

## BOOK66R

*Notes:*

"SORA Book No. 2 1967-1969" on spine

Blank pages: page opposite page 1, 1, 4, 7, 8, 182, 277, 292-307

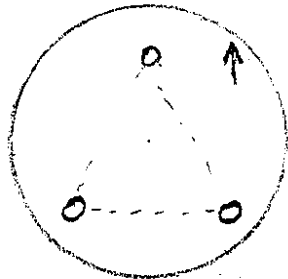
- page 9 has 3 sheets taped to it, and 1 photo taped to it
- page 10 has 2 photos taped
- page 15 has 1 index card stapled
- page 21 has 2 (8.5x11) sheets
- page 26 has 1 sheet taped
- page 38 has 1 small graph sheet taped
- page 46 has 1 small drawing taped
- page 154 has 1 sheet taped
- page 176 has 2 sheets taped
- page 190 has 1 sheet taped
- page 191 has 2 sheets taped
- page 200 has 1 small drawing taped
- page 205 has 3 photos taped
- page 208 has 2 photos taped
- page 209 has 1 photo taped
- page 222 has 1 drawing taped
- page 234 has 3 small graphs taped
- page 263 has 1 (8.5x11) graph sheet taped
- pages 270 & 273 has 1 graph taped to each
- page 276 has 1 sheet taped
- page 283 has 1 sheet taped
- inside back cover sheets had 1 sheet between pages
- last inside back cover has 1 sheet taped

*Scanned by:*

*Sheila Finch*

*RSICC /Oak Ridge National Lab.*

*August 23, 1999*



MOTOR SHAFT  
SOUTH  
MEANS  
BLADE IS DOWN  
& NEAR CORE AREA.

E-16



# Account Book

No. S 149

NO UNITS

Journal . . . . .

Ledger, Single Entry . .

Ledger, Double Entry .

Record Ruled (27 Lines)

Made in 150, and 300 Pages

MADE IN U. S. A.

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

Evaluations	Page	Foils (235U)	Page
Blade	69, 72	<del>235U</del> Radial	74
Sect 3	73	Vertical #91	76
Blade	88, 89	" 95	93
cd	88, 104, 105	" 18	95
H <sub>2</sub> O	103,	" 87	96
→ Fuel vs Fe vs void	99, 110, 154	Radial	97
Sect 2d	98	Vertical #15-	98
Block (Mock up)	114	" #11	107
Rossi & Detectors	78	" #43 + #53	108
Scatter #3	118		
1/4" Boral (Sect. 3)	120		
Blade Traverse	125		
Block (mock up)	128 (3/8" Fe)		
1/4" Boral (Sect 1+5)	131		
Be #1 + #5 (against Core)	139		
30 cm Core (Block Studies)	143 (3/8" Fe)		
24 cm Core (Block)	148		
#1 + #5 = Fe	151		
Sect 4 = BNL	152		
Block (Mock up, 1/4" Al)	164		

*dx*

*Rosier dx*

I	Page
Ni + Fe	53
"	55
"	63
Open	72
Ni + Fe (30 cm Cou)	142
Blade Remounted	179
Loading in pipe for RP	183
TC Locations	190
Sect 2 + 4 Interchanged	200
Small Scatters (Poly)	184
Blade Traverse (+55°)	204
" Velocity	205
Sect 2 + 4 Changed	219
Rotor Blade But	220

Detectors	Page
Top Plug	78
Top Plug + Be Blade	79
Top Plug + N. Refl.	80
" + Sect 4	81
" + Blade	83
No Blade	91
BNL (sect 4)	155
Sect 2 = Sect 4 Void <sup>sect 4</sup> BNL	227

RP	Page	P	Date
1	191	<u>\$8.00</u> -	Oct 15, 1968
2	192	<u>-6.00</u>	15,
3	194	<u>-4.00</u>	16,
4	195	<u>-2.00</u>	16,
5	196	<u>-1.50</u>	16,
6	197	<u>-0.75</u>	16,
7	198	<u>+0.55</u>	16,
8	201	<u>0.55</u>	21,
9+10	203	<u>0.55</u>	22,
11	209	<u>0.55</u>	23,
12	210	<u>0.55</u>	24,
13	214	<u>0.55</u>	25,
14	216	<u>0.55</u>	28,
15	218	<u>0.23</u>	29,
16	228	<u>0.55</u>	Nov 12, 1968
17	228	$\infty$	19,
18	233	<u>0.55</u>	DEC 12, 1968
19	234	<u>0.55</u>	13,
20	236	<u>0.55</u>	16,
21	237	<u>0.55</u>	17,
22	239	<u>0.55</u>	18,
23	240	$\infty$	19,
24	242	<u>-1.00</u>	20,
25	244	<u>0.55</u>	24,
26	245	<u>0.55</u>	26,
27	246	<u>0.55</u>	27,

RP#	Page	P	DATE
28	249	$0.55$	JAN 2, 1970
29	253	$-10.82$	8,
30	254	$-8.25$	9,
31	256	$0.55$	10,
32	259	$0.25$	14,
33	261	$\infty$	15,
34	264	$0.32$	16,
35	266	$\infty$	18,
36	268	$0.55$	20,
37	270	$0.55$	21,
38	271	$0.32$	21,
39	272	$0.32$	22,
40	274	$-2.20$	24,
41	275	$-4.63$	'24,

H. Dec. 67

A Chamber = 20" Center C. 90° to acc  
A = 100/1000 = 96% of full scale. 6  
9

Move A to 40" CC → 96280 c.p.m. → 22

A chamber at 8.25" C-C → Ref Count = 8785/cpm → 1

A chamber at 16.5" CC → Ref Count = 10674 → A = 15% on 1000/10



60 cy pulses at 50 Hz sec wide  
accelerator Tube.

60164 = .6 min

9686 0.1 min = 93% F.S.

= 22% F.S.

→ A readout = 48% FS on  $\frac{1000}{1000}$   
BK9D = 16%

$\frac{1000}{1000}$ , BK9D = 3.5% FS.

REQUEST AND REPORT OF SPECTROGRAPHIC ANALYSIS

SUBMITTED BY <b>W. C. TUNNELL</b>	CHARGE NO. <b>4410-72</b>	SAMPLE NO. <b>16 samples</b>	
	BUILDING NO.	PHONE	DATE
COPY REPORT TO	BUILDING NO.		
COMPOSITION OF SAMPLE IF KNOWN <b>MILD STEEL (ITALIAN ORIGIN) Identify</b>			
TYPE OF ANALYSIS DESIRED <input type="checkbox"/> Qualitative, <input type="checkbox"/> Semi-quantitative, <input checked="" type="checkbox"/> Quantitative, <input checked="" type="checkbox"/> Photoelectric			
ELEMENTS DESIRED <b><del>Spectro</del> Typical</b>			

GENERAL ANALYSIS  
(values in \_\_\_\_\_)

RARE EARTH ANALYSIS  
(values in \_\_\_\_\_)

METAL ANALYSIS  
(values in wt %)

Ag	In	Sc
Al	Ir	Si
As	K	Sn
Au	Li	Sr
B	Mg	Ta
Ba	Mn	Te
Be	Mo	Th
Bi	Na	Ti
Ca	Ni	Tl
Cb	Os	U
Cd	P	V
Co	Pb	W
Cr	Pd	Zn
Cs	Pt	Zr
Cu	Rb	
Fe	Re	
Ga	Rh	
Ge	Ru	
Hf	Sb	
Hg		

Sc
Y
La
Ce
Pr
Nd
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Th

Type alloy
Cr
Ni
Fe
Mo
Co
Cb
Ta
Mn
V
Ti
Cu
Al
Mg
Sn
Pb
Zn
Bi
Si

Explanation of Analysis:

Symbols Used: P-Present; T-Trace; < - less than; > - greater than; nd-not detected; no analyses made in all other cases.

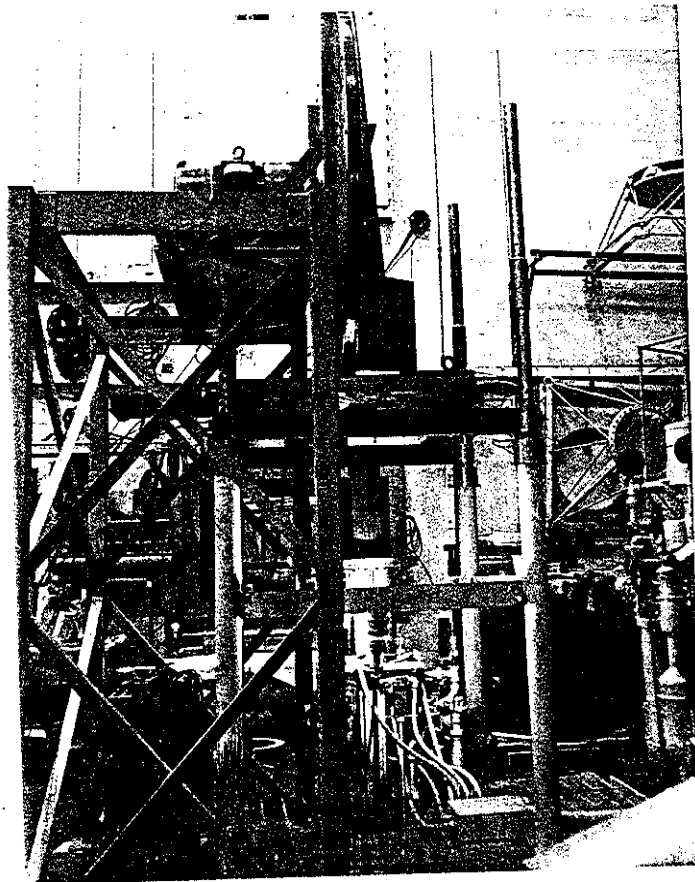
- Qualitative Analysis - Estimate only as follows: M-major; m-minor; t-trace.
- Semi-Quantitative Analysis - The values reported are visual estimates taken from a standard plate and using a common graphite matrix. These values are to be interpreted as approximations only. Actual value should be within the range times 1/2 to times 2.
- Quantitative Analysis - The values reported are obtained by visual comparison of the sample with standards similarly prepared. Precision is about ± 50% of the amount present.
- Densitometric Analysis - The values reported are obtained by precise analytical spectrochemical methods. Precision of the method varies but is of the order of ± 10% or better.
- Photoelectric Analysis - Rapid electronic method. Precision ± 20 %.

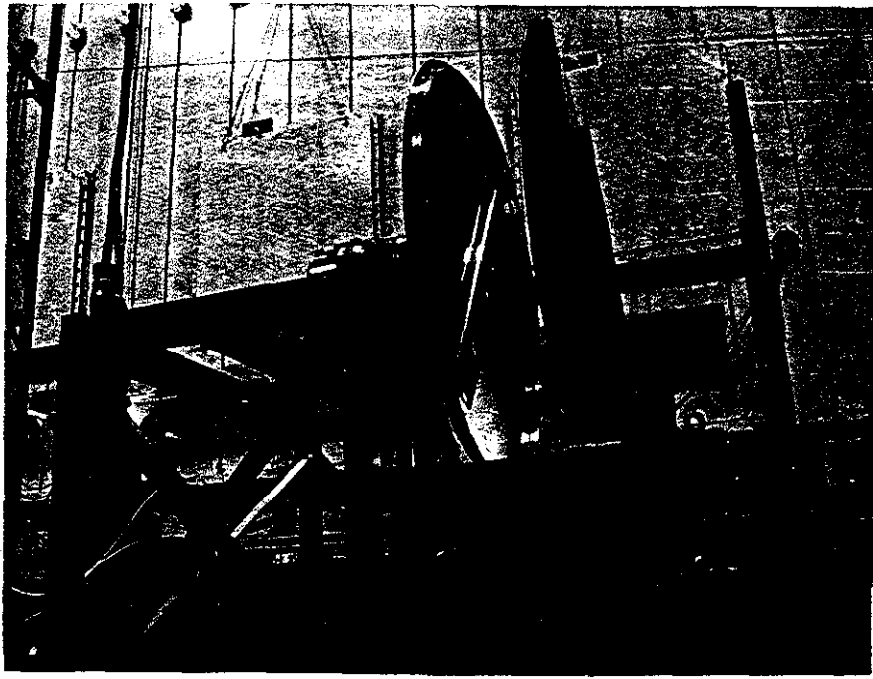
ANALYSIS PERFORMED BY <b>EW SAM JC</b>	APPROVED BY <b>J. A. Carter</b>	PLATE NO. <b>5722</b>	DATE REPORTED <b>11-20-67</b>
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COMMENTS  
 \* See attached results.  
 C & S can be obtained on a 0.5g sample

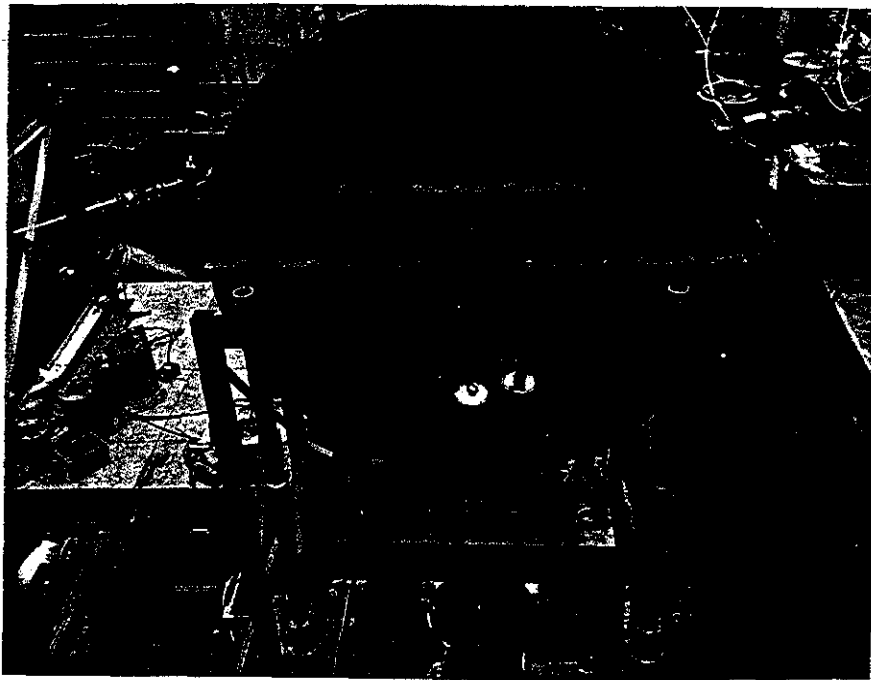
Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ag																
Al	<.05															
B	<.005															
Ba																
Be																
Bi																
Ca																
Cb																
Cd																
Co	≤.105	≤.05	≤.05	≤.05	≤.05	≤.05	≤.05	≤.05	≤.05	≤.05	≤.05	.07	≤.05	.07	≤.05	≤.05
Cr	.09	.08	.07	.08	.07	.10	.07	.12	.1	.10	.12	.21	.11	<.05	<.05	<.05
Cu	.27	.24	.26	.31	.22	.35	.23	.34	.28	.26	.24	.26	.12	.06	.056	.035
Fe	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
K																
Li																
Mg																
Mn	.75	.69	.75	.79	.62	.89	.69	.88	.77	.82	.75	.36	1.03	.33	.33	.37
Mo	.02	.02	.02	.03	.03	.02	.03	.02	.02	.02	.02	.05	.04	.02	.01	.02
Na																
Ni	.12	.10	.16	.16	.10	.21	.11	.23	.12	.14	.08	.12	.05	<.03	<.03	<.03
P																
Pb																
Pt																
Rb																
Sb																
Si	.25	.23	.28	.35	.23	.37	.23	.35	.26	.29	.21	.17	.05	.21	.19	.24
Sn	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.05	.05	≤.05	≤.05
Sr																
Ta																
Th																
Ti	.04	.02	.03	.03	.04	.03	.05	.03	.04	.04	.03	<.01	<.01	<.01	<.01	<.01
U																
V	<.02															
W																
Zn																
Zr																

Carbon & S needed for complete identification





27



13

28

Cont from SORA Book #1  
 Recopy the last item in #1

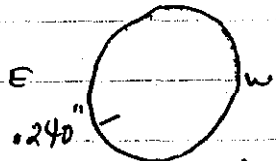
27 Jan 67 Cont. to set up "SORA" for the "pulse arm" experiment.  
 Ran alignment of empty core into reflector.  
 down selsyn = 000.30  
 1<sup>st</sup> offset @ 7.64 on selsyn #1  
 2<sup>nd</sup> offset @ 10.00  
 3<sup>rd</sup> offset @ 11.00

Up position #1 = 23.645; #2 = 23.339; #3 = +3; #4 = -4  
 Alignment was good with no core contact.  
 Minimum clearance of wooden test arm in housing:  
 0.290" on the North  $\pm$  0.190 on the South  
 redo  $\rightarrow$  0.213  $\pm$  0.232

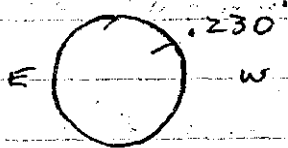
13 Feb 67 SORA housing clears the "real" pulse arm  
 by about 0.23" on either side

28 Jun 67 Set up "vibration detectors" & readouts etc.  
 Torqued all "ARM" bolts to 250 ft. lbs.

29 Jun 67 Checked and tightened all nuts and bolts associated with entire SDRA rig. (arm)  
 Made final clearance checks of blade vs housing: (minimum clearance).



North side of housing looking South



South side of housing looking South.

Start test of SDRA arm in motion:

13:31:43 Arm on  $\approx 4 \text{ sec}^{1067}$  - Up to about 1000 RPM

13:35:02 Arm on  $\approx 8 \text{ sec}^{137}$  - Up to  $\approx 2000 \text{ RPM}$   
 Ellis says arm is now about 15 miles closer to the N side.

13:39:46 Arm on  $10-12 \text{ sec}^{240}$  - Up to  $\approx 3000 \text{ RPM}$   
 Arm is "walking" a few miles ( $\approx 15$ ) but returns to with 5 miles of this runs start.

13:43:55  $\approx 180 \text{ RPM}$

13:46:15 Arm started Up to 3600 RPM

13:46:32 Stop as per Ellis. Moved \*80 miles toward North as per JE & off scale thus stopped. It slowed and returned to within 20 miles of original "zero".

Make inspection:

Top of motor "hand warm".

"Safety Iron" had vibrated outward  $\frac{1}{8}$ ".

13:58:30 Arm still @ ~ 10 RPM

run Made following measurements @ marked positions:

- from south surface of arm to the south outside surface of shroud original = 0.666"  
→ now = 0.698"

∴ relative change measured = 0.032 inches.

- Between main frame and outside SE shroud = 4.561"

- Same but on SW = 2.661"

- from Motor mount SW to nut on frame = 1.960"

14:49:23 Arm on for 1.11 min. - Stable @ 3600 RPM

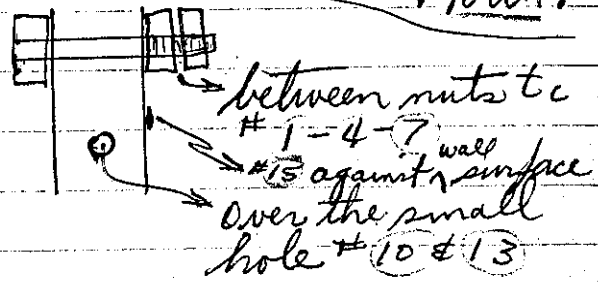
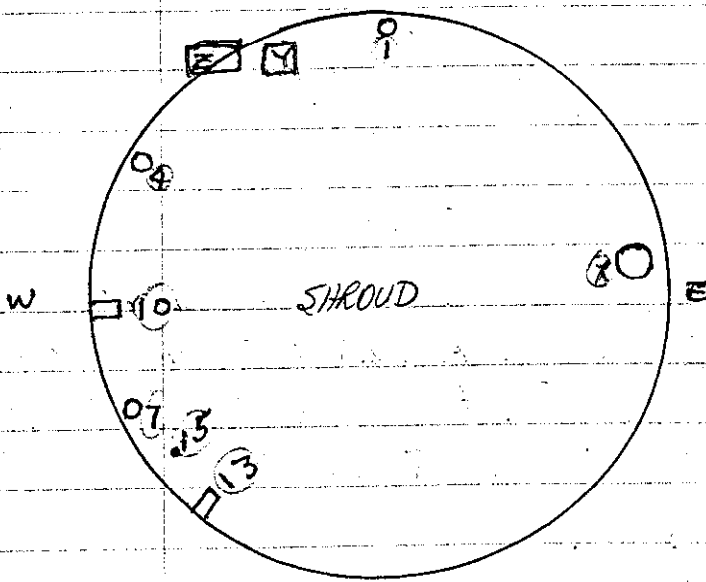
For this run the hole (1") on SE was taped closed \* (this helped <sup>prevent</sup> cause 80 mile shown at top of the page). The safety iron was wedged so it would not move.



During the run, J.E. max. dev. toward N was 3.30 mils and this returned to normal after Arm slowed.

15:02:00 The shroud is "hand warm" near outer perimeter. Thermal Couples to be installed and cooling of shroud is to be resolved.

30 Jun 67 Installed thermal couples. Also now show other read outs. South side looking North.

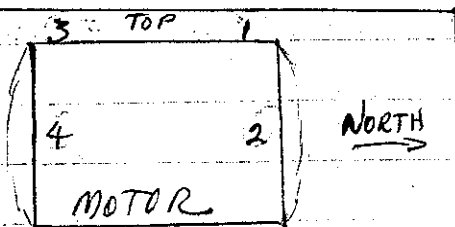


X is on the North side of the housing. Proximity detector. Measures distance of Blade (arm) from the inside surface

Y Ray data - (c-clamp) vibration pickup. Measures lateral vibration.

Z IRD - (on vicer grip) vibration pickup of horizontal vibration.

See attach C



1-2-3-4 are vibration det. used by Kiplinger from K-25.

SORA 30 JUN 67 START 15:15

NOTE: EXACT START TIME MARK ON CHART INVOLVES  
SOME QUESTION DUE TO SLOW REPETITION OF PRINTS

∴ FIRST 0.44 MIN =  $\approx 63^\circ/\text{MIN}$  AIR

\*NEXT 0.34 MIN =  $\approx 16^\circ/\text{MIN}$  AIR

FIRST 0.78 MIN =  $\approx 43^\circ/\text{MIN}$  AIR

\*<sup>12, 14, 2, 3, 16</sup> →  $\approx 16^\circ/\text{MIN}$  OTHER

\* SHOULD BE FAIRLY ACCURATE

CONSIDERING ALL PARAMETERS

*SR Taylor*

15:10:00 on for 0.35 min.

#15 = 4°C temp rise

#10 = 5°C rise

#7 = 1°C rise

15:15:00 on - reached 3600 RPM (full speed) in 0.25 min.

off @ 1.70 min.

The sound produced is not objectionable.

#13 = 32°C rise ; #10 = 29°C rise

#15 = 24°C rise ; #1 = 18°C rise after 4 min.

#4 = 20°C rise in 3 min.; #7 = 19°C rise in 3 min.

The 8 by 14 proximity was pretty good & stable.

∴ #15 showed steady increase of  $\approx 1\frac{1}{2}^{\circ}\text{C}/\text{min}$ .

#13 = " " " "  $\frac{80^{\circ}\text{C}}{15 \text{ min}}$  initial rate

See below attached card

@16:10 hrs all to cooling @ 0.33°C/min.

3 July 67 Ammeter recorder set up to measure motor input.

Installed vacuum tube on N side of center plate cover. Vacuum gauge in 107. Calibrated the proximity detector.

16:15 ARM on for 1.28<sup>1.25</sup> min

Vacuum @ 5.8" Hg

Amps - off scale then settle to 100 amps steady.

	PRE-START	MAX. TEMP.	Rise °C	1 hr.
1	27° C	41° in 5 min.	14°	32°
4	27°	43° in 5 min.	16°	32°
7	27°	42° in 5 min.	15°	32°
10	27°	55° in 1 min.	28°	32°
13	27°	62° in 1.2 min	35°	30°
15	27°	46° in 3 min	19°	32°

Proximity readout looked good.  
all other readouts normal.

7 July 67 Inspection after above run shows one of the screws holding thin iron piece to the housing had broken and the  $\frac{3}{8}$ " piece of it which would <sup>be</sup> expected to be inside housing cannot be found. Removed all of the components on North side and then removed North side of the housing away from the Arm.

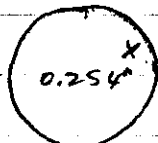
14:15 Wheel industrial hygiene man over for several Be smears. He took them to X-10 to be "spectrographed". Visual inspection of Arm shows little or no damage.

15:28 Highest Be  $\alpha$  = 0.8 (insignificant) Considered clean. Kiplinger's assistant picked up # 3 & 4 vib. det. (ref Pg 14).

8 July 67 Checked all Blade (Arm) bolts to assure each @ 250 ft lbs. all were OK. Made 3 more holes for proximity detectors. Now have "old hole" ① N & S on East. New hole at top ② on North. New hole at West on N side ③ and New hole on S side ④ at bottom.

Reinstalled North side of housing. All of the reflector assembly is down on the floor.  
measured clearance (min.)

.698  
.497  
.201



.682  
.428  
.254

N-Housing

S-Housing

Looking Southward.

17 July 67 #3 & #4 vib. det. picked up by "K-25"  
(ref pg 17)

18 July 67 Made 0.10 min "on time" run so  
J. Ellis could make check on his  
4 proximity read outs. Looks OK.  
(ref 8 July 67)

19 July 67 Kiplinger and associate brought the 4  
vibrating det. readouts back.

1-2-3-4 PROX det. positions (ref 8 July 67)

13:35 On 1.75 min,

IRD = .2-.3

RD = 40

Vac = 5.7" Hg

all tc @ 27°C

at start of run

Peak temps: 13 = 69°C ; 10 = Same ; 1 = 50°;  
4 = 52° ; 7 = 54° ; 15 = 54°

Rate of increase ~~13.3~~ <sup>13.3</sup> C/min on shroud.  
~~13.0~~ <sup>13.0</sup> C/min on air after  
the initial heating. First few  
seconds the air heats about = 60°C/min

Vibration det. 1 = 205 mils

2 = 155

3 = 165

4 = 2400

See Jim Ellis' log for "Proximity" details.

Same Conf.

Run 2:08 min <sup>2:08</sup>

start @ 14:26 hrs.

IRD

RD

Vac = 5.7" Hg

.3 - .4<sup>+</sup>

30

5.6

.2 - .4

28

5.6

.2 - .4 @ 2.00 min

25

5.5

- all tc @  $\approx 37^\circ\text{C}$  and cooling at start time.
- Peak temps = #13 =  $75^\circ$ ; 1 =  $59^\circ$ ; 4 =  $61^\circ$ ; 7 =  $58^\circ$
- Shroud temp. =  $12.8^\circ\text{C}/\text{min}$ .
- Air temp =  $10.8^\circ\text{C}/\text{min}$ . (after first few seconds.)

→ Remove center plate.

Start up 15:06 runtime = 0.48 min.

Amp = off scale for duration.

Stopped due to temp. rise rate surprise. Is OK.

Same conf.

Start up 15:11 runtime = 1.10 min

Amp = off scale for 3 div. then settle @ 35.

Kiplinger vib. det show vibrations to be about 3x worse than with center plate on.

- Air temp =  $37.5^\circ/\text{min}$  rise.

The motor stopped "on its own". see 0933 pg 2)

- Ellis' proximity shows about 30 mil overall blade ref. to housing.

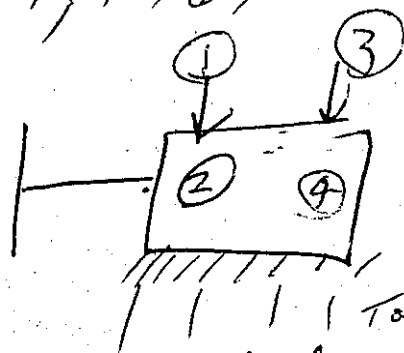


Kip Vibration data

10/11/63

Aug 9, 1967

Kip - G. Newman  
 Y-12  
 Newton  
 Chopper



0-30 Mls PP

0-3500 RPM

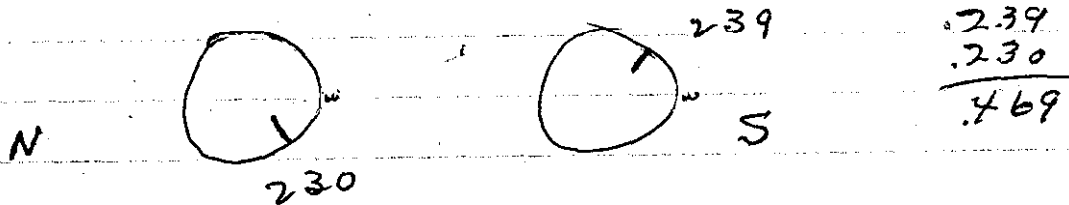
CR Meters & 70' cables  
 Visucorder - 4 channels (Output of CR Meters)  
 Sealed Ground with air

	Meter 1	Meter 2	Meter 3	Meter 4	Time
2-3" Vac Pressure 3-2" Mils pp. 1/2 Min. Run	13	17	13	6	10 AM
#2	14	6	12	6	10 <sup>15</sup>
#2	4	4	8	4	10 <sup>17</sup> AM
#3 in He.	2	3	3	4	130 PM
air mixed in.	4	3	6	5	2 PM
4	9	4	9	5	4 PM 4:35
2x helium flow 5	1 5	1 1	1 3	1 2	2:30 3:12 3:15



9 Aug 67 additional inlet in hub plate.  
 Drum sealed with glyptol, Silastic  
 RTU 731 and duct seal. (dural seal)  
 Vacuum gauge as per 19 July 67.  
 Pressure gauge at bottom (W side) of drum.  
 Thermocouples as per 19 July 67.  
 Additional inlet now sealed.  
 Blade clearance

20K.



0933 Motor fail to start.  
 Breaker found to be out from 19 July 67 <sup>PA20</sup> Run.

10101 ~ 30 sec Run

Vacuum = 3 in. Hg

Pressure = 3 → 2 psi

Temp = 40° C

10:16<sup>40</sup> Run = 2.18<sup>2.18</sup> min

Vacuum = 3 → 5 in Hg

Pressure = 2 → 41 PSI

Thermo #10 = 75.5° C (thru stopper into drum)  
 others = 70° C

13:30

soldered the gauged thermocouples  
to drum.

Purged drum with Helium.

15 ft<sup>3</sup>/hr  
for Run

13:34<sup>21</sup>

.2 min to reach power

4.35 min Run

After 2 min P just off peg.

V " " "

3½ min P " " "

V = 4 in. Hg.

Thermo Coupler = 70° - 75° C.

14:25

Thermo Coupler = 40° C

Purging 45 ft<sup>3</sup>/hr with H for run.

Thermocoupler = 30° C

15:10<sup>30</sup>

10 min Run

No vacuum at center

P = 1½ PSI

Temp = 94° C      63° C rise

mtc reached Power in 12 sec.

Blow seal warm and opened  
hole at bottom

8-10-67

15:17<sup>30</sup>

1.18 min Run

V = 0

P = 0

Temp = ~ 30°C

H = 50 ft<sup>3</sup>/hr.

Mtr = 320 Amp	start
26 Amp	Running

15:34<sup>44</sup>

1.04 min Run

V = 0

P = 0

Temp = 35°C

8-14-67

10:12<sup>30</sup>

1.1 min Run

V = 0

P = 0

H = 50 ft<sup>3</sup>/hr

Temp = 30°C

10:20<sup>25</sup>

0.4 min

Same

Temp = 32°C

10:42<sup>25</sup>

0.9 min

Same

Temp = 34°C

10:47<sup>30</sup>

0.25 min

Temp = 35°C

Probe  
@ 100 mib11:07<sup>52</sup>

Probe at 75 mib

1.0 min

Temp = 31 to 35°C

13:11:30

 $H = 50 \text{ ft}^3/\text{hr}$   
 11.25 min
 $V = 0$  $P = 0$ 

mtr = No Power Change.

 Temp =  $28^\circ$  to  $53^\circ \text{ C}$   
 $26^\circ$  rise

Better seal than for page 22.

16 Aug 67 Misc. activities and the cooling problem is being approached. Expect to put  $\frac{1}{2}$ " Cu tubing on much of housing surface for H<sub>2</sub>O cooling effect. Expect to hold tubing to the housing with "THERMO" which is a high heat transfer & holding material.

21 Aug 67 Housing now apart. Be smears <sup>(white)</sup> were taken (cf 7 July 67). Results = OK, - Clean.

22 Aug 67 All cooling coils on both sides are now tack-welded on (see pictures opposite page). Housing is back together with SIKASTK all around. Will remove tomorrow and make observation of the quality of seal around the perimeter using same.

23 Aug 67 Seal looks OK.

PICTURES # 74991 # - 93  
TO BE REPLACED  
BY BILL TUNNELL

ing  
the  
igh

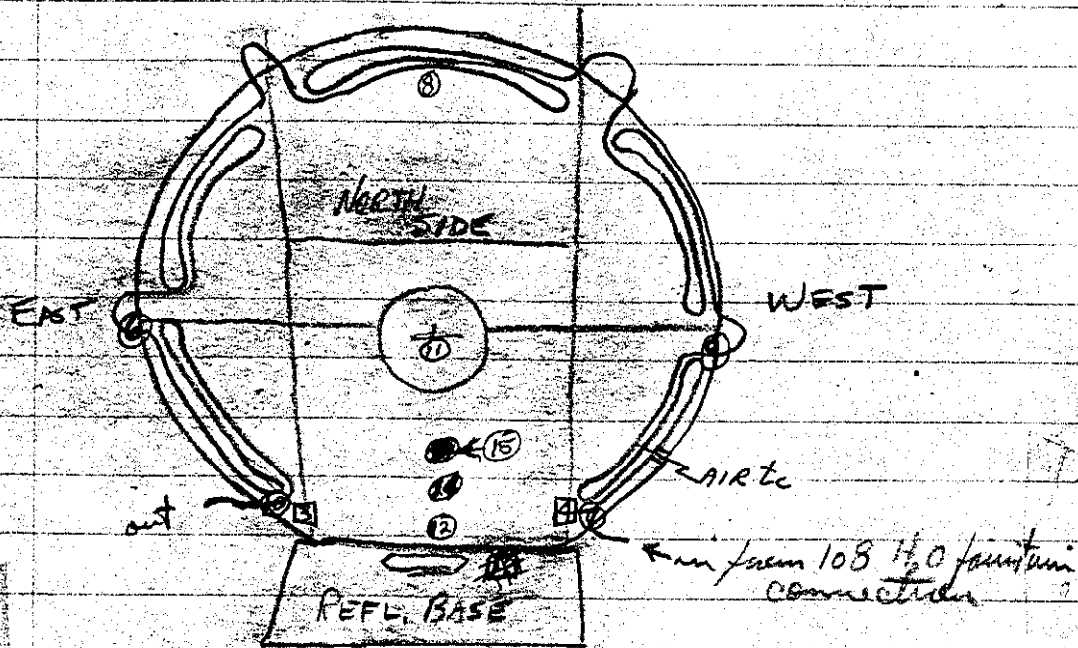
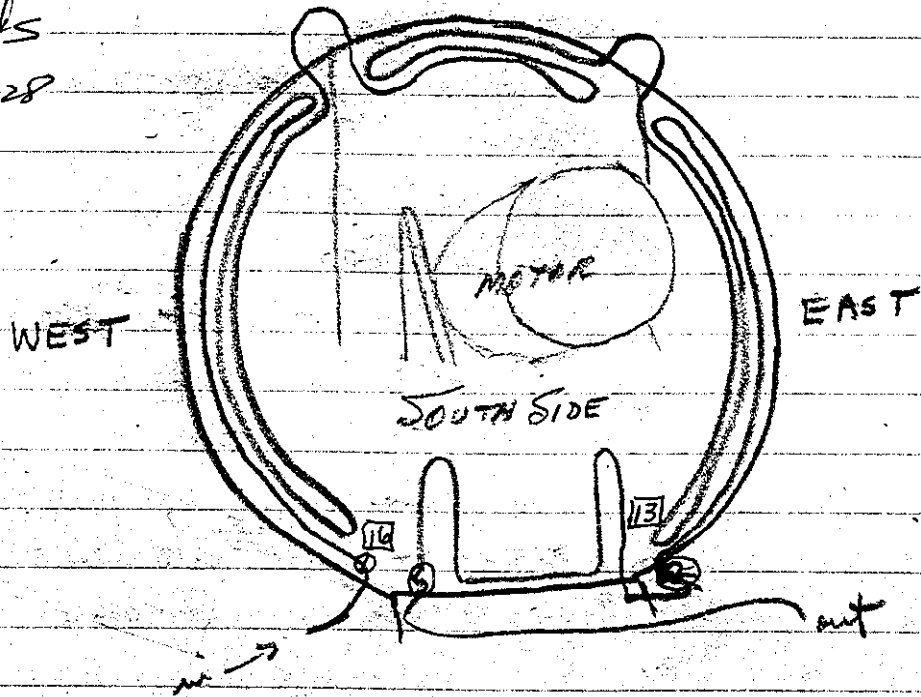
SOUTH SIDE

ken

NORTH SIDE



copied from  
Pg 25  
See Pg 28



○:00 Cu tube ; □ on housing or base.

30 Aug 67

Entire housing system is now sealed with SILASTIC. Tests show that a helium flow of about  $20 \text{ ft}^3/\text{hr}$  maintains a least  $1/4 \text{ #/sq in.}$  Cu coils  $1/2"$  for cooling put onto housing as per pictures page 25. A high temp. heat transfer material known as THERMON has been applied over the tubing with a minimum depth of  $1/4"$ . Had to flow hot water thru the coils in order for the THERMON TO "SET". The "thicker" portions never did set well. <sup>Hot</sup> Water was "hosed" from lab 213 thru a 5 KW heater and into coils. Typical temp. for this "THERMON SETTING"

Inlet South  $72^\circ\text{C}$

" outlet "  $65^\circ\text{C}$

" inlet North  $69^\circ\text{C}$

" outlet "  $49^\circ\text{C}$

Housing both sides  $58^\circ\text{C}$

31 Aug 67

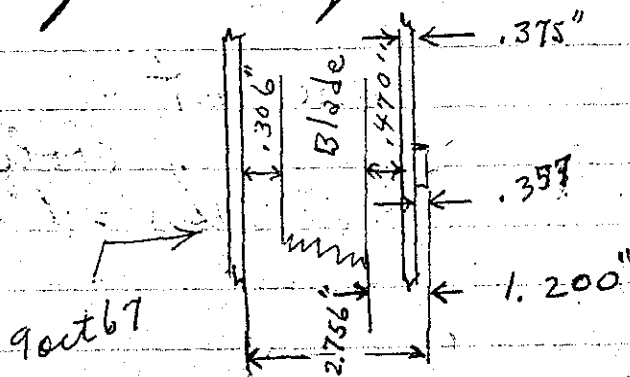
Made Proximity measurements from outside of the housing to the outside of the center of Be. Halk.

NE = .725 - .725"

NTOP = .748 - .748

NW = .665 - .662

S BOTTOM = .869 - .867



Position of various thermo-couples: See Pg 26

SOUTH SIDE TUBE IN = 1# (8 in parallel)

" OUT = ~~15#~~ <sup>#2</sup> (2 in #1)

H<sub>2</sub>O IN = 16

" OUT = 13

NORTH SIDE TUBE IN = 7

" OUT = 10

H<sub>2</sub>O IN = 4

" OUT = 3

TUBE OUTLET 1<sup>st</sup> loop on NW = 9

TUBE OUTLET S. SIDE SW = 5

TUBE OUTLET NORTH (PRECEEDING LAST LOOP) = 6

Bar on Base NEAR CORE AREA = 12 inside perimeter

Continuous readout of AIR @ "4:30 o'clock" looking South.

1 hr RUN 1205 to 1305 hrs

AIR @ pre-start = 72°F → after 20 min (stable) = 110°F

All other readouts prestart @ 25°C.

AFTER 20 min: 1 = 25°C; ~~15~~ <sup>2</sup> = 28°C; 16 = 38°C

13 = 44°C; 7 = 25°C; 10 = 29°C; 4 = 39°C; 3 = 43°C.

9 = 26°C; 5 = 30°C; 6 = 28°C; 12 = 25°C.

The last 40 min of run showed a degree or two of cooling.

H<sub>2</sub>O flow = 6 gal/min

Velum = 50 ft<sup>3</sup>/hr

26

Flow 6 gal minute - 24000 cc → 24000 gm  
 $\Delta T$  3.5 °C  
 SH 1 cal / gm °C

$$24000 \text{ gm} \cdot \frac{1 \text{ cal}}{\text{gm} \cdot ^\circ\text{C}} \cdot 3.5^\circ\text{C} = 84000 \text{ cal}$$

$$= 3.512 \times 10^5 \text{ joules}$$

$$1 \text{ cal} = 4.184 \text{ joules}$$

$$1 \text{ BTU} = 1050 \text{ joules} = 331 \text{ BTU / min}$$

$$= 19,860 \text{ BTU / Hr}$$

net South.

Rubber gasketing is "working" its way via motor shaft into blade area. Removed rear housing mtg. housing cover. Cleaned area and resealed with SILASTIC, packing material, and rubber gasketing. Let set over weekend.

F

5 Sept 67 Additional tc's added to description top Pg 28  
 All on North face of housing. (see Pg 26)

tc #8 = 27" above  $\oplus$   
 #11 = 2 1/2" below  $\oplus$   
 #15 ~~15~~ = 19" below  $\oplus$   
 #14 = 25" below  $\oplus$   
 #12 = 30" below  $\oplus$  or 4 1/2" above Refl. plate.  
 (this one moved from refl. plate to above.)

Static Press: 25 ft<sup>3</sup>/hr helium = 5.3" water  
 10 ft<sup>3</sup>/hr " = 1.8" H<sub>2</sub>O

1 hr & 38 min on 1.63 hr.

10:56:00 Start Press

1 hr run

full speed 0.45" H<sub>2</sub>O on Vac side.

13.60" " " Press. side.

11:08 Turn water on. Air @  $\approx 120^\circ\text{F}$  & cooling.  
Water @ 6 gpm

11:16 Air temp. @  $109^\circ\text{F}$

11:38 " " "  $106^\circ\text{F}$  and steady.

12:10 Heard strange noise & had a slight  
press. drop. (temp still holding).

12:14 Changed flow from  $5\text{ ft}^3$  to  $15\text{ ft}^3$  (for 10:56 reading)

12:17 Still losing press.

12:18 Vac side =  $-2.5$ " H<sub>2</sub>O

Press. side =  $+9.3$ " H<sub>2</sub>O Some temp. rise now.

12:21 Change flow to  $30\text{ ft}^3$  (for 10:56 reading)

12:33 Losing press very slowly.

12:34 Stop run.

Found the bolt at very top of housing  
to be sheared off and was lying  
in the floor in SW corner of 108.  
Put new one in. No other problems  
observed. The static press vs flow  
same as bottom pg 29.

Very few runs for few seconds duration of  
time for J. Ellis checks.

13:25 Start Run 40 min run

5 ft<sup>3</sup>/hr helium = +0.55" H<sub>2</sub>O on vac (at center)  
+10.70" H<sub>2</sub>O on Dues (at edge)

14:00 Pre start temp of all readouts except  
the air is 26.0°C ± 0.5°C. Pre-start  
air = 23°C.

The following temp are after 30 minutes  
and are at stable. They are also typical  
of (10:56 run Pg 30.)

1 = 23.0°C > 4.5

2 = 27.5°C

7 = 23.0°C > 4.0

10 = 27.0°C

4 = 38.0°C > 0.5

3 = 39.5°C

16 = 37.5°C > 3.0

13 = 40.5°C

9 = 23.0°C

6 = 27.5°C

5 = 29.0°C

12 = 42.5°C > 0.0

8 = 42.5°C

14 = 34.0°C

15 = 42.5°C

11 = 41.0°C

14:05 STOP Run

14:12 → several on-off checks by Jim E.

14:48 ~~Start Run~~

1 hr 21 min or 1.35 hr

16:09: ~~Stop~~

All readouts 'same' as (13:25 run).

6 SEPT 67

Installed reflector assembly on base plate. Aligned and put into up position the CTU table with empty matrix. CTU up light is on. We have no relays. Purged the housing with helium. Moved accelerator & associated gear into South facility.

All thermal couples as page 28-29 except ① moved to core & inside (toward fuel) scatterer #4 (west side).

② is in geometric center of core. ③ is between <sup>TOP 147</sup> core & reflector at top of core. ④ @ Core & inside control rod hole 3A.

#8 not used

14:49

Start run. <sup>36.9</sup> 1 hr 26 min or 1.47 hr. Sounds much smoother and not as loud as previous runs.

At start moment the CTU magnet voltage dropped from 80 to 65 then gradually crept back to 80 as full speed was attained.

Helium flow = 5 ft<sup>3</sup>/hr :  $\epsilon = +0.4$ " H<sub>2</sub>O and housing perimeter pressure = 11.2" H<sub>2</sub>O.

16:15 STOP run  
tc readouts:

	tc	PRE - START		+27 min		+54 min		+86 min	$\Delta T$
stube	1	24.0 °C		24.0 °C		23.8 °C		24.0 °C	0 °C
st	2	24.5	2.1	26.6	0.8	27.4	0.1	27.5	3.0
N <sup>t</sup>	7	24.0		-		-		24.0	0
N <sup>t</sup>	10	25.0		27.7		27.5		27.5	2.5
N housing	4	25.0		36.0		36.3		36.5	11.5
N <sup>h</sup>	3	24.8		39.5		40.0		40.0	15.2
S <sup>h</sup>	16	25.6		35.5		35.5		35.5	9.9
S <sup>h</sup>	13	25.0		40.0		40.0		40.5	15.5
N <sup>t</sup>	9	25.0		25.4		25.0		25.0	0
N <sup>t</sup>	6	25.5		27.0		26.8		27.0	1.5
S <sup>t</sup>	5	25.0		29.0		28.8		29.0	4.0
OPEN AIR NOT USED	8	24.5		25.0		24.2		25.0	0.5
CORE $\epsilon$	12	25.5	0.7	26.2	1.1	27.3	1.2	28.5	3.0
TOP REAR OF CORE $\epsilon$ 103	14	25.5	0.5	26.0	0.7	26.7	1.1	27.8	2.3
3A	15	25.0		25.5		25.6		25.3	0.3
$\epsilon$ SCATT #4	11	26.0	0.3	26.3	1.2	27.5	1.0	28.5	2.5
Helium		21.1 °C		38.0 °C		39.0 °C		39.0 °C	17.9



7 Sept 67 conditions (all) same as 6 Sept 67 run  
 except  $t_c$  (6) <sup>between</sup> shroud & top hat at top  
 of core & (9) is on outside of Be #1 and  
 1/2" below top of reflector.

10:37:45 START RUN <sup>37.5</sup> 5.7 hr. run time

CTU up lite is on

Selwyn #1 = 23.69 dial; VDT #3 = +2; #4 = 0

measured RPM @ end of first hr. = 3596 rpm / 1 min.  
 2<sup>nd</sup> hr. = 35955 rpm / 10 min.  
 3<sup>rd</sup> hr. = 35956 rpm / 10 min.  
 4<sup>th</sup> hr. = 35956 rpm / 10 min.  
 5<sup>th</sup> hr. = 35956 rpm / 10 min.

16:19:45 End run

ELAPSED TIME ↓	$t_c$ °C						
	0	60 MIN	120 MIN	180 MIN	240 MIN	300 MIN	342 MIN
1	25.0	24	24	23.5	23.5	24	24
2	25.0	26.2	26.2	27	27	27	27
7	25.0	—	—	23	33.5	23.5	23
10	25.0	27.5	27	27	27	27	27
4	26.0	36	36	36	36	36	36
3	25.5	40	40	39.5	39.4	39.5	39.5
16	25.5	35.2	35.5	35	35.2	35.2	35
13	26.0	40	40	40	39.7	39.7	39.7
9	25.0	38	39	39.5	40	40.5	41
6	25.0	35	36.5	37.8	38.5	40	39
5	25.5	29	28	28	28	29	28.5
8	NOT USED						
core 12	25.0	27.5	29.5	31	32	33	33
core 14	25.0	25.3	28	30	31	32	32.5
15	26.0	24.5	26	27	28.5	29.5	29.5
11 Helium	26.0	—	—	30	31	32	32
	21.5	39	39	39	39	39	39

Kipling Run No. 1  
 0  
 2  
 6  
 8  
 C  
 C  
 C  
 C  
 C  
 C

no  
top  
rd

Kiplinger Run No.:

8 SEPT 67

Began installing rack for helium in 107.  
"A" SCRAM condition as per R.R. is in power supply.  
SCRAM check of secondary iron block shows  
 $\approx 130$  m-sec + 130 to be removed 1." See J.E.

↓ 11 Sept 67 Vibration, etc. checks via Kiplinger & others

① 14:29 - 3 min run end 14:32 hrs.

Up relsyn = 23.25 dial down = 999.90

This run relsyn = 23.00 with core  
at "no contact" before start. During run  
core contact dial gave continuous "chatter"

② 14:51 - 14:53 <sup>2.0</sup> 2 min. run. (Con'ds same)

③ 15:07 - 15:09 <sup>2.0</sup> relsyn = 14.76 dial

④ 15:20 - 15:29 <sup>9.0</sup> relsyn = 7.40 dial

⑤ 15:38 - 15:40 <sup>2.0</sup> relsyn = 7.40 but core

is loading with iron. compare to 15:20 run

⑥ 15:52 - 15:54 <sup>2.0</sup> relsyn = 23.00 (same as 15:38 run)  
compare to 14:51 run.

12 Sept 67 More vibration tests with Kiplinger

⑦ 09:11 start relsyn #1 = 23.00 stop 09:14 <sup>2.0</sup>

⑧ 09:31 start " " 09:33 <sup>2.0</sup>

⑨ 09:48 " " 09:50 <sup>2.0</sup>

⑩ 09:59 " " 10:00 <sup>1.0</sup>

⑪ 10:12 " " 10:14 <sup>2.0</sup>

⑫ 10:31 " " 10:33 <sup>2.0</sup>

Vibrator Blade proximity, see V. Ellis  
Locations and results, see B. Tunnell.

14:38<sup>00</sup> Start run Demonstration run for  
 14:44 Stop Dr. Jordan & Meinschein  
 all observations normal. Selwyn #1 = 23.00

"Back-Up  
 safety block"  
 The orifice of the 3 way valve used on  
 (8 Sept 67) was  $5/32$ ". Changed to 3 way  
 valve ASCO 8300 B61 which has a  
 $1/4$ " orifice. This (unrestricted) gave  
 too large a bang against the back stop.  
 ∴ A restrictive valve was put into  
 and preceding the 3 way valve by  
 about 10 ft. This permits 10 ft of  
 $80^{\#}$  to  $100^{\#}$  initial pressure but allows  
 safety iron to be slowed so as not  
 to bang the back stop. To be  
 timed later. (see top Pg 37)

Kiplinger took all his "gear" back to K-25.  
 During above run (14:38) the core  
 contact indicator was clear. (no contact)

14 Sept 67 Time checks made by J. Ellis (see Same).  
 Had several visitors for observations including  
 Phil Heronig. Made run for same.

14:24 Start  
 14:52 Stop all readouts normal

15:03 Start for J.E. - SCRAM (VIB - FLUTTER check)  
 15:07 SCRAMMED & STOPPED THE BLADE.  
 SCRAMMED BOTH THE "CORE" & THE AUX. SAFETY.

— One typical test of J.E. time check of  
 auxiliary safety block:

84<sup>th</sup> air press.;  $\frac{1}{2}$  turn <sup>open</sup> of restrictive valve.

∴ from CTU SCRAM <sup>SIGNAL</sup> BUTTON UNTIL the block  
 starts to move = 30 m-sec.

① from SCRAM SIGNAL UNTIL block is  
 25 mils out = 45 m-sec.

② from SCRAM SIGNAL until  $\frac{1}{2}$ " withdraw from  
 configuration = 170 m-sec.

11 Sept 67  
 NOTICE: TC switches (changes as of  
 new) reference pg 26  
 Swap #1 & #7

main poly  
 scatterers.

3.00

stop

not

25.

