICAL POSITIONS	
C.A. <u>3</u>	Expr. <u>2</u> Run <u>5</u>
Table Pos. <u>000.003</u>	<u>T. 2285 B. 4314</u>
Control Rod	Channel
<u>A 999.989</u>	<u>A 73 on <math>\frac{100}{200}</math></u>
<u>C 10.036</u>	<u>D .020</u>
<u>D 0.026</u>	<u>C 6.6 on <math>5 \times 10^{-9}</math></u>
	<u>D 6.4 on <math>2 \times 10^{-9}</math></u>
	<u>E 25 on 1050V</u>
Tim Crit. <u>3:11</u>	<del>AM</del> PM Duration <u>20</u> min.

L10 G5-A167  
L11 G1-2 CdIn. 33  
G3-2 23  
P1-2 22  
P3-2 16  
L12 G1-4 26  
G3-4 25

Date 7/20 1951 Chief \_\_\_\_\_  
Recorder \_\_\_\_\_ Crew Hawke  
Downes Williams Scott

INSTRUMENT CHECK

Time 9:10 ~~AM~~ ~~PM~~ Source PB-173<sup>1</sup>175

	Channel				
	A	B	C	D	E
Range	<u>OK</u>	<u>OK</u>	<u><math>10^{-10}</math></u>	<u><math>10^{-10}</math></u>	<u>1200</u>
Source Dist.			<u>12"</u>	<u>12"</u>	<u>2"</u>
% F.S. Trip			<u>100*</u>	<u>100</u>	<u>100*</u>

Counters 1, 2 & 3 OK

C.A. 4 Run L  
Sheet \_\_\_\_\_ Date 7/20 1951 Time 9:30 ~~AM~~ ~~PM~~  
Purpose Split Reactor

all plexiglass removed from CA3 EXP. 2 135

MULTIPLICATION			
Scaler	<u>5</u>	BG/ <u>5</u>	Mult. 1/M
1	<u>633</u>	<u>439</u>	<u>.69</u>
2	<u>723</u>	<u>482</u>	<u>.67</u>
3	<u>379</u>	<u>315</u>	<u>.83</u>
Mass = 21.79 KG			

Mass @ BG = 18.63 KG (all plexiglass removed from CA-3)  
Voids filled in rows 9, 11, 13 both halves

MULTIPLICATION			
Scaler	<u>5</u>	BG/ <u>5</u>	Mult. 1/M
1	<u>818</u>	<u>439</u>	<u>.537</u>
2	<u>1060</u>	<u>482</u>	<u>.455</u>
3	<del>527</del> <u>527</u>	<u>315</u>	<u>.597</u>
Mass 27.378 KG			

Complete square 13x13 cells. G-5, 6-18 in.

Control Book Calibration

SR

- #1 - 574 Long
- #3 - 62.54 Long
- #4 - 644 } 2.7 126.5 Long
- #3 + #4 - 1222
- #5 - 564 Short
- " - 524
- " - 484
- 8 - 534

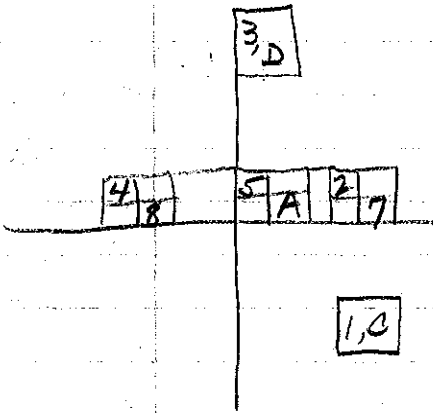
$$SR \cdot \frac{4 \text{ (Long)}}{8 \text{ Short}} = \frac{64}{53} = 1.2075$$

Control Rd.  
(SR 5)

$$A = .56 \times 1.2075 = .6762$$

$$C = \frac{(SR^{-1}) .57}{1.2075} = .472$$

$$D = \frac{(SR^{-3}) 62.5}{1.2075} = .5176$$





~~SECRET~~  
~~SECURITY INFORMATION~~

~~RESTRICTED DATA~~  
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~~SECURITY INFORMATION~~

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~~SECURITY INFORMATION~~