A

19 Sept 67 Alignment and checks made with Core.

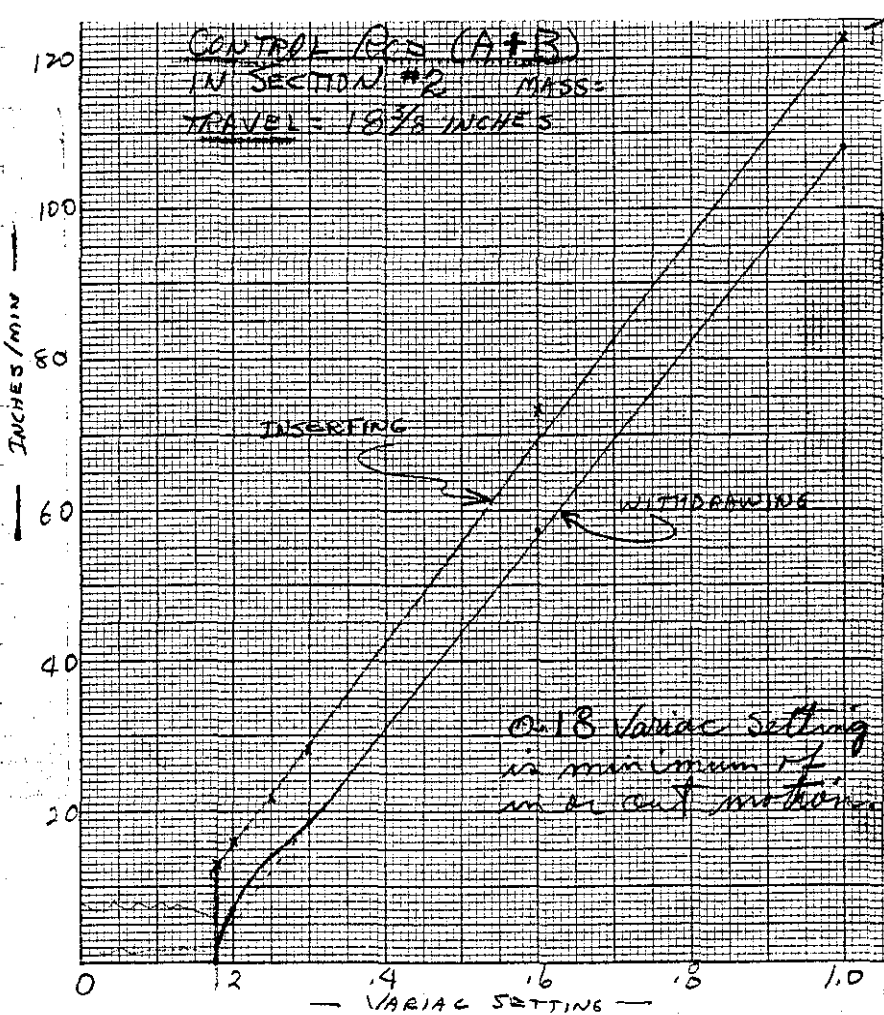
Core	#1 = 000.01	#2 = 00,00.6	VDI #1 -	VDI #2
1 <sup>st</sup> offset	7.37	7.374	—	—
2 <sup>nd</sup> offset	9.73	9.735	—	—
3 <sup>rd</sup> offset	10.73	10.735	—	—
→ Up position	23.345	23.353	+1	-2

up lite on + core contact indication.  
Took several pictures of SORA (North Side)

20 Sept 67

Control Rod Travel Rate  
V5 Variac Setting ↗

more info.  
this drive  
Pg 7 Log 1



Item: Run time to date using Welmin.

i.e. from 9 Aug 67 thru 14 Sept 67

Total runs = 30 ranging from 0.25 min to 342 min.

Total time = 880 min. or 13½ hrs.

- Additional bracing being installed to the SORA configuration.

- Made instrument check-out:

$L_n$  = OK but needs more adjustment on span.

BF<sub>3</sub> # 1 & # 3 = OK - # 2 (out).

A <sup>10</sup>/<sub>1000</sub> - trip 100 - 12" source distance.

D <sup>10</sup>/<sub>1000</sub> - trip 100 - 26" source distance.

C = OK trip 100 - 30" & 1-17

E = OK trip 100 - 3" & 750V

F = OK trip 100 - touch (Magnet <sup>sockets</sup> OK)

Remote control source operate fine.

Building alarms trip OK @  $\approx$  5K each.

- Loaded Core with fuel in preparation for static run.

- A pointer "read-out" for Be. Hook position has been installed. It ~~is~~ originates from the shaft of the motor (South side).

- Reactivity check 90 fuel 5 iron

critical @  $\approx$  20.8 selseyn.

- 87 fuel 8 iron

sub-critical @ up position (<sup>slight</sup> multiplier)

J. Miholcozo  
J. Lynn  
J. Taylor

DATE		9-21-67		SAFETY CHECK	
TIME		8:55 AM		Taylor + Lynn	
1000	Apr 1-17	1000	950	750	
12"	OK 30	1"	3"	OK	
%	100	100	100	100	OK
BLOS	✓	✓	✓		
AUX STAS	✓	-	✓		
SOURCES	M-226 + 8				✓
TABLES	✓	LIGHTS	-	AREA CLEARED	✓

Slow =  
21.7

Run 1 Loading =  $87\frac{1}{2}$  fuel  
 $7\frac{1}{2}$  Fe [1, 2, 3, 4, 7, 8, 9 and 10<sup>1/2</sup> #5]

Top Plug Control = Selsys<sup>"C"</sup> 42.08 in  
(TPC) 48.10 out

Travel time = 1.35 min or 4.44 in/min

2 Pool Period = Long v = 15.75  
#1 = 15.15 + 15.28¢  
#3 = 14.93  
Top plug control out = Neg period - 12.68¢  
TPC = 27.96¢

ups #1 = 23,335 #3 = +2  
2 = 23,350 4 = -6

3 Positions #1 = 23,305 #3 = -20  
= 23,322 4 = -23 ?

Core - 28 miles from up.  
Pool Period = LN = 79.6 = 11.51¢  
+ ~~11.4¢~~ + 11.4¢ #1 = 89 = 10.75¢  
#3 = 81.4 = 11.30¢

-131 sec  
-27.16°

# Position on Run 3  
TPC cut P =

LN = 91.5 sec  
#1 = 2  
#3 = -90.5 sec

5  $\infty$  up TPC down  
 $2(a+b) = 3 \text{ in.}$  (I)

Run 6 Added 28 mil thick polythelene to top of core.

Pos. #1 23,305 #3 = ?  
#2 = 23,322 4 = ?

1/2 #5	Pos	Period	log N = 66.2 sec	13.15¢
¢			BF3 1 = 69.05 "	12.72¢
8¢			2 = 71.42 "	12.43
¢	7	$\infty$	.028" poly =	12.77¢
		$2(a+b) = 4 \frac{7}{16}$ "	(I)	

TPC cut = P = -86.1 sec

2



8. Remained Poly

$$\text{loading} = 87^{3/4} \text{ U}$$

$$2^{1/4} \text{ Fe } [1, 2, 3, 7, 8, 9, 1^{\text{st}} \frac{1}{2} \# 5, \text{ and } 1^{\text{st}} \frac{3}{4} \# 4]$$

$$2(a+b) = \text{I } \bar{m}$$

$$\text{TPC} = \text{II } \bar{m}$$

$$\text{Core} = \# 2 = 23,287$$

$$\# 1 = 23,271$$

$$\rho = + \quad \text{Log N} = 35.6 \text{ sec } 19.96 \text{ ¢}$$

$$1 = 37.5 \text{ " } 19.32$$

$$2 = 38.7 \text{ " } 18.84$$

$$+ 19.4 \text{ ¢}$$

9. Separated 20 fuels pins, at Center,  
 $\frac{1}{16}$ " [4 eastern pins in Row 1, 2, 3, 4 + 5]

$$\text{Pos Period} \quad \text{log N} = 250.0 = 4.48 \text{ ¢}$$

$$\# 1 = 238.8 = 4.67$$

$$\# 3 = 235.8 = 4.72$$

$$\text{Average} = 4.62 \text{ ¢}$$

$$19.4$$

$$4.6$$

$$\underline{\underline{-14.8 \text{ ¢ fuel Separation}}}$$

$$\underline{\underline{14.8 \times \frac{88}{20} = 65 \text{ ¢}}}$$

21 Sept 67

0.13 hr run

43

3:52:40

Rod drive mechanisms have been installed. Scatter #3 = Fe.  
Core = Fe filled

6/3/32

78

run

Core inserted.

Rods run from out to in.

4:10

End of run -

0.07 hr run

16:22

Start.

Scatter #3 = Barium Polyethylene.

Core = up

Rods = in

Scanned system

16:26

off

+5

8 #

2 #

22 Sept 67

Rods in, Core down (Fe filled)

10:04 Start 0.63 hr run

Review Comm. present.

J. Wackter, B. Affel, J. Marable, J. Nichols  
and D. Magnuson.

10:15 inserted core.

10:40 Scram system.

10:42 Stop.

## MECHANICAL INFO. FOR ABOVE RUNS:

- Selcym<sup>#1</sup> = 23.335 Selcym<sup>#2</sup> = 23.349 VDT<sup>#3</sup> = +1 VDT<sup>#4</sup> = -10
- Core inserted with iron only in matrix.
- Amps were steady during run (at speed) @ 2.6 cal or 26 amp
- 5 ft<sup>3</sup>/hr of helium to shroud gives @ center = +0.4"  
of water and at the periphery = +10.7" H<sub>2</sub>O.
- Vibration readout @ 3.5 mils (top of shroud), with  
max. @ SCRAM (double) = 4.2 mils
- Temperature readouts "normal" as per previous runs.
- Blade RPM check shows 1/2 full speed in 1 1/2 min.  
after power off. STM

13:52 Start,

Scatter #3 = Fe

13:59 Scramed Scatter #

14:10 78. 0.3 hr run

14:24	Start	- 30 sec	run -	3
14:29	"	- 30 sec	run -	5
14:38	"	- 20 sec	run -	13
14:44	"	- 20 sec	run -	13
14:49	"	- 20 sec	run -	13

'obs

33.3

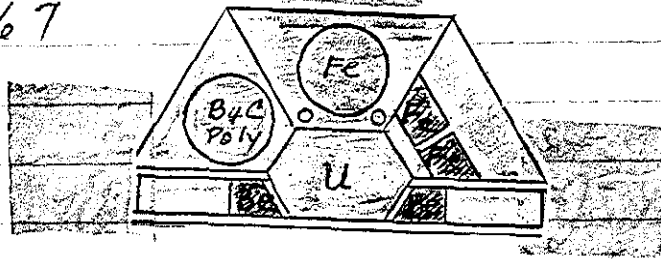
2bamp

ith

ns.

min

5 Oct 67



- Fe
- Be
- U
- B4C-Poly

DATE	10-5-67 SAFETY CHECK					
TIME	15:00	BY	Taylor & Lynn			
CHARGE						F
RECORD	10	1000 opt	1-15	100	900	750
SOURCE	10"	OK	30"	1"	3"	OK
% F. C. ...	100	✓	100	100	100+	✓
BLEB. ALI...	✓	✓	✓			
AUX. ST...	✓		✓			
SOURCES USED						✓
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

See  
p. 10

CA. SORA	Expt.	Run	10
88-24	Det	5 Oct 67	AM PM
Purpose:	Critical Condition.		
	Scatter #3 = Fe		
	#4 = B+C - Poly		

0.1" Space between fuel + Top Hat.  
Top Hat (7 hole) loaded on core top.

Sub critical  
Up #1 = 23.340                      #3 = +2  
#2 = 23.364                          #4 = -9

Bottom Fe Core pins cut off 0.1" (now 2.825")  
Found that Be arm was rotated 180°

DATE		6 Oct 67 SAFETY CHECK					
TIME		8:20 AM BY Taylor & Lynn					
CHANNEL	A	B	C	D	E	F	
RANGE	10	10	10	10	900	750	
SOURCE DIST.	1500	1500	1500	1500	1500	1500	
% F. S. THP	10"	OK	30"	1"	3"	OK	
BLDG. ALARM	100	-	100	100	100+	-	
AUX. CTRS.	✓	✓	✓	✓	✓	✓	
SOURCES USED	✓	✓	✓	✓	✓	✓	
TABLES	✓	✓	✓	✓	✓	✓	
LIGHTS	✓	✓	✓	✓	✓	✓	
AREA CLEARED	✓	✓	✓	✓	✓	✓	

Run 11

Loading - 8.6 U

9 Fe (Row 9)

Crit = 20.87 Rods in

up #1 = 23.340

#3 = +2

23.365

#4 = -9

Pos = 5.48 #

Rod I = -6.32

Selwyn #1 @ 23.15 = +4.52 #

Lette

22.78 = +2.23 #

22.36 = -3.21 #

22.25 = -5.74 #

22.04 = -10.05 #

21.62 = -23.10 #

21.18 = -40.05 #

20.71 = -63.29 #

Run 12 Loading - 85 1/2 u  
 9 1/2 Fe [ Row 9 and 1st 1/2 #10.

Crit. #1 = 21.43 Rods in.  
 Pitte  
 I = 4 3/8" #1 @ 22.80 = + 0.71 #  
 " #1 23.15 = 2.11 #  
 " #1 22.340 = 1.33 #

Run 13 Loading - 85 u  
 10 Fe [ Row 9, 1st 1/2 #10 + 2nd #19.

Rods in  
 Table Position #1 = 23,340 #3 = +2  
 #2 = 23,364 #4 = -9

#1 @ 23,340 = + 1.96 #  
 23,22 = + 3.81  
 23,10 = + 4.76  
 22,75 (22.86 = + 6.21  
 22.62 = + 6.19)  
 22,37 = + 4.93  
 21,97 = + 0.19  
 21,67 = - 5.35  
 21,39 = - 12.50  
 21,03 = - 26.01  
 20,70 = - 40.08

?  
 Blade out - # 4.00



Run 14 Loading -  $85 \frac{1}{4}$  u  
 $9 \frac{3}{4}$  Fe [Row 9, 1st  $\frac{1}{2}$  #10 + 3rd  $\frac{1}{4}$  #19]

Be Blade now on Shim drive

Limit to Limit =  $6 \frac{5}{8}$ " travel time = 1.15 min

Table Position #1 = 22.75 + 14.54  $\neq$

Hunted for most reactive position

7 Be blade.

Now + 14.30  $\neq$

with drew  $I = 18 \frac{3}{8}$ " - 100.4  $\neq$

Red  $I = 114.7 \neq$   
 (Fe + Fe)

Run 13 vs 14 14.30

6.2

4th  $\frac{1}{4}$  #19 = 8.1  $\neq$

Red  $I$  - Now W + Fe

( $I = 18 \frac{3}{8}$ )

DATE	9 Oct 67 SAFETY CHECK					
TIME	8:30	119 Taylor & Lynn				
CHANNEL						
RANGE	$\frac{10}{1500}$	OPR	2-15	$\frac{10}{1000}$	910	750
SOURCE	10"	OK	30"	1"	2"	OK
%	100	-	100	100	100	-
BLDG.	✓	✓	✓			
AUX BLDG.	✓	-	✓			
SOURCES USED	✓			✓		✓
TABLES	✓					✓
LIGHTS		✓				
AREA DETECTED						✓

Run 15 Loading =  $84 \frac{3}{4}$   
 $10 \frac{1}{4}$  [Row 9, #10 + 3rd  $\frac{1}{4}$  #19]  
 #1 = 22.75

$$P = +35.29 \text{ \#}$$

$$\text{withdrew } I(W+Fe) = -113.7 \text{ \#}$$

$$I = \text{\# } 1.49$$

$$(W+Fe)$$

Rods 1.49	P = 35.3
- 1.15	- 14.3
<u>34 \#</u>	<u>21.0 \#</u>

$$2 \text{nd } \frac{1}{2} \text{ \#10} = 13 \text{ \#}$$

filled?

Run 16 Loading -  $84\frac{1}{2}$  U  
 $10\frac{1}{2}$  Fe [Row #9, #10, 2<sup>nd</sup>+3<sup>rd</sup> 1/4 #19]

$$\#1 = 22.72 \quad P = +19.80 \text{ ¢}$$

$$\text{Withdrew I (w+Fe)} = -119.4 \text{ ¢}$$

$$I = 139.2 \text{ ¢}$$

$$2^{\text{nd}} \text{ 1/4 } \#10 = \underline{15.5 \text{ ¢}}$$

12:53

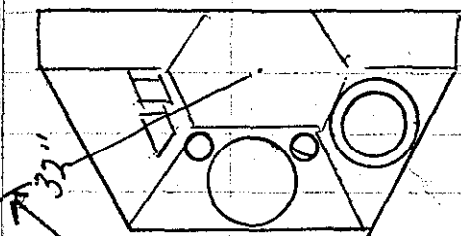
Run 17 Loading =  $84\frac{1}{4}$  U  
 $10\frac{3}{4}$  Fe [Row 9, #10 + 2<sup>nd</sup>, 3<sup>rd</sup> + 4<sup>th</sup> 1/4 #19]

Red I [2(a+b)] now Ni + Fe.

$$\#1 = 22.75 \quad P = 15.17 \text{ ¢}^{\text{dr}}$$

$$I \text{ out} = -129.6$$

$$I = 144.8 \text{ ¢}$$



Rhette  
 location for measurements  
 thru Run 17.

Run 18 Moved P itte to NW.

Loading. Same

$$\#1 = 22.75$$



$$P = 15.19 \neq$$

$$I(Ni+Fe)_{out} = -155.44$$

$$I = 170.6 \neq$$

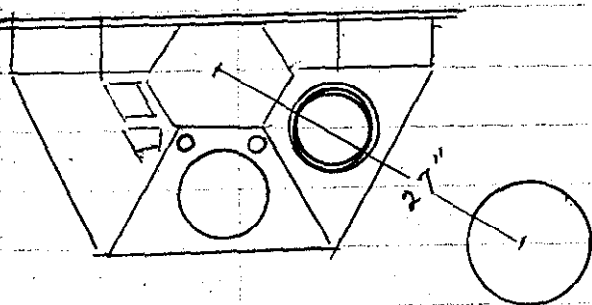
Zero on pointer = Center of Be  
Moved blade East =  $\sim -1.00$

Reversed -

Moved blade East then from  
East to West.

Stopped 6.5 cm from Zero on Arc.

0.17  
-1419



9 Oct 67. Blade Spin

1508 Start  
1517 Stop

Sound 11.29 ft/sec  
in air 20°C Sea Level

0.22 hrs

Reading normal except for  
 $H = 17.4$  (chart), not purged good.

40/1610 Start - 1614 Stop

10 Oct 67

AEC Review Committee present  
 Start up - Normal

0946

Start -

110

1054 <sup>AMP</sup> Prot. gauges.

Signal analyzer	• 1. 0.03 V	Flutter OK
made linear	2. .02 V	OK
Climb from	3. .05 V	OK
3.5 to 9.2	4. .145 V	OK

TIME = 14:42 hrs.

Temp., Pressure, etc  
 Normal

1. 0.03 V
2. 0.02 V
3. 0.05 V
4. 0.143 V

1606

Stop

38010

Time = 6 hrs 20 min.

6.33 hrs

Thermo # 7 plugged in # 14 to get good print out.

DATE		SAFETY CHECK				
TIME	9:35	BY Taylor & Lyman				
CHANNEL	10	10	10	10	10	10
RANGE	1000	Opt	L-15	1000	900	750
SOURCE DIST.	10"	OK	30"	1"	3"	OK
% S. S. DIST.	100	-	100	100	100+	-
BLDG. PLANS	✓	✓	✓			
ALX. OTRS.	✓	-	✓			
STANDARD USE	M-226	+	8	MAGNETS		✓
TABLES	✓	LIGHT	✓	AREA	✓	✓

Run 19 Conditions same Run 18.

$$\text{up \#1} = 22.75 \quad P = +19.19 \text{ \#}$$

Moved blade 7.1 cm west.

to get  $\sim -1.0$

? why 19.19 \# Sect. ~~2~~<sup>3</sup> has been fired and returned to position since Run 18.

Run 20 Set blade @ -0.4 cm  
 $P = 17.50 \text{ \#}$

Moved blade to get  $\sim -1.0$

Blade @ + 7.15 cm

Run 21

Set mode @ 0 zero (center)

Sect 3 - { East front = 32 mil gap  
Top { back = 0Bottom { West front = 0  
back = 18 mil gap.

$$P = 19.28 \text{ } \#$$

Run 22

moved Sect. 3 out and returned  
to position to see if a  
reactivity change occurs.  
measurements same as above.

$$P = 18.50 \text{ } \#$$

DATE	12 Oct 67 SAFETY CHECK					
TIME	11:00 by Taylor + Lynn					
CHANNEL	10	10	10	10	10	10
RANGE	1000	8pr	L-15	1000	900	750
SCU	2	OK	30"	1"	2"	OK
% F. S. 10	100	100	100	100	100	-
WLDN. ALK. #	✓	✓	✓			
ADA. BPN.	✓	✓	✓			
SO. HOES. USED	✓	✓	SECRET			✓
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓	

Run 23

Core position reactivities, Top Hat Moving

#1 = 22.755 <sup>b</sup>	$\rho = +17.136\phi$ ✓ with
.707	+ 17.29 $\phi$ ✓
.607	+ 17.29 $\phi$ ✓
.546	+ 16.87
—	+ 0.08
.38	- 4.58
21.15	- 12.94
20.43	- 47.1
19.81	- 89.1
22.75	+ 17.39
18.6 ✓	- 204.9
? .57	- 350.0
18.69 ✓	- 194.0
22.76	+ 17.38
16.22	- 637.0



Run 24 Core Position Reactivities with  
Stationary Top Hat.

#1 = 22.7 <sup>6</sup> <del>5</del>	$\rho = +18.12$ #
.207	17.36
.1607	17.88
.1546	12.08
.570	5.90
.380	9.00
21.30	- 10.50
20.10	- 102.2
19.49	- 206.2
18.2	- 268.4
17.19	- 441.0
	- 624.3

Rod I - Calibration

II - Calibration

R

DATE 13 Oct 67 SAFETY CHECK					
TIME	13:10	BY Taylor & Lynn			
CHANNEL	10	B	G	10	
RANGE	1500	800	15	1000	750
SOURCE USED	10"	8K	30	1"	8K
95 F. B. TYP	100		100	100	
BLDR. ALARM	✓	✓	✓		
AUX. COILS	✓	✓	✓		
SOURCES USED	M-226 + 8	MAGNETS		✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓

Run 25 Fuel Evaluation (6 cm) (Stationary)   
 Loading = 8 1/2 u

10 1/4 [1, 2, 3, 4, 6, 7, 8, 9, 10, 2nd, 3rd + 4th 1/4 #19,   
 and 1st 1/2 #5   
 1/4 void 4th 1/4 #71.

P Pitte + 22.50 \$   
 Log N + 27.14 sec = 23.50 \$   
 BF<sub>3</sub> #1 + 27.36 = 23.40 \$   
 #2 + 26.71 = 23.72 \$   
 #3 + 24.75 =   
 Avg = 23.28 \$

Run 26 Added (w) 1st 1/4 #5. (8 3/4 u)

P Pitte = + 35.42 \$   
 Log N = 12.77 sec 3.5.0   
 Avg = 35.21 \$

1st 1/4 #5 = 11.93 \$



Run 27 Raised 3rd  $\frac{1}{4}$  # 71 - .5"

$\rho$ +	Pit		+ 31.3	¢
	Lw	15.20 sec	32.13	¢
	# 1	14.33 "	33.11	¢
	2	14.33 "	33.11	¢
	3	14.01 "	33.46	¢
			<u>32.62</u>	¢

$$\text{Aug} = \underline{-2.59} \text{ ¢}$$

Run 28 3rd  $\frac{1}{4}$  # 71 raised 1"

$\rho$ +	Pit		+ 27.61	¢
	Lw	19.76 sec	28.0	¢
	# 1	19.54 "	28.22	
	# 2	19.54 "	28.22	
	# 3	19.22 "	28.47	

$$\text{Aug} = \underline{-7.11}$$

$$\text{Aug} = 28.10$$

Run 29 3rd  $\frac{1}{4}$  # 71 raised 2"

$\rho$ +	Pit		+ 17.56	¢
	log N	41.70 sec	18.05	
	# 1	40.39 "	18.43	
	# 2	39.41 "	18.71	
	# 3	41.00 "	18.25	
			<u>18.20</u>	

$$\text{Aug} = \underline{-17.01} \text{ ¢}$$

Run 30 Fuel Evaluation 12 cm - (moving top hat)

Loading = 84 1/2 u

18 1/2 Fe [1, 2, 3, 4, 6, 7, 8, 9, 10,  
2nd, 3rd, + 4th 1/4 # 19

P = +26.91 ¢

and ~~10 1/2~~

2nd 3rd + 4th 1/4 # 5

31 2nd 1/2 # 71 raised 0.5"

P = +16.85 ¢

ΔP = 9.96 ¢

32 2nd 1/2 # 71 raised 1.0"

P = +7.81 ¢

ΔP = 19.1 ¢

¢  
¢  
1 ¢  
1 ¢  
6  
2 ¢

61 ¢  
¢  
2  
2  
7  
0

6 ¢  
15  
13  
71  
25  
20

DATE	SAFETY CHECK					
TIME	8:30	AM	BY Taylor + Lynn			
CHANNEL	A	B	C	D	E	F
RANGE	$\frac{10}{1000}$	off	1-15	$\frac{10}{100}$		750
SOURCE DIST.	10"	OK	30"	7"		OK
PT. F. S. TRN	100	-	100	100		-
BLDG. ALARM	✓	✓	✓			
AUX CTCS.	✓	✓	✓			
SOURCES USED	M-226 + 8° MAGNETS					✓
TABLES	✓		LIGHTS	✓	AREA CLEARED	✓

Run 33 Loading 84 3/4 y

10 1/4 Fe [1, 2, 3, 4, 6, 7, 8, 9, 10, 2<sup>nd</sup> 3<sup>rd</sup> + 4<sup>th</sup> 1/4 #5  
2<sup>nd</sup> + 4<sup>th</sup> 1/4 #5]

$$P = 29.80 \text{ \#}$$

$$\infty I = 3.77$$

$$3^{\text{rd}} \frac{1}{4} \#5 = 22 \text{ \#}$$

$$\text{Base} = 48.90 \text{ \#}$$

34 Raised 2<sup>nd</sup> 1/2 #71 two inches.

$$P = 10.5 \text{ \#}$$

$$\infty I = 2.01$$

$$\Delta P = 38.4 \text{ \#}$$

Run 35

~~Run~~ L 70

Loading - 84 1/4 U

10 3/4 Fe [Row 9, #10, 2nd 3rd, 4th 1/4 #19]

Blade Position - +0.1 cm  
~~-3.0"~~

Pette	µ
LN = 44.75	16.76
BF3 1 = 43.65	17.25
2 = 43.97	17.52
3 = 43.97	17.44
Avg =	17.28

3 ctr = +17.47 µ

12 1/4 #

φ  
0 φ

-3.0 cm Pette -18.19

LN - 105.22	-23.6
1 - 99.7	
2 - 97.7	
3 - 109.4	-21.35
Avg	

X

Run 36

Blade Position

~~-0.1 cm~~

Pette	<u>-0.1 cm</u>	<u>+16.15 µ</u>	<u>-2.6 cm</u>	<u>-10.16 µ</u>
LN + 45.6	17.02		- 135.7	- 14.04
1 46.62	16.89		- 134.6	- 13.58
2 45.27	17.10		- 135.2	- 14.16
3 44.82	17.21		- 137.5	- 13.76

3 ctr = +17.07 µ

3 ctr = +13.83 µ

φ

Run 37

Pitte		Blade Position		
		<u>-0.3 cm</u>		<u>-1.95 cm</u>
		+15.78 ¢		-0.03 ¢
LN	+ 48.32	16.37	∞	
1	48.20	16.40	-	
2	47.56	16.55	-	
3	48.20	16.40	-	

3 etas +16.45 ¢

Run 38

Pitte		Blade Position		
		<u>-0.5 cm</u>		<u>-1.15 cm</u>
		+14.93 ¢		+9.18 ¢
LN	50.8	+15.83	+108.6	9.05
1	48.86	+16.25	91.2	10.36
2	50.16	+15.98	91.2	10.36
3	50.16	+15.98	93.2	10.19

3 etas +16.07 ¢

Aug

3 etas +10.30 ¢

Run 39

Pitte		Blade Position		
		<u>-0.6 cm</u>		<u>-1.6 cm</u>
		+14.27 ¢		+5.28 ¢
LN	+54.8	+15.03	+186.7	+5.78
1	54.7	15.05	+187.6	5.75
2	55.4	14.92	186.3	5.79
3	56.0	14.81	186.3	5.79

3 etas +14.96 ¢

3 etas +5.78 ¢

Run 40

- 0.9 cm

- 2.4 cm

Pette + 11.89¢

- 6.58¢

LN + 68.4 sec 12.85-

- 208 sec - 7.63

1 67.75 + 12.80

189 - 8.69

2 69.0 12.77

201.9 - 7.94

3 69.7 12.67

200.7 - 7.99

3 cts  
+ 12.75¢

3 cts  
- 8.21¢

cm

- .18
- .05
- .36
- 36
- 19

cm  
¢

- 
- 9
- 9



DATE	17 Oct 67		SAFETY CHECK			
TIME	9:30		BY Taylor & Lyman			
SCALE	$\frac{10}{1000}$	3	6	9	E	F
NO. OF VOLS	12"	off	L-15	$\frac{10}{1000}$	cut	750
% T. S.	100	-	100	100	-	-
BLDG. A	✓	✓	✓	-	-	-
AUX. D.	✓	✓	✓	-	-	-
SOURCES USED	M-226	+ 8	MARKETS	-	-	✓
TABLES	✓	✓	✓	✓	✓	✓

Run 41 (Repeat Run 35) Blade Positions

		<u>+0.1 cm</u>		<u>-2.95 cm</u>
Pette	17.23 #			-15.86 #
LN +43.4 sec	17.59 #		-110 sec	-21.08
1 45.6	17.02		-102.3	-25.60
2 41.7	18.05		-104.2	-24.10
3 43.0	17.69		-107.4	-22.35
3 extra	+17.59 #		3 extra	-24.01 #

Run 42

		<u>+0.15 cm</u>		<u>+3.15 cm</u>
Pette	17.68 #			-9.60 #
LN +41.7	18.05		-151 sec	-11.87
1 41.7	18.05		-144.6	-12.68
2 40.42	18.41		140.7	-13.25
3 42.34	17.87		139.4	-13.46
3 extra	+18.11 #		3 extra	-13.13 #

Run 43  
11:40 AM

+0.25 cm

+2.20 cm

Pette + 17.69 ¢  
 LN + 41.3 sec 18.16  
 1 40.39 " 18.44  
 2 39.74 " 18.62  
 3 40.39 " 18.41

~~run~~ + 4.96 ¢  
 195.4 sec + 5.55  
 171.8 " 6.20  
 179.8 " 5.96  
 177.1 " 6.04

3 etas  
+ 18.49

3 etas  
+ 6.02 ¢

Run 44

0.45 cm

+2.70 cm

Pette + 17.67 ¢  
 LN + 40.0 sec 18.54  
 1 40.39 18.44  
 2 41.69 18.06  
 3 41.04 18.23

- 1.93 ¢  
 -469 sec - 2.96 ¢  
 -623 " - 2.18  
 -520 " - 2.64  
 -563 " - 2.42

3 etas  
+ 18.24 ¢

3 etas  
- 2.41

Run 45

0.65 cm

+1.75 cm

Pette + 17.44 ¢  
 LN + 41.3 18.16  
 1 40.39 18.44  
 2 41.69 18.06  
 3 41.04 18.23

+ 10.15 ¢  
 + 83.6 sec + 11.07  
 80.13 11.43  
 81.43 11.29  
 80.78 11.35

3 etas  
+ 18.24

3 etas  
+ 11.36 ¢

6 ¢  
 8 -  
 0  
 3  
 -  
 m  
 7.60 ¢  
 .87  
 .68  
 .25  
 .46

Run 46

+ 0.80 cm

+ 1.45 cm

Pette

+ 16.91¢

+ 73.24¢

LN 428

sec 17.75

59.3 sec

14.57

1 41.69

18.06

54.07

15.17

2 42.34

17.86

55.37

14.94

3 43.00

17.69

56.02

14.80

3 ctrs  
+ 17.87¢

3 ctrs  
+ 14.97¢

+ 1.05 cm

+ 3.50 cm

Run 47

Pette

+ 15.98¢

- 16.58¢

LN 46.9

sec + 16.73

- 107.8 sec

- 22.28¢

1 44.95

17.18

- 101.6

- 25.95

2 45.60

17.02

- 104.2

- 24.20

3 48.2

16.41

- 108.8

- 21.60

3 ctrs  
+ 16.87

7

DATE 18 Oct 67		SAFETY CHECK					
TIME 14:00		BY Taylor + Lynn					
		V	S	B	E	F	
QUANTITY	10						
TABLE	1000	open	L-15	1000	cut	7.50	
SIZE & DIST.	12"	OK	36"	1"		OK	
9" F DIST.	100	-	100	100		-	
BLADE		✓	✓	✓			
AUX.		✓	✓	✓			
SU ROEL	M-226	✓			MAGNETS	✓	
TABLES	✓	LIGHTS	✓	AREA	✓	✓	

Run 48 Blade Evaluation (moving Top Hat)  
Loading - Same as Run 35.

$$\begin{aligned} \#1 &= 22.76 - & P &= +15.36 \\ \#2 &= 22.795 & &= -490.4 \end{aligned}$$

Core Normal up, Blade = # 5.057

49

$$\begin{aligned} \#1 &= 22.96 & P &= +15.04 \\ \#2 &= 22.994 & &= -491.50 \end{aligned}$$

.2" up Blade = # 5.065

50

$$\begin{aligned} \#1 &= 22.56 & P &= +15.09 \\ \#2 &= 22.593 & &= -490.52 \end{aligned}$$

.2" Below Blade = # 5.056

Pun 51

$$\begin{aligned} \#1 &= 23.16 \\ 2 &= 23.192 \end{aligned}$$

$$P = \begin{aligned} &+ 13.93 \\ &- 492.56 \end{aligned}$$

.4" up

Blade = \$ 5.065

52

$$\begin{aligned} \#1 &= 23.235 \\ 2 &= 23.265 \end{aligned}$$

$$P = \begin{aligned} &+ 13.34 \\ &- 490.90 \end{aligned}$$

Blade = \$ 5.042

53

$$\begin{aligned} \#1 &= 22.360 \\ 2 &= \end{aligned}$$

$$P = \begin{aligned} &+ 13.77 \\ &- 490.05 \end{aligned}$$

.4" Below

Blade = \$ 5.038

54

$$\begin{aligned} \#1 &= 22.160 \\ 2 &= 22.188 \end{aligned}$$

$$P = \begin{aligned} &+ 11.64 \\ &- 489.57 \end{aligned}$$

.6" Below

Blade = \$ 5.012

55

$$\begin{aligned} \#1 &= 21.960 \\ &21.988 \end{aligned}$$

$$P = \begin{aligned} &+ 8.38 \\ &- 487.14 \end{aligned}$$

.8" Below

Blade = \$ 4.955

Run 56

#1 = 21.76

P = + 4.19  
- 484.67

#2 = 21.787

Blade # 4,888

1" Below Normal up

Following samples taken for SPEC analysis:  
 → Fe from SODA ←

Sample No.	Sample Position in Configuration
1	Base of fuel matrix.
2	piece next above #1
3-10	pieces progressing upward.
11	Top section of matrix.
12	2 1/2" thick baseplate.
13	1" thick baseplate.
14	Reflector section (EAST)
15	Reflector section (NORTH)
16	Reflector section (WEST)

Results received 24 Oct 67 show:

N. .05% → .3%

M. .2 - .5%

≡ 1 thru 11 are same

≡ 12 & 13 are same

≡ 14 & 15 & 16 are same

In order to check for Carbon, Sulphur and phosphorus, samples of at least 1/2 gram will be needed.

DATE	19 Oct 67		SAFETY CHECK	
TIME	8:50		Taylor + Hym	
DRUM				
BAR	$\frac{10}{1000}$	opr L-15'	$\frac{10}{1000}$	out 750
ROD	12"	OK	30	1" OK
SP. T. C.	100	-	100	100
SALES	✓	✓	✓	
AREA	✓	✓	✓	
SOURCES	AND	M-226 + 8		
TABLES	✓	✓	AREA CHANGED	✓

Blade with I open

Run 57 Loading -  $86\frac{1}{2}$  u  
 $8\frac{1}{2}$  Fe [Row 9, except 2nd  $\frac{1}{2}$  #5]  
 Rod I = out  
 sub critical

58 Loading = 87 u  
 8 Fe [1, 2, 3, 4, 6, 7, 8 + 9]  
 sub critical

59 Loading =  $87\frac{1}{2}$  u  
 $7\frac{1}{2}$  Fe [1, 2, 3, 6, 7, 8, 9 + 1st  $\frac{1}{2}$  #4]

I = open

$P_1$	=	$21.16\text{¢}$	$21.76\text{¢}$
$P_2$	=	$4.66$	$4.686$
Blade	=	$4.87$	$4.90$

3a out 5"  
 $P_1 = 16.93\text{¢}$   
 3a in  $P = 21.28\text{¢}$

Run 60

SECTION 3 (All Fe) Evaluation

Loading - 84 1/4 u

[Movable Top Hat]

10 3/4 Fe [Row 9, #10 + 2nd, 3rd, 4th 1/4 #19]

3a up 5"

$P_1 = +10.39\text{¢}$

3a in

$P_2 = +16.41\text{¢}$

Sect. 3 out (4 1/8")

$P_3 = -4.007$

$$\text{Sect 3} = \frac{\$4.16}{5"} \leftarrow$$

$$5" \text{ of } 3a = 6.02\text{¢}$$

61 Lx I = open

Loading same as Run 59.

Blade @ +0.6 cm

P =

moved blade west to -86¢

then back to the east -90¢ (6.0 cm).

en

[5]

[4]

2nd

:76¢

.686

:90



DATE	20 Oct 67						SAFETY CHECK					
TIME	08:40			AM			BY Taylor + Lynn					
CHANNEL	A	B	C	D	E	F						
RANGE	10			10								
SOURCE DIST.	1000	OK	1-15	1000	OK	750						
% F. S. 700	12"	OK	30"	1"		OK						
BLED. ALARM	100	-	100	100		-						
AUX CTAS.												
SOURCES USED							MAGNETS					
TABLES	LIGHTS						AREA CLEARED					

Run 62 235 U foil (.004" Thick, .295" dia) exposure.

Foil no.	Position
30	Poly Reflector (B4C-Poly)
38	Hole # 91 @ center
42	# 71 "
45	# 46 "
26	# 45 "
31	# 44 "
28	# 43 "

Hole # 48 - Foil #

19	@ center	35,000/min after 20 min
41	1 1/2 cm above center	
27	3	
20	4 1/2	
67	7 1/2	
57	10 1/2	
62	12	

Foil # 48 - Center Outside of core, South

Run 62 cont'd -

$\text{Log } N = .035$   
 $I = \frac{2.30}{2.6} \infty$   
 Time 09:05 & 09:25  
 up #1 = 22.76  
 #2 = 22.795

$"A" = 54 \frac{1000}{1000}$   
 $"D" = 44 \frac{1000}{1000}$   
 $"C" = 35 \quad \#23$   
 $"P" = .1 \quad 750 \text{ V.}$

20 min

Loading -  $84\frac{1}{4}$   
 $10\frac{3}{4}$  [Row 9, #10 + 2<sup>nd</sup>, 3<sup>rd</sup> + 4<sup>th</sup>  $\frac{1}{4}$  #19]

Scatter #3 Fe

#4 B4C-Poly

Top Hat Moving.

Run 63  $\approx 35$  u fails (.295" dia, .004" thick).

Hole # ~~7~~ Location (cm from center)

Hole #	Location (cm from center)
48	#17
25	#56
91	#49, 43, 44, 46, 13, 34, 61, 66, 68, 36
95	47
87	70

cut @ 11:46

LN = .057

I = 2.55  $\infty$

"A" = 91  $\frac{1000}{1000}$  (Bare)

"D" = 74  $\frac{1000}{500}$  (Bare)

"C" = 79 (H-23)

"F" = 2.4 (7500)

down 12:25

Time = 39 min

Run 64

Shim Evaluation, 11" dia X  $\frac{3}{4}$ " Thick  
polyethylene centered behind  
proximity gauge #4.

I = 5" Pos  $\approx 20^\circ$

Pulled Shim

I = 1.65  $\approx (8^\circ)$

Loading = 84 u

11 Fe [Row 9, #10 + #11]

Run 65 Loading ~~83~~  $83 \frac{7}{8}$   $\swarrow$   
 $11 \frac{1}{8}$  [Row 9, #10, #11 and 8th 1/8 #12]

Shim  $\frac{1}{4}$ " Thick

$$I = 1.8$$

$$P_{00} \sim 20 \text{ \#}$$

Shim off

$$3a = 3.5"$$

k

DATE		SAFETY CHECK					
TIME	9:05 AM	BY JAY WARD HYN					
CHANNEL	A	B	C	D	E	F	
RANGE	10/1000	OPR	L-16	10/1000	cuty	750V	
SOURCE DIST.							
% F. S. TRIP	100	/	/	100	/	100	
BLDG. ALARM	/	/	/	/	/	/	
AUX CRTS.	/	/	/	/	/	/	
SOURCES USED	M226 & h					MAGNETS	/
TABLES	/	LIGHTS	/	AREA CLEARED	/	/	

Prep for  
Rossi Alpha



Rossi Alpha

Run 66 Loading -  $83 \frac{7}{8}$  U

$11 \frac{3}{8}$  Fe [Row 9, #10, #19 + 3<sup>rd</sup> 1/4 + 7<sup>th</sup> 1/8 #11]

Sub crit

67 Loading -  $83 \frac{7}{8}$  U

$11 \frac{1}{8}$  Fe [Row 9, #10, #19 + 7<sup>th</sup> 1/8 #11]

Sub crit.

Shim up  $\rho = +9.5 \frac{\text{g}}{\text{cm}^3}$   
80  
 $\frac{= 13.2}{22.7 \text{ g}}$

68 Loading -  $84 \frac{1}{4}$  U

$10 \frac{3}{4}$  [Row 9, #19 + 1<sup>st</sup> 3/4 #10]

$$"A" = 55 \frac{10}{200}$$

$$"D" = 44 \frac{10}{200}$$

$$"C" = 80 \text{ L-16}$$

$$Lr = .00008 \text{ (Est.)}$$

$$BF_3 = 600$$

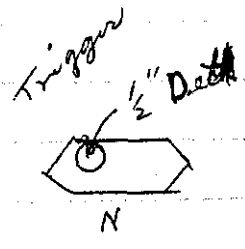
$$\#1 = 22.76$$

$$\#2 = 22.782$$

$$I = \text{~~0.9~~ } 0.9$$

2 Fe Plugs in Top Hat replaced with detectors -  $-15 \frac{\text{g}}$

DATE 24 Oct 67 SAFETY CHECK					
TIME	BY	Taylor	Lynn		
8:50					
DIAGNOSIS	D	B	E	F	
TIME	10	10	10	10	750
TYPE	1000	apr	L-16	1000	g
SIZE	10"	2K	30"	1"	g
QTY	100	-	100	100	-
BLDG.	✓	✓	✓		
ACK	✓	✓	✓		
SOURCES	USED	M-226 + Y		MAGNETS	✓
TABLES	✓	✓	✓	AREA CLEARED	✓



Rossi Alpha

Run 6.9

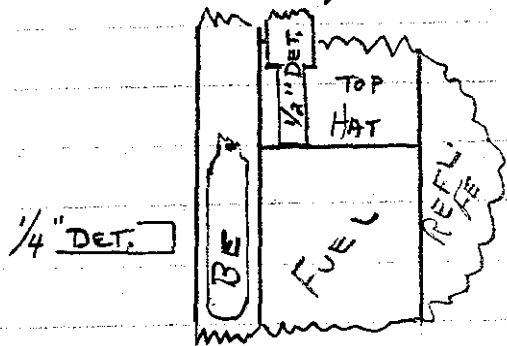
Loading - 8 1/8 U  
 10 7/8 Fe [Row 9, #19 + 1st 7/8 #10]

1/2" Detector in Top Plug.  
 1/4" " centered behind proximity  
 gauge #4 - 3/4" from shroud.

"A" 10/100 @ 70      LN 0.00005 (est)  
 "D" 10/100 @ 80      BF<sub>3</sub> #1 = 394 CPM; #2 = 321 CPM  
 "C" L16 @ 62      #3 = 318 CPM  
 ROD I = 2.1" WITHDRAWN (11")

(A) 35 min Run ending @ 10:13 hrs.

- (B) 35 min Run ending 10:48
- (C) 37 min Run ending 11:25
- (D) 35 min Run ending 12:04



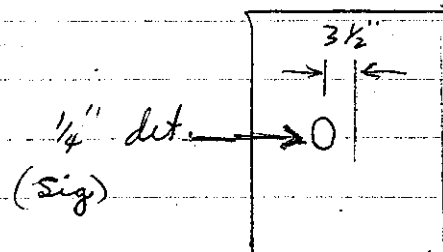
Run 70 Rossi Alpha -  
Loading - Same

$\frac{1}{2}$ " Detector in Top Plug. as p. 79

$\frac{1}{4}$ " " back of Fe Reflector (Sect 3)  
on north,  $3\frac{1}{2}$ " east of center.

Rod I @  $1.5''$  ( $\approx 7^\circ$ ) WITHDRAWN  
150 min run ending 1600 hrs.

Inst - Same -



$\frac{1}{4}$ " det. → 0  
(sig)

Sect. #3

DATE	25 Oct 67					SAFETY CHECK	
TIME	8:25					BY J.R. Taylor - J. Lyons	
CHANNEL	I	U	C	U	F		
RANGE	1000 OPR		4-16	1000		750V	
SOURCE DIST.	10" OK		30	1"		OK	
% F. S. CTR	100	-	-	100		100	
BLDG. ALIVE	✓	✓	✓				
AUX. OPER.	✓	✓	✓				
SOURCES USED	M226 & J			MAGNETS		✓	
TABLES	✓	LIGHTS		✓	AREA CLEARED		✓

Run 71 loading - Same

1/2" detector in Top Plug, as p. 79  
 1/4" " against B lined scatter # 4

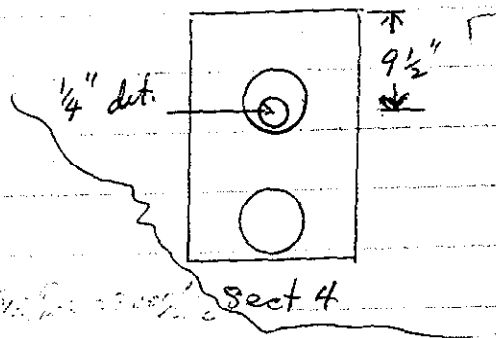
rod I @ 1.5" WITHDRAWN ↓

"A" = 100 @ 70

"D" = 100 @ 83

"C" = 116 @ 62

3000/sec. 500/sec.  
 TRIGGER = 1250V; SIGNAL = 1400V; sect 4



(A) 110 min run ending 10:46

(B) 38 min run ending 11:28

5000/sec 550/sec  
 TRIG = 1340; Sig 1550V



Run 72 LOADING -  $83\frac{3}{4}$  u11  $\frac{1}{4}$  Fe [Row 9, #10, #19 + 4 $\frac{1}{4}$  #11]Trigger -  $\frac{1}{2}$ " detector behind proximity gauge #4.  $\frac{3}{4}$ " from shroudRod I @ 0.4" ( $\approx 1\frac{1}{2}$ ) WITHDRAWN.Signal -  $\frac{1}{4}$ " detector same as for Run 71.

Printed out after 86 min. @ 13:22

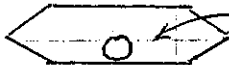
Restart accumulation of data @ 13:50

End run @ 15:44

Total run = 200 min.

DATE	26 Oct 67	SAFETY CHECK	
TIME	8:15	by Taylor & Lynn	
DRUM	10	10	
RANGE	1000	Op L-15	1000 out 750
CORRECTION	1.2"	OK 30"	1" OK
COUNT	100	- 100	1000 -
FILE #		✓	✓
DATA		✓	✓
SAMPLE	M-226 + 8		✓
TABLES	✓	✓	✓

Passes ✓

Run 73A Loading =  $83\frac{7}{8}$  u11  $\frac{1}{8}$  Fe [Row 9, #10, #19 + 7 $\frac{1}{8}$  #11]  $\frac{1}{2}$ " detector - Top of core plug. $\frac{1}{4}$ " " - Same as p. 81

Inst. Same

$I = 0.4''$

Start 08:36

Stop 9:45

1 hr 9 min

" 09:55

" 11:07

1 hr 12 min

Run time = 141 min

$I @ .4'' (\approx 1\#)$

73B Start 11:23

Stop 12:49

86 min run

73C Start 12:54

[print out 1326]

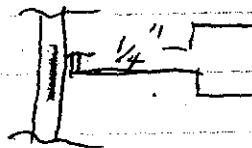
Stop 14:04

70 min run.

74

$\frac{1}{4}''$  - detector behind blades

$\frac{1}{2}''$  - out



Start - 14:22

Stop 14:52

$I = 1.25''$

30.4 min Run

75

$\frac{1}{4}''$  - detector core plug

$\frac{1}{2}''$  - out

Added  $\frac{1}{4}''$  #10



Start - 15:22

STOP 16:12

49.8 min

$I = 0.6$



Loading  
 $84 \frac{1}{8} \text{ U}$   
 $10 \frac{7}{8} \text{ Fe}$

#11

DATE		27 Oct 67		SAFETY CHECK	
TIME		0945		BY Taylor & Lynn	
QUANTEL	E	G	B	F	
RANGE	10	1000	Apr K-15	10	750
SOURCE DIST.	12"	OK	30"	11"	OK
% F. S. TAP	100	-	-	100	-
BLDG. ALARM	✓	✓	✓	-	-
AUX DEVS.	✓	-	✓	-	-
CHARGES USED	M-226 + 8	-	-	-	✓
TABLES	✓	LIBRIS	✓	ALL CLEAR	✓

Run 76

Rossi Alpha -

BF<sub>3</sub> (Small) - Behind blade.

Small spiral fissure - Center of Core [ #48 ]

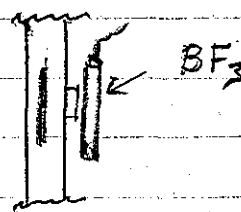
Moving Top Core plug.

Loading - 84 7/8 - U

9 7/8 - Fe

1/2 - Void

Sub critical



Loading - 85 U

9 1/2 Fe [ Row 9 + 1st 1/2 #10 ]

1/2 Void [ 2nd 1/2 #48 ]

∞

Rods in

Run 77 (A) Rossi Alpha -

BF<sub>3</sub> (small) - Behind blade as p. 84

1/4" Scient. - Top plug as Run 25 p. 83

Loading - 84 1/8 u

10 7/8 Fe [Row 9, #19, 1st 3/4 #10 + 7th 1/8 #11]

START DATA COLLECTION: 13:30

Rod I = 0.6" (out) ≈ 2<sup>+</sup>

Power level same as pg 81

STOP 15:02

92 min run

(B) START 15:03

STOP 16:12

69 min run

	A	B	C	D	F
DATE	30 Oct 67				
TIME	8:30				
OPERATOR	Taylor + Lynn				
TYPE	E	10	10	10	750
	1000	of L-15	100	100	
WAVE LENGTH	10"	OK	1"	OK	
WAVE NUMBER	100	-	100	100	-
WAVE LENGTH #	✓	✓	✓		
WAVE NUMBER #	✓	✓	✓		
SOURCES USED	226 & X				✓
TABLET	✓	✓	✓	✓	✓

Run 78

Rossi alpha -

Small BF<sub>3</sub> - as p. 84Spiral fissure - center of Poly., B lined  
scatter # 4

"A" 10/100 @ 42

"B" 10/100 @ 55

"C" 10 @ 50

Rod I = 1.0"

10300 (A) Start: 09:40 STOP 10:00 (20 min run)  
"Shut down" for WCT.

91203 (B) START 10:35 a restart, (not additional occur)  
STOP 12:15  
(100 min run).

83203 (C) Start 12:20  
Stop 12:55  
(35 min run).

~~Start 12:59 ("Playing" games)~~  
~~Stop 12:16~~ (17 min run)

72404

(D) Start 13:17

(165 min run)

Stop 16:02

Jug - SFC; Sig = 1/4"

DATE		SAFETY CHECK					
TIME	Taylor & Lynn	10:30					
CHANNEL	C	U	E	F			
RANGE	1000	opt	215	100	700		
SOURCE DIST.	12"	OK	30	1"	OK		
% F. S. TIME	100	-	100	100	-		
ELDR. PLUG	✓	✓	✓				
AIR OILS	✓	✓	✓				
SOURCES USED	226 + 8	MAGNETS		✓			
TABLES	✓	LIGHTS		✓			
		AREA CLEARED		✓			

Run 79

Rose's Alpha -

Small B<sub>1</sub>B<sub>3</sub> - as p.84 (not in use)

Spiral Jersian - as p.86 - Trigger

1/4" Scout - Top Core plug [S.E.]



72404

2594  
1/4"

START 11:54

ELDR - Stopped for

N

about 5 min @ 1400

stopped 21 min during Raffety

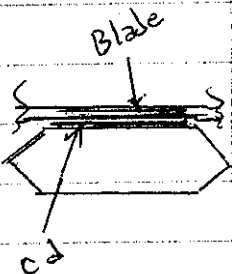
restart 13:26

stop 16:02

TOTAL 222 min run

DATE	SAFETY CHECK					
TIME	9:55	AM	BY Taylor & Hyman			
CHANNEL	$\frac{10}{1000}$	$\frac{0}{0}$	$\frac{0}{0}$	$\frac{0}{1000}$	$\frac{0}{0}$	$\frac{0}{0}$
RANGE	1000	opt	L-15	$\frac{10}{1000}$		750
SOURCE DIST.	12"	OK	30"	1"		OK
% F. S. TRIP	100	-	100	100		-
BLDG. ALARM	✓	✓	✓			
AUX CTRS.	✓		✓			
SOURCES USED	226 + X		MAGNETS			✓
TABLES	✓	LIGHTS	✓	AREA CLEARED		✓

Run 80 - Cadmium (25 mil) added to South face of Core. Between Core + Shroud



Fixed Top Plug - (cd. =  $18\frac{1}{2}'' \times 5\frac{1}{4}'' \times .025''$ )  
Loading -  $85\frac{1}{8} \text{ U}$  (extends from top of plug down)

$9\frac{7}{8}$  - [Row 9, 1st  $\frac{3}{4}$  #10, + 7th  $\frac{1}{8}$  #11]

#1: 22.75'

#3 = -3

Z: 22.814

#4 = -23?

$$I = 5.80 \quad (\approx 65\phi)$$

81 Loading -  $84\frac{1}{4} \text{ U}$

$10\frac{3}{4} \text{ Fe}$  [Row 9, #19, 1st  $\frac{1}{2}$  + 4th  $\frac{1}{4}$  #10]

Rods in

$$P_1 = 35.71\phi$$

Purged Blade

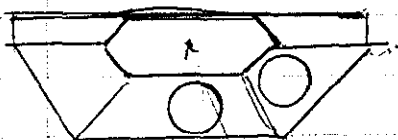
$$P_2 = 4.85$$

$$\text{Blade} = \underline{5.21}$$

Little as p. 53

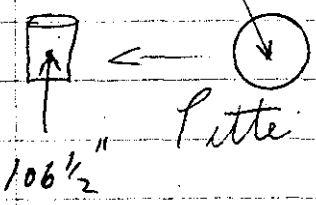
Run 82 Loading -  $84\frac{1}{4} 21$   
 $10\frac{3}{4}$  Fe [Row 9, #19 + ~~#34~~ #10]

Plate Moved -

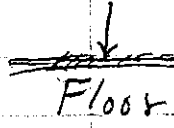


"A" = 70  $\frac{1000}{200}$   
 "D" = 80  $\frac{1000}{500}$   
 "C" = 70 L-22  
 LN = .035

round  
 5" )  
 own )  
 #  
 8 11



"A" = outside Pig, Cd Covered.  
 "D" = Bare.  
 Pitte =  $2 \times 10^{-8}$



$P_1 = 27.90 \text{ \#}$  Rods in  
 $P_2 = \text{\#}4,776$  Blade Away

Blade = \\$5.06

83 move Pitte back as p. 53

#10]

Rods in  $P_1 = 27.78 \text{ \#}$   
 Blade Away  $P_2 = \text{\#}4,867 \text{ \#}$

Blade = \\$5.14



90

Run 82 +27.90 \$  
 84a +17.51 \$  
 ed = +10.39 \$

Run 84a Loading - Same -  
 cd - Remerred.

Pette - as Run 82, except now 65"

$P_1 = 17.51 \text{ $}$        $3.3 (x50) = 16.50 \text{ $}$

- \$16.58

Normal lowering of tables =  $P_2 = -16.40 \text{ $}$

84b

$P_1 = 17.35 \text{ $}$

$3.3 (x50) = 16.50 \text{ $}$

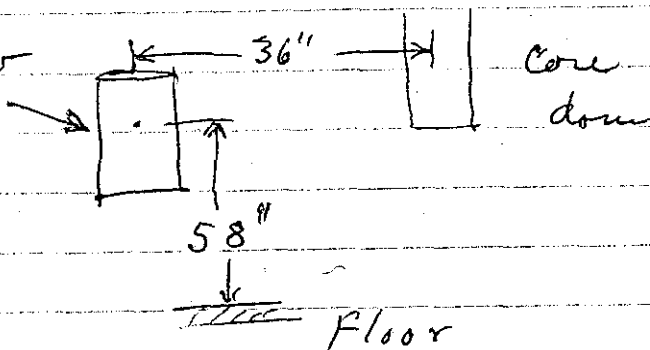
- \$16.12

Scrammed  
 (Planned)

$P_2 = -15.95 \text{ $}$

Run 85

Pette now  
 west of  
 core.



- \$6.70

$P_1 = 16.97 \text{ $}$

$3.195 (x50) = 15.98 \text{ $}$

Scrammed  
 (Planned)

$P_2 = -6.52 \text{ $}$

Run 86

Pette now 72" west.

$P_1 = 16.69 \text{ $}$

$3.115 (x50) = 15.57 \text{ $}$

- \$8.95

Scrammed  
 (Planned)

$P_2 = -8.78 \text{ $}$

DATE		SAFETY CHECK					
TIME	AM	BY Taylor + Lynn					
CHARGE	10	0	0	10	E	F	
RANGE	1000	0pr	L-15	1000		750	
SOURCE DIST.	10"	ok	30"	1"		ok	
% P. S. TR	100	-	100	100		-	
BLOK. ALARM	✓	✓	✓				
ADJ. DIALS.	✓	-	✓				
SOURCES USED	M-226 + Y MAGNETS					✓	
TARGET	✓	LIGHTS	✓	AREA-CLEANED		✓	

Run 87 No Blade (Blade Rotated 180°)

Loading - 93 u  
2 Fe [ #1 + #9 ]

Rod I = 7.2 ∞ (95#)

88 Loading - 91 3/4 u  
3 1/4 Fe [ 1, 8, 9 + 4th 1/4 #2 ]

Rod I = ~~3.66~~ 3.75 ∞ (28#)

89(A) Loading - 91 1/4 u  
3 3/4 Fe [ 1, 8, 9 + 1st 1/2 + 4th 1/4 #2 ]

Base & Det. same as p. 78  
I = 0.25" 3000 sig/sec (1/4")  
5000 Trig/sec (1/2")

Start - 11:23

Stop - 11:53

30 min run

6.50

15.98

15.57

6.240

72404

89(B) start - 11:53  
stop - 12:36

$$"A" = 53 \frac{10}{100}$$

$$"D" = 52 \frac{10}{100}$$

$$I = 0.25$$

43 min run

Run 90a No Block.

Scatter #3 = Fe  
#4 = Fe

Loading - 90 <sup>1</sup>/<sub>4</sub> U

4 <sup>3</sup>/<sub>4</sub> Fe [1, 7, 8, 9, 2<sup>nd</sup> <sup>1</sup>/<sub>2</sub> #2 + 4<sup>th</sup> <sup>1</sup>/<sub>4</sub> #6]

K < 1

90b Loading - 90 <sup>3</sup>/<sub>8</sub> U

4 <sup>5</sup>/<sub>8</sub> Fe [1, 7, 8, 9, 2<sup>nd</sup> <sup>1</sup>/<sub>2</sub> #2 + 8<sup>th</sup> <sup>1</sup>/<sub>8</sub> #6]

$$\text{Rod} = 0.72''$$

62404

Start: 13:38

Stop 14:38

60 min run

63404 90c Start: 14:39

15:38

60 min run

DATE	6 Nov 67					SAFETY CHECK				
TIME	11:00					Taylor + Lyman				
CHANNEL										
RANGE	100	OPR	4/16	1/1000	900V	750V				
SOURCE USE	6"	OK	30"	2"	3"	OK				
% F. S. TRK	100	-	100	100	100	100				
BLDG. ALARM	✓	✓	✓							
AUX CTAS.	✓	X	✓							
SOURCES USED	M226 & h					MAGNETS ✓				
TABLES	-						AREA CLEARED ✓			
LIGHTS		✓								

"A" + "D" = out of pig, not covered -

"E" = Corner of Horizontal Tables -

Loading - 85 3/4

Run 91

9 1/4 [Row 9 + 3rd 1/4 # 19]

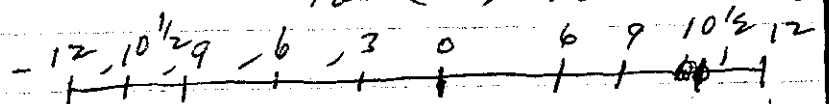
Scatter #3 = Blind  
#4 = Fe

235 U Forks

I = 3.5 (≈ 25#)

Pos (cm) Vertical (0 = E)

Hole #



# 5

# 23

# 25

39

# 48

22(N)

# 71

33

# 91

37

# 95

58, 54, 01, 64, 60, 55, 32, 38, 16, 25

Scatter #3

40

12145

Over

Run 97 Loading - 85  $\frac{5}{8}$  U  
 9  $\frac{3}{8}$  Fe [Bow #9, 2<sup>nd</sup>  $\frac{1}{4}$  + 5<sup>th</sup>  $\frac{1}{8}$  #19]

Exp. loading Run 91.

$$"A" = 73 \frac{1000}{500}$$

$$"D" = 70 \frac{1000}{500}$$

$$"C" = 46 \text{ Hz}$$

$$L_N = .12$$

$$\text{Crit} = 12.545$$

$$\text{Time} = 25 \text{ min}$$

$$"F" = .7 \quad 750 \text{ V.}$$

$$"E" = 0.2 \quad 675 \text{ V.}$$

$$I = 3.69$$

7 Nov 67 SAFETY CHECK  
 9:30 Taylor & Lynn

1000	opr	L-15	1000	900	750
2"	OK	30"	0	2"	OK
100	-	100	100	100	-
✓	✓	✓			
✓	-	✓			
226	+	8			✓
✓		✓			✓

Run 93

Scatter #3 = Fe  
 #4 = B Lined

235 U Foils  
 .295" dia  
 .1084" Thick

Loading - 84 7/8 U  
 10 1/8 Fe

I = 5.1 ∞

Hole #	Vertical Pos. (cm)					0 = #		
	-12	-10 1/2	-9	-6	-3	0	6	9 10 1/2 12
89						#53		
66						51		
68						50		
44						71		
48						240		
18			59, 3, 5, 11, 12,		6		10, 2, 4, 9	

94 Loading - 84 1/8 U

10 3/8 Fe [Row 9, #10, 1st 3/4 + 8th 1/8 #19]

EXA

I = 1.97

Crit 10:05

Time = 25 min

"A" = 84  $\frac{1000}{1000}$

"D" = 77  $\frac{1000}{1000}$

"C" 94 L-28

LV = .24

"F" = 4.0 <sup>650</sup>

"E" = 2 <sup>625</sup>

Run 95 Loading - Same.

Hole #	235 U Roofs		Vertical Pos (cm)						0 = $\phi$
	-12	-10 1/2 -9	-6	-3	0	6	9	10 1/2	12
# 20									
11									
23									
46									
48									
87	1, 2, 3,	4,	5,	6		7,	8,	9,	10

Cut 13155"

Time = 30 min

'A" = 84  $\frac{1000}{1000}$   
 'D' = 72  $\frac{1000}{1000}$   
 'C" = 95 L-28  
 LN = .26

"E" = .2 690  
 "F" = 5.0 650

DATE	8 Nov 67 SAFETY CHECK					
TIME	9:00 AM BY Taylor & Lyman					
CHANNEL	1	2	3	4	5	6
RANGE	1000	1000	1000	1000	1000	1000
CH. 1	3"	ok	30"	0"	3"	ok
% F. S. I.	100	-	100	100+	100+	-
BLED. ADJ.	✓	✓	✓			
ALX. STAS.	✓		✓			
SOURCES USED	226 + 8			MAGNETS		✓
TABLES	✓	LIGHTS	✓	AREA CLEARED		✓

Run 96 235U Fail Exp.

Hole #	Vertical Position (cm)					
	0	1/2	1	1 1/2	2	2 1/2
# 48						
# 93						
74						
76						
51						
53						
38						
30						

Crit = 09:39

Time = 30 min

I = 1.8

"A" = 84  $\frac{1000}{1000}$

"F" = 4.5 650 V.

"D" = 72  $\frac{1000}{1000}$

"E" = .2 675 V.

"C" = 92 L-28

Lv = .24



Prm 97 235 u Fr/s (Coated on 1 (one) side)

Hole	Vertical Position (cm)	$0 = \pm$
<del># 15</del>	-12	-10 1/2
# 15	-7 1/2	-4 1/2
# 48	-1 1/2	0 + 1 1/2
	50, 51, 52, 53, 54, 55, 56	+ 7 1/2
	60 (N)	+ 10 1/2

$$\text{cut} = 13:34$$

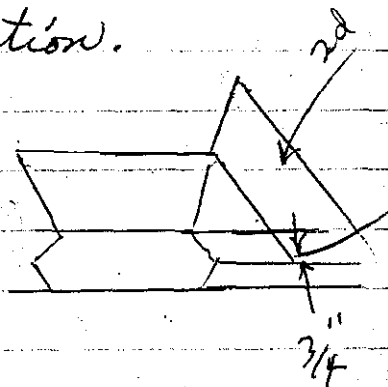
$$\text{Time} = 30 \text{ min} \quad I = 0.9$$

Inst = Same.

Prm 98 Section 2 d Evaluation.

$$P_i = 33.27 \text{ } \phi$$

$$I = 4.01 \infty$$



99 Section 2 d off-

$$P = 14.24 \text{ } \phi$$

$$I = 2.27 \infty$$

Section 2 d  
19.03  $\phi$

DATE	9 Nov 67					
TIME	10:00					
OPERATOR	Taylor + Lynn					
CHARGE	1	5	0	1	5	7
RAVE	1000	0 for	L-15	1000	900	750
SIZE	3"	OK	30"	1"	3"	OK
WEIGHT	100+	-	100	100+	100+	-
STATUS	✓	✓	✓			
TEST	✓	-	✓			
SO-NO	226	+ 8				✓
TABLES	✓	✓	✓	✓	✓	✓

Fuel Evaluation

Run 100

Loading - 84's U  
 10 7/8 Fe [Row 9, #10, 1 3/4 + 8 1/8 #19]

moving Top Hat (Core plug)

$$P_1 = +5.87 \text{ ¢}$$

{ Pulled Fuel #18  $P_2 = -66.16 \text{ ¢}$   
 + Top Fe pin

$$\#18 = 72.03 \text{ ¢}$$

$$\text{Fe pin} = 1.03 \text{ ¢ (1966 data)}$$

$$\underline{\text{Fuel \#18}} = \underline{71 \text{ ¢}}$$

Run 101

{ Pulled Fuel #48  $P_1 = +5.84 \text{ ¢}$   $P_2 = -1.568 \text{ ¢}$   
 + Top Fe pin

$$\#48 = 1.63$$

$$\text{Fe pin} = 2.09 \text{ ¢}$$

$$\underline{\text{Fuel \#48}} = \underline{1.61 \text{ ¢}}$$

Run 102

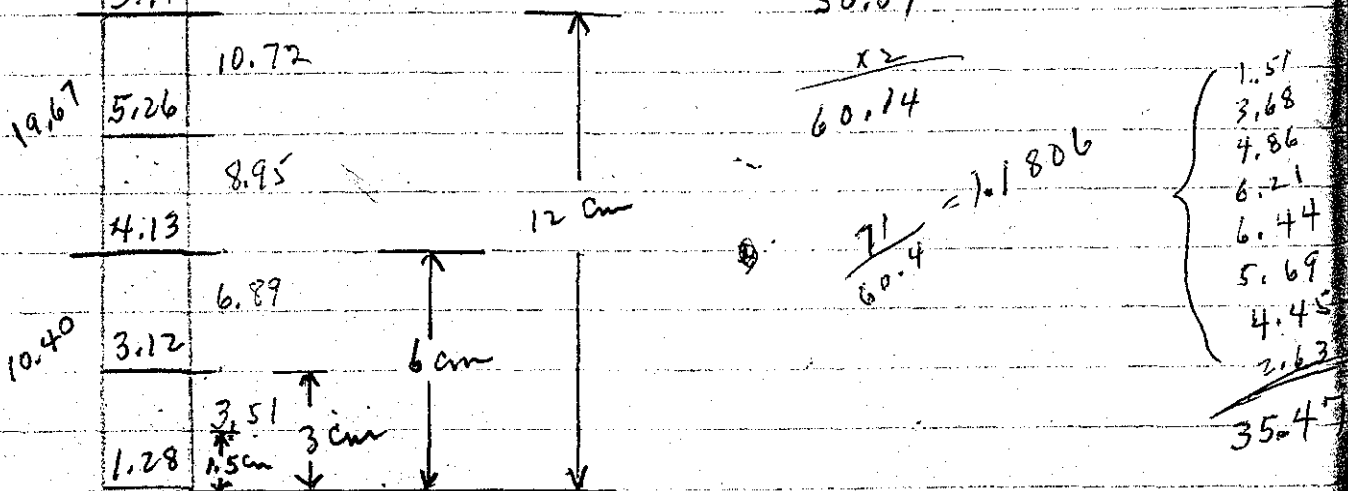
$P_1 = 6.08 \text{ \#}$

Pulled # 51  $P_2 = 114.84 \text{ \#}$   
 (U + Fe)  $\# 51 = 1.209$   
 Fe pin = 1.77  $\text{\#}$   
 Fuel # 51 = 1.19

Run 103

STEEL vs U vs Run 100 +5.87  $\text{\#}$

		1st $\frac{1}{16}$ # 18 = Fe	1.28 $\text{\#}$	$\rho = 4.456 \text{ \#}$
		3rd $\frac{1}{16}$ 18 = Fe	3.12 $\text{\#}$	$\rho = +2.75$
10.40	2.23	5th $\frac{1}{16}$ 18 = Fe	4.13	$\rho = +1.74$
		7th $\frac{1}{16}$ 18 = Fe	5.26	$\rho = +0.61$
	3.77	9th $\frac{1}{16}$ 18 = Fe	5.46	$\rho = +0.41$
		11th $\frac{1}{16}$ 18 = Fe	4.82	$\rho = +1.05$
19.67	4.82	13th $\frac{1}{16}$ 18 = Fe	3.77	$\rho = +2.10$
		15th $\frac{1}{16}$ 18 = Fe	2.23	$\rho = +3.64$
	5.46		<u>30.07</u>	



DATE	5 Dec 67					
TIME	1150					
CONTROL	Taylor & Lynn					
	A	B	C	D	E	F
	1500	1500	1500	1500	900	700
	3"	OK	30"	2"	2"	OK
	100+	-	100	100+	-	-
	✓	✓	✓	✓	✓	✓
	✓	-	✓	✓	✓	✓
	✓	226 + 8				✓
	✓	✓				✓

Run 104 Critical Condition - Rossi Alpha

FUEL = 83

FE = 12 [1 → 12 + 19]

Scotter #3 = FE Blade = Centered.

#4 = FE Top Hat = Fixed

Scint. (1/2") Top Hat, SE.



Super ≈ 30+

I = 3.7 ∞

105 Loading = 82 3/4

17 1/4 Fe [1 → 11, 19 + 3rd 1/4 #18]

Pos. 17.23 +

I = 2.64 ∞

up #1 = 22.682

#3 = -2

#2 = 22.750

#4 = 0

106 Blade Rotated  $180^\circ$  Secured. (#5)  
 Rossi  $\alpha$  (overnight)

Loading = 84  $\frac{1}{16}$  U

10  $\frac{5}{16}$  Fe [1  $\rightarrow$  9, 19 + 12  $\frac{1}{16}$  ~~10~~ <sup>#</sup> 10

+ ~~1.00~~ <sup># 0.95</sup> Fuel Added to Run 105

up #1 = 22.768

#2 = 22.838

5 }  
 # 16  
 # 10

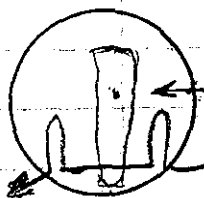
DATE		SAFETY CHECK				
DATE	6 Dec	Taylor + Lynn				
TIME	2115					
CHARGE						
BALANCE	1000	OK	L+R	1000	950	700
NO. OF...	3'	OK	30'	2'	2'	OK
...	100	=	100	100	100	T
BLOD...		✓	✓	✓		
AUX...		✓	✓	✓		
SOURCES USED	226 + 8	MAGNETS		✓		
TABLES	✓	LIGHTS	✓	AREA CLEARED		✓

Back to Normal See P. 101  
 Run 107 Water Evaluation - Cooling for Shroud.  
 Removed water from line  
 at base of shroud on Window Side.

$$\text{Loading} = 82 \frac{13}{16}$$

$$12 \frac{3}{16} [1 \rightarrow 9, 19, 1), 3 \text{ at } 4, 5, 10]$$

$$1 \text{ at } 2/8 + 8 \text{ at } 15/16 \# 10$$



Pos Period = 13.74  $\phi$

108 Filled water line.

Pos Period = 14.53  $\phi$

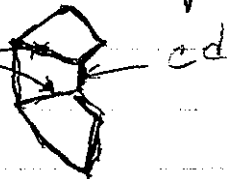
Change = +0.79  $\phi$

Run 109

Cd Reactivity-

Added to face of section 3, next to Core,  
 $18\frac{1}{2}'' \times 5\frac{1}{4}'' \times .025''$  cd.

Section 3 moved back to put  
 40 mil spacers.



$$\rho = +1.46 \text{ \#}$$

110

Removal cd.

$$\rho = -3.89$$

Run

Adding cd = +5.35 \#  
 with scatter #3 = Fe  
 #4 = Fe

SAFETY CHECK					
DATE	7 Dec 67				
TIME	9:30				
CHANNEL	Lynn + Taylor				
GAUGE	1000	Apr L-15	1000	900	750
SIZE	3"	ok	30"	1"	3" OK
DEPTH	100+	-	100*	100+	100+
DEPTH	✓	✓	✓	✓	✓
AREA	✓	-	✓	✓	✓
SC. POINT	226 + 8	8	8	8	✓
TABLES	✓	✓	✓	✓	✓

Run 111 Scatter # 3 = (Polyethylene) (14 cm dia) Top Hat Fixed  
 # 4 = Fe I = Normal [N. + FE]  
 $\frac{1}{2}$ " Scat as p. 101.

Loading =  $85\frac{1}{4}$  U  
 $9\frac{3}{4}$  Fe [1 → 9 and 1st  $\frac{1}{2}$  # 10]  
 and 3rd  $\frac{1}{4}$  # 18

$$P = -2.89 \text{ \#}$$

112 Added Cd as per Run 109  
 sub.

113 Loading =  $85\frac{3}{4}$  U  
 $9\frac{1}{4}$  Fe [1 → 9 and 3rd  $\frac{1}{4}$  # 18]

$$P = -15.59 \text{ \#}$$

114 Removed Cd  $P = 4.87 \text{ \#}$

$$\text{Change} = +20.46 \text{ \#}$$

$$\text{Adding Cd} = -20.46 \text{ \#}$$



Run 115 8 Dec 67 Rossi  $\alpha$

Same as Run 106 p. 102  
Sub crit.

Loading -  $84 \frac{1}{16}$  U

$10 \frac{7}{16}$  Fe [1  $\rightarrow$  9, 19, + 1<sup>st</sup>  $\frac{7}{8}$  +  
 16<sup>th</sup>  $\frac{1}{16}$  #10]

#1 = 22,765

#2 = 22,838

Ru

DATE	11 Dec 67	SAFETY CHECK				
TIME	12:50	Taylor Lynn				
INSTR.						
RANGE	1000	opt	1000	900	750	
SCS	6"	OK	30"	2"	3"	OK
% E	100+	-	100	100+	100+	-
BLDG.	✓	✓	✓			
AUX.	✓	-	✓			
SOURCE	226 + 8					✓
TABLES	✓		✓			✓

Run 116 235 u Foil Exposure.

Scatter #3 = Fe Filed Top Hat.  
 #4 = B lined

Loading - 84 <sup>1</sup>/<sub>8</sub>  
 10 <sup>7</sup>/<sub>8</sub> [1 → 9, 19, + 1<sup>st</sup> <sup>3</sup>/<sub>4</sub> + 8<sup>th</sup> <sup>1</sup>/<sub>8</sub> #18]

Vertical Hole # 11

Position - 12, -10 1/2, -7 1/2, -4 1/2, -3, 0, 1 1/2, 4 1/2, 10 1/2, 12  
 Foil # 17, 34, 36, 43, 44, 46, 49, 56, 61, 68

Norm. # 13 center Hole 48.

"A" = 80 <sup>1000</sup>  
 "D" = 63 <sup>1000</sup>/<sub>1000</sub> "E" = .2 690 V.  
 "C" = H-28 80 "F" = .35

log N = .2 I = 0.87

cut = 14:00

Exposed. 30 min.

"A" + "D" out of pig, Cd around.

DATE 12 Dec 67 SAFETY CHECK					
TIME	08:30	Taylor + Lynn			
CHANNEL					
RANGE	1000	opr	L-18	1000	900 750
SOURCE DIST.	2"	ok	30"	2"	1" ok
% F. C. T. A.	100 <sup>+</sup>	-	100	100 <sup>+</sup>	100 <sup>+</sup> -
BLES. ALARM	✓	✓	✓	✓	✓
AUX GR'S.	✓	-	-	-	-
SOURCES USED	226 + 8	MAGNET		✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓

Run 117 235 u Vertical Hole #43  
 Position -12, -10½, -7½, -4½, -3, 0, 1½, 4½, 10½, 12  
 Foil # 38, 42, 45, 26, 31, 28, 48, 57, 62, 67  
 Normalizer #19 Center Hole #48.  
 Crit 08:50  
 Exp. = 30 min I = 0.35  
 Inst - Same as Run 116. Log N = .2

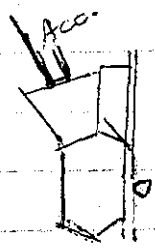
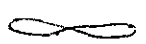
Run 118 235 u Vertical Hole #53  
 Position -12, -10½, -7½, -4½, -3, 0, 1½, 4½, 10½, 12  
 Foil 22, 23, 25, 32, 33, 35, 39, 39, 40, 54  
 Normalizer #16 center of Hole #48  
 Crit - 10:59 I = 0.41  
 EXP = 30 min Log N = .2  
 Inst - Same

Shutdown by reducing magnet  
 dropped off at 38 volts, ~ 100 mAmps

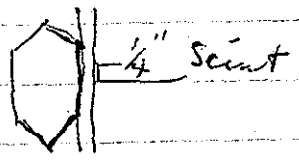
DATE 13 Dec 67  
 13:40  
 CHECK  
 Taylor + Lyon  

1500	off	L-15	1500	900	750
5"	ok	40"	3"	2"	ok
100+	-	100	100+	100+	-
✓	✓	✓	✓	✓	✓
✓	-	-	-	-	✓
227+	X				✓
ABLES	✓	✓	✓	✓	✓

12 Run 119 Loading - See Run 116.  
 67 Rossi α  
 Accelerator center section 2. Small BT<sub>3</sub> back of blade



12 Run 130 15 Dec 67 Inset check ok  
 54 1/4" Scint, Behind blade



Imp 5

DATE	3 Jan 68					
TIME	14:00					
CHECK	CHECK					
	A	B	C	D	E	F
	1000	opr	L-15	1000	90	700
	4"	OK	36"	2"	3"	OK
	100	-	100	100	100+	-
	✓	✓	✓			
SOURCES	227	+	✓			✓
TABLES	✓		✓	AREA	DESIGNED	✓

Run 121 FUEL EVALUATION - FUEL #48 = 1.61 (see p. 99)

Loading - 84 1/4 U  
10 3/4 Fe [1-9, 19 + 1st 3/4 #18]

BASE RUN  $P_b = +7.69 \text{ } \phi$

122 ((3/8" OD thin wall Al tubing 1 1/2 cm = void))

Void vs U Hole #48

↓	Void	1st 1/16 th	$P = +2.44 \text{ } \phi$	.75 cm	$P_b - P = 5.25 \text{ } \phi$
↓	"	3rd 1/16 th	$P = -0.84$	3.75 cm	8.53 $\phi$
↓	"	5th 1/16 th	$P = -3.74$	6.75	11.43 $\phi$
↓	"	7th 1/16 th	$P = -6.04$	9.75	13.73 $\phi$
↓	"	9th 1/16 th	$P = -6.61$	12.75	14.30 $\phi$
↓	"	11th 1/16 th	$P = -4.49$	15.75	12.18 $\phi$
↓	"	13th 1/16 th	$P = -1.44$	18.75	9.13 $\phi$
↓	"	15th 1/16 th	$P = +1.00$	21.75	6.69 $\phi$
Top					$\bar{P} = 10.16$

$\frac{P}{A_v} = .71$

DATE	SAFETY CHECK				
4 Jan 68					
TIME 08:40					
CHANNEL	1	2	3	4	5
RANGE	1000	Opt	L-15	1000	900 700
SCOUT DIST.	7"	ok	36"	4"	2" ok
SAFE DIST.	100	-	100	100	100+ -
DETECTORS	✓	✓	✓		
AUX. DEVS.	-	-	✓		
SOURCES	228	✓	✓	MAGNETS	✓
TABLES	✓	✓	✓	AREA CLEARED	✓

Run 123

FUEL EVALUATION -

FUEL #91 =

Loading - Same

BASE RUN

$T_b = 8.25 \text{ } \phi$

124

Void vs  $z$

Hole #91

$R_z - \rho$

a)	Void	2 <sup>nd</sup>	$\frac{1}{16}$ in	$\rho = +3.90 \text{ } \phi$	2.25 cm	4.35 $\phi$
b)	"	4 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = +1.21$	5.25 cm	7.04
c)	"	6 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = -0.11 \text{ } \phi$	8.25 cm	8.36
d)	"	8 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = -0.60$	11.25 cm	8.85
e)	"	10 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = -0.50$	14.25 cm	8.75
f)	"	12 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = +0.35$	17.25 cm	7.90
g)	"	14 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = +2.34$	20.25 cm	5.91
h)	"	16 <sup>th</sup>	$\frac{1}{16}$ in	$\rho = +4.80$	23.25 cm	3.45

54.61  $\phi$

$\rho = 6.82 \text{ } \phi$

(Void =  $1\frac{1}{2}$  cm)

( $\rho$ ) 17

5  $\phi$   
3  $\phi$   
3  $\phi$   
3  $\phi$   
0  $\phi$   
8  $\phi$   
3  $\phi$   
9  $\phi$   
1.24  $\phi$

Run 125

FUEL EVALUATION -

Loading same

BASE Run

$$L = 8.33 \text{ \#}$$

126	Void vs d	Pin #15	$P_0 - P$
a)	Void 2nd $\frac{1}{16}$ th	$P = +3.78 \text{ \#}$	2.25 cm 4.55 $\text{\#}$
b)	" 4th $\frac{1}{16}$ th	$P = +1.10 \text{ \#}$	5.25 7.23 $\text{\#}$
c)	" 6th $\frac{1}{16}$ th	$P = -0.42 \text{ \#}$	8.25 <del>8.75</del> $\text{\#}$
d)	" 8th $\frac{1}{16}$ th	$P = -1.17 \text{ \#}$	11.25 9.58 $\text{\#}$
e)	" 10th $\frac{1}{16}$ th	$P = -0.92 \text{ \#}$	14.25 <del>9.25</del> $\text{\#}$
f)	" 12th $\frac{1}{16}$ th	$P = +0.02$	17.25 8.31 $\text{\#}$
g)	" 14th $\frac{1}{16}$ th	$P = +2.39$	20.25 5.94 $\text{\#}$
h)	" 16th $\frac{1}{16}$ th	$P = +4.99$	23.25 3.32 $\text{\#}$
			56.85

$$\# 15 = 113.70 \text{ \#}$$

Run 127

16:05

Power for South wing to check  
back ground count.

$$L_N = .02$$

They did not see us.

DATE	8 Jan 68					SAFETY CHECK	
TIME	Taylor + Lynn						
CRANK	F						
RANGE	$\frac{1}{100}$	opt	2.15	$\frac{1}{100}$	900	700	
SOURCE INCL.	4"	OK	36"	2"	3"	OK	
% F. S.	100	-	100	100	100	-	
ELDS.	✓	✓	✓				
AUX. CTNS.	-	-	✓				
SOURCES	222 + 8					✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓		

Proc 128 Preparation of Radial Block Move.  
Section 3 Remount.

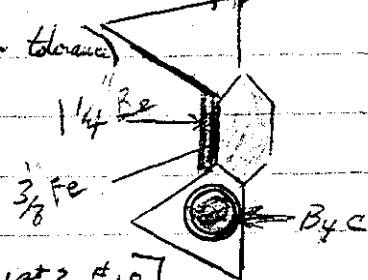
Fe  $5\frac{1}{2}$ " x  $10\frac{3}{4}$ " x  $\frac{3}{8}$ " (360 mils) placed adjacent to core (simulate shroud) with Be  $5\frac{3}{4}$ " x  $8\frac{5}{8}$ " x  $1\frac{1}{4}$ " (Block mock up) against it. [Fe @ Normal Reflector tolerance]

Loading Row 1 = Fe  
" 9 = U

Loading =  $84\frac{1}{4}$  U

$10\frac{3}{4}$  Fe [Row 1, 19 + 1st  $\frac{3}{16}$ " #18]

Sub-crit.



129 Loading =  $86\frac{1}{2}$  U

9 Fe [Row 1]

Sub Crit.

130 Loading = 88 U

7 Fe [87, 88, 89, 90, 93, 94 + 95]

Table	I	P
22.48	3.8	$\infty$
"	3.8	24 #
(22.882)	5.15	$\infty$



Run 131 heading - 89 u  
6 Fe [87, 88, 90, 93, 94 + 95]

$$I = 8.01 \infty$$

132 Loading 88 u  
6 Fe [87, 88, 89, 93, 94, 95 - ~~68~~]  
1 void ~~(88)~~  
Be Arm - on Drive.

$$P = +13.1 \phi$$

moved Be Arm East =  $-\$3.50$

Rod I = out ( $\$1.50$ )

133

more Fe + Be (mock up) against core.

$P = + \approx 18 \phi$  Levelled with Be Arm

Levelled  $I = \infty$

Pulled mock block away =  $-\$5.67$

134 Placed mock block .346" from the  
 $\frac{3}{8}$ " Fe. Added Fuel to #68.

$I = \infty$ , Levelled with Be Arm.

$$P = \infty$$

Pulled Block away =  $-\$4.66$

9mm (346")

DATE		SAFETY CHECK				
DATE	9 Jan 68	Taylor + Hym				
TIME	10:50					
QUANTITY	1					F
PRICE	1500	8pr	L-15	1000	900	700
SPRINT TEST	4'	OK	36"	3'	3'	OK
9-8-10	100+	-	100	100	100+	-
BLK	✓	✓	✓			
ADD TEST			✓			
SOURCES	227 + 8					✓
TABLES	2	✓		AREA CLEARED		✓

135 Loading - @ 89 u

6 Fe [ 87, 88, 89, 93, 94 + 95 ]

Mock Block Now { Be = 8 5/8" x 4 7/16" x 1 1/4"

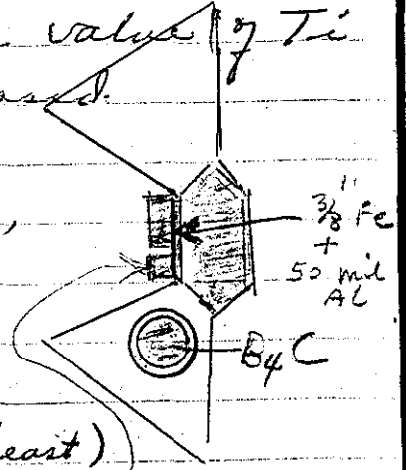
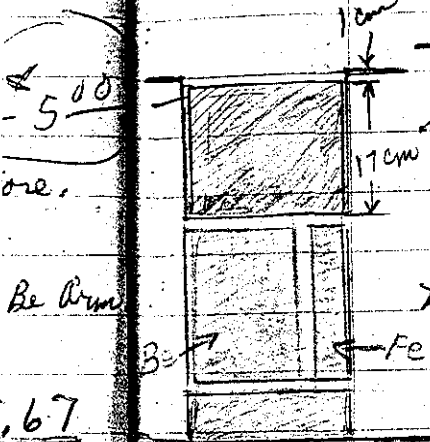
Fe = 8 5/8" x 1" x 1 1/4"

Trying to get idea of the value of Ti in the Be Block is increased.

(Use Fe for Ti)

3/8" Fe against core, 50 mil al,

Mock Block against Ad.



$I = in$

Be Arm ~ 50% of center (east)

Pulled the Fe = 8 5/8" x 1" x 1 1/4"

$\rho = -50.45 \#$

136 added Fuel # 89.

Al (50 mil) and Mock Block @ .346"

$I = in$

Pulled the Fe 8 5/8" x 1" x 1 1/4"

$\rho = -40.4 \#$

DATE	10 Jan 68	SAFETY CHECK		
TIME	10:05	Taylor + Lynn		
CHANNEL				F
RANGE	1000 cpl	1000	900	700
SOURCE USE	4" OK	36"	2"	2" OK
35 F. S. 1"	100	-	100	100
BLDG. ALL	4	✓	✓	
ALK STR.			✓	
SOURCES USED	227 + 5	MAGNETS		✓
TABLES	✓	LIGHTS	✓	AREA BLEADED ✓

Run 137 Conti'd block studies.

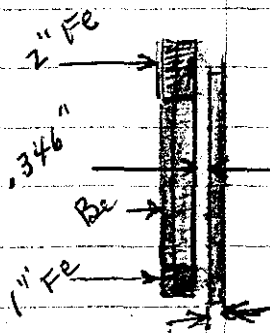
Loading - <sup>88</sup>U  
6 Fe [87, 88, 89, 93, 94 + 95]

#6.8 void

Block = Be 8 <sup>5</sup>/<sub>8</sub>" X 5 <sup>3</sup>/<sub>4</sub>" X 1 <sup>1</sup>/<sub>4</sub>" with

2" X 5 <sup>3</sup>/<sub>4</sub>" X 1 <sup>1</sup>/<sub>4</sub>" Fe on Top and

1" X 5 <sup>3</sup>/<sub>4</sub>" X 1 <sup>1</sup>/<sub>4</sub>" " on Bottom.



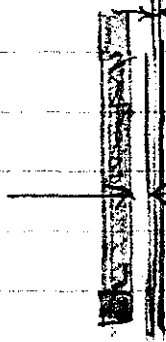
<sup>3</sup>/<sub>8</sub>" Fe against Core.

.346" space between <sup>3</sup>/<sub>8</sub>" Fe + Block

Be arm (33¢ east)

Pulled Block = P = 5.13

138 Loading = Same



<sup>3</sup>/<sub>8</sub>" Fe spaced .040" from Core

Block " .306" from <sup>3</sup>/<sub>8</sub>" Fe

.306" Be arm (25¢ east)

Pulled Block + <sup>3</sup>/<sub>8</sub>" Fe P = 6.76

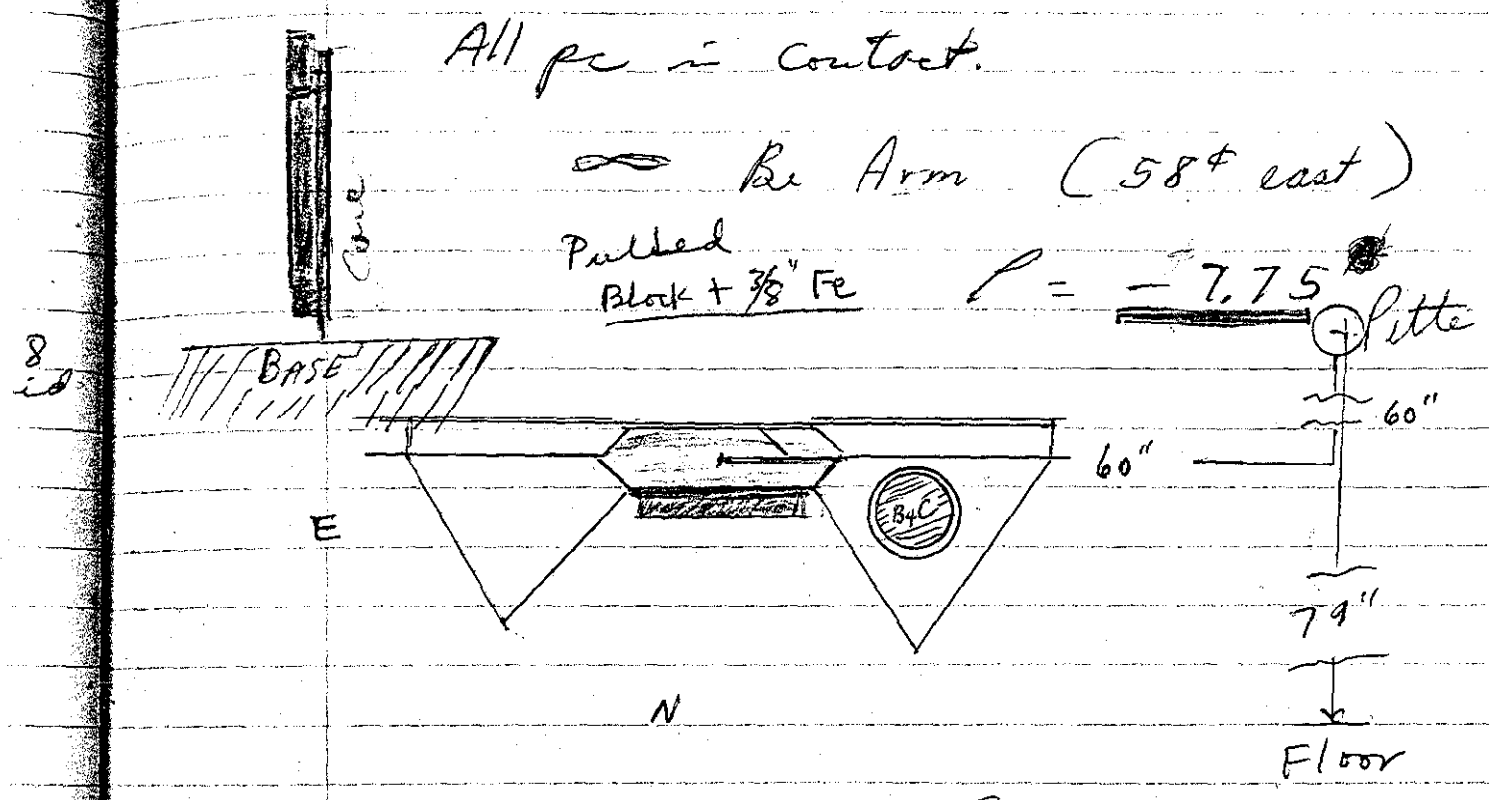
Run 139

Loading - 87 u  
7 Fe [87, 88, 89, 92, 93, 94 + 95]  
1 void (#68)

All pc in contact.

Be Arm (58# east)

Pulled Block + 3/8" Fe  $f = -7.75$



Pit location for Run  
140  
178 → ~~139~~

140 Same as Run 139.

Pulled Block only  $f = -6.05$

✓

Start Run 13 15:42 12 Jan 68  $\rightarrow 160^\circ$   
 2-11-14.55 (M5 BTS STT (in 2"))  
 150-71 accumulating data.

DATE	16 Jan 68					
TIME	10:45 Am Taylor + Williams					
TABLE	A	B	C	D	E	
NAME	1500	opr L-15	1500	900	700	
SOURCES	4"	ok 36"	3"	30"	ok (low only)	
	100 $\pm$	100	100	100 $\pm$		
ELDS.	$\checkmark$	$\checkmark$	$\checkmark$			
AUX. USE			$\checkmark$			
SOURCES	227 + 8					$\checkmark$
TABLES	$\checkmark$	11015	$\checkmark$			$\checkmark$

Run 14+ - A question on Run 4 b @ p 124 of Book #1.

Loading - Same as Run 139

Rod I = 5.0"  $\infty$

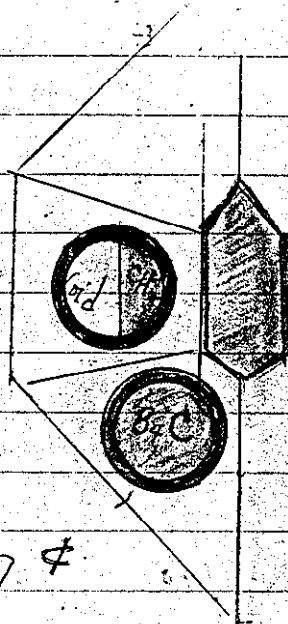
$\approx 50 \#$

Moved blade east.

Rod I = in  $\infty$

with drew CH<sub>2</sub> from

Scatter # 3, P = -51.7 #

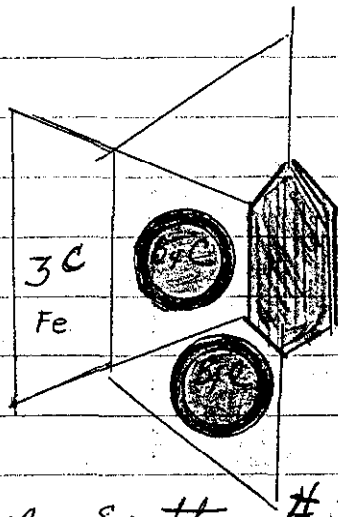


Run 142 Loading -  $86\frac{1}{2} \mu$   
 $8\frac{1}{2} \text{ Fe [1-4, 6-9 and } \frac{1}{2} \#5]$

Reflector as shown

Sub crit.

143, Loading -  $87 \mu$   
 $8 \text{ Fe [1-4, 6-9]}$



Base  $\infty$  Blade ( $\sim 20^\circ$  east)  
 withdrawn  $\text{CH}_2$  Core of  $\text{B}_4\text{C}$  Scatter #3.

(thru  $11.2 \text{ cm CH}_2$ )  $\rho = -11.83 \%$   
 $11.83 \%$

144 Core of  $\text{B}_4\text{C}$  Scatter #3 now  $\frac{1}{2} \text{ CH}_2$

(get Power with shim)  
 Blade and Rod I as above (no change mode)

$\rho = +6.19 \%$

Pulled the  $\frac{1}{2} \text{ CH}_2$   $\rho = -12.46 \%$

145, Core of  $\text{B}_4\text{C}$  Scatter #3 now  $\frac{1}{2} \text{ CH}_2$

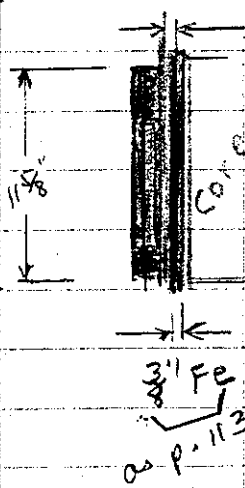
Blade + Rod I = Same

$\rho = -10.02 \%$

Pulled the  $\frac{1}{2} \text{ CH}_2$   $\rho = -12.34 \%$

DATE	18 Jan 68	SAFETY CHECK				
TIME	1:00	Taylor + Lynn				
CHANNEL						
RANGE	1000	op	L-15	1500	900	700
SOURCE DISC.	7"	ok	36"	2"	3"	ok
% F. S. 50"	100	-	100	100	100+	-
BLKS. ALARMS		✓	✓	✓		
ADJ. STRS.		-	-	✓		
SOURCES USED	2A7 + 8					✓
TABLES	✓	LIMITS	✓	ADJ. STRS.		✓

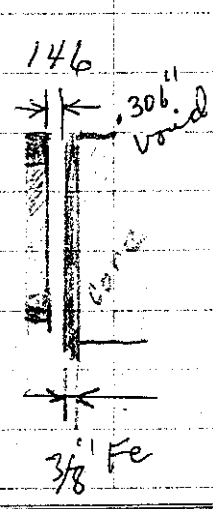
Run 146 Loading - 87 1/2 u



7 1/2 Fe [87, 88, 89, 90, 93, 94, 95 + 1st 1/2 #92]  
 Mock Block for Section 3 Be 8 5/8" x 5 3/4" x 1 1/4" with  
 (Fe 5 3/4" x 2" x 1 1/2" on top and  
 Fe 5 3/4" x 1" x 1 1/4" on bottom)  
 Rod I = 3.98"  
 33 #

Rod I = in, Blade (east 33 #)  
 Pulled block = P = - \$4.60

146  
 140

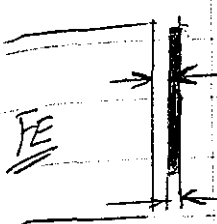


146 Loading - 88 u  
 7 Fe [87-90, 93-95]  
 Rod in + Blade in  
 Barrel removed P = + 3.44 #

Pulled block = P = - 4.98

Block = - \$5.01

Run 147 Section 3 Normal (all Fe)



Loading - 90 u  
5 Fe [87, 88, 93, 94 + 95]

Sealant = 19.4 crit up = 22.682  
(20 + Shim on)

148 Loading - 88 u  
7 Fe [87 - 90, 93 - 95]

#1 = 20.7 Crit.

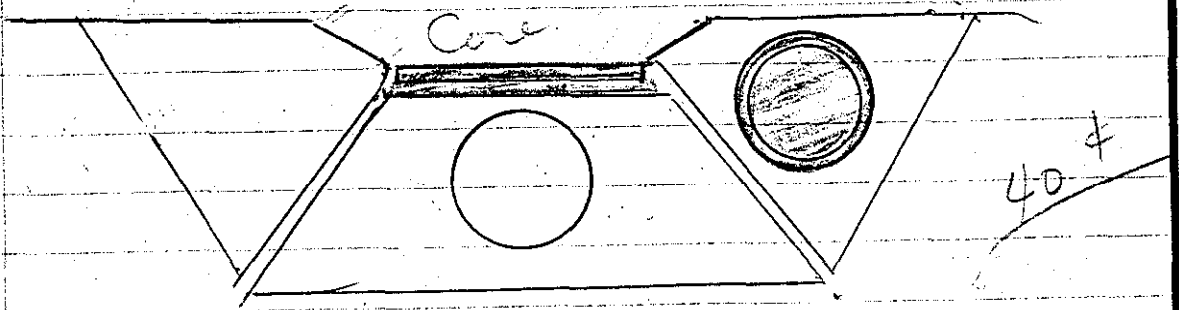
Rod I = 11.53 ∞ (20 + Shim on)

1/2 #92  
L  
ul)

149 Loading - 86 u  
9 Fe [87 - 95]

Rod I = 3.88" ∞ ~~∞~~  
≈ 32 †

Blade east ∞, Rod I = in #5.19  
Pulled section 3 = -



Boral - 14 1/2" X 6" X .3"

The 1/4" thick boral used was made of 1/8" thick pco plus tape ≈ .3"



DATE	19 Jan 68	SAFETY CHECK		
TIME	08:20	Taylor + Lynn		
HANNEL				
RANGE	1000	Op L-15	1000	900 700
SOE FE DIST.	4"	OR 36"	2"	3" OK
WATER	100	100	100	100
GLDS	✓	✓	✓	✓
AUX CTCS	✓	✓	✓	✓
SOURCES USED	227 +	8		✓
TABLES	✓	LIGHTS	✓	AREA CLEARED

Run 150

Loading - 85 1/2 U

← 1/4" Boral

9 1/2

[ Row 1 and 2nd 1/2 # 86 ]

Rod I = 6", ≈ 70 #

Rod I = in Blade east (70 #)

∞ Pulled Section<sup>3</sup>

3/8 Fe

Boral as in Run 146

P = - \$4.79

Run 151

Loading 87 U

8R [ Row 1, less # 91 ]

Scatter 3 Now CH<sub>2</sub> [ 14.1 can dia ]

Other Conditions as Run 150

Pulled Section<sup>3</sup> P = \$3.67

(32 #)

152

Loading 88 U

7 Fe

[ 87, 88, 89, 92, 93, 94 + 95 ]

Boral Removed.

∞ Rod I = 3.64, ≈ 28 #

∞ Rod I = in, Blade east (28 #)

Pulled Sect. 3

P = - \$3.99

7 MAR 68 SET UP AND PREPARE FOR SORA Run (No Fuel)  
 Jim Ellis is taking proximity data of rotating blade.

COOLING H<sub>2</sub>O FLOW RATE = 7 gal/min ✓

Helium flow rate = 5 ft<sup>3</sup>/hr ✓

± manometer = +0.4" H<sub>2</sub>O ✓

Penf. " = +11.0" H<sub>2</sub>O ✓

Ray Data vibration meter at top = 4 mils (x 10)<sup>-4</sup>

Ammeter = 2.6 ✓ # steady.

0.10 (START UP @ 1311 hrs.) (1352 hrs STOP) = 0.68 hr run

0.20 (START @ 1428 hrs.) (1528 hrs STOP) = 1.00 hr run

A)

T#	PRE-STOP + 30 min.	STOP + 4 min	PRE-STOP + 30 min	+ 30 min	STOP + 4 min	ΔT
1	10.8°C	10.0°C	9.7°C	9.5°C	9.6°C	0.1°C
10	12.9	14.5	14.0	12.0	14.3	1.5
14	10.8	10.0	9.9	9.8	9.9	0
5	12.0	15.3	15.3	12.0	15.3	3.3
3	16.8	30.0	29.1	15.0	29.3	15.0
4	15.6	25.5	25.2	13.8	24.9	11.7
13	14.7	29.5	26.9	11.3	29.7	18.0
16	12.9	24.5	24.0	10.8	23.4	13.2
6	11.4	13.2	13.3	10.5	12.3	1.8
9	11.3	12.0	11.0	9.9	11.0	1.2
39 MV	9.8	30.0	30.4	9.0	30.0	22.4

3.67

4.95

3

3.99

- See TC positions next pg -

1. H<sub>2</sub>O Inlet NW
10. H<sub>2</sub>O outlet NE
14. H<sub>2</sub>O Inlet SW
5. H<sub>2</sub>O outlet S
3. Housing NE
4. Housing NW
13. Housing SE
16. Housing SW
6. Just preceding the last loop NE
9. out of 1<sup>st</sup> loop on NW

"VISITED" BY DERBY  
 & SOME CONSULTANTS.

Helium just inside housing @ 7 o'clock (looking S)

TO BE INVESTIGATED: TO KEEP A DRY "ATMOSPHERE" AT ALL  
 TIMES INSIDE THE HOUSING. (WHAT GAS; WHAT COST, ETC.)

11 MAR 68 Using Helium @ minimum flow. Uael  $\approx$  50 ft<sup>3</sup> over  
 the last weekend.

15 MAR 68 START Run 1021 STOP @ 10:28 FOR FRANK BRUCE  
 ; all readouts similar to Pg 123 except that  
 temp. did not reach "peak" due to short run.

DATE	29 Mar 68			
TIME	1:00	Lynn + Taylor		
CHARGE				
RANGE	1000	OPR. K-16	1000	900 750
SPREADER	2"	OK	30"	OK
SP. S. S. S.	100	100	100	100+
BLDG. MARKS	✓	✓	✓	
ADK. DISE.	-	-	✓	
SOURCES USED	M-227	+	✓	MAGNETS ✓
TABLES	✓	LIGHTS	✓	AREA CLEARED ✓

Drive to Be arm -

→  $\frac{40 \text{ cm}}{.94 \text{ min}} = 42.33 \text{ cm/minute}$  movement of Blade.

Run 153 Loading - 86 u  
 9 Fe (Row 9) or 7.05 mm/Sec

~~Set~~ up Position #1 = 22.70  
 Refl. See p. 46 #3 =  
 #4 =

Sub Critical -  
 Found one fuel hole 1/2 empty.  
 Loading fuelly 85 1/2 u.

153 Loading - 86 u  
 9 Fe (Row 9)

Rad I =  $\bar{m}$  Pos period =  
 Rad I = 2.75  $\rightarrow$   
 moved Blade east 6 cm.  
 $\approx -1.00$

154 Loading 88 u

7 Fe (Row 9, less pin 4+5)

Blade as stopped for run 153.

+ 3.6 cm

$$\text{Rod I} = i \quad \rho = +$$

$$\text{Rod I} = 3.07$$

moved Blade east 3.6 cm (now 9.6 cm east)

$$\approx -1.20$$

155 Loading 90 u

5 Fe (1, 2, 7, 8 + 9)

$$\text{Rod I} = 4.03 \quad \infty$$

moved Blade east 15.2 cm (24.8 cm)

$$\approx -2.00$$

DATE	5 April 68				
TIME	1:45	Taylor & Lynn			
EXPT					
1000	apr	L-16	1000	900	750
2"	OK	30"	1"	2"	OK
100	-	100	100	100	F
	✓	✓	✓		
	✓	✓	✓		
	227	+ 8			✓
TABLES	✓				✓

cm

Run 156 Block Studies - Cont'd from p. 117  
 Block same as Run 137 (size wire)  
 Block in contact with 3/8" Fe.

Loading - 87 u  
 8 Fe [87, 88, 89, 91, 92, 93, 94 + 95]

Sub Critical -  
Little as p. 117.

cm

Apparently - unable to reproduce dropping  
 core and placing Block each time.

157 Loading - 88 u  
 7 Fe [87, 88, 89, 92, 93, 94 + 95]

$$P = +23.06 \text{ \#}$$

158 Block Spacing = 40 mils

$$P = +10.01 \text{ \#} \quad ?$$

why

159 Block Spacing = 80 mils

$$P = 14.8 \text{ \#} \quad \checkmark$$

Repeat, moving Rod only.  $P = 18. \text{ \#}$

DATE	8 April 68						SAFETY CHECK		
TIME	8:20		Taylor + Lynn						
GRAVITY									
PANEL	1000	Apr	L16	1000	900	750			
SL. DIST.	3"	OK	30"	1"	2"	OK			
% R. I. TOP	100		100	100	100	100+			
BL. ST.	✓	✓	✓						
ALL DATA	✓	✓	✓						
SO. ROSS USE	227	+	8						
TABLES	✓		LIGHTS	✓		AREA SECURED	✓		

Switch on

"D" = erratic

up #1 = 22.69

Run 160 Loading 88 u

7 Fe [87, 88, 89, 92, 93, 94 + 95]

Block = 0 (Contact with  $\frac{3}{8}$ " Fe)

$$P = 34.81 \text{ } \phi$$

161 Repeat Block = -0 mils

$$P = +34.85 \text{ } \phi$$

162 Loading Core in position, moving Blade + Rod out  
Block = -40 mils

$$P = +24.65 \text{ } \phi \quad \Delta P = 10.25$$

1.016 mm

163 Block = -80 mils

$$P = +14.97 \text{ } \phi \quad \Delta P = 9.68$$

2.032 mm

164 Block = -120 mils

$$P = +4.51 \text{ } \phi \quad \Delta P = 10.46$$

3.048 mm

165 Block = -160 mils

$$P = -4.64 \text{ } \phi \quad \Delta P = 9.15$$

4.064 mm

166 Block = -195 mils

$$P = -13.45 \text{ } \phi \quad \Delta P = 1.81$$

4.95 mm

167 Block = -265 mils

$$P = -29.47 \text{ } \phi \quad \Delta P = 16.02$$

0.67 cm

-64.37

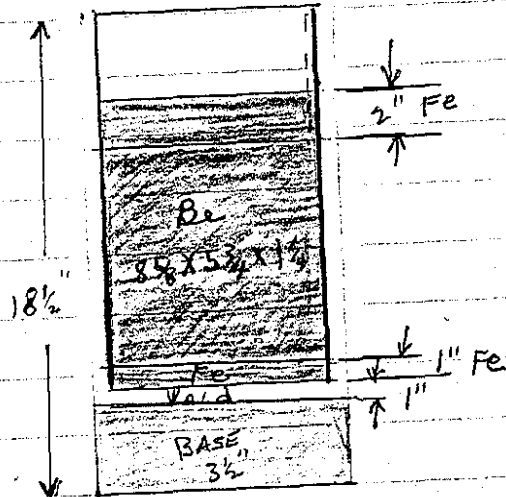
-64.37

Run 168 Loading 89 u  
6 Fe [82, 88, 89, 93, 94 & 95]

Block = -265 mils  $P = +29.42$   
6.73 m

169 Block = -365 mils  $P = +2.05$   $\Delta P = 27.37$   
.927 cm  $-91.74$

170 Block = -495 mils  $P = +25.36$   $\Delta P = 27.31$   
1.26 cm  $-119.05$



See p. 117

0  
out  
0.25  
7.68  
7.73  
0.46  
0.39  
7.75  
0.54  
4.81  
1.35  
1.37



Oak Ridge Repetitive Pulsed Assembly

DATE	18 APR 68						SAFETY CHECK					
TIME	8:15 AM						BY Taylor and Lynn					
CHANNEL	A	B	C	D	E	F						
RANGE	1/1000 OK		L-16		1/1000 good		750V					
SOURCE VOL.	2" -		36"		0		2" OK					
% F. S. REP	100		100		100		100					
BLOC. ALIVE	OK		X		OK							
AUX BYRE.	OK		OK		OK							
SOURCES USED	PBB # J			BAGNETS			OK					
TABLES	OK		LIGHTS		AREA CLEARED							

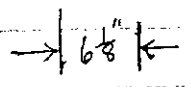
Scale Switch on "D" Bad.

\* Relay of "B" not working properly.  
 Rohrer will repair same.  
 Blade Traverser with  $\frac{1}{8}$ "  $\beta$  in.

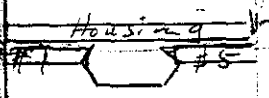
Run 171  
15.6cm

Loading 87 u

8 Fe [Row 1] less #90



Sheet Boral - 18" x 9" x  $\frac{1}{8}$ " placed between section #1 + #5 and blade housing.



Mock up Block as p. 129.

$R_{\text{total}} = +4.4$

172

Section #3 in place. (all Fe)

super @ #1 = 21.08 (+30#)

173 Loading 86 u

9 Fe [Row 9]

Moved blade  
 6.3 cm to East  
 as #1.20

Rad I = 5.38  $\infty$  (+55#)

Peta location

Run 174 Loading -  $85\frac{1}{2}$  u  
 $9\frac{1}{2}$  Fe [Row 9 + 2<sup>nd</sup>  $\frac{1}{2}$  # 19]  
 Rod I = ~~4.08~~  $4.08 \infty$   
 moved blade east @ 6.9 cm  $\cong -1.20$

175 Loading - 87 u  
 8 Fe [Row 9, less #5]  
 Core part way up.  
 Inst. Trip - Char "A"; no apparent  
 reason.

176 Reset and repeat: Sub cut

177 Loading -  $87\frac{1}{2}$  u  
 $7\frac{1}{2}$  Fe [1, 2, 3, 6, 7, 8 + 9 + 2<sup>nd</sup>  $\frac{1}{2}$  # 4]  
 Rod I =  $2.42'' \infty$   
 moved blade east @ 10.6 cm  $\cong -1.15$

178 Loading  $89\frac{1}{2}$  u  
 $5\frac{1}{2}$  Fe [1, 2, 7, 8, 9 + 2<sup>nd</sup>  $\frac{1}{2}$  # 4]

Rod I = 3.43  $\infty$   
 moved blade east @

Cable location

2x with 1/8" Boral (35¢ to 40¢ Excess) 135

Run 179

Loading 85 1/2 U

9 1/2 Fe [Row 9 + 2nd 1/2 #19]

Rod I = 4.10

moved blade west ~~to~~ ~~to~~ -40¢  
then east to -45¢ or 3.75 cur ←  
Stopped Blade →

20

180

Loading - Same

Rod I = 4.5

Blade worth = -4.55

Cattle location

(normal p. 69 \$5.05)

#4

DATE		19 April 68					SAFETY CHECK	
TIME		9:18		AM		BY TAYLOR + LYNN		
CHECKED	1	2	3	4	5	6	7	
TABLE	1000	apr 16	1000	900	750			
WIND	3'	OK	36"	1'	2'	OK		
TEMP	100		100	100	100+	-		
MOISTURE	✓	✓	✓					
ADJ. STKS.	✓	BAD	✓					
SUBS. BLDG	227 + 8						✓	
TABLES	✓	LIGHTS	✓	AREA CLEARED	✓			

Run 181 Loading - 85 u

10 Fe [Row 9 and #19]

$\alpha$   $\gamma$  with +15  $\phi$  to 20  $\phi$

Rod I = 3.0  $\infty$

Stopped Blade @ 3.8 cm

182 Loading - 84  $\frac{3}{4}$  u

10  $\frac{1}{4}$  Fe [Row 9, #19 and 4<sup>th</sup>  $\frac{1}{4}$  10]

$\alpha$   $\gamma$  with +10  $\phi$

Rod I = 1.5  $\infty$

Stopped Blade @ 3.65 cm

Little  
Location

Run 183 2 X with  $\frac{1}{4}$ " Thick Boral as p. 131  
 except separated by  $6\frac{1}{4}$ "  
 Boral  $18" \times 9" \times \frac{1}{4}"$

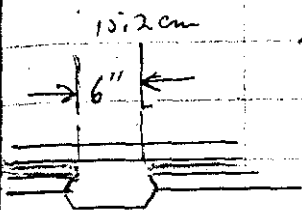
Loading 85 u  
 10 Fe [Row 9 and #19]

Excess = 1.5¢

Rod I = 0.25

Stopped Blade @ 3.4 cm

184 Moved Boral at section 5 moved  
 in  $\frac{1}{4}"$ .



Excess = 5.2¢

Rod I = 1.0

Stopped Blade @ 3.6 cm

185 Blade worth,  $\frac{1}{4}"$  Boral as 184.

Blade = - \$4.52

Take above experiments  
 Little located as p. 117  
 ~~~~~

DATE 22 April 68 SAFETY CHECK

TIME 8:45<sup>AM</sup> BY Taylor + Lynn

|              | A    | B      | C   | D          | E                | F   |
|--------------|------|--------|-----|------------|------------------|-----|
| CHARGE       | 1000 | opr    | 16  | 1000       | 900              | 750 |
| SIZE         | 3"   | OK     | 30" | 1"         | 2"               | OK  |
| %            | 100  | -      | 100 | 100        | 100 <sup>+</sup> | -   |
| BL. MARK     | ✓    | BAD    | ✓   | -          | -                | -   |
| AUX. MARK    | ✓    | ✓      | ✓   | -          | -                | -   |
| SCORERS USED | 227  | + 5    | -   | MAGNETS    | -                | ✓   |
| TABLES       | ✓    | LIGHTS | ✓   | AREA CLEAR | ✓                | ✓   |

Repeat Run 185.

Run 186

Little now as p. 89. (N, behind Set 3)  
 65" from  $\phi$  of Core  
 95" off floor

Excise = 5.0 #

∞ Rod I = 1.0"

1/4 inch

Blade = -4.82 #

187

α X, Repeat Run 184.

∞ Rod I = 1.01"

moved blade west to -35 # then East to -1.25 # ↓

Blade @ +6.45 cm

188

Loading 874

8 Fe [Row 9 except #7]

Sub crit

189

Loading 87 1/2 u

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

Blade @ +6.45 cm

∞ moved Blade to -1.50 #

Blade @ -11.1 cm

Run 190 ~~Blade north~~,  $\frac{1}{8}$ " boreal.  
~~Blade~~ boreal shafts  $5\frac{3}{4}$ " separated  
 loading - 85 u  
 10 Fe [Row #9 and #19]  
 Rod I = in  
 Blade = - \$5.05

191 loading 85  $\frac{1}{4}$  u  
 9  $\frac{3}{4}$  Fe [Row 9 and 10  $\frac{3}{4}$  #19]

$\alpha$   $\pi$  and traverse

Excess = 6.0  $\neq$

Rod I = 1.08

moved blade east to - \$1.85, @ 6.95 cm

192 Blade @ 6.95 cm

loading - 88 u

7 Fe [1, 2, 3, 4, 7, 8, + 9]

Rod I = 3.14

moved blade east - \$2.25 @ 15.1 cm



Run 193 Back to basic configuration with reflector sections in same positions as for the Boral runs. Some loose fitting of the sections.

Loading  $85\frac{1}{4}$  U

$9\frac{3}{4}$  Fe [Row 9 and 12<sup>th</sup>  $\frac{3}{4}$  #19]

Rod I = in

Excess = 1 $\phi$

Blade = - $5.00$

194

$\alpha$   $\chi$  and trousse

Loading  $85\frac{1}{4}$  U

$9\frac{3}{4}$  Fe [Row 9 and 12<sup>th</sup>  $\frac{1}{2}$  + 4<sup>th</sup>  $\frac{1}{4}$  #19]

Rod I =  $\infty$

Excess = 6.0 $\phi$

moved blade west to -40 $\phi$  west to 1.50 @ 7.35 cm

195

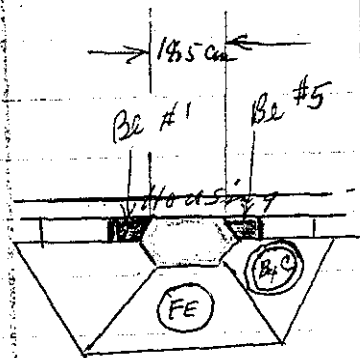
Loading 88 U

7 Fe [1, 2, 3, 4, 7, 8, + 9]

Rod I = 1.5

moved blade east to -2.25 @ 15.7 cm

| DATE    |   | 24 Apr 68 |     |      |       |     |     | SAFETY CHECK  |  |
|---------|---|-----------|-----|------|-------|-----|-----|---------------|--|
| TIME    |   | 0815      |     |      |       |     |     | TAYLOR & HYUN |  |
| UPPER   |   | A         | B   | C    | D     | E   | F   |               |  |
| WGT     |   | 1/1000    | OPR | h-16 | 1/100 | 900 | 750 |               |  |
| SLC     |   | 3"        | OK  | 30"  | 0     | 3"  | OK  |               |  |
| WGT     |   | 100       | -   | 100  | 100   | 100 | 100 |               |  |
| ELECT   |   | ✓         | BAD | ✓    |       |     |     |               |  |
| ADM     |   | ✓         | ✓   | ✓    |       |     |     |               |  |
| SOURCES |   | 227 + 8   |     |      |       |     |     | ✓             |  |
| TABLES  | ✓ |           |     |      |       |     |     | ✓             |  |



Run 196 Moving Be Rods #1 and #5 in  
Against Core.

Loading - 81 u  
14 Fe [1 → 11, 17, 18 + 19]  
Sub critical.

#19

197 Loading - 83 u  
12 Fe [1 → 10, 18 + 19]

35 cm

$$\rho = -17 \text{¢}$$

198 Loading - 83 1/4 u = 55.7 Kg.  
11 3/4 Fe [1 → 10, 19 + 10 1/2 + 4 1/4 #18]

Rod I = in   
Blade = -5.14

7 cm

$$3 \text{ 1/4} \text{ #18} = 17 \text{ ¢}$$

Run 199

Loading  $83 \frac{1}{2} \mu$  $11 \frac{1}{2} \text{ Fe } [1 \rightarrow 10, 19 + 1^{\text{st}} \frac{1}{2} \# 18]$ 

IX and Transverse

Rod I = 1.6

Excess =  $9.2 \neq$  [4th  $\frac{1}{4}$  #18] $e = 7.0 \text{ cm}$ moved blade west -  $40 \neq$  than

to east - #1.50 Blade @ 7.0 cm

200

Loading  $86 \frac{1}{2} \mu$  $8 \frac{1}{2} \text{ Fe } [ \text{Row 9, has } 2^{\text{nd}} \frac{1}{4} \# 5 ]$ 

Rod I = 1.45

Excess  $9.5 \neq$   $\$2.25$ 

moved blade east @ 15.3 cm

Core = 30 cm

MAY 22 1968

|              |             |        |      |                  |     |     |
|--------------|-------------|--------|------|------------------|-----|-----|
| DATE         | MAY 22 1968 |        |      |                  |     |     |
| TIME         | 0900        |        | AM   | BY TAYLOR & LYNN |     |     |
| CHANNEL      |             |        |      |                  |     |     |
| RANGE        | 1/1000      | OPR    | 6-16 | 1/1000           | 900 | 750 |
| SOURCE DIST. | 3"          | OPR    | 30"  | 0.3"             | OK  |     |
| % F. S. TRIP | 100         | OK     |      | 80               | 100 | 100 |
| BLDG. ALARM  |             | ✓      | ✓    | ✓                |     |     |
| AUX CTES.    |             | ✓      | ✓    | ✓                |     |     |
| SOURCES USED | 227 & d     |        |      | MARKETS          | ✓   |     |
| TABLES       | ✓           | LIGHTS | ✓    | AREA CLEARED     | ✓   |     |

\*It is difficult to make a scale change to 1 as has been the case for several months. Safety alarm "B" checks (trips) OK after having been lubricated (contacts i.e).

Run 201 Core - Row 1, 2, 3 + 4 = 30 cm except #54 + #65  
 Reflector as shown p. 139  
 Loading - 40 u (30 cm)  
 41 u (24 cm)  
 \* 80 1/2 14 Fe (Row 9, #10, #11, #12, #18 + #19)

For ctr + Pette check

Pos Period Log N = 62.3 sec 13.73 #  
 BF<sub>3</sub> #3 = 59.98 sec, 14.12 #  
 Pette = 13.50 #

Rod I = in P = -9.0 #

Blade = out P = -5.75

5.65 (over)

Run 202 loading =  $81\frac{1}{4}$  u  
 $13\frac{3}{4}$  Fe [1 → 11, 18, 19 + 1<sup>st</sup>  $\frac{1}{2}$  + 4<sup>th</sup>  $\frac{1}{4}$  #12]  
 \*  $50\frac{3}{4}$  Rod = ~~1.78~~  $\infty$  (+9.8 $\phi$ )  
 Blade away  $P = -5.35$   
 up #1 = 23.055

203 Repeat 202  
 Rod I = 1.87  $\infty$  (+10.8 $\phi$ )  
 Blade away  $P = -5.34$

204  $\alpha$   $\gamma$  (Blade on drive). Rod I = 1.97  $\infty$  (Excess 11.5 $\phi$ )  
 Moved west to -37.3 $\phi$   
 the east to -41.50 @ 7.3 cm

205 loading =  $84\frac{1}{4}$  u  
 $10\frac{3}{4}$  Fe [1 → 9, #19 and 1<sup>st</sup>  $\frac{1}{2}$  + 4<sup>th</sup>  $\frac{1}{4}$  #12]  
 Rod I = 3.27"  $\infty$  (Excess)  
 moved east to - @ 17.4 cm

⚡ Loadings for runs 201 → 205 should be 12 cm less than shown, a 12 cm void was found in #72.

MAY 23 1968

— 30 cm Core —

| DATE MAY 23 1968 |         | SAFETY CHECK |               |
|------------------|---------|--------------|---------------|
| TIME             | 9:20    | BY           | Taylor & Lynn |
| CHANGE           |         |              |               |
| NAME             |         |              |               |
| SECURE DIST.     |         |              |               |
| % F. S. TRIP     |         |              |               |
| BLDG. ALARM      | ✓       | *            | ✓             |
| AUX. CTAB.       | ✓       | ✓            | ✓             |
| SOURCES USED     | 227 + 8 |              | ✓             |
| TABLES           | ✓       | ✓            | ✓             |

Alarm "B"  
and  
Chon "D"  
Sick

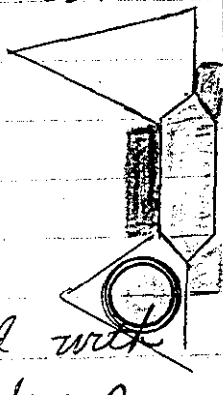
Run 206 Core - Rows 6, 7, 8 and 9, except #28 + #38  
are 30 cm.

Loading - 40 u (30 cm)  
44 u (24 cm)  
(84) 10 Fe [77, 87 → 95]  
1 void (#68)

Section 3 removed and replaced with  
shroud (3/8" Fe) and Block mock up.  
Block as p. 129

Little as p. 117

Pos @ #1 = 22,00



207 Loading = 82 1/2 u  
11 1/2 Fe [Row 1, #77, 86 + 2nd 1/2 #78]  
1 void. (68)

Sub Crit.

Run 208 Loading -  $83\frac{1}{2}$  u  
 10  $\frac{3}{8}$  Fe [Row 1, 77, 1st  $\frac{1}{2}$  # 86, Top  $\frac{3}{8}$  # 78]  
 1 void (#68)

Block @ 0 (contact with  $\frac{3}{8}$  Fe)  $P = +25.06 \neq$

209 Block = -40 mils  $P = +10.34 \neq$   
 $\Delta P = 14.72$

210 Block = -69 mils  $P = +9.96 \neq$

See p. 127 (same problem)

211 Set blade on west limit switch, continue experiments by moving blade east (-4.00) and withdrawing Rod I (-1.50) leaving core up.

Repeat Run 210 (-69 mils)  $P = +8.25 \neq$   
 $\Delta P = 1.75 \text{ m}$

212 Block = -40 mils  $P = +17.25 \neq$   
 $\Delta P = 9.0 \neq$   
 1.016 m

213 Block = 0  $P = +27.17 \neq$   
 $\Delta P = 9.92 \neq$   
 0

214 Block = -109 mils  $P = -1.76$   
 $\Delta P = 13.01$   
 2.77 mm

215 Block = -168 mils  $P = -19.71$   
 $\Delta P = 17.95$   
 4.27 mm

a

Run 216 Block @ ~~237~~ <sup>Same</sup> mils  $P = + 31.94 \text{ \#}$   
~~6.02 mm~~  
 Added 1st  $\frac{1}{2}$  #68  $\frac{19.71}{51.55 \text{ \#}}$

Loading =  $83 \frac{9}{8}$   
 $10 \frac{7}{8}$   
 $\frac{1}{2}$  mil (#68)

217 Block @ -237 mils ~~82.52~~  $P = - 3.80 \text{ \#}$   
 6.02 cm  $\Delta P = 35.7 \text{ \#}$

Found block loosely placed -

218 Repeat  $65.53 \text{ \#}$   $P = + 13.29$   
 $\Delta P = 18.65$

219 Block @ -300 mils  $80.22 \text{ \#}$   $P = - 1.40 \text{ \#}$   
 7.62 mm  $\Delta P = 14.69$

Pulled Block away  $P_2 = - 5.56$

Block =  ~~$\$ 5.57$~~   
 $\$ 5.55$

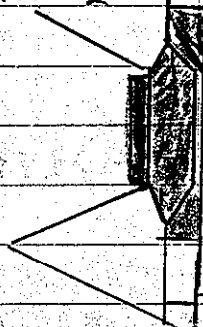


MAY 24 1968

— 30 cm Core —

| DATE         |                  | MAY 24 1968 |      |                  |      |                  |  |
|--------------|------------------|-------------|------|------------------|------|------------------|--|
| TIME         |                  | 11:00       |      | AM               |      | BY Taylor & Lynn |  |
| CHANNEL      | A                | D           | C    | D                | E    | F                |  |
| RANGE        | $\frac{1}{1000}$ | off         | L-16 | $\frac{1}{1000}$ | 900  | 750              |  |
| SOURCE DIST. | 4'               | ok          | 30"  | 0                | 2"   | ok               |  |
| % F. S. TRIP | 100              | -           | 150  | 150              | 100+ | -                |  |
| BLDG. ALARM  | ✓                | *           | ✓    |                  |      |                  |  |
| AUX CTRS.    | *                | ✓           | ✓    |                  |      |                  |  |
| SOURCES USED | 227 + 8          |             |      |                  |      | ✓                |  |
| TABLES       | ✓                | LIGHTS      | ✓    | DATA RECORDED    |      | ✓                |  |

Run 20

Loading - 83  $\frac{5}{8}$  l

10  $\frac{7}{8}$  Fe [Row 1, #77, 1st  $\frac{1}{2}$  #86, Top  $\frac{3}{8}$  #78]  
 $\frac{1}{2}$  void (Top #68)

Shroud mock removed, Be Block (p. 129)  
 placed against core.

Sect. 4 moved slightly to make room for Block  
 Pos Period #1 = 22.0

221 Loading - 83 u

11  $\frac{1}{2}$  Fe [Row 1, #77, #86 + 2nd  $\frac{1}{2}$  #78]  
 $\frac{1}{2}$  void

Block @ 0

 $\rho = 38.65^{\phi}$ 

Found block to be inverted  
 (2" Fe at bottom).

222 Turned Block

 $\rho = 29.50^{\phi}$ 

223 Repeat trying for better @  
 (placed better against core)

 $\rho = 42.72^{\phi}$

Run 224 Block ① - 40 miles  $P = 30.89 \text{¢}$   
 -1.016 mm  $11.83 \text{¢}$   $\Delta P = 11.83$

225 Block ① - 69 miles  $P = 16.69 \text{¢}$   
 1.75 mm  $26.10 \text{¢}$   $\Delta P = 14.20$

226 Block ① - 109 miles  $P = 0$   
 2.77 mm  $42.73$   $\Delta P = 16.7$

227 Block ① - 140 miles  $P = -12.10$   
 3.56 mm  $\frac{54.83}{27.17} = 2.017$

228 Added 2<sup>nd</sup> fuel to #68  $(43.32 \text{¢})$   
 Loading -  $83 \frac{1}{2} \text{ U}$   
 $11 \frac{1}{2} \text{ Fe [ See 221 ]}$

$P = 31.22 \text{¢}$

229 Block ① - 209 miles  $82.00$   $P = + \frac{4.05 \text{¢}}{27.27}$   
 5.31 mm

230 Block ① - 249 miles  $94.25$   $P = -8.20 \text{¢}$   
 6.32 mm  $\Delta 12.25$

Pulled block  $P = -7.72$

Block =  $7.64 \text{¢}$  ←

| DATE MAY 27 1968 |       | SAFETY CHECK |                   |              |      |                  |     |
|------------------|-------|--------------|-------------------|--------------|------|------------------|-----|
| TIME             | 10:36 | AM           | BY Taylor & Lyman |              |      |                  |     |
| CHANNEL          |       | A            | B                 | C            | D    | E                | F   |
| RANGE            |       | 1000         | OPR               | 146          | 1000 | 900              | 750 |
| SOURCE DIST.     |       | 3"           | OK                | 30"          | 0    | 2"               | OK  |
| % F. S. TRIP     |       | 150          | -                 | 150          | 100  | 100 <sup>+</sup> | -   |
| BLDG. ALARM      |       | ✓            | ✗                 | ✓            |      |                  |     |
| AUX CTGS.        |       | *            | ✓                 | ✓            |      |                  |     |
| SOURCES USED     | 227   | Y            | Y                 | MAGNETS      |      | ✓                |     |
| TABLES           | ✓     | LIGHTS       | ✓                 | AREA CLEARED |      | ✓                |     |

24 cm Core

Run 231 Be Block in Against Core as p. 146

loading - 84 1/2 u  
 10 1/2 [Row 1, ~~88~~, + 10<sup>+</sup> 86  
 1 void (#69)

Sub-critical

232 loading - 86 u  
 8 Fe [87 → 90, 92 → 95]  
 1 void (#69)

Sub-crit

$\rho = 1.77 \neq$

233 loading = 87 1/2 u  
 7 Fe [87, 88, 89, 92 → 95]  
 1 void

$\rho = 1.77 \neq$

234 Loading - 8 7 1/2 u  
 6 1/2 Fe [87, 88, 89, 93, 94, 95 + 12 1/2 #92]  
 1 void. (#69)

$$\rho = 33.18 \text{ } \phi$$

235 Place Be Block,  
 Block @ 0

$$\rho = 48.32 \text{ } \phi$$

236 Block @ 40 mil  
 1.016 mm 12.45  $\phi$

$$\rho = 32.87 \text{ } \phi$$

$$\Delta \rho = 12.45$$

237 Block @ 69 mils  
 1.75 mm 25.84  $\phi$

$$\rho = 19.48 \text{ } \phi$$

$$\Delta \rho = 13.39$$

238 Block @ 109 mils  
 2.77 mm 41.91  $\phi$

$$\rho = 3.41 \text{ } \phi$$

$$\Delta \rho = 16.07$$

239 Block @ 140 mils  
 3.56 mm 52.95  $\phi$

$$\rho = -7.63 \text{ } \phi$$

$$\Delta \rho = 11.04$$

240 Block @ 180 mils  
 4.57 mm 68.82

$$\rho = -23.50$$

$$\Delta \rho = 15.87$$

241 Add 12 1/2 #69 (61  $\phi$ )  
 Loading - 88 u

$$\rho = +37.82$$

6 1/2 Fe  
 1/2 void (#69)

$$\frac{13.08}{-4}$$

150

Run 242 Block @ 237 miles  $P = 13.08 \text{ \#}$   
6.2 mm 93.56  $\Delta P = 24.74$

243 Block @ 300 miles  $P = -6.62$   
7.62 mm 112.2  $\Delta P = 19.70$

Pulled Block - #6.896

Block = #6.82

MAY 30 1968

| DATE         |  | MAY 30 1968   |     |      |      |     |     |
|--------------|--|---------------|-----|------|------|-----|-----|
| TIME         |  | 3:00          |     |      |      |     |     |
| BY           |  | Taylor + Lynn |     |      |      |     |     |
| CHANNEL      |  | 1             | 2   | 3    | 4    | 5   | 6   |
| RANGE        |  | 1000          | Apr | L-16 | 1000 | 900 | 700 |
| SOURCE DIST. |  | 3'            | OK  | 38"  | 1'   | 2'  | 2'  |
| % F. S. TIME |  | 100           | -   | 100  | 100  | 100 |     |
| GLOBAL ALARM |  | ✓             | *   | ✓    |      |     |     |
| AUX DEBS.    |  | *             | ✓   | ✓    |      |     |     |
| SOURCES USED |  | 227           | +8  |      |      |     | ✓   |
| TABLES       |  | ✓             | ✓   | ✓    | ✓    | ✓   | ✓   |

Run 244

Substituting Fe #1 + #5 for Be.  
Normal Reflector.

Fe #1 + #5 = Separated by 14.8 cm at Shroud

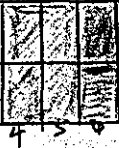
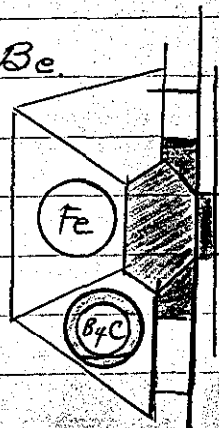
Loading = 86 1/2 u

8 1/2 Fe [Row 9, except 1st 1/2 #5]

Sub crit

245 Loading = 88 1/2 u

6 1/2 Fe [1, 2, 3, 7, 8, 9, 1st 1/2 #6 + #6]



246

Saw

Rod = 1.3

Pulled Blade - P = 4.54

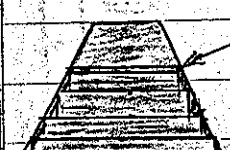
V.S. Run 253  
- 6 #

JUN 3 1968

|               |            |      |                   |      |      |     |
|---------------|------------|------|-------------------|------|------|-----|
| DATE          | JUN 3 1968 |      | SAFETY CHECK      |      |      |     |
| TIME          | 8:45       | AM   | BY Taylor ad Lynn |      |      |     |
| CHANNEL       | A          | B    | C                 | D    | E    | F   |
| LENGTH        | 1000       | 1000 | 1000              | 1000 | 1000 | 750 |
| CORNER DIST.  | 4"         | OK   | 30"               | 1"   | 2"   | OK  |
| % F. S. T. W. | 100        |      | 100               | 60   | 100+ |     |
| DELS. TEMP.   | ✓          | *    | ✓                 |      |      |     |
| AUX. CTES.    | *          | ✓    | ✓                 |      |      |     |
| SOURCES USED  | 227 + 5    |      |                   |      |      |     |
| TABLES        | ✓          | ✓    | ✓                 | ✓    | ✓    | ✓   |

Run 247  $\alpha \gamma$   $\infty$  Rod I = 2.3 (+13.3%)  
 Moved blade west - \$0.7  
 then east to - \$1.50 @ 8.2 cm

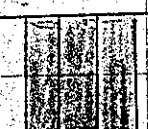
248 BNL Section 4 in place  
 Position 1 = Boral, remaining = Polyethylene  
 (2 → 16)



Sect 4  
 Core 24

loading =  $88 \frac{1}{2}$  W  
 $10 \frac{1}{2}$  Fe [1, 2, 3, 6, 7, 8 + 9] +  $10 \frac{1}{2}$  #6  
 $\infty$  Rod I = 4.98 (+50%)  
 up #1 = 22.645  $\Delta P = +3.7 \%$

249 - Loading = 88 W  
 $7$  Fe [1, 2, 3, 6, 7, 8 + 9]  
 $\alpha \gamma$   $\infty$  2.2 (+13.5%)  
 moved blade west - 40%  
 then east to - \$1.50 @ 8.2 cm

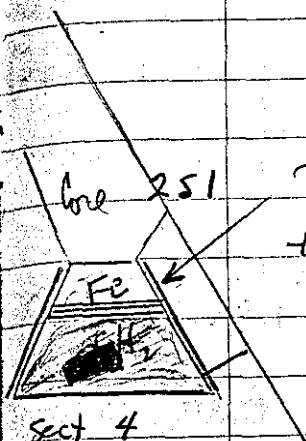


4 5 6

250 Blade worth.

Rod I = 2.3 (+13.5¢)

Pulled blade = -4.63



Placed Cd between sect 3 and sect 4 <sup>(.035")</sup> and between sect 4 + sect 5, (.050")

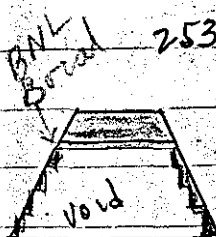
Loading Same

Sect 4 moved back to make room for Cd.

$\rho = +5.12 \text{¢}$

252 Removed the above Cd.

$\rho = +0.74 \text{¢}$



253 Removed Polyethylene from position 2 → 16 of BNL sect 4. Sect 4 in zero position

Loading 89.4 <sup>6 Fe</sup> [1, 2, 3, 7, 8, 9] as run 248.

Rod I = 3.3 = 24¢

$\rho = +31.56 \text{¢}$

55.56¢ excess

456

Run 248 vs 249 - 1/2 Pin # 6 = 37¢

∴ Pin # 6 = 74¢

Run 249 + 13.5  
87.5¢

87.5¢  
- 55.5¢

32.0¢  
vs Run 249



Fuel actually  
measured

| #4   | #6 | #6 | #4 |
|------|----|----|----|
| 4    |    | 14 | 3  |
| 25.8 | 3  | 37 | 9  |
| 22   |    | 23 |    |
|      |    | 13 |    |
|      |    |    |    |
|      |    |    |    |
|      |    |    |    |
|      |    |    |    |
|      |    |    |    |

68¢ 74¢

#1 + #5 = Fe

4 Sect 3 = Fe

Sect 4 = BNL

1  
JUN 4 1968

| DATE JUN 4 1968 |          | SAFETY CHECK     |      |           |     |  |
|-----------------|----------|------------------|------|-----------|-----|--|
| TIME            | 11:00 AM | BY Taylor & Lynn |      |           |     |  |
| CHANNEL         | 1        | 2                | 3    | 4         | F   |  |
| RANGE           | 1000     | Apr L-16         | 1500 | 900       | 700 |  |
| SOURCE DIST.    | 4" OK    | 30"              | 0    | 3         | OK  |  |
| % F. S. TRIP    | 100      | 100              | 80   | 100       | -   |  |
| BLDG. ALARM     | ✓        | *                | ✓    |           |     |  |
| AUX. CRTS.      | *        | ✓                | ✓    |           |     |  |
| SOURCES USED    | 227 + 8  |                  |      |           | ✓   |  |
| TABLES          | ✓        | LIGHTS           | ✓    | ALL CLEAR | ✓   |  |

\* Still Fuz

Rossi Alpha

DETECTORS  
in PLACE  
in Top Plug

Run 254

loading - 88 1/2 u

6 1/2 Fe [1, 2, 3, 7, 8, 9 and 2nd 1/2 # 6]

Rod I = 1.36 ∞ (+6.0 φ)



4 5 6

Log N = .0001

"A" = 45 <sup>10</sup>/<sub>1000</sub> (out of Pig)

"C" = 50 L-16

BF<sub>3</sub> (#3) = 1200 cts

Just Some  
Reading 5, hunting  
Count rate.

Log N = .0000

"A" = 32 <sup>10</sup>/<sub>100</sub>

"C" = 28 L-16

BF<sub>3</sub> (#3) = 417 cts/m

USE

255

loading - 88 3/16

6 9/16 [1, 2, 3, 7, 8, 9 + 1st 1/2 + 15th 1/16 # 6]

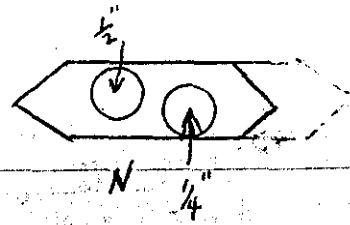
Rod I = 1.1 (+3.0 φ)

stop at 0.99



4 5 6

13733  
12155-



1/2" NE 102 = 1210 V  
 1/4" = 1490 V

Start at 14:05 Stop at 15:00  
 Change Chan. Width 61300 to 71300  
 Start @ 15:01 Stop at 15:31

JUN 5 1968

| DATE JUN 5 1968 |      | SAFETY CHECK |      |             |      |     |   |
|-----------------|------|--------------|------|-------------|------|-----|---|
| TIME            | 8:20 | AM           | BY   | Taylor + by |      |     |   |
| GUARD           | A    | B            | C    | D           | E    | F   |   |
| PERMITS         | 1000 | opr          | L-16 | 1000        | 900  | 750 |   |
| SCAFFOLD        | 4"   | OK           | 30"  | 0           | 3"   | OK  |   |
| % F. S. TOP     | 100  |              | 100  | 100         | 100+ |     |   |
| ELEC. WIRING    | ✓    | ✗            | ✓    |             |      |     |   |
| AUX. GEAR       | ✗    | ✓            | ✓    |             |      |     |   |
| SD: ROES USED   | 227  | +            | ✓    |             |      |     | ✓ |
| TABLES          | ✓    |              | ✓    |             |      |     | ✓ |

256 Continuation of Run 255

Chan width = 71300  $K_2'' = 1240 V$   
 Start at 08:50  $K_4'' = 1470 V$

Stop 11:20 BE = 680  $\frac{ctd}{m}$

Rod I = 0.98

JUN 6 1968

| DATE JUN 6 1968 |         | SAFETY CHECK     |      |              |      |     |     |
|-----------------|---------|------------------|------|--------------|------|-----|-----|
| TIME            | 9:30    | BY Taylor + Lynn |      |              |      |     |     |
| CHANNEL         |         | A                | B    | C            | D    | E   | F   |
| RANGE           |         | 1000             | 1000 | L-16         | 1000 | 900 | 750 |
| SOURCE DIST.    |         | 5                | 5    | 30           | 0    | 3'  | OK  |
| % F. G. TRIP    |         | 100              |      | 100          | 80   | 100 | -   |
| BLOK. ALARM     |         | ✓                | *    | ✓            |      |     |     |
| AUX CTDS.       |         | -                | ✓    | ✓            |      |     |     |
| SOURCES USED    | 227 + 8 |                  |      |              |      |     | ✓   |
| TABLES          | ✓       | LIGHTS           | ✓    | AREA CLEARED | ✓    |     | ✓   |

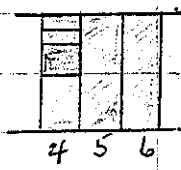
\* worse

Run 257 BNL case 5. Fe with 2" poly box. VS Run 255 -34¢

Scint Detectors in place  
 Loading - 88 u  
 7 Fe [1, 2, 3, 6, 7, 8 + 9]  
 ∞ 22.85

258 Loading - 87.4  
 8 Fe [Row 9, except 5]  
 P = -24.6¢

259 Loading - 87 3/8 u VS 257 -42¢  
 7 5/8 Fe [1, 2, 3, 6, 7, 8, 9 and 1st 1/2 + 7th 1/8 #4]



P = +1.2¢  
 ∴ 3rd 1/4 + 8th 1/8 #4 = 25.8¢  
 VS 255 +78¢

Rossi & start @ 11:17  
 1/2" = 1175 stop @ 15:32  
 1/4" = 1350

Rod I = 0.21

JUN 7 1968

| DATE JUN 7 1968 |         | SAFETY CHECK     |      |      |      |     |  |
|-----------------|---------|------------------|------|------|------|-----|--|
| TIME 9:45       |         | BY Taylor + Lynn |      |      |      |     |  |
| CHANNEL         | A       | D                | S    | J    | E    | F   |  |
| RANGE           | 1000    | ok               | L-16 | 1000 | 900  | 250 |  |
| SOURCE DIST.    | 4"      | ok               | 30"  | 0    | 21   | ok  |  |
| % F. S. TRIP    | 100     |                  | 100  | 80   | 100+ |     |  |
| BLEB. ALARM     | ✓       | *                | ✓    |      |      |     |  |
| AUX CTS.        | *       | ✓                | ✓    |      |      |     |  |
| SOURCES USED    | 227 & 8 |                  |      |      |      | ✓   |  |
| TABLES          | ✓       |                  |      |      |      | ✓   |  |

Run 260 BNL Case 6. Fe with 1/2" Lucite box.

Conditions & Loading Same.

$P = + 2.46 \phi$

Posi  $\alpha$

$1/2" = 1195$

Start 10:32

Vs Run 255

$1/4" = 1350 -5$

Stop 13:49

+ 79  $\phi$

$Rod f = 0.58$

#14

8  $\phi$

JUN 10 1968

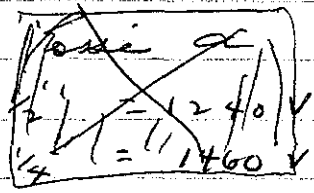
| DATE JUN 10 1968 |         | SAFETY CHECK |     |              |     |     |               |
|------------------|---------|--------------|-----|--------------|-----|-----|---------------|
| TIME             | 10:00   | AM           | BY  |              |     |     | Lynn + Taylor |
| CHANNEL          |         | A            | B   | C            | D   | E   | F             |
| RANGE            | 1000    | 500          | 100 | 100          | 100 | 100 | 100           |
| SCATTER DIST.    | 4"      | OK           | 7"  | 1"           | 2"  | OK  |               |
| % F. S. TRIP     | 100     | -            | -   | 100          | 100 |     |               |
| GLG. ALARM       | ✓       | *            | ✓   |              |     |     |               |
| AUX CTRS.        | *       | *            | ✓   |              |     |     |               |
| SOURCES USED     | 227 + X |              |     |              |     |     |               |
| TABLES           | ✓       | LIGHTS       | ✓   | AREA CLEARED | ✓   |     |               |

\* Sick

Run 261 BNL Case 4. 3" Fe with 1" poly at back.  
 Conditions + loading panel

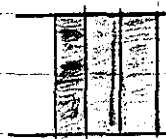
$P = -1.3 \#$

(Pitte out of order)



262 loading: 87 3/8" U  
 7 5/8" Fe [1, 2, 3, 6, 7, 8, 9# 8th 1/8 #4]

Rad I = 0.45



456

Rossi alpha  
 1/2" = 1240V  
 1/4" = 1460V

Start 11:13

Stop 13:55

JUN 11 1968

|              |                           |               |                  |              |
|--------------|---------------------------|---------------|------------------|--------------|
| DATE         | JUN 11 1968               |               | SAFETY CHECK     |              |
| TIME         | 9:50                      | Taylor + Lynn |                  |              |
| CONCENTR.    | $\frac{1}{1000}$ off      | L5            | $\frac{1}{1000}$ | 900 950      |
|              | 4" OK                     | 5'            | 1"               | 2" 012       |
|              | 100                       | 100           | 80               | 100+         |
| LEAK         | $\checkmark$ <del>X</del> | $\checkmark$  |                  |              |
| AUX. DR.     |                           |               | $\checkmark$     |              |
| SOURCES USED | 227 + 8                   |               |                  |              |
| TABLES       | $\checkmark$              |               | AREA CLEARED     | $\checkmark$ |

Run 263. B.N.L. case 2. Polyethylene Complete.

loading: 88 u

7 Fe [Row 9, except 4+5]

$$P = \log N = -6.3 \phi$$

$$P = BF_2 = -5.9 \phi$$

264. loading: 88  $\frac{1}{8}$  u

6  $\frac{7}{8}$  Fe [1, 2, 3, 7, 8, 9, + 10<sup>+</sup>  $\frac{3}{4}$  + 8<sup>th</sup>  $\frac{1}{8}$  #6]

Rod I = 0.8 (+2  $\phi$ )

VS Run 255  
+ 25  $\phi$

4 5 6

$\frac{1}{2}$ " = 1190 v

$\frac{1}{4}$ " = 1390 v

start @ 10:55

stop @ 14:12

JUN 12 1968  
1968

| DATE          | JUN 12 1968 |        |                  |              |     |   |
|---------------|-------------|--------|------------------|--------------|-----|---|
| TIME          | 8:20        | AM     | BY Taylor + Lynn |              |     |   |
| CHANNEL       | C           | D      | E                | F            |     |   |
| RANGE         | 1000        | 800    | 1000             | 900          | 900 |   |
| SEC. S. DIST. | 4" OK       | 24"    | 1"               | 2"           | OK  |   |
| % V. S. TYP   | 100         | 100    | 90               | 100          | -   |   |
| ELEC. MARK    | ✓           | *      | ✓                |              |     |   |
| AUX GNS.      | *           | *      | ✓                |              |     |   |
| SOURCES USED  | 227 + 8     |        | BANKS            |              | ✓   |   |
| TABLES        | ✓           | LIGHTS | ✓                | AREA CLEARED |     | ✓ |

Run 265 BNL Case 2 + 1/4" Borel position 1, 3 3/4" Poly.

See p-152

Loading: 88 <sup>1</sup>/<sub>16</sub> U

6 <sup>15</sup>/<sub>16</sub> Fe [1, 2, 3, 7, 8, 9 + 1st <sup>7</sup>/<sub>8</sub> + 16th <sup>1</sup>/<sub>16</sub> # 6]

Rod I = 0.6 (+ 2 #)

US 205  
+ 32 #

Rossi α

Start @ 8:51

1/2" = 1180 V.

Stop 11:51

1/4" = 1440 V.



4 5 6

(Pitte repaired ERR)



JUN 13 1968

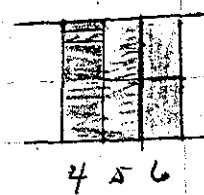
|              |                    |        |    |              |                  |     |
|--------------|--------------------|--------|----|--------------|------------------|-----|
| DATE         | JUN 13 1968        |        |    |              |                  |     |
| TIME         | 8:50 Taylor & Lynn |        |    |              |                  |     |
| CHANNEL      | 1                  | 2      | 3  | 4            | 5                | 6   |
| RANGE        | 1000               | opv    | L  | 1000         | 900              | 900 |
| SCALING DIAL | 4"                 | OK     | 4" | 1"           | 2"               | OK  |
| % E. ST. DIV | 100                |        | 90 | 100          | 100 <sup>+</sup> |     |
| BLOS. FLAMM  | ✓                  | ✓      | ✓  |              |                  |     |
| AUX CTS.     | ✓                  | ✓      | ✓  |              |                  |     |
| SOURCES USED | 227 + X            |        |    | MAGNETS      |                  |     |
| TABLES       | ✓                  | LIGHTS | ✓  | AREA CLEARED | ✓                |     |

Run 266 BNL Case 7. 2" Fe Pos. 1 → 8,  
2" Lucite Pos 9 → 16

loading: 87 <sup>3/4</sup>U  
7 <sup>1/4</sup> Fe [1, 2, 3, 6, 7, 8, 9 + 3<sup>rd</sup> <sup>1/4</sup> #4]

ctr. checks:  $\rho = +11.22 \text{ } \phi$   
 $\text{Log } N = 18.81 \text{ } \phi$   
 $\text{Pctt} = 17.49 \text{ } \phi$   
 $\text{BF}_3(3) = 18.81 \text{ } \phi$

267 loading: 87 <sup>9/16</sup>U  
7 <sup>7/16</sup> Fe [1, 2, 3, 6, 7, 8, 9 + 3<sup>rd</sup> <sup>1/4</sup>, 7<sup>th</sup> <sup>1/8</sup> + 16<sup>th</sup> <sup>1/16</sup> #4]



Res = 0.6 (+2 $\phi$ ) vs Run 255 +66 $\phi$

Resist  $\alpha$  start 9:34 1175V =  $\frac{1}{2}$ "  
 stop 13:50 1390V =  $\frac{1}{4}$ "

JUN 14 1968

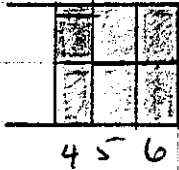
| DATE JUN 14 1968 |         | SAFETY CHECK    |     |              |      |                  |     |
|------------------|---------|-----------------|-----|--------------|------|------------------|-----|
| TIME             | 9:15    | BY Taylor & Lyp |     |              |      |                  |     |
| CHANNEL          |         | A               | B   | C            | D    | E                | F   |
| RANGE            |         | 1000            | opv | L            | 1000 | 900              | 900 |
| SOURCE DIST.     |         | 4'              | OK  | 4'           | 0    | 2'               | OK  |
| % F. S. TRIP     |         | 100             |     | 100          | 90   | 100 <sup>+</sup> |     |
| BLDG. ALARM      |         | ✓               | ✓   | ✓            |      |                  |     |
| AUX CTAS.        |         | ✓               | ✓   | ✓            |      |                  |     |
| SOURCES USED     | 227 + X |                 |     |              |      |                  | ✓   |
| TABLES           | ✓       | LIGHTS          | ✓   | AREA CLEARED | ✓    |                  |     |

Run 268 BNL Case 6C, 3" Lucite Box

Loading:  $87 \frac{9}{16}$  U  
 $7 \frac{7}{16}$  Fe [1, 2, 3, 6, 7, 8, 9 + 3<sup>rd</sup>/<sub>4</sub> + 7<sup>th</sup>/<sub>8</sub> + 16<sup>th</sup>/<sub>16</sub> #4]

Hunted max reactivity with blade.  
 Blade near normal position,  $\rho = +3 \%$

269 Loading:  $87 \frac{9}{16}$  U  
 $7 \frac{7}{16}$  Fe [1, 2, 3, 6, 7, 8, 9 + 9<sup>th</sup> thru 13<sup>th</sup> 1/16 #4]



Rod I = 0.7 (+2%)  
 Up #1 = 22.64

1/5 Run 255  
 +6.7%

Road  $\alpha$

1/2" =  
 1/4" =

Start @ 10:01  
 Stop @ 14:04

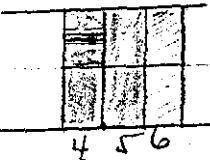
JUN 17 1968

| DATE JUN 17 1968 |         | SAFETY CHECK  |     |              |     |
|------------------|---------|---------------|-----|--------------|-----|
| TIME             | 1130    | Taylor & Lynn |     |              |     |
| CHARGE           |         |               |     |              |     |
| RANGE            | 1521    | 071           | 100 | 900          | 900 |
| SCATTER          | 3" OK   | 30"           | 0   | 2" OK        |     |
| % T. S. P. D.    | 100     | 100           | 100 | 100          |     |
| BLOS. BLANK      | ✓       | ✓             | ✓   |              |     |
| AUX. GENS.       | ✓       | ✓             | ✓   |              |     |
| SOURCES USED     | 227 + X |               |     | ✓            |     |
| TABLES           | ✓       | LIGHTS        | ✓   | AREA CLEARED | ✓   |

Run 270 BNL Case 3, 2" Polyethylene at back

Loading:  $87 \frac{9}{16}$  U  
 $7 \frac{7}{16}$  Fe (as Run 269)  
 $\rho = -2.21 \text{ g}$

271 Loading:  $87 \frac{9}{16}$  U  
 $7 \frac{7}{16}$  Fe [1, 2, 3, 6, 7, 8, 9, + 9th thru 11th  $\frac{1}{16}$ ,  
 + 4th  $\frac{1}{4}$  # 4



Prod I = 0.3  $\text{A}'' = 40 \frac{10}{100}$   
 (+0.5 $\pm$ )  $\text{C}'' = 80$  L-16

Rossi  $\alpha$   $\text{Log N} = .0001$

Vs Run 253  
 + 64 #

$\frac{1}{2}'' = 1160 \text{ V}$   
 $\frac{1}{4}'' = 1450 \text{ V}$

Start @ ~~1138~~ 12:14  
 Stop @ 1530

- BF<sub>3</sub>
- 1) 5191
  - 2) 3844
  - 3) 1038

JUN 19 1968

| DATE JUN 19 1968 |         | SAFETY CHECK  |      |              |      |     |  |
|------------------|---------|---------------|------|--------------|------|-----|--|
| TIME 9:25        |         | Taylor & Lynn |      |              |      |     |  |
| CHANNEL          | L       | D             | D    | E            | F    |     |  |
| RANGE            | 1500    | opr           | L-16 | 1500         | 900  | 700 |  |
| SOURCE DIST.     | 9'      | OK            | 30'  | 1'           | 2'   | OK  |  |
| % F. S. TSP      | 100     | -             | 100  | 100          | 100+ | -   |  |
| BLOB. AREA       | -       | -             | -    | -            | -    | -   |  |
| AUX OTS.         | -       | -             | -    | -            | -    | -   |  |
| SOURCES USED     | 227 + 8 |               |      |              |      | ✓   |  |
| TABLES           | ✓       | LIGHTS        | ✓    | AREA CLEARED |      | ✓   |  |

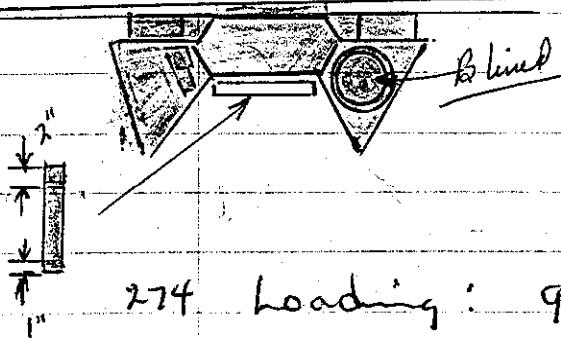
Run 272 Back to Nominal Sect. 4.

Block as per p. 129 for Sect 3.  
 1/4" X 5 7/16" X 18 3/8" Al between block  
 (260") and core.

"D" = erratic, out of circuit  
 Loading = 890 u  
 5 Fe [87, 88, 93, 94 + 95]  
 1 Void (#69)

Sub Crit.

273 Loading: 91 u  
 3 Fe [87, 94 + 95]  
 1 Void (#69)



Sub Crit.

274 Loading: 92 u  
 2 Fe [87 + 95]  
 1 Void (#69)

$$P = +3.2 \neq$$

275 Loading - 9 1/2 u

1 1/2 [95 + 1st 1/2 #87]

1 void (#69)

$$P = +22.09 \text{ \#}$$

$$\therefore \text{Top } 1/2 \text{ \#87} = 19 \text{ \#}$$

276 Block @ -40 mils

-1.016 mm -13.27

$$P = +8.82 \text{ \#}$$

$$\Delta = 13.27$$

277 Block @ -80 mils

-2.032 mm -19.17

$$P = +2.92 \text{ \#}$$

$$5.90$$

278 Block @ -100 mils

-2.54 mm -26.46

$$P = -4.37$$

$$7.29$$

279 Block @ -140 mils

-3.55 mm -36.20

$$P = -14.11 \text{ \#}$$

$$9.74$$

280 Loading: 9.3 u

1 1/2 Fe [95 + 1st 1/2 #87]

1st 1/2 #69

(57.4 \#)

1/2 void (2nd 1/2 #69)

$$P = +45.3 \text{ \#}$$

281 Block @ -120 mils

-4.57 mm -46.29

$$P = +35.21$$

$$\Delta P = 10.09$$

282 Block @ -228 mils

-5.97 mm -15.56

$$P = +19.65$$

$$-61.85$$

$$\Delta P = 15.56$$

Run 283

Block @ - 297 mids

- 7.54 mm - 82.80

$$\rho = -1.3 \text{ \#}$$

$$AP = 20.95$$

Pulled Block

$$\rho = -\text{\#}5.305$$

$$\text{Block} = \underline{\underline{\text{\#}5.29}}$$

284

Repeat 283.

Exchanged Ampl #2 and #4 (Pette)  
(ERR)

Print out looked OK.

switched 2 and 4 back

looked OK

285

Repeat 283.

made switch at back (Pette)  
from Fast to Thermal.

$$\rho = +5 \text{ \#}$$

286

Set Rod I = -14 \#

To sublook at Run 279.

Same result, drift of  $\sim 5 \text{ \#}$

JUN 21 1968

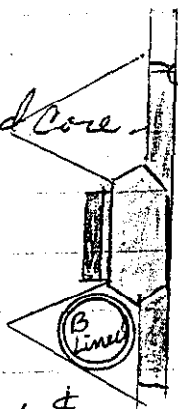
| DATE JUN 21 1968 |          | SAFETY CHECK  |                    |
|------------------|----------|---------------|--------------------|
| TIME 8:20        | AM       | Taylor + Lynn |                    |
| 1000             | OPT L-16 | 1000          | 900 910            |
| 5"               | OK       | 30"           | 0 2" OK            |
| 100              | 100      | 100           | 100 <sup>+</sup> - |
| ✓                | ✓        | ✓             |                    |
| ✓                | ✓        | ✓             |                    |
| SOLAR CELS USED  | 227 + X  |               | ✓                  |
| TABLES           | ✓        | LIGHTS        | ✓                  |
|                  |          | AREA CLEARED  | ✓                  |

Run 287  $\frac{3}{8}$ " Al <sup>as shown mick-up</sup> between block (~~5" x 3"~~ <sup>mick up</sup>) and core  
 Block against Al

.395"

Loading: 92 1/2 U  
 2 Fe [87 + 95]  
 1/2 void (2nd 1/2 #69)

$P = +61 \text{ \#}$



288 Loading: 92 U  
 2 1/2 Fe [87, 95 and 2nd 1/2 #94]  
 1/2 void (2nd 1/2 #69)

o. Top #94 = 28.5 #

Block @ 0

$P = +32.44 \text{ \#}$

289 Block @ - 40 mils 11.88  
 - 1.016 mm

$P = +20.56 \text{ \#}$

$\Delta P = 11.88$

290 Block @ - 80 mils 18.81  
 - 2.032 mm

$P = +13.63 \text{ \#}$

$\Delta P = 6.93$

Run 291 Block ② - 100 mils - 27.79  $P = +4.65^\dagger$   
 - 2.57 mm  $\Delta P = 8.98$

292 ~~Lead~~ Block ② - 180 mils - 45.44  $P = -13^\dagger$   
 - 4.57 mm  $\Delta P = 17.65$

293 loading: 92½ U  
 2½ Fe [87.95 + 22½ #94]  $P = +47.48^\dagger$

294 Block ② - 228 mils - 59.29<sup>†</sup>  $P = +33.63$  K  
 - 5.97 mm  $\Delta P = 13.85$

295 Block ② - 300 mils - 79.48  $P = +13.44$   
 - 7.62 mm  $\Delta P = 20.19$

Pulled Block  $P = -4.44$

Block = \$4.58



25 JUN 24 1968

| DATE JUN 24 1968 |       | SAFETY CHECK     |     |      |      |      |     |
|------------------|-------|------------------|-----|------|------|------|-----|
| TIME             | 10:30 | by Taylor & Lynn |     |      |      |      |     |
| GRADE            |       | 1                | 2   | 3    | 4    | 5    | 6   |
| DEPTH            |       | 100              | ops | 4-16 | 1000 | 900  | 900 |
| SOURCE DIST.     |       | 4"               | 6"  | 30"  | 1"   | 2"   | ok  |
| % F. S. EXP.     |       | 90               | -   | 100  | 110  | 100+ | -   |
| BLES. FROM       |       | ✓                | ✓   | ✓    |      |      |     |
| AUX. GEAR        |       | ✓                | ✓   | ✓    |      |      |     |
| SOURCES USED     |       | 227 + X          |     |      |      |      | ✓   |
| TABLES           |       | ✓                | ✓   | ✓    |      |      | ✓   |

63 Run 296 Loading: 92 1/4 u  
 .85 2 3/4 Fe [87, 95 + 1st 1/4 + 2nd 1/2 #94]  
 Repeating Run 295

44 Block @ -300 mils  
 19 P = +9.5¢  
 Rod I = 2.06  
 Pulled block = -4.43

297 3/8 (.375+) Fe now as shroud mockup.  
 Loading: 91 u  
 4 Fe [87, 88, 94 + 95]

P = -21¢

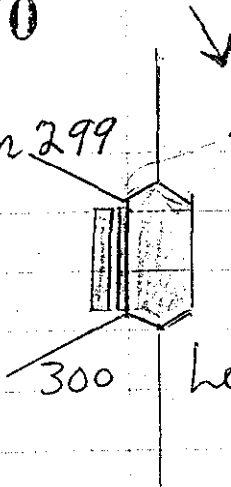
298 Loading: 91 1/2 u  
 3 1/2 Fe [87, 88, 95 + 2nd 1/2 #94]

P = +0.5¢

Pulled block = -4.91

170

Run 299



$\frac{1}{4}$ " Al (.260") as shroud mark-up.

Block 100 mils from ~~the~~

loading Some

$$P = +25 \phi$$

300 Loading: 91 u

$$4 \text{ Fe } [87, 88, 94 + 95]$$

$$P = -1.5 \phi$$

301 Loading: 91  $\frac{1}{4}$  u

$$3 \frac{3}{4} \text{ Fe } [87, 88, 95 + 1 \text{ at } \frac{3}{4} \# 94]$$

$$P = +3.5 \phi$$

$$\infty \text{ Rod I} = 1.08 \quad \#$$

$$\text{Pulled block} = -5.45$$

# 5.45

$$\text{Block} = -\cancel{5.45}$$

302  $\frac{1}{4}$ " Fe (.253") as shroud mark-up.

Block 100 mils from  $\bullet$  Fe

$$P = +26 \phi$$

$$\infty \text{ Rod I} = 3.72$$

$$\text{Pulled Block} = -5.51$$

303 Loading: 90  $\frac{3}{4}$  u

$$4 \frac{1}{4} \text{ Fe } [87, 88, 95, 1 \text{ at } \frac{1}{2} \# 89 + 1 \text{ at } \frac{3}{4} \# 94]$$

$$P = -3.54 \phi$$

$$\text{Pulled Block} = -5.68 \quad \#$$

$$\text{Block} = -5.65$$

27 Jun 68 made 2 runs of only 3 sec <sup>each</sup> duration to make calibration for Jim Ellis. Reflector components have been <sup>removed</sup> to floor.

28 Jun 68 Further calibration and shaft movement checks.

- Made: 4 - 2 sec starts only.
- 1 - 1 min run started @ 1137
  - 1 - 1.2 min 1146  
(full speed in 13 sec.)
  - 1 - 0.44 min started @ 1154
  - 1 - 0.52 1350
  - 1 - 0.46 1354
  - 1 - 0.31 1358
  - 1 - 3.40 1359
  - 1 - 0.35 1408
  - 1 - 0.26 1410
  - 1 - 0.30 1416
  - 1 - 3.42 1424

121  
144  
131  
146  
131  
134  
135  
136  
137  
138

Data taken and returned by Jim Ellis. All "read-outs" were normal.

JUL 1 1968 "End Play" checks for WCT #/or JE.

- 1 - 2.3 min started @ 1125
- 3 - 2 sec. starts only @ 1330
- 1 - 11.62 min @ 1403
- 1 - 3.3 min @ 1424

113  
103

17.2

42

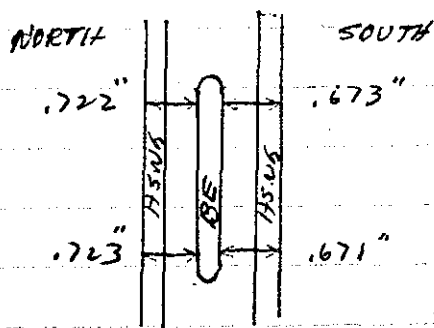
4  
44  
4

JUL 2 1968

Cont more of same.

|       |         |              |
|-------|---------|--------------|
| 1 run | 1.2 min | Started 0931 |
| 1     | 3.0     | 0952         |
| 1     | 1.7     | 1006         |

5.9 min



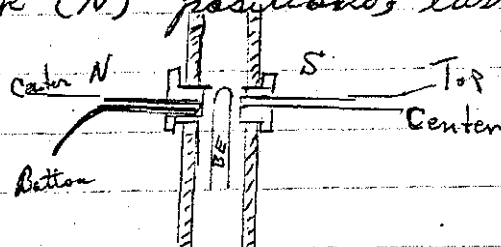
JUL 9 1968

~~1320~~

Installed thermocouples in probe holes at the 3 o'clock (S) and 9 o'clock (N) positions, east side of shroud.

maximum spacing 3(.065")

1  $\frac{1}{8}$ " + .195"



1320 Start - Pressure Manometer overflow. stop.

Poor purge. Plastic bag technique.

1402

Refurge <sup>Plastic bag</sup> start 30 min Run.

Temp leveled out. (1) ~ 40°C on permanent thermocouple and (2) ~ 46.5°C at probe holes.

(11" H<sub>2</sub>O)

Removed .065" spacers from probe hole thermocouples. Start @ 1453, 30 min run.

Helium = 21.5°C to 40°C

Probes = 28°C to 48.0°C

$\frac{1}{8}$ " + .130"

Removed another .065" shim from probe hole  
thermocouples.

1544 Start  $\frac{1}{8}" + .065"$

Slight pressure increase. (11.5" H<sub>2</sub>O)

Helium = 21.5°C to 42°C

Probe = 28.5°C to 51°C. 30 min run.

JUL 10 1968

Repeat the above run.  $\frac{1}{8}" + .065"$

0845 Start

Helium 21°C to 40°C

Pressure 10  $\frac{1}{2}$ " H<sub>2</sub>O

Probe 25°C to 47.5°C

down to 10" at 0900.

30 min run

All shims removed. Spacing of  $\frac{1}{8}"$

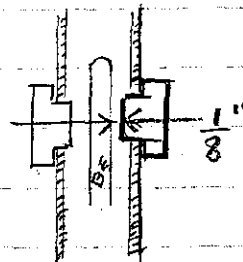
0952 start.

10.1" H<sub>2</sub>O

Helium 21.5° to 40°C

30 min run

Probe 26.5° to 48°C



Replaced one shim.  $\frac{1}{8}" + .065"$

1047 Start.

10.0" H<sub>2</sub>O

He 22.5° to 40°C

Probe 28° to 48°C

30 min run.

3 Skims in  $\frac{1}{8}$ " + .195"

1322 start

10" H<sub>2</sub>O

He 20.5° C to 39° C

Probe 24° C to 48° C

Start 1615 for JFE with probe at  
Stop 1616 center of Hub (N).

1 min run

JUL 11 1968

Start 1025

for JFE with probe at center  
of Hub and at rear of shaft.

10" H<sub>2</sub>O

Stop 1041

16 min run

JUL 12 1968

0909

A 10 sec run for "shaft checks".

JUL 15 1968

Runs for WCT for "blade + shaft checks"  
scope measurements and observations  
by JFE.

1325 - 10 sec

1410 - 10 sec

1411 - 4 min

1524 - 5 min

1554 - 4 min

1603 - 30 sec

1610 - 2 min

JUL 17 1968

15.2 min run. to compare vibrations etc when N<sub>2</sub> replaces He. See Jim Ellis.  
 Start time 1321 hrs, 25amps @ 6.4 min elapsed  
 +11.0 min start mixing in N<sub>2</sub> = 27amps  
 +11.5 He off and N<sub>2</sub> feeding only.  
 +12.0 = 30amps; +13.2 = 34amps; +14.0 = 37amps  
 +15.0 = 40amps +15.2 = 40.5amps and STOP  
 2 (20 sec) runs. Sound from speaker <sup>tripled</sup>  
 2 (30 sec) run @ 1430 # @ 1454 hrs  
 1502 - 2 min  
 1521 - 3 min 15.3 min  
 TOTAL SPIN TIME = ~~25.4 hrs~~ 27.7 hrs

JUL 18 1968

Disassembly of Shroud, etc.

JUL 23 1968

- Samples Taken from inside shroud.
- # 1 = RTV
  - # 2 = Rust from around sub.
  - # 3 = Burnt Rubber from ~~shroud~~
  - # 4 = Edge of Blade
  - # 5 = Tip of Blade
  - # 6 = O ring material.

SEP 10 1968

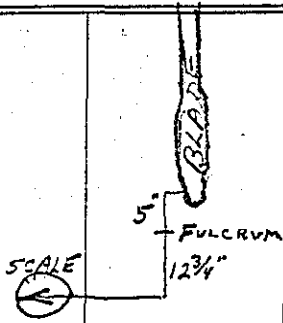
No Load motor Check (Blade off)  
 18 Amps / leg (E.R.R.)

# OAR

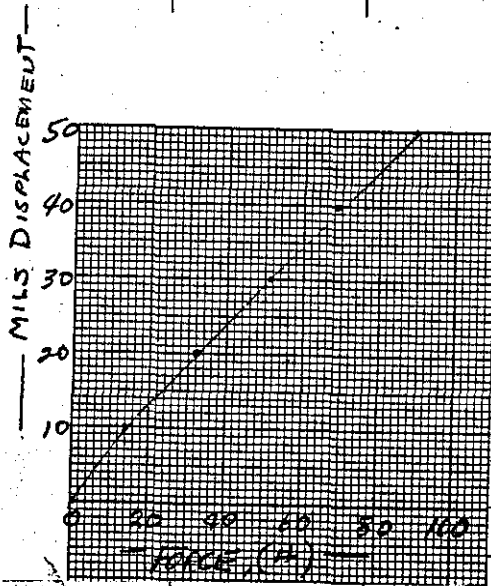
RED - TAKEN 18 SEPT 1968

JUL 24 1968

I



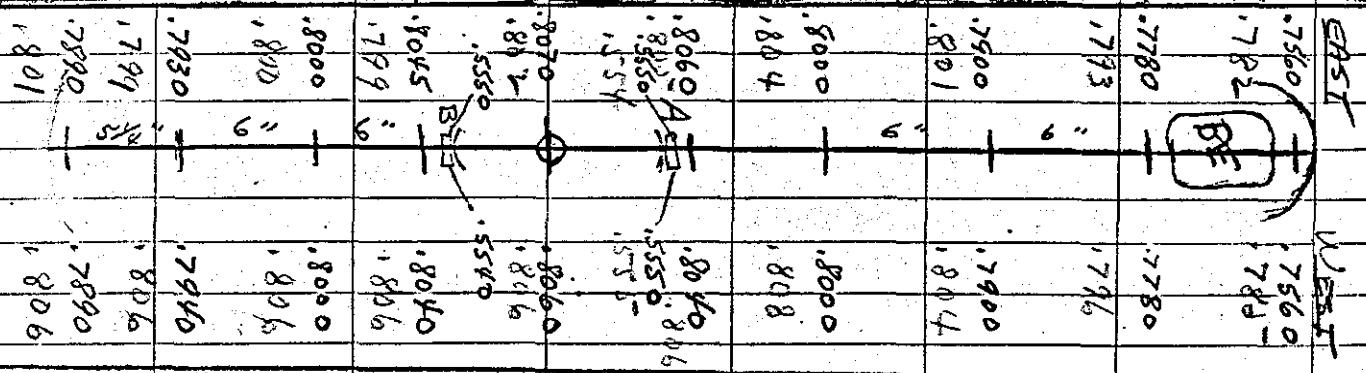
| FORCE (#) | DISTANCE FORCED SOUTH (MILS) |
|-----------|------------------------------|
| 0         | 0                            |
| 14.0      | 10                           |
| 31.9      | 20                           |
| 52.3      | 30                           |
| 68.9      | 40                           |
| 89.3      | 50                           |



II Make BLADE & measurements using stationary dial indicator and rotate blade

| TI END     | BE END    | BE END DIFF. | DIST. MEAS. FROM CENTER |
|------------|-----------|--------------|-------------------------|
| 32.0 5.0   | 31.0 3.0  | 1.0 S        | 2.5"                    |
| -6.0       | -7.5      | 1.5 S        | 5.5"                    |
| 11.25 21.0 | 9.25 18.8 | 2.0 S        | 11.5"                   |
| 8.8 13.0   | 8.2 10.0  | 0.6 S        | 14.75"                  |
| 7.9        | 15.0 9.5  | 7.1 N        | 21.5"                   |
| 11.0       | 14.5      |              |                         |
| -11.3      | -4.0      | 7.3 N        | 22.25"                  |
| 7.9        | 17.0      |              |                         |

III Place "straight edge" along & axis and touching at equally shimmed position A & B. Measure Bow <sup>relationship</sup>

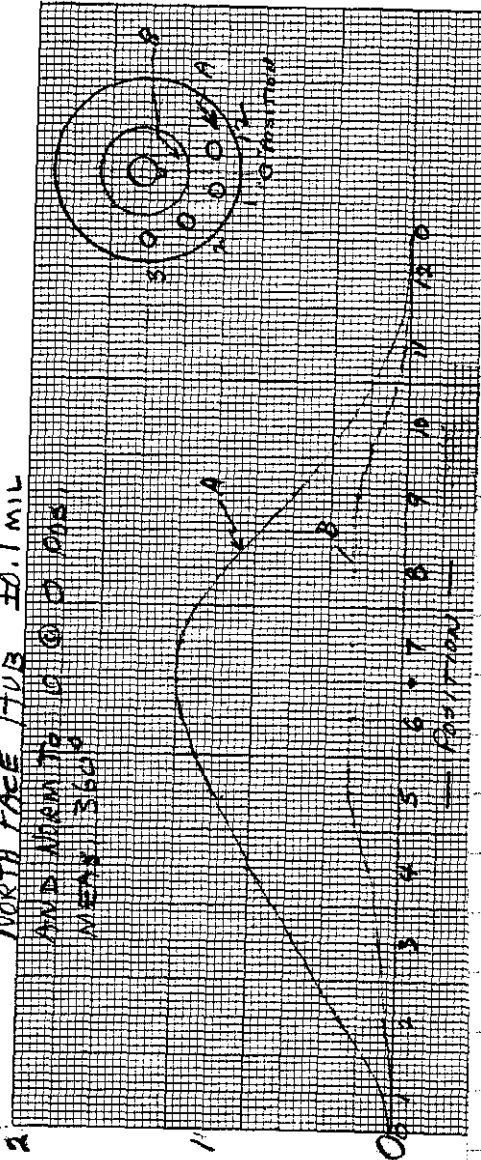




NO. 341-M DIETZSEN GRAPH PAPER  
MILLIMETER

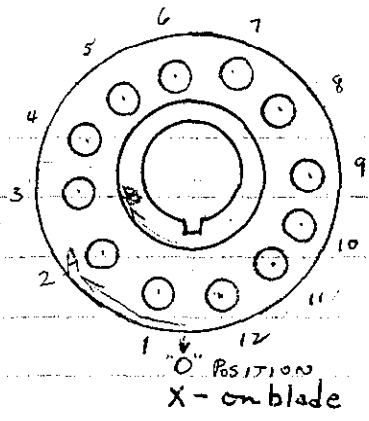
E1

NORTH FACE HUB ±0.1 MIL  
AND NORM TO 0 0 0 ONE  
MEAN 360°



-MIS-

SEP 11 1968



| Position | A (mils) |           | B <sup>177</sup> (mils) |           | B   |           |
|----------|----------|-----------|-------------------------|-----------|-----|-----------|
|          |          | $\pm .05$ |                         | $\pm .05$ |     | $\pm .05$ |
| 0        | .16      | 0         | 0                       | .02       | .1  | 0         |
| 1        | .2       | 0         | .04                     | .02       | .1  | 0         |
| 2        | .5       | .4        | .34                     | .1        | .1  | .05       |
| 3        | .7       | .6        | .59                     | .18       | .15 | .11       |
| 4        | .9       | .6        | .64                     | .20       | .2  | .06       |
| 5        | 1.2      | 1.0       | 1.04                    | .28       | .35 | .27       |
| 6        | 1.2      | 1.1       | 1.09                    | .3        | .35 | .27       |
| 7        | 1.5      | 1.2       | 1.29                    | .31       | .35 | .27       |
| 8        | 1.0      | .9        | .99                     | .31       | .35 | .27       |
| 9        | .8       | .6        | .64                     | .28       | .35 | .26       |
| 10       | .4       | .3        | .29                     | .10       | .28 | .14       |
| 11       | .25      | .1        | .11                     | .02       | .11 | .02       |
| 12       | .11      | 0         | 0                       | .02       | .05 | 0         |
| 0        | .11      | 0         | 0                       | .02       | .02 | 0         |

From stable position, measure variation by rotating "hub" and using dial gauge.

\* Is Avg. of 2 sets and is normalized to 0@0.

← See graph

Blade placed on surface plate  
 North side 0 = 55, ⊙ edge of block, reading every inch  
 53, 54, 53.2, 53.0, 51.5, 51.0, 50.0  
 49.8, 49.2, 48.8, 48.5, 48.5, 48.9, 49.0, 49.1, 49.5  
 50.0, 50.2, 50.6, 51.0, 51.4, 51.9 (52.2 Center of Hub)  
 52.2, 53.1, 53.8, 54.2, 54.5, 55.0, 55.1, 55.5,  
 55.8, 56.0, 56.0, 56.5, 56.9, 57.1, 57.2, 57.3,  
 57.5, 57.2, 57.5, 57.8, 57.8, 57.8, 57.8  
 Across Be 0 = 56 (Same as 0 = 55 above)  
 120.5, 121.2, 122, 122.8, 123.9, 124.1, 124.9,  
 125, on blade end 62.8, 63.2

Meter side of blade - on surface place  
 tip of blade to but, reading every inch  
 0 = 20, 21.1, on Be 93, 95.5, 98.0, 100.2,  
 102.4, 104.8, 106.5, 108.9, on blade 44.1,  
 45.5, 48.1, 51.5, 52.9, 55.0, 57.3, 59.9,  
 61.8, 63.5, 65.0, 66.1, 67.0, 68.0, 69.7,  
 69.8, 70.8, 72.6, 73.0, 73.5 Salt holes, 74.1,  
 in insert 6.5, 8.6,  $\Phi$  8.0, 9.2, 8.8,  
 back to normal 76, 75.8, 75.6, 75.2, 75.2,  
 74.5, 73.9, 74.0, 73.8, 73.2, 72.8, 72.4,  
 72.0, 71.3, 70.5, 70.1, 69.2, 68.3, 68.1.

readings  
 in  
 mils

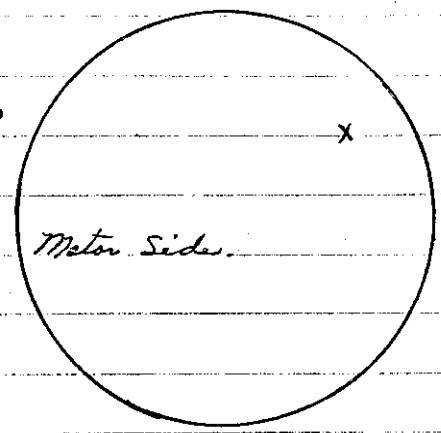
19

2

18 Sept 1968

Blade mounted - tightened bolt #7 first,  
 then <sup>alternately</sup> bolt on either side of seven.  
 1st time around with 60 #  
 2nd " " " 125 #  
 Final " " " 250 #

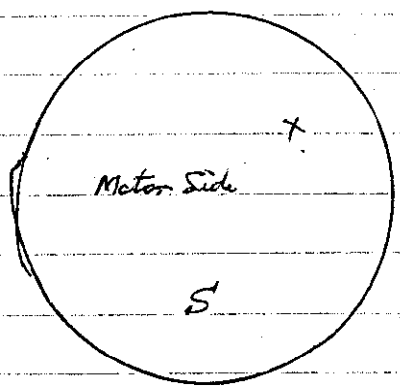
19 Sept 1968



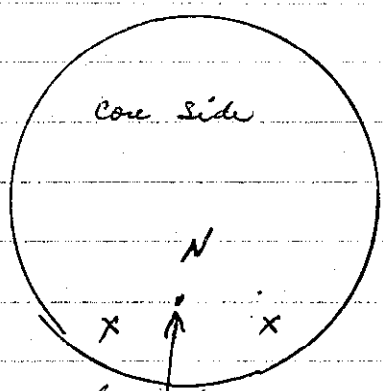
.632" to Be  
 .406 to screw  
 .226" min. clearance  
 of blade, before  
 other face of shroud  
 is mounted.

South side of shroud.

20 Sept 68



.673"  
 .451"  
 .222"



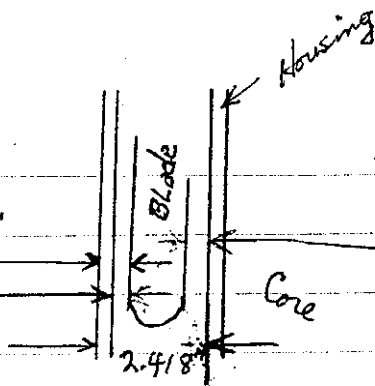
.742"  
 .532"  
 .210"

Installed N side of shroud. ↑  
 Tensioned peripheral bolts 2 pts same.  
 1st time @ 30 # with dial gage at  
 Final " @ 80 # this pt. indicated a  
 18 mil buckle from <sup>30 #</sup> to 80 #

23 Sept 68

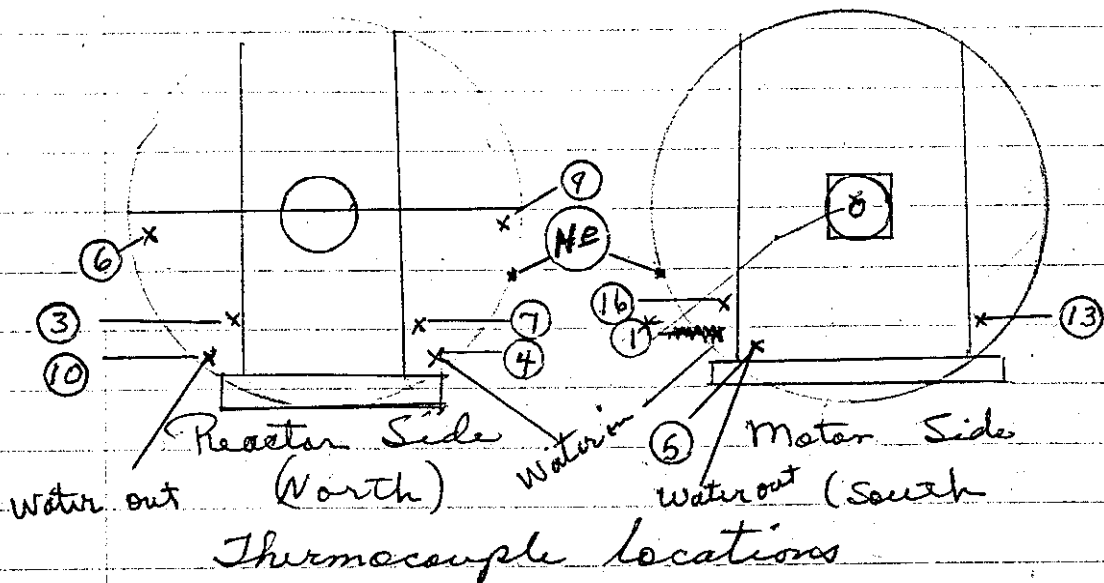
0.852  
0.375  
0.477"

meter  
0.852"



2.418  
- 0.852  
1.566  
- 1.250  
0.316"

Blade Clearance at Core



Cooling Water Flow = 9 gal/min.

ref  
Pg 186

tc # 2 between boreal & Fe in section 4.  
tc # 8 on housing @  $\phi$  of core (E/W) and 1/2" above top of core.

ref  
Pg 187

tc # 11 TOP of hole #60  
tc # 14  $\phi$  of hole #60  
tc # 15 Bottom hole #60

"Spin"

181

SEP 25 1968

Start @ 2:07

He flow @  $5 \text{ ft}^3$ ; 26 amps.

Peripheral pressure (He) = 10.6"  $\text{H}_2\text{O}$

Temp (He) =  $40^\circ\text{C}$ ; max. Shroud temp =  $39^\circ\text{C}$

$\text{H}_2\text{O}$  flow  $\approx 9 \text{ gal/min}$ .

RAYDATA (Top of Shroud) = 4.3 mils

Stop @ 14:37

30 min Run

\* change #1 from  $\text{H}_2\text{O}$  inlet to "Live Center" at rear of motor shaft.

OCT 9 1968

DATE OCT 9 1968

SAFETY CHECK

TIME 3:15 PM

Taylor + Lynn

J. Michalezo

J. Lynn

J. Taylor

W. Tunnel

J. Ellis

R. Rohrer

| CHANNEL      | 10      | 10       | 10   | 10           | F   |
|--------------|---------|----------|------|--------------|-----|
| RANGE        | 1200    | Apr L-18 | 1000 | 900          | 750 |
| SOURCE DIST. | 15"     | OK 20"   | 2"   | 2"           | OK  |
| % F. S. TRK  | 100     | OK       | 100  | 100          | OK  |
| BLDG. ALARM  | ✓       | ✓        | ✓    | ✓            | ✓   |
| AUX. CTRS.   | ✓       | ✓        | ✓    | ✓            | ✓   |
| SOURCES USED | 227 + 8 |          |      |              | OK  |
| TABLES       | ✓       | LIGHTS   | ✓    | AREA CLEARED | ✓   |

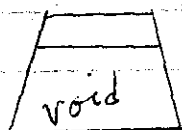
Blade on drive, physically centered.

Run 304

BNL Sect 4. (with void)  $k_{eff} = 22.38$ Sect 3 = Fe  $k_{eff} = 22.483$ Rod I = Ni + Fe  $k_{eff} = -3$ Loading = 81 u  $k_{eff} = -8$ 

14 Fe [1 → 12, 18 + 19]

Sub critical



305

Loading = 83 u

12 Fe [1 → 11 + 19]

 $\infty$  Rod I = 1.67 $\infty$   $k_{eff} = 9.42$  $A = 54$  $D = 43$  $C = 6.0$  (H-18) $k_{eff} = 10^{-8}$ 

Excess

 $k_{eff} = +9.42$  $k_{eff} = +10.15$  $k_{eff} = 10.0$

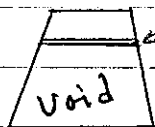
OCT 10 1968

| DATE         | SAFETY CHECK  |        |     |              |     |     |
|--------------|---------------|--------|-----|--------------|-----|-----|
| OCT 10 1968  | Taylor + Lynn |        |     |              |     |     |
| TIME         | 10:15         |        |     |              |     |     |
| CHANNEL      | 10            | 10     | 10  | E            | F   |     |
| BASE         | 1000          | ppr    | L6  | 1000         | 900 | 750 |
| SET POINT    | 0             | ok     | 24" | 3"           | 2'  | ok  |
| 9" F. S. DIA | 0             | -      | 100 | 100          | 100 | -   |
| BLEED VALVES | ✓             | ✓      | -   | -            | -   | -   |
| AUX UTAS     | -             | -      | ✓   | -            | -   | -   |
| SOURCES USED | 277           | +      | 8   | MAGNETS      | ✓   |     |
| TABLES       | ✓             | LIGHTS | ✓   | AREA CLEARED | ✓   |     |

Run 306 Loading - 83u

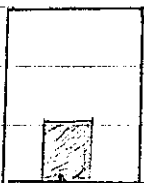
12Fe [ ] → 11 + 19

Added the 1/4" Borad to BNL 4



∞ Rod I = 3.37

ρ = + 27.13  
- 9.42



∞

Borad = + 17.71¢

Centered blade Reactivity wise

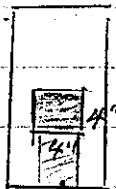
+ 2.75¢

3" x 3" x 5 1/8"

Al Box

Excess = 29.88¢

307 Placed 4" x 4" x 3" polyethylene in BNL 4 at radial center of core. (3" dimension radially)



∞

Rod I = 3.37

ρ = + 15.37

Rod I = 4.38

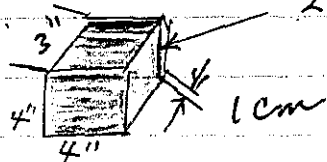
Poly = + 12.62¢

Al Box

3" x 3" x 5 1/8"



308 Placed 4" x 4" x 3" Sample as in 306  
25 mil cd sheet



$$\text{Rod I} = 3.37$$

$$P = +15.50 \text{ ¢}$$

$$\text{Sample} = \underline{+12.75 \text{ ¢}}$$

309 Placed 4" x 4" x 1 1/2" poly Sample as  
in 306. (1 1/2" diam. radially)

$$\text{Rod I} = 3.37$$

$$P = +14.0 \text{ ¢}$$

$$\text{Sample} = \underline{+11.25 \text{ ¢}}$$

310 Repeat Run 306, except for removed  
3" x 3" x 5 1/8" Al tube for positioning samples  
(Box)

$$\text{Rod I} = 3.37$$

$$P = +1.64 \text{ ¢}$$

$$\text{Box} = +1.11 \text{ ¢}$$

186

"Spin"

OCT 10 1968

To Adjust Live Center.

Start : 15:38 - 10 sec Run

start : 15:46

26.5 amp.

He flow = 10 ft<sup>3</sup>/minPeripheral pressure = 10.2" H<sub>2</sub>O.

He Temp = 40.5°C (max)

stop : 16:18

Shroud #43 = 39°C (max)

Live center = 67.5°C (max)

live center slightly loosened

start : 16:27

Stop : 16:43

Live center = 64.5°C (max)

other readings OK

all to # 2 &amp; # 8 (see pg 180).

OCT 14 1968

To Measure the displacement of blade in start up  
16 mls away from the coreTo determine if rotation of blade introduces counts  
into the NE 132 or BF<sub>3</sub> Detector mounted  
in the reflector. No counts from the rotationSTARTED 10:28 ENDED 10:57

all readouts normal.

Start 13:50 End 14:12 all readouts OK except  
J. Ellis is getting more "jitter" on blade.  
Found "live center" had vibrated loose.  
- Retighten "live center."

Start 14:23 Stop 14:33 " jitters better.

3 - 2 sec starts today for checks only.

- Check Rod I travel rate on 0.4 variac.  
travel out = 23.7"/min; travel in = 29.5"/min
- Installed 3 Fe's in core (see pg 180)  
i.e. # 11-14-15.

| DATE         | OCT 11 1963         |      |      |                   |      |     |
|--------------|---------------------|------|------|-------------------|------|-----|
| TIME         | 3:20 Taylor + Lyman |      |      |                   |      |     |
| CHANNEL      | A                   | B    | C    | D                 | E    | F   |
| RANGE        | $\frac{10}{1000}$   | 0.16 | 1.16 | $\frac{10}{1000}$ | 900  | 750 |
| SCANS PER    | 10"                 | 0.2  | 0.4  | 3"                | 2"   | 0.2 |
| % F. S. T.   | 100                 | -    | 100  | 100               | 100+ |     |
| ELC.         | ✓                   | ✓    | ✓    |                   |      |     |
| AUX. DEVS.   |                     | ✓    | ✓    |                   |      |     |
| SOURCES USED | 227 + 8             |      |      |                   |      | ✓   |
| TABLES       | ✓                   |      |      |                   |      | ✓   |
| LIGHTS       | ✓                   |      |      |                   |      | ✓   |
| AREA DECONT. |                     |      |      |                   |      | ✓   |

Run 311

Loading: 83 u

12 Fe [1 → 11 + 19]

scint ( $\frac{1}{4}$ " ) in NW of Top plug.

1" dia BF<sub>3</sub> in Rod 3a position

Fuel Thermocouples in Hole #60

(#11 @ top, #14 @ center + #15 @ bottom

nos as on 16 print out)

sub critical.

312

Loading 83 1/2 u

11 1/2 Fe [1 → 10, 19 + 1.0 + 1/2 #11]

$\rho = 18.0 \phi$

∞ Rod I = 2.61

OCT 15 1968

| DATE OCT 15 1968 |      | SAFETY CHECK |                  |              |      |     |     |
|------------------|------|--------------|------------------|--------------|------|-----|-----|
| TIME             | 8:50 | AM           | BY Taylor + Lynn |              |      |     |     |
| CHANNEL          |      | A            | B                | C            | D    | E   | F   |
| RANGE            |      | 10           |                  |              | 10   |     |     |
| SOURCE DIST.     |      | 1000         | 800              | 2-16         | 1000 | 900 | 750 |
| % F. S. TRIP     |      | 20"          | OK               | 24"          | 0    | 11" | OK  |
| BLDG. ALARM      |      | 100          | -                | 100          | 100  | 100 | -   |
| AUX CTCS.        |      | ✓            | ✓                | ✓            |      |     |     |
| SOURCES USED     |      |              | ✓                | ✓            |      |     |     |
| TABLES           | ✓    | 227 + 8      |                  | MAGNETS      |      | ✓   |     |
| LIGHTS           | ✓    |              |                  | AREA CLEARED |      | ✓   |     |

Run 313 Loading:  $84 \frac{1}{8}$  U  
 $10 \frac{1}{2}$  Fe [1 → 10 + 2<sup>nd</sup>  $\frac{1}{2}$  #19]  
 $\frac{3}{8}$  [For Source #358 at Center #48]

Blade on motor drive.

Hole #48 - [ $7 \frac{1}{2}$  cm U, Source and  $7 \frac{1}{2}$  cm U]

Scatter 4 - BNL void except for Borad.

" 3 - Fe

Top Plug - Fixed [ $\frac{1}{4}$ " Scint NW]

Rod I - Ni + Fe

Rod 3a - out [BF<sub>3</sub> in its hole (1" dia)]

Sub crit  $\mathcal{L}$  ~~⊗~~

314 Loading:  $84 \frac{7}{8}$  U  
 $9 \frac{3}{4}$  Fe [1 → 9, 4<sup>th</sup>  $\frac{1}{4}$  #10 + 2<sup>nd</sup>  $\frac{1}{2}$  #19]  
 $\frac{3}{8}$  For Source

$\rho = +34.7 \%$

Rod I = 2.55

315 Loading -  $85 \frac{1}{8}$  U  
 $9 \frac{1}{2}$  Fe [1  $\rightarrow$  9<sup>mid</sup>, 4<sup>th</sup>  $\frac{1}{4}$  #10 + #19]  
 $\frac{3}{8}$  S

$P = +50.46 \text{ } \phi$  ✓

$\therefore$  3rd  $\frac{1}{4}$  #19 = 15.76  $\phi$

316 Loading -  $85 \frac{3}{8}$  U  
 $9 \frac{3}{4}$  Fe [1  $\rightarrow$  9 + 4<sup>th</sup>  $\frac{1}{4}$  #10]  
 $\frac{3}{8}$  S

⑦

$P = +58.42 \text{ } \phi$  ✓

$\therefore$  4<sup>th</sup>  $\frac{1}{4}$  #19 = 7.96  $\phi$

#48

100  
5 110  
P. 127

RP #10 vs Run 316  
 Loading : ~ - [12 Fuel pins]  
 Run 317  $73 \frac{3}{8}$  U  
 $21 \frac{1}{4}$  Fe [1  $\rightarrow$  9 + 4<sup>th</sup>  $\frac{1}{4}$  #10]  
 $\frac{3}{8}$  S [19, 30, 42, 53, 65, 76]  
 "Spin" [20, 43, 54, 64, 77, 1st  $\frac{1}{2}$  #10, 2nd  $\frac{1}{2}$  #31]

Start : 11:20 AM

Stop : 11:20 AM

Did Not Raise Core.

Blade before start 87 mils

" after speed 70 mils J.F.E.

H<sub>2</sub>O flow (Sprand Carbont) = 9 gal/min

He flow = 10 ft<sup>3</sup>

Pressure = 10" H<sub>2</sub>O

Motor = 26 amps.

Loading Pattern No. ①

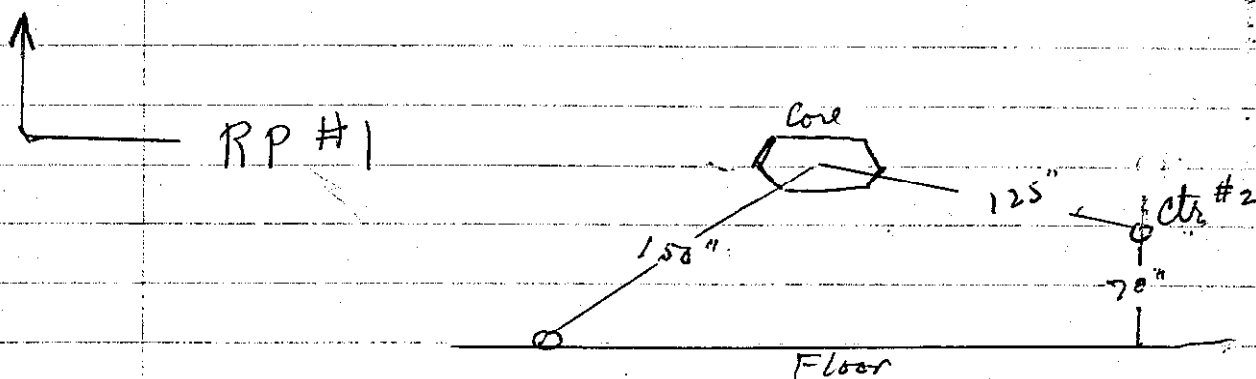
#19

| RP # (Chart Reading) |      |       |      |      |      |      |      |
|----------------------|------|-------|------|------|------|------|------|
| T.C.                 | 1    | 2     | 3    | 4    | 5    | 6    | 7    |
| 1                    | 36.0 | 39.5  | 39.5 | 40   | 38.8 | 39   | 39.5 |
| 2                    | 18.5 | 19.2  | 18.6 | 20.5 | 20.2 | 20.5 | 21   |
| 3                    | 25.5 | 25.1  | 25.5 | 25.5 | 25.4 | 25   | 25.3 |
| 4                    | 15.0 | 14.9  | 15.1 | 15   | 15   | 15   | 15   |
| 5                    | 17.1 | 17.1  | 17.5 | 17.2 | 17.2 | 17.1 | 17.1 |
| 6                    | 16.8 | 16.6  | 16.9 | 16.7 | 16.7 | 16.6 | 16.6 |
| 7                    | 22.2 | 22.0  | 22.2 | 22.3 | 22.2 | 22   | 22.1 |
| 8                    | 32.5 | 31.7  | 32.2 | 32.5 | 32.5 | 32   | 32.5 |
| 9                    | 15.7 | 15.6  | 15.8 | 15.6 | 15.6 | 15.5 | 15.5 |
| 10                   | 17.1 | 16.9  | 17.0 | 17.0 | 17.0 | 16.9 | 16.9 |
| 11                   | 18.6 | 19.1  | 18.2 | 19.2 | 20.4 | 20.5 | 21.4 |
| 12                   | 16.6 | 17.0  | 16.5 | 16.9 | 17.0 | 16.6 | 16.6 |
| 13                   | 26.3 | 25.9  | 26.2 | 26.1 | 26.1 | 25.9 | 26   |
| 14                   | 15.5 | 13.5? | 17.6 | 18.7 | 20.2 | 20.8 | 21.5 |
| 15                   | 19.0 | 19.1  | 18.1 | 20.0 | 21.0 | 21.6 | 22   |
| 16                   | 23.2 | 22.9  | 23.2 | 23.2 | 23.2 | 23.1 | 23.1 |

Chart Readings  $\times 1.5 = ^\circ\text{C}$

## Thermocouple Locations

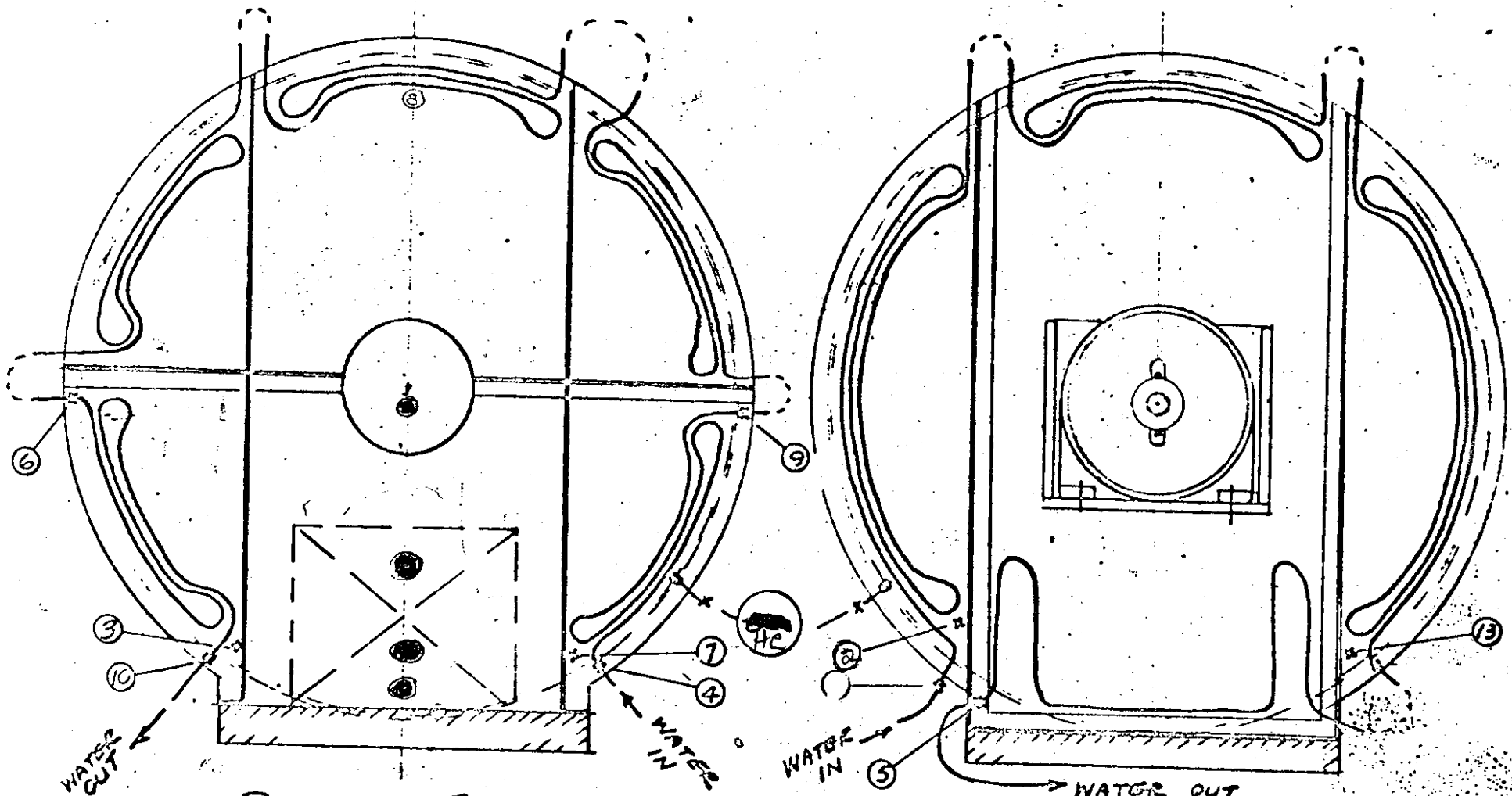
- |         |                                                               |
|---------|---------------------------------------------------------------|
| 40°C    | He — Periphery @ 4 o'clock looking South]                     |
| 57°C    | 1) — Live Center                                              |
| 28.2°C  | 2) — Between borat + Fe Sect 4 @ Core Center                  |
| 38.2°C  | 3) — on Shroud @ H <sub>2</sub> O out east (N)                |
| 22.5°C  | 4) — on H <sub>2</sub> O inlet west (N)                       |
| 26.2°C  | 5) — on H <sub>2</sub> O out west (S)                         |
| 28.2°C  | 6) — H <sub>2</sub> O line center east (S)                    |
| 33.6°C  | 7) — on shroud @ H <sub>2</sub> O in west (N)                 |
| 48.8°C? | 8) — on housing @ Vert $\phi$ of Core, 1/2" above top of Core |
| 23.4°C  | 9) — H <sub>2</sub> O line center west (N)                    |
| 25.5°C  | 10) — H <sub>2</sub> O out east (N)                           |
| 25.5°C  | 11) Top of Fuel pin #60                                       |
| 25.5°C  | 12) open                                                      |
| 39.4°C  | 13) — on shroud @ H <sub>2</sub> O line bottom east (S)       |
| ?       | 14) Center of Fuel #60                                        |
| ?       | 15) Bottom of " "                                             |
| 35.2°C  | 16) — on shroud @ H <sub>2</sub> O inlet west (S)             |



- #1 - Top Fuel Pin #60
- #16 - Center " "
- #12 - Bottom " "

22 Jan 69 2 3-5445

#2 and #12 - Switched



REACTOR SIDE  
(NORTH)

WATER OUT  
MOTOR SIDE  
(SOUTH)

SORA

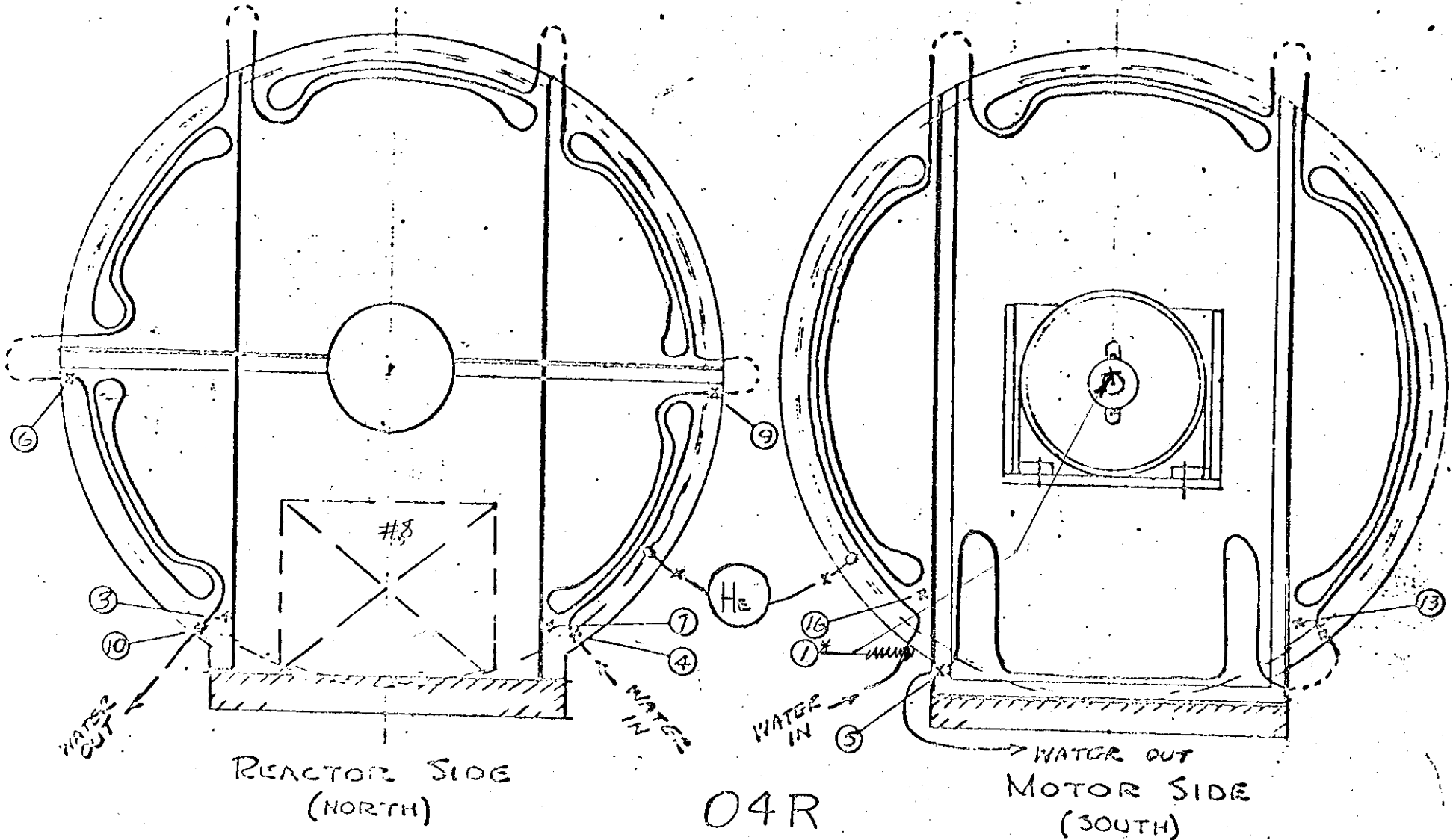
T-C LOCATIONS

as 14 Jan 69



25 Oct # 8 = Bad  
 # 2 = Top of Top Plug  
 12 Nov # 2 = Base Sect 4

9-25-68 \* #1 on "low center" at rear of motor shaft  
 14 Oct 68 \* # 2 between boron & Fe section  
 " # 8 on housing @ vert. E of core & 1/2" above top of core  
 " # 12 "open" (air)  
 " # 11 Top of Fuel #602 22 Oct 68  
 # 14 Center  
 # 15 Bottom



O4R  
 T-C LOCATIONS  
 as of 25 Sept 67

RP#1 Loading - Same

"SPIN"

Start: 11:56<sup>30</sup>

①

CORE STARTED UP @ 12:13 PM

Core @ 15" - BF<sub>3</sub> 2 = 282 cts 1 min

3 = 524 " 1 "

Core 21.55 -

2 = 250 " "

3 = 1151 " "

up

#1 = 22.39

#2 = 22.465

#3 = -4

#4 = -14

BF<sub>3</sub> 2 = 253 cts

3 = ~~232~~ cts

1187

1 min

BF<sub>3</sub> 1

2

3

170

233

1232

161

241

1187

153

227

1168

Aug

161

234

1196

"A" = 40  $\frac{10}{100}$

BARE

"D" = 38.5  $\frac{10}{100}$

BARE

"E" = 53 L-16

Core down 13:35 PM

Stop "Spin" @ 13:37 PM

RP#2 "Spin" - Start 13:44 <sup>PM</sup>

Loading - ~ - #6 [ 9 Fuel Pins ]

(2)

76 <sup>3/8</sup> U

18 <sup>1/4</sup> Fe

<sup>3/8</sup> S<sub>0</sub>

[ 1 → 9, and 4th <sup>1/4</sup> #10  
19, 30, 42, 53, 65, #10  
43, 54, 66, 1st <sup>1/2</sup> #10  
2nd <sup>1/2</sup> #31 ]

Core @ 21.55

1 min cts

BF<sub>3</sub> 1

2

3

131

267

1396  
~~1403~~

up

114

277

1403

125

288

1399

148

293

1536

Aug.

129

286

1453

<sup>1/m</sup>

pm

.818

.823

Stop - 14:15

Temp. OK

He = 40°C

BASE cts RP#1

cts

or  $\frac{1}{M}$

OCT 18 1968

193

|                   |               |        |      |              |     |     |
|-------------------|---------------|--------|------|--------------|-----|-----|
| DATE              | OCT 18 1968   |        |      |              |     |     |
| TIME              | 8:55          |        |      |              |     |     |
| CHANNEL           | Taylor & Lynn |        |      |              |     |     |
| RANGE             | 10            | 1000   | 2-16 | 1000         | 900 | 700 |
| SOURCE DIST.      | 8'            | OK     | 24'  | 8'           | 2'  | OK  |
| % F. S. [unclear] | 100           | -      | OK   | 100          | 100 | -   |
| BLDG. ALARM       | ✓             | ✓      | ✓    |              |     |     |
| AUX CTES.         | ✓             | ✓      | ✓    |              |     |     |
| SOURCES USED      | 227 & Y       |        |      | ALLOYS       |     |     |
| TABLES            | ✓             | LIGHTS | ✓    | AREA CLEARED |     | ✓   |

24  
12  
6  
3  
1 1/2

Run 318a Repeat Run 316.

Repeat  $P = +61.24 \text{ } \phi$  ✓  
 Repeat  $P = +61.14$  ✓

Run 319 Loading - 85  $\frac{5}{16}$  U  
 9  $\frac{5}{16}$  Fe [1 → 9, 11th  $\frac{1}{16}$  + 4th  $\frac{1}{4}$  #10]  
 3/8 So.



#10

$P = +56.24 \text{ } \phi$  ✓

∴ 11th  $\frac{1}{16}$  #10 = 4.95  $\phi$

194

RP#3

Loading - ~ - \$4.00 [6 Fuel Pins]

OCT 16 1968

(3)

79  $\frac{5}{16}$  U

15  $\frac{5}{16}$  Fe

$\frac{3}{8}$  S

[1 → 9, 11  $\frac{1}{16}$  + 4  $\frac{1}{4}$  #10  
53, 42, 30, 19, 43, 2nd  $\frac{1}{2}$  #31  
1st  $\frac{1}{2}$  #10]

Start: 10:57<sup>30</sup> Am

|      |       | 1 min cto       |            |            |             |
|------|-------|-----------------|------------|------------|-------------|
| Core | ⊙     | BF <sub>3</sub> | 1          | 2          | 3           |
|      | 21.55 |                 | 214        | 286        | 1602        |
|      | up    |                 | 238        | 329        | 1469        |
|      |       |                 | 234        | 327        | 1723        |
|      |       |                 | <u>236</u> | <u>288</u> | <u>1742</u> |
|      |       | Ang             | 236        | 315        | 1645        |
|      |       | $\frac{1}{m}$   | .682       | .743       | .727        |

Temp ok He = 40.5°C

Down: 12:07<sup>30</sup>

RP#4 Loading - ~ - 2.00 (3 Fuel Pins)

OCT 16 1968

(4)

82  $\frac{5}{16}$  U  
 12  $\frac{5}{16}$  Fe [ 1st 9, 11  $\frac{1}{16}$  #4  $\frac{1}{4}$  #10  
 3/8 So. [ 30, 19, 2nd  $\frac{1}{2}$  #31  
 1st  $\frac{1}{2}$  #10 ]

Start : 12:12 PM

| Core @ | 21.55 | 1 min cts        |      |      |      |
|--------|-------|------------------|------|------|------|
|        |       | B F <sub>3</sub> | 1    | 2    | 3    |
|        |       |                  | 266  | 444  | 2118 |
|        |       |                  | 264  | 438  | 2184 |
| Up     |       |                  | 298  | 477  | 2533 |
|        |       |                  | 291  | 472  | 2431 |
|        |       |                  | 272  | 504  | 2460 |
|        |       |                  | 287  | 484  | 2475 |
|        |       | $\frac{1}{m}$    | .561 | .483 | .504 |

Basode Pos indicator = ~~.34~~ .34 V

Temp. or He 40.5°C

Down - 13:33 PM

196

RP #5

Loading - ~ - \$1.50 [2 Fuel pins]

OCT 16 1968

83  $\frac{5}{16}$  U

11  $\frac{5}{16}$  Fe

$\frac{3}{8}$  So

[1 → 9, 11th  $\frac{1}{16}$  + 4th  $\frac{1}{4}$  #10]  
30 + 19.

(5)

Start: 13:42

| Core @ | 21.55         | BF <sub>3</sub> | 1 min cts |      |      |
|--------|---------------|-----------------|-----------|------|------|
|        |               |                 | 1         | 2    | 3    |
|        |               |                 | 331       | 490  | 2292 |
| up.    |               |                 | 326       | 529  | 2623 |
|        |               |                 | 331       | 582  | 2706 |
|        |               |                 | 342       | 492  | 2615 |
|        |               | Aug             | 333       | 534  | 2648 |
|        | $\frac{1}{m}$ |                 | .483      | .438 | .452 |

Blade Pos. = .34V

Temp OK He = 40.5° C

Down: 14:53 PM

RP#6 Loading =  $\sim \frac{1}{75}$  [ 1 Fuel Pin ]

OCT 16 1968

84  $\frac{5}{16}$  U  
 10  $\frac{5}{16}$  Fe [ 1  $\rightarrow$  9, 11<sup>th</sup>  $\frac{1}{16}$  + 4<sup>th</sup>  $\frac{1}{4}$  #10 ]  
 3/8 S.

(6)

Start - 14:59

|    | Core @ | 21.55 | B <sub>2</sub> F <sub>3</sub> | 1                             | 2    | 3    |
|----|--------|-------|-------------------------------|-------------------------------|------|------|
|    |        |       |                               | 334                           | 544  | 2600 |
| 3  | up     |       |                               | <del>680</del> <sup>346</sup> | 632  | 2944 |
| 6  |        |       |                               | 309                           | 637  | 3130 |
| 5  |        |       |                               | 326                           | 617  | 3683 |
| 18 |        |       | Avg                           | 327                           | 629  | 3052 |
| 52 |        |       | $\frac{1}{M}$                 | .492                          | .372 | .392 |

Blade Pos = .34V

Temp OK He = 40.5°C

Down : 15:40 PF



198

RP#7

Loading - Same as Run 319

OCT 1: 1968

88  $\frac{5}{16}$  U

9  $\frac{5}{16}$  Fe [1  $\rightarrow$  9, 11<sup>th</sup>  $\frac{1}{16}$  + 4<sup>th</sup>  $\frac{1}{4}$  #10]

$\frac{3}{8}$  S

~~\*~~

Start - 15:44

1 min etc

| Core @ 21.55 | BF <sub>3</sub> | 1   | 2   | 3    |
|--------------|-----------------|-----|-----|------|
|              |                 | 313 | 588 | 2772 |

up

|     |     |      |
|-----|-----|------|
| 389 | 732 | 3691 |
| 391 | 750 | 3666 |
| 367 | 745 | 3632 |

|               |      |      |      |
|---------------|------|------|------|
| Aug           | 382  | 741  | 3663 |
| $\frac{1}{m}$ | .421 | .316 | .327 |

Blade position - .34 V.

Temp ok He = 40.5°C

Down - 16:48

OCT 17 1968

| DATE         | OCT 17 1968 |        |      |              |     |     | SAFETY CHECK        |  |  |  |  |  |
|--------------|-------------|--------|------|--------------|-----|-----|---------------------|--|--|--|--|--|
| TIME         | 9:10        |        |      |              |     |     | AM BY Taylor & Lynn |  |  |  |  |  |
| CHANNEL      | A           | B      | C    | D            | E   | F   |                     |  |  |  |  |  |
| WADDER       | 1000        | up     | 2-16 | 1000         | 950 | 750 |                     |  |  |  |  |  |
| SOIL S. OK   | 5'          | OK     | OK   | 8"           | 2"  | OK  |                     |  |  |  |  |  |
| % H. S. 100  | 100         | —      | —    | 100          | 100 | —   |                     |  |  |  |  |  |
| BLOS. ALARM  | ✓           | ✓      | —    | —            | —   | —   |                     |  |  |  |  |  |
| AUX STPS.    | ✓           | ✓      | —    | —            | —   | —   |                     |  |  |  |  |  |
| SOURCES USED | 227 +       |        |      |              |     |     | ✓                   |  |  |  |  |  |
| TABLES       | ✓           | LIGHTS | ✓    | AREA DELETED |     | ✓   |                     |  |  |  |  |  |

Run 320

Repeat Run 319.

Sect 3 has been Scramed since Run 319.

P = +55.82 \$

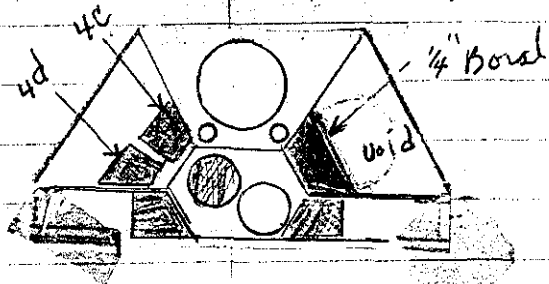
OCT 21 1968

| DATE OCT 21 1968 |         | SAFETY CHECK  |              |
|------------------|---------|---------------|--------------|
| TIME             | 9:45    | Taylor & Lynn |              |
| OPERATOR         |         |               |              |
| RODS             | 1000    | OP L-16       | 1000 P00 200 |
| SCISSOR          | 24" OK  | OK            | 8' 2' OK     |
| SCISSOR          | 100     | -             | 100 100      |
| SCISSOR          | ✓       | ✓             | ✓            |
| SCISSOR          | ✓       | ✓             | ✓            |
| SCISSOR          | 257 ± 8 |               | ✓            |
| TABLES           | ✓       | ✓             | ✓            |

SECTION 2 #4 Interchanged.

Run 321 Loading - 85 u

10 FE [1 → 10]



$P = 34.46 \text{ } \phi \text{ } \checkmark$

∞ with Rod 4c (on overhead drive)

Central blade gain  $g \sim 6 \text{ } \phi \text{ } \checkmark$

∞ Rod 4c = 6.63

Rods 4c and 4d = Fe

1" dia BF<sub>3</sub> in hole 3 b

1/4" Scit in NW top plug.

Rod c Traverse

Rod 4c = 82.7  $\phi$

322 Accelerator in place, in BN L # 2.

Loading - 85 1/4 u

9 3/4 Fe [1 → 9 and ~~1/2~~ 4 # 10]

$P = +57.3 \text{ } \phi$



#10

⑧

OCT 31 1968

RP#8

"Spin"

TC #2 + #12 = air

Start - 12:27 <sup>30</sup>

Core up @ 12:57 ✓

He = 40.5° C

Blade Pos = .42 V,

| TC      | He      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14 | 15 | 16   |
|---------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|----|------|
| @ 13:20 | 40.5° C | 35.5 | 17.1 | 25.5 | 14.9 | 17.1 | 16.5 | 22.2 | 32.1 | 15.5 | 16.8 | 18.5 | 16.9 | 26.2 | ?  | 18 | 22.2 |

Tc = chart readings (times 1.5 = °C)

Tc #1 drifting down

Core down @ 14:34

RP#8a

Core down, Blade Spinning.

Stop - 14:41 <sup>30</sup> ✓

15:15

"Spin" to check Tc #1 after adjusting.

Blade pos. = .43 V

#1 = OK

Down @ 15:24

RP #9

During "Bump" = 0.3 VOLT

He = 10 ft<sup>3</sup>, 26 ampsStart - 09:28H<sub>2</sub>O = 9 gal/min, Press = 10" H<sub>2</sub>O

Core up - 09:46

Blade @ .42 V

STOP - 10:13

He = 40.5° C

| TC             | 1  | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
|----------------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Chart Readings | 43 | 17.2 | 24.5 | 14.9 | 17.0 | 16.5 | 21.8 | 30.6 | 15.5 | 16.8 | 17.5 | 17.2 | 25.5 | 17.5 | 17.4 | 22.3 |

RP #10Start - 10:36

Core up - 10:43

Blade @ .42 V

" down - 12:09

Stop - 12:09 30

He = 40.5° C

| TC            | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Chart Reading | 41.5 | 17.1 | 25.1 | 14.9 | 17.0 | 16.4 | 22.0 | 32.0 | 15.3 | 16.6 | 18.3 | 17.2 | 25.8 | 17.6 | 19.8 | 22.5 |

\* TC #12 now top of fuel #60  
#11 air

OCT 22 1969

Found that cone and top plug were  
Run 325 not properly adjusted.

Loading -  $84 \frac{11}{16}$  U  
 $10 \frac{5}{16}$  Fe [1 → 9, 2nd  $\frac{1}{2}$  #19, 1st  $\frac{1}{2}$  + ~~23~~  $\frac{1}{16}$  #10]

up #1 = 22.62

#2 = 22.687

#3 = -1

#4 = -2

$P = 49.62 \neq$

Blade @ .3V

326 Loading -  $84 \frac{13}{16}$  U  
 $10 \frac{3}{16}$  Fe [1 → 9, 2nd  $\frac{1}{2}$  #19, 1st  $\frac{1}{2}$  + ~~23~~  $\frac{1}{16}$  #10]



#19



#10



$P = 55.34 \neq$

Made seven blade traverses

E to W = 71.25 sec travel time

.4912 cm/sec from

print tapes

.4854 cm/sec by using stop

watch over 23 cm travel

(NO STARTS OR STOPS INVOLVED)

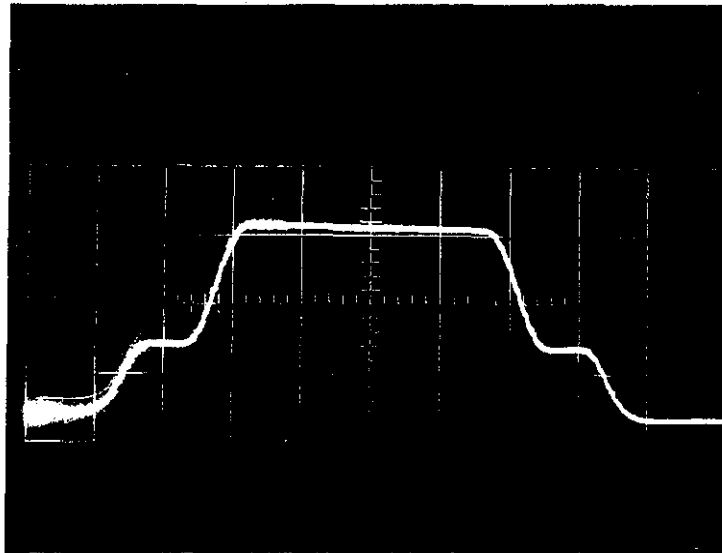
USE

*[Faint handwritten notes]*

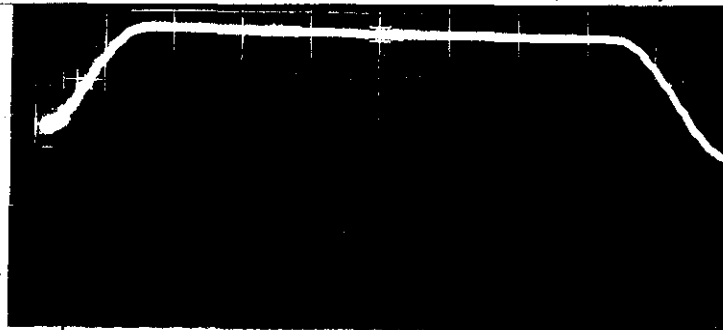
OCT 23 1968

205

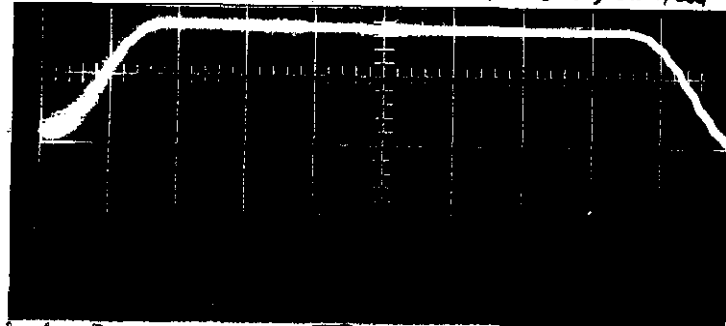
Velocity of Motion of Be moving past the  
CORE. The following photos are the output of  
Proximity gage as the Be is moved for the  
 $\rho$  vs position of the blade.



10/23/68 BLADE MOTION - SLOW SCAN 53/cm; .14/cm



10/23/68 BLADE MOTION - WEST 2.53/cm; 0.14/cm



10/23/68 BLADE MOTION - EAST 2.53/cm; .14/cm

OCT 22 1968

DATE OCT 22 1968

## SAFETY CHECK

TIME 8:25

Taylor &amp; Lyman

CORRECTION

DIP

100

OK

L6

1000

900

250

CIRCUIT BREAKER

30"

OK

24"

6"

2"

OK

CIRCUIT BREAKER

100

100

100

100

CIRCUIT BREAKER

✓

✓

✓

ASST. DIR.

✓

✓

✓

SOURCE USED

227 + ✓

BIBLIOGRAPHY

✓

TABLES

✓

AREA SECURED

✓

Run 323 Repeat Run 322, Reactivity Check.  
Blade position' .31 V

$$P = +58.34 \text{ f}$$

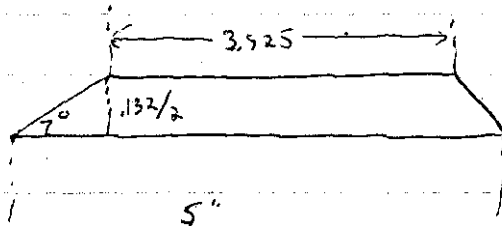
324 Loading -  $85 \frac{3}{16}$  U
 $9 \frac{13}{16}$  Fe [1 → 9, 1st  $\frac{1}{2}$ , 11  $\frac{1}{16}$  + 4  $\frac{1}{4}$  #10]

$$P = +55.06 \text{ f}$$

#10



TIME IT TAKES TO MOVE ACROSS THE FLAT  
SURFACE OF BK IS 17.5 m going east  
17.5 m going west



velocity is  $\frac{3.925}{17.5} = .2243 \frac{\text{in}}{\text{sec}} \rightarrow .569 \frac{\text{cm}}{\text{sec}}$

OCT 23 1968

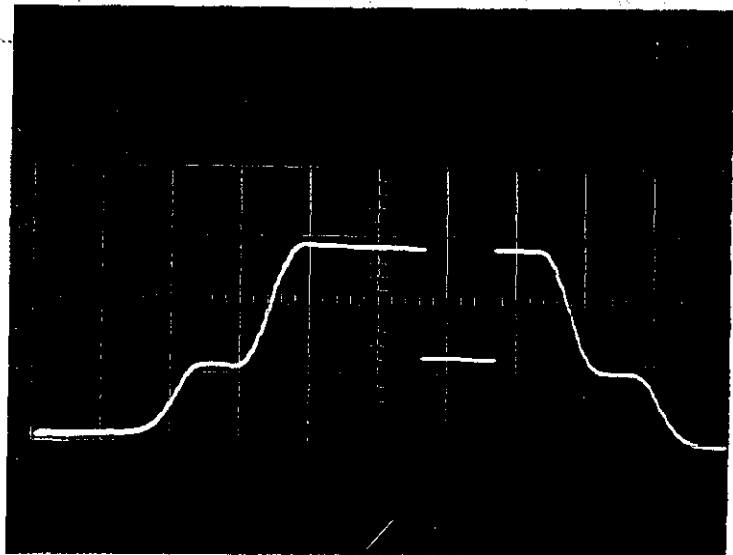
| DATE         |         | OCT 23 1968    |         |             |       |
|--------------|---------|----------------|---------|-------------|-------|
| TIME         |         | 9:50           |         |             |       |
| NAME         |         | Taylor + Flynn |         |             |       |
| CHANNEL      |         |                |         | E           | F     |
| RANGE        | 10      | opr L-16       | 1000    | 900         | 750   |
| SOURCE DIST. | 10"     | OK             | 30"     | 10"         | 2" OK |
| % F. S. T.W. | 100     | 100            | 100     | 100         | —     |
| BLOCK ALARM  | ✓       | ✓              | ✓       |             |       |
| AUX CTAS.    | ✓       | ✗              | ✓       |             |       |
| SOURCES USED | 227 + 8 |                | MAGNETS |             | ✓     |
| TABLES       | ✓       | LIGHTS         | ✓       | MARK SCALED | ✓     |
|              |         |                |         |             |       |

Run 327 Repeat Run 326

$$P = +56.36 \text{ †}$$

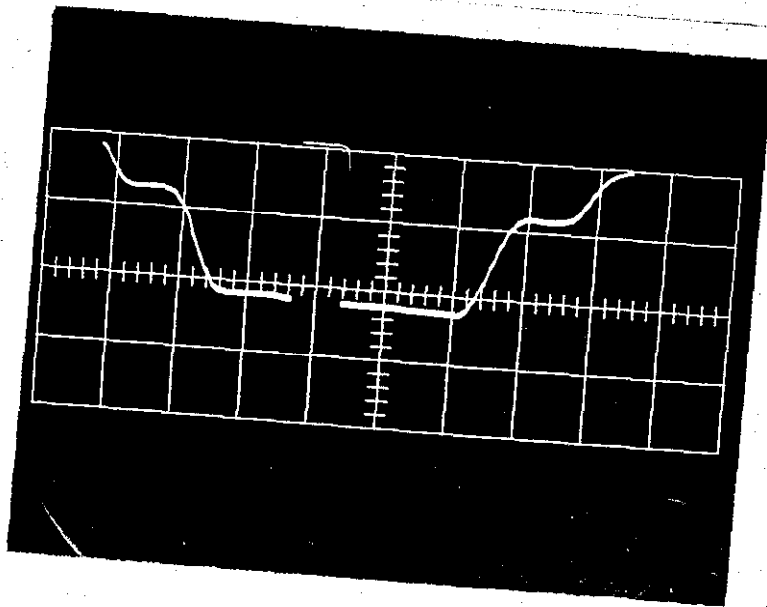
Blade Traverse made on ERR to get picture.

With +56 † shut down with Core, normal speed. (Printed Petle.)



1 mV/cm 1 V/cm BLACK MOTION TO LEFT

measured on lead found by the core at the  
 res - it - maximum the scale on the trace was

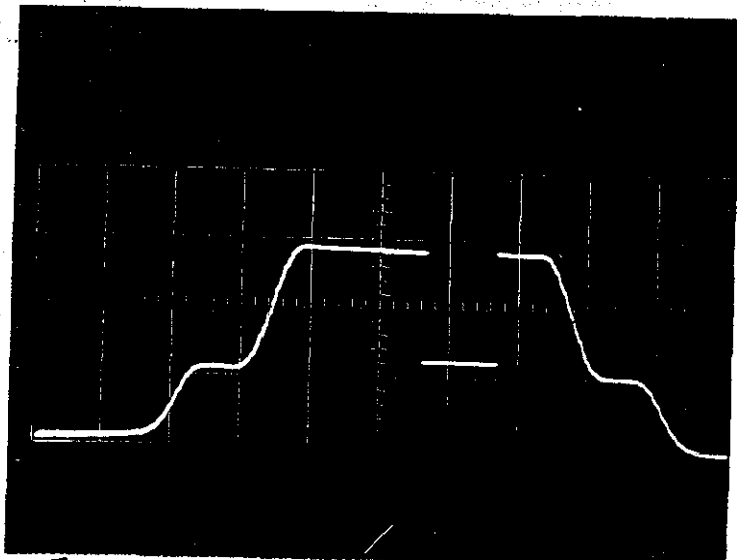


let put  
 out on

it is indicated



R170  
 T335  
 L155



2 mV/cm, 1 V/cm BLA06 MOTION TO EAST

$\rho$  measured on blade moved by the core at the  
 sensitivity maximum the scale on the trace was  
 changed:

3.85 cm to 7.4 — 3.55 cm on flat part

MAX  $\rho$  at 5.65 1.8 cm past start on

0.025 part middle

or .06067 cm part midpoint as indicated

by the graph

R.P.# 11

Looking for effect of Acc trigger time with respect to blade motion on the pulse slope

Blade pos. .29 V

start - 10:56 <sup>20</sup>

Core up - 11:

Blade @ .39 V

core down - 16:24 <sup>30</sup>

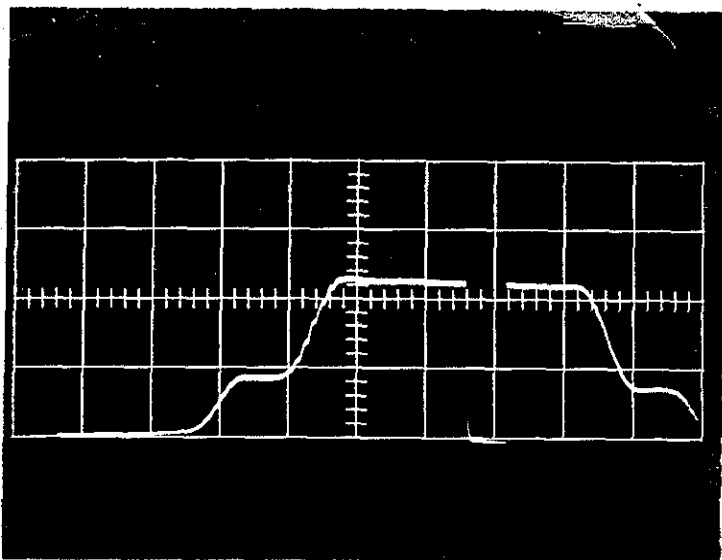
He = 40.5°C

BF<sub>3</sub> 3 = 1300 Cts  
Min

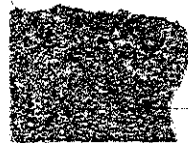
13:45 (ch. read x 1.5 = °C)

| TC            | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13 | 14 | 15 | 16   |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|----|----|----|------|
| Chart Reading | 36.2 | 17.1 | 25.0 | 14.5 | 16.8 | 16.1 | 21.8 | 32.0 | 15.1 | 16.5 | 18.0 | 25.6 | 20 | 20 | 20 | 22.8 |

Stop - 16:25



2.17  
T 34.5  
R 1.5



OCT 24 1968

| DATE         |                   | SAFETY CHECK   |      |                  |     |     |
|--------------|-------------------|----------------|------|------------------|-----|-----|
| DATE         | OCT 24 1968       | Taylor & Lyman |      |                  |     |     |
| TIME         | 10:20             |                |      |                  |     |     |
| CHANNEL      |                   |                |      |                  |     |     |
| RANGE        | $\frac{10}{1000}$ | off            | L-16 | $\frac{1}{1000}$ | 900 | 250 |
| SCALES       | 2"                | OK             | 24"  | 8"               | 2"  | OK  |
| % F. S.      | 100               | -              | 100  | 100              | 100 | -   |
| BLDG. ALARM  | ✓                 | ✓              | ✓    |                  |     |     |
| AUX. CTNS.   | ✓                 | ✓              | ✓    |                  |     |     |
| SOURCES USED | 227 + 8           |                |      |                  |     |     |
| TABLES       | ✓                 | LIGHTS         | ✓    | AREA CLEARED     | ✓   |     |

"A" = out of pig with cd  
Bldg Alarm "B" tripped but seemed slow

Run 328 Repeat of Run 327, except for addition of Scient. ( $\frac{1}{2}$ " counter now behind Sect. 4 @ Core & Blade @ .3 V.  $\rho = 56.2 \text{ } \phi \leftarrow$   
Up #1 = 22.

Dropped Core @ normal speed for .2 min @ 13,615 9.005"  

|      |       |   |
|------|-------|---|
| .1 " | 8.85  | ↑ |
| .1 " | 4.09  |   |
| .1 " | 0.235 |   |

 45"/min

329 Repeat of 328, Scient. away.  $\rho = 55.92 \text{ } \phi$   
 Core Normal down @ 4.39"  
 .4 min = 18.23"  
 45.575"/min

OCT 24 1960

"Spin" 49.8 ~~11.5~~ as 4 ~~211~~

RP #12 Scint. (1/2") behind Sect. 4.

Start - 11:38 Blade @ .43V

Core up - 12:27

down 15:07

He = 40.5°C

STOP - 15:08

|                       |                    |            |
|-----------------------|--------------------|------------|
| RP #12 & Counts (JTM) | BF <sub>3</sub> #2 | 3          |
| 2 1/2 min             | 1092               | 2 min 1800 |
| "                     | 1154               | " 1797     |

|      |       |     |      |
|------|-------|-----|------|
| #12c | 2 min | 977 | 2055 |
|      |       | 825 | 1982 |
|      |       | 896 | 1955 |

|      |  |     |      |
|------|--|-----|------|
| #12d |  | 960 | 2058 |
|      |  | 913 | 1926 |

|      |     |                |                      |
|------|-----|----------------|----------------------|
| #12e | 847 | <del>882</del> | 1925                 |
|      | 920 | <del>874</del> | 1947 <del>1956</del> |
|      | 909 | <del>796</del> | 1809 <del>1674</del> |

|      |                |                    |
|------|----------------|--------------------|
| #12f | 772, 847 + 800 | 1707, 1765, 1562   |
|      | 675 + 676      | 1418 + 1420        |
|      | 701, 663 + 711 | 1439, 1440 + 1508  |
|      | 618, 677 + 575 | 1291, 1031, + 1287 |

|                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| TC             | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Chart Readings | 38.5 | 17.0 | 25.0 | 14.4 | 16.6 | 15.0 | 21.8 | 31.5 | 15.0 | 16.2 | 17.5 | 18.7 | 25.8 | 19.0 | 22.5 | 20.0 |

Voltages on B display need to be high by 33%  
Displacement error output may be too high by 33%.



| DATE        |                   | SAFETY CHECK     |      |              |     |    |
|-------------|-------------------|------------------|------|--------------|-----|----|
| TIME        | 8:20              | by Taylor & Lynn |      |              |     |    |
| CHANNEL     |                   |                  |      |              |     | F  |
| RANGE       | $\frac{10}{1000}$ | 1000             | 1000 | 900          | 750 |    |
| SCOPES      | 2"                | ok               | 30"  | 8"           | 2"  | ok |
| % F. S. T.  | 100               | 100              | 100  | 100          |     |    |
| BLDG. PLUGS |                   | ✓                | ✓    | ✓            |     |    |
| AUX. CHES.  |                   | ✓                | X    | ✓            |     |    |
| SOURCES     | 227 + 8           |                  |      |              |     | ✓  |
| TABLES      | ✓                 | LIGHTS           | ✓    | AREA CLEARED | ✓   | ✓  |

Run 330

Repeat Run 328.

core up #1 = 22.64

P = +59.16 #

core @ 21.87 = -9.87 #

" 20.27 = -147.9 #

331

Loading - 84 3/4 u

10 1/4 Fe [1 -> 9, 2nd 1/2 #19, 1st 1/2 + 4th 1/4 #10]

(10)



#19 #10

Core @ 21.53 = -39. #

P = 55.28 #

@ ~~21.97~~ <sup>19.61</sup> = -219.1 #

@ 18.38 = -413.5

(TC #8 "Open" Rod  
#2 TOP OF TOP PLUG)

RP #13

Start - 10:05

Core up @ 10:33

" down

STOP - 16:50

Blade @ 1345 V.

He = 40.5 °C

(6.75 hrs)

14:35 (Chart readings times 1.5 = °C)

| TC             | 1    | 2  | 3  | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16 |
|----------------|------|----|----|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Chart Readings | 39.5 | 20 | 25 | 14.1 | 16.5 | 15.6 | 21.5 | 14.5 | 15.8 | 17.1 | 18.2 | 25.6 | 17.5 | 20.5 | 22.2 |    |

BF<sub>3</sub> # 3 - 5 min ets

13A - 2931

- 3000

B - 2463

- 2220

C - 4034

- 4250

13D - 3425

E - 4611

F - 4578

G - 3478

OCT 29 1968

| DATE         |         | SAFETY CHECK  |      |              |       |
|--------------|---------|---------------|------|--------------|-------|
| TIME         | 9:00    | Taylor & Lynn |      |              |       |
| CHANNEL      | 1       | D             | E    | F            |       |
| RESIST       | 1000    | OPR L-16      | 1000 | 900          | 750 ✓ |
| COND         | 24" OK  | 30" 8"        | 2"   | OK           |       |
| % E. S. 1    | 100     | 100           | 100  | 100          |       |
| BLDG. ALRT   | ✓       | ✓             | ✓    |              |       |
| AUX CTRS.    | ✓       | X             | ✓    |              |       |
| SOURCES USED | 227 + 8 |               |      |              | ✓     |
| TABLES       | ✓       | LIGHTS        | ✓    | AREA CLEARED | ✓     |

Run 332 Repeat Run 331.

$$P = 54,39 \text{ \textcircled{+}}$$

$$\text{Core up \#1} = 22.64$$

$$\textcircled{+} \quad 21.12 = -71.1 \text{ \textcircled{+}} \quad 70.1$$

$$\textcircled{+} \quad 19.13 = -2.86$$

216

RP#14

Start @ 1324.

Blade @ .35 V

Core up @ 1355

Down @ 1437

$T_c = 40.5^\circ C$

Stop @ 1803

| $T_c$          | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Chart Readings | 39.5 | 18.5 | 28.0 | 13.5 | 15.6 | 18.1 | 20.9 | 13.9 | 15.2 | 17.5 | 18.3 | 24.9 | 16.9 | 17.2 | 21.5 |    |

| SAFETY CHECK |         |        |     |               |      |     |
|--------------|---------|--------|-----|---------------|------|-----|
| DATE         | 7/27/80 |        |     |               |      |     |
| TIME         | 8:30    | AM     | BY  | Taylor & Lynn |      |     |
| CHANNEL      | 10      | D      | C   | D             | E    | F   |
| RANGE        | 1000    | epc    | L46 | 1000          | 900  | 950 |
| SOURCE DIST. | 10"     | OK     | 30" | 8"            | 2"   | OK  |
| % F. S. TOIP | 100     | -      | 100 | 100+          | 100+ | -   |
| BLDG. ALARM  | ✓       | ✓      | ✓   | -             | -    | -   |
| AUX CTRS.    | ✓       | X      | ✓   | -             | -    | -   |
| SOURCES USED | 227+X   |        |     | MAGNETS       | ✓    |     |
| TABLES       | ✓       | LIGHTS | ✓   | AREA CLEARED  | ✓    |     |

Run 333 Loading

BLADE STATIC = .22 VOLTS.

Bump = .25 "

Loading - 84 1/4

10 3/4 [1 → 10 + 1st 3 (1/4) #19]



P = 22.80 #

#19

Rod 4C

Blade Traverse E to E  
 then E to W  
 E to W  
 then W to E

RP#15a Blade static = .22 volts  
 Bump = .25 volts

Start - 12:10

Stop - 12:56 Stopped to investigate a sound over speaker. Found CTU Post "Ring pin" (no relevance to O4R) had fallen to floor. Completely moved from the assembly this and the other pin.

Run

RP#15b START 13:22 Core up @

sect 2

Stop @ 15:07 down @ 15:06 ~~30~~

14:55

| TC             | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16 |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Chart Readings | 39.5 | 19.5 | 24.5 | 13.4 | 15.5 | 15.0 | 20.7 | 13.6 | 15.1 | 16.6 | 18.0 | 24.8 | 18.0 | 18.2 | 21.5 |    |

NOV 1 1968

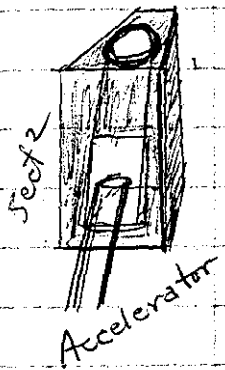
NOV 1 1968

NOV 5 1968

| DATE         |         | NOV 5 1968 |                   |              |     |     |  | SAFETY CHECK |  |
|--------------|---------|------------|-------------------|--------------|-----|-----|--|--------------|--|
| TIME         | 9:00    | AM         | BY Taylor + Lyman |              |     |     |  |              |  |
| CHANNEL      | 10      |            |                   |              |     |     |  |              |  |
| RANGE        | 1000    | opt        | L-16              | 1000         | 900 | 750 |  |              |  |
| SOURCE DIST. | 10"     | OK         | 24"               | 6"           | 2"  | OK  |  |              |  |
| % F. S. TRIP | 10      |            | 100               | 100          | 100 |     |  |              |  |
| BLDG. ALARM  |         | ✓          | ✓                 | ✓            |     |     |  |              |  |
| AUX CTRS.    |         | ✓          |                   | ✓            |     |     |  |              |  |
| SOURCES USED | 227 & 8 |            | MAGNETS           |              |     |     |  | ✓            |  |
| TABLES       | ✓       | LIGHTS     | ✓                 | AREA CLEARED |     |     |  | ✓            |  |

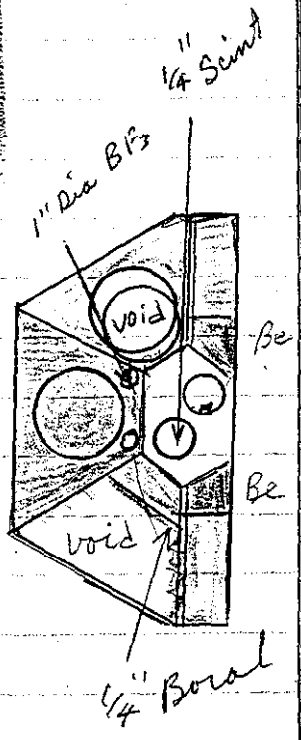
Run 334

Sect 2 now = original Sect 4 piece with cut out for accelerator nose -  
Sect 4 = BNL, void with 1/4" Boral



Loading -  $86 \frac{1}{2} \mu$   
 $8 \frac{1}{2} \text{ Fe } [1 \rightarrow 4, 6 \rightarrow 9 + 2^{\text{nd}} \frac{1}{2} \#5]$

Sub critical -



16  
21.5

335 Loading -  $88 \mu$   
 $7 \text{ Fe } [1, 2, 3, 6, 7, 8 + 9]$

$\rho = +39.9 \phi$

Blade @ east limit =  $-3.96$

NOV 7 1968

| DATE         |         | NOV 7 1968   |      |              |     |     | SAFETY CHECK |  |
|--------------|---------|--------------|------|--------------|-----|-----|--------------|--|
| TIME         | 2:00    | Taylor + Hym |      |              |     |     |              |  |
| CHANNEL      |         | F            |      |              |     |     |              |  |
| RANGE        | 1000    | op           | L-16 | 1000         | 900 | 750 |              |  |
| SOURCE       | 8" OK   | 24"          | 8"   | 2"           | OK  |     |              |  |
| % F. S. 100  | 100     | 100          | 100  | 100          | 100 | 100 |              |  |
| BLED, ALK    | ✓       | ✓            | ✓    |              |     |     |              |  |
| AUX COND.    | ✓       |              | ✓    |              |     |     |              |  |
| SOURCES USED | 227 + 8 |              |      |              |     |     |              |  |
| TABLES       | ✓       | LIGHTS       | ✓    | AREA CLEANED |     |     |              |  |

Run 336

An attempt to see if the But of Rotor Blade is contributing to the reactivity of the Core as it ~~passes~~ passes. Blade Rotated 180° on drive.

Sect 2 all Fe, Sect 4 all Fe, except for the 1/4" Boralt Sect 3 all Fe.

Loading - 91 u

4 Fe [1, 2, 8 + 9]

Supr crit

#1 = 21.70

up #1 = 22.62

337

Loading - 90 u

5 Fe [1, 2, 7, 8 + 9]

$\rho = +13.21 \%$

Rotated But  $\approx 15$  cm

$\rho = +1.61 \%$

$\Delta \rho = 11.60 \%$

338

Rotated blade 90° from position in 337.

used Shim to get Power.

$\rho = -14.05 \%$

18 3/4" from  $\leftarrow$

Pulled Shim

Rotor But  
= 27.26 %



NOV 8 1968

|              |                                                     |              |      |
|--------------|-----------------------------------------------------|--------------|------|
| DATE         | NOV 8 1968                                          | SAFETY CHECK |      |
| TIME         | 1:15                                                | Taylor       | Lynn |
| CHANNEL      |                                                     | E            | F    |
| RANGE        | $\frac{10}{1000}$ OFF L-16 $\frac{1}{1000}$ 900 750 |              |      |
| SCORING      | 8" OK 24" 8" 2" OK                                  |              |      |
| % E. S.      | 10 100 100 100+                                     |              |      |
| BLDG. ALARM  | ✓ ✓ ✓                                               |              |      |
| AUX GING.    | ✓ * ✓                                               |              |      |
| SOURCES USED | 227 + 8                                             | MASTERS      | ✓    |
| TABLES       | ✓                                                   | LIGHTS       | ✓    |
|              |                                                     | AREA CLEARED | ✓    |

Alarm "B"  
still has  
slow response

"A" - Voltage adjustment by ERR

Run 339

Loading -  $88\frac{3}{8}$  U  
6 Fe [1,2,3,7,8+9] LN 0.0006  
 $\frac{5}{8}$  void #58 for counter

$\rho = +30\%$

Ratio of counts in two beam BF<sub>3</sub> counter  
at the back side of the 4x4x1.5 Polyethylene  
To see how the efficiency of the counter  
differs

|    |        |    |        |
|----|--------|----|--------|
| #1 | 141320 | #2 | 133562 |
|    | 141564 |    | 135714 |
|    | 167944 |    | 159663 |
|    | 140508 |    | 134300 |

|              |            |     |           |
|--------------|------------|-----|-----------|
| #1           | 1750 V     | #2  | 1780 V    |
| GAIN         | 1x1        |     | 8x1       |
|              | 12 $\mu$ m |     | 2 $\mu$ m |
| PHS          | 20         | PHS | 10        |
| NOISE AT PHS | 4          | PHS | 1.2       |

222

Run 340

Repeat 339

$\rho = +30$  \$

$L_n = 0.001$

PHS 10 78645 M

PHS 8 77733

81052 JT

81223

83973 JT

85071

84849 JM

84181

85650

85209

87051

86723

87821

87514

88489

88455

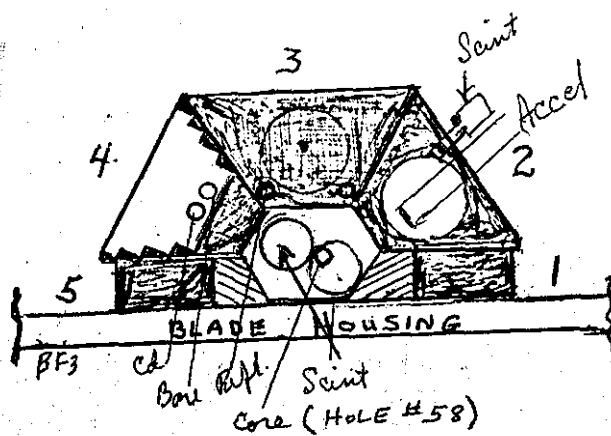
GRAV 16x1

16x1

HV

1700 V

1700 V

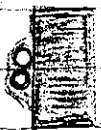


NOV 1968

|              |                                    |               |                  |              |                  |
|--------------|------------------------------------|---------------|------------------|--------------|------------------|
| DATE         | NOV - 1968                         | SAFETY CHECK  |                  |              |                  |
| TIME         | 2:45                               | Taylor & Lynn |                  |              |                  |
| CHANNEL      | A                                  |               | F                |              |                  |
| RANGE        | $\frac{10}{1000}$                  | opr L-16      | $\frac{1}{1000}$ | 900          | 750              |
| SCATTER      | 8"                                 | OK            | 20"              | 8"           | 2" OK            |
| % F. S.      | 100 <sup>+</sup>                   |               | 100              | 100          | 100 <sup>+</sup> |
| BLED. ALARM  | -                                  | *             | -                |              |                  |
| AUX GENS.    | Counters now involved in PD4 + TMC |               |                  |              |                  |
| SOURCES USED | 227 + X                            |               |                  |              |                  |
| TABLES       | -                                  | LIGHTS        | -                | AREA CLEARED | -                |

Run 341 all Counters and Accelerator in place.

- ① BF<sub>3</sub> (1" dia) - Rod Hole 3-b
- ① BF<sub>3</sub> ( $\frac{3}{8}$ " ) - Fuel Hole #58
- ② " " -  $\frac{1}{2}$ " of core ~~at~~ behind 4" X 4" X 1 $\frac{1}{2}$ " poly scatter located in BNL Scatter, 1 ctr Cd covered inside Cd covered unit, no Cd on core side of unit.



- ① Scint  $\frac{1}{4}$ " - Top plug NW
  - ① "  $\frac{1}{2}$ " - Near Accel. Target sect 2.
- Accelerator as p. 219.

Loading -  $88 \frac{3}{8}$  u  
 6 Fe [1, 2, 3, 7, 8 + 9]  
 $\frac{3}{8}$ " void #58

$P = +40.66 \#$

342 Blade worth -  
 pulled blade away -  $P = - \# 4.41$   
 Blade =  $\# 4.81$  ←

|              |                       |                 |                  |      |      |                |
|--------------|-----------------------|-----------------|------------------|------|------|----------------|
| DATE         | NOV 12 1968           |                 | SAFETY CHECK     |      |      |                |
| TIME         | 9:00                  | AM              | BY LYNN & TAYLOR |      |      |                |
| CHANNEL      | A                     | B               | C                | D    | E    | F              |
| RANGE        | $\frac{10}{1000}$ DPR | $\frac{4}{600}$ | $\frac{1}{1000}$ | 900V | 750V |                |
| SOURCE DIST. | 0                     | OK              | 20"              | 8"   | 2"   |                |
| % F. S. TRIP | 100+*                 | OK              | OK               | 100  | 100  | OK             |
| BLDG. ALARM  | ✓                     | ✓               | ✓                |      |      |                |
| AUX CTRS.    |                       |                 |                  |      |      |                |
| SOURCES USED | 227 & 1               |                 |                  |      |      | MAGNETS ✓      |
| TABLES       | ✓                     | LIGHTS ✓        |                  |      |      | AREA CLEARED ✓ |

\* Is sluggish on tripping of relay (red light).  
 \*\* A is out of trip circuit and is showing a large shift in trip relation pt.

Run 343 Loading - ~~88  $\frac{13}{16}$  U~~ 88  $\frac{9}{16}$  U  
 5  $\frac{13}{16}$  Fe [1, 2, 7, 8, 9 + 1st  $\frac{1}{2}$  + Top  $\frac{5}{16}$  #3]  
 $\frac{5}{8}$  void #58



$P = +58 \text{ } \phi$

#3

Made 5 blade sweeps each direction.

| Counters      | #1      | 30 sec counts | #2 (Cd covered) |
|---------------|---------|---------------|-----------------|
| Unit          | 220,730 | Log N = .0032 | 27,888 7.91     |
| behind Sect 4 | 219,543 | Q = 36 H-14   | 27,977 7.96     |
|               | 218,206 |               | 27,749 7.86     |
|               | 217,430 | 214,234       | 28,080 7.74     |
|               | 203,681 | 209,472       | 26,431 7.71     |
|               | 193,584 |               | 25,896 7.47     |
|               |         |               | 27,685 7.74     |
|               |         |               | 27,376 7.65     |
|               |         |               | avg 7.74 ±      |

344 After Counter Changes (JTM + E'RR)

Back to  $\infty$  @ .00045

72,594  
72,859

36 sec/min

19,242 7.09  
10,104 7.21

down 12:32

7.10 ± .10

RP#16

Bump = 0.27 VOLTS

(Run for ERR)

Run = .38 Volts

Start @ 13:30

Inst. Normal

stop @ 13:53

Temp Normal

Did Not Raise Core.

of  
and  
a  
in  
st.

ed)

774  
685  
376

NOV 13 1968

PD4 into Bldg

R. ENGLE

E. CARROL

774#

10

NOV 13 1968

DATE NOV 13 1968 SAFETY CHECK

TIME 2:15 Taylor + Lynn

| CHANNEL      | A       | B      | C    | E            | F       |
|--------------|---------|--------|------|--------------|---------|
| RANGE        | 1000    | op     | L-16 | 1000         | 900 750 |
| SCALES       | 2'      | 5/16   | 20"  | 8"           | 2" OK   |
| % F. S. E.   | 100+    |        | 100  | 100          | 100+    |
| BLEED ALARM  | ✓       | *✓     | ✓    |              |         |
| AUX GND      |         |        |      |              |         |
| SOURCES USED | 227 + 5 |        |      |              | ✓       |
| TABLES       | ✓       | LIGHTS | ✓    | AREA CLEARED | ✓       |

Run 345 Loading as Run 343.

To make blade traverses. Drive meter now mounted 6" from big inter. shaft.

Tronl = 38.7 cm in .645 <sup>mm</sup> sec  
60 cm/min (center of Be)

$\rho = +48 \#$

346 Sect 3 adjusted in

$\rho = +62 \#$

347 Sect 3 set and fixed at a position.

Loading - 88 <sup>1</sup>/<sub>4</sub> # 4



#3

must have been 88 <sup>1</sup>/<sub>4</sub> # 5 <sup>7</sup>/<sub>8</sub> Fe [1, 2, 7, 8, 9 + 1st 1/2 + top 3/8 # 3]  
5/16 void #58

$\rho = +5335 \#$

Made blade measurements, made one direction at the time, starting just off center (+35 #). Had to do this to keep enough current for Pitter

NOV 18 1968

|              |             |               |       |
|--------------|-------------|---------------|-------|
| DATE         | NOV 18 1968 | SAFETY CHECK  |       |
| TIME         | 11:40       | Taylor + Lynn |       |
| CHANNEL      |             | L             | F     |
| RANGE        | 1000        | 46            | 900   |
| SOURCE DIST. | 2' OK       | 20' 6"        | 2' OK |
| % F. S. TRIP | 100+        | 100           | 100+  |
| BLDG. ALARM  | ✓ *         | ✓             |       |
| AUX. CTFS.   |             |               |       |
| SOURCES USED | 227 + 8     | MAGNETS       | ✓     |
| TABLES       | ✓           | LIGHTS        | ✓     |
|              |             | AREA CLEARED  | ✓     |

Run 348

Loading - ~~88 1/8~~ 87 7/8 u

6 1/2 Fe [1, 2, 3, 7, 8, 9 + 2nd 1/2 #6]

5/8 void #58

(12)

$\rho = + 8.68 \phi$

349

Loading - ~~88~~ 87 3/4 u

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

5/8 void #58

$\rho = 0.2 \phi$

# 6

$L_v = .0005 \rightarrow .0009$

"A" = 4.0  $\frac{10}{500}$

# 3

loading this

NOV 19 1968

DATE NOV 19 1968

## SAFETY CHECK

TIME 8:20

Taylor &amp; Lyman

CHANNEL

F

RAISE

|                   |     |     |                  |     |     |
|-------------------|-----|-----|------------------|-----|-----|
| $\frac{10}{1000}$ | opr | L16 | $\frac{1}{1000}$ | Pos | 750 |
|-------------------|-----|-----|------------------|-----|-----|

SOURCE EMIT

2" ok 24" 6" 2" ok

% F. S. ...

100+ 100 100 100+ =

BLEC. ALARM

✓ ✗ ✓

AUX CTRS.

SOURCES USED

227 + 8

TABLES

✓ LIGHTS ✓ AREA CLEARED ✓

channel "A"  
back into  
trip circuit.Run 350 Rossi Alpha @ - \$2.00 (Blade East)  
(8.4 cm)RP #17 Loading - See ~~Run~~ Run 349

Blade Bumps .25 V

Start - 11:11 Blade .38 V

STOP - 11:32 Inst + Temp. Normal.

Did not raise Core.

RP #17b Start @ 13:04

CORE IN 13:26

Core SCRAMMED DUE TO ACCEL. ~~...~~

STOP @ 13:37 "A" tripped @ hv = 0.009

Inst. &amp; temp. all normal.



DEC 03 1968 RP #17C

A  
to  
int  
13:15 - Blade Pump @ .25 V.

13:20 Start

Run Blade @ .38 V.

16:00 Stop

Core Not Raised

He Temp = 37°

Cooler Tap H<sub>2</sub>O

Inst. Normal

Temp Normal.

mal.

230

DEC 4 1968

|              |                   |                 |     |                  |                  |     |
|--------------|-------------------|-----------------|-----|------------------|------------------|-----|
| DATE         | DEC 4 1968        | SAFETY CHECK    |     |                  |                  |     |
| TIME         | 8:40              | Taylor and Lynn |     |                  |                  |     |
| CHANNEL      |                   | 1               | 0   | 0                | E                | F   |
| RANGE        | $\frac{10}{1000}$ | Op              | 16  | $\frac{1}{1000}$ | 900              | 750 |
| SOURCE DIST. | 2" OK             | 30"             | 16" | 2"               | OK               |     |
| % F. S. T.   | 100               | -               | 100 | 100              | 100 <sup>+</sup> | -   |
| BLOC. ALARM  |                   | r               | *v  | v                |                  |     |
| AUX CTOS.    |                   |                 |     |                  |                  |     |
| SOURCES USED |                   | v               |     |                  |                  | v   |
| TABLES       | v                 | LIGHTS          | v   | AREA CLEARED     | v                |     |

Run 351

Loading -  $88 \frac{5}{8}$  U

(13)

$5 \frac{3}{4}$  Fe [1, 2, 7, 8, 9 + 12<sup>+</sup>  $\frac{3}{4}$  #3]

$\frac{5}{8}$  void #58



#1 = 0.120 down

#1 = 22.775 up

P = +

#3

#2 =

#3 = -4

∞ Inst checks for JTM + R. Engle

#4 = -6

9:40 AM Shut down did not complete Exp.

352 Repeat. Pette in trouble. Blinking overload lite #1.

∞ Read from curve 45<sup>+</sup> Excess

DEC 4 1968

RP #17d

16:20 Start Normal responses.  
 16:26 Stop Core Not raised.

DEC 5 1968

| DATE         |  | DEC 5 1968   |  | SAFETY CHECK            |  |
|--------------|--|--------------|--|-------------------------|--|
| TIME         |  | 8:20         |  | Taylor + Lynn           |  |
| CHANNEL      |  |              |  | F                       |  |
| RANGE        |  | 1000 cpr. M6 |  | 1000 900 750            |  |
| SCC          |  | 3' ok        |  | 24" 6" 2" ok            |  |
| % F. S.      |  | 100          |  | 100 100 100+            |  |
| BLEB. ALIAS  |  | ✓ ✓ ✓        |  |                         |  |
| AUX CTRS.    |  |              |  |                         |  |
| SOURCES USED |  | 227 + Y      |  | ✓                       |  |
| TABLES       |  | ✓            |  | LIGHTS ✓ AREA CLEARED ✓ |  |

Reactivity Check, reactivity comparison of Lette  
 Run 353 Repeat Run 351  $P = +56.0 \phi$

|                    | Lette         | Lv                              |
|--------------------|---------------|---------------------------------|
| Ran Pos. period    | + 46 $\phi$   | TMC + 45.6 $\phi$ + 45.8 $\phi$ |
| <del>Ran</del> Pos | + 19 $\phi$   | 19.6 $\phi$ + 20.0 $\phi$       |
|                    | - 18.4 $\phi$ | - 30.0 $\phi$ - 24.6 $\phi$     |
|                    | - 19.6 $\phi$ | - 17.6 $\phi$                   |
|                    | - 11.7 $\phi$ | - 16.8 $\phi$ , - 17.6 $\phi$   |

css

232

DEC 5 1968

RP # 17 e

He feed 12 ft<sup>3</sup>

0945 Blade Bump, 30 V.

mtr = 28 amps

0945 Start

H<sub>2</sub>O = 10 inches

1205 Stop

(No Core)

He Temp = 37°C

11:20 AM

| T.C.          | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Chart Reading | 37.5 | 18.8 | 22.5 | 10.5 | 13.0 | 12.2 | 18.5 | 11.0 | 12.4 | 17.5 | 18.8 | 22.7 | 16.5 | 16.5 | 19.3 |

Chart Readings times 1.5 = °C.

RP # 17 f

13:25 Start

13:58 STOP (No Core)

RP # 17 G

1524 START BLADE

1532 STOP (No Core)

HAVING DIFFICULTIES WITH PROPER  
FUNCTIONING OF THE ACCELERATOR.

DEC 11 1968

Blade away (Roughly # -500) is @ 90° stationary.

1135 Core Up Ln = .00017 using accelerator

1140 Core down

1430 Core Up (same as above) 11 Dec 68.

1615 Core down

DEC 11 1968

DATE DEC 11 1968 SAFETY CHECK

TIME 8:25 Taylor and Lynn

CHANNEL F

RANGE  $\frac{10}{1000}$  of  $\frac{1}{1000}$  900 250

SCALE FACTOR 1" OK 20" 6" 2" OK

% F 100 - 100 100 100

BLIND  \*

ADA

SOURCES U. 227 +

TABLES  LIGHTS  AREA CLEARED

"A" - made slight V. adjustment

Alarm "B" - Worse

Run 354 Reactivity Check.

Loading same as  $\frac{3.51}{P = +56.3 \text{ \#}}$

Inst. Trip - Chan "A" Low Scale [Reed @ 100]

RP#18 + 56 #

10:35 A Bump

10:39 Bump He Temp = 36°

10:44 Start Temp and Inst.

11:49 Core up ( $L_m = .00036$ ) Normal.

12:58 Core down

12:59 STOP Blade Down 18 57

14:50 Start stop 18 57

15:14 Core Up ( $L_m = .00026$ ) VIA ACCEL.

DER  
AOR.

ry.  
2

| DATE <u>13 DEC 68</u> SAFETY CHECK |                                                    |
|------------------------------------|----------------------------------------------------|
| TIME <u>8:30</u> AM                | BY <u>TAYLOR MINALCZO</u>                          |
| CHANNEL                            | A D C D E F                                        |
| RANGE                              | $\frac{1}{1000}$ DPR L-16 $\frac{1}{1000}$ 900 900 |
| SOURCE DIST.                       | 2" OK 30" 6" 2" OK                                 |
| % F. S. TRIP                       | 100 ✓ ✓ 100 100 100                                |
| BLDG. ALARM                        | ✓ ✗ ✓                                              |
| AUX CTFS.                          |                                                    |
| SOURCES USED                       | ✓ MAGNETS ✓                                        |
| TABLES ✓                           | LIGHTS ✓ AREA CLEARED ✓                            |

\* "SLUGGISH" ON TRIP.

Run # 355 REACTIVITY CHECK BY TRAVERSING ACROSS PEAK.  
LOADING SAME AS Run # 354, Rho<sub>eff</sub> = +54.4%

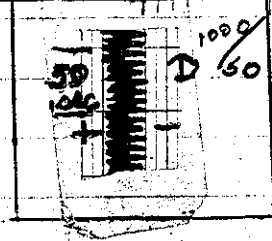
RP # 19A 1039 "BUMP" BLADE 0.30 VOLTS SCOPE  
1040 START 0.39 VOLTS  
1109 STOP (ALL READOUTS NOMINAL) No Core.

19B 1130 START 0.39 VOLTS  
1154 CORE UP  $h\nu = .00032$  <sup>USED</sup>  $.00045$  VIA ACCEL.

continuous cycling  
as shown →

1324 CORE DOWN  
1335 STOP BLADE  
(ALL READOUTS NOMINAL)

DATA RUN TIME = 77 MIN



19C

1513 "BUMP"

1514 START BLADE 0.39 VOLTS SCOPE

1545 CORE UP  $h_N = .00040$  VIA ACCEL.

2110 Core down

Data Start 18:56 ~~19:44~~

2110 down

" " 19:50

2110

1943 Log N = .0036

"C" = 54 → 60 @ L-21

"A" = 24 @  $\frac{1000}{25}$ 

AIR.

CEL.

| DATE         |                     | SAFETY CHECK |    |                  |     |     |  |
|--------------|---------------------|--------------|----|------------------|-----|-----|--|
| TIME         | 9:00                | AM           | BY | Cross & Taylor   |     |     |  |
| CHANNEL      |                     | I            | D  | D                | E   | F   |  |
| RANGE        | $\frac{1}{1000}$ OR | h            | 76 | $\frac{1}{1000}$ | 900 | 900 |  |
| SOURCE DIST. | 2" OR               | 30"          | 6" | 2"               | OK  |     |  |
| % F. S. TRIP | 100                 | ✓            | ✓  | 100              | 100 | 100 |  |
| BLDG. ALARM  | ✓                   | ✓            | ✓  |                  |     |     |  |
| AUX CTRS.    |                     |              |    |                  |     |     |  |
| SOURCES USED | ✓                   |              |    | WADGETS          | ✓   |     |  |
| TABLES       | ✓                   | LIGHTS       | ✓  | AREA CLEARED     | ✓   |     |  |

Run #356 REACTIVITY CHECK VIA BLADE TRAVERSE.

Rhoetta  $\rightarrow +56.9\%$

SAME LOADING AS RUN #354

~~R.P. #20~~ HAVING MORE ACCEL. PROBLEMS. SEE ROHRER LOG,  
REPLACED PALLADIUM LEAKAMON'S OTHER ACTIVITIES.

RP#20

Start 16:55

Core up @ 17:27

17:45 Core Scram due to Accelerator Chan "A"

17:47 Stop

Inst + Temp.

17:58 Start Nominal

18:31 Core up #1 = 22.685

18:52 Lowered Core #1 = 22.02

18:53 Stopped Protos. 7.2 sec cycling stopped

18:55 Lowered Core.



| DATE         |      | SAFETY CHECK |        |      |              |     |                |
|--------------|------|--------------|--------|------|--------------|-----|----------------|
| TIME         | 0815 | AM           | BY     |      |              |     | CROSS & TAYLOR |
| CHANNEL      |      | A            | D      | D    | E            | F   |                |
| RANGE        |      | 1/1000       | OPR    | L-16 | 1/1000       | 900 | 900            |
| SOURCE DIST. |      | 2"           | OK     | 30"  | 6"           | 2"  | OK             |
| % F. S. TRIP |      | 100          | -      | -    | 100          | 100 | 100            |
| BLDG. ALARM  |      | ✓            | ✓      | ✓    |              |     |                |
| AUX GTRS.    |      |              |        |      |              |     |                |
| SOURCES USED |      |              | ✓      |      | MAGNETS      | ✓   |                |
| TABLES       |      | ✓            | LIGHTS | ✓    | AREA CLEARED | ✓   |                |

Run # 357 Reactivity check via Blade traverse  
 Fuel Loading Same as #354 Rhoette +55.0%

0915 "BUMP"

0916 START BLADE

0945 STOP (CORE NOT RAISED)

RP# 21A

RP# 21B

1106 "Bump"

1107 START BLADE 0.40 VOLTS (SCOPE)

1143 CORE UP Sel. #1 = 22.69 ; #2 = 22.697 ; #3 = +2 ; #4 = +5

Data 1208 till 1808

Bkgd 1835 till 1935 (JTM has other data times)

2130 Core down

2130 stop [to gas up] "C" = 40 @ L-13

2144 start, core up 2159 Data 2205 → 2230

2230 core down to #1 = 15.00 (For Accel Tune up)

2237 core up, "C" = 58 @ L-13 Blade = .4 V

12-18-68 0058 core down, stop

W H O O P S !

~~SAFETY CHECK~~

~~DATE~~ \_\_\_\_\_

~~TIME~~ \_\_\_\_\_

~~CHANGE~~ \_\_\_\_\_

~~RANGE~~ \_\_\_\_\_

~~SOURCE DIST.~~ \_\_\_\_\_

~~% F. S. TRIP~~ \_\_\_\_\_

~~LOGG. ALARM~~ \_\_\_\_\_

~~ANY GPS~~ \_\_\_\_\_

~~SOURCES USED~~ \_\_\_\_\_

~~TARGETS~~ \_\_\_\_\_

~~AREA CLEARED~~ \_\_\_\_\_

~~MAGNETS~~ \_\_\_\_\_

~~F E B S~~

16

| DATE DEC 18 1968 |          | SAFETY CHECK         |      |         |              |     |  |
|------------------|----------|----------------------|------|---------|--------------|-----|--|
| TIME             | AM<br>PM | BY CALLIHAN & TAYLOR |      |         |              |     |  |
| CHANNEL          | A        | B                    | C    | D       | E            | F   |  |
| RANGE            | 1/1000   | OPR                  | L-16 | 10/1000 | 900          | 900 |  |
| SOURCE DIST.     | 2"       | OK                   | 30"  | 6"      | 2"           | OK  |  |
| % F. S. TRIP     | 100      | ✓                    | ✓    | 100     | 100          | 100 |  |
| BLDG. ALARM      | ✓        | ✓                    | ✓    |         |              |     |  |
| AUX CTRS.        |          |                      |      |         |              |     |  |
| SOURCES USED     |          |                      |      |         |              |     |  |
| TABLES           |          |                      |      |         |              |     |  |
|                  |          |                      |      |         | MAGNETS      | ✓   |  |
|                  |          |                      |      |         | AREA CLEARED | ✓   |  |
|                  |          |                      |      |         | LIGHTS       | ✓   |  |

Run # 358A REACTIVITY CHECK VIA BLADE TRAVERSE.

FUEL = SAME Rho<sub>eff</sub> = +55.6¢

Count ratio check of Bare & Cd rods. (1 minute)

| C <sub>1</sub> (Bare) | C <sub>2</sub> (Cd rod) | $\frac{C_1}{C_2}$ | Bare/cd     |
|-----------------------|-------------------------|-------------------|-------------|
| 32120                 | 4560                    | .0005             | 7.04        |
| 100314                | 14472                   | .0013             | 6.93        |
| 103399                | 14853                   | .0017             | 6.96        |
| 103673                | 14826                   |                   | 6.99        |
| 276654                | 39488                   | .0036             | 7.01        |
| 277031                | 39470                   |                   | 7.02        |
|                       |                         | avg               | 6.99 ± 0.06 |

358B New set blade West @ #1.00 below DC.  
(i.e. 7.8cm FROM PEAK) Rho<sub>eff</sub> = #1.00

RP#22 "Bump" 1258

START Blade 1300 SCOPE = 0.40 VOLTS

Core In 1332 C = 114-58 1350

1420 to 1500 "bearing heated an extra 10°C gradually then cooled to near normal.

1717 - Fuel pressure gauge trip and V. trip.

2314 - Lowered Core, Stopped Blade.

2322 - Start Blade, 2328 - Core up.

12-19-68 0002 - Core Down, Blade off.

| DATE         |        | SAFETY CHECK |              |        |     |     |  |
|--------------|--------|--------------|--------------|--------|-----|-----|--|
| TIME         | 0900   | AM           | BY TAYLOR-MG |        |     |     |  |
| CHANNEL      | A      | B            | C            | D      | E   | F   |  |
| RANGE        | 1/1000 | OPR          | 6-16         | 1/1000 | 900 | 900 |  |
| SOURCE DIST. | 2"     | OK           | 30"          | 6"     | 2"  | OK  |  |
| % F. S. TRIP | 100    | ✓            | ✓            | 100    | 100 | 100 |  |
| BLDG. ALARM  | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| AUX CTRS.    | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| SOURCES USED | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| MAGNETS      | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| TABLES       | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| LIGHTS       | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |
| AREA CLEARED | ✓      | ✓            | ✓            | ✓      | ✓   | ✓   |  |

Run #359 changed fuel loading to  $6\frac{5}{8}$  Fe and Rhoelette = -6<sup>9/16</sup> Using 25<sup>4</sup> shim to get up.

Run #360 changed loading to Fe =  $6\frac{11}{16}$ <sup>9/16</sup>  
 Fe = 1-2-3-7-8-9- $\frac{1}{2}$  #6 &  $9\frac{1}{4}$  #6  
 Rhoelette =  $\infty$  0.0<sup>4</sup>  $\frac{5}{8}$  void #58  
 Fuel =  $87\frac{11}{16}$   $\frac{13}{16}$   
 LN period = .0025 to .00275 in 900 sec

RP#23

0.25 STATIC  
 1320 Bump 0.29 volts  
 1322 START BLADE 0.36 VOLTS

(slight adjustment to "LIVE CENTER" has been made.)

1410 1346 Core In

2323 Lowered Core, Stopped Blade [to go up]

2333 Start Blade, # 2339 Core up

20 Dec 68 0200 STOP

|              |           |    |                     |                |     |     |
|--------------|-----------|----|---------------------|----------------|-----|-----|
| DATE         | 10 Dec 68 |    | SAFETY CHECK        |                |     |     |
| TIME         | 0800      | AM | BY TAYLOR & ROBERTS |                |     |     |
| CHANNEL      | A         | D  | C                   | D              | E   | F   |
| RANGE        | 1000 OPR  |    | L-16                | 1000           | 900 | 900 |
| SOURCE DIST. | 2" OK     |    | 30"                 | 6"             | 2"  | OK  |
| % F. S. TRIP | 100       | ✓  | ✓                   | 100            | 100 | 100 |
| BLDG. ALARM  | ✓         | ✓  | ✓                   |                |     |     |
| AUX CTRS.    |           |    |                     |                |     |     |
| SOURCES USED | -         |    | MAGNETS -           |                |     |     |
| TABLES       | -         |    | LIGHTS              | AREA CLEARED ✓ |     |     |

"BUMPED" BLADE → HIVE CENTER GOOD.

Run #361 Reactivity check vs run #360  
 Same loading.  $\rho_{\text{effective}} = -2.0\%$

Changed loading to  $\approx -1.0\%$   
 Removed #4 & rest of #6  
 Fe = 1-2-3-4-6-7-8-9  $\frac{5}{8}$ " TOP #58

| C <sub>1</sub> (Base) | C <sub>2</sub> (cd end) | $\approx L_m$ | B/cd |
|-----------------------|-------------------------|---------------|------|
| 218107                | 48573                   | -             | 4.44 |
| 196576                | 44180                   | .0050         | 4.45 |
| 171382                | 37997                   | .0038         | 4.51 |
| 149718                | 32946                   | .0035         | 4.51 |

This diff rel. to  
 by 239 being  
 worked into.

Put  $1.0\%$  fuel back in core repeat #361  
 for inst. checks.

Run #362 Loading same as #361

Pos & Neg periods for inst check.

\* Now reload for  $-1.0\%$  as above  
 gain

#6  
 58

mount  
 has  
 2.

RP#24A

1334 "Bump" 0.27 volts (SCOPE PROXIMITY SNAKE)

1339 START BLADE 0.37 VOLTS

1352 STOP BLADE ACCEL. "ACTING UP" Pulsing ~~mode giving~~  
Power "blips" (factor 100)RP#24B

1445 Bump

1446 START BLADE 0.39 VOLTS

1504 STOP BLADE

- Changed final pulse  
from Dewlett Packard  
to the Electro pulse.RP24C

1517 START BLADE

1525 STOP BLADE SCRAM VIA FINAL PULSE #A  
ZERO power, Core not up, but @ 19.00RP24D

1534 "Bump"

1535 START BLADE

1543 Core-in (22.68#1)

1638 Core Perammed by Accel. failure to pulse

1641 Blade stopped.

1702 " started

1717 Core up - Setting "15 sec pips Chon A" from

16 to 320  $\frac{1000}{25}$ 

1804 Core down, Stop Blade

LN .0001 to .0006

DEC 23 1968

| DATE         |         | SAFETY CHECK |      |              |     |     |  |
|--------------|---------|--------------|------|--------------|-----|-----|--|
| TIME         | 10:10   | AM           | BY   | Lynn + Cross |     |     |  |
| CHANNEL      | 10      | D            | C    | D            | E   | F   |  |
| RANGE        | 1000    | 0/r          | L-14 | 1000         | 900 | 750 |  |
| SOURCE DIST. | 2"      | ok           | 20'  | 0            | 2'  | ok  |  |
| % F. S. TRIP | 100     | 7            | 100  | 100          | 100 | 100 |  |
| BLDG, ALARM  | ✓       | *✓           | ✓    |              |     |     |  |
| AUX CTRS.    |         |              |      |              |     |     |  |
| SOURCES USED | 227 + 8 |              |      | MAGNETS      |     | L   |  |
| TABLES       | ✓       | LIGHTS       | ✓    | AREA CLEARED |     | ✓   |  |

wing  
eye  
else  
hand  
pulse.

### Reactivity Check (≈ 56%)

Run 363 Loading -  $88 \frac{5}{8} \text{ U}$   
 $5 \frac{3}{4} \text{ Fe [1, 2, 7, 8, 9 + pot } \frac{3}{4} \#3]$   
 $58 \text{ void } \#58$

(13)

$\rho = + 59.6 \%$   
 ↑  
 little zero high  
 maybe

(13)

### Blade Spin (To check Accel. reaction)

"A"  
 1525 Bump 0.28 Volts  
 1528 Start 0.39 Volts  
 1534 Testing pulsing of Accelerator (steady state  $L_n = 103$ )  
 1622 Stop  
 (no core)

m  
1000  
25  
6

244

DEC 24 1968

DEC 24 1968

| DATE         |                   | SAFETY CHECK      |      |    |      |     |                |
|--------------|-------------------|-------------------|------|----|------|-----|----------------|
| TIME         | 10:15             | BY Lynn + Mihakzo |      |    |      |     |                |
| CHANNEL      |                   | A                 | B    | C  | D    | E   | F              |
| RANGE        | $\frac{10}{1000}$ | OK                | L-14 | OK | 900  | 750 |                |
| SOURCE DIST. | 3"                | OK                | 20"  | OK | 2"   | OK  |                |
| % F. S. TRIP | 100               |                   | 100  |    | 100+ |     |                |
| BLDG. ALARM  |                   | ✓                 | ✓    | ✓  |      |     |                |
| AUX CTBS.    |                   |                   |      |    |      |     |                |
| SOURCES USED | 227 +             | ✓                 |      |    |      |     | MAGNETS ✓      |
| TABLES       | ✓                 |                   |      |    |      |     | LIGHTS ✓       |
|              |                   |                   |      |    |      |     | AREA CLEARED ✓ |

Reactivity check

56.6 \$  
56.2

Run 364

Loading Same

Little = 56.4 \$

RP#25

Spin

Bump 0.29 Volts.

1120

Start

0.39 Volts

1400

Core up

1550

Core down, Stepped



DEC 26 1968

|              |                   |        |                 |              |     |
|--------------|-------------------|--------|-----------------|--------------|-----|
| DATE         | DEC 26 1968       |        | SAFETY CHECK    |              |     |
| TIME         | 10:10             | BY     | LYNN + MIHALCZO |              |     |
| CHANNEL      |                   |        | D               | E            | F   |
| RANGE        | $\frac{10}{1000}$ | OFF    | L-12            | 900          | 850 |
| SOURCE DIST. | 2"                | OK     | 24"             | 2"           | OK  |
| % F. S. TRIP | 100               | -      | 100             | +            | 100 |
| BLDG. ALARM  |                   | ✓      | *✓              | ✓            |     |
| AUX CTRS.    |                   |        |                 |              |     |
| SOURCES USED | 227 + X           |        | MAGNETS         | ✓            |     |
| TABLES       | ✓                 | LIGHTS | ✓               | AREA CLEARED | ✓   |

.6 #  
.2  
.4 #  
iv

Reactivity Check (0.28 Volts)  $\frac{54.0}{54.9}$  #  
 Loading Same Little =  $\frac{54.5}{54.9}$  #  
 "D" Scram just after print out on 2nd  
 sweep of blade.  $L_N = .018$ , "A" = 25 @  $\frac{1000}{1000}$   
 "Bump" 0.29 Volts

RPA#26 1122 Start 0.29 Volts  
 1216 Stop (No Core)  
 1233 Start  
 1235 Stop  
 1250 Start  
 1307 Core up  
 1331 Core down  
 1334 Stop Blade

Core down  
 Acc study  
 "C" = 68 @ H-17  
 "A" = 46 @  $\frac{1000}{500}$   
 $L_N = .015$

DATE DEC 21 1968

## SAFETY CHECK

DEC 27 1968

TIME 08:25 AM

BY Lynn + Michael

| CHANNEL      | A                 | B        | C   | D   | E   | F              |
|--------------|-------------------|----------|-----|-----|-----|----------------|
| RANGE        | $\frac{10}{1500}$ | Apr L-14 | 0   | 900 | 800 |                |
| SOURCE DIST. | 1"                | OR 24    | 4   | 2"  | OK  |                |
| % T. S. TRIP | 100               | 100      | 100 |     |     |                |
| BLDG. ALARM  | ✓                 | ✓        | ✓   |     |     |                |
| AUX CTDS.    |                   |          |     |     |     |                |
| SOLDSIS TRIP | 227 + 8           |          |     |     |     | MAGNETS ✓      |
| TABLES       | ✓                 | LIGHTS   | ✓   |     |     | AREA CLEARED ✓ |

Reactivity Check: (0.24 Volts)

Run 366

Loading: Same

$$P_{\text{tube}} = \frac{56.7 \text{ } \#}{57.0 \text{ } \#}$$

LV = .0003

| Counters                | 1/min | Cts                     | Ratio |
|-------------------------|-------|-------------------------|-------|
| Disc <sup>15</sup> #1 = | 14757 | Disc <sup>15</sup> #2 = | 1753  |
| Gain <sup>64</sup>      | 11057 | Gain <sup>32</sup>      | 1383  |
|                         | 8468  |                         | 965   |
| Disc <sup>10</sup>      | 9817  | Disc <sup>8</sup>       | 1287  |
|                         |       |                         | 7.67  |

RP<sup>27</sup>

Bump (0.25 Volts)

0919 Start Blade (~~0.38~~ Volts) DATA  
 1204 Core up Start 12:26  
 1 Stop 12:45

Developed 15 sec pulse as 20 Dec then later  
 the pulse appear at the 7.2 sec frequency  
 Turned ion source off for a few seconds  
 then on. Frebble is gone.  
 1403 Core down, Stopped



| DATE DEC 31 1968 |      | SAFETY CHECK |                      |         |     |              |     |
|------------------|------|--------------|----------------------|---------|-----|--------------|-----|
| TIME             | 1100 | AM           | BY TAYLOR & MIHALCZO |         |     |              |     |
| CHANNEL          |      | A            | B                    | C       | D   | E            | F   |
| RANGE            |      | 10/1000      | OPR                  | L-16    | OUT | 900          | 900 |
| SOURCE DIST.     |      | 2"           | 11C                  | 30"     | X   | 2"           |     |
| % F. S. TRIP     |      | 100          | -                    | 110     | X   | 100          |     |
| BLDG. ALARM      |      | ✓            | ✓                    | ✓       |     |              |     |
| AUX. CTRS.       |      |              |                      |         |     |              |     |
| SOURCES USED     |      | ✓            |                      |         |     |              |     |
| TABLES           | ✓    | LIGHTS       | ✓                    | MAGNETS | ✓   | AREA CLEARED | ✓   |

Run # 368 Set Up for Rossi-Alpha @ D.C. VIA BLADE.

Loading: Same

1125 ∞ with Blade ~ 4cm west =  $L_n = .00018$   
 "Charlie" =  $L^{22} @ 33$

1235 ∞ @  $L_n = .00013$  ;  $C = L^{22} @ 25$  or  $L^{19} @ 57$

DATA Collection: 12:57 to 14:51

1506 ∞ @  $L_n = .00025$  ;  $C = L^{23} @ 40$

Data: 1506 to 1520

1526 ∞ @  $L_n = .00013$  ;  $C = L^{19} @ 57$

DATA: 1525 to 1541

1545 Check reactivity via trav. &  
 $R_{\text{white}} = +60.0\%$

SECURED BLADE @ 90° ON THE EAST SIDE

1630 Raised and Braced Core in Up position

JAN 2 1969

CONT MISC. CHECKS ON THE ACCEL. SEEKING ANS. TO ITS PROBLEMS. SEE ERR. LOG FOR DETAILS. CORE WAS LOWERED @ NOON.

RP#28

1424 BUMP NOM. VOLTS ON SCOPE

1425 START 0.40 VOLTS

1459 STOP (No Core) (ALL READOUTS NOMINAL)

| DATE         |      | SAFETY CHECK     |        |     |              |                  |                   |
|--------------|------|------------------|--------|-----|--------------|------------------|-------------------|
| JAN 2 1969   |      |                  |        |     |              |                  |                   |
| TIME         | 1510 | AM               | BY     |     |              |                  | TAYLOR & MIZALCZO |
| CHANNEL      |      | A                | B      | C   | D            | E                | F                 |
| RANGE        |      | 10/1000 CPR L-16 |        |     |              | 0                | 900 900           |
| SOURCE DIST. |      | U                |        |     |              |                  |                   |
| % F. S. TRIP |      | 100              | -      | 100 | T            | 100 <sup>+</sup> | -                 |
| BLDG. ALARM  |      | ✓                | ✓      | -   | 2            | -                | -                 |
| AUX CTRS.    |      | -                | -      | -   | -            | -                | -                 |
| SOURCES USED |      | ✓                | -      | -   | -            | -                | -                 |
| TABLES       |      | -                | LIGHTS | ✓   | AREA CLEARED | ✓                | ✓                 |

22.75 ~

22.53

22.69 → ≈ 50 or less  
22.17 → ≈ ∞

Run #369 Reactivity check looks low (Shuttle?)

1600 Blade @ 9.7 cm WEST & Secured.

See JTM "Same Run" @ z - 2.00  
i.e., from a + 60° to a (-2.00 on curve).



1400 Core down for some accel. checks

1440 Core back in and  $\infty$  as this is continuation of the 1200 hrs run.

| BF <sub>3</sub> | Bare  | ed coil | 60 sec'cts accumul. |
|-----------------|-------|---------|---------------------|
|                 | 6080  | 1011    |                     |
|                 | 12161 | 1956    |                     |
|                 | 18563 | 3508    |                     |
|                 | 24885 | 4522    |                     |

Run #373 Made fuel change to  $\infty$  - #58. <sup>#52</sup> -4.63  
 Fe = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, 19.  
 at 5/8" VAD in #58. FUEL = 80 3/8

(16)

PROP CORE up DROPPED .04 in. when scan

Blade MAX. POS.

Run with Source overnight

JAN 6 1969

TAYLOR & MINARCO

C = h17 @ 25 ; A = 10/100 @ 47

| BF <sub>3</sub> | Bare | ed coil | accumulative 60 sec |
|-----------------|------|---------|---------------------|
|                 | 2809 | 830     |                     |
|                 | 5673 | 1625    |                     |
|                 | 8394 | 2360    | 3-5                 |

Print out data

cont next page

252

Run #374

-10-

#10.82

Changed fuel loading to ~~-10~~<sup>est.</sup>

Fe = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,  
16, 17, 18, 19, 20, 30 ~~3/8~~ VOID in #58,

(17)

Fucl = 73 3/8

BLADE MAX. POSITION.

12:30 Core in and "propped" for <sup>#</sup>-1000 data. <sup>would be</sup>  
C = 117 @ 21; A = 100 @ 41 Selenium #1 = 22.65 (22.70 up)  
1 min BF<sub>3</sub> etc Bare cdovel accumul. 60 sec.

|      |      |
|------|------|
| 1290 | 184  |
| 2549 | 345  |
| 3872 | 513  |
| 5192 | 695  |
| 6492 | 871  |
| 7804 | 1049 |

JAN 7 1969

Print out PDP4 @ 0800 Then cont data.  
i.e. using F. Hayward Source.

Run #375 Get power level using accel of .03 <sup>accel.</sup> Lm.  
Turn off source and Rheette = -13.06

NOTE large N source near by.  
to be run.

#10.82  
See p. 276



JAN 8 1969

Run #376 Repeat #375 without Haywood source.

$$\text{Rhett's} = -12.65 \text{ } \# -10.82$$

Lower the Core.

RP29# Bump 0851

(Various runs to check accel.)

0900 START BLADE

SCOPE = 0.39 VOLTS.

0922 (a" 25 sec power off only)

0931 STOP

(0935 START 0937 STOP)

(1031 " 1048 " )

(all readouts nominal) No Core

— Changed fuel loading to  $\approx \frac{\# \text{ ext}}{50}$  (see TOP NEXT Pg)

Fe = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, ~~13~~, 16, 17, 18, 19,  
 # (5/8 VOID IN #58)

Fuel =  $77 \frac{3}{8}$  # 7.60

Rained and "propped" core in up position.

Propped Selsyn #1 = 22.66 ; Norm Up: 22.70

Haywood Source Up.

C =  $\frac{1}{10}$  @ 30 ; A =  $\frac{10}{100}$  @ 441 min BF<sub>3</sub> cts accumulative

| Bare  | ed. void |
|-------|----------|
| 2048  | 857      |
| 4104  | 1478     |
| 6063  | 2058     |
| 8126  | 2589     |
| 10157 | 3057     |

254

JAN 9 1969

STOPPED DATA AND PRINTED @ 0944

Run #377 Use accel to attain .03 hr  
measur (accel. 50%) neg. (Photo = -8.25)  
off  
∴ Pins #14-15-20-30 TOTAL #440

Lower Core

RP#30 Bump 0.28 VOLTS

1419 START 0.39

1530 STOP (ALL READ OUTS NOMINAL) No Core.

"Prop" Core up. Selbyn = 22.66 (i.e. 35 mils  
below up lite).

| DATE         |        | SAFETY CHECK |      |              |     |     |                |
|--------------|--------|--------------|------|--------------|-----|-----|----------------|
| TIME         | 0830   | AM           | BY   |              |     |     | TAYLOR & CROSS |
| CHANNEL      | A      | D            | C    | D            | E   | F   |                |
| RANGE        | 10/100 | OPR          | 6-16 | ✓            | 900 | 900 |                |
| SOURCE-DIST. | 2"     | OK           | 30"  | ✓            | 2"  | -   |                |
| % F. S. TRIP | 100    | -            | 100  | ✓            | 100 | -   |                |
| BLDG. ALARM  | ✓      | ✓            | ✓    | 0            | -   | -   |                |
| AUX CTRS.    | -      | -            | -    | 0            | -   | -   |                |
| SOURCES USED | ✓      | -            | -    | MAGNETS      | ✓   | -   |                |
| TABLES       | ✓      | LIGHTS       | ✓    | AREA CLEARED | ✓   | -   |                |

Reinstalled CTU "SLOW SPEED" TRIP ARM (ref Pg 250)

08:00 changed fuel loading TO Same as page 243 for +25.6¢

Run #378 Sweep Blade Rhoette = +63.5¢

Run #379 Remove top 1/8 of fuel of #3  
"Sweep" Rhoette = +59.1¢

Fe = 1, 2, (Bottom 3/4 & Top 1/8 of #3), 7, 8, 9,  
(3/8) VOID in #58 for det.

FUEL = 88 1/2

- Found graphite-like material under the live center. collected sample for B.T.

- Scope Static Blade = 0.25 VOLTS

- Remove live center and recheck run #379

Run #380 "Sweep" Rhoette = +59.5¢

- Clean rear end of shaft area and put clean paper under motor shaft.

11:28 Bump Blade & SCOPE = 0.28 VOLTS.

RP# 31A 11:30 START BLADE SCOPE = 0.43 (i.e. 5 MILS AWAY FROM  
CORE COMPARED TO LIVE CENTER "0.0" OF YESTERDAY).

12:15 STOP

B 12:25 START BLADE

12:44 STOP

C 12:48 START

12:50 STOP

D 12:59 START

13:20 CORE IN  $L_m = 10001.7$ ;  $C = 1.8 @ 67$ ;  $A = 10/500 @ 41$

RAY DATA = 2.5 MILS;  $H_2O = FULL OPEN.$

$H_e$  FLOW = 12 CFH;  $H_e$  °C = 34;

$H_e$  PRESS. = 0.2"  $H_2O$  (center); 10.0" (periphery);

$t_c$ 's @ °C = 1: 26; 2: 30; 3: 27; 4: 6;

5: 15; 6: 8; 7: 24; 8: X; 9: 11;

10: 13; 11: 26; 12: 29; 13: 31; 14: X,

15: 30; 16: 25; ~~17: 25~~ 1 is remain.

MOTOR AMPS = 28

16:25 CORE DOWN

16:26 STOP BLADE

1/10/69

Removal 3, 4, 5, 6, 10, & (1/2 of 19)

Propped core 22.60

FUEL = 85 7/8

22.60 - .050

Fe = 1-2-3-4-5-6-7-8-9-10 - (TOP 1/2 of #19)

1/11/69

Al 222 6 + 10 (fuel i.e.)

# 1.08

Propped core

22.60

FE = 1, 2, 3, 4, 5, 7, 8, 9 & (TOP 1/2 #19)

85 7/8 u

~~578 void~~

|              |             |          |                  |               |
|--------------|-------------|----------|------------------|---------------|
| DATE         | JAN 13 1969 |          | SAFETY CHECK     |               |
| TIME         | 09:20       | AM       | BY Taylor & Lynn |               |
| CHANNEL      | 10          | 0        | 0                | E F           |
| RANGE        | 2000        | opt 1-16 | 0                | 900 900       |
| SOURCE DIST. | 2"          | ok 24"   | u                | 2" OK         |
| % T. S. TRIP | 100         | 100      | T                | 100+          |
| BLDG. ALARM  | ✓           | ✓        | ✓                |               |
| AUX CTRS.    |             |          |                  |               |
| SOURCES USED | 227 + 8     |          |                  | ✓             |
| TABLES       | ✓           | LIGHTS   | ✓                | APR 3 CLEAR ✓ |

Run 381

Loading - 86 3/8 u

8 Fe [1, 2, 3, 4, 6, 7, 8 & 9]

5/8 void #58

Ressi α ⊙ = -1.00

"C" = 38 0 L-13

After sheet down found that # 5 = Fe so little value is 0.70

Measured reactivity using Accelerator to get power level. Little = -1.60

→ Fuel changes SAY it is -98 #

Reasi ~~o~~ Run @ ~~≡~~ ~~2.50~~ \$-2.22

loading - ~~8 1/8 u~~ 8 3 7/8 u

10 1/2 Fe [1 → 10 + 2nd 1/2 #19]

3/8 Void

"Dropped" core up Sub #1 = 22.60 (ie - 40 mls from up lite).

JAN 14 1969

Measure above loading via accel. &

Run #382

Rho<sub>l</sub> = 2.37

| DATE         |         | SAFETY CHECK |                   |      |              |     |     |
|--------------|---------|--------------|-------------------|------|--------------|-----|-----|
| TIME         | 0830    | AM           | BY TAYLOR & CROSS |      |              |     |     |
| CHANNEL      |         |              | D                 | G    | B            | E   | F   |
| RANGE        | 10/100  |              | OPR               | 6.76 | ✓            | 900 | 900 |
| SOURCE DIST. | 2"      |              | OK                | 21"  | ✓            | 2"  | =   |
| % F. S. TRIP | 100     |              | =                 | 100  | ✓            | 100 | =   |
| BLDG. ALARM  |         |              |                   |      | ✓            |     |     |
| AUX. CTRS.   |         |              |                   |      | ✓            |     |     |
| SOURCES USED | 222 & 6 |              | MAGNETS           |      |              |     | ✓   |
| TABLES       | ✓       |              | LIGHTS            | ✓    | AREA CLEARED |     | ✓   |

Changed fuel loading back to +59¢

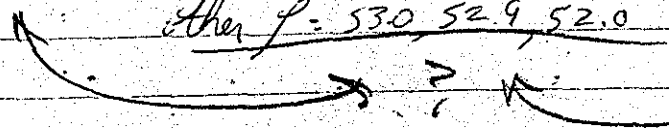
Fe = 1-2 - (BOT 3/4 & TOP 1/8 OF #3) - 7-8-9 & (5/8 #58) (VOID 58)

Run #383

Rho<sub>l</sub> = +58.34 VIA TRAVERSE

FUEL = 88 1/2

Other f = 530, 52.9, 52.0



R.P.#32

STATIC SCOPE = 0.28 VOLTS

"BUMP" BLADE = 0.29

A 10:13 START BLADE = 0.42

|      | $L_N = 0.03$ | $L_N = 1.002$ | $L_N = 1.0003$ |
|------|--------------|---------------|----------------|
| Bowl | 86040        | 9224          | 1856           |
| cd   | 69661        | 3296          | 489            |

Set of steady state readings (Core down) via accel.:  
 $L_N = 0.03$ ;  $C = H_2 @ 56$ ;  $A = \frac{1000}{1000} @ 48$ ;  $\rho_{white} = 2.4E-8$ .

10:50 CORE IN (all readouts nominal).

11:02 SCRAM CORE VIA (ACCEL) <sup>50.0%</sup> (STANVELA)  $L_N = 0.1$

11:03 STOP BLADE

B 11:10 START BLADE 0.42 VOLTS

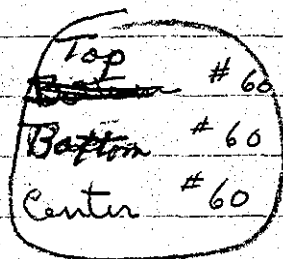
11:20 Core In  $L_N = 0.0014$ ;  $C = L^6 @ 70$

20:42 Core down Stop Blade

#383B Rhettie Meas. with Blade rotating = -3.97

Run #384 Reactivity Check after rotation.

| Temperature of Core | #  |      |
|---------------------|----|------|
|                     | 1  | 30   |
|                     | 12 | 25.5 |
|                     | 16 | 30.5 |



Scram on A low scale setting

Blade pos 0.3 volts #1 29.5

#12 25.0

#16 29.5

$\rho = 45.4, 46.6, 45$

ils

(# VOID SP)

2.0



DATE JAN 15 1969 SAFETY CHECK

TIME 08:25 AM BY TAYLOR-MINATOZC

| CHANNEL      | A        | B      | C    | D            | E   | F   |
|--------------|----------|--------|------|--------------|-----|-----|
| RANGE        | 1/1000   | OPP    | L-16 | ✓            | 90  | 900 |
| SOURCE DIST. | 2"       | OK     | 24"  | ✓            | 2"  | —   |
| % F. S. TRIP | 100      | —      | 100  | ✓            | 100 | —   |
| BLDG. ALARM  | ✓        | ✓      | ✓    | ✓            | ✓   | ✓   |
| AUX CTBS.    | —        | —      | —    | —            | —   | —   |
| SOURCES USED | 227 & 11 | —      | —    | —            | —   | —   |
| TABLES       | —        | LIGHTS | —    | —            | —   | —   |
|              |          |        |      | AREA CLEARED | ✓   | ✓   |

Run #385 Recheck last night reactivity.  
 "Sweep & Rhoette  $+54.7, 55.4, 56.0$ ; Scope = 0.3 VOLTS."

Removed CTU "SLOW SPEED" TRIP ARM.

Run #386 Checks Ln - Rhoette & TMC.  
 Rhoette =  $+15.77^{\circ}$ ; Ln =  $+14.2^{\circ}$

|        | BF <sub>3</sub> (Small) | BF <sub>3</sub> (Ref) | Ln    | Chalk    | ALE    | Rhoette | C <sup>1</sup> | C <sup>2</sup> |
|--------|-------------------------|-----------------------|-------|----------|--------|---------|----------------|----------------|
| 177671 | 29271                   | .026                  | H@56  | 100% @66 | 2.0E-8 | 250432  | 212.865        |                |
| 16873  | 54058                   | .0026                 | H9@62 | 100% @62 | 1.6E-9 | 45946   | 20622          |                |

Run #387 Change fuel to  $\infty$   
 Fuel =  $57 \frac{1}{16}$  (Same as Run # 372)  
 Rhoette =  $\infty$

(15)



RP# 33

"BUMP" SCOPE = 0.29 VOLTS

A 12:44 START BLADE ROTATING. 0.43 VOLTS

13:08 STOP FOR N<sub>2</sub>

B 13:20 START BLADE

13:30 CORE IN (ALL READOUTS NOMINAL).

 $L_m = .0001$ ;  $C = K6 @ 55$ 

19:08 Core Temp #1 = 30.5°C<sup>v</sup>  
 #16 = 31°C

~~Top~~ #60  
 Center #60

21:25 down Stop Blade

Run 388

Reintensity check after pulsing

Blade 0.36 Volts?

1

.32

.32

?

 $\rho = -28 \%$ 

after shut down found that due to tape <sup>on</sup> Center in Core it had raised Counter plug.

| DATE         |      | SAFETY CHECK |        |              |              |     |     |
|--------------|------|--------------|--------|--------------|--------------|-----|-----|
| TIME         | 0800 | AM           | BY     | TAYLOR-CROSS |              |     |     |
| CHANNEL      |      | A            | B      | C            | D            | E   | F   |
| RANGE        |      | 10/100       | ERR    | 6-16         |              | 900 | 900 |
| SOURCE DIST. |      | 2"           | OK     | 24"          |              | 2"  | -   |
| % F. S. TRIP |      | 100          | -      | 100          |              | 100 | -   |
| BLOG. ALARM  |      | ✓            | x      | ✓            |              |     |     |
| AUX CTRS.    |      |              |        |              |              |     |     |
| SOURCES USED |      | M27 & h      |        | MAGNETS      |              | ✓   |     |
| TABLES       |      | ✓            | LIGHTS | ✓            | AREA CLEARED |     | ✓   |

\* No. 2 would not trip with source. ERR. informed of same.

Run # 389 RECHECK REACTIVITY (vs Run # 387)

Rhoette =  $\infty$

Run # 390 ADD  $\frac{1}{2}$  fuel pin to top of # 3

$\therefore$  Fe = 1; 2; (Bot  $\frac{1}{2}$  # 3); ( $\frac{1}{2}$  at  $\frac{9}{16}$  & Top  $\frac{1}{8}$  # 6); 7; 8; 9

22

Fuel =  $88\frac{3}{16}$

# 5 (VOID # 58)

Rhoette = + 32.0 $^{\circ}$

Run # 391 Set +5.6 $^{\circ}$  via Rhoette & Core Position.

Measure from low to high power

"D" - "A" & Rhoette "out" for high part of the run.

Use core for "regulation" of power.

See table for counting results below.

JAN 15 1968

9/15

Data B-263 OSR 2-6

x (E-1)

(E-2)

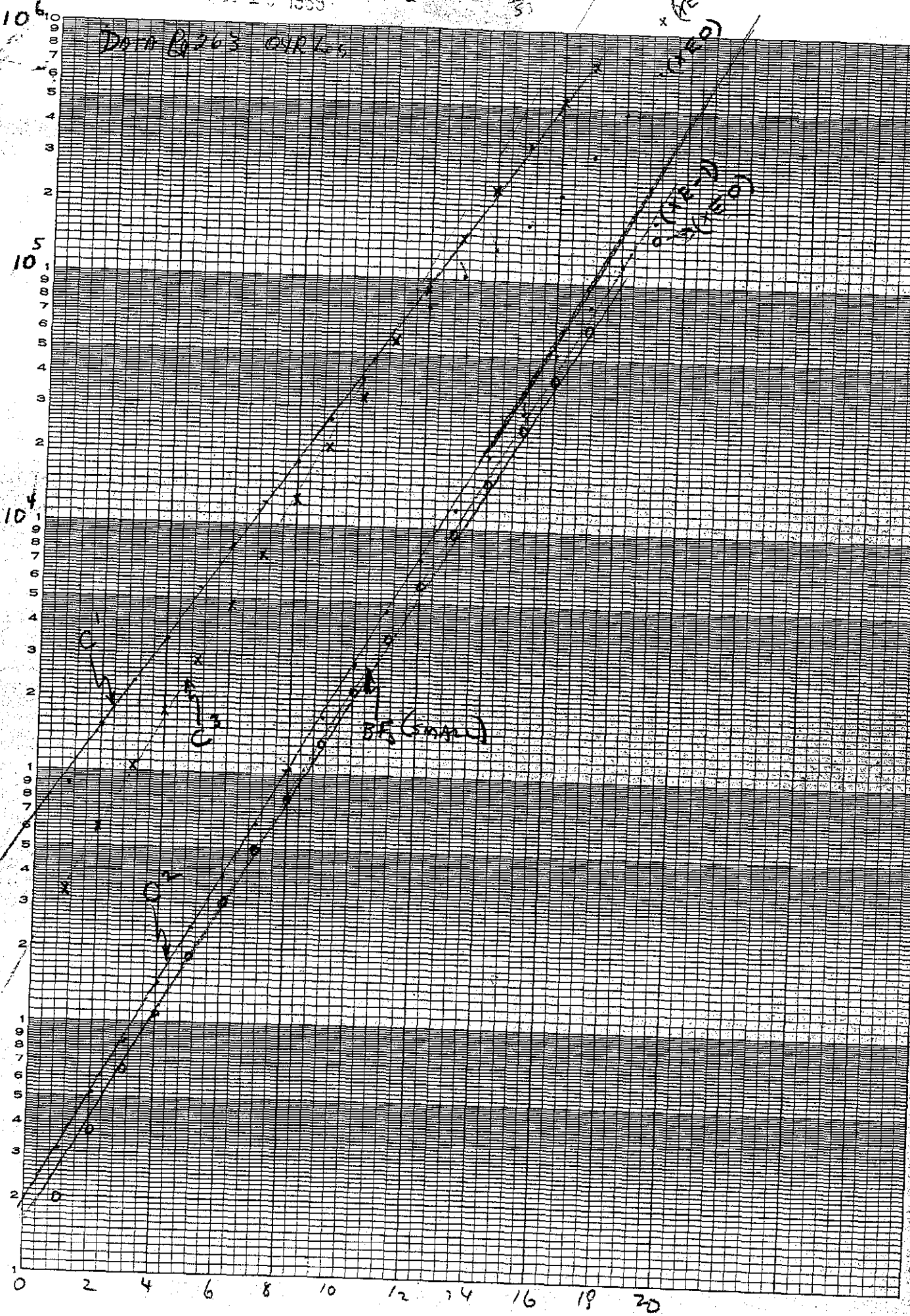
(E-3)

(E-4)

BE (GMA)

EUBENE DIETZGEN CO.  
MADE IN U.S.A.

NO. 340-LS10 DIETZGEN GRAPH PAPER  
SEMI-LOGARITHMIC  
5 CYCLES X 10 DIVISIONS PER INCH



- 1 MIN. CTS  
- 1/2 MIN. WAITS

ld  
h  
R  
vml.

| LOGS N      | CHANNEL "C"          | CHANNEL "A"          | PMS=35<br>C1 | PMS=15<br>C2 | VIA PDP <sup>4</sup><br>C3 | BF <sub>3</sub> (SMALL) |
|-------------|----------------------|----------------------|--------------|--------------|----------------------------|-------------------------|
| X           | X                    | X                    | 873          | 310          | 3249                       | 195                     |
| X           | X                    | X                    | 1514         | 511          | 5927                       | 360                     |
| .00009 ext. | L <sup>13</sup> @ 76 | X                    | 2796         | 825          | 10240                      | 641                     |
| .00015      | L <sup>19</sup> 46   | 100/<br>200 @ 10     | 3475         | 1400         | 17271<br>287 cps           | 1077<br>17.3            |
| .00024      | X                    | X                    | 5575         | 2397         | 28742                      | 1844                    |
| .00035      | L <sup>26</sup> @ 24 | 100/<br>200 @ 26     | 8226         | 3866         | 46808                      | 3000                    |
| .0006       | 38                   | 40                   | 12109        | 6199         | 76167                      | 4891                    |
| .001        | 64                   | 69                   | 18021        | 10389        | 126822<br>3114             | 7893<br>131             |
| .0016       | 100                  | 1000/<br>200 @ 11    | 26594        | 16698        | 206947                     | 13393                   |
| .0026       | H <sup>11</sup> @ 37 | 13                   | 39039        | 27912        | 336502                     | 21559                   |
| .0043       | H <sup>13</sup> @ 70 | 30                   | 55801        | 45104        | 553830                     | 35896                   |
| .007        | H <sup>20</sup> @ 13 | 50                   | 77301        | 74091        | 894754                     | 58279                   |
| .011        | 26                   | 81                   | 102644       | 119474       | 1432671<br>23278           | 95465<br>1511           |
| .017        | 45                   | 100/<br>1500 26      | 131167       | 144802       | 2259294                    | 155717                  |
| .028        | 75                   | 43                   | 169416       | 316736       | 3510191                    | 253698                  |
| .048        | H <sup>28</sup> 17   | 71                   | 225485       | 509440       | 5226748                    | 406587                  |
| .075        | 30                   | PUT OUT<br>OF "TRIP" | 324858       | 796994       | 7300143                    | 644638                  |
| .012        | 50                   | X                    | 484168       | 1202029      | 4620422 1/2                | 473472 1/2              |
| .019        | 76                   | X                    | 708505       | 1782298      | 11311593                   | 1542351                 |

(V<sub>0</sub>, D  
58)

vml.

@ : Sel. #1 = 22.290

BLDS Alarm A = 500 MR

h<sub>N</sub> = 0.20

B = 150 MR

C = H<sup>28</sup>@ 84%

C = 150 MR

F = 620V@40%

E = 750V@10%

POWER TAKING  
SCOPE PICTURES.

264

RE-CONNECT RHOETTE & PUT ABLE IN TRIP CIRCUIT

STATIC SCOPE = 0.25

RP# 34

BUMP = 0.30

A 10:18 START BLADE = 0.43

11:00 CORE IN (ALL READOUTS NOMINAL)

11:24 EXPERIENCED "ARCING" OF ACCEL.

11:30 CORE DOWN

11:31 STOP BLADE

B 11:56 START BLADE 0.44

12:15 CORE IN (A.R. Nom.)

$h_n = .0001$  ;  $C = 11^6 @ 67$

20:10 Core Temp #1 = 31°C

21:12 Blade 0.42 VOLTS

21:45 Down , Stop Blade

Run 392 Reactivity Check

Temp #1 = 30°C #16 35°C

Rhoette = +28.7%

DATE 17 Jan 69 SAFETY CHECK

TIME 0815 AM BY TAYLOR & MINALCZO

| CHANNEL      | A                                   | B                                   | C                                   | D            | E                                   | F   |
|--------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------|-------------------------------------|-----|
| RANGE        | $10/100$                            | OPR                                 | 6-76                                | $\sqrt{10}$  | 900                                 | 900 |
| SOURCE DIST. | 2"                                  | OK                                  | 24"                                 |              | 2"                                  | -   |
| % F. S. TRIP | 100                                 | -                                   | 100                                 |              | 100                                 | -   |
| BLDG. ALARM  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |              |                                     |     |
| AUX CTRS.    |                                     |                                     |                                     |              |                                     |     |
| SOURCES USED | <u>M227 &amp; 1</u>                 |                                     | <u>WADRES</u>                       |              | <input checked="" type="checkbox"/> |     |
| TABLES       | <input checked="" type="checkbox"/> | LIGHTS                              | <input checked="" type="checkbox"/> | AREA CLEARED | <input checked="" type="checkbox"/> |     |

\* OUTZ

U = 87 1/16

Reload to delayed critical (←)

.27 V on BLADE

Loading same as Run # 372

Run # 393  
0910 ∞

Reactivity check =  $\rho + 3\lambda$  ( $\rho_{ln} = +3\lambda$  also. VISUAL RHODES @ LOW POWER.)  
Maintain D.C. with Blade.  $\rho_{ln} = .0013$ ;  $C = k^{27} @ 60$ ;  $A = 100/200 @ 77$

R<sub>2</sub>

5 min ct:  $C^1 = 31016$ ;  $C^2 = 40125$  (10:00)  
31436 39449 (10:20)

10:35 ∞

D.C.:  $\rho_{ln} = .0005$ ;  $C = k^{27} @ 22$  OR  $k^{23} @ 60$ ;  $A = 100/200 @ 31$  OR  $100/100 @ 66$   
5 MIN. CT:  $C^1 = 16649$   $C^2 = 17068$   
16508 17181

11:55 ∞

D.C.:  $\rho_{ln} = .00011$ ;  $C = k^{15} @ 60$ ;  $A = 10/200 @ 70$   
5 MIN. CT:  $C^1 = 4510$   $C^2 = 4030$   
4485 3660  
4440 4020

PS  
89

Look out Fuel is that there was 1 row in  
1-2-3-4 (Top 1/2 of 5) 6-7-8-9 = 8 1/8 Fe  
86 1/4 U  
57.8 Void



JAN 18 1969

| DATE         |         | SAFETY CHECK |       |              |      |     |                |
|--------------|---------|--------------|-------|--------------|------|-----|----------------|
| TIME         | 09:50   | AM           | BY    |              |      |     | Mihalcz + Lynn |
| CHANNEL      |         | A            | B     | C            | D    | E   | F              |
| RANGE        | 1000    | opt          | L=16  | 0            | 900  | 900 |                |
| SOURCE DIST. | 2"      | ok           | 24" U | 1"           | ok   |     |                |
| % F. S. TRIP | 90      | 1            | 100   | 7            | 100+ | -   |                |
| BLDG. ALARM  |         | ✓            | ✓     | ✓            |      |     |                |
| AUX CTFS.    |         |              |       |              |      |     |                |
| SOURCES USED | 227 + 8 | MAGNETS      |       |              |      | ✓   |                |
| TABLES       | ✓       | LIGHTS       | ✓     | AREA CLEARED |      | ✓   |                |

Penetrivity check

Run #394 Loading -  $87 \frac{11}{16} U$   
 $6 \frac{11}{16} Fe [1, 2, 3, 7, 8, 9 + 1^{st} \frac{9}{16} + Top \frac{1}{8} \# 6]$   
 $\frac{5}{8}$  Void  
 $\rho = +5.26$

395 Loading -  $87 \frac{5}{8} U$   
 $6 \frac{3}{4} Fe [1, 2, 3, 7, 8, 9 + 1^{st} \frac{9}{16} + Top \frac{3}{16} \# 6]$   
 $\frac{5}{8}$  Void  
 $\rho = +1.91 \neq$

396 Loading -  $87 \frac{5}{8} U$  Blade 0.32 Volts  
 $6 \frac{3}{4} Fe [1, 2, 3, 7, 8, 9 + 1^{st} \frac{5}{8} + Top \frac{1}{8} \# 6]$   
 $\frac{5}{8}$  Void  
 $\rho = \infty$

RP#35 10:58 Bump 0.28 Volts

DC 11:00 Start Blade 0.4 Volts

11:35 Core up

16:15 Core down, Stop Blade

Core Temp  
 #1 = 38.5°C  
 #16 = 30.5°C

Run 397 Reactivity Check - Repeat Run 396

$$\rho = -4.71 \phi$$

Loaded @ 8.25 as 8 Jan 69

8 #6

3 #6  
16

#6

30.5°C

30.2°C



JAN 20 1969 FOUND FE PUNG RAISED 3 3"

MOVED RHODETTE TO SOUTH WEST SIDE from N.W. side.  
 Run #398 VIA ACCEL. MEASURED REACTIVITY Rhodette =  
 #1 -7.77; #2 -7.39; #3 -7.49; #4 -7.59; #5 -7.46 (Ref: Pg 254)

|              |             |        |                      |              |      |      |
|--------------|-------------|--------|----------------------|--------------|------|------|
| DATE         | JAN 20 1969 |        | SAFETY CHECK         |              |      |      |
| TIME         | 1005        | AM     | BY TAYLOR & MIHALCZO |              |      |      |
| CHANNEL      | A           | B      | C                    | D            | E    | F    |
| RANGE        | 1/100       | OK     | 1/16                 | OK           | 9/10 | 9/18 |
| SOURCE DIST. | 2"          | OK     | 24"                  | OK           | 1"   | OK   |
| % F. S. TRIP | 100         | OK     | 100                  | OK           | 100  | OK   |
| BLDG. ALARM  | ✓           | ✓      | ✓                    | ✓            | ✓    | ✓    |
| AUX CTRS.    |             |        |                      |              |      |      |
| SOURCES USED | M227        | #1     |                      | MAGNETS      | ✓    |      |
| TABLES       | ✓           | LIGHTS | ✓                    | AREA CLEARED | ✓    |      |

\* "SPECIAL EFFORT"  
 IN ORDER TO TRIP.

Moved Rhodette back to usual NW position  
 Changed fuel to (88 1/2 fuel) as Pg 255, Run #379.  
 Run #399 Rhodette = +58F VIA "SWEEP"

(19)

RP#36 STATIC = 0.29 VOLTS ON Scope  
 "Bump" = 0.27

- A 10:38 START Blade: 0.39
- 10:56 Core In (Readouts are norm.)
- 11:32 Core down STOP Blade
- B 11:48 START Blade 0.34 VOLTS.
- 11:55 Core In

Am = 1.0001; C = L17 @ 1/2; A = 100/50 @ 34/38

11:52 Core down, STOP Blade [To GAS up]

Core Temp #1 = 31.5°C

20:02 Start Blade

0.34 Volts

20:08 Core up

Log N = 000115 C = 750 L-17

A = 380 @  $\frac{100}{50}$

21:30

Log N = 00007

C = 450 L-17

A = 240 @  $\frac{100}{50}$

Core Temp #1 = 32°C

JAN 21 1969 00:11 Core Down, Stop Blade

EFFORT  
TRIP.

#  
m. 379.

| SAFETY CHECK |             |        |              |                |     |     |
|--------------|-------------|--------|--------------|----------------|-----|-----|
| DATE         | JAN 21 1969 |        |              |                |     |     |
| TIME         | 0900        | AM     | BY JCT & JIM |                |     |     |
| CHANNEL      | A           | B      | C            | D              | E   | F   |
| RANGE        | 10/1000     | OPR    | L-16         |                | 900 | 900 |
| SOURCE DIST. | 2"          | OK     | 24"          |                | 1"  | OK  |
| % F. S. TRIP | 100         | OK     | 100          |                | 100 |     |
| BLDG. ALARM  | ✓           | X      | ✓            |                |     |     |
| AUX CTRS.    | ✓           | ✓      | ✓            |                |     |     |
| SOURCES USED | M227 & J    |        |              | MAGNETS ✓      |     |     |
| TABLES       | ✓           | LIGHTS | ✓            | AREA CLEARED ✓ |     |     |

\* WOULD NOT  
TRIP.

0830 "HIGH HIPTED" SORA Fe TO OUTSIDE OF FENCE. TO

BE DISCARDED AS PER U.S. CUSTOMS. SEE WCT.

Run #400 Reactivity Check via "Sweep"

Rhett = +55¢

up]

270

R.P.#37 "BUMP" = 0.30 VOLTS.

A 09:34 START BLADE 0.42V.

40MSBL 09:50 CORE IN (ALL REBOOTS NOMINAL).

10:32 START PDP4 DATA

10:35 START ROSSI-ALPHA DATA.

LN: "JUST OFF PEG"; C=L17@31 OR L14@72; A=<sup>100</sup>/<sub>25</sub>@42.

10:47 Core down; Stop Blade

B 10:53 Start Blade 0.40V.

11:14 Core In (A.R.N.)

LN=X; C=L14@<sup>50</sup>58; A=<sup>100</sup>/<sub>25</sub>@<sup>23</sup>28

SORA FE WAS PICKED UP @ ~ 1300 HRS FOR DISPOSAL.

Core Temp = 31.5°C

18:39 Log N = .00013 Via Accel. "C" = 55 @ L-19

18:40 ~~Stop~~ Blade Power Off "A" = 16 @ <sup>1000</sup>/<sub>25</sub>

19:20 Core down

Blade @ 24 RPM

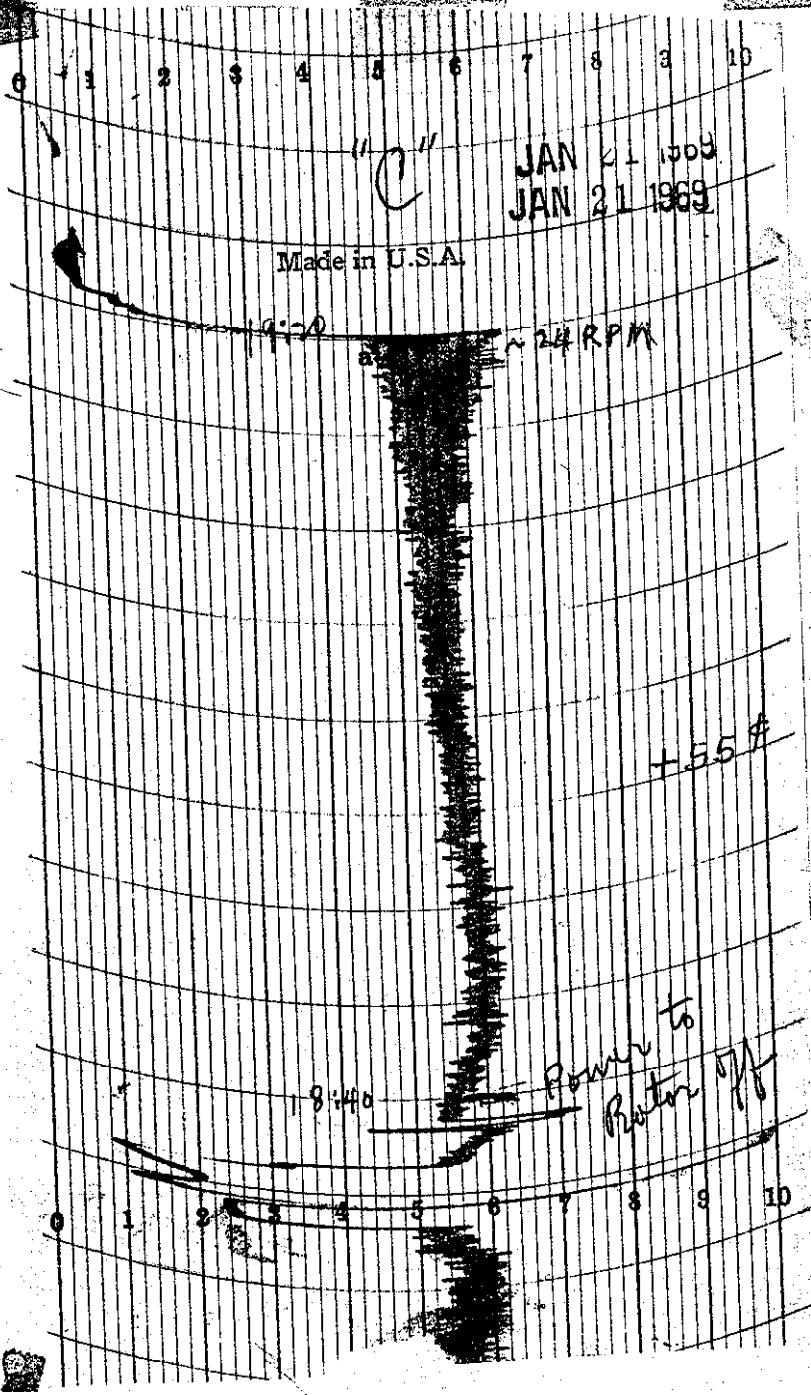
C = 46 → 64

Period = ~ 10 sec

A = 19 → 21

JAN

270



*[Faint, illegible handwritten notes on the right side of the page]*

Run #401

Reactivity Check

Core Temp #1 = 32°C

Reprod: 400

#16 = 29°C

#12 = 28°C

$P = +52.0 \phi$   
 $P = +53.0 \phi$  Blade Sweep

Run #402

Loading -  $88 \frac{3}{16} U \cong +32 \phi$

$6 \frac{3}{16} Fe$

1, 2, 7, 8, 9,  
1st 1/2 #3 + 1st 1/2 #6 + 1st 1/2 #6

Core Temp #1 = 29.0°C

#16 = 29.5°C

#12 = 26°C

(22)

void #58  
5/8

$P = +32.0 \phi$   
 $+31.8$   
 $+31.3 \phi$  }  $+31.7 \phi$

Blade Sweep

RP #38

20:34

Bump 0.27 Volts

20:36

Start Blade

0.42 Volts (21:16)

20:51

Core up

"C" = 40 @ L-17

JAN 22 1969

01:20 Core down, stop

Core Temp #1 = 31.5°C

#16 = 33°C

#12 = 27.5°C

|              |             | SAFETY CHECK         |        |   |   |     |     |
|--------------|-------------|----------------------|--------|---|---|-----|-----|
| DATE         | JAN 22 1969 |                      |        |   |   |     |     |
| TIME         | 0800 AM     | BY JET & JTM         |        |   |   |     |     |
| CHANNEL      |             | A                    | B      | C | D | E   | F   |
| RANGE        |             | $\frac{10}{100}$ OPR | L-16   |   |   | 900 | 900 |
| SOURCE DIST. |             | 2"                   | OK 24" |   |   | 1"  | -   |
| % F. S. TRIP |             | 100                  | OK 100 |   |   | 100 | -   |
| BLDG. ALARM  |             | ✓                    | No     | ✓ |   |     |     |
| AUX CTRS.    |             |                      |        |   |   |     |     |
| SOURCES USED | mms & h     | MAGNETS              |        |   |   | -   |     |
| TABLES       | -           | LIGHTS               |        |   |   | ✓   |     |
|              |             | AREA CLEARED         |        |   |   | ✓   |     |

Run #403 Reactivity check  
 Rho<sub>eff</sub> = +34.0%

2894

Change fuel loading to 86 1/4 fuel as page 265  
 FE = 1-2-3-4-(TOP 1/8#5)-6-7-8-9 & (5/8 VOID #58).

POT "NEW" D<sub>2</sub> BOTTLE ON REEL.

(24)

RP#39 "BUMP" 0.28 VOLTS

09:12 START BLADE 0.41

09:37 Core In (A.R.N.)

C = K4@50 ; A = 10/100@52 , h<sub>0</sub> = X

11:15 tc#1 = 29°C ; Tc#12 = 28°C ; Tc#16 = 30°C

14:19 Bunted out PDP4 & TMC ; SCOPE = 0.40 volts.

→ 17:53 Core down, Stop [To Gas up]

18:02 Start Blade.

18:13 Core up

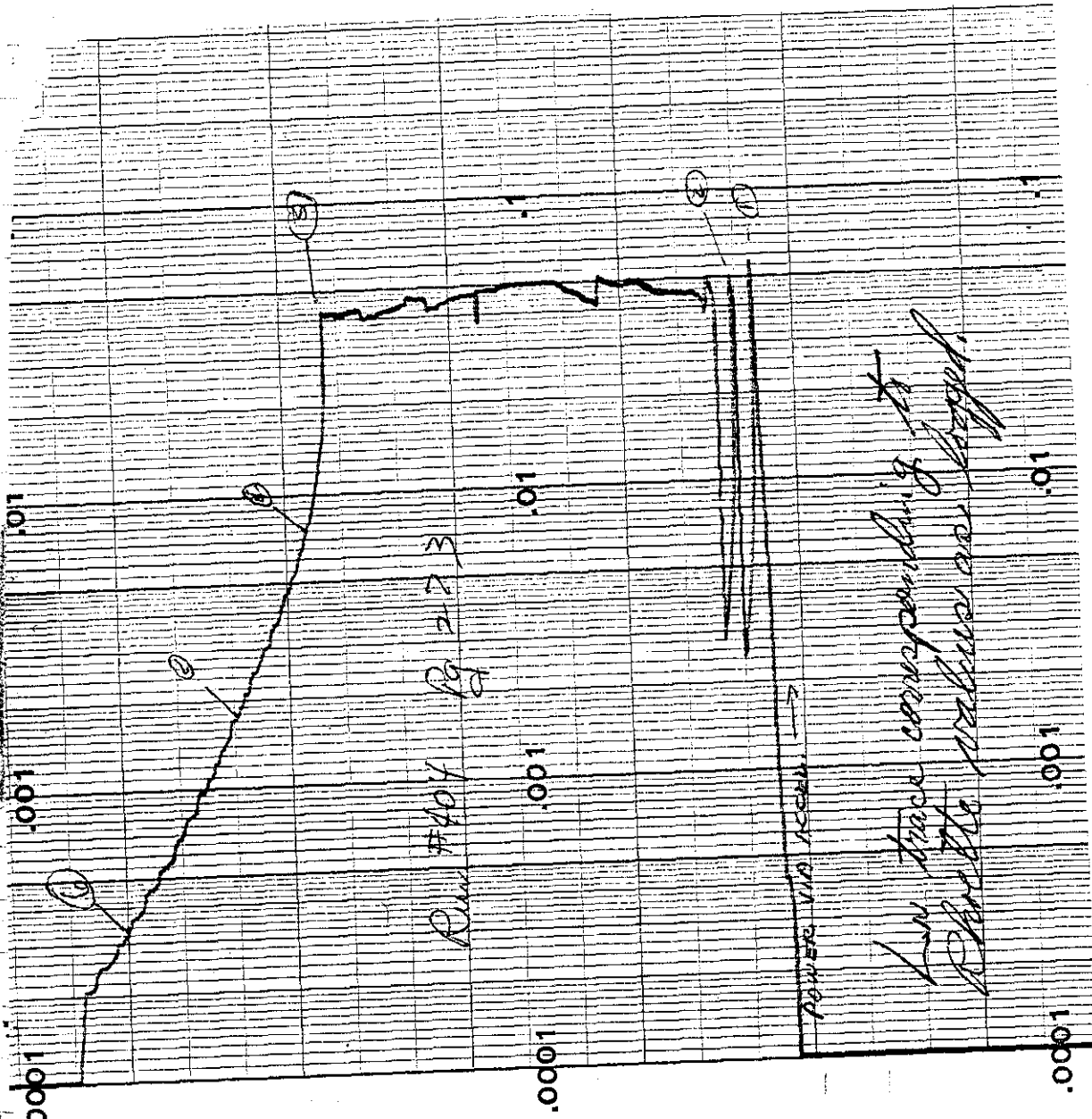
18:35 Core down, Stop [To wrap core counter]

19:00 Start Blade, 1906 Core up.

JAN 23 1969 01:19 Core down, Stop

Tc#2 & 12 switched

tc#1 = 26°C  
 tc#16 = 26°C  
 tc#12 = 26°C



Low trace corresponding to  
 Photo values are log<sub>10</sub>.

| DATE         |      | SAFETY CHECK |     |           |   |              |     |
|--------------|------|--------------|-----|-----------|---|--------------|-----|
| TIME         | 0910 | AM           | BY  | JRT & JTM |   |              |     |
| CHANNEL      |      | A            | B   | C         | D | E            | F   |
| RANGE        |      | 10/1000      | OPR | k-16      |   | 900          | 500 |
| SOURCE DIST. |      | 2"           | OK  | 24"       |   | 1"           | -   |
| % F. S. TRIP |      | 100          | OK  | 100       |   | 100          | -   |
| BLDG. ALARM  |      | ✓            | NO  | ✓         |   |              |     |
| AUX CTRS.    |      |              |     |           |   |              |     |
| SOURCES USED |      | M227         | +   | k         |   | MAGNETS      | ✓   |
| TABLES       |      | ✓            |     | LIGHTS    | ✓ | AREA CLEARED | ✓   |

MOVED Rhoette to SW position

Run #404 Reactivity checks:

Rhoette = ① -91.5<sup>+</sup> ② -90.5<sup>+</sup> ③ -90.9<sup>+</sup> ④ -90.3<sup>+</sup> (2x10<sup>-9</sup>)  
 ⑤ -90.0<sup>+</sup> (5x10<sup>-10</sup>) ⑥ -81.2<sup>+</sup> (5x10<sup>-11</sup>)

NOTE: ① & ②: Bring accel. up fast (while printing) and cut off the source. ③ Do after a 5 min. at power. ④ ⑤ ⑥ are just print continuation as level drops. (see p.276)

Run #405

10:00 Core up for various PDP4 checks by JTM.

10:51 PDP4 <sup># TIME</sup> taking data. (STATIC)

C: 114 @ 92; A: 100 @ 46

14:45 Core down.

Changed Fuel to (<sup>83/8</sup> ~~83/8~~ Fuel) as pg 257

Run #406 Reactivity check

Rhoette = ① <sup>#</sup> -2.24 ② <sup>+</sup> -2.22 ③ <sup>#</sup> -2.18 ④ <sup>#</sup> -2.17 ⑤ <sup>#</sup> -2.13



274

15:35 Core In for "Static" meas.  
 18:30 Core down

RP #40

18:36 Bump  
 18:38 Start Blade 0.4 volts  
 18:42 Core up

24 Jan 69 00:42 Core Down, Stop

Core Temp #1 - 31°C  
 #2 - 31°C  
 #16 - ?

| DATE JAN 24 1969 |           | SAFETY CHECK |              |              |     |     |   |
|------------------|-----------|--------------|--------------|--------------|-----|-----|---|
| TIME             | 0830      | AM           | BY JRT & NTM |              |     |     |   |
| CHANNEL          | A         | B            | C            | D            | E   | F   |   |
| RANGE            | $10/1000$ | OPR          | h-16         | /            | 900 | 900 |   |
| SOURCE DIST.     | 2"        | OK           | 24"          | /            | 1"  | -   |   |
| % F. S. TRIP     | 100       | OK           | 100          | /            | 100 | -   |   |
| BLDG. ALARM      | ✓         | OK           | ✓            | /            |     |     |   |
| AUX CTRS.        |           |              |              | /            |     |     |   |
| SOURCES USED     | M227 & h  |              |              | MAGNETS      |     |     | ✓ |
| TABLES           | ✓         | LIGHTS       | ✓            | AREA CLEARED |     |     | ✓ |

23

FUEL Change to  $\infty$  =  $87\frac{5}{8}$  fuel as pg 266

Run # 407 Channel C =  $\approx$   $1/2^+$  neg. Core In 09:45  
 Use remote source to maintain  $\infty$ .  
 Actually used "Source in" and Blade was used (very close!)

$h_{11} = .00011$  ;  $C = 2.7 @ 65$  ;  $A = 10/200 @ 60$

\$4.63

1340 Core Down.

~~RP#4~~ Changed Fuel to 80<sup>3</sup>/2 fuel as pg 251

(16)

RP#4) Bump 0.30 volts

14:30 START 0.40 v.

15:12 Core In (A.R.N.)

15:30 Experiencing accel. problems.

23:44 Stop.

Prep Core for Week end Run in.

66

0945

y. chae!)

RHOETTE LOCATED  
@ S.W. POSITION

| Fuel Loading<br>Description<br>No | FUEL    | DATE        | OF<br>MEASUREMENT | ①<br>Quick         | ② ↓<br>Quick        | ③<br>AFTER<br>SMIN<br>@<br>2x10-8 | ④<br>2x10-9        | ⑤<br>5x10-10       |
|-----------------------------------|---------|-------------|-------------------|--------------------|---------------------|-----------------------------------|--------------------|--------------------|
| 265                               | 86 1/4  | JAN 23 1969 | 404               | -91.5 <sup>4</sup> | -90.5 <sup>4</sup>  | -90.9 <sup>4</sup>                | -90.3 <sup>9</sup> | -90.0 <sup>4</sup> |
|                                   |         | JAN 27 1969 |                   | -91.1              | -89.4               | -89.4                             | -91.2              | -94.1              |
| 257                               | 83 1/8  | JAN 23 1969 | 406               | -2.24              | -2.22               | -2.18                             | -2.17              | 2.13               |
|                                   |         | JAN 27 1969 |                   | -2.14              | -2.21               | -2.17                             | —                  | 2.10               |
| 266                               | 87 5/8  | JAN 24 1969 | 407               | <del>—</del>       | <del>—</del>        | <del>—</del>                      | <del>—</del>       | <del>—</del>       |
|                                   |         | JAN 27 1969 |                   | -1.8 <sup>4</sup>  |                     |                                   |                    |                    |
| 251                               | 80 3/8  | JAN 27 1969 | 408               | -4.67              | -4.63               | -4.45                             | —                  | 4.32               |
| 252                               | 73 3/8  | JAN 27 1969 |                   | -10.82             | -10.82              | -10.46                            | —                  | -10.20             |
| 253                               | 77 3/8  | JAN 27 1969 |                   | -7.60              | -7.60               | -7.24                             | —                  | -7.07              |
| 251                               | 85 3/8  | JAN 27 1969 |                   | -1.54              | -1.54               | -1.51                             | —                  | -1.49              |
| 257                               | 85 7/8  | JAN 27 1969 |                   | -1.08              | -1.08               | -1.11                             | -1.08              | -1.09              |
| 262                               | 88 1/16 | JAN 27 1969 |                   | —                  | +34.84 <sup>9</sup> | +34.24 <sup>4</sup>               |                    |                    |
| 255                               | 88 1/2  | JAN 27 1969 |                   |                    | +58.8 (avg of 3)    | 31.9<br>34.3                      |                    | trans              |

13

276

JAN 2

276

JAN 27 1969

| SAFETY CHECK |                                     |                                     |                                     |                          |                          |                                     |
|--------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| DATE         | JAN 27 1969                         |                                     |                                     |                          |                          |                                     |
| TIME         | 09:00                               | AM                                  | BY                                  | Taylor & Lynn            |                          |                                     |
| CHANNEL      | I                                   | D                                   | D                                   | E                        | F                        |                                     |
| RANGE        | $\frac{10}{1000}$                   | opt                                 | 16                                  | 100                      | 900                      | 900                                 |
| SOURCE DIST. | 3"                                  | OK                                  | 24"                                 | 2"                       | 1"                       | OK                                  |
| % T. S. TRIP | 100                                 | -                                   | 100                                 | 100                      | 100+                     |                                     |
| BLDG. ALARM  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| AUX GTS.     | _____                               |                                     |                                     |                          |                          |                                     |
| SOURCES USED | _____                               |                                     |                                     | MAGNETS                  |                          | <input type="checkbox"/>            |
| TABLES       | <input checked="" type="checkbox"/> | LIGHTS                              | <input checked="" type="checkbox"/> | AREA CLEARED             |                          | <input checked="" type="checkbox"/> |

Run #408 Reactivity Check 80<sup>3</sup>/<sub>8</sub> fuel. exp. 251

5/8 void #58 for all runs this page.

Changed fuel loading to -760 (77<sup>3</sup>/<sub>8</sub> fuel) <sup>exp. 253</sup>  
 Propped Core Up, blade max. used Cmp. Source  
 for PDP 4 Rossi Alpha overnight run.  
 Start Dms @ 1618 hrs.

(13)

278

JAN 28 1969

| DATE JAN 28 1969 |                                     | SAFETY CHECK                        |                                     |                  |                                     |                                     |  |
|------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------|-------------------------------------|-------------------------------------|--|
| TIME             | 12:40                               | AM                                  | BY Taylor + Lynn                    |                  |                                     |                                     |  |
| CHANNEL          | A                                   | D                                   | C                                   | D                | E                                   | F                                   |  |
| RANGE            | $\frac{10}{1000}$                   | opr                                 | L-16                                | $\frac{1}{1000}$ | 900                                 | 900                                 |  |
| SOURCE DIST.     | 4"                                  | OK                                  | 24"                                 |                  | 2"                                  | OK                                  |  |
| % T. S. TRIP     | 100                                 |                                     | 100                                 | ?                | 100+                                |                                     |  |
| BLDG. ALARM      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | X                                   |                  |                                     |                                     |  |
| AUX. CTFS.       |                                     |                                     |                                     |                  |                                     |                                     |  |
| SOURCES USED     | 227 + 8                             |                                     | MAGNETS                             |                  | <input checked="" type="checkbox"/> |                                     |  |
| TABLES           | <input checked="" type="checkbox"/> | LIGHTS                              | <input checked="" type="checkbox"/> | AREA CLEARED     |                                     | <input checked="" type="checkbox"/> |  |

|                             |       |     |      |
|-----------------------------|-------|-----|------|
| CA                          | Expr. | Run | 409  |
|                             | Date  | 19  | Time |
| Purp - 235 Foil - RADIAL AT |       |     |      |
| MID PLANE,                  |       |     |      |

Added sheet  
cd around "A"

Normalizing Foil @  $\frac{3}{4}$  position in Hole 48.

Run #409 Loading -  $87\frac{5}{8}$  u  
 $6\frac{3}{4}$  Fe [1, 2, 3, 7, 8, 9 +  $10^{\text{th}}\frac{1}{2}$  +  $4^{\text{th}}\frac{1}{8}$  #6]  
 $\frac{5}{8}$  void #58

$$\rho = -433 \text{ ac}$$

$$- 3.2 \#$$

410 Loading -  $87\frac{3}{4}$  u  
 $6\frac{5}{8}$  Fe [1, 2, 3, 7, 8, 9 +  $10^{\text{th}}\frac{1}{2}$  +  $7^{\text{th}}\frac{1}{8}$  #6]  
 $\frac{5}{8}$  void #58

(12)

$$\rho = +2 \#$$

"A" out of trip.

Foils at mid plane -

Norm # 12 @ 3/4 Rod #48

Hole # 5 - 25 - 71 - 91 - 93 - 95 - 89 - 87 - 68 - 73 - 76 - 46 - 47 - 43 - 59

Foil # 12 - 13 - 16 - 41 - 20 - 6 - 53 - 51 - 50 - 1 - 55 - 32 - 35 - 24 - 33

Time = 23 min

LN = .28

Down at 13:46

'E' = 95 @ H-28

'E' = .5 @ Min V. (60+)

10 min after shut down 4 ft = 100 MR

Instr. at Core Contact = ~~3R~~

20 min after " " = 3.6 R

1 hr 55 min " " = 850 MR

sheet  
d "A"

# 4  
# 6

all  
#

# 6

JAN 29 1969

| DATE         |         | SAFETY CHECK |                  |              |   |      |     |
|--------------|---------|--------------|------------------|--------------|---|------|-----|
| JAN 29 1969  |         |              |                  |              |   |      |     |
| TIME         | 09:05   | AM           | BY Taylor + Lynn |              |   |      |     |
| CHANNEL      |         | A            | B                | C            | D | E    | F   |
| RANGE        | 1000    | opr          | L-16             |              |   | 900  | 900 |
| SOURCE DIST. | 15"     | OK           | 20"              |              |   | 2"   | OK  |
| % F. S. TRIP | 100     | -            | 100              |              |   | 100+ | -   |
| BLDG. ALARM  | ✓       | OK           | ✓                |              |   |      |     |
| AUX CTFS.    |         |              |                  |              |   |      |     |
| SOURCES USED | 227 + 8 |              | MAGNETS          |              | ✓ |      |     |
| TABLES       | ✓       | LIGHTS       | ✓                | AREA CLEARED |   | ✓    |     |

Run

Run 411

235 U - VERTICAL in Row 1.

Normalizer at 3/4 pos. of #48 - #3

| Hole #      | 95      | 93  | 91  | 89  |
|-------------|---------|-----|-----|-----|
| Location    | -12 #67 | #42 | #62 | #45 |
| from center | -6 10   | 4   | 5   | 22  |
| cu          | +6 57   | 26  | 48  | 28  |
|             | +12 14  | 31  | 19  | 38  |

Exp. Time = 25

log N = .280

Down = 09:48

"C" = 99 @ H-28

"E" = .4 @ min v.

"F" = 5.6 @ 625 v.

Run 412 - 235 U RADIAL AT MIDPLANE

Hole # 47-51-53-38-31-29-23-10-12-4-66-19

Foil # 60-64-70-58-9-23-54-25-39-37-71-2

Norm #30

Exp. Time = 25 min Inst same as Run 411

Down = 12:32

Run 413

235 U VERTICAL Foil Run

| Hole # | 10 | 48     | 51 | 53 | Pos. L |
|--------|----|--------|----|----|--------|
| Foil # | 13 | 49     | 56 | 36 | -12 cm |
|        | 61 | 68 ✓   | 17 | 47 | -6     |
|        | 46 | 44 (N) | 43 | 34 | +6     |
|        | 8  | 66     | 65 | 27 | +12    |

Exp Time = 25

Down = 15:11

Log N = .28

°C = 99 @ H-28

°E = .4 @ Min.

F = 56 @ 625 V.



JAN 20 1969

|              |             |        |                  |         |              |     |
|--------------|-------------|--------|------------------|---------|--------------|-----|
| DATE         | JAN 20 1969 |        |                  |         |              |     |
| SAFETY CHECK |             |        |                  |         |              |     |
| TIME         | 09:05       | AM     | BY TAYLOR + LYNN |         |              |     |
| CHANNEL      | A           | B      | C                | D       | E            | F   |
| RANGE        | 1000        | opr    | L-16             | 7       | 900          | 900 |
| SOURCE DIST. | 12"         | OK     | 30"              | 7       | 2"           | OK  |
| % F. S. TRIP | 100         |        | 100              |         | 100+         |     |
| BLDG. ALARM  | ✓           | *      | ✓                |         |              |     |
| AUX CTBS.    |             |        |                  |         |              |     |
| SOURCES USED | 227 + 8     |        |                  | MAGNETS |              | ✓   |
| TABLES       | ✓           | LIGHTS |                  | ✓       | AREA CLEARED |     |

Run 414 235 u Foil - VERTICAL  
Norm #7

| Hole # | Foil # | 22 | 24 | 26 | 20 | cm Position |
|--------|--------|----|----|----|----|-------------|
|        | 59     |    | 80 | 76 | 81 | -12         |
|        | 29     |    | 79 | 75 | 82 | -6          |
|        | 63     |    | 78 | 74 | 83 | 0           |
|        | 8      |    | 77 | 73 | 84 | +6          |
|        | 86     |    | 87 | 88 | 85 | +12         |

Exp Time = 30 min  
Down = 09:55

Log N = 0.28  
"C" = 93  
"E" = .2 @ min  
"F" = 5.0 @ 625



Run 415 235 u Foil & VERTICAL

Norm # 89

| Hole # | 12  | 19  | 29  | 76  | Location    |
|--------|-----|-----|-----|-----|-------------|
| Foil # | 90  | 93  | 96  | 99  | cm -<br>-12 |
|        | 91  | 94  | 97  | 100 | -6          |
|        | 92  | 95  | 98  | 101 | +6          |
|        | 102 | 103 | 104 | 105 | +12         |

Exp Time = 30 min

Down = 13:08

Inst - Same as Run 414

Run 416

235 u Foil Vertical

Norm # 106

| Hole # | 43  | 68  | 71  | 87  | Pos. Cm |
|--------|-----|-----|-----|-----|---------|
| Foil # | 107 | 110 | 113 | 116 | -12     |
|        | 108 | 111 | 114 | 117 | -6      |
|        | 109 | 112 | 115 | 118 | +6      |
|        | 119 | 120 | 121 | 122 | +12     |

NEGATIVE PERIOD

Log N = .2 <sup>down</sup> → .04

Time = 22 min

Down = 15:54

"C" = 96 → 18 @ # 28

1.5 mil (#9) Au foil back of  
poly in Sect 4.



284

JAN 31 1969

DATE JAN 31 1969

SAFETY CHECK

TIME 08:20

BY TAYLOR + LYNN

| CHANNEL      | S       | C      | D    | E            | F   |
|--------------|---------|--------|------|--------------|-----|
| RANGE        | 1000    | opr    | 2-12 | 200          | 900 |
| SOURCE DIST. | 12" OK  | 5'     |      | 2'           | OK  |
| % F. S. TRIP | 100     | -      | 100  | 100+         | -   |
| BLDG. ALARM  | ✓       | *      | ✓    |              |     |
| AUX. CTRS.   |         |        |      |              |     |
| SOURCES USED | 227 + 8 |        |      | MAGNETS      | ✓   |
| TABLES       | ✓       | LIGHTS | ✓    | AREA CLEARED | ✓   |

Run 417

VS Run 410

Added 7<sup>th</sup> 1/8 Fuel #6

Return of Run 416

Exp Time = 25 min

LN = .34

Down = 09:05

"C" = 94 @ H28

"E" = .4 @ Mn

"F" = 5.0625V

MOVED "EASY" TO: NEAR SOUTH WALL WITH 4" Pb  
AROUND IT. LAYING ON THE FLOOR.

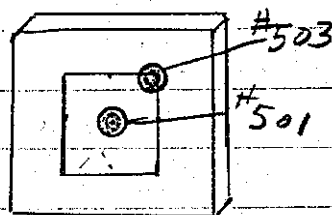
MOVED "ABLE" INTO: START OF CONFERENCE  
ROOM HALL (JUST INSIDE MAIN HALLWAY).  
IT IS STILL CD. CYD.

MOVED "FOX" TO: INSIDE CONTROL ROOM ON THE  
FLOOR 4 FT FROM THE CORNER.

MADE SOURCE "SCRAM" CHECK OF THE ABOVE ALL OK.  
DOG; CHARLIE, BAKER ARE NOT IN TRIP CIRCUIT.

Run 418 - Test Look Run For Au Foil Exp.

2 - 5 mil Au Foils Behind Poly  
of Sect 4.



Exp. Time = 10 min  
down = 18:59

$$\text{Log } N = .6$$

$${}^cA = 46 \frac{100}{100}$$

$${}^cE = .1 @ 660 \text{ V.}$$

Foils Bare - #501 = 7050 CPM }  
#503 = 8100 CPM } 18 min  
after shutdown

JAN

1969

## High Power Run

4B + 5B = Bare, 4C + 5C = Cd Covered.

Au Foil - .005" x 1/2" dia, <sup>From</sup> Fred Haywood

Behind POLY OF SECT 4.

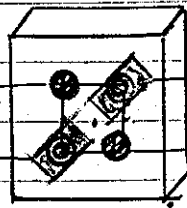
Crit = 15:33

15B

5B

4C

712



15C

5C

4B

655

Exp Time = 35 min

Down = 17:08

At Controls = 20 MR/HR

Log N = 4.2

"A" = 56 @  $\frac{1000}{100}$ 

"E" = 2.0 @ 660V

"F" = 1.5 @ 850V

Bldg Alarm

"A" = 8.5K

"B" = 23.0K

"C" = 8.5K

TC #1 = 36.5°C

#16 = 39.0°C

Top of Fuel #60

Center " #60

|        |                |                                         |
|--------|----------------|-----------------------------------------|
| Set #4 | Thermal N flux | $3.74 \times 10^{11}$ N/cm <sup>2</sup> |
| #5     | "              | $4.86 \times 10^{11}$ "                 |

3 Feb 69

Center Fuel Rod (#48), 666 gms to Chem. for analysis. (pc #I 24cm)

11 Feb 69.

235 U Thermal Fission Yield =  $1.93 \times 10^{14}$ 

RU

B

Center Fuel #48

FEB 3 1969

| DATE FEB 3 1969 |             | SAFETY CHECK |                  |
|-----------------|-------------|--------------|------------------|
| TIME            | 11:65       | AM           | BY Taylor + Lynn |
| CHANNEL         | A B C D E F |              |                  |
| RANGE           | 1000        | opr L-5      | 900 900          |
| SOURCE DIST.    | 15"         | OK 48"       | 2" ok            |
| % F. S. TRIP    | 100         | 100          | 100+             |
| BLDG. ALARM     | ✓           | ✓            | ✓                |
| AUX CTPS.       |             |              |                  |
| SOURCES USED    | 227 + 8     | MAGNETS      | ✓                |
| TABLES          | ✓           | LIGHTS       | ✓                |
|                 |             | AREA CLEARED | ✓                |

Bldg Alarms Checked by E.R.R. Before Run

Run 419

High Power Run

Fails as shown in Red p. 286

15B + 712 = Bare 15C + 655 = Cd Covered

Inst as p. 285

Trip on "E" @ <sup>Log N</sup> 5.5

Log N = 4.3 (average) for 2 min ending 1218 hrs

Run 420

Removed 7<sup>th</sup> 1/8 Fuel #19

Added more Shielding to "E"

Log N = 4.3

"A" = 70.5  $\frac{1000}{100}$

"E" = 60 @ min

Bldg. Alarms

"A" = 10.1 K

"B" = 10.1 K

"C" = 10.1 K

Time = 41 min

Down = 13:34

TC #1 = 41°C

#16 = 44°C

H.P. checked air monitor and found reading to be below tolerance.

J.T. Mihalczo - STARTED LEAVE TO ATTEND SCHOOL

d.  
2d  
d  
vered  
bare

m  
K  
K  
K

m<sup>2</sup>  
v.  
14

Center Fuel #48 made up of 2-6 cm pps (#11 and #81 = 670gms) (335.4 gms + 334.8 gms)

| DATE FEB 7 1969 |            | SAFETY CHECK |              |              |             |   |                                                               |
|-----------------|------------|--------------|--------------|--------------|-------------|---|---------------------------------------------------------------|
| TIME            | 0940       | AM<br>PM     | BY JRT & JWL |              |             |   |                                                               |
| CHANNEL         | A          | B            | C            | D            | E           | F |                                                               |
| RANGE           | 10/1000 OK | OR           | L-5          | X            | 900v. 990v. |   |                                                               |
| SOURCE DIST.    | 15" OK     | ?            |              |              | 2" OK       |   | "A" + "D" in<br>paraffin pigs.<br>out of<br>trip for this run |
| % F. S. TRIP    | 100        |              | 100          | 0            | 100         | ✓ |                                                               |
| BLDG. ALARM     | ✓          | ✓            | ✓            | 0            |             |   |                                                               |
| AUX CTRS.       |            |              |              |              |             |   |                                                               |
| SOURCES USED    | M227 & b   |              | MAGNETS      |              | ✓           |   |                                                               |
| TABLES          | ✓          | LIGHTS       | ✓            | AREA CLEARED | ✓           |   |                                                               |

235 u Foil Exposure.

Run 421 Loading - 87 5/8 u

6 3/4 Fe [1, 2, 3, 7, 8, 9 + 10<sup>th</sup> 1/2 + 4<sup>th</sup> 1/4 #6  
5/8 Void #58 #6

VERTICAL IN FUEL #48

|          |      |      |          |      |          |      |      |
|----------|------|------|----------|------|----------|------|------|
| Position | -6   | , -3 | , -1 1/2 | , 0  | , +1 1/2 | +3   | , +6 |
| Foil #   | 123, | 124, | 125,     | 126, | 127,     | 128, | 129  |

#130 at +12 cm Fuel #43

P = -2 #

422 Loading - 87 3/4 u

6 5/8 Fe [1, 2, 3, 7, 8, 9 + 10<sup>th</sup> 1/2, 13<sup>th</sup> 1/4 + 16<sup>th</sup> 1/6 #6  
5/8 Void

Exp. Time = 28 min

Log N = .25

Down = 11:38

"E" = .4 @ min.

"F" = 5.7 @ 650V  
6.5 at shut down



FEB 11 1969

Removed all Fe to the floor. Inst. were taken down and North Housing was removed. "Be Smear" was taken of the inside area of the housing and the PHIDE.

FEB 12 1969

\* Removed Blade and cleaned and wrapped. Bill Everett reports "Be Smears" O.K.

FEB 13 1969

Took 2 TITANIUM RODS TO RITTENHOUSE @ 4500 S. Took Blade & Bolts to O.J. Smith in Bldg 2000 to be inspected, also returned previous "x Ray" pictures to him. Stems were checked and given tagged for destination.

FEB 14 1969

Received data from Fred Hayward on High Power Runs Jan 31 & Feb 3, 1969. i.e. Bare & cd. vid fails of gold.

Jan. 31, 1969 Run:  $T$  5B vs 5C =  $4.81 \times 10^{-12}$  Flux  $N/cm^2$

$B$  4B vs 4C =  $3.89 \times 10^{-12}$

$L$  5B vs 4C =  $4.66 \times 10^{-12}$

$R$  4B vs 5C =  $4.04 \times 10^{-12}$

Feb 3, 1969 Run:  $T$  15B vs 15C =  $7.73 \times 10^{-12}$   $N/cm^2$

$B$  655 vs 712 =  $6.76 \times 10^{-12}$

$R$  655 vs 15C =  $7.32 \times 10^{-12}$

$L$  15B vs 712 =  $7.19 \times 10^{-12}$

Bare/cd ratio of Erete =  $2.276 \pm 0.122$

\* All bolts "broke" their hold at 250 ft lbs  $\pm 10$ .

FEB 25 1969

Verbal report from O.J. Smith: O&R blade went thru same inspection as before. There was no detectable change of any kind.

- Returned Blade and bolts to 9203. Also X-Ray<sup>B</sup> B.T.

FEB 26 1969

FISSION Analysis: Jan 31, 1969  $1.93 \times 10^{14}$  (ref pg 286)

FEB 3, 1969

 $3.20 \times 10^{14}$ 

AS PER ED WYATT OF X-10.

SEP 10 1970

All SORA fuel returned to  
Y-12 ( Bldg 9212, E wing, J. McNabb)

To B.T.  
9286)

308  
A-31701-80

GLYPTAL 1201 Red

SILASTIC RTV 731 Gen. St. Y12 (07-480-0635)

POLAROID 4x5 POS/NEG. Chem Y12 Land Film Packets  
TYPE 55P/N

50-50 Solder 07-571-4621 Gen. St. Y-12

flux 07-566-2500

Thermon 01-012-1710

(has high heat transfer properties) Use on

Cu coils for cooling.

Red Brush 02-082-2000

Blade Speed

0 - 3596 RPM

90 sec ~ 1800 "

23 min ~ 60 "

746 W = 1 HP

7 - 4,25

29  
28  
32  
24  
31

1961  
b1  
6  
162  
2  
81  
14  
56

8 1/2 h

881  
02  
891

8 1/2 h  
8 1/2 h -  
8 1/2 h  
8 1/2 h

8

3 1/2

4

3

(4)

16812

(40)

9

(5)

(5)

66,821  
- 1,336  
65,485

66,115  
65,485  
630 gms -

5 5  
5 5

40 AC 5mc

---

10 B 5mc

---

10 MC

24 cm = 9.45"

